HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Ph-0172-577870-73, Fax No. 2581201
E-mail: hspcbhazardouswaste@gmail.com

HSPCB/YMN/2021/ Dated: 30/12/2021

To

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

Sub: Regarding conducting of Public hearing as per submission of Draft EIA/EMP report for "Capacity Expansion for Formaldehyde Manufacturing unit with the existing production capacity 60 TPD to 150 TPD at village Jathlana, District Yamuna Nagar, Haryana by M/s Pahwa Plastic - Reg.

I have been directed to enclose herewith an advertisement regarding Public hearing to be held on **02.02.2022 at 11.00 AM** at M/s Pahwa Plastic situated at Village Jathlana, District Yamuna Nagar, Haryana regarding conducting of Public hearing for Environmental Clearance for " Capacity Expansion for Formaldehyde Manufacturing unit with the existing production capacity 60 TPD to 150 TPD at village Jathlana, District Yamuna Nagar, Haryana by M/s Pahwa Plastic in compliance with EIA notification dated 14th September,2006 for publication in the following leading newspapers on DAVP rates:-

1. One major national daily newspaper.
2. One Regional vernacular daily Newspapers in Hindi.

This advertisement should appear on or before 31.12.2021 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 newspapers only.

Endst. No. HSPCB/YMN/2021/ Dated: 30/12/2021

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

1. The Deputy Commissioner, Yamuna Nagar.
2. The Chairman Zila Parishad, Yamuna Nagar.
3. The Joint Director, District Industries Centre, Yamuna Nagar
4. The Secretary, Municipal Committee, Jagadhri, Distt. Yamuna Nagar.

DA/Advertisement

Endst. No. HSPCB/YMN/2021/ Dated: 30/12/2021

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

1. Regional Officer, Haryana State Pollution Control Board, Yamuna Nagar. You are asked to send the copy of EIA report and Executive Summary and CD to the concerned authorities mentioned above to place the same in their offices for consultation of the general public during office hours.
2. M/s Pahwa Plastic, Village Jathlana, District Yamuna Nagar, Haryana.
3. Sr. EE (IT), to ensure that the notice is uploaded on the website of the Board.

Endst. No. HSPCB/YMN/2021/ Dated: 30/12/2021

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

1. The Additional Chief Secretary to Govt. of Haryana, Environment and Climate Change Department, Haryana, Chandigarh.
2. The Director, Environment and Climate Change Department, Haryana.

Endst. No. HSPCB/YMN/2021/ Dated: 30/12/2021

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

1. Administrative officer-cum PS to Chairman.
2. PA to Member Secretary.

DA/Advertisement

Signed by Naveen Gulia
Date: 30-12-2021 11:45:57
Reason: Approved

Sr. Environmental Engineer (HQ)
For Member Secretary

HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Ph- OI72 -2577870-73, Fax No. 2581201
E-mail: hspcbhazardouswaste@gmail.com

Notice for Public Hearing

It is for the information of all concerned regarding conducting the Public Hearing for considering grant of Environmental Clearance for the existing unit named M/s Pahwa Plastic situated at Village Jathlana, District Yamuna Nagar, Haryana, established for manufacturing of Formaldehyde under the violation category, as the unit was established without necessary prior Environmental Clearance, thus violating the provisions of EIA Notification, 2006, existing production capacity 60 TPD to 150 TPD.

The project is covered under the category A of item 5 (f) "Synthetic Organic Chemicals" of the schedule to the EIA notification dated 14th September 2006, issued by Ministry of Environment, Forests and Climate Change, Govt. of India, New Delhi, requiring prior EC from Expert Appraisal Committee, MoEF&CC, and thus Environmental Clearance is mandatory for the project and its expansion. The project proponent will be liable to comply with the conditions / penalty / prosecution action, as imposed / provided by Government of India or any competent agency in this regard.

The project proponent has applied to the authority for Environmental Clearance for the existing unit under violation category and for expansion as mentioned above, and the public hearing has been fixed on **02.02.2022 at 11.00 AM** onwards at the factory site.

Copies of executive summary of the project report and EIA study report, submitted by the project proponent, are available in the Head Office of the Board and on the website of the Board i.e. https://hspcb.gov.in/ as well as in the following offices, which can be perused during office hours, on any working day:-

1. Deputy Commissioner, Yamuna Nagar.
2. Regional Officer, Yamuna Nagar, Haryana State Pollution Control Board, SCO 131/ 17, HUDA Jagadhari.
3. Chairman Zila Parishad, Yamuna Nagar.
4. Executive Officer, Municipal Council, Yamuna Nagar.
5. Joint Director, District Industries Centre, Yamuna Nagar.

Notice is hereby given to all concerned to file suggestions, views, comments and objections, if any, on the above said proposed project, to the Chairman, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula as well as Regional Officer, Yamuna Nagar, Haryana State Pollution Control Board, SCO 131/ 17, HUDA Jagadhari 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 Environmental Groups, bonafide residents 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.

S Narayanan, IFS
Member Secretary

1097401/2021/Estt.Br

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

Date:23.08.2021

To,
The Member Secretary,
Haryana State Pollution Control Board
C-11, Sector-6, Panchkula, Haryana

Subject: Submission of Draft EIA/EMP report for "Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State Haryana" by **M/s Pahwa Plastics Pvt. Ltd.-Reg. Public Hearing**

Reference: ToR Letter No. IA-J-11011/185/2020-IA II (I) dated 20th July 2021

Respected Sir,

This is in reference to the aforesaid subject we are hereby submitting the Draft copies of EIA/EMP report for conducting Public Hearing process as per EIA notification dated 14th September 2006 for M/s Pahwa Plastics Pvt. Ltd.at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State Haryana. We want to draw your kind attention that MoEF&CC has grant Terms of Reference vide letter no ToR letter IA-J-11011/185/2020-IA II (I) Dated 20th July 2021 for preparation of EIA/EMP report.

Accordingly we have prepared the Draft EIA-EMP Report incorporating all the ToR points and are submitting the following documents

1. Hard& Soft copy of Draft EIA-EMP Report
2. Hard & soft copy of Executive Summary of EIA-EMP in English
3. Public Hearing fee **Rs.50,000/-** (Draft No. 002035 dated 23/08/2021, HDFC BANK LTD.) in favor Member Secretary, Haryana State Pollution Control Board, Panchkula, Haryana.

You are therefore requested that the receipt of this letter along with Draft EIA/EMP Report may kindly be acknowledged and kindly fix a schedule for conducting public hearing at the earliest in case of above.

Yours Truly

M/s Pahwa Plastics Pvt. Ltd.

Authorized Signatory

PAHWA PLASTICS PVT. LTD. * KARNAL *

Corporate Office: 8A/1, 1st FLOOR MANGOLPURI INDL. AREA, PHASE-II, DELHI-110034
PHONE NO.: 011-27024410-5510, 5520
E-mail: form@pahwaplastics.co.in

Works: KHASRA NO. 10//7, VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

HDFC BANK

A/C PAYEE ONLY
NOT NEGOTIABLE

DEMAND DRAFT
VALID FOR 3 MONTHS ONLY
PAYABLE AT PAR AT ALL BRANCHES OF HDFC BANK LTD

1097401/2021/Estt.Br

2 3 0 8 2 0 2 1

HARYANA STATE POLLUTION CONTROL BOARD

SESHAASAI(C) / CTS-2010

ON DEMAND PAY **Or Order**
अदा करे या उनके आदेश पर

Rupees FIFTY THOUSAND ONLY.
रुपये

₹ *50,000.00

FC

FOR VALUE RECEIVED
PAHWA PLASTICS PVT LTD

SARASWATI VIHAR - PITAM PURA
NEW DELHI - 110034

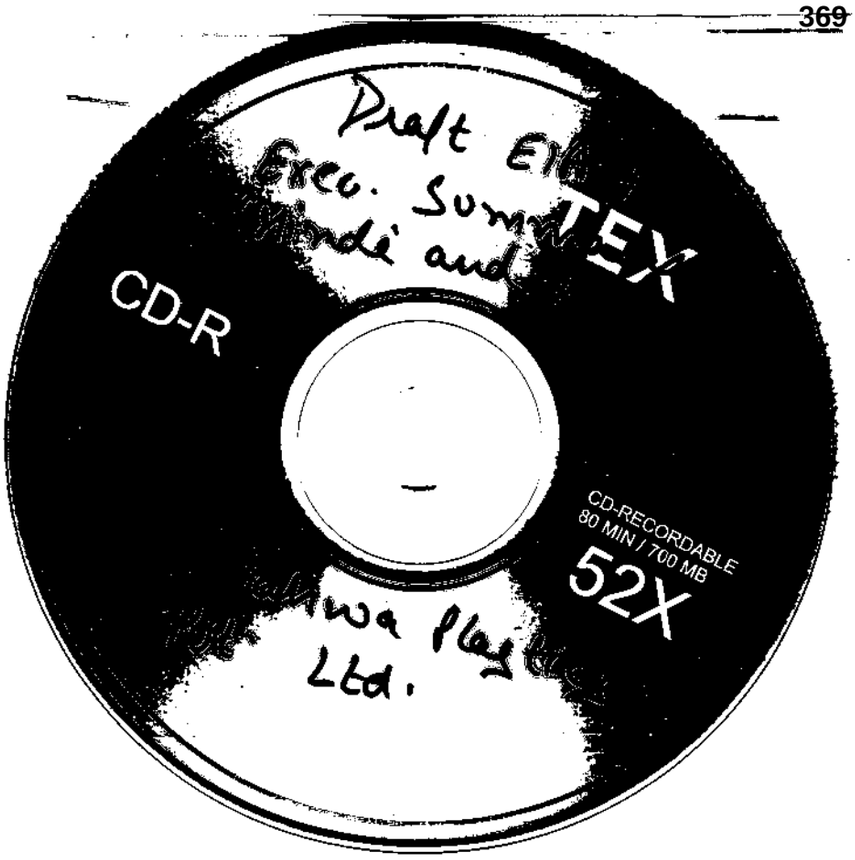
For HDFC BANK LTD.

REF. No. 156513002368

ISSUING BRANCH

AUTHORISED SIGNATORIES
Please sign above

"002635" 110240180": 999990" 16


Draft Eff
Exec. Sum
Mondi and
TEX
CD-R
CD-RECORDABLE
80 MIN / 700 MB
52X
wa Plas
Ltd.

Draft EIA Report
Aug, 2021

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR FORMALDEHYDE MANUFACTURING UNIT OF 150 TPD AT VILLAGE- JATHLANA, TEHSIL- JAGADHRI, DISTRICT- YAMUNANAGAR, STATE- HARYANA

APPLICANT: M/S PAHWA PLASTICS PVT. LTD.

MONITORING DONE
BY
M/S VARDAN ENVIROLAB
(NABL ACCREDITION TC- 6299 MOEF&CC NO. S.O. 1783(E))
Baseline Monitoring Period- Oct to Dec 2020
Project Cost- Rs. 1.13 Crores
Project Area- 0.23 Hectares

ENVIRONMENT CONSULTANT

Vardan EnviroLab

(QCI/NABET ACCREDITION NUMBER NABET/EIA/1922/RA0166)
Plot No 82-A, Sec-5, IMT Manesar, Gurgaon-122051, Haryana
E-Mail: industry@vardanenvironet.com
Contact: 0124-4343750, (+91)-9899651342
Document No.: 2020_VI_012

REVIEW AND REVISION HISTORY

History of revisions of the present report:

Table I: History of the Revisions

Rev.	Date	Description	Review	Approval
Rev. 00	August, 2021	Draft EIA / EMP Report	Dr. Ashok Rathoure	Mr. R.S. Yadav
-	-	-		

Document no. 2020_VI_012

Table II: Record of Review

Rev.	Date	Description	Review-1	Review-2	Approval
Rev. 00	August, 2021	Draft EIA/ EMP Report	Mr. Pawan Kumar	Dr. Ashok Rathoure	Mr. R.S. Yadav
-	-	-			

This Report has been prepared by Vardan EnviroNet on behalf of and for the use of the **M/s Pahwa Plastics Pvt. Ltd.** with due consideration and skill as per our general terms and conditions of business and terms of agreement with **M/s Pahwa Plastics Pvt. Ltd.**

Declaration by Experts contributing to the Formaldehyde Manufacturing Unit of 150 TPD At Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd. I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator: Dr. Ashok Rathoure

Period of involvement:

Contact information: Vardan Environet, Plot No 82A, Sec 5, IMT Manesar, Gurgaon-122051, Haryana

Contact no & E-mail address: 0124-4343750, industry@vardanenvironet.com

Functional Area Experts (FAEs):

S. No.	Functional Areas	Name of the expert/s	Involvement during	Signature &Date
1.	AP	**FAE:** Mr. K.M.Khare	Period: Oct 2020 to Jan 2021 a) Identifying the sources of emissions and mitigation measures. b) Site-specific micro meteorology monitoring. c) Ambient Air Quality (AAQ) monitoring station finalization and ensuring the monitoring as per Guidelines Impact predictions and suggestion of mitigations measures.	
2.	WP	**FAE:** Mr. Ashok Rathoure	Period: Oct 2020 to Jan 2021	

			a) Selection of sampling locations as per site b) Ground water quality monitoring and assessment, impacts on water environment and suggsstion of mitigations measures. c)Identification, characterisation of effluent and treatments there of d)Water balance and conservation measures	
3.	SHW	**FAE:** Mr. Pawan Kumar Verma **Team Member:** Shweta Ghildiyal	Period: Oct 2020 to Jan 2021 a) Identification and assessment of haz, solid w.g, and their disposal and mitigation measure. b). Recycling and disposal plan preparation	
4.	SE	**FAE:** Ms. Shilpa Mishra	Period: Oct 2020 to Jan 2021 a) Determination of demographic profile including socio economy & livelihood b) Assessing the changes in socio economic pattern c) Preparation of CER Plan based on socioeconomic survey.	

5.	EB	FAE: Dr. Niteesh Kumar	Period: Oct 2020 to Jan 2021 a) Biological environment status in respect of terrestrial fauna and aquatic eco system b) Impact on ecological environment c) Suggestion of mitigation measures. Preparation of Greenbelt Development plan.	
6.	HG/Geo	FAE: Mr. R. S Yadav	Period: Oct 2020 to Jan 2021 a) Ground water resource assessment b) Impact on ground water potential and mitigation measures for avoiding ground water contamination.	
7.	AQ	FAE: Mr. Surbhi Makhwana	Period: Oct 2020 to Jan 2021 a) Processing of site specific micro-meteorological data. b) Collection and use of data for modelling. c) Air dispersion modelling for prediction of GLCS due to PM_{10}, $S0_2$ and Nox	

8.	NV	**FAE:** Mr. K.M Khare	Period: Oct 2020 to Jan 2021 a) Analysis of ambient noise quality data b) Assessment of Impact due to plant noise and suggesting mitigation measures	
9.	LU	**FAE:** Mr. Ankur Agrawal	Period: Oct 2020 to Jan 2021 a) Analysis of data related to land use pattern b) Land use map development. c) Impact on land environment in respect to land form change	
10.	RH	**FAE:** Mrs. Ashwini Ganvir **Team Member:** Shweta Ghildiyal	Period: Oct 2020 to Jan 2021 a) Identification of hazardous prone areas b) Environment risk evaluation c) On-site and Off-site emergency plan preparation	Shweta
11.	SC	**FAE:** Mr. Ashok Rathour	Period: Oct 2020 to Jan 2021 a) Monitoring, analysis and characterisation of soil b) Assessment of impact on soil quality and mitigation measure.	

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

S.NO.	ANNEXURE	DOCUMENT
1.	Annexure 1	Certificate of Accreditation
2.	Annexure 2	Land Documents
3.	Annexure 3	Change of Land Use
4.	Annexure 4	CTE
5.	Annexure 5	All CTOs
6.	Annexure 6	HWRA Application
7.	Annexure 7	Environmental Baseline Reports
8.	Annexure 8	Wildlife Conservation Plan
9.	Annexure 9	Environment Management Policy
10.	Annexure 10	Undertaking for Solid and Hazardous Waste Disposal
11.	Annexure 11	Safety Policy
12.	Annexure 12	List of Major Nearby Industries
13.	Annexure 13	Material Safety Data Sheet (MSDS)
14.	Annexure 14	All show cause notices received till date
15.	Annexure 15	NGT Orders
16.	Annexure 16	Vehicular Dispersal Plan
17.	Annexure 17	Undertaking for Bank Guarantee submission
18.	Annexure 18	Access for diversion of forest land

TOR LETTER

F. No. IA-J-11011/185/2020-IA-II(I)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Vayu Wing, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 20th July, 2021

To,

M/s Pahwa Plastics Pvt. Ltd.
Village Jathlana, Tehsil Jagadhri
Yamunanagar, Haryana

Email: pahwaplastics20@gmail.com

Sub: Expansion in Formaldehyde Manufacturing unit in existing facility from 60 TPD to 150 TPD at Village Jathlana, Tehsil Jagadhri District Yamunanagar, Haryana by M/s Pahwa Plastics Pvt. Ltd - Terms of Reference – reg.

Sir,

This has reference to your online proposal No. IA/HR/IND3/204462/2021 dated 17th June, 2021 for Terms of Reference to the above mentioned project.

2. The proposal is for Terms of Reference (ToR) for expansion in Formaldehyde Manufacturing unit in existing facility from 60 TPD to 150 TPD at Village Jathlana, Tehsil-Jagadhri Distt. Yamunanagar, Haryana by M/s Pahwa Plastics Pvt. Ltd. Industries, operating since 2018 without prior Environmental clearance, thus violating the provisions of the EIA Notification, 2006.

3. The said project/activity is covered under category "A" (located outside Notified Industrial Area) of item 5(f) "Synthetic Organic Chemicals" of the Schedule to the EIA Notification, 2006, and requires prior EC from Expert Appraisal Committee, MoEF&CC.

4. The chronology of events and the actions taken on the instant proposal are as under:

The plant was setup with the consent to establish dated 02.06.2016 from the Haryana State Pollution Control Board (HSPCB). Subsequently, the unit has started operation after obtaining consent to operate dated 26.03.2018. HSPCB issued show cause notices for closure and revocation of CTO. After that, the unit has obtained CTO for 150 TPD Formaldehyde manufacturing vide Letter 313096621YAMCTO10961479 dated 08.04.2021 valid up to 10.05.2021.

The chronology of events is as under:

S. No.	Date	Description
1	02.06.2016	Consent to Establish obtained from HSPCB vide letter no. 2846616YAMCTE3087415 dated 02.06.2016.
2	26.03.2018	The unit has obtained initial CTO for 60 TPD Formaldehyde manufacturing vide Letter 2846618YAMCTO3098246 dated 26.03.2018 valid up to 31.03.2022
3	03.06.2019	Show cause notice for closure under Section 5 of EPA, 1986 vide letter no. HSPCB/YR/2019/17376
4	21.08.2019	Show cause notice for revocation of CTE and CTO issued vide letter no. HSPCB/YR/2019/1616
5	11.11.2020	Additional Chief Secretary, Environment Department, Haryana Govt. vide their order dated 11.11.2020 allowed the units to continue their operations for a period of six months without prejudice to any legal actions taken against the violations committed by them, by the competent authorities, with the conditions that they will immediately apply for Environmental Clearance from the competent authority and provide the proof of such application within 60 days from the issuance of this communication to Environment and Climate Change Department and to Haryana State Pollution Control Board.
6	08.04.2021	After that, the unit has obtained CTO for 150 TPD Formaldehyde manufacturing vide Letter 31309662IYAMCTO10961479 dated 08.04.2021 valid up to 10.05.2021
7	03.06.2021	The NGT order dated 03.06.2021 in Original Application No. 287/2020 (Dastak N.G.O. vs Synochem Organics Pvt. Ltd. & Ors.) concluded "Since prior EC is statutory mandate, the same must be complied. We have no doubt that the stand of the private respondents will be duly considered by the concerned regulatory authorities, including the MoEF&CC on merits and in accordance with law but till compliance of statutory mandate, the units cannot be allowed to function. For past violations, the concerned authorities are free to take appropriate action in accordance with polluter pays principle, following due process."
8	03.06.2021	The NGT order dated 03.06.2021 for the Original Application No. 840/2019 (Ayush Garg Vs. Union of India & Ors.) concluded "no further direction appears to be necessary except that the State PCB may ensure that the unit does not re-start functioning without requisite statutory clearance".

Production Capacity

Product	Capacity
Formaldehyde	150 TPD

Raw Material Detail: The major raw material is Methanol which comes by road through tankers from Kandla Port, Gujarat & stored in underground M.S tanks. Methanol requirement is as below:

Material	Total requirement
Methanol	75 TPD

Resource Requirement

S.No.	Particular	Detail
1	Land Requirement	Total plot area is 0.23 hectare. Green belt will be developed in an area of 0.08 Hectare (Approximately 34.78% of total land area).
2	Water Requirement	**Quantity: 90 KLD** **Source:** Ground Water **Approving Authority:** Haryana Water Resources Authority
3	Power Requirement	**Total requirement:** 200 KW **Source:** UHBVN (Uttar Haryana Bijli Vitran Nigam) **DG sets as backup:** 180 KVA and 250 KVA
4	Boiler	**Capacity:** 1 No. 800 Kg/Hr HSD Fired
4	Manpower Requirement	**Total Manpower: 10** **Source: Local public as per capability**
5	Cost of the Project	**Total Project Cost: 113 Lakhs**

5. There are no Wild Life Sanctuary or National Park within 10 km radius of the Project Site. No NBWL Clearance required. No forest land involved in the project site. Company has obtained diversion of 0.0022 Ha of forest land for access, from MoEF&CC.

6. **Details of Violation:**

S. No.	Period	Production	Remarks
1	June 2016 to April 2021	Formaldehyde Manufacturing (60 TPD)	Prior EC was not secured before setting up and operating the Unit, hence covered under violation as per EIA Notification 2006 and subsequent amendments
2	April 2021 to May 2021	Formaldehyde Manufacturing (150 TPD)	Prior EC was not secured before enhancing the capacity, hence covered under violation as per EIA Notification 2006 and subsequent amendments

7. The Committee was informed that the Ministry had issued a Notification vide S.O. 804 (E) dated 14th March, 2017 for appraisal of projects for grant of terms of reference/ Environmental Clearance, which have started the work on site, expanded the production beyond the limit of Environmental Clearance, or changed the product mix without obtaining prior

Environmental Clearance under EIA Notification, 2006. The above said notification i.e., Notification vide S.O. 804 (E) dated 14th March, 2017 was an open window for 6 months. The projects or activities which are in violation as on date of this notification only will be eligible to apply for environmental clearance under this notification and the project proponents can apply for environmental clearance under this notification only within six months from the date of this notification.

The Competent Authority in the Ministry (in other proposal) has inter-alia, instructed to deal the violation cases as under:

(i) The violation proposal should be considered by the sectoral EAC on merit
(ii) Action to be taken against the alleged violation as per law
(iii) Do not wait for either the evidence of action having been started or violation proceedings to finish before taking up the case on merit.
(iv) The EC if given after consideration on merit would be valid from the date it is given and not with retrospective effect. For the period before it, if violation is established by the Court of competent authority, the punishment/penalty as per law would be imposed.
(v) Assessment of environmental damage, if any.

8. The Committee was also appraised that there were three recent court cases in the Hon'ble NGT [viz. Dastak NGO vs Syncochem Prganics Pvt. Ltd. & ors in OA No. 287 of 2020, Vineet Nagar Vs. Central Ground Water Authority & Ors, in OA No. 298 of 2020, and Ayush Garg Vs Union of India & Ors. in OA No. 840 of 2019], which were disposed of by Hon'ble NGT vide its Order dated 03.06.2021 with the following directions:

(i). For past Violations, the concerned Authorities are free to take appropriate action in accordance with polluter pays principle, following due process.
(ii). Since having prior EC is statutory mandate, it has to be complied with by the formaldehyde producing industrial units barring which the units cannot be allowed to function.
(iii). State PCB may assess and recover compensation for illegal operation of the Units on 'Polluter Pays' principle.
(iv). State PCB to ensure that the unit does not re-start functioning without requisite Statutory Clearance.
(v). To be duly considered by the concerned regulatory authorities including MOEFCC on merits and in accordance with law.

9. The Proposal was examined in the Ministry and EDS has been sought on Parivesh Portal on 17th May 2021. The Project Proponent, on 17th June 2021 has submitted the EDS reply on Parivesh Portal and accordingly the Proposal is placed before the present EAC meeting for its appraisal.

10. The proposal was considered by the EAC (Industry-3) in its 13th meeting held during 1-2 July, 2021. The project proponent and their consultant M/s Vardan Environet, made a detailed presentation through Video Conferencing (VC) and have presented the PFR report. The Committee, after detailed deliberations on the information presented by the project proponent, **recommended** for issuing **Standard Term of Reference** for undertaking EIA and preparation

of Environmental Management Plan (EMP) as per **Annexure-I** and with additional ToR as under:

(i) The project proponent will be liable to pay the penalty for the period of violation, as may be determined by Ministry, arisen due to constructing and/or operating the project without prior EC. An undertaking in this regard shall be submitted by PP along with EC proposal. The project proponent shall also submit the details on the cost incurred on establishment of the project and year-wise total turnover till date.

(ii) The Directions of the Hon'ble NGT shall be implemented vide its Orders dated 03.06.2021, in the matter of Dastak NGO vs Syncochem Prganics Pvt. Ltd. & ors in OA No. 287 of 2020; Vineet Nagar Vs. Central Ground Water Authority & Ors. in OA No. 298 of 2020; and Ayush Garg Vs Union of India & Ors. in OA No. 840 of 2019]. Implementation Report may be submitted by the PP at the time of submission of EIA/EMP Report.

(iii) The State Government/SPCB to take action against the project proponent under the provisions of section 19 of the Environment (Protection) Act, 1986, and further no consent to operate to be issued till the project is granted EC.

(iv) Haryana PCB may assess and recover compensation for illegal operation of the Units on 'Polluter Pays' principle. Implementation Report may be submitted by the SPCB at the time of submission of EIA/EMP Report by the PP.

(v) Assessment of ecological damage with respect to air, water, land and other environmental attributes. The collection and analysis of data shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or an environmental laboratory accredited by NABL, or a laboratory of a Council of Scientific and Industrial Research (CSIR) institution working in the field of environment. The cost for assessment of environmental damage may be guided by the Ministry of Environment, Forest and Climate Change O.M No. 19-125/2019-IA.III, dated 05.03.2020.

(vi) EMP shall be prepared comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation.

(vii) The remediation plan and the natural and community resource augmentation plan to be prepared as an independent chapter in the EIA report by the accredited consultants.

(viii) The project proponent shall be required to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan with the SPCB prior to the grant of EC. The quantum shall be recommended by the EAC and finalized by the regulatory authority. The bank guarantee shall be released after successful implementation of the EMP, followed by recommendations of the EAC and approval of the regulatory authority.

(ix) Budget of remediation plan and natural and community resource augmentation plan corresponding to the ecological damage shall be completed within three years and to be prepared accordingly.

11. You are required to submit the final EIA/EMP reports prepared by the consultants accredited with the Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET), to the SEIAA/SEAC for grant of environmental clearance within 3 years, as per this Ministry's OM No. J-11013/41/2006-IA. II (I) dated 8th October, 2014.

12. This issues with the approval of the competent authority.

(Dr. Saranya P)
Scientist D/ Joint Director

(डा. सरन्या पी)
(Dr. SARANYA P)
वैज्ञानिक 'डी'/Scientist 'D'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Copy to:-

1. The Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Integrated Regional, Office, Bays No. 24-25, Sector 31 A, Dakshin Marg, Chandigarh - 160030
2. The Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula, Haryana: ***with a request to immediately close the unit and ensure that the unit does not re-start functioning without requisite Statutory Clearance in compliance to the Hon'ble NGT orders dated 03.06.2021 and this Ministry's OM dated 07.07.2021. The copies are enclosed for ready reference.***
3. Guard File/Monitoring File/Record File/Parivesh Portal

(Dr. Saranya P)
Scientist D/ Joint Director
Email: saranya.p@gov.in

(डा. सरन्या पी)
(Dr. SARANYA P)
वैज्ञानिक 'डी'/Scientist 'D'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Annexure-I

Standard TOR for 5 (f) Category

A. STANDARD TERMS OF REFERENCE

1) **Executive Summary**
2) **Introduction**
   i. Details of the EIA Consultant including NABET accreditation
   ii. Information about the project proponent
   iii. Importance and benefits of the project

3) **Project Description**
   i. Cost of project and time of completion.
   ii. Products with capacities for the proposed project.
   iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
   iv. Details of existing products and production, if any, along with present product/production details in tabular format, to verify the compliance of the EIA Notifications.
   v. List of raw materials required and their source along with mode of transportation.
   vi. Other chemicals and materials required with quantities and storage capacities
   vii. Details of Emission, effluents, hazardous waste generation and their management.
   viii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
   ix. Details of boiler/gensets (including stacks/exhausts) and fuels to be used
   x. Process description along with major equipments and machineries, process flow sheet (quantitative) from raw materials to products to be provided
   xi. Hazard identification and details of proposed safety systems.
   xii 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 Integrated Regional Office of the Ministry of Environment, Forest and Climate Change 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, copy of the latest CTO and 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 for selecting the site, whether other sites were considered.
(ii) A topo-sheet 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)
(iii) Details w.r.t. option analysis for selection of site
(iv) Co-ordinates (lat-long) of all four corners of the site.
(v) Google map-Earth download of the project site.
(vi) 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.
(vii) Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
(viii) 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)
(ix) A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
(x) Geological features and Geo-hydrological status of the study area shall be included.
(xi) 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)
(xii) Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land. Documents related to conversion of land for Industrial purpose.
(xiii) R&R details in respect of land in line with state Government policy

5) **Forest, wildlife and CRZ 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 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

vii. Recommendations and NOC from the concerned State/UT Coastal Zone Management Authority on CRZ angle

6) Environmental Status

(i) Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.

a. 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. Study should indicate minimum, maximum value of different parameters for the period (3 months) collected. Collected data should be supported by the reference data of either CPCB or SPCB. AAQ data & GLC of pollutants from stack emissions should suggest technology/ measures- Best Practiced Technology (BPT) indicating best achieved results.

(ii) 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.

(iii) 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.

(iv) Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.

(v) Ground water monitoring at minimum at 8 locations shall be included.

(vi) Noise levels monitoring at 8 locations within the study area.

(vii) Soil Characteristic as per CPCB guidelines.

(viii) Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

(ix) 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.

(x) Socio-economic status of the study area.

7) Environment 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 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.

ii. Water Quality Modelling – 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 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.
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.
xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.
xii. Action plan for post-project environmental monitoring shall be submitted.
xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

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

v. 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.

10) Corporate Environmental Responsibility (CER)

i. Adequate funds, as per the Ministry's OM/Guidelines, shall be earmarked towards the Corporate Environmental Responsibility based on Public Hearing issues/socio-economic issues and item-wise details along with time bound action plan shall be included (CER activities shall be related to environment). Socio-economic development activities need to be elaborated upon. For the projects where public hearing is not conducted, CER plan shall be provided based on socio-economic study of the area.

10) Additional studies/Measures to be considered

(i) Provide latest and ecofriendly technology for product manufacturing.
(ii) Emphasize on Green chemistry/Clean Manufacturing
(iii) Provide CAS No. of products along with product list.
(iv) Provide details of amount of carbon sequestered in their unit through greenbelt/other modes, in case of expansion project.
(v) Life structure and sustainability for carbon and water foot print.
(vi) Detailed pollution Load estimation.
(vii) Transportation of Hazardous substance, effluents etc shall be carriedout through authorized and GPS enable vehicles/Trucks only.
(viii) Category of Hazardous Wastes shall be mentioned in the EIA/EMP report and in presentation.
(ix) Details of greenhouse gases and emissions shall be provided.
(x) Greenbelt shall be developed in the first year of the project and wind breaks shall be erected.
(xi) Study area map shall be overlapped with all the associated features.
(xii) Emphasize on green fuels.
(xiii) The project from NCR shall not use Coal as fuel. Further, PP shall avoid use of Coal in the CPAs and elsewhere also if alternatives are available.
(xiv) Provide the Cost-Benefit analysis with respect to the environment due to the

project.

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 thereof and compliance/ATR to the notice(s) and present status of the case.

12) A tabular chart with index for point wise compliance of above TORs and its details needs to be submitted in the EIA/EMP Report.

B. SPECIFIC TERMS OF REFERENCE FOR EIASTUDIES FOR SYNTHETIC ORGANIC CHEMICALS INDUSTRY

1. Details on solvents to be used, measures for solvent recovery and for emissions control.
2. Details of process emissions from the proposed unit and its arrangement to control.
3. Ambient air quality data should include VOC, other process-specific pollutants* like NH3*,chlorine*,HCl*,HBr*,H2S*,HF*,*etc*.,(*-as applicable)
4. Work zone monitoring arrangements for hazardous chemicals.
5. Detailed effluent treatment scheme including segregation of effluent streams for units adopting 'Zero' liquid discharge.
6. Action plan for odour control to be submitted.
7. A copy of the Memorandum of Understanding signed with cement manufacturers indicating clearly that they co-process organic solid/hazardous waste generated.
8. Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.
9. Action plan for utilization of MEE/dryers salts.
10. Material Safety Data Sheet for all the Chemicals are being used/will be used.
11. Authorization/Membership for the disposal of solid/hazardous waste in TSDF.
12. Details of incinerator if to be installed.
13. Risk assessment for storage and handling of hazardous chemicals/solvents. Action plan for handling & safety system to be incorporated.
14. Arrangements for ensuring health and safety of workers engaged in handling of toxic materials.

***

TOR COMPLIANCE

S.No	ToR Point	Action to be taken	Chapter & Heading
1	**Executive Summary**	Executive Summary is attached before Chapter 1 M/s Pahwa Plastics Pvt. Ltd. has an existing Formaldehyde manufacturing unit for 150 TPD capacity at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana The said project/activity is covered under category "A" (located outside Notified Industrial Area) of item **5(f) "Synthetic Organic Chemicals"** of the Schedule to the EIA Notification, 2006	Executive Summary Page 1-4
2	**Introduction**		
I.	Details of the EIA Consultant including NABET accreditation	Vardan EnviroNet is an accredited organization by Quality Council of India/NABET Certificate No. **NABET/EIA/1922/RA0166** and NABET accreditation certificate incorporated in the EIA.	**Annexure 1**
II.	Information about the project proponent	**Company Name:** M/s Pahwa Plastics Pvt. Ltd. **Manufacturing unit address:** Village Jathlana, Tehsil- Jagadhri District- Yamunanagar, Haryana Pincode- 135133. **Registered address:** BA-1, 1st floor, Mangolpuri Industrial Area, Phase II, Delhi, 110034 **Name:** Mr. Chandan Pahwa **Designation:** Director **Mob.:** 9911024000 **Email ID:** formalin.ynr@pahwaplastics.com	Chapter 1, Item no 1.2.2, Page no. 7

III.	Importance and benefits of the project	Importance • The project is envisaged to meet the demand supply gap of domestic & international market. **Benefits** • Socio-economic benefit to the locals as it would provide both direct employment and indirect employment. • The project activity and the management will definitely support the local Govt. bodies and provide other form of assistance for the development of public amenities in this region. • The development of green belt in and around the plant premises will improve on the aesthetics of the area. Moreover, it will help in reducing the noise levels within the plant boundary. • It will attract generation of additional revenue to the Government by means of Taxes and duties. • The implementation of Rain Water Harvesting Scheme will help in increasing the ground water level of the area. Details of importance and benefits of the project are incorporated in the EIA.	Chapter 8 Page No. 182-184
3	**Project Description**		
I.	Cost of project and time of completion.	Cost of the project: Rs. 1.13 Crores (Rs. 113 Lakhs) Cost for EMP: Rs. 0.056 Crores (Rs. 5.65 Lakhs) Cost for OH&S: Rs. 0.008 Crores (Rs. 80,000) The project will be commencing after 6 months from getting EC.	Chapter 1, Table no 1.3, Page no 8

<table>
<tr><td>II.</td><td>Products with capacities for the proposed project.</td><td>Formaldehyde manufacturing facility for 150 TPD capacity.</td><td></td></tr>
<tr><td>III.</td><td>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>Not applicable</td><td></td></tr>
<tr><td>IV.</td><td>Details of existing products and production, if any, along with present product/production details in tabular format, to verify the compliance of the EIA Notifications.</td><td>The unit had started construction in 2016 after obtaining CTE from HSPCB and came in operation in 2018. Production details are as follows:
<table><tr><th>S. No.</th><th>Product</th><th>CTO obtained on</th><th>Production (MT)</th></tr><tr><td>1</td><td>Formaldehyde</td><td>26.03.2018</td><td>60 TPD</td></tr><tr><td>2</td><td>Formaldehyde</td><td>08.04.2021</td><td>150 TPD</td></tr></table></td><td></td></tr>
<tr><td>V.</td><td>List of raw materials required and their source along with mode of transportation.</td><td><table><tr><th>Raw Material</th><th>Total Requirement</th><th>Source</th><th>Transport</th></tr><tr><td>Methanol</td><td>75 TPD</td><td>Import</td><td>Tank Trucks</td></tr></table></td><td></td></tr>
<tr><td>VI.</td><td>Other chemicals and materials required with quantities and storage capacities</td><td>No other Chemicals are required</td><td></td></tr>
<tr><td>VII.</td><td>Details of emission</td><td><table><tr><th>Particulars</th><th>Emission</th><th>Effluent/Solid</th><th>Hazardous Waste</th></tr></table></td><td>Chapter- 2,</td></tr>
</table>

	effluent, hazardous waste generation and their management			waste		Item No.- 2.9-2.11, Page no.- 32-33
			Sources	Boiler (800 Kg/hr.) & D.G. sets (180 KVA and 250 KVA)	There will be no solid waste generated from the process. It is based on Zero Liquid Discharge.	Used oil	
			Control/ Treatment	Boiler - Stack height 30m, DG set stack height-6m Wet Scrubber will also be installed.	Salt from RO reject will be sent to TSDF site.	Used oil will be sold to vendors authorized by State Pollution Control Board.	
		The details of emission effluent, hazardous waste generation and their management are incorporated in EIA.					

VIII.	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	**Water Requirement:** Existing: 90 KLD; Source: Ground water application has been submitted to HWRA vide 30-3/20655/1/HR/IND/2021 **Power Requirement:** Power: Total requirement 200 KW; Source: UHBVN (Uttar Haryana Bijli Vitran Nigam) DG Sets: Total requirement 180 KVA, 250 KVA; Source: - **Manpower requirement:** Total 10 workers has been appointed in the unit.	
IX.	Details of boiler/gensets (including stacks/ exhausts) and fuels to be used	Boiler of 800 kg/hr is used to generate steam for the manufacturing process and fuel used is Wood briquettes. DG Set of 180 KVA and 250 KVA are used as backup of power failure and fuel used is HSD.	
X.	Process description along with major equipments and machineries, process flow sheet (quantitative)	Process description and process flow sheet from raw material to product are incorporated in the EIA. Major equipment list is also mentioned in EIA report.	Chapter 2, Item No. 2.5, 28. Page no. 27, 31

	from raw material to products to be provided		
XI.	Hazard identification and details of proposed safety systems.	Hazard identification and details of proposed safety systems are incorporated in the EIA.	Chapter-7, Item no. 7.2, Page no. 159
XII.	Expansion/modernization proposals:		
	a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated	The unit has never obtained Environmental Clearance and was operating on the basis of obtained CTOs from HSPCB. Copy of CTE and all CTOs are attached as Annexure 4 and Annexure 5.	Annexure 4 and Annexure 5

	in all the existing environmental clearances including Amendments shall be provided. In addition, copy of the latest CTO and 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	The unit has never obtained Environmental Clearance and was operating on the basis of obtained CTOs from HSPCB and hence applied under Violation category. Copy of CTE and all CTOs are attached as Annexure 4 and Annexure 5 respectively.	Annexure 4 and Annexure 5

	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 for selecting the site, whether other sites were considered	The project is located at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana. No alternative sites have been considered as the plant was already established since 2018. Land ownership documents are attached as Annexure 2.	
II.	A toposheet of the study area of radius of 10km and site location on	Toposheet No: H43L4, H43L8, H43R1, H43R5 Incorporated in the EIA report.	Chapter-1, Fig. 1.2, Page no. 11

	1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)		
III.	Details w.r.t. option analysis for selection of site	No alternative sites have been considered as the plant was already established since 2018.	
IV.	Co-ordinates (lat-long) of all four corners of the site.	**Points** / **Latitude** / **Longitude** Core / 30° 2'22.96"N / 77°15'3.37"E A / 30° 2'23.92"N / 77°15'2.45"E B / 30° 2'23.89"N / 77°15'4.03"E C / 30° 2'21.99"N / 77°15'4.09"E D / 30° 2'21.94"N / 77°15'2.67"E	Chapter-1, Table- 1.3, Page no. 8
V.	Google map-Earth downloaded of the project site.	Google map-Earth downloaded of the project site is incorporated in the EIA.	Chapter- 2 Figure 2.2 Page no. 23
VI.	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	The layout map of the existing unit indicating storage area, plant area, greenbelt area, utilities etc. is incorporated in the EIA report.	Chapter-2, Figure-2.4, Page no. 25

	Industrial Area indicating location of unit within the Industrial area/ Estate.		
VII.	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/ greenbelt, in particular.	Photographs of the project site are incorporated in the EIA report.	Chapter-2, Figure-2.5, Page no. 26
VIII.	Landuse 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).	Landuse break-up of total land of the project site : S.no. | Details | Area (Hec.) | Percentage (%) 1 | Plant built-up area | 0.05 | 21.74 2 | Greenbelt area | 0.08 | 34.78 3 | Open land and | 0.10 | 43.48 **Total** | **0.23** | **100**	Chapter - 2, Table no- 2.10, Page no. 30
IX.	A list of major industries with name and type within study area shall be incorporated. Land use details of the study area	List of Major Industries are attached as an Annexure 12.	**Annexure 12**
X.	Geological features and	The Geological features and Geo-hydrological status of the study area	Chapter-3,

	Geo-hydrological status of the study area shall be included.	are incorporated in the EIA.	Item No. 3.8 Page no. 67
XI.	Details of Drainage of the project upto 5 km 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)	Drainage Map of study area (10km area) is attached in EIA report. The water body in the study area is Yamuna River at a distance of 4.5 kms in east direction.	Chapter-3, Figure no- 3.14, Page no.- 66
XII.	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land. Documents related to conversion of land for	The location of the project being outside the Notified Industrial Area. Proposed project established over the purchased land for which the document has been attached as an **Annexure 2**. The total land area for the plant is 0.23 Hectares, at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana. Change of Land Use documents has been attached as **Annexure 3**.	Annexure 2 Annexure 3

	Industrial purpose.		
XIII	R&R details in respect of land in line with state Government policy.	Not applicable as the land is already under the possession of proponent.	
5	**Forest and wildlife related issues**		
I	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department (if applicable)	Company has obtained diversion of 0.0022 ha of forest land for access, from MoEF&CC vide F.No. 9-HRB157/2016-CHA dated 07.12.2016.	**Annexure 18**
II	Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forest land (in case of projects involving forest land more than 40 ha)	Not applicable	
III	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Company has obtained diversion of 0.0022 ha of forest land for access, from MoEF&CC vide F.No. 9-HRB157/2016-CHA dated 07.12.2016.	**Annexure 18**
IV	The projects to be located within 10 km of the	Not applicable	

	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.	Pavo cristatus is listed in the Schedule I, found in the study area. Wildlife Conservation Plan has been prepared and is attached as Annexure 8.	Annexure 8
VI	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to	Not Applicable	

<table>
<tr><td></td><td>the Standing Committee of the National Board for Wildlife.</td><td></td><td></td></tr>
<tr><td>6</td><td>Environmental Status</td><td></td><td></td></tr>
<tr><td>I.</td><td>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.</td><td>
<table>
<tr><th rowspan="2">Months</th><th colspan="2">Temp (°C)</th><th rowspan="2">Avg Relative Humidity (%)</th><th rowspan="2">Average wind speed (Km/h)</th><th rowspan="2">Total Rainfall (mm)</th></tr>
<tr><th>Max</th><th>Min</th></tr>
<tr><td>Dec 2020</td><td>30.4</td><td>17.5</td><td>63</td><td>6.4</td><td>14</td></tr>
<tr><td>Jan 2021</td><td>26.4</td><td>12.7</td><td>60</td><td>7.4</td><td>5</td></tr>
<tr><td>Feb 2021</td><td>21.4</td><td>8.2</td><td>68</td><td>8.7</td><td>22</td></tr>
</table>
</td><td>Chapter-3, Table no 3.1, Page no. 36</td></tr>
<tr><td></td><td>a) 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</td><td>The monitoring stations selected are based on CPCB guidelines. Nearest populated habitat, water body, protected/reserved forest are also been considered. AAQ data was collected from 8 locations in 10 km radius if the project site.</td><td>Chapter- 3, Table no 3.3 Page no.- 37</td></tr>
</table>

	zone and sensitive receptors including reserved forests. Study should indicate minimum, maximum value of different parameters for the period (3 months) collected. Collected data should be supported by the reference data of either CPCB or SPCB. AAQ data & GLC of pollutants from stack emissions should suggest technology/ measures- Best Practiced Technology (BPT) indicating best achieved results.		
II.	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of	Raw data of AAQ parameters PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, HC & VOC of 8 locations for 12 weeks of all stations measured twice a week are attached with EIA report as an Annexure 7. Lab data is tabulated in table 3.4	Chapter-3, Table 3.4 Page no. 40 Annexure 7

	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.		
III.	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.	Surface water quality data of 8 locations is incorporated in EIA. Surface water monitoring report is attached as Annexure 7.	Chapter-3, Table 3.12 Page no. 56 Annexure 7
IV.	Whether the site falls near to polluted stretch of river identified by the CPCB/ MoEF&CC, if yes give details	No polluted stretch nearby.	
V.	Ground water monitoring at minimum at 8 locations shall be included.	Ground water samples from 8 different locations & the results are incorporated in EIA report. Ground water monitoring reports are attached as Annexure 7.	Chapter-3, Table 3.11, Page no. 53 Annexure 7
VI.	Noise levels monitoring at	Noise levels monitoring at 8 locations within the study area are	Chapter 3,

	8 locations within the study area.	incorporated in EIA report and noise levels monitoring report is attached as Annexure 7.	Table no. 3.6, Page no- 44 Annexure 7
VII.	Soil Characteristic as per CPCB guidelines.	For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features and soil quality monitoring report is attached as Annexure 7.	Chapter 3, Table no. 3.8, Page 49 Annexure 7
VIII.	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project.	Detailed traffic study of the area along with type & frequency of the heavy vehicles and additional traffic due to proposed project has been carried out and incorporated in EIA report.	Chapter- 3, Item no. 3.12, Page no- 124
IX.	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-1 fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished	Detailed Ecology and Biodiversity report is incorporated in EIA Report. Pavo cristatus is listed in the Schedule I, found in the study area. Wildlife Conservation Plan has been prepared and is attached as Annexure 8.	Chapter 3 , Item no. 3.10, Page no- 78

X.	Socio-economic status of the study area.	Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. The detailed study report is incorporated in EIA report.	Chapter 3 , Item no. 3.11, Page no- 100
7	**Impact and Environment Management Plan**		
I.	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed.	**Air Quality Modeling** U.S. EPA AERMOD dispersion model, 1996 – 2018 Lakes Environmental Software, Version 9.5.0 has been used for this report. The details are incorporated in EIA report.	Chapter 4, Item no 4.4, Page no. 134
II.	Water Quality modelling - in case of discharge in water body	Not Applicable.	
III.	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and	The LOS value from the project may be same as earlier value "Very good" for all highways. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect.	Chapter- 3, Item no. 3.12, Page no- 124

	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.	There is no effluent generated through the process. However, salt from evaporator will be sent to TSDF Site.	Chapter 2, Item no- 2.10, Page no.- 32
V.	Details of stack emission and action plan for control of emissions to meet standards.	**DG sets:** Standard Emission from DG set is ≤0.2 g/kW-hr for PM, ≤3.5 g/kW-hr for CO and ≤4.0 g/kW-hr for NO2+HC which is strictly maintained. Also stack height of 6m is provided. **Boiler:**	Chapter 2, Item no- 2.12, Page no.- 33

		Standard Emission from boiler of 800 kg/hr capacity is approx. 1600 which is strictly maintained. Also stack height of 30m is provided.	
VI.	Measures for fugitive emission control	Formaldehyde manufacturing does not have significant fugitive emissions as the process is automated and carried out in closed environment.	
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	All the Solid & hazardous waste generated, will be collected, stored separately and disposed off as per the guidelines issued by CPCB & Haryana State Pollution Control Board. Undertaking for Solid and Hazardous Waste Disposal is attached as Annexure 10.	Annexure 10
VIII.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Not applicable	
IX.	Action plan for the green	34.78% of total area as per MoEF stipulated norms will be developed as	Chapter 10,

	belt development plan in 33 % area. 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	the green belt.	Item No. 10.6, Page no. 197
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	Rainwater Harvesting Plan is incorporated in EIA Report.	Chapter 4, Item no 4.7, Page no. 146
XI.	Total capital cost and	The total capital investment on environmental control measures is	Chapter 10,

	recurring cost/annum for environmental pollution control measures shall be included.	envisaged to be about Rs 5.65 lakhs. Details are given in EIA report.	Item No. 10.7, Page no. 197
XII.	Action plan for post-project environmental monitoring shall be submitted	A detailed monitoring of emissions for different environmental parameters will be carried out as per the present norms and any further notification / direction from Haryana State Pollution Control Board, Central Pollution Control Board and MoEF&CC. Monitoring methodologies will follow standard methods prescribed by Central Pollution Control Board (CPCB), Bureau of Indian Standards (BIS) etc.	
XIII.	Onsite and Offsite Disaster, Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Disaster management plan is prepared with an aim of taking precautionary step to control the hazard propagation, take action after the disaster which limits the damage to the minimum and follow the on-site & off-site emergency planning.	Chapter 7, Item no. 7.7, 7.8, 7.9 Page no. 175-185
8	**Occupational health**		
I.	Plan and fund allocation to ensure the occupational health & safety of all contract and casual	Rs. 0.008 Crores (Rs. 80,000) will be kept to ensure safety of all employees including contract & casual workers.	

	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.	Camps for regular health checkup will be conducted for all the workers.	
III.	Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and	Personal protective equipment are provided to the workers working at the production area, boiler, near storage tank, control room etc. PEL summary is incorporated in Chapter 7 of the EIA Report.	

	whether they are within Permissible Exposure level (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 health status of workers with special reference to Occupational Health and Safety.	There is no such record maintain at the plant. However, PP agreed to maintain when the project restarts after getting EC.	
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.	Environment Policy is attached with EIA report as Annexure 9.	**Annexure 9**
II.	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation	Yes. All the Environmental policy is followed for SOPs and procedures so that any further violation regarding environmental or forest norms will be avoided. For that scheduled internal audits and management review meeting shall be done.	

	/ 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	Hierarchical system of the company is shown in Environmental Policy, attached as an Annexure 9.	**Annexure 9**
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	The system of reporting of Non-conformances/ violation of any Environmental Law/Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any Non-conformances/ violation to Environmental Law/Policy will be closed and discussed during Management Review Meetings of board of directors/partners and Environment Policy for this is attached as Annexure 9.	**Annexure 9**

V	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 includes truck drivers during operation phase.	Training will be given to all employees working at the unit.	
10	**Corporate Environmental Responsibility (CER)**		
i.	Adequate funds, as per the Ministry's OM/ Guidelines, shall be earmarked towards the Corporate Environmental Responsibility based on Public Hearing issues/socio-economic issues and item-wise details along with time bound action plan shall be included (CER activities shall be related to environment). Socio-economic development	CER budget will be finalized after Public Hearing of the project addressing the issues raised during the hearing.	

	activities need to be elaborated upon. For the projects where public hearing is not conducted, CER plan shall be provided based on socio-economic study of the area		
11	**Additional studies/Measures to be considered**		
i)	Provide latest and ecofriendly technology for product manufacturing	The technology adopted for formaldehyde manufacturing is ecofriendly itself as there is no hazardous waste or effluent generated from the process.	
ii)	Emphasize on Green chemistry/ Clean Manufacturing	Emissions can only be generated through wood briquettes boiler. PP is committed to shift towards cleaner fuel is the LPG pipeline connection once it will be easily available at the project site.	
iii)	Provide CAS No. of products along with product list.	CAS No. is tabulated in EIA Report	Chapter 7, Table no. 7.3 Page no. 157
iv)	Provide details of amount of carbon sequestered in their unit through greenbelt/ other modes, in case of expansion project	Not applicable	
v)	Life structure and sustainability for carbon	Will incorporate the details in Final EIA Report	

	and water foot print		
vi)	Detailed pollution Load estimation	Will incorporate the details in Final EIA Report	
vii)	Transportation of Hazardous substance, effluents etc. shall be carried out through authorized and GPS enable vehicles/ Trucks only	Transportation plan is attached as Annexure 16.	Annexure 16
viii)	Category of Hazardous Wastes shall be mentioned in the EIA/EMP report and in presentation	Used oil is the only hazardous waste which comes under 5.1 of Schedule- I as per Hazardous and Other Waste Management Rules 2016 and will be sent to authorize recyclers.	
ix)	Details of greenhouse gases and emissions shall be provided		
x)	Greenbelt shall be developed in the first year of the project and wind breaks shall be erected	Greenbelt plantation is already started by PP and will commit to achieve in coming 6 months.	
xi)	Study area map shall be overlapped with all the associated features	Toposheet Map for the same is prepared and is incorporated in the EIA Report	Chapter 1 Figure 1.2 Page No. 11
xii)	Emphasize on green fuels.	Emissions can only be generated through wood briquettes in boiler. PP is committed to shift towards cleaner fuel is the LPG pipeline connection	

		once it will be easily available at the project site.	
xiii)	The project from NCR shall not use Coal as fuel. Further, PP shall avoid use of Coal in the CP As and elsewhere also if alternatives are available.	Coal is not used in the plant.	
xiv)	Provide the Cost-Benefit analysis with respect to the environment due to the project.	Cost benefit analysis will be carried out during final EIA	
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/ A TR to the notice(s) and present	Chronology of legal orders is incorporated in EIA Report and all show cause notices are attached as Annexure 14.	Chapter-1 Table No. 1.1 Page No. 5 **Annexure 14**

	status of the case.		
13	A tabular chart with index for point wise compliance of above TOR.	Have been Complied.	
	SPECIFIC TERMS OF REFERENCE		
I.	Details on solvents to be used, measures for solvent recovery and for emissions control	There is no solvent used in the manufacturing process, the major raw material is methanol and hence no solvent recovery system is proposed.	
II.	Details of process emissions from the proposed unit and its arrangement to control	The details of process emission from the existing unit and its arrangement to control are incorporated in the EIA.	
III.	Ambient air quality data should include VOC, other process-specific pollutants* like NH3*, chlorine*, HCl*, HBr*, H2S*, HF*,etc., (*as applicable)	Ambient air quality data include the VOC and other process-specific pollutants* like HC. The results are incorporated in the EIA and Air results are attached as Annexure 7.	
IV.	Work zone monitoring arrangements for hazardous chemicals	Work place monitoring to be done regularly & detectors will be installed. Hazardous chemicals will be stored separately.	Chapter 7
V.	Detailed effluent treatment scheme	There will be no hazardous waste generated in the manufacturing process. It is based on Zero Liquid Discharge. Although, septic tank is	

	including segregation of effluent streams for units adopting 'Zero' liquid discharge	already exists for the treatment of domestic waste.	
VI.	Action plan for odour control to be submitted.	Green belt will be maintained to control the odor problem. 34.78% of total area as per MoEF stipulated norms will be developed as the green belt.	
VII.	A copy of the Memorandum of Understanding signed with cement manufacturers indicating clearly that they co-process organic solid/ hazardous waste generated	Undertaking for the same is attached as Annexure 10.	Annexure 10
VIII.	Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.	Undertaking for the same is attached as Annexure 10.	Annexure 10
IX.	Action plan for utilization of MEE/dryers salts.	Salt from single stage evaporator will be sent to TSDF Site.	
X.	Material Safety Data Sheet for all the Chemicals are being used/will be used	Material safety data sheet for all the chemicals are attached as Annexure 13.	**Annexure 13**

XI.	Authorization/Membership for the disposal of solid/hazardous waste in TSDF	Company will collect, store separately and disposed off solid/hazardous waste at authorized site. Company will take the Membership of TSDF facility after the grant of Environmental Clearance	
XII.	Details of incinerator if to be installed	Not Applicable	
XIII.	Risk assessment for storage and handling of hazardous chemicals/ solvents. Action plan for handling & safety system to be incorporated.	Risk assessment for storage and handling of hazardous chemicals and Action plan for handling & safety system is incorporated in the EIA.	Chapter 7
XIV.	Arrangements for ensuring health and safety of workers engaged in handling of toxic materials	Various arrangements will be made for ensuing the health and safety of worker engaged in handling of toxic materials are mention in the EIA report.	Chapter 7
ADDITIONAL POINTS			
(i)	The project proponent will be liable to pay the penalty for the period of violation, as may be determined by Ministry, arisen due to constructing and/or operating the project without prior EC.	The damage assessment study has been done as per MoEF&CC O.M No. 19-125/2019-IA.III, dated 05.03.2020 and is incorporated in Chapter 13 of EIA Report. PP has given an undertaking regarding bank Guarantee for remediation measures as decided by the EAC.	Annexure 17

	An undertaking in this regard shall be submitted by PP along with EC proposal. The project proponent shall also submit the details on the cost incurred on establishment of the project and year-wise total turnover till date.		
(ii)	The Directions of the Hon'ble NGT shall be implemented vide its Orders dated 03.06.2021 , in the matter of Dastak NGO vs Syncochem Prganics Pvt. Ltd. & ors in OA No. 287 of 2020; Vineet Nagar Vs. Central Ground Water Authority & Ors, in OA No. 298 of 2020; and Ayush Garg Vs Union of India & Ors. in OA No. 840 of 2019]. Implementation Report may be submitted by the	As per the direction issued from NGT vide order dated 03.06.2021, the unit is not in operation phase any more. Implementation report for the same is under process and will submit till final EC Presentation.	

	project proponent at the time of submission of EIA/EMP Report.		
(iii)	The State Government/ SPCB to take action against the project proponent under the provisions of section 19 of the Environment (Protection) Act, 1986, and further no consent to operate to be issued till the project is granted EC.	No further Consent to Operate is issued by Haryana State Pollution Control Board.	
(iv)	Haryana PCB may assess and recover compensation for illegal operation of the Units on 'Polluter Pays' principle. Implementation Report may be submitted by the SPCB at the time of submission of EIA/EMP Report by the project proponent.	Implementation report for the same is under process and will submit till final EC Presentation.	
(v)	Assessment of ecological damage with respect to air, water, land and other	The damage assessment study has been done as per MoEF&CC O.M No. 19-125/2019-IA.III, dated 05.03.2020 and is incorporated in Chapter 13 of EIA Report.	

	environmental attributes. The collection and analysis of data shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or an environmental laboratory accredited by NABL, or a laboratory of a Council of Scientific and Industrial Research (CSIR) institution working in the field of environment. The cost for assessment of environmental damage may be guided by the Ministry of Environment, Forest and Climate Change O.M No. 19-125/2019-IA.III, dated 05.03.2020.		
(vi)	EMP shall be prepared comprising remediation plan and natural and community resource	Separate Ecological Assessment Plan is incorporated in Chapter 13	

	augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation.		
(vii)	The remediation plan and the natural and community resource augmentation plan to be prepared as an independent chapter in the EIA report by the accredited consultants.	The independent chapter for remediation plan and the natural and community resource augmentation plan has been prepared as Chapter 13 in EIA Report.	
(viii)	The project proponent shall be required to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan with the SPCB prior to the grant of EC. The quantum shall be recommended by the EAC and finalized by the	PP has given an undertaking regarding bank Guarantee for remediation measures as decided by the EAC.	Annexure 17

	regulatory authority. The bank guarantee shall be released after successful implementation of the EMP, followed by recommendations of the EAC and approval of the regulatory authority.		
(ix)	Budget of remediation plan and natural and community resource augmentation plan corresponding to the ecological damage shall be completed within three years and to be prepared accordingly.	Remediation plan corresponding to the ecological damage is prepared and the budget for same has been allocated. The details are provided in Chapter 13 of EIA Report.	Chapter 13

EXECUTIVE SUMMARY

a) Introduction

M/s Pahwa Plastics Pvt. Ltd. has an existing Formaldehyde manufacturing unit at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana.

The plant was setup with the consent to establish dated 02.06.2016 from the Haryana State Pollution Control Board (HSPCB). Subsequently, the unit has started operation after obtaining consent to operate dated 26.03.2018.

The said project/activity is covered under category "A" (located outside Notified Industrial Area) of item **5(f) "Synthetic Organic Chemicals"** of the Schedule to the EIA Notification, 2006, and requires prior EC from Expert Appraisal Committee, MoEF&CC.

b) Basic Details of the Project

S.No.	Particulars	Details
1.	**Nature and size of the Project**	Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.
2.	**Location details**	
	Village /Town/Plot No.	Jathlana
	District	Yamunanagar
	State	Haryana
3.	**Area Details**	
	Total Project Area	Total plot area is 0.23 hectare. Green belt will be developed in an area of 0.08 Hectare (Approximately 34.78% of total land area).
4.	**Cost Details**	
	Project Cost	Rs. 1.13 Crores (Rs. 113 Lakhs)
	EMP Budget	Rs. 0.0565 Crores (Rs. 5.65 Lakhs)
5.	**Basic Requirements of the Project**	
	Fresh Water (m3/day)	90 KLD Source: HWRA
	Power	200 KW **Source:** UHBVN (Uttar Haryana Bijli Vitran Nigam) **DG sets as backup:** 180 KVA and 250 KVA (existing)
	Boiler	800 Kg/Hr
	Fuel	Wood Briquettes
	Manpower	10

c) Production Capacity

Capacity	Mar 2018 to Mar 2021	April-May 2021	Total
Formaldehyde	60 TPD	150 TPD	150 TPD

d) Raw Material Detail

The major raw material is Methanol which comes in road through tankers from Kandla Port, Gujarat & stored in underground M.S tanks.

Raw Material	Total Requirement	Source	Transport	Storage
Methanol	75 TPD	Import	Tank Trucks	U/G Tanks 6*75 KL

e) Project Benefits

- The plant will help in providing employment in priority to local people.
- There will be an increase in indirect employment and earnings of the small time shop owners like tea vendors, transporters, etc.
- The Project proponent has planned to contribute in socio-economic development of the area.
- The easy availability of infrastructure, manpower, raw materials will reduce the production cost as well as demand supply gap.
- The development of greenbelt in and around the plant premises will improve on the aesthetics of the area. Moreover, it will help in reducing the noise levels within the plant boundary.

f) Mitigation Measures for Control of Pollution

i. Air Pollution Control Measures

- Online Stack Monitoring System as an air pollution control measures to control the emission of particulate matter, the flue gas emission will remain well within gaseous emission norms prescribed by the CPCB.
- To control the air emissions from D.G. Set, stack height of 6.0 m shall be provided.
- Green belt will be developed on 34.78% area of the total project area which will help in attenuating the pollutants emitted by the plant.

ii. Waste Water Treatment

There will be no waste water discharge from the plant. Zero Liquid Discharge (ZLD) concepts to be adopted. Domestic waste water after treatment (in septic tank) will be

fully utilized with the facility for cleaning, flushing, water sprinkling and other non portable domestic purpose.

iii. Noise Pollution Control

- Vibrating pads & acoustic enclosure will be provided to noise generating equipment to control noise level within norms.
- Latest technology and utmost care will be taken at the time of equipment/machinery installation.
- Lubrication of moving/rotating part or component of machineries will be done on regular basis.
- The operators working in the high-noise areas will be provided with ear-muffs or plugs.
- Acoustic enclosures and silencers will be provided to the equipment wherever necessary
- Proper green belt will be developed to reduce the noise level.
- Thus, it is envisaged that there will not be any adverse impacts of noise. The greenbelt developed within the premises will have significant beneficial impacts on reduction of noise within the periphery and outside the boundary.

iv. Land Pollution Control

- The plant will implement zero liquid discharge concepts. The treated water will be recycled in the process. Therefore, there will not be any negative impact on soil.
- No toxic /waste water will be disposed directly on land.
- Other hazardous solid wastes will be sent to authorized recycler or vender.
- It is envisaged that there will not be any major impacts on land environment during the operation phase.

v. Solid & Hazardous Waste Generation and Disposal

- Used Oil will be sold to authorized recycler.
- Solid waste from evaporator will be sent to TSDF.
- All the Solid & hazardous waste generated, will be collected, stored separately and disposed off as per the guidelines issued by CPCB & Haryana State Pollution Control Board.

g) Environmental Management Plan (EMP)

The total capital investment on environmental control measures is envisaged to be abqut Rs 0.056 Crores out of a total project cost of Rs 1.13 Crores.

S. No.	Particulars	Initial Cost (in Lakhs)	Recurring Cost (per year)

1.	Air Pollution Control Device	2.45	0.5
2.	Occupational Health and Safety	0.8	0.2
3.	Green Belt Development	1.0	0.4
4.	Rain Water Harvesting Pit	1.4	0.3
	Total	**5.65 Lakh (0.056 Crores)**	**1.4 Lakh (0.014 Crores)**

h) National Parks or Wild Life Sanctuary

There is no Wild Life Sanctuary or National Park within 10 km radius of the Project Site hence no NBWL Clearance required.

i) Demography & Socio-Economic Environment

- Improvement of infrastructure, transportation, health care and education facility.
- Direct and indirect employment will be generated like business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.
- The impact of employment opportunities will not be significant due to low level of education and skills in the area which will result in sourcing skilled work force from outside the immediate area.
- Skill based training to local employed people will be given by project proponent.
- The interaction and intermingling of all these people will improve the understanding of various cultures and will definitely improve and strengthen friendliness, brotherhood and unity among them.

CHAPTER 1: INTRODUCTION

1.1 PURPOSE OF THE PROJECT

As per the EIA Notification dated 14th September 2006, as amended from time to time; it is mandatory to have the Environmental Clearance for any new industry or the expansion of the industry from Ministry of Environment Forest and Climate Change (MoEF&CC), Government of India, New Delhi for which EIA is required to be conducted as per the guidelines of MoEF&CC, New Delhi. The purpose of this report is to assess the environmental impacts due to manufacturing unit of Formaldehyde at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana.

1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

1.2.1 Project Details

The plant was setup with the consent to establish dated 02.06.2016 from the Haryana State Pollution Control Board (HSPCB). Subsequently, the unit has started operation after obtaining consent to operate dated 26.03.2018. HSPCB issued show cause notices for closure and revocation of CTO. After that, the unit has obtained CTO for 150 TPD Formaldehyde manufacturing vide Letter 313096621YAMCTO10961479 dated 08.04.2021 valid up to 10.05.2021. The chronology of events are as under:

Table 1.1: Chronology of the Events

S. No.	Date	Description
1	02.06.2016	Consent to Establish obtained from HSPCB vide letter no. 2846616YAMCTE3087415 dated 02.06.2016.
2	26.03.2018	The unit has obtained initial CTO for 60 TPD Formaldehyde manufacturing vide Letter 2846618YAMCTO3098246 dated 26.03.2018 valid up to 31.03.2022
3	03.06.2019	Show cause notice for closure under Section 5 of EPA, 1986 vide letter no. HSPCB/YR/2019/17376
4	21.08.2019	Show cause notice for revocation of CTE and CTO issued vide letter no. HSPCB/YR/2019/1616
5	11.11.2020	Additional Chief Secretary, Environment Department, Haryana Govt. vide their order dated 11.11.2020 allowed the units to continue their operations for a period of six months without prejudice to any legal actions taken against the violations committed by them, by the competent authorities, with the conditions that they will immediately apply for Environmental Clearance from the competent

S. No.	Date	Description
		authority and p: ovide the proof of such application within 60 days from the issuance of this communication to Environment and Climate Change Department and to Haryana State Pollution Control Board.
6	08.04.2021	After that, the unit has obtained CTO for 150 TPD Formaldehyde manufacturing vide Letter 313096621YAMCTO10961479 dated 08.04.2021 valid up to 10.05.2021
7	03.06.2021	The NGT order dated 03.06.2021 in Original Application No. 287/2020 (Dastak N.G.O. vs Synochem Organics Pvt. Ltd. & Ors.) concluded "Since prior EC is statutory mandate, the same must be complied. We have no doubt that the stand of the private respondents will be duly considered by the concerned regulatory authorities, including the MoEF&CC on merits and in accordance with law but till compliance of statutory mandate, the units cannot be allowed to function. For past violations, the concerned authorities are free to take appropriate action in accordance with polluter pays principle, following due process."
8	03.06.2021	The NGT order dated 03.06.2021 for the Original Application No. 840/2019 (Ayush Garg Vs. Union of India & Ors.) concluded "no further direction appears to be necessary except that the State PCB may ensure that the unit does not re-start functioning without requisite statutory clearance".

Table 1.2: Details of Violation

S. No.	Period	Production	Remarks
1	June 2016 to April 2021	Formaldehyde Manufacturing (60 TPD)	Prior EC was not secured before setting up and operating the Unit, hence covered under violation as per EIA Notification 2006 and subsequent amendments
2	April 2021 to May 2021	Formaldehyde Manufacturing (150 TPD)	Prior EC was not secured before enhancing the capacity, hence covered under violation as per EIA Notification 2006 and subsequent amendments

Tha land is already in possession of Project proponent (Land documents are attaced as **Annexure 2**). Permission has been granted for Change of Land Use (CLU) from

Directorate of Town & Country Planning, Haryana vide Memo No. 581 dated 07.04.2014 (attached as **Annexure 3**).

Screening Category

As per EIA Notification 2006 and its subsequent amendments; the project falls under schedule 5 (f) "Synthetic Organic Chemical Project" and as the project is located outside the Notiifed Industrial Area, it will be treated as category "A" and EC was required before starting construction work. The project was developed after EIA Notification 2006 without securing prior Environmental Clearance; hence the project has violated the conditions of said Notification. Hence, the Environmental Clearance will be granted from Expert Appraisal Committee for the proposal involving violation of EIA Notification, 2006. The general condition is also applicable to the project as Interstate Boundary of Haryana & Uttar Pradesh is at distance of 4.7 Km in SE direction from the project site.

1.2.2 Identification of Project Proponent

Company Name: M/s Pahwa Plastics Pvt. Ltd.
Manufacturing unit address: Village Jathlana, Tehsil- Jagadhri District- Yamunanagar, Haryana Pincode- 135133.
Registered address: BA-1, 1st floor, Mangolpuri Industrial Area, Phase II, Delhi, 110034
Name: Mr. Chandan Pahwa
Designation: Director
Mob.: 9911024000
Email ID: formalin.ynr@pahwaplastics.com

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

The Brief description about the nature, size and location of the project is given in **Table 1.3**

Table 1.3: Project detail and Environment Setting

S.No.	Particulars	Details
1.	Nature and size of the Project	Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.
2.	**Location details**	
	Village /Town/Plot No.	Jathlana
	District	Yamunanagar

	State	Haryana
	Latitude and Longitude	Core: 30° 2'22.96"N, 77°15'3.37"E A: 30° 2'23.92"N, 77°15'2.45"E B: 30° 2'23.89"N, 77°15'4.03"E C: 30° 2'21.99"N, 77°15'4.09"E D: 30° 2'21.94"N, 77°15'2.67"E
	Toposheet No.	H43L4, H43L8, H43R1, H43R5
3.	**Area Details**	
	Total Project Area	Total plot area is 0.23 hectare. Green belt will be developed in an area of 0.08 Hectare (Approximately 34.78% of total land area).
4.	**Environmental Setting Details (with approximate aerial distance and direction from the project site)**	
	Nearest major settlement	Village Jathlana is at a distance of 2 Kms (approx.) in S direction.
	Nearest highway	SH-6~0.2 Km in E direction
	Nearest Railway Station	Yamunanagar Railway Station at a distance of 9.8 kms in N direction.
	Nearest Airport	Chandigarh International Airport is at a distance of 83.25 kms in NW direction.
	National Parks/ Wild Life Sanctuaries/ Biosphere Reserves/ RF and PF within 10km radius	No National Park/Wildlife Sanctuary within 10 km radius of the Project Site.
	Nearest Water Bodies	Yamuna River at a distance of 4.5 kms in east direction
	Interstate Boundary	Haryana & Uttarpradesh at 4.7 Km in SE direction
	Religious Place	Beed Wali Masjid 3.2 Kms in N
	Medical Facility	Gaba Hospital 12.46 Kms in N direction
	Nearest School	Govt. Middle School 1.6 Kms in N
	Defence Installations	Nil
	Seismic Zone	Zone IV
5.	**Cost Details**	
	Project Cost	Rs. 1.13 Crores (Rs. 113 Lakhs)
	EMP Budget	Rs. 0.0565 Crores (Rs. 5.65 Lakhs)
6.	**Basic Requirements of the Project**	
	Fresh Water	90 KLD

		Source: HWRA
	Power	200 KW **Source:** UHBVN (Uttar Haryana Bijli Vitran Nigam) **DG sets as backup:** 180 KVA and 250 KVA (existing)
	Boiler	800 Kg/Hr
	Fuel	Wood Briquettes
	Manpower	10

All corner-coordinates of plant area are superimposed on Toposheet (OSM No.) of survey of India. Coordinate map and toposheet map is given as **Figure 1.1 and 1.2** respectively.

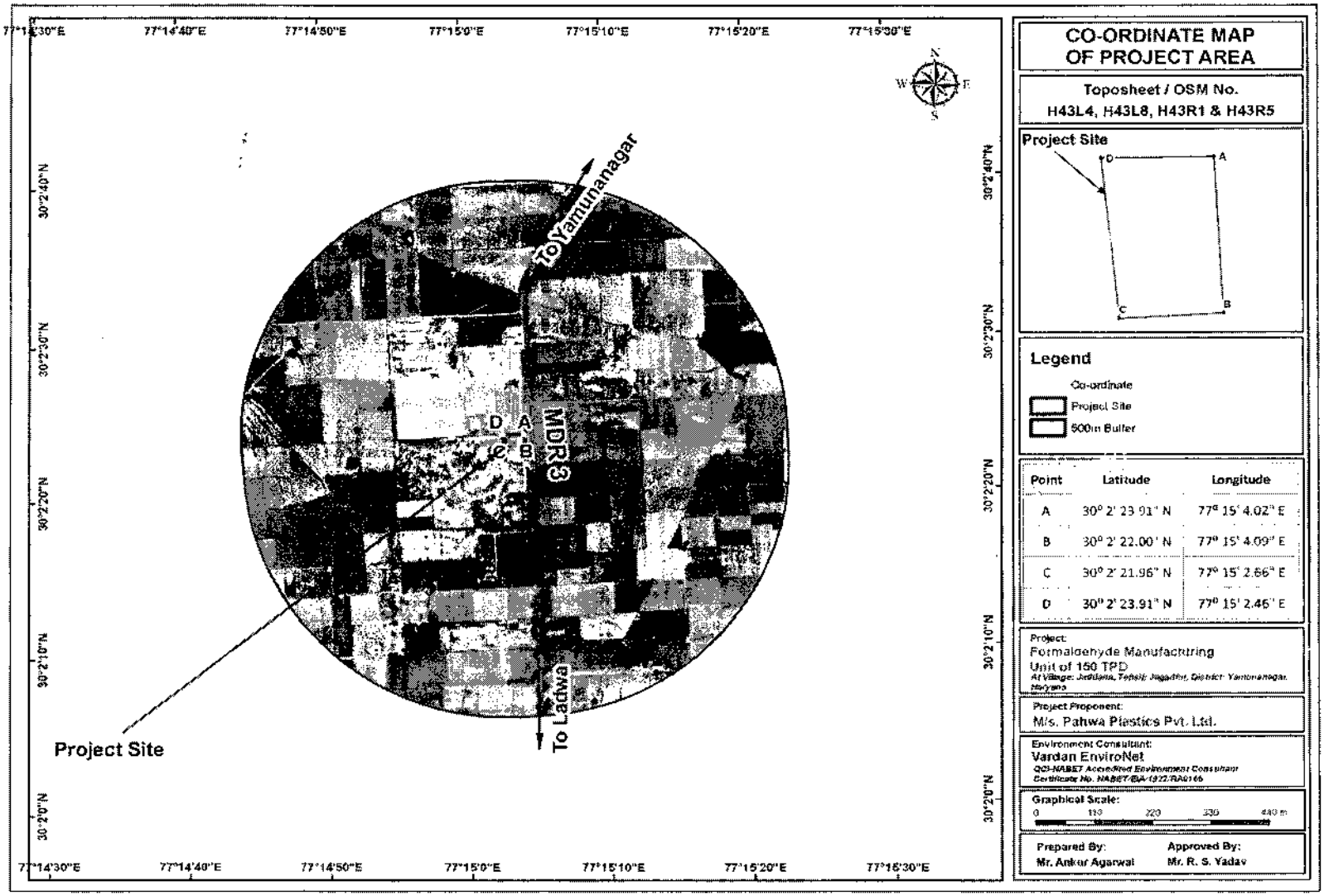


Figure 1.1: Coordinate Map of the Project Site

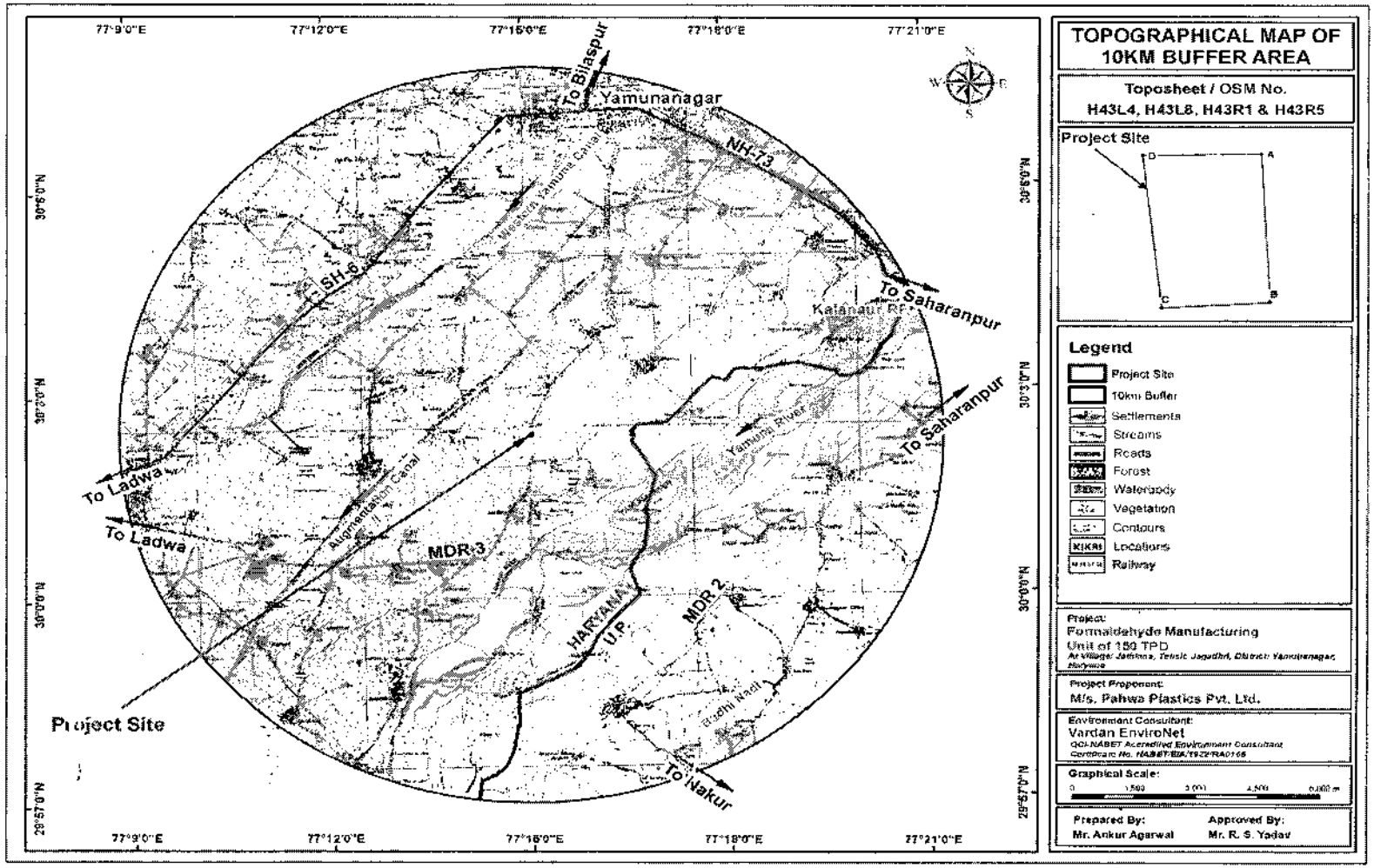


Figure 1.2: Study Area Map – 10 KM Radius around the Project Site

1.4 IMPORTANCE TO THE COUNTRY AND REGION

The formaldehyde segment (about 45% of the methanol market) is expected to grow at a CAGR of 10-15 per cent during the same period, led by growth in the enduser industries, mainly construction and automobiles.

Formaldehyde

Unlike methanol, production of its derivative formaldehyde in India is sufficient to meet the domestic demand. The Indian formaldehyde market is projected to grow at a CAGR of 6% during 2019-2030 on account of growing focus towards roofing mat application and the surging demand for wood-based articles in India.

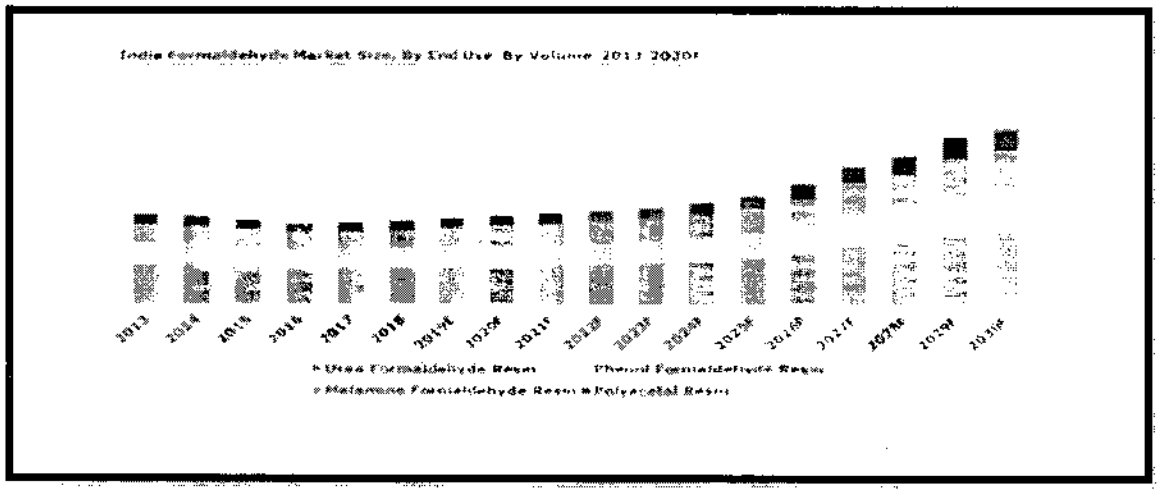


Figure 1.3: India Formaldehyde Market Size

The Formaldehyde is used by plywood and sunmica laminated sheets manufacturers, who make adhesives like Urea Formaldehyde, Phenol Formaldehyde, Malamine Formaldehyde.

Plywood Boards and sun mica sheets market is growing very fast in India. The market is expected to continue to grow at the minimum rate of 10 to 15% per year.

During the last decade, India has built a very strong position as sun mica sheets and ply wood boards for domestic consumption and for Exports to South asian countries & Middle East.

The project of formaldehyde manufacturing plant will play an important role in upliftment of the socio economic condition of the region particularly nearby villages.

1.5 SCOPE OF THE STUDY & METHODOLOGY FOR ENVIRONMENTAL IMPACT ASSESSMENT

This report is prepared based on the one non monsoon season (three months) baseline monitoring data during 1st Oct 2020 – 28th Dec 2021 (Post-Monsoon Season) by field study. Data from the secondary sources are used for comparion between present environmental conditions and our laboratory results. The data includes meteorological conditions, ambient air quality, noise, water quality and soil quality. Site survey has been conducted for studying the flora and fauna, socio- economic conditions land use etc. Additional information is also collected from several agencies and departments, both under State and Central Governments pertaining to above. The collected data have been analyzed in detail for identifying, predicting and evaluating the environmental impacts of the project. The anticipated impacts on environment are assessed and suitable environmental management plan has been suggested.

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report.

Chapter 2 – Project Description

This chapter deals with all the details pertaining to the project. These include technical details of the process, products & the raw material details alongwith the utilities in plant.

Chapter 3 – Description of the Environment

This chapter deals with the methodology and findings of field studies undertaken with respect to ambient air, meteorology, water, soils, noise levels, ecology to define the various existing environmental status in the area of the project. Once the affected environmental parameters are identified, a monitoring network is set up for each environmental parameter to establish itsbackground quality. For Air Environment, ambient air quality monitoring stations were set up at key points to establish the representative background levels of criteria for air pollutants like Suspended Particulate Matter (SPM), Respirable Dust (RD), Carbon Monoxide (CO), and HydroCarbon (HC). The data for other environmental components such as Noise, Water, Land, Socio-economic were also collected in the study area. The detailed description on the above is covered in the relevant chapter of this report. Baseline data in terms of above environmental parameters had been collected by M/s. Vardan Envirolab, Gurgaon, an

NABL and MoEFCC approved Laboratory. Population statistics of villages in the study area was collected from census data available from the National Informatics Centre. Similarly, the baseline status of flora and fauna had been collected by Field Area Expert (Ecology & Biodiversity). Land Use/ Land Cover study was also done.

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

In this part of the report the sources of emissions (Gaseous, Liquid, Solid, Noise) due to the proposed activities are identified and their emission load and characteristics are estimated. Predictions were then carried out to know the quantitative/qualitative effect on various environmental parameters. Parts of the predictions are qualitative in nature also, especially in cases where such predictive techniques are not available. These predictions are subsequently superimposed on the background quality of various environmental components and their individual and synergistic impact is evaluated using the "Cause and Effect" relationship matrix. The resultant matrix attempts to give an objective assessment to help the Assessment Agency in the decision-making process.

Chapter 5 – Analysis of Alternatives

This chapters deals with the consideration of ulternative of sites and technologies so that best technology and least impacted site can be selected. As the project located within the Notified Industrial area hence no ulternative site was considered.

Chapter 6 - Environment Monitoring Programme

This chapter described with the planning for Environmental Manitoring considering all environmental component during construction and operation of the project.

Chapter 7 – Additional Studies

This chapter includes risk assessment, studies conducted, proposing Onsite and off site emergency management plan, disaster management plan for the project.

Chapter 8 – Project Benefits

This chapter deals with improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits due to the project activity.

Chapter 9 – Environmental cost benefit analysis

Environmetal Cost benefit analysis is not recommnded hence not included in the EIA/EMP Report.

Chapter 10- Environment Management Plan

In order to mitigate or minimize the negative impacts of the project, an effective EMP is called for. Therefore, this chapter deals with the planning and implementation of various pollution abatement strategies including the proposed monitoring/surveillance network.

Chapter 11 – Summary and Conclusion

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

This will include the names of the consultants engaged in preparation of EIA and nature of consultancy rendered.

1.6 SUMMARY OF ENVIRONMENTAL LEGISLATION FOR THE PROJECT

Legislation	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
The Environment (Protection) Acts 1986/Rules 1986. The Environmental Impact Assessment (EIA) Notification, 2006.	MoEF&CC, CPCB, SPCB	Protection and Improvement of the Environment	1. Prevent discharge or emission of environment pollutants in excess of the prescribed standards 2. Submit 'Environmental Statement' every year. 3. Obtain prior "Environmental Clearance' from MoEF&CC in case of new project or for Modernisation / Expansion.
The Water (Prevention & Control of Pollution) Acts1974/ Rules1975	CPCB, SPCB	The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water	1. Not to discharge any effluent, not confirming to standards, prescribed by CPCB into any stream, well, sewers or land 2. Not to discharge air pollutant(s) in excess of standards, prescribed by the State PCB 3. Obtain 'Consent to Establish' prior to establish any process, operation or treatment system 4. Obtain 'Consent to Operate' prior to operation of system which is likely to discharge effluent. 5. Apply for renewal of the 'Consent to Operate' before the expiry. 6. Comply with conditions as prescribed under consents.
The Air (Prevention & Control of Pollution) Acts 1981/ Rules 1982	CPCB, SPCB	The prevention, control and abatement of air pollution	1. Comply with conditions as prescribed under consents.
Hazardous and Other Wastes (Management and Transboundary	MoEF&CC, CPCB, SPCB, DGFT	Management & Handling of hazardous wastes in line with the	1. It is the responsibility of the occupier to identify the hazardous wastes in their units and ensure proper handling and disposal. 2. Obtain authorization from PCB and comply with the

Movement) Rules, 2016		Basel convention	conditions. 3. Maintain records of Hazardous Waste generated in Form-3 and submit yearly return for generation, treatment, recycling, disposal etc., to SPCB 4. Used Oil to be send / sold to the registered recycler, re-processor, registered authorized facility 5. Shall be transported in accordance with the rule. 6. Site storage is allowed for 90 days only
Factories Act, 1948 (as amended till 1987)	Ministry of Labour, DGFASLI and Directorate of Industrial Safety and Health/Factories Inspectorate	Control of workplace environment, and providing for good health and safety of workers	1. Obtain and renew factory license and obtain permission for the site from State Government or the Chief Inspector of Factories in case of new or extension of any Factory. 2. Ensure health, safety and welfare of all workers while they are at work in the Factory as far as reasonably practicable. 3. Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature. 4. Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature.
The Central Motor Vehicle Rules, 1989	Ministry of Shipping, Road Transport and Highways	To consolidate and amend the law relating to motor vehicles including to regulate the transportation of dangerous goods with a view to prevent loss of life	1. Ensure compliance to safety provisions in the transport vehicle carrying dangerous and hazardous substances inside works 2. Display of emergency information panels at front, back and both side of vehicle 3. Every transporter to ensure safe transportation of dangerous/ hazardous goods. 4. Earthing chain for grounding, any prevalent static charge. 5. All motor vehicle entering the works shall have properly maintained brakes, lights, signal system for brakes, blinkers and

		or damage to the environment	registration number displayed, and valid Pollution under Control Certificate
The Solid Waste Management Rules, 2016	CPCB, SPCB	To manage/ utilize the generated solid waste without damaging the environment and surroundings	1. Segregate waste in to three streams, Wet (Biodegradable), Dry (Plastic, Paper, metal, wood, etc.) and domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.
E-Waste (Management) Rules, 2016	SPCB, CPCB and MoEF&CC	To recycle/ manage the electronic waste from the industry	1. Shall make provisions for collection of e-waste generated from 'end of life' of their products and shall ensure that such e-wastes are channelized to registered dismantler or recycler, In line with the principle of 'Extended Producer Responsibility'. 2. Set-up of collection centres or take back systems either individually or collectively. 3. Finance and organize a system to meet costs involved in the environmentally sound management of e-waste generated from the 'end of life' of its own products. 4. Create Awareness
The Boiler Acts 1923 & Rules 1950	State Government, District magistrate	To register the boilers used in industry	1. Ensure availability and effective functioning of steam vents, safety valve, drain valve, monitoring instruments of critical parameter through regular checks and maintain records for the same. 2. Obtain authorization for boilers and their renewal prior to due date and / or when an accident occurs to the boiler / when any structural alteration / addition / renewal is made. 3. Ensure mandatory registration of boilers. 4. Ensure to obtain prior approval before taking any alteration and renewals to steam pipes after submitting plan and report. 5. Ensure to obtain prior approval before taking structural

			alteration, addition and renewal to boilers from Chief Boiler Inspectors. 6. Ensure prior examination of boiler by Inspector during & after any repair/shut down and maintain record for the same. 7. Report accident / incident or any severe damage to property, human life within 24 hours giving details of occurrence.
Noise Pollution (Regulation and Control) Rules, 2000 and its amendments	CPCB, SPCB, MoEF&CC	To maintain the noise levels with respect to the place/equipment/ industry	1. Noise Quality Monitoring & submission of reports on weekly/monthly basis. 2. Providing Ear plugs and Muffs to the workers working in noise prone areas. 3. Dampening the source noise level or making the noise characteristics less annoying by providing suitable enclosures and barriers.

CHAPTER 2: PROJECT DESCRIPTION

2.1 TYPE OF THE PROJECT

The report is for Formaldehyde manufacturing unit of 150 TPD Capacity at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana by M/s Pahwa Plastics Pvt. Ltd. The number of working days for the manufacturing of formaldehyde is 330 days. The operation of the unit is continuous along with effective utilization of the resources.

As per EIA Notification dated 14th Sep, 2006, as amended from time to time; the project falls under **Category "A"**- as the project is located outside the Notified Industrial Area and **Activity "5(f)"**- Synthetic Organic Chemical Industry. The unit had started construction in 2016 and came in operation in 2018 without securing prior Environmental Clearance. Production capacity has also enhanced in April 2021 from 60 TPD to 150 TPD after obtaining CTO on 08.04.2021 for the period of One Month without securing prior Environmental Clearance. Hence it attracts the violation as per EIA Notification, 2006. Currently industry is not in operation.

2.1.1 NEED FOR THE PROJECT

Formaldehyde is best known for its preservative and anti-bacterial properties, but formaldehyde-based chemistry is used to make a wide range of value-added products. Formaldehyde is one of the most well-studied and well-understood compounds in commerce. It is an essential building block chemical in the production of hundreds of items that improve everyday life. Some applications are as follows:

Building and Construction:

Formaldehyde-based resins are used to manufacture composite and engineered wood products used extensively in cabinetry, countertops, moldings, furniture, shelving, stair systems, flooring, wall sheathing, support beams and trusses and many other household furnishings and structures. Glues that use formaldehyde as a building block are exceptional bonding agents, delivering high-quality performance that is also economical.

The wood products industry uses formaldehyde-based resins in a wide range of panel and board products, enabling sustainable use of forestry resources and minimizing waste. For example, composite wood panels are typically made from recovered wood waste that might otherwise be burned or disposed of in a landfill.

Personal Care and Consumer Products

Formaldehyde-based chemistry is essential in the production of many personal care and consumer items. These products may contain formaldehyde-releasing ingredients, which

act as a preservative to kill microorganisms and prevent growth of bacteria and other pathogens, extending product shelf life.

Health Care Applications

Formaldehyde has a long history of safe use in the manufacture of vaccines, anti-infective drugs and hard-gel capsules. For example, formaldehyde is used to inactivate viruses so they don't cause disease, such as the influenza virus in making the influenza vaccine.

Automobiles

Formaldehyde technology helps make vehicles lighter and more energy efficient. Formaldehyde-based resins are used to make interior molded components and under-the-hood components that need to withstand high temperatures. These resins are also used in the production of highly durable exterior primers, clear coat paints, tire-cord adhesives, brake pads and fuel system components

2.2 LOCATION OF PROJECT (MAPS SHOWING GENERAL LOCATION, SPECIFIC LOCATIONS, PROJECT BOUNDARY AND PROJECT SITE LAYOUT)

The existing plant is located in 0.23 ha area and is situated at Village Jathlana, Tehsil-Jagadhri Distt. Yamunanagar, Haryana. The land is already under the possession of project proponent. The geographical coordinated of the plant is as under.

Table 2.1: Coordinates of Project

Points	Latitude	Longitude
Core	30° 2'22.88"N	77°15'3.35"E
A	30° 2'23.91"N	77°15'2.48"E
B	30° 2'23.90"N	77°15'4.03"E
C	30° 2'21.99"N	77°15'4.10"E
D	30° 2'21.95"N	77°15'2.70"E

The Location Map, Google Imaginary, Route Map, Plant Layout and Site Photographs are shown below as **Fig. 2.1, Fig. 2.2, Fig. 2.3, Fig. 2.4 & Fig. 2.5.**

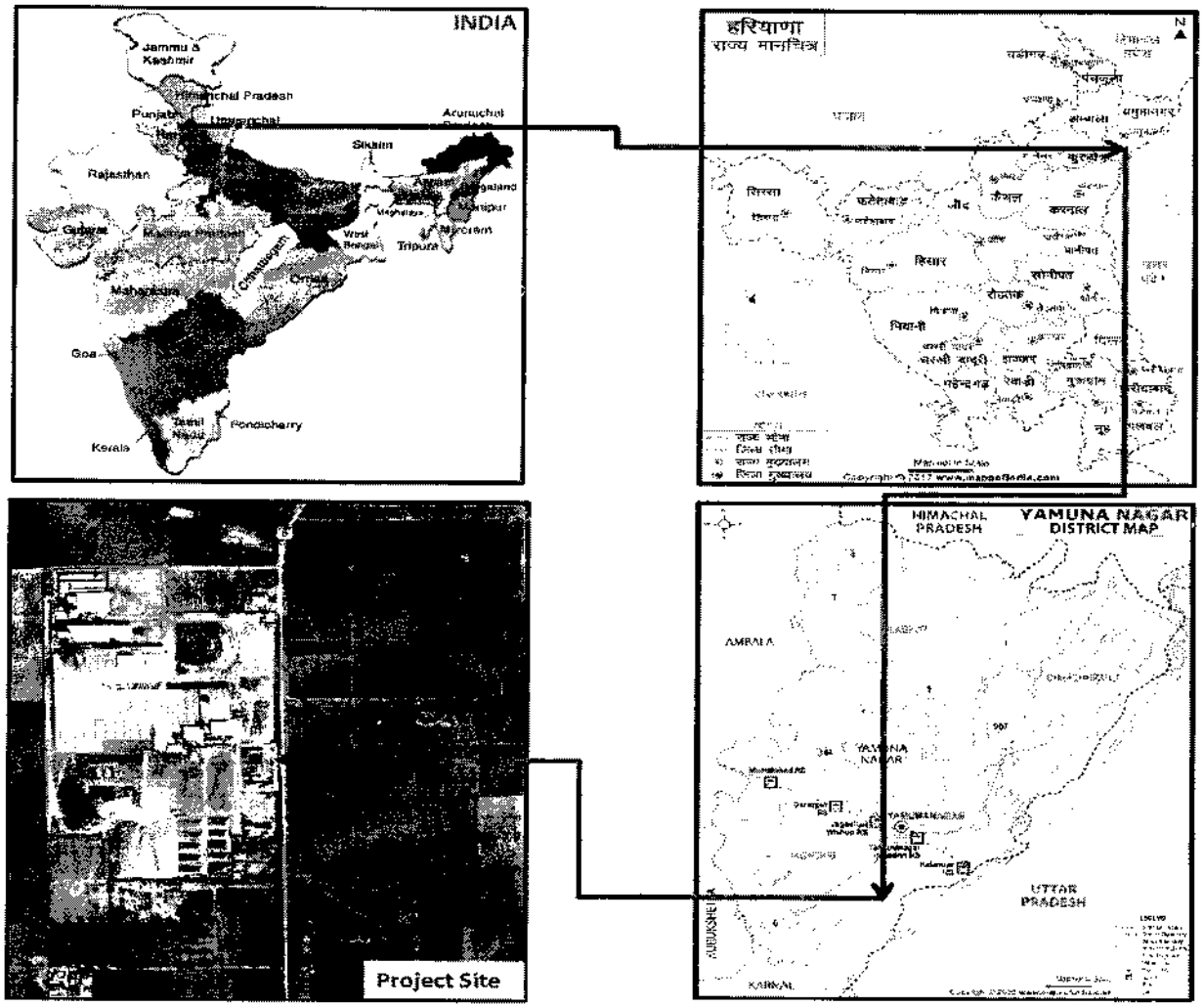


Figure 2.1: Location Map of the Project Site

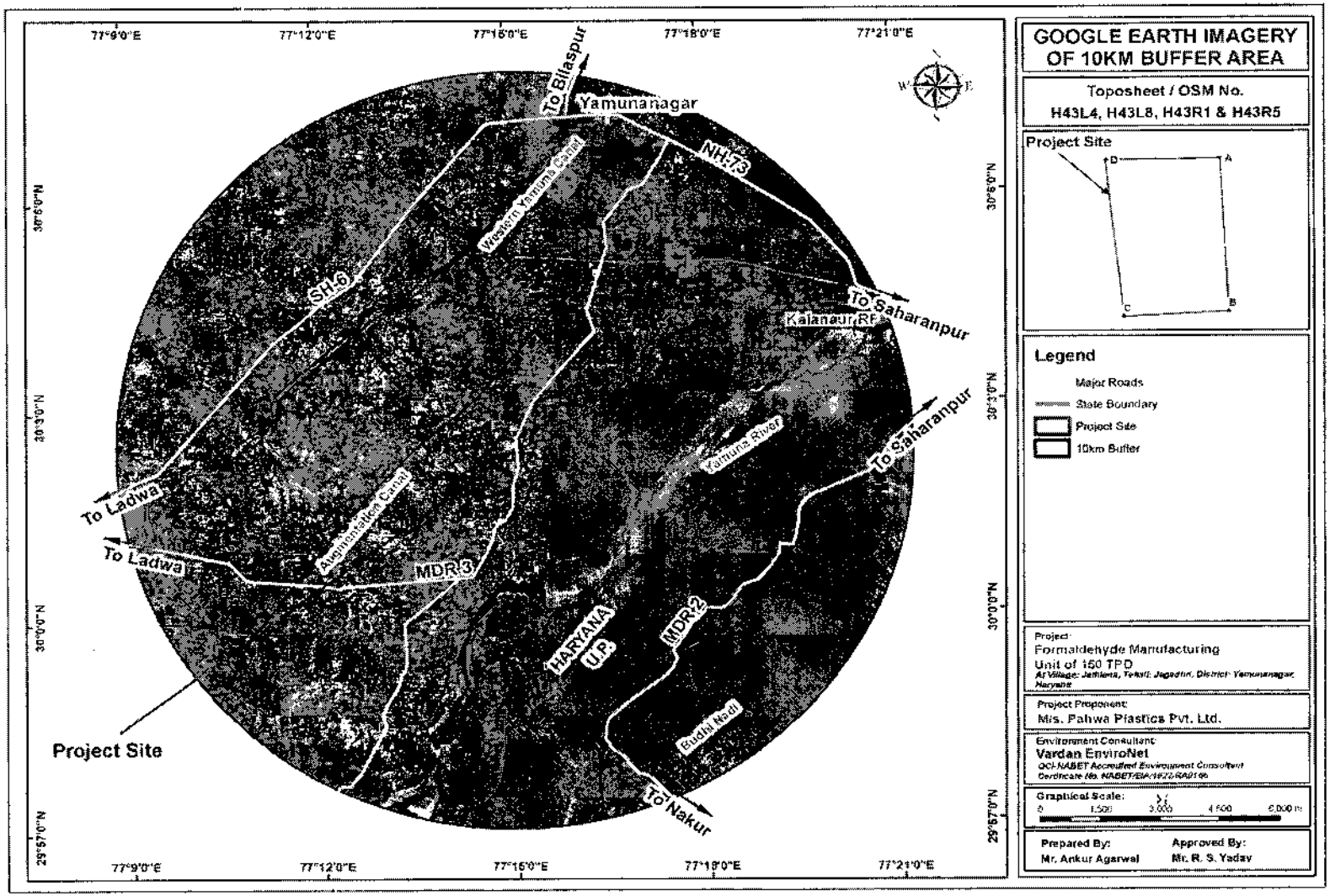


Figure 2.2: Google Earth Imagery of 10 km radius of Project Site

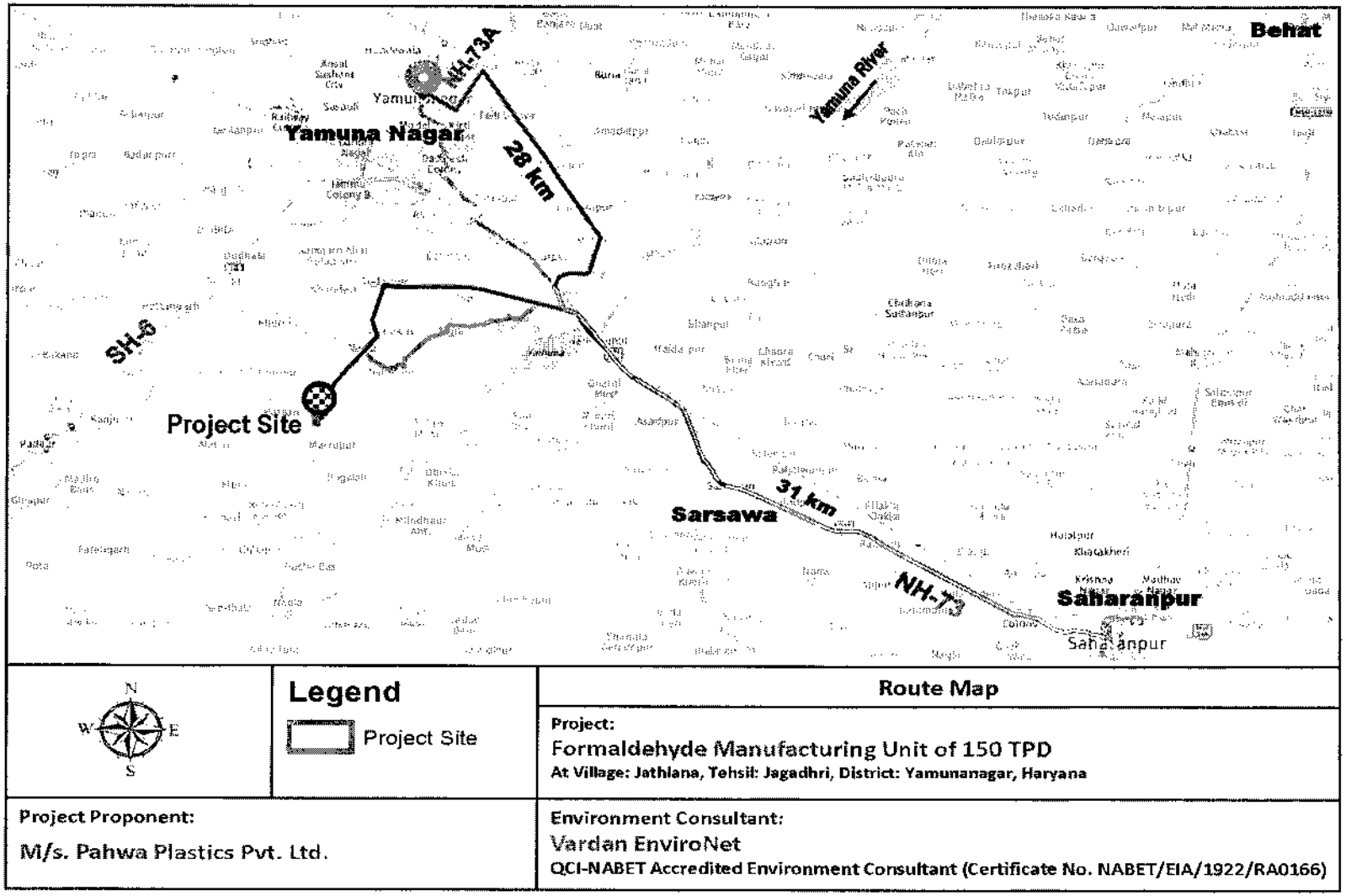


Figure 2.3: Route Map of the Project Site

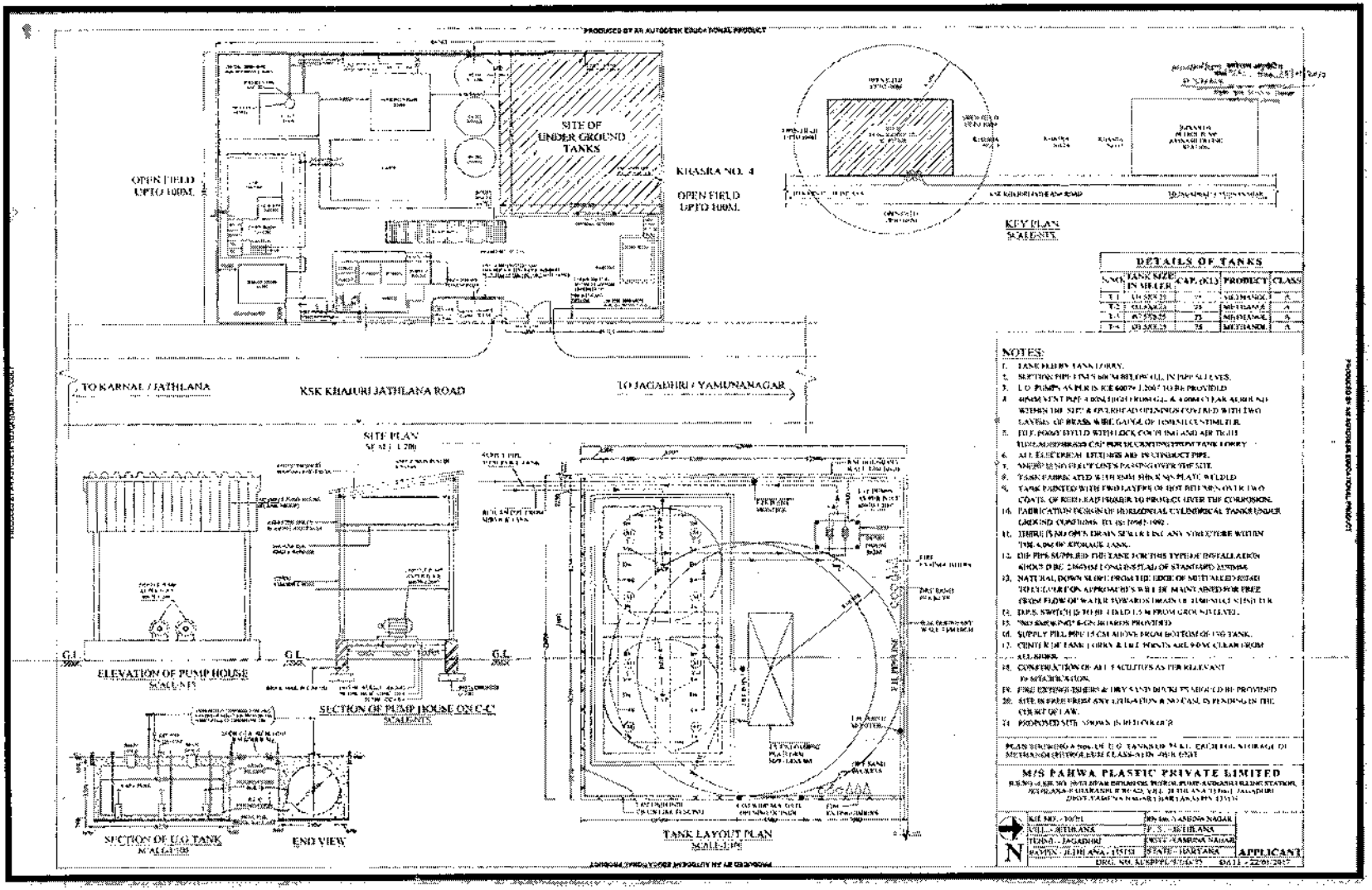


Figure 2.4: Plant Layout

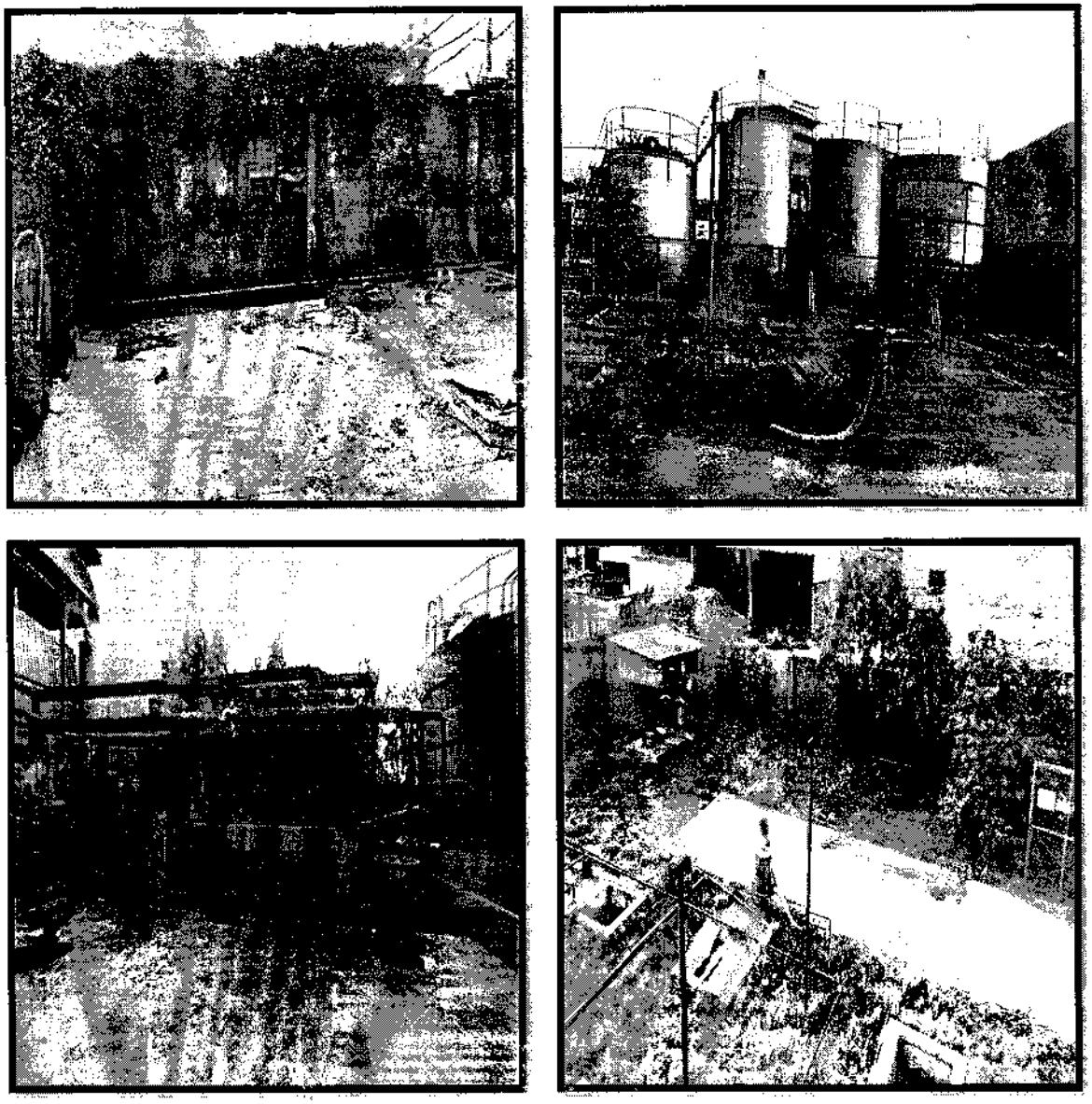


Figure 2.5: Site Pictures

2.3 MAGNITUDE OF OPERATION

The unit has obtained initial CTO for 60 TPD formaldehyde manufacturing vide Letter 2846618YAMCTO3098246 dated 26.03.2018 valid up to 31.03.2022. After that, the unit has enhanced its production capacity to 150 TPD after obtaining CTO vide Letter 313096621YAMCTO10961479 dated 08.04.2021 valid up to 10.05.2021.

Table 2.2: Production capacity

Capacity	Mar 2018 to Mar 2021	April-May 2021	Total
Formaldehyde	60 TPD	150 TPD	150 TPD

2.4 CHRONOLOGY OF THE PROJECT

Table 2.3: Implementation Time

Date	Activity
Aug 2020	Work order received
Oct to Dec 2020	Baseline monitoring period
19.03.2021	Submission of online application (Form-1 & PFR)
17.05.2021	EDS raised by MoEF&CC
17.06.2021	EDS Reply submission
01.07.2021	ToR Presentation
20.07.2021	ToR Granted
August 2021	Draft EIA submission

2.5 PROCESS DESCRIPTION AND TECHNOLOGY

Chemical Reaction & Mass Balance for Manufacturing of Formaldehyde

Raw Material: 1 Methanol {CH3OH}

: 2 Silver {Ag}

: 3 Water {H2O from tubewell}

: 4 Oxygen {O2 from atmosphere}

Finished Product: Formaldehyde {HCHO}

Plant & Machinery {Main}: Evaporator, Mixing Tank, Reactor, Condenser, Absorption column, heat exchanger, pumps, pipe line

Methanol is converted into formaldehyde by oxidation process with Oxygen, Silver & Water at a temperature of **650°C to 700°C**. It is an exothermic reaction.

Step I: Methanol is pumped from the underground storage tanks to a mixing tank where water is added to dilute the solution.

Step II: Diluted Methanol solution I is taken into evaporator where it is evaporated to proper stage at **700°C**. Air also passed through the blower and applied steam. The mixture of vapors (AIR + METHANOL + WATER) is passed to the reactor through silver bed where methanol is converted into formaldehyde gas at **670°C** (approx.)

Step III: The temperature of formaldehyde gas is taken down upto **110°C** through condensers and then passed to absorption column to absorb the gases in water. We circulate the formaldehyde solution till desired quality of formaldehyde liquid is obtained, then it is transferred to the storage tank. Material is dispatched after Quality check.

Normally, the ratio of methanol and formaldehyde is approx. 1:2, we get 2 kg of formaldehyde by 1 kg of methanol, if the quantity of raw material & product is OK. It

is produced on the demand of buyer. The ratio of methanol and formaldehyde, sp. varies depends on the specification desired by the party.

Catalytic oxidation process is an optimized production method. It is a simple process as per the material balance shown below.

Material Balance:

2 Moles CH_3OH + ½ Mole O_2 → 2 Moles HCHO + 1 Mole H_20

(64) (16) (60) (18)

The water produced will be reuse in the process to obtain 37% of formaldehyde

78 grams of HCHO solution formed is having 18 grams of water

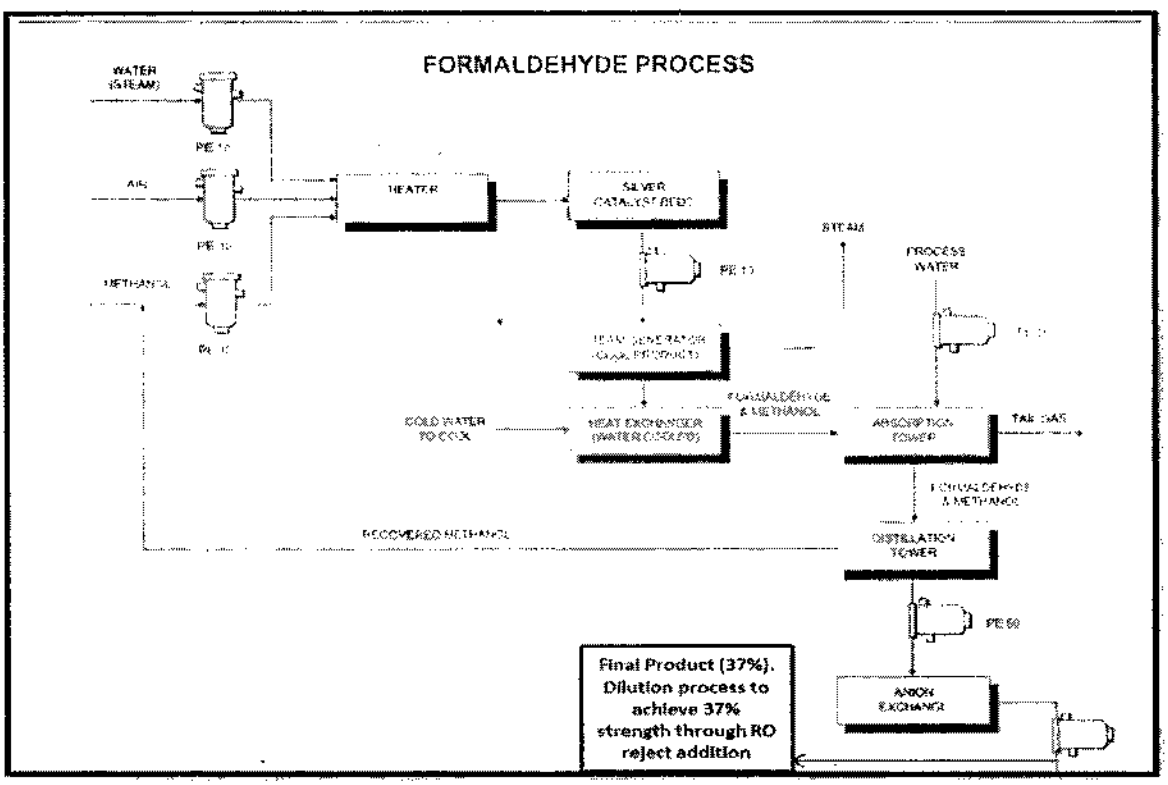


Figure 2.6: Flow Diagram of Formaldehyde Manufacturing

2.6 REQUIREMENTS FOR THE PROJECT

2.6.1 Raw Material Requirement

The major raw material is Methanol which comes in road through tankers from Kandla Port, Gujarat & stored in underground M.S tanks.

Table 2.4: Raw Material Requirement

Raw Material	Total Requirement	Source	Transport	Storage
Methanol	75 TPD	Import	Tank	U/G Tanks

			Trucks	6*75 KL

2.6.2 Boiler Details:

1 Boiler with capacity 800 kg/hr exists at the unit. Others details are mentioned in the table given below:

Table 2.5: Boiler Details

S. No.	Particular	Details
1.	Type of Fuel	Wood Briquets
2.	Capacity of Boiler	800 kg/hr.
3.	Stack Height	30 m
4.	Pollution Control Equipment Measures	Wet Scrubber

2.6.3 Details regarding D.G. Sets:

1 DG set of 180 KVA and 1 DG set of 250 KVA exists in the unit Details regarding the D.G. Sets are mentioned in the table given below:

Table 2.6: Details regarding the D.G. Sets

S. No.	Particular	Existing
1.	No. of DG sets	2
2.	Type of Fuel	HSD
3.	Capacity	180 KVA and 250 KVA
4.	Stack Height	6m

2.7 AVAILABILITY OF WATER, ITS SOURCE, ENERGY/ POWER REQUIREMENT AND SOURCE

2.7.1 Water Requirement:

Total water requirement project is 90 KLD which is being sourced from own tubewell.

Table 2.7: Water Consumption Detail of Proposed Plant

Total Requirement	Source
90 KLD	Ground water application has been submitted to HWRA vide 30-3/20655/1/HR/IND/2021

To Atmosphere

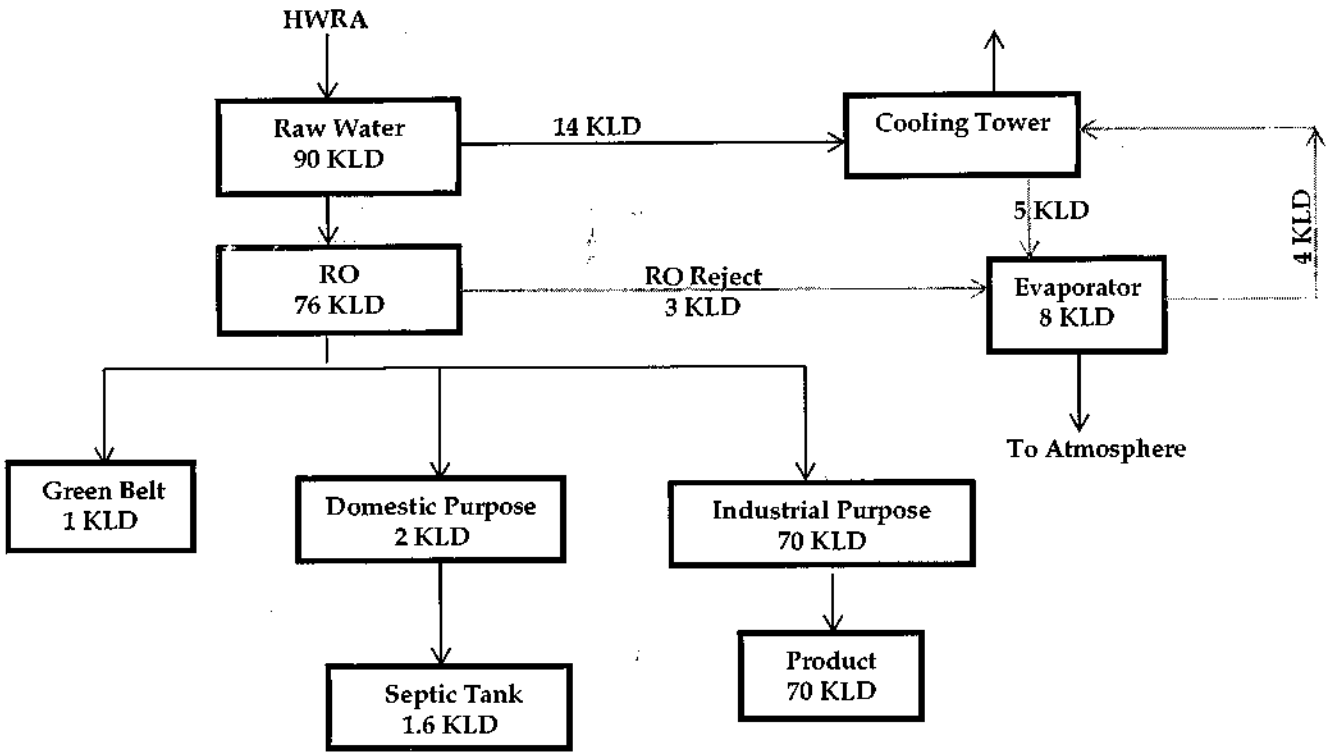


Figure 2.7: Water Balance Diagram

2.7.2 Power Requirement:

Table 2.8: Power Requirement

Total	Source
200 KW	UHBVN (Uttar Haryana Bijli Vitran Nigam)

2.7.3 Manpower Requirement:

Table 2.9: Manpower enganged

Total	Source
10	Preference will be given to local people

2.7.4 Land Requirement:

The land use breakup for the proposed project is given in below table:

Table 2.10: Land use breakup

S.no.	Details	Area (Hec.)	Percentage (%)
1	Plant built-up area	0.05	21.74
2	Greenbelt area	0.08	34.78
3	Open land and paved area	0.10	43.48
Total		**0.23**	**100**

2.7.5 Cost Details:

The total cost for the project is calculated to be Rs. 1.13 Crores.

Table 2.11: Cost Breakup

S. No.	Description	Cost (Crores)
1	Land and Building	0.872
2	Plant and Machinery	0.258
Total cost		**1.13 Crores**

2.8 UTILITIES REQUIRED

The storage facility provided for the project along with the major equipment is listed below.

Table 2.12: Major Equipment

S.No.	Particulars	Qty (Nos.)	S.No.	Particulars	Qty (Nos.)
1	Air Washer	2	10	Steam separator	2
2	Mixing vessel and mixture	2	11	Absorption column I	2
3	Evaporation vessel	2	12	Absorption column II	2
4	Steam coil	2	13	Absorption column III	2
5	Super heater jacket	2	14	Process vessel	2
6	Vapour Filter	2	15	Feed vessel	2
7	Separator-I	2	16	Water filter	2
8	Separator-II	2	17	Methanol filter	2
9	Separator-III	2	18	Production tank	2

Storage:

Adequate and proper storage facilities for all the raw materials and finished products are provided within the plant. Hazardous chemicals and solid waste are stored away from other plant activities. The storage yard is equipped with all necessary safety measures.

Handling:

All of the raw materials and finished products are handled as per the standard practice. To avoid leakage or spillage of chemicals from all storage tanks, third party will inspect transfer lines, valves, fittings and every joint periodically.

Transportation

All the necessary precautions will be taken carrying out transport of the above materials as per the hazardous rules of transportation. The vehicles for the

transportation of raw materials and products will be parked at specified loading facilities where there will be a provision of fire extinguishers. The finished product will be transported by road.

2.9 WATER AND WASTE WATER MANAGEMENT

2 KLD of water from the total 90 KLD is used for domestic purpose. Approx. 1.6 KLD (80% of total domestic water consumption) is likely generated. Waste water is currently treated in Septic tank and will be continue to treat in septic tank (2 KLD). Treated wastewater is used for cleaning, washing, water sprinkling and other non portable domestic purpose. No effulent will be generated from the process.

2.10 SOLID AND HAZARDOUAS WASTE GENERATION AND MANAGEMENT

Hazardous Waste:

There is no hazardous waste generated from the process.

Used oil from machineries/D.G. Set is carefully stored in HDPE drums in isolated covered facility and will be sold to vendors authorized by Haryana State Pollution Control Board for the treatment of the same. Suitable care has been taken so that spills / leaks of used oil from storage could be avoided.

The following hazardous waste identified for the project.

5.1- Used Oil

28.3 - Off specification products/ date expired

Air Emissions and Control:

- To control the air emissions from D.G. Set, stack height of 6.0 m will be provided.
- To control emission from boiler, stack height of 30 m will be provided.
- To control fugitive emissions, wet scrubber will be provided.

2.11 DESCRIPTION OF MITIGATION MEASURE INCORPORATED IN TO THE PROJECT TO MEET ENVIRONMENTAL STANDARD, ENVIRONMENTAL OPERATING CONDITIONS OR OTHER EIA REQUIREMENTS

Details of emission effluent, hazardous waste generation and their management

Table 2.13: Mitigation Measures Adopted for the Proposed Project

S. No.	Particulars	Mitigation measures to be adopted
1.	Air Environment	• Online Stack Monitoring System as an air pollution control measures to control the emission of particulate matter the flue gas emission will remain well within gaseous emission norms prescribed by the CPCB. • Scrubber will be installed for scrubbing the residual Formaldehyde from the main product stream which also

S. No.	Particulars	Mitigation measures to be adopted
		controls the odour problem. • To control the air emissions from D.G. Set, stack height of 6.0 m shall be provided. • Green belt will be developed on 34.78% area of the total project area which will help in attenuating the pollutants emitted by the plant. • Adequate measures for control of fugitive dust emissions will be taken.
2.	Water Environment	• Fresh water requirement of the project will be met by ground water through tubewell. • Domestic wastewater discharged will be treated in septic tank & will be utilized for greenbelt development to reduce the water consumption.
3.	Solid/ Hazardous Waste Environment	• Used oil to be sold to registered recycler.
4.	Noise Environment	• Green belt development (plantation of dense trees across the boundary) will help in reducing noise levels in the plant as a result of attenuation of noise generated due to plant operations and transportation. • Personal protective equipments like ear plugs and ear muffs will be provided to employees working in the noise prone areas. • Time to time oiling and servicing and Maintenance of machineries will be done. • Acoustic enclosure for heavy machines/equipment/D.G. sets would be used. • The Noise free machines of latest technology will be installed • A high standard of maintenance and proper lubricants will be practiced for plant machinery and equipments, which helps to avert potential noise problems.
5.	Odour management	• Scrubber system will be used to control the odour from the exit gases. • The remedial measures will be taken such as better house-keeping by regular steaming of all the equipments. • Temperature will be kept under control during the process

CHAPTER 3: DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environmental attributes. The existing environmental setting is considered to establish the baseline conditions which are described with respect to physical environment, air environment, noise environment, traffic pattern and density, water environment, land environment, biological environment, socio economic environment. Baseline environmental status report contains the results of environmental monitoring carried out during the study period, Oct to Dec 2020 (Post-Monsoon). The baseline environmental study reveals information on existing environmental scenario. To achieve these objectives, team of Vardan Envirolab monitored the environmental parameters as per the Guidelines for EIA issued by the Ministry of Environment & Forests, Govt. of India.

3.1.1 Study Area

The environmental impact due to the project is likely to affect the project site and its surroundings. Therefore, the study area for monitoring of environmental parameters covers 10 kms. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects in the 10 kms study area.

3.1.2 Study Period

The baseline environmental study has been done for the period of 1st Oct 2020 to 31st Dec 2020 by M/s Vardan Envirolab, Gurugram, NABL Accredited Lab, and Certificate No. TC-6299 (Certificate enclosed as **Annexure 1**).

3.1.3 Components and Methodology

The baseline data has been collected during pre-monsoon season by M/s. Vardan Envirolab, Gurgaon {NABL Accredited Lab, Certificate No. T-2629 MOEFCC NO. S.O. 1783 (E) (Certificate enclosed as Annexure I)} in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB.

The scoping and the extent of data generation were formulated based on interdisciplinary team discussions, and professional judgment. Primary data was collected from the above mentioned monitoring stations. Various Government and other organizations were approached for getting information for the secondary data.

3.2 ESTABLISHMENT OF BASELINE FOR VALUED ENVIRONMENTAL COMPONENTS

The scope of the study is as per TOR issued by MoEF&CC vide File no. **F.No. IA-J-11011/185/2020-IA.II (I)** dated 20th July 2021.

3.2.1 Meterological Data

The meterological station was set-up at the project site and data were collected which is as under:

Wind

The critical weather elements that influence air pollution are wind speed, wind direction, temperature, which together determines atmosphere stability. Wind speed and direction data recorded during the study period is useful in identifying the influence of meteorology on the air quality of the area.

Wind Rose

The meteorological data was collected at the site by installing an automatic weather station during pre-monsoon season, 2020. Wind Speed, Wind Direction, Temperature and Relative Humidity were recorded for the study period. The data on wind patterns are pictorially represented by means of windrose diagrams for study period 1st Oct to 31st Dec 2020 as **Figure 3.1.** The meteorological data reflecting minimum, maximum temperature in ^{0}C, relative humidity in %, rainfall in mm/hr, wind speed in km/hr, was collected for the study period.

Table 3.1: Onsite Meteorological Data (Period: 1st Oct 2020 to 31st Dec 2020)

Months	Temp (°C)		Avg Relative Humidity (%)	Average wind speed (Km/h)	Total Rainfall (mm)
	Max	Min			
Oct 2020	30.4	17.5	63	6.4	14
Nov 2020	26.4	12.7	60	7.4	5
Dec 2020	21.4	8.2	68	8.7	22

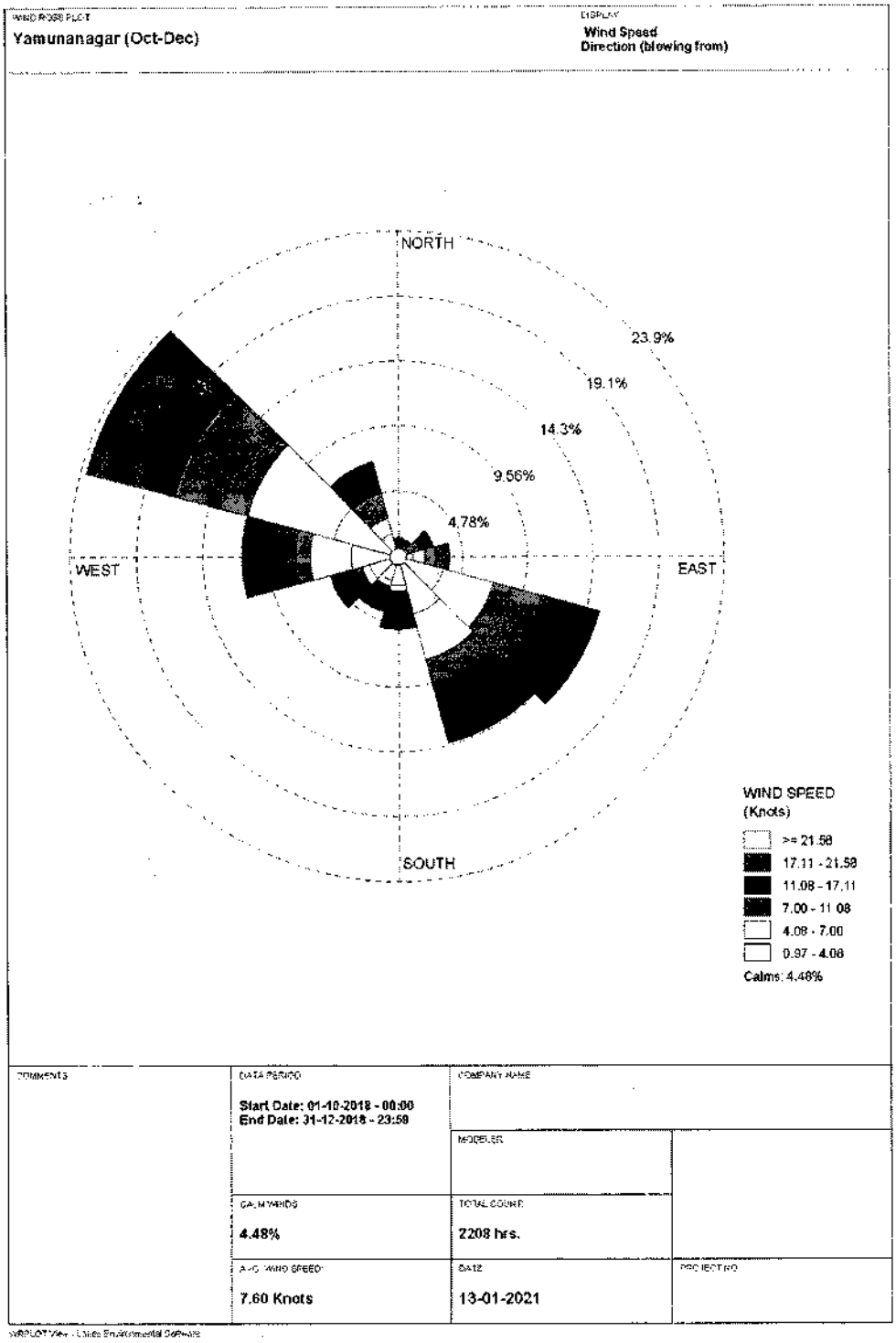


Figure 3.1: Wind Rose Diagram of Study Period: (1st Oct to 31st Dec 2020)

3.3 AMBIENT AIR QUALITY

Baseline data for ambient air quality were collected from 8 locations within the study area during the period of 1st Oct to 31st Dec 2020. The sampling stations along with their distance and direction from the project site are detailed in **Table 3.3** and **Figure 3.2**. Ambient air quality analysis data for various parameters are given in **Table 3.4**.

The observations made during the study period are presented under the forthcoming sub-sections.

3.3.1 Methodology Adopted for the Study

The baseline status of the ambient air has been established through a scientifically designed ambient air quality monitoring network.

Table 3.2: Procedures for Determining Various Air Quality Parameters

Parameters	Testing Procedure
PM_{10} & $PM_{2.5}$	Gravimetric Method by using Respirable Dust Sampler (RDS) and Repairable fine Particulate Matter 9 ($PM_{2.5}$) sampler.
NO_2	Absorption in diluted NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nepthyle) Ethylene diamine Di-hydrochloride and Hydrogen Peroxide (IS: 5182 1975, Part-VI).
SO_2	Absorption in Sodium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part – II, 2001).
CO	Each constituent gas in a sample will absorb some infra red at a particular frequency. By shining an infra-red beam through a sample cell (containing CO), and measuring the amount of infra-red absorbed by the sample at the necessary wavelength, a NDIR detector is able to measure the volumetric concentration of CO in the sample.
VOC	ASTM D2369 test standards & EPA Method 24

8 Ambient Air Quality Monitoring Locations are given below: -

Table 3.3: Ambient Air Quality Monitoring Locations

Stations	Monitoring Location	Aerial Distance (km)	Direction	Latitude	Longitude
A1	Project Site	0.0	--	30°2'22.97"N	77°15'3.45"E
A2	Marupur	1.5	SE	30° 1'55.23"N	77°15'24.15"E
A3	Jatlana	2	S	30° 1'15.42"N	77°14'52.66"E
A4	Naharpur	3	NE	30° 3'20.78"N	77°16'49.37"E

A5	Khajuri	2	N	30° 3'7.31"N	77°15'15.17"E
A6	Bahadurpur	3	NW	30° 3'19.30"N	77°13'52.45"E
A7	Jaipur	4	NW	30° 3'16.59"N	77°12'44.72"E
A8	Unheri	2	SE	30° 1'39.07"N	77°15'59.04"E

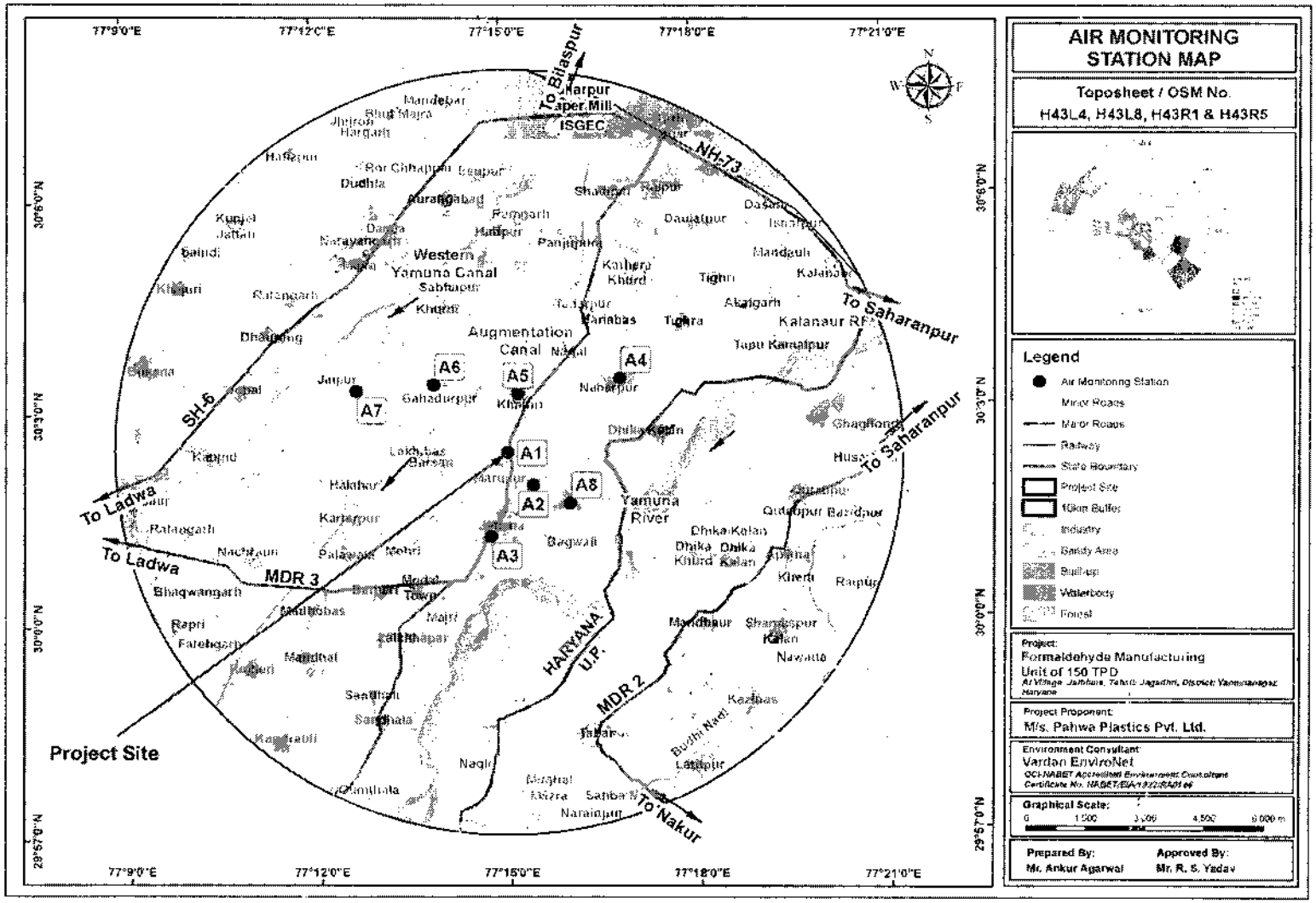


Figure 3.2: Air Monitoring Sampling Station

Table 3.4: Ambient Air Quality Monitoring Results

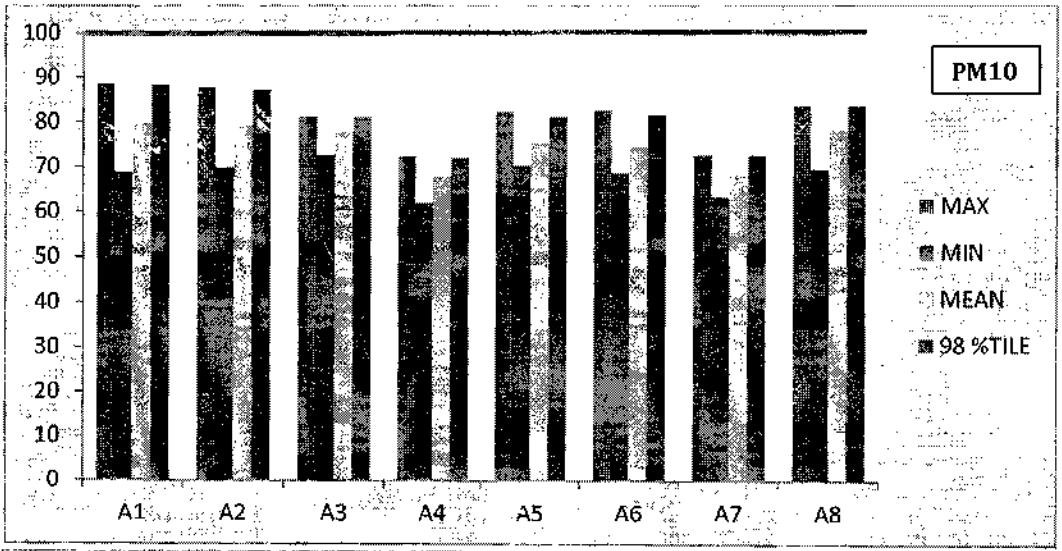
Parameters	PM10 (µg/m3)	$PM_{2.5}$ (µg/m^3)	NO_2 (µg/m3)	SO_2 (µg/m^3)	CO (mg/m3)	VOC (µg/m3)	HC (ppm)
AAQM Norms	100	60	80	80	4 (for 8 hours)	5	0.2
Project Site (AQ1)							
Max	88.6	49.1	32.8	20	0.98	ND	ND
Min	68.9	38.2	20.7	7.9	0.76	ND	ND
Mean	79.69	43.81	26.12	12.17	0.86	ND	ND
98 Percentile	88.18	48.63	31.29	19.27	0.97	ND	ND
Marupur (AQ2)							
Max	87.7	48.2	31.2	18.2	0.99	ND	ND
Min	69.8	38.1	20.7	7	0.73	ND	ND
Mean	79.23	43.04	25.67	11.67	0.86	ND	ND
98 Percentile	87.13	47.84	30.99	17.99	0.98	ND	ND
Jatlana (AQ3)							
Max	81.2	42.3	26.7	15.8	0.98	ND	ND
Min	72.6	30.8	17.1	8.6	0.54	ND	ND
Mean	77.77	36.24	21.86	12.59	0.76	ND	ND
98 Percentile	81.04	41.94	26.23	15.70	0.94	ND	ND
Naharpur (AQ4)							
Max	72.2	45.6	27.6	13.4	0.94	ND	ND
Min	62	28.6	17.2	7.3	0.72	ND	ND
Mean	67.85	34.42	20.51	10.02	0.83	ND	ND
98 Percentile	72.00	44.40	27.55	13.00	0.93	ND	ND
Khajuri (AQ5)							
Max	82.3	46.5	32.8	15.8	0.98	ND	ND
Min	70.4	30.1	18.6	8.5	0.55	ND	ND
Mean	75.27	37.72	25.50	11.81	0.71	ND	ND
98 Percentile	81.15	44.70	32.35	15.70	0.95	ND	ND
Bahadurpur (AQ6)							
Max	82.6	43.4	32.2	13.7	0.9	ND	ND
Min	68.6	32.5	17.9	7.6	0.61	ND	ND
Mean	74.29	36.93	22.87	10.09	0.76	ND	ND
98 Percentile	81.65	42.95	30.85	12.90	0.90	ND	ND

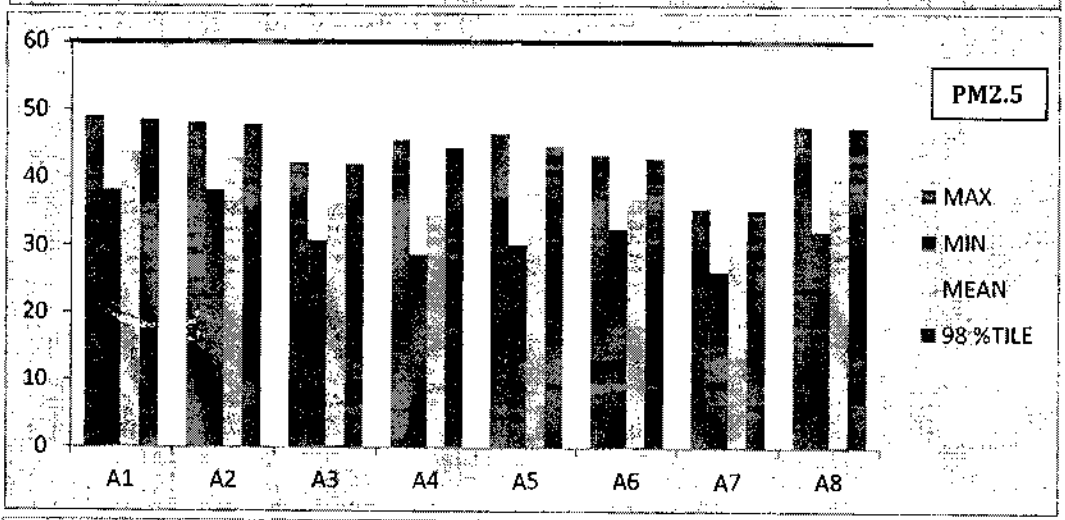
Parameters	PM10 (µg/m3)	$PM_{2.5}$ (µg/m³)	NO_2 (µg/m3)	SO_2 (µg/m³)	CO (mg/m3)	VOC (µg/m3)	HC (ppm)
AAQM Norms	100	60	80	80	4 (for 8 hours)	5	0.2
Jaipur (AQ7)							
Max	72.6	35.6	25.6	12.4	0.86	ND	ND
Min	63.3	26.2	16.5	7	0.62	ND	ND
Mean	68.12	30.84	19.65	9.67	0.74	ND	ND
98 Percentile	72.60	35.25	24.55	12.25	0.86	ND	ND
Unheri (AQ8)							
Max	83.6	47.8	30.7	19.3	92	ND	ND
Min	69.5	32.2	19.6	8.1	0.56	ND	ND
Mean	78.20	39.75	25.47	12.50	4.34	ND	ND
98 Percentile	83.60	47.45	30.45	19.10	46.49	ND	ND

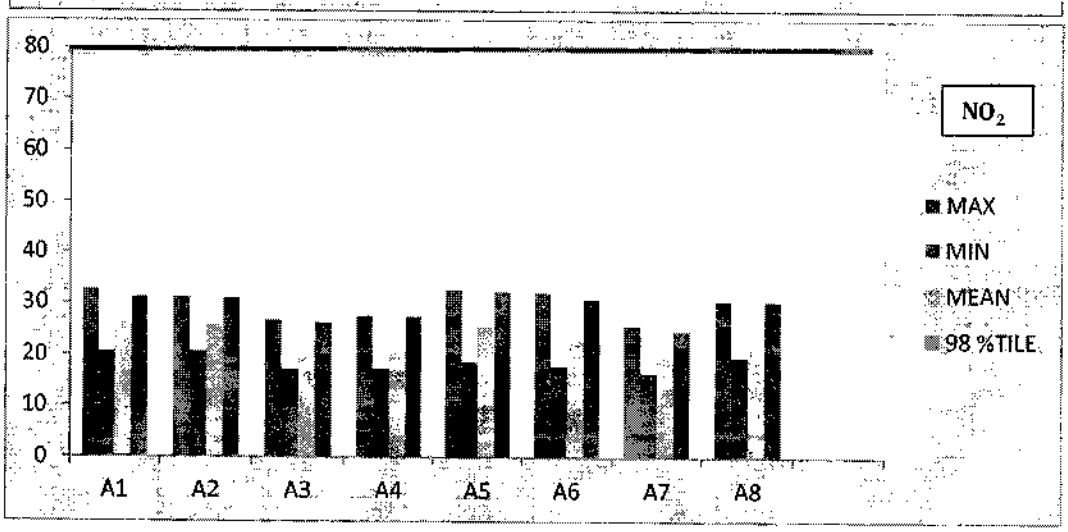
(Source: VardanEnviroLab)

3.3.2 Observations

Ambient Air Quality Monitoring reveals that the **minimum** and **maximum concentrations of PM_{10}** for all the 8 Air Quality monitoring stations were found to be **62 µg/m³** and **88.6 µg/m³** respectively, while for $PM_{2.5}$ varies between **26.2 µg/m³** and **49.1 µg/m³**. As far as the gaseous pollutants SO_2, NO_2, CO& VOC are concerned, the prescribed limits under NAAQ Standards for residential and rural areas has never surpassed at any station. The **minimum** and **maximum concentrations of NO_2** were found to be **16.5 µg/m³** and **32.8 µg/m³** respectively. The **minimum** and **maximum concentrations of SO_2** were found to be **7.0 µg/m³** and **20.0 µg/m³** respectively. The **minimum** and **maximum concentrations of CO** were found to be **0.54 mg/m³** and **0.99 mg/m³** respectively. The prescribed limits of SO_2 and NO_2 is 80 µg/m³ and CO is 4 mg/m³ for residential and rural areas has never surpassed at any monitoring station. Detailed Air Monitoring Lab report is attached as **Annexure 7**. The standards of Ambient Air Quality in India are available online at *http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php*


PM10
100
90
80
70
60
50
40
30
20
10
0
A1
A2
A3
A4
A5
A6
A7
A8
MAX
MIN
MEAN
98 %TILE


PM2.5
60
50
40
30
20
10
0
A1
A2
A3
A4
A5
A6
A7
A8
MAX
MIN
MEAN
98 %TILE


NO2
80
70
60
50
40
30
20
10
0
A1
A2
A3
A4
A5
A6
A7
A8
MAX
MIN
MEAN
98 %TILE

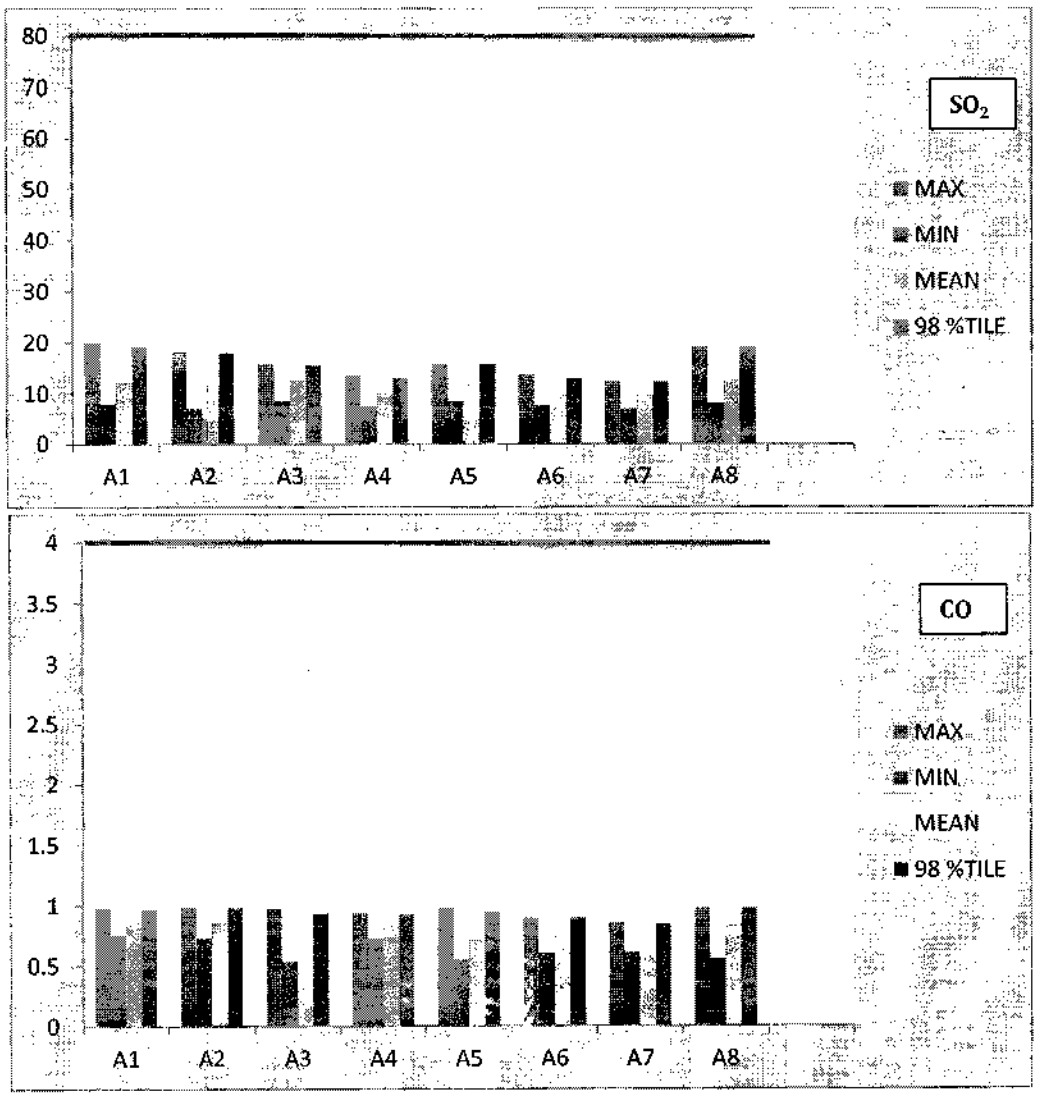


Figure 3.3: Graph Showing Pollutants Concentration of the Study Area

3.4 NOISE ENVIRONMENT

Noise often defined as unwanted sound, interferes with speech communication, causes annoyance, distracts from work, disturb sleep, thus deteriorating quality of human environment. Noise Pollution survey has therefore been carried out.

Noise levels were measured in residential areas and other settlements located within 10 km radius around the site.

3.4.1 Noise Analysis within the Study Area

The noise analysis within the study area was recorded using 4012 Maxtech sound level meter. The analysis reveals that the noise's well within the permissible range. The location of Noise level monitoring is presented in **Table 3.5** and the levels recorded are as stated in **Table 3.6**.

Table 3.5: Noise Monitoring Sampling Station

S. No.	Monitoring Location	Aerial Distance (km.)	Direction	Latitude	Longitude
N1	Project Site	--	--	30°2'22.97"N	77°15'3.45"E
N2	Marupur	1.5	SE	30° 1'55.23"N	77°15'24.15"E
N3	Jatlana	2	S	30° 1'15.42"N	77°14'52.66"E
N4	Naharpur	3	NE	30° 3'20.78"N	77°16'49.37"E
N5	Khajuri	2	N	30° 3'7.31"N	77°15'15.17"E
N6	Bahadurpur	3	NW	30° 3'19.30"N	77°13'52.45"E
N7	Jaipur	4	NW	30° 3'16.59"N	77°12'44.72"E
N8	Unheri	2	SE	30° 1'39.07"N	77°15'59.04"E

Table 3.6: Noise Monitoring Result

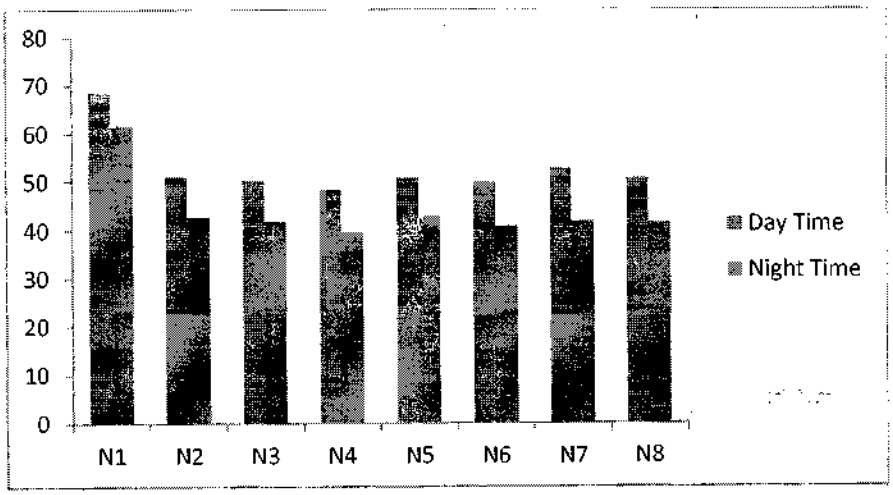
3.4.1.1 S. No	Locations	Noise Level Leq. dB (A)	
		Day Time (6:00 a.m. to 10:00 p.m.)	Night Time (10:00 p.m. to 6:00 a.m.)
1.	N1	68.6	61.8
2.	N2	51.1	42.8
3.	N3	50.3	41.8
4.	N4	48.3	39.6
5.	N5	50.7	42.8
6.	N6	49.8	40.8
7.	N7	52.8	41.8
8.	N8	50.8	41.6
CPCB Standards			
a.	**Residential Area**	**55.0**	**45.0**
b.	**Industrial Area**	**75.0**	**70.0**
c.	**Commercial Zone**	**65.0**	**55.0**
d.	**Silence Zone**	**50.0**	**40.0**

Figure 3.4: Graph Showing Noise Pollutants Concentration of the Study Area

3.4.2 Observations

Ambient noise levels were measured at 08 locations around the project site. **Minimum and maximum** noise levels recorded during the **day time** were from **48.3 Leq dB and 68.6 Leq dB** respectively and **minimum and maximum** level of noise during **night time** were **39.6 Leq dB and 61.8 Leq dB** respectively. Lab result is attached as **Annexure 7** and noise levels at all locations were observed to be within the prescribed limits and Ambient Air Quality Standards in respect of Noise is available online.

From the above study and discussions it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.



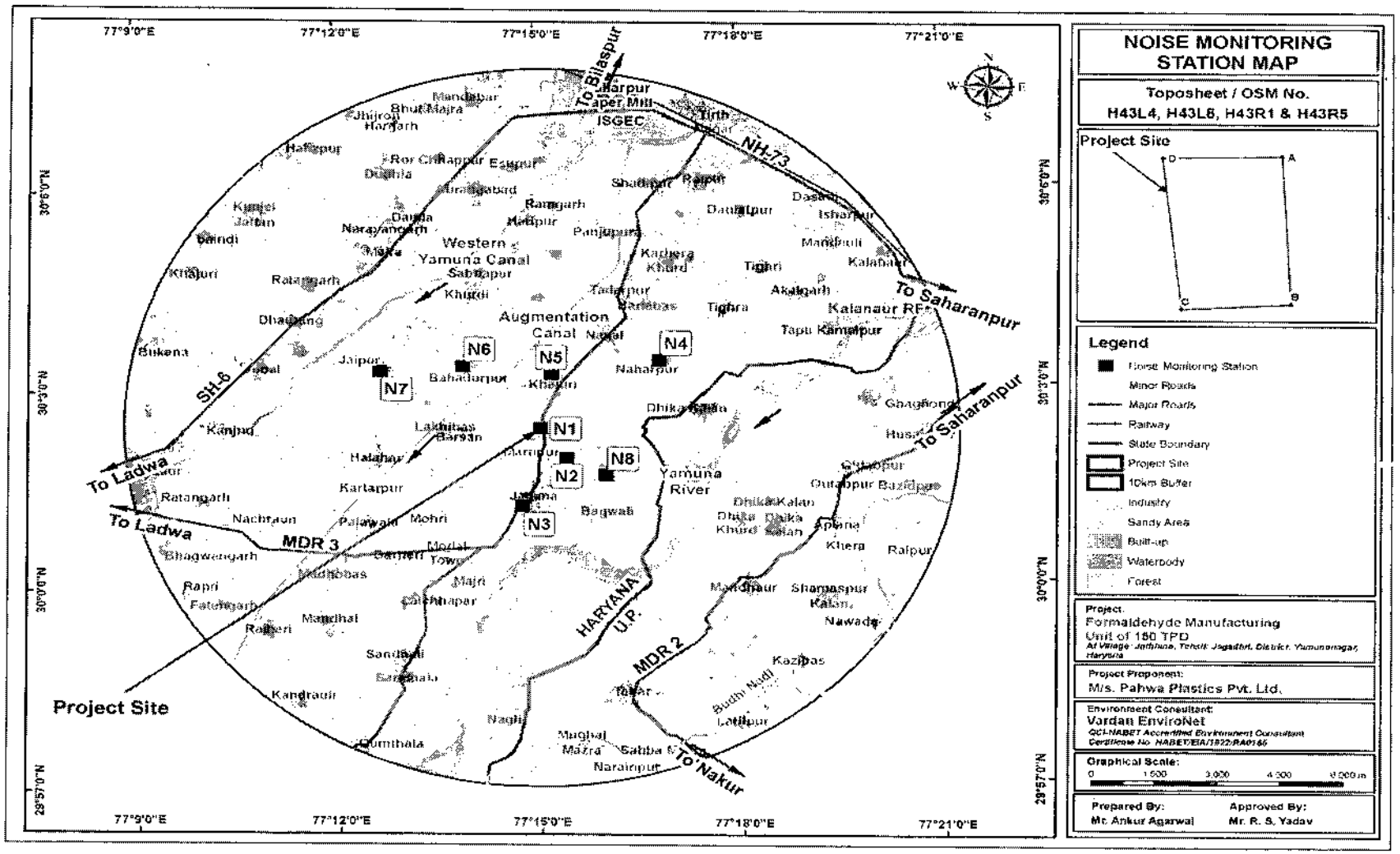


Figure 3.5: Key Plan of Noise Monitoring Station

3.5 SOIL ENVIRONMENT

The soils of district are mainly two types: Silty and Sandy loam.

3.5.1 Soil Quality and Characteristics

The information on soils has been collected from various secondary sources and also through primary soil sampling analysis of which is described in this section.

The sampling locations have been finalized with the following objectives:

- To determine the base line characteristics
- To determine the soil characteristics of proposed project site.
- To determine the impact of industrialization/ urbanization on soil characteristics.
- To determine the impacts on soils from agricultural productivity point of view.

3.5.2 Criteria Adopted for Selection of Sampling Locations

For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features.

3.5.3 Methodology and Sampling

The homogenized soil samples collected at different locations were packed in a polyethylene plastic bag and sealed. The sealed samples were sent to laboratory for analysis. The important physical, chemical parameter concentrations were determined from all samples

3.5.4 Soil Sampling Locations

Details of the soil sampling locations are given in **Table 3.7.**

Table 3.7: Soil Sample Monitoring Station

S. No.	Monitoring Location	Aerial Distance (km.)	Direction	Latitude	Longitude
S1	Project Site	0.0	--	30°2'22.97"N	77°15'3.45"E
S2	Marupur	1.5	SE	30° 1'56.31"N	77°15'17.80"E
S3	Jatlana	2	S	30° 1'16.20"N	77°15'6.69"E
S4	Naharpur	3	NE	30° 3'16.57"N	77°16'55.56"E
S5	Khajuri	2	N	30° 3'14.92"N	77°15'21.47"E
S6	Bahadurpur	3	NW	30° 3'17.38"N	77°14'1.55"E
S7	Jaipur	4	NW	30° 3'15.35"N	77°12'50.18"E
S8	Unheri	2	SE	30° 1'42.71"N	77°15'59.04"E

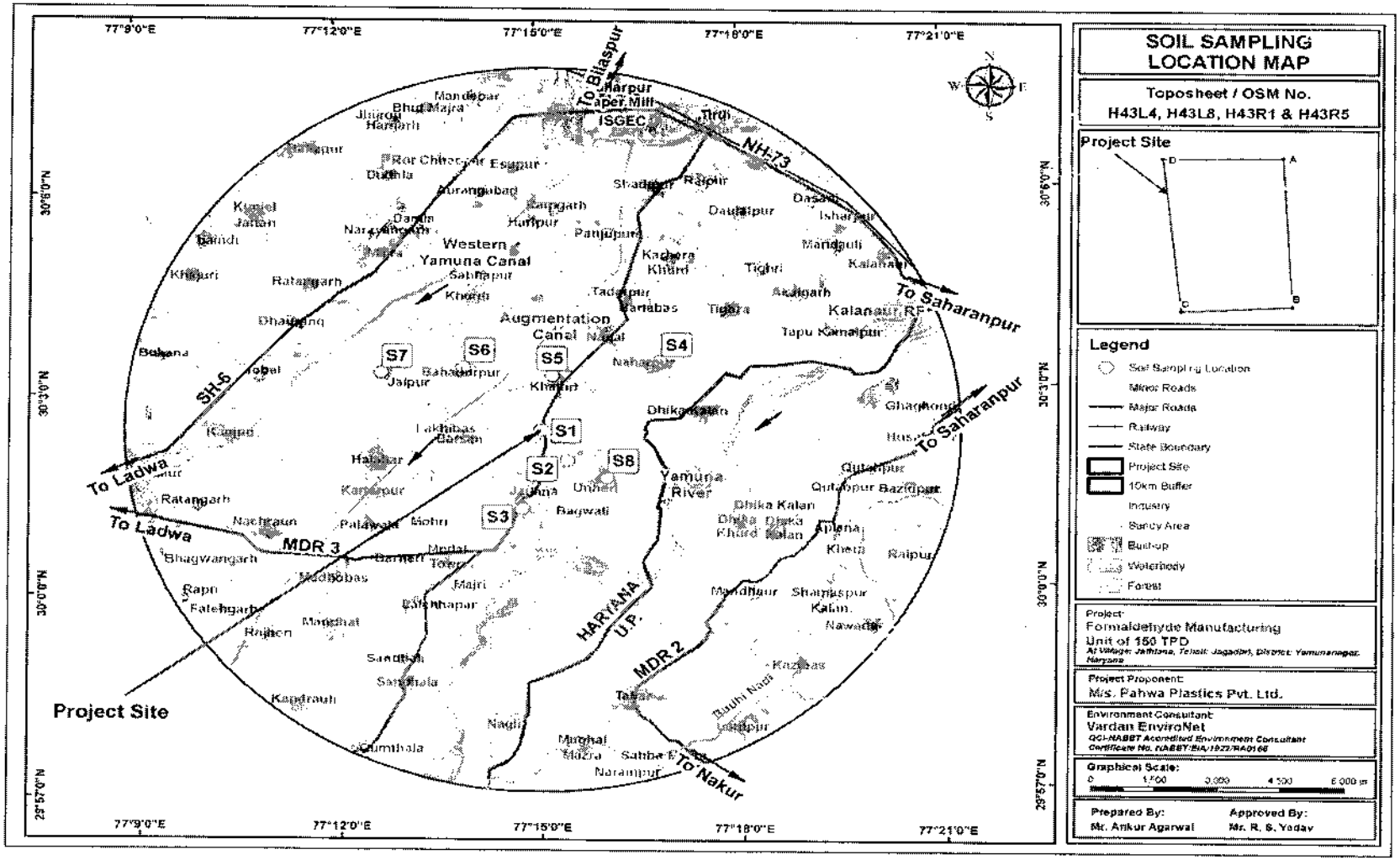


Figure 3.6: Soil Sampling Stations

Table 3.8: Soil Analysis Results

S.No	Parameter	Result (S1)	Result (S2)	Result (S3)	Result (S4)	Result (S5)	Result (S6)	Result (S7)	Result (S8)
1.	pH (at 25 °C)	7.61	7.68	7.56	7.59	7.71	7.56	7.48	7.6
2.	Conductivity (mS/cm)	0.276	0.31	0.264	0.341	0.31	0.242	0.234	0.295
3.	Soil Texture (%)	Sand – 53	Sand – 54	Sand – 58	Sand – 51	Sand – 55	Sand – 57	Sand – 62	Sand – 52
		Silt - 29	Silt - 30	Silt - 31	Silt - 37	Silt - 34	Silt - 31	Silt - 28	Silt - 35
		Clay – 18	Clay - 16	Clay - 11	Clay – 12	Clay – 11	Clay - 12	Clay - 10	Clay – 13
4.	Color	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown
5.	Water holding capacity (%)	31.4	30.32	31.26	31.34	31.47	26.8	24.85	29.41
6.	Bulk density (gm/cc)	1.43	1.28	1.32	1.46	1.56	1.53	1.38	1.46
7.	Chloride as Cl (mg/100g)	52.17	35.3	39.48	37.2	47.1	42.7	33.15	48.22
8.	Calcium as Ca (mg/100g)	42.5	41.72	42.87	41.67	41.68	51.28	49.84	58.52
9.	Sodium as Na (mg/kg)	48.37	42.51	47.2	48.52	38.54	26.89	38.62	43.1
10.	Potassium as K (kg/hec.)	121	126	178	182.4	118.4	143	102	128
11.	Organic Matter (%)	0.36	0.42	0.39	0.48	0.48	0.44	0.34	0.47
12.	Magnesium as Mg (mg/100g)	28.3	19.28	18.2	19.3	22.3	23.65	18.4	26.5
13.	Available Nitrogen as N (kg/hec.)	202.47	213.5	191.43	221.87	202.32	181.41	182	193.24
14.	Available Phosphorus (kg/hec.)	15.3	17.85	17.96	19.61	17.41	18.68	16.9	19.42
15.	Zinc as Zn (mg/kg)	7.1	9.17	10.21	12.2	9.5	5.36	4.14	5.85

16.	Manganese (as Mn) (mg/kg)	3.81	5.5	6.62	8.51	4.19	3.6	2.43	3.41
17.	Lead (as Pb) (mg/kg)	0.83	0.74	0.84	0.7	0.65	0.54	0.55	0.75
18.	Cadmium (as Cd) (mg/kg)	0.42	0.35	0.56	0.42	0.3	0.38	0.43	0.56
19.	Chromium (as Cr) (mg/kg)	0.3	0.23	0.43	0.33	0.42	0.29	0.27	0.33
20.	Copper (as Cu) (mg/kg)	2.5	2.59	3.39	3.56	2.81	1.9	2.1	2.8

3.5.5 Observations

The analysis results show that soil is basic in nature as pH value ranges from 7.48 to 7.71 with organic matter 0.34% to 0.48%. The concentration of Nitrogen (181.41 Kg/ha. to 221.87 Kg/ha.) Phosphorus (15.3 Kg/ha. to 19.61 Kg/ha.) and Potassium (102 Kg/ha. to 182.4 Kg/ha.) has been found to be in good amount in the soil samples. The consumption of fertilizers is as important factor as their production. There should be appropriate balance in the consumption of different fertilizer nutrients. Soil Quality data attached as **Annexure 7.**

3.6 WATER ENVIRONMENT

The impact has been assessed on randomly selected surface and ground water sources falling within the impact zone. In order to assess the existing water quality, the Ground water samples were collected from 8 different locations and Surface Water quality from 8 locations within the study area and analyzed it as per the procedure specified in standard methods for examination of water and wastewater published by American Public Health Association and Bureau of Indian Standards (APHA/BIS).

Monitored values have been used for describing the water environment and assessing the impacts on it. To assess the water quality impacts, water resources in the impact area have been grouped into 2 classes.

- Ground water resources in the deeper strata of the ground
- Surface water resources

A) Ground Water

About 8 ground water and surface water samples were collected from the study area to assess the water quality during the study period. The ground water samples were drawn from the hand pumps and open wells being used by the villagers for

their domestic needs. Surface water sampling was carried out from distributary and pond present within 10 Km of the project site. The details of the locations are given in below tables

Table 3.9: Ground Water Sampling Stations

S.No.	Monitoring Location	Aerial Distance (km.)	Direction	Latitude	Longitude
GW1	Project Site	0.0	--	30°2'22.97"N	77°15'3.45"E
GW2	Marupur	1.5	SE	30° 1'55.23"N	77°15'24.15"E
GW3	Jatlana	2	S	30° 1'15.42"N	77°14'52.66"E
GW4	Naharpur	3	NE	30° 3'20.78"N	77°16'49.37"E
GW5	Khajuri	2	N	30° 3'7.31"N	77°15'15.17"E
GW6	Bahadurpur	3	NW	30° 3'19.30"N	77°13'52.45"E
GW7	Jaipur	4	NW	30° 3'16.59"N	77°12'44.72"E
GW8	Unheri	2	SE	30° 1'39.07"N	77°15'59.04"E

B) Surface Water

Surface water sampling locations is given in **Table 3.10.**

Table 3.10: Surface Water Sampling Stations

Station	Sampling Location	Aerial distance (km)	Direction	Co-ordinates	
				Latitude	Longitude
SW1	Augmentation Canal near Khajuri (US)	2.0	N	30° 3'21.88"N	77°14'43.65"E
SW2	Augmentation Canal near Kartarpur (DS)	5	SW	30° 1'29.17"N	77°12'30.52"E
SW3	Yamuna River Near Dhika Kalan	5	NE	30° 2'27.08"N	77°17'46.62"E
SW4	Yamuna River near Jatlana	3	S	30° 0'34.83"N	77°15'2.23"E

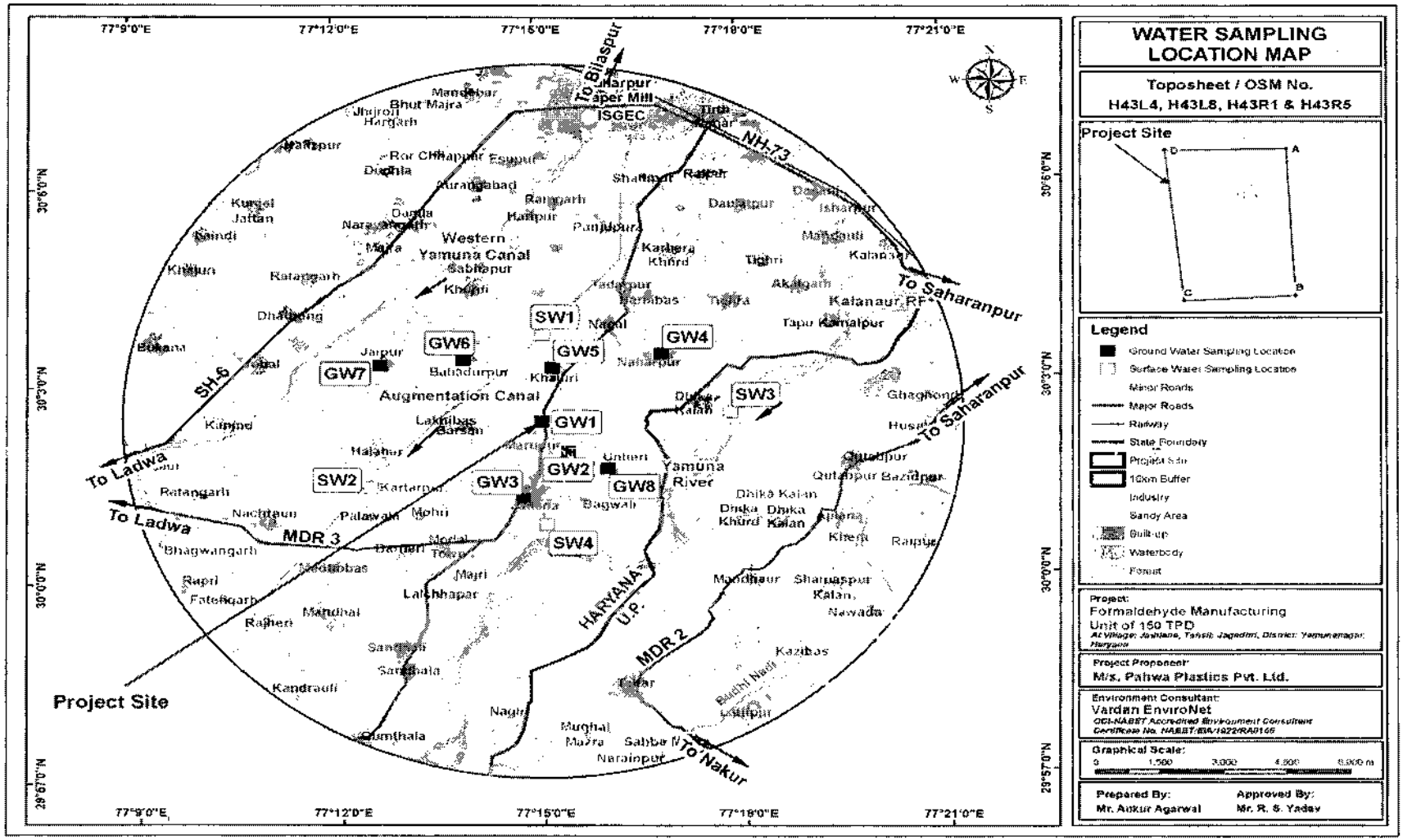


Figure 3.7: Key Plan of Water Sampling Stations

Table 3.11: Ground Water Analysis Results

S.no	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	Desirable Limit	Permissible Limit
1.	pH (at 25 °C)	7.54	7.41	7.58	7.56	7.45	7.47	7.43	7.66	6.5 to 8.5	No Relaxation
2.	Colour (Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	*BDL (**DL 1.0 Hazen)	5	15
3.	Turbidity (NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	*BDL (**DL 1.0 NTU)	1	5
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$ (mg/l)	232.00	236.00	262.00	274.60	283.76	210.00	241.00	212.00	200	600
7.	Calcium as Ca (mg/l)	51.63	58.45	54.69	53.84	57.89	46.44	57.86	54.44	75	200
8.	Alkalinity as $CaCO_3$(mg/l)	213.00	210.56	243.60	253.00	214.50	186.51	224.00	192.04	200	600
9.	Chloride as Cl (mg/l)	71.41	65.21	63.47	64.92	63.47	57.12	62.13	50.4244	250	1000
10	#Cyanide as CN(mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	0.05	No Relaxation
11.	Magnesium as Mg (mg/l)	25.01		30.44	34.08	33.85	22.87	23.41	18.51	30	100

			21.83								
12.	Total Dissolved Solids (mg/l)	364.00	354.00	390.00	415.00	428.00	315.00	353.00	310.00	500	2000
13.	Sulphate as SO_4(mg/l)	45.20	41.63	48.96	56.41	51.44	34.12	31.58	29.64	200	400
14.	Fluoride as F (mg/l)	0.58	0.53	0.60	0.55	0.43	0.73	0.53	0.45	1	1.5
15.	Nitrate as NO_3 (mg/l)	7.10	6.87	9.56	11.26	14.5	8.64	11.20	9.44	45	No Relaxation
16.	Iron as Fe (mg/l)	0.26	0.26	0.26	0.32	0.23	0.32	0.31	0.26	0.3	No relaxation
17.	#Aluminium as Al (mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	0.03	0.2
18.	Boron (mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	0.5	1
19	Chromium as Cr(mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.03 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	0.05	No Relaxation
20.	Conductivity (µS/cm)	607	590	650	692	713	525	588	516	--	--
21.	Phenolic Compounds (mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	0.001	0.002

22.	#Mineral Oil (mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	0.5	No Relaxation
23.	Anionic Detergents as MBAS (mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	0.2	1
24.	Zinc as Zn (mg/l)	1.52	1.40	1.50	1.36	1.38	1.06	0.96	1.20	5	15
25.	Copper as Cu (mg/l)	0.31	0.27	0.25	0.26	0.20	0.12	0.18	0.10	0.05	1.5
26.	Manganese as Mn (mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	0.1	0.3
27.	Cadmium as Cd (mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	0.003	No Relaxation
28.	Lead as Pb (mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	0.01	No Relaxation
29.	#Selenium as Se(mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.001 mg/l)	0.01	No Relaxation
30.	#Arsenic as As (mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	0.01	0.05

31.	#Mercury as Hg (mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	*BDL (**DL 0.0005 mg/l)	0.001	No Relaxation
32.	Total Coliform (MPN/100ml)	<2	<2	<2	<2	<2	<2	<2	<2	Shall not be detectable in any 100ml sample	
33.	E. Coli (MPN/100ml)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Shall not be detectable in any 100ml sample	

Table 3.12: Surface Water Analysis Results

S.No.	Parameter	SW1	SW2	SW3	SW4
1.	pH (at 25 0C)	7.53	7.63	7.72	7.54
2.	Colour (Hazen)	*BDL (**DL 1Hazen)	*BDL (**DL 1Hazen)	*BDL (**DL 1Hazen)	*BDL (**DL 1Hazen)
3.	Turbidity (NTU)	21.00	32.00	24.00	20.00
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable
5.	Total Hardness as $CaCO_3$ (mg/l)	310.45	283.00	229.00	260.00
6.	Calcium as Ca (mg/l)	73.63	81.54	57.69	63.54
7.	Alkalinity as $CaCO_3$(mg/l)	285.22	262.20	215.52	238.00
8.	Chloride as Cl (mg/l)	85.41	101.69	71.20	85.36
9.	Residual free Chlorine(mg/l)	*BDL(**DL 0.15mg/l)	*BDL(**DL 0.15mg/l)	*BDL(**DL 0.15 mg/l)	*BDL(**DL 0.15mg/l)
10.	#Cyanide as CN (mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)	*BDL(**DL 0.02 mg/l)
11.	Magnesium as Mg (mg/l)	30.71	19.23	20.60	24.58
12.	Total Dissolved Solids (mg/l)	585.00	562.00	424.00	440.00

13.	Total Suspended solids(mg/l)	139.00	121.00	118.00	119.00
14.	Dissolved Oxygen(mg/l)	5.1	5.5	5.2	5.6
15.	Sulphate as SO4 (mg/l)	61.36	69.44	44.68	40.8
16.	Fluoride as F (mg/l)	0.54	0.52	0.78	1.00
17.	BOD (3 Days at 270C)	11.00	9.44	12.00	15.00
18.	COD(mg/l)	30.00	30.00	40.00	43.45
19.	Conductivity (µS/cm)	975	937	706	733
20.	Nitrate as NO3 (mg/l)	34.64	24.12	23.40	16.25
21.	Sodium as Na(mg/l)	98.45	68.21	52.00	48.36
22.	Potassium as K(mg/l)	12.36	20.10	16.58	6.5
23.	Iron as Fe (mg/l)	*BDL(**DL 0.01 mg/l)	0.21	0.26	0.27
24.	#Aluminium as Al (mg/l)	0.52	*BDL(**DL 0.03 mg/l)	*BDL(**DL 0.03 mg/l)	*BDL(**DL 0.03 mg/l)
25.	Boron (mg/l)	*BDL(**DL 0.01 mg/l)	0.43	0.40	0.53
26.	Chromium as Cr(mg/l)	*BDL(**DL 0.001 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)
27.	Phenolic Compounds(mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)	*BDL(**DL 0.0004 mg/l)
28.	#Mineral Oil(mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)
29.	Anionic Detergents as MBAS (mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)	*BDL(**DL 0.05 mg/l)
30.	Zinc as Zn (mg/l)	1.15	1.20	1.51	2.40
31.	Copper as Cu (mg/l)	0.09	0.09	0.06	0.05

32.	Manganese as Mn (mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)	*BDL(**DL 0.01 mg/l)
33.	Cadmium as Cd (mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)	*BDL(**DL 0.002 mg/l)
34.	Total Coliform (MPN/100ml)	1600	1000	900	1600
35.	Fecal Coliform (MPN/100ml)	900	800	300	800

3.6.1 Observations

Analysis results of ground water reveal the following:

- pH varies from 7.41 to 7.66
- Total Hardness varies from 210 to 283.76 mg/l.
- Total Dissolved Solids varies from 310 to 428 mg/l.

Analysis results of surface water reveal the following:

- pH varies from 7.53 to 7.72
- Total Hardness varies from 229 to 310.45 mg/l.
- Total Dissolved Solids varies from 424 to 585 mg/l.
- BOD varies from 9.44 to 15.0 (mg/l)
- COD varies from 30.0 to 43.5 (mg/l)

3.6.2 Interpretation

Water results indicates that the water quality is quite good due to less industrialization in the area & less water contamination.

3.7 LAND USE AND LAND COVER

3.7.1 Data Used

United States Geological Survey (USGS) Satellite Data: Landsat 8 cloud free data has been used for Land use /Land cover analysis, Satellite Sensor–OLITIRS multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. 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.

Methodology: The methodology used for the study consists of following components.

3.7.2 Methodology Adopted for Thematic Data Extraction from the Satellite Imageries

ERDAS image processing 10.0 software and ARC/GIS 10.0 software were used for the project. ERDAS 10.0 image processing software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use land cover classes of the provided area from the satellite data.

The land use pattern of the study area is given in the table below:

Table 3.13: Land Use Pattern of the Study Area

Landuse Classification	Area in %	Area in Hectare
Waterbody	2.1	665
Sandy Area	3.1	977
Industry	2.4	745
Forest	0.2	65
Buildup	5.4	1716
Crop Land	44.3	13987
Fellow Land	32.1	10144
Open Scrub	2.4	751
West Land	8.0	2537
Total	**100**	**31587**

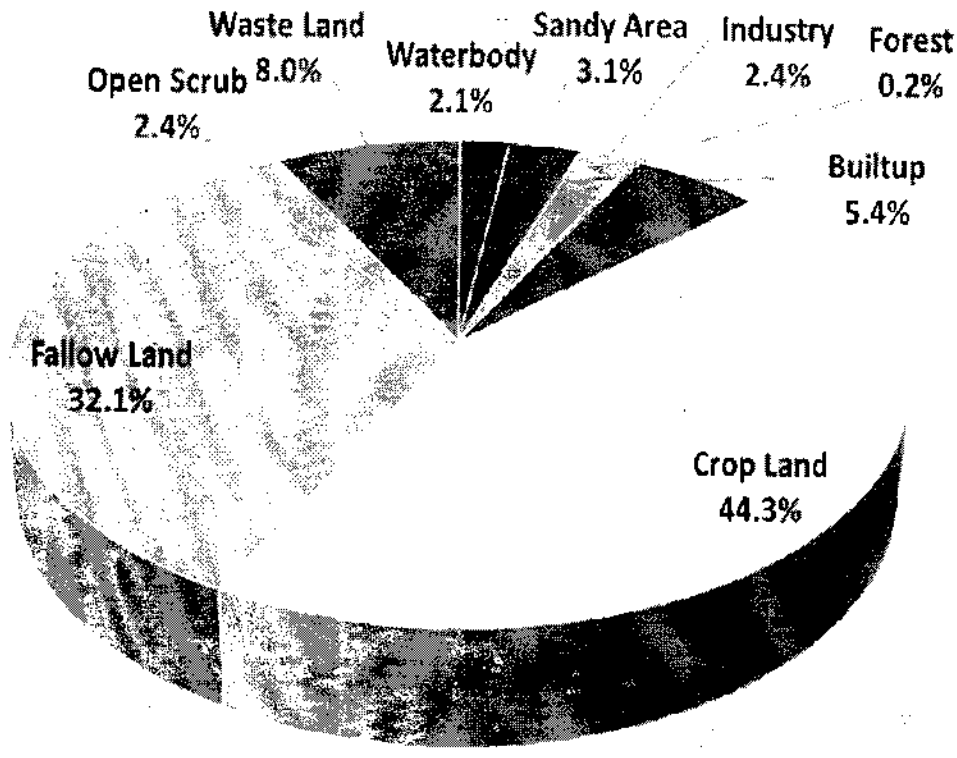


Figure 3.8: Pictorial Representation of Land Use Classification

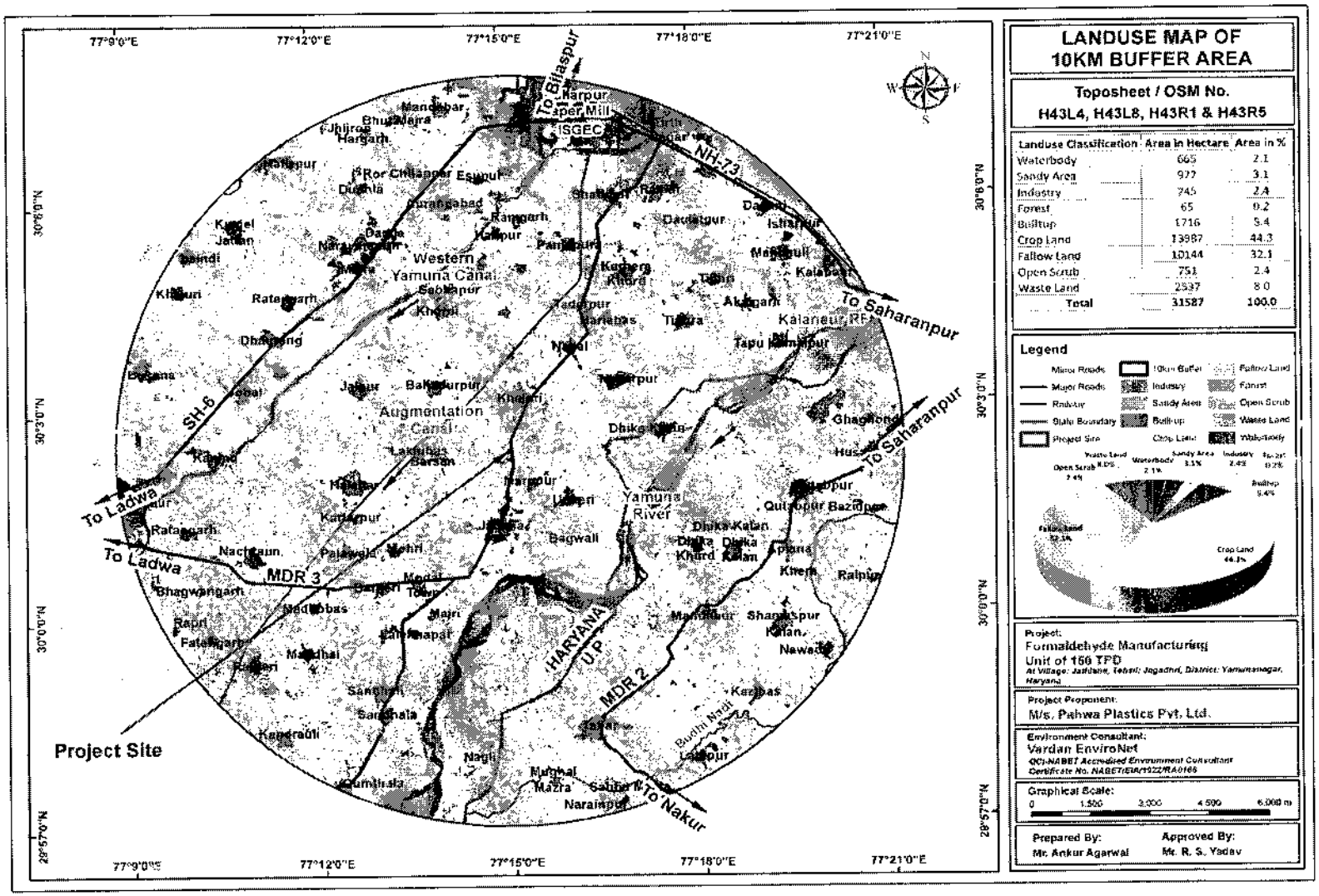


Figure 3.9: Land Use of Study Area

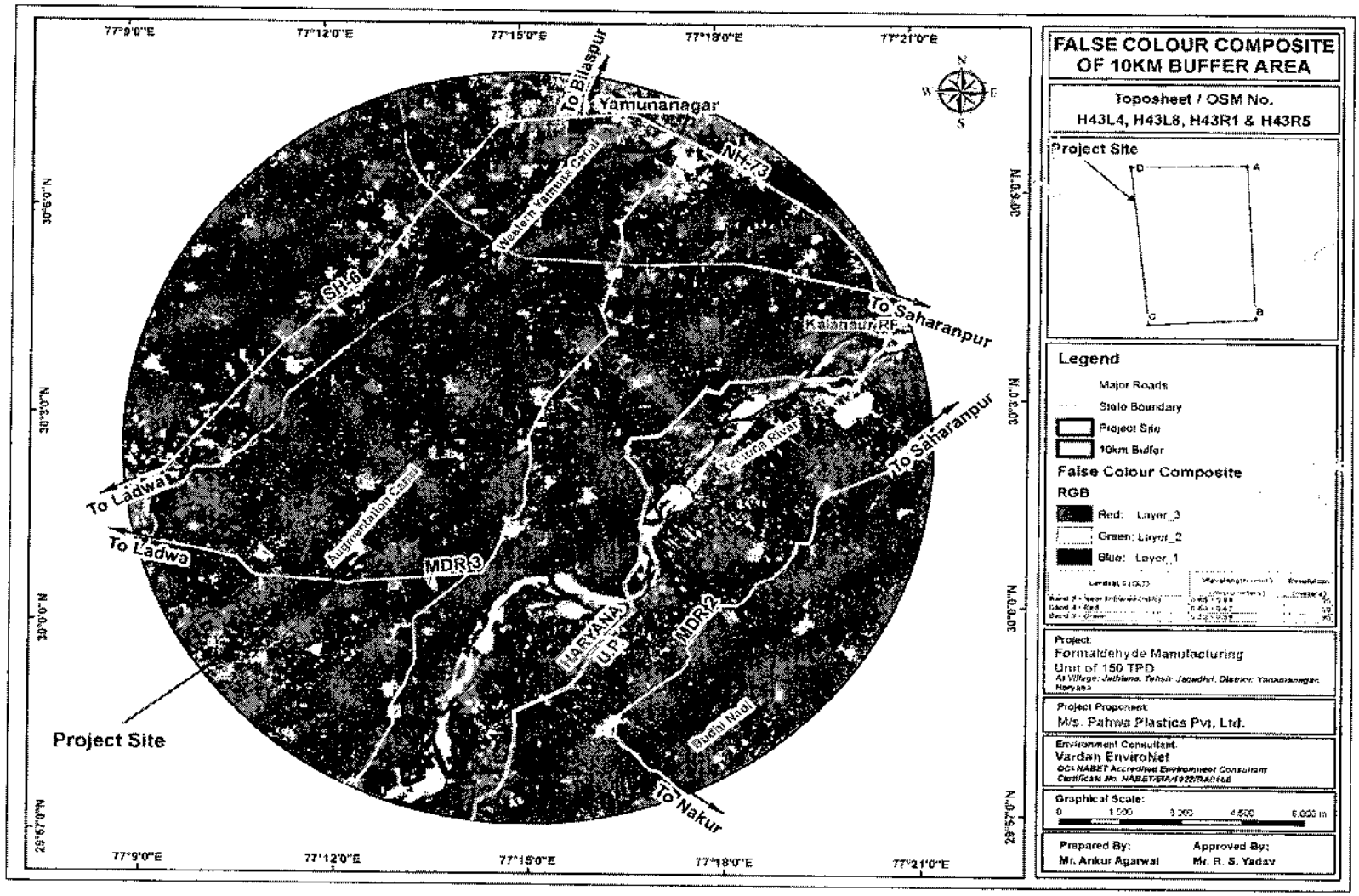


Figure 3.10: False Color composite (FCC) Map of study area

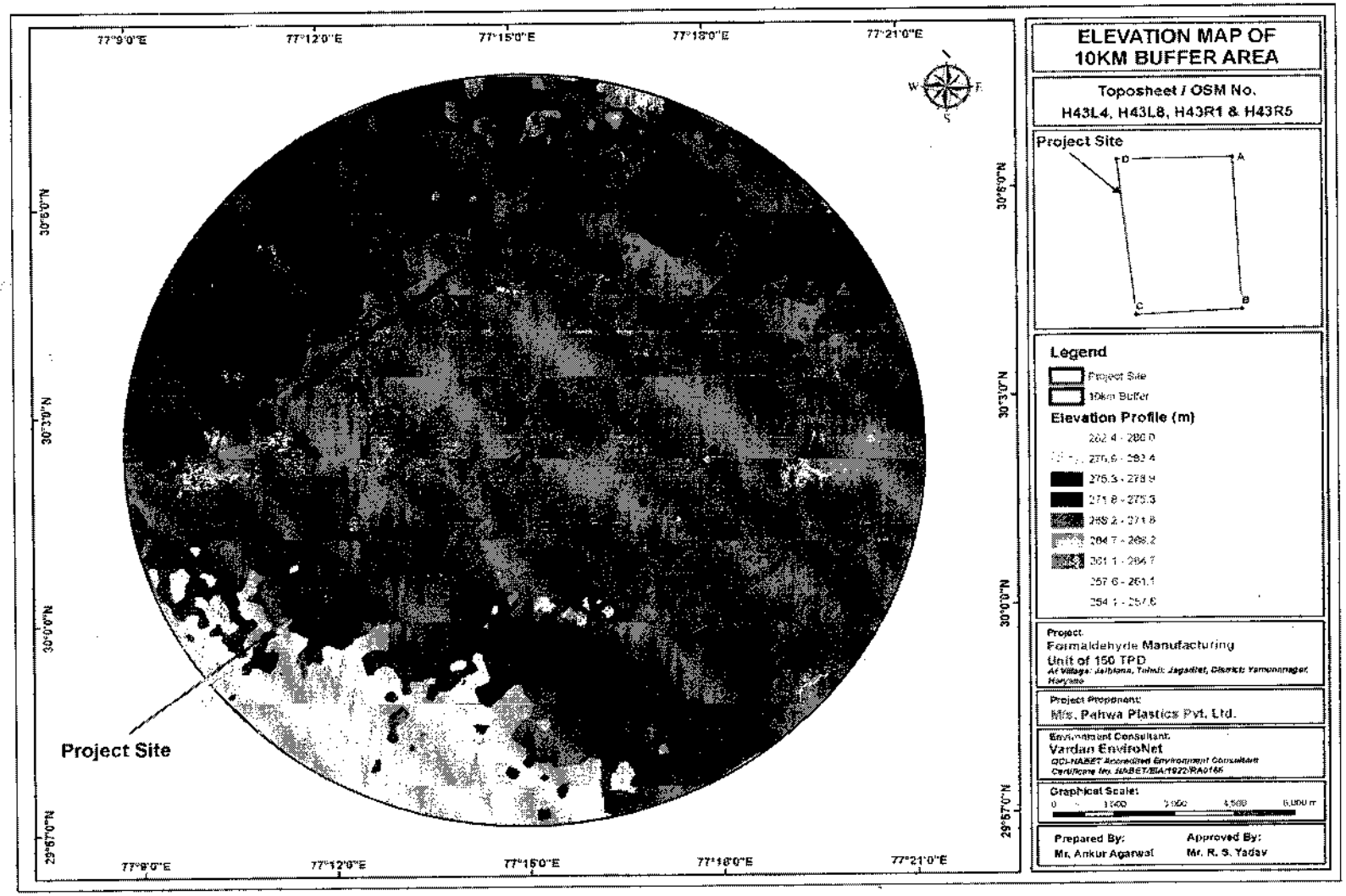


Figure 3.11: Elevation Map of the Study Area

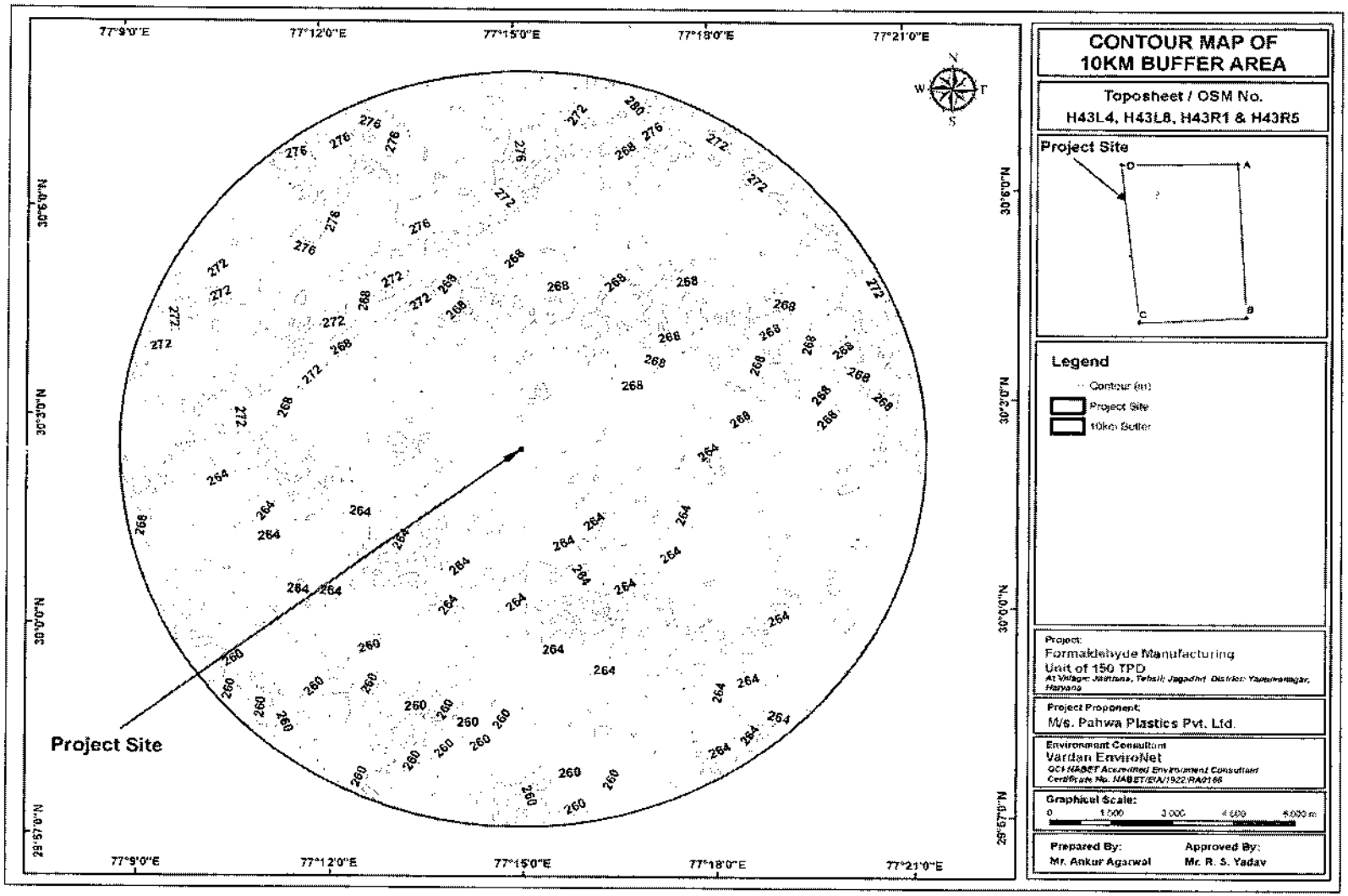


Figure 3.12: Contour Map of the Study Area

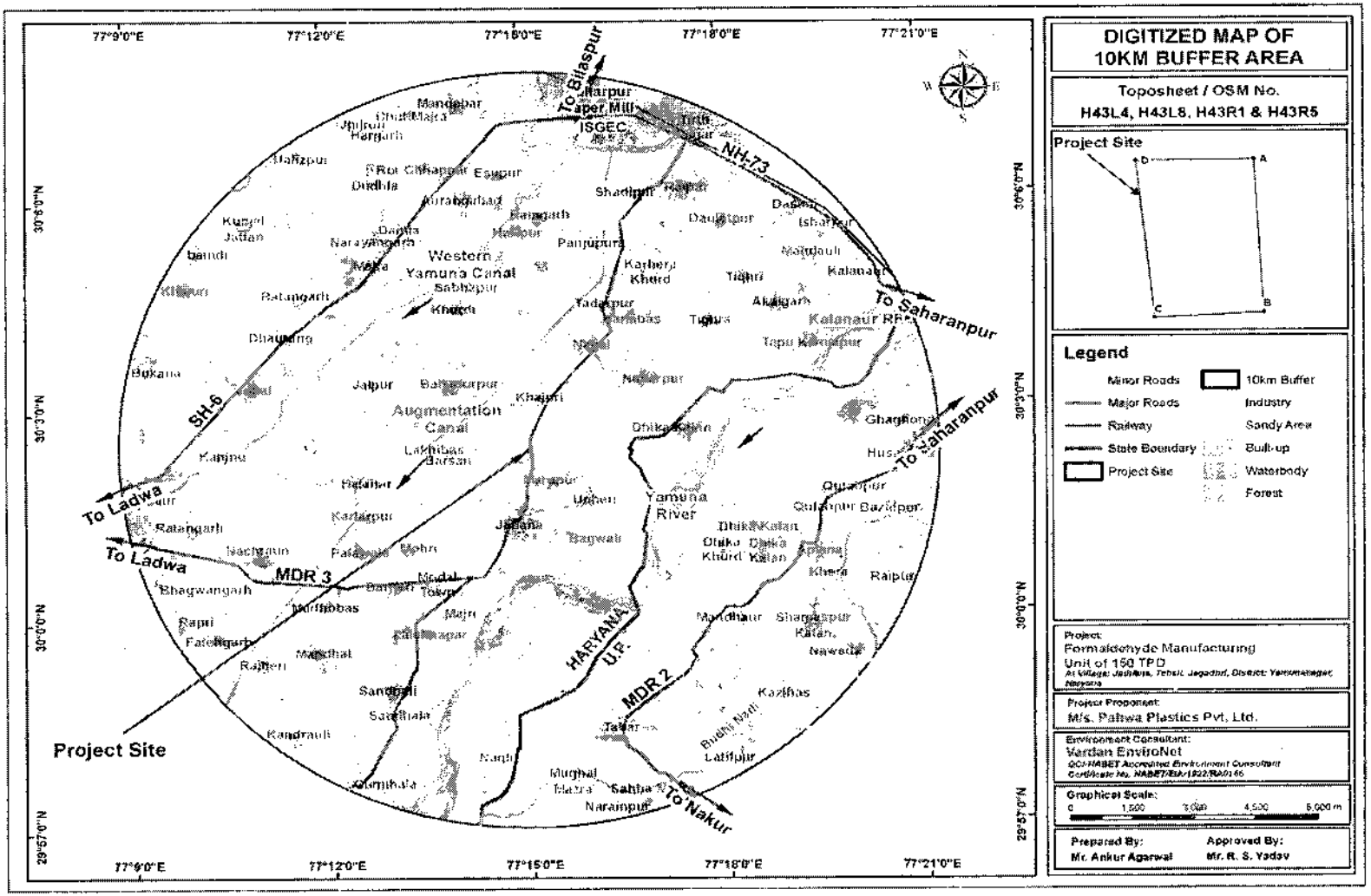


Figure 3.13: Digitize Map of the Study Area

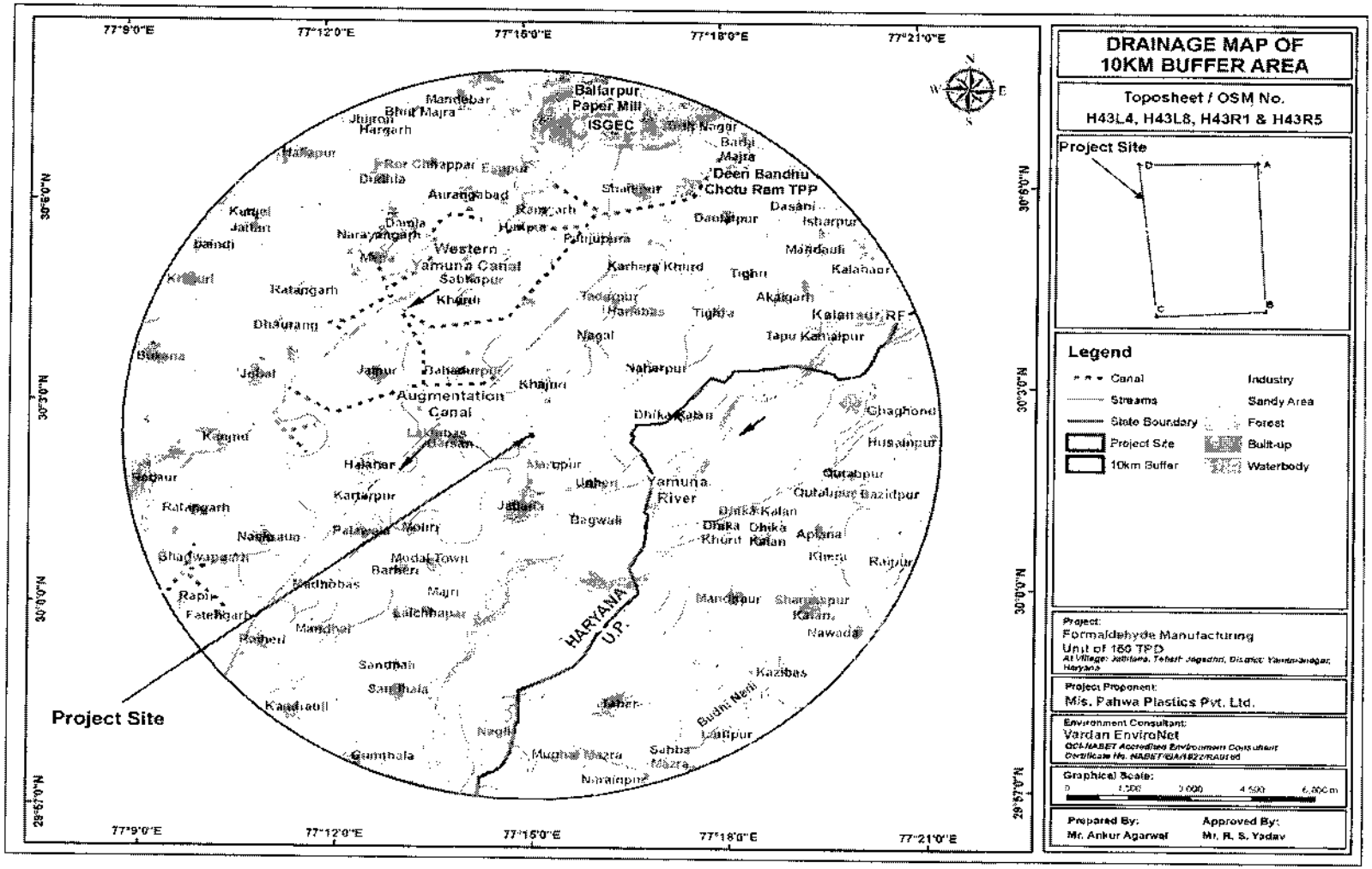


Figure 3.14: Drainage Map of the Study Area

3.8 GEOLOGY

3.8.1 Geomorphology

Yamuna Nagar district of Haryana located in north-eastern part of Haryana State and lies between 29° 55': 30° 31'north latitudes and 77° 00': 77° 35' east longitudes. Total geographical area of the district is 1756 sq.km and comprises 4% of total area of State.

The district is divided into four Physiographic units

- Siwaliks
- Dissected Rolling Plains
- Interfluvial Plains
- Active And Recent Flood Plains
- Relict Plains

Siwaliks hills - Siwalik hill ranges occupy the northern fringe of Yamuna Nagar district and attain the height up to 950m AMSL. The hills are about 500m high with respect to the adjacent alluvial plains. These are characterized by the broad tableland topography that has been carved into quite sharp slopes by numerous ephemeral streams come down to the outer slopes of the Siwaliks and spread much of gravels boulders, pebbles in the beds of these streams.

Kandi Belt - A dissected rolling plain in the northern parts of district is a transitional tract between Siwaliks hills and alluvial plains. It is about 25 km wide and elevation varies between 250 and 375m AMSL.

Interfluvial plains - This tract is part of higher ground between Ghaggar and Chautang and includes high mounds and valleys. In general, the slope is from northeast to southwest.

Active and recent flood plains - This plain is narrow tract along river Yamuna in the district.

Relict wedge plain - This is almost in alignment to the surface water divide between the westward flowing Ghaggar and eastward flowing Yamuna River.

3.8.2 Soil Types

- *Eurtrochrepts/ Udorthents* - These are shallow and loamy sands to fine sandy loams, except in depressions, well-drained, non-saline, non-alkali, noncalcareous, mostly base saturated and are classified as loamy skeletal typic, lithyhic, eurtrochrepts/ udorthents. These soils are found in the Siwalik range.

- *Udipsamments/ udorthents* - These are loamy sand to sandy loam deep, excessively or well-drained, non-saline, non-alkali. These are placed under the associations of transitional tract between Siwaiks hills and alluvial plains.
- *Psammaquents and Haplaquepts* - These soils are found in Yamuna Plains
- *Haplaquept* - These soils are non saline, alkalinity hazards are classified as typic ustochrepts but water logged soils with loam to clay loam texture showing the effect of glazing, are classified as aeric/ typic Haplaquepts. Areas as aeridic soil moisture, moisture have soils classified as camborthics and torropsamments.

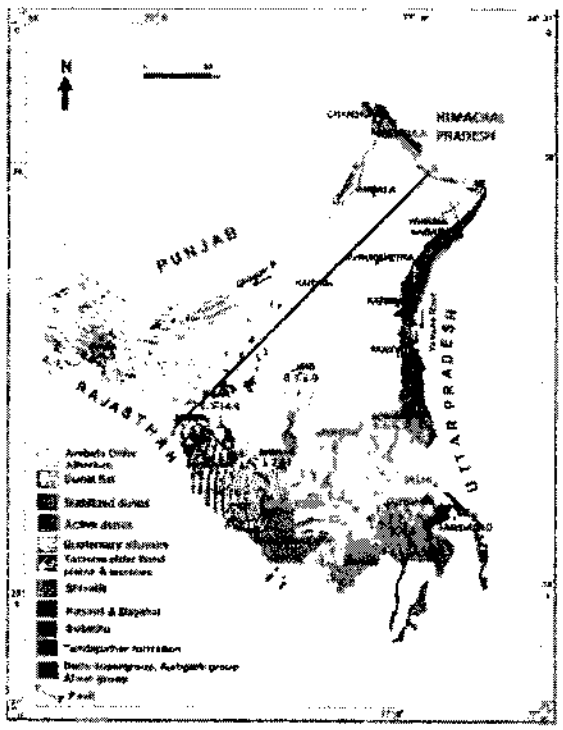


Figure 3.15: Geomorphology map of Haryana District

3.8.3 Regional Geology

The Geology of Project area categorized in the Great Indo-Gengetic Alluvial Plain and the entire area covered by quaternary deposits. The area is conspicuously flat and has master slope from north to south. The quaternary sediments of the area are composed of recent and fresh deposits of clay, silt and sand which are of loose to semi-consolidated nature of recent to sub-recent age. The Geological classification of the sediments depending upon relative disposition, occurrence, development of soil thickness oxidation etc. has been broadly made into two formations viz. the Older Alluvial Formation and the Newer Alluvial Formation. The details of which are as follows: The Older Alluvial Formation: It occurs at higher level and chiefly consists of

silt, silty clay and clay with occurrence of kankar at certain places. The color of the sediments varies from dirty yellow to pale brown due to oxidation. Newer Alluvial Formation: It occurs concomitant to the Jamuna channel in the form of recent flood plain and low laying terrace deposits. It consists of greyish silt, silty sand with sporadic pebbles of quartzite basic rock fragments and clay pockets.

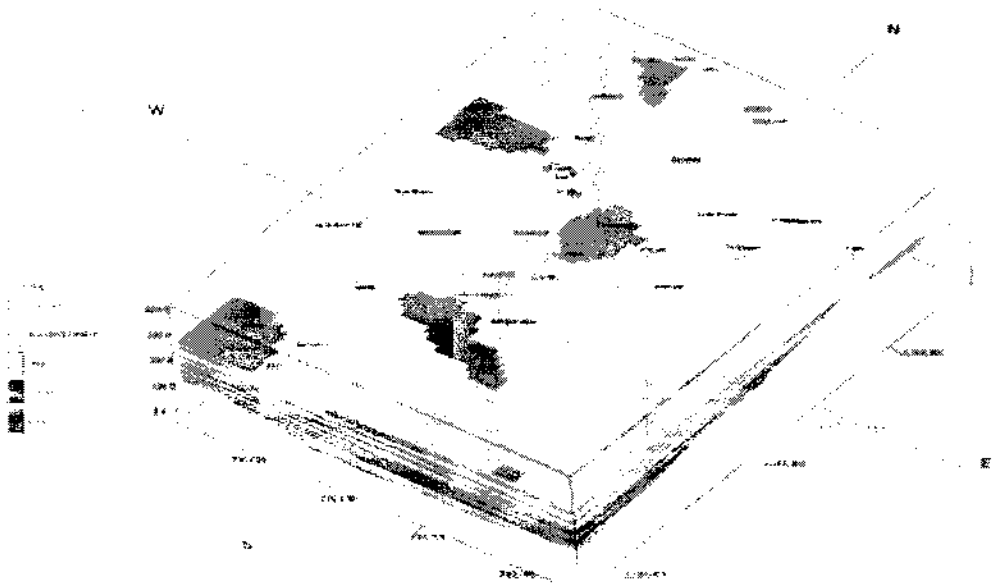


Figure 3.16: Lithological Model of Yamunanagar District

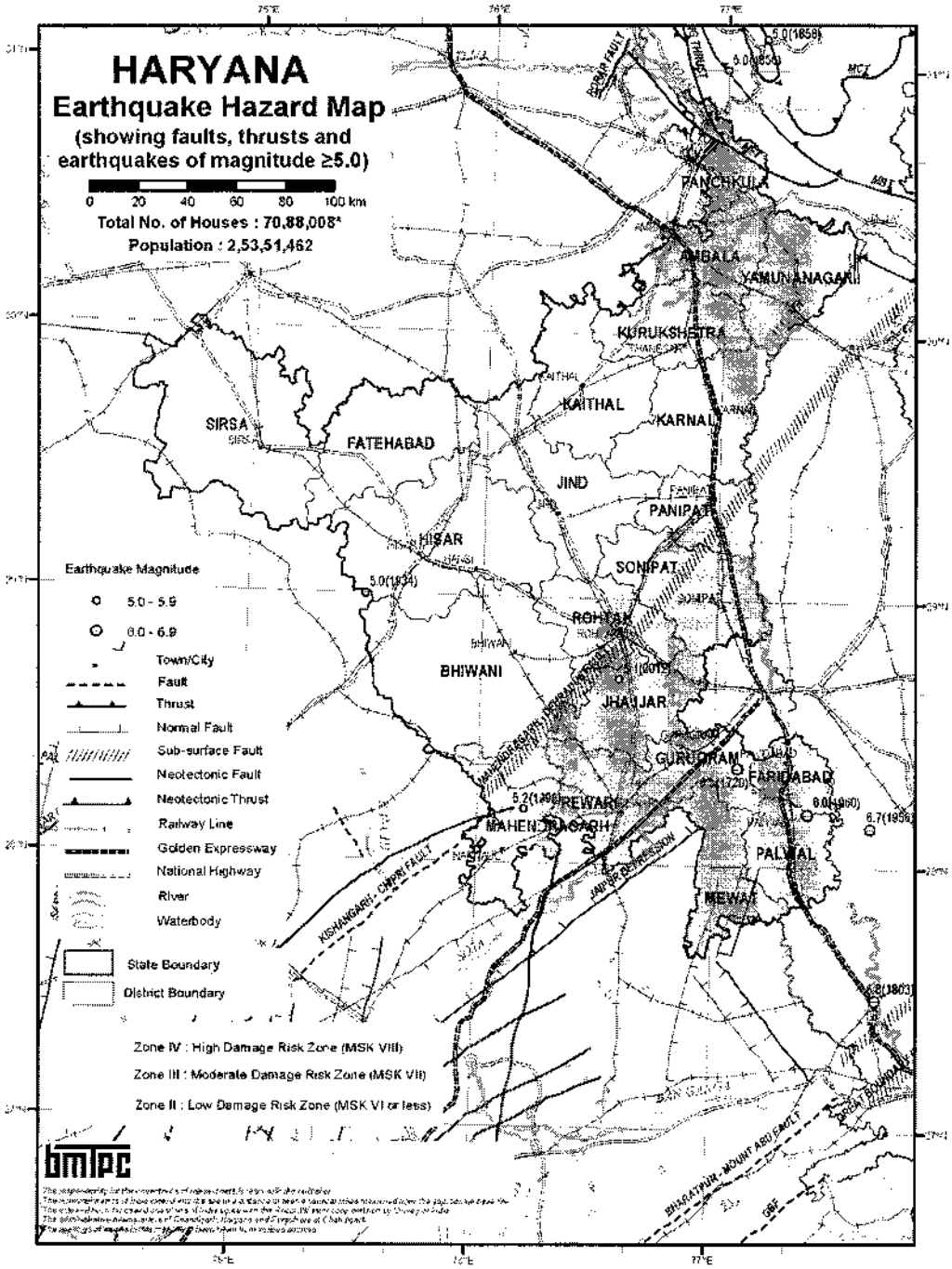
Source: CGWB Aquifer Mapping Report

3.8.4 Seismic Study

Eastern parts of Haryana along with Delhi lie in the Gangetic Plain. It is a down warp of the Himalayan foreland, of variable depth, converted into flat plains by long-vigorous sedimentation. This is known as a geosynclines and the Gangetic Plain is the Indo-Gangetic Geosynclines. It has shown considerable amounts of flexure and dislocation at the northern end and is bound on the north by the Himalayan Frontal Thrust. The floor of the Gangetic trough (if seen without all the sediments) is not an even plain, instead shows corrugated inequalities and buried ridges (shelf faults). The region sits atop the Delhi-Haridwar ridge, which is a sub-surface ridge, trending NE-SW. There are numerous faults in this region, like the Moradabad, Panipat and Sohna faults. Delhi, Chandigarh and many parts of Haryana lie in Zone IV and thus they are extremely vulnerable to earthquakes. Most earthquakes in this region are shallow, though a few earthquake of intermediate depth have been recorded in Haryana. The alluvial cover of the Indo-Gangetic plain makes even distant earthquake felt here quite strongly. This

region often feels deep-seated earthquakes that are centered on the Pakistan-Afghanistan Border and in the Hindukush mountains in Afghanistan. However, it must be stated that proximity to faults does not necessarily translate into a higher hazard as compared to areas located further away, as damage from earthquakes depend on numerous factors such as subsurface geology and adherence to the building codes.

As per seismic map of Haryana, Yamuna Nagar comes under the High damage risk zone -IV.



BMTPC : Vulnerability Atlas - 3rd Edition : Peer Group, MoHUA, GOI; Map is Based on digitised data of SOI: Seismic Zones of India Map IS:1893 (Part I) 2002, BIS; Earthquake Epicentre from IMD; Seismotectonic Atlas of India and its Environs, GSI; Houses/Population as per Census 2011.
*Houses including vacant & locked houses. Disclaimer: The maps are solely for thematic presentation.

Figure 3.17: Seismic map of Haryana

Source: BMTPC

Study of landslide:

Project site is located on flat surface so there will be no chances of the land slide due to any tectonic activity.

3.9 HYDROGEOLOGY

As per CGWA the Radaur block comes under the Non-Notified, Over-exploited zone.

3.9.1 Drainage Study

The district is mainly drained by the rivers Yamuna, Markanda and its tributaries. Markanda is tributary of river Ghaggar and drains major part of the district. The high land between Markanda River and small rivulets of River Yamuna acts as basin boundary between west flowing rivers of Indus system and east flowing rivers of Ganga basin. River Yamuna drains eastern part of the district and acts as boundary between Haryana and Uttar Pradesh State.

3.9.2 Hydrogeology

The ground water exploration in the district reveals that clay group of formations dominates over the sand group in the district area. Ground water in the district occurs in the alluvium under water table and semi-confined to confined conditions. These aquifers consist of sand, silt, gravels and kankar associated with clay and form highly potential aquifers. In alluvium, the permeable granular zones comprise fine to medium grained sand and occasionally coarse sand and gravel. Their lateral and as well as vertical extent is extensive. In Kandi belt, which has not been explored fully boulders cobbles and pebbles, constitutes the major aquifer horizon. Siwalik Hills occupy marginal areas in the northeastern parts of the district constitute a low potential zone. In Kandi areas, the shallow aquifers are isolated lenses embedded in clay beds whereas aquifers in alluvial areas occur on regional scale and have pinching and swelling disposition and are quite extensive in nature. These aquifers generally consists sands (fine to coarse grained) and gravels and are often intercepted by clay and kankar horizons. These aquifers are under unconfined to semi-confined conditions and support a large number of shallow tubewells within the depth of 50m only. The discharge of these tubewells varies between 100lpm and 500 lpm for moderate tubewells.

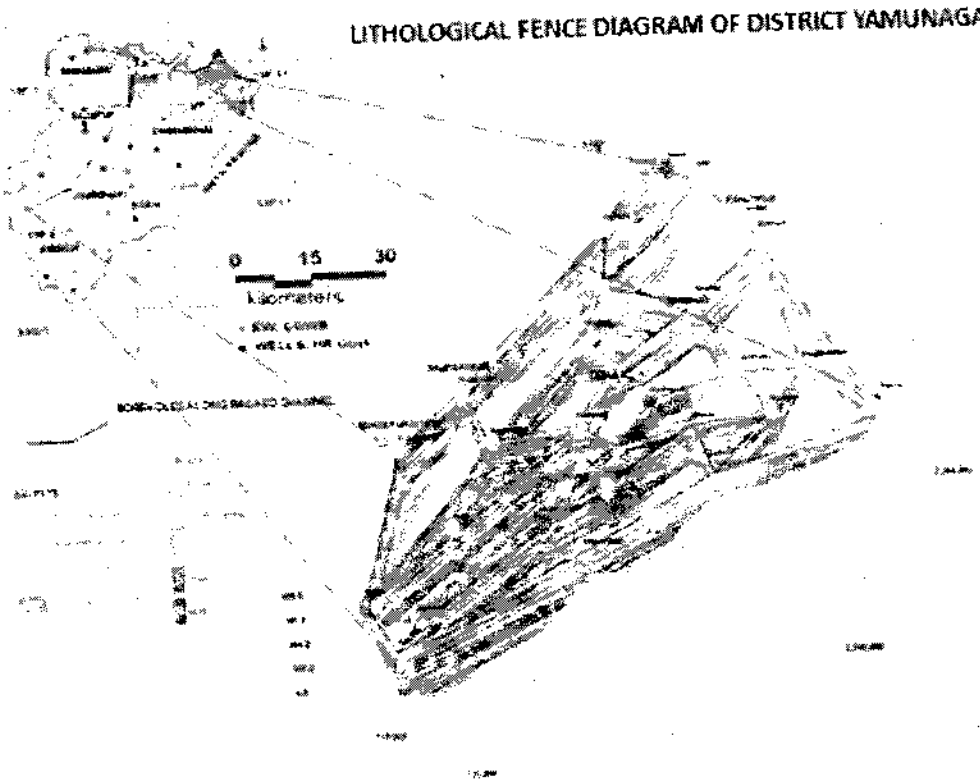


Figure 3.18: Lithological Fence diagram

3.9.3 Aquifer Study

Majority of the Yamunanagar District falls under the Ghaggar River Basin; therefore it belongs to a single aquifer system up to 180 m depth with thin inter-layering of sand and clay and below that clay layer starts getting thickened (Ghaggar River Project Report). Based on the same criteria, to know the broad picture of the aquifer disposition, inter-relationship of granular zones, nature, geometry and extension of aquifers in the Yamunanagar district, the aquifer grouping has been done using the sub-surface lithology. The first aquifer is water table aquifer and extends all over the area. The aquifer is mainly composed of fine to coarse grained sand.

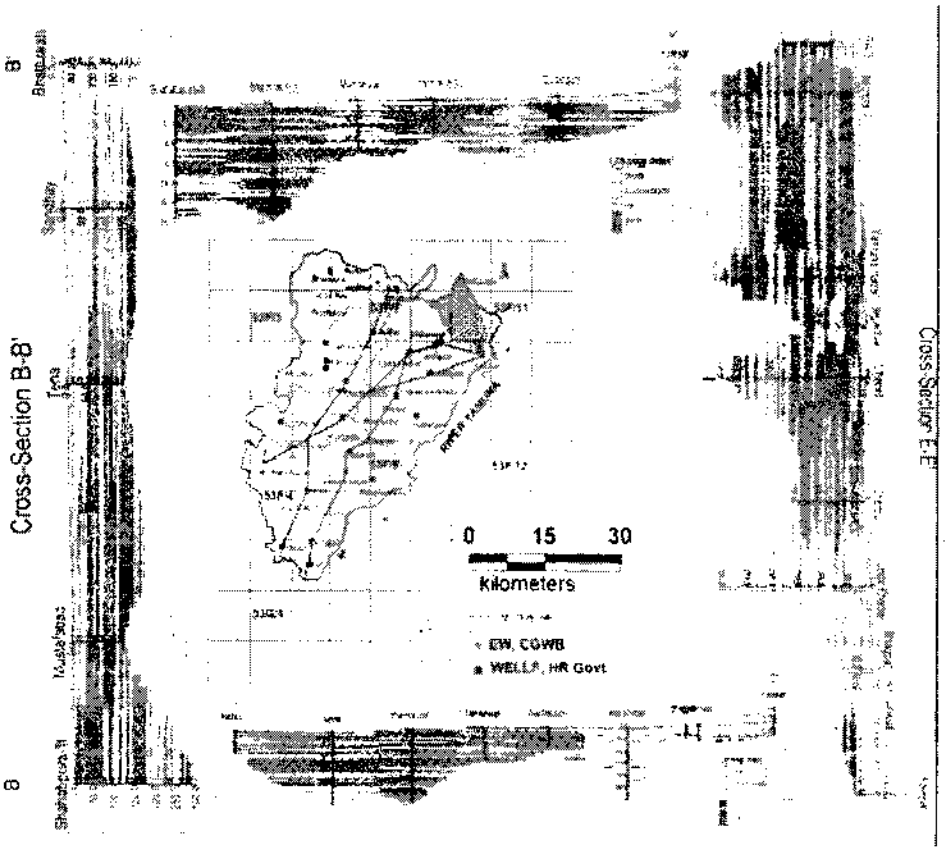


Figure 3.19: Cross sections of Aquifer Map of Yamunanagar District

3.9.4 Ground Water Level

3.9.4.1 District Scenario

The depth to water level during pre-monsoon period in the district ranges between 2.17m bgl at Choli and 16.02m bgl at Khizrabad. However, in major part of district water level ranges between 5.0m bgl and 10.0m bgl covering the Central and Northern portion of the district, while southern and North-eastern portion covering Radaur and Chacharauli blocks show water level more than 10 m ranging upto 16.02 m bgl. The Depth to water level during post-monsoon period in the district ranges between 2.04m bgl at Choli and 15.30m bgl at Dharaung. However, in major part of district water level ranges between 5.0m bgl and 15.0m bgl. The long term water level fluctuation shows a declining trend ranging from 0.17 m to 3.06 m. Maximum decline is shown in Rasulpur village of Sadhaura block. There is rise also seen in the Northern portion of the district ranging from 0.25 m to 4.94 m.

3.9.4.2 Ground water level at project location

Ground water level near the project location varies from 14.68 to 17.11 mbgl.

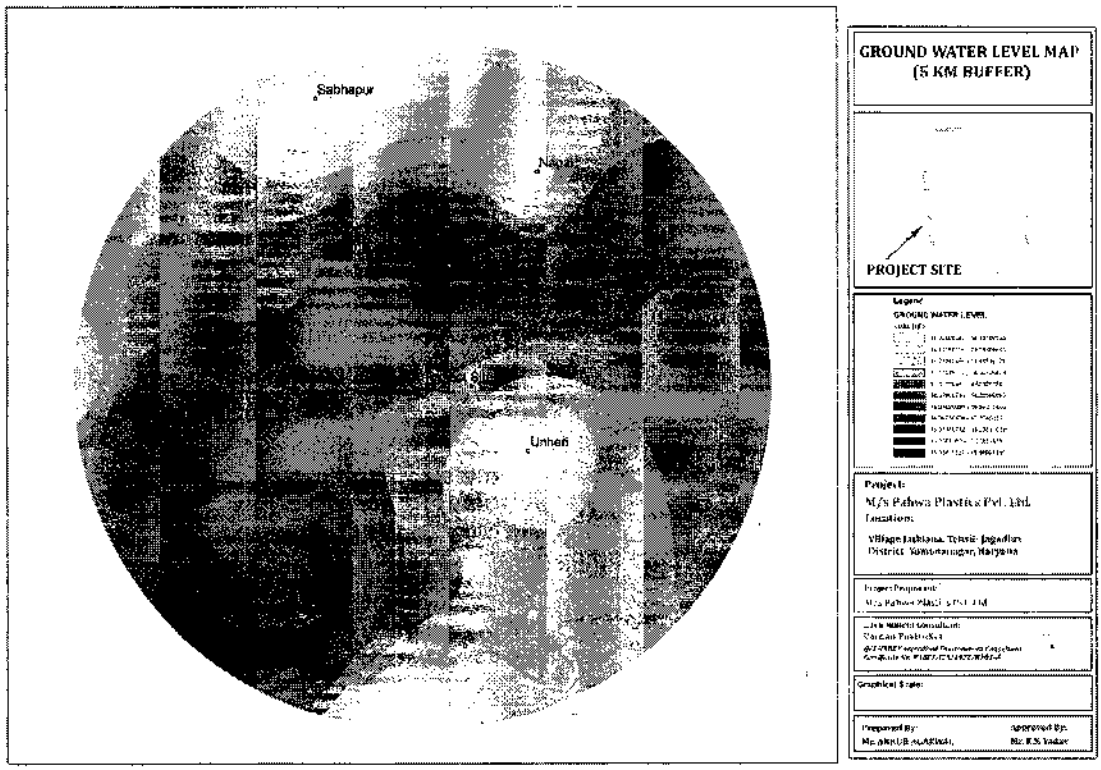


Figure 3.20: Ground Water Level of 5KM Buffer

3.9.4.3 Status of Ground Water Development

The block wise ground water resource potential in the district has been assessed as per GEC-97. The stage of ground water development ranges between 97% (block-Bilaspur) to 181% (block-Jagadhri). The total replenish able ground water resource in the district is 481.99 mcm, of which the total existing ground water draft by all means is 652.92 mcm. The net utilizable ground water resources for future irrigation development are - 173.49 MCM.

3.9.4.4 Ground Water Management Strategy

Due to pressure of population and improvement in the standard of living, the demand of fresh water for both agriculture and domestic use has substantially increased. As surface flow is available only for a limited period ground water withdrawal has sharply increased. The top layer of fresh ground water is also reducing every year. Artificial recharge serves as a means for restoring the depleted ground water storage, slow down the quality deterioration and put back into operation many groundwater abstractions structures.

3.9.4.5 Water Conservation and Artificial Recharge

Irrigation potential generated by irrigation project is negligible being scanty rainfall and high evaporation rate. Ani-cuts, tanks and check dams are surface water storage structures and these structures augment recharge to ground water bodies during monsoon period. The rain water during monsoon period can be used for artificial recharge through various techniques feasible in alluvial hard rock terrains. In hard rock terrain nala bunding and anicuts, dug wells, percolation tanks etc. are feasible structures which may be used to recharge the ground water body.

In alluvial area following ways of recharge techniques may be adopted.

- Roof top/paved area rainwater harvesting for recharge to ground water in urban and industrial areas.
- Village water run off/ roof top rainwater harvesting by dug wells and percolation tank in rural areas
- Construction of recharge shafts with gabian structures in Nalas.
- Recharge by dug well/percolation pit in agriculture farms

However, the prospects of using artificial recharge in hard rock areas are not very promising. Thus, conjunctive use of surface and groundwater is to be considered. In such a case the combined surface and groundwater supply for irrigation is more reliable than in the case of relatively small aquifer storage, and even more so compared to surface water supply alone.

3.9.4.6 Flood Study

Flood is a temporary inundation of large region due to increase in reservoir levels, or of rivers flooding their banks because of heavy rains, high winds, cyclones, storm surge along coast, tsunami, melting snow or dam bursts. In the sub-region of Haryana, the propensity of flooding is more as a hazard rather than a disaster. The areas under low-lying contour zone (heterogeneous topography) and along the river of Yamuna are subject to flood hazard. There are number of instances when several districts faced flood hazard primarily due to heavy rain in monsoon and discharge in Yamuna.

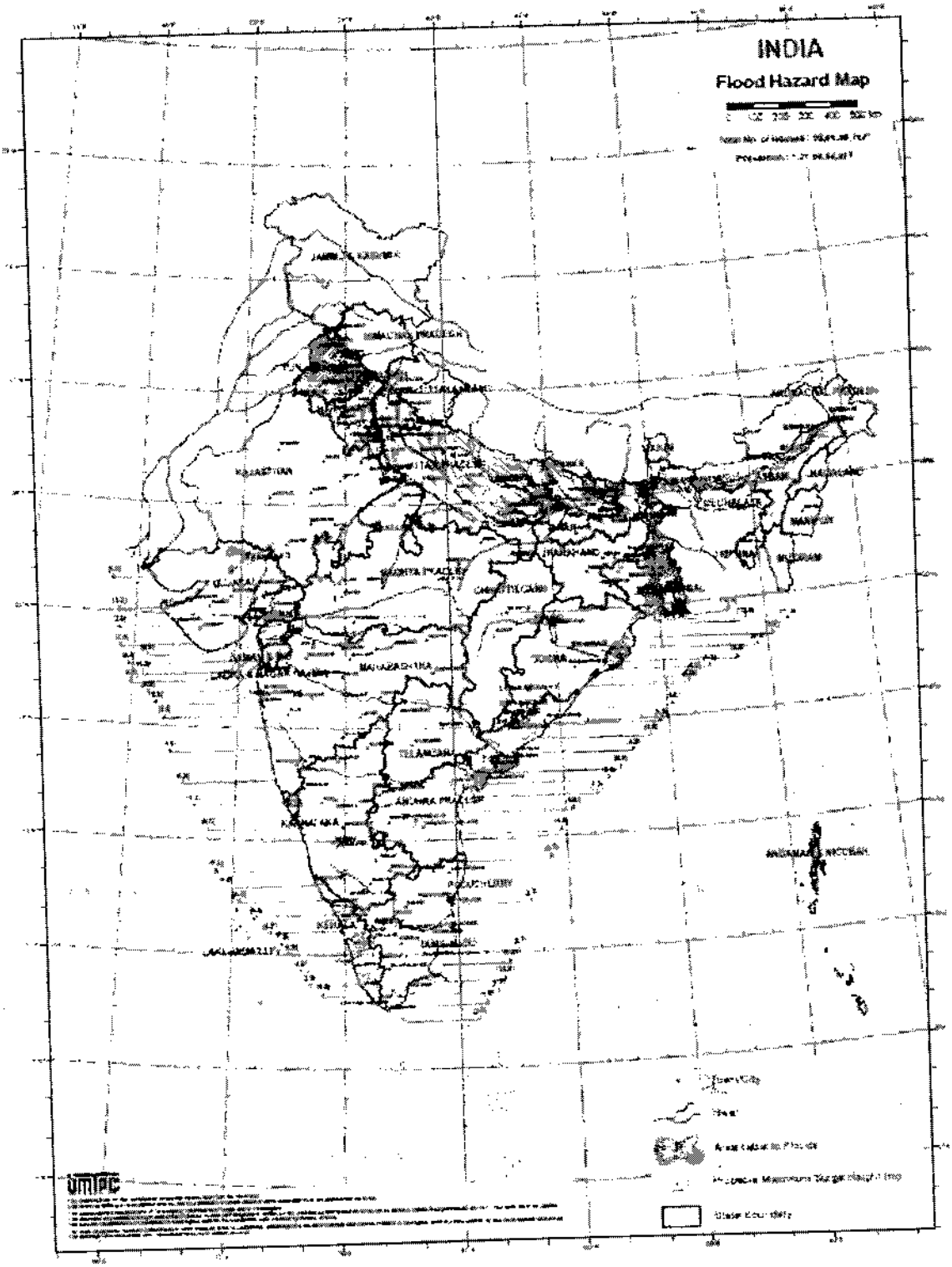


Figure 3.21: Flood Hazard Map of India

3.9.5 Hydrogeological Impacts and its Mitigation Measure

Appropriate mitigation measures can enormously reduce the damage caused by Hydrogeology is listed below.

Hydro-geological Impacts	Mitigation Measure
1. Due to over extraction of ground water, there will be chances of depletion of water level.	1. Adopted water saving technologies in the premises and adopted the rain water harvesting for the recharge of ground water
2. Due to release of the chemical ether will be chance of contamination of ground water	2. Any waste water will not be allowed to release on any open surface. It will be utilized in greenbelt are after proper treatment.
3. Existing drainage pattern will be changed due to topographical alteration.	3. There is no natural watercourse passing through the project site. Hence natural drainage pattern will not be affected.

3.10 BIOLOGICAL ENVIRONMENT

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of particular geographical area. Ecological systems show complex interrelationship between biotic and Abiotic components including dependence, competition and mutualism. Biotic components comprises of plant and animal communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical; components of the environment.

A natural ecosystem is a structural and functional unit of nature. It has different components, which are interrelated to each other survive by interdependence. An ecosystem has self sustaining ability and controls the number of organisms at any level by cybernetic rules. The basic purpose to explore the biological environment under Environmental Impact Assessment (EIA) is to assist the decision making process and to ensure that the project options under consideration are environmental friendly.

An ecological survey of the study area was conducted, particularly with reference to listing of species and assessment of the existing baseline ecological conditions in the study area. The main objective of the ecological survey is aimed at assessing the existing flora and fauna components in the study area. Data has been collected through secondary sources and by site visits. With the change in environmental conditions, the vegetation cover as well as animals reflects several changes in its structure, density and

composition. The present study was carried out separately for floral and faunal community respectively.

3.10.1 Objectives of Biological Study:

The main objectives of biological study were:

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the exisying site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance.
- To identify the Impacts of the project before, after and during development phase.

Table 3.14: Mode of data collection and parameters considered during the Survey

Sr.No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transect, point sampling and nest sampling etc.
2.		From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth.

3.	Aquatic Biodiversity	By field survey	Floral and Faunal diversity	For Plankton Study- Lackey's drops method and light microscope For other aquatic- Random survey, opportunistic observations
4.		From authentic sources like Forests department of Haryana.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Desktop literature review to indentify the representative spectrum of threatened species, population and ecological communities.

3.10.2 Study Area

The proposed project is established on 0.23 ha land falling under Khasra No.-10//7/1 and there is no forest land involved in this 0.23 ha of land. The geographical location of the Existing plant lies from Latitude- 30° 2'22.97"N & Longitude- 77°15'3.45"E. The Existing plant site is well connected with the rail and road connectivity. The Existing project site is situated at Khajuri- Jathlana road and SH-6~0.01 Km in E direction.

It is connected with the adjacent states and other patts of India as well, which facilitates transportation of goods, both inwards and outwards. This further facilitates the marketing of Formaldehyde all over India including Haryana, Punjab & Uttar Pradesh are nearby industrial areas having plywood and decorative laminate industry. The study area is divided into two parts i.e.:

a) **Core Zone:** Project Site i.e. M/s Pahwa Plastics Pvt. Ltd.
b) **Buffer Zone:** Area within 10 Km radius from the project site.

3.10.3 Riparian Environment

Riparian habitats are the interface of terrestrial and aquatic ecosystems and they are essential in controlling flows of energy and nutrients between terrestrial and aquatic ecosystems. Despite the relatively small area that they occupy within the landscape, riparian zones provide a major contribution to the ecology and biodiversity in the areas where they occur.

The study of riparian vegetation of a river is an important as it strongly affects soil-water characteristics of the area and thus the aquatic life. Moreover, the vegetation provides the human population with vital life support and socio- economic security. Riparian zones often regulate aquatic-terrestrial linkages. Riparian vegetation is important for regulating nutrient cycle of the streams, preventing soil erosion and stabilizing river banks. Further, the riparian vegetation is modified or destroyed by grazing, logging, urbanization, road construction, water development, mining and recreation. Also, the riparian zone is thought to have a disproportionate influence (relative to its land area) on the running water because of its immediate effects on the transport of water, nutrients and sediments. Riparian flora of Yamuna River, Western Yamuna Canal, Budhi Nadi and Augmentation canal was studied during the site visit.

3.10.4 Terrestrial Flora and Fauna

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animal (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance and diversity.

3.10.5 Terrestrial Flora

The Vegetation and plant species composition observed and documented during field visit in and around the proposed location of the project. Besides primary surveys in the project sites, published literature and various floras were consulted to prepare an inventory of plant species growing at project sites. The vegetation of the study area is highly degraded and some areas consisting water bodies. The plant diversity is classified into various plant groups such as tree, shrubs, herbs, climbers, sedges and grasses. The plant diversity survey in the project area was undertaken during the summer season with the objectives of preparing a checklist of flora in the study area which is divided into two parts i.e. Core Zone & Buffer Zone.

Core Zone: Core zone of the proposed project i.e. 0.23 ha is situated at Khasra No.- 10//7/1, Village Jathlana, Tehsil- Jagadhri, Yamuna Nagar, Haryana. There is no forest land is involved in this proposed project land.

Buffer Zone: The selection of terrestrial and aquatic ecological sampling location was based on land use pattern, topography and habitat patterns of the study area. The terrestrial ecological survey was carried out in forest and non-forest areas (agricultural fields, roadsides, urban & semi-urban wastelands etc) and the aquatic ecological survey was carried out at rivers & ponds/lakes within the study area.

3.10.5.1 Methodology

The present study on the floral assessment for the project activity is based on field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the buffer zone (10 km radial distance) from project site at Khasra No.-10//7/1, Village Jathlana, Tehsil- Jagadhri, Yamuna Nagar, Haryana, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCB during the study period. A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A **forest inventory is "an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown."** The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

3.10.5.2 Forest types of Haryana

The state presents diverse vegetation types from pine forests to desert thorn forests. Depending upon the altitude and climate, the main forest types of Yamuna Nagar district as per Champion and Seth's classification (1968) are:

i) Northern Dry Mixed Deciduous Forests 5B/C2
ii) Dry Deciduous Scrub 5/DS1

Northern Dry Mixed Deciduous Forest 5B/C2:

This type occurs on the upper dry slopes along the Siwaliks and their extensions. The upper canopy is usually light, open and irregular. The trees having relatively short bole and poor form and a height rarely over 10 meters. The canopy is formed entirely of deciduous trees. Major species are Cassia fistula, *Diospyros tomentosa, Acacia catechu, Anogeissus latifolia, Bombax cieba, Albizzia lebbek, Albizzia procera, Acacia nilotica, Acacia modesta, Bauhinia variegate, Syzygium cumini, Mangifera indica, Ehretia laevis, Phoenix sylvestris, Morus alba, Morus Australia, Terminalia tomentosa, Boswellia serrata, Aegle marmelos, Bauhinia racemosa, Bauhinia purpurea, Erythrina suberosa, Ficus glomerata, Grewia elastic, Mallotus philippensis* and *Shorea robusta.*

Dry Deciduous Scrub (5/DS1):

This type is located adjacent to the habitation in the Siwalik foot hills of the district and state. These represents a degradation stage of the tropical dry deciduous forest and

have been brought into existence by adverse biotic factor like excessive grazing, lopping, felling and fires. In spite of sufficient rains, moisture retention is very poor and the type has now become a stable edaphic climax. The crop is open with less tree cover. The main tree species found are *Diospyros tomentosa, Acacia leucophloea, Butea monosperma, Premna barbata, Cassia fistula, Anogeissus latifolia* and *Lannea grandis*. The undergrowth is mainly *Carissa apaca, Woodfordia Fruticosa, Nyctanthes arbortristis* and *Flacourtia indica*.

3.10.5.3 Floristic Composition of Core Zone

Core zone of the proposed project i.e. Khasra No.-10//7/1, Village Jathlana, Tehsil-Jagadhri, Yamuna Nagar, Haryana. During the field survey some floral (Some ornamental Greenbelt developed by Project Proponent) and faunal (Avifauna) diversity was recorded from the project area.

3.10.5.4 Floristic Composition of Buffer Zone

The terrestrial flora of the study area i.e. buffer zone (10 km radial distance) from the project site could be categorized as agriculture vegetation, social forestry plantation, Agro-forestry plantation, plantation for green belt development and natural/forest vegetations.

3.10.5.4.1 Agricultural and Horticulture Crops

Agriculture is the primary sector of Haryana State economy and majority of the population is directly or indirectly dependent on agriculture and its allied activities. The climatic conditions of a region affect the agricultural cropping pattern of different areas. Thus, it produces different crops. Amongst a host of climatic factors i.e. rainfall, temperature, humidity, wind velocity and duration of sunshine etc. affect the cropping pattern in a significant way. Annual rainfall and its distribution over the entire year and the regimes of diurnal and annual temperatures are by far, the prominent factors affecting agriculture and the life style of the people.

Table 3.15: Cropping Pattern of Study Area

Crop Variety	Family	Botanical Name	Trade Name
Agriculture Crops			
Vegetable	Malvaceae	*Abelmoschus esculentus*	Lady Finger
	Cucurbitaceae	*Cucurbita pepo*	Kaddu
	Cucurbitaceae	*Momordica charantia*	Karela
	Solanaceae	*Capsicum fruitiscens*	chilli

Crop Variety	Family	Botanical Name	Trade Name
	Solanaceae	*Solanum melongena*	Brinjal
	Solanaceae	*Solanum tuberosum*	Potato
	Solanaceae	*Lycopersicon lycopersicum*	Tomato
	Liliaceae	*Allium cepa*	Onion
	Brassicaceae	*Brassica oleracea var. capitata*	Cabbage
	Brassicaceae	*Brassica oleracea var. botrytis*	Cauliflower
	Cucurbitaceae	*Cucumis melo*	Cucumber
	Cucurbitaceae	*Cucurbita maxima*	Pumpkin
	Apiaceae	*Daucus carota*	Carrot
	Convonvulaceae	*Ipomoea batatas*	Sweet Potato
	Brassicaceae	*Raphanus sativus*	Radish
	Chenopodiaceae	*Spinacia oleracea*	Spinach
Cereals	Poaceae	*Oryza sativa*	Rice
	Poaceae	*Triticum aestivum*	Wheat
	Poaceae	*Zea mays*	Maize
Pulses	Fabaceae	*Vigna radiate*	Moong
	Fabaceae	*Vigna mungo*	Urd
	Fabaceae	*Cajanus cajan*	Pigeon Pea
	Fabaceae	*Vigna umbellata*	Rice Bean
	Fabaceae	*Cicer arietinum*	Gram
	Fabaceae	*Pisum sativum* Subsp. *arvense*	Field Pea
Spices	Amaryllidaceae	*Allium sativum*	Garlic
	Zingiberaceae	*Zingiber officinale*	Adrak
Oilseeds	Asteraceae	*Helianthus annus*	Sunflower
	Pedaliaceae	*Sesamum indicum*	Sesamum
Other	Malvaceae	*Gossypium hirsutum*	Cotton
	Poaceae	*Saccharum officinarum*	Sugar Cane

Crop Variety	Family	Botanical Name	Trade Name
Horticulture Crops			
Fruits	Moraceae	*Artocarpus heterophyllus*	Jack Fruit
	Caricaceae	*Carica papaya*	Papaya
	Rutaceae	*Aegle marmelos*	Bel
	Anacardiaceae	*Mangifera indica*	Mango
	Musaceae	*Musa paradasiaca*	Banana
	Myrtaceae	*Psidium guajava*	Guava
	Myrtaceae	*Syzygium cumini*	Jamun
	Fabaceae	*Tamarindus indica*	Imli

3.10.5.4.2 Social/Agro-Forestry

In India, natural forests are being conserved primarily for the environmental benefits. Serious efforts are also being done to plant large number of trees outside forest under social forestry programs to increase the tree cover and fulfill demand of various forest produce required by the people and forest based industries. Agricultural fields are one of the potential areas, where large scale planting of trees can be taken up along with the agricultural crops. Agro-forestry models adopted by the farmers in Haryana state are highly lucrative, therefore, attracting farmers in a big way.

Table 3.16: Agro Forestry Species of the Study Area (Buffer Zone)

Botanical Name	Trade Name	Family
Delonix regia	Gulmohar	Caesalpiniaceae
Dalbergia sisso	Shisham	Fabaceae
Azadirachta indica	Neem	Meliaceae
Mangifera indica	Aam	Anacardiaceae
Pongamia pinnata	Karanj	Euphorbiaceae
Musa paradisiacal	Banana	Musaceae
Ficus religiosa	Pipal	Moraceae
Eucalyptus cameldulensis	Nilgiri	Myrtaceae
Pisidium guava	Guava	Myrtaceae
Tectona grandis	Sagwan	Verbenaceae
Dendrocalamus strictus	Lathi bans	Poaceae
Butea monosperma	Kachnar	Fabaceae

Cassia fistula	Amaltas	Fabaceae
Saraca asoca	Asok	Fabaceae
Populous deltoids	Popular	Salicaceae
Shorea robusta	Sal	Dipterocarpaceae
Tectona grandis	Teak	Lamiaceae
Toona ciliata	Toon	Meliaceae

3.10.5.4.3 Grasslands

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

3.10.5.4.4 Endemic/Endangered Flora

No endangered and endemic flora was recorded from core and buffer zone of the project area.

3.10.5.4.5 Location of National Park/Sanctuaries

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site

3.10.5.4.6 Natural/Forest Vegetation:

Upper layer is stratified by dominant tree species: *Mangifera indica* (Mango); *Dalbergia sisso* (Shisham); *Azadirachta indica* (Neem); *Populus deltoides* (popular); *Bombax cieba* (Semel); *eucalyptus cameldulensis* (Eucalyptus); *ailanthus excelsa* (Arusa); *Zizyphus Mauritiana* (Ber); and *Ficus religiosa* (Peepal).

Lower strata of shrubs occupied at ground level: *Cassia alata* (Wild Senna); *Cocculus hirsutus* (Jamiti-ki-bel); *Tinospora cordifolia* (Giloy); *Barleria cristata* (Jhinti); *Vitex negundo* (Nirgundi); *Coccinia grandis* (Kundru); *Lantana camara* (Raimuniya); *Ricinus communis* (Arandi); and *Hyptis suaveolens* (Wilaiyati tulasi).

The herbaceous species: *Cynodon dactylon* (Dubh); *Achyranthes aspera* (Chirchira); *Saccharum spontaneum* (Kansh); *Parthenium hysterophorus* (Congress weed); *Cassia tora* (Tarota); *Tridax procumbens* (Kamarmodi); *Panicum indicum* (Fox tail grass); *Croton bonplandianus* (Mirchini); and *Hemidesmus indicus* (Anantmul). The status of natural/forest flora of buffer zone is presented below.

Table 3.17: Floristic composition of Buffer zone

Sr. No.	Botanical Name	Family	Common Name
TREES			
1.	*Aegle marmelos*	Rutaceae	Bel
2.	*Ailanthus excels*	Simaroubaceae	Adusa
3.	*Albizia procera*	Fabaceae	Safed Siris
4.	*Albizia lebbeck*	Fabaceae	Kala Siris
5.	*Anogeissus latifolia*	Combretaceae	Dhaura
6.	*Azadirachta indica*	Meliaceae	Neem
7.	*Acacia catechu*	Fabaceae	Khair
8.	*Adina cordifolia*	Rubiaceae	Haldu
9.	*Bauhinia acuminate*	Fabaceae	Safed Kachnar
10.	*Bauhinia vahlii*	Fabaceae	Malu Creeper
11.	*Bauhinia variegate*	Fabaceae	Kachnar
12.	*Bombax ceiba*	Malvaceae	Semal
13.	*Cassia fistula*	Fabaceae	Amaltas
14.	*Cassia siamea*	Fabaceae	Kasood
15.	*Dalbergia sissoo*	Fabaceae	Shisham
16.	*Delonix regia*	Fabaceae	Gulmohar
17.	*Emblica officinalis*	Phyllanthaceae	Amla
18.	*Eucalyptus camaldulensis*	Myrtaceae	Nilgiri
19.	*Ficus racemosa*	Moraceae	Gular
20.	*Ficus religiosa*	Moraceae	Pipal
21.	*Ficus benghalensis*	Moraceae	Bargad
22.	*Holoptelia integrifolia*	Ulmaceae	Kanju
23.	*Mallotus philippensis*	Euphorbiaceae	Kamala
24.	*Melia azedarach*	Meliaceae	Bakain
25.	*Morus alba*	Moraceae	Shehtoot

Sr. No.	Botanical Name	Family	Common Name
26.	*Phoenix sylvestris*	Palmaceae	Khajur
27.	*Populous deltoids*	Salicaceae	Poplar
28.	*Syzygium cumini*	Myrtaceae	Jamun
29.	*Tectona grandis*	Lamiaceae	Teak
30.	*Terminalia arjuna*	Combretaceae	Arjun
31.	*Terminalia chebula*	Combretaceae	Harad
32.	*Toona ciliata*	Meliaceae	Toon, Cedar
SHRUBS & HERBS			
33.	*Abrus precatorius*	Fabaceae	Ratti
34.	*Abutilon indicum*	Malvaceae	Kanghi
35.	*Achyranthes aspera*	Amaranthaceae	Chirehitta
36.	*Adhatoda vasica*	Acanthaceae	Vasaka
37.	*Alternanthera sessilis*	Amaranthaceae	Garundi
38.	*Amaranthus spinosa*	Amaranthaceae	Kate Chawli
39.	*Amaranthus viridis*	Amaranthaceae	Jungle Chaulai
40.	*Argenimone maxicana*	Papaveraceae	Satyanashi
41.	*Barleria crisata*	Acanthaceae	Varja Danti
42.	*Bauhinia vahlii*	Leguminoceae	Maljhan
43.	*Boerhavia diffusa*	Nyctaginaceae	Punarnawa
44.	*Bulbostylis barbata*	Cyperaceae	Water Grass
45.	*Caesalpinia sepiaria*	Sapindaceae	Kainju Bel
46.	*Calotropis procera*	Asclepiadaceae	Aak
47.	*Calotropis gigantea*	Asclepiadaceae	Madar
48.	*Cannabis sativa*	Urticaceae	Bhang
49.	*Carrissa occidentalis*	Apocynaceae	Karaunda
50.	*Cassia tora*	Caesalpiniaceae	Panwar
51.	*Chinopodium album*	Amaranthaceae	Bathuwa

Sr. No.	Botanical Name	Family	Common Name
52.	*Clematis gouriana*	Ranuculaceae	Balkangu
53.	*Crotolaria medicaginea*	Papilionaceae	Rattle Weed
54.	*Cryptolepis buchanani*	Apocynaceae	Dudhi
55.	*Cyperus compressus*	Cyperaceae	Annual Sedge
56.	*Cyperus rotundus*	Cyperaceae	Nut grass
57.	*Datura metel*	Solanaceae	Datura
58.	*Denderocalamus strictus*	Poaceae	Lathi Baans
59.	*Eclipta alba*	Asteraceae	Bhangra
60.	*Eriophorum Comosum*	Cyperaceae	Nakli Bhabbar
61.	*Euphobia hirta*	Euphorbiaceae	Dudhi
62.	*Evolvulus alsinoides*	Convonvulaceae	Vishnukrantha
63.	*Gloriosa superba*	Colchicaceae	Glory Lilly
64.	*Ipomoea carnea*	Convonvulaceae	Besharam
65.	*Lantana camara*	Verbenaceae	Raimuniya
66.	*Murraya koenigii*	Rutaceae	Gandhela
67.	*Nerium indicum*	Apocynaceae	Kaner
68.	*Ocimum sanctum*	Lamiaceae	Tulsi
69.	*Oxalis corniculata*	Oxalidaceae	Yellow sorrel
70.	*Parthenium hysterophorus*	Asteraceae	Gajar Ghas
71.	*Physalis minima*	Solanaceae	Rasbhari
72.	*Pueraria truberosa*	Leguminoceae	Sural
73.	*Ranunculus sceleratus*	Ranunculaceae	Jaldhaniya
74.	*Rumex dentatus*	Polygonaceae	Jungle Palak
75.	*Sida acuta*	Malvaceae	Baraira
76.	*Solonum erianthum*	Solanceae	Aradu, Ban
77.	*Solanum indicum*	Solanaceae	Makoi
78.	*Solanum viarum*	Solanaceae	Jungle Begun

Sr. No.	Botanical Name	Family	Common Name
79.	*Syzygium cumini*	Myrtaceae	Jamun
80.	*Tephrosia purpurea*	Fabaceae	Nili
81.	*Terminalia chebula*	Combretaceae	Bahera
82.	*Trichodesma indicum*	Boraginaceae	Chota Kalpa
83.	*Tridax procumbens*	Asteraceae	Kamarmodi
84.	*Typha angustifolia*	Typhaceae	Patera
85.	*Urena lobata*	Malvaceae	Caesar Weed
86.	*Withania somnifera*	Solanceae	Asgandh
87.	*Xanthium stumarium*	Asteraceae	Chota Gokhru
88.	*Zizyphus nummularia*	Rhacnaceae	Beri
GRASSES			
89.	*Apluda mutica*	Poaceae	Banjura grass
90.	*Aristida hystrix*	Poaceae	
91.	*Cenchrus echinatus*	Poaceae	Sandbur
92.	*Chloris barbata*	Poaceae	
93.	*Cymbopogon ernate*	Poaceae	Tikhadi
94.	*Cynodon dactylon*	Poaceae	Doob
95.	*Dactyloctenum aegyptium*	Poaceae	Crow foot grass
96.	*Digitaria ernate*	Poaceae	
97.	*Echinochloa colona*	Poaceae	Jungle Rice
98.	*Eragrostiella bifaria*	Poaceae	
99.	*Eragrostis ciliaris*	Poaceae	
100.	*Panicum tripheron*	Poaceae	
101.	*Sacharrum spontanium*	Poaceae	

3.10.6 Wetland Diversity & Marsh Lands

Wetlands are very useful to us. By producing resources, enabling recreational activities and controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services

to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table 3.18: Wetland/Marshland Diversity of Study area

Family	Botanical Name	Local Name
Pteridaceae	*Adiantum capillus*	Maiden Hair Fern
Fabaceae	*Aeschynomene indica*	Phulan
Amaranthaceae	*Alternanthera philoxeroides*	Alligator Weed
Amaranthaceae	*Alternanthera sessilis*	Garundi
Myrsinaceae	*Anagallis arvensis*	Neel
Salviniaceae	*Azolla pinnata*	Mosquito Fern
Asteraceae	*Caesulia axillaris*	Maka
Ceratophyllaceae	*Ceratophyllum demersum*	Hornwort
Poaceae	*Chrysopogon zizanioides*	Vetiver
Poaceae	*Coix lacryma-jobi*	Adlay Millet
Araceae	*Colocasia esculenta*	Taro
Commelinaceae	*Commelina benghalensis*	Kana
Cyperaceae	*Cyperus alternifolius*	Umbrella Sedge
Dryopteridaceae	*Dryopteris filix-mas*	Fern
Dryopteridaceae	*Dryopteris sieboldii*	Fern
Poaceae	*Echinochloa colona*	Shama
Pontederiaceae	*Eichhornia crassipes*	Jal Kumbhi
Asteraceae	*Grangea maderaspatana*	Madras Carpet, Mustaru
Acanthaceae	*Hygrophila salicifolia*	---
Lemnaceae	*Lemna minor*	Duck Weed
Onagraceae	*Ludwigia adscendens*	Water Primrose
Marsileaceae	*Marsilea quadrifolia*	Four Leaf Clover
Sterculiaceae	*Melochia corchorifolia*	Bilpat
Nelumbonaceae	*Nelumbo nucifera*	Lotus, Kamal

Family	Botanical Name	Local Name
Nymphaeaceae	*Nymphaea pubescens*	White Lotus
Oxalidaceae	*Oxalis corniculata*	Amrul
Urticaceae	*Pilea microphylla*	Gun Powder Plant
Polygonaceae	*Polygonum hydropiper*	Marsh Pepper Knot Weed
Portulacaceae	*Portulaca oleracea*	Little Hog-Weed
Potamogetonaceae	*Potamogeton natans*	Floating Pond Weed
Lythraceae	*Trapa natans*	Water Chest Nut
Ranunculaceae	*Ranunculus sceleratus*	Aglaon
Polygonaceae	*Rumex dentatus*	Ambavati
Typhaceae	*Typha angustata*	Patera
Hydrocharitaceae	*Vallisneria spiralis*	Tape Grass
Lentibulariaceae	*Utricularia gibba*	Floating Bladderwort
Plantaginaceae	*Veronica anagallis-aquatica*	Water Speedwell

3.10.7 Faunal Diversity

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area from the project site to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

a) Wildlife Survey (Diversity)
b) Habitat Study (Feeding, Breeding and Roosting areas)
c) Distribution/Status of Birds
d) Rare & Endangered species of Fauna
e) Specific local characteristics of biodiversity in the study area.

3.10.7.1 Methodology for Faunal Diversity

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that

could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 3.19: Faunal Diversity from Study Area

S. No.	English Name	Scientific Name	Status/Schedule
Mammals			
1.	Indian Hare	*Lepus nigricollis*	Schedule-IV
2.	Little Indian field mouse	*Mus booduga*	Schedule-V
3.	Nilgai	*Boselaphus tragocamelus*	Schedule-III
4.	Jungle Cat	*Felis catus*	Schedule-II
5.	Monkey	*Maccaca mulata*	Schedule-II
6.	Black Rat	*Rattus rattus*	Schedule-V
7.	Bat	*Rousettus leschenaultia*	Schedule-V
8.	Common Langur	*Semnopithecus entellus*	Schedule-II
9.	Common Mangoose	*Herpestes edwerdsii*	Schedule-II
10.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
11.	Hare	*Lepus nigrigolis*	Schedule-IV
Amphibians			

S. No.	English Name	Scientific Name	Status/Schedule
1.	Indian pond frog	*Rana hexadactyla*	Schedule-IV
2.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
3.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
4.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
5.	Marble Toad	*Bufo stomaticus*	Not Listed
		Reptiles	
1.	House gecko	*Hemidactylus flaviviridis*	Common
2.	Common garden lizard	*Calotes versicolor*	Common
3.	Brahminy skink	*Mabuya carinata*	Common
4.	Indian Cobra	*Naja naja*	Schedule-II
5.	Rat Snake	*Ptyas mucosa*	Schedule-IV
6.	Famn Throated Lizard	*Sitana ponticeriana*	Not Listed
		Butterflies	
1.	White orange tip	*Ixias marianne*	Common
2.	Lime butterfly	*Papilio demoleus*	Common
3.	Common crow	*Euploea core*	Common
4.	Common map	*Cyrestis thyodamas*	Common
5.	Common mormon	*Papilio polytes*	Common
6.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
7.	Stripped Tiger	*Danaus genutia*	Common
8.	Danaid Egg Fly	*Hypolimanas misippus*	Common
9.	Common Bush Brown	*Mycalesis perseus*	Common
		Aves	
1.	House Crow	*Corvus splendens*	Schedule-V
2.	Rock Pigeon	*Columba livia*	Common
3.	Gery francolin	*Francolinus pondicerianus*	Least Concern

S. No.	English Name	Scientific Name	Status/Schedule
4.	Jungle babbler	*Turoides striatus*	Schedule-IV
5.	Common Myna	*Acridotheres tristis*	Schedule-IV
6.	Green bee-eater	*Merops orientalis*	Least Concern
7.	Indian roller	*Coracias benshalensis*	Schedule-IV
8.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
9.	Little cormorant	*Microcarbo niger*	Schedule-IV
10.	Common swift	*Apus apus*	Schedule-IV
11.	House swift	*Apus affinis*	Schedule-IV
12.	Shikra	*Accipiter badius*	Schedule-IV
13.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
14.	Little Egret	*Egretta garzetta*	Schedule-IV
15.	Pond heron	*Ardeola grayii*	Schedule-IV
16.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
17.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
18.	Ring dove	*Streptopelia decaocto*	Schedule-IV
19.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
20.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
21.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
22.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
23.	Drongo Cuckoo	*Surniculus lugubris*	Schedule-IV
24.	Red Jungle Fowl	*Gallus sallus*	Schedule-IV
25.	White breasted water hen	*Amaurornis phoenicurus*	Schedule-IV
26.	Common Moorhen	*Gallinule chloropus*	Schedule-IV
27.	Raven	*Corvus corax*	Schedule-IV
28.	Tree Pie	*Dendrocitta vagabunda*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
29.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
30.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
31.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
32.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
33.	House Sparrow	*Passer domesticus*	Schedule-IV
34.	Grey Tit	*Parus major*	Schedule-IV
35.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
36.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
37.	Common Babbler	*Turdoides caudatus*	Schedule-IV
38.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
39.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
40.	Baya	*Ploceus philippinus*	Schedule-IV
41.	Owl	*Bubo bubo*	Schedule-IV
42.	Indian peafowl	*Pavo cristatus*	Schedule-I
	Pisces		
1.	Rohu	*Labeo rohita*	Least Concern
2.	Katla	*Catla catla*	Least Concern
3.	Calbasu	*Labeo calbasu*	Least Concern
4.	Cat fish	*Mystus cavasius*	Least Concern
5.	Mosquito fish	*Gambusia affinis*	Least Concern
6.	Black Fish	*Barbus chilinadea*	Least Concern
7.	Singi	*Clarias batrachus*	Least Concern
8.	Bronze Feather Back	*Notopterus notopterus*	Least Concern
9.	Ganges River Gizzard Shad	*Gonialosa manmina*	Least Concern
10.	hilsa	*Tenualosa ilisha*	Not Listed

S. No.	English Name	Scientific Name	Status/Schedule
11.	Chelluah	*Aspidoparia morar*	Least Concern
12.	Barna Baril	*Barilius barna*	Least Concern
13.	Chaguni	*Chagunius chagunio*	Least Concern
14.	Common Carp	*Cyprinus carpio*	Least Concern
15.	Reba Carp	*Cirrhinus reba*	Least Concern
16.	Sind Danio	*Danio devario*	Least Concern
17.	Kharsa, Butter	*Labeo angra*	Least Concern
18.	Bata	*Labeo bata*	Least Concern
19.	Boga Bata	*Labeo boga*	Least Concern
20.	Kali, Boalla	*Labeo dyocheilus*	Least Concern
21.	Kuri, Khursa	*Labeo gonius*	Least Concern
22.	Swamp Barb	*Puntius chola*	Least Concern
23.	Olive Barb	*Puntius sarana*	Least Concern
24.	Ticto Barb	*Puntius ticto*	Least Concern

Reference: For Avifauna: The book of Indian Birds by Salim Ali
For Amphibians: Atlas of amphibians, Published by Zoological Survey of India, Kolkata (September, 2013)

3.10.7.2 Endangered Species:

As per list of **The Indian Wildlife (Protection) Act, 1972,** Fauna coming under the **schedule - I** is treated as endangered species. As per reconnaissance survey only one species i.e. *Pavo cristatus* **schedule - I** faunal species have been reported from the project site. Although some schedule-II species have been reported during the site survey, which are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life:

I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.
II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being.

3.10.8 Aquatic Diversity

Methodology for Aquatic Diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton (Table 3.20). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table 3.20: Wetland/Marshland Diversity of Study area

PHYTOPLANKTON	ZOOPLANKTONS
CHLOROPHYCEAE	**PROTOZOA**
Ankistrodesmus falcatus	*Paramecium caudatum*
Chlorella vulgaris	*Vorticella campanula*
Chlorococcum infusionum	**CLADOCERA**
Cladophora fracta	*Alona rectangula*
Cosmarium tenue	*Bosmina longirostris*
Closterium Sp.	*Daphnia carinata*
Hydrodictyon reticulatum	**COPEPODA**
Pediastrum simplex	*Cyclops bicuspidatus*
Ulothrix	*Macrocylops albidus*
Spirogyra condensate	**ROTIFERA**
EUGLENOPHYCEAE	*Asplanchna intermedia*
Euglena acus	*Brachionus falcatus*
Phacus caudatus	*Filinia longiseta*
BACILLARIOPHYCEAE	*Keratella tropica*
Cyclotella meneghiniana	*Philodina citrine*
Synedra ulna	*Polyarthra* Sp.
CYANOPHYCEAE	**MACROBENTHOS – MOLLUSCA**
Anabaena fertilissima	*Pila*
Nostoc Sp.	*Bellamya* Sp.
Oscillatoria clorina	*Gyraulus*
Phormidium calciola	

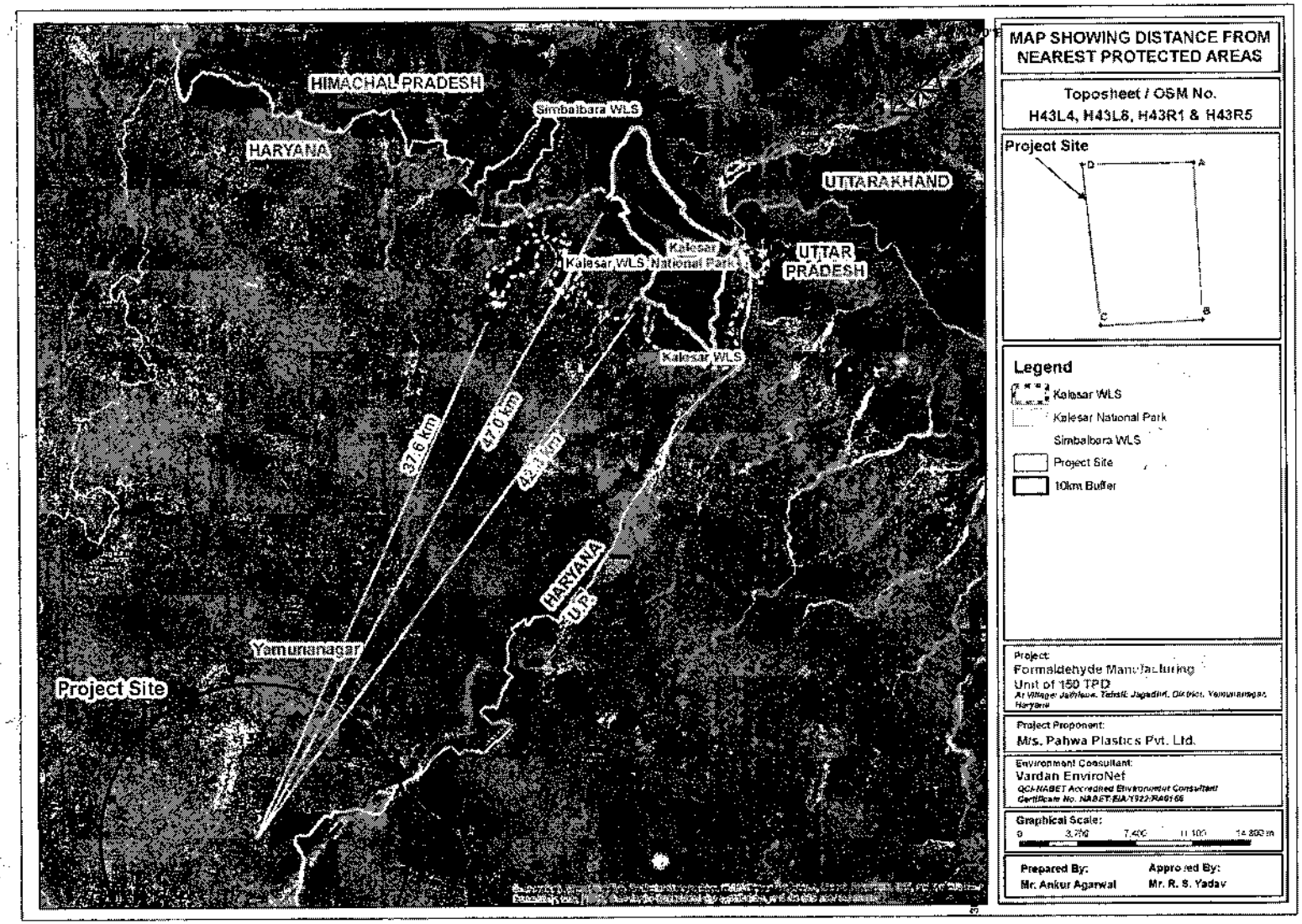


Figure 3.22: Map Showing Distance from Nearest Protected Areas

3.11 SOCIO-ECONOMIC ENVIRONMENT

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any.

The study of socio-economic component of environment is incorporating various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region.

3.11.1 Baseline Status

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.

3.11.2 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.

3.11.3 Study Area

The study area was defined as an area within 10 km radius around the project site which includes total 85 villages are from Jagadhri tehsil of Yamunanagar District of Haryana State and Nakur Tehsil of Saharanpur District of Uttar Pradesh State.
The Socio-Economic Status of the study areas is mentioned below and the villages surveyed are enlisted in below table:

Table 3.21: List of the Villages for Field Survey

Sr. No.	Villages
1.	Jathlana
2.	Barsan
3.	Marrupur

4.	Unheri
5.	Dhikka Tapri
6.	Alahar
7.	Kalanaut
8.	Naharpur
9.	Narayanpur
10.	Khajuri

3.11.4 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 of Haryana State. The summarized demographic structure of the study area with rural and urban area is presented in **Table 3.22**, while the details of the parameters of demographic structure of the villages within 10 kms are shown in **Table 3.23**.

Table 3.22: Summarized Demographic Stucture of the Study Area

Sr. No.	Parameter	Study Area
1.	No. of Villages	85
2.	Households	28993
3.	Household Ratio	5.4
4.	Total Population	159041
5.	Male Population	86084(54.12%)
6.	Female Population	72957(45.87%)

7.	Population (0-6 Years.)%	20591(12.94%)
8.	Sex Ratio	847
9.	Child Sex Ratio	833
10.	Scheduled Caste %	39520(24.84%)
11.	Scheduled Tribes %	Nil
12.	Literates %	103975(65.37%)
13.	Male Literates%	61160(58.82%)
14.	Female Literates%	42815(41.17%)
15.	Main Workers %	44489(27.97%)
➢ Cultivators		11433(25.69%)
➢ Agriculture Labourers		9731(21.87%)
➢ Household Labourers		720(1.61%)
➢ Other Workers		22605(50.81%)
16.	Marginal Workers %	7647(4.80%)
17.	Non-Workers %	106905(67.21%)

Source: PCA Census 2011, Haryana & Uttar Pradesh State

Table 3.23: Demographic Structure of the Study Area (Rural)

Sr.No.	Villages	Households	Total Population	Population 0-6 Years	Scheduled Caste	Literates
Haryana State						
Yamunanagar District						
Jagadhri Tehsil						
1.	Jathlana (4)	1342	7018	887	1557	4847
2.	Ramgarh (37)	0	0	0	0	0
3.	Unheri (38)	430	2516	326	671	1638
4.	Marrupur (39)	119	658	64	131	494
5.	Khajuri (159)	535	3003	312	763	2111
6.	Bahadurpur (162)	325	1791	197	577	1199
7.	Jaipur (163)	185	1127	132	226	806
8.	Dhorang (488)	450	2401	321	834	1457
9.	Nachraon (9)	480	2876	381	560	1906
10.	Rattangarh (10)	127	669	73	167	462
11.	Palewala (7)	234	1354	141	271	964
12.	Kanjnon (42)	321	1887	210	427	1254
13.	Kartarpur (6)	78	461	46	24	339
14.	Alahar (1)	728	3760	407	1300	2694
15.	Lakhi Bans (2)	141	761	86	180	556

16.	Barsan (3)	210	1221	138	134	914
17.	Mohri (5)	172	896	127	267	481
18.	Barheri (27)	243	1403	140	459	1004
19.	Daulatpur (482)	263	1395	161	819	1062
20.	Damla (484)	1643	8659	972	1379	5411
21.	Sabhapur (161)	108	629	83	423	429
22.	Nagal (158)	281	1638	200	306	1189
23.	Naharpur (150)	789	4446	629	1396	2778
24.	Karera Khurd (148)	614	3213	415	2248	2258
25.	Hariawas (151)	139	676	67	0	526
26.	Todarpur (152)	521	2349	244	97	1288
27.	Khandwa (157)	49	319	30	0	250
28.	Sukhpura (156)	156	847	102	573	539
29.	Haripur Kambo (155)	101	578	59	20	421
30.	Ramgarh Alias Gulabgarh (154)	130	730	89	684	492

31.	Patasgarh (474)	31	151	18	0	112
32.	Panjupur (153)	269	1330	136	418	958
33.	Shadipur (147)	584	3218	447	858	1818
34.	Garhi Gujran (418)	74	447	72	64	224
35.	Tapu Kamalpur (140)	310	1759	201	655	1249
36.	Tapu Mandauli (139)	0	0	0	0	0
37.	Kalanaur (136)	287	1521	230	589	915
38.	Mandauli (138)	554	2972	460	828	1893
39.	Akalgarh (142)	188	1039	130	5	730
40.	Tapu Akalgarh (141)	0	0	0	0	0
41.	Tigra (149)	325	1711	218	510	1224
42.	Tigri (143)	208	1038	149	545	699
43.	Daulatpur (144)	181	1256	233	49	641
44.	Rajheri (15)	284	1566	208	199	1092

45.	Fatehgarh (14)	140	836	62	50	598
46.	Kandrauli (19)	236	1314	150	419	861
47.	Mandhar (26)	220	1198	111	117	905
48.	Sandhali (25)	302	1703	195	125	1231
49.	Sandhala (24)	250	1397	141	441	995
50.	Pahladpur (22)	0	0	0	0	0
51.	Nagla Ranghran (31)	0	0	0	0	0
52.	Majri Dayalgarh (29)	21	180	22	14	128
53.	Bucha Bas (32)	0	0	0	0	0
54.	Nakum (33)	0	0	0	0	0
55.	Karhera (30)	348	1941	238	783	1316
56.	Lal Chhapar (28)	154	900	115	199	615
57.	Jathlana (4)	1342	7018	887	1557	4847
58.	Dhakwala (34)	0	0	0	0	0
59.	Jubal (41)	508	2833	362	362	1643
60.	Bakana (40)	495	2736	344	640	1899
61.	Badhi Majra (126) (CT)	1869	9188	1313	2757	5541

62.	Radaur (CT)	2794	13690	1467	2410	10380
Total		**22888**	**122223**	**14948**	**31087**	**82283**
Uttar Pradesh State						
Saharanpur District						
Nakur Tehsil						
63.	Sarsawan Dehat	678	3686	384	761	2809
64.	Kamalpur	0	0	0	0	0
65.	Roop Rowli	0	0	0	0	0
66.	Naurangpur	0	0	0	0	0
67.	Husainpur Aht.	0	0	0	0	0
68.	Husainpur	245	1516	237	188	782
69.	Qutubpur Must	775	4466	682	1096	2726
70.	Qutubpur Aht.	0	0	0	0	0
71.	Dhikka Kalan	757	4763	814	1631	2454
72.	Tabra Must.	39	334	68	0	172
73.	Tabra Aht.	96	599	74	168	385
74.	Dhikka Khurd	0	0	0	0	0
75.	Haji Saqdarpur	0	0	0	0	0
76.	Lahora	102	734	102	60	526

77.	Samaspur Kalan	603	4066	871	183	1811
78.	Tabar Must	1099	6259	857	2048	3901
79.	Tabar Aht	6	35	2	0	21
80.	Narayanpur	48	300	44	151	203
81.	Latifpur	286	1813	259	168	1150
82.	Sahaba Mazra	229	1411	176	346	920
83.	Malha Mazra	398	2201	402	690	1025
84.	Nasrulla Garh Must.	630	3982	575	714	2413
85.	Mugal Mazra	114	653	96	229	394
Total		**6105**	**36818**	**5643**	**8433**	**21692**
Grand Total		**28993**	**159041**	**20591**	**39520**	**103975**

Source: PCA Census 2011, Haryana & Uttar Pradesh State

3.11.5 Demographic Profile of the Study Area (Rural Area)

3.11.5.1 Household and Population

Total number of household in the study area of rural region is about 28993 with total population of about 159041 with male population about 86084 (54.12%) and female population is 72957 (45.87%) and is represented in below **Figure 3.23.**

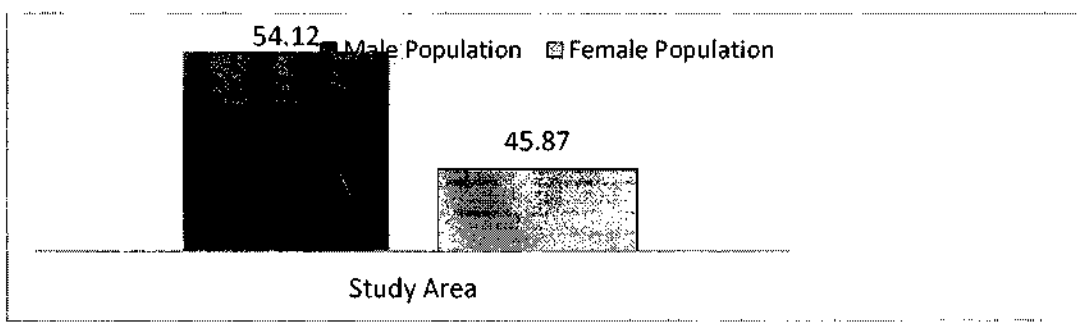


Figure 3.23: Bar diagram representing the distribution of population in the study area

Household Ratio- The average family size i.e person per family in rural area is 5.4 for study area.

Population Age-Group (0-6yrs) - Out of the total population, the population of children within the age of 0-6 age-group in study area is about 20591 (12.94%).

Sex Ratio & Child Sex Ratio-

Sex ratio (No. of females per 1000 males) is 847 in rural area of the study area which indicates that females are less in number than their male counterpart in rural area

Child Sex ratio is 833 in rural area i.e no.of female child per 1000 male child.

It can be concluded from the data that adult female is lower than male population but higher than the female child population in the study area.

The graphical presentation of the distribution of population is given in **Figure 3.24** below:

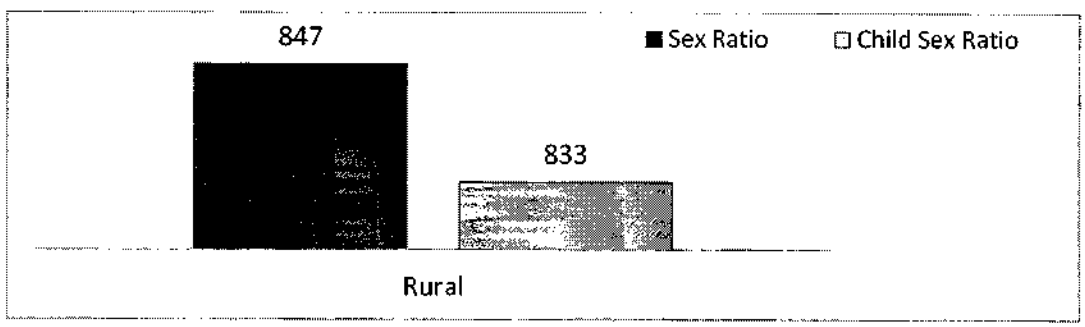


Figure 3.24: Bar Diagram Representing the Ratio of Population in the Study Area

3.11.5.2 Scheduled Caste Population in the Study Area

Scheduled caste population in study area is about 39520 i.e 24.84% in study area while the Scheduled tribe population are nil in the study area.

3.11.5.3 Literacy Rate in the Study Area

Out of the total population 103975 i.e 65.37% literates are from study area. Male literates are 61160 (58.52%) than female literates about 42815(41.17%) in the study area.

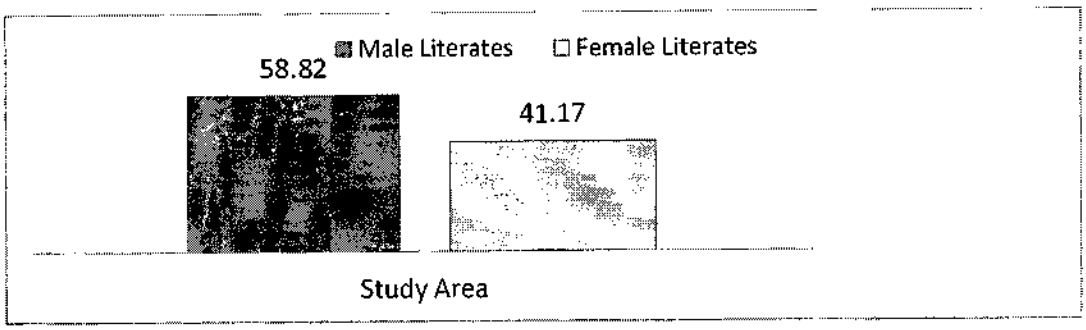


Figure 3.25: Representing the Literacy Rate in the Study Area

3.11.5.4 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.

3.11.5.5 Total Workers

Occupational pattern of the villages and urban area within 10 km is given in **Table 3.24**. 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 labors and those engaged in live stock, 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 & communication, and other services

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

A. 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 Out of the total population 44489 (27.97%) comes under the main workers category. 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. In the study area the cultivator population in rural area is 11433(25.69%).

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 the agricultural laborers population in rural area is about 9731(21.87%).

Laborers in Household Industry

The laborers engaged in household activity are quite low in all the study area. Among the total main worker only 720 workers from study area i.e 1.61% are engaged in Household activity.

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 can be seen higher in study area which is about 22605 (50.81%).

B. 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 comprises of about 7647(4.80%) of study area.

C. 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 & non workers are complementary to each other. Therefore, in areas where the proportion of main workers & 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 & women to work in agriculture & 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 & harvesting which are to be carried out in a short span of time covering large areas in each village. The non-worker population in rural area is observed to be almost about 106905(67.21%) in study area.

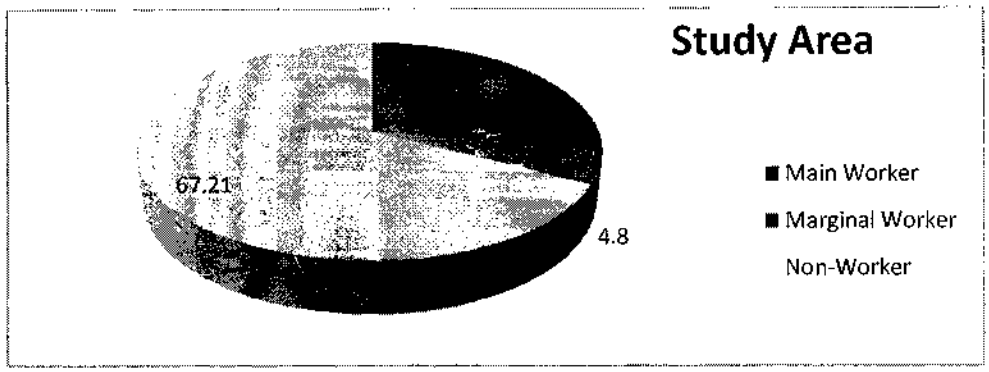


Figure 3.26: Occupational Structure in the Rural Area

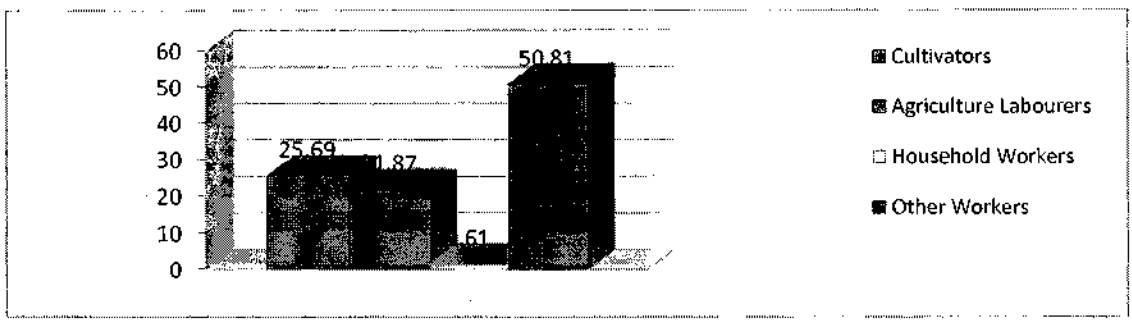


Figure 3.27: Category of Main Workers in the Study Area

Table 3.24: Occupational Structure of the Study Area (Rural)

Sr.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Haryana State								

Yamunanagar District								
Jagadhri Tehsil								
1.	Jathlana (4)	1477	356	326	22	773	571	4970
2.	Ramgarh (37)	0	0	0	0	0	0	0
3.	Unheri (38)	782	239	445	7	91	35	1699
4.	Marrupur (39)	162	92	3	7	60	80	416
5.	Khajuri (159)	779	176	243	3	357	97	2127
6.	Bahadurpur (162)	455	189	158	10	98	187	1149
7.	Jaipur (163)	193	115	22	2	54	134	800
8.	Dhorang (488)	725	143	59	2	521	242	1434
9.	Nachraon (9)	830	325	359	0	146	75	1971
10.	Rattangarh (10)	220	46	140	5	29	6	443
11.	Palewala (7)	342	177	85	4	76	45	967
12.	Kanjnon (42)	399	179	44	4	172	291	1197
13.	Kartarpur (6)	136	83	33	0	20	27	298
14.	Alahar (1)	937	301	141	7	488	318	2505
15.	Lakhi Bans (2)	216	92	61	0	63	2	543

16.	Barsan (3)	311	109	34	1	167	220	690
17.	Mohri (5)	226	84	105	1	36	159	511
18.	Barheri (27)	419	148	130	7	134	66	918
19.	Daulatpur (482)	394	71	154	0	169	17	984
20.	Damla (484)	3607	351	180	26	3050	286	4766
21.	Sabhapur (161)	232	44	58	0	130	1	396
22.	Nagal (158)	450	150	56	0	244	0	1188
23.	Naharpur (150)	1149	216	392	43	498	131	3166
24.	Karera Khurd (148)	946	84	332	32	498	21	2246
25.	Hariawas (151)	185	69	9	7	100	56	435
26.	Todarpur (152)	1216	83	92	5	1036	206	927
27.	Khandwa (157)	97	67	1	2	27	1	221
28.	Sukhpura (156)	195	22	134	4	35	61	591
29.	Haripur Kambo (155)	175	142	1	4	28	6	397
30.	Ramgarh Alias Gulabgarh (154)	134	34	19	3	78	91	505

31.	Patasgarh (474)	50	27	7	0	16	6	95
32.	Panjupur (153)	382	73	11	0	298	158	790
33.	Shadipur (147)	1017	72	19	15	911	47	2154
34.	Garhi Gujran (418)	126	2	0	0	124	2	319
35.	Tapu Kamalpur (140)	476	243	175	0	58	26	1257
36.	Tapu Mandauli (139)	0	0	0	0	0	0	0
37.	Kalanaur (136)	428	86	224	3	115	0	1093
38.	Mandauli (138)	798	71	131	25	571	36	2138
39.	Akalgarh (142)	342	74	31	4	233	32	665
40.	Tapu Akalgarh (141)	0	0	0	0	0	0	0
41.	Tigra (149)	442	218	108	0	116	76	1193
42.	Tigri (143)	315	5	124	6	180	18	705
43.	Daulatpur (144)	321	147	16	5	153	21	914
44.	Rajheri (15)	617	192	325	5	95	11	938

45.	Fatehgarh (14)	244	207	13	0	24	7	585
46.	Kandrauli (19)	400	148	119	27	106	15	899
47.	Mandhar (26)	292	227	30	1	34	71	835
48.	Sandhali (25)	439	216	122	1	100	37	1227
49.	Sandhala (24)	413	132	189	4	88	13	971
50.	Pahladpur (22)	0	0	0	0	0	0	0
51.	Nagla Ranghran (31)	0	0	0	0	0	0	0
52.	Majri Dayalgarh (29)	8	0	0	0	8	38	134
53.	Bucha Bas (32)	0	0	0	0	0	0	0
54.	Nakum (33)	0	0	0	0	0	0	0
55.	Karhera (30)	421	172	132	2	115	151	1369
56.	Lal Chhapar (28)	250	83	115	0	52	47	603
57.	Jathlana (4)	1477	356	326	22	773	571	4970
58.	Dhakwala (34)	0	0	0	0	0	0	0
59.	Jubal (41)	957	199	101	24	633	115	1761

60.	Bakana (40)	666	223	176	12	255	200	1870
61.	Badhi Majra (126) (CT)	2965	33	4	78	2850	124	6099
62.	Radaur (CT)	4010	226	491	119	3174	366	9314
Total		**35245**	**7619**	**6805**	**561**	**20260**	**5620**	**81358**
Saharanpur District								
Nakur Tehsil								
63.	Sarsawan Dehat	1244	82	122	2	1038	302	2140
64.	Kamalpur	0	0	0	0	0	0	0
65.	Roop Rowli	0	0	0	0	0	0	0
66.	Naurangpur	0	0	0	0	0	0	0
67.	Husainpur Aht.	0	0	0	0	0	0	0
68.	Husainpur	398	185	207	1	5	67	1051
69.	Qutubpur Must	1146	334	600	30	182	159	3161
70.	Qutubpur Aht.	0	0	0	0	0	0	0
71.	Dhikka Kalan	1081	562	304	23	192	293	3389
72.	Tabra Must.	77	47	10	1	19	0	257
73.	Tabra Aht.	155	118	16	1	20	58	386
74.	Dhikka Khurd	0	0	0	0	0	0	0
75.	Haji	0	0	0	0	0	0	0

	Saqdarpur							
76.	Lahora	203	162	20	0	21	11	520
77.	Samaspur Kalan	776	340	212	2	222	173	3117
78.	Tabar Must	1682	799	674	41	168	463	4114
79.	Tabar Aht	11	11	0	0	0	0	24
80.	Narayanpur	93	39	5	1	48	4	203
81.	Latifpur	508	172	170	2	164	17	1288
82.	Sahaba Mazra	403	270	46	5	82	1	1007
83.	Malha Mazra	620	136	440	1	43	48	1533
84.	Nasrulla Garh Must.	832	557	99	49	127	292	2858
85.	Mugal Mazra	15	0	1	0	14	139	499
Total		**9244**	**3814**	**2926**	**159**	**2345**	**2027**	**25547**
Grand Total		**44489**	**11433**	**9731**	**720**	**22605**	**7647**	**106905**

Source: PCA Census 2011, Haryana & Uttar Pradesh State

3.11.6 Infrastructure Resource Base

The details of infrastructure resources base of the study area with reference to education, medical facility, water supply, post and telegraph, transportation, communication facility, power supply, existence of nearest town etc. are presented in Table 3.25. The significant features of these important parameters for each study area are discussed as below:

Table 3.25: Infrastructure Resource Base of the Study Area

Sr.No.	Amenities	Availability in Number

1.	Education Facility	P(59),PvtP(33), M(44),PvtM(21),S(18), Pvt.S(13),Ssc(7)
2.	Medical Facility	CHC(2),PHC(6), PHS(16), D(5), MCW(14), FCW(3)
3.	Drinking Water Facility	T (53) , UnT(11), CW(10),UCW(4),HP(47),TW(54
4.	Drainage Facility	OD(66), CD(1)
5.	Communication Facility	PO(7)
6.	Transportation Facility	BS(49),Pvt BS(52)
7.	Approach Road	KR(54),PR(65)
8.	Power Supply	ED(54),EAG(67)

Source: **Village amenities 2011, Haryana & Uttar Pradesh State**

Table 3.26: Abbreviations

Educational Institutions			**Medical Facilities**			**Drinking Water Supply**			**Communication**		
P	:	Primary School	PHC	:	Primary health Centre	T	:	Tap Water	PO	:	Post Office
M	:	Middle School	PHS	:	Primary health sub centre	CW	:	Covered Well Water	PH	:	Phone connections
S	:	Secondary School	D	:	Dispensary	UCW	:	Uncovered Well Water	**Drainage Facility**		
						HP	:	Hand pump	OD	:	Open Drainage
									CD	:	Covered Drainage

Power Supply			Approach Road			Transportation					
ED	:	Electricity for domestic purpose	PR	:	Pucca Road	BS	:	Bus			
			KR	:	Kuccha road	RS	:	Railway Station			

3.11.6.1 Educational Facility

As per the data available through village amenities 2011 there were 59 government primary school,33 private Primary School,44 Middle schools, 21 private middle schools and 18 secondary schools, 13 private secondary schools and 7 senior secondary schools in villages of the study area. There are colleges in Radaur, Yamunanagar of Haryana and Saharanpur town of Uttar Pradesh.

Table 3.27: School within the Project Site

S.No.	Name of the Schools
1	Sri Krishna Public School
2	Government Middle School
3	Govt. High School Bahadurpur
4	Govt Sr. Sec. School Jathlana
5	Bala Ji Public School.Jathlana
6	Govt Sr. Sec. School Jathlana
7	Govt. School Dhikka Tapri,
8	Govt high school, Naharpur
9	Government Middle School, Barheri

3.11.6.2 Drinking Water Facility

The numbers of major sources of drinking water in the study area is mainly through treated Tap water in 53 villages, Hand Pump facility in 47 villages, Tube Well in 54 villages, untreated tap water in 11 villages, uncovered Wells in 4 villages (Tabra Must, Lahora, Nasrulla Garh Must, and Narayanpur) and covered well in only 8 villages.

3.11.6.3 Sanitation & Drainage Facility

Sanitation facility is poor in the villages of the study area. 66 villages have the open drainage system while Sahaba Mazra village of Nakur Tehsil of Saharanpur district has closed drainage system.

3.11.6.4 Communication Facility

Communication facility is available in the form of Post office is available in only 7 villages. Telephone connections are available in all 67 villages. At present time all 67 villages have mobile phones for communication.

3.11.6.5 Cultural and Aesthetic Attributes

As such no culturally and aesthetically important places are located within the 10 km of the study area.

3.11.6.6 Economic Attributes

Health Status

Health of the people is not only a desirable goal, but it is also an essential investment in human resources. As per the National Health Policy (1983), Primary Health Care has been accepted as main instrument for achieving this goal of development and strengthening rural health infrastructure through a three-tier system, viz., Primary Health Center (PHCs), Primary Health Subcentres (PHS) and Community Health Centers have been established to provide heath care facility not only to the resident population of the concerned villages but also to the neighboring villages.

Primary Health Centers - PHC is the first contact point between village community and the Medical Officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care.

Primary Health Sub-Centers - Sub-Centers are assigned tasks relating to interpersonal communication in order to bring about behavioral change and provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programmes.

Community Health Centre - Community Health Centre (CHCs) are being established and maintained by the State Government under MNP/BMS programme. As per minimum norms, a CHC is required to be manned by four medical specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician supported by 21 paramedical and other staff.

Lack of building, shortage of manpower and inadequate provision of drug supplies are hampering the operation of these units. The standards to be met according to National Rural Health Care System are given below:

Table 3.28: National Rural Health Care System Standards

Population	Medical Facility & Infrastructure	Personnel
3000-5000	1 Sub centre (Contact Unit of PHC and Community)	1 Health Worker (Female)/ Auxiliary Nurse Midwives & 1 Health Worker (Male)
20,000-30,000	1 PHC (Unit of 6 Sub-Centers)- 6 beds	Medical officers & 14 Paramedical Staff
80,000-1,20,000	Community Health Centre (Referral Unit-4 PHCs)- 30 Bedded Hospital	Medical superintendent

Source: National Rural Health Care System in India (2005-12)

Medical institutions as per the data recorded in the village amenities CD 2011 and through field survey are in the form of community health centre in Naharpur village of Jagadhri tehsil of Haryana and Sarsawan Dehat of Nakur tehsil of Saharanpur District, Primary health centre in 6 Villages (Alahar, Naharpur, Kalanaur, Qutubpur Must, Tabar Must and Tabar Aht), Primary health sub-centre (PHS) is in 16 villages, Maternal Child Welfare Centre in 14 villages and Dispensary is available in 5 villages and Family & Child Welfare Centre in 3 villages of the study area.

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.

3.11.6.7 Methodology applied for selection of sample & 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:

3.11.6.8 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.

3.11.6.9 Data Collection Method

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

3.11.6.10 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.

3.11.6.11 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.

Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the project site. 8 villages were surveyed from study area.

The respondents were asked for their awareness / opinion about the proposed project which is an important aspect of socio-economic environment, viz. job opportunities, education, health care, housing, transportation facility and economic status.

The salient observations recorded during socio economic survey in the study areas are depicted below:

- More than 45% villagers occupation is primarily based on agriculture and its allied activities.
- About 70% villages in the surveyed area have government and private Primary School (PS), about 50% villages have Middle School facility and 20% villages have Secondary school while very few have senior secondary schools. Further education villagers go to the Radaur, Yamunanagar and Saharanpur town.
- The main source of drinking water supply is through treated Tap water facility and Hand Pump facility available in villages. But majority of respondents expressed that there is shortage of availability of drinking water facility.
- Power supply is available in mostly all the sampling villages for both agriculture and Domestic purpose. Street lights are also available in all villages.

3.12 TRAFFIC STUDY

Traffic study measurements were performed at National Highway-76 and State Highway- 70 to assess impact on local transport infrastructure due to the project. Road and highway studies are given in **Table 3.29**.

Table 3.29: Highway in the Study Area

Name of National/State Highway	Direction		Ratio in Percentage (%)
	Up	Down	
SH-6	Ladwa	Bilaspur	60
NH-73	Bilaspur	Saharanpur	25
MDR-3	Ladwa	-	15
Total			100%

Table 3.30: No. of Vehicles per Day

Vehicles Distribution	Number of Vehicles Distribution/Day			PCU	Total Number of Vehicle in PCU			Total Number of Vehicle(PCU)/Hour		
	SH-6	NH-73	MDR-3		SH-6	NH-73	MDR-3	SH-6	NH-73	MDR-3
Cars	1051	1652	852	1	1051	1652	852	43.7917	68.8333	35.5
Buses	1135	2689	846	3	3405	8067	2538	141.875	336.125	105.75
Trucks	542	1385	501	3	1626	4155	1503	67.75	173.125	62.625
Two wheelers	1231	1136	1658	0.5	615.5	568	829	25.6458	23.6667	34.5416667
Three wheelers	636	706	703	0.75	477	529.5	527.25	19.875	22.0625	21.96875
Total	**4595**	**7568**	**4560**		**7174.5**	**14971.5**	**6249.25**	**298.938**	**623.813**	**260.38542**

Table 3.31: Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
SH-6	298.94	1250	0.24	B
NH-73	623.81	3000	0.21	B
MDR-3	260.39	900	0.29	B

Note: The existing level may be "Very Good" for all the highways.

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

Note: Capacity as per IRC: 64-1990

Table 3.32: Additional Traffic during Plant Operation

S. No.	Type of Vehicle	Additional Vehicle Per day	PCU	Total Number of Vehicle in PCU/day	PCU/Hr
1	Truck	26	3	78	3.25
2	2 Wheeler	10	0.5	5	0.21
3	Car	5	1	5	0.21
Total				76	**3.17**

Basis No. of vehicle x 2 (Up and Down)

Table 3.33: Modified Traffic Scenarios and LOS

Road	Ratio	Total V	C	V/C	LOS
SH-6	60	301.14	1250	0.24	B
NH-73	25	624.73	3000	0.21	B
MDR-3	15	260.94	900	0.29	B

3.12.1 Conclusion

The LOS value from the project may be same as earlier value "Very Good" for all the highways. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The transportation map is given as below figure:

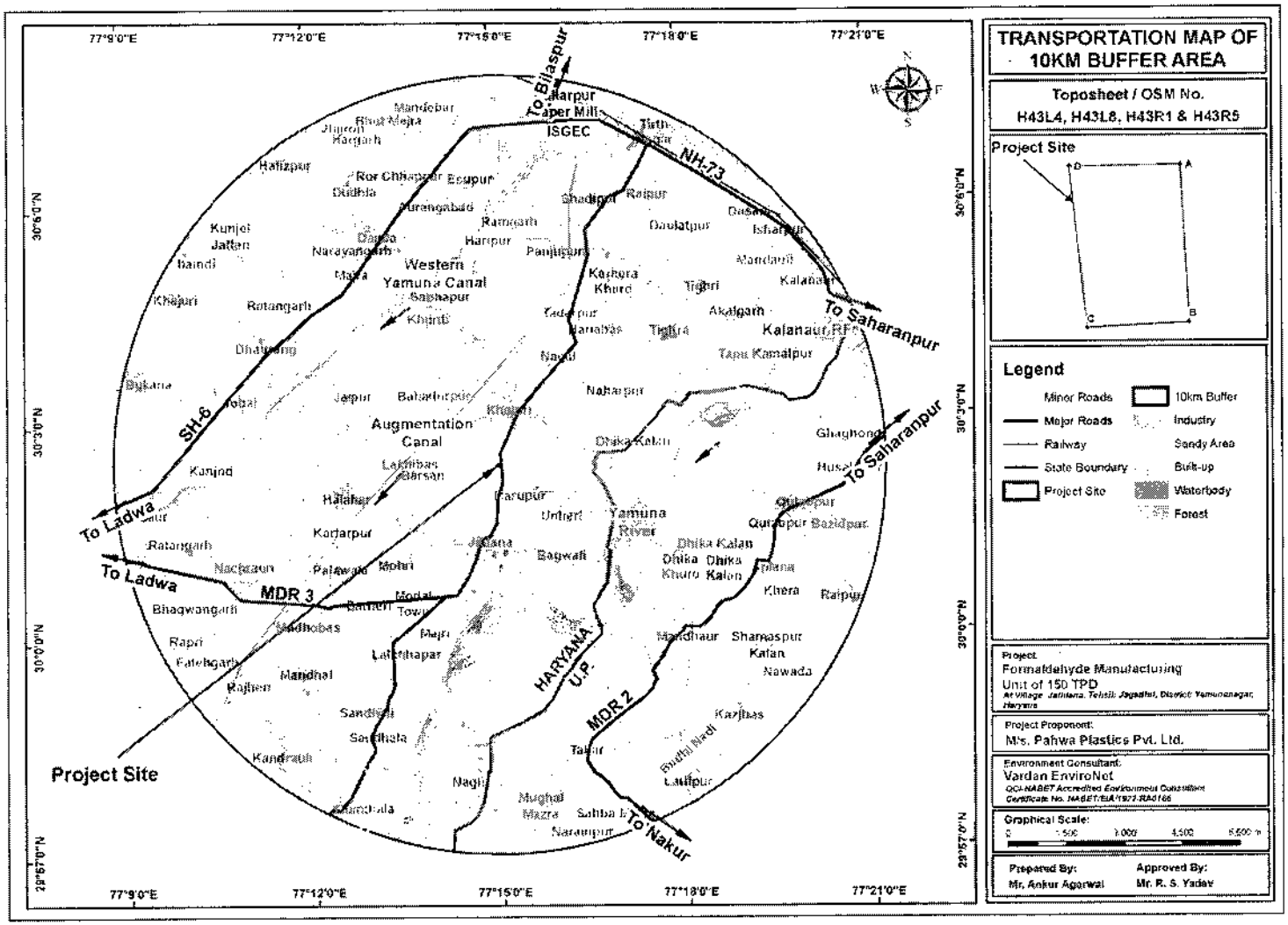


Figure 3.28: Transportation Map

CHAPTER 4: ANTICIPATED ENVIRONMENT IMPACT AND MITIGATION MEASURES

4.1 INTRODUCTION

This chapter presents identification and appraisal of various impacts from the project in the study area. Generally, the environmental impacts can be categorized as either primary or secondary. Primary impacts are those which are attributed directly to the project and secondary impacts are those which are indirectly induced and typically include the associated investment and changed patterns of social and economic activities by the proposed action.

Quantification of assessments in terms of measurable units would be the ideal method for impact assessment. Mathematical models are the best tools to quantitatively describe cause-effect relationships between sources of pollution and different components of environment. However, due to lack of information/data, uncertainties involved and complex interrelationships between various sectors of environment; it is not always possible or at least not easily achievable. In such cases, only qualitative predictions have been made based on experience and judgments.

The Environment Management Plan (EMP) is required to ensure sustainable development in the study area (10 km) of the plant site, hence it needs to be an all en-compassive plan for which the proposed industry, Regulating agencies like pollution control board working in the region and more importantly the affected population of the study area need to extend their co-operation and contribution.

The affected environmental attributes in the region are air quality, water quality, soil, land use, ecology and public health. The management action plan 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.

4.2 IMPACT IDENTIFICATION

Considering that identification of significant environmental impact is essential in the preparation of EIA report, an attempt has been made here through the use of "Activity Effect" matrix.

Table No 4.1: Impact Identification Matrix during Operation Phase

Component	Parameter Factor	Raw materials handling and storage, access, parking, and loading/ Unloading	Chemical reactions of unit processes and unit operations - Cracking process, Dryers, Reactors, Distillation units operation, Product separation and refinement	Process Emission	Flue Gas Emission	Water Consumption (Source: Bore well)	Wastewater Generation, its treatment and disposal	Storage of toxic and flammable chemicals Solid & Hazardous	Solid & Hazardous waste Management
Soil	Contamination	✔	✔	-	-	-	-	✔	✔
	Soil quality	✔	✔	-	-	✔	-	✔	✔
	Reduction offarmland productivity	✔	✔	-	-	-	-	-	-
Resources	Fuels/Electricity	✔	✔	✔	✔	✔	✔	-	✔
Water	Alteration of Hydraulic	-	-	-	-	✔	-	-	
	Water Quality	-	-	-	-	-	✔	-	-
Air	Air Quality	✔	✔	✔	✔		✔	✔	
Noise	Noise Environment	✔	✔	-	-	✔	✔	-	-
Biological	Effect on trees & shrubs	✔	✔	✔	✔	-	-	✔	✔

Component	Parameter Factor	Raw materials handling and storage, access, parking, and loading/ Unloading	Chemical reactions of unit processes and unit operations - Cracking process, Dryers, Reactors, Distillation units operation, Product separation and refinement	Process Emission	Flue Gas Emission	Water Consumption (Source: Bore well)	Wastewater Generation, its treatment and disposal	Storage of toxic and flammable chemicals Solid & Hazardous	Solid & Hazardous waste Management
	Disturbance of habitats by Noise and vibration	✔	-	-	-	✔	✔	-	✔
Social	Generation of temporary and permanent jobs	✔	✔	-	-	-	✔	-	✔
	Income for the state and private sector	✔	✔	-	-	-		-	-
	Training in new technology and new skill to worker.	-	✔	-	-	-	✔	-	✔
	Health	✔	✔	✔	✔		✔	✔	✔

4.3 ASSESSMENT OF SIGNIFICANCE OF IMPACTS (CRITERIA FOR DETERMINING SIGNIFICANCE, ASSIGNING SIGNIFICANCE) & MITIGATION MEASURES

This section is devoted to the assessment of impacts due to the industrial project, which are the most important components of EIA. Assessment involves determination of nature and extent of impacts due to the industrial activities or the actions involved. Here it is determined whether the environmental impacts will be:

1. Direct or Indirect
2. Impact of low, medium, or high significance

Based on Environmental Impact Analysis, the Environmental Impacts under this step are quantitatively and qualitatively assessed.

Quantitative assessment with the help of a mathematical model has been done wherever possible. In other cases, the impact assessment has been qualitative which is based on available scientific knowledge and judgement. The mathematical model used for assessment in the present study includes "AERMOD" Dispersion Model for air quality. For other cases i.e. Water, Noise, Land/Soil, Ecology, Socio-economic etc., the available scientific knowledge and judgements have been used.

- ✓ N (D): Negative Direct
- ✓ N (ID): Negative Indirect
- ✓ P (D): Positive Direct
- ✓ P (ID): Positive Indirect
- ✓ LS: Low Significance
- ✓ MS: Medium Significance
- ✓ HS: High Significance
- ✓ ST: Short Term
- ✓ LT: Long Term

Table No 4.2: Impact Assessment Matrix during Operation Phase

Component	Parameter Factor	Raw materials handling and storage, access, parking, and loading/ Unloading	Chemical reactions of unit processes and unit operations - Cracking process, Dryers, Reactors, Distillation units operation, Product separation and refinement	Process Emission	Flue Gas Emission	Water Consumption (Source : Borewell)	Wastewater Generation, its treatment and disposal	Storage of toxic and flammable chemicals Solid & Hazardous	Solid & Hazardous waste Management
Soil	Contamination	N(D) HS LT	N(D) HS LT	-	-	-	-	-	-
	Soil quality	N(D) HS LT	N(D) HS LT	-	-	-		-	-
Water	Reduction of farmland productivity	-	-	-	-	-	-	-	-
	Fuels/Electricity	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	-	N(D) HS LT
Water	Alteration of Hydraulic	-	-	-	-	N(D) HS LT	-	-	-
	Water Quality	-	-	-	-	-	N(D) HS LT	-	-

Air	Air Quality	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	-	-	N(D) HS LT	-
Noise	Noise Environment	N(D) HS LT	N(D) HS LT	-	-	-	N(D) HS LT	-	N(D) HS LT
Biological	Effect on trees & shrubs	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	-	-	N(D) HS LT	N(D) HS LT
	Disturbance of habitats by Noise and vibration	N(D) HS LT	N(D) HS LT	-	-	N(D) HS LT	N(D) HS LT	-	N(D) HS LT
Social	Generation of temporary and permanent jobs	P(D) HS LT	P(D) HS LT	-	-	-	P(D) HS LT	-	P(D) HS LT
	Income for the state and private sector	P(D) HS LT	P(D) HS LT	-	-	-	P(D) HS LT	-	P(D) HS LT
	Training in new technology and new skill to worker.	-	P(D) HS LT	P(D) HS LT	P(D) HS LT	-	P(D) HS LT	-	P(D) HS LT

	Health	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT	N(D) HS LT

4.4 AMBIENT AIR QUALITY MODELING

AERMOD Model

The impact has been predicted separately for operation phase of the project. During operation phase, air emissions both gaseous and fugitive will be on account of process emissions from stacks, transportation of men and material.

4.4.1 Air Quality Modeling

The Gaussian Dispersion Modeling (GDM) is used for prediction of dispersion of air emission and the computation of Ground Level Concentration (GLC) up to a specified distance from source. The fundamental model is given below:

$$c(x,y,z) = \frac{Q}{2\pi\sigma_y\sigma_z u}\exp\left(\frac{-y^2}{2\sigma_y^2}\right)\left(\exp\left(\frac{-(z-h)^2}{2\sigma_z^2}\right)+\exp\left(\frac{-(z+h)^2}{2\sigma_z^2}\right)\right),$$

Where c is a concentration at a given position, Q is the source term, x is the downwind, y is the crosswind and z is the vertical direction and u is the wind speed at the h height of the release. The σy, σz deviations describe the crosswind and vertical mixing of the pollutant. The above equation describes a mixing process that results in a Gaussian concentration distribution both in crosswind and in vertical direction, centered at the line downwind from the source. Gravitational settling and chemical or radioactive decays are neglected.

AERMOD VIEW: AERMOD is an air dispersion-modeling package, which seamlessly incorporates the popular USEPA Model AERMOD into one interface without any modifications to the models. These models are used extensively to assess pollution concentration and deposition from a wide variety of sources.

AERMET: In order to carry out the air dispersion modeling project using the AERMOD, it is necessary to process the meteorological data of study area being modeled. The collected meteorological data has been pre-processed using AERMET program. The AERMET Program is a meteorological pre-processor, which prepares hourly surface data and upper air data for use in the AERMOD air quality dispersion model.

Parameter	Details
Model name	AERMOD
Version	9.5.0
Model type	Gaussian plume air dispersion model
Topography	Undulated

Averaging time	24 hours
Source type	Point source
Boundary limits	10 km
Co-ordinate system	Uniform grid
Surface meteorological data	Site specific data processed by AERMET

4.4.2 Stack details

The emission will be from the boiler and DG sets.

Emissions were analyzed for their impacts on the GLC for various distances using the dispersion modeling guidelines given by the Central Pollution Control Board, New Delhi and the dispersion modeling software AERMOD of the United States Environment Protection Agency (USEPA).

Table 4.3: DG Set details

#	PM10	PM2.5	SO2	NO2	CO
Boiler 800kg/hr	0.011	0.0044	0.001	0.0022	0.0004
DG 180 KVA	0.0006	0.0002	0.00145	0.0012	0.0001
DG 250 KVA	0.0008	0.0003	0.00201	0.0012	0.0001

4.4.3 Meteorological Data

The meteorology of the project area plays very important role in dispersion of pollutants and buildup of pollution within the atmosphere. In the present study, one season (Oct to Dec 2020) meteorological data has been taken to find the dispersion of pollutant concentration. The mixing height for study period, which is an important parameter to express the dispersive potential of atmosphere, has been taken from the atlas of hourly mixing height and assimilative capacity of atmosphere in India (Attri, S.D. et al., 2008).

Location	Village	Max Baseline Concentrations					Predicted GLC – AERMOD					Cumulative GLC				
		PM10	PM2.5	Nox	SO2	CO	PM10	PM2.5	Nox	SO2	CO	PM10	PM2.5	Nox	SO2	CO
		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(mg/m³)
A1	Project Site	88.6	49.1	32.8	20	0.98	0.03485	0.01358	0.02149	0.02727	0.0000021	88.63485	49.11358	32.82149	20.02727	0.9800021
A2	Marupur	87.7	48.2	31.2	18.2	0.99	0.00666	0.0026	0.00364	0.00418	0.0000004	87.70666	48.2026	31.20364	18.20418	0.9900004
A3	Jatlana	81.2	42.3	26.7	15.8	0.98	0.00238	0.00093	0.00109	0.00117	0.0000001	81.20238	42.30093	26.70109	15.80117	0.9800001
A4	Naharpur	72.2	45.6	27.6	13.4	0.94	0.00154	0.00061	0.00111	0.00153	0.0000001	72.20154	45.60061	27.60111	13.40153	0.9400001
A5	Khajuri	82.3	82.3	82.3	82.3	82.3	0.00191	0.00075	0.00067	0.00065	0.00000009	82.30191	82.30075	82.30067	82.30065	82.3
A6	Bahadurpur	82.6	43.4	32.2	13.7	0.9	0.00441	0.00174	0.00276	0.00337	0.00000029	82.60441	43.40174	32.20276	13.70337	0.9000003
A7	Jaipur	72.6	35.6	25.6	12.4	0.86	0.00753	0.00294	0.00408	0.00467	0.00000004	72.60753	35.60294	25.60408	12.40467	0.86
A8	Unheri	83.6	47.8	30.7	19.3	0.98	0.00728	0.00289	0.00399	0.00525	0.0000003	83.60728	47.80289	30.70399	19.30525	0.9800003

The contour maps showing the predicted concentration levels of PM10, PM2.5, SO2, NO2 of Study area are presented as below figures:

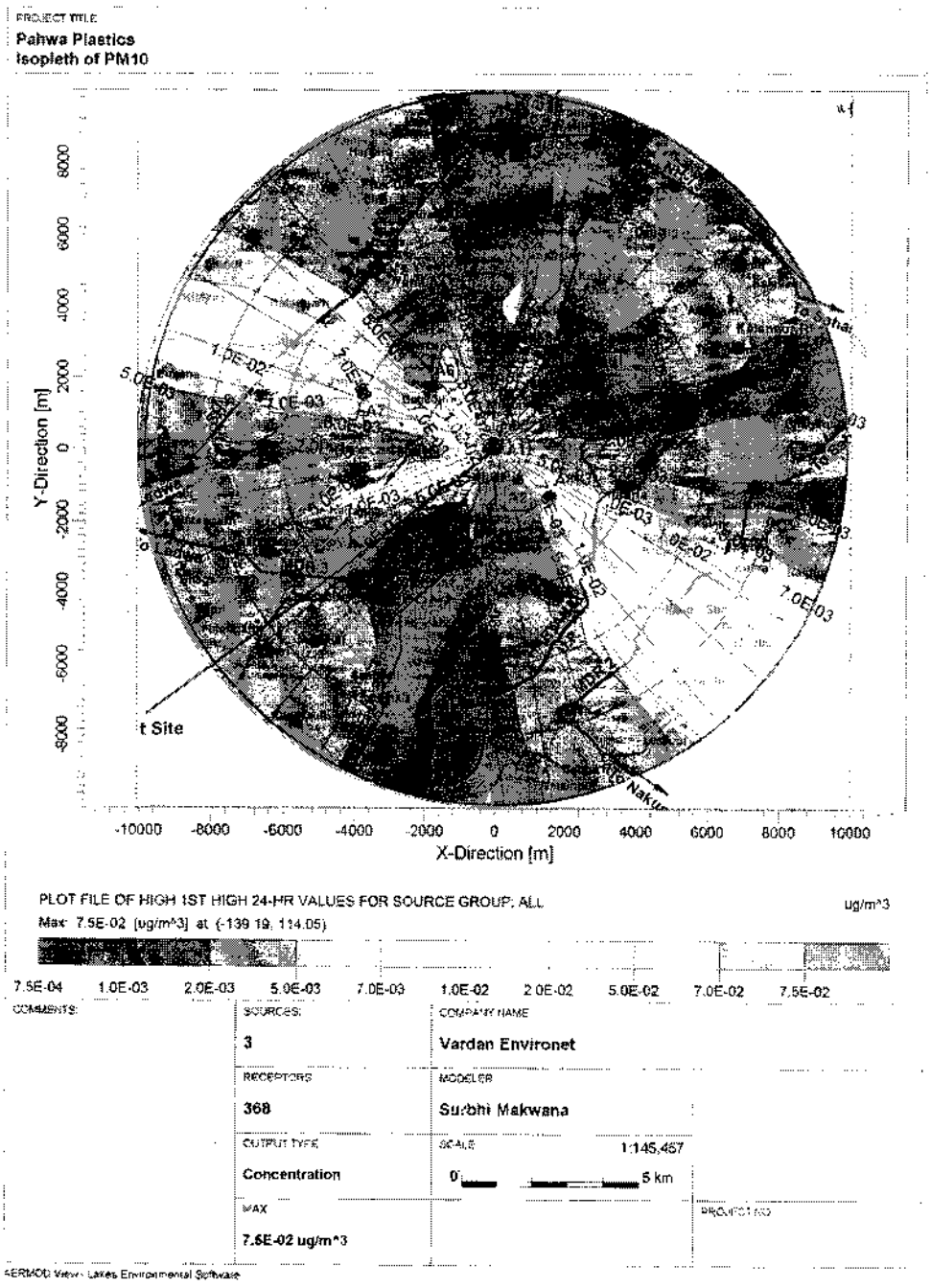


Figure 4.1: Spatial distribution of predicted GLCs of PM10

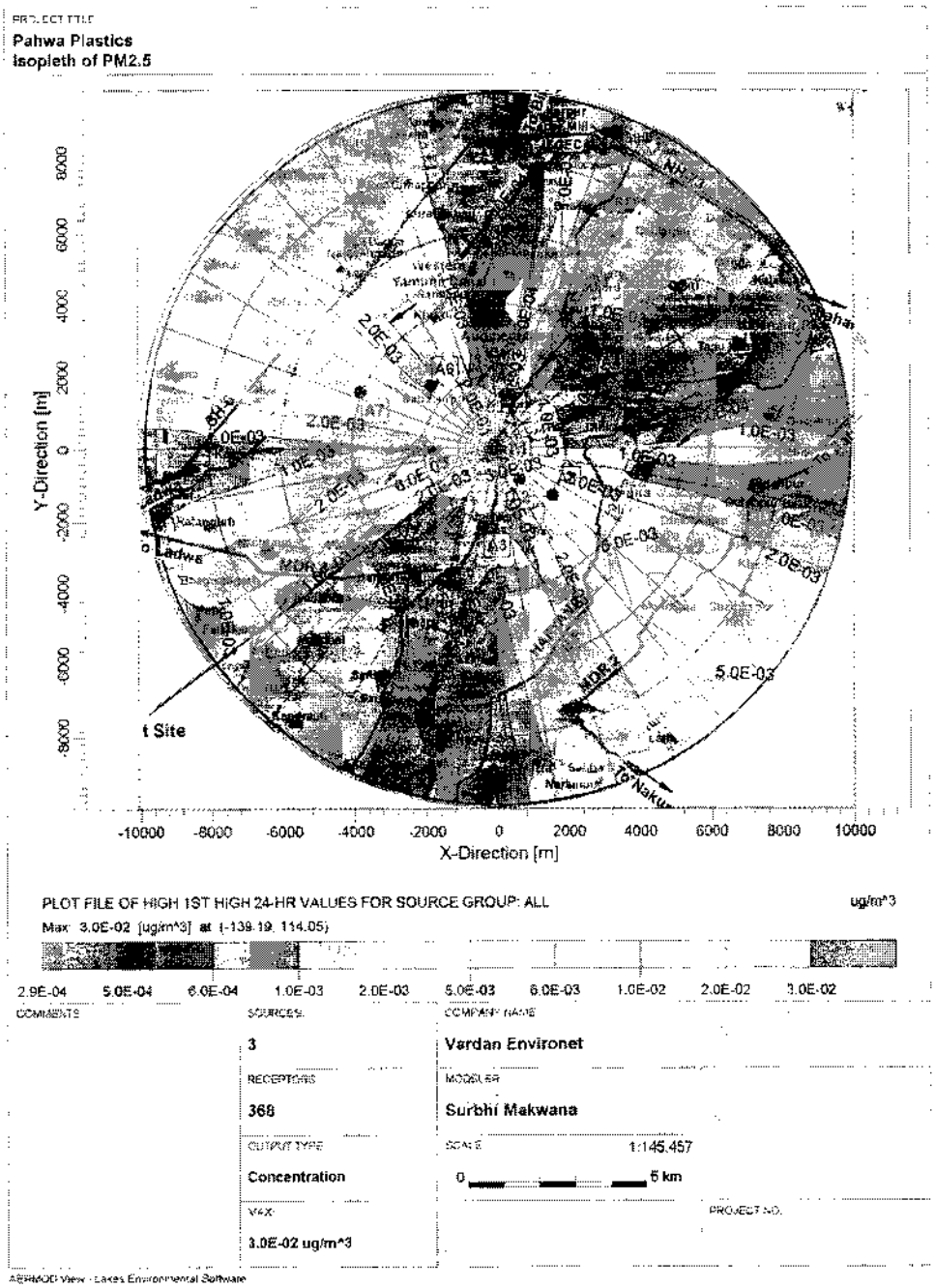


Figure 4.2: Spatial distribution of predicted GLCs of PM2.5

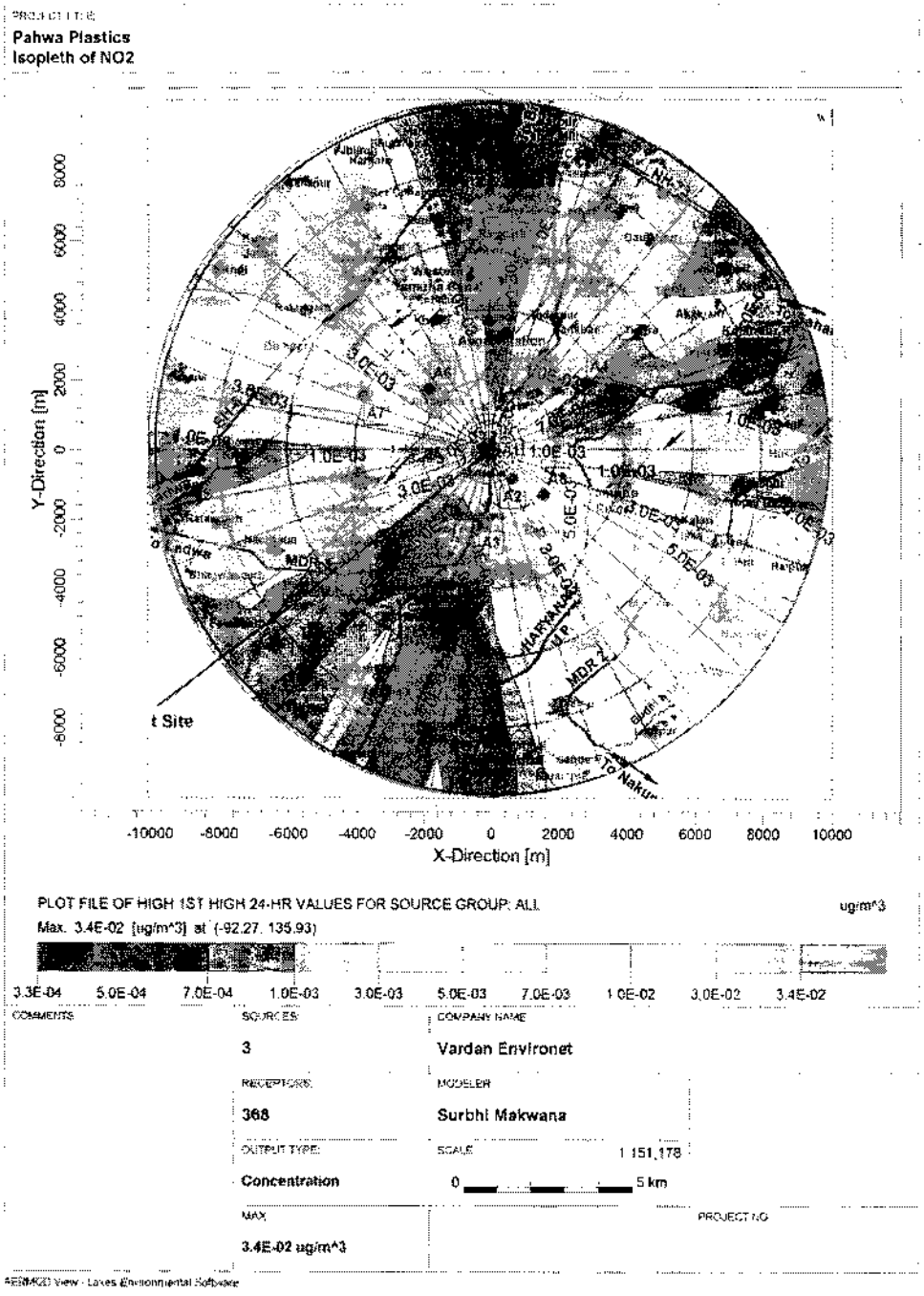


Figure 4.3: Spatial distribution of predicted GLCs of NO2

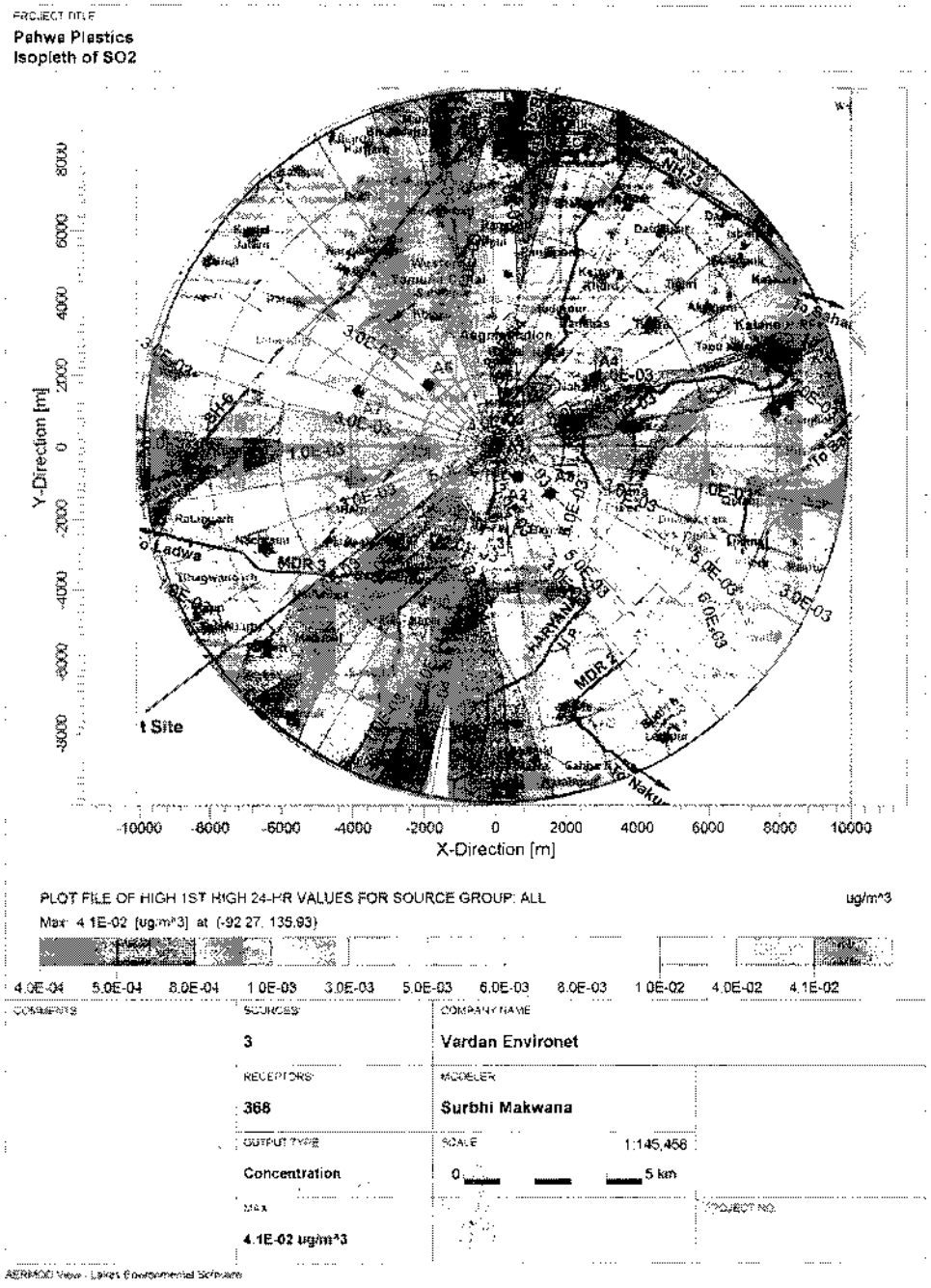


Figure 4.4: Spatial distribution of predicted GLCs of SO2

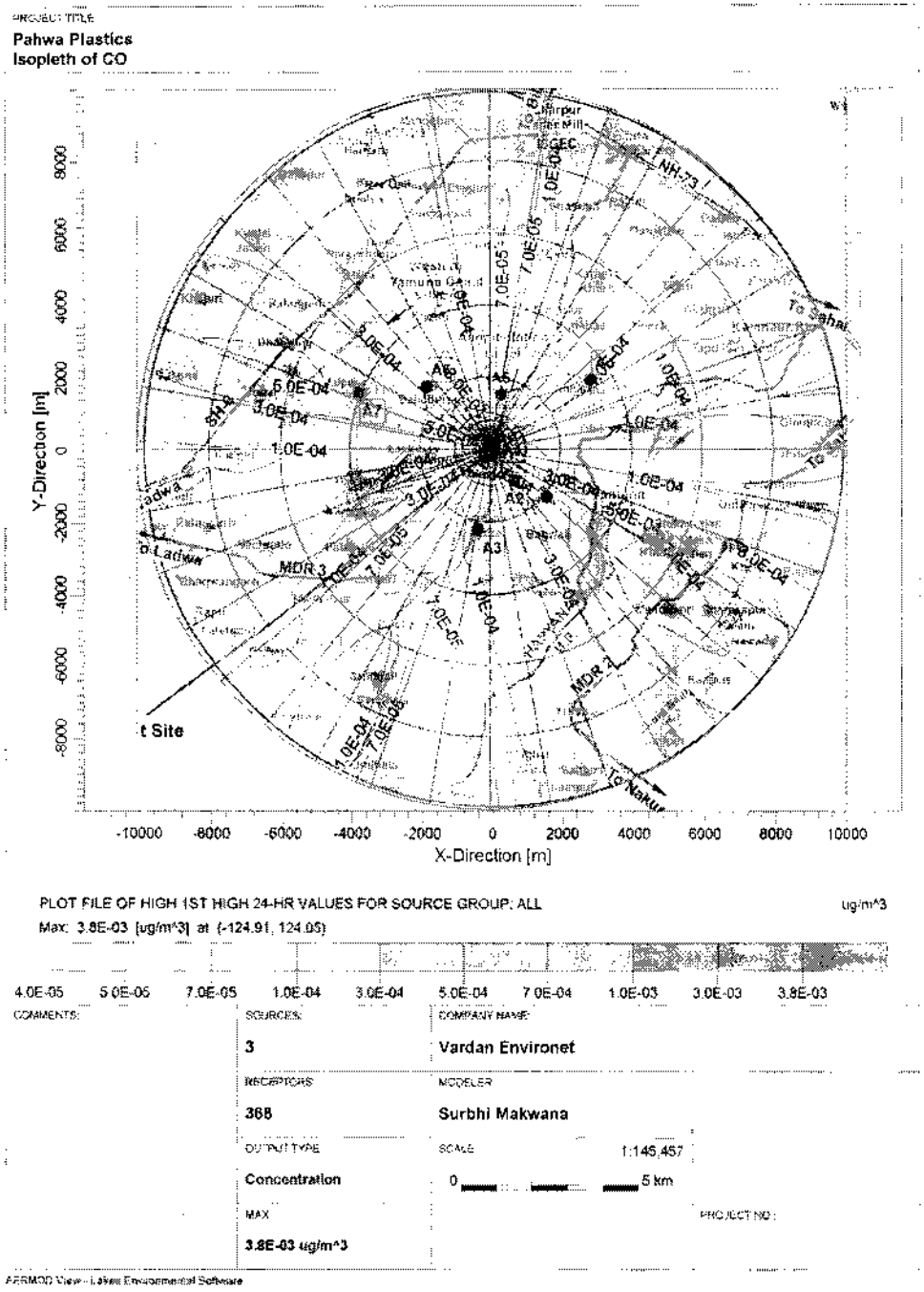


Figure 4.5: Spatial distribution of predicted GLCs of CO

4.5 MITIGATION MEASURES FOR IMPACTS ON ENVIRONMENT DURING OPERATION PHASE

4.5.1 Air Environment

- Main sources of air emission will be from the DG and Boiler.

Mitigation Measures

- Scrubber will be installed for scrubbing the residual Formaldehyde from the main product stream which also controls the odour problem.
- Online Air monitoring system for stack emission (for Particulate Matter) will be installed & transmission of online data to Haryana State Pollution Control Board and CPCB will be done
- Pucca roads within the premises and greenbelt/green cover in 34.78% of total area to arrest the fugitive dust emission.

4.5.2 Water Environment

- Ground water and soil pollution may occur if directly disposed on the land.
- Disposal of untreated wastewater may causes health problems in the community, change in physical and chemical properties of soil and water which ultimately affects organisms present.

Mitigation Measures

- This is a zero liquid discharge plant.
- Treated water from single stage evaporator is being reused in process and utilities.
- Treated water from septic tank will be used for gardening and the same will meet the quality required by local body regulations.

4.5.3 Land Environment

- No major impact on land environment is investigated. Apart from this land may be impacted if untreated waste water, waste oil disposed.drained openly which may contaminate the ground water.

Mitigation Measures

- The plant will implement zero liquid discharge concepts. Therefore, there will not be any negative impact on soil.
- Other hazardous solid wastes will be sent to authorized recycler or vendor.
- It is envisaged that there will not be any major impacts on land environment during the operation phase.

4.5.4 Noise Environment

Ambient noise levels will be increased during operation phase due to machineries and other industrial activities. However, the impacts of noise during this phase will be confined within plant boundary or within the source of generation.

Mitigation Measures

- Vibrating pads & acoustic enclosure will be provided to noise generating equipment to control noise level within norms.
- It can be reduced by providing padding at various locations to avoid rattling due to vibration
- Latest technology and utmost care will be taken at the time of equipment / machinery installation.
- Lubrication of moving/ rotating part or component of machineries will be done on regular basis.
- The insulation provided for prevention of loss of heat and personnel safety gears will also act as noise reducers.
- Design and layout of building to minimize transmission of noise, segregation of particular items of plant.
- The operator's cabins (control rooms) will be properly (acoustically) insulated with special doors with observation windows.
- The operators working in the high-noise areas will be provided with ear-muffs or plugs.
- Acoustic enclosures and silencers will be provided to the Equipment wherever necessary
- Proper green belt will be developed to reduce the noise level.
- Thus, it is envisaged that there will not be any adverse impacts of noise. The greenbelt developed within the premises will have significant beneficial impacts on reduction of noise within the periphery and outside the boundary.

4.5.5 Occupational Health & Safety

- It is envisaged that occupational health hazards shall be associated with operational activities such as spillage and exposure to the chemical, mechanical hazards like cuts and hits and electrical shocks.
- Accident due to fall from height, burn injury and trap in the machine or motors.

Mitigation Measures

- All safety signs will be placed at proper location.
- First aid kits will be made available at every department.

- Pre-employment Medical check-up and periodical medical check-up shall be undertaken to know the occupational health hazards at the early stage.
- Work permit system will be introduced to avoid the entry or un-authorized working to avoid the incidences which can lead to the accident if proper care is not taken.
- All arrangement required for Fire hydrant system shall made at every vulnerable location to have the firefighting facility.
- Apart from above, all required Fire Extinguishers shall be provided at appropriate locations.
- All staff and workers will be trained in firefighting operations and emergency preparedness plan or to tackle the accident.
- Apart from all engineering control measures, if required necessary PPEs shall be provided as last protection measures to the employees.
- Good housekeeping also plays important role in avoiding the undesirable incidences / accidents, hence good housekeeping practices will be employed throughout the Factory premises

4.5.6 Socio Economic Environment

Impacts

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the project in the region that are stated below:

Positive Impacts:

- The project does not involve any displacement of inhabitants and so issues like resettlement and rehabilitation does not figure in the study
- There was a growth in indirect jobs and business opportunities to the local about 15 personnel will be required for the project work and surrounding people will get jobs such as contractors, transporters and raw material suppliers etc. due to the proposed development in the area
- Demands of community services and commercial development also create additional employment for the poor strata of society by way of security guard, driver, maid/servant, sweeper, gardener etc
- Educational facility, approach and internal road network, commercials as well as daily need shops are the major areas to experience positive impact due to the proposed township project
- Improvement is safety, security, banking and fire-fighting facility

- Health facility will also be improved with the development of the project.
- The project envisages bringing various other communities to the area and thereby enabling rapid enhancement of an urban environment.
- The sanitation and the aesthetic environment of the village would also improve with the coming of the project.

Adverse Impacts:

- Due to the proposed project activity, influx of population may increase during the construction phase. This may lead to strain on infrastructure facilities in the area as well as increase in population at local level. However, this impact is only for the short duration and temporary in nature
- The transport of construction materials to the project site will result in increased traffic in the impact area.
- Due to the frequent moving of the trucks at the site during construction the temporary traffic impacts like risks of accidents in the area will increase.
- Proposed development may have a significant impact on the community's ability to accommodate new residents and adapt to changes in the social environment for existing surrounding residents.
- The post project occupants from areas outside the region could introduce a potential effect on the local culture and habits.

Mitigation Measures

- Project proponent should take appropriate steps to keep environment clean and healthy during construction phase
- Provision of adequate drinking water, toilet and bathing facilities should be made available on project site
- Water shall be sprinkle/spread to suppress dust during construction phase to control air pollution and thereby avoid adverse health impact
- Proper living condition with appropriate facilities for residential labours should be provided
- Proper Training and awareness programme should be carried out so that the workers understand the importance of wearing the personal protective equipments.
- Periodic health checkup camps, distribution of medical aid and medicines shall be organized by project authority for villagers, contract laborers, employees and their family
- At the work place, first aid facilities shall be maintained at a readily accessible place with necessary appliances including sterilized cotton wool etc.

- Ambulance facility shall also be provided at the project site during emergency at the time of construction period

4.6 WASTE WATER MANAGEMENT

4.6.1 Domestic Effluent

Domestic wastewater will be treated through septic tank followed by soak pits & sludge from soak pit will be used as manure.

4.6.2 Process Waste

There will be no solid waste generated in the process. Any kitchen solid waste can be binned and disposed. There will be no liquid effluent generated from the process except once in 4 months when the plant is washed after shut down. The waste water will be treated in single stage evaporator and solid waste from evaporator will be sent to TSDF site. It is a ZLD project.

4.7 PROPOSED RAIN WATER HARVESTING

Rainwater harvesting is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to runoff. Rainwater can be collected from surface runoffs or roofs, and in many places the water collected is redirected to a deep pit (well, shaft, or borehole), a reservoir with percolation, or collected from dew or fog with nets or other tools. Depending upon the available contours at detailed engineering stage, the number of drainage outfall and extent of open drains etc. will be designed so as to discharge the water to the rainwater harvesting pond for reuse in dust suppression & greenbelt development. The calculation of rainwater endowment is presented here which shows the total rainwater harvesting potential of the plant area.

4.7.1 Design of Rainwater Recharge Structure

Three most important components, which need to be evaluated for designing a rainwater harvesting structure, are

- Hydrogeology of the area including nature and extent of aquifer, soil cover, topography, depth to water table and quality of ground water.
- Area contributing to runoff i.e., total area and land use pattern, whether industrial, residential or green belts and general built up pattern of the area.
- Hydro meteorological characters viz. rainfall duration, general pattern of intensity of rainfall.

In order to design the recharge structure, hourly intensity of rainfall is considered to be 30 mm/hr has been taken into account and the details are tabulated below.

Based on the Runoff Coefficient the water harvesting potential of a site could be estimated using the formula given below:

Water harvesting potential in m3/year = Annual Rainfall (m) x Area of catchment (m^2) x Runoff coefficient.

Table 4.4: Data Assumed and/or Available for Rain Water Harvesting

S. No.	Details	Values
1	Roof top Area (Plant & Storage area + Administrative offices, canteen, security) (m^2)	500.0
2	Open and Paved Area (Roads+Floor+Parking) (m^2)	1000.0
3	Green Belt Area (m^2)	800.0
4	Average Annual rainfall (mm) for Yamunanagar District & surrounding areas (Source: Indian Metrological Dept.)	1063.0
5	Runoff coefficient for roof top 0.80-0.90	0.85
6	Runoff coefficient for yard & paved area 0.60-0.65	0.65
7	Runoff coefficient for green belt 0.10-0.20	0.15
8	Runoff coefficient for open area 0.10-0.15	0.20

Table 4.5: Water Quantity of Runoff Water

Sr. No.	Details	Calculation (Annual Rainfall (m) x Area (m2) x Run-off coefficient	Total Runoff (Cubic m per Annum)
1	Roof top	1.063x500x0.85	451.78
Total Runoff water quantity/annum (m3/year)			**451.78**
Potential harvested water (considering 20% loss due to evaporation, spillage, etc)			**361.43**

The industry is chemical based therefore recharge inside the plant site can have chances of contamination. As per the CGWA guidelines, only rooftop runoff can store and reuse for domestic purpose. Therefore, the industry has proposed a concrete storage tanks for storing of only rooftop runoff i.e. 361.43 m3/year.

Tank size will be: 12m x 10m x 3.2m = 384 m^3

A typical size of rectangular tank will be proposed having dimensions of about 12m*10m*3.2m (Length*Width*Depth) to store and utilize the water for domestic purpose. General design of rectangular recharge tank is given in **Figure 4.6**.

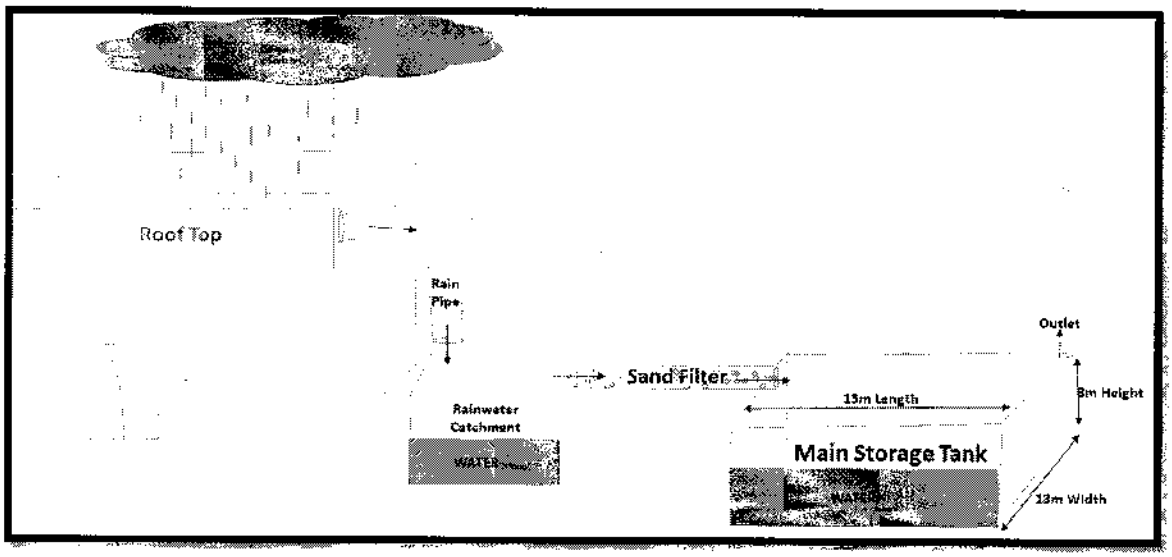


Figure 4.6: Schematic Diagram of Recharge tank

Observation:-

- The industry is chemical based therefore recharge inside the plant site can have chances of contamination therefore, the industry has proposed a storage tanks for storing of approx. 384 cubic meter/year water and use the same for domestic purposes (Flushing).
- A typical size of about (1) one rectangular recharge tank will be proposed having dimensions of about 12*m*10m*3.2m, (Length*Width*Depth) to store and utilize the water for domestic purposes.

CHAPTER 5: ANALYSIS OF ALTERNATIVES

5.1 PREAMBLE

M/s Pahwa Plastics Pvt. Ltd. is seeking Environmental clearance for Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana under violation. The alternative options considered for the existing unit were:

- Environmental Sensitivity
- Technology

5.1.1 Selection of Location

Selection of location in this case is not applicable as the unit is already established.

5.1.2 Environment Sensitivity of the Location

Environment sensitivities present in the study area of 10 km around the project site are given in Chapter 3.0.

- There is no Wildlife Sanctuary/National Park/Bio-sphere Reserve/Habitat of Migratory birds within 10 km radius from the project site.
- There is no Tiger Reserve / Elephant Reserve / Turtle Nesting Ground within 10 km radius from the project site.
- There is no Archeological Monument / Defense installation within 10 km radius from the project site.
- There is no Forest land in the project site

The location is having following advantages

- Proximity to the electricity grid.
- Access to markets.
- Both skilled and unskilled labour is available near the site.
- Good connectivity for transportation of inward and outward materials.

5.1.3 Selection of Technology

The existing technology used by M/s Pahwa Plastics Pvt. Ltd. for manufacturing of Formaldehyde is one of the best and proven technology, hence no alternative technology has been analyzed.

CHAPTER 6: ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

Environmental Monitoring is an essential tool for sustainable development and ensuring most effective implementation and monitoring of Environmental Management Plan and mitigation measures. It is also very essential to keep updating the environmental management system for effective conservation of environment during construction and operation phase. The environment monitoring plan enables environmental management system with early sign of need for additional action and modification of ongoing actions for environment management, improvement and conservation. It provides exact idea for mitigation measures to be implemented as it is linked with actual degradation of environmental quality due to the project activities. Hence, monitoring of critical parameters of environmental quality is very essential in the routine activity schedule of project operation.

An Environmental Monitoring Program will be scheduled for the following major objectives:

- Assessment of the changes in environmental conditions, if any, during the project operation/construction activities.
- Monitoring and tracking the effectiveness of Environment Management Plan and implementation of mitigation measures planned.
- Identification of any significant adverse transformation in environmental condition to plan additional mitigation measures.

6.2 ENVIRONMENTAL MONITORING

It is imperative that proponent should set up regular monitoring locations to assess the environmental health in the post period. A post study monitoring program is important as it provides useful information on the following aspects:

- It helps to verify the predictions on environmental impacts presented in this study.
- It helps to indicate warnings of the development of any alarming environmental situations and thus provide opportunity for adopting appropriate control measures in advance.

The environmental monitoring points will be decided considering the environmental impacts likely to occur due to the operation of proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action for protection of environment. Post study monitoring program including areas, number and location of monitoring stations, frequency of sampling and parameters to be covered has been given in the table below:

Table 6.1: Environmental Monitoring Program

Sr.No	Item	Parameters	Frequency	Methodology
1.	Ambient Air quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, etc.	3-4 Location (Main Gate, Process Area, Near Boilers and DG Sets Half Yearly, 24 Hr. at each location).	IS-5182, CPCB (guidelines for measurement of Ambient Air Pollutants).
2.	Stationary Emission from Stack	PM, SO_2, NO_x	Quarterly (Continuous Stack Monitoring by provided Online Monitoring station.	IS-11255 (guidelines for stack emission)
3.	Process emission	Fugitive gaseous pollutant expected.	Half Yearly	
4.	Surface water and ground water	pH, Temperature, EC, Turbidity, Total Dissolved Solids, Calcium, magnesium, Total hardness, Total Alkalinity, Chlorides, Sulphates, Nitrates, DO, COD, BOD, oil and Grease, Metals expected in effluent.	Half Yearly	Standard limits: Surface- IS:2296 Ground- IS 10500 Sampling Methodology- IS: 3025
5	Liquid Effluent/Waste Water	Physical and chemical parameters with organic content	Once in every week	Sampling Methodology- IS: 3025
6.	Noise	Equivalent noise level- dB (A)	Half Yearly	IS:9989 (Assessment of noise with respect to community response)
7.	Solid/Haz. Waste	As per CPCB/HSPCB Direction	As per CPCB/ HSPCB Direction	As per CPCB/ HSPCB Direction
8.	Greenbelt	Number of plantation (Units), Number of Survived plants/ trees, Number of poor plants/ Trees	Reguler basis	-

9.	Environmental Audit	As per Direction of ISO 14001	Once in a Year	-

6.2.1 Monitoring Methodology

Monitoring of environmental samples will be done as per the guidelines provided by MoEF&CC/ CPCB. The method followed will be recommended / standard method approved / recommended by MoEF&CC /CPCB/SPCB.

6.2.2 Reporting and Documentation

The records of the monitoring program will be kept on regular basis for all aspects of the monitoring. Separate records for water, wastewater, solid wastes, air emission, soil and manure/compost will be prepared and preserved regularly. Immediately upon the completion of monitoring as per the planned schedule, report will be prepared and necessary documents will be forwarded to the concerned authorities. Methodology of monitoring (sampling and analysis) will be prepared as separate documents as SOP (Standard Operating Procedure) wherever required. The records showing results/ outcome of the monitoring programs will be prepared as per the requirement of the schedule mentioned above. Regularly, these documents and records will be reviewed for necessary improvement of the monitoring plan/ mitigation measures/ environmental technologies as well as for necessary actions of environmental management cell.

Table 6.2: Post Project Environmental Monitoring Locations

S.No.	Environmental Components	Monitoring Points/Locations
1.	Ambient Air Quality	Ambient air quality monitoring at 3-4 locations within the plant premises (Main Gate, Process area, Near Boiler, DG Sets etc.)
2.	Water and Waste water	Intake Raw Water Quality
3.	Noise	At all source and outside the Plant area. At least 3 points near/around the plant Boundary.
4.	Greenbelt/Vegetation Cover	Greenbelt area at Boundary and Garden
5.	Solid Waste	As per CPCB/RSPCB Direction in EC Letter and CTO Letter respectively.

6.2.3 Meteorology

Meteorology forms one of the important categories of environment in the area as it directly controls the levels of ambient air quality in the surrounding. As such, a

meteorological station is proposed to be set up inside of plant at the highest point of building/ structure for recording of relevant meteorological parameters. The observatory should have equipment for recording the temperature, relative humidity, rainfall, atmospheric pressure as well as wind speed and wind direction. The parameters are regularly monitored at meterological stations.

6.2.4 Ambient Air Quality

Monitoring of ambient air quality at inside and outside the plant should be carried out on a regular interval to ascertain the levels of harmful pollutants in the atmosphere. Ambient Air quality shall be monitored on quarterly basis for PM10, SOx and NOx. 24 hourly samples of ambient air quality at three locations outside and inside the plant, at least one in dominant wind direction, one in upwind direction shall be taken for PM10, SO2 and NOx quarterly basis at uniform interval at each location.

6.2.5 Surface Water Quality

Water quality constitutes another important area in post study monitoring programme. There are some major streams or perennial sources of surface water in the study area. Contamination of surface water during operation of Plant is possible. Surface water should be generally sampled once in six months and analyzed for physical, chemical and bacteriological parameters, including heavy metals and trace elements throughout the year.

6.2.6 Ground Water Qaulity

Ground water quality is also required to be checked periodically to detect any contamination arising out of operation of plant. Ground water at the bore well should be generally sampled in six months and analyzed for physical, chemical and bacteriological parameters, including heavy metals and trace elements.

6.2.7 Noise Level

Ambient noise should be monitored at inside and outside of the plant covering industrial, commercial residential and sensitive areas seasons for day time and night time Leq.

6.3 BUDGET AND PROCUREMENT SCHEDULE

On regular basis Environment Management Cell will inspect the necessity and availability of the materials, technologies, services and maintenance works. The cell will make appropriate budget for the purpose. Regular record review for any change in financial requirement of environment management will be done and appropriate budget provisions will be made. Along with other budgets, budget for environmental

management will be prepared and revised regularly as per requirement. The budget will include provisions for:

- Environmental Monitoring Program
- Operation and Maintenance of Equipments
- Emergency Purchase of necessary material, equipments, tools, services
- Greenbelt development
- Social and Environmental Welfare and Awareness programs / training (CSR)
- Annual Environmental Audit.

6.4 SUMMARY

The environment monitoring plan enables environmental management system with early sign of need for additional action and modification of ongoing actions for environment management, improvement and conservation. The environmental monitoring points will be decided considering the environmental impacts likely to occur due to the operation of the project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action for protection of environment Monitoring of environmental samples will be done as per the guidelines provided by MoEF&CC/CPCB/SPCB. Separate records for water, wastewater, air emission, soil and manure/ compost will be prepared and preserved regularly. Along with other budgets, budget for environmental management will be prepared and revised regularly as per requirement.

CHAPTER 7: ADDITIONAL STUDIES

7.1 INTRODUCTION TO RISK ASSESSMENT

Chemical industry is associated with potential hazards that effect to the employee and environment. In the event of failure (Leak or Catastrophic rupture) will require the assistance of emergency services to handle it effectively. The operation shall be taken out under the well management and control by the qualified safety manager.

Disaster management plan shall be formulated with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum.

(A)Objectives of Risk Assessment

Industrial accident results in great personal & financial loss. Managing these accidental risks in today's environment is the concern of every industry including chemical, because either real or perceived incidents can quickly jeopardize the financial viability of a business. Many facilities involve various manufacturing processes that have the potential for accidents which may be catastrophic to the plant, work force, and environment or public.

The main objective of the risk assessment study is to propose a comprehensive but simple approach to carry out risk analysis and conducting feasibility studies for industries and planning & management of industrial prototype hazard analysis in Indian context.

(B) Hazard Identification & Risk Assessment (HIRA)

Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that exist in the plant. 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 is 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 production of Formaldehyde plant.

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

On-site

- Exposure to fugitive dust, noise, and other emissions
- Housekeeping practices requiring contact with solid and liquid wastes
- Emission/spillage etc. from storage and handling

Off-site

- Exposure to pollutants released from offsite/ storage/related activities
- Contamination due to accidental releases or normal release in combination with natural hazard
- Deposition of toxic pollutants in vegetation / other sinks and possible sudden releases due to accidental occurrences.

7.1.1 Raw Material Requirement (for production of Formaldehyde):

Raw material required for the manufacturing of Formaldehyde (i.e. Methanol) directly purchased from original importers at Kandla port, Gujarat along with the possibility from other network in Delhi and nearby states.

Table 7.1: Raw Material Requirement

Raw Material	Total Requirement
Methanol	75 TPD

7.1.2 Details of finished products:

Table 7.2 Details of Finished Products

S.No.	Product	Quantity (TPD)	Storage	Physical state
1.	Formaldehyde	150	MS Tank (lined with FRP)	Liquid

7.1.3 List of Hazardous Chemicals alongwith their Toxicity Level as per MSIHC Rules

Table 7.3: List of hazardous chemicals along with their toxicity levels as per MSIHC rules

S.No.	Chemicals	TLV	Toxicity level			Flammable limit					Chemicals Class
			LD50 Oral mg/kg	LD50 Dermal mg/kg	LC50 Mg/l	LEL	UEL	FP°C	BP°C	Class	
1	Formaldehyde CAS No.- 50-00-0	0.1 ppm	100	270	203	6	36.5	50°C	96°C	B	Flammable, toxic, hazardous.
2	Methanol CAS No. 67-56-1	200 ppm	5628	15800	64000 ppm/ 4hr	6	36.5	12°C	64.5°C	A	Highly flammable
3	Silver Catalyst CAS No. 7440-22-4	0.1 mg/m3	N.A	N.A	N.A	N.A	N.A	-38°C	2210°C	-	Acute Toxic

The Toxicity level of hazardous chemicals as per Manufacture, storage and import of Hazardous Chemical (Amendment) Rules, 2000 (MSIHC) is shown as below:

Table 7.4: Toxicity index as per MISHC rules 2000

S.No	Toxicity	Oral Toxicity LD 50(mg/kg)	Dermal Toxicity LD50 (mg/kg)	Inhalation Toxicity LD 50(mg/kg)
1.	Extremely	<5	<40	<0.5
2.	Highly	>5-50	>40-200	>0.5-2.0
3.	Toxic	>50-200	>200-1000	>2.0-10

7.2 HAZARD IDENTIFICATION AND PREVENTIVE MEASURES

Man made disaster at Formaldehyde plant may occur due to following hazards:

- Fire in Electric Panels & fuel storage area
- Fire in Methanol and Formaldehyde storage area
- Run away reaction
- Explosion in Boiler house
- Cleaning of barrels, which have held chemical substances
- Fall of material

The potential hazardous areas and the likely accidents with the concerned area have been enlisted below Table No 7.5.

Table 7.5: Possible Hazardous Locations Onsite

S. No.	Hazardous Area	Likely Accident
1.	Boiler Area	Fire
2.	Methanol and Formaldehyde storage area	Fire & toxic exposure
3.	Electrical rooms	Fire and electrocution
4.	Cable tunnel	Fire and electrocution
5.	Fuel storage area	Fire hazard
6.	Chimney	Air pollution

A) Fire

Fire can be observed in the boiler area, storage yard, Fuel spillage, Electrical rooms etc. due to accidental failure scenario.

Table 7.6 : List of Damages Envisaged at Various Heat Loads

S.No.	Heat loads (kW/m^2)	Likely Accident	
		Damage to Equipment	Damage to People
1.	37.5	Damage to process equipment	100% lethality in 1 min. 1%

			lethality in 10 sec
2.	25.0	Minimum energy required to ignite wood	50% Lethality in 1 min. Significant injury in 10 sec
3.	19.0	Maximum thermal radiation intensity allowed on thermally unprotected equipment	--
4.	12.5	Minimum energy required to melt plastic tubing	1% lethality in 1 min
5.	4.0	--	First degree burns, causes pain for exposure longer than 10 sec
6.	1.6	--	Causes no discomfort on long exposures

Source: World Bank (1988). Technical Report No. 55: Techniques for Assessing Industrial Hazards. , Washington, D.C: The World Bank.

Table 7.7: List of Damages Envisaged at Various Overpressure Level

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

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 Loaded trains boxcars completely demolished
0.612	Probable total destruction of buildings; heavy machines tools (7,000 lb) moved and badly damaged, very heavy machines tools (12,000 lb) survived.

(CCPS guidelines)

C) Electrocution

Fatal Accident due to carelessness in handling electrical appliances may lead to electrocution.

D) 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 h 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, neoplastigenic or teratogenic effect in humans or animals.
- Emergency Response Planning Guidelines 1 (ERPG1): 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.

F) Meteorology/Stability Class

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".

Dispersion of vapors largely depends upon the Stability Class. Various stability classes that are defined as Pasquill classes are:

- A Very Unstable
- B Unstable
- C Slightly Unstable
- D Neutral
- E Stable
- F Very Stable

The stability class for a particular location is generally dependent upon:

- Time of the Day (Day or Night)
- Cloud Cover
- Season
- Wind Speed

Six stability classes from A to F are defined while wind speed can take any one of numerous values. It may thus appear that a large number of outcome cases can be formulated by considering each one of very many resulting stability class-wind speed combinations. However in fact the number of stability class - wind speed combinations that needs to be considered for formulating outcome cases in any analysis is very limited. This is because, in nature, only certain combinations of stability class and wind speed occur. Thus, for instance combinations such as A-3 m/s or B-5 m/s or F-4 m/s do not occur in nature. As a result only one or two stability class - wind speed combinations need to be considered to ensure reasonable completeness of Quantitative Risk Analysis study. Furthermore, though wind speeds less than 1 m/s may occur in practice, none of the available dispersion models, including state-of-art ones, can handle wind speeds below 1 m/s. Fortunately, wind speed does not influence consequences as much as stability class and for a given stability class, the influence of wind speed is relatively less. On the other hand, consequences vary considerably with stability class for the same speed.

Except during the monsoon months little or no cloud cover along with the prevailing low wind velocities results in unstable conditions during the day (C or D) and highly stable conditions (E or F) at night. During the three months of monsoons, the wind velocities are generally higher and cloud cover generally present. This results in stability class of D during the day and E or F during the night. The stability class distribution over the year roughly works out as below:

A - B - C	17%
D	50%
E or F	33%

The following wind velocity/ stability class combinations & frequencies are used for Quantified Risk Analysis.

D – 5 m/s
D – 3 m/s
F – 2 m/s

Hazard Identification is a critical step in Risk Analysis. Many aids are available, including experience, engineering codes, checklists, detailed process knowledge, equipment failure experience, hazard index techniques, What-if Analysis, Hazard and Operability (HAZOP) Studies, Failure Mode and Effects Analysis (FMEA), and Preliminary Hazard Analysis (PHA). In this phase all potential incidents are identified and tabulated. Site visit and study of operations and documents like drawings, process write- up etc. are used for hazard identification. In the present case, the release of hazardous chemicals (as per MSIHC rules) like formaldehyde and methanol can lead to undesirable consequences like toxic exposure/fire/explosion.

7.3 PROPOSED MITIGATION MEASURES

(A) Preventive Measures for Electricity Hazard

- All electrical equipment's is to be provided with proper earthing. Earthed electrode are periodically tested and maintained
- Emergency lighting is to be available at all critical locations including the operator's room to carry out safe shut down of the plant
- Easy accessibility of fire fighting facilities such as fire water pumps and fire alarm stations is considered
- All electrical equipment's are to be free from carbon dust, oil deposits, and grease
- Use of approved insulated tools, rubber mats, shockproof gloves and boots, tester, fuse tongs, discharge rod, safety belt, hand lamp, wooden or insulated ladder and not wearing metal ring and chain.
- Flame and shock detectors and central fire announcement system for fire safety are to be provided.
- Temperature sensitive alarm and protective relays to make alert and disconnect equipment before overheating is to be considered

- Danger from excess current due to overload or short circuit is to be prevented by providing fuses, circuit breakers, thermal protection

(B) Precautionary Measures for Falling material

- Safety helmets to be used to protect workers below against falling Material
- Barriers like a toe boards or mesh guards is to be provided to prevent items from slipping or being knocked off the edge of a structure
- An exclusion zone is to be created beneath areas where work is taking place.
- Danger areas are to be clearly marked with suitable safety signs indicating that access is restricted to essential personnel wearing hard hats while the work is in progress.

7.3.1 Material Handling Hazards and Controls:

S.No.	Name of material stored	Quantity (max.)	Operating press/temp	Hazard rating systems	Type of hazard or risks involved	Persons affected
1	Formaldehyde	1x150 KL and 3x50 KL	NTP	TLV-0.3 Ppm (1ppm) NFPA ratings: Health-3 Flammability -2 Reactivity-0 Flash point-50°C	-Flammable -Very toxic by inhalation -Very toxic in contact with skin -Very toxic if swallowed -Causes burns -Limited evidence of carcinogenic effect -Risk of serious damage to eyes -May cause sensitization by skin	-Operators -Maintenance -Technicians
	Control measures: - Dyke provision to storage tank. - Safety board's displayed in the tank area. - Good ventilation must be provided.					

S.No.	Name of material stored	Quantity (max.)	Operating press/temp	Hazard rating systems	Type of hazard or risks involved	Persons affected
	- Use of proper PPES (like SCBA), full body protection suite					
2	Methanol	6x75 KL	NTP	TLV-200 PPM(8 hr TWA) STEL-250 PPM NFPA Ratings: Health-1 Flammability -3	-Highly flammable -Toxic by inhalation -Toxic when contact with skin -Toxic if swallowed -Danger of very serious irreversible effects	-Operators -Maintenance -Technicians
	Control measures: -Keep away from sources of ignition -Safety board's displayed in the tank area. -Effective ventilation must be provided. -For accidental contact if you feel unwell, seek medical advice immediately -Handling of methanol with safety gloves and protective clothing. -Use of proper PPES (like SCBA), full body protection suite					

7.3.2 Process Hazards and Controls:

Table 7.8: Process Hazards and Controls

Name of hazardous process and operation	Material in process /operation	Type of hazard possible toxic gas release/ fire / explosion / run away reaction/ rupture, etc.	Control measures provided

Reactor Vessel	Formaldehyde	-Exothermic run away reaction -Release of heat and flammable gases -Fire, toxic gas release and explosion	-Raw materials quantity must be controlled either volumetrically or gravimetrically -Process control devices must be installed includes the use of sensors, alarms, trips and other control systems that either take automatic action or allow for manual intervention to prevent the conditions for uncontrolled reaction occurring. -High temperature indicator valve and alarm system must be provided -Auto cutoff system must be provided after reaching of predetermined maximum safe temperature. -Pressure gauge must be provided -Safety control valve must be provided. The vessel emergency relief vent should be discharged to suitably designed catch pot or should be so positioned that people working in the area and members of the public will not be in danger if the contents of the vessel are discharged. -Use skilled worker -Proper selection of

			MOC -Mechanical seal in all pumps and reactors

7.3.3 Safe Practice for Handling, Storage, Transportation and Unloading of Hazardous Chemicals:

For Storage/Handling:

- Separate from strong oxidant & keep it in well ventilated room.
- Dyke wall shall be provided to all above ground storage tank.
- Fire hydrant system shall be installed.
- Safety shower and eye washer shall be installed near storage area.
- Flame proof light fitting shall be provided at flammable storage area.
- Sprinkler system shall be installed at flammable material storage area
- Earthing/bonding shall be provided for static charges.
- Level gauge and level measurement instrument shall be provided on material storage tank.
- Hazardous material should be stored separately at the plant and safe distance shall be maintained.
- Safety permit system shall be followed for loading, unloading of hazardous chemical.
- Fencing, caution note, hazardous identification board should be provided.
- Only authorized person shall be permitted in storage tank area and register will be maintained.

For Transportation & Unloading:

- Raw material shall be received by road tanker and stored in under ground storage tank in separated bulk storage area.
- Loading and unloading procedure shall be prepared for material received through road tanker.
- Earthing/bonding shall be provided for static charges.
- Flexible steel hose shall be used for unloading from the road tanker.
- Flame proof electric motor shall be used during loading/unloading.
- Fixed pipeline with pumps shall be provided for transfer to vessel.
- TERM CARD will be provided to all transporters and shall be trained for transportation of hazardous chemicals.

- Personal Protective Equipment (safety goggles, hand gloves, apron, masks, gum boots etc.) shall be provided.

7.4 OCCUPATIONAL HEALTH SURVEILLANCE PROGRAMME

Health surveillance is the monitoring of a person's health to identify changes in health status due to occupational exposure to a hazardous substance. It includes biological monitoring. Ideally, the avoidance of work-related diseases should be achieved by the prevention or controlling exposures to hazardous substances in the workplace. Where a process cannot be designed or maintained to eliminate the risk of exposure, it may be necessary for workers to undergo health surveillance.

7.4.1 Aims of health surveillance:

i) Identify those at increased risk

Health surveillance is used to identify workers who have an increased risk of developing an occupational disease. For example, people who have existing skin problems, kidney, liver and eye disorders, heart problem; additionally smokers and pregnant women are at increased risk of being severely affected if exposed to Methanol/Formaldehyde.

ii) Early detection

The major purpose of health surveillance is to detect adverse health effects at an early stage so that the worker may be protected from further injury, either by control of the process or by removal from exposure.

iii) Evaluating effectiveness of control measures

Health surveillance is not a control measure in itself and should not be the sole means of determining whether control measures are effective. However, it can provide useful information on the effectiveness of safe working practices.

iv) Epidemiology and disease

Health surveillance can be used to evaluate the health experiences of groups of workers exposed to specific hazardous agents or working within a particular industry.

Workers should be made aware that health surveillance is sometimes necessary to ensure their ongoing health. Health surveillance is often used in addition to workplace monitoring. Workplace monitoring will only indicate the potential for exposure of

workers to a hazardous substance. It can never be an indication of the actual amount of substance absorbed or the effect on the body of absorbing the hazardous substance.

When a toxic substance (such as an industrial chemical) is present in the environment, it contaminates air, water, food, or surfaces in contact with the skin: environmental monitoring evaluates the amount of toxic agent in these media.

As a result of absorption, distribution, metabolism, and excretion, a certain internal dose of the toxic agent (the net amount of a pollutant absorbed in or passed through the organism over a specific time interval) is effectively delivered to the body and becomes detectable in body fluids.

Subsequent interaction with a receptor in the critical organ (the organ which, under specific conditions of exposure, exhibits the first or the most important adverse effect) leads to biochemical and cellular events. Both the internal dose and the elicited biochemical and cellular effects may be measured through biological monitoring.

7.4.2 Occupational Health Programme

- The health & physical hazards caused due to toxic, irritant, corrosive, flammable materials. All chemicals should be within Threshold Limit Value as per ACGIH.
- Monitoring of occupational hazards like noise, ventilation, chemical exposure etc. will be carried out regularly and its record will be maintained.
- Good housekeeping, use of PPE, Engineering controls, Enclosure processes, scrubber system, display of safety boards, SOP of loading / unloading, local exhaust ventilation, safety shower etc. are important safety measures have taken to keep these chemicals within TLV.
- Appropriate personal protective equipment will be provided & ensure the usage of them.
- Workers will be trained on safe material handling of hazardous chemicals.
- Prepare & display the safe operating procedure for hazardous chemicals storage, handling & transporting or using.
- Periodical medical examination of the workers & Liver Function Testes will be done.
- Employee training and education will be carried out.
- Control the noise at source by substitution, isolation, segregation, barriers etc.
- Local Exhaust ventilation and scrubber should be installed where it is required to reduce fumes, vapors, temperature and heat stress.
- Insulate all hot equipment to reduce air temperature.

- Reduce the level of physical activity by sharing workload with other or by using mechanical mean.

7.4.3 Minimization of the Manual Handling of Hazardous Substance

- Whether moving materials manually or mechanically, your employees should know and understand the potential hazards associated with the task at hand and how to control. Their workplaces to minimize the danger.
- Employers and employees should examine their workplaces to detect any unsafe or unhealthful conditions, practices, or equipment and take corrective action.
- Provide flameproof electrical motor & transfer chemicals through the pipelines.
- Use specially designed pallets to hold, move raw materials, finished products through work areas.
- Minimize lifting of raw materials, heavy loads by using appropriate platforms, trolleys etc.
- Avoid the moving, manual handling of hazardous material.

7.5 DO'S AND DONTS'

7.5.1 Handling of Chemicals

Do's	Don'ts
• Know the hazards of the chemical before handling. • Know the antidotes for chemical, which is to be handled. • Do keep material safety data sheet in locations where chemicals are being handled and study it. • Use appropriate personal protective equipment like gloves, aprons, and respirator; face shield etc. depending upon nature of the work. • Label every chemical that you use and tightly close the container. • Use eye wash fountain / safety shower in case of splash of chemicals in the eye or body for at least 15 minutes. • Segregate toxic, flammable	• Do not store the chemicals that are incompatible with other chemicals. • Do not spill the chemicals. • Do not dispose chemical without neutralizing. • Do not keep large inventory of chemicals. • Do not allow empty containers of hazardous chemicals to be used by others. • Do not use compressed air for transferring chemicals. • Do not stand near chemical transfer pump while it is in operation with temporary hose connection. • Pouring of chemicals by hand or doing siphoning by mouth should never be adopted. • Chemicals drums should never be moved without

chemicals and keep them under control. • In addition to draining and closing valves, lines should be blanked before taking up maintenance work. • Provide proper ventilation at the chemical handling area to limit their concentration within prescribed level.	protection. • Do not attempt to neutralize the acid /alkali on the skin. Use water only. • Do not use solvent for cleaning hands.

7.5.2 Material Handling

Do's	Don'ts
• Use proper lifting tool and tackle having adequate capacity. • Only authorized persons should operate material handling equipment's. • Each tool, tackle or equipment should have number and safe working load (SWL) marked on it. • Assess weight of the material, distance to be carried and hazards etc. before lifting the load. • Inspect and test all the lifting tools and tackles regularly as per Factory Rules. • Wear Personal Protective Equipments while handling of material.	• Do not use the equipment for the purpose other than its design intention. • Do not allow personnel to move underneath lifted load. • Do not load the equipment above its safe working load. • Does not use make shift arrangements for lifting equipment without inspection and test. • Do not use effective tool and tackles. • Keep the tools & tackles free from adverse effect of atmosphere by applying suitable protective coating.

7.5.3 House Keeping

Do's	Don'ts
• Assign places for everything and maintain things at assigned places. • Clean the area after completion	• Do not leave combustible materials in the work area. • Do not smoke in the area of work.

of work. • Use aisle space free for personnel and material movement. • Ensure adequate illumination and ventilation for the job.	• Do not allow dust bin to overflow. • Do not generate extra waste. • Do not disturb the safety equipment from assigned location. • Do not block emergency switches and on/off.

7.5.4 Fire Prevention

Do's	Don'ts
• Follow 'NO SMOKING' sign. • Deposit oily rags and waste combustible material in the identified containers and dispose them suitably. • Fire Hose used for any other purpose should be permanently marked and taken out of fire hydrant system. • Keep minimum inventory of flammable and combustible substances. • Take permission before breaking or removal of fire barrier and ensure subsequent relocation of fire barrier. • Check periodically the operability of fixed fire fighting system. • Attend any abnormality/deficiency with fire protection system promptly. • Provide earthling or bonding to prevent accumulation of static charges to tanks where flammable chemicals are stored / handled. • Use instruments that are intrinsically safe in explosive atmosphere.	• Do not leave flammable material like acetone, kerosene etc. used as cleaning agent at the work area. • Do not over tighten fire hydrant valves with F-lever. • Do not allow wild grass growth around storage of the gas cylinders and switchyard. • Do not obstruct accessibility to the fire related equipment. • Do not destroy the inspection tag provided with the fire equipment. • Do not misuse fire-fighting equipment other than intended purpose. • Do not store the flammable material in the open container. • Do not use instruments that are not intrinsically safe in the explosive atmosphere.

7.6 RISK REDUCTION MEASUREMENT & RECOMMENDATION IN VIEW OF SAFETY CONSIDERATION

- In order to ensure the safety of the installation, the facility should be constructed as per relevant codes and standards.
- As per consequence analysis, the damage distance may go outside the plant boundary as it involves the involvement as hazardous chemical like formaldehyde. So care to be taken to prevent the leakage of such chemical by proper designing, preventing corrosion, proper periodic inspection and maintenance of all instruments/ equipments.
- Storage tank of Formaldehyde and Methanol should be installed separately at the plant area.
- Wind indicator should be provided at the highest level of the plant to know the wind direction.
- Automatic sprinkler system for the flammable material tanks (over ground tanks only) may be provided as knock on effect in case of fire is possible.
- Containment dyes with proper sloping and collection sumps should be provided so that any spillages in the bulk storage and other handling areas shall not stagnate and shall be quickly lead away to a safe distance from the source of leakage. This reduces the risk of any major fire on the bulk storages and the risk to the environment shall be minimized/ eliminated.
- Inspection of the storage tanks as per prefixed inspection schedule for thickness measurement, joint and weld efficiency etc.
- Provision of flameproof electrical fittings / equipment's.
- Proper maintenance of earth pits.
- Strict compliance of security procedures like issue of identity badges for outsiders, gate passes system for vehicles, checking of spark arrestors fitted to the tank lorries etc.
- Strict enforcement of no smoking.
- Periodic training and refresher courses to train the staff in safety fire fighting.
- Employee training and education will be carried out.
- Structural fireproofing in the process area could be considered as a safety measure in the light of probable spill and fires in the area.
- Emergency drills should be carried out periodically to ensure preparedness must continue.

- Many operations involve use of highly toxic/flammable materials and these needs to be documented as SOPs. These must be made and kept updated on priority.
- Extensive training on use of Self Contained Breathing apparatus (SCBAs) must be ensured for emergency control.
- Loose drums of waste materials must be removed from the working areas and close watch kept.
- Proper Earthing system needs to be provided at appropriate locations for example while loading/unlading of methanol from Tanker.
- All electrical equipment needs to place as per HAC.
- Ventilation should be provided for any enclosed are where hydrocarbon or toxic vapors may accumulate. Several such areas were noticed- these may be surveyed and tackled accordingly.
- All personnel should be trained in handling emergency situations and should be appraised of their role in handling emergency situation and to ensure adequacy of the emergency procedures simulated exercise should be carried out.
- Flame arrestor should be provided.
- Adequate number of caution boards highlighting the hazards of chemicals should be provided at critical locations.
- The health & physical hazards caused due to toxic, irritant, corrosive, flammable materials. All chemicals are within Threshold Limit Value as per ACGIH.
- Monitoring of occupational hazards like noise, ventilation, chemical exposure etc. will be carried out regularly and its record will be maintained.
- Good housekeeping, use of PPE, Engineering controls, Enclosure processes, scrubber system, display of safety boards, SOP of loading / unloading, local exhaust ventilation, safety shower etc. are important safety measures have taken to keep these chemicals within TLV.
- Appropriate personal protective equipment will be provided & ensure the usage of them.
- Workers will be trained on safe material handling of hazardous chemicals.
- Prepare & display the safe operating procedure for hazardous chemicals storage, handling & transporting or using.
- Local Exhaust ventilation and scrubber should be installed where it is required to reduce fumes, vapors, temperature and heat stress.
- Reduce the level of physical activity by sharing workload with other or by using mechanical means.

- Pre-employment medical checkup and periodically medical examination will be done.
- Proper inspection and maintenance of all instruments like PSVs, temperature indicator etc to avoid bolier/furnace box explosion
- Use alcohol foam, water spray or fog in case of large fire.
- Use dry chemical powder for small fire.

Following Fire Safety Devices/ Provision will be provided to protect from any incidents:

- Water storage of adequate capacity to meet the requirements of water for firefighting purposes.
- Fire hydrants and automatic sprinkler system. Diesel driven pumps and headers to supply water to fire hydrant network.
- Adequate Portable fire extinguishers, sand bucket, wheeled fire & safety equipment should be provided at the required places.
- Equipment required for personal safety like blankets, gloves, apron, gum boots, face mask helmets, safety belts, first aid boxes etc. are provided. Proximity suits and self- contained breathing apparatus to be provided.
- Designated fire fighting team should be present to handle the emergency.

7.7 DISASTER MANAGEMENT PLAN

7.7.1 Definition

A major emergency in an activity/project is one which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the activity/project. It would normally require the assistance of emergency services to handle it effectively.

7.7.2 Scope

An important element of mitigation is emergency planning, i.e. identifying accident possibility, assessing the consequences of such accidents and deciding on the emergency procedures, both on site and off site that would need to be implemented in the event of an emergency.

7.7.3 Objective

The overall objectives of the emergency plan will be:

- To localize the emergency and, eliminate it; and
- To minimize the effects of the accident on people and property.

Elimination will require prompt action by operations and works emergency staff using, for example, fire-fighting equipment, water sprays etc.

Minimizing the effects may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby.

7.7.4 Phases of Disaster

There are various phases of Disaster including pre and post Management of Hazardous Event that may or has occurred.

Warning Phase

Emergencies /disasters are generally preceded by warnings during which preventive measures may be initiated. For example uncontrollable build-up of pressure in process equipment, weather forecast give warning about formation of vapor cloud, equipment failure etc.

Period of Impact Phase

This is the phase when emergency /disaster actually strike and preventive measures may hardly be taken. However, control measures to minimize the effects may be taken through a well-planned and ready-to-act disaster management plan already prepared by organization. The duration may be from seconds to days.

Rescue Phase

This is the phase when impact is almost over and efforts are concentrated on rescue and relief measures.

Relief Phase

In this phase, apart from organization and relief measures internally, depending on severity of the disaster, external help are also to be summoned to provide relief measures (like evacuations to a safe place and providing medical help, food clothing etc.). This phase will continue till normalcy is restored.

Rehabilitation Phase

This is the final and longest phase. During which measures required to put the situation back to normal as far as possible are taken. Checking the systems, estimating the damages, repair of equipment and putting them again into service are taken up. Help from revenue/insurance authorities need to be obtained to assess the damage, quantum of compensation to be paid etc.

7.8 ONSITE EMERGENCY PLAN

The onsite emergency is an unpleasant situation that causes extensive damage to plant personnel and surrounding area and its environment due to in operation, maintenance, design and human error. Following points are to be taken into consideration:

- To identify, assess, foresee and work out various kinds of possible hazards, their places, potential and damaging capacity and area in case of above happenings.
- Review, revise, redesign, replace or reconstruct the process, plant, vessels and control measures if so assessed.
- Measures to protect persons and property of processing equipments in case of all kinds of accidents, emergencies and disasters.
- To inform people and surroundings about emergency if it is likely to adversely affect them.

7.8.1 Disaster control Management system

Disaster Management group plays an important role in combating emergency in a systematic manner. Schematic representation Emergency Control Management system for M/s G.B.Overseas Pvt. Ltd. is shown in **Figure 7.1.**

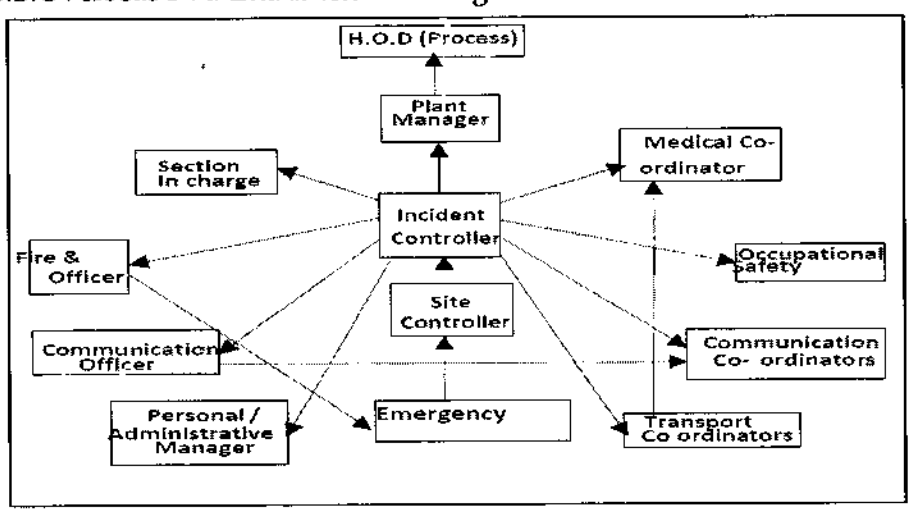


Figure 7.1: Onsite DMP - Disaster Control / Management System

7.8.2 Control Room Facility

Following are the facilities to be provided at the control room of M/s Pahwa Plastics Pvt. Ltd. to tackle the emergency failure scenarios:

- Fire Detection System is to be installed in the control room
- VHF base station with a range of 25 km and VHF handsets of range 5 km is to be installed for ready communication in emergency
- Public address System (PAS) is to be installed to ease the communication to various corners of the site
- The duties and responsibilities of different Co-ordinators of Onsite Disaster Management Plan are to be displayed in the Control Room.

7.8.3 Alarm System

A siren shall be provided under the control of Security office in the plant premises to give warning. In case of emergencies this will be used on the instructions to shift in charge that is positioned round the clock. The warning signal for emergency shall be as follows:

- Emergency Siren: Waxing and waning sound for 3 minutes.
- All clear signal: Continuous siren for one minute.

7.8.4 Communication

Walkies & Talkies shall be located at strategic locations; internal telephone system EPBX with external P&T telephones would be provided.

7.8.5 Fire Fighting System

The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The fire detection and protection system has been planned to meet the above objective an all-statutory and insurance requirement of Tariff Advisory Committee (TAC) of India. The complete fire protection system will comprise of the following.

A designated fire fighting team would be available in the facility to handle the fire emergency.

System Description of Fire Fighting System

The entire fire safety installation shall be compliant with the most stringent codes / standard for the entire complex to ensure the highest safety standard and uniformity of system. Further, before property is operational, the fire protection shall be fully operated and tested under simulated conditions to demonstrate compliance with the most stringent standards, codes and guidelines.

A) Fire pumping system

The fire pumping system shall comprise of independent electrical pumps for hydrant and sprinkler system, diesel engine driven pump & jockey pump for hydrant & sprinkler system.

Electrical pump shall provide adequate flow for catering requirement of hydrant system. Diesel engine driven fire pumps shall be provided for ensuring operation & performance of the system in case of total electrical power failure. Jockey pumps shall compensate for pressure drop and line leakage in the hydrant and sprinkler installation. Provision of PRS/ orifice plate shall be made in sprinkler riser to restrict pressure on sprinkler system.

Individual suction lines shall be drawn from the fire reserve tanks at the basement level and connected to independent fire suction header. The electric fire pumps, diesel engine driven fire pumps and the jockey pumps shall all draw from this suction header.

Delivery lines from various pumps shall also be connected to a common header in order to ensure that maximum standby capacity is available. The sprinkler pump shall be isolated from the main discharge header by a non return valve so that the hydrant pump can also act as standby for the sprinkler system. The ring main shall remain pressurized at all times and Jockey pumps shall make up minor line losses. Automation required to make the system fully functional shall be provided.

B) Fire hydrant system

Internal and external standpipe fire hydrant system shall be provided with landing valve, hose reel, first aid hose reels, complete with instantaneous pattern short gunmetal pipe in the Complex.

The internal diameter of inlet connection shall be at least 80 mm. The outlet shall be of instant spring lock type gunmetal ferrule coupling of 63 mm dia. for connecting to hose pipe. Provision of flow switch on riser shall be made for effective zone monitoring. The flow switch shall be wired to FAP and shall indicate water flow on hydrant of the identified zone.

Recessed cupboard/ fire hydrant cabinet shall be strategically located for firefighting requirement. Location of cabinets shall be accessed as per compartmentation plan in consultation with the Architect. Provision of fire man's axe shall be made for internal hydrant.

External hydrant shall be located within 2 m to 15 m from the building to be protected such that they are accessible and may not be damaged by vehicle movement. A spacing of about 45-50 m between hydrants for the building shall be adopted. Details of fire hydrant system are as follows:

Piping: Mild Steel pipes (heavy class) as per IS: 1239 shall be provided throughout the complex. Pipes buried below ground shall be suitably lagged with 2 layers of 400 micron polyethelene sheet over 2 coats of bitumen.

External Hydrants: External hydrants shall be provided all around the Complex. The hydrants shall be controlled by a cast iron sluice valve or butterfly valve. Hydrants shall have instantaneous type 63mm dia outlets.

For each external fire hydrant two numbers of 63mm dia. 15 m long controlled percolation hose pipe with gunmetal male and female instantaneous type couplings machine wound with GI wire, gunmetal branch pipe with nozzle shall be provided.

- Each external hydrant hose cabinet shall be provided with a drain in the bottom plate.
- Each hose cabinet shall be conspicuously painted with the letters "FIRE HOSE".

Hose Reel: Hose reel shall be heavy duty, 20 mm dia, length shall be 36.5 metre long fitted with gun metal chromium plated nozzle, mild steel pressed reel drum which can swing upto 170 degree with wall brackets of cast iron finished with red and black enamel complete.

C) Sprinkler system

Elaborate automatic sprinkler system shall be provided. The system shall be suitably zoned for its optimum functional performance.

The sprinkler system shall be provided with control valves, flow and tamper switches at suitable location and shall be connected to control module of the fire alarm system for its monitoring and annunciation in case of activation.

Sprinkler type along with its Quartzite bulbs rating shall be selected based on the requirement of the space and shall be specified accordingly. Inspector's test valve assembly with sight glass shall be provided at remote end with discharge piped to drain outlet / pipe.

D) Fire Extinguishers

Portable fire extinguishers of water (gas pressure), Carbon-di-oxide, foam type, Dry Chemical Powder and FM-200 or Clean agent type shall be provided as first aid fire extinguishing appliances. These extinguishers shall be suitably installed in the entire areas as per IS: 2190.

The appliances shall be so installed over the entire sections, that a person is not required to travel more than 15 m to reach the nearest extinguisher. These shall be placed or hanged on wall in a group on several suitable places.

E) Fire Pump

The fire pump shall be horizontally mounted, variable speed type. It shall have a capacity to deliver and developing adequate head so as to ensure a minimum pressure at the highest and the farthest outlet. The pump shall be capable of giving a discharge of not less than 150 per cent of the rated discharge, at a head of not less than 65 per cent of the rated head. The shut off head shall be within 120 per cent of the rated head.

The pump casing shall be of cast iron and parts like impeller, shaft sleeve, wearing ring etc. shall be of non-corrosive metal like bronze/brass/gun metal. The shaft shall be of stainless steel. Provision of mechanical seal shall also be made.

Bearings of the pump shall be effectively sealed to prevent loss of lubricant or entry of dust or water. The pump shall be provided with a plate indicating the suction lift, delivery head, discharge, speed and number of stages. The pump casing shall be designed to withstand 1.5 times the working pressure.

F) Foam System for Fire Fighting

Aqueous Film-Forming Foams (AFFF) based on combinations of fluoro-chemical surfactants, hydrocarbon surfactants, and solvents will be used as foam agent. These agents require a very low energy input to produce high quality fire-fighting foam.

Foam concentrate will be stored in a bladder tank system. In AFFF systems a bladder tank containing a nylon reinforced elastomeric bladder is used to store the foam concentrate. System water pressure is used to squeeze the bladder providing firefighting foam concentrate, at the same pressure, to the proportional.

An aqueous film will be formed on the surface of the alcohol by the foam solution as it drains from the foam blanket.

This film is very fluid and floats on the surface of most alcohol. This gives the AFFF unequaled speed in fire control and control the spill fire.

7.8.6 First Aid

A first aid centre with adequate facilities shall be provided. It shall be maintained round the clock by a compounder cum dresser and a doctor. An Ambulance shall also be provided at site to carry affected people to hospital.

7.8.7 Security

The security requirements of the company premises shall be taken care of by CSO assisted by a Fire In charge. The team, apart from the normal security functions will manage the role required during a disaster management operation as a part of the crisis control team.

7.8.8 Safety

The safety wing led by a Safety Head will meet the requirement of emergencies round the clock. The required safety appliances shall be distributed at different locations of the plant to meet any eventualities. Poster/placards reflecting safety awareness will be placed at different locations in the plant area.

7.8.9 Evacuation Procedure

As the major hazard is only due to fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

7.8.10 Personal Protective Equipment's (PPE)

This equipment is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. The list of Personal Protective Equipment provided at the facility and their locations shall be available in ECC.

Effective command and control accomplish these functions necessitates personal trained in this On-site Disaster Management Plan with adequate facilities and equipments and

equipment to carry out their duties and functions. These organizations and the facilities required to support their response are summarized in the following subsections.

Personal protective equipment's play a vital role in overcoming major disastrous situation saving life during onsite emergency. List of recommended Personal Protective equipment (PPE) is given below in Table 7.9.

Table 7.9: Summary of Recommended Personal Protective Equipment According to hazard onsite

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, liquid chemicals, gases or vapors, light radiation	Safety glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic helmets with top and side impact protection
Hearing protection	Noise of machineries	Hearing protectors (ear plugs or ear muffs)
Foot protection	Failing or rolling objects, points objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and failing objects, liquids and chemicals
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures	Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases). Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines). Onsite rescue equipment
Body / leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Insulating clothing, body suits, aprons etc. of appropriate materials

7.8.11 Mock Drill

As per the Industrial Major Accident Hazard Rules,

- Mock drills of the on-site emergency plan will be conducted every six month.
- A detail report of the mock drill conducted is to be made immediately available to all the concerned authority
- Also, Major Fire and Minor Fire mock drills are conducted once in six months

7.8.12 Training

On job training to the engineers on various stages of risk analysis and preparedness during emergency to reflect in the operation of terminal, especially from the safety stand point. The fire team belonging to the firefighting department is to be intensively trained for the use of all equipment and in various fire fighting methods for handling different types of fires.

Details of Training facilities for	
• Safety	Monthly
• Fire Fighting	Monthly
• Occupational Health & safety	Monthly

7.8.13 Procedure for Testing & Updating the Plan

Simulated emergency preparedness exercises and mock fire fighting exercises including mutual aid scheme resources and in conservation with district emergency authority to be carried out time to time. Designated assembly point to be present in the facility.

7.8.14 Disclosure of Information to Worker & Public Awareness System in Existence & Anticipated

- Safety awareness among workers by conserving various training programs and Seminars, competition, slogans etc.
- Practical exercise.
- Distribution and practices of safety Instructions.
- Safety Quiz contests.
- Display of Safety Posters & Safety Slogans.
- Developing Safety Instructions for every Job and ensuring these instructions/booklets or manuals by the workers.

7.9 OFF-SITE EMERGENCY PLANNING

The off-site emergency plan is an integral part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and

the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans therefore complement each other. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority. Schematic representation of various organizations involved during emergency is shown below in **Figure 7.2.**

Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. Consideration of evacuation may include the following factors:

- In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation.
- If fire is escalating very fast it is necessary to evacuate people nearby as soon as possible.
- In acute emergency people are advised to stay indoors and shield themselves from the fire.

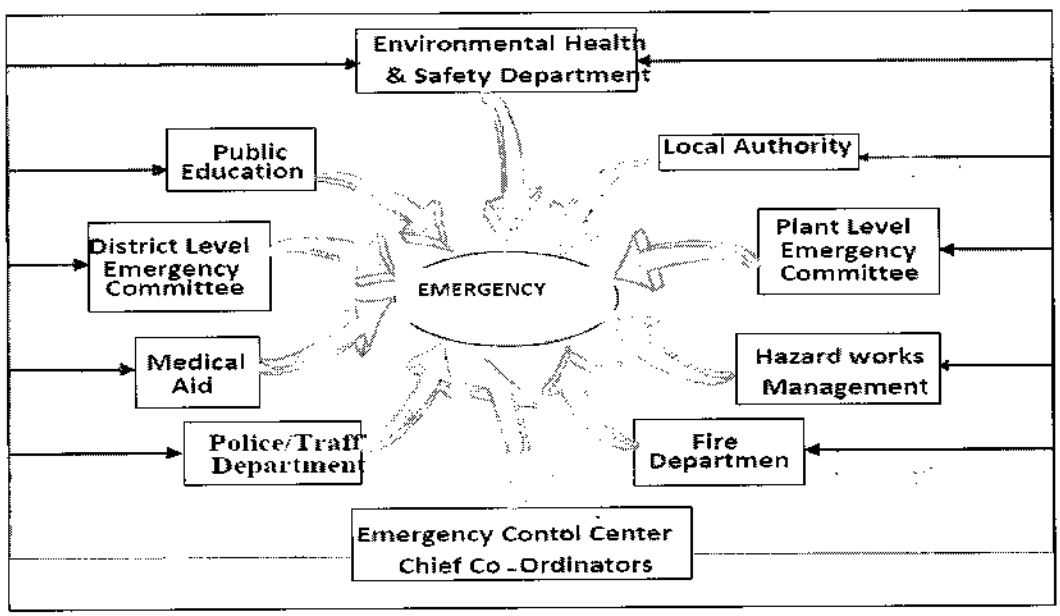


Figure 7.2: Various Organizations Involved During Emergency

7.9.1 Organization

Organizational details of command structure, warning systems, implementation procedures, emergency control centres include name and appointments of incident

controller, site main controller, their deputies and other key personnel involved during emergency.

7.9.2 Communications

Identification of personnel involved, communication centre, call signs, network, list of telephone numbers.

7.9.3 Special Emergency Equipment

Details of availability and location of heavy lifting gear, specified fire-fighting equipment, fireboats etc.

7.9.4 Voluntary Organizations

Details of Voluntary organizations, telephone numbers nearby of hospitals, Emergency helpline, resources etc are to be available with chief authorities.

7.9.5 Non-governmental Organizations (NGO)

NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process.

- Evacuation of personnel from the affected area
- Arrangements at parking yards
- Rehabilitation of evacuated persons

7.9.6 Chemical information

Details of the hazardous substances (MSDS information) and a summary of the risks associated with them are to be made available at respective site.

7.9.7 Meteorological information

There is to be arrangements for obtaining details of weather conditions prevailing at or before the time of accident and weather forecasts updates.

7.9.8 Humanitarian Arrangements

Transport, evacuation centers, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

7.9.9 Public Information

- Dealing with the media-press office
- Informing relatives, etc.

7.9.10 Assessment

- Collecting information on the causes of the emergency
- Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

7.9.11 Role of local authority

Local Authorities like Panchayat, Sabha, Samity, municipalities can help in combating emergency situation after assessing the impact scenario in rescue phase.

7.9.12 Role of police

The police is to assist in controlling of the accident site, organizing evacuation and removing of any seriously injured people to hospitals.

- Co-ordination with the transport authorities, civil defense and home guards.
- Arrange for post mortem of dead bodies
- Establish communication center with easy contact with ECC.

7.9.13 Role of Fire Brigade

The fire brigade is to be organized to put out fires and provide assistance as required during emergency.

7.9.14 Media

The media is to have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to avoid commotion and confusion.

- Efforts are made to check the clarity and reliability of information as it becomes available, and before it is communicated to public
- Public health authorities are consulted when issuing statements to the media concerning health aspects of chemical accidents
- Members of the media are to facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances

7.9.15 Role of health care authorities

Hospitals and doctors must be ready to treat all type of injuries to causalities during emergency.

- Co-ordinate the activities of Primary Health Centers and Municipal Dispensaries to ensure required quantities of drugs and equipment.
- Securing assistance of medical and paramedical personnel from nearby hospitals/institutions.
- Temporary mortuary and identification of dead bodies.

7.10 CONCLUSION

As discussed in above sections, adequate risk control measures for process, needs to be considered for the project activity, is not likely to cause major significant risk to onsite, offsite & environment. Suitable Mitigation Measures will be taken by M/s Pahwa Plastics Pvt. Ltd., Haryana to ensure complete workplace safety. In the event of disaster onsite, offsite and all the emergency planning procedures will be followed so as to minimize the impact on working personnel, plant surrounding and environment.

CHAPTER 8: PROJECT BENEFITS

8.1 INTRODUCTION

The development of industrial projects plays a key role in the economic growth of any country. Formaldehyde is best known for its preservative and anti-bacterial properties, but formaldehyde-based chemistry is used to make a wide range of value-added products. Formaldehyde is one of the most well-studied and well-understood compounds in commerce. It is an essential building block chemical in the production of hundreds of items that improve everyday life. Peripheral development takes place and due to more influx of money through the area, overall importance of the area increases and overall the infrastructure improves.

8.2 EDUCATION

The local peoples' interest towards education will increase due to the expectation of getting jobs, especially from non-agricultural sources such as the industries in the vicinity of M/s Pahwa Plastics Pvt. Ltd. The project is expected to increase such aspirations by bringing opportunities of some direct and indirect employment for the local people. The general awareness towards the importance of education is expected to increase as a result of the project. The project will have positive impact on the level of education of the people.

8.3 EMPLOYMENT POTENTIAL

8.3.1 Direct Employment

Employment scenario of the study area is largely dependent on the Industrialization of the area. The plant has employment generation potential by way of recruiting local people directly for different activities of the project. There are 10 workers working at the plant. Both skilled & un-skilled workers are employed by the company. From unloading of raw materials to loading of finished goods one or more labour contracts will be awarded to local contractors. Local people will be given the opportunity in employment as per their capability and expertise. This will enhance the present socio economic status of the local people.

8.3.2 Indirect Employment

Indirect employment and income effects of the plant are non-marginal and usually remain widespread across a long region. It is expected that substantial portion of the investment in this project will trickle down to the local people in the form of employment and income. A part of this increase in employment potential may be attributed to the existing plant and other industries in the vicinity. The project is

expected to generate substantial indirect employment in other sectors such as service units etc. employment and income effects indicates that the project has strong positive direct as well as indirect impact on employment and income generation of the area. Since the infrastructure for maintenance of the specialized plant and machinery may not be readily near site, adequate maintenance facilities for day-to-day and minor plant maintenance including a well-equipped workshop and trained technicians shall be developed for the project. Major maintenance and annual overall will be contracted out to manufactures or reputed agencies.

8.4 IMPROVEMENT IN INFRASTRUCTURE

M/s Pahwa Plastics Pvt. Ltd. is intended to provide the following infrastructure in the study area of 10 km radius:

a) Road Transport: There will be improved road communication due to the proposed activity and maintenance will also be done time to time.

b) Market: Need for the products are based on the demand and supply gap in the current market. With increasing utilization of the current products, in future, to cater the requirement of all the products, it is essential to have the manufacturing unit.

c) Infrastructure: Creation of community assets (infrastructure) like Installation/ Repair of Hand Pumps/ Bore wells Gram Panchayat dug well de-siltation and deepening, as a part of corporate social responsibility.

8.5 CORPORATE ENVIRONEMNET RESPONSIBILITY

M/s Pahwa Plastics Pvt. Ltd. will carry out social development works under Corporate Environmental Responsibility as per Ministry of F.No.22-65/2017-IA.III OM dated 30.09.2020 to address the issues of the general public to the extent possible.

8.6 OTHER TANGIBLE BENEFITS

For several decades, formaldehyde has been used consistently in a wide range of products, ranging from personal hygiene, to medicine, to building products and much more. Many different resins are created from formaldehyde, which are in turn used to create other materials having different properties. Formaldehyde derivatives are used as preservatives in personal hygiene products because they kill bacteria or they are used to make other products more effective in terms of foaming action such as soaps and detergents. Its versatile chemistry and unique properties have created applications for use of formaldehyde in all kinds of every day products such as plastics, carpenting, clothing, resins, glues, medicines, vaccines and the film used in x-rays.

- Formaldehyde destroys bacteria, fungi, molds, yeast & other type of germs. So it can be used as a sterilant/ disinfectant.
- Industrial adhesive use formaldehyde as a bonding agent, such as in pressed wood, plywood, fiberboards, etc.
- Formaline (mixture of water & formaldehyde) is used as a preservation of food, antiseptics, medical labs, funeral homes & cosmetic (shampoo, deodorant, toothpaste, lipsticks, soaps, lotions etc.
- It can also help stabilizing fabrics, reducing wrinkles and shrinkages.
- It is also found in cigarette smoke, kerosene space heaters & fuel burning appliances.
- Since it also acts as a preservative, formaldehyde plays a critical role in our medical schools, preserving cadavers used in teaching human anatomy. It has been used for tissue and organ preservation for more than a century and has greatly assisted the advance of biological science.

CHAPTER 9: ENVIRONMETAL COST BENEFIT ANALYSIS

9.1 ENVIRONMETAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th September, 2006 as amended from time to time; the chapter on "Environmental Cost Benefit Analysis" is applicable only, if the same is recommended at the Scoping stage. The Environmental Cost analysis is not required.

CHAPTER 10: ENVIRONMENT MANAGEMENT PLAN

10.1 INTRODUCTION

Any industrial development is associated with certain positive impacts as well as some negative impacts on the environment. However, the negative or adverse impacts cannot possibly rule out scientific development. At the same time adverse impacts cannot be neglected. An Environment Management Plan shall be formulated for mitigation of the adverse impacts and is based on the present environmental conditions and the environmental impact appraisal. This plan helps in formulation, implementation and monitoring of the environmental parameters during and after commissioning of the project. The Environmental Management Plan describes in brief, the management plan for proper and adequate implementation of treatment and control system for air and water and noise pollution and for maintaining the environment. It also includes the development of green belts in and around the plant, proper safety of the workers, noise control, fire protection systems and measures.

10.2 PURPOSE OF ENVIRONMENTAL MANAGEMENT PLAN

The environment management plan is prepared with a view to facilitate effective environment management of the project, in general and implementation of the mitigation measures in particular. The EMP provides a delivery mechanism to address potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. For each operation, which could otherwise give rise to impact, the following information is presented:

- To treat and dispose-off all the pollutants *viz.* liquid, gaseous and solid waste so as to meet statutory requirements (Relevant Pollution Control Acts) with appropriate technology
- To support and implement work to achieve environmental standards and to improve the methods of environmental management
- To promote green-belt development
- To encourage good working conditions for employees
- To reduce fire and accident hazards
- Budgeting and allocation of funds for environment management system

- To adopt cleaner production technology and waste minimization program

10.3 ENVIRONMENTAL MANAGEMENT CELL

Apart from having an EMP, it is also necessary to have a permanent organizational set up charged with the task of plant will create a department consisting of officers from various disciplines to co-ordinate the activities concerned with the management and implementation of the environmental control measures. Environment Management cell is defined in the Fig 10.1.

Basically this department will undertake to monitor the environmental pollution levels by measuring stack emissions, ambient air quality, water and effluent quality, noise level etc. either departmentally or by appointing external agencies wherever necessary.

- In case the monitored results of environmental pollution are found exceeding the allowable values, the environmental management cell will suggest remedial action and get these suggestions implemented through the concerned plant authorities. The actual operation and maintenance of pollution control equipment of each unit will be under the respective plant managers.
- 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.

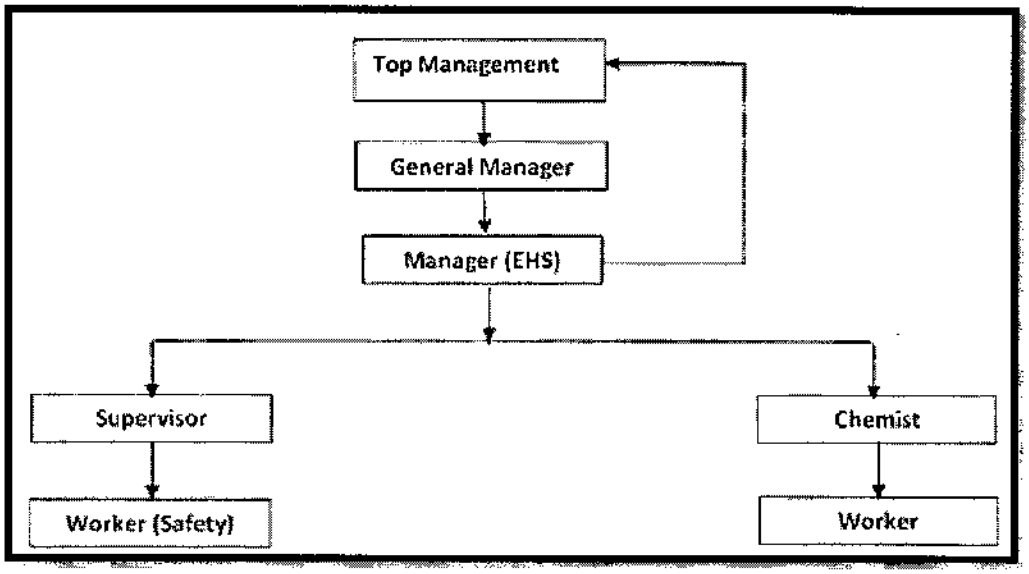


Figure 10.1: Organization Chart of Environmental Monitoring Cell

10.4 ENVIRONMENT MANAGEMENT POLICY

The Environment cell follows the well-defined Environment policy which is defined below:

- Effectively manage, monitor, Improve and communicate the environmental performance.
- Take all reasonable steps to prevent environmental pollution.
- Set realistic anti measurable objectives and targets for continual improvement of the Environmental performance.
- Ensure that all employees and contractors are trained to understand their environmental responsibilities and create an environment that adheres to the company's Policies, Procedures and Application Regulations.
- Hold leadership accountable for good environment performance of our operations and projects, inherent in that accountability will be the commitment of senior management to provide resources and successfully create an appropriate environment.
- Comply fully with all relevant legal requirements, codes of practice and regulations.
- Reduce, recycle and reuse natural resources.
- Minimize waste anti increase recycling within the frame work of waste management procedures, identify and manage environmental risks anti hazards.

- The project proponent shall regularly review this policy and ensure that corrective and preventive actions are taken in order to ensure continual improvement.
- To treat all the pollutants viz liquid and gaseous, which contribute to the degradation of the environment, with appropriate technologies.
- To comply with all regulations stipulated by the Central State Pollution Control Boards related to air emission and liquid effluent discharge as per air and water pollution control laws.
- To handle hazardous wastes as per the Hazardous and Other Waste Management Rules 2016 of the Environment (Protection) Act, 1986.
- To encourage support and conduct development work for the purpose of achieving environmental standards and to improve the methods of environmental management.
- To create good working conditions (avoid of all order and noise pollution) for employees.
- To minimize fire and accident hazards.
- Perspective bed getting and allocation of funds for environment management expenditure.
- Preventive maintenance and regular checking of machineries and equipments.
- To make continuous efforts in waste minimization.
- For the equipments and pipe lines, leakage detection and repair shall be scheduled to minimize fugitive emissions. '
- Continuous efforts with energy nudist for the reduction of fuel and energy consumption.
- The system of reporting of none–conformance/ violation of any Environmental Law/ Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any none–conformance violation to Environmental Law/ Policy will be closed and discussed during Management Review Meetings of Board of Directors/ Partners.
- Environmental Management Cell will be responsible to implement the Environmental Policy.

10.5 MONITORING AND RESPONSIBILITIES:

(a) For Water Environment

- The supervisor shall visit and check the devices daily.
- The General Manager will keep in touch with the Environmental Consultant and seek their guidance for corrective action as and when required.

- The Committee shall meet once every month to ensure implementation of the programme.
- The General Manager will bring to the notice of the Managing Director any further action to be taken to ensure environmental requirements. The Managing Director will report to the Board of Directors, the action taken to set right deficiency, if any.

(b) For Air Environment

- The supervisor will ensure that the APCD provided are functional at all times. Air emissions from the stack will be got checked by him once a month from a Laboratory to see that the limits of the various parameters are not exceeded. In case of any deviation noticed, he will inform the General Manager to take corrective action.
- The supervisor will ensure that the water is sprinkled on roads whenever transportation of material is to be done to and from the factory premises in trucks.
- The General Manager will ensure that all the vehicles coming to the premises have PUC Certificates and they do not blow horn unnecessarily within the premises.
- The Manager Operations will ensure that the transportation of raw materials and finished goods is done in trucks covered with Tarpaulins.
- The Board of Directors will discuss at frequent intervals & see that the environmental policy laid-down by them, is followed meticulously by all persons in the Unit and the Environment is within the prescribed limits.

(c) The cell will also be responsible for monitoring of the plant safety and safety related systems which include:

- Checking of safety related operating conditions.
- Visual inspection of safety equipments.
- Preparation of a maintenance plan and documentation of maintenance work specifying different maintenance intervals and the type of work to be performed.

Other responsibilities of the cell will include:

- Conduct and submit annual Environmental Audit. A registered agency will be retained to generate the data in respect of air, water, noise, soil and meteorological data and prepare the Environmental Audit report. Timely renewal of Consolidated Consents & Authorization (CC&A) will also be taken care of.
- Submitting environmental monitoring report to statutory body. Data monitored

by the cell will be submitted to the Board regularly. The cell will also take mitigative or corrective measures as required or suggested by the Board.

- Keeping the management updated on regular basis about the conclusions/ results of monitoring activities and proposes measures to improve environment preservation and protection.
- Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the identification of the hazardous conditions and unsafe acts of workers and advise on corrective actions, organize training programs and provide professional expert advice on various issues related to occupational safety and health.
- Conducting safety and health audits to ensure that recommended safety and health measures are followed.

Table No.10.1: Responsibility of Environment Management Cell

S.No.	Designation	Nos.	Responsibility
1	Top Management	01	Communicate company strategy to board of directors. Attend board meetings. Work with audit committee to prepare budgets. Analyze financial reports for environmental protection measures. Report and share information with the board to ensure they are kept fully informed on the condition of the organization and important factors influencing it. Participate in and nurture broad networks of alliances with others to exchanges knowledge and information about learning and change in support of change initiatives.
2	General Manager	01	Sets goal, monitor work, and evaluate results to ensure that departmental and organizational objectives and operating requirements are met and are in line with the needs and mission of the organization. Supervision, public relations, marketing, profitability and sales, service, reporting, capital requirements, and other duties as assigned by the board of directors. Managing all the Environmental issue.

			Ensure appropriate EHS supervision of Employee. Checking of non compliance/ violations of environmental norms.
3	Manager (EHS)	01	Develop performance standards. Handle claims and complaints promptly. Developing and promoting a vision of EHS. Conduct and submit annual Environmental Audit. Submitting environmental monitoring report to HSPCB. Reporting of non compliance/ violations of environmental norms to the Board of Directors of the company.
4	Supervisor	01	Report to Manager EHS. Provide information, training and supervision. Assist in preparation of risk assessments. Reporting to EHS hazardous and incidents.
5	Chemist	01	Report to Manager EHS. Taking responsibilities of all environmental issue as assigned by Manager EHS.
6	Worker (Safety)	01	Report to Supervisor for safety issues. Conducting regular safety drills and training programs. Conducting safety and health audits.
7	Worker (Environment)	01	Report to Supervisor for environmental issues. Conducting Environment audits.

10.6 GREENBELT DEVELOPMENT

Green belt will be developed over 34.78% area of the total plant area out of the 0.23 ha of the plant area i.e., 0.08 Ha of the total land. This greenbelt will serve as a buffer between the peripheries and the industry, there by controlling the air emissions and noise levels. PP has already developed green belt for exsitng unit.

A budget of approx. Rs. 1 Lakh (approx..) has been kept for Green belt development.

Table 10.2: Calculation of Cost for Green Belt Development

S. No.	Components	Budget (in Rs)
1.	Total no. of plants i.e., 205 *100	20,500

2.	Maintenance of Green Belt (Tree gaurds, Watering, manure etc.)	80,000
Total		1,00,500 **(1.005 L)**

10.7 BUDGETS FOR ENVIRONMENTAL MANAGEMENT PLAN

On regular basis, Environment Management Cell shall inspect the necessity and availability of the materials, technologies, services and maintenance works. The Cell shall make appropriate budget for the purpose. Regular record review for any change in financial requirement of environment management shall be done and appropriate budgetary provisions shall be made. Along with other budgets, Budget for environmental management shall be prepared and revised regularly as per requirement. The budget shall include provisions for:

- Air Pollution Control inchuding instrumentation
- Water and Waste Water Treatement
- Occupational Health and Safety
- Stack and Online Monitoring system
- Greenbelt Development
- Rain water Harwesting
- Solid and Haz. Waste Management
- Environmental monitoring Program
- Miscellaneous item

The total capital investment on environmental control measures is envisaged to be about **Rs 0.056 Crores** out of a total project cost of **Rs 1.13 Crores**. Details are given in **Table 10.3**

Table 10.3: EMP Cost Details

S. No.	Particulars	Initial Cost (in Lakhs)	Recurring Cost (per year)
1.	Air Pollution Control Device	2.45	0.5
2.	Occupational Health and Safety	0.8	0.2
3.	Green Belt Development	1.0	0.4
4.	Rain Water Harvesting Pit	1.4	0.3

	Total	5.65 Lakh (0.056 Crores)	1.4 Lakh (0.014 Crores)

CHAPTER 11: EXCECUTIVE SUMMARY

11.1 STRUCTURE OF EIA REPORT

The EIA report has been prepared as per TOR (Terms of Reference) grant in addition to "Generic Structure of EIA/EMP Report" required by the Ministry of Environment & Forest, Government of India as per the general condition stipulated in the EIA notification dated 14.9.2006.

11.2 BRIEF SUMMARY OF PROJECT

Table No. 11.1: Project details

<table>
<tr><th>S.No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1.</td><td>Nature and size of the Project</td><td>Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.</td></tr>
<tr><td rowspan="5">2.</td><td colspan="2">Location details</td></tr>
<tr><td>Village /Town/Plot No.</td><td>Jathlana</td></tr>
<tr><td>District</td><td>Yamunanagar</td></tr>
<tr><td>State</td><td>Haryana</td></tr>
<tr><td>Latitude and Longitude</td><td>
<table>
<tr><th>Points</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>Core</td><td>30° 2'22.96"N</td><td>77°15'3.37"E</td></tr>
<tr><td>A</td><td>30° 2'23.92"N</td><td>77°15'2.45"E</td></tr>
<tr><td>B</td><td>30° 2'23.89"N</td><td>77°15'4.03"E</td></tr>
<tr><td>C</td><td>30° 2'21.99"N</td><td>77°15'4.09"E</td></tr>
<tr><td>D</td><td>30° 2'21.94"N</td><td>77°15'2.67"E</td></tr>
</table>
</td></tr>
<tr><td>Toposheet No.</td><td>H43L4, H43L8, H43R1, H43R5</td></tr>
<tr><td rowspan="2">3.</td><td colspan="2">Area Details</td></tr>
<tr><td>Total Project Area</td><td>Total plot area is 0.23 hectare. Green belt will be developed in an area of 0.08 Hectare (Approximately 34.78% of total land area).</td></tr>
<tr><td rowspan="4">4.</td><td colspan="2">Environmental Setting Details (with approximate aerial distance and direction from the project site)</td></tr>
<tr><td>Nearest major settlement</td><td>Village Jathlana is at a distance of 2 Kms (approx.) in S direction.</td></tr>
<tr><td>Nearest highway</td><td>SH-6~0.2 Km in E direction</td></tr>
<tr><td>Nearest Railway</td><td>Yamunanagar Railway Station at a distance of 9.8 kms in N</td></tr>
</table>

	Station	direction.
	Nearest Airport	Chandigarh International Airport is at a distance of 83.25 kms in NW direction.
	National Parks/ Wild Life Sanctuaries/ Biosphere Reserves/ RF and PF within 10km radius	No National Park/Wildlife Sanctuary within 10 km radius of the Project Site.
	Nearest Water Bodies	Yamuna River at a distance of 4.5 kms in east direction
	Interstate Boundary	Haryana & Uttarpradesh at 4.7 Km in SE direction
	Religious Place	Beed Wali Masjid 3.2 Kms in N
	Medical Facility	Gaba Hospital 12.46 Kms in N direction
	Nearest School	Govt. Middle School 1.6 Kms in N
	Defence Installations	Nil
	Seismic Zone	Zone IV
5.	**Cost Details**	
	Project Cost	Rs. 1.13 Crores (Rs. 113 Lakhs)
	EMP Budget	Rs. 0.057 Crores (Rs. 5.65 Lakhs)
6.	**Basic Requirements of the Project**	
	Fresh Water	90 KLD Source: HWRA
	Power	200 KW **Source:** UHBVN (Uttar Haryana Bijli Vitran Nigam) **DG sets as backup:** 180 KVA and 250 KVA (existing)
	Boiler	800 Kg/Hr
	Fuel	Wood briquettes
	Manpower	10

11.3 ENVIRONMENTAL BASELINE STUDY

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during **1st Oct to 31st Dec 2020.**

S. No	Parameters	Baseline Status
1.	**Ambient Air Quality**	
i.	PM_{10}	62 µg/m³ to 88.6 µg/m³
ii.	$PM_{2.5}$	26.2 µg/m³ to 49.1 µg/m³
iii.	SO_2	7.0 µg/m³ to 20.0 µg/m³
iv.	NO_2	16.5 µg/m³ to 32.8 µg/m³

v.	CO	0.54 mg/m^3 to 0.99 mg/m^3
Values are well within the stipulated standard of CPCB.		
2.	**Noise Level Monitoring**	
i.	Day Time (6:00 a.m. to 10:00 p.m.)	48.3 Leq dB to 68.6 Leq dB
ii.	Night Time (10:00 p.m. to 6:00 a.m.)	39.6 Leq dB to 61.8 Leq dB
The observed noise levels were found below the stipulated standards of CPCB.		
3.	**Soil Quality and Characteristics**	
i.	pH	7.48 to 7.71
ii.	Organic Matter	0.34% to 0.48%
iii.	Nitrogen	181.41 Kg/ha. to 221.87 Kg/ha..
4.	**Ground Water**	
i.	pH	7.41 to 7.66
ii.	Total Hardness	210.0 to 283.76 mg/l
iii.	Total Dissolved Solids	310 to 428 mg/l.
5.	**Surface Water**	
i.	pH	7.53 to 7.72
ii	Total Hardness	229 to 310.45 mg/l.
iii	Total Dissolved Solids	424 to 585 mg/l.
The concentrations were found to be within permissible limits (Compared with IS 10500:2012)		

11.4 MITIGATION MEASURES FOR CONTROL OF POLLUTION

11.4.1 Air Pollution Control

- Online Stack Monitoring System as an air pollution control measures to control the emission of particulate matter, the flue gas emission will remain well within gaseous emission norms prescribed by the CPCB.
- Scrubber will be installed for scrubbing the residual Formaldehyde from the main product stream which also controls the odour problem.
- To control the air emissions from D.G. Set, stack height of 6.0 m shall be provided.
- Green belt will be developed on 34.78% area of the total project area which will help in attenuating the pollutants emitted by the plant.
- Adequate measures for control of fugitive dust emissions will be taken

11.4.2 Waste Water Treatment

There will be no waste water discharge from the plant. Zero Liquid Dischage (ZLD) concepts to be adopted. Domestic waste water after treatement (in septic tank) will be

fully utilized with the facility for cleaning, flushing, water sprinkling and other non portable domestic purpose.

11.4.3 Noise Pollution Control

- Vibrating pads & acoustic enclosure will be provided to noise generating equipment to control noise level within norms.
- It can be reduced by providing padding at various locations to avoid rattling due to vibration.
- Latest technology and utmost care will be taken at the time of equipment/machinery installation.
- Lubrication of moving/rotating part or component of machineries will be done on regular basis.
- The insulation provided for prevention of loss of heat and personnel safety gears will also act as noise reducers.
- Design and layout of building to minimize transmission of noise, segregation of particular items of plant.
- The operator's cabins (control rooms) will be properly (acoustically) insulated with special doors with observation windows.
- The operators working in the high-noise areas will be provided with ear-muffs or plugs.
- Acoustic enclosures and silencers will be provided to the equipment wherever necessary
- Proper green belt will be developed to reduce the noise level.
- Thus, it is envisaged that there will not be any adverse impacts of noise. The greenbelt developed within the premises will have significant beneficial impacts on reduction of noise within the periphery and outside the boundary.

11.4.4 Land Pollution Control

- The plant will implement zero level discharge concepts. The treated water will be recycled in the process. Therefore, there will not be any negative impact on soil.
- No toxic /waste water will be disposed directly on land.
- Vegetation will be done on uncovered soil.
- Other hazardous solid wastes will be sent to authorized recycler or vender.
- It is envisaged that there will not be any major impacts on land environment during the operation phase as most of the effluent generated shall be reused in the process.

11.4.5 Odour Management

- Scrubber will be installed for scrubbing the residual Formaldehyde from the main product stream.
- Temperature will be kept under control during operation phase.

11.4.6 Solid & Hazardous Waste Generation and Disposal

- Used Oil generated will be sold to authorised recycler.
- Solid waste from evaporator will be sent to TSDF.

All the Solid & hazardous waste generated, will be collected, stored separately and disposed off as per the guidelines issued by CPCB & Haryana State Pollution Control Board.

11.5 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Total capital cost for Environmental management is proposed to be Rs. 5.65 Lakhs whereas recurring cost for the same is Rs. 1.4 Lakhs/year.

11.6 CONCLUSION

Company has committed to implement all the pollution control measures to protect the surrounding environment. The project can definitely improve the regional, state and national economy. Industrial growth is an indication of socio economic development. The implementation of this project will definitely improve the physical and social infrastructure of the surrounding area.

CHAPTER 12: DISCLOSURE OF CONSULTANTS

12.1 INTRODUCTION

Vardan Environet is a pioneer consulting organisation of India specializing in Environmental Protection, Industrial Pollution Control, Environmental & Mechanical testing and engineering field. Vardan assists clients in comprehensive environmental and engineering services ranging from conceptual planning and preliminary investigation to detailed engineering designs.

Vardan has successfully completed a wide range of multi-disciplinary assignments/reports. The company's project formulation requires preliminary and detailed project investigation. The objective of the investigation is to assess the technical viability and cost effectiveness of the proposals vis-à-vis the objective and benefit. Vardan was founded in 2012 and brought together a number of consultancy services with a track record of performance in the environmental Science and Engineering field. Headquartered in Gurugram, Vardan has prominent presence in Delhi-NCR, Rajasthan, Maharashtra, Madhya Pradesh, West Bengal and Jharkhand. With a man-power of over 125 professionals, the organization comprises of senior retired government officers from various departments like Pollution Control Board, Mines & Geology, Civil Services, SAIL, GAIL, NEERI who have decades of experience in the field of environmental management. The team also Comprises of young, dynamic and progress driven Environment, Civil, Mechanical & Chemical engineers, Geologists, GIS experts, Ecologists and Auditors.

Vardan Envirolab, a sister concern provides reliable and precise testing services for a wide range of Environmental, Chemical, Food testing, Microbiology and Building Materials with in-house Equipment/Instruments of advance technology along with experienced technical staff.

12.2 SERVICES OF VARDAN ENVIRONET

- Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), Environmental Compliance, Mining Plan, Social Impact Assessment.
- Testing of water, Waste water, Ambient & work zone air, stack emissions, noise, soil, limestone, dolomite, iron ore, coal, cement, bricks, concrete, blocks, steel bars & wires, Indoor Air Quality monitoring, Sludge.
- Hydrological surveys for ground water clearance.
- Approvals/NOC/Clearances from various Government Authorities.
- Detailed Project report/Feasibility report/Plans/Designs.

- Environmental Quality Monitoring and analysis.
- Geotechnical investigations, Topographical Survey, Planning and Designs.
- EHS, Energy and water Audit, risk/hazard studies and disaster management plan (both onsite and off-site).

12.3 RECOGNITIONS

- Approved by NABET in 17 sectors for preparation of EIA/EMP reports
- Vardan EnviroNet is recognized by Ministry of Environment, Forest & Climate Change, Govt. of India under Environmental Protection Act 1986
- Vardan EnviroLab is accredited by NABL in the field of Testing
- Vardan EnviroLab is certified by OHSAS 18001:2007
- Vardan EnviroLab is certified by ISO 14001:2015
- Vardan EnviroLab is certified by ISO 9001:2015
- Vardan EnviroLab is approved by HSPCB & RSPCB

12.4 KEY MANAGEMENT PERSONNEL OF VARDAN

- Multisource Dispersion Model based on Gaussian Model (ISCST3, AERMOD).
- Noise Propagation Model (Dhawani Pro).
- Risk and Hazard studies through PHAST model.
- GIS mapping through Arc GIS, watershed & area drainage mapping, cadastral mapping, DGPS survey, 3D modelling, Urban/Rural area planning & management and Digital Elevation Model.
- Transect and line intercepts for Ecology and Biodiversity studies.
- Extrapolative method & Intuitive technique (Delphi technique) in socio-economic assessment.

Sl.No.	Name	Designation	Experience (years)
1	R.S. Yadav	Managing Partner	36
2	Aman Sharma	Vice President	15
3	Roopika Sharma	CEO	10
4	Anshul Yadav	General Manager	8
5	K.M. Khare	EIA Coordinator	43
6	Dr. Ashok Rathoure	EIA Coordinator & FAE	14

7	Nemi Chand Choudhary	General Manager-Jaipur	12

12.5 EMINENT CLIENTELE OF VARDAN

Vardan has executed around 1000 projects across all over India in a short span of time covering both public and private sectors. Following are some of our reputed clients.

Indian Oil, HPCL, NTPC, NHPC, DMRC, GAIL, SAIL, NHAI, APCPL, RITES, MPPGCL, Indian Railways, JK Lakshmi Cement Ltd., L&T, Tata, Adani, Hero, Honda, HCL, Panasonic, Jaypee group, DLF, Godrej, Haldiram's, Unitech, JBM, Trident hotels, Lanco, Mangalam cement, JW Marriot, Eros group and many others.

CHAPTER 13: DAMAGE ASSESMENT, REMEDIATION PLAN AND NATURAL & COMMUNITY RESOURCE AUGMENTATION PLAN (NCRAP)

13.1 INTRODUCTION

The project was issued ToR by MoEFCC vide F.No. IA-J-11011/185/2020-IA.II(I) dated 20th July 2021 for preparing the Environmental Impact Assessment Report and Environmental Management Plan (Including Assessment of ecological damage and the remediation plan and the natural and community resource augmentation plan as an independent chapter in the EIA).

The primary concern of remediation plan is to evaluate the extent to environmental damage done due to construction and operation of SAF in absence or inadequacy of environmental protection measures. The traditional knowledge of the project is being utilized to derive the extent of damage and plan remediation with time bound action plan and budgetary provision.

13.2 PROJECT DEVELOPMENT

As elaborated in the previous chapters, M/s Pahwa Plastics Pvt. Ltd. has installed Formaldehyde unit during the year 2018 in order to meet the market demand. This unit was installed in order to fulfill the market demands for economic benefits without obtaining prior Environmental Clearance.

13.3 NEED OF THE STUDY

The specific Terms of Reference granted to the project, under the provisions of MoEFCC's notification vide S.O. 804 (E) dated 14.03.2017 regarding conducting EIA Study for obtaining Environment Clearance to the projects, considering violation of EIA Notification, 2006 and its subsequent amendments and recommended the following:

- Assessment of damage to be carried out with respect to air, water, land, ecology and other environmental attributes.
- A remediation plan and natural and community resource augmentation plan to be prepared corresponding to the ecological damage assessed and economic benefits derived due to violation.

13.4 OBJECTIVE OF THE STUDY

The objective of Damage Assessment Report (DAR) and Natural & Community Resource Augmentation Plan (NCRAP) includes the study of affects which are caused by change in the environment due to the project activity and to identify the corrective measures to compensate or replace those resources such as "Land, Biota, Air, Water and others in order to mitigate the adverse effects on such resources". The

damage is assessed based on negative changes brought onto the various environmental aspects due to the project activity.

However, any industrial activity does pose threat on environmental, which can either be avoided or minimized in terms of size, scope and duration. It is based on the fact that minimizing the environmental impact of an activity primarily entails managing the environmental consequence(s).

To ameliorate the adverse impacts on the environment due to the construction of the new units as well as its operation, a remediation plan is necessary. Also, a Natural & Community resource augmentation plan (NCRAP) is required to pay for the ecological damage as well as economic benefits derived at the cost of the environment and the local community. Both of these, with respect to violation units, have been elaborated in the subsequent sections.

As per the ToR, the following studies were carried out with respect to the violation activities carried out within the premises of M/s Pahwa Plastics Pvt. Ltd.

- Ecological/environmental damage assessment
- Remediation plan
- The natural and community resource augmentation plan

13.5 ECOLOGICAL DAMAGE ASSESSMENT AND REMEDIATION PLAN

The assessment of environmental damage caused due to an industrial activity under violation of a regulatory framework needs to be measured across different aspects viz. biotic environment; abiotic environment and social environment. The environmental damage & assessment has been studied in comparison to the earlier environmental status before the start of the construction considering following parameters.

- Air Environment
- Water Environment
- Noise Environment
- Land Environment
- Ecological Environment
- Socio-economic Environment

A regional background to the baseline data is presented in **Chapter-3**, which will help in better appreciation of field data, generated on several environmental and ecological attributes of the study area.

13.5.1 Damage Assessment and its Remediation Plan

The project proponent has installed and operated formaldehyde unit without getting environmental clearance under EIA notification 2006. Damage assessment and

Remediation Plan along with Cost of remediation measures for Water, Noise, Air, Social and Ecological environment is given in **Table 13.1**.

Table 13.1: Damage Assessment and Remediation Plan

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
Land Environment					
1. Excavation 2. Generation of Hazardous waste like empty cans of paints, fuel/oil 3. Land contamination due to spill of oil, paint, varnishes etc., during construction phase 4. Generation of construction solid wastes 5. Solid waste from process.	1. Change in Land use/ Land cover of site 2. Change in topography and drainage pattern 3. Fugitive dust emission due to blowing of wind 4. Unmanaged dumping. 5. Soil erosion 6. Impact on productivity and fertility of the soil 7. Contamination of surface water bodies due to runoff	1. Sprinkling of water to reduce fugitive dust emission. 2. Material storage under sheds. 3. Separate bins for onsite collection and segregation of domestic waste. 4. Filling of low lying area with construction wastes 5. Constructions of storm water drain	1. Removal of top soil 2. Dust pollution in dry season 3. Contamination of soil/water. 4. Effects on Flora/ Fauna 5. Health effects on workers handling chemical/oil/fuel /paints etc. 6. Health effects on workers near solid waste collection area	1. To maintain quality of soil in vicinity of site 2. Reducing point of contact of hazardous waste if any. 3. Using designated /earmarked areas for refuelling and washing of machinery or storing empty cans of	1. Assistance to gram panchayat regarding usage of Organic Fertilizer that shall be provided to the farmers to increase the productivity and to increase fertility of soil. 2. Concrete flooring for storage of raw materials, waste

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
	from construction site during rain 8. Contamination of Soil. Leaching may affect Ground water quality. 9. Unmanaged disposal of solid waste / Construction waste 10. Solid waste disposal on land may degrade soil.	to divert storm water from flowing over the construction areas. 6. Installation of oil and grease traps in construction workshop. 7. Solid waste was disposed as per Municipal rules.		paints, varnishes etc. 4. Concrete flooring of storage area to prevent leaching. 5. Solid waste generated was given to Municipal Corporation for proper disposal.	materials and products 3. Domestic waste collection and disposal system shall be created.
Air Environment					
1. Site Clearance (removal of shrubs) 2. Soil Excavation 3. Loading and	1. Dust emission during site cleaning 2. Dust and gaseous emission from	1. Water sprinkling on haul road. 2. Only PUC certified vehicles were	Air Pollution at nearby areas. Increase in air pollution due to installation of formaldehyde plant	To reduce Air Pollution in nearby area.	1. Suppression of dust by sprinkling of water by water tankers on

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
Unloading of construction material 4. Operation of DG Sets 5. Transportation of construction materials through Vehicles 6. Operation of construction machineries like Mixer and others 7. Operation of formaldehyde unit	transportation vehicle during construction 3. Dust and gaseous emission from transportation vehicle during operation 4. Emissions from Boiler operations, DG sets and transportation	allowed to enter the site. 6. Material were transported with covered trucks 3. Wheel Wash arrangement was provided. 4. 'Pacca road' inside plant 5. Water sprinkling on 'kaccha road' 6. Bag filter system was provided to Boiler for control of air emissions			'kaccha' road of the nearby villages 2. Plantation and maintenance of trees along the approach road of plant in collaboration with NHAI /Forest Deptt. 3. Regularly checking of Ambient Air Quality (3 stations) at nearby villages (twice in year)

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
Water Environment					
Fresh water requirement 1. Water requirement for Site Preparation and Infrastructure development 2. Water requirement for construction activities 3. Water requirement for domestic use 4. Water requirement during operation of formaldehyde unit	1. Ground water (0.6 KL per sqm.) has been used in various construction activity like dust suppression, RMC Production, Cement Blocks/ Brick Preparation, Plastering etc. 2. Ground water has been used for domestic consumption and during operation of Unit	Curing compounds have been used to reduce the usage of water during construction purpose.	The rain water during construction/Operation phase was neither used for storage/ recharge and wasted completely Tanker water was used during construction and Operation phases	1. Potable drinking water to be provided to nearby villages. 2. Rain water harvesting ponds to be installed in near village	Providing and maintaining water treatment plant in nearby area.
Waste Water	1. Water	1. Mobile	1. Percolation of	1. Preventing	1. Toilet

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
1. Generated due to domestic use 2. Generated during construction activity 3. Waste water generated during operation of unit	Logging & Mosquito breeding 2. Soil Contamination 3. Odour issues 4. Ground water contamination.	toilets provided for labours on the site with soak pit 2. Waste water was treated in neutralization pit during operation of unit 3. Training of staff & labours on the site for proper usage of water through signage	waste water in the soil 2. Runoff during rains will lead to increase in pollutants in surface drains	open defecation in the vicinity of site	construction under Swatch Bharat Mission. After construction the same shall be handed over to Municipal Corporation as Sulabh Shauchalya and will be operated on pay and use model.
Storm Water	1. Increase in Sediment load 2. Contamination of Soil due to run off from	Separate storm water drain to avoiding mixing of plant effluent with storm water	1. Water logging in area leading to breading of mosquito 2. Deterioration	Increasing the ground water recharge in the area	1. Rain Water Harvesting Ponds are proposed for harvesting

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
	construction site.		of the water channel / drain and impact on aquatic life. 3. Reduction in ground water recharge quantum due to coverage of land with impervious materials		the rain water in governmen t schools and panchayat building of nearby villages.
Noise Environment					
1. Movement and operation of construction equipment and construction activity 2. Transportatio n of construction materials in	Noise and vibration Generation and increase in background ambient Noise levels	1. Construction workers working at site were provided with PPEs like ear plugs and ear muffs 2. Construction of boundary wall has	1. Increase in noise levels due to construction activities. 2. Increase in ambient noise levels causing discomfort to nearby locals and fauna.	Providing medical assistance to nearby villages.	1. Audiometr y test for workers and nearby villagers. 2. Distributio n of Hearing Aids hearing impaired Sr. Citizens

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
Trucks and Dumpers 3. Operation of Unit		been made >3m to reduce the level of noise outside the campus 3. PPE were provided to the worker during operation phase			of nearby villages,
Socio- Economic Environment					
1. Occupational Health and Amenities 2. Other social attributes	1. Health of the construction and operational workers 2. Facilities related to hygiene and sanitation 3. Pressure on the existing infrastructure 4. Loss of	1. PPEs were provided to all the construction and operational workers 2. Periodical health examination of workers was done 3. Existing	1. Injuries to labours while working at site 2. Health issues of construction and operational workers 3. Health issues of cattle	1. Organizing g health camps for constructio n and operationa l labourers 2. Provision of medical camp for local domestic animals	1. Organizing health camps for labourers 2. Provision of an medical camp for local domestic animals of nearby villages.

Activity/ Causes of pollution	Probable Impacts	Environmental measures already taken	Damage Assessment	Remediation plan proposed	Remediation Measures
	livelihood	Medical Establishment in the area are adequate			
Biological Environment					
Habitat Fragmentation and other ecological attributes	1. Key species likely to be disturbed. 2. Loss of herbs and shrubs	Nil	1. Habitat disturbance 2. Health problems to cattle	1. Landscape plan to improve vegetation cover in the area	1. Tree plantation

13.6 NATURAL & COMMUNITY RESOURCES AUGMENTATION PLAN (NCRAP)

13.6.1 Introduction

A need assessment survey was carried out for the purpose to formulate the Natural and community resources augmentation plan. The need assessment survey covered the 10 Km radius study area of plant site. The augmentation plan will be multi fold in nature and will be in conjunction with the damage assessment as stated earlier.

Activities for the augmentation plan can be classified in major categories as under:

A. Natural Resource Augmentation Plan

B. Community Augmentation Plan

Activities proposed for Natural Resource Augmentation Plan

- Creation of drainage & Repair of culverts and embankments in villages
- Road repair & maintenance
- Creation of Cow shed in villages
- Plantation in common areas of nearby villages
- Additional awareness programs on Environmental protection

Activities proposed for Natural Resource Augmentation Plan

- Infrastructure development for training of youth
- Entrepreneurial development program aiming make in India
- Provision of solar panel lighting in common areas of villages
- Supply of Agriculture water pump sets for locals

13.7 CONCLUSION

M/s Pahwa Plastics Pvt. Ltd. aims to compensate for whatever minimal damages identified due to the plant's construction and operation of the plant, by way of a dedicated Natural & Community resource augmentation plan with an earmarked budget and defined timeframe for implementation of the same.

Through the summary of budgetary allocation with respect to violation activity and remediation measures suggested/recommended, natural and community resource augmentation plan, the impact on the environment and its relative damages are very low.

As far as the impacts due to the future operation of the plant are concerned, the cumulative impact of implementation of the latest State-of-the-art technologies in the plant will bring an overall improvement in the environmental quality of the area.

1097401/2021/Estt.Br

Annexure-1

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Vardan Environet, Gurugram

Plot No. 82-A, Sector 5, IMT Manesar, Gurugram, Haryana

Accredited as Category - A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA-EMP reports in the following Sectors:

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including open cast/ underground mining	1	1 (a) (i)	A
2	Offshore & Onshore Oil and gas exploration, development & production	2	1 (b)	A
3	River Valley projects	3	1 (c)	A
4	Mineral beneficiation	7	2 (b)	A
5	Metallurgical industries (ferrous & nonferrous)- both primary & secondary	8	3 (a)	A
6	Coke oven plants	11	4 (b)	A
7	Petrochemical based processing	20	5 (e)	B
8	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
9	Distilleries	22	5 (g)	A
10	Sugar Industry	25	5 (j)	B
11	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	27	6 (a)	A
12	Highways	34	7 (f)	A
13	Building and construction projects	38	8 (a)	B
14	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 Feb 28, 2020 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions as per the Scheme. The accreditation needs to be renewed before the expiry date by Vardan Environet, Gurugram following due process of assessment.

Sd/-
Sr. Director, NABET
Dated: June 17, 2020

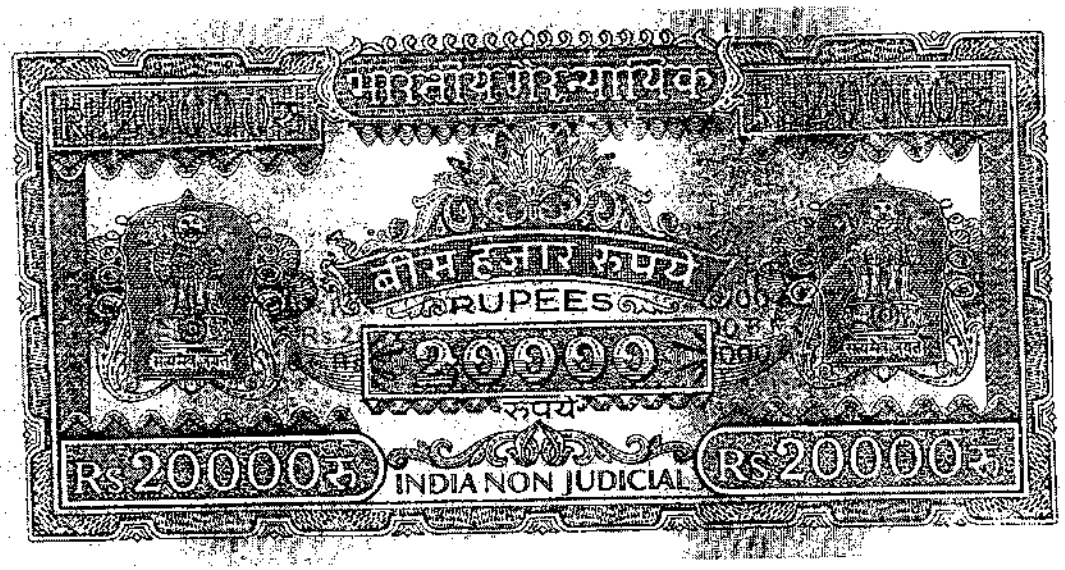
Certificate No.
NABET/EIA/1922/RA 0166

Valid till
Nov 06, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website

1097401/2021/Estt.Br

Annexure 2



हरियाणा HARYANA

386479

इकरारनामा अराजी बदले मुबलिग 14, 10,000/-रुपये स्टाम्प मु0 70,500/-रुपये किते 5 नं 688 दिनांक 06/12/2013 उपजाजाना रादौर। मिक्रित भूमि 4कनाल 12मरले वाकेा वाका मौजा जलाना-04 सब तहसील रादौर तह0 जगाधरी जिला यमुनानगर लेकर रजि0 असर मु0 14, 10,000/-रुपये बस्ती मैसेजरस बैंक नं 000444 दिनांक 5/12/2013 एच डी एफ सी बैंक सरस्वती विहार पीतम पुरा नई दिल्ली-110034

1. कलैक्टर रेट	23,00,000/-रुपये प्रति एकड़
2. जायदाद का सही वाका	गाम जलाना-04
3. मुन्तकिला रकबा	4कनाल 12मरले
4. जायदाद की किस्म	वाही
5. जायदाद रिहायशी/कमर्शियल/वृक्षी	वृक्षी
6. जायदाद की किस्म अनुसार कलैक्टर रेट	23,00,000/-रुपये प्रति एकड़
7. भूमि पर मिमारी इमारे तुलना व कर्ब	रकबा खाली है।
8. जायदाद की कलैक्टर रेट अनुसार कीमत:	13, 22,500/-रुपये
9. इस वसीका पर अदा की गई स्टाम्प ड्यूटी:	70,500/-रुपये
10. जायदाद प्रार्डम लेकर है या नही	हाँ
11. जायदाद अन्दर झूठ कैसटी है या नही	नही

मैसर्ज यूनिक इन्टरप्राईजिज 514-एल मॉडल टाउन यमुनानगर बजरिया हितेंद्र राम श्री संजीव गुप्तापुत्र श्री हरिराम गुप्ता नि0 514-एल मॉडल टाउन यमुनानगर व राजीव गुप्ता पुत्र श्री अभिनंद कुमार गुप्ता निवासी 180 मॉडल टाउन यमुनानगर के है। जो कि अराजी मुन्तजा खेवट नं 683 मिन खतौनी नं 835 मिन खसरा नं 10//7/1 रकबा 4कनाल 12मरले इकरा पेश हो कर

1. यूनिक इन्टरप्राईजिज बजरिया संजीव गुप्ता-राजीव गुप्ता हितेंद्र राम

For UNIQUE ENTERPRISES

Sanjiv Gupta

Partner

For PANWA PLASTICS PVT. LTD.

Director/Authorised Signatory

1097401/2021/Estt.Br

Annexure 2

बही नं. 1957 06/12/2013

संपत्ति विवरण

संपत्ति का नाम SALE OUTSIDE MC AREA

तहसील/जिला/उपजिला सदर गांव/शहर उदयाना स्थित [illegible] रोड पर

भवन की विवरण

भूमि का विवरण

चतुर्दिक 4 Kanal 12 Marla

धन संबंधी विवरण

राशि 1,41,0,000.00 रुपये [illegible] 12.10 रुपये

स्टाम्प की राशि 70,500.00 रुपये रजिस्ट्रेशन फीस की राशि 10,000.00 रुपये अतिरिक्त शुल्क 5.00 रुपये

रूपये

Drafted By: Parveen Kumar

यह प्रलेख आज दिनांक 06/12/2013 दिन शुक्रवार समय 4:18:00 PM बजे [illegible] निवासी 514-L, Model Town, Fazilka द्वारा पेश किया गया [illegible] प्रस्तुत किया।

हस्ताक्षर प्रस्तुतकर्ता

उप/सहायक पंजीयन अधिकारी
गदौर

[illegible] Other संबंधित गुप्ता हिस्सेदार(OTHER), मेसर्स पुनिक इन्टरप्राईज का पेश किया गया, हिस्सेदार(OTHER)

[illegible] निवासी श्री/श्रीमती/कुमारी व्यक्ति पेशकर्ता उपस्थित पेश हाजिर है। प्रस्तुत प्रलेख के तथ्यों को पेश [illegible] सुनकर तथा अवलोकन स्वीकार किया। प्रलेख के अनुसार 1,410,000.00 रुपये की राशि पेश ने मेरे [illegible] निष्पादन तथा की तथ्य प्रलेख में वर्णित अग्रिम अदा की गई राशि के लेन देन को स्वीकार किया।

[illegible] पक्षों की पहचान श्री/श्रीमती/कुमारी [illegible] सिंह कार्यपालक सहायक पुत्र/पुत्री/पत्नी श्री/श्रीमती/कुमारी निवासी उदयाना [illegible] श्री/श्रीमती/कुमारी [illegible] पुत्र/पुत्री/पत्नी श्री/श्रीमती/कुमारी पेशा [illegible] निवासी गदौर [illegible] से की [illegible] को स्वयं हकदार/अधिवक्ता के रूप में जानते है तथा यह प्रलेख नं:2 की [illegible] करता है।

दिनांक 06/12/2013

उप/सहायक पंजीयन अधिकारी
गदौर

1097401/2021/Estt.Br

Annexure 2

हरियाणा HARYANA /2/ 386480

वाकिा मौजा जगेलाना-04 सब तहसील रादौर तहसील जगाधरी जिला यमुनानगर बल्ये पर्ट जमाबन्दी साल 2008-09 व बल्ये इन्तकाल बैय नं 7160 मजूरशुदा मेरी हकीयत मकीयत व मकबूजा बिला भार रहन आदि के है। जो कि हर प्रकार के झगड़े मुकदमा से पाक व साफ है। जिसको मुझे हर प्रकार से मुन्तकिल करने का पूर्ण हक व अधिकार है। अब बरयेे तरक्की कारोबार व खरीद दोगर जायदाद मुझे बाया को रुपया की आवश्यकता है। अब मैने अपनी खुशी व रजामन्दी से अपनी उपरोक्त 4 कनाल 12मरले भूमि सहित तमाम हकूक रास्ता आमदोरफ्त व खाल डोल मोहर बोरा बदले इवलिग 14, 10,000/-रुपये चौदह लाख दस हजार रुपये। प्रति किले 7,05,000/-रुपये होते है मैं पास मैसर्ज पाहवा प्लास्टिक्स प्रा0 लि0 गांव खरावर तहसील सोनीपत जिला रोहतक बजरिया डायरेक्टर श्री नरेन्द्र पाहवा पुत्र श्री रामकिशन पाहवा निवासी सी-344 सरस्वती विहार पीतम पुरा नई दिल्ली-110034 कतई तौर से विक्रय कर दी है और खरीददारा से मुकम्मल विक्रय मूल्य मु0 14, 10,000/-रुपये बजरिये चैक नं 000444 दिनांक 5/12/13 एच डी एफ सी बैंक सरस्वती विहार प्रीतम पुरा नई दिल्ली 110034 बवक्त तसदीक रजि0 बैनामा सामने रजि0 अफसर प्राप्त करूंगा। मजोद हुई लेना बाकी नही रहेगा। कब्जा व दखल विक्रित भूमि का मौका पर हवाला खरीद दारा करा दिया है। इन्तकाल बैय खरीददारा के नाम तहरीर व तसदीक करा दूंगा या खरीददारा खुद करा लेवे मुझे बाया को किसी किस्म का एतराज नही होगा।

मैसर्स इन्टरनेशनल इन्टरप्राइजेज बजरिया सजीव गुप्ता-राजीव गुप्ता इश्तिहारान

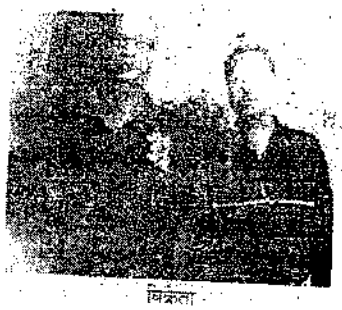
For UNIVERSAL ENTERPRISES

Partner

1097401/2021/Estt.Br

Annexure 2

Reg. No.	Reg. Year	Book No.
1,057	2013-2014	1



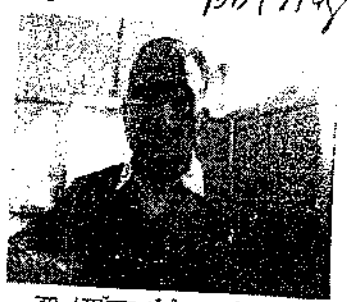
विक्रेता

क्रेता

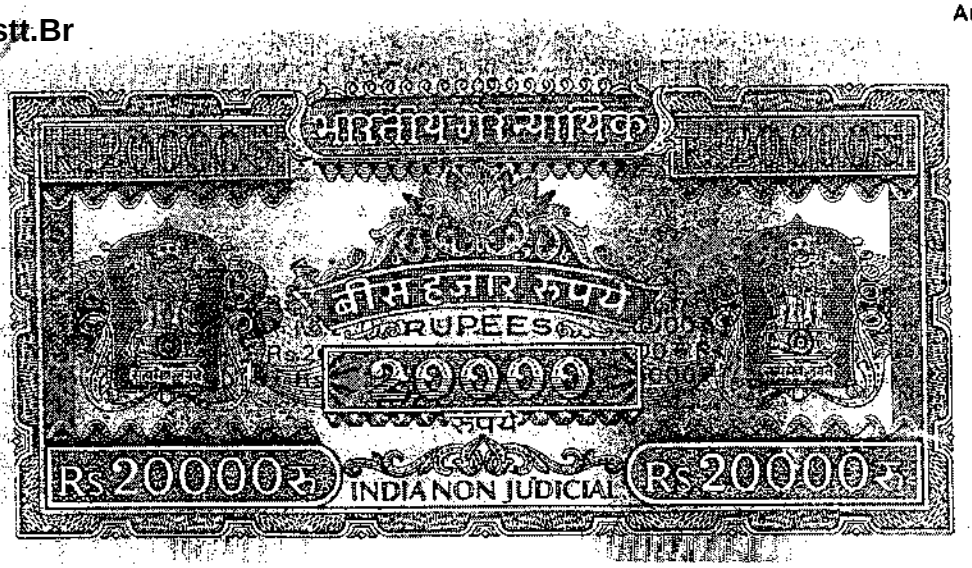
गवाह

For PAHWA PLASTICS PVT. LTD.

Director



उप / सयुंक्त पंजीयन अधिकारी



हरियाणा HARYANA /31 386481

हर प्रकार की तुरंत मलकीयत का मै बायां जिम्मेवार हुंगा। यदि किसी तुरंत मलकीयत के कारण खरीददार से लिखित भूमि का कब्जा व दखल निकल जावे तो खरीददार को हर प्रकार की क्षति पूर्ति मय हर्जा खर्चा व नुकसान सहित वापसी विक्रय मूल्य की देनदार व्यक्तिगत मुझ बायां की जात जाति व दीगर जायदाद व वारसान होवेंगे। अब मेरा या मेरे किसी वारसान का लिखित भूमि से कोई तालुक या वास्ता किसी किस्म का ना रहा है और नाही आईन्दा होगा। रजि० बैनामा पर तालिम अर्था खरीददार ने कुब्ज किया है और लिखित भूमि पर कोई स्टे/मुकदमा नहीं है।

लिहाजा रजि० बैनामा हजा ठीक सुन व समझ कर बिना किसी दबाव अथवा प्रभाव के अपने मर्जी से लिखवा दिया है कि समय पर काम आवे लिखित

दिनांक:- 06/12/2013

लेखक:-पूर्वेश कुमार वकील नवीस रादौर क्रमांक:-572 दिनांक:-06/12/2013

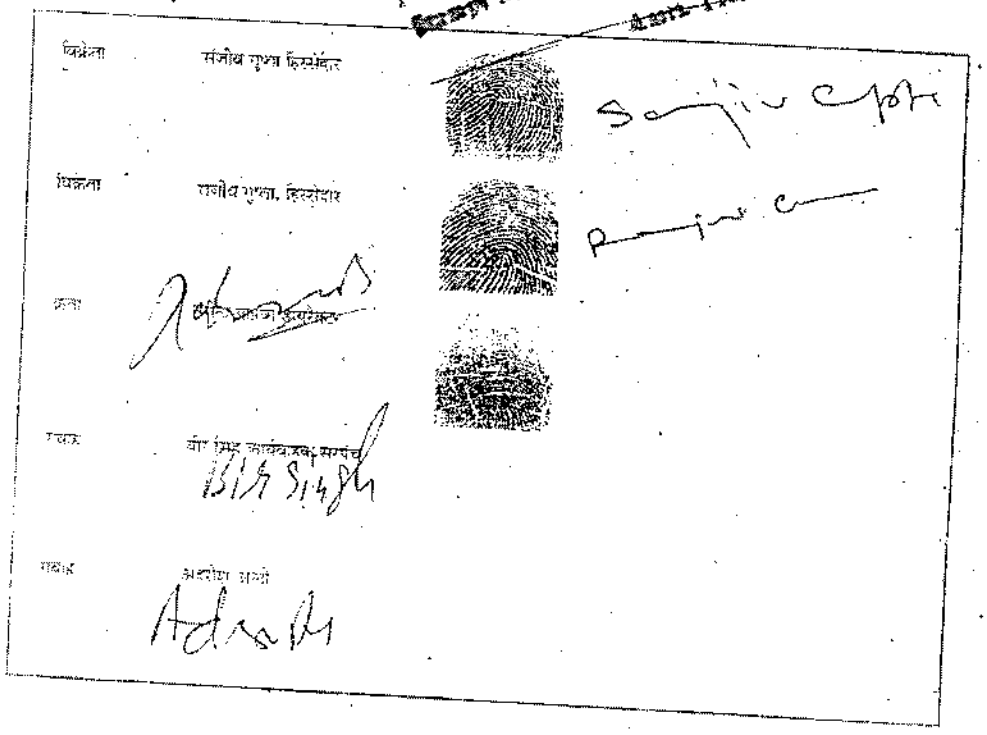
तथा:- मै० निक इन्फ्रा० बजरिया, खरीददार, तथा:-अदरीजा अलीपुत्र तजीव गुप्ता-राजीवगुप्ता हिस्सेदारान होल्डिंग मै० निक इन्फ्रा० डेवलपर्स

For Nik Infraprojects Developers

Partner

572
6/12/13

Reg. No.	Reg. Year	Book No.
1097401/2021/Estt.Br 1,957	2013-2014	1



प्रमाण-पत्र

प्रमाणित किया जाता है कि यह प्लेख क्रमांक 1,957 आज दिनांक 06/12/2013 को बही नं: 1 जिल्द नं: 73 के पृष्ठ नं: 129 पर फोटोस्टेट किया गया तथा इसकी एक प्रति अतिरिक्त बही संख्या 1 जिल्द नं: 1,368 के पृष्ठ संख्या 28 से 30 पर चिपकाई गयी। यह भी प्रमाणित किया जाता है कि इस दस्तावेज के प्रस्तुतकर्ता और गवाहों ने अपने हस्ताक्षर/निशान अंगुठा मेरे सामने किये है।

दिनांक 06/12/2013

उप/सयुंक्त पंजीयन अधिकारी
रादौर

1097401/2021/Estt.Br

Annexure 2

— 1 —

06AA 136261

Sanjiv Gupta
For Dir
Partner

हरियाणा HARYANA

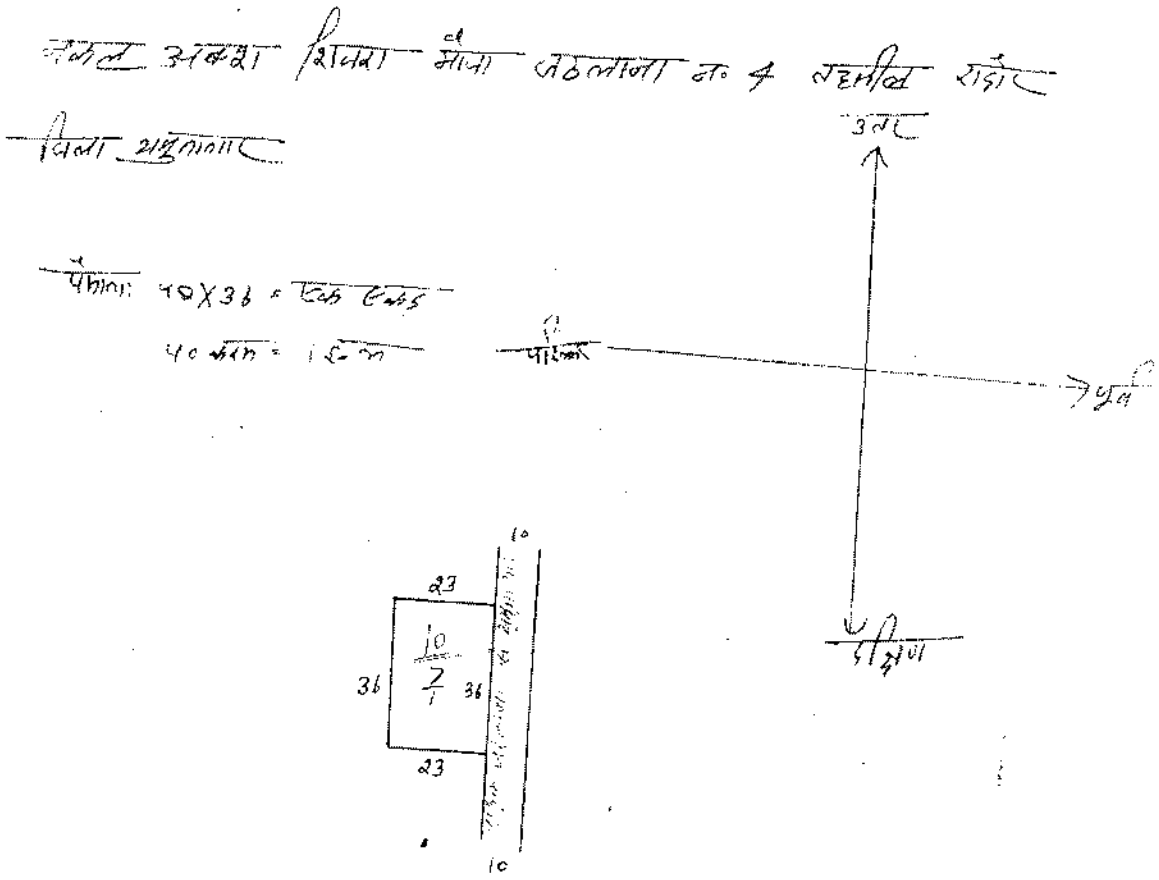
B 234087

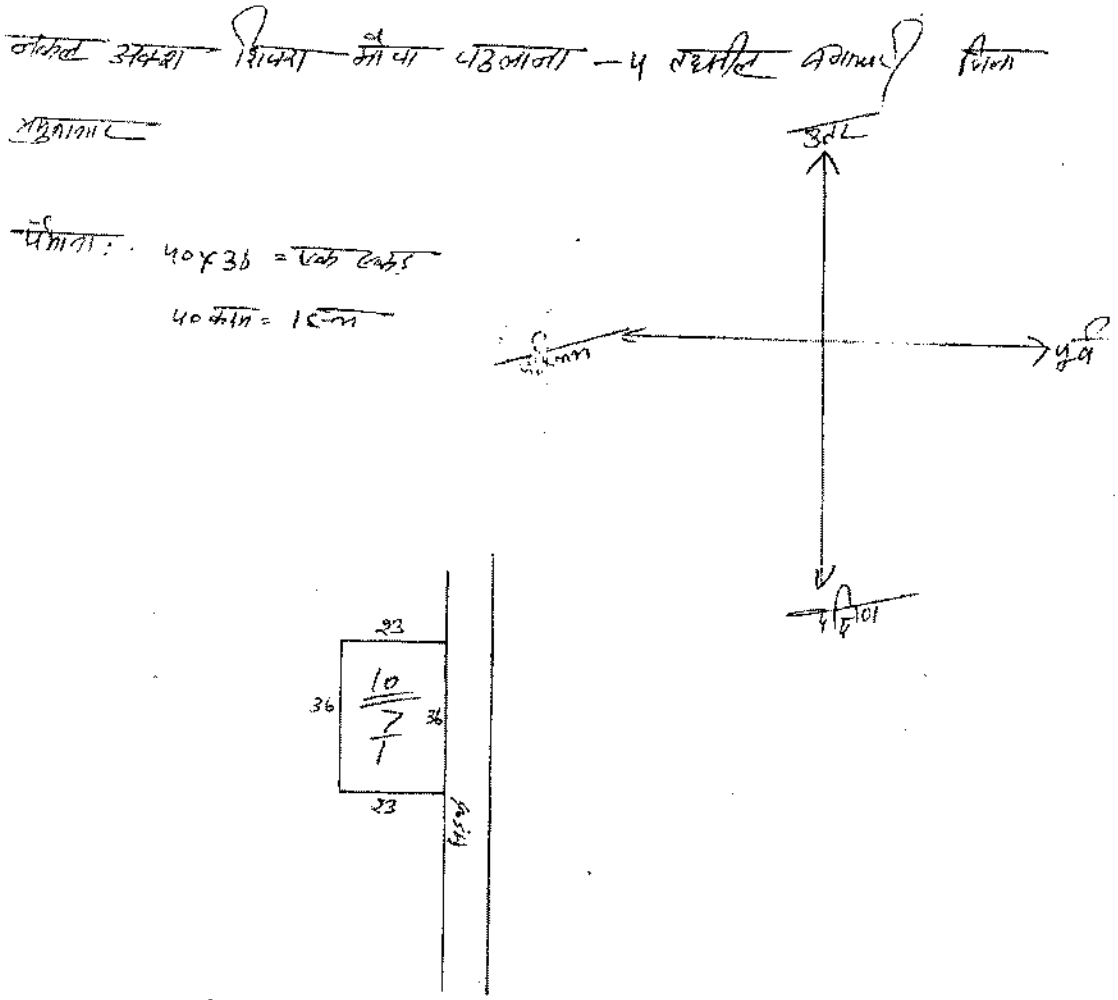
For UNIQUE ENTERPRISES

Partner

1097401/2021/Estt.Br

Annexure 2




उत्तर
पश्चिम
पूर्व
दक्षिण
23
10
36
7
1
36
23

1097401/2021/Estt.Br

Annexure 3

OFFICE OF DISTRICT TOWN PLANNER, YAMUNA NAGAR ☎ 01732-237885(O)
email:- dtp.yamunanagar.tcp@gmail.com

Memo no. 591 DTP(Y)
Dated: 7-4-14

To

M/s Pahwa Plastics Pvt. Ltd.
Through Director Sh. Narinder Pahwa S/o Sh. Ram Kishan Pahwa,
R/o C-344, Saraswati Vihar, Pitam Pura,
New Delhi-110034.

Subject:- Issuing of NOC for setting up a unit for making Formaldehyde at Village Jathlana, Sub-Tehsil Radaur, Tehsil Jagadhri, Distt. Yamuna Nagar.

Reference:- Your application no. nil dated 31-03-2014.

It is intimated that the land having Khewat no. 683min, Khatoni no., 835min, khasra no 10//7/1 measuring 4K-12M situated in the revenue estate of village Jathlana, HB no. 4, Sub-Tehsil Radaur, Tehsil Jagadhri, Distt. Yamuna Nagar does not fall in any of the urban area or controlled area declared by Department of Town and Country Planning, Haryana. This information is given subject to the following conditions.

1. That it does not provide any immunity to the site from other Acts and Rules as may be applicable on it.
2. That it will abide by the provisions of controlled areas Act 1963, when it comes into force at site.
3. That it will abide by the provisions of NBC/BIS code for any type of construction at site.
4. That in case of non fulfillment of the above, this letter shall stand cancelled automatically.

District Town Planner,
Yamuna Nagar.

Attested
District Town Planner
Yamuna Nagar

1097401/2021/Estt.Br

Annexure 4

Given by APHO

HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA

Website – www.hspcb.gov.in E-Mail - hspcb.pkl@sify mail.com
Telephone No. – 0172-2577870-73

No. HSPCB/Consent/ : 2846616YAMCTE3087415 Dated:02/06/2016

To

M/s : PAHWA PLASTICS PVT LTD
JATHLANA
YAMUNANAGAR
135133

Sub. : Issue of Consent to Establish from pollution angle .

Please refer to your Consent to Establish application received in this office on the subject noted above.Under the Authority of the Haryana State Pollution Control Board vide its agenda Item No. 47.8 dated 28.04.83 sanction to the issue of "Consent to Establish" with respect to pollution control of Water and Air is hereby accorded to the unit PAHWA PLASTICS PVT LTD. for manufacturing of FORMALDHEYDE, with the following terms and conditions:-

1. The industry has declared that the quantity of effluent shall be 45 KL/Day i.e 0KL/Day for Trade Effluent, 44 KL/Day for Cooling, 1 KL/Day for Domestic and the same should not exceed .

2. The above "Consent to Establisn" is valid for 60 months from the date of its issue to be extended for another one year at the discretion of the Board or till the time the unit starts its trial production whichever is earlier. The unit will have to set up the plant and obtain consent during this period.

3. The officer/official of the Board shall have the right to access and inspection of the industry in connection with the various processes and the treatment facilities being provided simultaneously with the construction of building/machinery. The effluent should conform the effluent standards as applicable

4. That necessary arrangement shall be made by the industry for the control of Air Pollution before commissioning the plant. The emitted pollutants will meet the emission and other standards as laid/will be prescribed by the Board from time to time.

5. The applicant will obtain consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21/22 of the Air (Prevention & Control of Pollution) Act,1981 as amended to-date-even before starting trial production

6. The above Consent to Establish is further subject to the conditions that the unit complies with all the laws/rules/decisions and competent directions of the Board/Government and its functionaries in all respects before commissioning of the operation and during its actual working strictly.

7. No in-process or post-process objectionable emission or the effluent will be allowed, if the scheme furnished by the unit turns out to be defective in any actual experience

8. The Electricity Department will give only temporary connection and permanent connection to the unit will be given after verifying the consent granted by the Board, both under Water Act and Air Act.

9. Unit will raise the stack height of DG Set/Boiler as per Board's norms.

10. Unit will maintain proper logbook of Water meter/sub meter before/after commissioning.

11. That in the case of an industry or any other process the activity is located in an area approved and that in case the activity is sited in an residential or institutional or commercial or agricultural area, the necessary permission for siting such industry and process in an residential or institutional or commercial or agricultural area or controlled area under Town and Country Planning laws CLU or Municipal laws has to be obtained from the competent Authority in law permitting this deviation and be submitted in original with the request for consent to operate.

12. That there is no discharge directly or indirectly from the unit or the process into any interstate river or Yamuna River or River Ghaggar.

13. That the industry or the unit concerned is not sited within any prohibited distances according to the Environmental Laws and Rules, Notification, Orders and Policies of Central Pollution control Board and Haryana State Pollution Control Board.

14. That of the unit is discharging its sewage or trade effluent into the public sewer meant to receive trade effluent from industries etc. then the permission of the Competent Authority owing and operating such public sewer giving permission letter to his unit shall be submitted at time of consent to operate.

15. That if at any time, there is adverse report from any adjoining neighbor or any other aggrieved party or Municipal Committee or Zila Parishad or any other public body against the unit's pollution; the Consent to Establish so granted shall be revoked.

16. That all the financial dues required under the rules and policies of the Board have been deposited in full by the unit for this Consent to Establish.

17. In case of change of name from previous Consent to Establish granted, fresh Consent to Establish fee shall be levied.

18. Industry should adopt water conservation measures to ensure minimum consumption of water in their Process. Ground water based proposals of new industries should get clearance from Central Ground Water Authority for scientific development of previous resource.

19. That the unit will take all other clearances from concerned agencies, whenever required.

20. That the unit will not change its process without the prior permission of the Board.

21 That the Consent to Establish so granted will be invalid, if the unit falls in Aravali Area or non conforming area.

22. That the unit will comply with the Hazardous Waste Management Rules and will also make the non-leachate pit for storage of Hazardous waste and will undertake not to dispose off the same except for pit in their own premises or with the authorized disposal authority.

23. That the unit will submit an undertaking that it will comply with all the specific and general conditions as imposed in the above Consent to Establish within 30 days failing which Consent to Establish will be revoked.

24. That unit will obtain EIA from MoEF, if required at any stage.

25. In case of unit does not comply with the above conditions within the stipulated period, Consent to Establish will be revoked.

Specific Conditions

1 Unit will construct the proper septic tank as per Bureau of Indian standards.

2 Green belt of adequate width shall be provided by the unit.

Other Conditions :

Unit will obtain prior CTO before operation of plant & machinery.

Sanjeev Kumar
Digitally signed by Sanjeev Kumar
Date: 2016.06.07 23:42:20 +05:30

Regional Officer, HQ

Annexure 5

HARYANA STATE POLLUTION CONTROL BOARD

SCO-131 Sector-17, HUDA
Jagadhari Ph.01732-200137
E-mail: hspcb.pkl@sify.com

No. HSPCB/Consent/ : 2846618YAMCTO3098246 Dated:26/03/2018

To.

M/s :PAHWA PLASTICS PVT LTD
JATHLANA

Subject: Grant of consent to operate to M/s PAHWA PLASTICS PVT LTD.

Please refer to your application no. 3098246 received on dated 2018-02-08 in regional office Yamuna Nagar. With reference to your above application for consent to operate, M/s PAHWA PLASTICS PVT LTD is here by granted consent as per following specification/Terms and conditions.

Consent Under	BOTH
Period of consent	08/02/2018 - 31/03/2022
Industry Type	Urea formaldehyde manufacturing units
Category	ORANGE
Investment(In Lakh)	95.8700027
Total Land Area(Sq. meter)	0.0
Total Builtup Area(Sq. meter)	0.0
Quantity of effluent	
1. Trade	0.0 KL/Day
2. Domestic	1.0 KL/Day
Number of outlets	1.0
Mode of discharge	
1. Domestic	Septic tank
2. Trade	00
Domestic Effluent Parameters	
1. NA	
Trade Effluent Parameters	
1. NA	
Number of stacks	1
Height of stack	
1. Stack	32 Meter
Emission parameters	
1. SPM	1200 mg/m3
Product Details	
1. FORMALDEHYDE	60 Metric Tonnes/day
Capacity of boiler	

Annexure 5

1. Boiler	0.3 Ton/hr
Type of Furnace	
1. NA	
Type of Fuel	
1. Wood	50 KG/day
Raw Material Details	
METHANOL	28 Metric Tonnes/Day

RAJINDER SHARMA
Digitally signed by RAJINDER SHARMA
Date: 2018.03.26 18:09:32 +05'30'

Regional Officer, Yamuna Nagar

Haryana State Pollution Control Board

Terms and conditions

1. The applicants shall maintain good house keeping both within factory and in the premises. All hose pipelines values, storage tanks etc. shall be leak proof. In plant allowable pollutants levels, if specified by State Board should be met strictly.
2. The applicant/company shall comply with and carry out directive/orders issued by the Board in this consent order at all subsequent times without negligence of his /its part. The applicant/company shall be liable for such legal action against him as per provision of the law/act in case of violation of any order/directives. Issued at any time and or non compliance of the terms and conditions of his consent order.
3. The applicant shall make an application for grant of consent at least 90 days before the date of expiry of this consent.
4. Necessary fee as prescribed for obtaining renewal consent shall be paid by the applicant alongwith the consent application.
5. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above required variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard vary all or such condition and there upon the applicant shall be bound to comply with the conditions so varied.
6. The industry shall provide adequate arrangement for fighting the accidental leakages, discharge of any pollutants gas/liquids from the vessels, mechanical equipment etc. which are likely to cause environment pollution.
7. The industry shall comply noise pollution (Regulation and control) Rules, 2000.
8. The industry shall comply all the direction/Rules/Instructions as may be issued by the MOEF/CPCB/HSPCB from time to time.
9. The industry shall ensure that various characteristics of the effluents remain within the tolerance limits as specified in EPA Standard and as amended from time to time and at no time the concentration of any characteristics should exceed these limits for discharge.
10. The industry would immediately submit the revised application to the Board in the event of any change in the raw material in process, mode of treatment/discharge of effluent. In case of change of process at any stage during the consent period, the industry shall submit fresh consent application alongwith the consent to operate fee, if found due, which may be on any account and that shall be paid by the industry and the industry would immediately submit the consent application to the Board in the event of any change during the year in the raw material, quantity, quality of the effluent, mode of discharge, treatment facilities etc.

11. The officer/official of the Board shall reserve the right to access for the inspection of the industry in connection with the various process and the treatment facilities. The consent to operate is subject to review by the Board at any time.
12. Permissible limits for any pollutants mentioned in the consent to operate order should not exceed the concentration permitted in the effluent by the Board.
13. The industry shall pay the balance fee, in case it is found due from the industry at any time later on.
14. If the industry fails to adhere to any of the conditions of this consent to operate order, the consent to operate so granted shall automatically lapse.
15. If the industry is closed temporarily at its own, they shall inform the Board and obtain permission before restart of the unit.
16. The industry shall comply all the Directions/ Rules/Instructions issued from time to time by the Board.

Specific Conditions :

1. That the unit will submit the analysis report from the Board lab within one month from the date of issue of first consent to operate.
2. That the unit will run and maintain the APCM.
3. That the unit will apply for renewal of consent to operate before 90 days from the expiry of this CTO.
4. Unit will not discharge any kind of effluent outside the premisis of the Unit.

RAJINDER SHARMA
Digitally signed by RAJINDER SHARMA
Date: 2018.03.26 18:10:29 +05'30'

Regional Officer, Yamuna Nagar
Haryana State Pollution Control Board

1097401/2021/Estt.Br

Annexure 5

HARYANA STATE POLLUTION CONTROL BOARD

SCO-131 Sector-17, HUDA Jagadhari Ph.01732-200137 Email:- hspcbroyr@gmail.com
E-mail: hspcb@hry.nic.in

No. HSPCB/Consent/ : 313096621YAMCTO10961479 Dated:08/04/2021

To.

M/s :PAHWA PLASTICS PVT LTD
JATHLANA

Subject: Grant of consent to operate to M/s PAHWA PLASTICS PVT LTD.

Please refer to your application no. 10961479 received on dated 2021-03-30 in regional office Yamuna Nagar.With reference to your above application for consent to operate,M/s PAHWA PLASTICS PVT LTD is here by granted consent as per following specification/Terms and conditions.

Consent Under	BOTH
Period of consent	08/04/2021 - 10/05/2021
Industry Type	Organic Chemicals manufacturing
Category	RED
Investment(In Lakh)	112.93
Total Land Area(Sq. meter)	2320.0
Total Builtup Area(Sq. meter)	1000.0
Quantity of effluent	
1. Trade	0.0 KL/Day
2. Domestic	0.5 KL/Day
Number of outlets	1.0
Mode of discharge	
1. Domestic	septic tank
2. Trade	
Domestic Effluent Parameters	
1. NA	
Trade Effluent Parameters	
1. NA	
Number of stacks	1
Height of stack	
1. stack	15 M
Emission parameters	
1. SPM	1200 mg/m3
Product Details	
1. FORMALDEHYDE	150 Metric Tonnes/day
Capacity of boiler	

Annexure 5

1. baby boiler	Ton/hr
Type of Furnace	
1. NA	
Type of Fuel	
1. Electricity	KL/day
Raw Material Details	
METHANOL	70 Metric Tonnes/Day

Regional Officer, Yamuna Nagar
Haryana State Pollution Control Board.

Terms and conditions

1. The applicants shall maintain good house keeping both within factory and in the premises. All hose pipelines values, storage tanks etc. shall be leak proof. In plant allowable pollutants levels, if specified by State Board should be met strictly.
2. The applicant/company shall comply with and carry out directive/orders issued by the Board in this consent order at all subsequent times without negligence of his /its part. The applicant/company shall be liable for such legal action against him as per provision of the law/act in case of violation of any order/directives. Issued at any time and or non compliance of the terms and conditions of his consent order.
3. The applicant shall make an application for grant of consent at least 90 days before the date of expiry of this consent.
4. Necessary fee as prescribed for obtaining renewal consent shall be paid by the applicant alongwith the consent application.
5. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above required variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard vary all or such condition and there upon the applicant shall be bound to comply with the conditions so varied.
6. The industry shall provide adequate arrangement for fighting the accidental leakages, discharge of any pollutants gas/liquids from the vessels, mechanical equipment etc. which are likely to cause environment pollution.
7. The industry shall comply noise pollution (Regulation and control) Rules, 2000.
8. The industry shall comply all the direction/Rules/Instructions as may be issued by the MOEF/CPCB/HSPCB from time to time.
9. The industry shall ensure that various characteristics of the effluents remain within the tolerance limits as specified in EPA Standard and as amended from time to time and at no time the concentration of any characteristics should exceed these limits for discharge.
10. The industry would immediately submit the revised application to the Board in the event of any change in the raw material in process, mode of treatment/discharge of effluent. In case of change of process at any stage during the consent period, the industry shall submit fresh consent application alongwith the consent to operate fee, if found due, which may be on any account and that shall be paid by the industry and the industry would immediately submit the consent application to the Board in the event of any change during the year in the raw material, quantity, quality of the effluent, mode of discharge, treatment facilities etc.

11. The officer/official of the Board shall reserve the right to access for the inspection of the industry in connection with the various process and the treatment facilities. The consent to operate is subject to review by the Board at any time.
12. Permissible limits for any pollutants mentioned in the consent to operate order should not exceed the concentration permitted in the effluent by the Board.
13. The industry shall pay the balance fee, in case it is found due from the industry at any time later on.
14. If the industry fails to adhere to any of the conditions of this consent to operate order, the consent to operate so granted shall automatically lapse.
15. If the industry is closed temporarily at its own, they shall inform the Board and obtain permission before restart of the unit.
16. The industry shall comply all the Directions/ Rules/Instructions issued from time to time by the Board.

Specific Conditions :

1. That Unit will comply with the various provisions of Water Act 1974, Air Act 1981 and Environment Protection Act 1986 and the various directions conveyed by the HSPCB from time to time.
2. That Unit will be bound to closed the operation of their unit before or on 10.05.2021 if unit failed to obtain the Environment Clearance as per requirement of Environment Impact Assessment Notification dated 14 September 2006, before 10.05.2021 or orders dated 11.11.2020 issued by the Govt. withdrawn or cancelled or any adverse directions issued by the Hon'ble NGT or any other Court of Law.
3. That the Haryana State Pollution Control Board shall be at liberty to issue closure orders against the Unit under Water Act and Air Act, any time during such period of consent.
4. That the Environment and Climate Change Deptt. Govt. of Haryana shall be at liberty to review the orders dated 11.11.2020 and closure directions issued against the Unit under Environment Protection Act 1986.
5. Unit will submit the analysis report within 30 days from the date of issuance of CTO or start of operation.
6. The CTO so granted is only to comply with the Govt. orders dated 10.11.2020/11.11.2020 and nowhere change in the stand of board that unit has been established and in operation in gross violation of EIA Notification 2006 and unit will remain liable for closure action once the relaxation period granted by Govt. expires on 10.05.2021 and legal action as per provisions of EP Act 1986 and Environmental Compensation as per policy of the Board.

Regional Officer, Yamuna Nagar
Haryana State Pollution Control Board.

1097401/2021/Estt.Br

Annexure 6

Government of Haryana

Haryana Water Resources Authority

Applications for Issue of Permission to Extract Ground Water

Application for Permission to Extract Ground Water for Industrial Use

Application No: 30-3/20655/1/HR/IND/2021

I. **General Information:**

Application Type Category/ Type of Application:

(i)	**Name of Applicant:**	CHANDAN PAHWA
(II)	**Designation of Applicant:**	DIRECTOR
(iii)	**Name of Industry:**	PAHWA PLASTICS PRIVATE LIMITED
(iv)	**Registration number of Industry:**	HWRA10020655
(v)	**Location Details of the Industrial Unit**	
	State:	Haryana
	District:	YAMUNANAGAR
	Sub-Division/Tehsil	Radaur
	Block/Mandal	RADAUR
	Village/Town:	Jathlana
(vi)	**Correspondence Address**	
	Complete Postal Address	VILLAGE JATHLANA DISTT. YAMUNA NAGAR
	Mobile Number:	7454022222
	E-Mail of Industry:	FORMALIN.YNR@PAHWAPLASTICS.COM
(vii)	**Salient Features of the Industrial Activity:**	
	Type of Industry	Chemical
	Groundwater utilization for	Unknown
	Date of commencement	
	Description	MANUFACTURING OF FORMALDEHYDE
(viii)	**Land use details of the existing/proposed Industrial unit premises**	
	Ownership of the land(Enclose documents of ownership)	Download
	Location Map	Download
	Total Land area(in sq m)	2826.00
	Rooftop area of buildings/sheds(in sq m)	150.00
	Road/paved area(in sq m)	0.00
	Green belt area(In sq m)	506.00
	Open Land (in sq m)	2170.00
	Source of availability of surface water for Industrial use, if any	No

Annexure 6

Townships/villages within 2 km radius of the Industrial unit	No
Source of recycled water	ETP/STP

2) **Detail of water requirement/ recycled water usage : (Please enclose flow chart of activities and requirement of water at each stage)**

Flow Chart of activities and requirement of water	Download
Quality of groundwater	Fresh Water
Name of NABL(Under Valid Certificate)	HARYANA TEST HOUSE
Upload test report of groundwater quality from NABL accredited lab	Download
Total water required(in m3/day)	90.00
Ground Water required(in m3/day)	90.00
Recycled Water usage(in m3/day)	0.00
Proposed/existing water supply from any agency(in m3/day)	0.00

(ii) Breakup of Water Requirement and Uasage:

Activity	Existing Requirement (m3/day)	Proposed Requirement (m3/day)	Total Requirement (m3/day)	No. of Operational Days in a Year	Annual Requirement (m3/year)
Industrial Activity	85.00	0.00	85.00	300	25500.00
Residential / Domestic	3.00	0.00	3.00	300	900.00
Greenbelt Development / Environment Maintenance	2.00	0.00	2.00	300	600.00
Other Use					0.00
Grand Total	90.00	0.00	90.00		27000.00

(iii) Breakup of Recycled Water Usage:

	(m3/day)	(Days)	(m3/year)
(a) Total Waste Water Generated:			
(b) Quantity of Treated Water Available			
i). Reuse in Industrial Activity:			
ii). Reuse in Green Belt Development:			
(c) Total Treated Water Utilized:			

3. **Details of existing and/ or proposed groundwater abstraction structures**

Annexure 6

(a) Groundwater Abstraction Structure-Existing

SNo.	Type/ Year of construction	Depth (meter) / Diameter (mm)	Depth to water level (meters below ground level)	Discharge(m3 per hour)	Operational hours/ (day)/ days/year	Mode of lift	Horse Power of pump	Whether fitted with water meter or not	Wheter permission/ registered with HRWA / if so Details of permission
1	bore well/ 2018	80.00/ 100.00	18.00	5.00	8/ 300	4	3HP	Yes	No/
2	bore well/ 2018	80.00/ 100.00	18.00	5.00	8/ 300	4	2HP	Yes	No/

Quantum of ground water recharge(m3/year)	0.00
NOC for water supply from Local Authority	Download
Details of rainwater harvesting and artificial recharge measures for groundwater recharge in the premises. If the firm has proposed to take up rainwater harvesting and recharge outside the Industrial unit premises, then provide NOC from the concern authority/agency where the harvesting measures are proposed, if already implemented, details may be furnished. (attach report on comprehensive & feasible Rainwater harvesting/recharge proposal).	Download
Water Balance Chart with water requirement at each Stage.	Download
Have you applied earlier for groundwater clearance from Government Agency, if so, give details thereof with status	Download
Water Efficient Technology will be adopted	Download
Consent of operate Issued by HSPCB(CTO)	Download
Impact Assesment Report Proposed Extraction	

Annexure 6

I shall comply with all the terms and conditions of the Permission	Yes

It is to certify that the details and information furnished above are true to the best of my knowledge and belief and I am aware that if any part of the data/information submitted is found to be false or misleading at any stage the application will be rejected out rightly.

Date:

Place:

Name of Authorized Person:

Designation of Authorized Person:

Authorization Letter:

Signature of Applicant with Office Seal

a) Information of payment for Application Fee

Total Amount

Mode of Payment Online

b) Information of payment for Tarrif Fee

Total Amount

Mode of Payment

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.:	VEL/AA/PPPL/001-027	Report No.:	VEL/AA/001-027
Name & Address of the Project	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Project Site (A1)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
01.10.2020	78.1	42.5	26.5	9.2	0.80	ND	ND
02.10.2020	80.3	41.6	23.3	10.3	0.81	ND	ND
08.10.2020	76.0	39.4	28.6	11.5	0.79	ND	ND
09.10.2020	82.8	39.0	29.0	15.6	0.92	ND	ND
15.10.2020	84.8	40.2	28.8	12.5	0.94	ND	ND
16.10.2020	87.8	42.1	26.9	11.0	0.91	ND	ND
22.10.2020	79.3	42.6	28.2	10.6	0.81	ND	ND
23.10.2020	81.6	45.8	25.3	9.2	0.84	ND	ND
29.10.2020	80.0	46.5	23.6	8.5	0.79	ND	ND
30.10.2020	82.5	47.8	24.6	8.6	0.81	ND	ND
05.11.2020	83.1	46.4	28.5	7.9	0.87	ND	ND
06.11.2020	80.5	45.8	27.6	10.5	0.91	ND	ND
12.11.2020	85.1	46.9	26.3	12.6	0.82	ND	ND
13.11.2020	74.2	44.9	28.6	11.0	0.89	ND	ND
19.11.2020	76.5	38.9	29.9	11.6	0.93	ND	ND
20.11.2020	81.2	46.8	23.8	10.5	0.87	ND	ND
26.11.2020	77.6	48.0	22.7	12.5	0.89	ND	ND
27.11.2020	74.9	47.2	24.5	10.5	0.93	ND	ND
03.12.2020	88.6	49.1	27.4	18.6	0.92	ND	ND
04.12.2020	82.4	47.6	26.5	15.5	0.82	ND	ND
10.12.2020	80.0	39.9	32.8	20.0	0.96	ND	ND

(Tested By)
ASHISH SINGH
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.: VEL/AA/001-027

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
11.12.2020	84.8	44.3	24.9	12.8	0.98	ND	ND
17.12.2020	80.2	48.2	26.6	14.3	0.76	ND	ND
18.12.2020	76.5	41.7	23.3	11.9	0.81	ND	ND
24.12.2020	72.6	40.1	22.6	12.4	0.82	ND	ND
25.12.2020	68.9	38.2	20.7	11.7	0.76	ND	ND
31.12.2020	71.4	41.5	23.8	17.2	0.86	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards

(Tested By) RAHUL SINGH ANALYST

ARJUN RAWAT (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/028-054	Report No.:	VEL/AA/028-054
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village- Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village- Marupur (A2)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
01.10.2020	78.3	41.8	25.8	8.5	0.86	ND	ND
02.10.2020	81.5	42.5	21.2	8.1	0.81	ND	ND
08.10.2020	75.6	38.1	26.5	7.5	0.91	ND	ND
09.10.2020	80.5	39.6	28.1	8.3	0.95	ND	ND
15.10.2020	86.6	41.0	27.2	11.6	0.91	ND	ND
16.10.2020	85.5	41.7	30.3	14.6	0.77	ND	ND
22.10.2020	78.4	39.5	27.5	10.5	0.85	ND	ND
23.10.2020	81.3	45.8	26.4	9.8	0.94	ND	ND
29.10.2020	80.6	44.6	22.1	8.3	0.83	ND	ND
30.10.2020	84.5	45.7	23.7	8.7	0.88	ND	ND
05.11.2020	82.6	46.0	27.8	7.0	0.79	ND	ND
06.11.2020	81.5	43.2	26.5	9.1	0.84	ND	ND
12.11.2020	84.6	47.5	25.9	11.8	0.81	ND	ND
13.11.2020	73.3	42.7	27.4	12.1	0.82	ND	ND
19.11.2020	75.0	38.8	28.3	11.7	0.93	ND	ND
20.11.2020	80.6	45.3	22.5	10.3	0.88	ND	ND
26.11.2020	74.8	47.0	21.0	11.9	0.81	ND	ND
27.11.2020	73.5	48.2	26.6	10.7	0.87	ND	ND
03.12.2020	87.7	41.4	28.5	17.5	0.99	ND	ND
04.12.2020	81.5	46.1	25.7	14.7	0.85	ND	ND
10.12.2020	80.6	42.6	31.2	18.2	0.98	ND	ND

(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.: VEL/AA/028-054

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
11.12.2020	81.2	43.3	30.8	17.8	0.95	ND	ND
17.12.2020	78.6	46.1	25.5	16.1	0.73	ND	ND
18.12.2020	75.4	42.8	21.6	14.8	0.85	ND	ND
24.12.2020	73.1	40.7	20.7	12.9	0.87	ND	ND
25.12.2020	69.8	39.5	21.8	11.8	0.77	ND	ND
31.12.2020	72.6	40.6	22.5	10.9	0.82	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

(Tested By) ANALYST

ARJUN RAWAT (Checked By)

VARDAN E.M.L. Gurgaon (Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/055-081	Report No.:	VEL/AA/055-081
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village – Jatlana (A3)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
01.10.2020	75.2	31.6	21.3	8.9	0.63	ND	ND
02.10.2020	79.6	34.6	19.2	9.5	0.85	ND	ND
08.10.2020	77.5	30.8	22.5	10.8	0.67	ND	ND
09.10.2020	78.6	32.8	20.1	8.6	0.74	ND	ND
15.10.2020	79.5	31.0	26.7	9.0	0.76	ND	ND
16.10.2020	75.6	32.1	25.7	10.5	0.90	ND	ND
22.10.2020	76.5	30.9	23.6	11.2	0.79	ND	ND
23.10.2020	78.6	36.0	21.4	13.5	0.72	ND	ND
29.10.2020	76.2	34.6	20.3	14.5	0.84	ND	ND
30.10.2020	79.8	35.8	19.2	15.1	0.61	ND	ND
05.11.2020	78.0	36.6	20.5	15.3	0.75	ND	ND
06.11.2020	77.8	37.8	21.6	14.2	0.72	ND	ND
12.11.2020	80.1	41.6	25.0	15.2	0.87	ND	ND
13.11.2020	79.2	40.2	24.5	13.2	0.89	ND	ND
19.11.2020	76.6	38.7	24.6	15.8	0.80	ND	ND
20.11.2020	77.8	37.9	25.8	14.8	0.69	ND	ND
26.11.2020	78.9	36.0	17.9	12.6	0.54	ND	ND
27.11.2020	80.4	41.2	18.9	13.2	0.67	ND	ND
03.12.2020	78.6	38.0	20.3	12.2	0.73	ND	ND
04.12.2020	80.9	39.2	22.2	14.5	0.78	ND	ND
10.12.2020	81.2	42.3	24.3	15.6	0.75	ND	ND

(Issued By)
NIMAL SINGH
ANALYST

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
(Approved By)

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.:							VEL/AA/055-081
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
11.12.2020	75.4	39.1	21.3	12.7	0.76	ND	ND
17.12.2020	72.8	37.6	22.5	10.6	0.84	ND	ND
18.12.2020	78.6	35.7	23.8	12.5	0.67	ND	ND
24.12.2020	79.7	34.3	19.4	13.6	0.73	ND	ND
25.12.2020	72.6	32.8	17.1	11.4	0.88	ND	ND
31.12.2020	74.1	39.2	20.5	10.9	0.98	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards

(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/082-107	Report No.:	VEL/AA/082-107
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village – Naharpur (A4)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
03.10.2020	64.5	28.6	20.3	7.3	0.82	ND	ND
04.10.2020	65.5	29.0	18.6	8.0	0.78	ND	ND
10.10.2020	66.0	30.1	21.4	7.9	0.73	ND	ND
11.10.2020	67.1	32.5	19.1	8.2	0.88	ND	ND
17.10.2020	68.3	29.0	27.5	12.5	0.90	ND	ND
18.10.2020	66.0	28.6	27.6	11.0	0.87	ND	ND
24.10.2020	67.7	29.5	22.2	10.6	0.82	ND	ND
25.10.2020	68.7	32.5	20.6	9.2	0.75	ND	ND
31.10.2020	69.3	34.6	19.2	8.5	0.89	ND	ND
01.11.2020	68.7	36.8	18.3	8.6	0.86	ND	ND
07.11.2020	67.2	32.5	17.6	7.9	0.91	ND	ND
08.11.2020	67.3	29.0	18.1	10.5	0.84	ND	ND
14.11.2020	68.4	36.8	21.6	12.6	0.78	ND	ND
15.11.2020	70.5	30.2	20.4	11.0	0.82	ND	ND
21.11.2020	71.2	31.2	22.5	11.6	0.78	ND	ND
22.11.2020	72.2	33.5	19.7	10.5	0.84	ND	ND
28.11.2020	68.5	34.5	18.5	10.3	0.86	ND	ND
29.11.2020	68.2	36.0	17.2	10.5	0.87	ND	ND
05.12.2020	70.5	32.0	19.3	11.5	0.75	ND	ND
06.12.2020	71.6	33.6	21.6	13.4	0.72	ND	ND

(Tested By) NOMAL SINGH ANALYST

ARJUN RAWAT (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.:	VEL/AA/082-107						
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
12.12.2020	66.6	41.8	20.6	8.2	0.88	ND	ND
13.12.2020	68.3	39.4	21.5	9.5	0.89	ND	ND
19.12.2020	62.9	41.7	20.6	10.8	0.80	ND	ND
20.12.2020	65.0	43.2	19.8	11.9	0.77	ND	ND
26.12.2020	71.8	45.6	20.9	9.6	0.83	ND	ND
27.12.2020	62.0	42.7	18.6	9.0	0.94	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards

(Tested By) L. SINGH ANALYST

(Checked By) ARJUN RAWAT

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/108-133	Report No.:	VEL/AA/108-133
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
Sample Collected By:	Vardan Envirolab Representative	Protocol Used:	IS-5182
Sample Description:	Ambient Air Quality Monitoring	Parameter Required	As per ToR Letter
Location:	Village – Khajuri (A5)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
03.10.2020	70.4	36.3	21.2	10.2	0.61	ND	ND
04.10.2020	72.5	37.5	26.4	8.9	0.67	ND	ND
10.10.2020	80.0	46.5	23.8	9.6	0.72	ND	ND
11.10.2020	75.4	36.2	25.9	8.7	0.55	ND	ND
17.10.2020	70.6	30.1	28.8	10.2	0.67	ND	ND
18.10.2020	78.6	40.7	26.7	14.9	0.79	ND	ND
24.10.2020	72.0	36.1	22.5	15.4	0.68	ND	ND
25.10.2020	77.6	39.5	28.7	14.5	0.56	ND	ND
31.10.2020	72.8	37.5	24.9	12.4	0.74	ND	ND
01.11.2020	71.7	36.5	28.3	10.8	0.67	ND	ND
07.11.2020	78.6	42.9	27.4	9.9	0.86	ND	ND
08.11.2020	75.0	37.5	23.4	8.5	0.73	ND	ND
14.11.2020	76.5	32.6	29.6	9.6	0.85	ND	ND
15.11.2020	78.6	40.5	25.4	11.3	0.67	ND	ND
21.11.2020	82.3	41.2	27.6	13.4	0.63	ND	ND
22.11.2020	78.3	39.3	32.8	15.8	0.86	ND	ND
28.11.2020	79.4	40.5	31.9	14.9	0.69	ND	ND
29.11.2020	72.3	38.9	30.6	13.5	0.78	ND	ND
05.12.2020	73.0	36.5	26.7	15.6	0.75	ND	ND
06.12.2020	72.4	35.5	28.9	9.6	0.62	ND	ND

(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Annexure 7

Test Report

Report No.:							VEL/AA/108-133
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
12.12.2020	76.3	38.2	19.6	10.7	0.62	ND	ND
13.12.2020	71.5	35.5	21.4	11.3	0.75	ND	ND
19.12.2020	79.2	36.6	22.2	10.1	0.92	ND	ND
20.12.2020	78.5	35.8	20.5	13.2	0.98	ND	ND
26.12.2020	72.0	35.9	18.6	12.4	0.58	ND	ND
27.12.2020	71.6	36.5	19.1	11.6	0.63	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards

Tested By
KOMAL SINGH
ANALYST

ARJUN RAWAT
Checked By

Approved By

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/134-159	Report No.:	VEL/AA/134-159
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village – Bahadurpur (A6)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
03.10.2020	72.2	36.6	20.6	8.0	0.65	ND	ND
04.10.2020	69.5	32.5	18.1	9.5	0.72	ND	ND
10.10.2020	70.1	35.9	22.4	11.7	0.84	ND	ND
11.10.2020	71.5	34.7	21.0	8.0	0.72	ND	ND
17.10.2020	70.3	37.8	28.6	11.5	0.68	ND	ND
18.10.2020	72.3	35.9	27.4	12.0	0.73	ND	ND
24.10.2020	76.6	39.2	21.3	12.1	0.90	ND	ND
25.10.2020	78.9	35.7	20.9	8.6	0.87	ND	ND
31.10.2020	73.6	37.2	18.3	9.2	0.90	ND	ND
01.11.2020	74.4	38.1	19.2	9.1	0.82	ND	ND
07.11.2020	72.3	36.2	20.7	7.6	0.74	ND	ND
08.11.2020	73.8	37.5	21.3	8.5	0.74	ND	ND
14.11.2020	72.6	36.6	24.1	8.9	0.71	ND	ND
15.11.2020	71.3	35.3	23.5	7.6	0.79	ND	ND
21.11.2020	70.2	34.1	24.6	9.5	0.72	ND	ND
22.11.2020	68.6	33.2	22.8	11.4	0.70	ND	ND
28.11.2020	69.3	34.3	18.9	12.0	0.67	ND	ND
29.11.2020	75.5	38.6	17.9	12.1	0.78	ND	ND
05.12.2020	80.5	42.5	21.3	8.6	0.85	ND	ND
06.12.2020	82.6	43.4	23.2	9.8	0.88	ND	ND

KC SINGH (Tested By) ANALYST

ARJUN RAWAT (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Annexure 7

Test Report

Report No.:							VEL/AA/134-159
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m3)	VOC ($\mu g/m^3$)	HC(ppm)
12.12.2020	73.6	37.2	20.7	9.1	0.81	ND	ND
13.12.2020	77.1	34.6	25.6	10.3	0.70	ND	ND
19.12.2020	79.9	41.8	32.2	12.1	0.74	ND	ND
20.12.2020	80.7	35.4	29.5	10.0	0.69	ND	ND
26.12.2020	78.1	39.9	27.3	11.4	0.74	ND	ND
27.12.2020	76.0	36.0	23.1	13.7	0.61	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standards

Checked By: SINGH ANALYST

ARJUN RAWAT
Checked By

Approved By

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/160-185	Report No.:	VEL/AA/160-185
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village - Jaipur (A7)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
05.10.2020	63.3	29.2	17.2	8.6	0.78	ND	ND
06.10.2020	64.1	28.3	16.6	7.0	0.81	ND	ND
12.10.2020	66.2	31.4	20.5	7.5	0.65	ND	ND
13.10.2020	68.9	30.6	17.2	8.6	0.66	ND	ND
19.10.2020	67.5	27.5	23.5	10.8	0.78	ND	ND
20.10.2020	65.1	28.7	25.6	11.2	0.63	ND	ND
26.10.2020	67.2	26.2	21.1	9.6	0.71	ND	ND
27.10.2020	65.3	30.1	20.6	9.5	0.85	ND	ND
02.11.2020	67.3	32.9	18.9	8.2	0.62	ND	ND
03.11.2020	66.8	34.5	17.5	8.9	0.66	ND	ND
09.11.2020	68.9	31.5	17.2	7.6	0.78	ND	ND
10.11.2020	67.3	28.0	18.1	11.3	0.72	ND	ND
16.11.2020	70.4	34.6	22.5	12.4	0.66	ND	ND
17.11.2020	69.5	30.3	21.4	10.3	0.71	ND	ND
23.11.2020	71.2	31.5	22.1	11.6	0.70	ND	ND
24.11.2020	72.6	32.6	19.7	8.7	0.82	ND	ND
30.11.2020	68.5	34.9	16.5	7.9	0.76	ND	ND
01.12.2020	66.9	35.6	17.2	9.7	0.72	ND	ND
07.12.2020	70.5	33.9	18.3	10.4	0.68	ND	ND
08.12.2020	72.6	33.8	20.5	11.9	0.70	ND	ND
14.12.2020	67.3	27.6	21.3	7.6	0.86	ND	ND
15.12.2020	66.5	28.0	18.6	8.1	0.75	ND	ND

KOMAL SINGH
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)

www.vardan.co.in

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.: VEL/AA/160-185

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
21.12.2020	69.5	31.9	19.2	11.9	0.79	ND	ND
22.12.2020	71.2	32.1	20.7	12.1	0.78	ND	ND
28.12.2020	68.9	28.7	21.2	11.8	0.78	ND	ND
29.12.2020	67.5	27.5	17.6	8.3	0.80	ND	ND

Noted:- HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standard

KOMAL SINGH
ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.	VEL/AA/PPPL/186-211	Report No.:	VEL/AA/186-211
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil - Jagadhri Distt.- Yamunanagar, Haryana.	Reporting Date:	08/01/2021
		Ref. No:	NIL
		Monitoring Period:	Oct 2020 to Dec 2020
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182
Sample Collected By:	Vardan Envirolab Representative	Parameter Required	As per ToR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Village- Unheri(A8)		

RESULT

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
05.10.2020	76.1	38.6	25.5	9.7	0.72	ND	ND
06.10.2020	75.6	35.5	21.6	8.1	0.76	ND	ND
12.10.2020	80.7	45.6	27.4	10.4	0.86	ND	ND
13.10.2020	82.6	41.8	28.0	11.2	0.69	ND	ND
19.10.2020	76.7	37.5	26.1	12.3	0.80	ND	ND
20.10.2020	82.1	42.7	30.2	10.0	0.85	ND	ND
26.10.2020	83.6	36.9	27.5	11.5	0.91	ND	ND
27.10.2020	74.8	47.1	24.6	9.6	0.87	ND	ND
02.11.2020	78.4	41.7	22.9	8.4	0.90	ND	ND
03.11.2020	81.3	38.9	24.8	8.9	0.87	ND	ND
09.11.2020	80.3	36.2	27.9	10.4	092	ND	ND
10.11.2020	83.6	47.8	26.7	12.4	0.96	ND	ND
16.11.2020	72.1	32.2	25.3	11.2	0.74	ND	ND
17.11.2020	78.1	41.3	27.2	10.9	0.71	ND	ND
23.11.2020	72.3	37.8	29.9	11.8	0.84	ND	ND
24.11.2020	77.3	32.5	24.8	9.5	0.69	ND	ND
30.11.2020	80.2	35.5	20.6	13.2	0.73	ND	ND
01.12.2020	82.6	38.2	23.2	11.6	0.85	ND	ND
07.12.2020	76.9	36.1	26.6	17.4	0.86	ND	ND
08.12.2020	81.5	41.8	25.5	14.5	0.92	ND	ND
14.12.2020	78.2	40.7	30.7	17.7	0.98	ND	ND
15.12.2020	82.4	42.6	27.4	10.8	0.91	ND	ND

KOMAL SINGH (Tested By) ANALYST

ARJUN RAWAT (Checked By)

Gaurav (Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Report No.:	VEL/AA/186-211						
Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	VOC ($\mu g/m^3$)	HC(ppm)
21.12.2020	78.8	42.5	24.1	18.9	0.56	ND	ND
22.12.2020	75.2	40.6	21.7	19.3	0.98	ND	ND
28.12.2020	69.5	39.7	19.6	18.7	0.86	ND	ND
29.12.2020	72.3	41.8	22.5	16.7	0.92	ND	ND

Noted: - HC- Hydrocarbon, ND- Not Detected

Limit as per NAAQS	Parameter	PM10 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
	--	100	60	80	80	4

*National Ambient Air Quality Standard

ROHAN SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/01	Report No.:	VEL/AN/2012/18/001
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil – Jagadhri, Distt.- Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Project Site
Instrument Used	:	Sound Level Meter- 09
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020-18/12/2020
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

RESULT

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	77.1	66.5	dB(A)
2.	L_{min}	IS 9989	55.8	42.7	dB(A)
3.	L_{eq}	IS 9989	68.6	61.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Industrial Area)		75.0	70.0	dB(A)

KOMAL SINGH
(Tested By) ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/02	Report No.:	VEL/AN/2012/18/002
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil – Jagadhri, Distt.- Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan Envirolab Representative
Sampling Location	: Village - Marupur
Instrument Used	: Sound Level Meter- 10
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 17/12/2020-18/12/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS-9989
Sampling Duration	: 24 Hours
Parameter Required	: As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	62.7	53.5	dB(A)
2.	L_{min}	IS 9989	43.5	36.4	dB(A)
3.	L_{eq}	IS 9989	51.1	42.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

KOMAL SINGH (Tested By)

ARJUN RAWAT (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/03	Report No.:	VEL/AN/2012/18/003
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil – Jagadhri, Distt.- Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan Envirolab Representative
Sampling Location	: Jatlana
Instrument Used	: Sound Level Meter- 11
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	Clear Sky
Date of Monitoring	: 17/12/2020-18/12/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS-9989
Sampling Duration	: 24 Hours
Parameter Required	: As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	57.6	49.6	dB(A)
2.	L_{min}	IS 9989	43.5	37.4	dB(A)
3.	L_{eq}	IS 9989	50.3	41.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)		55.0	45.0	dB(A)

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/04	Report No.:	VEL/AN/2012/18/004
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.: Party Reference No.: Reporting Date: Receipt Date:	7.8 F-01 NIL 23/12/2020 18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	**Naharpur**
Instrument Used	:	Sound Level Meter- 12
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020-18/12/2020
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1	L_{max}	IS 9989	52.8	44.5	dB(A)
2.	L_{min}	IS 9989	45.4	35.2	dB(A)
3	L_{eq}	IS 9989	48.3	39.6	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)		55.0	45.0	dB(A)

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/05	Report No.:	VEL/AN/2012/18/005
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	**Khajuri**
Instrument Used	:	Sound Level Meter- 13
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020-18/12/2020
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	58.6	50.6	dB(A)
2.	L_{min}	IS 9989	47.7	36.2	dB(A)
3.	L_{eq}	IS 9989	50.7	42.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: VEL/AN/PPPL/06
Name & Address of the Project: M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.

Report No.: VEL/AN/2012/18/006
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 23/12/2020
Receipt Date: 18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	**Bahadurpur**
Instrument Used	:	Sound Level Meter- 14
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020-18/12/2020
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	55.7	48.7	dB(A)
2.	L_{min}	IS 9989	41.6	36.4	dB(A)
3.	L_{eq}	IS 9989	49.8	40.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)		55.0	45.0	dB(A)

KOMAL SINGH (Tested By) ANALYST

ARJUN RAWAT (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/07	Report No.:	VEL/AN/2012/18/007
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil – Jagadhri, Distt.- Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Jaipur
Instrument Used	:	Sound Level Meter- 15
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020 - 18/12/2020
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	56.9	46.7	dB(A)
2.	L_{min}	IS 9989	43.2	37.0	dB(A)
3.	L_{eq}	IS 9989	52.8	41.8	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

KOMAL SINGH
(Tested By) ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/AN/PPPL/08	Report No.:	VEL/AN/2012/18/008
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village - Jathlana, Tehsil – Jagadhri, Distt.- Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Receipt Date:	18/12/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Envirolab Representative
Sampling Location	:	Unheri
Instrument Used	:	Sound Level Meter- 16
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	17/12/2020-18/12/2020
Time of Monitoring		06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per TOR Letter

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	54.6	79.2	dB(A)
2.	L_{min}	IS 9989	42.7	36.7	dB(A)
3.	L_{eq}	IS 9989	50.8	41.6	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.0	45.0	dB(A)

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/W/01	**Report No.:**	VEL/W/2012/18/001
Name of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
Sample Description:	Surface Water Sample	**Period of Analysis:**	18/12/2020– 23/12/2020
Sampling Location:	Augmentation Canal near Khajuri (US)	**Receipt Date:**	18/12/2020
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Date:**	17/12/2020
Preservation:	Refrigerator	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sampling and Analysis Protocol:	IS-10500-2012,APHA&SOP	**Sampling Type:**	Grab

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H$^+$ B Electrometric Method	7.53	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B. Nephlelometric Method	21.00	NTU
4.	Odour	APHA, 2150 B . Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	310.45	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	73.63	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	285.22	mg/l
8.	Chloride as Cl	APHA, 4500-Cl$^-$ B, Argentometric Method	85.41	mg/l
9.	Residual free Chlorine	APHA, 4500 ClB Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	Cyanide as CN	APHA , 4500 CN$^-$ D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	30.71	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	537.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	139.00	mg/l
14.	Dissolved Oxygen	APHA.4500 O B Iodometric Method	5.1	mg/l
15.	Sulphate as SO^{2}	APHA , 4500 E, Turbidimetric Method	61.36	mg/l
16.	Fluoride as F	APHA . 4500-F$^-$ D. SPADNS Method	0.54	mg/l
17.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025.P-44	11.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	30.00	mg/l

NISHA DEVI
Jr. Chemist
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/ PPPL/W/01 | Report No.: VEL/W/2012/18/001

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	895	µS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	34.64	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	65.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	12.36	mg/l
23.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	*BDL(**DL 0.01 mg/l)	mg/l
24.	Aluminium as Al	APHA . 3111 DNitrous Oxide Acetylene Flame Method	0.52	mg/l
25.	Boron	APHA. 4500B C, Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l
26.	Chromium as Cr	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	APHA . 3111 B, Direct Air, Acetylene Flame Method	1.15	mg/l
31.	Copper as Cu	APHA . 3111 B, Direct Air, Acetylene Flame Method	0.09	mg/l
32.	Manganese as Mn	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622	1600	MPN/100ml
35.	Fecal Coliform	IS 1622	900	MPN/100ml

Note: -*BDL -Below Detection Limit, **DL- Detection Limit

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/ PPPL/W/02	**Report No.:**	VEL/W/2012/18/002
Name of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020- 23/12/2020
Sample Description:	Surface Water Sample	**Receipt Date:**	18/12/2020
Sampling Location:	Augmentation Canal near Kartarpur (DS)	**Sampling Date:**	17/12/2020
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	5.0 Ltr + 250ml.
Preservation:	Refrigerator	**Sampling Type:**	Grab

Sampling and Analysis Protocol: IS-10500-2012,APHA &SOP

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.63	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	32.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	283.00	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	81.54	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	262.20	mg/l
8.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	101.69	mg/l
9.	Residual free Chlorine	APHA, 4500 ClB Iodometric Method	*BDL(**DL 0.15mg/l)	mg/l
10.	Cyanide as CN	APHA , 4500 CN^- D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	19.23	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	544.00	mg/l
13.	Total Suspended solids	APHA,2540 D Gravimetric Method	121.00	mg/l
14.	Dissolved Oxygen	APHA,4500 O B Iodometric Method	5.5	mg/l
15.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	69.44	mg/l
16.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.52	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	9.44	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	30.00	mg/l

Nisha Devi
Jr. Chemist

(Checked By)

Authorized Signatory

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/ PPPL/W/02			Report No.:	VEL/W/2012/18/002
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	907	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	24.12	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	68.21	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	20.10	mg/l
23.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l
24.	Aluminium as Al	APHA . 3111 DNitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	APHA, 4500B C. Carmine Method	0.43	mg/l
26.	Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	1.20	mg/l
31.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.09	mg/l
32.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
34	Total Coliform	IS 1622	1000	MPN/100ml
35.	Fecal Coliform	IS 1622	800	MPN/100ml

Note: -*BDL-Below Detection Limit, **DL- Detection Limit

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/ PPPL/W/03	**Report No.:**	VEL/W/2012/18/003
Name of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
Sample Description:	Surface water Sample	**Receipt Date:**	18/12/2020
Sampling Location:	Yamuna River Near Dhika Kalan	**Sampling Date:**	17/12/2020
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	5.0 Ltr + 250ml.
Preservation:	Refrigerator	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS-10500-2012,APHA &SOP		

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H⁺ B Electrometric Method	7.72	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL, 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	24.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	229.00	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	57.69	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	215.52	mg/l
8.	Chloride as Cl	APHA, 4500-Cl⁻ B, Argentometric Method	71.20	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15 mg/l)	mg/l
10.	Cyanide as CN	APHA , 4500 CN⁻ D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	20.60	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	416.00	mg/l
13.	Total Suspended solids	APHA.2540 D Gravimetric Method	118.00	mg/l
14.	Dissolved Oxygen	APHA.4500 O B Iodometric Method	5.2	mg/l
15.	Sulphate as SO^{4}	APHA , 4500 E, Turbidimetric Method	44.68	mg/l
16.	Fluoride as F⁻	APHA , 4500-F⁻ D, SPADNS Method	0.78	mg/l
17.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	12.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	40.00	mg/l

NISHA DEVI
Jr. Lab Asst.
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Annexure 7

Test Report

Sample No.: VEL/ PPPL/W/03 | Report No.: VEL/W/2012/18/003

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	693	µS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	23.40	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	50.00	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	16.58	mg/l
23.	Iron as Fe	APHA , 3500-Fe B 1.10 Phenanthroline Method	0.26	mg/l
24.	Aluminium as Al	APHA , 3111 DNitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	APHA. 4500B C. Carmine Method	0.40	mg/l
26.	Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	1.51	mg/l
31.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.06	mg/l
32.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622	900	MPN/100ml
35.	Fecal Coliform	IS 1622	300	MPN/100ml

Note: -*BDL-Below Detection Limit, **DL- Detection Limit

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/ PPPL/W/04	Report No.:	VEL/W/2012/18/004
Name of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
Sample Description:	Surface Water Sample	Receipt Date:	18/12/2020
Sampling Location:	Yamuna River near Jatlana	Sampling Date:	17/12/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	5.0 Ltr + 250mL
Preservation:	Refrigerator	Sampling Type:	Grab
Sampling and Analysis Protocol:	IS-10500-2012,APHA &SOP		

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H$^+$ B Electrometric Method	7.54	--
2.	Colour	APHA .2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	20.00	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Tiurimetric Method	260.00	mg/l
6.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	63.54	mg/l
7.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	238.00	mg/l
8.	Chloride as Cl	APHA, 4500-Cl$^-$ B, Argentometric Method	85.36	mg/l
9.	Residual free Chlorine	APHA, 4500 Cl B Iodometric Method	*BDL(**DL 0.15 mg/l)	mg/l
10.	Cyanide as CN	APHA , 4500 CN$^-$ D	*BDL(**DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	24.58	mg/l
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	431.00	mg/l
13.	Total Suspended solids	APHA.2540 D Gravimetric Method	119.00	mg/l
14.	Dissolved Oxygen	APHA.4500 O B Iodometric Method	5.6	mg/l
15.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	40.8	mg/l
16.	Fluoride as F	APHA , 4500-F$^-$ D, SPADNS Method	1.00	mg/l
17.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	15.00	mg/l
18.	COD	APHA, 5220 B, Open Reflux Method	43.45	mg/l

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/ PPPL/W/04 | Report No.: VEL/W/2012/18/004

S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	718	µS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	16.25	mg/l
21.	Sodium as Na	APHA,3500 Na B, Flame Photometric Method	48.36	mg/l
22.	Potassium as K	APHA 3500 K B, Flame Photometric Method	6.5	mg/l
23.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.27	mg/l
24.	Aluminium as Al	APHA , 3111 DNitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
25.	Boron	APHA. 4500B C, Carmine Method	0.53	mg/l
26.	Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
27.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l
30.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.40	mg/l
31.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.05	mg/l
32.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
33.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l
34.	Total Coliform	IS 1622	1600	MPN/100ml
35.	Fecal Coliform	IS 1622	800	MPN/100ml

Note: -*BDL-Below Detection Limit, **DL- Detection Limit

NISHA DEVI
Jr. Lab. (Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/001	**Report No.:**	VEL/W/2012/18/001
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Project site	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan EnviroLab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.54	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	232.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	51.63	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B. Titrimetric Method	213.00	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B. Argentometric Method	71.41	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B. Calculation Method	25.01	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C. Gravimetric Method	382.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E. Turbidimetric Method	45.20	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D. SPADNS Method	0.58	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.10	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1.10 Phenanthrotine Method	0.26	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA , 3111 B. Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

NISHANT VI
Jr. Lab Analyst

(Checked By)

(Authorised Signatory)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/W/PPPL/001 — Report No.: VEL/W/2012/18/001

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	637	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	1.52	mg/l	5	15
25.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.31	mg/l	0.05	1.5
26.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	0.05
31	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622.1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500 2012 (RA 2018)
*BDL-Below Detection Limit, **DL- Detection Limit
Amendment No 1 in June 2015 (Limits of Iron & Arsenic) and Amendment No 2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

NISHA DEVI
Jr. Lab Analyst
(Checked By)
(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/002	**Report No.:**	VEL/W/2012/18/002
Name &Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village-Marupur	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.41	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B, Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C. EDTA Titrimetric Method	236.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	58.45	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B. Titrimetric Method	210.56	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	65.21	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11	Magnesium as Mg	APHA , 3500 Mg B. Calculation Method	21.83	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	364.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E. Turbidimetric Method	41.63	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D. SPADNS Method	0.53	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	6.87	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.26	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA , 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Tested By) (Checked By) (Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Vardan EnviroLab

Annexure 7

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/W/PPPL/002 — Report No.: VEL/W/2012/18/002

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	607	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA . 3111 B, Direct Air, Acetylene Flame Method	1.40	mg/l	5	15
25.	Copper as Cu	APHA . 3111 B, Direct Air, Acetylene Flame Method	0.27	mg/l	0.05	1.5
26.	Manganese as Mn	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA . 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit. **DL- Detection Limit.
Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E Coli)

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/003	**Report No.:**	VEL/W/2012/18/003
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village- Jatlana	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.58	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C. EDTA Titrimetric Method	262.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B. EDTA Titrimetric Method	54.69	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B. Titrimetric Method	243.60	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B. Argentometric Method	63.47	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B. Calculation Method	30.44	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C. Gravimetric Method	392.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E. Turbidimetric Method	48.96	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D. SPADNS Method	0.60	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	9.56	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.26	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA , 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

Director
(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/W/PPL/003 — Report No: VEL/W/2012/18/003

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity at (25°C)	APHA, 2510 B, Conductivity Meter Method	653	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	1.50	mg/l	5	15
25.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.25	mg/l	0.05	1.5
26.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit
Amendment No 1 in June 2015 (Limits of Iron & Arsenic) and Amendment No 2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

VARDAN ENVIRO LAB
Gaurav Pratap Singh
(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/004	**Report No.:**	VEL/W/2012/18/004
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village-Naharpur	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.56	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C. EDTA Titrimetric Method	274.60	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	53.84	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B. Titrimetric Method	253.00	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B. Argentometric Method	64.92	mg/l	250	1000
10.	*Cyanide as CN	APHA . 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	34.08	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	415.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA . 4500 E. Turbidimetric Method	56.41	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F- D, SPADNS Method	0.55	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	11.26	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.32	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

MISHA DEVI
Jr. Lab Analyst

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: **VEL/W/PPPL/004** — **Report No VEL/W/2012/18/004**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25°C)	APHA, 2510 B, Conductivity Meter Method	692	µS/cm	--	--
21	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA , 3111 B, Direct Air. Acetylene Flame Method	1.36	mg/l	5	15
25.	Copper as Cu	APHA , 3111 B, Direct Air. Acetylene Flame Method	0.26	mg/l	0.05	1.5
26.	Manganese as Mn	APHA , 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA , 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622.1981. RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622.1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit
Amendment No 1 in June 2015 (Limits of Iron & Arsenic) and Amendment No 2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/W/PPPL/005 — Report No.: VEL/W/2012/18/005

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	630	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	1.38	mg/l	5	15
25.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.20	mg/l	0.05	1.5
26.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit
Amendment No 1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E Coli)

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/005	**Report No.:**	VEL/W/2012/18/005
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd, Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village-Khajuri	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.45	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C, EDTA Titrimetric Method	283.76	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	57.89	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B. Titrimetric Method	214.50	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B. Argentometric Method	63.47	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	33.85	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	378.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA . 4500 E. Turbidimetric Method	51.44	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F- D. SPADNS Method	0.43	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	14.5	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA . 3111 B. Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

NISHA DEVI
Jr. Lab Analyst

(Checked By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/006	**Report No.:**	VEL/W/2012/18/006
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village-Bahadurpur	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H+ B Electrometric Method	7.47	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B. Nephlelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA , 2340 C. EDTA Titrimetric Method	210.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	46.44	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B. Titrimetric Method	186.51	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl B. Argentometric Method	57.12	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	22.87	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C. Gravimetric Method	319.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E. Turbidimetric Method	34.12	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D. SPADNS Method	0.73	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.64	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1.10 Phenanthroline Method	0 32	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Tested By)
NISHA DEVI
Jr. Lab Analyst

(Checked By)

(Authorised By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: **VEL/W/PPPL/006** | Report No.: **VEL/W/2012/18/006**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	532	µS/cm	--	--
21.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	#Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA . 3111 B, Direct Air, Acetylene Flame Method	1.06	mg/l	5	15
25.	Copper as Cu	APHA . 3111 B, Direct Air, Acetylene Flame Method	0.12	mg/l	0.05	1.5
26.	Manganese as Mn	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA . 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA. 2018)
*BDL-Below Detection Limit, **DL - Detection Limit
Amendment No 1 in June 2015 (Limits of Iron & Arsenic) and Amendment No 2 in Sept 2018(Limit of Boron & IS method of Total Coliform & E. Coli)

(Tested By)

NISHA DEVI
Jr. Lab Asst.

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/007	Report No.:	VEL/W/2012/18/007
Name & Address of the Project:	M/s Pahwa Plasties Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	Sampling Date:	17/12/2020
Sample Location:	Village- Jaipur	Sampling Quantity:	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Type:	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	Preservation:	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.43	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B, Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C. EDTA Titrimetric Method	241.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	57.86	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B. Titrimetric Method	224.00	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl- B. Argentometric Method	62.13	mg/l	250	1000
10.	#Cyanide as CN	APHA . 4500 CN- D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	23.41	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	363.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA . 4500 E. Turbidimetric Method	31.58	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F- D. SPADNS Method	0.53	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	11.20	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	0.31	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA . 3111 B. Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

NISHA DEVI (Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample No.: VEL/W/PPPL/007 — Report No.: VEL/W/2012/18/007

S. No.	Parameter	Test Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity (at 25 °C)	APHA, 2510 B, Conductivity Meter Method	605	µS/cm	--	--
21	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
22	*Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05 mg/l)	mg/l	0.5	No Relaxation
23.	*Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
24	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.96	mg/l	5	15
25.	Copper as Cu	APHA . 3111 B, Direct Air, Acetylene Flame Method	0.18	mg/l	0.05	1.5
26.	Manganese as Mn	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA . 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA . 3114 B, Manual Hydride Generation	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA . 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981, RA-2019	<2	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981, RA-2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit. **DL- Detection Limit

NISHA DEVI
Jr. Lab Analyst
(Tested By)

(Checked By)

(Approved By)

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/W/PPPL/008	**Report No.:**	VEL/W/2012/18/008
Name & Address of the Project:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	Ground Water Sample	**Sampling Date:**	17/12/2020
Sample Location:	Village-Unheri	**Sampling Quantity:**	5.0 Ltr + 250ml.
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Type:**	Grab
Sampling and Analysis Protocol:	IS 3025 &APHA, 23rd Edition 2017	**Preservation:**	Refrigerator

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H+ B Electrometric Method	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA . 2340 C. EDTA Titrimetric Method	212.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	54.44	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA . 2320 B. Titrimetric Method	192.04	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	50.42	mg/l	250	1000
10.	*Cyanide as CN	APHA . 4500 CN D	*BDL(**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	18.51	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	311.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	29.64	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	0.45	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) .Chromotropic Method	9.44	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	0.26	mg/l	1.0#	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4#
19.	Chromium as Cr	APHA . 3111 B. Direct Air, Acetylene Flame Method	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Tested By)

(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/01	Report No.:	VEL/S/2012/18/001
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Project Site (S1)	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.61	--
2.	Conductivity	IS:14767 by Conductivity meter	0.276	mS/cm
3.	Soil Texture	SOP . SP-87.Issue No.-01& Issue Date-14/02/2013	Sand – 53 Silt - 29 Clay – 18	%
4.	Color	SOP . SP-78.Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81,Issue No.-01& Issue Date-14/02/2013	31.40	%
6.	Bulk density	SOP . SP-80.Issue No.-01& Issue Date-14/02/2013	1.43	gm/cc
7.	Chloride as Cl	SOP . SP-85.Issue No.-01& Issue Date-14/02/2013	52.17	mg/100g
8.	Calcium as Ca	SOP . SP-82.Issue No.-01& Issue Date-14/02/2013	42.50	mg/100g
9.	Sodium as Na	SOP . SP-84.Issue No.-01& Issue Date-14/02/2013	48.37	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	121.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.36	%
12.	Magnesium as Mg	SOP . SP-83.Issue No.-01& Issue Date-14/02/2013	28.30	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	202.47	kg./hec.
14.	Available Phosphorus	SOP . SP-86.Issue No.-01& Issue Date-14/02/2013	15.30	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	7.10	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	3.81	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.83	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.42	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.30	mg/kg
20.	Copper (as Cu)	USEPA 3050B	2.50	mg/kg

VANDANA Analyst (Tested By)

MAMTA NAYAK SR. ANALYST (Checked By)

(Approved By)

www.vardan.co.in

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/02	Report No.:	VEL/S/2012/18/002
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Marupur	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.310	mS/cm
3.	Soil Texture	SOP . SP-87,Issue No.-01& Issue Date-14/02/2013	Sand – 54 Silt - 30 Clay - 16	--
4.	Color	SOP . SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81,Issue No.-01& Issue Date-14/02/2013	30.32	%
6.	Bulk density	SOP . SP-80,Issue No.-01& Issue Date-14/02/2013	1.28	gm/cc
7.	Chloride as Cl	SOP . SP-85,Issue No.-01& Issue Date-14/02/2013	35.30	mg/100g
8.	Calcium as Ca	SOP . SP-82,Issue No.-01& Issue Date-14/02/2013	[illegible]	mg/100g

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/02	Report No.:	VEL/S/2012/18/002
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Marupur	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.310	mS/cm
3.	Soil Texture	SOP . SP-87.Issue No.-01& Issue Date-14/02/2013	Sand – 54 Silt - 30 Clay - 16	--
4.	Color	SOP . SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81,Issue No.-01& Issue Date-14/02/2013	30.32	%
6.	Bulk density	SOP . SP-80,Issue No.-01& Issue Date-14/02/2013	1.28	gm/cc
7.	Chloride as Cl	SOP . SP-85.Issue No.-01& Issue Date-14/02/2013	35.30	mg/100g
8.	Calcium as Ca	SOP . SP-82,Issue No.-01& Issue Date-14/02/2013	41.72	mg/100g
9.	Sodium as Na	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	42.51	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	126.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.42	%
12.	Magnesium as Mg	SOP . SP-83,Issue No.-01& Issue Date-14/02/2013	19.28	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	213.50	kg./hec.
14.	Available Phosphorus	SOP . SP-86,Issue No.-01& Issue Date-14/02/2013	17.85	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	9.17	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	5.50	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.35	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.23	mg/kg
20.	Copper (as Cu)	USEPA 3050B	2.59	mg/kg

VANDANA Anal. (Tested By)

MAMTA NAYAK SR. ANALYST

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/03	Report No.:	VEL/S/2012/18/003
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Jatlana	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.56	--
2.	Conductivity	IS:14767 by Conductivity meter	0.264	mS/cm
3.	Soil Texture	SOP . SP-87.Issue No.-01& Issue Date-14/02/2013	Sand – 58 Silt - 31 Clay - 11	--
4.	Color	SOP . SP-78.Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81.Issue No.-01& Issue Date-14/02/2013	31.26	%
6.	Bulk density	SOP . SP-80.Issue No.-01& Issue Date-14/02/2013	1.32	gm/cc
7.	Chloride as Cl	SOP . SP-85.Issue No.-01& Issue Date-14/02/2013	39.48	mg/100g
8.	Calcium as Ca	SOP . SP-82.Issue No.-01& Issue Date-14/02/2013	42.87	mg/100g
9.	Sodium as Na	SOP . SP-84.Issue No.-01& Issue Date-14/02/2013	47.20	mg/kg
10.	Potassium as K	SOP . SP-84.Issue No.-01& Issue Date-14/02/2013	178.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.39	%
12.	Magnesium as Mg	SOP . SP-83.Issue No.-01& Issue Date-14/02/2013	18.20	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	191.43	kg./hec.
14.	Available Phosphorus	SOP . SP-86.Issue No.-01& Issue Date-14/02/2013	17.96	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	10.21	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	6.62	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.84	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.56	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.43	mg/kg
20.	Copper (as Cu)	USEPA 3050B	3.39	mg/kg

VANDANA
Analyst

MAMTA NAYAK
SR. ANALYST

(Authorized By)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/04	Report No.:	VEL/S/2012/18/004
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Naharpur	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.341	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Sand – 51 Silt - 37 Clay – 12	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	31.34	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.46	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	37.20	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.67	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.52	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	182.40	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.48	%
12.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	19.30	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	221.87	kg./hec.
14.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.61	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	12.20	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	8.51	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.70	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.42	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.33	mg/kg
20.	Copper (as Cu)	USEPA 3050B	3.50	mg/kg

VANDANA Analyst (Tested By)

MAMTA NAYAK Chemist ANALYST

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/05	Report No.:	VEL/S/2012/18/005
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020 – 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Khajuri	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.310	mS/cm
3.	Soil Texture	SOP . SP-87.Issue No.-01& Issue Date-14/02/2013	Sand – 55 Silt - 34 Clay – 11	--
4.	Color	SOP . SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81.Issue No.-01& Issue Date-14/02/2013	31.47	%
6.	Bulk density	SOP . SP-80,Issue No.-01& Issue Date-14/02/2013	1.56	gm/cc
7.	Chloride as Cl	SOP . SP-85,Issue No.-01& Issue Date-14/02/2013	47.10	mg/100g
8.	Calcium as Ca	SOP . SP-82,Issue No.-01& Issue Date-14/02/2013	41.68	mg/100g
9.	Sodium as Na	SOP . SP-84.Issue No.-01& Issue Date-14/02/2013	38.54	mg/kg
10.	Potassium as K	SOP . SP-84.Issue No.-01& Issue Date-14/02/2013	118.40	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.48	%
12.	Magnesium as Mg	SOP . SP-83.Issue No.-01& Issue Date-14/02/2013	22.30	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	202.32	kg./hec.
14.	Available Phosphorus	SOP . SP-86.Issue No.-01& Issue Date-14/02/2013	17.41	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	9.50	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	4.19	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.65	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.30	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.42	mg/kg
20.	Copper (as Cu)	USEPA 3050B	2.81	mg/kg

VANDANA
Analyst
(Analyzed by)

MAMTA NAYAK
SR. ANALYST
(Checked by)

(Approved by)

Note: Terms & conditions refer on backside of test report.

www.vardan.co.in

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/06	Report No.:	VEL/S/2012/18/006
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020~ 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village-Bahadurpur	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26) by pH Meter	7.56	--
2.	Conductivity	IS:14767 by Conductivity meter	0.242	mS/cm
3.	Soil Texture	SOP . SP-87,Issue No.-01& Issue Date-14/02/2013	Sand – 57 Silt - 31 Clay - 12	--
4.	Color	SOP . SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81,Issue No.-01& Issue Date-14/02/2013	26.80	%
6.	Bulk density	SOP . SP-80,Issue No.-01& Issue Date-14/02/2013	1.53	gm/cc
7.	Chloride as Cl	SOP . SP-85,Issue No.-01& Issue Date-14/02/2013	42.70	mg/100g
8.	Calcium as Ca	SOP . SP-82.Issue No.-01& Issue Date-14/02/2013	51.28	mg/100g
9.	Sodium as Na	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	26.89	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	143.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.44	%
12.	Magnesium as Mg	SOP . SP-83.Issue No.-01& Issue Date-14/02/2013	23.65	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	181.41	kg./hec.
14.	Available Phosphorus	SOP . SP-86,Issue No.-01& Issue Date-14/02/2013	18.68	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	5.36	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	3.60	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.38	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.29	mg/kg
20.	Copper (as Cu)	USEPA 3050B	1.90	mg/kg

VANDANA
(Technical Analyst)

MAMTA NAYAK
SR. ANALYST

(Approved By)

Note: Terms & conditions refer on backside of test report.

Ph. 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/07	Report No.:	VEL/S/2012/18/007
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village- Jaipur	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.48	--
2.	Conductivity	IS:14767 by Conductivity meter	0.234	mS/cm
3.	Soil Texture	SOP . SP-87,Issue No.-01& Issue Date-14/02/2013	Sand – 62 Silt - 28 Clay - 10	--
4.	Color	SOP . SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP . SP-81,Issue No.-01& Issue Date-14/02/2013	24.85	%
6.	Bulk density	SOP . SP-80,Issue No.-01& Issue Date-14/02/2013	1.38	gm/cc
7	Chloride as Cl	SOP . SP-85,Issue No.-01& Issue Date-14/02/2013	33.15	mg/100g
8	Calcium as Ca	SOP . SP-82,Issue No.-01& Issue Date-14/02/2013	49.84	mg/100g
9.	Sodium as Na	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	38.62	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No.-01& Issue Date-14/02/2013	102.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.34	%
12.	Magnesium as Mg	SOP . SP-83,Issue No.-01& Issue Date-14/02/2013	18.40	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	182.00	kg./hec.
14.	Available Phosphorus	SOP . SP-86,Issue No.-01& Issue Date-14/02/2013	16.90	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	4.14	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	2.43	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.55	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.43	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.27	mg/kg
20.	Copper (as Cu)	USEPA 3050B	2.10	mg/kg

VANDANA Analyst (Tested By)

MAMTA NAYAK SR. ANALYST (Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

1097401/2021/Estt.Br

Annexure 7

Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/PPPL/S/08	Report No.:	VEL/S/2012/18/008
Name & Address of the Party:	M/s Pahwa Plastics Pvt. Ltd. Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	23/12/2020
		Period of Analysis:	18/12/2020– 23/12/2020
		Receipt Date:	18/12/2020
Sample Description:	SOIL SAMPLE	Sampling Date:	17/12/2020
Sample Location:	Village- Unheri	Sample Quantity:	2.0 Kg
Sample Collected by:	Vardan Envirolab Representative	Sampling Type:	Composite
Sampling and Analysis Protocol:	IS 2720, USEPA 3050B	Packing Status:	Temp Sealed
		Parameter Required:	As Per ToR Letter

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.60	--
2.	Conductivity	IS:14767 by Conductivity meter	0.295	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Sand – 52 Silt - 35 Clay – 13	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Brown	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.41	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.46	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	48.22	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	58.52	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	43.10	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	128.00	kg/hec.
11.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.47	%
12.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.50	mg/100g
13.	Available Nitrogen as N	IS:14684 Distillation Method	193.24	kg./hec.
14.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.42	kg./hec.
15.	Zinc (as Zn)	USEPA 3050B	5.85	mg/kg
16.	Manganese (as Mn)	USEPA 3050B	3.41	mg/kg
17.	Lead (as Pb)	USEPA 3050B	0.75	mg/kg
18.	Cadmium (as Cd)	USEPA 3050B	0.56	mg/kg
19.	Chromium (as Cr)	USEPA 3050B	0.35	mg/kg
20	Copper (as Cu)	USEPA 3050B	2.80	mg/kg

VANDANA
(Tested By) Analyst

MAMTA NAYAK
SR. ANALYST
(Checked By)

(Approved By)

Note: Terms & conditions refer on backside of test report.

Annexure 8

WILDLIFE CONSERVATION PLAN

FOR

FORMALDEHYDE MANUFACTURING UNIT

OF 150 TPD

AT

VILLAGE- JATHLANA, TEHSIL- JAGADHRI,

DISTRICT- YAMUNANAGAR, STATE- HARYANA

BY

M/S PAHWA PLASTICS PVT. LTD.

Prepared By
ENVIRONMENT CONSULTANT
VARDAN ENVIRONET
(QCI/NABET ACCREDITED NO. NABET/EIA/1922/RA0166)
Plot No. 82A, Sector-5, IMT Manesar
Gurgaon, Haryana

Table of Contents

CHAPTER-1: INTRODUCTION

1.1 INTRODUCTION:

Biodiversity management is considered as a difficult task as it refers to diversity at all levels like genetic, species and community. The formulation of a biodiversity management and wildlife conservation plan for a developmental Project is one of the steps towards the environment conservation. Human activities like agricultural expansion, road construction, urbanization, and other mining activities are supposed to be major threats to biodiversity and wildlife, therefore, the most effective and efficient mechanisms for conserving biodiversity is to prevent further destruction of degradation of habitats. Four strategies required for the biodiversity management are in Situ strategy, ex Situ Strategy, reduction of anthropogenic pressure and rehabilitation of endangered species.

M/s Pahwa Plastics Pvt. Ltd. is a proprietor firm started with the objective to get involved in the business of manufacturing & trading in organic chemicals viz. Formaldehyde. M/s Pahwa Plastics Pvt. Ltd. has an existing unit for manufacturing of Formaldehyde with the production capacity 150 MTPD at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana. The existing plant was established on the basis of CTE Obtained by Haryana State Pollution Control Board vide Letter HSPCB/Consent/2846616YAMCTE3087415 dated 02.06.2016.

M/s Pahwa Plastics Pvt. Ltd. will generate a fair amount of direct and indirect employment in the study region. The local economy will receive a boost due to employee spending and services generated by the company. The overall effect will improve the buying power of employees and locals, thus a higher standard of living viz. better education, improved health and sanitation facilities, housing etc. This will be envisaged as a major positive benefit, which will ultimately lead to the sustainable development of the region.

During biological environment study it has been found that through the local villagers and by direct evidence that some wildlife are harboring the area occasionally for their food, water and crossing from one place to another places. During the survey total 101 plants species and 97 faunal species were recorded by primary field observations and information of local villages. Total five schedules –I species were documented as per Wildlife Protection Act, 1972. Hence, conservation Plan is to be prepared for the conservation of these

scheduled species.

1.2 PROJECT DETAILS

The proposed Project is established on 0.23 ha land falling under Khasra No.-10/7/1 and is situated at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana. There is no forest land involved in this 0.23 ha of land. The geographical location of the Existing plant lies from Latitude- 30° 2'22.97"N & Longitude- 77°15'3.45"E

The Existing plant site is well connected with the rail and road connectivity. The Existing project site is situated at Khajuri- Jathlana road and SH-6~0.01 Km in E direction.

1.3 PROJECT/TECHNOLOGY

The commercial production of Formaldehyde is manufactured from oxidation-dehydrogenation using a silver catalyst involving the complete conversion of methanol.

Methanol is vaporized and mixed with air and steam and it is then passed over a thin bed of silver catalyst at 650 °C. Formaldehyde is formed by the dehydrogenation of methanol.

The heat required for the endothermic reaction is obtained by burning hydrogen content in the off gasses, produced from the dehydrogenation reaction.

1.4 MANPOWER REQUIREMENT

Total 10 employees have been employed at the plant.

1.5 WATER REQUIREMENT

Total water requirement after expansion will be 92 KLD for which we will apply ground water abstraction application in CGWB, Haryana. Existing water requirement is fulfilled from ground water CGWA/CGWB has not been taken.

1.6 POWER REQUIREMENT

Maximum power requirement for the plant is 200 KW (Total sanctioned load). The power is supplied from UHBVN (Uttar Haryana BijliVitran Nigam).

2D.G sets of capacity 180 KVA & 250 KVA is also installed as the backup power supply.

1.7 RAW MATERIAL REQUIREMENT

The only raw material is Methanol which comes in road tankers from Kandla Port, Gujarat & stored in underground M.S tanks. Methanol requirement for the existing unit is 75 MTPD.

1.8 CAPITAL COST OF THE PROJECT

The calculated cost is approx. Rs. 113 Lakhs.

1.9 LOCATION OF THE PROJECT

The Existing project is located in 0.23 ha and is situated at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana. The land is already under the possession of project proponent. The geographical location of the Existing plant lies from Latitude- 30° 2'22.97"N & Longitude- 77°15'3.45"E. Study area falls in survey of India Toposheet no. H43L4, H43L8, H43R1 & H43R5.

Location map of the Project Site, Plant Layout and Toposheet Map is presented in Figure 1, Figure 2 and Figure 3.

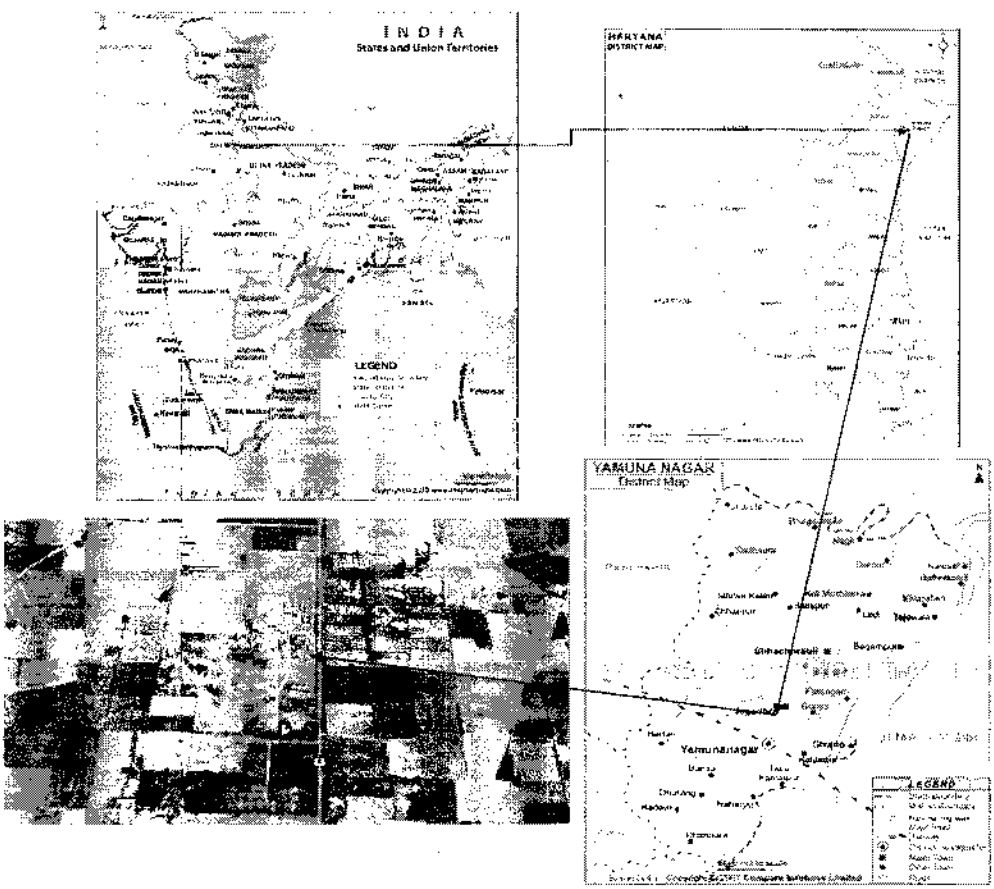


Fig 1: Location Map of the Project Site

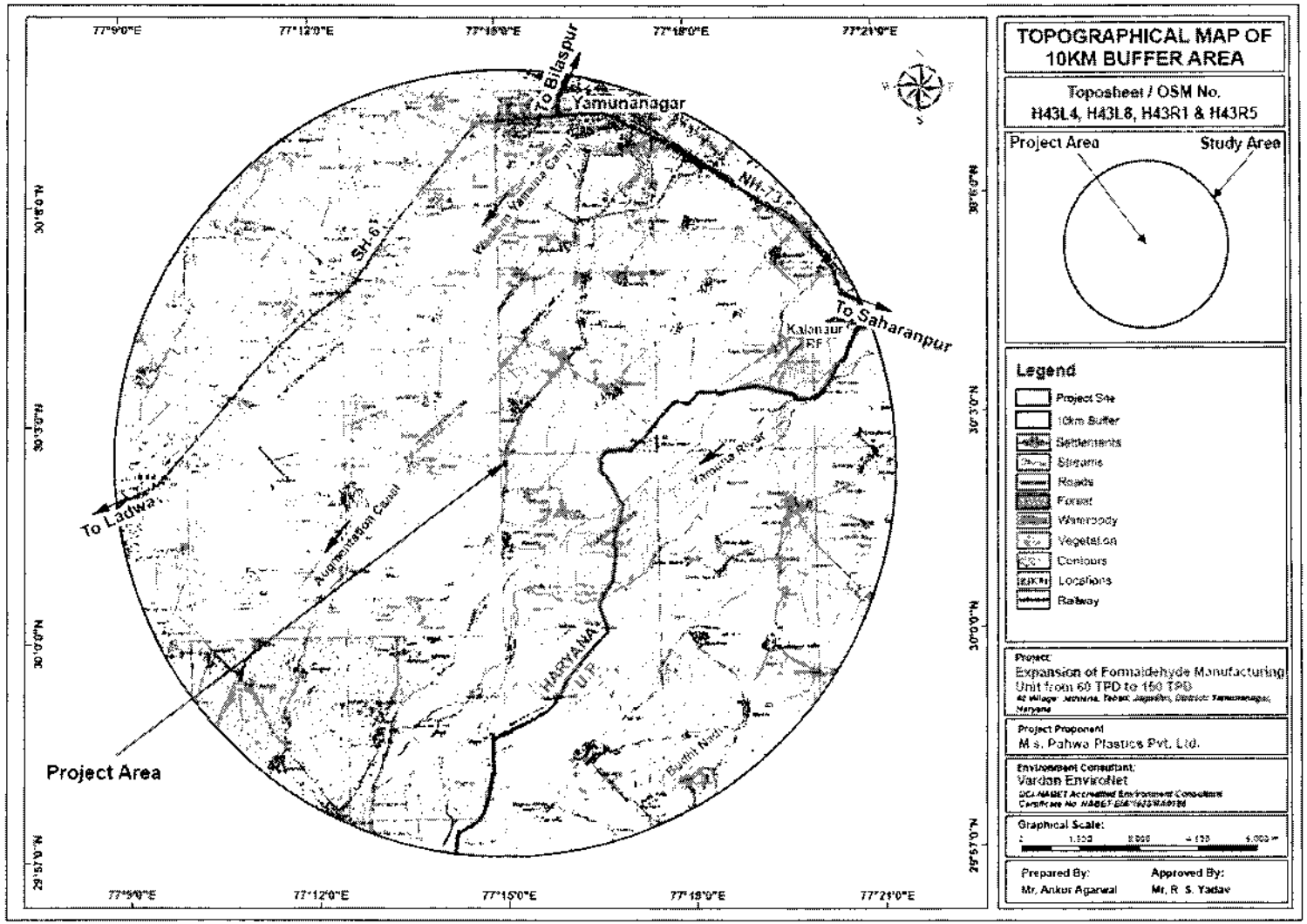


Fig-2: Location Map of the Study Area

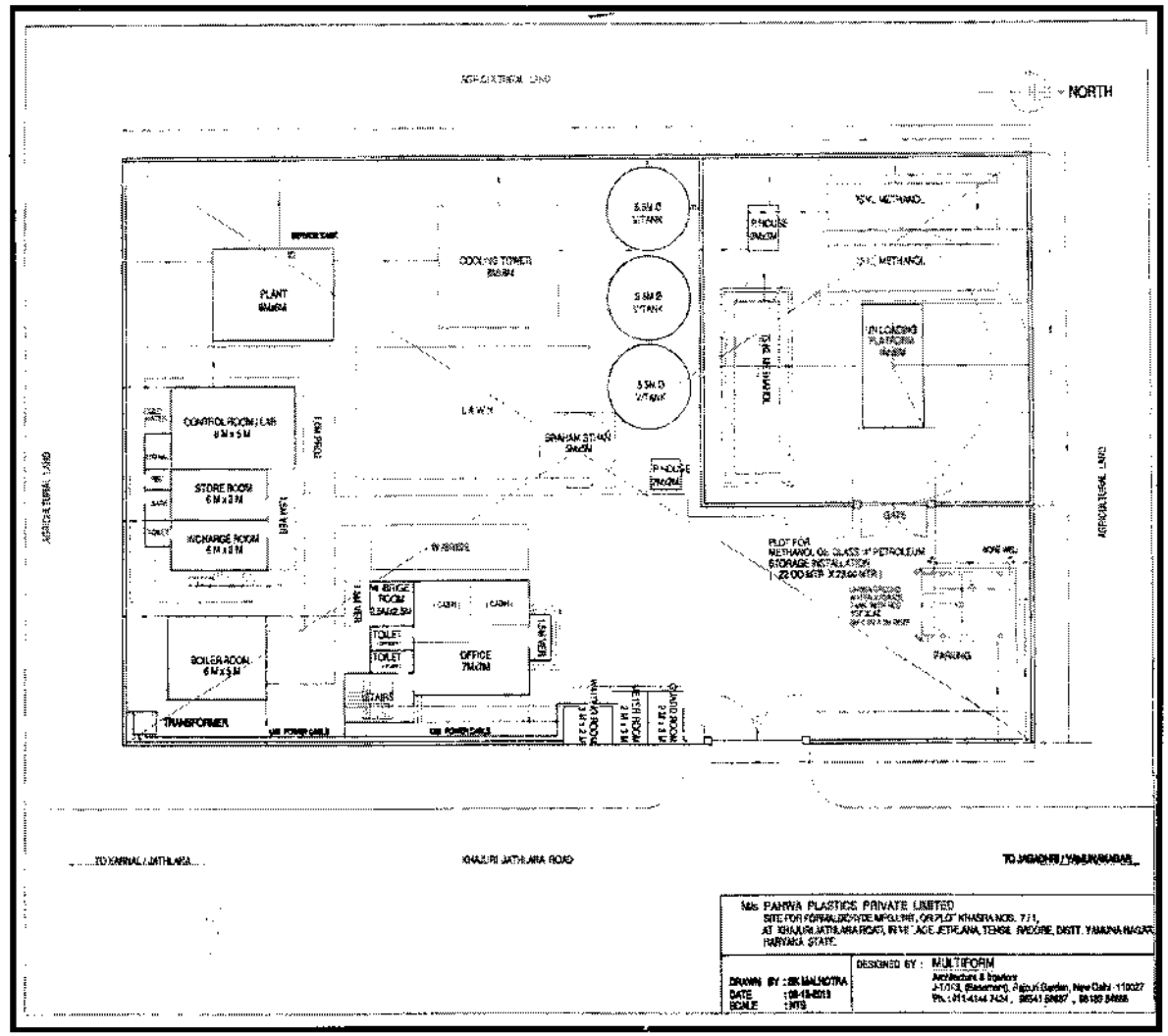


Fig-3.: Layout Plan of M/s Pahwa Plastics Pvt. Ltd.

CHAPTER-2: BIOLOGICAL ENVIRONMENT

2.1 INTRODUCTION

The term biological environment covers the prevalence of all living forms (plants and animals) both terrestrial and aquatic in study areas. Living forms range over a very wide spectrum of specie. Even a small area may have thousands of species including bacteria, protozoa, worms, insects, plants, animals and birds. In the present study, Flora (trees, small trees, shrubs, under shrubs, climbers and grasses) and Fauna (mammals, birds and reptiles) are considered. It is needless to emphasize that living system is extremely complicated. They are directly affected by changes in the physical environment but may often either adapt or avoid the adverse environmental conditions.

Generally, biological communities are the best indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

The animal and plant communities exist in their natural habitats in a well-organized manner. Their natural settings can be disturbed by externally induced anthropological activities or by naturally induced calamities or disaster. So, once this setting is disturbed, it becomes practically impossible or takes a long time to come back to its original state. Plants and animals are more susceptible to environmental stress. A change in the composition of biotic communities is reflected by a change in the distribution pattern of natural species of flora and fauna existing in the ecosystem. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can, therefore, be used for monitoring Environmental Impact Assessment studies of any project.

2.2 OBJECTIVES OF BIOLOGICAL STUDY

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).

- To identify the locations and features of ecological significance.
- To identify the impacts of a proposed project before, after and during the development phases.

Table: 2.1. Mode of data collection and parameters considered during the Survey

Sr. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transect, point sampling and nest sampling etc.
2.		From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth.
3.	Aquatic Biodiversity	By field survey	Floral and Faunal diversity	**For Plankton Study-** Lackey's drops method and light microscope **For other aquatic-** Random survey, opportunistic observations
4.		From authentic sources like Forests department of Haryana.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Desktop literature review to indentify the representative spectrum of threatened species, population and ecological communities.

2.3 PROJECT DESCRIPTION

M/s. Pahwa Plastics Pvt. Ltd. has an existing unit for manufacturing of Formaldehyde with the production capacity 150 MTPD at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.

2.4 STUDY AREA

The proposed project is established on 0.23 ha land falling under Khasra No.-10/7/1 and there is no forest land involved in this 0.23 ha of land. The geographical location of the Existing plant lies from Latitude- 30° 2'22.97"N & Longitude- 77°15'3.45"E. The Existing plant site is well connected with the rail and road connectivity. The Existing project site is situated at Khajuri- Jathlana road and SH-6~0.01 Km in E direction.

It is connected with the adjacent states and other parts of India as well, which facilitates transportation of goods, both inwards and outwards. This further facilitates the marketing of Formaldehyde all over India including Haryana, Punjab & Uttar Pradesh are nearby industrial areas having plywood and decorative laminate industry. The study area is divided into two parts i.e.:

a) **Core Zone:** Project Site i.e. M/s Pahwa Plastics Pvt. Ltd.

b) **Buffer Zone:** Area within 10 Km radius from the project site.

2.5 RIPARIAN ENVIRONMENT

Riparian habitats are the interface of terrestrial and aquatic ecosystems and they are essential in controlling flows of energy and nutrients between terrestrial and aquatic ecosystems. Despite the relatively small area that they occupy within the landscape, riparian zones provide a major contribution to the ecology and biodiversity in the areas where they occur.

The study of riparian vegetation of a river is an important as it strongly affects soil-water characteristics of the area and thus the aquatic life. Moreover, the vegetation provides the human population with vital life support and socio- economic security. Riparian zones often regulate aquatic-terrestrial linkages. Riparian vegetation is important for regulating nutrient cycle of the streams, preventing soil erosion and stabilizing river banks. Further, the riparian vegetation is modified or destroyed by grazing, logging, urbanization, road construction, water development, mining and recreation. Also, the riparian zone is thought to have a disproportionate influence (relative to its land area) on the running water because of its immediate effects on the transport of water, nutrients and sediments. Riparian flora of Yamuna River, Western Yamuna Canal, Budhi Nadi and Augmentation canal was studied during the site visit.

2.6 TERRESTRIAL FLORA AND FAUNA

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animal (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance and diversity.

2.7 TERRESTRIAL FLORA

The Vegetation and plant species composition observed and documented during field visit in and around the proposed location of the project. Besides primary surveys in the project sites, published literature and various floras were consulted to prepare an inventory of plant species growing at project sites. The vegetation of the study area is highly degraded and some areas consisting water bodies. The plant diversity is classified into various plant groups such as tree, shrubs, herbs, climbers, sedges and grasses. The plant diversity survey in the project area was undertaken during the summer season with the objectives of preparing a checklist of flora in the study area which is divided into two parts i.e. Core Zone & Buffer Zone.

Core Zone: Core zone of the proposed project i.e. 0.23 ha is situated at Khasra No.-10/7/1, Village Jathlana, Tehsil- Jagadhri, Yamuna Nagar, Haryana. There is no forest land is involved in this proposed project land.

Buffer Zone: The selection of terrestrial and aquatic ecological sampling location was based on land use pattern, topography and habitat patterns of the study area. The terrestrial ecological survey was carried out in forest and non-forest areas (agricultural fields, roadsides, urban & semi-urban wastelands etc) and the aquatic ecological survey was carried out at rivers & ponds/lakes within the study area.

2.7.1. Methodology

The present study on the floral assessment for the project activity is based on field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the buffer zone (10 km radial distance) from project site at Khasra No.-10/7/1, Village Jathlana, Tehsil- Jagadhri, Yamuna Nagar,

Haryana, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCB during the study period.

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A **forest inventory** is **"an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown."** The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

2.7.2. Forest Types of Haryana

The state presents diverse vegetation types from pine forests to desert thorn forests. Depending upon the altitude and climate, the main forest types of Yamuna Nagar district as per Champion and Seth's classification (1968) are:

i) Northern Dry Mixed Deciduous Forests 5B/C2

ii) Dry Deciduous Scrub 5/DS1

Northern Dry Mixed Deciduous Forest 5B/C2:

This type occurs on the upper dry slopes along the Siwaliks and their extensions. The upper canopy is usually light, open and irregular. The trees having relatively short bole and poor form and a height rarely over 10 meters. The canopy is formed entirely of deciduous trees. Major species are Cassia fistula, *Diospyros tomentosa, Acacia catechu, Anogeissus latifolia, Bombax cieba, Albizzia lebbek, Albizzia procera, Acacia nilotica, Acacia modesta, Bauhinia variegate, Syzygium cumini, Mangifera indica, Ehretia laevis, Phoenix sylvestris, Morus alba, Morus Australia, Terminalia tomentosa, Boswellia serrata, Aegle marmelos, Bauhinia racemosa, Bauhinia purpurea, Erythrina suberosa, Ficus glomerata, Grewia elastic, Mallotus philippensis* and *Shorea robusta.*

Dry Deciduous Scrub (5/DS1):

This type is located adjacent to the habitation in the Siwalik foot hills of the district and state. These represents a degradation stage of the tropical dry deciduous forest and have been brought into existence by adverse biotic factor like excessive grazing, lopping, felling and fires. In spite of sufficient rains, moisture retention is very poor and the type has now become a stable edaphic climax. The crop is open with less tree cover. The main tree species found are *Diospyros tomentosa, Acacia leucophloea, Butea monosperma, Premna barbata, Cassia fistula, Anogeissus latifolia* and *Lannea grandis.* The undergrowth is mainly *Carissa apaca, Woodfordia Fruticosa, Nyctanthes arbortristis* and *Flacourtia indica.*

2.7.3. Floristic Composition of Core Zone

Core zone of the proposed project i.e. Khasra No.-10/7/1, Village Jathlana, Tehsil- Jagadhri, Yamuna Nagar, Haryana. During the field survey some floral (Some ornamental Greenbelt developed by Project Proponent) and faunal (Avifauna) diversity was recorded from the project area.

2.7.4. Floristic Composition of Buffer Zone

The terrestrial flora of the study area i.e. buffer zone (10 km radial distance) from the project site could be categorized as agriculture vegetation, social forestry plantation, Agro-forestry plantation, plantation for green belt development and natural/forest vegetations.

2.7.4.1. Agricultural and Horticulture Crops:

Agriculture is the primary sector of Haryana State economy and majority of the population is directly or indirectly dependent on agriculture and its allied activities. The climatic conditions of a region affect the agricultural cropping pattern of different areas. Thus, it produces different crops. Amongst a host of climatic factors i.e. rainfall, temperature, humidity, wind velocity and duration of sunshine etc. affect the cropping pattern in a significant way. Annual rainfall and its distribution over the entire year and the regimes of diurnal and annual temperatures are by far, the prominent factors affecting agriculture and the life style of the people.

Table: 2.2: Cropping pattern of Study area

Crop Variety	Family	Botanical Name	Trade Name
Agriculture Crops			
Vegetable	Malvaceae	*Abelmoschus esculentus*	Lady Finger
	Cucurbitaceae	*Cucurbita pepo*	Kaddu
	Cucurbitaceae	*Momordica charantia*	Karela
	Solanaceae	*Capsicum fruitiscens*	chilli
	Solanaceae	*Solanum melongena*	Brinjal
	Solanaceae	*Solanum tuberosum*	Potato
	Solanaceae	*Lycopersicon lycopersicum*	Tomato
	Liliaceae	*Allium cepa*	Onion
	Brassicaceae	*Brassica oleracea var. capitata*	Cabbage
	Brassicaceae	*Brassica oleracea var. botrytis*	Cauliflower
	Cucurbitaceae	*Cucumis melo*	Cucumber
	Cucurbitaceae	*Cucurbita maxima*	Pumpkin
	Apiaceae	*Daucus carota*	Carrot
	Convonvulaceae	*Ipomoea batatas*	Sweet Potato
	Brassicaceae	*Raphanus sativus*	Radish
	Chenopodiaceae	*Spinacia oleracea*	Spinach
Cereals	Poaceae	*Oryza sativa*	Rice
	Poaceae	*Triticum aestivum*	Wheat
	Poaceae	*Zea mays*	Maize
Pulses	Fabaceae	*Vigna radiate*	Moong
	Fabaceae	*Vigna mungo*	Urd
	Fabaceae	*Cajanus cajan*	Pigeon Pea
	Fabaceae	*Vigna umbellata*	Rice Bean
	Fabaceae	*Cicer arietinum*	Gram
	Fabaceae	*Pisum sativum* Subsp. *arvense*	Field Pea
Spices	Amaryllidaceae	*Allium sativum*	Garlic
	Zingiberaceae	*Zingiber officinale*	Adrak

Crop Variety	Family	Botanical Name	Trade Name
Oilseeds	Asteraceae	*Helianthus annus*	Sunflower
	Pedaliaceae	*Sesamum indicum*	Sesamum
Other	Malvaceae	*Gossypium hirsutum*	Cotton
	Poaceae	*Saccharum officinarum*	Sugar Cane
Horticulture Crops			
Fruits	Moraceae	*Artocarpus heterophyllus*	Jack Fruit
	Caricaceae	*Carica papaya*	Papaya
	Rutaceae	*Aegle marmelos*	Bel
	Anacardiaceae	*Mangifera indica*	Mango
	Musaceae	*Musa paradasiaca*	Banana
	Myrtaceae	*Psidium guajava*	Guava
	Myrtaceae	*Syzygium cumini*	Jamun
	Fabaceae	*Tamarindus indica*	Imli

2.7.4.2. Social/Agro-Forestry:

In India, natural forests are being conserved primarily for the environmental benefits. Serious efforts are also being done to plant large number of trees outside forest under social forestry programs to increase the tree cover and fulfill demand of various forest produce required by the people and forest based industries. Agricultural fields are one of the potential areas, where large scale planting of trees can be taken up along with the agricultural crops. Agro-forestry models adopted by the farmers in Haryana state are highly lucrative, therefore, attracting farmers in a big way.

Table 2.3: Agro Forestry Species of the Study Area (Buffer Zone)

Botanical Name	Trade Name	Family
Delonix regia	Gulmohar	Caesalpiniaceae
Dalbergia sisso	Shisham	Fabaceae
Azadirachta indica	Neem	Meliaceae
Mangifera indica	Aam	Anacardiaceae
Pongamia pinnata	Karanj	Euphorbiaceae

Musa paradisiacal	Banana	Musaceae
Ficus religiosa	Pipal	Moraceae
Eucalyptus cameldulensis	Nilgiri	Myrtaceae
Pisidium guava	Guava	Myrtaceae
Tectona grandis	Sagwan	Verbenaceae
Dendrocalamus strictus	Lathi bans	Poaceae
Butea monosperma	Kachnar	Fabaceae
Cassia fistula	Amaltas	Fabaceae
Saraca asoca	Asok	Fabaceae
Populous deltoids	Popular	Salicaceae
Shorea robusta	Sal	Dipterocarpaceae
Tectona grandis	Teak	Lamiaceae
Toona ciliata	Toon	Meliaceae

2.7.4.3. Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

2.7.4.4. Endemic/Endangered Flora:

No endangered and endemic flora was recorded from core and buffer zone of the project area.

2.7.4.5. Location of National Park/Sanctuaries:

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

2.7.4.6. Natural/Forest Vegetation:

Upper layer is stratified by dominant tree species: *Mangifera indica* (Mango); *Dalbergia sisso* (Shisham); *Azadirachta indica* (Neem); *Populus deltoides* (popular); *Bombax cieba* (Semel); *eucalyptus cameldulensis* (Eucalyptus); *ailanthus excelsa* (Arusa); *Zizyphus Mauritiana* (Ber); and *Ficus religiosa* (Peepal).

Lower strata of shrubs occupied at ground level: *Cassia alata* (Wild Senna); *Cocculus hirsutus* (Jamiti-ki-bel); *Tinospora cordifolia* (Giloy); *Barleria cristata* (Jhinti); *Vitex negundo* (Nirgundi); *Coccinia grandis* (Kundru); *Lantana camara* (Raimuniya); *Ricinus communis* (Arandi); and *Hyptis suaveolens* (Wilaiyati tulasi).

The herbaceous species: *Cynodon dactylon* (Dubh); *Achyranthes aspera* (Chirchira); *Saccharum spontaneum* (Kansh); *Parthenium hysterophorus* (Congress weed); *Cassia tora* (Tarota); *Tridax procumbens* (Kamarmodi); *Panicum indicum* (Fox tail grass); *Croton bonplandianus* (Mirchini); and *Hemidesmus indicus* (Anantmul). The status of natural/forest flora of buffer zone is presented below.

Table 2.4: Floristic composition of Buffer zone

Sr. No.	Botanical Name	Family	Common Name
TREES			
1.	*Aegle marmelos*	Rutaceae	Bel
2.	*Ailanthus excels*	Simaroubaceae	Adusa
3.	*Albizia procera*	Fabaceae	Safed Siris
4.	*Albizia lebbeck*	Fabaceae	Kala Siris
5.	*Anogeissus latifolia*	Combretaceae	Dhaura
6.	*Azadirachta indica*	Meliaceae	Neem
7.	*Acacia catechu*	Fabaceae	Khair
8.	*Adina cordifolia*	Rubiaceae	Haldu
9.	*Bauhinia acuminate*	Fabaceae	Safed Kachnar
10.	*Bauhinia vahlii*	Fabaceae	Malu Creeper
11.	*Bauhinia variegate*	Fabaceae	Kachnar
12.	*Bombax ceiba*	Malvaceae	Semal
13.	*Cassia fistula*	Fabaceae	Amaltas
14.	*Cassia siamea*	Fabaceae	Kasood
15.	*Dalbergia sissoo*	Fabaceae	Shisham
16.	*Delonix regia*	Fabaceae	Gulmohar
17.	*Emblica officinalis*	Phyllanthaceae	Amla

Sr. No.	Botanical Name	Family	Common Name
18.	*Eucalyptus camaldulensis*	Myrtaceae	Nilgiri
19.	*Ficus racemosa*	Moraceae	Gular
20.	*Ficus religiosa*	Moraceae	Pipal
21.	*Ficus benghalensis*	Moraceae	Bargad
22.	*Holoptelia integrifolia*	Ulmaceae	Kanju
23.	*Mallotus philippensis*	Euphorbiaceae	Kamala
24.	*Melia azedarach*	Meliaceae	Bakain
25.	*Morus alba*	Moraceae	Shehtoot
26.	*Phoenix sylvestris*	Palmaceae	Khajur
27.	*Populous deltoids*	Salicaceae	Poplar
28.	*Syzygium cumini*	Myrtaceae	Jamun
29.	*Tectona grandis*	Lamiaceae	Teak
30.	*Terminalia arjuna*	Combretaceae	Arjun
31.	*Terminalia chebula*	Combretaceae	Harad
32.	*Toona ciliata*	Meliaceae	Toon, Cedar
SHRUBS & HERBS			
33.	*Abrus precatorius*	Fabaceae	Ratti
34.	*Abutilon indicum*	Malvaceae	Kanghi
35.	*Achyranthes aspera*	Amaranthaceae	Chirchitta
36.	*Adhatoda vasica*	Acanthaceae	Vasaka
37.	*Alternanthera sessilis*	Amaranthaceae	Garundi
38.	*Amaranthus spinosa*	Amaranthaceae	Kate Chawli
39.	*Amaranthus viridis*	Amaranthaceae	Jungle Chaulai
40.	*Argemmone maxicana*	Papaveraceae	Satyanashi
41.	*Barleria crisata*	Acanthaceae	Varja Danti
42.	*Bauhinia vahlii*	Leguminoceae	Maljhan
43.	*Boerhavia diffusa*	Nyctaginaceae	Punarnawa
44.	*Bulbostylis barbata*	Cyperaceae	Water Grass

Sr. No.	Botanical Name	Family	Common Name
45.	*Caesalpinia sepiaria*	Sapindaceae	Kainju Bel
46.	*Calotropis procera*	Asclepiadaceae	Aak
47.	*Calotropis gigantea*	Asclepiadaceae	Madar
48.	*Cannabis sativa*	Urticaceae	Bhang
49.	*Carrissa occidentalis*	Apocynaceae	Karaunda
50.	*Cassia tora*	Caesalpiniaceae	Panwar
51.	*Chinopodium album*	Amaranthaceae	Bathuwa
52.	*Clematis gouriana*	Ranuculaceae	Balkangu
53.	*Crotolaria medicaginea*	Papilionaceae	Rattle Weed
54.	*Cryptolepis buchanani*	Apocynaceae	Dudhi
55.	*Cyperus compressus*	Cyperaceae	Annual Sedge
56.	*Cyperus rotundus*	Cyperaceae	Nut grass
57.	*Datura metel*	Solanaceae	Datura
58.	*Denderocalamus strictus*	Poaceae	Lathi Baans
59.	*Eclipta alba*	Asteraceae	Bhangra
60.	*Eriophorum Comosum*	Cyperaceae	Nakli Bhabbar
61.	*Euphobia hirta*	Euphorbiaceae	Dudhi
62.	*Evolvulus alsinoides*	Convonvulaceae	Vishnukrantha
63.	*Gloriosa superba*	Colchicaceae	Glory Lilly
64.	*Ipomoea carnea*	Convonvulaceae	Besharam
65.	*Lantana camara*	Verbenaceae	Raimuniya
66.	*Murraya koenigii*	Rutaceae	Gandhela
67.	*Nerium indicum*	Apocynaceae	Kaner
68.	*Ocimum sanctum*	Lamiaceae	Tulsi
69.	*Oxalis corniculata*	Oxalidaceae	Yellow sorrel
70.	*Parthenium hysterophorus*	Asteraceae	Gajar Ghas
71.	*Physalis minima*	Solanaceae	Rasbhari
72.	*Pueraria truberosa*	Leguminoceae	Sural

Sr. No.	Botanical Name	Family	Common Name
73.	*Ranunculus sceleratus*	Ranunculaceae	Jaldhaniya
74.	*Rumex dentatus*	Polygonaceae	Jungle Palak
75.	*Sida acuta*	Malvaceae	Baraira
76.	*Solonum erianthum*	Solanceae	Aradu, Ban
77.	*Solanum indicum*	Solanaceae	Makoi
78.	*Solanum viarum*	Solanaceae	Jungle Begun
79.	*Syzygium cumini*	Myrtaceae	Jamun
80.	*Tephrosia purpurea*	Fabaceae	Nili
81.	*Terminalia chebula*	Combretaceae	Bahera
82.	*Trichodesma indicum*	Boraginaceae	Chota Kalpa
83.	*Tridax procumbens*	Asteraceae	Kamarmodi
84.	*Typha angustifolia*	Typhaceae	Patera
85.	*Urena lobata*	Malvaceae	Caesar Weed
86.	*Withania somnifera*	Solanceae	Asgandh
87.	*Xanthium stumarium*	Asteraceae	Chota Gokhru
88.	*Zizyphus nummularia*	Rhacnaceae	Beri
	GRASSES		
89.	*Apluda mutica*	Poaceae	Banjura grass
90.	*Aristida hystrix*	Poaceae	
91.	*Cenchrus echinatus*	Poaceae	Sandbur
92.	*Chloris barbata*	Poaceae	
93.	*Cymbopogon ernate*	Poaceae	Tikhadi
94.	*Cynodon dactylon*	Poaceae	Doob
95.	*Dactyloctenum aegyptium*	Poaceae	Crow foot grass
96.	*Digitaria ernate*	Poaceae	
97.	*Echinochloa colona*	Poaceae	Jungle Rice
98.	*Eragrostiella bifaria*	Poaceae	
99.	*Eragrostis ciliaris*	Poaceae	

Sr. No.	Botanical Name	Family	Common Name
100.	*Panicum tripheron*	Poaceae	
101.	*Sacharrum spontanium*	Poaceae	

2.7.4.7. Wetland Diversity & Marsh Lands:

Wetlands are very useful to us. By producing resources, enabling recreational activities and controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table 2.5: Wetland/Marshland Diversity of Study area

Family	Botanical Name	Local Name
Pteridaceae	*Adiantum capillus*	Maiden Hair Fern
Fabaceae	*Aeschynomene indica*	Phulan
Amaranthaceae	*Alternanthera philoxeroides*	Alligator Weed
Amaranthaceae	*Alternanthera sessilis*	Garundi
Myrsinaceae	*Anagallis arvensis*	Neel
Salviniaceae	*Azolla pinnata*	Mosquito Fern
Asteraceae	*Caesulia axillaris*	Maka
Ceratophyllaceae	*Ceratophyllum demersum*	Hornwort
Poaceae	*Chrysopogon zizanioides*	Vetiver
Poaceae	*Coix lacryma-jobi*	Adlay Millet
Araceae	*Colocasia esculenta*	Taro
Commelinaceae	*Commelina benghalensis*	Kana
Cyperaceae	*Cyperus alternifolius*	Umbrella Sedge
Dryopteridaceae	*Dryopteris filix-mas*	Fern
Dryopteridaceae	*Dryopteris sieboldii*	Fern
Poaceae	*Echinochloa colona*	Shama

Family	Botanical Name	Local Name
Pontederiaceae	*Eichhornia crassipes*	Jal Kumbhi
Asteraceae	*Grangea maderaspatana*	Madras Carpet, Mustaru
Acanthaceae	*Hygrophila salicifolia*	---
Lemnaceae	*Lemna minor*	Duck Weed
Onagraceae	*Ludwigia adscendens*	Water Primrose
Marsileaceae	*Marsilea quadrifolia*	Four Leaf Clover
Sterculiaceae	*Melochia corchorifolia*	Bilpat
Nelumbonaceae	*Nelumbo nucifera*	Lotus, Kamal
Nymphaeaceae	*Nymphaea pubescens*	White Lotus
Oxalidaceae	*Oxalis corniculata*	Amrul
Urticaceae	*Pilea microphylla*	Gun Powder Plant
Polygonaceae	*Polygonum hydropiper*	Marsh Pepper Knot Weed
Portulacaceae	*Portulaca oleracea*	Little Hog-Weed
Potamogetonaceae	*Potamogeton natans*	Floating Pond Weed
Lythraceae	*Trapa natans*	Water Chest Nut
Ranunculaceae	*Ranunculus sceleratus*	Aglaon
Polygonaceae	*Rumex dentatus*	Ambavati
Typhaceae	*Typha angustata*	Patera
Hydrocharitaceae	*Vallisneria spiralis*	Tape Grass
Lentibulariaceae	*Utricularia gibba*	Floating Bladderwort
Plantaginaceae	*Veronica anagallis-aquatica*	Water Speedwell

2.8 FAUNAL DIVERSITY

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area from the project site to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

a) Wildlife Survey (Diversity)

b) Habitat Study (Feeding, Breeding and Roosting areas)

c) Distribution/Status of Birds

d) Rare & Endangered species of Fauna

e) Specific local characteristics of biodiversity in the study area.

2.8.1. Methodology for Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 2.6: Faunal Diversity from Study Area

S. No.	English Name	Scientific Name	Status/Schedule
		Mammals	
1.	Indian Hare	*Lepus nigricollis*	Schedule-IV
2.	Little Indian field mouse	*Mus booduga*	Schedule-V
3.	Nilgai	*Boselaphus tragocamelus*	Schedule-III
4.	Jungle Cat	*Felis catus*	Schedule-II
5.	Monkey	*Maccaca mulata*	Schedule-II
6.	Black Rat	*Rattus rattus*	Schedule-V
7.	Bat	*Rousettus leschenaultia*	Schedule-V
8.	Common Langur	*Semnopithecus entellus*	Schedule-II
9.	Common Mangoose	*Herpestes edwerdsii*	Schedule-II
10.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
11.	Hare	*Lepus nigrigolis*	Schedule-IV
		Amphibians	
1.	Indian pond frog	*Rana hexadactyla*	Schedule-IV
2.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
3.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
4.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
5.	Marble Toad	*Bufo stomaticus*	Not Listed
		Reptiles	
1.	House gecko	*Hemidactylus flavivridis*	Common
2.	Common garden lizard	*Calotes versicolor*	Common
3.	Brahminy skink	*Mabuya carinata*	Common
4.	Indian Cobra	*Naja naja*	Schedule-II
5.	Rat Snake	*Ptyas mucosa*	Schedule-IV
6.	Famn Throated Lizard	*Sitana ponticeriana*	Not Listed
		Butterflies	
1.	White orange tip	*Ixias marianne*	Common
2.	Lime butterfly	*Papilio demoleus*	Common
3.	Common crow	*Euploea core*	Common
4.	Common map	*Cyrestis thyodamas*	Common
5.	Common mormon	*Papilio polytes*	Common
6.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
7.	Stripped Tiger	*Danaus genutia*	Common
8.	Danaid Egg Fly	*Hypolimanas misippus*	Common
9.	Common Bush Brown	*Mycalesis perseus*	Common
		Aves	
1.	House Crow	*Corvus splendens*	Schedule-V
2.	Rock Pigeon	*Columba livia*	Common
3.	Gery francolin	*Francolinus pondicerianus*	Least Concern
4.	Jungle babbler	*Turoides striatus*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
5.	Common Myna	*Acridotheres tristis*	Schedule-IV
6.	Green bee-eater	*Merops orientalis*	Least Concern
7.	Indian roller	*Coracias benshalensis*	Schedule-IV
8.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
9.	Little cormorant	*Microcarbo niger*	Schedule-IV
10.	Common swift	*Apus apus*	Schedule-IV
11.	House swift	*Apus affinis*	Schedule-IV
12.	Shikra	*Accipiter badius*	Schedule-IV
13.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
14.	Little Egret	*Egretta garzetta*	Schedule-IV
15.	Pond heron	*Ardeola grayii*	Schedule-IV
16.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
17.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
18.	Ring dove	*Streptopelia decaocto*	Schedule-IV
19.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
20.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
21.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
22.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
23.	Drongo Cuckoo	*Srniculus lugubris*	Schedule-IV
24.	Red Jungle Fowl	*Gallus sallus*	Schedule-IV
25.	White breasted water hen	*Amaurornis phoenicurus*	Schedule-IV
26.	Common Moorhen	*Gallinule chloropus*	Schedule-IV
27.	Raven	*Corvus corax*	Schedule-IV
28.	Tree Pie	*Dendrocitta vagabunda*	Schedule-IV
29.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
30.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
31.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
32.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
33.	House Sparrow	*Passer domesticus*	Schedule-IV
34.	Grey Tit	*Parus major*	Schedule-IV
35.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
36.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
37.	Common Babbler	*Turdoides caudatus*	Schedule-IV
38.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
39.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
40.	Baya	*Ploceus philippinus*	Schedule-IV
41.	Owl	*Bubo bubo*	Schedule-IV
42.	Indian peafowl	*Pavo cristatus*	Schedule-I
		Pisces	
1.	Rohu	*Labeo rohita*	Least Concern
2.	Katla	*Catla catla*	Least Concern

S. No.	English Name	Scientific Name	Status/Schedule
3.	Calbasu	*Labeo calbasu*	Least Concern
4.	Cat fish	*Mystus cavasius*	Least Concern
5.	Mosquito fish	*Gambusia affinis*	Least Concern
6.	Black Fish	*Barbus chilinadea*	Least Concern
7.	Singi	*Clarias batrachus*	Least Concern
8.	Bronze Feather Back	*Notopterus notopterus*	Least Concern
9.	Ganges River Gizzard Shad	*Gonialosa manmina*	Least Concern
10.	hilsa	*Tenualosa ilisha*	Not Listed
11.	Chelluah	*Aspidoparia morar*	Least Concern
12.	Barna Baril	*Barilius barna*	Least Concern
13.	Chaguni	*Chagunius chagunio*	Least Concern
14.	Common Carp	*Cyprinus carpio*	Least Concern
15.	Reba Carp	*Cirrhinus reba*	Least Concern
16.	Sind Danio	*Danio devario*	Least Concern
17.	Kharsa, Butter	*Labeo angra*	Least Concern
18.	Bata	*Labeo bata*	Least Concern
19.	Boga Bata	*Labeo boga*	Least Concern
20.	Kali, Boalla	*Labeo dyocheilus*	Least Concern
21.	Kuri, Khursa	*Labeo gonius*	Least Concern
22.	Swamp Barb	*Puntius chola*	Least Concern
23.	Olive Barb	*Puntius sarana*	Least Concern
24.	Ticto Barb	*Puntius ticto*	Least Concern

Reference: For Avifauna: The book of Indian Birds by Salim Ali
For Amphibians: Atlas of amphibians, Published by Zoological Survey of India, Kolkata

2.8.2. Endangered Species:

As per list of **The Indian Wildlife (Protection) Act, 1972,** Fauna coming under the **schedule - I** is treated as endangered species. As per reconnaissance survey only one species i.e. *Pavo cristatus* **schedule - I** faunal species have been reported from the project site. Although some schedule-II species have been reported during the site survey, which are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life:

I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.

II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being.

2.9 AQUATIC DIVERSITY

2.9.1. Methodology for Aquatic Diversity

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20μ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton (Table 2.7). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table 2.7: List of Phytoplankton & Zooplanktons from Study Area

PHYTOPLANKTON	ZOOPLANKTONS
CHLOROPHYCEAE	**PROTOZOA**
Ankistrodesmus falcatus	*Paramecium caudatum*
Chlorella vulgaris	*Vorticella campanula*
Chlorococcum infusionum	**CLADOCERA**
Cladophora fracta	*Alona rectangula*
Cosmarium tenue	*Bosmina longirostris*
Closterium Sp.	*Daphnia carinata*
Hydrodictyon reticulatum	**COPEPODA**
Pediastrum simplex	*Cyclops bicuspidatus*
Ulothrix	*Macrocylops albidus*
Spirogyra condensate	**ROTIFERA**
EUGLENOPHYCEAE	*Asplanchna intermedia*
Euglena acus	*Brachionus falcatus*
Phacus caudatus	*Filinia longiseta*
BACILLARIOPHYCEAE	*Keratella tropica*
Cyclotella meneghiniana	*Philodina citrine*
Synedra ulna	*Polyarthra* Sp.
CYANOPHYCEAE	**MACROBENTHOS – MOLLUSCA**
Anabaena fertilissima	*Pila*
Nostoc Sp.	*Bellamya* Sp.
Oscillatoria clorina	*Gyraulus*
Phormidium calciola	

CHAPTER-3: WILDLIFE CONSERVATION PLAN

Biodiversity management is considered as a difficult task as it refers to diversity at all levels like genetic, species and community. The implementation of biodiversity conservation strategy is a challenging job especially in North India. The area is predominated with various Schedule/tribal populations, which consider themselves as an integral part of the forest ecosystem. The formulation of a biodiversity management and wildlife conservation plan for a developmental Project is one of the steps towards the environment conservation. Human activities like agricultural expansion, road construction, urbanization, and other developmental/Mining activities are supposed to be major threats to biodiversity and wildlife, therefore, the most effective and efficient mechanisms for conserving biodiversity is to prevent further destruction of degradation of habitats.

The destruction of habitats is the primary reason for the loss of biodiversity in terrestrial and aquatic ecosystems. Habitat loss could be attributed to conversion, habitat degradation and fragmentation. When people cut down trees, fill a wetland, plough grassland or burn a forest, the natural habitat of a species is changed or destroyed. Introduction of invasive species may cause disappearance of native species through biotic interactions. Invasive species are considered second only to habitat destruction as a major cause of extinction of species. Communities are affected by natural disturbances, such as fire, tree fall, and defoliation by insects. Man-made disturbances differ from natural disturbances in intensity, rate and spatial extent. For example, man by using fire more frequently may change species richness of a community. Exploitation, including hunting, collecting, fisheries and fisheries by-catch, and the impacts of trade in species and species' parts, constitute a major threat for globally threatened birds (30% of all), mammals (33% of all), amphibians (6% of those assessed), reptiles and marine fishes (Baillie *et al.* 2004). Trade affects 13% of both threatened birds and mammals. Extinction is a natural process. Species have disappeared and new ones have evolved to take their place over the long geological history of the earth. It is useful to distinguish three types of extinction processes. Over-fishing, habitat destruction, widespread marine pollution and human induced climate change threaten the survival of marine biodiversity. Pollution, oil and gas drilling and oil spills may increase the

risks of extinction by increasing mortality of marine organisms. The Silent Valley Project in Kerala was abandoned because it was considered as a threat to biodiversity in the region.

1.1 STATUS OF BIODIVERSITY IN THE SURROUNDING

The terrestrial flora of the study area i.e. buffer zone (10 km radial distance) from the project site can be categorized as agriculture vegetation, social forestry plantation, Agro-forestry plantation and natural/forest vegetation. No endangered or endemic flora was recorded from the core and buffer zone of the project area. No Wildlife Sanctuary/National Park is situated within the 10 km radius of the proposed project site.

Endangered species present within the study area are listed in Table 3.1. It was observed that out of 97 species only one species i.e. Peafowl listed in the Schedule I with 5 species of Schedule II, under the Wildlife Protection Act, 1972 and Near Threatened, Vulnerable, Endangered & Critically Endangered categories of IUCN 3.1.

Table -3.1: Schedule-I Species observed within 10 Km Study area

Species		Schedule
AVES		
2.	*Pavo cristatus*	Schedule-I

Table -3.2: Schedule-II Species observed within 10 Km Study area

Species		Schedule
REPTILE		
1.	*Naja naja* (Indian cobra)	Schedule-II
MAMMALS		
5.	*Semnopithecus entellus* (Langur)	Schedule-II
6.	*Macaca mulatta* (Monkey)	Schedule-II
7.	*Herpestes edwardsii* (Common mongoose)	Schedule-II
8.	*Felis chaus* (Jungle cat)	Schedule-II

1.2 SCHEDULE-I SPECIES

Biodiversity conservation plan is developed with the aim to reduce adverse impact on the natural habitat of various wild animals. Day by day issues related to threats to natural terrestrial and aquatic ecosystems arises due to high anthropogenic activities and loss of natural habitat due to climate change. A conservation plan is needed for the conservation of critical habitats of wildlife for endangered and schedule-I species along with their scientific

management strategy. During the industrial/mining and construction activities, natural resources (Land, Biodiversity, Forest, Animals and Humans) are likely to expert tremendous pressure due to various activities in the respective region, while the present management plan will ensure mitigation of such impacts. A separate Wildlife conservation Plan has been prepared for proposed Formaldehyde Manufacturing unit over an area of 0.23 ha at Village Jathlana, Tehsil- Jagadhri Distt. Yamunanagar, Haryana.

Some general behavior and biology of encountered schedule-I species are discussed below which help in making the conservation and management plan success fully.

3.2.1 INDIAN PEAFOWL:

Conservation status:

The Indian Peafowl is listed as Least Concern species in the Red List of International Union for Conservation of Nature (BirdLife International 2008), probably owing to its widespread distribution, occurrence of locally abundant semi-feral populations, and protection from people on religious grounds. In India, it is given the utmost protection by inclusion in the Schedule I of Indian Wildlife Act, 1972. Although the train feathers of the Indian Peafowl are traded for various reasons, it is not included on any Appendix of the Convention on International Trade of Endangered Species perhaps on the claim that these feathers are naturally fallen ones during annual molt of the species, and also that the scale of trade across international border is still to be understood.

Threats:

The Indian Peafowl is under threat from various quarters that include the demand for feathers and wild meat, conflict with farmers during cropping season, increased use of chemical fertilizers and pesticides, and habitat degradation. Other threats include habitat degradation and loss - more significantly from conversion of their habitat to agriculture, habitation and Mining/Industrial growth, poisoning to counter crop damage, consumption of eggs and fat extracts for alleged medicinal values, and killing for wild meat (del Hoyo *et. al.,* 1994; Chakkaravarthy 2002). Although these threats are believed to be causing an alarming decline in

populations, the magnitude and pattern of the effects in different parts of the country are yet to be quantified.

Conservation Measures:

It is critical that urgent efforts are made to understand the habitat and population status of the species through field based research and *in situ* conservation projects. A meeting of the Indian Board for Wild Life (held on 19 June 2006) underlined the need for such efforts. The actions required are:

1) Mapping of habitat and distribution status of the species across the country, inside and outside protected areas;
2) Time series analysis of habitat change to quantify the rate of change and identify high-risk areas and potential sites for further affirmative action;
3) Estimation of population size by established count methods such as line transect, call counts and roost counts;
4) Intensive ecological investigations in representative sites in major biogeographic zones with focus on the effects of threats in relation to breeding success and survival probability;
5) Quantification of trade, with details on source and people involved; and

Undertaking outreach activities to sensitize local communities, which may be carried out by a network of 'student clubs' (e.g. National Green Corps) throughout the country. These people could be trained to collect population data and undertake monitoring within their localities, and the reliability of the results could be ensured by adopting rigorous protocols.

3.2.2 SCHEDULE-II SPECIES

3.2.2.1 Jungle Cat (*Felis chaus*):

Population:

Jungle Cat remains probably the most common cat species in South Asia (India, Nepal, Bangladesh), where the majority of the global population occurs and despite likely extensive declines in mainland Southeast Asia, where the species is now extremely scarce and largely restricted to remote lowland deciduous dipterocarp forest.

In India, there is evidence of continued, and likely accelerating, habitat loss and ongoing poaching for both skins and, potentially, as a result of conflict with farmers. The Jungle Cat's preference for habitat is open scrub and grassland. The majority of the suitable Indian habitat is classified as 'wasteland' which legally eases conversion into any other form of uses particularly industrialization and urbanization – the latter has been identified as a particular threat in India given the pace of urbanization of agricultural and unprotected forest areas.

Habitat & Ecology:

The Jungle Cat, despite its name, is not strongly associated with the classic rainforest "jungle" habitat, but rather with wetlands - habitats with water and dense vegetative cover, especially reed swamps, marsh, and littoral and riparian environments - scrubland, and deciduous dipterocarp forest. Water and dense ground cover can be found in a variety of habitats, ranging from desert (where it is found near oases or along riverbeds) to grassland, shrubby woodland and dry deciduous forest, as well as cleared areas in moist forest.

Major Threats:

The biggest threat to Jungle Cat is habitat loss particularly industrialization and urbanization of low intensity agricultural areas and scrubland in the Indian subcontinent. Habitat destruction for agricultural purposes and infrastructure development are also major issues. Unselective trapping, snaring and poisoning around agricultural and settled areas have caused population declines in many areas throughout its range. India formerly exported large numbers of Jungle Cat skins before

the species came under legal protection (over 300,000 were declared as being held by traders there when export was banned in 1979).

Conservation Action:

The Jungle Cat is listed on CITES Appendix II. It is protected from hunting in some range states (India), but in many it receives no legal protection outside protected areas. The Indian Wildlife Protection Act (1972) prohibits hunting of all wildlife and lists the Indian Fox in Schedule II. However, no hunting of any wildlife is permitted under the current legal system in India. The ecology and status of the Jungle Cat is poorly known.

3.2.2.2 Common Mongoose (*Herpestes edwardsii*):

Population:

Indian Grey Mongoose is mostly common, often abundant, in suitable habitat throughout its main range, but it is relatively rare in North-east India. One study in central India, where the species is common, found its abundance even decreased moving from human settlement towards undisturbed forests.

Habitat & Ecology:

Although it is a common semi-synanthropic species, the natural history of Indian Grey Mongoose is little studied. It has been recorded in disturbed (even urban) areas, in dry secondary forests, and thorn forests, in central India during 2002-2003, saw it near refuse bins and dumps, scavenging on carrion, and on roads. This species feeds on a wide variety of animal food including insects and snakes.

Major Threats:

Indian Grey Mongoose has no range-wide threats sufficient to drive significant population declines. It is likely that in some areas the levels of harvest are sufficient to reduce local densities. Over recent centuries the species has probably benefited from conversion of closed evergreen forest.

Conservation Action:

The Indian Grey Mongoose is listed on CITES Appendix III by India. It is listed in Schedule II of the Wildlife (Protection) Act (1972) in India. In central India people consider the mongoose to be sacred and thus it is not killed there. This species is found

in numerous protected areas. Populations are not quantitatively monitored in any country; but the species remains widely and commonly seen in human-dominated areas, indicating a lack of significant ongoing threats and no need for separate conservation action.

3.2.2.3 Langur (*Presbytis entellus*):

Population:

The total population of this species is unknown. Most of the populations occupy human-dominated landscapes, with very few actually occurring in forested areas. Conflict with humans is a major cause of concern and predicted declines are based on this.

Habitat & Ecology:

Gray langurs are diurnal. They sleep during the night in trees but also on man-made structures like towers and electric poles when in human settlements. When resting in trees, they generally prefer the highest branches.

Ungulates like bovine and deer will eat food dropped by foraging langurs. Langurs are preyed upon by leopards, dholes and tigers. Wolves, jackals and pythons may also prey on langurs.

Major Threats:

Major threats for this species are: intensive agriculture, habitat loss, man-animal conflict, and fires. Hunting for food by newly settled human populations in Andhra Pradesh and Orissa is very rampant and many populations are affected locally.

Conservation Action:

The Jungle Cat is listed on CITES Appendix II. Langur feature on Part II of Schedule II of the Wildlife Protection Act (1972) of India and are afforded the least legal protection. However, no hunting of any wildlife is permitted under the current legal system in India.

3.2.2.4 Monkey (*Macaca mulatta*):

Population:

It occurs to the north of the Krishna River in central and eastern India and to the north of the lower Tapti River in western India, north into Afghanistan, Nepal, Sikkim,

Bhutan, and northeast into China. There are introduced populations (mostly not mapped) in areas within this region as well as outside it, for instance south of the Krishna River in India.

Habitat & Ecology:

This species is diurnal and omnivorous, and alternatively arboreal and terrestrial. It resides in a range of habitats, including temperate coniferous, moist and dry deciduous, bamboo, and mixed forests, mangroves, scrub, rainforest, and around human habitations and developments, including cultivated areas, temples, and roadsides.

Macaca mulatta lives in a wide range of habitats, and shows a great deal of adaptability. Some populations live in flatlands, while others, in northern India and Pakistan, live in the Himalayas at elevations up to 3,000 m. These primates are able to acclimate to a variety of climatic extremes, from the hot, dry temperatures found in deserts, to cold winter temperatures which fall to well below the freezing point.

In addition to living in the wilderness, some populations of *M. mulatta* have become accustomed to living alongside humans. Occasionally, small groups can be found living in the densely populated urban areas of northern India. Groups of rhesus monkeys that become used to living in areas occupied by people usually search out other human-populated areas if people attempt to relocate them away from civilization.

Major Threats:

This species is generally unthreatened, though its original habitat is increasingly being lost to development. While *M. mulatta* exists easily around humans, the increasing level of cohabitation has been associated with waning levels of human tolerance for the animals. Confiscation for laboratory testing is a mostly localized threat, but it is considerable in certain areas. Capture and release of laboratory and "problem monkeys" from rural and urban areas into natural forests is a major threat to wild macaques.

Conservation Action:

The species is included in CITES Appendix II (in India). Monkeys feature on Part II of Schedule II of the Wildlife Protection Act (1972) of India and are afforded the least

legal protection. However, no hunting of any wildlife is permitted under the current legal system in India.

3.2.2.5 Indian cobra (*Naja naja*):

Description:

The Indian cobra (*Naja naja*) also known as the spectacled cobra, Asian cobra, or binocellate cobra is a species of the genus *Naja* found in the India, Pakistan, Bangladesh, Sri Lanka, Nepal, and Bhutan, and a member of the "big four" species that inflict the most snakebites on humans in India. This snake is revered in Indian mythology and culture, and is often seen with snake charmers. It is now protected in India under the *Indian Wildlife Protection Act* (1972).

Habitat & Ecology:

The Indian cobra is native to the Indian subcontinent and can be found throughout India, Pakistan, Sri Lanka, Bangladesh, and southern Nepal. In India, it may or may not occur in the state of Assam, some parts of Kashmir, and it does not occur in high altitudes of over 2,000 metres (6,600 ft) and extreme desert regions.

The Indian Cobra inhabits a wide range of habitats throughout its geographical range. It can be found in dense or open forests, plains, agricultural lands (rice paddy fields, wheat crops), rocky terrain, wetlands, and it can even be found in heavily populated urban areas such as villages and city outskirts. This species is absent from true desert regions. The Indian cobra is often found in the vicinity of water. Preferred hiding locations are holes in embankments, tree hollows, termite mounds, rock piles and small mammal dens.

Major Threat:

The Indian cobra is not considered an endangered species, but there are some threats to the species. These include killing them out of fear or for human consumption and road kill. The Indian cobra is also the snake used by Indian snake charmers. Its toxic venom is also necessary in the production of anti-venom and other research including pain-killers and anti-cancer drugs, some of it harvested illegally in regions of India and other countries within its range.

They are also hunted for their skin bearing the distinctive hood markings which is then used in the leather industry. The Indian cobra is one of the many venomous snakes exploited for making traditional Chinese medicines and also snake vine. The species is listed in CITES because it closely resembles other threatened species. The species is also protected in India under the Indian Wildlife Protection Act (1972).

CHAPTER-4: ACTION PLAN AND FINANCIAL PROJECTION FOR CONSERVATION PLAN

4.1 Introduction

Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people has become a major working principle for IUCN. For the protection of habitat sensitive wildlife and other living form need proper action plan and budgetary allocation which will be a roadmap for the success of conservation scheme.

4.2 Conservation Plan for fauna requires knowledge on:

1 Home range of the animal

2 Territorial requirement of the animal

3 Deciding the number of animals to be conserved and accordingly evaluating the carrying capacity of the habitat

4 Conservation is aimed at single species or multiple species

5 Conservation is proposed in a managed ecosystem or an un-managed, natural ecosystem.

6 However, very little knowledge exists on the above parameters of most of the animals.

4.3 Reasons for decline of wildlife:

Several reasons for the decline of wild life and methods for their conservation are proposed. However, the best method for the conservation of wild life is related directly to the maintenance of ecosystems in their natural condition, allowing their natural development and protection to the wildlife and their habitat. Both these phenomena (ecosystem development and habitat protection) are related to anthropogenic factors. Some of the important anthropogenic factors are listed below:

I. Habitat fragmentation and destruction

II. Man-animal conflict

III. Forest fire

IV. Poaching

V. Stake-holders dependence on forest resources

VI. Creating awareness amongst forest stake holders

To the above-mentioned factors may be added a non-anthropogenic but important factor:

VII. Water scarcity

4.4 Action Plan

4.4.1 Non-Formal Education

Conservation education and awareness would be imparted both at the formal and non-formal levels. At the formal level, it would be given at school, colleges and university levels. Formal education, in spite of all the curriculum development and introduction of the study of ecology, wildlife and conservation at the school and college levels, however, largely remains text book and examination oriented. Because of the situation, non-formal education becomes all the more necessary for creating the right kind of awareness and attitude among people at all levels- children, teenagers, adults, family groups, teachers, administrators, politicians and policymakers. To achieve this some local tours of school and college students would be arranged to nearby National Parks.

4.2.2 Institutional Infrastructure

The prime requisite for building up an understanding and awareness about wildlife and conservation is to develop an appreciation, respect and love for nature. Most people lack the curiosity to know even the names of animals and plants they come across in their day-to-day life. Development of an inquisitive mind, a keen sense of observation and curiosity about the fauna and flora are, therefore, very important. Concern for conservation can only emanate from a love for nature and awareness about the interdependence of all species of animals and plants, including the man. To arouse curiosity about the wildlife in the young mind some quiz and essay competitions would be arranged in the schools and colleges of the buffer zone and some nearby areas.

4.2.3 Indian Tradition of Conservation

The theme of conservation, wildlife and reverence for life is reflected in some of the exquisite images in Indian art paintings, sculpture, architecture and decorative art. The most wide-ranging wild life imagery is found in Indian miniature paintings. Early literatures like the *Panchatantra* and *Hitopadesha* contain animal fables that have been

used to preach both wisdom and morals. The long term tradition and abiding faith in conservation of nature is vividly seen in recent times also like the Chipko and Appiko movements. These conservation themes would be popularized through pamphlets and posters.

4.2.4 Role of the Individual

Each individual should develop a personal ethic towards nature and wildlife which could pave the way for commitment and conviction not to destroy wildlife particularly that of not considering hunting as a sport, nor to use products made out of skins or other parts of endangered animals. Unless these products are boycotted by their users, the clandestine killing and poaching of wildlife at the hands of unscrupulous people would continue. Everyone can play important role in spreading the message of conservation among their friends, family and community at the large.

4.2.5 Eco-Development Works

People in and around the forest area generally are hostile against the forest department and its staff, because they are prevented from taking out timber and other forest products illegally. Such antagonistic behaviour arises mainly because little effort is made to meet their genuine demands either from outside the forest area or from the forest area but in a sustainable manner. Regular interaction with them with agreement for sustainable utilization of forest resources combined with some incentives can completely change their indifferent or even un-concerned attitude to conservative attitude.

4.2.6 Checks and control on the Movement of Vehicle

Due to movement of vehicles, animals might get injured. For this reason, speed limit of vehicles would be fixed and operators would be educated and advised regularly to drive vehicle safely and slowly. All operators would also be advised to stop the vehicle on seeing such animals and let it go away before moving the vehicle further.

4.2.7 Pressure horn

Noise generated by pressure horn disturbs the wild life and forces them to leave the place. No pressure horn would be fixed on vehicle plying in these Industries. All the drivers would be advised to make minimum use of horn while working in Industry.

4.2.8 Vehicles head lights

Efforts would be made to cover the lights suitably with paint so that strong beam of head light is not formed and light falls in front of the vehicle only.

4.2.9 People Participation

With the help of the local people and employees of the Company, watch would be kept on the wild life as well as illegal tree felling. A Forest and a police department would be informed if such incident occurs, to take legal action against the offenders. For this they would be trained for motivation.

4.2.10 Encourage local villagers to grow trees on their on their field bounds/court yards

In consultation with the Forest Department, the company would provide some finance, to grow saplings of tree species, having importance for wood, small timber and fuel wood to distribute to the villagers. Bamboo would be another important species with a lot of environmental and economic value. This no doubt would help reduce dependence of people on RF forest; as a result the ecological condition of the area would improve so the wild life would be attracted to this area.

4.2.11 Reducing Environmental Pollution

To keep the environment frees from smoke, cooking gas cylinders would be provided to all the workers.

4.2.12 Provide employment to the villagers

On the basis of their suitability, jobs in the plant would be provided to the nearby villagers. As a result, their economic condition would improve. This would keep them busy so that they would not be tempted/compelled to cause destruction to forest which would help improve the status of wild life in the zone of influence of proposed project.

4.3 Reclamation and Habitat Restoration

4.3.1 Green Belt Development

A green belt will be developed along the boundary of the proposed plant. The area for green belt plantation consists of undisturbed soil; hence plantation can be made in any garden or along periphery of the plant. Green belt will be erected not from biodiversity or conservation point of view, but is basically developed as a screen to check the spread of

dust pollution. A green belt, 2m in width will be developed on the periphery of the project site. Green belt plantation will be started with the onset of the operation of plant and will be completed within the time.

Following precaution will be taken:

- Seedlings of only local species, suitable for green belt plantation will be considered.
- All the representative plant species of the region are found to grow in and around the study site.
- Care will be provided against grazing and browsing.
- Timely watering during the initial stages of survival and provisions for the allocation of funds will be made as well.
- During the running of plant, flora will be regenerated in different stages and the area having matured afforestation will be properly fenced so as to avoid cutting, browsing and hacking of branches and pruning of trees
- Awareness will be created among villagers residing on the periphery of the plant regarding the use of plantations.
- Plantation of indigenous species, fodder and fruit bearing tree species which can also act as habitats for wild life will be carried out.
- Plantation of fruits bearing trees is attracting wildlife population.

4.3.2 Plantation in the Buffer zone

Trees are being planted in the buffer zone also. This plantation will be done at selected places only and only local species will be used in the plantation. Plantation of such tree species is ensuring provision for food to the herbivores, which in turn would be the food source for the carnivores. Water, particularly during drier seasons, becomes the most important factor to all types of wild animals including the mammals, birds and reptiles. If water is available safely, then all other factors become secondary for the presence and survival of the wild life in any forested area. Places suitable for mini watersheds will be identified in the core as well as in the buffer zone to store rainwater. Further, to make water available at all the times, throughout the year, some of these water holes will be recharged through artificial means. Proper slope will be given to approach these water sources so that the wild animals would be able to drink water without any difficulty. Proper

cover through vegetation or any other type of even artificial cover will be developed near these water sources so that the prey species would be able to hide themselves from the predators, at the time of approaching the water sources. To attract the birds, plants yielding food to the birds will be planted on priority basis. If water and food are available to the birds without any anthropogenic disturbances the area can become an ideal place for bird watching.

4.3.3 Plantation Programme

The tree plantation will be made all along the industry approach roads surrounding the site services and road sides.

The survival rate will be 80%. The dead plants will be replaced by fresh plants in next year and 20% as replacement from second year.

The total project area is 0.23 Ha, out of which, 33% should be maintained under greenbelt, i.e., 0.076 Ha should be under green cover within plant boundary. As per MoEF&CC Guidelines, number of plants per hectare within the green belt should not be less than 2000. In line with such guidelines, the number of plants has been calculated as 114 for 0.076 ha area. Based on the local land quality and climatic conditions, around 20% mortality in the plantation has been observed. The same number of plants is being replaced annually to compensate the mortality.

As per the guideline, local mortality rate has been calculated and given in the table below.

Irrigation and proper protection measures will be provided by project proponent in order to sustain the plantation.

4.4 Financial Projection

Rs. 2.00 Lakh has been allocated towards conservation of scheduled fauna in the area for the implementation of conservation proposal. An effective conservation plan will help in proper management of habitat of such ecologically and nationally significant species. Implementation of conservation plan should be step by step in described format. M/s Pahwa Plastics Pvt. Ltd. will allocate budget in assistance with the forest department, Yamuna Nagar, Haryana.

Table-4.2: Financial Projection for Wildlife Conservation

S. No.	Component	Budget in Rs (Lakh)
1	Planting of trees groves in surrounding area and Promotion of agro forest in villages planting fruits trees	1.0
2	Artificial nests, feeding and watering arrangement for Peafowl	0.5
3	Water supply	0.5
Total		**2**

Annexure 9

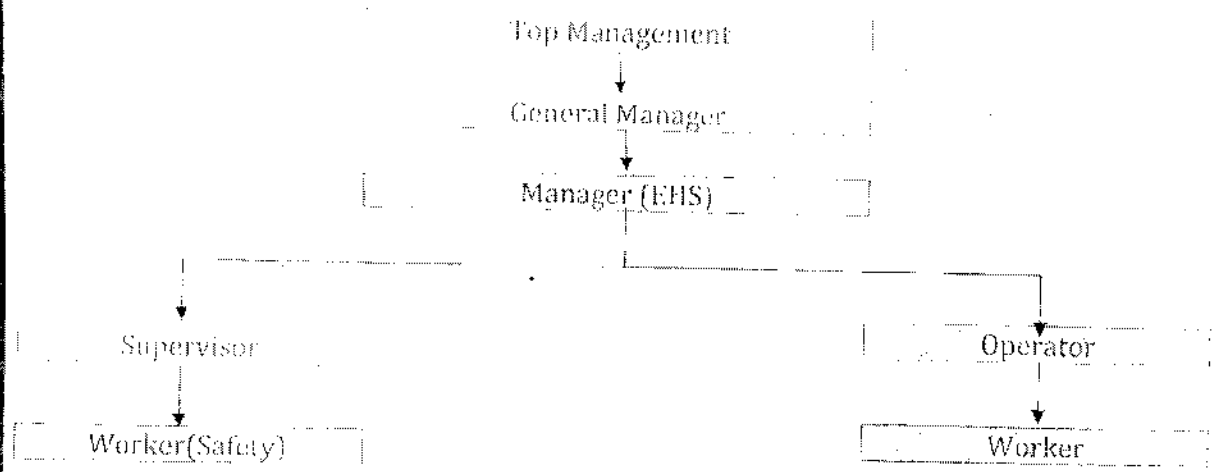
PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

ENVIRONMENT MANAGEMENT POLICY

I, ChandanPahwa, Director of M/s Pahwa Plastics Pvt. Ltd.having vast experience in Industrial Management, acknowledge its responsibility to manage the environment issues associated with Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil Jagadhri, District- Yamunanagar, State Haryana.

The company is very much oblivious of its responsibility in protecting the Environment. Regular monitoring has thus, been provided. The Company has a well defined policy to keep the Environment Clean. The company has decided that all effective steps shall be taken to prevent deterioration of the existing environment. They have formed an Environment Committee committed for this cause. The committee will consist of following persons as given in.



Environment Management Cell

The main aims under the said policy are to:

Corr. off : BA-1,1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI-110034
PHONE NO : (011) 27024410/5510/5520
E-mails: formalin.ynr@pahwaplastics.com

Works: KHASRA NO. 10/7/1,VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

- Effectively manage, monitor, improve and communicate the environmental performance.
- Take all reasonable steps to prevent pollution.
- Set realistic and measurable objectives and targets for continual improvement of the environmental performance.
- Comply fully with all relevant legal requirement, codes of practices and regulations
- Reduce, recycle and reuse natural resources.
- Minimize waste and increase recycling within the framework of waste management procedures.
- Identify and manage environmental risks and hazards.
- The project proponent shall regularly review the policy and ensure the corrective and preventative actions are taken in order to ensure continual improvement.
- To treat all the pollutants viz. liquid and gaseous, which contribute to the degradation of the environment with appropriate technologies.
- To comply with all regulations stipulated by the Central/State Pollution Control Boards related to air emissions and liquid effluent discharge as per air and water pollution control laws.
- Hazardous and other wastes (Management and Transboundary Movement) Amendments Rules 2016.
- To encourage support and conduct developmental work for the purpose of achieving environmental standards and to improve the methods of environmental management.
- To create good working conditions (devoid of air and noise pollution) for employees.
- To minimize fire and accident hazards.
- Perspective budgeting and allocation of funds for environment management expenditure.
- Preventive maintenance and regular checking of machineries and equipments.

Corr. off : BA-1,1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI 110034
PHONE NO : (011) 27024410/5510/5520
E-mail: formalin.yer@pahwaplastics.com

Works: KHASRA NO. 10/7/1,VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

1097401/2021/Est. Br

Annexure 9

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

- To make continuous efforts in waste minimization.

- For the equipments and pipelines, leakage detection and repair shall be scheduled to minimize fugitive emissions.
- Continuous efforts with energy audits for the reduction of fuel and energy consumption.

Authorized Signatory

Chandan

M/s Pahwa Plastics Pvt. Ltd.

Corr. off : BA-1, 1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI-110034
PHONE NO : (011) 27024410/5510/5520
E mail : formalin.ynnr@pahwaplastics.com

Works: KHASRA NO. 10/7/1,VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

UNDERTAKING

I, **ChandanPahwa, Director of M/s Pahwa Plastics Pvt. Ltd.,** located at Village Jathlana, Tehsil Jagadhri, District- Yamunanagar, State- Haryanaproposing Formaldehyde Manufacturing Unit of 150 TPD, hereby solemnly affirm an undertaking as stated herein:

1) That a solid/hazardous waste generated from the project will be disposed at the TSDF site and used oil from machineries or DG sets will be sold to the recyclerauthorized by Haryana State Pollution Control Board. Memorandum of Understanding will be signed after securing Environmental Clearance and before restart of the unit.

What is situatedherein is true to the best of my knowledge and the same I believed to be true.

For

M/s Pahwa Plastics Pvt. Ltd.

Corr. off : BA-1, 1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI 110034
PHONE NO : (011) 27024410/5510/5520
E-mail: formalin.ynr@pahwaplastics.com

Works: KHASRA NO. 10/7/1, VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

Annexure

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

SAFETYPOLICY

I,ChandanPahwa, Director of M/s Pahwa Plastics Pvt. Ltd.,acknowledgeitsresponsibilitytomanagetheenvironmentalissuesassociatedwith theFormaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil Jagadhri,District- Yamunanagar, State- Haryana.

We at**M/s Pahwa Plastics Pvt. Ltd.,**areconmitted

- To provide safe working condition to all our employees.
- Toachievezeroaccidenttarget.
- Toprovide&ensureuseof personalprotectiveequipmenttoallemployeesas perjob requirement.
- Toprovidesatisfactoryfacilities& arrangetraining&providemedical;checkup& medical helpasrequired.
- Toprovidesafehygiene&cleanenvironmentin & around workingareas.
- Tomplementallrules &regulationsperthefactoryAct1987(amended)

Authorized Signatory

M/s Pahwa Plastics Pvt. Ltd.

Corr. off : BA-1, 1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI-110034
PHONE NO : (011) 27024410/5510/5520
E-mail: formalin.ppl@pahwaplastics.com

Works: KHASRA NO. 10/7/1,VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

Annexure 12

LIST OF MAJOR INDUSTRIES NEAR M/S PAHWA PLASTICS PVT. LTD.

1. Trenox Laminates at a distance of 0.12 km in N direction
2. Salasar Wood Industry at a distance of 0.74 km in NE direction
3. Artis Laminates at a distance of 0.76 km in SE direction
4. Big Wig Factory at a distance of 0.52 km in SE direction

FORMALDEHYDE
Methyl aldehyde
Methylene oxide
Methanal

ICSC: 0275

June 2012

CAS #: 50-00-0
UN #: (see Notes)
EC Number: 200-001-8

	ACUTE HAZARDS	PREVENTION	FIRE FIGHTING
FIRE & EXPLOSION	Extremely flammable. Gas/air mixtures are explosive. Risk of explosion on contact with strong oxidants, strong acids or strong bases.	NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. NO contact with incompatible materials: See Chemical Dangers	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

AVOID ALL CONTACT!

	SYMPTOMS	PREVENTION	FIRST AID
Inhalation	Cough. Sore throat. Burning sensation behind the breastbone. Headache. Shortness of breath.	Use ventilation, local exhaust or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.
Skin	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Seek medical attention if you feel unwell.
Eyes	Watering of the eyes. Redness. Pain. Blurred vision.	Wear safety goggles or eye protection in combination with breathing protection.	Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.
Ingestion			

SPILLAGE DISPOSAL

Evacuate danger area! Consult an expert! Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Turn off gas at source if possible. Remove gas with fine water spray.

STORAGE

Fireproof. Cool. Separated from incompatible materials. See Chemical Dangers.

PACKAGING

CLASSIFICATION & LABELLING

According to UN GHS Criteria

DANGER

Extremely flammable gas
Fatal if inhaled
Causes serious eye irritation
May cause cancer if inhaled
May cause an allergic skin reaction
May cause respiratory irritation

Transportation
UN Classification

Prepared by an international group of experts on behalf of ILO and WHO, with the financial assistance of the European Commission.

International Labour Organization
World Health Organization
European Commission

FORMALDEHYDE **ICSC: 0275**

PHYSICAL & CHEMICAL INFORMATION

Physical State; Appearance
COLOURLESS GAS WITH PUNGENT ODOUR.

Physical dangers
The gas mixes well with air, explosive mixtures are easily formed.

Chemical dangers
The substance polymerizes in contact with alkalies and if dissolved in water. Upon heating, toxic fumes are formed. Reacts violently with strong oxidants, strong acids and strong bases. This generates explosion hazard.

Formula: H_2CO
Molecular mass: 30.0
Boiling point: -20°C
Melting point: -92°C
Relative density (water = 1): 0.8
Solubility in water: very good
Relative vapour density (air = 1): 1.08
Auto-ignition temperature: 430°C
Explosive limits, vol% in air: 7-73
Octanol/water partition coefficient as log Pow: 0,35

EXPOSURE & HEALTH EFFECTS

Routes of exposure
The substance can be absorbed into the body by inhalation.

Effects of short-term exposure
The substance is severely irritating to the eyes and respiratory tract. Inhalation of high concentrations may cause lung oedema, but only after initial corrosive effects on the eyes and the upper respiratory tract have become manifest.

Inhalation risk
A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

Effects of long-term or repeated exposure
Repeated or chronic inhalation of the vapour may cause chronic inflammation of the upper respiratory tract. Repeated or prolonged contact may cause skin sensitization. This substance is carcinogenic to humans.

OCCUPATIONAL EXPOSURE LIMITS

TLV: 0.1 ppm as TWA; 0.3 ppm as STEL; (SEN); A1 (confirmed human carcinogen).

MAK: 0.37 mg/m^3, 0.3 ppm; peak limitation category: I(2); carcinogen category: 4; pregnancy risk group: C; germ cell mutagen group: 5; sensitization of skin (SH).

EU-OEL: 0.37 mg/m^3, 0.3 ppm as TWA; 0.74 mg/m^3, 0.6 ppm as STEL; (skin sensitizer); (see Notes)

ENVIRONMENT

NOTES

Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered.
No UN number is presented because formaldehyde is not transported as a gas. It is usually transported as a solution.
See ICSC 0695.
Limit value for EU-OEL of 0.62 mg/m^3 or 0.5 ppm for the health care, funeral and embalming sectors until 11 July 2024.

ADDITIONAL INFORMATION

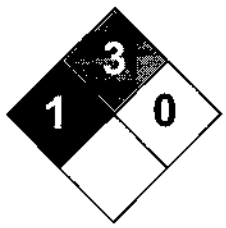
EC Classification
Symbol: T; R: 23/24/25-34-40-43; S: (1/2)-26-36/37/39-45-51

See Also:
Toxicological Abbreviations
Formaldehyde (EHC 89, 1989)
Formaldehyde (HSG 57, 1991)
Formaldehyde (CICADS 40, 2002)
Formaldehyde (IARC Summary & Evaluation, Volume 62, 1995)
Formaldehyde (IARC Summary & Evaluation, Volume 88, 2006)

1097401/2021/Estt.Br

Annexure 13

ScienceLab.com
Chemicals & Laboratory Equipment



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Methyl alcohol MSDS

Section 1: Chemical Product and Company Identification

Product Name: Methyl alcohol

Catalog Codes: SLM3064, SLM3952

CAS#: 67-56-1

RTECS: PC1400000

TSCA: TSCA 8(b) inventory: Methyl alcohol

CI#: Not applicable.

Synonym: Wood alcohol, Methanol; Methylol; Wood Spirit; Carbinol

Chemical Name: Methanol

Chemical Formula: CH3OH

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Methyl alcohol	67-56-1	100

Toxicological Data on Ingredients: Methyl alcohol: ORAL (LD50): Acute: 5628 mg/kg [Rat]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 64000 ppm 4 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to eyes. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), optic nerve. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 12°C (53.6°F). OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER. 6% UPPER: 36.5%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and irritating fumes. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME

Special Remarks on Explosion Hazards:
Forms an explosive mixture with air due to its low flash point. Explosive when mixed with Choroform + sodium methoxide and diethyl zinc. It boils violently and explodes.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:
Flammable liquid. Poisonous liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 200 from OSHA (PEL) [United States] TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [United States] [1999] STEL: 250 from NIOSH [United States] TWA: 200 STEL: 250 (ppm) from NIOSH SKIN TWA: 200 STEL: 250 (ppm) [Canada] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Alcohol like. Pungent when crude.

Taste: Not available.

Molecular Weight: 32.04 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 64.5°C (148.1°F)

Melting Point: -97.8°C (-144°F)

Critical Temperature: 240°C (464°F)

Specific Gravity: 0.7915 (Water = 1)

Vapor Pressure: 12.3 kPa (@ 20°C)

Vapor Density: 1.11 (Air = 1)

Volatility: Not available.

Odor Threshold: 100 ppm

Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.8

Ionicity (in Water): Non-ionic.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizers. Violent reaction with alkyl aluminum salts, acetyl bromide, chloroform + sodium methoxide, chromic anhydride, cyanuirc chlorite, lead perchlorate, phosphorous trioxide, nitric acid. Exothermic reaction with sodium hydroxide + chloroform. Incompatible with beryllium dihydride, metals (potassium and magnesium), oxidants (barium perchlorate, bromine, sodium hypochlorite, chlorine, hydrogen peroxide), potassium tert-butoxide, carbon tetrachloride, alkali metals, metals (aluminum, potassium magnesium, zinc), and dichlormethane. Rapid autocatalytic dissolution of aluminum, magnesium or zinc in 9:1 methanol + carbon tetrachloride - sufficiently vigorous to be rated as potentially hazardous. May attack some plastics, rubber, and coatings.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 5628 mg/kg [Rat]. Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 64000 4 hours [Rat].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. Causes damage to the following organs: eyes. May cause damage to the following organs: blood, kidneys, liver, brain, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), optic nerve.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

Passes through the placental barrier. May affect genetic material. May cause birth defects and adverse reproductive effects(paternal and maternal effects and fetotoxicity) basec on animal studies.

Special Remarks on other Toxic Effects on Humans:

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 29400 mg/l 96 hours [Fathead Minnow].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation:
Methanol in water is rapidly biodegraded and volatilized. Aquatic hydrolysis, oxidation, photolysis, adsorption to sediment, and bioconcentration are not significant fate processes. The half-life of methanol in surfact water ranges from 24 hrs. to 168 hrs. Based on its vapor pressure, methanol exists almost entirely in the vapor phase in the ambient atmosphere. It is degraded by reaction with photochemically produced hydroxyl radicals and has an estimated half-life of 17.8 days. Methanol is physically removed from air by rain due to its solubility. Methanol can react with NO2 in pollulted to form methyl nitrate. The half-life of methanol in air ranges from 71 hrs. (3 days) to 713 hrs. (29.7 days) based on photooxidation half-life in air.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Methyl alcohol UNNA: 1230 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Methyl alcohol Illinois toxic substances disclosure to employee act: Methyl alcohol Illinois chemical safety act: Methyl alcohol New York release reporting list: Methyl alcohol Rhode Island RTK hazardous substances: Methyl alcohol Pennsylvania RTK: Methyl alcohol Minnesota: Methyl alcohol Massachusetts RTK: Methyl alcohol Massachusetts spill list: Methyl alcohol New Jersey: Methyl alcohol New Jersey spill list: Methyl alcohol Louisiana spill reporting: Methyl alcohol California Directors List of Hazardous Substances (8CCR 339): Methyl alcohol Tennesse Hazardous Right to Know : Methyl alcohol TSCA 8(b) inventory: Methyl alcohol SARA 313 toxic chemical notification and release reporting: Methyl alcohol CERCLA: Hazardous substances.: Methyl alcohol: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). Class D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R39- Danger of very serious irreversible effects. R39/23/24/25- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed. S7- Keep container tightly closed. S16- Keep away from sources of ignition - No smoking. S36/37- Wear suitable protective clothing and gloves. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References:
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. LOLI, HSDB, RTECS, HAZARDTEXT, REPROTOX databases

Other Special Considerations: Not available.

Created: 10/10/2005 08:23 PM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

1097401/2021/Estt.Br

Annexure 14

Regional Office, Yamuna Nagar Region
Haryana State Pollution Control Board

S.C.O. No- 131, Sector –17, HUDA, Jagadhri, Yamuna Nagar
Website – www.hspcb.gov.in E-Mail - hspcbroyr@gmail.com -Contact No. 01732-268137,237840

No. HSPCB/YR/2019/ 17376 **Dated:** 3/6/19

To

M/s Pabwa Plastics Pvt. Ltd.
VILL Jathlana, Radaur, Yamuna Nagar

Sub: - Show Cause Notice for Closure under section 05 of Environment Protection Act, 1986.

Whereas your unit is engaged in manufacturing of Formaldehyde and your product is requires prior Environmental Clearance as per project activity mentioned at Sr. No. 5 (f) of Schedule of Environment Impact Assessment Notification 2006.

Whereas, as per record of this office, your unit for manufacturing of formaldehyde has been Established and Operating without prior Environmental Clearance as per Environment Impact Assessment Notification 2006

In view of the above, you are hereby show caused for 07 days as to why closure action not be initiated against your unit as per provisions of 05 of Environment Protection Act, 1986.

In case you fail to comply with the deficiencies mentioned above within stipulated period, it will be presumed that you have nothing to say in this regard and accept the status as mentioned above, which will warrant closure action against your unit under section 05 of Environment Protection Act, 1986.

Regional Officer
Yamuna Nagar

Endst. No. HSPCB / YMN /2019/ **Dt.** / /

A copy of the above is forwarded to The Chairman, HSPCB, C-11, Sector-6, Panchkula for information, please.

Regional Officer
Yamuna Nagar

1097401/2021/Estt.Br

Annexure 14

Regional Office, Yamuna Nagar Region
Haryana State Pollution Control Board

S.C.O. No- 131, Sector -17, HUDA, Jagadhri, Yamuna Nagar
Website – www.hspcb.gov.in E-Mail - hspcbroyng@gmail.com Contact No. 01732-268137,237840

No. HSPCB/YR/2019/ 1616 **Dt.21/ 08/ 2019**

To

M/s Pahwa Plastics Pvt Ltd,
Village Jathlana, Radaur,
Yamuna Nagar

Sub: - Show Cause Notice for Revocation of Consent to Establish and Consent to Operate issued under Water Act 1974 & Air Act 1981.

Whereas your have established and operated a unit for manufacturing of Formaldehyde and this product requires prior Environmental Clearance as per project activity mentioned at Sr. No. 5 (f) of Schedule of Environment Impact Assessment Notification 2006.

Whereas, as per record of this office, your unit for manufacturing of formaldehyde is running without prior Environmental Clearance as per Environment Impact Assessment Notification 2006.

Whereas consent to establish was granted with the condition that unit will obtain Environment Clearance but unit failed to obtain Environment Clearance till date as per requirement of EIA notification 2006.

In view of the above, you are hereby show caused for 07 days as to why Consent to Establish and Consent to Operate granted to you under Water Act 1974 & Air Act 1981may not be revoked.

In case you fail to comply with the deficiencies mentioned above within stipulated period, it will be presumed that you have nothing to say in this regard and accept the status as mentioned above, which will warrant revocation of Consent to Establish and Consent to Operate issued under Water Act 1974 & Air Act 1981.

Regional Officer
Yamuna Nagar

Endst. No. HSPCB / YR /2019/ **Dt. / 08/ 2019**

A copy of the above is forwarded to The Chairman, HSPCB, C-11, Sector-6, Panchkula for information, please.

Regional Officer
Yamuna Nagar

1097401/2021/Estt.Br

Annexure 14

Regional Office, Yamuna Nagar Region
Haryana State Pollution Control Board
S.C.O. No- 131, Sector -17, HUDA,Jagadhari, Yamuna Nagar
Website – www.hspcb.gov.in E-Mail - hspcbroyr@gmail.com
Contact No. 01732-268137,237840

No. HSPCB/YR/2021/ 407 **Dated:** 03 **/ 05/2021**

To

M/s Pahwa Plastics Pvt Ltd,
Village Jathlana, Radaur,
Yamuna Nagar

Subject:- ***Direction to stop operation of unit on dated 10.05.2021 in view of expiry of relaxation granted to formaldehyde units by Haryana Government.***

Whereas your unit M/s Pahwa Plastics Pvt. Ltd., Village Jathlana is covered by the provisions of 5(f) of the Schedule of the EIA Notification 2006 and so required the prior environmental clearance before established which the said unit failed to obtain and established and operated in violation of EIA Notification 2006.

Whereas the closure order under EP Act was issued against the unit vide orders no. 16/02/2020-3 Env. Dated 11.08.2020.

Whereas the Board also issued the closure orders against the unit vide orders no. HSPCB/HWM/41-290/2020/1145-48 dated 03.09.2020.

Whereas Environment Department Govt. of Haryana vide orders no. 16/14/2020 – 3Env. Dated 11.11.2020 allowed 06 months' time of operation to these Formaldehyde manufacturing units with the conditions that "these unit shall be allowed to continue their operations for a period of six months, without prejudice to any legal action taken against the violations committed by them, by the competent authorities.

Whereas the relaxation of 06 months granted by the Govt. is going to expire on 10.05.2021. Therefore you are hereby directed to schedule the closure of operation of your unit till 10.05.2021. No time even for completing the process will be allowed beyond 10 05.2021. You asked to submit the compliance in this regard immediately.

Regional officer
Yamuna Nagar

1097401/2021/Estt.Br

E-mail : hspcbroyr@gmail.com

Annexure 14

Haryana State Pollution Control Board

REGIONAL OFFICE : S.C.O. No. 131, Sector-17, Jagadhri (Yamuna Nagar)

Ref. No. HSPCB/YMN/20 /..... Dated.....

Govt. Order No. 16/42/2020-3 Env. dt 12/08/2020

COMPLIANCE REPORT OF HEAD OFFICE ORDER NO. HSPCB/HWM/41-2020/1985-88

DATED 03.09.2020 M/S. Pahwa Plastic Pvt Ltd village Jathlana, Yamuna Nagar

In compliance of Haryana State Pollution Control Board Head Office Order No. HSPCB/HWM/41-2020/1985-88 dated 03/09/2020

Govt Order No. 16/42/2020-3 Env. dt 12/08/2020

under section 31-A of the Air (Prevention & Control of Pollution) Act, 1981/under section 33-A of water (Prevention & Control of Pollution) Act, 1974 of M/s. Pahwa Plastic Pvt Ltd village Jathlana

The above said unit has been closed and sealed in presence of Sh. Arun Kumar, Munshi, Pahwa Plastic Pvt Ltd

and unit representative Sh. Arun Kumar.

of M/s. Pahwa Plastic Pvt Ltd

on 19.05.2021 at

The following components have been sealed :

1. Conveyor Belt of Motor
2. Opening Gap of Reaction Tank
3. DG Set
4.

The Seal impression on the above components is given as below.

The unit has not produced any stay order on enquiry.

Signature of 5/2/2021

Signature of Officer
HSPCB Yamuna Nagar

Item No. 07 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 287/2020
(I.A. No. 10/2021)

(With report dated 03.03.2021)

Dastak N.G.O. Applicant

Versus

Synochem Organics Pvt. Ltd. & Ors. Respondent(s)

Date of hearing: 03.06.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER
HON'BLE MR. JUSTICE M. SATHYANARAYANAN, JUDICIAL MEMBER
HON'BLE MR. JUSTICE BRIJESH SETHI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Applicant: Dr. S.S. Hooda, Advocate

Respondent: Mr. Anil Grover, Senior AAG with Mr. Rahul Khurana, Advocate for State of Haryana and HSPCB
Ms. Sunita Bhardwaj, Advocate for MoEF&CC
Mr. A.K. Prasad, Advocate for CGWA
Mr. Sunil Chadha, Senior Advocate with Mr. Akshay Chadha, Advocate for R-6
Mr. Pardeep Gupta, Advocate for R-1
Mr. Shiv Mangal Sharma and Mr. Sourabh Rajpal, Advocate for R-3,5&7
Mr. Ashu Jain, Advocate

ORDER

1. This application seeks quashing of the order of State of Haryana dated 10.11.2020 allowing manufacturers of formaldehyde, requiring prior Environmental Clearance (EC), to operate for six months without EC, subject to making application for EC within 60 days. The applicant submits that requirement of prior EC is mandatory. There is no jurisdiction with the State to exempt the same. Reference has been made to an order of this Tribunal dated 28.11.2019 in *O.A. No. 840/2019, Ayush Garg v. Union of India & Ors.* to the effect that consent to establish

to such establishments is liable to be removed. Accordingly, closure order was passed by the State PCB but thereafter the impugned order has been passed by the State of Haryana. It is further stated that the industries are using ground water of approximately 6 Lakhs litres per day without requisite permission of the Ground Water Authority. There is also non-compliance of Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989. No requisite safety measures have been allotted. There has been incidents of damage to the crops, soil and ground water for which no adequate compensation has been recovered. TDS of the water has been reduced to almost zero by use of Hydrochloric Acid (33%) and pH level has increased. Untreated effluents are dumped back into the ground water through reverse borewells. In the condensation process, excess steam is discharged, using chimney adding to the air pollution. There is no mechanism to check leaching of methanol from underground tanks. This is one of the causes of cancer. As per statistics, 39% of national deaths from cancer are taking place in the State of Haryana.

2. The matter last considered on 9.12.2020 and finding *prima-facie* merit in the case of the applicant, the contesting respondents were required to show cause why impugned order dated 10.11.2020 passed by the State of Haryana be not quashed. Operative of the part of the order is as follows:-

> *"1...xxx.....xxx.....xxx*
>
> *2. We prima facie find the impugned order to be without jurisdiction. Requirement of prior environmental clearance cannot be dispensed with. This legal position has been recently reiterated in Alembic Pharmaceuticals Ltd. v. Rohit Prajapati & Ors., 2020 SCC Online 347. Learned Counsel for Respondent Nos. 1 and 6 have put in appearance without notice and have relied upon specific condition in the Notification dated 14.09.2006 to the effect that prior EC is not required where such prior EC is obtained by the industrial area,*

where a unit is set up. There is no merit in the submission as there is nothing to show that such prior EC has been obtained by the industrial area in question.

3. Accordingly, let the contesting respondents show cause why the impugned order be not quashed by their response by email before the next date. The applicant may provide a set of papers and a copy of this order to all the contesting respondents and file an affidavit of service within one week."

3. Accordingly, the State of Haryana has filed an action taken report dated 03.03.2021 through the Secretary, Environment *inter-alia* stating as follows:-

"3. That for the purpose of environmental protection certain restriction and prohibition on new projects and activities, or on the expansion or modernization of the existing project or activities based on their potential environmental impact were imposed vide S.O. 1533 dated 14.09.2006 By MoEF, GOI. under schedule to the aforementioned notification, the process of manufacturing of Formaldehyde is covered under provision 5(f) which requires prior Environmental Clearance (EC) from the competent authorities State Environment Impact Assessment Authority(SEIAA)/MoEF & CC, GOI, before establishment and operation of such units, besides other mandatory clearances as applicable.

4. That 15 formaldehyde units (list attached at Annexure — R/1) were issued consent to establish and consent to operate by Haryana State Pollution Control Board at different times which were later revoked by the HSPCB for violating provision 5(f) of schedule to EIA Notification 2006 on the ground that no prior environmental clearance was obtained before establishment and operation of these units.

5. That a representation was received from all Haryana formaldehyde manufacturing association, Yamunanagar dated 23.10.2020 addressed to Additional Chief Secretary to Govt. of Haryana department of Environment and Climate Change, Chandigarh requesting to allow such formaldehyde units to operate and give sufficient time reasonable to obtain the Environmental Clearance from MoEF & CC and SEIAA on the basis of parity that same decision was taken by State of Rajasthan in similar case (Annexure —R/2). The copy of order of Rajasthan State Pollution Control Board was annexed with aforementioned representation.

6. That keeping in view the fact that units were established with the requisite consent from Haryana State Pollution Control Board and were operating with the necessary pollution control measures, as prescribed by Board, along with the investment in plant and machinery incurred by the individual units in establishing their plants, possible stock of raw material used for production, the case was referred to Government of Haryana by Haryana State Pollution Control Board for granting interim relief to

these units for obtaining environmental clearance from the appropriate authority.

7. The units were granted interim relief on basis of the fact that notification dated 14.09.2006 is being re-drafted by MoEF & CC and the zero draft has been circulated to all the States and other Stake holders for comments. The finalization and publication of revised notification is likely to take some time and that window for accepting application seeking environmental clearance is not kept open at present by the MoEF & CC.

Further, it is to mention here specifically that from the facts and circumstances of the given case, it can easily be inferred that the industries were operating in good faith with valid CTE/CTOs granted by Haryana State Pollution Control Board. Alongside it was admitted by Haryana State Pollution Control Board that the units in question were posing any pollution hazards and that only procedural laps was the deficiency against these units.

8. That keeping in view all the aforementioned facts, Government of Haryana vide order No. 16/14/2020-3Env. dated 11.11.2020 (Annexure—R/3) decided to allow these units to continue their operation for a period of 6 months without invoking any legal action against the procedural laps occurred, with the condition that these units will apply for environmental clearance within a period of 60 days from the date of issuance of this communication."

4. Reply has also been filed on behalf of the contesting Respondents Nos. 3, 5 and 7 which is in identical terms. It is stated that the contesting respondents have now sought EC in violation category. It is also stated that Central Government has delegated powers to the Haryana Government vide Notification dated 10.02.1988 which enables the State to exempt units from seeking EC and thus order dated 10.11.2020 of the State of Haryana is valid. The point of requirement of EIA was never raised for about 9 years during which the private respondents have functioned which shows that the Authorities themselves were not aware about this requirement. The private respondents were merely given breathing time to comply with the law. The said units are not causing any pollution and even if prior EC is not

taken, Principle of Proportionalities applies as held in Alembic Chemicals v Rohit Prajapati[1].

5. We have heard learned counsel for the parties and with their assistance perused the records.

6. While the period of operation of the impugned order is over, we have gone into the matter on merits in view of contest by the private respondents.

7. It is clear from the stand of the State itself that prior EC is required under EIA Notification dated 14.09.2006 (Entry 5(f) of the Schedule. Once it is so there is no justification to permit function of such units in violation of mandate of law. In *Alembic Chemicals v Rohit Prajapati & Ors.*, 2020 SCC Online 347, the Hon'ble Supreme Court has made it clear that prior EC requirement cannot be dispensed with. While it is true that having regard to the fact situation therein particularly grant of EC later, the units were not closed and instead were required to pay compensation for the period the units functioned without prior EC, it does not mean that in absence of prior EC the units can be allowed to function by paying compensation. We thus hold that without prior EC the units cannot be allowed to operate. The State has no power to exempt the requirement of prior EC or to allow the units to function without EC on payment of compensation. Same view has been taken in *O.A. No. 840/2019, Ayush Garg v. UOI & Ors.* which has been dealt with by a separate order today.

8. As regards the stand of the private respondents that the State has delegated power under section 3(3) of the Environment (Protection) Act,

[1] 2020 SCC OnLine SC 347

which implies that the State could exempt EIA requirement, neither any such delegation is shown nor the State claims to have such power or to have exercised such power. A statement has been made on behalf of the private respondents as well as State that the units now stand closed. Learned Counsel for the private respondents also submitted that their units have been functioning in a bonafide manner without causing pollution. Though they did not have EC only for want of knowledge of such requirement, they had requisite consents to establish and operate which have been renewed from time to time. They wish to comply with law and have also applied for EC.

9. We are of the view that since prior EC is statutory mandate, the same must be complied. We have no doubt that the stand of the private respondents will be duly considered by the concerned regulatory authorities, including the MoEF&CC on merits and in accordance with law but till compliance of statutory mandate, the units cannot be allowed to function. For past violations, the concerned authorities are free to take appropriate action in accordance with polluter pays principle, following due process.

The application is disposed of.

In view of order in the main matter, I.A. No. 10/2021 also stands disposed of.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

M. Sathyanarayanan, JM

Brijesh Sethi, JM

Dr. Nagin Nanda, EM

June 03, 2021
Original Application No. 287/2020
A

Item No. 06 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 840/2019
(I.A. No. 52/2021)

(With report dated 18.12.2020)

Ayush Garg Applicant

Versus

Union of India & Ors. Respondent(s)

Date of hearing: 03.06.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER
HON'BLE MR. JUSTICE M. SATHYANARAYANAN, JUDICIAL MEMBER
HON'BLE MR. JUSTICE BRIJESH SETHI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Applicant: Mr. Rahul Choudhary, Advocate

Respondent: Mr. Anil Grover, Senior AAG with Mr. Rahul Khurana, Advocate for State of Haryana and HSCPB
Mr. Shiv Mangal Sharma and Mr. Saurabh Rajpal, Advocates for R-5

ORDER

1. A factual and action taken report was sought from a joint Committee of Haryana State Pollution Control Board (State PCB) and the State Environment Impact Assessment Authority (SEIAA), Haryana with reference to the allegation of illegal operation of manufacturing unit by M/s Om Chem at Village Kurali, Sabapur Road, Tehsil Bilaspur, District Yamunanagar, Haryana. According to the Applicant, formaldehyde is a hazardous chemical which was being used releasing Volatile Organic Compounds (VOCs) in violation of Hazardous Waste (Management and Transboundary Movement) Rules, 2016.

2. The matter was considered on 28.11.2019 in light of the report filed by the State Environment Impact Assessment Authority (SEIAA), Haryana on 15.10.2019. It was observed:

> *"2. Accordingly, a report has been filed by SEIAA, Haryana on 15.10.2019 to the effect that there is no Environmental Clearance and thus operation of the unit is illegal. Notice for revocation of 'Consent to Establish' was issued by the SPCB but the same was stayed on 13.09.2019 by the Appellate Authority.*
>
> *3. Without commenting upon the issue of proceedings before the Appellate Authority on the subject of 'Consent to Establish', the action could certainly be taken for absence of EC by SEIAA under the Environment (Protection) Act, 1986. Regional Officer of MoEF&CC at Chandigarh or SEIAA or CPCB can certainly exercise jurisdiction under Section 5 of the Environment (Protection) Act, 1986* ***for stopping illegal operation of manufacturing activities in violation of requirement of EC forthwith.*** *Let such action be taken in accordance with law. Let SEIAA, Haryana furnish an action taken report in the matter within one month after coordinating with concerned authorities by e-mail at judicial-ngt@gov.in."*

3. The matter was thereafter considered on 10.08.2020 in the light of report of the SEIAA, Haryana dated 27.12.2019 that the activities of the unit have been directed to be stopped.

4. Accordingly, the Tribunal directed unless valid Environmental Clearance (EC) and other statutory clearances taken, the Unit may not be allowed to function. It was also directed that State PCB may assess and recover compensation for illegal operation of the units on 'Polluter Pays' principle. Operative part of the order is quoted below:-

> *"1&2..xxx.....xxx.....xxx*
>
> *3. In view of the above, the SEIAA filed its report dated 27.12.2019 to the effect that a decision was taken to stop the activities of the unit. However, there was nothing to show that actual stopping of such activities was effective. The applicant has filed an application on 03.08.2020 to the effect that unit was still functioning. During the hearing, learned Counsel for the State Pollution Control Board states that on 07.08.2020 the functioning of the unit has been stopped.*

4. In view of the above, we direct the District Magistrate, Yamunanagar and the State PCB to ensure that unless a valid Environmental Clearance (EC) and other statutory clearances are available, the unit may not be allowed to function. The State PCB will be nodal agency for compliance. State PCB may also assess and recover compensation for illegal operation of the unit on 'Polluter Pays' principle, following due process of law. Compliance report be filed before the next date by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF."

5. Accordingly, the State PCB has filed its report on 18.12.2020 as follows:-

"That the Unit M/s Om Chem Village Kurali, Tehsil Bilaspur, Yamuna Nagar has been closed by the Board vide order dated 07.08.2020 and same was complied on dated 08.08.2020. The Environmental compensation of Rs 49,40,000/- (Forty Nine Lakh forty thousand, only) has been imposed on the unit vide order dated 24.11.2020."

6. In view of above, no further direction appears to be necessary except that the State PCB may ensure that the unit does not re-start functioning without requisite statutory clearance. We have also noted the stand of the private respondents in connected matter being OA 287/2020 that their activities are bonafide and except for technical violation which they are remedying by seeking EC, they have consent from State PCB and are compliant with environment norms. The authorities may verify and act as per law. The MoEF&CC may also consider the matter accordingly.

The application is disposed of.

In view of order in the main matter, I.A. No. 52/2021 also stands disposed of.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

M. Sathyanarayanan, JM

Brijesh Sethi, JM

Dr. Nagin Nanda, EM

June 03, 2021
Original Application No. 840/2019
A

The Emission Norms for Heavy Diesel Vehicles will be within the limits as per CPCB Vehicular Exhaust Guidelines. The values for CO, HC, NOx, PM will be within 1 g/kmhr, 0.96 g/kmhr, 3.5 g/kmhr and 0.02 g/kwhr respectively.

TRUCK/VEHICLE DISPERSAL PLAN

The Truck/Vehicle dispersal plan has been developed for quick and safe dispersal of Truck/ Vehicle for effective control of emergencies. While developing this plan, the following points have been taken into consideration:

- Maximum numbers of Truck/ Vehicle available at a time inside premises,
- Safe route of Truck/ Vehicle for dispersal,
- Adequate parking space in safe areas,
- TREM Card to be provided to all drivers,
- Route for Fire tenders and imaginary emergency scenarios, which may necessitate the dispersal of Truck/ Vehicle etc.

GENERAL PROCEDURE FOR TRUCK/VEHICLES DISPERSAL

1. In case of major fire/ disaster, siren will be raised and the dispersal of Trucks/Vehicles will automatically start on hearing the siren through main gate.
2. The route of Trucks/Vehicles dispersal and parking shall be categorically marked on road sides for guidance and mock rehearsal shall be carried out time to time to make the drivers and others conversant with the plan.
3. The security personal at those spots ensure the smooth dispersal of Trucks /Vehicles.

Annexure 17

PAHWA PLASTICS PVT LTD

MANUFACTURERS OF FORMALDEHYDE

UNDERTAKING

I, Chandan Pahwa, authorized signatory for **M/s Pahwa Plastics Pvt. Ltd.**, is proposing Capacity Expansion in Formaldehyde Manufacturing unit in existing facility from 60 TPD to 150 TPD at VPO Jathlana, Tehsil- Jagadhri District Yamunanagar, Haryana, hereby solemnly affirm an undertaking as stated herein:

1. That we will submit the bank guarantee for remediation measures as decided by the EAC.

For

M/s Pahwa Plastics Pvt. Ltd.

Corr. off : 6A-1, 1st FLOOR MANGOLPURI INDL. AREA, PHASE-II
DELHI-110034
PHONE NO : (011) 27024410/5510/5520
E-mail : formalin.ymr@pahwaplastics.com

Works: KHASRA NO. 10/7/1, VILLAGE JATHLANA
YAMUNANAGAR
HARYANA-135133

1097401/2021/Estt.Br

Annexure 18

भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
उत्तर क्षेत्रीय कार्यालय

बेज़ नम्बर २४-२५
दक्षेण मार्ग, सेक्टर ३१ ए
चण्डीगढ़-१६००३०
दिनांक: 07.12. 2016

F.No. -: 9-HRB157/2016-CHA

सेवा में,

अतिरिक्त मुख्य सचिव (वन),
हरियाणा सरकार,
हरियाणा सिविल सचिवालय,
चण्डीगढ-160001

विषय:- **Diversion of 0.0022 ha. of forest land for access to M/s Pahwa Plastics Pvt. Ltd along Khajuri-Jathlana road, at Village Khajuri, under forest division and District Yamunanagar, Haryana.**

संदर्भ:- 1 प्रधान सचिव वन के पत्र कमांक 6828/2322 दिनांक 24.10.16

2 नोडल आफिसर एवं वन सरक्षक (FC) के पत्र संख्या प्रशा-डी-तीन 6828/2640 दिनांक 23.11.16

महोदय,

कृपया उपर्युक्त विषय से संदर्भांकित पत्र का अवलोकन करें जिसमें वन (संरक्षण) अधिनियम, 1980 की धारा-२ के अधीन अनुमति मांगी गई है।

2. राज्य सरकार के प्रस्ताव का ध्यानपूर्वक अध्ययन करने के पश्चात उपर्युक्त विषय हेतू **0.0022** हेक्टेयर वन भूमि के उपयोग के लिए सैधांतिक स्वीकृति निम्नलिखित शर्तो को पूरी करने पर प्रदान की जाती है।

i. प्रयोक्ता एजेंसी से स्कीम के अनुसार प्रतिपूर्ति पौधारोपण की राशि जमा करवाई जाये।
ii. माननीय उच्चतम न्यायालय के आदेश दिनांक 30.10.2002, 28.03.2008, 24.04.2008 एवं 09.05.2008 तथा पर्यावरण एवं वन मंत्रालय, भारत सरकार, नई दिल्ली के निर्देश संख्या 5-3/2007-FC दिनांक 05.02.2009 के अनुसार प्रयोक्ता एजेंसी से प्रस्तावित वन भूमि की नैट प्रजैंट वैल्यु जमा करवाई जाये।
iii. प्रयोक्ता एजेंसी भुगतान राशि पर्यावरण,वन एवं जलवायु परिवर्तन मंत्रालय की website http://forestsclearance.nic.in या http://efclearance.nic.in पर ऑनलाइन जमा करवाएगी।

3. अन्तिम स्वीकृति के उपरांत निम्नलिखित शर्तों का पालन भी किया जायेगा।

i. वन भूमि की विधिक परिस्थिति बदली नहीं जाएगी।
ii. वन भूमि का प्रयोग प्रस्ताव में दर्शाये गये उद्देश्य के अलावा किसी अन्य उद्देश्य के लिये नहीं किया जायेगा।
iii. जब कभी भी NPV की राशी बढाई जायेगी तो उस बढी हुई NPV की राशि को जमा करने के लिए प्रयोक्ता एजेंसी बाध्य होगी।
iv. साथ लगते वन और वन भूमि को किसी तरह का कोई नुकसान नहीं पंहुचाया जावेगा और साथ लगते हुए वन और वन भूमि को बचाने के लिये सभी प्रयत्न किये जायेंगे।
v. स्थानान्तरण के लिए प्रस्तावित वन भूमि को केंद्रीय सरकार की पूर्व अनुमति के बिना किसी भी परिस्थिति में किसी अन्य एजेंसी, विभाग या व्यक्ति विशेष को हस्तांतरित नहीं किया जावेगा।
vi. केंद्रीय सरकार की अनुमति के बिना प्रस्ताव की ले आउट प्लान को बदला नहीं जायेगा।
vii. वन भूमि पर किसी भी प्रकार का कोई श्रमिक शिविर नहीं लगाया जायेगा।

viii. प्रयोक्ता एजेंसी द्वारा वांछित भूमि संरक्षण पैमाने उपयोग किये जायेंगे, जिसके लिए प्रयोक्ता एजेंसी द्वारा वर्तमान दरों पर धनराशी उपलब्ध करायी जायेगी।

ix. प्रयोक्ता एजेंसी द्वारा श्रमिकों तथा कार्यस्थल पर कार्यरत स्टाफ को अधिमानत: वैकल्पिक इंधन उपलब्ध करायेगी, ताकि साथ लगते वन क्षेत्र को किसी प्रकार के नुकसान तथा दबाव से बचाया जा सके।

x. प्रयोक्ता एजेंसी राज्य के मुख्य वन्य जीव संरक्षक द्वारा तैयार की गयी योजना के अनुसार उस क्षेत्र के वनस्पति और प्राणी समूह के संरक्षण तथा परिरक्षण में राज्य सरकार की सहायता करेगी।

xi. स्थानांतरित वन भूमि की सीमायें आगे तथा पीछे लिखे गये क्रम संख्या वाले 4 फीट ऊँचे सीमेंट के खम्बों द्वारा चिन्हित की जाएगी।

xii. यदि आवश्यक हो तो प्रयोक्ता एजेंसी पर्यावरण (सुरक्षा) अधिनियम 1986, के अनुसार पर्यावरण अनुमति प्राप्त करेगी;

xiii. कूड़ा कर्कट निपटान वन विभाग द्वारा जारी योजना के अनुसार किया जायेगा।

xiv. अन्य कोई भी शर्त इस क्षेत्रीय कार्यालय द्वारा वन तथा वन्य जीवों के संरक्षण, सुरक्षा तथा विकास हेतू समय – समय पर लगाई जा सकती है।

xv. प्रयोक्ता एजेंसी उपरोक्त शर्तों की वार्षिक अ-अनुपालना रिपोर्ट राज्य सरकार तथा इस क्षेत्रीय कार्यालय को नियमित रूप से भेजेगी।

xvi. यदि कोई अन्य सम्बंधित अधिनियम/अनुच्छेद/नियम/न्यायालय आदेश/अनुदेश आदि इस प्रस्ताव पर लागू होते हैं तो उनके अधीन जरूरी अनुमति लेना राज्य सरकार की जिम्मेवारी होगी।

4. उपरोक्त पैरा -2 के अधीन शर्तों की अनुपालना रिपोर्ट प्राप्त होने के उपरान्त, वन संरक्षण अधिनियम, 1980 की धारा-2 के अधीन अन्तिम स्वीकृति के लिये प्रस्ताव पर विचार किया जायेगा। *केन्द्रीय सरकार की अन्तिम अनुमति दिये जाने तक वन भूमि का उपयोग नहीं किया जायेगा।*

भवदीय

7-12-16

(हर्ष मित्र)

अ०प्र०मु०वन संरक्षक (केन्द्रीय)

प्रतिलिपि:-

1. अपर वन महानिदेशक (वन), पर्यावरण वन एवं जलवायु परिवर्तन ,मंत्रालय, इन्द्रा पर्यावरण भवन, जोर बाग़, अलीगंज, नई दिल्ली।
2. प्रधान मुख्य वन संरक्षक, हरियाणा सरकार, C-18, वन भवन सैक्टर 6, पंचकुला हरियाणा।
3. Divisional Forest Officer, Forest Division & District Yamunanagar, Haryana.
4. M/s Pahwa Plastic Pvt. Ltd. C-344, Sarswati Vihar, Pritampura North West Delhi.

Formaldehyde Manufacturing Unit of 150 TPD At Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.

EXECUTIVE SUMMARY

1. Introduction

M/s Pahwa Plastics Pvt. Ltd. has an existing Formaldehyde manufacturing unit at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana.

The plant was setup with the consent to establish dated 02.06.2016 from the Haryana State Pollution Control Board (HSPCB). Subsequently, the unit has started operation after obtaining consent to operate dated 26.03.2018.

The said project/activity is covered under category "A" (located outside Notified Industrial Area) of item **5(f) "Synthetic Organic Chemicals"** of the Schedule to the EIA Notification, 2006, and requires prior EC from Expert Appraisal Committee, MoEF&CC.

2. Basic Details of the Project

S.No.	Particulars	Details
1.	**Nature and size of the Project**	Formaldehyde Manufacturing Unit of 150 TPD at Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.
2.	**Location details**	
	Village /Town/Plot No.	Jathlana
	District	Yamunanagar
	State	Haryana
3.	**Area Details**	
	Total Project Area	Total plot area is 0.23 hectare. Green belt will be developed in an area of 0.08 Hectare (Approximately 34.78% of total land area).
4.	**Cost Details**	
	Project Cost	Rs. 1.13 Crores (Rs. 113 Lakhs)
	EMP Budget	Rs. 0.0565 Crores (Rs. 5.65 Lakhs)
5.	**Basic Requirements of the Project**	
	Fresh Water (m3/day)	90 KLD Source: HWRA
	Power	200 KW **Source:** UHBVN (Uttar Haryana Bijli Vitran Nigam) **DG sets as backup:** 180 KVA and 250 KVA (existing)
	Boiler	800 Kg/Hr
	Fuel	Wood Briquettes
	Manpower	10

Brief Summary

Formaldehyde Manufacturing Unit of 150 TPD At Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.

3. **Production Capacity**

Capacity	Mar 2018 to Mar 2021	April-May 2021	Total
Formaldehyde	60 TPD	150 TPD	150 TPD

4. **Raw Material Detail**

The major raw material is Methanol which comes in road through tankers from Kandla Port, Gujarat & stored in underground M.S tanks.

Raw Material	Total Requirement	Source	Transport	Storage
Methanol	75 TPD	Import	Tank Trucks	U/G Tanks 6*75 KL

5. **Project Benefits**

- The plant will help in providing employment in priority to local people.
- There will be an increase in indirect employment and earnings of the small time shop owners like tea vendors, transporters, etc.
- The Project proponent has planned to contribute in socio-economic development of the area.
- The easy availability of infrastructure, manpower, raw materials will reduce the production cost as well as demand supply gap.
- The development of greenbelt in and around the plant premises will improve on the aesthetics of the area. Moreover, it will help in reducing the noise levels within the plant boundary.

6. **Mitigation Measures for Control of Pollution**

6.1 Air Pollution Control Measures

- Online Stack Monitoring System as an air pollution control measures to control the emission of particulate matter, the flue gas emission will remain well within gaseous emission norms prescribed by the CPCB.
- To control the air emissions from D.G. Set, stack height of 6.0 m shall be provided.
- Green belt will be developed on 34.7?% area of the total project area which will help in attenuating the pollutants emitted by the plant.

6.2 Waste Water Treatment

There will be no waste water discharge from the plant. Zero Liquid Discharge (ZLD) concepts to be adopted. Domestic waste water after treatment (in septic tank) will be

fully utilized with the facility for cleaning, flushing, water sprinkling and other non portable domestic purpose.

6.3 Noise Pollution Control

- Vibrating pads & acoustic enclosure will be provided to noise generating equipment to control noise level within norms.
- Latest technology and utmost care will be taken at the time of equipment/ machinery installation.
- Lubrication of moving/rotating part or component of machineries will be done on regular basis.
- The operators working in the high-noise areas will be provided with ear-muffs or plugs.
- Acoustic enclosures and silencers will be provided to the equipment wherever necessary
- Proper green belt will be developed to reduce the noise level.
- Thus, it is envisaged that there will not be any adverse impacts of noise. The greenbelt developed within the premises will have significant beneficial impacts on reduction of noise within the periphery and outside the boundary.

6.4 Land Pollution Control

- The plant will implement zero liquid discharge concepts. The treated water will be recycled in the process. Therefore, there will not be any negative impact on soil.
- No toxic / waste water will be disposed directly on land.
- Other hazardous solid wastes will be sent to authorized recycler or vender.
- It is envisaged that there will not be any major impacts on land environment during the operation phase.

6.5 Solid & Hazardous Waste Generation and Disposal

- Used Oil generated will be sold to authorized recycler.
- Solid waste from evaporator will be sent to TSDF.
- All the Solid & hazardous waste generated, will be collected, stored separately and disposed off as per the guidelines issued by CPCB & Haryana State Pollution Control Board.

7. Environmental Management Plan (EMP)

The total capital investment on environmental control measures is envisaged to be about Rs 0.056 Crores out of a total project cost of Rs 1.13 Crores.

S. No.	Particulars	Initial Cost (in Lakhs)	Recurring Cost (per year)

Formaldehyde Manufacturing Unit of 150 TPD At Village- Jathlana, Tehsil- Jagadhri, District- Yamunanagar, State- Haryana by M/s Pahwa Plastics Pvt. Ltd.

1.	Air Pollution Control Device	2.45	0.5
2.	Occupational Health and Safety	0.8	0.2
3.	Green Belt Development	1.0	0.4
4.	Rain Water Harvesting Pit	1.4	0.3
	Total	**5.65 Lakh (0.056 Crores)**	**1.4 Lakh (0.014 Crores)**

8. National Parks or Wild Life Sanctuary

There is no Wild Life Sanctuary or National Park within 10 km radius of the Project Site hence no NBWL Clearance required.

9. Demography & Socio-Economic Environment

- Improvement of infrastructure, transportation, health care and education facility.
- Direct and indirect employment will be generated like business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.
- Skill based training to local employed people will be given by project proponent.
- The interaction and intermingling of all these people will improve the understanding of various cultures and will definitely improve and strengthen friendliness, brotherhood and unity among them.

मैसर्स पाहवा प्लास्टिक्स प्राइवेट लिमिटेड द्वारा ग्राम- जठलाना, तहसील- जगाधरी, जिला- यमुनानगर, राज्य- हरियाणा में मौजूदा 90 टन प्रति दिन फॉर्मेल्डिहाइड निर्माण इकाई की परियोजना

कार्यकारी सारांश

1 परिचय

मेसर्स पाहवा प्लास्टिक्स प्रा. लिमिटेड की ग्राम- जठलाना, तहसील- जगाधरी, जिला- यमुनानगर, राज्य- हरियाणा में एक मौजूदा फॉर्मलडिहाइड निर्माण इकाई है।

हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड (एचएसपीसीबी) से दिनांक 02.06.2016 को स्थापित करने की सहमति से संयंत्र की स्थापना की गई थी। तत्पश्चात, दिनांक 26.03.2018 को संचालित करने के लिए सहमति प्राप्त करने के बाद इकाई ने संचालन शुरू कर दिया था।

उक्त परियोजना/गतिविधि ईआईए अधिसूचना, 2006 की अनुसूची के मद 5(एफ) "सिंथेटिक कार्बनिक रसायन" की श्रेणी "ए' (अधिसूचित औद्योगिक क्षेत्र के बाहर स्थित) के अंतर्गत आती है, और विशेषज्ञ मूल्यांकन समिति, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय से पूर्व पर्यावरणीय स्वीकृति की आवश्यकता होती है।

2 परियोजना का मूल विवरण

क्रमिक संख्या	घटक	विवरण
1.	**परियोजना की प्रकृति और आकार**	मेसर्स पाहवा प्लास्टिक्स प्रा. लिमिटेड की ग्राम- जठलाना, तहसील- जगाधरी, जिला यमुनानगर, राज्य- हरियाणा में एक मौजूदा 150 टीपीडी की फॉर्मलडिहाइड निर्माण इकाई है।
2.	**स्थान विवरण**	
	गांव/कस्बा/प्लॉट नं.	जठलाना
	ज़िला	यमुनानगर
	राज्य	हरियाणा
3.	**क्षेत्र का विवरण**	
	कुल परियोजना क्षेत्र	उपलब्ध कुल क्षेत्रफल 0.23 हेक्टेयर है। हरित पट्टी 0.08 हेक्टेयर (कुल भूमि क्षेत्र का लगभग 34.78%) के क्षेत्र में विकसित किया जाएगा।
4.	**लागत विवरण**	
	परियोजना की लागत	रु. 1.13 करोड़ (रु.113 लाख)
	ईएमपी बजट	रु. 0.0565 करोड़ (रु. 5.65 लाख)
5.	**परियोजना की बुनियादी आवश्यकताएं**	
	पानी	90 किलो लीटर प्रति दिन स्रोत: हरियाणा जल संसाधन प्राधिकरण।
	बिजली की आवश्यकता	200 किलोवाट

		स्रोत: यूएचबीवीएन (उत्तर हरियाणा बिजली वितरण निगम) डीजी सेट बैकअप के रूप में: 180 केवीए और 250 केवीए (मौजूदा)
	बायलर	800 किलोग्राम प्रति घंटा
	ईंधन	लकड़ी ब्रिकेट्स
	श्रमशक्ति	10

3 उत्पादन क्षमता

उत्पाद	मार्च 2018 से मार्च 2021	अप्रैल-मई 2021	कुल क्षमता
फॉर्मेल्डिहाइड	60 टन प्रति दिन	150 टन प्रति दिन	150 टन प्रति दिन

4 कच्चे माल का विवरण

प्रमुख कच्चा माल मेथनॉल है जो कांडला बंदरगाह, गुजरात से टैंकरों के माध्यम द्वारा सड़क से आता है और भूमिगत भूमिगत टैंकों में संग्रहीत किया जाता है। मौजूदा इकाई के लिए मेथनॉल की आवश्यकता 75 टन प्रति दिन है।

कच्चा माल	कुल आवश्यकता	स्रोत	भंडारण
मेथनॉल	75 टन प्रति दिन	आयात	भूमिगत टैंक 6*75 किलोलीटर

5 परियोजना लाभ

- प्रस्तावित संयंत्र की स्थापना से से रोजगार (स्थानीय लोगों को प्राथमिकता) उपलब्ध कराने में मदद मिलेगी।
- चाय विक्रेताओं, ट्रांसपोर्टरों आदि जैसे छोटे दुकान मालिकों के अप्रत्यक्ष रोजगार और आय में वृद्धि होगी।
- परियोजना प्रस्तावक ने क्षेत्र के सामाजिक-आर्थिक विकास में योगदान देने की योजना बनाई है और रक्तदान शिविर, स्वास्थ्य शिविर, स्वास्थ्य जागरूकता कार्यक्रम आदि आयोजित करेगा।
- बुनियादी ढांचे, जनशक्ति, कच्चे माल की आसान उपलब्धता से उत्पादन लागत के साथ-साथ मांग आपूर्ति का अंतर भी कम होगा.
- संयंत्र परिसर में और उसके आसपास हरित पट्टी के विकास से क्षेत्र की सुंदरता में सुधार होगा। इसके अलावा, यह संयंत्र की सीमा के भीतर शोर के स्तर को कम करने में मदद करेगा।

6 प्रदूषण नियंत्रण के उपाय

6.1 वायु प्रदूषण नियंत्रण के उपाय

- उत्सर्जन की निरंतर निगरानी के लिए स्टैक के साथ ऑनलाइन स्टैक मॉनिटरिंग सिस्टम उपलब्ध कराया जाएगा।
- डी.जी. से वायु उत्सर्जन को नियंत्रित करने के लिए स्टैक की ऊंचाई 6.0 मीटर रखी जाएगी.
- कुल परियोजना क्षेत्र के 34.78 प्रतिशत क्षेत्र में हरित पट्टी विकसित की जायेगी जिससे संयंत्र से निकलने वाले प्रदूषकों को कम करने में मदद मिलेगी।

6.2 अपशिष्ट जल का उपचार

प्लांट से गंदे पानी का रिसाव नहीं होगा। जीरो लिक्विड डिस्चार्ज (जेडएलडी) अवधारणाओं को अपनाया जाना है। उपचार के बाद घरेलू अपशिष्ट जल का उपयोग पूरी तरह से सफाई, फ्लशिंग, पानी के छिड़काव और अन्य गैर पोर्टेबल घरेलू उद्देश्यों के लिए सुविधा के साथ किया जाएगा।

6.3 ध्वनि प्रदूषण नियंत्रण

- मानदंडों के भीतर शोर स्तर को नियंत्रित करने के लिए ध्वनि उत्पन्न करने वाले उपकरणों को वाइब्रेटिंग पैड और ध्वनिक संलग्नक प्रदान किया जाएगा।
- उपकरण/मशीनरी स्थापना के समय नवीनतम तकनीक और अत्यधिक सावधानी बरती जाएगी।
- मशीनों के गतिशील/घूर्णन वाले भाग अथवा घटकों का स्नेहन नियमित आधार पर किया जाएगा।
- उच्च शोर वाले क्षेत्रों में काम करने वाले ऑपरेटरों को ईयर-मफ्स या प्लग प्रदान किए जाएंगे।
- जहां भी आवश्यक होगा, उपकरण को ध्वनिक बाड़े और साइलेंसर प्रदान किए जाएंगे।
- ध्वनि स्तर को कम करने के लिए उचित हरित पट्टी विकसित की जाएगी।
- इस प्रकार, यह परिकल्पना की गई है कि शोर का कोई प्रतिकूल प्रभाव नहीं होगा। परिसर के भीतर विकसित हरित पट्टी का परिधि के भीतर और सीमा के बाहर शोर में कमी पर महत्वपूर्ण लाभकारी प्रभाव पड़ेगा।

6.4 भूमि प्रदूषण नियंत्रण

- प्लांट जीरो लेवल डिस्चार्ज कॉन्सेप्ट को लागू करेगा। इस प्रक्रिया में उपचारित पानी का पुनर्चक्रण किया जाएगा। इसलिए, मिट्टी पर कोई नकारात्मक प्रभाव नहीं पड़ेगा।
- कोई भी जहरीला/अपशिष्ट जल सीधे जमीन पर नहीं डाला जाएगा।
- अन्य खतरनाक ठोस कचरे को अधिकृत पुनर्चक्रणकर्ता या विक्रेता को भेजा जाएगा।
- यह परिकल्पना की गई है कि संचालन चरण के दौरान भूमि पर्यावरण पर कोई बड़ा प्रभाव नहीं पड़ेगा।

6.5 ठोस और खतरनाक अपशिष्ट उत्पादन और निपटान

- उत्पादित तेल को अधिकृत पुनर्चक्रणकर्ता को बेचा जाएगा।

- बाष्पीकरणकर्ता से ठोस अपशिष्ट उपचार, भंडारण और निपटान की सुविधा को भेजा जाएगा।

उत्पन्न सभी ठोस और खतरनाक कचरे को सीपीसीबी और हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड द्वारा जारी दिशा-निर्देशों के अनुसार अलग से एकत्र, संग्रहीत और निपटाया जाएगा।

7 पर्यावरण प्रबंधन योजना

पर्यावरण नियंत्रण उपायों पर कुल पूंजी निवेश 1.13 करोड़ रुपये की कुल विस्तार परियोजना लागत में से लगभग 0.056 करोड़ रुपये होने की परिकल्पना की गई है। विवरण नीचे तालिका में दिया गया है:

क्रमिक संख्या	अवयव	आरंभिक लागत (लाख)	आवर्ती लागत (प्रति वर्ष)
1	वायु प्रदूषण नियंत्रण उपकरण	2.45	0.5
2	व्यावसायिक स्वास्थ्य और सुरक्षा	0.8	0.2
3	हरित पट्टी विकास	1.0	0.4
4	वर्षा जल संचयन पिट	1.4	0.3
कुल		**5.65 लाख ~0.056 करोड़**	**1.4 लाख 0.014 करोड़**

8 राष्ट्रीय उद्यान या वन्य जीवन अभयारण्य

परियोजना स्थल के 10 किमी के दायरे में कोई वन्य जीव अभ्यारण्य या राष्ट्रीय उद्यान नहीं है इसलिए किसी राष्ट्रीय वन्यजीव बोर्ड से मंजूरी की आवश्यकता नहीं है। परियोजना स्थल के भीतर कोई वन भूमि शामिल नहीं है।

9 जनसांख्यिकी और सामाजिक-आर्थिक वातावरण

- बुनियादी ढांचे, परिवहन, स्वास्थ्य देखभाल और शिक्षा सुविधा में सुधार।
- व्यापार, ठेका कार्य एवं विकास कार्य जैसे सड़क आदि तथा अन्य कल्याणकारी सुविधाएं जैसे चिकित्सा सुविधा, वाहन, निःशुल्क शिक्षा, पेयजल आपूर्ति आदि प्रत्यक्ष एवं अप्रत्यक्ष रोजगार सृजित होंगे।
- परियोजना प्रस्तावक द्वारा स्थानीय नियोजित लोगों को कौशल आधारित प्रशिक्षण दिया जाएगा।
- इन सभी लोगों के आपस में मिलने से विभिन्न संस्कृतियों की समझ में सुधार होगा और निश्चित रूप से उनमें मित्रता, भाईचारा और एकता में सुधार और मजबूती आएगी।