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

31-12-2024

To

The Member Secretary,
State Environment Impact Assessment Authority Haryana
Bays No. 55-58, 1st Floor Paryatan Bhawan Sector-2, Panchkula.

Sub: Proceeding of the Public Hearing of M/s Ambuja Cements Limited., VPO. Naultha Tehsil-Israna, District Panipat, Haryana.

Kindly refer to the subject noted above.

In this connection, I have been directed to enclose herewith the proceedings of the Public Hearing for obtaining Environment Clearance of our "Proposed Naultha Cement Grinding Unit with Cement production capacity of 1 x 4.0 million Metric Tons Per Annuam (4MMTP) at village Naultha, Tehsil Israna, District Panipat of M/s Ambuja Cements Limited conducted on 20.11.2024 at the project site under Environment Impact Assessment Notification dated 14.09.2006 anlogwith pen drive for video recording, photographs, attendance sheet and project report for information and further necessary action please.

DA/As above

Signed by

Monika

Scientist-C (SWM Cell)
Date: 31-12-2024 14:36:02
For Member Secretary

CC:

A copy of the above alongwith copy of proceedings with enclosure is forwarded for following for information and further necessary action please.:-

1. The Additional Chief Secretary to Govt. Haryana, Environment, Forests & Wildlife Department.
2. The Director General, Environment, Forests & Wildlife Department, Haryana.
3. The Deputy Commissioner, Panipat.
4. The Chairman, Zila Parishad, District, Panipat.
5. Commissioner Municipal Corporation District, Panipat.
6. Joint Director, District Industries Centre, Panipat.
7. Regional Officer, Haryana State Pollution Control Board, Panipat . He is requested to send the copy of proceedings to all concerned village Panchyats for displaying in their offices.
8. Sr. Environmental Engineer (IT) (HQ) for uploading the proceeding on the website of the Board.
9. M/s Ambuja Cement Ltd., Village Naultha Tehsil Israna, District Panipat..

DA/Copy of Proceeding.

**Scientist-C (SWM Cell)
For Member Secretary**

CC:

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

1. PS to Chairman.
 2. PA to Member Secretary.
- DA/Copy of Proceeding.**

**Scientist-C (SWM Cell)
For Member Secretary**

HARYANA STATE POLLUTION CONTROL BOARD
SCO No.55, SECTOR-25, HUDA, PANIPAT

Ph. - (0180) 2672037, Telefax - 2664951, E-mail: hspcbropr@gmail.com

No. HSPCB/PR/2024/ 2138

Dated 03/12/2024

To


The Chairman
Haryana State Pollution Control Board,
Panchkula.

Sub: Proceeding of the Public Hearing of M/s Ambuja Cements Limited.,VPO. Naultha, Tehsil-Israna, District Panipat, Haryana.

Please find enclosed herewith the signed copy of proceedings of Public Hearing of M/s Ambuja Cement Limited, at Village-Naultha, Tehsil-Israna, District-Panipat held on 20/11/2024 at 11:30 AM.

It is submitted for your kind information and further necessary action, please

1. Photographs of site
2. Videography with sound
3. Proceeding in original
4. Attendance Register of public (2) & officers (1).


Regional Officer,
HSPCB, Panipat

Proceeding of the Public Hearing

Proceeding of the Public Hearing for Project requiring clearance under Environmental Impact Assessment Notification, 14th September, 2006 (subsequent amended) for Proposed Naulatha Cement Grinding Unit with Cement Production Capacity of 1 x 4.0 Million Metric Tons Per Annum (4 MMTPA) at Village Naulatha, Tehsil Israna, District Panipat, State Haryana on 20/11/2024 at 11:30 AM- M/s Ambuja Cements Limited.

The above project is required to obtain the Environmental Clearance as this project is covered under EIA Notification dated 14th September 2006 & its subsequent amended of the Ministry of Environment and Forest, Government of India, New Delhi. The project proponent (PP) applied for the Environmental Clearance to MoEF&CC, Government of India and submitted draft EIA report. As per TOR issued by State Level Appraisal committee (SEAC), Haryana vide letter of ToR Identification No. TO23B1103HR5990664N dated 06.04.2024 and directed to conduct the public hearing for Environmental clearance. In this regard, an advertisement/notice of public hearing was published in leading English Newspaper "The Tribune" dated 10.10.2024 by Haryana State Pollution Control Board.

The public hearing conducted on dated 20/11/2024 (Wednesday) under the chairmanship of Sh. Virender Kumar Dahiya, IAS, District Commissioner, Panipat and along with other officers from respective departments. The attendance sheets of the officers and public attended the public hearing are enclosed as **Annexure-A & B** alongwith respectively. Videography (Uncut) still photographs in Pen Drive of the entire public hearing is enclosed as **Annexure-C**.

The following officers are present in the public hearing meeting.

1. Ms. Jyoti Mittal, HCS, SDM Israna
2. Sh Bhupinder Singh, Regional Officer, HSPCB, Panipat
3. Sh. Kuldeep Singh, AEE, HSPCB, Panipat
4. Sh. Narendra Dalal, Tehsildar Israna
5. Smt. Kshitij Kapoor, Joint Director, DIC, Panipat
6. Sh. Sunil Kumar, Forest Department Panipat
7. Sh. Astitm Parashar, Naib Tehsildar Panipat
8. Sh. Pramod Kumar, AR JD DIC, Panipat
9. Sh. Ashok Kumar (ATP), DTP(E), Panipat



RO-PCB welcomed the Deputy Commissioner, Panipat with all other officers of district administration and public present during the hearing and thereafter sought permission from the Chairman to start the Public Hearing for proposed project Cement Grinding unit with Cement Production Capacity of 4.0 Million Metric Tons per Annum (4 MMTPA) at Village Naulatha, Tehsil Israna, District Panipat, Haryana by Ambuja Cements Limited.

RO-PCB, Panipat briefed about the process of public Hearing as per EIA notification dated 14.09.2006. RO-PCB also requested the public to speak one by one and put up their questions after the presentation of project and assured the public that their questions will be answered by the Project Proponents. Thereafter he asked the Project Proponent (PP)/EIA Consultant to give a presentation of the project.

Representative of PP, Mr. Mukesh Saxena briefed the proposed project and requested EIA Consultant to explain about the draft EIA/EMP study for the proposed cement grinding unit.

Salient Features of the proposed Cement Grinding Unit project

Particulars	Details
Project	Proposed Naulatha Cement Grinding Unit with Cement Production Capacity of 1 x 4.0 Million Metric Tons Per Annum (MMTPA)
Project Proponent	M/S Ambuja Cements Limited
Location	Village Naulatha, Tehsil Israna, District Panipat, State Haryana
Project Area	9.28 Ha
Land Use	Presently the land is owned by Adani Agri Logistics Panipat Ltd, a group company of Adani. Ambuja Cements Limited, the applicant is another group company of Adani group and presently there is MOU between Adani Agri Logistic and Ambuja Cements Limited, for utilization of 9.28 Ha of land for proposed Cement grinding Project.
Topo sheet	H43Q15
Screening Category	Schedule 3 (b) Cement Plants. It falls under Category 'B1' as it is a standalone grinding unit.
Capital cost of the Project	1059 Crores

EMP Cost of the Project	55 Crores
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Resource Requirement

1	Water Demand	
	During construction Phase	: 200 KLD
	During Operational Phase	400 KLD
	Source of water	Ground water
2	Manpower	
	Construction Phase	: 1530 Nos
	Operational Phase	155 Nos
3	Electricity Demand	
	Power Requirement	23 MW
	Source	Dedicated supply line from nearby sub-station at Naulatha at 132 KV / 66 KV switch yard with suitable step-down transformer, if required.

The raw material namely Clinker, Gypsum and Fly ash from domestic sources. Clinkers would be sourced from domestic plants in Marwar Mundwa or any other in-house sources as per price dynamics. Fly Ash shall be sourced from nearby thermal power plant from Hissar/Panipat/NPL Rajpura/ Talwandi Sabo. Natural Gypsum shall be sourced from Bikaner, Rajasthan. No Litigation/Court case or legal matter is pending against the proposed project.

Process description of Cement Grinding Unit

Cement Grinding

Clinker, gypsum and Fly ash will be loaded into their respective hoppers using a suitable material handling system. Clinker grinding will be achieved using either a Vertical Roller Mill (VRM) or a combination of a ball mill and roller press. The cement grinding circuit will include arrangements for clinker storage, gypsum storage, fly ash storage, and other raw material storages as required by BIS standards for different




types of cement, as well as cement storage and a packing plant. Clinker unloading and loading of bagged cement for rail/road transport will be carried out by trucks and bulkers. Process technology of VRM is discussed below:

Vertical Roller Mill (VRM)

Vertical roller mill operates under the principle of air swept with impact, Compression & Shear forces.

- Latest Generation VRM are most Robust state of art technology for Cement grinding application.
- VRM performs four major operations inside a single machine: Drying of Raw material, Grinding, Material Transportation and Material Classification
- It comes in 2 Roller / 4 Roller/ 6 Grinding roller segment design, which gives greater flexibility; if one roller is down, production with 70% capacity can be achieved with remaining rollers.
- VRM is the most energy efficient equipment, Hence, Less power consumption.
- Water Spray is required on table for material bed stabilization.
- External Heat sourced is required for Drying of Material.

A high efficiency circulating fan will be operated to collect the ground material in the system. The collected ground material will be taken into the cement silos with the help of series of air slides and Bucket elevators.

To minimize the pollution, the exhaust of circulating fan is connected with bag filter. Product collected at bag filter shall be transported to the cement silo through a set of air slides and bucket elevator.

Cement packing

The cement from four silos will be extracted and fed to the installed 2 x3 nos. of electronic packers, 16 spout, double discharge with a capacity of 240 TPH each through air slides, bucket elevators and screens. Each Packer will be connected with 3 nos. truck/trailer loaders for loading packed cement bags. The packed bags from packers will be transported to truck loading bays by suitable flat belts conveyors and diverters. A separate provision will be also available to load bulk cement through closed Bulkers.

IMPACT ASSESSMENT AND MITIGATION MEASURES

Component	Mitigation Measures
AIR	- All major sources of air pollution (Cement Mill) will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms less than 30 mg/Nm ³ for particulate matter emission from the stacks.

(Handwritten signatures)

	<ul style="list-style-type: none"> - Bag filters will be provided at all loading /unloading points and transfer points. - Clinker will be transported by truck/conveyor and fed directly/through Bulk Reception Unit; Gypsum will be stored in covered shed at proposed plant and cement in cement silo. Fly- ash will be transported through bulkers and stored in fly ash silo. - Proper maintenance of vehicles will be done to reduce gaseous emissions. - Operators will be provided with personal protective equipment like safety Goggles, dust mask, ear plugs, helmets, shoes etc. - Periphery of plant and surrounding areas of office building will be covered by thick green belt to attenuate the pollutants emitted by the Plant. - Ambient air quality and stack emissions will be regularly monitored to keep emission levels below the prescribed limits.
WATER	<ul style="list-style-type: none"> - The total water requirement for grinding unit will be 400 KLD which will be sourced from ground water, which approval will taken out from CGWA / Haryana water resource department. Rest water requirement will be full fill with treated water from STP plant. - No industrial wastewater will be generated during cement manufacturing process.
Noise	<ul style="list-style-type: none"> - The vehicles used for movement will be ensured for schedule & preventive maintenance to reduce noise generation. - The construction labors will be provided with adequate personal protective equipment like earmuffs and earplugs. - The high noise zones at site will be demarcated and provided with enclosures & barriers. - Construction activities and Heavy equipment's operations will be carried out only during the daytime.
Soil	<ul style="list-style-type: none"> - Construction wastes will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces

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	<p>as saleable scrap.</p> <ul style="list-style-type: none"> - Litter disposal and collection points will be established around the work sites. - Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc. will be disposed through local recyclers. - The construction spoils will be temporarily stored at designated locations inside the plant premises. - Discharge of any kind of pollutant will be strictly prohibited during construction period. - Green belt develop for conservation of soil. 		
Solid & Haz. Waste	Sr. No.	Types of Waste	End Use/Disposal Plan
	1	Dust Collected from air pollution control equipment	Will be totally recycled back to process
	2	Sludge from Sewage Treatment Plant (~10 Kg/Annum)	Will be used in development as manure for Greenbelt
	3	Municipal Waste (domestic and/or commercial waste)	Organic waste will be composted and will be reused as manure. Inorganic waste shall be disposed of properly.
	4	Redundant machinery equipment	Occasionally, scraps as and when generated segregated, stored & sold to vendors.
5	Horticultural Waste	Horticultural waste generated from gardens/greenbelt will be composed	
Green Belt	<ul style="list-style-type: none"> - 33% Plantation of total plot area will be done in and around the plant premises. - 70% survival rate will be maintained with all possible efforts. 		

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	<ul style="list-style-type: none"> - The trees will be planted at suitable grid spacing to encourage proper growth. - Local plant species will be preferred
<p>Occupational Health & safety</p>	<ul style="list-style-type: none"> - Adequate dust control systems will be implanted, and good housekeeping will be practiced. Protective masks and respirators will be provided at areas where high dust exposure is going to be encountered even for a very short duration. - Proper maintenance of machinery - Installation of compressors in closed buildings - Regular monitoring of noise level - Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformers, cable, general store and office area. Hydrant line at all locations in the plant area along with clinker storage area. Fire tender is to be kept ready at the plant gate. - Oil storage area will be fenced and declared as "Fire Hazardous Area-No Smoking Area" - Permit and safety instruction will be given to use welding / gas cutting in the area of oil, and bag go down. - Predictive interlock in transformers to give alarm and trip the system. - Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done. - Silos and buildings will be constructed as per the structural design as per IS Codes - Installing light arrestors at all tall buildings. - Permit to be taken to work at height with work instruction to use safety belts etc. - Testing of all lifting tools, tackles and pressure vessel to avoid failure. - Safe working pressure maintained in air receiver

Amal

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After the completion of Presentation by Environmental Consultant Regional Officer, HSPCB asked the public to raise their Queries/ suggestion which are given as below:

S. No.	Name	Village	Question	Reply
1	Deepak Kumar	Naulatha	<p>What is the mitigation plan for transporting the raw material & road condition as problem would be cause to the local people due to movement of trucks carrying raw material.</p> <p>What is the control measures in case of road damage due to transportation. Due to small width of road there is possibility of traffic jam.</p>	<p>Project Proponent replied that,</p> <p>There are three types of raw material which is used for cement unit i.e., Clinker, Gypsum & Fly ash, out of which 80% to 90% will be transport by Rail line & rest will be through Road with fully covered vehicle. The product i.e. cement shall be transported through railway line. All due care will be taken so that no local people is affected due to movement of raw material.</p> <p>Deputy Commissioner, Panipat directed project proponent to give undertaking that no material will be transported through trucks except for the cement material which is to be available in Panipat market. The project proponent further submitted that only the bulkers carrying the fly ash which is approx. 5% of raw material would be transported using trucks.</p>
2	Ranbir Singh	Naulatha	<p>Whatever goods will come, it will come by road as well as by rail. This road is not that wide and due to movement of truck situation of jam like situation will arise.</p> <p>Secondly, Sarpanch may be aware of projects as you have communicated to Panchayat, but villagers are not aware of this public</p>	<p>Sh. Virender Kumar Dahiya, IAS, District Commissioner, Panipat clarified that raw material and finished product (cement) will be transported by both Rail and Road.</p> <p>In the case of road transportation, the existing road approached to NH-709 is only 2 km with 18 ft. widen, which can be further widened as around 100ft as per availability road area.</p> <p>It can be further discussed with villagers for widening of road as per necessary requirement.</p>

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			<p>hearing and to provide copy of project report.</p>	<p>Project proponent informed that copy of draft EIA and executive summary of proposed project is also submitted at different local govt. bodies and panchayats through BDPO which accessible to villagers.</p> <p>Besides munadi (public announcement with mike) in local villages also carried out 48hrs prior to the Public Hearing.</p> <p>Deputy Commissioner Panipat further directed to provide copy of project report to all the villagers as per issue raised by the local person present in hearing.</p>
3	Mr. Randheer Singh	Naulatha	<p>There is already problem with the existing power plant and cement factory at Pardhana. The village near Thermal was shifted. There will be dust problem for the village due to establishment of cement factory. The plant is located at such location at which all dust will move towards the village with western wind direction. Earlier, the unit has taken the land for food grain storage and the villagers allowed the site for food grain as there is no pollution but now it has come with come with the project of with cement factory. The factory will be situated in</p>	<p>Sh. Bhupinder Singh, Regional Officer, HSPCB, Panipat replied that the main issue of air pollution in this belt is due to fly ash generated by Thermal Power Plant. The cement plant located at village-Pardhana has provided latest technology machinery. These plants are regularly checked by different authorities MoEF&CC, CPCB & HSPCB time to time. The cement plant will use of this fly ash as raw material and hence problem of fly ash will be resolved. The Thermal Power Plant has been directed to provide proper fly ash storage facility and take measures to reduce fly ash generation such as using biomass instead of coal. Recently Hon'ble NGT as imposed environmental compensation of 07 cr. on Thermal Power Plant for improper handling of fly ash. If such complaint are received against this project then all the necessary action will be taken as per environment laws.</p>





			NCR and if there is any harm with the coming cement plant in Village-Naultha.	
4	Mr. Randheer Singh	Naulatha	The project proponent make commitments at time of establishment but in future, if problem arises then the village may be required to be shifted to new location.	The Deputy Commissioner, Panipat replied that your point is noted. You have raised the objection that two cement factories are established at Village-Pardhana and Village-Khukhrana. Both the villages has been shifted to new location due to the problem caused by the cement factories and there is damage to the crops. Deputy Commissioner, Panipat informed that whatever issue you have raised has been noted down.
5	Mr. Dharmendra	Naulatha	<p>We know that the land is already acquired by the Adani group, and no one has any right to take away someone other's right. We will give green signal to the project after having discussion with all the people of our village. If any resident of the village is having any objection then permission should not be granted for this project.</p> <p>Not all the residents of the villager are present in the hearing, some people have come from outside and giving their opinion which is not acceptable, this is my suggestion.</p>	Deputy Commissioner, Panipat replied that beside this observation if there is any other issue. Kindly raise as this matter has already been taken up. He directed the project proponent to provide copy of project report to the people
6	Sarpanch, Naultha		We are in favor of project and only	Sh. Virender Kumar Dahiya, IAS, District Commissioner, Panipat

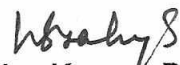
		<p>request to increase the road and its length so that it approached to village without obstacle, and it also help in safety of the people.</p> <p>We are in favor of the project to operate in Village-Naultha. Our request is only to consider that the length of road to be increased from 16 feet to 33 feet where it has not been done</p>	<p>clarified that this point as already been asked.</p> <p>Due care will be taken by project proponent and by administration to meet your demand as raised in this public hearing.</p>
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Thereafter, Regional Officer, HSPCB, Panipat again appealed to the general public present during the time of hearing to ask any more questions/suggestions/written objection w.r.t. the said project. No more questions/suggestion asked by the public present during hearing and thereafter public hearing was ended with permission of the chair.


Ajay Ahlawat,
AEE, HSPCB,
Panipat.


Kuldeep Singh,
AEE, HSPCB,
Panipat.


Bhupinder Singh,
Regional Officer,
HSPCB, Panipat.


Virender Kumar Dahiya, IAS
Deputy Commissioner,
Panipat

A Attendance Sheet Naulatha Public hearing
 Date → 20-11-2024 for Ambuja Cements Ltd.
 Proposal: Proposed Naulatha Cement grinding unit with Production Capacity
 of 1x4.0 Million MTPA at Village - Naulatha, Tehsil - Issrana, District - Panipat,
 Haryana

S.No.	Name	Department	Contact No	Signature
1.	Mr Vik Sahay	DC, Panipat	9872603090	
2.	Jyoti	SDM, Issrana	8950889440	
3.	Bhupinder Singh	PO, HSPCB, PMA	9896376055	
4.	KSHITIJ	JD, DIC PNA	8529890468	
5.	PARMODKUMAR	%JD, DIC Panipat	8930532373	
6.	ASHOK KUMAR (ATE)	%DTP(E), Panipat	9991888129	
7.	Atishya Parashar	Naib Tehsildar Issrana	9318320916	
8.	Narender Palal	Tehsildar Issrana	9729080408	
9.	Kuldip Singh	AGE, HSPCB	9069000079	
10.	SUNIL KUMAR	Forest Dept. Pnp	7988093895	

Date
20/11/2024Attendance Sheet for Naulatha Public Hearing of
Proposal: Proposed Naulatha Cement Grinding Unit with Prod
Tehsil - Issrana, District - Panipat, State - Haryana

S.No.	Name	Father Name	Village
1	Jagpal	Ramchandra	Issrana
2	Sahil	Surgj mal	Mundlana
3	Mukesh	Balvinder Singh	Safidon
4	Vikas	Surendra	Ossar
5	Gorav	Kuldeep	Ossar
6	Sumit	Jaypal	Panipat Bapalli
7	Balraj Sharma	Ompakash	Panipat Bapalli
8	Sonu	Jeet Singh	Noltha
9	Pawan	Surajbhan	Panipat Noltha
10	Susil Kumar	Shyam Singh	Noltha
11	Bablu	Ram santhi	Naultha
12	Dinesh	Dharamveer	Issrana
13	Rahul	Rajendra	Issrana
14	Anil	Rajendra	Issrana
15	Jasmer Kumar	Balraj Singh	Noltha
16	Abhishek	Vinod	Ossar
17	Sonu	Gariba	Ossar
18	Avinash		
19	Ajay	Jaypal	Naulatha
20	Lalita	Potas	Panipat
21	Vikas	Rampal	Samal Kher
22	Mahaveer	Shri Ram	Naulatha
23	Rajveer	Lakhi	Naulatha
24	Ravi Singh	Sultan Singh	Samal Kher
25	MOHIT	Randhir	Puthar
26	DEEPAK	RAFIK	Jondhan Kadan
27	PARDEEP	Sardar	NARAYAN
28	Sachin Seini	Sutpal	Safidon
29	Jaypal	Ramnarayan	Naulatha
30	Naveen	Narshi	Brahaman Najra

Dated 20-11-2024 for Ambuja Cements Ltd.
 Production capacity of 1x4.0 million MTPA at village - Naulatha,

Contact No.	Signature	Date
9813845527	Jagdeep	
8397945723	Sahil	
7015922155	mukesh	
8689078314	VIKASH	
8396084563	GODUN	
8930659639	Sunit	
9813172816	Baleshram	
9896487489	Sany	
9671018296	Rajan Kumar	
8816054808	Sashid Kumar	
9991630348	BABU	
9813712096	Dinesh	
9050714724	Rohul	
8930239725	Arun	
9068301020	Jasim	
7027099406	Abhishek	
9991334457	Rishi	
7999992501	Ajay	
8791811080	Vijay	
8221905663	Vijay	
	Hitesh	
	Shantanu	
9996654045		
80539-57528	Mohit	
8397976737	Dweepal	
8814087429	Praty	
8168856823	Sechar	
9991875099	Tejpal	
8607230015	Navin	

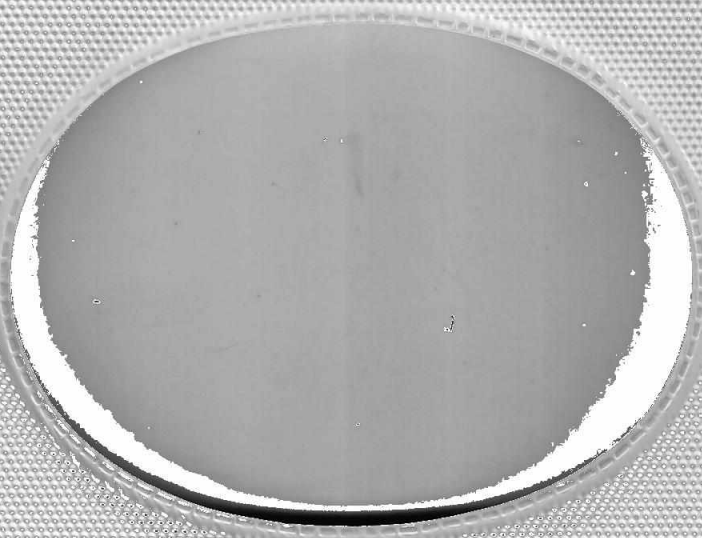
Date
20/11/2024

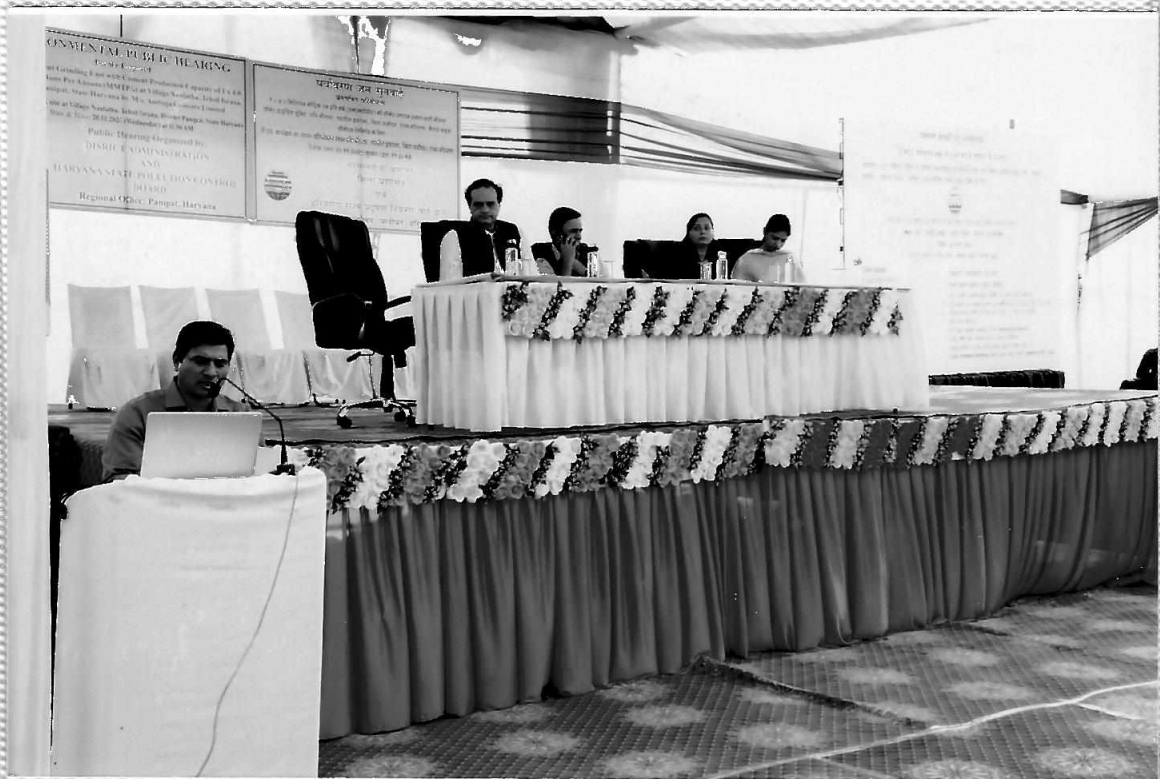
Attendance Sheet for Naulatha Public Hearing
 Proposal: Proposed Naulatha cement Grinding unit with
 Tehsil - Israna, District - Panipat, State - Haryana

Sl. No.	Name	Father / Husband	Village
31	Surendra	Jaipal Singh	Bandh
32	Randheer Singh	Sh. Hardwa	Noltha
33	Ramveer Singh	Surajmal	Noltha
34	Ram Mehar Singh	Ajeet Singh	Noltha
35	Sumit Kumar	Surenada Kumar	Netheer
36	Dharmender	Balraj	Chhatohar
37	Pawan	Mahender Pooleson	Mamalkone
38	Narinder Kumar	Mahender	Bussana
39	Vikash Narwal	Sh. Ramesh Chander	Naultha
40	Pardeep Sharma	Sh. Ramhar Sharma	Naultha
41	Manish	Sh. Satbir Singh	do
42	Neeraj Kaushik	Sh. Balmani Kaush	Naultha (सरपंच)
43	Ranlal	S. Raj Singh	Basham (सरपंच)
44	Pooleson	Rajbir Smooh	Vilken - chidra
45	Sunil Kapoor	Rajender Singh	Naultha
46	_____	_____	906
47	Sandeep	Sutarna (Kaurpal)	Sutarna
48	Uttara Singh	_____ Sh. Dilip	Naultha
49	Rammbir	Sh. Preet Singh	Machlauda
50	Randheer Singh	Jai Singh Jaglan	Naulatha
51	Manoj Kumar	Surat Singh	Naulatha
52	Sunil	Lakshmi Chand	Naulatha
53	Surush	Aqua Singh	Naulatha
54	Khushiram	Aanand	Bhursham
55	Sagar	Ramthkri	Bhursham
56	Veenban	Shri Neetsam	Jamba
57	Rajveer Singh	Changiram	Publicgang
58	Rammehar	Randheer	Naultha
59	Vijaypal	Pramsingh	Naulatha
60	Bijendra	Ramkaran	Naulatha
61	Jaidev	Bijendra	Naulatha

Hearing for the dated 20-11-2024 for Ambuja Cements Ltd.
 with Production Capacity of 1x4.0 Million TPA at Village - Naulatha,
 State - Haryana. Page 1 JASHOKA

Mobile No.	Signatures	Date
8570079487	[Signature]	
9050824050	[Signature]	
8053069649	Ranbir Singh	
9466898883	[Signature]	
9815262551	[Signature]	
880762173	[Signature]	
9466669761	[Signature]	
7497021220	[Signature]	
7015924559	Perdeep Sharma	
8930125521	manim	
9818803378	Neesa	
9416541934	Rambal	
9466488662	[Signature]	
7015527155	[Signature]	
9588307297	[Signature]	
9050000265	Soedup	
98135-13547	Jai Singh	
7404340001	[Signature]	
9671967276	Ranbir Singh	
9050022213	Manoj	
9671964574	[Signature]	
9050528082	[Signature]	
8814062939	[Signature]	
9671711364	[Signature]	
9466343722	[Signature]	
9991477610	Vijay Pal	
206668733	Bijender	
7206668733	[Signature]	











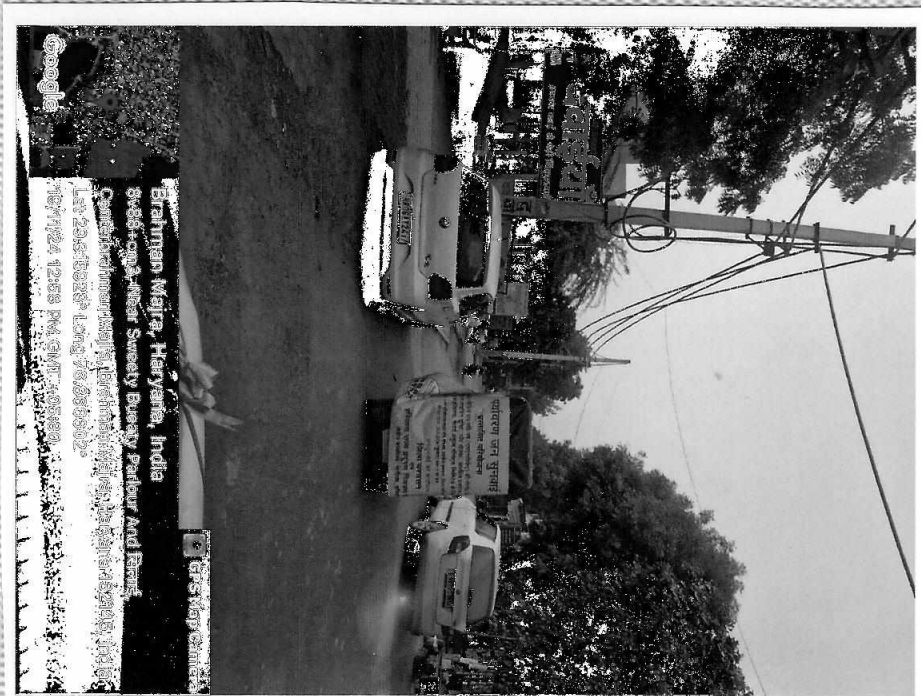
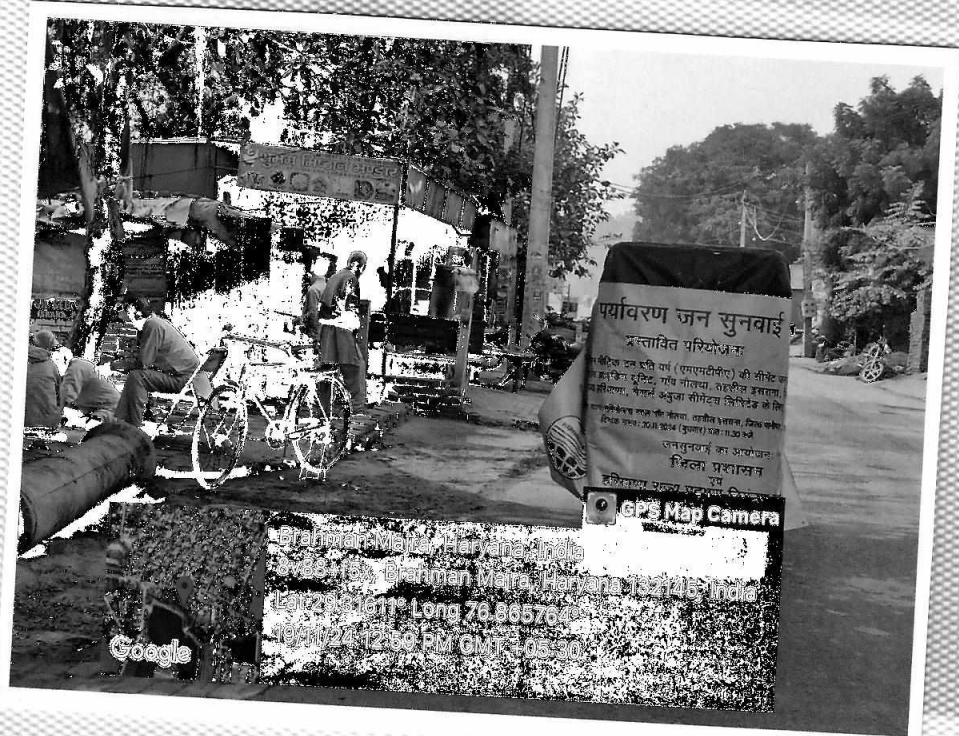




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**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND
ENVIRONMENTAL MANAGEMENT PLAN
FOR**

**Proposed Naulatha Cement Grinding Unit with Cement Production Capacity of
1 x 4.0 Million Metric Tons Per Annum (MMTPA) at Village Naulatha, Tehsil
Israna, District Panipat, State Haryana.**

ToR Identification NO.TO23B1103HR5990664N dated 06/04/2024



PROJECT PROPONENT

M/s AMBUJA CEMENTS LIMITED

Address: Adani Corporate House, Shantigram, SG Highway, Ahmedabad, Pin code- 382421

Email: bhimsi.kachhot@adani.com/sanjeewkumar.singh@adani.com

PREPARED BY:



ECOMEN MINING PRIVATE LIMITED

(formerly known as Ecomen Laboratories Pvt. Ltd)

Accredited by QCI/NABET Certificate No. NABET/EIA/22-25/SA 0219, valid till March 22, 2025

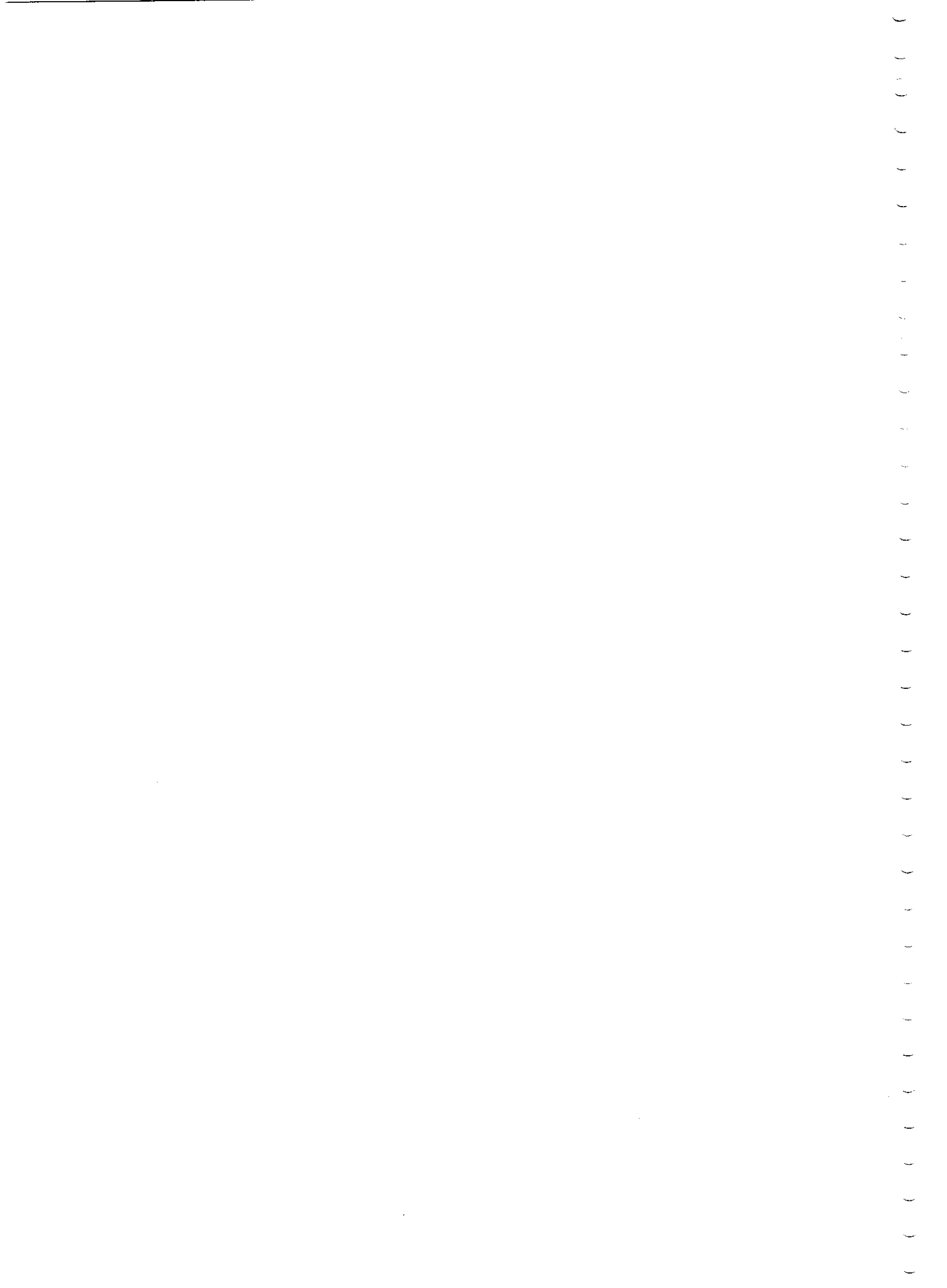
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E-mail: contactus@ecomen.in

**3 (b) Cement Plants type of activity, Category 'B1'- Green Field Project Baseline Data
Generation carried out during Oct 2023- Dec 2023 by NABL Approved Lab: Ecomen Mining
Private Limited**

(Certificate No.: TC 12751)




Date: 08.07.2024

UNDERTAKING

We hereby certify that the contents (Information & Data) given in the EIA-EMP with respect to proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, State: Haryana by M/s. Ambuja Cements Limited (ACL), a group company of Adani Group are correct to the best of my knowledge.

The prescribed ToR have been complied with and presented in EIA/EMP Report.



Sanjeev Kumar Singh
(Authorized Signatory)
Ambuja Cements Limited

ECOMEN MINING PRIVATE LIMITED
(Formerly Known as Ecomen Laboratories Pvt. Ltd.)

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E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN: U74210UP1989PTC010601, GSTIN: 09AAACE6076H1ZI

Date: 08.07.2024

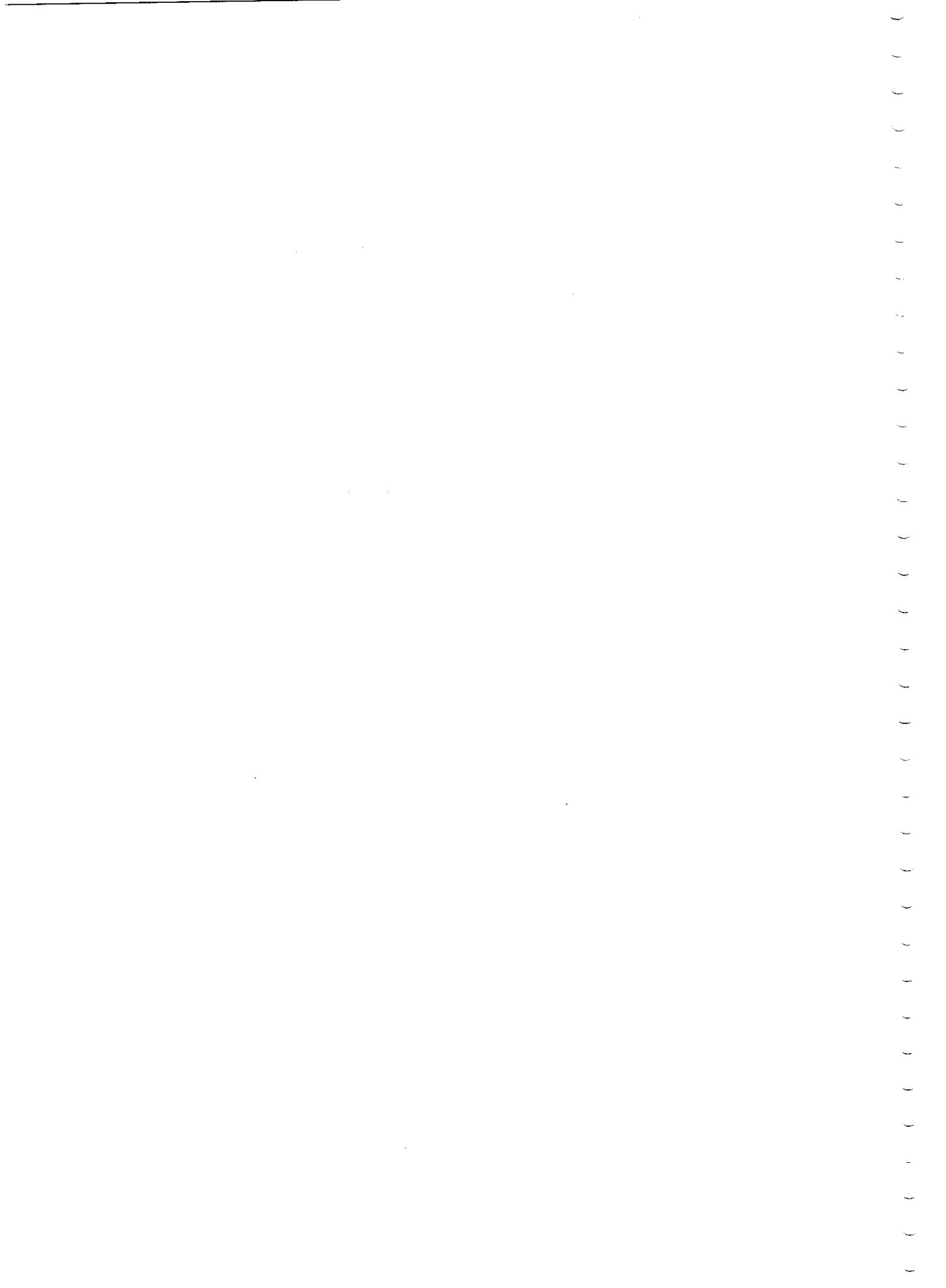
UNDERTAKING

We hereby certify that the contents (Information & Data) given in the EIA-EMP with respect to proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, State: Haryana by M/s. Ambuja Cements Limited (ACL), a group company of Adani Group are correct & based on the information provided by Project Proponent.

for Ecomen Mining Pvt. Ltd.



(Dr. Binay Prakash Pandey)
Chairman & CEO





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DISCLOSURE OF CONSULTANT

Part A: Declaration by ACO and Experts contributing to the EIA Report

Declaration by Experts contributing to contributing to Draft EIA-EMP with respect to proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, State: Haryana by M/s. Ambuja Cements Limited (ACL), a group company of Adani Group are correct & based on the information provided by Project Proponent.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA Coordinator: Dr Binay Prakash Pandey

Signature :



Date : 08.07.2024

Team Member : Ms Anuradha Srivastava

Signature :



Date : 08.07.2024

Period of involvement: August 2023 - May 2024


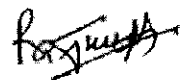

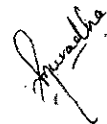
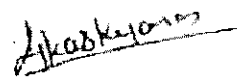
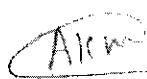

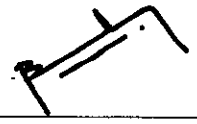

Contact information: Ecomen Mining Pvt. Ltd.




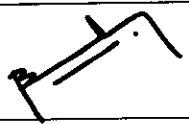

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Functional area experts:

SsNo.	Functional areas	Name of the expert/s	Involvement (Period and task**)	Signature and date
1	AP*	Mr K N Bhaskar Rao	August 2023 - May 2024 Identification of Locations, interpretation of data wrt to standard, statistical analysis compilation etc.	
2	WP*	Mr Rajneesh	August 2023 - May 2024 Identification of Locations, interpretation of data wrt to standard, Compilation of report	
3	SHW*	Dr Binay Prakash Pandey	August 2023 - May 2024 Identification of waste generation management & mitigation measures etc.	
		Ms Anuradha		
4	SE	Mr Vikas Jaiswal	August 2023 - May 2024 Group discussion, designing of questionnaire, data analysis and interpretation	
5	EB*	Dr Ashish Mishra	August 2023 - May 2024 Conducted ecological survey, assessment of impacts, prepared report and compilation etc.	
6	HG*	Dr Binay Prakash Pandey	August 2023 - May 2024 Hydrogeology of the study area including status, water level of ground water of the area & possibility of recharge rain water harvesting etc.	
7	GEO*	Dr Binay Prakash Pandey	August 2023 - May 2024 Geological features & formations, topography & Lithology of the 10 km radius area and lease area	
8	SC*	Dr Ashish Mishra	August 2023 - May 2024 Identification of Locations, interpretation of data report quality, Compilation of report	

S.No.	Functional areas	Name of the expert/s	Involvement (Period and task**)	Signature and date
9	AQ*	Ms Anuradha	August 2023 - May 2024 Prediction of GLC by using AERMOD model etc.	
10	NV	Dr. M. K. Jain	August 2023 - May 2024 Identification of locations, Data Interpretation (Leq), Compilations of report including impact assessment, vibration & impact etc.	
11	LU*	Mr. Anshuman Singh	August 2023 - May 2024 Developing the Land use/ land cover of the study area by using remote sensing data.	
12	RH*	Dr Binay Prakash Pandey	August 2023 - May 2024 Identification of Hazards, Hazardous substance. Preparation of on- site emergency plan etc.	
		Ms Anuradha		

*One TM against each FAE may be shown, **Please attach additional sheet if required

Date and Sign of EIA Coordinator:

Name: Dr Binay Prakash Pandey

Signature: 

Date: 08.07.2024

Date and Sign of Head of ACO / authorised person:

Name: Dr Binay Prakash Pandey

Signature: 

Designation: Chairman & CEO

Date: 08.07.2024

Name of the EIA consultant organization: Ecomen Mining Private Limited

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NABET Certificate No. & Issue Date: NABET/EIA/22-25/SA 0219 dated 27.03.2024

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LIST OF PLANS

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ABBREVIATION

AAQM	:	Ambient Air Quality Monitoring
AAQMS	:	Ambient Air Quality Monitoring Stations
AAS	:	Atomic Absorption Spectrometer
ACL	:	Ambuja Cement Limited
AERMOD	:	Atmospheric Dispersion Modelling
APCE	:	Air Pollution Control Equipment's
APM	:	Air Particulate Matter
AQC	:	Air Quenching Cooler
AMSL	:	Above Mean Sea Level
AvRc	:	Average run-off coefficient
BDL	:	Below Detection Limit
BGL	:	Below Ground Level
BIS	:	Bureau of Indian Standards
BOD	:	Bio-chemical Oxygen Demand
CAP	:	Climate action programme
CEMS	:	Continuous Emission Monitoring System
CEP	:	Condensate extraction pump
CER		Corporate Environment Responsibility
CGWA	:	Central Ground Water Authority
CPLC	:	Carbon Pricing Leadership Coalition
CPCB	:	Central Pollution Control Board
CO	:	Carbon Monoxide
CREP	:	Corporate Responsibility for Environment Protection
CSI	:	Cement Sustainability Initiative
CSR	:	Corporate Social Responsibility
CTE	:	Consent to Establish
CTO	:	Consent to Operate
D.G	:	Diesel Generator
DL	:	Detection Limit
DO	:	Dissolved Oxygen
DMP	:	Disaster Management Plan
EAC	:	Expert Appraisal Committee
EC	:	Environmental Clearance
ECC	:	Emergency Control Centre
EIA	:	Environmental Impact Assessment
EMC	:	Environment Management Cell
EMP	:	Environmental Management Plan
ERDAS	:	Earth Resources Data Analysis System
ERT	:	Emergency Response Team
ESE	:	East of South East
ESC	:	Enterprise Social Commitment
ESP	:	Electrostatic Precipitator
ETP	:	Effluent treatment Plant
FCC	:	False Color Composite
FSE	:	Full-scale exercise
FE	:	Functional exercise
FPS	:	Fine Particulate Sampler
FY	:	Financial Year
GDP	:	Gross Domestic Product

GES	:	Groundwater Estimation Committee
GIS	:	Geographic Information System
GOI	:	Government of India
GOVT.	:	Government
GPS	:	Global Positioning System
GLC	:	Ground Level Concentration
Ha	:	Hectare
HPCB	:	Haryana Pollution Control Board
HAZID	:	Hazard Identification
HP	:	High Pressure
HC:	:	Hydrocarbons
HES	:	High efficiency separator
HSE	:	Health, Safety & Environment
ISO	:	International Organization for Standardization
ILC	:	Inline calciner
ISRO	:	Indian Space Research Organization
IMD	:	India Meteorological Department
IWPA	:	Indian Wildlife protection Act
IS	:	Indian Standards
KLD	:	Kilo Litre Per Day
Km	:	Kilometer
KWH	:	Kilo Watt Hour
LULC	:	Land Use/Land Cover
LP	:	Low Pressure
MSDS	:	Material Safety Data Sheets
MT	:	Metric Tonne
MTPA	:	Million Tonnes Per Annum
MoEFCC	:	Ministry of Environment and Forest & Climate Change
MW	:	Mega Watt
NAAQS	:	National Ambient Air Quality Standards
NABARD	:	National Bank for Agriculture and Rural Development
NABL	:	National Accreditation Board for Testing And Calibration Laboratories
NABET	:	National Accreditation Board for Education & Training
NGO	:	Non- Governmental Organization
NDIR	:	Non-dispersive Infrared Detector
NE	:	North East
NW	:	North West
NH	:	National Highway
NIDM	:	National Institute of Disaster Management
NOC	:	No Objection Certificate
NNW	:	North of Northwest
NO _x	:	Oxides of Nitrogen
NRSA	:	National Remote Sensing Agency
NTU	:	Nephelometric Turbidity Unit
NW	:	North West
OHS	:	Occupational Health & Safety
OPC	:	Ordinary Portland Cement
PAT	:	Perform Achieve Trade Scheme
PAS	:	Public address system

PA	:	Polyamide
PBL	:	Project Based Learning
PCU	:	Passenger Car unit
PET	:	Potential Evapo Transpiration
PF	:	Protected forest
pH	:	Potential Hydrogen
PH	:	Pre- Heater
PHC	:	Public Health Centers
PM	:	Particulate Matter
PMGSY	:	Pradhan Mantri Gram Sadak Yojana
PPE	:	Personal Protective Equipment's
PPC	:	Pozzolana Portland Cement
PPM	:	Parts Per Million
PSC	:	Portland Slag Cement
PVC	:	Poly Vinyl Chloride
RDS	:	Respiratory Dust Sampler
RI	:	Rainfall Infiltration
RO	:	Reverse Osmosis
RSPM	:	Respirable Suspended Particulate Matter
R & R	:	Rehabilitation & Resettlement
S	:	South
SAR	:	Specific Absorption Rate
SC	:	Scheduled Caste
SE	:	South East
SEAC	:	State Expert Appraisal Committee
SELC	:	South Eastern Coalfields Limited
SEIAA	:	State Environment Impact Assessment Authority
SH	:	State Highway
SHE	:	Safety, Health and Environmental Protection
SOP	:	Safe operating procedure
SIC	:	Site Incident Controller
SOI	:	Survey of India
SRTM	:	Shuttle Radar Topographic Mission
SSE	:	South of South East
SW	:	South West
SSW	:	South of Southwest
ST	:	Scheduled Tribes
SHMP	:	Sodium hexa metaphosphate
STP	:	Sewage treatment Plant
TAD	:	Tertiary air Duct
TTE	:	Table-top exercise
TDS	:	Total Dissolved Solids
ToR	:	Terms of Reference
TPD	:	Tonnes Per Day

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 Project

Ambuja Cements Limited (ACL), a member company of the Adani Group, has developed a large number of Cement Projects (Integrated Cement Plant, Grinding Units & Limestone Mines). Currently, Ambuja Cement has a cement capacity of 31 million tonnes with six integrated cement manufacturing plants and eight cement grinding units across the country.

Ambuja Cements Limited (ACL) has proposing to establish a Greenfield Cement Grinding Unit with a production capacity of 4.0 million metric tons per annum (MMTPA) in Naulatha Village, Israna Tehsil, Panipat District, Haryana. The project was considered in the State Environment Appraisal Committee, Haryana (SEAC) and Standard ToR was issued on 6th April, 2024 for the preparation of the Environmental Impact Assessment report and Environment Management Plan (EIA/EMP). As per EIA Notification 2006 and subsequent amendments, the project can be classified under Schedule 3(b) Cement Plants. All standalone grinding units are classified under Category 'BI' and must obtain environmental clearance from the SEAC/SEIAA.

1.2 Details of the Project

1.2.1 Location and accessibility

The location of the project is at Naulatha Village, Israna Tehsil, Panipat District Haryana. Location map & Salient features / Environmental setting map for the proposed project is given in Figure 1 & Table 1.

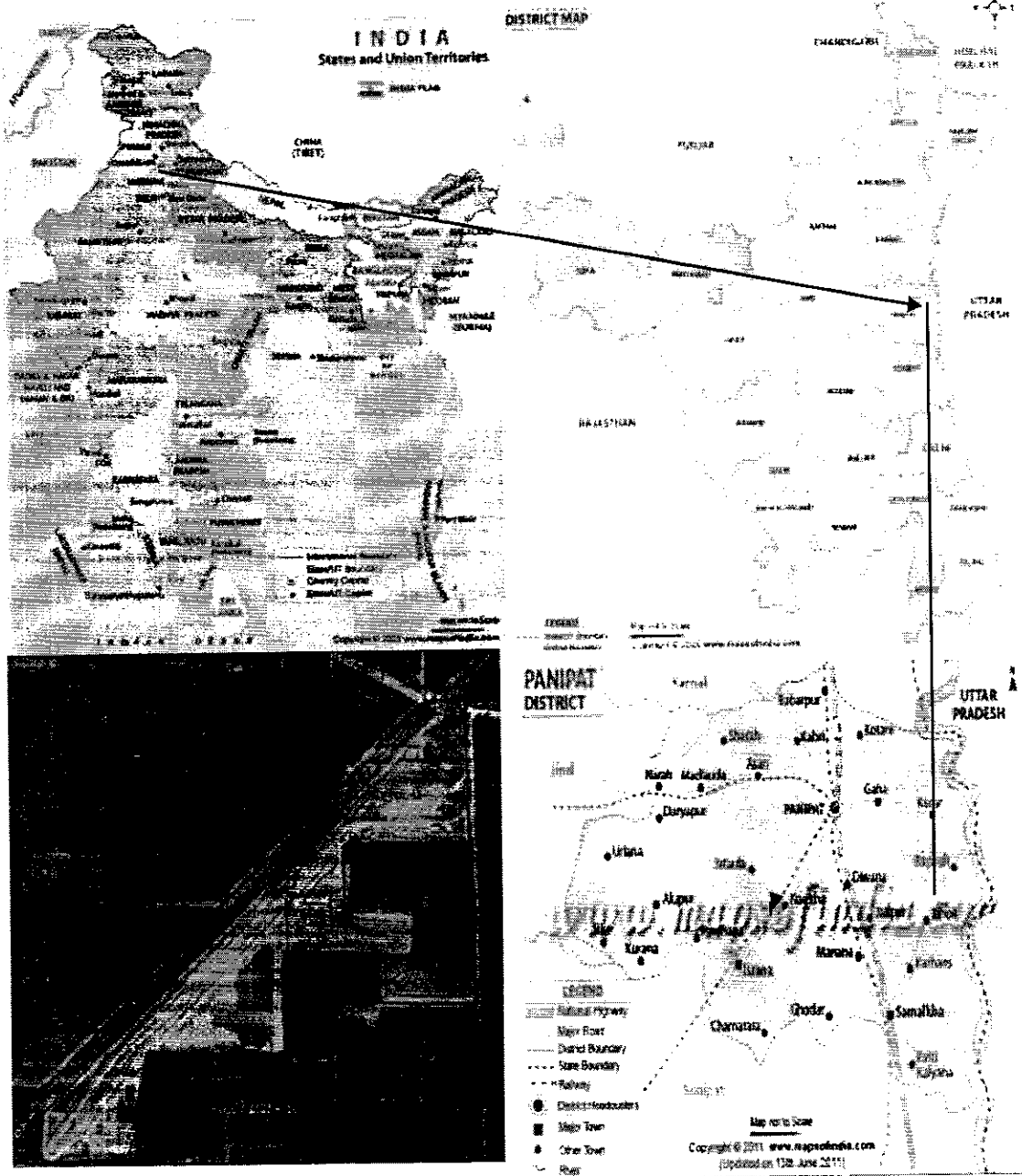


FIGURE 1: LOCATION MAP OF THE PROJECT SITE

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TABLE 1: SALIENT FEATURES & ENVIRONMENTAL SETTINGS OF PROJECT SITE

S. No	Salient Features/Environmental Features	Distance W.r.t Site/Remarks
1.	Type of Project	Proposed Cement Grinding & Packing unit.
2.	National Park/ Wild life sanctuary /Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	None
3.	Historical places / Places of Tourist importance / Archaeological sites.	Panipat museum 8.9 km, NE
4.	Industrial areas/cluster /Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010.	None`
5.	Defence Installations	None`
6.	Nearest village	Naulatha, 1.3 km, E
		Balana, 3.6 km, SE
		Israna 3.8 km, SSW
		Jondhan Kalan 2.3 km, WSW
		Brahman Majra 1.4 km, WNW
		Bhadaur 3.8 km, N
		Dohar 4.9 km, NE
7.	Forests	Nil
8.	Water body	Western Yamuna canal- 7.3 km, in E direction
9.	Highway	NH -709, 1.6 km, N
		SH-14, 8.3 km, N
10.	Railway Station	Naulatha railway station, 0.7 km, NE
11.	Fort facility	Nil
12.	Airport/Airstrip	Karnal Airport, 48.30 km, NE
13.	Interstate Border	None within 15 km radius from the project site.
14.	R & R	None
15.	Litigation / court case is pending against	None

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2.0 PROJECT DESCRIPTION

2.1 Resource Requirements for Project Activity

2.1.1 Land Requirement

The total project area is 9.28 Ha out of which 3.23 Ha will be developed as green belt/plantation. Plant area Break- up is given in Table 2.

TABLE 2: LAND BREAKUP DETAILS

Sl. No.	Land use Description	Proposed in Ha	Percentage
1.	Plant & Machinery	2.07	22.31
2.	Open area	3.98	42.89
3.	Green Belt Area	3.23	34.80
	Total	9.28	100

2.1.2 Water Requirement

The total water requirement for grinding unit will be 400 KLD which will be sourced from ground water, no water will be utilized in plant processes. Break -up of water requirement is given in Table 3.

TABLE 3: BREAK UP OF WATER REQUIREMENTS

Description	Consumption in KLD
Potable water consumption	10
Process water consumption(Mill Spray)	280
Water consumption in lab	5
Equipment cooling Evaporation + Blow down losses	90
Total water consumption	385
Total waste water from process and cooling	
Loss in CT blow down	15
Losses in water treatment	15
Regeneration from sewerage water treatment plant	6
Total for dust suppression system and green belt	36

2.1.3 Power Requirement

Total power requirement for the proposed grinding unit will be 23 MW which will be sourced from nearest sub-station at Naulatha at 132 KVA/66 KVA switch yard with suitable step- down transformer, if required.

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2.1.4 Fuel Requirement

The fuel is required for the operation of 1250 KVA DG set and HGG which will be used for emergency purpose only. It will be directly sourced from nearby authorized local retailers. The estimated requirement of the fuel will be 125 liters per hour.

2.1.5 Raw Materials Requirement

The maximum annual requirement of major raw materials and their probable sources of procurement are given below in Table 4. Raw material requirement shall vary with the type of cement (OPC/PPC & other types as per market demand) manufacturing.

TABLE 4: RAW MATERIAL DETAILS

Sl. No.	Raw material for each line (Dry basis)			Source & Distance	Mode of Transport	Storage for both lines
	Particulars	Max	Min			
1.	Clinker	1 X 3.8 MTPA	1 X 1.2 MTPA	In house/ Domestic Plants (Marwar Mundwa or any other in house sources) ~600Km	Road & Rail	Clinker Silo 50000 MT
2.	Gypsum	1 x 0.32 MTPA	1 x 0.20 MTPA	Bikaner, Rajasthan or any other domestic sources ~500Km	Road & Rail	Covered Shed 4000 MT
3.	Fly ash	1 x 1.4 MTPA	1 x 1.2 MTPA	Nearby thermal Power plant (Hissar Panipat/ NPL Rajpura/Talwandi Sabo) ~210 Km	Road & Rail	RCC Silo 1 x 4000 MT

2.1.6 Manpower Requirement

The total manpower requirement for the project is estimated around 1685 persons. Details of manpower required during construction and operation phase are given as below in Table 5.

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TABLE 5: MANPOWER DETAILS

Description		Construction Phase	Operation Phase
Proposed	Permanent	30	30
	Contractual	1500	125
Total (A)		1530	155

2.2 Operational Activity

Major steps involved in the process of Grinding unit are given as below:

- Clinker storage and handling
- Gypsum storage and handling
- Fly ash storage and handling
- Cement production
- Cement packing and dispatch

2.2.1 Cement Manufacturing Process

Clinker, gypsum and Fly ash will be loaded into their respective hoppers using a suitable material handling system. Clinker grinding will be achieved using either a Vertical Roller Mill (VRM) or a combination of a ball mill and roller press. The cement grinding circuit will include arrangements for clinker storage, gypsum storage, fly ash storage, and other raw material storages as required by BIS standards for different types of cement, as well as cement storage and a packing plant. Clinker unloading and the loading of bagged cement for road transport will be carried out by trucks and bulkers.

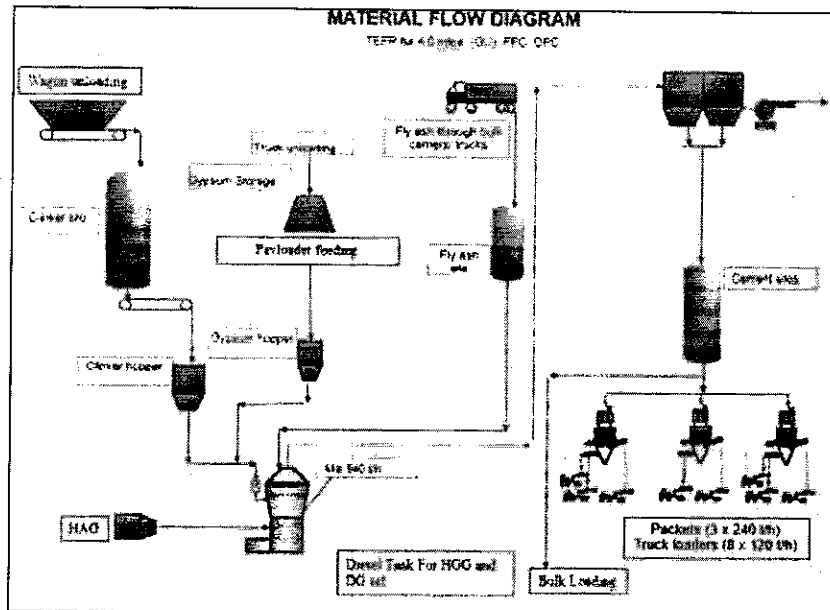


FIGURE 2: MATERIAL FLOW DIAGRAM

2.3 Key Pollution Concerns

The source of pollution that are expected from the proposed projects are described in this section. Identification of source of pollution is required for management of the emissions, effluents, solid and hazardous waste generation from the plant so as to meet the environmental standards and environmental operating conditions. The major sources of pollution from the proposed cement grinding unit are given below:

- Fugitive emission
- Stack emission
- Noise from the plant operation

Details of solid and Hazardous waste generation are given in Table 6.

TABLE 6: DETAILS OF THE SOLID AND HAZARDOUS WASTE GENERATION

Sl. No.	Name of materials	Schedule	Proposed Quantity (TPA)	Handling & Storage	Method of disposal
1	Used Oil	5.1	1	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)

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2	Cotton rags	33.2	2	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
3	Lead Acid Batteries	-	0.5	In isolated area with non-permeable concrete flooring	To OEM through buy-back/through authorized recycler
4	Used Oil Containers @30 x200L capacity	-	0.4	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB Authorized agency (TSDF)

3.0 BASELINE ENVIRONMENT STUDIES

As per the EIA guidelines, study was conducted within 10 km radius from the periphery of the proposed project site. Baseline data for the environmental attributes like meteorology, ambient air, water, hydrology, soil, geology, noise, socio-economic, ecology and bio-diversity were collected. The study was conducted during the post monsoon season from October 2023 to December 2023. The Baseline data monitoring was carried out by M/s Ecomen Mining Pvt Ltd. in house team.

3.1 Land Use

The land use/ land cover map has been generated on 1:50,000 scale using digital classification of LISS-IV. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories. The proposed Land use /Land cover of the study area given in Table 7.

TABLE 7: PROPOSED LAND USE/ LAND COVER OF THE STUDY AREA

SL No	Category	Area in Ha	% of the Study Area
1	Agricultural Land	22176.74	66.68
2	Fallow Land	4151.92	12.48
3	Water bodies/Canal/Nala	1182.33	3.56
4	Plantation	278.67	0.84
5	Settlements/Built-up Land	5468.08	16.44
	Total	33257.74	100

3.2 Meteorological Data

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The site meteorological data is described below in the Table 8.

TABLE 8: METEOROLOGICAL DATA AVERAGES DURING THE STUDY PERIOD

Period	Mean			Relative Humidity			Mean Wind Speed			Rainfall (mm)
	Temperature (°C)			(%)			m/s			
	Max	Min	Avg	Max	Min.	Avg	Max	Min.	Avg	
October	35.54	16.92	25.11	98	32	71.4	5.73	0.08	2.40	0.54
November	31.37	3.51	20.05	100	38	76.51	5.19	0.05	1.80	0.44
December	25.02	6.57	14.65	100	41	82.3	5.16	0.14	1.96	1.09
Oct-Dec	30.64	9.01	19.93	99.33	37	76.73	5.36	0.09	2.05	0.69

3.3 Ambient Air Quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including plant site during October 2023 to December 2023. Based on the monitoring & analysis of the results, the concentration of PM_{2.5} varied from maximum 39.4 µg/m³ to minimum 17.2 µg/m³ and the concentration of PM₁₀ varied from maximum 74.0 µg/m³ to minimum 32.19 µg/m³. NO₂ concentration is maximum from 34.8 µg/m³ to minimum 15.2 µg/m³. CO is under the 2 mg/ m³. All the parameters were observed within the permissible limits as prescribed by CPCB standards. (PM₁₀ =100, PM_{2.5} =60, gaseous pollutants 80)

3.4 Water Quality

3.4.1 Surface Water Quality

The pH of the surface water sample was observed from 7.53 to 7.73. The observed value of surface water quality indicators like total hardness varied from 236 mg/l to 148 mg/l, alkalinity varied from 216 mg/l to 136 mg/l, total dissolved solids varied from 659 mg/l to 398 mg/l, BOD varied from 5.6 mg/l to 3.2 mg/l, COD varied from 28 mg/l to 10 mg/l. The level of DO is varied from 5.5 to 4.0 mg/litre. The concentration of Chloride, Magnesium, Calcium and Fluoride is found varied from 44.0 mg/l to 26.0 mg/l, 19.44 mg/l to 14.58 mg/l, 62.4 mg/l to 35.2 mg/l and 0.45 mg/l to 0.33 mg/l respectively.

3.4.2 Ground Water Quality

The Ground water / Drinking water samples were collected from 8 locations. The Physio-Chemical quality of ground water was compared with drinking water standard (IS:10500-2012). The pH of the ground water sample was observed from 7.95 to 7.5. The observed value of groundwater quality indicators like total hardness varied from 272 mg/l to 212 mg/l, alkalinity varied from 260 mg/l to 192.0 mg/l, total dissolved solid varied from 712 mg/l to 526 mg/l. Thus it can be concluded that the ground water samples were observed to be good and complying to the drinking water standard (IS:10500-2012).

3.5 Noise Quality

Ambient noise levels were measured at eight locations in and around the project area. During the day, the noise level varies from a minimum of 45.2 dB (A) to a maximum of 59.5 dB (A) During the night, the noise level varies from a minimum of 39.8 dB (A) to a maximum of 54.0 dB (A). The results were found to be well within the standards.

3.6 Soil Quality

Soil sampling was carried out at seven locations, and the analysis results show that the soil is slightly acidic to slightly alkaline in nature. The pH of the soil samples varies from 7.27 at Brahman Majra village to 8.12 at Village Jondhan khurd, which indicates the soil samples are slightly acidic to slightly alkaline in nature. The texture of the soil samples mainly consists of sandy clay and sandy loam.

3.7 Traffic study

Due to the proposed project, there will be addition of Heavy and Light motor vehicles in the existing traffic. The LOS value is 0.24. According to this the performance will be in the category of very good. The present road capacity is good enough to bear the increased traffic load due to proposed project. However, internal roads and feeder roads will be maintained to facilitate transportation.

3.8 Socioeconomic Environment

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. Male and female ratio of study area is a major concern. It was also found that a part of population was suffering from lack of earning source. Their expectation is to earn some income for their sustainability on a long-term basis. The infrastructure and amenities available in the area denotes the economic wellbeing of the region. The study area as a whole possesses an average level of infrastructural facilities. This area lacks higher level of amenities like higher education, health, drinking water and communication network. In terms of education and health facilities, the area is less than moderate. The area needs more medical facilities. Though the area is well connected with road transport and communication facilities still more frequent bus service is required. The overall socio-economic status of the target population is average in terms of literacy, work participation rate etc.

3.9 Ecological Biodiversity

Based on a study conducted in the project area and information from the Divisional Forest Officer, Panipat, it has been determined that there are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, or Tiger/Elephant Reserves within 10 kilometers of the project site. The topographical map of the core area and its 10 kilometer radius confirms the absence of

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these ecological entities. The nearest ecologically sensitive area is the Bir Bara Ban Wildlife Sanctuary, located 56 kilometers west of the proposed plant site. No rare, endangered, or threatened species were observed in the core area during the study. The diversity survey revealed that the variety of trees, shrubs, and herbs is higher in the buffer zone compared to the core zone. The core zone, characterized by fallow land, has lower vegetation value compared to the buffer zone.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Impacts on Air Quality

Airborne dust will be the primary pollutant, originating from site development activities and vehicular traffic on the road. The exhaust emissions from vehicles and equipment used during construction are expected to lead to a slight rise in levels of PM, SO₂, NO_x, and CO. PM concentrations are anticipated to be highest during active construction periods on the site. However, this impact is expected to be short-lived and localized, confined within the boundaries of the plant site, with negligible effects outside the plant perimeter. Overall, the impact is projected to be minimal and temporary.

Mitigation measures

- Proper schedule maintenance of vehicle and construction equipment will help in controlling the emissions.
- Construction equipment having PUC Certificate will be deployed during the activity to restrict exhaust emission.
- Proper training of the drivers so as to ensure adherence to speed limit.
- Covered storage facilities for storage of construction materials.
- Water sprinkling on roads and construction site to prevent fugitive dust getting air borne.
- Proper greenbelt development and plantation inside and outside the plant premises.
- A separate storage area will be demarcated for construction material to confine the dust dispersion.
- Proper PPEs will be provided to workers to prevent air borne diseases.
- All major sources of air pollution (Cement Mill) will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms i.e. 30 mg/Nm³ for particulate matter emission from the stacks.
- Bag filters will be provided at all loading /unloading points and transfer points.
- Clinker will be transported by truck/conveyor and fed directly/through Bulk Reception Unit; Gypsum and slag will be stored in covered shed at proposed plant and cement in cement silo. Fly ash will be transported through bulkers and stored in fly ash silo.

- Proper maintenance of vehicles will be done to reduce gaseous emissions.
- Operators will be provided with personal protective equipment like safety Goggles, dust mask, ear plugs, helmets, shoes etc.
- Periphery of plant and surrounding areas of office building will be covered by thick green belt to attenuate the pollutants emitted by the Plant.
- Ambient air quality and stack emissions will be regularly monitored to keep emission levels below the prescribed limits.

4.2 Impacts on Noise Quality

Noise will be generated due to movement/ operation of transport and construction vehicles, equipment's, materials and people. Other important activities involved in construction stage such as excavation, earthmoving, compaction, concrete mixing, crane operation, steel erection, mechanical/electrical installation.

The noise generated will be high due to construction activities, high noise levels can cause irritation and gradual hearing loss to construction laborer's if high levels of noise exposure are continuously experienced. Sudden exposure can cause irritation in ear drums and sudden loss in hearing whereas long term exposure will result in gradual ENT problems. Though the noise generation during construction phase will be temporary and will be limited to the project site but workers who are directly exposed can have related problems.

Mitigation measures

- The vehicles used for movement will be ensured for schedule & preventive maintenance to reduce noise generation.
- The construction labors will be provided with adequate personal protective equipment like earmuffs and earplugs.
- The high noise zones at site will be demarcated and provided with enclosures & barriers.
- Construction activities and Heavy equipment's operations will be carried out only during the daytime.

4.3 Impacts on Water Environment

Water requirement at construction phase of proposed plant activities will be fulfilled from the existing source of surface /ground water. This water requirement during the construction phase will be temporary in nature and limited to short period only. Therefore, water requirement will not have a significant impact on the ground water availability in the region.

Drinking water facility will be provided to the construction workers and domestic waste water

being treated in septic tanks followed by soak pit. There will not be any discharge from the site, which can have any impact on the surrounding water quality.

Mitigation measures

- Domestic waste water will be treated in septic tanks followed by soak pit.
- No discharge of any kind will be done inside or outside plant premises in any water body. Thus, there will not be any discharge from the site which can have any impact on the water quality of the surrounding areas.

4.4 Impacts on Land Environment

The soil and debris will be generated due to the project activity. Before the monsoon season begins, efforts will be made to stabilize disturbed slopes effectively. Topsoil will be carefully stored and reinstated after the completion of the work. Additionally, the levelling process will entail the placement of backfill materials. It is advisable to utilize dust suppressant spraying to reduce fugitive dust emissions during construction activities.

Mitigation measures

- Construction wastes will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.
- Litter disposal and collection points will be established around the work sites.
- Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc. will be disposed through local recyclers.
- The construction spoils will be temporarily stored at designated located inside the plant premises.
- Discharge of any kind of pollutant will be strictly prohibited during construction period.

4.5 Impacts on Road and Traffic

Increase in the Road traffic density which will result in deteriorating the ambient air quality. Rapid Movement of heavy-duty vehicles will cause in increase noise level. No direct impact is envisaged on the flora and fauna of the vicinity area due to noise/ or the vibrations, slight impact could be observed on the nearby biodiversity. Increased traffic volume may increase the probability of accidental incidences in the area. Increased transportation can also lead to impacts on public health.

Mitigation measures

- Vehicles with PUC Certificate will be hired and allowed inside the plant premises.
- Vehicles will be covered with a tarpaulin and not over loaded.

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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- Un- necessary blowing of horn will be avoided.
- Roads will be maintained in good condition to reduce noise due to traffic.
- Greenbelt & Plantation in 36% of plant area is developed along the periphery and inside the plant premises.
- To avoid accidents, the speed of vehicles will be low near habitation areas.

4.6 Impact on Socio-economic Environment

All industrial projects have social and economic linkages. Therefore, putting up a new project has impact on the socio-economic environment of the locality around it. This impact may be marginal or non-marginal. The intensity of impact may depend upon the various social and environmental factors associated with it and the extent of change caused by the project to alter the existing equilibrium of the socio-economic system. The various activities of the proposed projects are likely to stimulate the existing socio-economic environment in the surrounding area. The influx of money and various construction activities may not only change the economic status of the area but also influence the existing cultural scenario. This impact is expected to be more in the area closer to the site, which decreases with increase of distance from the site.

Mitigation measures

- In addition to direct employment, several opportunities for locals will be available in terms of supply of construction materials & machinery, vehicles and other essential commodities.
- Project will have positive impact on socio-economic status of the area due to construction employment.
- The cement situation will improve in study area and will open up opportunities for new economic activities. The literacy rate is likely to improve.
- Many will find employment in service sector and marketing of day-to-day needs viz. poultry and other agricultural products.
- The project will improve the basic infrastructure and the people of nearby villages can also use these amenities.

5.0 ALTERNATIVE ANALYSIS

ACL has analyzed all the aspects related to alternative technology and site in terms of environment and social consideration and it has been found that the proposed technology is best suited for this project. Based on the analysis, VRM is the best proven technology which is best and economically feasible for grinding units. It will result in cost effective project and will lead to minimum social concern as all the environment aspects has been analyzed by the company before selecting the suitable and efficient technology and site for this proposed cement Grinding unit project.

TABLE 9: DETAILS OF ALTERNATIVE SITES

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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Site 1: Israna, District Panipat, State: Haryana	Site 2: Village Naulatha , Taluka Israna, District Panipat , State: Haryana	Site 3: Mehrana, District Panipat , State: Haryana
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The selected site is site 2. Selected site is suitable due to road and rail connectivity. 90% of raw materials are expected by rail to arrive at project site and 90% product will be transported by road. Since the selected site of Village Naulatha scores over other two, same has been considered. The selected site is a fallow land with no agriculture and the land is already converted for industrial purposes.

6.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF & CC and are tabulated below in Table 9. A monitoring schedule is very important to comply with the standards for which control measures have been designed.

TABLE 10: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Sl. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
2. Air Quality				
	A. Stack Monitoring	Online monitors (all stacks) and Once in a month		PM, SO ₂ & NO _x
	B. Ambient Air quality (CAAQMS)	Continuous and Quarterly Once	Continuous 24 hours	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
	C. Fugitive emissions	Quarterly Once	8 hours	PM
3. Water & Waste water quality				
	A. Water quality in the area	Once in a month except for heavy metals which will be monitored on Quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
	B. STP Inlet & Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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4.Noise level monitoring

Ambient Noise levels	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels
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5. Soil Quality Monitoring

Soil levels	Quarterly Once	7 location in and around grinding unit (with respect to the downwind direction and 3 locations each at 120° directions.	Ph, Electrical conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus. Chloride etc..
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6. Medical Check-up

Check up	Yearly as per factory act	-	Spirometry, Audiometry, biochemical parameter, ECG, Vision test and chest x ray
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6.1 Emissions and discharge from plant

The details of proposed emission monitoring system installation are given in Table 11.

TABLE 11: DETAILS OF EMISSION MONITORING SYSTEM INSTALLATION

Particulars	Frequency of Monitoring	Duration of Sampling	Parameters
A. Stack Monitoring			
Grinding Mill	Online monitors (all stacks) and	once in a month	PM, SO ₂ & NO _x
B. Industrial Waste waters			
STP Inlet & Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996

6.2 Green Belt

The extent project is 9.28 Ha out of which approximately 3.23 Ha i.e. 34.80% of total project area) will be developed under greenbelt plantations. This greenbelt will serve as a buffer between the peripheries and the industry, there by controlling the air emissions and noise levels.

6.3 Social Parameters

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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The socio economic development activities for the proposed project will be provided to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness is being/ will be created among people by organizing awareness camps. Keeping the view of achieving the national objective of sustainability, developmental activities will be carried out.

7.0 ADDITIONAL STUDIES – RISK ASESMENT & DISASTER MANAGEMENT PLAN

Disaster management facilities and risk assessment for the proposed project activity has been done by identifying the risk involved & then preparation of action plan for handling internal emergencies.

7.1 Risk Assessment

Risk assessment is the measure of quantitative and qualitative value of risk related to a concrete situation and a recognized threat. The details are explained in Table 12.

TABLE 12: RISK HAZARD ASSESSMENT AND MITIGATION MEASURES

S. No	Activity	Associated hazards	Associated risk/ health impact	Mitigation Measures
1	Storage, handling of raw material, fuel, etc.	Heat, Fire & dust	Exposure above threshold limits, physical injuries, burning, air pollution due to fugitive emissions.	<ul style="list-style-type: none"> - Use of PPEs. - Regular water sprinkling on the haul roads. - Safety and technical training to workers for proper handling of equipment. - Proper system for loading and unloading operations. - Firefighting and first aid facilities. - Storage should be away from ignition sources. - Proper housekeeping facilities.
2	Onsite working	Heat, Fire, Dust, Smoke & Explosion	Physical injuries, burning, air	<ul style="list-style-type: none"> - Firefighting and first aid facilities. - Use of PPEs.

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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			pollution	<ul style="list-style-type: none"> - Installation of APCEs like bag houses and bag filters. - Inspection and regular monitoring. - Training workers for proper handling of raw materials and fuels.
3	APCE failure	Release of PM in ambient air	Air pollution	<ul style="list-style-type: none"> - CEMS & inspection - Plant shall shut down immediately on APCE failure.
4	Working at height	Slip, trips & falls of operators	Physical injuries	<ul style="list-style-type: none"> - Alertness of the workers. - First aid boxes shall be provided in a dedicated place.
5	Electrical maintenance work	Electric shock, short circuits in power room	Electrical shocks, Injury or burn.	<ul style="list-style-type: none"> - Regular checking and maintenance of electrical equipment - Use of PPEs - Provision of First aid box.
6	Working near D.G. sets during emergency	High noise	Noise induced hearing losses	<ul style="list-style-type: none"> - PPEs to the workers. - Silent DG sets/Acoustic enclosures will be used.

7.2 Public consultation

The Draft EIA/EMP report has been submitted to concerned authority, Haryana for public hearing. Action plan will be prepared and submitted after the conduction of public hearing.

8.0 PROJECT BENEFITS

The proposed project aims to enhance the socio-economic landscape of the area by improving various facts such as employment opportunities, infrastructure, and access to education. It endeavors to elevate living standards, provide avenues for education, and foster adaptability to

changing circumstances. Additionally, the project aims to strengthen essential community infrastructure, thereby promoting overall economic advancement within the region.

8.1 Employment Benefits (Direct & Indirect) due to the Project

During the construction phase, an estimated 1530 personnel will be required, with approximately 155 individuals will employ during the operational phase. Emphasis will be on recruiting locals from nearby villages, leading to increased income levels and driving economic growth in the surrounding area.

8.2 Economic benefits

Special emphasis on financial benefits will be planned for local people by providing them business opportunities in allied activities. They will be engaged for internal/local movements, maintenance and housekeeping on contractual work.

8.3 Social Benefits

The company will bring social and economic awareness among local peoples. It will supplement the existing government programmes. Environment awareness will be created by organizing awareness camps etc.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

The major source of pollution in a cement plant are stack. Air pollution will be the major concern to be looked upon for the project activity. No major water, noise & soil pollution is envisaged from the project activity. Various mitigation measures have been proposed to take care of the environment in respect of air, water, noise, soil & the green cover of the project.

9.1 Air quality management plan

- Development of sufficient vegetation
- Construction equipment having valid PIC certificate will be deployed during the activity to restrict exhaust emission.
- Proper up keep and maintenance of vehicles
- All vehicles will be maintained in well condition by regular preventive maintenance to reduce the exhaust level.
- Treated sewage water will be used for dust suppression.

9.2 Solid and hazardous waste management plan

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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Solid waste generation from the Grinding unit and their end use is given Table 13.

TABLE 13: SOLID WASTE GENERATION AND THEIR END USE

S. No.	Type of Waste	End Use / Disposal Plan
1	Dust collected from air pollution control equipment	Will be totally recycled back to process.
2	Sludge from Sewage Treatment Plant (~10 Kg/annum)	Will be used development as manure for greenbelt
3	Municipal waste (domestic and orcommercial wastes	Organic waste will be composted and will be used as manure. Inorganic waste shall be disposed of properly
4	Redundant equipment machinery	Occasionally, scraps as and when generated segregated, stored & sold to vendors.
5	Horticultural waste	Horticultural wastes generated from gardens/greenbelt will be composted.

TABLE 14: HAZARDOUS WASTE GENERATION

Sl. No	Name of the Hazardous waste	Stream	Disposal Option
1	Used or Spent Oil	5.1 of Schedule-1	Will be sold to CPCB Authorized recycler
2	Waste Residue containing oil	5.2 of Schedule-1	
3	Empty barrels/ Containers/liners	33.1 of Schedule-1	
4	Cotton rags or other cleaning materials	33.2 of Schedule-1	
5	E-waste	--	Will be sold to registered vendors as per E- Waste Management Rules, 2016

9.3 Effluent management plan

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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- In the proposed project of Grinding unit majority of the water requirement (>90%) for non-potable industrial applications for the project will be met from ground water. The remaining will be met from treated water from STP
- Periodic preventive maintenance of water distribution systems.
- Use of water efficient and saving devices such as Low flow high efficiency faucet aerators, Automatic shutoff nozzles, and low flow water efficient water heads.
- Water will be used via water sprinkler for Horticulture activity, at various storage facilities and transportation purpose activity to conserve the water demand.
- Water conservation and awareness programmes within the premises as well as in the nearby schools and village for fresh water conservation.
- To conserve water and to replenish ground water resources of the area, rain water harvesting system will be installed for long term sustenance of the industry.

9.4 Storm water management plan

- Rainwater harvesting will be done as per the elevation of the site as per the contours profile of the project site, and then the storm water will be directed towards the rainwater harvesting pond base on the elevation profile.
- Since the storm water collected on site will be harvested for direct use, proper management of this resource is necessary to prevent contamination.
- Regular inspection and cleaning of storm drains will be carried out. Use of fertilizers and pesticides will be avoided prior to and during monsoon months.

9.5 Occupational health and safety management plan

- Adequate dust control systems will be implanted and good housekeeping will be practiced. Protective masks and respirators will be provided at areas where high dust exposure is going to be encountered even for a very short duration.
- Proper maintenance of machineries
- Installation of compressors in closed buildings
- Regular monitoring of noise level
- Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with clinker storage area. Fire tender is to be kept ready at plant main gate.
- Oil storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area"
- Permit and safety instruction will be given to use welding / gas cutting in the area of oil, and bag go down.

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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- Predictive interlock in transformers to give alarm and trip the system.
- Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done.
- Silos and buildings will be constructed as per the structural design as per ISCodes.
- Installing light arrestors at all tall buildings.
- Permit to be taken to work at height with work instruction to use safety beltsetc.
- Testing of all lifting tools, tackles and pressure vessel to avoid failure.
- Safe working pressure maintained in air receiver.

9.6 Greenbelt development plan

- Plantation will be done in and around the plant premises.
- 70% survival rate will be maintained with all possible efforts.
- The trees will be planted at suitable grid spacing to encourage proper growth.
- Local plant species will be preferred

9.7 Socio economic management plan

- Environmental Cell formation to be responsible for mitigation of impacts during construction phase though they are transient and temporary.
- All possible air pollutants will be minimised by installation of pollution control equipments before emitting into atmosphere. The norms will be maintained through regular monitoring and analysis of gases.
- Short term positive impacts will result in better quality of life. The project proponent/contractors shall ensure that most of the workforce shall be engaged from the nearby villages/town.

9.8 Project Cost and EMP Implementation budget

The total investment for the proposed project works out to approximately INR 1059 Crores for 4 MMTPA Naulatha Cement Grinding Unit. The breakup of cost of the project is given in the Table 15.

TABLE 15: PROJECT COST BREAKUP

Particulars	Amount (INR in Crore)
Land & Site development	18.0
Engineering know-how & project management	17.0
Civil works & structure	360.0
Plant & machinery	435.0
Expense on training	5.0
Misc. fixed asset	7.0
Pre-operative expenses including interest during construction	102.0

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
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EMP cost	55.0
Contingency @ 6%	60.0
Total Capital Budget	1059.0

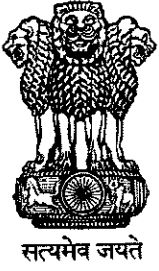
The cost breaks up of EMP is indicated in the Table 16.

TABLE 16: PROPOSED EMP COST

Sl. No.	Particulars	Estimated Cost (Rs. In Crore)	
		Capital	Recurring
1	Air pollution Control Measures	40.3	7.7
2	Water Pollution Control Measures	4.1	0.7
3	Occupational Health and Safety	2.9	1.1
4	Environmental Monitoring, RWH & maintenances	5.5	2.2
5	Green Belt Development	2.2	0.7
	Total	55.0	12.5

10.0 CONCLUSION

In the plant design itself, latest state-of-art technology has been envisaged so as to achieve the desired air emissions and noise levels from plant operation levels. No effluent will be generated from the plant. Further, all generated solid waste will be either recycled back into the respective plant operations. This EIA study highlights that the judicious implementation of proposed Environmental Management Plan will ensure negligible negative impacts on the environment with direct and indirect positive development to the society due to the proposed project.



सत्यमेव जयते

File No.:
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Level Expert Appraisal
Committee(SEAC), HARYANA)



Dated

To,

M/s Ambuja Cement Limited a group company of Adani Group,
Adani Corporate House, Shantigram, S. G. Highway, Khodiyar, AHMADABAD, GUJARAT, , 382421
anurag.solankey@ambujacement.com

Subject: Standard Terms of Reference (ToR) to the proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana.

Sir/Madam,

This is in reference to your application submitted to SEAC vide proposal number SIA/HR/IND1/441923/2023 dated 05/04/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO23B1103HR5990664N
(ii) File No.	
(iii) Clearance Type	Fresh ToR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	3(b) Cement plants Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, State: Haryana by M/s. AMBUJA CEMENTS LIMITED (ACL), a group company of Adani Group
(vii) Name of Project	
(viii) Name of Company/Organization	Ambuja Cement Limited
(ix) Location of Project (District, State)	PANIPAT, HARYANA
(x) Issuing Authority	SEAC
(xii) Applicability of General Conditions	YES

3. The SEAC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification,

2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of Reference to the instant proposal of M/s.Ambuja Cement Limited under the provisions of the aforementioned Notification.

4. The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
5. The Ministry reserves the right to stipulate additional TORs, if found necessary.
6. The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
7. The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

Copy To

anurag.solankey@ambujacement.com
 scy.seachr@gmail.com

Annexure 1

Standard Terms of Reference

1. Preliminary requirements

S. No..	Terms of Reference
1.1	EIA/EMP report cover page shall consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.
1.2	Besides, following points shall be compiled as per QCI/NABET norms: a. Disclaimer by the EIA consultant. b. Declaration by the Functional Area Experts contributed to the EIA study and declaration by the head of the accredited consultant organization/authorized person. c. Undertaking by the project proponent owning the contents (information and data) of the EIA/EMP report. d. Undertaking by the EIA consultant regarding compliance of ToR issued by MoEF&CC. e. Consultant shall submit the Plagiarism Certificate for the EIA/EMP Report.

2. Executive Summary

S. No..	Terms of Reference
2.1	Table of Contents of the EIA report including list of tables/figures/annexures/abbreviations/symbols/notations.
2.2	Point wise compliance to the ToR issued by MoEF&CC.

3. Executive Summary

3.1. Introduction

S. No..	Terms of Reference
3.1.1	Name of the project along with applicable schedule and category as per EIA, 2006.
3.1.2	Location and accessibility

4. Executive Summary

4.1. Project description

S. No..	Terms of Reference
4.1.1	Resource requirements (Land; water; fuel; manpower)
4.1.2	Operational activity
4.1.3	Key pollution concerns

5. Executive Summary

5.1. Baseline Environment Studies

S. No..	Terms of Reference
5.1.1	Ambient air quality
5.1.2	Ambient Noise quality
5.1.3	Traffic study
5.1.4	Surface water quality
5.1.5	Ground water quality
5.1.6	Soil quality
5.1.7	Biological Environment
5.1.8	Land use
5.1.9	Socio-economic environment

6. Executive Summary

6.1. Anticipated impacts

S. No..	Terms of Reference
6.1.1	Impact on ambient air quality
6.1.2	Impact on ambient noise quality

S. No..	Terms of Reference
6.1.3	Impact on road and traffic
6.1.4	Impact on surface water resource and quality
6.1.5	Impact on ground water resource and quality
6.1.6	Impact on terrestrial and aquatic habitat
6.1.7	Impact on socio-economic environment

7. Executive Summary

7.1. Alternative analysis

S. No..	Terms of Reference
7.1.1	

8. Executive Summary

8.1. Environmental Monitoring program

S. No..	Terms of Reference
8.1.1	Ambient air, noise, water and soil quality
8.1.2	Noise quality management plan
8.1.3	Emission and discharge from the plant
8.1.4	Green Belt
8.1.5	Social Parameters

9. Executive Summary

9.1. Additional Studies

S. No..	Terms of Reference
9.1.1	Risk assessment
9.1.2	Public consultation
9.1.3	Action plan to address the issues raised during public consultation as per MoEF&CC O.M. dated 30/09/2020

10. Executive Summary

10.1. Environment management plan

S. No..	Terms of Reference
10.1.1	Air quality management plan
10.1.2	Solid and hazardous waste management plan
10.1.3	Effluent management plan
10.1.4	Storm water management plan
10.1.5	Occupational health and safety management plan
10.1.6	Green belt development plan
10.1.7	Socio-economic management plan
10.1.8	Project cost and EMP implementation budget.

11. Introduction

S. No..	Terms of Reference
11.1	Background about the project
11.2	Need of the project
11.3	Purpose of the EIA study
11.4	Scope of the EIA study

12. Project description

12.1. Site Details

S. No..	Terms of Reference
12.1.1	Location of the project site covering village, Taluka/Tehsil, District and State.
12.1.2	Site accessibility
12.1.3	A digital toposheet in pdf or shape file compatible to google earth of the study area of radius of 10km and site location preferably on 1:50,000 scale. (including all eco-sensitive areas and environmentally sensitive places).
12.1.4	Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.
12.1.5	Environment settings of the site and its surrounding along with map.
12.1.6	A list of major industries with name, products and distance from plant site within study area (10km radius)

S. No..	Terms of Reference
	and the location of the industries shall be depicted in the study area map.
12.1.7	In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If it's near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.
12.1.8	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated 14/02/2022.
12.1.9	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.
12.1.10	Type of land, land use of the project site needs to be submitted.
12.1.11	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated 7/10/2014 shall be furnished.
12.1.12	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
12.1.13	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.
12.1.14	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.
12.1.15	Details of drone survey for the site, needs to be included in report and presented before the EAC during appraisal of the project.

13. Project description

13.1. Forest and wildlife related issues (if applicable)

S. No..	Terms of Reference
13.1.1	Status of Forest Clearance for the use of forest land shall be submitted.
13.1.2	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive

S. No..	Terms of Reference
	Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.
13.1.3	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.
13.1.4	Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.

14. Project description

14.1. Salient features of the project

S. No..	Terms of Reference
14.1.1	Products with capacities in Tons per Annum for the proposed project.
14.1.2	If expansion project, status of implementation of existing project, details of existing/proposed products with production capacities in Tons per Annum.
14.1.3	Site preparatory activities.
14.1.4	List of raw materials required and their source along with mode of transportation.
14.1.5	Other than raw materials, other chemicals and materials required with quantities and storage capacities.
14.1.6	Manufacturing process details along with process flow diagram of proposed units.
14.1.7	Consolidated materials and energy balance for the project.
14.1.8	Total requirement of surface/ ground water and power with their respective sources, status of approval.
14.1.9	Water balance diagram
14.1.10	Details of Emission, effluents, hazardous waste generation and mode of disposal during construction as well as operation phase.
14.1.11	Man-power requirement.
14.1.12	Cost of project and scheduled time of completion.
14.1.13	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.
14.1.14	Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby

S. No..	Terms of Reference
	<p>industries. c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall switch over to 100 % use of surface water from nearby source. d. Copy of all the Environment Clearance(s) including Amendments/validity of extension/transfer of EC, there to obtained for the project from MoEF&CC/SEIAA shall be attached as Annexures. A Certified Compliance Report (CCR) of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change/ or concerned authority as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022 on the status of compliance of conditions stipulated in all the existing environment clearances including amendments shall be provided. A Certified Compliance Report (CCR) issued by the concerned Authority shall be valid for a period of one year from the date of inspection. e. In case the existing project has not obtained Environment Clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. A proper justification needs to be submitted along with documentary proof. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 1994 or 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of CTO from the Regional Office of the SPCB shall be submitted, as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022. CCR on CTO conditions issued by the concerned SPCBs/PCCs shall be valid for a period of one year from the date of inspection of the project.</p>

15. Description of the Environment

S. No..	Terms of Reference												
15.1	Study period												
15.2	<p>Approach and methodology for data collection as furnished below</p> <table border="1"> <thead> <tr> <th>Attributes</th> <th>Network</th> <th>Sampling Frequency</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td> Air Environment Micro-Meteorological <ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover • Environmental • Lapse Rate </td> <td> Minimum 1 site in the project area </td> <td> impact hourly continuous </td> <td> IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered. </td> </tr> <tr> <td> Pollutants <ul style="list-style-type: none"> • PM10 </td> <td> At least locations </td> <td> As per National Ambient Air Quality </td> <td> • Sampling as per CPCB guidelines </td> </tr> </tbody> </table>	Attributes	Network	Sampling Frequency	Remarks	Air Environment Micro-Meteorological <ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover • Environmental • Lapse Rate 	Minimum 1 site in the project area	impact hourly continuous	IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered. 	Pollutants <ul style="list-style-type: none"> • PM10 	At least locations	As per National Ambient Air Quality	• Sampling as per CPCB guidelines
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S. No..	Terms of Reference
	<p style="text-align: center;">Standards,CPCB Notification.</p> <ul style="list-style-type: none"> • SO2 • NOx • CO • HC • Other parameters relevant to the project and topography of the area <ul style="list-style-type: none"> • Collection of AAQ data (except in monsoon season) • Locations of various stations for different parameters should be related to the characteristic properties of the parameters. • The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests, • Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of 16/11/2009 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. <p>Noise</p> <p>Hourly equivalent noise levels At least 8-12 locations s per CPCB norms</p> <p>Water</p> <p>Parameters for water quality</p> <ul style="list-style-type: none"> • pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity • Total nitrogen, total phosphorus, DO, BOD, COD, Phenol • Heavy metals • Total coliforms, faecal coliforms • Phyto plankton <p>Samples for water quality should be collected and analyzed as per:</p> <ul style="list-style-type: none"> • IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents • Standard methods for examination of water and wastewater analysis published by American Public Health Association

S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Zoo plankton <p>For River Bodies</p> <ul style="list-style-type: none"> • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH4 • Boron • Sodium Absorption Ratio • Electrical Conductivity <p>For Ground Water</p> <p>Traffic Study</p> <p>Type of vehicles</p> <ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project <p>Soil</p> <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability • Water holding capacity • Porosity <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code <p>Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies</p> <p>Yield of water sources to be measured during critical season</p> <p>Standard methodology for collection of surface water (BIS standards)</p> <p>Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/existing current records) from the study area and shall be included.</p> <p>Land Environment</p> <p>Soil samples be collected as per BIS specifications</p>

S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Total project area • Topography • Drainage (natural) <p>Cultivated, forest, plantations, water bodies, roads and settlements</p> <p>Biological Environment</p> <p>1. Aquatic</p> <ul style="list-style-type: none"> • Primary productivity • Aquatic weeds • Enumeration of phyto plankton, zoo plankton and benthos • Fisheries • Diversity indices • Trophic levels • Rare and endangered species • Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) <p>2. Terrestrial</p> <ul style="list-style-type: none"> • Vegetation-species list, economic importance, forest produce, medicinal value • Importance value index (IVI) of trees • Fauna • Avi fauna • Rare and endangered species • Sanctuaries / National park / Biosphere reserve • Migratory routes <p>socio-economic</p> <ul style="list-style-type: none"> • 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. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species. • Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity site. • For forest studies, direction of wind should be considered while selecting forests. • Secondary data to collect from Government offices, NGOs, published literature.

S. No..	Terms of Reference												
	<p>Demographic structure</p> <ul style="list-style-type: none"> • Infrastructure resource base • Economic resource base • Health status: Morbidity pattern • Cultural and aesthetic attributes. • Education <p>Socio-economic survey is based on proportionate, stratified and random sampling method.</p> <ul style="list-style-type: none"> • Primary data collection through questionnaire • Secondary data from census records, statistical hand books, topo sheets, health records and relevant official records available with Govt. agencies <p>Approach and methodology for data collection as furnished below</p> <table border="1"> <thead> <tr> <th>Attributes</th> <th>Network</th> <th>Sampling Frequency</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td> Air Environment Micro-Meteorological <ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover • Environmental • Lapse Rate </td> <td> Minimum 1 site in the project impact area </td> <td> hourly continuous </td> <td> IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered. </td> </tr> <tr> <td> Pollutants <ul style="list-style-type: none"> • PM10 • SO2 • NOx • CO • HC • Other parameters relevant to the project and topography of the area </td> <td> At least 8-12 locations </td> <td> As per National Ambient Air Quality Standards, CPCB Notification. </td> <td> <ul style="list-style-type: none"> • Sampling as per CPCB guidelines • Collection of AAQ data (except in monsoon season) • Locations of various stations for different parameters should be related to the characteristic properties of the parameters. • The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take </td> </tr> </tbody> </table>	Attributes	Network	Sampling Frequency	Remarks	Air Environment Micro-Meteorological <ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover • Environmental • Lapse Rate 	Minimum 1 site in the project impact area	hourly continuous	IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered. 	Pollutants <ul style="list-style-type: none"> • PM10 • SO2 • NOx • CO • HC • Other parameters relevant to the project and topography of the area 	At least 8-12 locations	As per National Ambient Air Quality Standards, CPCB Notification.	<ul style="list-style-type: none"> • Sampling as per CPCB guidelines • Collection of AAQ data (except in monsoon season) • Locations of various stations for different parameters should be related to the characteristic properties of the parameters. • The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take
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S. No..	Terms of Reference
	<p style="text-align: right;">into account the predominant wind direction, population zone and sensitive receptors including reserved forests,</p> <ul style="list-style-type: none"> • Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of 16/11/2009 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. <p>Noise</p> <p>Hourly equivalent noise levels At least 8-12 locations per CPCB norms</p> <p>Water</p> <p>Parameters for water quality</p> <ul style="list-style-type: none"> • pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity • Total nitrogen, total phosphorus, DO, BOD, COD, Phenol • Heavy metals • Total coliforms, faecal coliforms • Phyto plankton • Zoo plankton <p>For River Bodies</p> <ul style="list-style-type: none"> • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH4 <p>Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies</p> <ul style="list-style-type: none"> • IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents • Standard methods for examination of water and wastewater analysis published by American Public Health Association • Yield of water sources to be measured during critical season • Standard methodology for collection of surface water (BIS standards) <p>Samples for water quality should be collected and analyzed as per:</p>

S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Boron • Sodium Absorption Ratio • Electrical Conductivity <p>For Ground Water</p> <p style="padding-left: 40px;">Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/existing current records) from the study area and shall be included.</p> <p>Traffic Study</p> <p>Type of vehicles</p> <ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project <p>Land Environment</p> <p>Soil</p> <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability • Water holding capacity • Porosity <p style="padding-left: 40px;">Soil samples be collected as per BIS specifications</p> <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code • Total project area • Topography • Drainage (natural) <p style="padding-left: 40px;">Cultivated, forest, plantations, water bodies, roads and settlements</p> <p>Biological Environment</p>

S. No..	Terms of Reference
	<p>1. Aquatic</p> <ul style="list-style-type: none"> • Primary productivity • Aquatic weeds • Enumeration of phyto plankton, zoo plankton and benthos • Fisheries • Diversity indices • Trophic levels • Rare and endangered species • Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) <p>2. Terrestrial</p> <ul style="list-style-type: none"> • Vegetation-species list, economic importance, forest produce, medicinal value • Importance value index (IVI) of trees • Fauna • Avi fauna • Rare and endangered species • Sanctuaries / National park / Biosphere reserve • Migratory routes <p>socio-economic Demographic structure</p> <ul style="list-style-type: none"> • Infrastructure resource base • Economic resource base • Health status: Morbidity pattern • Cultural and aesthetic attributes. • Education <p>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. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species.</p> <p>Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity site.</p> <p>For forest studies, direction of wind should be considered while selecting forests.</p> <p>Secondary data to collect from Government offices, NGOs, published literature.</p> <p>Socio-economic survey is based on proportionate, stratified and random sampling method.</p> <p>Primary data collection through questionnaire</p> <p>Secondary data from census records, statistical hard books, topo sheets, health records and relevant official records available with Govt. agencies</p>

S. No..	Terms of Reference
15.3	Interpretation of each environment attribute shall be enumerated and summarized as given below: • Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality • Biological Environment • Land use • Socio-economic environment
15.4	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

16. Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessment shall be carried out)

S. No..	Terms of Reference												
16.1	<p>Identification of potential impacts in the form of a matrix for the construction and operation phase for all the environment components</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Environment</th> <th>Ecological</th> <th>Socio-economic</th> </tr> </thead> <tbody> <tr> <td>Construction phase</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Operation phase</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Environment	Ecological	Socio-economic	Construction phase				Operation phase			
Activity	Environment	Ecological	Socio-economic										
Construction phase													
Operation phase													
16.2	Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase • Details of stack emissions from the existing as well as proposed activity. • Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period • Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions.												
16.3	Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.4	Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.5	Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.6	Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.7	Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.8	Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.9	Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												

S. No..	Terms of Reference
16.10	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.11	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase

17. Analysis of Alternatives (Technology & Site)

S. No..	Terms of Reference
17.1	No project scenario
17.2	Site alternative
17.3	Technical and social concerns
17.4	Conclusion

18. Environmental Monitoring Program

S. No..	Terms of Reference																		
18.1	Details of the Environment Management Cell																		
18.2	Performance monitoring schedule for all pollution control devices shall be furnished.																		
18.3	<p>Corporate Environment Policy</p> <p>a. 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.</p> <p>b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environment or forest norms / conditions? If so, it may be detailed in the EIA.</p> <p>c. What is the hierarchical system or Administrative order of the company to deal with the environment issues and for ensuring compliance with the environment clearance conditions? Details of this system may be given. Page 9 of 10</p> <p>d. Does the company have system of reporting of non-compliances / violations of environment 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</p>																		
18.4	<p>Action plan for post-project environment monitoring matrix:</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Aspect</th> <th>Monitoring Parameter</th> <th>Location</th> <th>Frequency</th> <th>Responsibility</th> </tr> </thead> <tbody> <tr> <td colspan="6">Construction phase</td> </tr> <tr> <td colspan="6">Operation phase</td> </tr> </tbody> </table>	Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility	Construction phase						Operation phase					
Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility														
Construction phase																			
Operation phase																			

19. Additional Studies

S. No..	Terms of Reference																	
19.1	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitorable with defined time frames.																	
19.2	Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of "net Zero" emission.																	
19.3	Implementation status/measures adopted for avoiding the generation of single used plastic waste.																	
19.4	In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22-23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.																	
19.5	Public consultation details (Entire proceedings as separate annexure along with authenticated English Translation of Public Consultation proceedings).																	
19.6	As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.																	
19.7	<p>Summary of issues raised during public consultation along with action plan to address the same as per MoEF&CC O.M. dated 30/09/2020</p> <table border="1"> <thead> <tr> <th rowspan="2">S.No</th> <th rowspan="2">Name of the Physical Activity</th> <th rowspan="2">Physical activity and action plan of the Physical Targets</th> <th colspan="3">Year of implementation (Budget in INR)</th> <th rowspan="2">Total Expenditure (Rs. in Crores)</th> </tr> <tr> <th>1st</th> <th>2nd</th> <th>3rd</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S.No	Name of the Physical Activity	Physical activity and action plan of the Physical Targets	Year of implementation (Budget in INR)			Total Expenditure (Rs. in Crores)	1st	2nd	3rd							
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		1st	2nd	3rd														
19.8	<p>Risk assessment</p> <ul style="list-style-type: none"> • Methodology • Hazard identification • Frequency analysis • Consequence analysis • Risk assessment outcome 																	
19.9	Emergency response and preparedness plan																	

20. Project Benefits

S. No..	Terms of Reference
20.1	Environment benefits
20.2	Social infrastructure
20.3	Employment and business opportunity
20.4	Other tangible benefits

21. Environment Cost Benefit Analysis

S. No..	Terms of Reference
21.1	Net present value
21.2	Internal rate of return
21.3	Benefit cost ratio
21.4	Cost effectiveness analysis

22. Environment Management Plan (Construction and Operation phase)

S. No..	Terms of Reference
22.1	Action plan for hazardous waste management
22.2	Action plan for solid waste management
22.3	Action plan for e-waste management.
22.4	Action plan for plastic waste management, considering the Plastic Waste Management Rules 2016.
22.5	Action plan for construction and demolition waste management.
22.6	Rain water harvesting plan
22.7	Plan for maximum usage of waste water/treated water in the Unit
22.8	Green belt development plan: An action plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.
22.9	Wildlife conservation plan (In case of presence of schedule I species)
22.10	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.

S. No..	Terms of Reference
22.11	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demand and waste disposal.
22.12	An Action Plan for improving the house-keeping activities in the raw material handling area need to be submitted
22.13	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap run off material shall be submitted.
22.14	Action plan to limit the dust emission from all the stacks below 30 mg/Nm ³ shall be furnished.
22.15	Action plan for fugitive emission control in the plant premises shall be provided.

Standard Terms of Reference for conducting Environment Impact Assessment Study for Cement plants and information to be included in EIA/EMP report

1.

Sr. No.	Terms of Reference
1.1	Limestone and coal linkage documents along with the status of environment clearance of limestone and coal mines.
1.2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;
1.3	Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.
1.4	If the raw materials used have trace elements, an environment management plan shall also be included.
1.5	Plan for the implementation of the recommendations made for the cement plants in the Corporate Responsibility for Environmental Protection (CREP) guidelines shall be prepared.
1.6	Energy consumption per ton of clinker and cement grinding
1.7	Provision of waste heat recovery boiler
1.8	Arrangement for co-processing of hazardous waste in cement plant.
1.9	Provision of Alternate fuels.

Sr. No.	Terms of Reference
1.10	Details of Implementation of Fly Ash Management Rules
1.11	Emission/Effluent norms as per GSR 496 (E) dated 9/5/2016 [EPA Rules 1986].
1.12	Action plan to limit the particulate matter emission from all the stacks below 30 mg/Nm ³ shall be furnished.
1.13	PP shall explore the possibility of plastic waste utilization in the Plant/Unit process.
1.14	Action plan for 100 % solid waste utilization shall be submitted.
1.15	PM (PM ₁₀ and P _{2.5}) present in the ambient air must be analysed for source analysis – natural dust/RSPM generated from plant operations (trace elements) of PM ₁₀ to be carried over.

Additional Terms of Reference

N/A

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Ordinary Portland Cement (OPC)/ Portland Pozzolana Cement (PPC) and other cement	Product	4	MMTPA	Road	RCC silo- 1 No. of 10000 Tons.

Subject: Standard Terms of Reference (ToR) to the proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana.

Proposal Number: SIA/HR/IND1/441923/2023 dated 05/04/2024

ToR Identification No.: TO23B1103HR5990664N

Compliance of ToR

S. No.	ToR	Compliance
1.	Executive Summary	Complied and attached with the Draft EIA
2.	Introduction	
i	Background about the project	Complied. Please refer section 1.2 in chapter 1.
ii	Need of the project	Complied. Please refer section 2.2 in chapter 2.
iii	Purpose of the EIA study	Complied. Please refer section 1.1.
iv	Scope of the EIA study	Complied. Please refer section 1.4 in chapter 1.
3.	Project description	
i.	Location of the project site covering village, Taluka/Tehsil, District and State.	Complied. Please refer chapter 1, section 1.3.3.
ii.	Site accessibility	Complied. Please refer section 1.3.3 in chapter 1
iii.	A digital topo sheet in pdf or shape file compatible to google earth of the study area of radius of 10km and site location preferably on 1:50,000 scale. (including all eco-sensitive areas and environmentally sensitive places).	Complied. Please refer section 2.3, Figure 2.2.
iv.	Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quick bird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.	Complied. Please refer chapter 3, section 3.7.2..
v.	Environment settings of the site and its surrounding along with map.	Complied. Please refer chapter 2, table 2.2.
vi	A list of major industries with name, products and distance from plant site within study area (10km radius) and the location of the industries shall be depicted in the study area map.	Complied. Please refer section 2.6.2, Table 2.7.
vii	In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If	Not Applicable

	it's near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.	
viii	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated 14/02/2022.	Not Applicable
ix	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.	Not Applicable
x	Type of land, land use of the project site needs to be submitted.	Complied. Please refer section 2.6.1 Table 2.4 and 2.5 in chapter 2.
xi	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated 7/10/2014 shall be furnished.	Complied. Please refer section 2.6.1 Table 2.6 in chapter 2.
xii	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	Complied. Please refer section 2.3.3. (Attached in the Plan 1)
xiii	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.	Complied. Attached in plan 4 (contour map) and please refer section 10.6.2.
xiv	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.	Complied. Please refer chapter 7 in section 7.3.3.2.
xv	Details of drone survey for the site, needs to be included in report and presented before the EAC during appraisal of the project.	Will be submitted in Final draft EIA

3.1 Forest and wildlife related issues (if applicable)

i.	Status of Forest Clearance for the use of forest land shall be submitted.	No Forest land use. But as per Haryana SEAC norms for NOC application is under process in Forest department.
ii.	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.	Not Applicable
iii.	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.	Not Applicable
iv	Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.	Schedule I species details are given in Table 3.29 in chapter 3. Wildlife Conservation Plan will be prepared and submitted with in Final EIA.

3.2 Salient features of the project

i	Products with capacities in Tons per Annum for the proposed project.	Complied. Please refer section 2.3.
ii	If expansion project, status of implementation of existing project, details of existing/proposed products with production capacities in Tons per Annum.	Not Applicable
iii	Site preparatory activities.	Complied. Please refer Chapter 2, in section 2.4.
iv	List of raw materials required and their source along with mode of transportation.	Complied. Please refer Chapter 2, section 2.7.
v	Other than raw materials, other chemicals and materials required with quantities and storage capacities.	Complied. Please refer section 2.7.1.
vi	Manufacturing process details along with process flow diagram of proposed units.	Complied. Please refer section 2.5.1.
vii	Consolidated materials and energy balance for the project.	Complied. Please refer chapter 2, section 2.11.6 and in chapter 10 section 10.6.

viii	Total requirement of surface/ ground water and power with their respective sources, status of approval.	Complied. Please refer chapter 2, section 2.9.
ix	Water balance diagram	Complied. Please refer section 2.9, figure 2.3.
x	Details of Emission, effluents, hazardous waste generation and mode of disposal during construction as well as operation phase.	Complied. Please refer chapter 2 Table 2.15, chapter 10 in section 10.4.2.
xi	Man-power requirement.	Complied. Please refer section 2.8.
xii	Cost of project and scheduled time of completion.	Complied. Please refer section 2.4.
xiii	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.	Not Applicable
xiv	Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby industries.	Not Applicable
	c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall switch over to 100 % use of surface water from nearby source. d. Copy of all the Environment Clearance(s) including Amendments/validity of extension/transfer of EC, there to obtained for the project from MoEF&CC/SEIAA shall be attached as Annexures. A Certified Compliance Report (CCR) of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change/ or concerned authority as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022 on the status of compliance of conditions stipulated in all the existing environment clearances including amendments shall be provided. A Certified Compliance Report (CCR) issued by the concerned Authority shall be valid for a period of one year from the date of inspection. e. In case the existing project has not obtained Environment Clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. A proper justification needs to be submitted along with documentary proof. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 1994 or 2006,	Water withdrawal permission application will be apply

	CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of CTO from the Regional Office of the SPCB shall be submitted, as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022. CCR on CTO conditions issued by the concerned SPCBs/PCCs shall be valid for a period of one year from the date of inspection of the project.	
xv	Interpretation of each environment attribute shall be enumerated and summarized as given below: • Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality • Biological Environment • Land use • Socio-economic environment	Complied. Please refer chapter 3 in section 3.7.1, 3.8, 3.9.2, 3.10.7, 3.11, 3.12, 3.13, 3.14.
xvi	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.	Complied. Please refer chapter 3 in table 3.11, 3.14, 3.16, 3.17 and please refer sections 3.9, 3.10, 3.11, 3.12. The lab reports are attached to Annexure III.

4 Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessments shall be carried out)

i.	Identification of potential impacts in the form of a matrix for the construction and operation phase for all the environment components Activity Environment Ecological Socio-economic Construction phase Operation phase	Complied. Please refer chapter 4 in section 4.13.1 and table 4.14, 4.22.
ii.	Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase • Details of stack emissions from the existing as well as proposed activity. • Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period • Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions.	Complied. Please refer chapter 4, section 4.2.2.
iii.	Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 4, section 4.2.3.

iv.	Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 3. Please refer section 3.15.1.
v.	Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 4, section 4.2.5.
vi.	Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 4, section 4.3.1.
vii.	Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 4, section 4.5.
viii.	Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 4, section 4.2.4.
ix.	Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 11 in section 11.2.6.
x.	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 11 in section 11.2.5.
xi.	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Please refer chapter 10 in section 10.10.2..

5 Analysis of Alternatives (Technology & Site)

i.	No project scenario	Complied. Please refer chapter 5 in section 5.2.
ii.	Site alternative	Complied. Please refer chapter 5 in section 5.4.
iii.	Technical and social concerns	Complied. Please refer chapter 5 in section 5.4.1.
iv.	Conclusion	Complied. Please refer chapter 5 in section 5.6.

6 Environmental Monitoring Program

i.	Details of the Environment Management Cell	Complied. Please refer chapter 6 in section 6.2.
ii.	Performance monitoring schedule for all pollution control devices shall be furnished.	Complied. Please refer chapter 6 in section 6.3.
iii.	<p>Corporate Environment Policy</p> <p>a. 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.</p> <p>b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environment or forest norms / conditions? If so, it may be detailed in the EIA.</p> <p>c. What is the hierarchical system or Administrative order of the company to deal with the environment issues and for ensuring compliance with the environment clearance conditions? Details of this system may be given. Page 9 of 10</p> <p>d. Does the company have system of reporting of non-compliances / violations of environment 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</p>	Complied in chapter 10, please refer section 10.19.
iv	Action plan for post-project environment monitoring matrix:	Complied. Please refer chapter 6 in section 6.4.4.

7.0 Additional Studies

i.	<p>Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitor able with defined time frames.</p>	Under preparation and will be incorporated in the Final EIA.
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ii.	Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbonemission and carbon intensity with long-term target of "net Zero" emission.	Under preparation, will be incorporated in the Final EIA.
iii.	Implementation status/measures adopted for avoiding the generation of single used plastic waste.	Complied, please refer chapter 10 in section 10.19.1.
iv.	In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22- 23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.	Not Applicable
v.	Public consultation details (Entire proceedings as separate annexure along with authenticated English Translation of Public Consultation proceedings).	Draft report to be submit for PH
vi.	As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.	Complied.
vii	Summary of issues raised during public consultation along with action plan to address the same as per MoEF&CC O.M. dated 30/09/2020 Physical activity and action Year of implementation (Budget plan in INR) Total Expenditure (Rs. In Cr.)	Will be incorporate in Chapter 7 after PH
viii	Risk assessment <ul style="list-style-type: none"> • Methodology • Hazard identification • Frequency analysis • Consequence analysis • Risk assessment outcome 	Complied. Please refer chapter 7, section 7.3.
ix	Emergency response and preparedness plan	Complied. Please refer chapter 7 in section 7.3.2.

8.0 Project Benefits

i.	Environment benefits	Complied. Please refer chapter 8 in section 8.3.1.
ii.	Social infrastructure	Complied. Please refer chapter 8 in section 8.3.3.
iii.	Employment and business opportunity	Complied. Please refer chapter 8 in section 8.3.1.
iv.	Other tangible benefits	Complied. Please refer chapter 8 in section 8.3.4.

9.0 Environment Cost Benefit Analysis

i.	Net present value	Complied. Please refer chapter 9 in section 9.3.
ii.	Internal rate of return	Complied. Please refer chapter 9.
iii.	Benefit cost ratio	Complied. Please refer chapter 9.
iv.	Cost effectiveness analysis	Complied. Please refer chapter 9 in section 9.3.1.

10.0 Environment Management Plan (Construction and Operation phase)

i.	Action plan for hazardous waste management	Complied. Please refer in the section 10.4.2.
ii.	Action plan for solid waste management	Complied. please refer in the section 10.4.1.
iii.	Action plan for e-waste management.	Complied. Please refer section 10.11 in chapter 10.
iv.	Action plan for plastic waste management, considering the Plastic Waste Management Rules 2016.	Complied. Please refer section 10.19.1.
v.	Action plan for construction and demolition waste management.	Complied.
vi.	Rain water harvesting plan	Complied. Please refer in section 10.6.2.
vii.	Plan for maximum usage of waste water/treated water in the Unit	Complied. Please refer section 10.16.
viii.	Green belt development plan: An action plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be	Complied. Please refer section 4.9.2.

	submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.	
ix.	Wildlife conservation plan (In case of presence of schedule I species)	Under preparation and will be submitted in Final EIA.
x.	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.	Complied in chapter 10. Please refer in 10.18.
xi.	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demand and waste disposal.	Complied in chapter 10. Please refer section 10.5.1.
xii.	An Action Plan for improving the house-keeping activities in the raw material handling area need to be submitted	Complied.
xiii.	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap run off material shall be submitted.	Complied. Please refer section 10.2.
xiv.	Action plan to limit the dust emission from all the stacks below 30 mg/Nm ³ shall be furnished.	Complied in chapter 10. Please refer section 10.10.2.
xv.	Action plan for fugitive emission control in the plant premises shall be provided.	Complied in chapter 10.

Standard Terms of Reference for conducting Environment Impact Assessment Study for Cement plants and information to be included in EIA/EMP report

1	Limestone and coal linkage documents along with the status of environment clearance of limestone and coal mines.	Not Applicable
2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;	Not Applicable
3	Present land use shall be prepared based on satellite imagery. High-resolution satellite imagedata having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.	Complied. Please refer chapter 3. Please refer section 3.7.
4	If the raw materials used have trace elements, an environment management plan shall also be included.	Not Applicable

5	Plan for the implementation of the recommendations made for the cement plants in the Corporate Responsibility for Environmental Protection (CREP) guidelines shall be prepared.	Complied. Please refer section 10.3.
6	Energy consumption per ton of clinker and cement grinding	Complied.
7	Provision of waste heat recovery boiler	Complied.
8	Arrangement for co-processing of hazardous waste in cement plant.	Complied.
9	Provision of Alternate fuels.	Complied
10	Details of Implementation of Fly Ash Management Rules	Complied.
11	Emission/Effluent norms as per GSR 496 (E) dated 9/5/2016 [EPA Rules 1986].	Complied.
12	Action plan to limit the particulate matter emission from all the stacks below 30 mg/Nm ³ shall be furnished.	Complied.
13	PP shall explore the possibility of plastic waste utilization in the Plant/Unit process.	Complied.
14	Action plan for 100 % solid waste utilization shall be submitted.	Complied.
15	PM (PM ₁₀ and P _{2.5}) present in the ambient air must be analyzed for source analysis – natural dust/RSPM generated from plant operations (trace elements) of PM ₁₀ to be carried over.	Complied.

Additional Terms of Reference

Not Applicable

CHAPTER -1 INTRODUCTION

1.1 INTRODUCTION

Ambuja Cements Limited (ACL) proposes to setup a greenfield cement grinding unit with cement production capacity of 4 MMTPA in Naulatha Village, Israna Tehsil, Panipat District, Haryana. This chapter outlines the objectives of the report, clearly identifies the proposed project and its proponent, and offers a concise overview of the project's nature, scale, and geographic location. It also highlights the project's significance to both the region and the country. Additionally, this chapter delineates the study's scope and provides comprehensive details about the regulatory scoping process, as mandated by the Terms of Reference (ToR) issued by State Level Expert Appraisal Committee (SEAC) Haryana.

1.2 PURPOSE OF THE REPORT

Environmental management plays a vital role in sustainable development of a country. Recognizing its importance, the Ministry of Environment, Forest & Climate Change, Government of India had formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concern in developmental projects. Ministry of Environment, Forest & Climate Change (MoEFCC) has made prior Environmental Clearance (EC) for certain developmental projects mandatory through its notification issued on 14th September 2006 and its subsequent amendments thereof.

Environmental Impact Assessment (EIA) is a systematic process used to identify, predict, evaluate, and mitigate the physical, biological, social, and other pertinent environmental impacts of proposed development projects. It is crucial for informing decision-making regarding the environmental consequences of these projects. EIA promotes environmentally sound and sustainable development by identifying, enhancing, and implementing appropriate mitigation measures.

The proposed plant has both positive and negative impacts on the environment. It is the responsibility of the company to document the associated positive and negative impacts, so that the attempts can be made to minimize the effects due to the negative impacts and maximize the benefits due to the positive impacts. In this regard, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been considered as the most important documentation in understanding the environmental implications and safeguarding the environment.

As per EIA Notification 2006 and subsequent amendments, the project falls under Schedule 3(b) Cement Plants. It falls under Category 'B1' for all standalone grinding units and needs environmental clearance from SEAC.

Application for prior environmental clearance for the above proposal has been submitted to SEAC Haryana vide proposal no. SIA/HR/IND1/441923/2024 for the grant of Terms of Reference (ToR) for the preparation for EIA report under category 'B1' as it is a case of standalone grinding unit. The application for prior Environmental Clearance (Form-1) for the project was considered by the State Expert Appraisal Committee for prescribing Terms of Reference (ToR) for preparation of the Environmental Impact Assessment (EIA) report. The Committee, after going through the Form-1, Pre-Feasibility report and presentation, has issued Standard ToR by SEAC dated 6/04/2024 for preparation of the EIA report. The ToR letter and its compliance is enclosed as **Annexure I**.

The objective of the EIA study report is to take stock of the prevailing quality of environment, to assess

the impacts of proposed project on surrounding environment and to plan appropriate environmental control measures to minimize adverse impacts and to maximize beneficial impacts of proposed cement plant.

The following major objectives have been considered:

- Assess the existing status of surrounding environment.
- Assess the impacts on surrounding environment due to the proposed project.
- Suggest pollution control and ameliorative measures to minimize impact.
- Prepare an action plan for implementation of suggested ameliorative measures.
- Suggest a monitoring programme to assess the efficacy of the various adopted environmental control measures.
- Assess financial considerations for suggested environmental control plans.
- Clearances from statutory authorities

1.3 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

1.3.1 THE PROJECT

Ambuja Cements Limited (ACL) proposes to set up a green field cement grinding unit with Cement Production Capacity of 4.0 Million Metric Tons per Annum (MMTPA) at Village Naulatha, Tehsil Israna, District Panipat, Haryana. The proposed cement grinding unit project will utilize raw material namely Clinker, Gypsum and Fly ash from domestic sources. Clinker would be sourced from domestic plants in Marwar Mundwa or any other in-house sources as per price dynamics. Fly Ash will be sourced from nearby thermal power plant from Hissar Panipat/NPL, and Rajpura/Talwandi Sabo. Natural Gypsum will be sourced from Bikaner, Rajasthan. No Litigation/Court case or legal matter is pending against the proposed project. Implementation period can be further shortened with careful detail planning and close monitoring of various activities involved in project execution

1.3.2 PROJECT PROPONENT

The Adani Group is a diversified organization in India with combined market cap of \$240 billion (as on September 30th, 2022) comprising of 7 publicly traded companies. Adani Group is headquartered in Ahmedabad, in the state of Gujarat, India. Over the years, Adani Group has positioned itself to be the market leader in its transport logistics and energy utility portfolio businesses focusing on large scale infrastructure development in India with O & M practices benchmarked to global standards with key businesses across Resources - Coal mining and trading; Logistics – airports, shipping, rail and airport terminals; Energy – Gas (LNG, City Gas), thermal power generation, renewable (Solar & wind) and transmission energy infrastructure, city gas distribution; Agro commodities and ancillary industries, Real estate. Adani Group is the largest private power producer in India. The biggest source of competitive advantage for the Adani Group is its highly qualified & experienced team of the professionals. The team has demonstrated capabilities in conceptualization and implementation of large projects and has excellent records of establishing benchmarks in the industry.

The Group currently has seven listed companies namely:

- Adani Enterprises Limited (AEL) -- the diversified entity mainly into Integrated Coal Management, bunkering, Coal MDO operations and Edible Oil Refining and marketing
- Adani Ports and Special Economic Zone Limited (APSEZ) – the operating and holding company

- for Port, SEZ and Logistics business,
- Adani Transmission Limited (ATL) – the operating and holding company for transmission assets
 - Adani Power Limited (APL) - the operating and holding company for thermal generation assets
 - Adani Green Energy Limited (AGEL) – the operating and holding company for renewable energy assets.
 - Adani Gas Limited the operating and holding company for Group’s Gas Business,
 - Adani Wilmar Limited.
 - Adani Group is one of the fastest growing conglomerates in India and has the distinction of being the industry leader with business interest in India as well as abroad. Some highlights of the group are:
 - It has the distinction of being India’s largest port operator.
 - Its Fortune brand of edible oil is the largest selling brand in its category in India.
 - Adani Group is the largest Integrated Coal Manager in the country.
 - It is the largest private sector thermal power producer in India.
 - It is the largest Solar Power producer in India.
 - It has the largest network of transmission lines in India.

AEL is the flagship company of the group and has been instrumental in bringing up new business growth and prospects to the group. It has been instrumental in setting up thermal power generation, renewable power generation and transmission business of the group. Group has attained leadership position in the field it present and created immense value for the stakeholders.

Ambuja Cements Limited (ACL), a group company of Adani Group, has developed a large number of Cement Projects (Integrated Cement Plant, Grinding Units & Limestone Mine).

Address for correspondence:

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1.4 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY AND REGION

1.4.1 NATURE OF THE PROJECT

Ambuja Cements Limited (ACL) proposes to set up a green field cement grinding unit with Cement Production Capacity of 4.0 Million Metric Tons per Annum (MMTPA) at Village Naulatha, Tehsil Israna, District Panipat, Haryana.

The proposed cement grinding unit project will utilize raw material namely Clinker, Gypsum and Fly ash from domestic sources. Clinker would be sourced from domestic plants in Marwar Mundwa or any other in-house sources as per price dynamics. Fly Ash shall be sourced from nearby thermal power plant from Hissar Panipat/NPL, and Rajpura/ Talwandi Sabo. Natural Gypsum shall be sourced from Bikaner, Rajasthan.

No Litigation/Court case or legal matter is pending against the proposed project.

1.4.2 SIZE OF THE PROJECT

The total production capacity of the standalone grinding unit is 4 MMTPA. Photographs of the proposed site is shown in figure 1.1. Brief description of nature, size and the location of the project is given in Table 1.1.

Photographs of Site

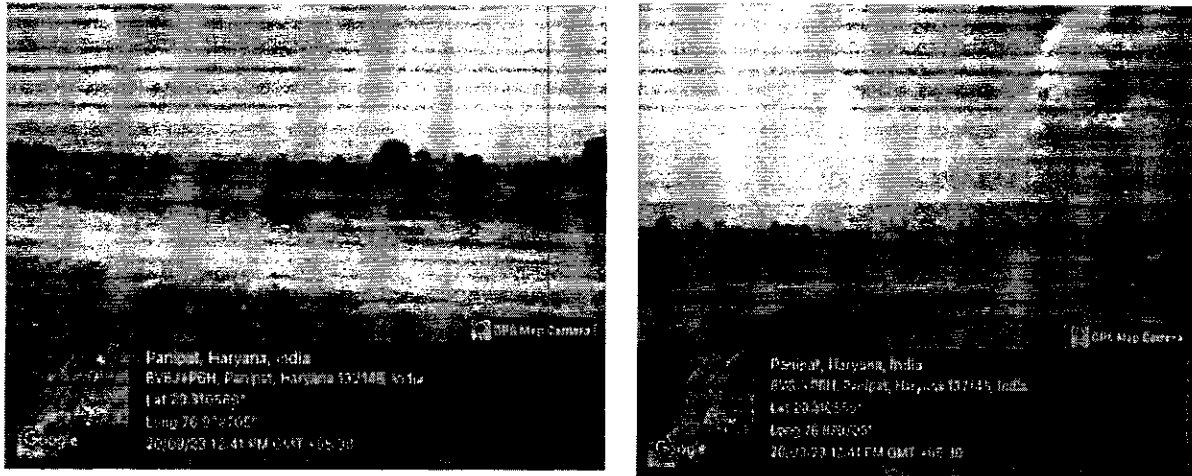


FIGURE 1.1 PHOTOGRAPH OF THE SITE

TABLE 1.1 BRIEF DESCRIPTION OF PROPOSED PROJECT SITE

Sl. No	Particulars	Details
1.	Geographical Location	Centroid - 29°18'41.71"N, 76°52'49.97"E
2.	Elevation above Mean Sea Level	244-247 m
3.	Present Land Use	Fallow Land
4.	Nearest Railway Station	Naulatha Railway Station, 0.7 Km, NE
5.	Nearest Airport	Karnal Airport, 48.30 km, NE
6.	Nearest Highway	NH -709, 1.6 Km, N SH-14, 8.3 Km, N
7.	Nearest Road	NH-709, 1.6 Km, E
8.	Nearest Villages	Naulatha, 1.3 Km, E Balana, 3.6 Km, SE Israna 3.8 Km, SSW Jondhan Kalan 2.3 Km, WSW Brahman Majra 1.4 Km, WNW Bhadaur 3.8 Km, N Dohar 4.9 Km, NE
9.	Nearest District Headquarter	Panipat 11.81 Km, NE

10.	Nearest City	Panipat 11.81 Km, NE				
11.	Densely populated area	S. No	Places	Population as per census 2011 (Nos.)	Distance (~km)	Direction
		1	Naulatha	8665	1.3	E
12.	Inland water bodies	Western Yamuna Canal- 7.3 Km in E direction				
13.	Reserved Forests/ Protected Forests/Notified Wildlife Sanctuary/ Notified national parks/ Ecologically sensitive areas	Nil				
14.	Defense Installations	Nil				
15.	Archeologically Important places	Panipat Museum				
16.	Interstate/ National Boundaries	Nil				
17.	Hills/Valleys	Nil				

1.4.3 LOCATION OF THE PROJECT

The Cement Grinding & Packing unit will be situated in Village Naulatha, Tehsil Israna, District Panipat, Haryana as per the approved ToR. The closest railway station is Naulatha Railway Station, located approximately 0.7 km to the northeast, with the nearest National Highway (NH 709) situated approximately 1.6 km to the south. The district headquarters of Panipat is positioned around 11.81 km northeast from the project site. The area falls within Survey of India Topo sheet no. H43Q15, scaled at 1: 50,000. The Geographical coordinates of proposed project site are given in Table 1.2.

TABLE 1.2 GEOGRAPHICAL COORDINATES OF THE PROPOSED PROJECT SITE

Points	Latitude	Longitude
F	29°18'26.24"N	76°52'35.54"E
G	29°18'28.26"N	76°52'35.55"E
H	29°18'28.21"N	76°52'41.51"E
I	29°18'32.11"N	76°52'41.63"E
J	29°18'31.99"N	76°52'46.62"E
K	29°18'30.13"N	76°52'46.60"E
L	29°18'30.08"N	76°52'51.53"E
M	29°18'31.14"N	76°52'51.50"E
N	29°18'31.17"N	76°52'49.01"E
O	29°18'32.07"N	76°52'48.97"E
P	29°18'32.09"N	76°52'48.43"E

Q	29°18'33.81"N	76°52'48.40"E
R	29°18'33.81"N	76°52'43.98"E
S	29°18'34.07"N	76°52'44.00"E
T	29°18'34.06"N	76°52'44.77"E
U	29°18'36.04"N	76°52'44.76"E
V	29°18'36.03"N	76°52'45.79"E
W	29°18'36.40"N	76°52'45.79"E
X	29°18'36.40"N	76°52'51.53"E
Y	29°18'41.48"N	76°52'51.57"E
ZA	29°18'42.27"N	76°52'50.33"E
ZB	29°18'44.55"N	76°52'53.38"E
ZC	29°18'44.32"N	76°52'54.23"E
ZD	29°18'42.10"N	76°52'51.33"E

The location map of the project site is presented in figure 1.2, Study Area (10 Km radius) is shown in Figure 1.3 and Google Earth map of the proposed Project site is given in Figure 1.4. There is no critically polluted cluster identified by CPCB/MOEF in the vicinity of the project.

Total project site area is 9.28 Hectare. This consists of 2.07 ha of Plant & Machinery, 4.18 ha of open area and 3.23 ha of green belt.

Status of Land Ownership

Currently, the land is owned by Adani Logistics Panipat Ltd, a subsidiary of the Adani Group. Ambuja Cements Ltd, the applicant, is also part of the Adani Group. There is a Memorandum of Understanding (MOU) between the two companies, stipulating that 22.94 hectares (as per the coordinates provided above) will be transferred from Adani Logistics to Ambuja Cements Ltd for the establishment of a cement grinding unit. The MOU detailing this agreement is included as Annexure II.

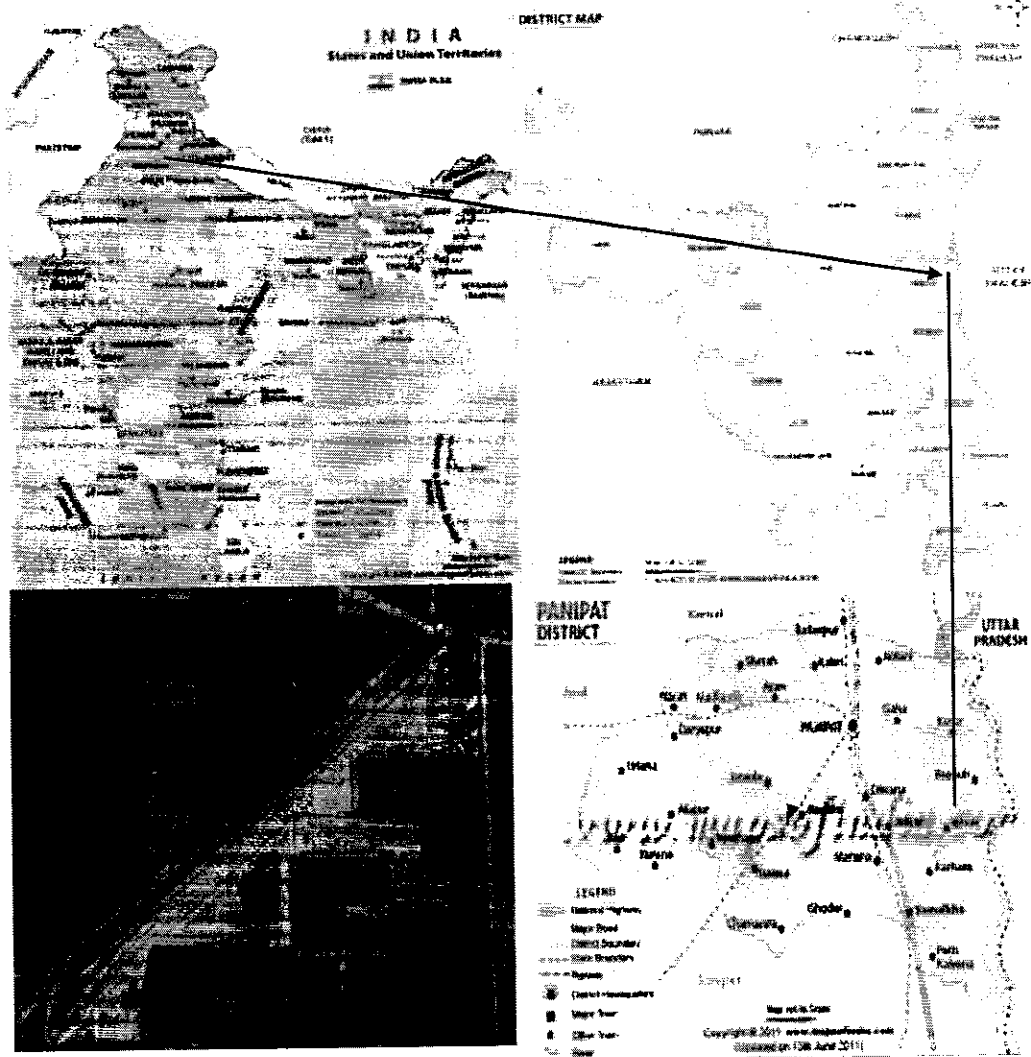


FIGURE 1. 2 LOCATION MAP OF THE PROPOSED PROJECT AREA

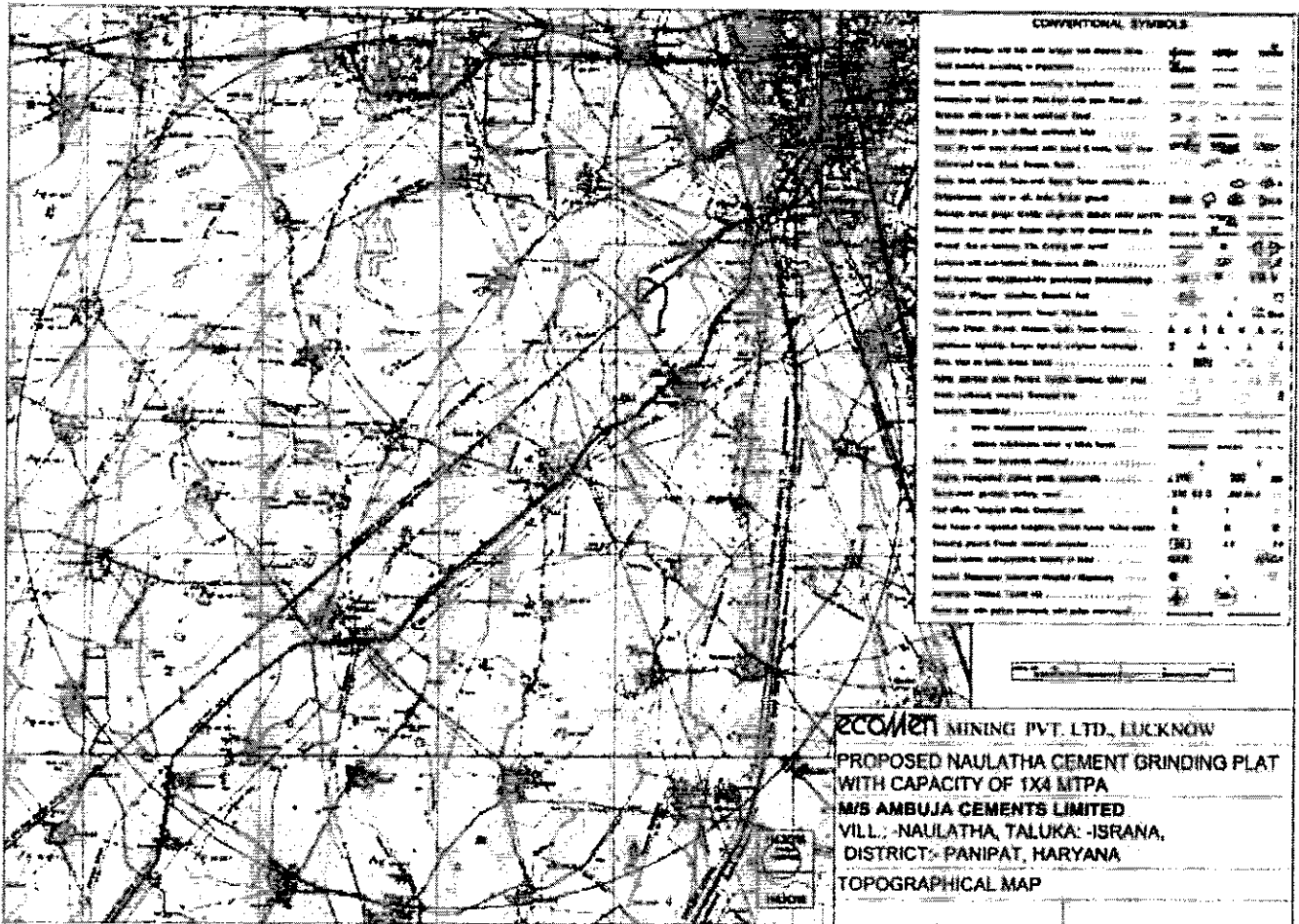


FIGURE 1.3 INDEX MAP OF THE PROPOSED PROJECT ON TOPO SHEET, 10 KM RADIUS IN 1: 50000 SCALE

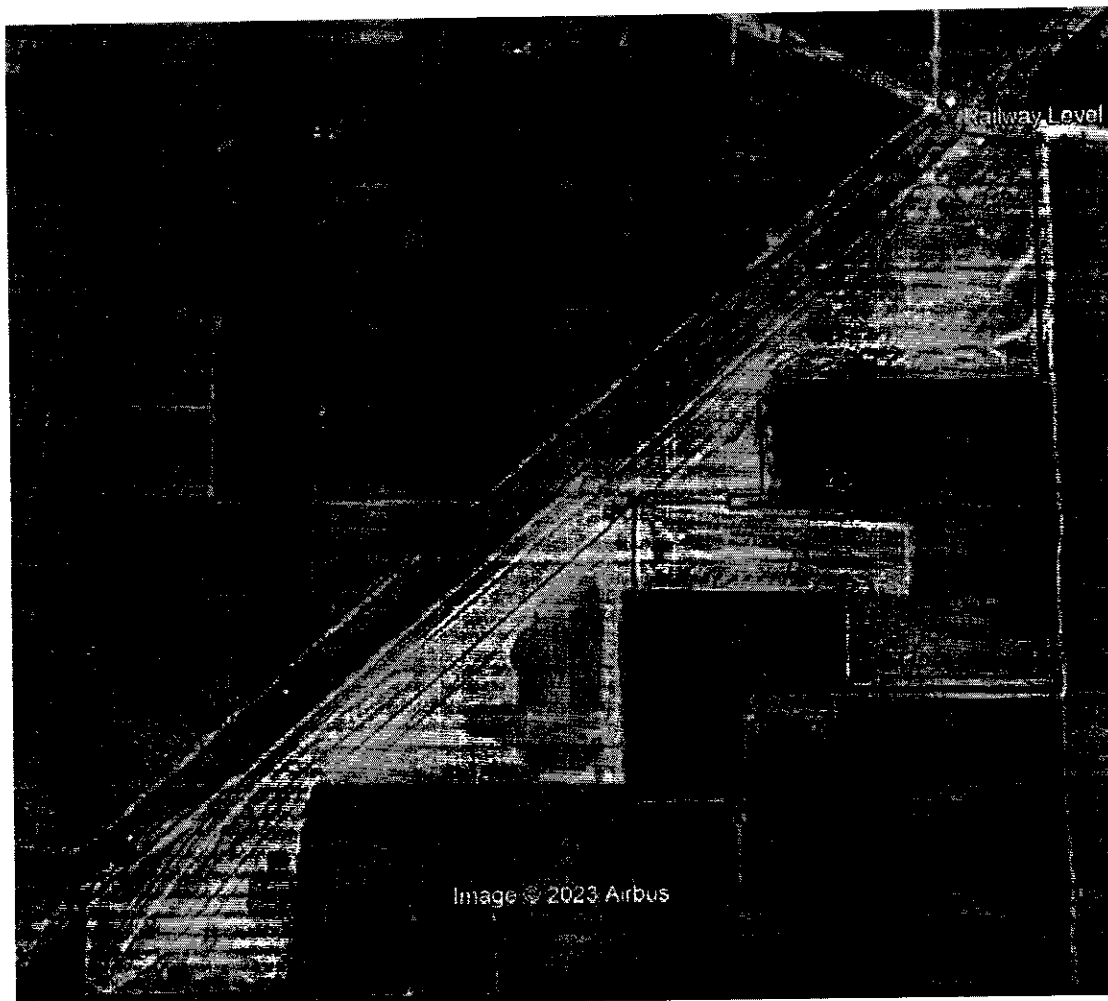


FIGURE 1.4 GOOGLE EARTH IMAGE SHOWING THE PLANT LOCATION

1.4.4 CONNECTIVITY TO THE SITE

The site is well connected to the nearest road NH-709 in East direction about 1.6 km. Nearest city is Panipat about 11.81km in NE. The nearest railway station is Naulatha railway station 0.7km in NE direction and nearest airport is Karnal airport, 48.30km in NE direction.

1.4.5 STATUS OF THE PROPOSED PROJECT WITH RESPECT TO THE ENVIRONMENTAL CLEARANCE

The Table 1.3 outlines the sequence of project activities completed thus far in relation to obtaining environmental clearance.

TABLE 1. 3 SEQUENCE OF PROJECT ACTIVITIES

S.No	Project activity details	Details
1	Application (Form -1/ToR and Pre-Feasibility Report) uploaded on PARIVESH Portal	05/04/2024
2	ToR Letter issued by SEAC	06/04/2024
3	Baseline monitoring & data collection	Post-Monsoon Season (Oct 2023 to Dec 2023)

1.4.6 PROJECT'S IMPORTANCE TO THE COUNTRY/ REGION.

i) National

The Cement Industry in India is among the core Industries that is vital for economic growth and development. Ever since the Industry was de-licensed in 1991, there has been remarkable growth that metamorphosed it to a globally competitive market, making India the second largest producer of cement after China in the world. The product Cement is one of the major components in the infrastructure development. Cement is the basic building material and is used extensively in urban housing, industrial sector and infrastructure development. It has become synonymous with construction activity and the per capita consumption of cement is accepted as an important indicator of the country's economic growth.

The Working Group on Cement Industry constituted by the erstwhile Planning Commission for the 12th Plan period has projected a demand growth for cement at the rate of 10.75% per annum based on expected GDP growth rate of 9%. The cement capacity requirement during 12th Plan is projected at 479.3 million TPA by 2021 and about 1035 million tonnes by 2027. The annual production of cement by the end of 12th Plan are estimated at and 407.4 million tonnes, respectively, with 85% capacity utilization.

Based on the demand growth projection, the consumption of cement by the end of the 12th Five Year Plan would be between 366.9 million tonnes and 397.4 million tonnes with assumed growth rates of 9.75% to 10.75% during the Plan period. (Indian Minerals Yearbook 2017 (Part- III: Mineral Reviews) 56th Edition). The Indian cement sector has a robust demand profile, stimulated mostly by government plans to build physical and social infrastructure like Pradhan Mantri Awaas Yojana (PMAY-G and PMAY-U) (Housing for All by 2022), Pradhan Mantri Gramin Sadak Yojana (PMGSY) (Prime Minister's Rural Road Scheme), Concrete Roads, Smart cities, Swachh Bharat (Clean India), Construction of hospitals and educational institutions, Canal lining projects, Cold chain storage projects etc.

ii) Regional

The state of Haryana, adjacent states as well as the National Capital Region (NCR) of Delhi have huge demand for cement for the housing, urban area development and industrial corridor projects, national highways, bridges and air ports. Proposed project will result in growth of the surrounding areas by increasing direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure.

1.5 SCOPE OF THE EIA STUDY

The study area covers a radius of 10 km in and around the project site. The scope of study broadly

includes:

Literature review and collection of secondary relevant data aligned to the Terms of Reference (ToR) issued by State Expert Level Appraisal Committee (SEAC).

Establishing by primary survey and field visits, the baseline environmental status of the study area of 10 km radius for Meteorology, Ambient Air, Water (Surface & Ground), Noise, Traffic, Soil, Socio-economic, Ecology etc.; Assessing the project activity, predicting & interpreting through modeling and determining the Incremental Ground Level Concentrations (GLC) for ambient Air Quality components. Preparation of EMP outlining the measures for mitigating the impacts for various attributes like air, water, noise, soil, etc. and scope for future expansions for environmentally sustainable development; and Identification of critical environmental attributes required to be monitored during the operation of the post-monitoring plan for the project.

The current site conditions are taken as the baseline conditions for the completion of the EIA and Base Line data monitoring has been carried out during Oct 2023 to Dec 2023.

1.6 METHODOLOGY OF THE STUDY

Ecomen mining Private Limited along with the team of ACL had conducted a reconnaissance survey and sampling locations were identified on the basis of:

- Predominant wind directions in the study area as recorded by India Meteorological Department (IMD) at Karnal.
- Existing topography;
- Location of surface water bodies like ponds, canals and rivers;
- Location of villages/towns/sensitive areas;
- Accessibility, power availability and security of monitoring equipment; pollution pockets in the area;
- Areas which represent baseline conditions;
- Collection, collation and analysis of baseline data for various environmental attributes.

The study also provides framework and institutional strengthening for implementing the mitigation measures. Field studies were conducted for a period of three months representing post monsoon Season to determine the existing conditions of various environmental attributes as outlined in Table-1.4.

TABLE 1. 4 MONITORING TO DETERMINE THE EXISTING CONDITIONS OF VARIOUS ENVIRONMENTAL ATTRIBUTES

S. No.	Attribute	Parameters	Frequency of Monitoring	No. of Locations
1	Ambient air quality	PM _{2.5} , PM ₁₀ , NO _x and CO	24 hourly sample twice a week for post monsoon season. CO samples collected on 8 hourly basis.	8 Locations
2	Meteorology	Wind speed & direction, temperature, relative humidity, rainfall and other non-instrumental observations like visibility hail, thunder storms, dust storms, fog and smog	Continuous monitoring with hourly average recording through setting up of onsite meteorological station	1 central monitoring location at plant site
3	Water quality	Physical, chemical & bacteriological parameters	Once during the study period	8 ground water and 4 surface water samples
4	Ecology	Existing terrestrial and aquatic flora and fauna	Once during the study period	Entire study period
5	Noise levels	Noise levels in dB	Once during the study period	8 location
6	Soil characteristics	Soil profile, characteristics, soil type and texture, heavy metal, NPK value etc.	Once during the study period	8 location
7	Land use	Land use for different characteristics	Based on data published in latest published district census handbooks	Entire study area
8	Socio economic aspects	Socio economic characteristics labor force characteristics	Based on published handbooks data from districts latest census	Entire study area
9	Hydrology	Drainage area and pattern, nature of streams, aquifer characteristics, recharge and discharge areas	Based on study carried out and data collected from secondary sources	
10		Ground water levels and other hydro geological parameters	Once	Ground water level monitoring 8 stations

1.7 APPLICABLE LEGISLATIONS TO THE PROJECT

The environmental regulations, legislations and policy guidelines and control that may impact the project are the responsibility of a variety of Government agencies. The principal environmental regulatory agency in India is the Ministry of Environment, Forests & Climate Change (MoEF&CC), Delhi. MoEF&CC formulates environmental policies and accords environmental clearance for different projects. Many State and Central legislations have a bearing on environment but laws on environment protection have been notified recently. These legal enactments can be broadly classified in the terms of focus areas, viz. pollution, natural resources and its linkages respectively all are given in Table-1.5.

TABLE 1.5 DETAILS OF APPLICABLE LEGISLATION OF THE PROJECT

Legal Channel	Responsible Body	Objective of Legislation	Action Plan
The Water (Prevention & Control of Pollution) Acts 1974/ Rules 1975	CPCB, SPCB	The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water	<ul style="list-style-type: none"> - Not to discharge any effluent, not conforming to standards, prescribed by State PCB into any stream, well, sewers or land - Not to discharge air pollutant(s) in excess of standards, prescribed by the State PCB
The Air (Prevention & Control of Pollution) Acts 1981/Rules 1982	CPCB, SPCB	The prevention, control and abatement of air pollution	<ul style="list-style-type: none"> - Obtain 'Consent to Establish' prior to establish any process, operation or treatment system - Obtain 'Consent to Operate' prior to operation of system which is likely to discharge effluent - Apply for renewal of the 'Consent to Operate' before the expiry - Comply with conditions as prescribed under consents
The Environment (Protection) Acts 1986/Rules 1986 The Environmental Impact Assessment (EIA) Notification, 2006	MoEF, CPCB, SPCB	Protection and Improvement of the Environment	<ul style="list-style-type: none"> - Prevent discharge or emission of environment pollutants in excess of the prescribed standards - Submit Environmental Statement' every year - Obtain prior "Environmental Clearance' from MoEF&CC in case of new project or for modernization/Expansion

<p>Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016</p>	<p>MoEF&CC, CPCB, SPCB</p>	<p>Management & Handling of hazardous wastes in line with the Basel convention</p>	<ul style="list-style-type: none"> - It is the responsibility of the occupier to identify the hazardous wastes in their units and ensure proper handling and disposal - To take all steps to contain contamination, prevent accident and limit consequences on human being and environment - Obtain authorization from MPCB and comply with the conditions - Maintain records of Hazardous Waste generated in Form-3 and submit yearly return for generation, treatment, recycling, disposal etc., to SPCB in Form-4 - Used Oil to be send / sold to the registered recycler, re-processor, registered authorized facility Shall be transported in accordance with the rule. - Site storage is allowed for 90 days only
<p>Factories Act, 1948 (as amended till 1987)</p>	<p>Ministry of Labour, DGFASLI and Directorate of Industrial Safety and Health/Factories Inspectorate</p>	<p>Control of workplace environment, and providing for good health and safety of workers</p>	<ul style="list-style-type: none"> - 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. - Ensure health, safety and welfare of all workers while they are at work in the Factory as far as reasonably practicable. - Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature. - 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 or damage to the environment	<ul style="list-style-type: none"> - Ensure compliance to safety provisions in the transport vehicle carrying dangerous and hazardous substances inside works - Display of emergency information panels at front, back and both side of vehicle - Every transporter to ensure safe transportation of dangerous/hazardous goods. - Earthing chain for grounding, any prevalent static charge. - All motor vehicle entering the works shall have properly maintained brakes, lights, signal system for brakes, blinkers and registration number displayed and valid Pollution under Control Certificate.
The Solid Waste Management Rules, 2016 as amended	SPCB, CPCB	To manage/ utilize the generated solid waste without damaging the environment and surroundings	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.
Batteries (Management and Handling) Rules, 2022 amended	SPCB, CPCB and MoEF&CC	To control the hazardous waste generation (lead waste) from used lead acid batteries	<p>It is the responsibility of the generator to ensure, used batteries are not disposed of in any manner other than depositing with dealer, manufacturer, importer, re-conditioner registered recycler or at designated collection center</p> <ul style="list-style-type: none"> - In case of auction, ensure batteries are auctioned to the registered recycler only maintain record for such auction
E-Waste (Management) Rules, 2016 as amended	SPCB, CPCB and MoEF&CC	To recycle/ manage the electronic waste from the industry	Shall make provisions for collection of e-waste generated from 'end of life' of their products and shall ensure that such e-wastes are handed over only to the registered producer, refurbisher, or recycler, In line with the principle of 'Extended Producer Responsibility'.

			Create Awareness to the employees for handling E-waste generated.
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	<ul style="list-style-type: none"> - Noise Quality Monitoring & submission of reports on weekly/ monthly basis. - Providing Ear plugs and Muffs to the workers working in noise prone areas. - Dampening the source noise level or making the noise characteristics less annoying by providing suitable enclosures and barriers.

1.8 CONTENT OF THE REPORT

This EIA Report is prepared in accordance with the EIA Notification, 2006 & prescribed ToR. The EIA report contains project features, baseline environmental setup, assessment of environmental impacts, and formulation of mitigation measures, environmental management, and monitoring plan with risk & disaster management plan. The report contains 12 Chapters as follows:

Chapter 1 – Introduction

This chapter provides background information on need of project, need of EIA study and brief of the project. The scope and EIA methodology adopted in preparation of EIA report have also been described in this Chapter. It also covers the identification of project & project proponent, brief description of nature, size, location of the project and its importance to the country and the region. Scope of the study details about the regulatory scoping carried out as per the generic structure given in the EIA Notification, 2006.

Chapter 2 – Project Description

This chapter deals with the project details of the proposed cement plant, location, size & magnitude of operation including associated activities required, proposed schedule for approval and implementation, including technical details of raw material, quality and quantity etc.

Chapter 3 – Description of the Environment

This chapter presents the environmental status of the study area around the unit and the proposed project including topography, drainage pattern, water environment, geological, climate, transport system, land use, flora & fauna, socio-economic aspects, basic amenities etc. Environmental assessment of the proposed project site considering its capability to receive the proposed new development is also discussed in this Chapter.

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

This chapter describes the overall impacts of the proposed project activities and underscores the areas of concern, which need mitigation measures and describing the already implemented mitigation measures at the unit for respective environment concerns. It predicts the overall impact proposed project on different components of the environment viz. air, water, land, noise, biological, and socio-economic.

Chapter 5 – Analysis of Alternatives (Technology and Site)

The alternatives to a project proposal is a crucial requirement of the Environmental Impact Assessment (EIA) process. Comparing these alternatives helps identify the most effective method of achieving the

project's objectives with minimal environmental impact, thereby highlighting the most environmentally friendly and cost-effective options.

Chapter 6 – Environmental Monitoring Program

Technical aspects of monitoring the effectiveness of mitigation measures which should set for the unit and updated as per the need of proposed at the site (incl. Measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules).

Chapter 7 – Additional Studies

This chapter deals with the potential risk assessment carried out for the proposed cement plant during construction and operation due to bulk storages of Hazardous materials and sample disaster management plan.

Chapter 8 – Project Benefits

This chapter presents the details of direct and indirect benefits due to proposed project.

Chapter 9 – Environmental Cost Benefit Analysis

Environmental Cost Benefit Analysis (ECBA) is a systematic approach for comparing the total expected costs and benefits of a project, policy, or regulation that affects the environment. It aims to quantify the economic values of both the positive and negative impacts on the environment

Chapter 10 – Environmental Management Plan(EMP)-Administrative Aspects

This chapter details the inferences drawn from the environmental impact assessment exercise and the EMP developed for the unit to strengthen the mitigation measures for the project. It describes the overall impacts of the proposed activities during construction and operation phases and underscores the areas of concern, which need mitigation measures. It also provides mitigation and control measures for environmental management plan (EMP) for minimizing the negative environmental impacts and to strengthen the positive environmental impacts of the proposed project.

Chapter 11 – Summary and Conclusion

This chapter provides the summary and conclusions of the EIA study of the proposed project with overall justification for implementation of the project and explanation of how, adverse effects will be mitigated.

Chapter 12 – Disclosure of Consultant

This chapter provides the brief resume of the consultants engaged and the team engaged to carry out the EIA study.

CHAPTER -2 PROJECT DESCRIPTION

2.1 INTRODUCTION

The proposed project is a green field cement grinding unit with Cement Production Capacity of 4.0 Million Metric Tons per Annum (MMTPA). This chapter deals with details of project which includes need of the project, location of the project site, size or magnitude of operation, requirements of the project, proposed schedule for approval and implementation, technology & process description, major equipment & machineries, infrastructural facilities, description of mitigation measures and assessment of new & tested technology for the risk of technological failure.

2.1.1 TYPE OF THE PROJECT

ACL is proposing to setup a green filed project of 4 MMTPA. The proposed standalone grinding unit will be setup in area of 9.28 Ha of land. As per EIA Notification 2006 and subsequent amendments, the project falls under Schedule 3 (b) Cement Plants. It falls under Category 'B1' as it is a standalone grinding unit.

2.2 NEED FOR THE PROJECT

India ranks as the second-largest cement producer globally. Its cement industry plays a pivotal role in the country's economy, offering employment opportunities to over a million individuals, both directly and indirectly. India possesses significant potential for growth in the infrastructure and construction sectors, with the cement industry poised to reap substantial benefits from this development. The Indian Government has placed a strong emphasis on infrastructure development as a means to stimulate economic growth, with ambitious plans including the establishment of 100 smart cities. Additionally, efforts are underway to enhance railway capacity and improve handling and storage facilities, aimed at streamlining cement transportation and reducing associated costs. These initiatives are expected to spur heightened construction activity, consequently driving up the demand for cement.

Demand and Supply Gap:

The anticipated gap between cement demand and supply in 2024 is expected to be significant. With rapid urbanization, infrastructural development, and increasing construction activities, the demand for cement is projected to outstrip supply. This gap is likely to necessitate strategic measures to ramp up production capacities and streamline distribution channels to meet the burgeoning demand. Government initiatives aimed at bolstering the cement industry and addressing logistical challenges will be crucial in bridging this gap and ensuring sustained growth in the sector. Growth in demand for cement is due to Central government liberalization policies and development of housing, road and infrastructure projects.

2.3 LOCATION OF THE PROJECT

The Cement Grinding & Packing unit will be situated in Village Naulatha, Tehsil Israna, District Panipat, Haryana. The closest railway station is Naulatha Railway Station, located approximately 0.7 km to the northeast, with the nearest National Highway (NH 709) situated approximately 1.6 km to the south. The district headquarters of Panipat is positioned around 11.81 km northeast from the project site. The area falls within Survey of India Topo sheet no. H43Q15, scaled at 1: 50,000. Index

map, google map (10km radius), study area map showing environmental settings and photographs of the proposed site is given in Chapter – 1.

2.3.1 SIZE OR MAGNITUDE OF OPERATION

M/s. ACL Pvt Ltd. is proposing to setup a Stand-alone grinding unit with Cement Production Capacity of 4.0 MMTPA will be done in 9.28 Ha of land at Naulatha village, Panipat District, Haryana (Table 2.1). Plant area breakup is given in Table 2.3. The overall layout indicating the Grinding and other sections of the plant is shown in Figure-2.1.

TABLE 2. 1 THE CAPACITY/PRODUCT DETAILS AS PER THE TOR

Description	Size/Proposed Capacity
Cement Grinding Unit	4 MMTPA

2.3.2 ENVIRONMENTAL SETTING WITHIN 10 KM. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the plant site as given in Table 2.2.

TABLE 2. 2 ENVIRONMENTAL SETTING WITHIN 10 KM RADIUS OF THE PLANT SITE

S. No	Salient Features/Environmental Features	Distance W.r.t Site/Remarks
1.	Type of Project	Proposed Cement grinding
2.	National Park/ Wild life sanctuary /Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	None within 15 km radius from the project site.
3.	Historical places / Places of Tourist importance / Archaeological sites.	Panipat Museum 8.9 Km, NE
4.	Industrial areas/cluster /Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010.	None
5.	Defence Installations	None
6.	Fort facility	None
7.	Interstate Border	15 km radius from the project site.
8.	R & R	No R & R issues
9.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	None

TABLE 2.3 LAND AREA BREAK UP DETAILS

Sl. No.	Land use Description	Proposed in Ha	Percentage
1.	Plant & Machinery	2.07	22.31
2.	Open area	3.98	42.89
3.	Green Belt Area	3.23	34.81
	Total	9.28	100

2.3.3 PLANT LAYOUT

The proposed plant is located within the land which is already under possession of ACL. The site has been selected based on the following points

- Availability of land and raw material transport.
- Ease of accessibility for road and railway line.
- Proximity and availability of water resource

The detailed engineering plant layout showing the proposed plant set up has been given in figure 2.1.

Facilities / Activities Proposed

The major facilities and associated activities of proposed project are as given in Table-2.4.

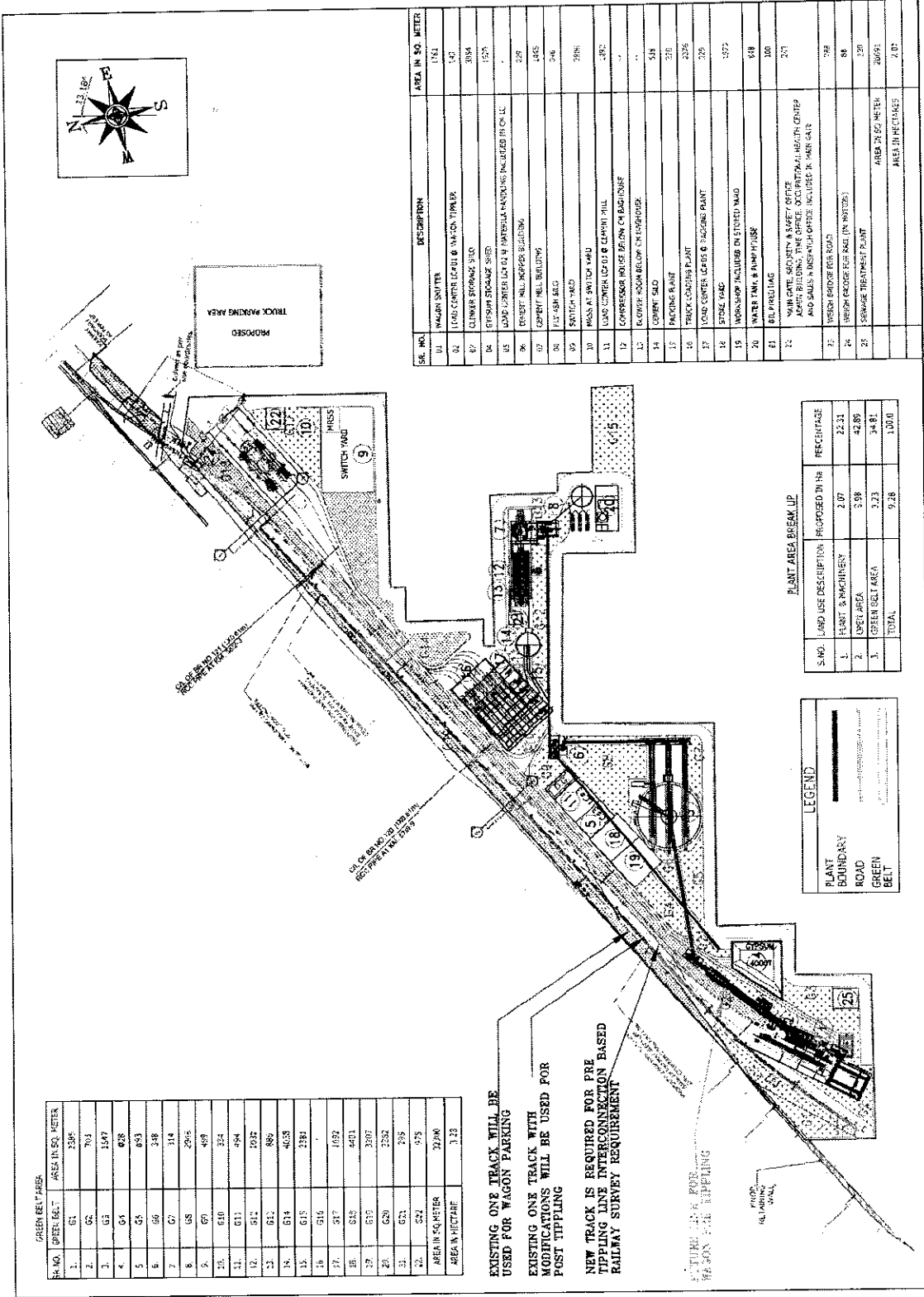


FIGURE 2.1 PROPOSED PLANT LAYOUT

TABLE 2. 4 MAJOR FACILITIES AND ACTIVITIES OF PROPOSED PROJECT

Unit	Major facilities and associated activities proposed
Proposed Cement Grinding Unit	<ul style="list-style-type: none"> - Cement Mill - Storage Facilities for Raw Materials (Covered Sheds, Silos) - Packing Plant - Truck Parking Area

Taking into account, reliability of equipment and matching capacities between the different sections of the grinding unit, the type of equipment/ installation system and the departmental capacities at the grinding unit, will be arrived.

2.4 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The project implementation period shall be 18 months for project execution activities after placement of main machinery order until the plant commissioning. As per the project implementation schedule the expected implementation time has been estimated as 6 months for pre-project activities and project execution within 18 months. The installation of several production units along with utilities and services require co- operation for procurement of equipment, equipment foundations, awarding of all contracts and supervision of all construction jobs at plant site.

The factors which are responsible for timely implementation of the project are:

- i. Arrangement of proper finance for the project.
- ii. Designing of utilities and services.
- iii. Placement of orders for plant and machinery.
- iv. Arrangements for Govt. sanctions and supply of power.
- v. Recruitment of personnel.

As per an initial estimate around 18 months will be needed for implementation of the project after obtaining EC and CTE/CFE from regulatory authorities.

TABLE 2. 5 DETAIL PLANNING AND CLOSE MONITORING OF VARIOUS ACTIVITIES INVOLVED IN PROJECT EXECUTION

SN	Project Activity	Months																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Project Activities after Main Machinery Order																		
2	Load Data/GA from Suppliers (Main Machinery)																		
3	Procurement of Auxiliary Equipments																		
4	LoadData/GA from Auxiliary Equipments																		
5	Departmental GA drawings																		
6	Design and Construction drawings																		
7	Civil Construction																		
8	Inspection and Delivery of Main Machinery																		
9	Inspection and Delivery of auxiliary Equipment																		
10	Mechanical Erection																		
11	Electrical Erection																		
12	Instrumentation Erection																		
13	Trial Runs and Commissioning of Grinding Unit																		

2.5 MANUFACTURING PROCESS OF GRINDING UNIT

2.5.1 PROCESS DESCRIPTION

The major facilities and associated activities proposed as a part of proposed project are provided in Table 2.6 as below:

TABLE 2. 6 PROPOSED PLANT FACILITIES

Sl. No	Unit	Proposed major Facilities
1	Grinding Unit	<ul style="list-style-type: none"> - 2 no. with feeding system - Wagon Tippler with unloading system - Packers (6 no.) - Stacker & Reclaimer - Storage facilities: Clinker Silo (2), Cement Silo (4), Fly ash Silo (2), RM Storage hoppers, and Covered Sheds - Raw material Conveying system (belt conveyors) - Cement bags loading machine for trucks (18 nos.) - fly ash dryer (with HAG - 2 nos.)

1. Cement Grinding

Clinker, gypsum and Fly ash will be loaded into their respective hoppers using a suitable material handling system. Ambuja. Clinker grinding will be achieved using either a Vertical Roller Mill (VRM) or a combination of a ball mill and roller press. The cement grinding circuit will include arrangements for clinker storage, gypsum storage, fly ash storage, and other raw material storages as required by BIS standards for different types of cement, as well as cement storage and a packing plant. Clinker unloading and the loading of bagged cement for road transport will be carried out by trucks and

bulklers. The process technology for VRM and the ball mill with roller press is discussed below:

2. Vertical Roller Mill (VRM)

A Vertical Roller Mill (VRM) is an advanced grinding technology used in the cement manufacturing process. This type of mill is particularly suitable for producing high-quality cement efficiently, with several advantages over traditional grinding systems.

Efficiency and Energy Savings:

- VRMs are highly efficient and consume less power compared to ball mills. This results in significant energy savings, making VRMs an environmentally friendly option.
- They offer a low power consumption per ton of cement produced, which reduces operational costs.

Compact Design:

- The vertical arrangement of the grinding rollers and the grinding table makes VRMs more compact and space-efficient.
- This design allows for a smaller plant footprint, which is particularly beneficial in urban or space-constrained environments.

Material Feed and Drying:

- VRMs can handle a wide range of raw materials, including clinker, gypsum, and fly ash.
- The mill integrates a drying function, allowing for the simultaneous grinding and drying of materials with moisture content, enhancing overall process efficiency.

Grinding Efficiency:

- The grinding rollers apply a high pressure to the material bed, resulting in efficient comminution.
- VRMs provide a consistent particle size distribution and a finer product, which improves the quality of the final cement.

Operational Flexibility:

- VRMs can be adjusted to grind various types of cement by modifying operational parameters, providing versatility in product output.
- They allow for easy and quick adjustments to optimize performance and maintain high productivity levels.

Maintenance and Durability:

- VRMs are designed for minimal wear and tear. The rollers and table are made from durable materials to withstand the grinding process.
- Maintenance is simplified due to the easy accessibility of wear parts and the straightforward design, reducing downtime and operational interruptions.

Application in Cement Grinding:

In the cement grinding process, the VRM is used to grind clinker along with other materials such as gypsum. The ground materials are then conveyed to the storage silos or directly to the packing plant.

The VRM's ability to grind a variety of raw materials and produce a uniform product makes it an integral part of modern cement manufacturing. Overall, the Vertical Roller Mill (VRM) represents a significant advancement in cement grinding technology, offering energy efficiency, compact design, and operational flexibility, making it a preferred choice for modern cement plants.

3. Cement packing

The cement from four silos will be extracted and fed to the installed 2 x 3 nos. of electronic packers, 16 spout, double discharge with a capacity of 240 TPH each through air slides, bucket elevators and screens. Each Packer will be connected with 3 nos. truck/trailer loaders for loading packed cement bags. The packed bags from packers will be transported to truck loading bays by suitable flat belts conveyors and diverters. A separate provision will be also available to load bulk cement through closed Bulklers.

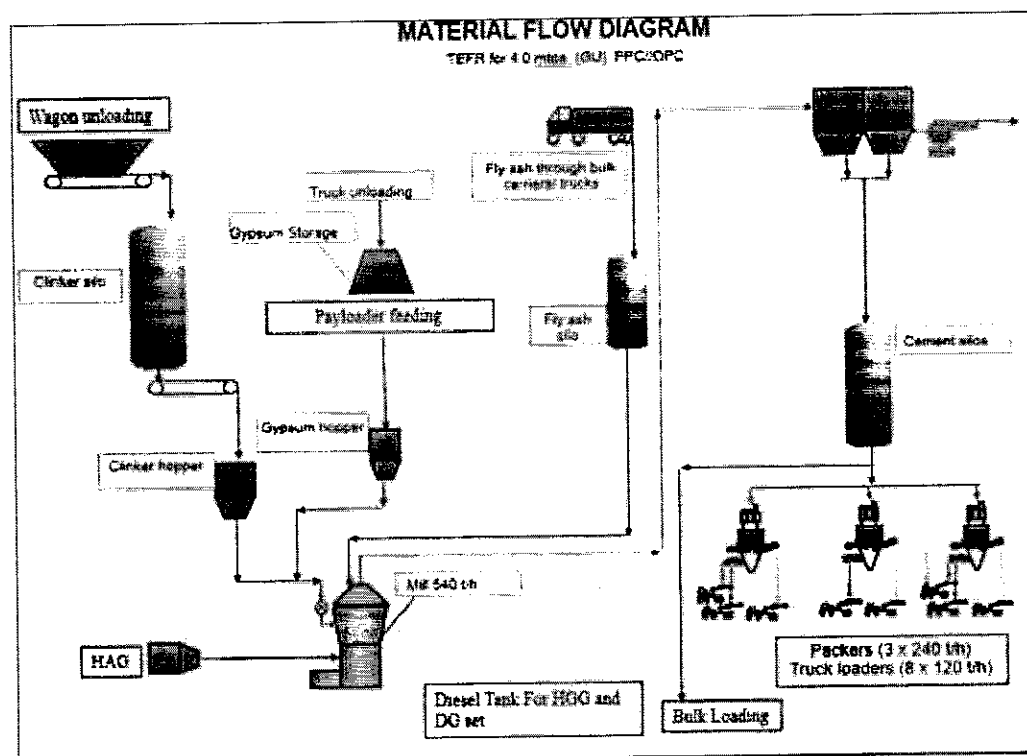


FIGURE 2. 2 PROPOSED PROCESS FLOW DIAGRAM

2.6 RESOURCES REQUIREMENT

2.6.1 LAND REQUIREMENT

Total project site area is 9.28 hectare. 34.81 % of the total area shall be covered under Green Belt (3.23Ha).

TABLE 2. 7 LAND USE CLASSIFICATION

S. No	Type of Land	Area (In Hectare)	Suitability of land	Status of Acquisition
1.	Fallow Land	9.28	Land is suitable for cement Industry: already identified for industrial & commercial uses.	Presently the land is owned by Adani Agri Logistics Panipat Ltd, a group company of Adani. Ambuja Cements Limited, the applicant is another group company of Adani and presently there is MOU between Adani Agri Logistic and Ambuja Cements, for utilization of 9.28 Ha of land for proposed Project.

2.6.2 LIST OF INDUSTRIES WITHIN 10 KM. RADIUS OF THE PLANT SITE

Following are list of Industries within 10 Kms. radius of the plant site in the Table 2.8.

TABLE 2. 8 LIST OF INDUSTRIES WITH IN 10 KM REGION

S.No	Name of Industry	Distance/Direction
1.	National Fertilizer Limited	8.3 km / NE
2	Panipat Thermal Power Plant	7.2 Km/ N
3	Shree Cement Limited Grinding Unit	9.52 Km/N
4	Nirmal Transport Company	9.37 Km/NE

2.7 RAW MATERIAL DETAILS

The maximum annual requirement of major raw materials and their probable sources of procurement are given below in Table 2.9. Raw material requirement shall vary with the type of cement (OPC/PPC & other types as per market demand) manufacturing.

TABLE 2. 9 THE MAXIMUM ANNUAL REQUIREMENT OF MAJOR RAW MATERIALS

Sl. No.	Raw material for each line (Dry basis)			Source & Distance	Mode of Transport	Storage for both lines
	Particulars	Max	Min			
1.	Clinker	1 X 3.8 MTPA	1 X 1.2 MTPA	In house/ Domestic Plants (Marwar Mundwa or any other in-house sources) ~600Km	Road & Rail	Clinker Silo 50000 MT
2.	Gypsum	1 x 0.32 MTPA	1 x 0.20 MTPA	Bikaner, Rajasthan or any other domestic sources	Road & Rail	Covered Shed 4000 MT

				~500Km		
3.	Fly ash	1 x 1.4 MTPA	1 x 1.2 MTPA	Nearby thermal Power plant (Hissar Panipat/ NPL Rajpura/Talwandi Sabo) ~210 Km	Road & Rail	RCC Silo 1 x 4000 MT

Note: The raw materials will have minor percentage moisture and undergo some losses during transportation, handling and screening. Considering all such losses, the estimated gross annual requirement of raw materials is to be procured annually.

2.7.1 RAW MATERIAL TRANSPORT, STORAGE & HANDLING

Major raw materials (clinker/gypsum/fly ash) will be brought to the plant site by rail and by road in covered trucks up to the plant site. All the trucks used for the transport of raw materials, products and wastes will be completely covered with tarpaulin and ensured no spillage during transportation. All the raw material required for the project will be stored in covered storage yards. All the raw material yards are equipped with water sprinkling system so as to avoid fugitive emission during the material handling.

Internal roads will be made pucca as per the need during expansion also. Trucks will be used for raw material & final product transportation.

2.7.2 RAW MATERIAL MIX OF CEMENT:

The raw materials mix of cement is given below in the Table 2.10.

TABLE 2. 10 REPRESENTS THE RAW MATERIAL MIX OF THE CEMENT

Sl. No.	Raw Material	OPC	PPC
1	Clinker	92%-95%	60%-65%
2	Gypsum	5%-8%	5%-8%
3	Fly ash	0%	30%-35%

*Slag may be used in future depending upon the availability.

These values have been used as a basis for this report.

Moisture in gypsum(natural/chemical)	- 12-20%
Moisture in CFA / Wet Fly ash	- <10-20%
Moisture in Dry Fly ash	- <1-2%
Moisture in Clinker	- <1% Dry

2.8 MANPOWER REQUIREMENT

The total manpower requirement during construction and operation phase is given in table 2.11.

TABLE 2. 11 MANPOWER REQUIREMENT

Description		Construction Phase	Operation Phase
Proposed	Permanent	30	30
	Contract	1500	125
Total (A)		1530	155

2.9 WATER REQUIREMENT

2.9.1 DURING CONSTRUCTION PHASE

The water requirement of about 200 KLD will be sourced from Ground Water. The construction will be sustaining about 18 months approx. Application for ground water extraction will be submitted to Haryana state/CGWA and permission shall be processed progressively.

2.9.2 DURING OPERATION PHASE

The water requirement will be 400 KLD for process and equipment cooling. Major quantity of water in Cement grinding process requires for water spray in the mill to stabilize the material bed and to control the cement temperature. In addition to this second major quantity of water is required for equipment cooling. For plant equipment, water shall be re- circulated after cooling to avoid any wastage and only losses shall be making up from fresh water. Besides some quantity of water is required for drinking and green belt development activities. The proposed freshwater requirement of about 400 KLD will be sourced from Ground water.

2.9.3 WASTEWATER GENERATION

There will be no effluent generation in the proposed project. The only wastewater generation will be sewage of quantity 10 KLD which will be treated in the proposed STP of total capacity of 15 KLD. Following the treatment, the treated sewage will be used for dust suppression and plantation purpose.

TABLE 2. 12 DISTRIBUTION OF WATER REQUIREMENT

Description	Consumption in KLD
Potable water consumption	10
Process water consumption(Mill Spray)	280
Water consumption in lab	5
Equipment cooling Evaporation + Blow down losses	90
Total water consumption	385
Total waste water from process and cooling	
Loss in CT blow down	15
Losses in water treatment	15
Regeneration from sewerage water treatment plant	6.0
Total for dust suppression system and green belt	36

The proposed water balance diagram is given below in figure 2.3:

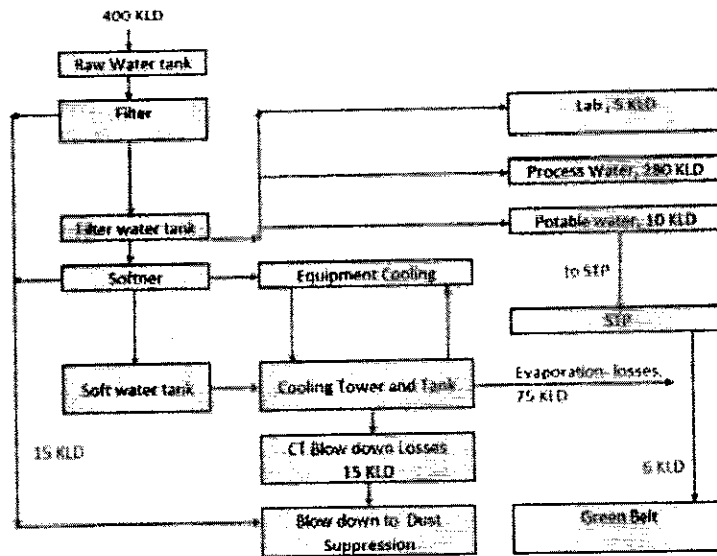


FIGURE 2. 3 PROPOSED WATER BALANCE DIAGRAM

2.10 POWER REQUIREMENT

The power requirement for the project is sourced from nearby sub- station at Naulatha at 132 KV/ 66 KV switch yard with suitable step-down transformer, if required. The details of power requirement are given below.

TABLE 2. 13 POWER AND FUEL REQUIREMENT

Description	Proposed	Source
Power requirement (MW)	23 MW	Dedicated supply line from nearby sub-station at Naulatha at 132 KV / 66 KV switch yard with suitable step-down transformer, if required.
Diesel (Standby)	125 L/h for DG set 400 L/h for HGG	To be directly sourced from nearby authorized local retailers as and the required for intermittent consumption for HGG (Hot Gas Generator) and DG Set (1 X 1250KVA) as power backup.

2.11 MITIGATION MEASURES INCORPORATED IN THE PROJECT:

2.11.1 AIR POLLUTION CONTROL MEASURES

- All major sources of air pollution (Cement Mill) will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms less than 30 mg/Nm³ for particulate matter emission from the stacks.
- Bag filters will be provided at all loading /unloading points and transfer points.
- Clinker will be transported by truck/conveyor and fed directly/through Bulk Reception Unit; Gypsum will be stored in covered shed at proposed plant and cement in cement silo. Fly- ash

will be transported through bulkers and stored in fly ash silo.

- Proper maintenance of vehicles will be done to reduce gaseous emissions.
- Operators will be provided with personal protective equipment like safety Goggles, dust mask, ear plugs, helmets, shoes etc.
- Periphery of plant and surrounding areas of office building will be covered by thick green belt to attenuate the pollutants emitted by the Plant.
- Ambient air quality and stack emissions will be regularly monitored to keep emission levels below the prescribed limits.

2.11.2 WASTE-WATER GENERATION & TREATMENT

- No industrial wastewater will be generated during cement manufacturing process.
- Domestic wastewater generated from office toilets will be treated in modular STP and used for dust suppression and plantation.

2.11.3 NOISE ENVIRONMENT

- Walls and ceilings of the concerned buildings will be lined with sound absorbing materials.
- Properly insulated enclosures will be provided for high noise generating plant machinery.
- Personal Protective Equipment like earplugs and earmuffs will be provided to the workers.
- Regular monitoring of noise level will be carried out and corrective measures in concerned.

2.11.4 SOLID WASTE GENERATION

Most of the process waste generated in cement industry is reused in process. Dust collected from air pollution control equipment will be totally recycled in process. Sludge from Modular Sewage Treatment Plant (STP) will be used as manure for green belt development. A part of used oil will be utilized for lubrication purpose & remaining will be sold to authorized PCB vendors. Following type of waste will be generated. The solid waste generation and management details are given in the table 2.14.

TABLE 2. 14 SOLID WASTE GENERATION AND MANAGEMENT

Waste	Quantity (TPA)	Collection method	Treatment / disposal method
	Proposed		
Organic Waste (Including Sewage sludge)	25	Bins	Organic waste is composted and used as manure for greenbelt development
In Organic	15	Bins	Authorized PCB vendors

TABLE 2. 15 HAZARDOUS WASTE GENERATION AND MANAGEMENT

Sl. No.	Name of materials	Schedule	Proposed Quantity	Handling & Storage	Method of disposal
1	Used Oil	5.1	1 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
2	Cotton rags	33.2	2 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
3	VRLA (sealed battery)	-	0.5 TPA	In isolated area with non-permeable concrete flooring	To OEM through buy-back/through authorized recycler
4	Used Oil Containers @30 x200L capacity	-	0.4 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB Authorized agency (TSDF)

2.11.5 GREEN BELT DEVELOPMENT

Out of total land about 3.23 hectare of which ~34.81 % of the area will be developed as greenbelt area & plantation. A thick greenbelt all along the roads and plant will be developed.

- Plantation will be done in and around the plant premises.
- 70% survival rate will be maintained with all possible efforts.
- The trees will be planted at suitable grid spacing to encourage proper growth.
- Local plant species will be preferred

2.11.6 ENERGY SAVING MEASURES

Power savings methods are adopted as per energy conservation:

- Temperature sensors with visible temperature indicators in the switch boards
- Check metering at various locations to check the power consumption and power loss if any.
- Variable speed drives for motors
- Suitable rating and size cables selection to limit the total power distribution losses less than 1%
- Solar water heater for pre – heating water required for bathing and cooking.
- Use of high efficiency hybrid chillers (water and air cooled) and variable speed drivers.

2.11.7 QUALITY CONTROL

The quality control department at the proposed plant shall have the following facilities:

i) Chemical Analysis laboratory

Facilities for testing the physical properties like sieve analysis, setting time, soundness, fineness, CCS,

Grind ability, moisture content, drying shrinkage, etc. following lab equipment are envisaged:

- X-ray diffractometer (XRD)
- Conventional chemical analysis equipment.
- For Physical Analysis system

ii) Particle Size Distribution (PSD)

To determine the PSD of the clinker, cements, etc. a laser diffraction type PSD analyzer will be installed.

2.11.8 QUALITY CONTROL PLAN

To produce good quality cement, it is imperative that sampling & testing of various raw materials like clinker, gypsum, fly ash and the final product is carried out regularly at the required intervals for taking corrective action timely as per standards. To ensure consistent product quality and to permit the trouble free and cost-effective operation, the quality control plan for sampling & testing of various raw materials, in-process materials and the final product is suggested. While proposing the methods and procedures for quality control, the following aspects have been considered.

- Requirements and norms, particularly in cement testing.
- Corrective measures to be undertaken as quickly as possible in the process operation.
- Desired degree of automation.
- Available raw materials and process equipment.
- The main area of quality control has been envisaged.
- Before Cement Mill
- After Cement Mill
- Laboratory

The laboratory will be accommodated in the Central Control Room (CCR) building at the proposed plant site. The laboratory shall have the provision of chemical and physical testing facilities for raw materials, clinker, gypsum, fly ash and cement.

CHAPTER -3 DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

This chapter gives an idea and description of environmental status of the study area with reference to the prominent environmental attributes. The main objective of describing the environment is to assess present environmental quality & the environmental impacts. The study area comprising 10 Km. radius of the project site of M/s Ambuja Cements Limited, Naulatha, Haryana is covered in Survey of India Topo Sheet Nos. H43Q15.

The impact identification always commences with the collection of baseline data such as ambient air quality, ground water quality, surface water quality, noise levels, land environment, land use pattern, flora & fauna and socio-economic aspects with in the study zone of 10 Km. radius

3.2 STUDY AREA AND PERIOD

As per the EIA guidelines, study was conducted within a 10 km radius from the periphery of the proposed site. For this project the data was collected during 1st October 2023 to 31st December 2023. Baseline data for environmental attributes like ambient air, meteorology, water, hydrology, land use, soil, geology, noise, socio-economic, ecology and biodiversity etc. were collected. The study was conducted during the Post Monsoon Season (Oct, 2023 to Dec.,2023). Further, a buffer area extending to 10 km radius from the site has also been studied, though with a lesser degree of detail, in order to understand the land use and places of environmental sensitivity of the area.

3.3 METHODOLOGY OF EIA STUDY

Various steps involved in environmental impact assessment study of this project site are:

- Identification of significant environmental parameters and assessing the existing status within the impact zone with respect to air, water, noise, soil, biodiversity and socioeconomic components of environment.
- Study of various activities of the proposed in the plant to identify the activity leading to impact / change in environmental quality.
- Prediction of impact for the identified activities and to study level of impact on various environmental components.
- Evaluation of impacts after superimposing the predicted / experienced scenario over the baseline scenario.
- Formulation of Environmental Management Plan for implementation in the proposed project.

3.3.1 PRIMARY DATA COLLECTION

The primary Environmental data has been collected in relation to proposed project for environmental parameters which is pre-requisite for environmental impact assessment study in order to assess the status and future trends of environmental attributes against which the predicted changes can be compared and evaluated in terms of importance. Primary data can be interpreted with site conditions and cross checked with secondary data. For selection of monitoring stations, the entire 10km radius-surrounding project area has been considered for following parameters in Table 3.1.

TABLE 3. 1 PRIMARY DATA COLLECTION AND METHOD

S.No	Area	Description	Method
1	Meteorology	The meteorological data was collected for ambient temperature, rainfall, relative humidity, wind pattern, wind speed	An automatic meteorological station was set up at project site to record temperature, relative humidity, wind direction and other parameters were recorded hourly continuous for three months.
2	Ambient Air Quality	Particulate matter (PM10 & PM2.5), Sulphur dioxide (SO2), Nitrogen dioxide (NO2), Carbon monoxide (CO).	In order to assess the Ambient Air Quality (AAQ), samples were collected by installation of Respirable Dust Sampler - APM 460 of Envirotech make (with Gaseous attachment facility) and Fine Particle Sampler - APM 550 of Envirotech make at 8 different locations in the study area and analyzed for project specific air pollutants, as per CPCB guidelines.
3	Noise Level	L day: This represents Leq of day-time. and calculated as logarithmic average using the hourly Leq for day time hours from 6.00 A.M to 10. 00P.M L night: This represents Leq of night-time. and calculated as logarithmic average using the hourly Leq for night-time hours from 10.00 PM to 6.00 A.M.	Noise level measurements were done once at 8 locations in the study area at different intervals of time for 24 hours with the help of sound level meter to establish the baseline Lday and Light noise pressure levels in the study area.
4	Water Quality	Surface Water	Surface water samples collected from 4 locations for analysis once in the study period.
		Ground Water	Ground water samples were collected once in study period from 8 locations and analyzed as per standard APHA and IS: 3025 criteria and IS: 10500, 2012.
5	Soil Quality	Physical and chemical characteristics	Random soil samples were collected by auger up to depth of 30 cm and homogenized samples were analyzed as per the methods described in "Soil Chemical Analysis" (M. L. Jackson, 1967), once during study period at 7 locations.
6	Ecology&	Inventory of flora & fauna in 10	Floral and faunal inventory were

	Biodiversity	km radius	prepared by identifying various plants and animal species in the study area during field visit, data collected from Forest Department and other sources.
7	Socioeconomic status	Population, household, caste distribution, infrastructure available	Socio-economic data was collected from primary sources through village-level surveys, group discussions and consultation.

3.3.2 SECONDARY DATA COLLECTION

Secondary data are those collected over the years by external agencies that can be used to understand the existing environmental scenario of the study area. The environmental impact assessment (EIA) studies are conducted over a short period of time and therefore the understanding of the environmental trends, based on a few months of primary data, has limitations. Ideally, the primary data must be considered along with the secondary data for complete understanding of the existing environmental status of the area. The secondary sources used for reference for this project are given in Table-3.2.

TABLE 3. 2 SECONDARY DATA COLLECTION

S. No.	Area	Description	Source	Use of data
1	Meteorology	Temperature, rainfall, humidity, seasonal wind pattern, wind speed, cloud cover, stability, mixing height, inversion	IMD Station, Karnal (1981-2010). Hourly meteorological data collected during site visit.	The data was used for verification of data generated during the on-site monitoring through data logger.
2.	Ambient Air Quality	Hourly concentration of PM10, PM2.5, SO2, NO2, CO	Ambient air quality data reported in various EIA Reports of nearby industries available in MoEF&CC website.	The data was used for verification
3.	Water Quality	Ground Water	Water quality data reported in various EIA Reports of nearby industries available in MoEF&CC website and Central Ground Water Board.	The data was used for verification

4.	Soil Quality	Physical & Chemical characteristics	Soil quality data reported in various EIA reports of nearby industries available in MoEF&CC website and other publications	Soil data was verified by collecting soil samples from the study area which was then analyzed for relevant physical & chemical characteristics.
5.	Nature of terrain	Land-use	Survey Toposheet, National Remote Sensing Centre (Satellite image) of India	Data from various sources were used
6.	Hydrogeology	Geological Formation and analysis, hydro-geological analysis	Ground water brochure of Haryana State, before monsoon and after monsoon	The data was used for verification
7	Seismic Data	Seismic zone, presence of faults, thrust	Vulnerability Atlas of India (2006)	Discussion were carried out with local people to verify the frequency of occurrence of earthquake in the area
8	Biological Environment	Inventory of flora & fauna, endemic species, migratory routes	District Forest Department	Ecological data was used during carrying out field survey and discussion with locals to establish the species richness of the area.
9	Socio-economic status	Demographic profile, household, occupation status	Census data (2001 & 2011) Data collected from district office.	The census data was used with the primary data and the data from district office.

3.4 VULNERABILITY OF THE SITE

a) Seismicity

As per the seismic hazard map of India updated in 2000 by the Bureau of Indian standards (BIS), Haryana state is divided into 3 seismic zones. The study district Panipat falls under seismic zone III which is a moderate risk zone. The IS code assigns zone factor of 0.10 % of gravitational acceleration) for zone III.

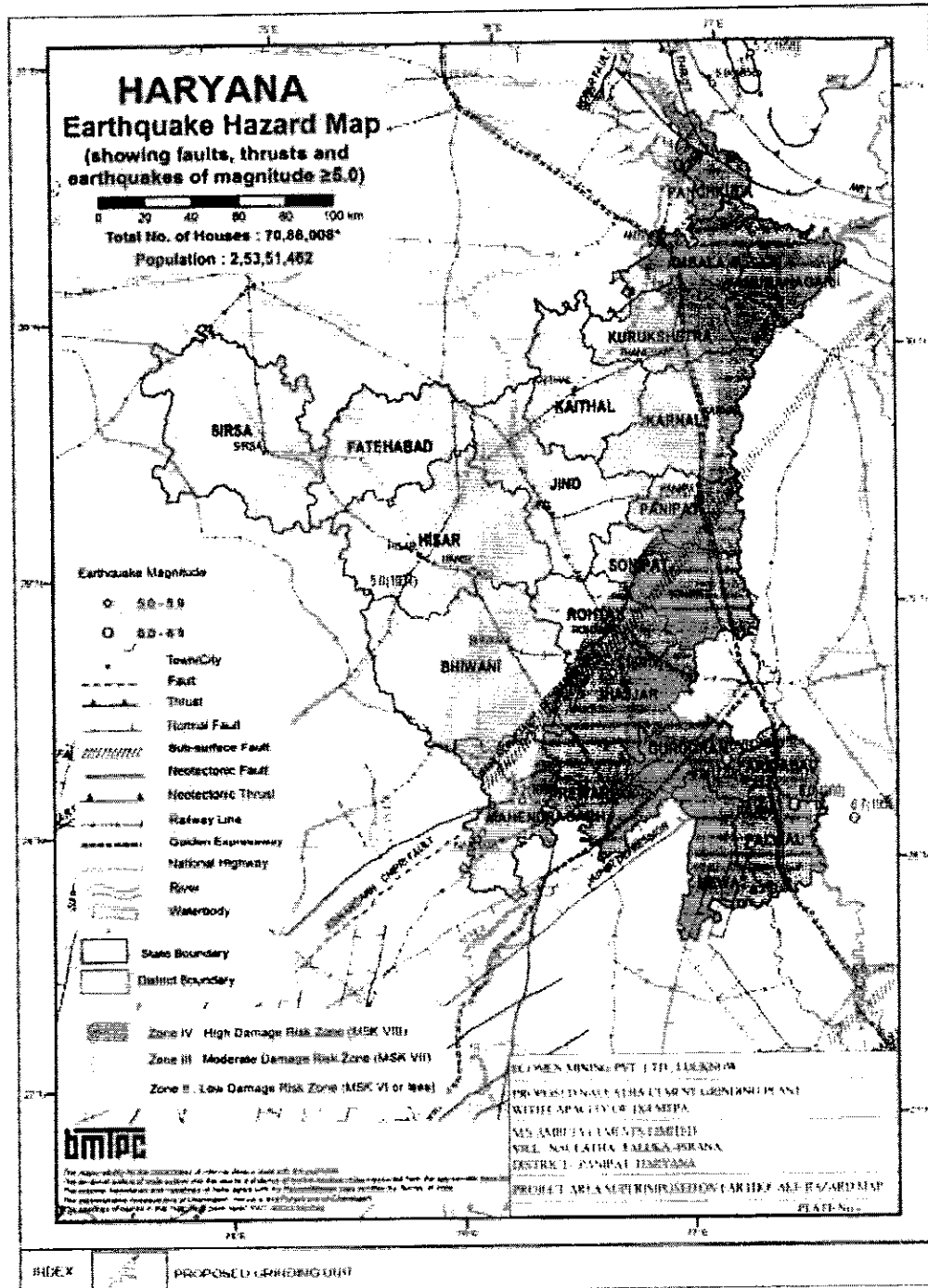


FIGURE 3.1 SEISMIC ZONATION MAP OF INDIAN

b) Wind

The Panipat district falls under low wind risk. The map for flood risk of India is given in figure and Haryana state is given comes in low wind hazard zone as per the BMTPC Wind Hazard Zonation Map.

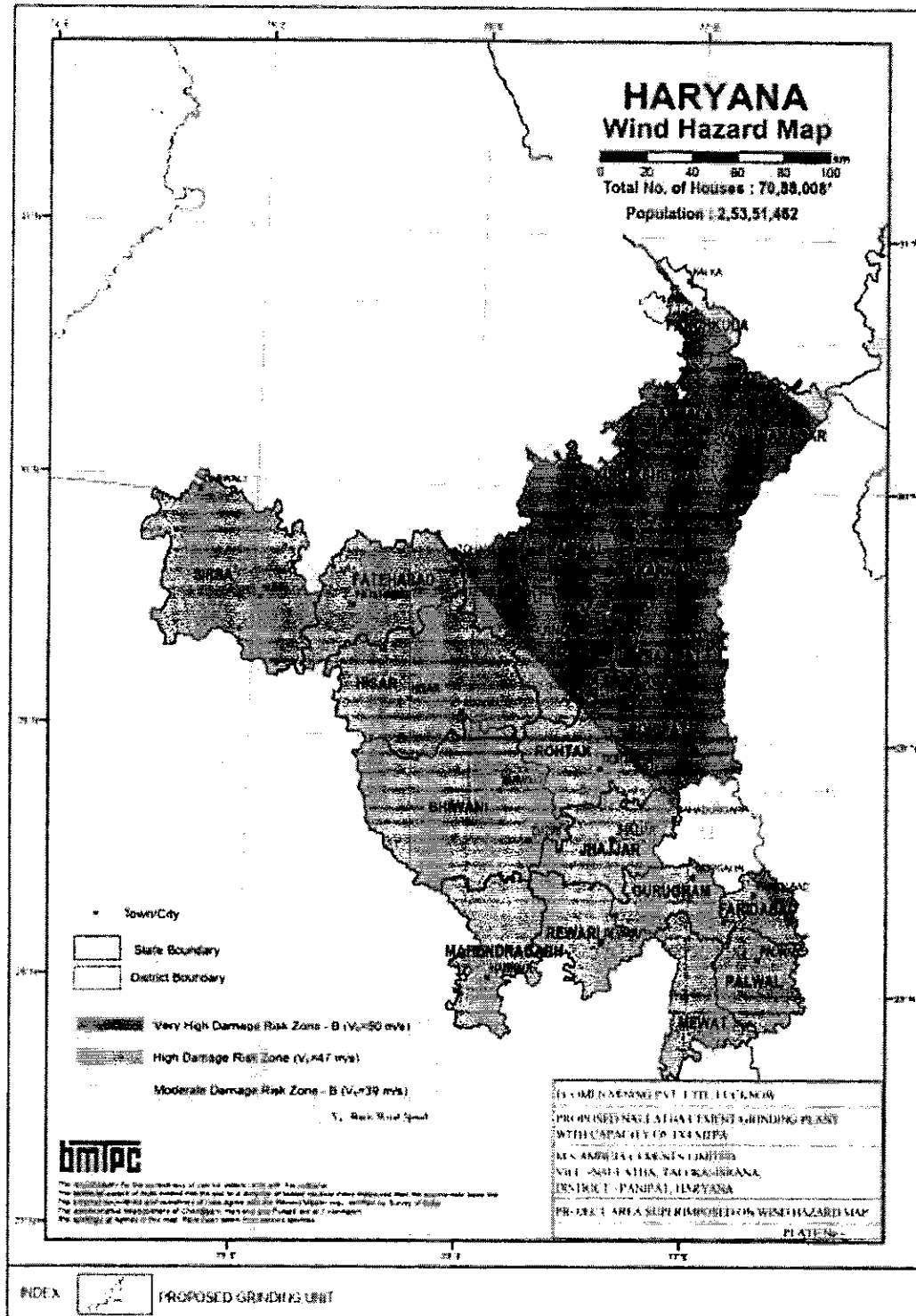


FIGURE 3.2 WIND ZONATION MAP OF INDIAN

c) Flood

The Panipat district falls under moderate flood risk. The map for flood risk of India is given in figure and Haryana state is given comes in moderate flood hazard zone as per the BMTPC Flood Hazard Zonation Map.

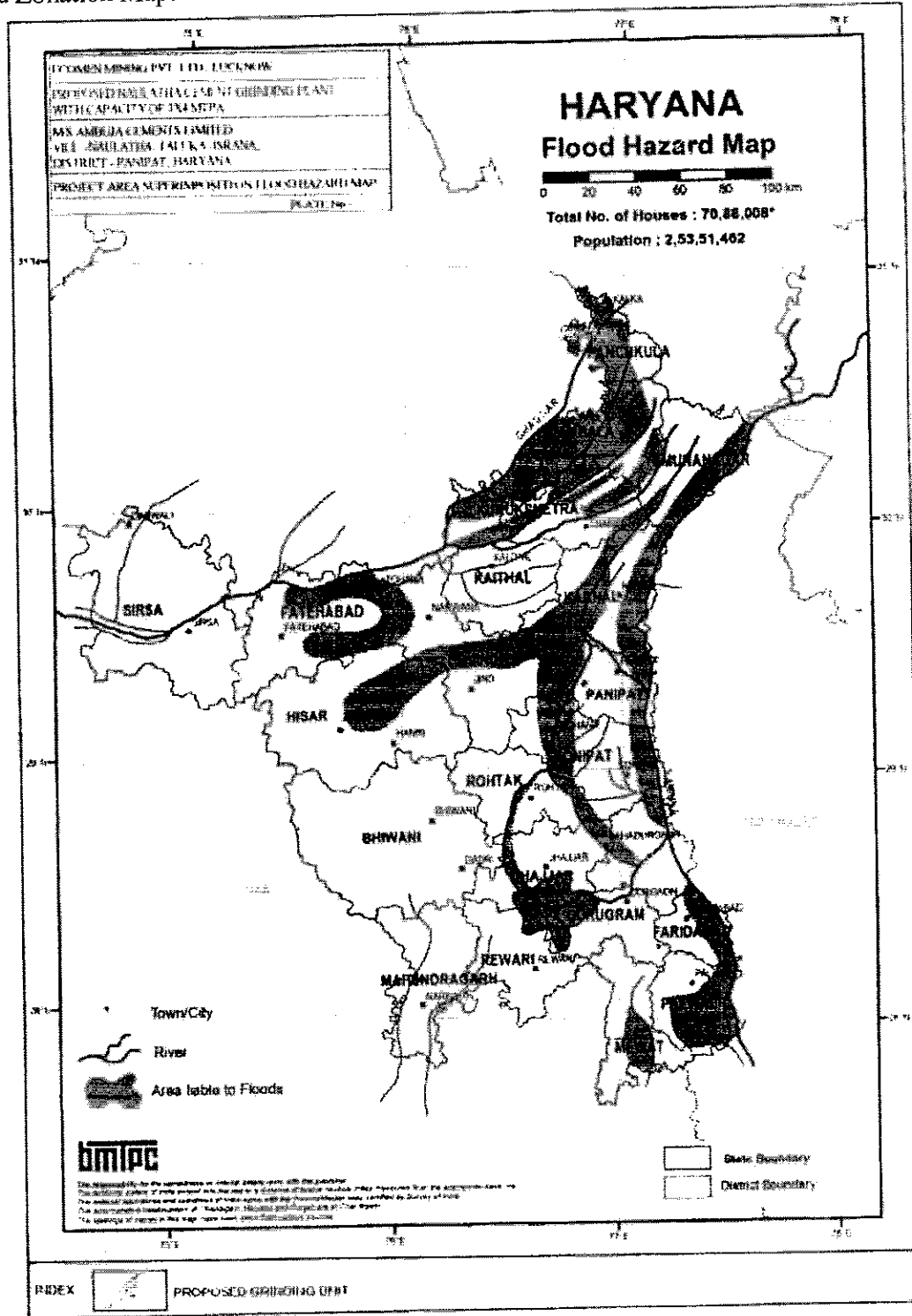


FIGURE 3. 3 FLOOD HAZARD ZONATION MAP

3.5 PHYSICAL ENVIRONMENT

The study has been done for the entire district through published literature for general idea which also covers the project area.

3.5.1 TOPOGRAPHY

Panipat is situated between latitudes 29°9'50" N and 30°15'15" N and longitudes 76°10'10" E and 77°17'05" E. As part of the Indo-Gangetic Plain, the area features generally flat terrain with slight slopes running from the northeast towards the south and southwest. The region predominantly consists of alluvial deposits formed by tectonic activities due to the uplift of the Himalayan ranges. These deposits comprise layers of alluvial silt and sand. Beneath these deposits lie the Shivalik and tertiary residues, as well as formations from the Gondwana and Cretaceous periods. Soil in Panipat is mostly tropical arid in nature with variations from sandy loam to alkaline loam. The higher amount of organic matter has made these soils darker in color. The area comes under Yamuna sub basin under Ganga Main basin and it is drained by Yamuna along with its tributaries. The Yamuna flows narrowly towards north and its flood plain widens downstream.

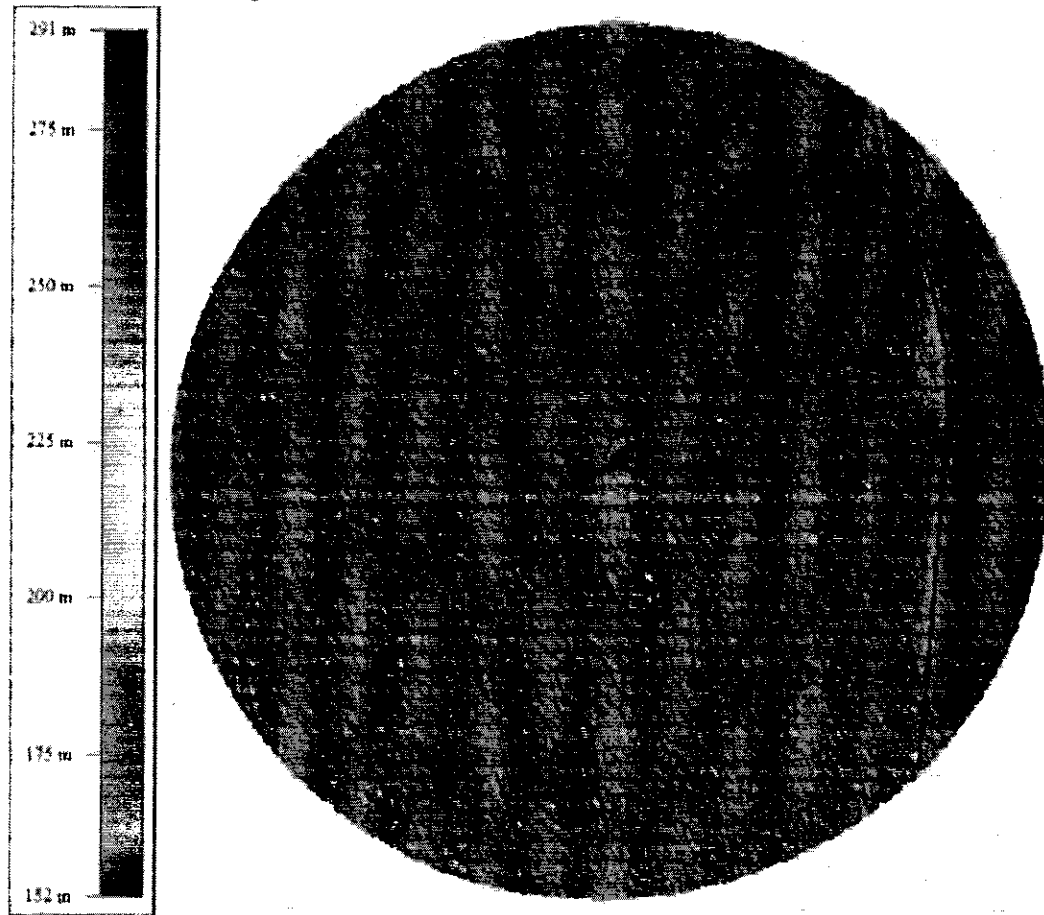


FIGURE 3. 4 DIGITAL ELEVATION MODEL OF PROJECT AREA

3.5.2 GEOLOGY

The district is occupied by geological formations of Quaternary age comprising of Recent alluvial deposits belonging to the vast Gangetic alluvial plains. Geologically, Sub-recent to Recent alluvium and windblown sand of fluvial and aeolian origin are the predominant units occupying region, except few exposures of quartzite's on southern part and sand dunes in western part. These sediments have 300-650 m of thickness on the average, which increases gradually towards north in the fore deep of Indo- Gangetic basin. These sediments unconformably overlie undulating basement of Delhi Super Group of rocks belonging to Proterozoic age. The age of Quaternary sediments ranges from upper Pleistocene to recent. The Delhi Super Group of rocks are further divided into the Alwar and Ajabgarh Groups. The former comprises predominantly arenaceous sediments consisting of felspathic quartzite, massive quartzite, mica-schist and carbonaceous phyllites. The Alwar rocks also occur in Khodana-Sohna- Dadri ridge in the southwest. The Ajabgarh rocks are by and large of argillaceous and calcareous facies, which comprise shale, slate, phyllites, pelitic schist, crystalline limestone, marble, calc schist etc. with intercalations of quartzite. The Older Alluvium consists normally of clay, sand, gravel, silt, silty sand and silty clay with Kankar mixed in various proportions. The Older Alluvium is poorly sorted and is usually characterized by richness and nodules of calcium carbonate known as Kankar. The Older Alluvium generally forms slightly elevated terraces above the flood level of the present drainage.

3.5.2.1 REGIONAL GEOLOGY

The north-eastern and central part of Haryana is predominantly characterized by sedimentary lithology in the Sub-Himalayan zone comprising Subathus, Dagshais, Kasaulis and Siwaliks. A general Regional stratigraphic sequence in the area is given in below Table 3.3.

TABLE 3.3 REGIONAL STRATIGRAPHIC SEQUENCE

Age	Super group	Group	Formation	Lithology
Holocene			Newer alluvium and Newer Aeolian Deposits	Gravel, Sand, silt, clay, limestone, gypsum
Lower to upper Pleistocene			older alluvium and Older Aeolian Deposits	Gravel, grey sand, silt, clay, brown sand, calcrete
Lower to Middle Pleistocene	S I W A L	Upper Siwalik	Boulder Conglomerates formation	Conglomerate, sandstone, silt, clay
Upper Pliocene			Pinjore Formation	Coarse grit, red sand stone and clay, conglomerate
			Tat rot Formation	Friable Sandstone and variegated clay

	I K		Dhokpathar Formation	Brown sandstone and orange clay
Middle Miocene		Middle Siwalik	Nagri Formation	Hard grey sand stone, mudstone and minor shale
		Lower Siwalik	Nahan Formation	Coarse gritty, clay and red sandstone often calcareous, brownish shale with lignite lenticels, greenish white Quartzite
Lower Miocene		Sirmur	Kausauli Formation	Grey and stone, green shale and grey clay
			Dagsai Formation	Purple and green sand stone, deep red gritty, clay, white sandstone with ferruginous concretions
TEL Upper Eocene			Subathu formation	Sandstone with grit clay. Impure Fossiliferous limestone calcareous slate, greenish shale and dark brown quartzite.
Pre-Proterozoic			Tundapathar	Thickly bedded, stromatolite limestone with carboniferous shale and quartzite

3.5.2.2 LOCAL GEOLOGY

The district is occupied by geological formations of Quaternary age comprising of Recent alluvial deposits belonging to the vast Gangetic alluvial plains. Geologically, Sub-recent to Recent alluvium and windblown sand of fluvial and aeolin origin are the predominant units occupying region, except few exposures of quartzites on southern part and sand dunes in western part. These sediments have 300-650 m of thickness on the average, which increases gradually towards north in the fore deep of Indo- Gangatic basin. These sediments unconformably overlie undulating basement of Delhi Super Group of rocks belonging to Proterozoic age. The age of Quaternary sediments ranges from upper Pleistocene to recent. The Delhi Super Group of rocks are further divided into the Alwar and Ajabgarh Groups. The former comprises predominantly arenaceous sediments consisting of felspathic quartzite, massive quartzite, mica-schist and carbonaceous phyllites. The Alwar rocks also occur in Khodana-Sohna- Dadri ridge in the southwest. The Ajabgarh rocks are by and large of argillaceous and calcareous facies, which comprise shale, slate, phyllites, pelitic schist, crystalline limestone, marble, calc schist etc with intercalations of quartzite.

The Older Alluvium consists normally of clay, sand, gravel, silt, silty sand and silty clay with Kankar mixed in various proportions. The Older Alluvium is poorly sorted and is usually characterized by richness and nodules of calcium carbonate blown as Kankar. The Older Alluvium generally forms slightly elevated terraces above the flood level of the present drainage.

3.5.3 HYDROGEOLOGY

Panipat district, lying in the east central part of Haryana State and is located between 29° 09' 15": 29° 27' 25" north latitudes and 76° 38' 30" 77° 09' 15" east longitudes. The total geographical area of the district is 1268 sq.km. Administratively, the district is controlled by Rohtak division. The district is sub-divided into five development blocks namely Panipat, Bapoli, Samalkha, Madlauda and Israna. The climate of the district can be classified as sub-tropical and semi-arid. The area receives normal annual rainfall is about 680 mm which is spread over 31 rainy days. 77% of rainfall occurs during south-west monsoon. The normal annual rainfall of district based on average of 5 years (2006-2010) has been computed as 591 mm.

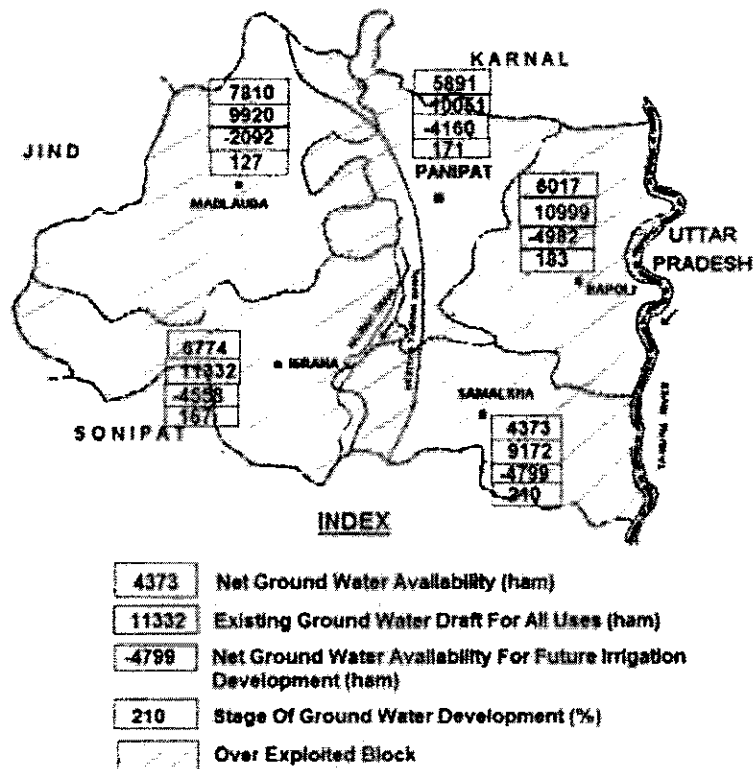


FIGURE 3. 5 HYDROGEOLOGY OF PANIPAT DISTRICT

3.5.4 DRAINAGE

The district forms a part of Indo Gangetic plain and lies in Yamuna Sub basin of main Ganga basin. Physio graphically, the district is characterized by two distinct features i.e. vast upland plain and Yamuna flood plain. The width of the flood plain varies according to the amount of shift experienced by the river. It is narrow in the Northern part and widens downstream. The district is mainly drained by the river Yamuna and its tributaries. The river Yamuna is major perennial river which flows all along the eastern margin of the district from northern to southern direction. The district is also drained by the artificial drain named as 'Naurah Drain' which originate in southern eastern part of Madlauda block and flows through south western part of Panipat and all along eastern boundary of Israna block in southerly direction. The district has two types of soils viz-tropical arid brown and arid brown soils

(solemnized). The arid brown soils are found in major parts of the district whereas tropical arid brown soils are found in north eastern part of the district especially in parts of Bapoli and Panipat blocks.

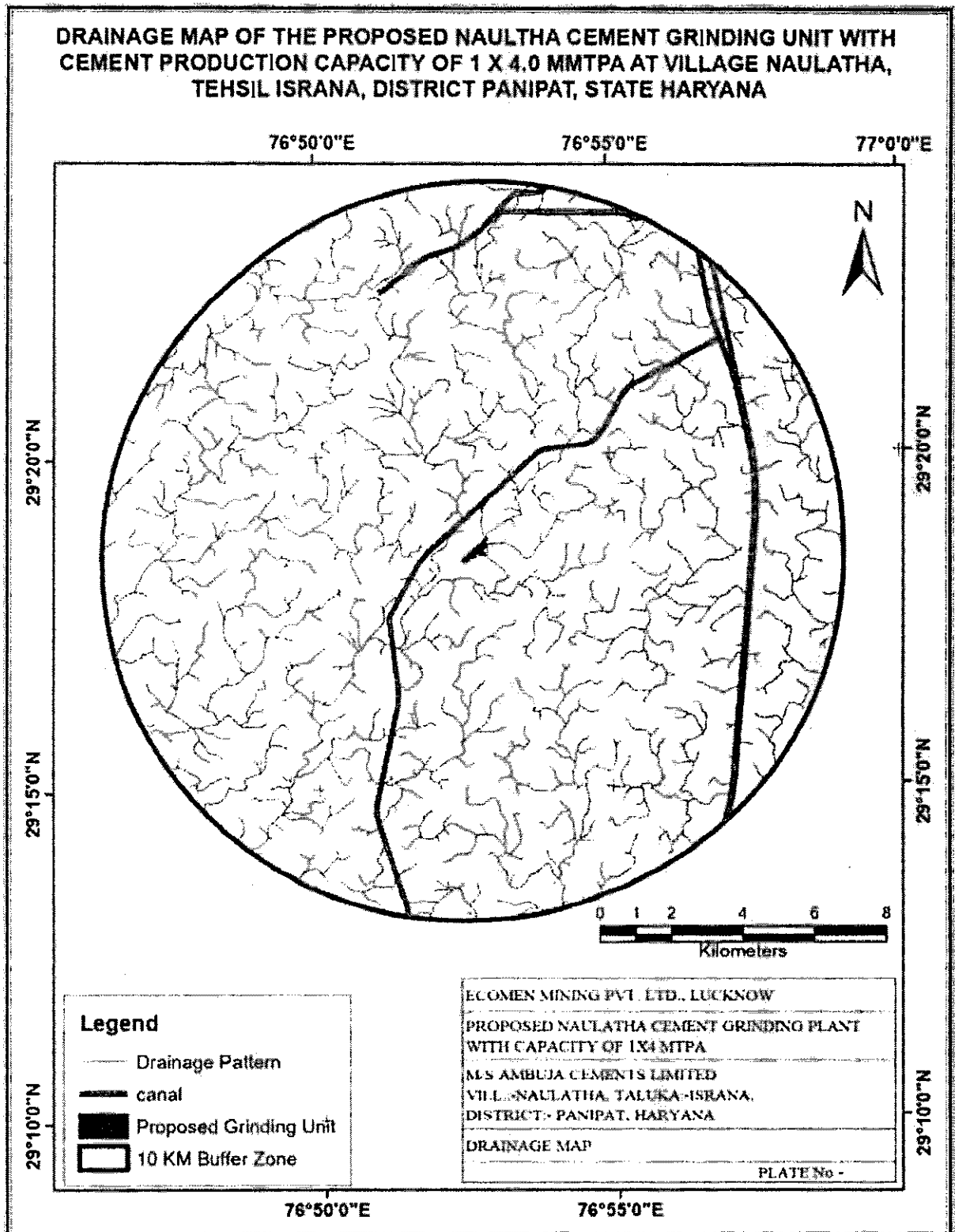


FIGURE 3. 6 DRAINAGE PATTERN OF STUDY AREA OF 10 KM

3.6 LAND USE/ LAND COVER STUDIES

Studies on land use aspects of eco-system play important roles for identifying sensitive issues, if any, and taking appropriate actions for maintaining the ecological balance in the development of the region.

3.6.1 OBJECTIVES

The objectives of land use studies are:

- To determine the present land use pattern of project site and 10 km radius area.
- To analyze the impacts on land use pattern due to the proposed project activities in the study area.
- To give recommendations for optimizing the future land use pattern in light of increasing project activities in the study area and its associated impacts.

3.6.2 DATA INPUT

A) SATELLITE DATA

LISS-IV composite band of visible and near infrared B3, B4 and B5 with spatial resolution of 5.8m of 09/03/2024 is used for the land use land cover study.

B) COLLATERAL DATA USED

- Survey of India Topographical Map
- Ground Truth Information
- Other Collateral Information

3.7 METHODOLOGY

The research on remote sensing has been directed for several decades towards image processing & development of methods for digital map generation especially on land use/land cover. The primary aims were to produce thematic maps that could be quickly updated. However, maps obtained from digital automatic classification fails to fully satisfy the purpose for which it is generated. Therefore, digital classification procedure has been used for generation of maps on land use/land cover from satellite data. The technique is based on stratified approach. The overall methodology for land use/land cover map generation is explained in the flowchart in Figure 3.7.

Eradas 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 methodology applied comes under following steps:

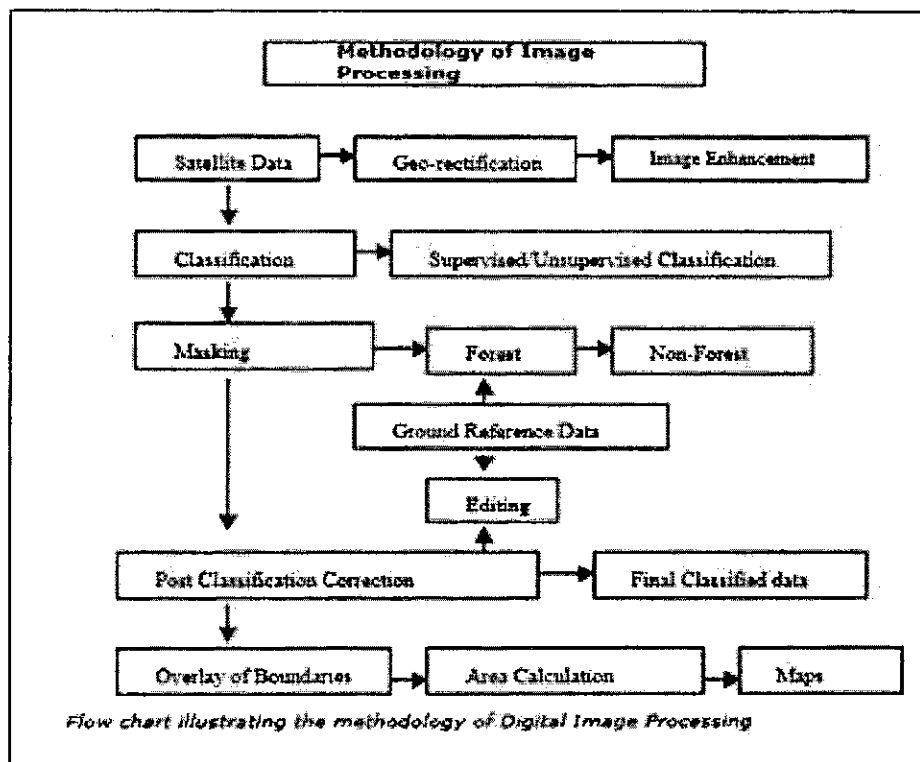


FIGURE 3.7 METHODOLOGY OF IMAGE PROCESSING

3.7.1 IMAGE ENHANCEMENT

Image enhancement is one of the important image processing functions primarily done to improve the appearance of the imagery to assist in visual interpretation and analysis. Various options of image enhancement techniques were tried out to get the best image for visual interpretation. Histogram equalized stretch enhancement techniques were applied to the imagery of the study area for better interpretation of different features in the satellite imagery.

The LISS-IV of 5.8m has been used for digital classification of land use categories. The subset area of 10 kms radius area has been stratified by generating forest mask from topographical map. In non-forest area, the un-supervised classification has been applied. In this particular type of classification spectral classes are grouped first, based solely on the numerical information in the data, and are then matched by the analyst to information classes. Unsupervised classifiers do not utilize training sets as the basis for classification. Rather it involves algorithms called clustering algorithms, that examine the unknown pixels in an image and aggregate them into a number of classes based on the natural groupings or clusters present in the image values. The analyst specifies the desired number of classes. Thus, unlike supervised classification, it does not start with a pre-determined set of classes, however it is neither done completely without human intervention. The cultural features like roads, villages and forest boundaries have been drawn from the existing maps.

The land use classified through supervised classification of the area and the cultural features of roads, rail and village locations have been overlaid. The land use/ land cover map of the area has been extracted using 10 km radius mask and area statistics have been generated.

3.7.2 RESULTS AND DISCUSSIONS

General Land use/ Land cover

The land use/ land cover map has been generated on 1:50,000 scale using digital classification of LISS-IV. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories.

Agricultural land

Based on satellite data and ground truth, the total agricultural crop land, are classified by using image classification techniques. Existing agricultural area were depicted by utilizing multispectral satellite data. The total agricultural area is about 22176.74 Ha which is 66.68 percent of the total study area.

Fallow land

Based on satellite data and ground truth, the total fallow land, are classified by using image classification techniques. Existing fallow land area were depicted by utilizing multispectral satellite data. The total fallow land is 4151.92 Ha area which is about 12.48 percent of the total study area.

Water bodies/Canal/Nala

No major river is found in study area. Based on satellite data, the water bodies and water-logged areas are giving the same tone and texture so it is very difficult to discriminate water logged areas with the water bodies. Presently old water logged is also being considered as water body in the study area. The total area falling within the river/ water bodies' area is about 1182.33 Ha which is about 3.56 percent of the study area.

Plantation Area

The total plantation area is classified by using image classification techniques. Plantation area were depicted by utilizing multispectral satellite data. The total area is about 278.67 Ha which is 0.84 percent of the total study area.

Built-up land/Settlements

Built-up land includes the settlements, roads and railway line etc. The village locations and their area extent have been extracted from the satellite data of high resolution and also from the existing topographical maps. The area occupied by built-up class shown in the classified image is therefore based on the visual interpretation of high-resolution satellite data and also topographical maps. The major built-up area is about 5468.08 Ha which is 16.44 percent of the total study area.

TABLE 3.4 PROPOSED LAND USE/ LAND COVER OF THE STUDY AREA AT 10 KM

SL No	Category	Area in Ha	% of the Study Area
1	Agricultural Land	22176.74	66.68
2	Fallow Land	4151.92	12.48
3	Water bodies/Canal/Nala	1182.33	3.56
4	Plantation	278.67	0.84
6	Settlements/Built-up Land	5468.08	16.44
	Total	33257.74	100

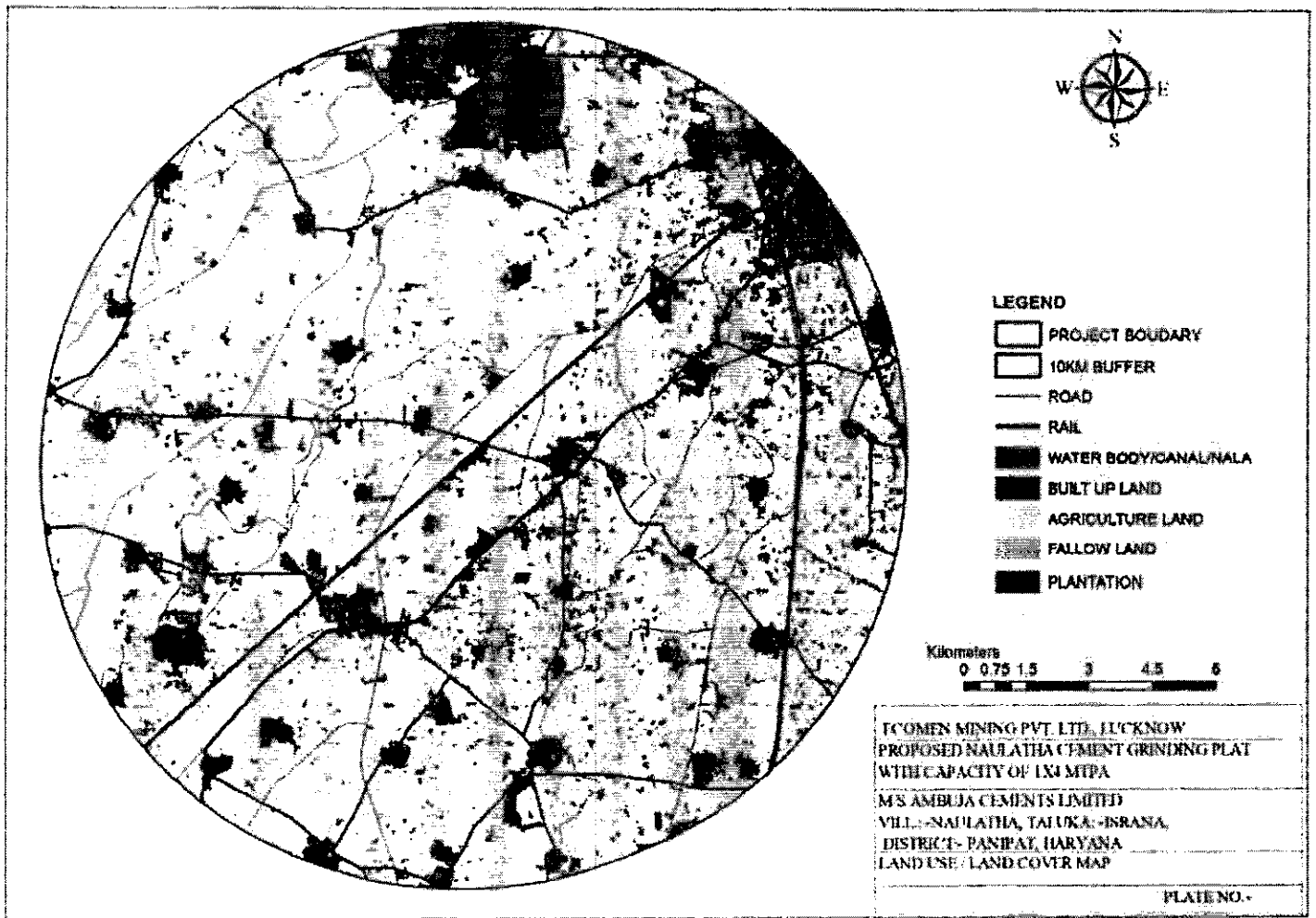


FIGURE 3. 8 LAND USE AND LAND COVER MAP OF THE STUDY AREA

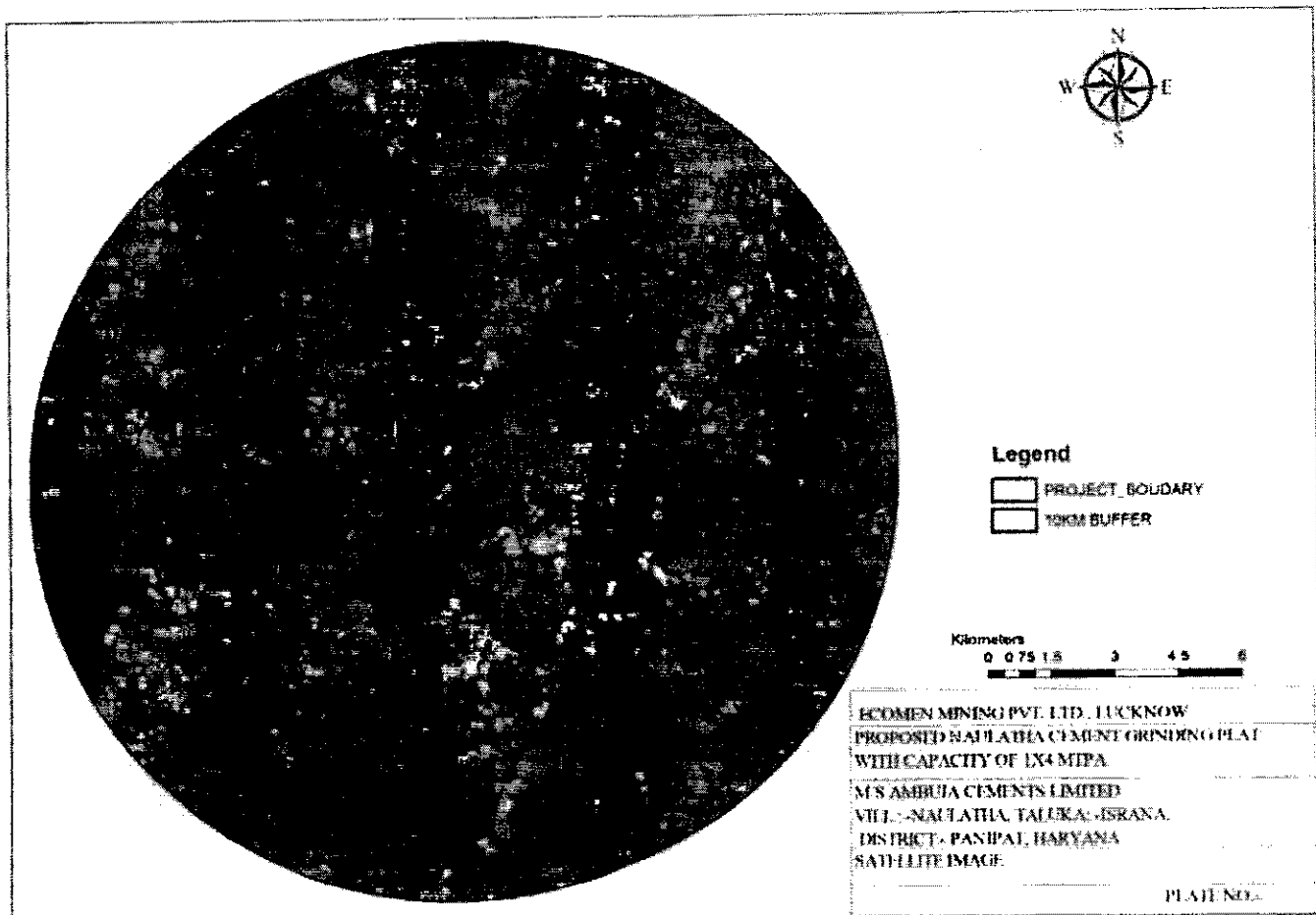


FIGURE 3.9 SATELLITE IMAGE MODEL FOR RADIUS 10 KM INDICATING ELEVATION VALUES OF PROJECT SITE AND ADJOINING AREAS

3.8 METEOROLOGY

Meteorology of the study area plays an important role in the air pollution studies. The prevailing micro meteorological conditions at the site will regulate the dispersion and dilution of air pollutants in the atmosphere. The predominant wind directions and the wind speed will decide the direction and distance of the most affected zone from the proposed activity. The meteorological data collected during the monitoring period is very useful in interpretation of baseline as input for dispersion models for predicting the Ground Level Concentrations (GLC).

3.8.1 METEOROLOGICAL DATA RECORDED AT PLANT SITE

Meteorological parameters such as temperature, relative humidity, wind direction, wind speed, and rainfall. This data collection occurred over one season, from October 1, 2023, to December 31, 2023. The observed meteorological conditions during this study period are summarized in Table 3.5. Additionally, secondary data was gathered from the nearest station in Karnal, located 33 km from the proposed project area. Typically, data at IMD is measured twice daily. To enhance our analysis, we are utilizing the Open Weather Data website to purchase and extract detailed meteorological data for the baseline period, which will be used to plot a wind rose diagram.

TABLE 3.5 METEOROLOGICAL DATA AVERAGES DURING THE STUDY PERIOD

Period	Mean Temperature (°C)			Relative Humidity (%)			Mean Wind Speed m/s			Rainfall (mm) Total Average
	Max	Min	Avg	Max	Min.	Avg	Max	Min.	Avg	
	October	35.54	16.92	25.11	98	32	71.4	5.73	0.08	
November	31.37	3.51	20.05	100	38	76.51	5.19	0.05	1.80	0.44
December	25.02	6.57	14.65	100	41	82.3	5.16	0.14	1.96	1.09
Oct-Dec	30.64	9.01	19.93	99.33	37	76.73	5.36	0.09	2.05	0.69

The Wind rose diagram is prepared using the Procured Meteorological Data during the study period October, 2023 to December, 2023, the diagram is given below

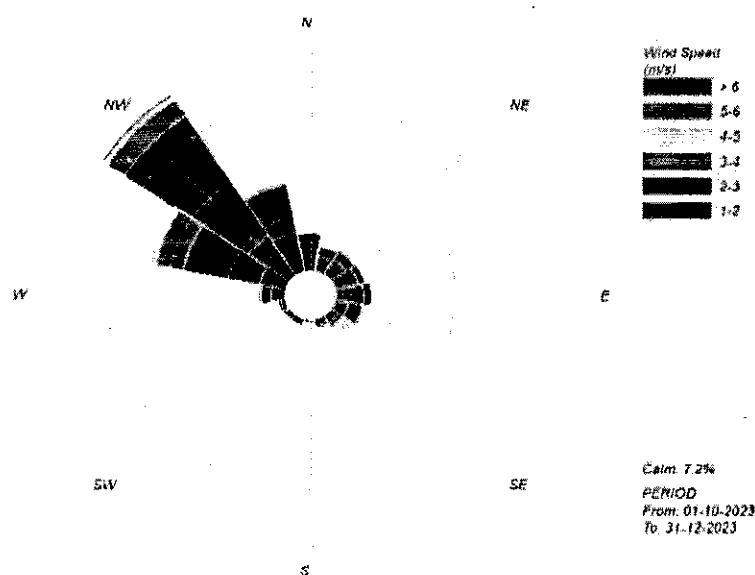


FIGURE 3.10 THE WIND ROSE DIAGRAM BASED ON THE METEOROLOGICAL DATA DURING THE STUDY PERIOD

3.9 AMBIENT AIR QUALITY

The baseline ambient air quality monitoring has been carried out to establish the present ambient air quality scenario within the project area and its conformity to National Ambient Air Quality Standards. The baseline status of ambient air quality was assessed considering the following:

- Meteorological condition
- Topography
- The assumed regional influences on background air quality
- The areas where impact would most likely be greatest

The ambient air quality monitoring has been carried out at eight locations in the month of October 2023 to December 2023 with a frequency of twice a week for twelve weeks with respect to Particulate Matter (size less than 10µm) or PM10, Particulate Matter (size less than 2.5 µm) or PM2.5, Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) Carbon Monoxide and metals like Arsenic, Lead and Nickel in accordance with Bureau of Indian Standards (BIS), CPCB guidelines (CPCB Gazette notification

dated 18.11.2009 on AAQ) and MoEF&CC guidelines. The Ambient Air Quality Sampling locations are given in Table 3.6 and shown in Figure 3.11. Analytical results of the air monitoring are presented in Table 3.10.

TABLE 3. 6 AMBIENT AIR QUALITY MONITORING LOCATIONS

Sl.No	Location	Coordinates	Distance & Direction from Plant (in Kms)	Criteria for selection
1	Within Project Site	29° 18' 33.491" N 76° 52' 41.307" E	-	Industrial
2	Near Naulatha Station	29° 19' 3.857" N 76° 53' 7.661" E	0.8 NNE	Commercial
3	Naulatha	29° 18' 13.289" N 76° 53' 44.698" E	1.6 E	Residential
4	Didwari	29° 17' 23.790" N 76° 55' 46.359" E	5.2 ESE	Residential
5	Balana	29° 16' 55.908" N 76° 53' 55.728" E	3.4 SE	Residential
6	Israna	29° 16' 59.307" N 76° 51' 5.990" E	3.6 SSW	Commercial
7	Brahman Majra	29° 19' 0.928" N 76° 52' 4.998" E	1.2, NW	Residential
8	Kalkha	29° 19' 55.193" N 76° 50' 59.020" E	3.7 NW	Residential



Naulatha village

Israna Village

FIGURE 3. 11 THE PHOTOGRAPHS OF THE AIR QUALITY MONITORING LOCATIONS

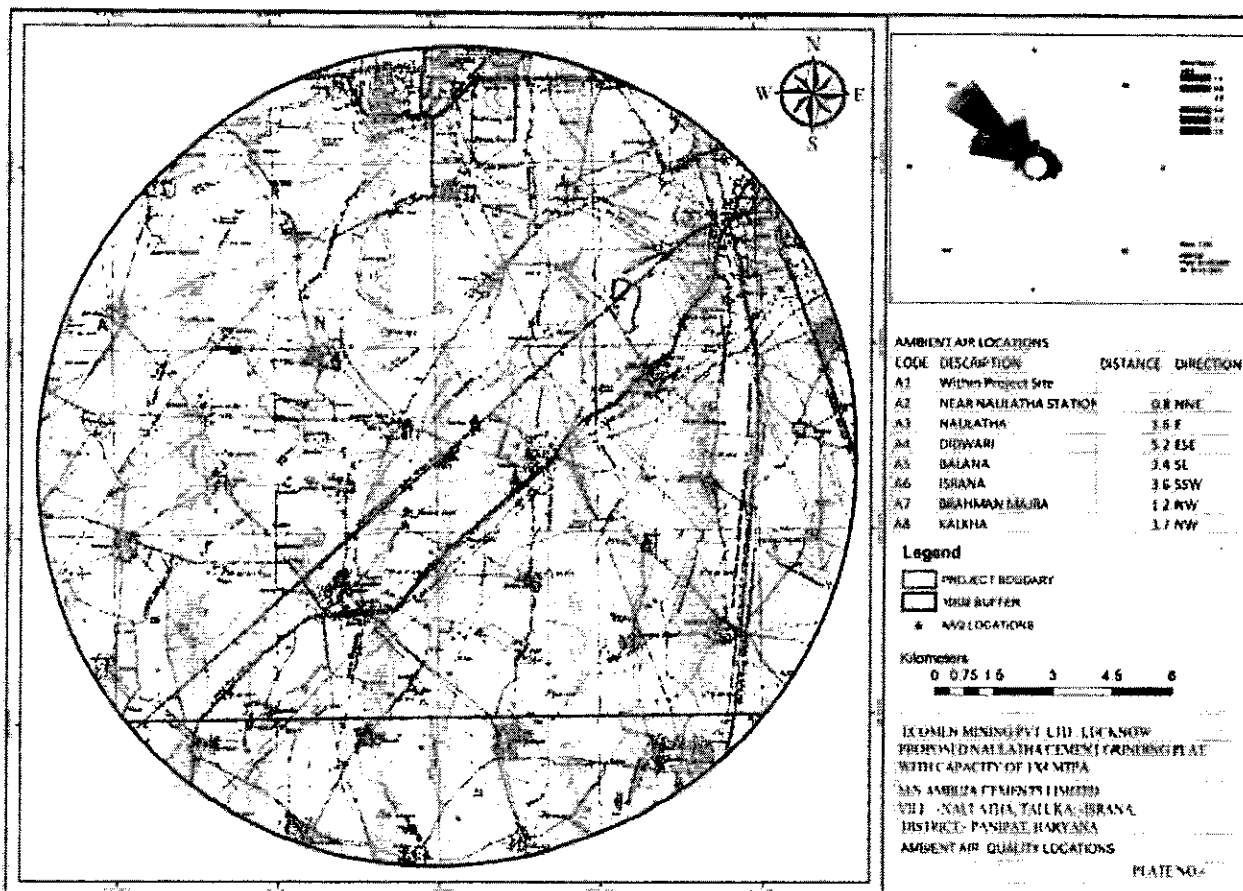


FIGURE 3. 12 TOPO MAP SHOWING THE AMBIENT AIR QUALITY LOCATIONS IN THE STUDY AREA

3.9.1 METHODOLOGY

As per the CPCB guidelines on methods of monitoring & analysis, 8 (eight) AAQ monitoring stations were selected. These stations are marked in Figure. 3.12.

For Particulate Matter of size $<2.5 \mu$ (PM_{2.5}), Particulate Matter of size $<10 \mu$ (PM₁₀), Sulphur Dioxide (SO₂) and Nitrogen Di-oxide (NO₂), samples were collected twice a week during the monitoring period. The sampling duration of different parameters was taken as follows in Table 3.7.

TABLE 3. 7 DETAILS OF SAMPLING DURATION OF DIFFERENT PARAMETERS

Parameters	Sampling Duration
PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂	24 hourly
CO	1 hourly for 24 hours

The methods of sample collection, equipment used and analysis procedure as followed for different air quality parameters are given in Table 3.8. The AAQ results have been compared with MoEFCC National. Ambient Air Quality Standards 2009 as given in Table 3.9.

TABLE 3. 8 METHODOLOGY OF SAMPLING AND ANALYSIS FOR AAQ MONITORING

Sl. No.	Parameter	Instrument / Apparatus Used	Methodology
1.	SO ₂ (µg/m ³)	RDS with Impinger Tube, Colorimeter	Improved West & Gaeke Method; IS:5182 (Part II)
2.	NO ₂ (µg/m ³)	RDS with Impinger Tube, Colorimeter	Modified Jacobs & Hoccheiser Modified (Na-Arsenite) Method; IS:5182 (Part VI)
3.	PM ₁₀ (µg/m ³)	Respirable Dust Sampler	Gravimetric IS:5182 (Part 23)
4.	PM _{2.5} (µg/m ³)	PM _{2.5} Fine-Dust Sampler	Gravimetric IS:5182 (Part 24)
5.	CO (µg/m ³)	CO Analyzer	NDIR Method

TABLE 3. 9 NATIONAL AMBIENT AIR QUALITY STANDARDS

SN.	Parameter	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural & Other Areas	Eco-sensitive Area (Notified by Central Govt.)
1	SO ₂ ; (µg/m ³)	Annual*	50	20
		24 Hours**	80	80
2	NO ₂ ; (µg/m ³)	Annual*	40	30
		24 Hours**	80	80
3	PM ₁₀ ; (µg/m ³)	Annual*	60	60
		24 Hours**	100	100
4	PM _{2.5} ; (µg/m ³)	Annual*	40	40
		24 Hours**	60	60
5	Carbon Monoxide (CO); (mg/m ³)	8 Hours**	02	02
		1Hours **	04	04
*	Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals			
**	24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days.			

TABLE 3. 10 VALUES OBTAINED AT THE SAMPLING LOCATIONS ARE AS FOLLOWS:

M/S Ambuja Cement Limited, Naulatha											
	Parameter Location	PM ₁₀ ($\mu\text{g}/\text{m}^3$)		PM _{2.5} ($\mu\text{g}/\text{m}^3$)		SO ₂ ($\mu\text{g}/\text{m}^3$)		NO ₂ ($\mu\text{g}/\text{m}^3$)		CO(mg/m^3)	
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
		A1	Within Project Site	70.6	40.4	38.0	23.4	15.6	9.4	32.1	16.9
A2	Near Naulatha Station	67.4	47.9	34.2	21.4	17.2	10.0	27.6	19.4	0.56	0.26
A3	Naulatha	74.0	51.2	39.4	27.1	13.7	8.7	32.1	18.5	0.74	0.35
A4	Didwari	62.6	43.8	33.9	20.3	16.8	10.1	34.8	18.2	1.20	0.27
A5	Balana	55.1	38.1	27.7	17.2	14.3	8.0	31.1	19.9	0.79	0.26
A6	Israna	67.2	49.1	33.1	24.1	17.4	10.5	29.5	18.5	0.75	0.40
A7	Brahman Majra	60.8	40.9	29.0	18.6	16.4	10.0	25.0	15.2	0.57	0.27
A8	Kalkha	58.66	32.19	32.84	22.15	18.01	7.81	31.91	19.44	0.65	0.34
Standard		100.00		60.00		80.00		80.00		2.00	

3.9.2 INTERPRETATION OF AMBIENT AIR QUALITY MONITORING

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including plant site during October 2023 to December 2023. Based on the monitoring & analysis of the results, the concentration of PM_{2.5} varied from maximum 39.4 $\mu\text{g}/\text{m}^3$ to minimum 17.2 $\mu\text{g}/\text{m}^3$ and the concentration of PM₁₀ varied from maximum 74.0 $\mu\text{g}/\text{m}^3$ to minimum 32.19 $\mu\text{g}/\text{m}^3$. NO₂ concentration is maximum from 34.8 $\mu\text{g}/\text{m}^3$ to minimum 15.2 $\mu\text{g}/\text{m}^3$. CO is under the 2 mg/m^3 . All the parameters were observed within the permissible limits as prescribed by CPCB standards. The traffic near the rail station and resultant vehicular pollution is contributing to the higher values. The incremental GLC are calculated and furnished in Chapter-4.

3.10 NOISE ENVIRONMENT

The physical description of sound concerns its loudness as a function of frequency. Noise in general is sound, which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human being to a complex sound made up various frequencies at different loudness levels. The most common and heavily favored of those scales is the A weighted decibel (dBA). This is more suitable for audible range of 20 to 20,000 Hertz. The scale has been designed to weigh various components of noise according to the response of a human ear.

The impact of noise sources on surrounding community depends on

- Characteristics of noise sources (instantaneous, intermittent or continuous in nature). It is well known that steady noise not as annoying as one that is continuously varying in loudness.
- The time, at which noise occurs, for example loud noise levels at night in residential areas are not acceptable because of sleep disturbance.
- The location of the noise source, with respect to noise sensitive area, which determines the loudness and period of noise exposure.

The environmental impact of noise can have several effects varying from Noise Induced Hearing Loss (NIHL) to annoyance depending on loudness of Noise levels.

The environmental impact assessment of noise from the proposed project can be carried out by taking into consideration of various factors: potential damage to hearing, potential physiological responses, and annoyance and general community responses. The main objective of noise level monitoring is to assess the background noise levels in different zones viz., industrial, commercial, residential and silence zones within the study area.

The basic studies conducted were

- Assessment of background noise levels.
- Identification and monitoring the major noise generating sources in the study area.
- Impact of noise on general population in the study zone of 10 Km. radius.

3.10.1 RECONNAISSANCE & RATIONALE OF SELECTING NOISE MEASURING LOCATION

Noise levels were measured at different locations within 10 Km. radius of the plant such as villages, schools, bus stands etc., and close to the receptors. The measurement was restricted to areas close to project site, since noise from operation of the cement grinding unit is not expected to travel beyond a distance of 2-3 km from the site. Same has been proved during Noise modeling, which is discussed in the chapter 4 of this report. Measurements were carried out during the day and night to compare with the prevailing maximum noise levels for day and night and different zones

3.10.2 SOURCES OF NOISE.

Typical considerations in environmental noise assessment can be divided into two categories; one is related to noise sources and the other related to potential receiver. Two quantities are needed to describe completely the strength of the source. They are sound Power level and directivity. Sound Power levels measures the total sound Power radiated by the source in all directions whereas directivity is a measure of difference in radiation with direction. This concept of sound Power level and directivity index makes it possible to calculate the sound pressure level created by the source.

3.10.3 OCCUPATIONAL EXPOSURES

To assess the magnitude of impact due to noise sources, it is essential to know the following:

- The duration of sound.
- Distribution through the working day.
- Overall noise levels.
- It's composition including frequency and intensity at various intervals of time. After characterizing the noise sources noise at receiver's location, the impact must be assessed. The environmental impact of noise can lead to the following effects.
- Damages the hearing capacity.
- Interference in communication.
- Interference with work.

- Interference with sleep.
- Causes annoyance.

3.10.4 METHODOLOGY ADOPTED FOR NOISE LEVEL OBSERVATION

For measurement of Ambient Noise level in the Study area, a Digital Sound Level Meter (Make & Model: Lutron SL-4001) was used. The instrument was calibrated with a Standard Acoustic calibrator before using in the field. The measurements were carried out continuously for the 24-hour period to obtain hourly equivalent sound pressure level, which is equivalent to the same sound energy as the fluctuating sound measured in the same period.

TABLE 3. 11 GUIDANCE FOR ASSESSMENT OF REPRESENTATIVENESS AND RELIABILITY OF BASELINE ENVIRONMENTAL ATTRIBUTES

Attributes	Sampling		Measurement Method	Remarks
	Noise	Network		
Hourly equivalent noise levels	Identified study area	Once in each season	Instrument: Noise level meter	IS:4954-1968 as adopted by SPCB
Hourly equivalent noise levels	In plant (1.5 m from machinery)	Once	Instrument: Noise level meter	SPCB/OSHA
Hourly equivalent noise levels	Highways	Once in each season	Instrument: Noise level meter	SPCB/IS:4954-1968

3.10.5 NOISE LEVEL OBSERVATION IN THE STUDY AREA

The sampling was done during day-time and night-time once in the study period. Locations / stations selected for noise level monitoring are given table 3.12.

TABLE 3. 12 DETAILS OF LOCATIONS / STATIONS SELECTED FOR NOISE LEVEL MONITORING

S.No	Location	Coordinates	Distance & Direction from Plant (in kms)	Criteria for selection
1	Within Project Site	29° 17' 47.443" N 76° 52' 3.639" E	-	Industrial
2	Nr. Naulatha Station	29° 16' 59.307" N 76° 51' 5.990" E	0.8 NNE	Commercial
3	Naulatha	29° 19' 55.193" N 76° 50' 59.020" E	1.6 E	Residential
4	Didwari	29° 18' 26.720" N 76° 51' 41.369" E	5.2 ESE	Residential
5	Balana	29° 18' 33.491" N 76° 52' 41.307" E	3.4 SE	Residential
6	Israna	29° 19' 0.928" N 76° 52' 4.998" E	3.6 SSW	Commercial

7	Barhman Majra	29° 18' 13.289" N 76° 53' 44.698" E	1.2 NW	Residential
8	Kalkha	29° 19' 3.857" N 76° 53' 7.661" E	3.7 NW	Residential

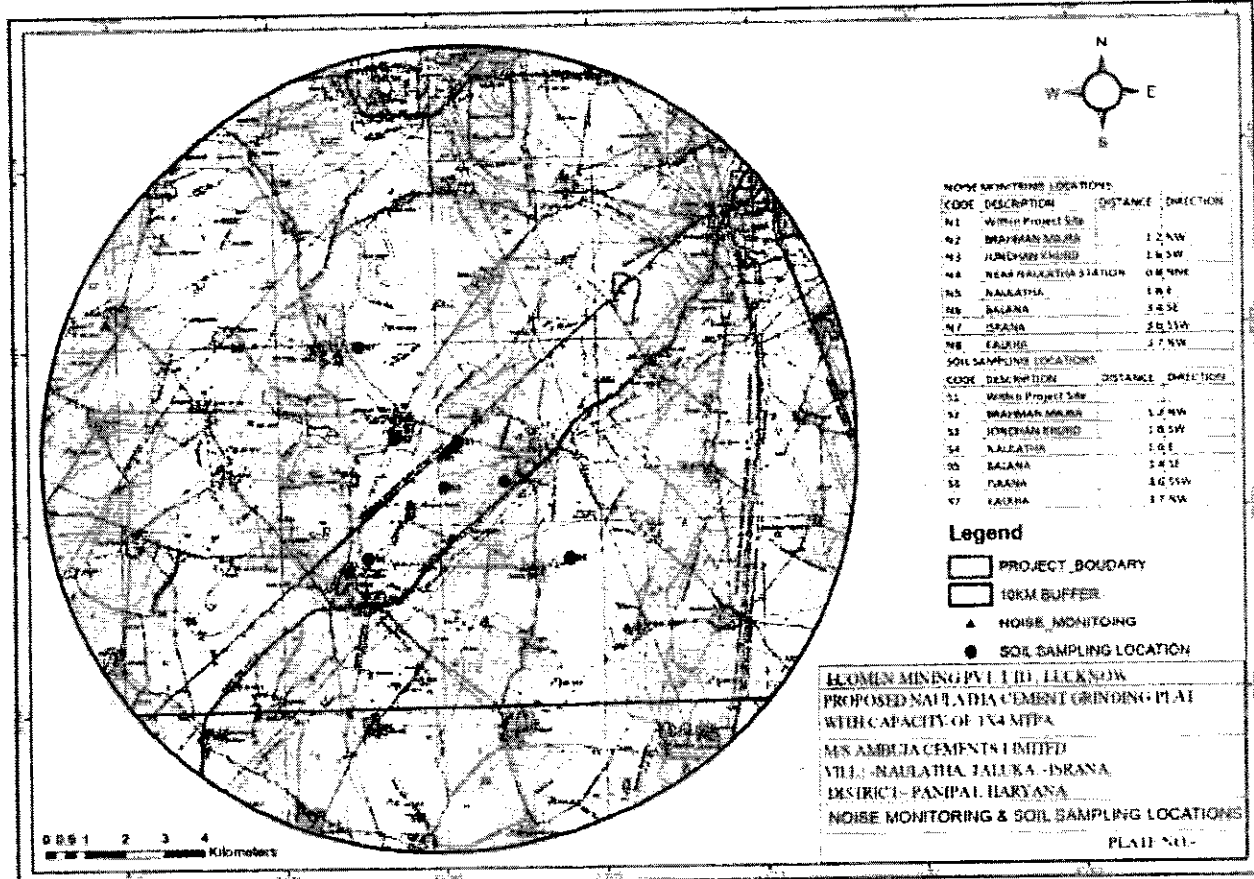
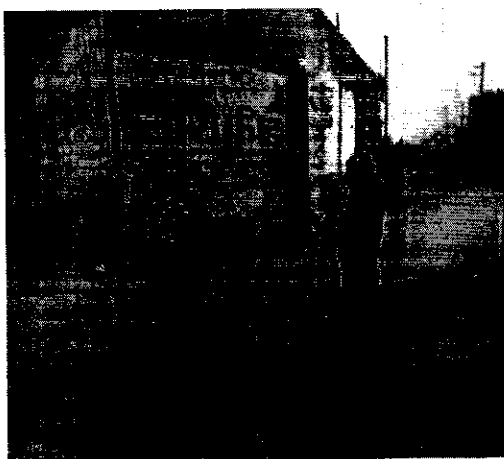


FIGURE 3. 13 TOPOGRAPHICAL MAP OF NOISE AND SOIL MONITORING LOCATIONS



Israna Village



Didwari Village

FIGURE 3. 14 PHOTOGRAPHS OF NOISE QUALITY MONITORING LOCATION

The Central Pollution Control Board has stipulated specific standard for ambient noise level in industrial, commercial, residential and silence zones for both day and night time. These are given below in Table-3.13.

TABLE 3. 13 AMBIENT NOISE STANDARDS

S.No	Category of the area	Limits (Leq in dB (A))	
		Day Time (6.00 AM – 10.00 PM)	Night Time (10.00 PM -6.00 AM)
1.	Industrial Area	75	70
2.	Commercial Area	65	55
3.	Residential Area	55	45
4.	Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM
- Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

Source: Central Pollution Control Board Norms (As per Noise Pollution (Regulation and Control) Rules.

3.10.6 MEASURED NOISE VALUES DURING BASELINE STUDY

TABLE 3. 14 MEASURED NOISE VALUE DURING BASELINE STUDY

Location	Area Type	Day (0600-2200 hours)				Night (2200-0600 hours)			
		Norm	Max.	Min.	Mean*	Norm	Max.	Min.	Mean*
Within Project Site	Industrial	75	66.8	43.8	59.5	70	61.2	40.9	54.0
Nr. Naulatha Station	Commercial	55	53.1	37.8	50.2	45	44.2	39.8	41.7
Naulatha	Residential	65	63.4	45.6	56.5	55	53.2	39.3	49.9
Didwari	Residential	55	51.8	39.2	45.2	45	42.5	36.4	39.8
Balana	Residential	55	51.6	42.3	48.9	45	42.8	40.1	41.6
Israna	Commercial	65	61.4	44.8	56.9	55	53.2	43.5	48.6
Barhman Majra	Residential	55	49.8	39.7	47.0	45	41.7	37.8	39.9
Kalkha	Residential	55	50.6	39.5	46.2	45	43.2	37.3	40.6

All values in dB(A); * Logarithmic Averages

3.10.7 INTERPRETATION OF NOISE LEVEL MONITORING

*The noise levels monitored at Plant are within the norms prescribed for Industrial Zone. The noise levels monitored at all residential areas are within the norms prescribed for Residential Zone. However, it is observed that background noise levels are high, due to the movement of vehicles

and other activities in the commercial areas of villages, station area and therefore it is essential that the noise levels from the plant, once it is in operation do not travel to long distances and add to the background values. To assess the mitigation measures that need to be recommended as part of EMP, noise modeling was carried out. Results and interpretation of noise induced impacts and recommended control measures to minimize the same are discussed in the Chapter 4 of the report.

3.11 SOIL QUALITY STUDY

3.11.1 RATIONALE OF SAMPLE LOCATION SELECTION

Soil stations in the core and buffer zone were chosen to fairly represent the soil quality of study area. Locations were chosen from project site, agriculture and fallow lands in the villages as well as degraded forest areas, to assess the physical and chemical composition of the soil of the area. The sampling was done and samples were collected from an average depth of 15-90 cm from surface, preserved and transported to the lab for analysis.

3.11.2 SAMPLE LOCATION DETAILS

The soil quality sampling locations and their distances from the project site are shown in Table.3.15. This table presents the analysis; sampling station location and distance from projects site need to be incorporated:

TABLE 3. 15 DETAILS OF THE ANALYSIS; SAMPLING STATION LOCATION AND DISTANCE FROM PROJECTS SITE

S. No.	Location/Code	GPS Coordinate	Distance & Direction from Plant (in km.)	Type of Land
1	Within Project Site (S-1)	29° 18' 38.946" N 76° 52' 49.533" E	-	Fallow land
2	Brahman Majra Village (S-2)	29° 18' 42.474" N 76° 51' 50.982" E	1.2 NW	Agricultural Land
3	Jondhan Khurd (S-3)	29° 18' 1.282" N 76° 52' 35.728" E	1.6 SW	Agricultural Land
4	Naulatha Village (S-4)	29° 18' 4.958" N 76° 53' 31.881" E	1.6 E	Agricultural Land
5	Balana Village (S-5)	29° 17' 0.861" N 76° 54' 31.087" E	3.4 SE	Garden Soil
6	Israna Village (S-6)	29° 17' 3.862" N 76° 51' 22.524" E	3.6 SSW	Fallow land
7	Kalkha Village (S-7)	29° 19' 58.900" N 76° 51' 18.632" E	3.7 NW	Garden Soil

TABLE 3. 16 SOIL SAMPLING ANALYSIS RESULTS

S.No	Parameters	Unit	Sampling Locations						
			S1	S2	S3	S4	S5	S6	S7
1.	pH (Ratio 1:5)	-	8.11	7.27	8.12	7.95	7.77	8.01	7.64
2.	Electrical Conductivity (Ratio 1:5)	μ mhos/cm	890.0	723.0	778.0	398.0	440.0	437.0	523.0
3.	Moisture	%	2.6	4.4	10.1	12.2	14.2	13.4	11.2
4.	Bulk Density	gm/cc	1.23	1.18	1.19	1.16	1.31	1.21	1.24
5.	Av. Calcium (Ca)	mg/kg	52.0	108.0	132.0	80.0	88.0	72.0	104.0
6.	Av. Magnesium (Mg)	mg/kg	28.0	58.0	78.0	40.0	60.0	46.0	52.0
7.	Av. Potassium (K ₂ O)	Kg/ha	21.5	32.5	96.5	37.5	33.3	53.4	29.6
8.	Av. Phosphorous (P ₂ O ₅)	Kg/ha	115.0	88.5	220.0	114.0	44.5	145.0	77.5
9	Zinc (Zn)	mg/kg	0.88	1.04	3.2	0.94	1.12	1.45	0.68
10	Iron as Fe ₂ O ₃	mg/kg	16.4	32.2	11.24	26.29	17.09	20.4	13.97
11	Organic Carbon	%	0.50	0.92	1.58	0.56	0.62	0.90	0.75
12	Boron (B)	mg/kg	0.54	0.44	0.88	0.64	0.65	0.34	0.45
13	Water Soluble Chloride as Cl	mg/kg	28.0	34.0	40.0	22.0	32.0	34.0	32.0
14	Sulphate as SO ₄	mg/kg	23.1	18.6	34.9	30.8	24.5	30.8	29.6
15	Sodium (Na)	mg/kg	54.4	64.4	105.4	56.4	62.6	74.5	60.4
16	Total Porosity	%	15.17	11.94	21.71	18.31	12.67	20.92	17.88
17	Water Holding Capacity	%	23.2	26.4	19.6	21.5	20.8	18.3	22.5
18	Organic Matter	%	0.76	1.4	2.4	0.85	0.94	1.36	1.13
19	Available Nitrogen as N	Kg/ha	32.40	50.40	134.40	68.20	78.70	94.40	64.80
20	Sodium Absorption ratio (SAR)	%	1.61	1.28	1.80	1.28	1.26	1.68	1.20
21	Cation Exchange capacity	meq/100gm	23.46	22.83	25.49	24.36	22.47	21.34	25.01

	(CEC)								
22	Grain Size Distribution								
a	Textural Class		Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
b	Sand	%	41.0	38.0	47.0	41.0	39.0	42.0	40.0
c	Silt	%	28.0	34.0	24.5	27.0	32.0	32.0	28.0
d	Clay	%	31.0	28.0	28.5	32.0	29.0	26.0	32.0

Interpretation - The soil quality is good enough for agriculture with additional macro and micro nutrients by way of fertilization through organic/inorganic means. As the soil parameters shows varying nutrient contents, acidic to basic soil parameters and organic carbon contents, slightly basic pH soil, varying organic carbon, soil amendments as well addition of fertilizers may be needed to make the soil amenable to chosen agricultural crop or plantation.

3.12 WATER QUALITY STUDY

3.12.1 SURFACE WATER QUALITY

There is no water body within the project site. However, 1 location has been located for surface water monitoring. Western Yamuna Canal- 7.3 Km in E direction from the project site. Samples have been drawn from upstream and downstream of this canal. Two more village ponds near Naultha and Brahman Majra were selected to draw and analyses water samples and arrive at baseline surface water characteristics of the area. Open and bore wells exist in the study area and the villagers draw the water for potable purposes. Eight (8) numbers of ground water samples from were collected from the nearby villages – open wells and bore wells, to assess ground water quality impacts. Samples were homogenized before preserving the same and transporting the samples to the in-house lab at Lucknow. The SOPs for preservation, transportation; receipt of samples at lab, coding and analysis of the samples were followed as per the CPCB guidelines and the SOPs of the QMS of the company.

TABLE 3. 17 THE SURFACE WATER CHARACTERISTICS WERE SHOWN:

Code	Name of sampling location	Coordinates	Direction	Distance in Km
SW-1	Pond near Naulatha	29° 18' 43.120" N 76° 53' 57.037" E	E	1.8
SW-2	Brahman Majra	29° 18' 52.966" N 76° 51' 57.817" E	W	1.5
SW-3	Up stream of Yamuna Canal	29° 19' 48.526" N 76° 57' 27.082" E	NE	7.7
SW-4	Downstream of Yamuna canal	29° 16' 10.836" N 76° 57' 10.200" E	SE	8.4

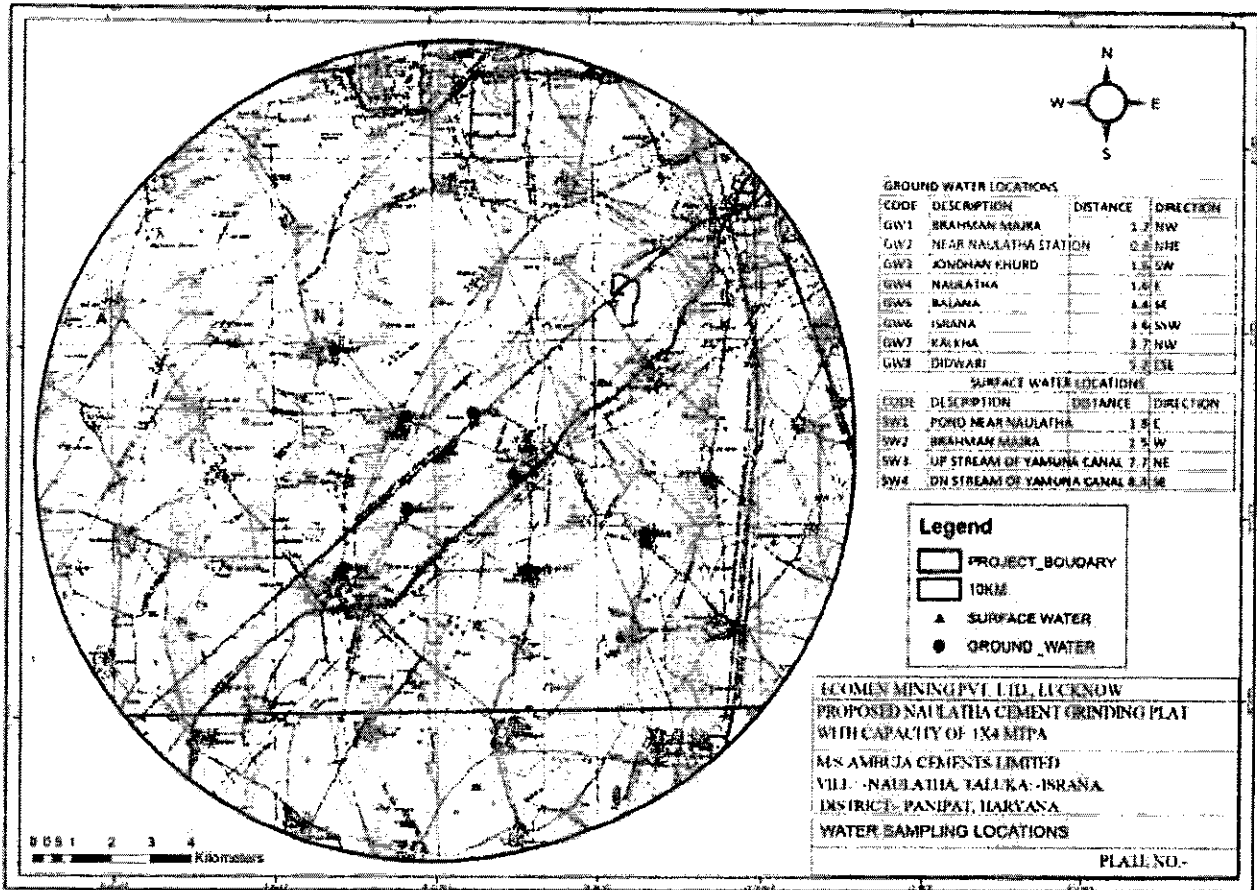
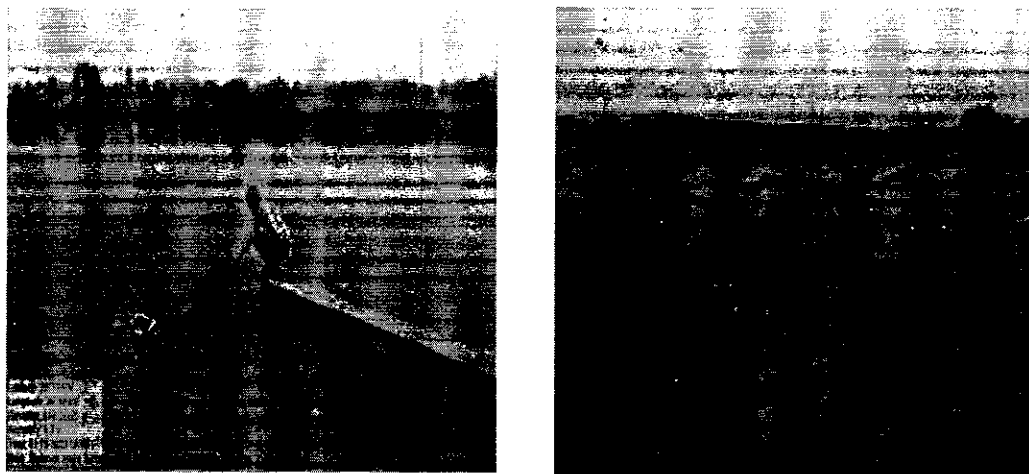


FIGURE 3. 15 TOPOGRAPHIC MAP OF SURFACE AND GROUND WATER



Brahman Majra

FIGURE 3. 16 PHOTOGRAPHS OF SURFACE WATER SAMPLING

TABLE 3. 18 SURFACE WATER ANALYSIS RESULT

Sl. No.	TESTS	Unit	IS 2296	RESULT			
			Class-C	Pond Near Naulatha (SW-1)	Brahman Majra (SW-2)	Up Stream of Yamuna Canal (SW4)	Down Stream of Yamuna Canal (SW4)
1	pH	-	6.0-9.0	7.53	7.57	7.67	7.73
2	Colour	Hazen	300	80.0	60.0	15.0	20.0
3	Electrical Conductivity	Us/cm	-	1015.0	873.0	613.0	710.0
4	Dissolved Oxygen as DO	mg/l	4	4.0	4.2	5.1	5.5
5	Biological Oxygen Demand as BOD (mg/l) 5 days at 20 °C	mg/l	3	5.6	5.0	3.2	3.5
6	Chemical Oxygen Demand as COD	mg/l	-	28.0	16.0	10.0	14.0
7	Total Suspended Solids as TSS	mg/l	-	28.4	18.6	16.2	23.2
8	Total Dissolved Solids as TDS	mg/l	1500	659.0	567.0	398.0	461.0
9	Oil & Grease as O & G	mg/l	-	<2.5	<2.5	<2.5	<2.5
10	Alkalinity as CaCO ₃	mg/l	-	216.0	192.0	136.0	156.0
11	Total Hardness as CaCO ₃	mg/l	-	236.0	204.0	148.0	172.0
12	Calcium as Ca	mg/l	-	62.4	54.4	35.2	40
13	Magnesium as Mg	mg/l	-	19.44	16.52	14.58	17.496
14	Sodium as Na _s	mg/l	-	43.5	32.4	19.6	23.1
15	Potassium as K _s	mg/l	-	2.12	1.89	1.02	2.01
16	Chloride as Cl	mg/l	600	44.0	36.0	26.0	32.0
17	Sulphate as SO ₄	mg/l	400	38.5	32.5	19.5	21.2
18	Nitrate Nitrogen as NO ₃	mg/l	50	13.2	7.44	6.76	8.4
19	Fluoride as F	mg/l	1.5	0.45	0.49	0.33	0.37
20	Iron as Fe	mg/l	0.5	0.18	0.13	0.09	0.16
21	Copper as Cu	mg/l	1.5	<0.05	<0.05	<0.05	<0.05
22	Zinc as Zn	mg/l	15	0.12	0.08	0.07	0.06
23	Arsenic as As	mg/l	0.2	<0.05	<0.05	<0.05	<0.05
24	Total Chromium as T. Cr.	mg/l	-	<0.05	<0.05	<0.05	<0.05
25	Phosphate as PO ₄	mg/l	-	<0.1	<0.1	<0.1	<0.1
26	Phenolic Compound as C ₆ H ₅ OH	mg/l	0.005	<0.005	<0.005	<0.005	<0.005
27	Anionic Detergent as MBAS	mg/l	1	<0.02	<0.02	<0.02	<0.02
28	Boron as B	mg/l	-	<0.5	<0.5	<0.5	<0.5
29	Cadmium as Cd	mg/l	0.01	<0.01	<0.01	<0.01	<0.01

30	Mercury as Hg	mg/l	-	<0.01	<0.01	<0.01	<0.01
31	Lead as Pb	mg/l	0.1	<0.01	<0.01	<0.01	<0.01
32	Manganese as Mn	mg/l	-	<0.1	<0.1	<0.1	<0.1
33	Free Residual Chlorine as FRC	mg/l	-	<0.05	<0.05	<0.05	<0.05
34	Aluminum as Al	mg/l	-	<0.01	<0.01	<0.01	<0.01
35	Selenium as Se	mg/l	0.05	<0.005	<0.005	<0.005	<0.005
36	Cyanide as CN	mg/l	0.05	<0.04	<0.04	<0.04	<0.04
37	Total coliform	MPN/100 ml	5000	220.0	170.0	70.0	90.0

Surface water parameters are to be compared with CPCB guidelines for different uses and not be compared with ISO 10500. Accordingly change the above table at columns 4 & 5 and then compare.

Surface Water – All the parameters concentrate range are found within the permissible limits. So, Suitable for bathing and other domestic purposes.

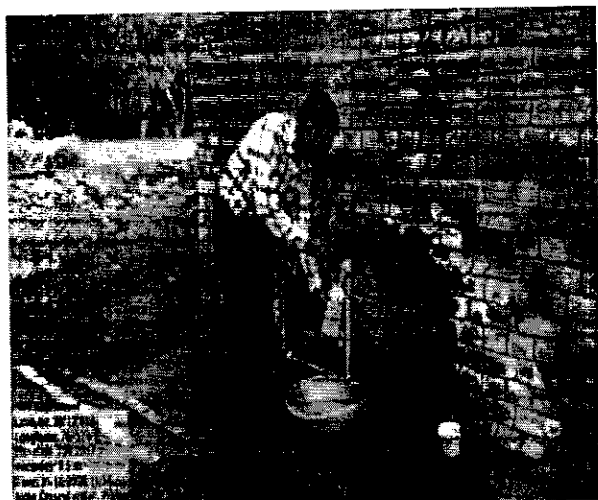
3.12.2 GROUND WATER ANALYSIS

The ground water samples have been collected and analyzed for various parameters like pH, Suspended Solids, Total Dissolved Solids, Temperature, Total Hardness, Calcium Hardness, Magnesium hardness, Alkalinity, Fluoride, Chloride, Sulphates, Nitrates, COD, BOD, Phenolic compounds, Heavy metals etc. and is compared with the standards to know the water quality.

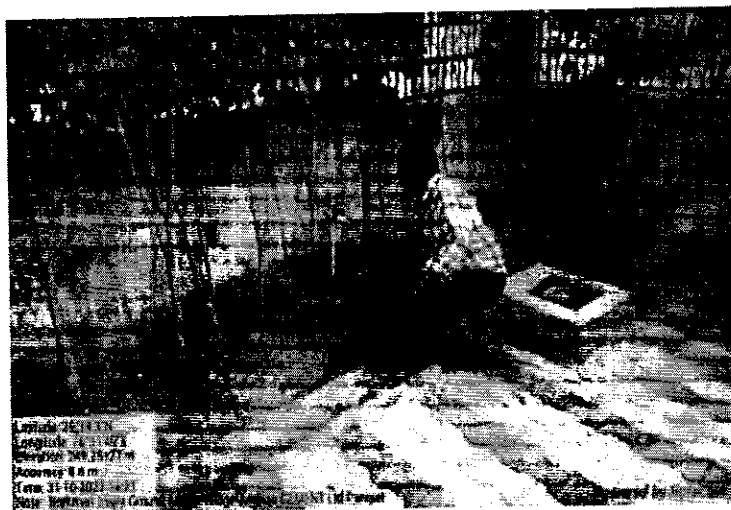
Eight (8) numbers of ground water samples from were collected from the nearby villages – open wells and bore wells, to assess ground water quality impacts. The ground water sampling locations and their distances is given in table 3.19.

TABLE 3. 19 THE GROUND WATER SAMPLING LOCATIONS AND THEIR DISTANCES

S. No	Location	Coordinates	Distance & Direction from Plant (in kms)
1	Brahman Majra Village	29° 19' 0.928" N 76° 52' 4.998" E	1.2 NW
2	Near Naulatha Station	29° 19' 3.857" N 76° 53' 7.661" E	0.8 NNE
3	Jondhan Khurd	29° 17' 46.030" N 76° 52' 5.377" E	1.6 SW
4	Naulatha Village	29° 18' 13.289" N 76° 53' 44.698" E	1.6 E
5	Balana Village	29° 16' 55.908" N 76° 53' 55.728" E	3.4 SE
6	Israna Village	29° 16' 59.307" N 76° 51' 5.990" E	3.6 SSW
7	Kalkha Village	29° 19' 55.193" N 76° 50' 59.020" E	3.7 NW
8	Didwari Village	29° 17' 23.790" N 76° 55' 46.359" E	5.2 ESE



Jodhan Khurd



Brahman Majra

FIGURE 3. 17 PHOTOGRAPHS OF GROUND WATER MONITORING LOCATION

TABLE 3. 20 GROUND WATER ANALYSIS RESULTS

Sl. No.	TESTS	Unit	INDIAN STANDARDS as per IS 10500:2012		RESULT								
			Desirable	Permissible	Brhman Majra Village (GW-1)	Near Naulatha Station (GW-2)	Jondhan Khurd (GW-3)	Naulatha Village (GW-4)	Balana Village (GW-5)	Israna Village (GW-6)	Kalkha Village (GW-7)	Didwari Village (GW-8)	
1	Colour	Hazen	5	15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1	5	1.22	1.56	1.03	1.21	1.11	1.34	1.09	1.23	1.23
5	Electrical Conductivity	Us/cm	-	-	1050.0	1118.6	863.0	1167.0	982.0	939.1	883.0	966.0	966.0
6	pH	-	6.5-8.5	No Relax	7.81	7.95	7.89	7.55	7.65	7.61	7.69	7.29	7.29
7	Total Dissolved Solids as TDS	mg/l	500	2000	640.0	682.0	526.0	712.0	599.0	572.0	539.0	589.0	589.0
8	Alkalinity as CaCO ₃	mg/l	200	600	240.0	244.0	196.0	260.0	224.0	208.0	192.0	232.0	232.0
9	Total Hardness as CaCO ₃	mg/l	200	600	252.0	260.0	212.0	272.0	236.0	220.0	216.0	244.0	244.0
10	Calcium as Ca	mg/l	75	200	75.2	72.0	56.0	67.2	60.8	52.8	60.8	65.6	65.6
11	Magnesium as Mg	mg/l	30	100	15.55	19.44	17.50	25.27	20.41	21.38	15.55	19.44	19.44
12	Sodium as Na	mg/l	-	-	31.8	38.9	25.2	43.3	30.2	31.2	29.5	26.5	26.5

Chapter 3

Draft EIA/EEMP of Proposed Naulatha Cement Grinding Unit With Cement Production Capacity of 1 X 4.0 MMTPA at Naulatha Village, Panipat District, Haryana by M/s Ambuja Cements Limited

13	Potassium as K	mg/l	-	-	3.32	2.65	1.65	3.23	1.87	2.98	1.54	2.01
14	Chloride as Cl	mg/l	250	1000	38.0	46.0	30.0	44.0	34.0	36.0	30.0	28.0
15	Sulphate as SO ₄	mg/l	200	400	27.3	33.4	26.2	35.5	27.8	27.1	33.8	21.6
16	Nitrate Nitrogen as NO ₃	mg/l	45	No Relax	9.12	8.78	6.31	8.78	8.22	8.78	9.22	10.2
17	Fluoride as F	mg/l	1	1.5	0.32	0.41	0.37	0.45	0.53	0.48	0.37	0.62
18	Iron as Fe	mg/l	1	No Relax	0.24	0.18	0.12	0.23	0.23	0.18	0.14	0.14
19	Copper as Cu	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Manganese as Mn	mg/l	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Zinc as Zn	mg/l	5	15	0.09	0.05	0.09	0.14	0.08	0.11	0.09	0.09
22	Arsenic as As	mg/l	0.01	No Relax	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
23	Total Chromium as T. Cr.	mg/l	0.05	No Relax	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Phenolic Compound as C ₆ H ₅ OH	mg/l	0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Free Residual Chlorine as FRC	mg/l	0.2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
26	Boron as B	mg/l	0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
27	Anionic Detergent as MBAS	mg/l	0.2	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
28	Mercury as Hg	mg/l	0.001	No Relax	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Chapter 3

Draft EIA/EMP of Proposed Naulatha Cement Grinding Unit With Cement Production Capacity of 1 X 4.0 MMTPA at Naulatha Village, Panipat District, Haryana by M/s Ambuja Cements Limited

29	Cadmium as Cd	mg/l	0.003	No Relax	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30	Lead as Pb	mg/l	0.01	No Relax	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
31	Aluminum as Al	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Selenium as Se	mg/l	0.01	No Relax	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
33	Mineral Oil	mg/l	0.5	No Relax	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
34	Cyanide as CN	mg/l	0.05	No Relax	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
35	Total coliform	Cfu/ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
36	E.coli	Cfu/ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Observation of Ground Water Monitoring Result

The Groundwater sample analysis indicates that all physical, Chemical & Bacteriological parameters of all the samples collected are within the Potable water standards as per IS 10500: 2021 standards.

3.13 BIOLOGICAL ENVIRONMENT

3.13.1 OBJECTIVES

The present study was undertaken with the following objectives:

- To inventories the flora in and around the project site and within the study area;
- To assess the biodiversity of Plantation ecosystems, present in the study area;
- To inventories the wild life fauna / avifauna within the study area;

3.13.2 SAMPLING LOCATIONS

The 10 Km radius study area is sparsely populated and is Plane area. Ecology & Biodiversity study separately done in Project Core area & Buffer areas.

3.13.3 METHODOLOGY

The study area taken for the study is 10 km radius with the project boundary as center. The different methods adopted were as follows:

- Inventorisation of flora / fauna: The list of flora and fauna found in the area was taken from the Working Plan of Panipat Forest Division 2022- 2023 for reference. The list of flora and fauna found in the study area was prepared by conducting field survey and by discussions with concerned Forest Department personnel using the list available in the Working Plan as a base.
- Generation of primary data through filed visit: Core & Buffer area has been visited and prepare the flora & Fauna Checklist
- Discussion with local people to elicit information about local plant and animals.

The present study is based on field studies conducted during Post Monsoon Season (Oct to Dec 2023). The biotic environment is studied / investigated with respect to the following biotic components in the study area and at the project site.

3.13.4 ECOLOGICAL FEATURES DESCRIPTION

A. Project Site: The project site is studied for the following:

- Vegetation present
- Fauna and Avi-fauna present

B. Study Area: The study area is studied for the following:

- Agricultural land
- Barren area with weeds
- Vegetation around Human Settlements
- Plantation in the Study Area
- Wildlife and Avifauna
- Endangered Animal & Bird Species: Schedule - I & II
- Scheduled Plant Species

The study area including project site is high populated and land use is Plane area as agriculture land and habitation.

C. PROJECT SITE: ECOLOGICAL FEATURES

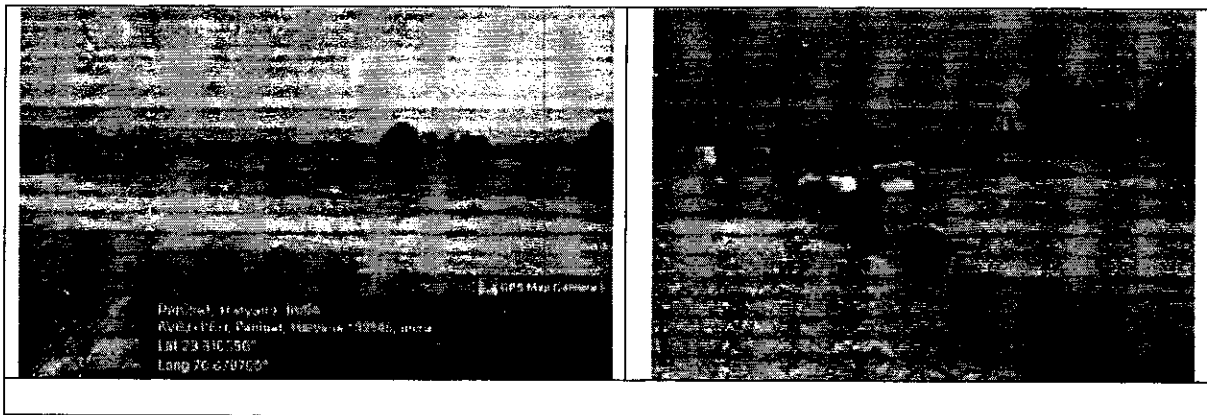
The proposed project is located at Village Naulatha, Tehsil Israna, District: Panipat, State: Haryana. Naulatha is a tiny village and the surrounded 10 Km radius area is Plane with habitation and Agriculture area. The project site landform is fallow land.

D. Vegetation Present:

Project site is fallow land and having herbaceous ground layer with single tree of *Azadiracta indica*. The plant species found in the project site are given in Table 3.21.

TABLE 3. 21 PLANT SPECIES PRESENT AT THE PROJECT SITE

SN	Vernacular Name	Botanical Name	Family	Habit
1	<i>Azadiracta indica</i>	Neem	Meliaceae	Tree
2	<i>Calotropis procera</i>	Bili aekka	Apocynaceae	Shrub
3	<i>Lantana camara</i>	Kakke	Verbenaceae	Shrub
4	<i>Parthenium hysterophorus</i>	Congress grass	Asteraceae	Herb
5	<i>Argemone mexicana</i>	Datturigidda	Papaveraceae	Herb
6	<i>Senna tora</i> Syn. <i>Cassia tora</i>	Chakod	Fabaceae	Herb

**FIGURE 3. 18 A VIEW OF THE PROJECT AREA SHOWING WEEDS & BARREN AREAS****FAUNA AND AVIFAUNA PRESENT:**

The Core Zone is a barren land with open landscape, therefore not much sightings of Fauna were encountered during the study. The fauna and avifauna seen / present at the project site is given in table 3.22.

TABLE 3. 22 FAUNA AND AVI-FAUNA PRESENT AT THE PROJECT SITE

SN.	Scientific Name	Common Name	Schedule species as per amendment in WPA (1972) in 2022
	Mammal		
1	Indian Hare	<i>Lepus nigricallis</i>	II
2	Striped Palm Squirrel	<i>Funambulus palmarum</i>	II
	Reptiles		
3	Common garden lizard	<i>Calotes versicolor</i>	II
	Avifauna		
4	Indian Pond Heron	<i>Ardeola grayii</i>	II
5	House Crow	<i>Corvus splendens</i>	II
6	Common Mynah	<i>Acridotheres tristis</i>	II
7	House Sparrow	<i>Passer domesticus</i>	II

STUDY AREA: ECOLOGICAL FEATURES

The extent of forest cover of Haryana is 1603.48 km² forests/tree cover area is recorded in the State from total Geographical area (44,212 km²) which is about 3.63% of the total state's geographical area (FSI 2021). Panipat District have 1268 km² geographic area in which 1.3% (16.45 km²) is forest area in which no very dense forest found in Panipat district whereas, 3.14 km² is Moderately dense forest and 13.31 km² area is open forest (FSI 2021). Several anthropogenic activities are going on inside the forest, depleting the forest cover day by day. *Acacia*, *Prosopis*, *Eucalyptus* & *Populus* plantations are found in agroforestry and in Private plantation in the study area.

The study area covers 10km radius around the project site. The area exhibits a Plane topography. The landscape of the study area represents a complex of agricultural land, urban & rural habitation mixed with Planted vegetation.

a) Bio-climatic Features of the Study Area

The study area falls in North Punjab plain, Ganga-Yamuna Doab and Rajasthan upland, hot, dry, semi-arid eco-sub region. The project site landform is Plain and Fallow land.

The National Agricultural Research Project (NARP) delineated agro climatic zones based on soil type, temperature, rainfall (agrometeorological characteristics) and geologic constraints. Haryana District falls under the Agro-climatic Zone, Trans Gangetic Plain region (VI). The area falls under climatic region " Semi-Arid steppe Climate (BShw)" as per Köppen classification system. The district is classified in to Agro-climatic / Ecological Zone by different agencies as given in table 3.23.

TABLE 3. 23 AGRO-CLIMATIC / AGRO-ECOLOGICAL CLASSIFICATION OF STUDY AREA IN HARYANA DISTRICT

Agro Ecological Sub Region (ICAR) ¹	North Punjab plain, Ganga-Yamuna Doab and Rajasthan upland, hot, dry, semi-arid eco-sub region
Agro-Climatic Zone (Planning Commission) ¹	(4.1) Trans Gangetic Plain region (VI)
Agro Climatic Zone : National Agricultural Research Project (NARP) ¹	Eastern Zone (HR-1)
Agro-ecological regions by the National Bureau of Soil Survey & Land Use Planning (NBSS & LUP) ²	4.Northern Plain and Central Highlands including Aravallis
Climatic Region (Koppen's) ³	Semi-Arid stippe Climate (BShw)
Bio-geographic Zone (Wildlife Institute of India) ⁴	4. Semi-Arid
Bio-geographic Province (Wildlife Institute of India) ⁵	4A. Semi-Arid Punjab Plains

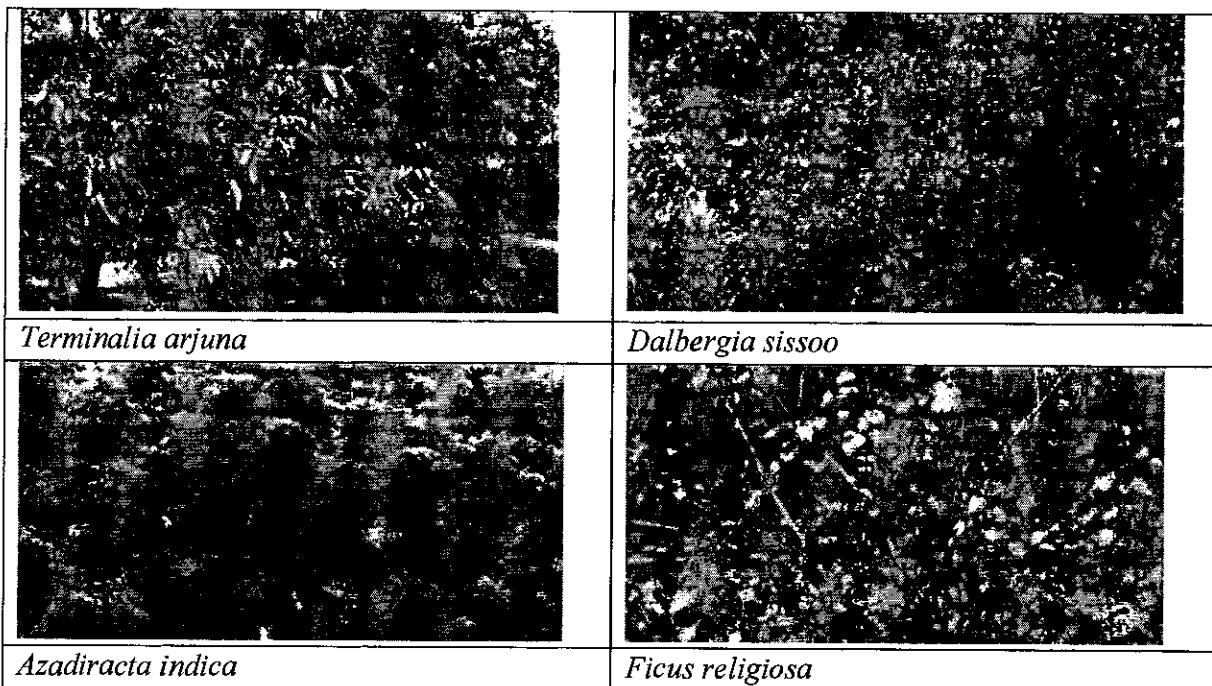
The study area falls under "Semi-Arid stippe Climate (BShw)" climatic region as per Koppen classification system, where the precipitation in driest month less than 6 cm and the dry season is strongly developed. geographically⁶ the study area falls under Bio-geographic Zone " Semi-Arid " and under Bio-geographic Province "Semi-Arid Punjab Plains", as per the Biogeographic classification of Rodgers et. al. 2007. The plant species present in the study area is given in Table 3.24.

TABLE 3. 24 LIST OF PLANTS IN THE STUDY AREA

S. No	Scientific Name	Local Name	Family
A) Trees			
1	<i>Acacia nilotica</i>	Kikar	Fabaceae
2	<i>Acacia Senegal</i>	Khairi	Leguminosae
3	<i>Albizia lebbek</i>	Kala siris	Leguminosae
4	<i>Albizia procera</i>	Safed siris	Leguminosae
5	<i>Alstonia scholaris</i>	Chatim	Apocyanaceae
6	<i>Ailanthus excelsa</i>	Aruna	Simarubiaceae
7	<i>Azadiracta indica</i>	Neem	Meliaceae
8	<i>Banahinia purpurea</i>	Kachnar	Leguminosae
9	<i>Bomax ceiba</i>	Simal	
10	<i>Butea monosperma</i>	Dhak	Leguminosae
11	<i>Cassia fistula</i>	Amaltas	Leguminosae
12	<i>Cassia siamea</i>	--	Leguminosae
13	<i>Callistemon speciosus</i>	Bottel Brush	Myrtaceae
14	<i>Dalbergia sissoo</i>	Shisham	Leguminosae

15	<i>Delonix regia</i>	Gulmohar	Leguminosae
16	<i>Eucalyptus sp</i>	Neelgiri	Myrtaceae
17	<i>Ficus bengalensis</i>	Bargad	Urticaceae
18	<i>Ficus religiosa</i>	Pipal	Urticaceae
19	<i>Ficus palmata</i>	Anjir	Urticaceae
20	<i>Ficus glomerata</i>	Gullor	Urticaceae
21	<i>Holoptelea integrifolia</i>	Papri	Urticaceae
22	<i>Leucaena leucocephala</i>	Subabul	Leguminosae
23	<i>Mangifera indica</i>	Aam	Anacardiaceae
24	<i>Melia azedarach</i>	Bakain	Meliaceae
25	<i>Moringa oleifera</i>	Sohanjana	Moringaceae
26	<i>Morus alba</i>	Toof	Urticaceae
27	<i>Mitragyna parvifolia</i>	Phaldu	Rubiaceae
28	<i>Phoenix sydyeshis</i>	Khazoor	Palmae
29	<i>Pongamia pinnata</i>	Papri	Leguminosae
30	<i>Prosopis juliflora</i>	Mesquite	Leguminosae
31	<i>Populus deltoides</i>	Popular	Salicaceae
32	<i>Polyalthia longifolia</i>	Debdaru	Anonaceae
33	<i>Putranjiva roxburghii</i>	Retranjba	Euphorbiaceae
34	<i>Salix tetrastomatica</i>	Willow	Salicaceae
35	<i>Syzygium cumini</i>	Jamun	Myrtaceae
36	<i>Tamarindus indica</i>	Imli	Leguminosae
37	<i>Tectona grandis</i>	Sagun	Verbenaceae
38	<i>Terminalia arjuna</i>	Arjun	Combretaceae
39	<i>Terminalia belerica</i>	Bahera	Combretaceae
40	<i>Thevetia peruviana</i>	Karabi	Apocyanaceae
41	<i>Ziziphus mauritiana</i>	Ber	Rhamnaceae
(B) Shrubs and Herbs			
1	<i>Abutilon indicum</i>	Pathaka	Malvaceae
2	<i>Achyranthes aspera</i>	Phutkanda	Amoranthaceae
3	<i>Adhatoda vasica</i>	Bansak	Acanthaceae
4	<i>Aerva tomentosa</i>	Bui	Amoranthaceae
5	<i>Agave americana</i>	Keora	Amaryllidaceae
6	<i>Boerhaavia diffusa</i>	Punaruara	Nyctaginaceae
7	<i>Bougainvillea</i>	Bougainvella	Nyctaginaceae
8	<i>Calotropis procera</i>	Aak	Asclepiadaceae
9	<i>Cassia tora</i>	Panwar	Leguminosae
10	<i>Cleome viscosa</i>	Bulhul	Capparidaceae
11	<i>Datura metel</i>	Kala Dhatura	Solanaceae
12	<i>Datura stramonium</i>	Dhatura	Solanaceae
13	<i>Euphobia hirta</i>	Dudhi	Euphobiaceae
14	<i>Flacourtia indica</i>	Kango	Leguminosae
15	<i>Ipomoea fistulosa</i>	Walafyali Aak	Convulaceae
16	<i>Lantana camara</i>	Panchpuli	Verbenaceae
17	<i>Opuntia dillenii</i>	Magphani	Cactaceae
18	<i>Polygonium orientale</i>	--	Polygonaceae
19	<i>Parthenium</i>	Gajar Ghas	Compositae
20	<i>Ricinus communis</i>	--	Euphorbiaceae
21	<i>Nerium odorum</i>	Kaner	Apocyanaceae
22	<i>Sida acuta</i>	Kharenti	Malvaceae

23	<i>Solanum xanthocarpum</i>	Kateri	Solanaceae
24	<i>Solanum nigrum</i>	Mahua maho	Solanaceae
25	<i>Solanum surattense</i>	Kakri	Solaceae
26	<i>Tribulus terrestris</i>	Chota	Zygophyceae
27	<i>Vitex negundo</i>	Bana	Verbenaceae
28	<i>Urena lobata</i>	--	Malvaceae
29	<i>Xanthium strumarium</i>	Chola	Compositae
C) Grasses, Hedges and Climbers:			
1	<i>Coccinia cordifolia</i>	Janglo	Cucurbitaceae
2	<i>Cuscuta reflexa</i>	Akash bel	Cosnopolaceae
3	<i>Capparis sepiaria</i>	Hins	Capparidaceae
4	<i>Cyperus bulbosus</i>	Kila	Cyperaceae
5	<i>Cyperus rotundus</i>	Dilla	Cyperaceae
6	<i>Cocculus pendulus</i>	Vallus	Merispermaceae
7	<i>Tinospora cordifolia</i>	Gilloh	Menispermaceae
8	<i>Andropogon annulatus</i>	Gandra	Poaceae
9	<i>Chrysopogon fulvus</i>	Dhanlar	Poaceae
10	<i>Cymbopogon</i>	Anjan	Poaceae
11	<i>Cynodon dactylon</i>	Dubsha	Poaceae
12	<i>Dichanthium</i>	Talwan	Poaceae
13	<i>Desmostachys</i>	Dub	Poaceae
14	<i>Echinochloa colorium</i>	China	Poaceae
15	<i>Erianthus munja</i>	Kana	Poaceae
16	<i>Imperata cylindrica</i>	Siris	Poaceae
17	<i>Panicum colonum</i>	Sanuak	Poaceae
18	<i>Saccharum</i>	Kans	Poaceae
19	<i>Vetiveria zizanoides</i>	Khas	Poaceae



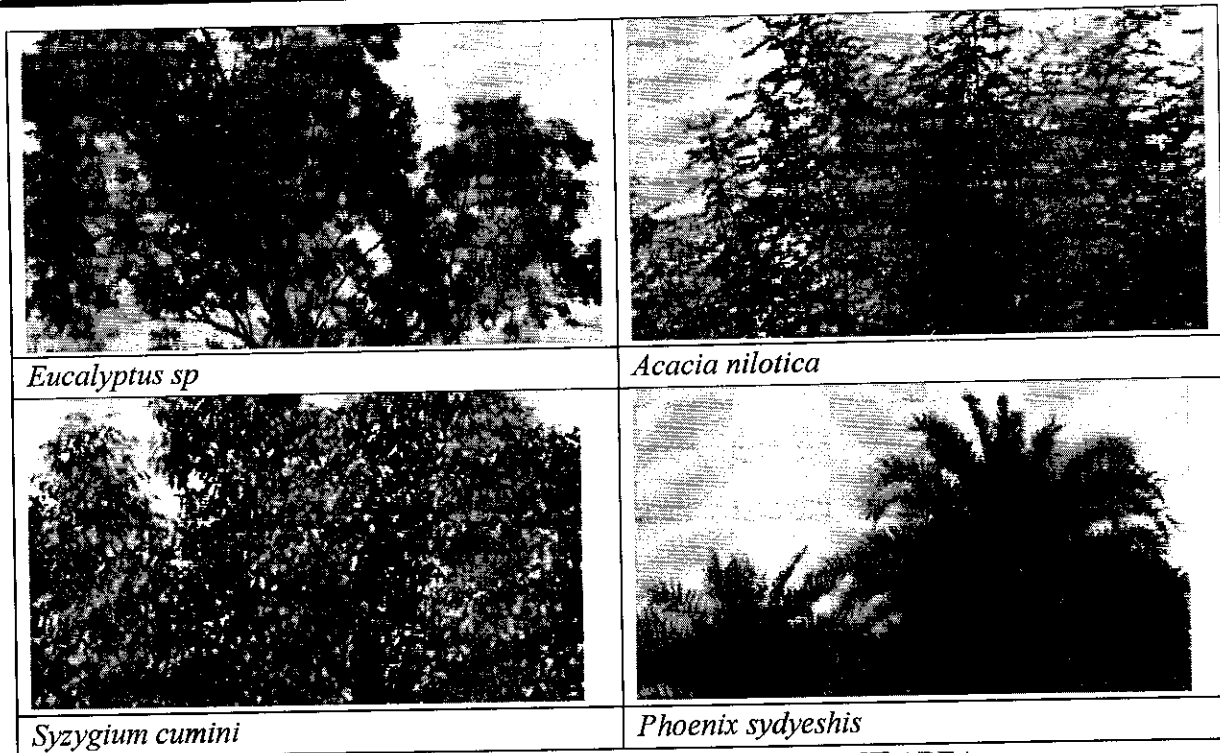


FIGURE 3. 19 LIST OF PLANTS IN PROJECT AREA

Ecological Features

The study area is plane area which is distributed with habitation & vegetation or with trees. There are stretches of barren land whose vegetation comprises of grasses, herbs and small shrubs. There are also patches of land covered with thickets of Lantana with few widely distributed.

- The study area is described as given below:
- Agricultural land
- Barren area with weeds
- Vegetation around Human Settlements
- Plantation Areas
- Wild life and Avi-fauna
- Endangered Animal Species
- Scheduled Plant Species
- Location of National Parks & Wildlife sanctuaries

The ecological features of the study area are described under following heads:

i) Agricultural land

The agriculture is dependent on rain in the study area, except for some areas irrigated with canals. Main crops are Wheat, Rice, Sugarcane & Rapeseed-mustard etc. The main Rabi and Kharif crops grown in the study area along with productivity per ha is given in table 3.25. The horticultural fruit crops like, Guavava, Mango & Ber etc. are grown in the study area. Horticulture vegetable crops grown are Cauliflower and Potato etc.

TABLE 3. 25 STATUS OF AGRICULTURE IN THE STUDY AREA

Major Crops Grown	Productivity (kg/ha)	
	Kharif	Rabi
Wheat	-	4477
Rice	2738	-
Sugarcane (Gur)	7566	-
Rapeseed-mustard	-	1341
Source : Agriculture Contingency Plan :Panipat District		

ii) Barren Area with Weeds

Barren land is seen in the area where the soil conditions are poor and under high biotic pressure. In such areas the soil conditions are not appropriate to support plant growth. Such areas are either without any vegetation or are covered with sparsely scattered plants of *Acacia nilotica*, *Achyranthes aspera*, *Argemone mexicana*, *Lantana sp.*, *Calotropis spp*, *Zyziphus sp.*, *Parthenium hysterophorus* etc.

iii) Vegetation Around Human Settlements

Near the villages, the vegetation pattern changes from that what it is seen in open areas. The species commonly found are mostly of economic importance and used in day-to-day life (Table 3.24). Among the fruit trees mostly Mango, Tamarindus etc. are grown. Among the non-fruit trees Neem, Siris, etc. are grown.

TABLE 3. 26 MAJOR PLANT SPECIES USED FOR SOCIAL FORESTRY PLANTATION IN PANIPAT, HARYANA

Sl. No.	Common name	Scientific name
1	Kikar	<i>Acacia nilotica</i>
2	Eucalyptus	<i>Eucalyptus hybrids</i>
3	Mango	<i>Mangifera indica</i>
4	Gulmohar	<i>Delonix regia</i>
5	Bahera	<i>Terminalia balerica</i>
6	Subabul	<i>Leucenea leucocephala</i>
7	Arjun	<i>Terminalia arjuna</i>
8	Neem	<i>Azadiracta indica</i>
9	Jamun	<i>Syzgium cuminii</i>
10	Sisham	<i>Dalbergia sisso</i>
11	Papri	<i>Holoptelea integrifolia</i>
12	Asan	<i>Terminalia tomentosa</i>
13	Cassia	<i>Cassia siamea</i>
14	Amrood	<i>Psidium guajava</i>
15	Teak	<i>Tectona grandis</i>
16	Kachnar	<i>Bauhinia variagata</i>
17	Bakain	<i>Melia azedirachta</i>
18	Popular	<i>Populas deltoides</i>
19	Mesquite	<i>Prosopis juliflopha</i>
20	Imli	<i>Tamarindus indica</i>
21	Mullsery	<i>Morus alba</i>
Source: Field Study		

iv) Plantation in the Study Area

Kikar, Eucalyptus and Popular plantation are present in Buffer zone area.

v) Fauna and Avifauna

There are a number of planted trees, agroforestry and Plantation area found in the study area. The Amphibian, Reptiles, Avi-fauna and mammals found in the study area are given Tables 3.23.

Fauna

For inventorisation of wild animals a preliminary list of probable animals and specific avifauna were prepared based on "Working Plan of Panipat Forest Division". Subsequently the preliminary list was finalized / prepared by:

- Interacting / discussion / interviewing local people from study area villages;
- Interacting / discussion / interviewing forest department officials (Divisional Forest Officer / Foresters / Beat Officers) in study area;

The list of fauna and avifauna along with their conservation status in the study area are given in table 3.27.

TABLE 3. 27 LIST OF FAUNA AND AVIFAUNA ALONG WITH THEIR CONSERVATION STATUS

S. No	Common name	Scientific name	Schedule species as per amendment in WPA (1972) in 2022
Amphibia			
1	Cricket Frog	<i>Rana limnocharis</i>	Schedule II
2	Frog	<i>Rana tigrina</i>	Schedule II
Reptilia			
1	Garden Lizard	<i>Calotes sp</i>	Schedule II
2	Bengal Monitor Lizard	<i>Varanus bengalensis</i>	Schedule I
3	Common Krait	<i>Bungarus caeruleus</i>	Schedule II
4	Rat Snake	<i>Ptyas mucosus</i>	Schedule I
Aves			
1	Purple Heron	<i>Ardea purpurea</i>	Schedule II
2	Pond Heron	<i>Ardeola grayii</i>	Schedule II
3	Cattle Egret	<i>Bubulcus ibis</i>	Schedule II
4	Large/Int. Egret	<i>Ardea/ Egretta sp</i>	Schedule II
5	Black Ibis	<i>Pseudibis papillosa</i>	Schedule II
6	Whistling Teal	<i>Dendrocygna sp</i>	Schedule II
7	Partridge	<i>Francolinus sp</i>	Schedule II
8	Peafowl	<i>Pavo cristatus</i>	Schedule I
9	Blue Rock Pigeon	<i>Columba livia</i>	Schedule II
10	Ring Dove	<i>Streptopelia decaocto</i>	Schedule II
11	Roseringed Parakeet	<i>Psittacula krameri</i>	Schedule II
12	Koel	<i>Eudynamys</i>	Schedule II
13	Crow-Phasant	<i>Centropus sinensis</i>	Schedule II
14	White breasted	<i>Halcyon smyrnensis</i>	Schedule II
15	Green Bee-eater	<i>Merops orientalis</i>	Schedule II

16	Hoopae	<i>Upupa epops</i>	Schedule II
17	Pied Myna	<i>Sturnus Contra</i>	Schedule II
18	Common Myna	<i>Acridotheres tristis</i>	Schedule II
19	Bank Myna	<i>Acridotheres</i>	Schedule II
20	House Crow	<i>Corvus splendens</i>	Schedule II
21	Jungle Crow	<i>Corvus macrorhynchos</i>	Schedule II
22	Redvented Bulbul	<i>Pycnonotus cafer</i>	Schedule II
23	Jungle Babbler	<i>Turdoides striatus</i>	Schedule II
24	Babbler	<i>Turdoides sp</i>	Schedule II
25	Pied Bush Chat	<i>Saxicola caprata</i>	Schedule II
26	Indian Robin	<i>Saxicoloides fulicata</i>	Schedule II
27	Sunbird	<i>Nectarinia sp</i>	Schedule II
28	House Sparrow	<i>Passer domesticus</i>	Schedule II
29	Baya	<i>Ploceus sp</i>	Schedule II
30	White throated Munia	<i>Lonchura malabarica</i>	Schedule II
31	Spotted Munia	<i>Lonchura punctulata</i>	Schedule II
Mammals			
1	House Rat	<i>Rattus sp</i>	Schedule II
2	Mongoose	<i>Herpestes sp</i>	Schedule II
3	Squirrel	<i>Funumbulus sp</i>	Schedule II
4	Field Mouse	<i>Mus sp</i>	Schedule II
5	Hare	<i>Lepus sp</i>	Schedule II
6	Mole Rat	<i>Bandicota sp</i>	Schedule II
7	Monkey	<i>Macaca fascicularis</i>	Schedule II

Fishes

The fishes found in the study area are given in table 3.28. There is no organized fishing activity within study area.

TABLE 3. 28 LIST OF FISHES IN THE STUDY AREA

S.no.	Common name	Scientific name
1	Chital	<i>Notopterus chitala</i>
2	Pholus	<i>Notopterus notopterus</i>
3	Chela	<i>Salmostoma bacaila</i>
4	Catla	<i>Catla catla</i>
5	Rahu	<i>Labeo nolita</i>
6	Bata	<i>Labeo bata</i>
7	Mrigal	<i>Cirrhina mrigala</i>
8	Punti	<i>Puntius sophor</i>
9	Catfish	<i>Mystus seenglala</i>
10	Rita	<i>Rita rita</i>
11	Magur	<i>Clarius batrachus</i>
12	Nandus	<i>Nardus nardus</i>
13	Cyprinus cemp	<i>Cyprinus carpio</i>
14	Lata	<i>Channa punctatus</i>
15	Cylindrical fish	<i>Sinolia cylindica</i>

vi) **Schedule - I Species of Study area**

The Schedule-I faunal / avifaunal species present in the study area is given in table 3.29. However, the project proponent is dedicated and committed to conserve these species. The wild life conservation plan will be prepared (Under Preparation) and after approval from statutory authorities will be implemented in the region for conservation of the above species.

TABLE 3. 29 LIST OF SCHEDULED FAUNA AND AVIFAUNA PRESENT IN THE STUDY AREA

SN	English Name	Scientific Name	Schedule I species as per amendment in WPA (1972) in 2022	IUCN Status (Global)
Schedule I Reptiles				
1	Bengal Monitor Lizard	<i>Varanus bengalensis</i>	Schedule I	Near Threatened
2	Rat Snake	<i>Ptyas mucosus</i>	Schedule I	Least Concern
Schedule I Avifauna				
3	Peafowl	<i>Pavo cristatus</i>	Schedule I	Least Concern

vii) **Scheduled Plant Species**

The study area did not record the presence of any species mentioned under Schedule VI of Wild Life Protection Act 1972 (and amendments).

viii) **Ecologically Sensitive Areas within Study Area**

Based on a study conducted in the project area and information from the Divisional Forest Officer, Panipat, it has been determined that there are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, or Tiger/Elephant Reserves within 10 kilometers of the project site. The topographic map of the core area and its 10-kilometer radius confirms the absence of these ecological entities. The nearest ecologically sensitive area is the Bir Bara Ban Wildlife Sanctuary, located 56 kilometers west of the proposed plant site. No rare, endangered, or threatened species were observed in the core area during the study. The diversity survey revealed that the variety of trees, shrubs, and herbs is higher in the buffer zone compared to the core zone. The core zone, characterized by fallow land, has lower vegetation value compared to the buffer zone.

3.14 SOCIO-ECONOMIC FEATURES

3.14.1 INTRODUCTION

All industrial projects have social and economic linkages. Therefore, putting up a new project has impact on the socio-economic environment of the locality around it. This impact may be marginal or non-marginal. The intensity of impact may depend upon the various social and environmental factors associated with it and the extent of change caused by the project to alter the existing equilibrium of the socio-economic system. Influx of people from outside during various stages of the project may also alter the existing cultural identity of the local people. Further, there is a cash flow associated with the project which may affect the existing socio-economic activities and may introduce many newer activities associated with the project to which the local people have strong adherence.

M/s Ambuja Cements Limited proposes to set up a cement grinding unit in at Village Naulatha, Tehsil Isarana, District Panipat, Haryana. The various activities of the proposed projects are likely to stimulate the existing socio-economic environment in the surrounding area. The influx of money and various construction activities may not only change the economic status of the area but also influence the existing cultural scenario. This impact is expected to be more in the area closer to the site, which decreases with increase of distance from the site.

A. Objectives

The proposed project will impact the social and economic conditions of the people of the region in terms of direct and indirect employment, skill diversification, infrastructure development, business development etc. On this background, the present study is directed towards the following objectives:

- To assess the present demographic profile of the study area;
- To assess the agricultural situation and to assess the impact of the project on agricultural situation;
- To assess the impact of the project on pattern of demand;
- To examine the impact of the project on consumption pattern;
- To examine the employment and income effects of the project;
- Assessment of the educational status of the people and to explore the impact of the project on education;
- To ascertain the impact of the project on industrialization in the study area;
- To examine the impact of the project on community development activities;
- To analyze peoples' perception regarding impact of the project;

B. Methodology Adopted for the Study

The methodology adopted for the study is based on the following process:

C. Review of Secondary Data

Baseline data on socio-economic parameters were generated using information available with Government agencies, census data etc. Data from the secondary sources, viz. the latest available District Statistical Handbook, 2011 Census data and various census updates based on the 2011 census, were explored / reviewed for getting the demographic profile, viz., number of households, population, social composition, literacy and occupational structure, etc. of the population within the study area (10 km radius) of the project site. The secondary data was used to supplement the primary data collected through limited field survey.

D. Field Survey

Limited socio-economic survey was carried out covering the villages of the study area to record awareness, opinion, apprehensions, quality of life and expectations of the local people about the proposed project. The opinion of local people about the proposed project was obtained through socio-economy survey of the villages / towns in the study area.

A brief about the sampling design adopted for the field survey is described below. The survey has been conducted through specially designed questionnaire covering the main aspect of the present study. In addition to the field data, secondary data / information collected, compiled and published by different Governmental agencies / departments were also collected and utilized appropriately.

E. Sampling Design

For selection of respondents from the study area, Two Stage Random Sampling has been adopted. In the first stage, villages are selected and in the second stage, households / respondents are selected. From each selected village, the respondents are selected randomly to account intra-village variability among the respondents for the character under study. As the variability of the characters in each study strata does not vary widely among the households, a smaller sample size is expected to represent the population.

Samples of about 30 respondents were drawn from the study area. The sample covers an estimated 150 persons.

F. Composition of the Questionnaire

Households / respondents were interviewed with the structured questionnaire specifically designed for this study keeping in view the objectives of the study. The questionnaire consists of following major sections:

- Educational status
- Demographic profile of the households
- Health status
- Information on agricultural situation.
- Employment (sources of employment)
- Income (income from various sources)
- Information on family budget
- Consumption and saving
- Availability of Basic amenities such as drinking water, electricity etc.
- Respondents' perception about the project

G. Existing Socio-Economic Scenario

The information on socio-economic aspects of the study area as defined in this Chapter has been compiled from secondary sources, which include various public offices. The sociological aspects of this study include human settlements, demography, social, such as Scheduled castes and Scheduled Tribes and literacy levels besides infrastructure facility available in the study area. The economic aspects include occupational structure of workers. The salient features of the demographic and socio-economic details are presented in the following sections.

i) Population Distribution: Demographic Pattern

Panipat district is divided into two sub-divisions: Panipat and Samalkha, which are further divided into five tehsils: Panipat, Samalkha, Israna, Bapoli and Madlauda. The study area falls under tehsil Israna, districts Panipat of Haryana State. The city is famous in India by the name of "City of Weavers" and "Textile City". It has a geographical area of 1268.00 km² which comprises 1188.65 km² of rural area and 79.35 km² of urban area. According to the 2011 census, Panipat district has a population of 1,205,437. The district has a population density of 951 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 24.60%. Panipat has a sex ratio of 864 females for every 1000 males and a literacy rate of 75.94%.

The total 47 villages falling within the study area (10km radius) along with their demographic profile based on 2011 census data are listed shown in figure 3.20. Demographic pattern based on 2011 census data in 10 km study area is given in Table 3.30 and its main features is shown in Figure: 3.21 to 3.24.

Primary survey was conducted during 15th October 2023 to 31st October 2023 and primary data was collected based on specific designed questionnaire and focussed group discussion. Villages covered in area are Brahman Majra, Naulatha, Balana, Israna, Kalkha, Didwari, Jondhan Khurd, Luhari, Bhadaur and Bijawah etc. The Table 3.30 indicates the following demographic features up to 0-10km.

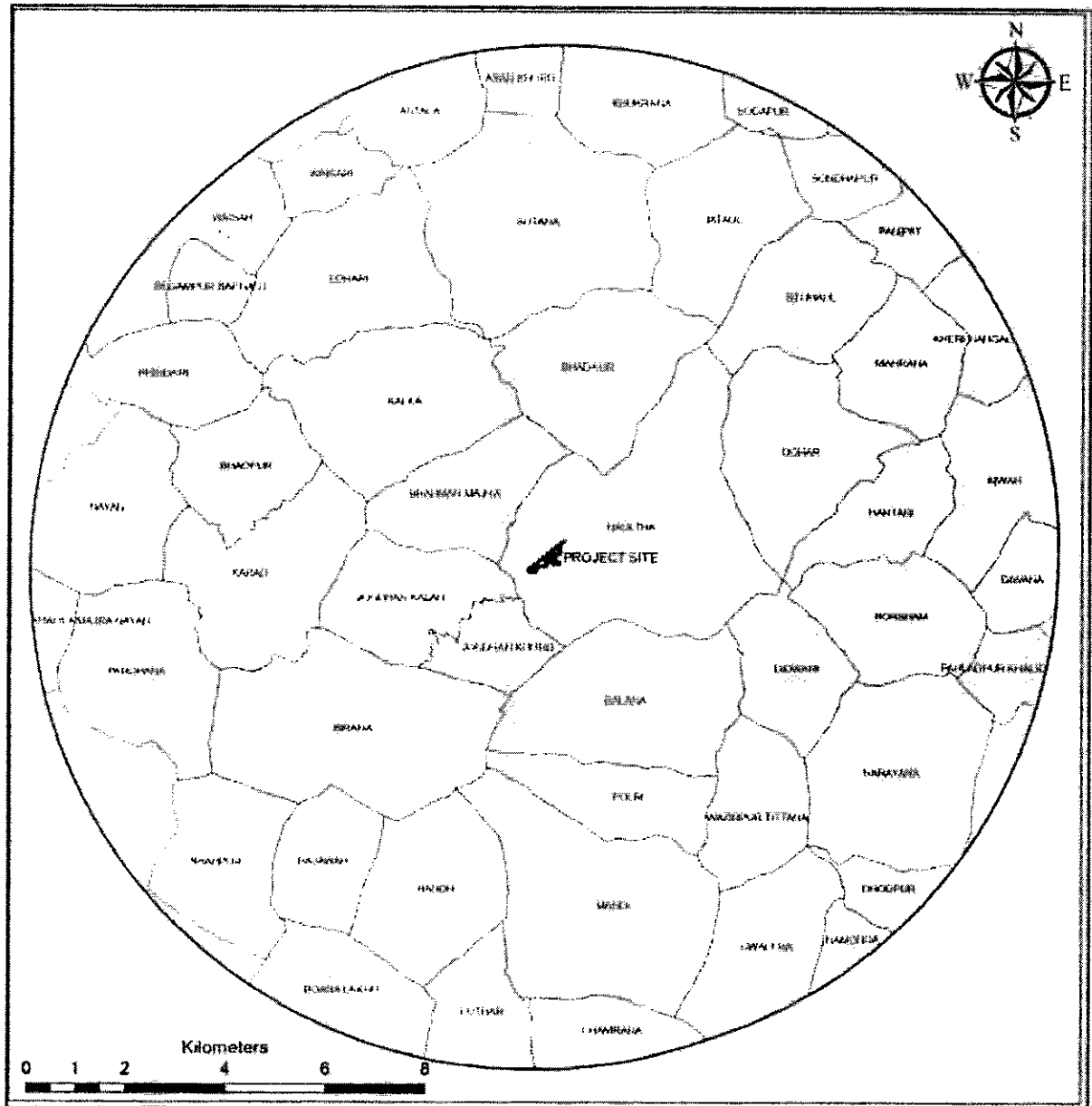


FIGURE 3. 20 VILLAGES OF STUDY AREA

ii) **Population**

The total population of 47 villages is 230541. The study area population density is 734 per village in 2011. There is no Schedule Tribe (ST) in the study area. Schedule Caste (SC) have 20.51% of total population (Figure: 3.15). Other population of study area is 79.49 of the total population.

iii) **Village and Household Size**

The total households in the 47 villages are 44134. The average household per village is 939. The

average household size is 5.22 in rural.

iv) Sex Ratio

The sex ratio in the district is 864 females per 1000 males, whereas in the study area is 868 females per 1000 males. The percentage of male and female population to the total population is 53.68 and 46.32, respectively (Figure: 3.22).

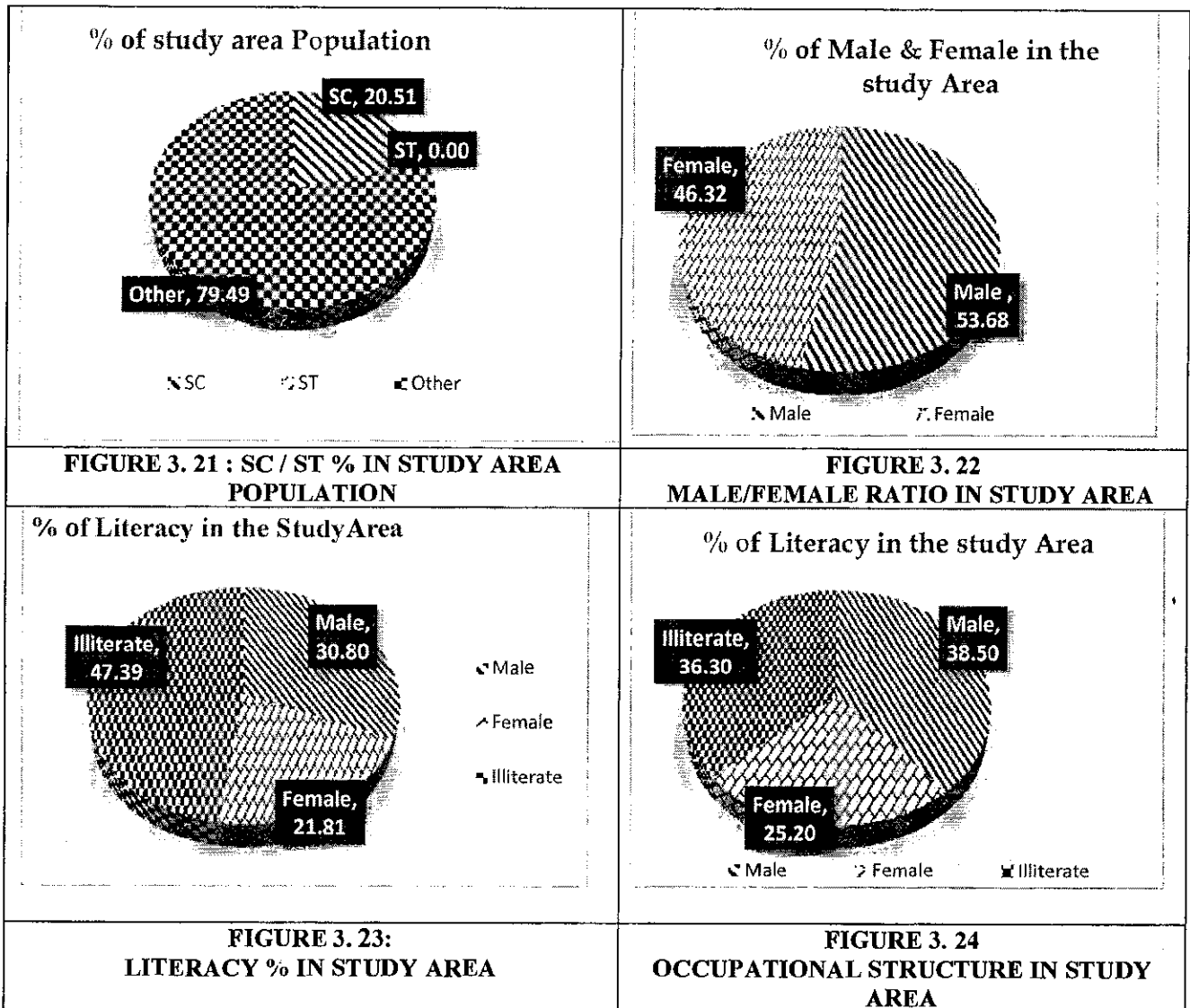
v) Literacy Rate

The overall literacy rate of study area is 63.70%. The % male and female literacy to the total population is 71.72 & 54.39, respectively (Figure: 3.23).

TABLE 3. 30 DEMOGRAPHIC PROFILE OF RURAL POPULATION IN THE STUDY AREA (2011 CENSUS)

SN.	Population Data	Study Area up to 10km (2011 Census)
1.	Area sq km	314.16
2.	Number of House Hold	44134
3.	Total Population	230541
4.	Average Family Size	5.22
5.	Average no. of house hold per village	939.03
6.	Average population per village	4905
7.	Female per 1000 Males	868
8.	% of male population to total population	53.68
9.	% of female population to total population	46.32
10.	Total Males	123744
11.	Total Females	106797
12.	Population Density (Nos/sq. km)	733.8
13.	% of SC population to the total population	20.51
14.	Schedule Cast Total Population	47291
15.	% of ST population to the total population	-
16.	Schedule Tribe Total	-
17.	Total Literates	146846
18.	Literates Males	88754
19.	Literate Females	58092
20.	Literacy Percent (%)	63.70
21.	Literacy Percent (%) Males	71.72
22.	Literacy Percent (%) Females	54.39
23.	Total Illiterates	83695
24.	Male Illiterates	34990
25.	Female Illiterates	48705
26.	% of main worker to the total population	26.72
27.	Total Main Worker	61610

SN.	Population Data	Study Area up to 10km (2011 Census)
28.	% of marginal worker to the total population	7.71
29.	Total Marginal Worker	17777
30.	% of non-worker to the total population	65.56
31.	Total Non-worker	151154



VI) Occupational Structure

The occupational structure of residents in the study area is analyzed with reference to main workers, marginal workers and non-workers. The main workers include 10 categories of workers defined by the Census Department consisting of cultivators, agricultural laborers, those engaged in live-stock, forestry, fishing, mining and quarrying; manufacturing, processing and repairs in household industry; and other than household industry, construction, trade and commerce, transport and communication and other services.

The marginal workers are those workers engaged in some work for a period of less than six months during the reference year prior to the census survey. The non-workers include those engaged in unpaid

household duties, students, retired persons, dependents, beggars, vagrants etc.; institutional inmates or all other non-workers who do not fall under the above categories. The occupational structure of the study area is shown in Table 3.31. As per 2011 census altogether the main workers work out to be 34.43% in the study area. The marginal workers constitute approximately 7.71 % of the total population within 0-10 km radius. The non-workers constitute approximately 65.56% of the total population, within 0-10 km radius. The distribution of workers by occupation indicates that the non-workers are the predominant population. The marginal workers can possibly be the pool for unskilled labour for the proposed project.

TABLE 3. 31 OCCUPATIONAL STRUCTURE IN THE AREA (2011 CENSUS)

SN	Population Data	Study Area Up to 10km
1.	Total Population	230541
2.	Total Worker (Main + Marginal) Population	79387
3.	% Total Workers (Main + Marginal) to Total Population	34.43
4.	Main Workers Total	61610
5.	Total Main Workers (%) to Total Population	26.72
6.	Marginal Worker Total	17777
7.	Total Marginal Workers % to Population	7.71
8.	Non-Working Population Total	151154
9.	Total Non-workers % to Total Population	65.56

VII) Infrastructure Facilities

General

The infrastructure and amenities available in the area denotes the economic wellbeing of the region. The area as a whole possesses moderate level of infrastructural facilities.

A review of infrastructure facilities available in Panipat District has been done based on the information available at the websites of Directorate of Economics and Statistics, Department of Medical and Family Welfare, National Health Mission, Medical Health and Family Welfare Department, Government of Haryana and limited field survey.

Apart from collecting data from secondary sources, a review of infrastructure facilities available in the area has also been given on the basis of field survey of the study area. In this exercise the villages which fall within 10 km radius around the site has been considered. Infrastructure facilities available in the area are presented below.

Educational Facilities

Education is a very important determinant of socio-economic development of any area. Universal primary education is one of the essential development strategies of a developing country like India, which focus mainly over raising the Net Enrolment Ratio (NER) in primary education. As per Government of India norms, the education facilities available should be as follows:

- Availability of primary school within one kilometer of habitation,
- Availability of middle school within 3 kilometer of habitation and
- Availability of high school and secondary education within 5 kilometer of habitation

Block Israna have 13 Govt. Senior Secondary Schools, 7 Govt. High Schools, 13 Govt. Middle Schools and one Private University (<https://cdnbbsr.s3waas.gov.in/>). As per the Government of India

norms, the education facilities in the district in general and in particular in the blocks falling in study area are less than adequate to fulfill the Government of India norms. Most of the villages in the study area, Anganwadis and schools up to primary level. Schools up to Middle Level are found in some villages / panchayats. Hence there is a need to develop the educational facilities by establishing more number of secondary and higher secondary level schools in the area.

Agricultural Situation

Agriculture is an important source from which people of the area derive their income. The climatic condition, irrigation facilities and the quality of soil, in the district are not suitable for developed agriculture Table 3.32 depicts the cropping intensity in Panipat district. Cropping intensity in the district is average (196%).

TABLE 3. 32 CROPPING INTENSITY PANIPAT DISTRICT

SN.	Agriculture Land-use	Area (in 000'ha)	Cropping Intensity (%)
1	Net sown area	94	196
2	Area sown more than once	90	
3	Gross Cropped Area (GCA)	184	

Source: Agricultural contingency plan for district, Panipat

Agriculture is dependent on rain in the study area, except for some areas irrigated with canals from dams. Main crops are Wheat, Rice, Sugarcane (Gur) & Rapeseed-mustard etc. The main Rabi and Kharif crops grown in the study area along with productivity per ha is given in Table 3.31. The horticultural fruit crops like, Guava, Mango, & Ber, etc are grown in the study area. Horticulture vegetable crops grown are Cauliflower, & Potato etc.

TABLE 3. 33 STATUS OF AGRICULTURE IN THE STUDY AREA

Major Crops Grown	Productivity (kg/ha)	
	Kharif	Rabi
Wheat	-	4477
Rice	2738	-
Sugarcane (Gur)	7566	-
Rapeseed-mustard	-	1341

Source : Agriculture Contingency Plan : Panipat District

Irrigation Facilities in The District

The irrigation-based classification of the crop land in the district is given in Table 3.34. The irrigated area is given in to two heads, as gross irrigated area and net irrigated area. The gross irrigated area covers 184 thousand hectares and the net irrigated area covers 94 thousand hectares in the district, whereas there is no rain-fed area is in the district.

TABLE 3. 34 SOURCE OF IRRIGATION FOR AGRICULTURE IN PANIPAT DISTRICT

Area in ha.		
Gross Irrigated	Net Irrigated	Rain-fed
184	94	-

Health Care System in Panipat District

Panipat is one of the important districts in Haryana known for its unprecedented industrial growth. The city boasts of large-scale industries operating here and it has diverse population attracted by the ample job opportunities provided by them. With this high influx of population, health care sector needed a much-required revamp in the city. The State government has managed to achieve certain Millennium Development Goals through specific measures such as establishment of Health Task Force, State Health Policy initiatives etc. Few of the significant changes seen in state's health status are:

The major Public sector hospitals in Panipat are Civil Hospital, ESI Hospital, and Chaturbhuj Leelavati Trust Hospital. The city also has many private medical institutions including Shri Balaji Hospital, Aman Hospital, Madaan Hospital, Chhabra Hospital, Maharaja Aggarsain Hospital, and Ravindra hospital etc. The health care facilities available in the District are given in Table 3.35.

TABLE 3. 35 HEALTH CARE FACILITIES IN PANIPAT DISTRICT

Health Sub Centers	PHC	CHC	Sub Divisional Hospital	District Hospital
89	7	21	8	2
PHC: Primary Health Centre; CHC: Community Health Centre Source: OGD platform of India, data.gov.in				

Panipat is one of the revenues generating District of the state. However, the health care facilities and system needs attention. The delivery of Primary Health Care is the foundation of the rural health care system and is an integral part of the national health care system. Currently the number of government health facilities in the district is not sufficient to meet the needs the whole population (as per 2011 census).

Anganwadi

Anganwadi is available in all villages in the study area but with limited basic facilities in Anganwadi as revealed during the primary survey. Anganwadi is a type of rural mother and child care centre in India. They were started by the Indian government in 1985 as part of the Integrated Child Development Services program to combat child hunger and malnutrition. It is a part of the Indian public health care system. Basic health care activities include contraceptive counseling and supply, nutrition education and supplementation, supply of basic medicines including oral rehydration salts and pre-school activities.

Following facilities are available in the anganwadi's located in the study area:

- Supply of food supplements to pregnant women and child
- Family planning counselling
- Monitoring of child growth
- Regular Health Check-ups

- Maternal & Baby care

In the study area in the surveyed villages medical facilities were satisfactory. But few PHCs were noticed over a vast area comprising a number of villages. Hence there is a requirement for opening up of more number of hospitals.

Public Distribution System (PDS)

Public distribution system is a government-sponsored chain of shops entrusted with the work of distributing basic food and non-food commodities to the needy sections of the society at very cheap prices. PDS shops are available in all villages of the study area. The following items are distributed every month through the PDS shops:

- Wheat
- Rice

Transportation

Proposed project is situated along the road side. Adequate provision of transport is a prerequisite for economic development in general and rural development in particular. It acts as a catalyst both for production and distribution system of the economy. The economic development requires a well-developed transport network. Roadways and private taxis are the principal mode of transport in the district. There has been phenomenal increase in road transport in the district during 11th plan period. Though passenger service is made available to all the Community Development Block. Despite all these measures some of the rural roads in the district are not all-weather roads. In the study area adequate roads and bus services are available near the State Highways which are well connected with roads connected to the villages.

Sanitation and Water Supply Facilities

The information based on the sampled survey, reveals that the problem of open defecation doesn't exist in the study area. Moreover, as per the water supply is concerned most of the villages are dependent on traditional source of water resources (hand-pumps). Very few villages have public or private supply of water to their home through tap. Clean drinking water facility exists in the study area.

Status of Electricity

The state of have achieved more than 95% electrification of households. Almost all of the villages in the study area are electrified as revealed during the primary survey. Electricity is used for domestic, industrial, agricultural and public lighting purposes. However, there is a serious problem among these villages regarding frequent power cuts, load shading and during rainy season where solar panels are the only source of electricity.

a) Industrialization

National Fertilizers Limited, NTPC, Panipat, MK Spuntex Pvt. Ltd. Adani logistics, M/s Altra Tech. Cement Ltd. & M/s. Grasim Industries Ltd are the industries found in 10 Km study area, whereas status of industrialization in the district is given in table 3.36.

TABLE 3. 36 EXISTING LARGE SCALE INDUSTRIES/ PUBLIC SECTOR UNDERTAKINGS LIST IN THE PANIPAT DISTRICT

SN	Name of unit	Product	Year of Set up
1	M/s Indian Oil Corpn. Ltd. (Oil Refinery) Panipat	LPG,Petrol,Diesel, K.Oil	1998- 99
2	M/s National Fertilizers Ltd. G.T. Road Panipat	Urea	1980- 81
3	M/s Panipat Thermal Plant Vill. Assan (Panipat)	Electricity Generation	1974- 75
4	M/s Northern Hatcheries Pvt. Ltd Vill. Dikadla Panipat	Hatcheries	1994- 95
5	M/s Ultratech Ltd Vill. Karad, Israna, Panipat	Birla Cement	2007-08
6	M/s Grasim Inds.Ltd.	Portland Cement	2007- 08
7	M/s Jay Pee Cement Vill. Khukhrana, Asan Kalan (Panipat)	Portland Pozzlana Cement,Ordinary Cement	2007- 08
8	M/s Om Overseas, Vill. Jattipur (Panipat)	Bath Mats Rugs, Carpets,Floor Mats	2005-06
9	M/s Harison & Harlaj Ltd., G.T Road, Panipat	Bath Mats Rugs, Carpets,Floor Mats	1998-99
10	M/s Attar Filte Ltd., Panipat	Hosiery Fabrics	1997- 98
11	M/s Shiv Om Paper Mills Pvt. Ltd, Vill. Pardhana (Panipat)	Paper, Craft Paper	2009- 10
12	M/s Natural Food Products (India) Ltd. (Nestle Ltd.) Samalkha (Panipat)	Cereals	1992- 93
13	M/s G.R.M. Overseas, Ltd. Gohana Road, Panipat	Rice Milling	2008- 09

Source: Report of Brief Industrial Profile of Panipat District, MSME-Development Institute

b) Study Area Infrastructure: Summary

The total study area (10 km) falls in Israna Block, Panipat district. The major portion of study area is covered under Israna Block. The infrastructure and amenities available in the district denotes the economic wellbeing of the region. The area as a whole possesses moderate level of infrastructural facilities.

c) Opinion of the People About Project

It is observed that 80% of them have identified creation of employment opportunity as the main advantage. People are hopeful of getting employment in the project and through other indirect employment opportunities. About 73% of the respondents are expecting improvement in business. About 67% of the respondents are of the view that the living standard of those employed will improve. About 60% of the respondents are of the view that the infrastructure facilities in the area will improve.

Around 40% of the respondents feel water scarcity in the area. The major disadvantage is that about 17% of the respondents are showing concern to health due to environmental pollution.

TABLE 3. 37 PEOPLES' PERCEPTION ON THE PROJECT

Perception	No. of Respondents	Distribution (%)
Advantages		
Employment opportunity	24	80
Business development	22	73
Improvement in Living Standards	20	67
Improvement in infrastructure	18	60
Dis-Advantages		
Water scarcity	12	40
Damage to health	5	17
Total Respondents	30	

Perceptions on Major Advantage:

- Present project may generate more employment, directly and indirectly, and major portion of it may be provided to the local people.
- Development of business opportunity in the area.
- Improvement in living standard.

Perceptions on Major Disadvantage:

- Health damage due to pollution arising from the project.

Basic Needs of the People in the Study Area

People feel that the project has positive impact on their lives. The project will provide them employment and hope for better future. M/s. Ambuja cements Limited to some extent will address the issues of poverty, unemployment, and drinking water under its CSR policies in the nearby areas for meeting the social infrastructure demand. It appears that the expectations and needs of the villagers are quite moderate. The people in the study require basic minimum amenities wherever they are not available and improving these facilities wherever these are inadequate.

- Basic issues which needs to be addressed are related to the following:
- Education & communication
- Health care and enhancement of drinking water source.
- Alternative livelihood and environmental protection.
- Infrastructure development including drainage.
- Financial inclusion through enhanced banking facilities.
- Enhancement of sports and cultural activities.

Conclusion

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. Male & Female ratio of study area is a major concern. It was also found that a part of population was suffering from lack of earning source. Their expectation

is to earn some income for their sustainability on a long-term basis. The infrastructure and amenities available in the area denotes the economic well being of the region. The study area as a whole possesses an average level of infrastructural facilities. This area lacks higher level of amenities like higher education, health, drinking water and communication network. In terms of education and health facilities, the area is less than moderate. The area needs more medical facilities. Though the area is well connected with road transport and communication facilities still more frequent bus service is required. The overall socio-economic status of the target population is average in terms of literacy, work participation rate etc.

3.15 TRAFFIC STUDY

3.15.1 MODE OF TRANSPORTATION OF RAW MATERIAL, FUEL & FINISHED PRODUCT:

- Clinker would be sourced from domestic plants in Marwar Mundwa or any other in-house sources as per price dynamics.
- Fly Ash shall be sourced from nearby thermal power plant from Hissar Panipat/NPL, and Rajpura/Talwandi Sabo.
- Natural Gypsum shall be sourced from Bikaner, Rajasthan.

3.15.2 EXISTING TRANSPORTATION DETAILS

The site is well connected to NH – 709 (1.6 km in E direction) and SH - 14 (8.3 km in N direction). The site is also well connected to rail. The nearest railway station is Naulatha Railway Station, 0.7 km, NE and nearest airport is Karnal Airport, 48.30 km, NE.

3.15.3 EXISTING TRAFFIC SURVEY

Traffic survey has been conducted for 24 hours at NH- 709 (1.6 km in E direction). Measurements of traffic density was made continuously for 24 hours by visual observation and counting of vehicles for the seven categories, viz., motor cycle/scooter, passenger car/ van / Auto rickshaw, tractors, trucks, bus, trailer and cycle. The traffic survey monitoring was done in the month of October 2023., to project the future traffic growth and the load on the NH- 709 and the nearby connecting minor roads due to the proposed grinding unit. Total numbers of vehicles per hour under the seven categories were determined. The details of the traffic volume count have been provided in Table 4.15.

3.15.4 BASELINE TRAFFIC SURVEY:

Road conditions and traffic volume was counted in road connecting to ACL by EMPL team. The name of road whose conditions and volume was counted is given Table 3.38.

TABLE 3. 38 NAME OF TRAFFIC SURVEY LOCATION

Point	Name of Road Stretches	Place where Classified Vehicle Count done for 24-hr
1	NH-709 Road	Near ACL Gate

Recommended design service volume four lane roads:

Sufficient information about the capacity of multi-lane roads under mixed traffic conditions is not yet available. Tentatively, a value of 35,000 PCUs can be adopted for four-lane divided carriageways located in plain terrain. It is assumed for this purpose that reasonably good earthen shoulders exist on the outer side, and a minimum 3.0 m wide central verge exists.

TABLE 3. 39 TRAFFIC VOLUME COUNT SURVEY

Time	2 Wheeler	Car/Jeep/Van	Buses	Trucks/ Dumper/ Multi wheeler
7:00 AM – 11:00 AM	216	128	28	420
11:00 AM - 5:00 PM	186	67	20	210
5:00 PM - 10:00 PM	258	146	32	202
10:00 PM - 7:00 AM	38	19	4	368
Total	698	360	84	1200

No. of Vehicles with respect to PCU

Time	2 Wheeler	Car/Jeep/Van	Buses	Trucks/ Dumper/ Multi wheeler
7:00 AM – 11:00 AM	216	128	28	420
11:00 AM - 5:00 PM	186	67	20	210
5:00 PM - 10:00 PM	258	146	32	202
10:00 PM - 7:00 AM	38	19	4	368
Total	698	360	84	1200
PCU count	349	360	168	2760
Total PCU/ day	3637			
PCU /hr.= (PCU/day)/24 = 151				

Existing Traffic Scenario and LOS (Level of Service)

V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
151	625	0.24	B

Capacity as per IRC: 64-2011

V/C	LOS (Level of Service)	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
>1.0	F	Unstable (Free flow = 0)

Considering 100 % transportation through Road. Both raw and finished materials will be majorly transported by the road. Adequate parking facilities will be provided to accommodate additional trucks within the plant premises. Additional Traffic during operation of the plant due to raw material and finished products transportation has been given Table 3.40.

TABLE 3. 40 INWARD TRAFFIC DUE TO THE RAW MATERIAL TRANSPORTATION-ROAD

S.No	Raw Material	Quantity			Type of Vehicle & Capacity	Number of Trips / Day (approx.)
		MTPA	TPA	TPD		
1.	Clinker	1.2	1,200,000	3636	Truck, 30 T	121
2.	Gypsum	0.20	200,000	606	Truck, 30 T	20
3.	Fly ash	1.2	1,200,000	3636	Truck, 30 T	121
Total = 262						

**Considering 100% by Road to Calculate Maximum Pollution Load with 330 working days*

TABLE 3. 41 OUTWARD TRAFFIC DUE TO THE FINISHED PRODUCT TRANSPORTATION

Material	Quantity			Type of vehicle and Capacity	Number of Trips (approx.) Per Day
	MTPA	TPA	TPD		
Cement	4	4000000	12,121	Truck, 30 T	404

**Considering 100% by Road to Calculate Maximum Pollution Load with 330 working days*

Total No. of increased trucks / bulkers per day (raw materials) = 262

Total No. of increased trucks / tankers per day (finished product) = 404

Total No. of increased trucks / bulkers per day (raw material + finished product) = 666

Total No. of increased trucks / bulkers per day (Inward + outward) = 666*2= 1332

Increase in PCU / day = 1332*4.5= 5994

Increase in PCU/Hr.= 5994*24= 249.75

Due to the proposed project, there will be addition of heavy and light motor vehicles in the existing traffic. The LOS value is 0.24. According to this performance will be in the category of very good scenario. The present road capacity is good enough to bear the increased traffic load due to proposed project. However, internal roads and feeder roads will be maintained to facilitate transportation.

CHAPTER -4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

The anticipated environmental impacts of the project would be mainly due to the construction & operational activities. The environmental parameters likely to be affected are related to many factors, viz. physical, social and economic, agriculture and aesthetic.

These industrial operations can disturb the environment in various ways, such as change in air, noise level; water & soil quality of that area. While for the purpose of development and economic upliftment of people, there is need for establishment of industries, but these must be environment friendly. Therefore, it is essential to assess the impacts of project on different environmental parameters, so that abatement measures could be planned for eco-friendly project operation of cement grinding unit in the area. The increasing awareness among the people about ecological imbalance and environmental degradation has raised many apprehensions.

Impacts are identified and predicted based on the analysis of the information collected from the following:

- Project information (Described in Chapter 2)
- Baseline information (Described in Chapter 3)

4.2 ANTICIPATED IMPACTS DURING CONSTRUCTION PHASE & PROPOSED MITIGATION MEASURES

For the proposed plant, during construction, the activities related to land, leveling of site and construction of building structures and installation of machineries and equipment will lead to emission of particulate matter. Construction activities during this stage will temporary and does not have potential to alter the environment of the nearby area due to movement of heavy machineries and vehicles.

4.2.1 IMPACT ON TOPOGRAPHY AND LAND USE & MITIGATION MEASURES

Topography of the plant site is undulating to almost flat. Total land available with company is 9.28 Ha. There will be minimal or no loss of top soil due to leveling of parcel of land. The current land use of the site is agriculture fallow land. At present no agriculture activity is being done at this land. There are no trees present on the identified land however few herbs and grasses needs clearing. The land use of the site will be changed into industrial. The development of greenbelt would help in preventing soil erosion. The construction of proposed plant will change the land use of the project site. However, the green belt plantation along project boundary will improve the aesthetic appeal of the site.

4.2.1.1 MITIGATION MEASURES

- All earth work will be completed in such a way so that the soil erosion and carryover of the materials in other areas are protected.
- Excavated soil will be stored properly to avoid the spread of wind-blown dust and shall be reused for greenbelt maintenance.
- Proper disposal of construction debris, the packaging materials which may consist of wooden boxes

- and jute wrappers will be stored at suitable place and disposed of suitably.
- Change in existing Land use/Land cover from agricultural fallow land into industrial uses will be for longer duration and this change in Land use/Land cover shall be confined to project site only.
- There will be no change in Land use/Land cover outside the plant area.

4.2.2 IMPACT ON AIR QUALITY & MITIGATION MEASURES

During construction phase, dust getting air borne will be the main pollutant, which would generate from the site development activities and vehicular movement on the road. Exhaust emissions from vehicles and equipment to be deployed during the construction phase is likely to result in marginal increase in the levels of PM, SO₂, NO_x and CO. PM concentrations will be high, when construction activities will be going on at the site. Though, the impact will be for short duration and local in nature. This will be confined within the plant site and is expected to be negligible outside the plant boundary. The impact will, however, be marginal and temporary in nature.

4.2.2.1 MITIGATION MEASURES

- Proper schedule maintenance of vehicle and construction equipment will help in controlling the emissions.
- Construction equipment having PUC Certificate will be deployed during the activity to restrict exhaust emission.
- Proper training of the drivers so as to ensure adherence to speed limit.
- Covered storage facilities for storage of construction materials.
- Water sprinkling on roads and construction site to prevent fugitive dust getting air borne.
- Proper greenbelt development and plantation inside and outside the plant premises.
- A separate storage area will be demarcated for construction material to confine the dust dispersion.
- Proper PPEs will be provided to workers to prevent air borne diseases.

4.2.3 IMPACT ON NOISE ENVIRONMENT & MITIGATION MEASURES

During construction phase, noise will be generated due to following activities/ processes:

- Movement/ operation of transport and construction vehicles for equipment, materials and people.
- Other important activities involved in construction stage such as excavation, earthmoving, compaction, concrete mixing, crane operation, steel erection, mechanical/electrical installation.

The noise generated will be high due to construction activities, high noise levels can cause irritation and gradual hearing loss to construction laborer's if high levels of noise exposure are continuously experienced. Sudden exposure can cause irritation in ear drums and sudden loss in hearing whereas long term exposure will result in gradual ENT problems. Though the noise generation during construction phase will be temporary and will be limited to the project site but workers who are directly exposed to it can have problems related to it. It may also be noted that, most of the construction activities will be carried out only during the daytime. The expected noise levels from these activities are as given below table 4.1.

TABLE 4.1 THE EXPECTED NOISE LEVELS FROM CONSTRUCTION ACTIVITIES

Particulars	Noise Levels dB(A)
Earth Movers:	
Front End Loaders	72-84
Tractors	76-96
Trucks	82-94
Material Handlers:	
Concrete mixers	75-88
Drum Mixer	75-80
Drum Truck	80-85
Other Construction Equipment:	
Wheel Loader	87-95
Truck Mounted Crane	76-83
Operating a Welder	80-85

4.2.3.1 MITIGATION MEASURES

- The vehicles used for movement will be ensured for schedule & preventive maintenance to reduce noise generation.
- The construction labors will be provided with adequate personal protective equipment like earmuffs and earplugs.
- The high noise zones at site will be demarcated and provided with enclosures & barriers.

4.2.4 IMPACT ON WATER QUALITY & MITIGATION MEASURES

Water requirement at construction phase of proposed plant activities will be fulfilled from the existing source of surface /ground water. This water requirement during the construction phase will be temporary in nature and limited to short period only. Therefore, water requirement will not have a significant impact on the ground water availability in the region. Drinking water facility will be provided to the construction workers and domestic waste water being treated in septic tanks followed by soak pit. There will not be any discharge from the site, which can have any impact on the surrounding water quality.

4.2.4.1 MITIGATION MEASURES

Domestic waste water will be treated in septic tanks followed by soak pit. No discharge of any kind will be done inside or outside plant premises in any water body. Thus, there will not be any discharge from the site which can have any impact on the water quality of the surrounding areas.

4.2.5 IMPACT ON SOIL & MITIGATION MEASURES

At the time of construction, there will be soil and debris generation. The disturbed slopes will be well stabilized before the onset of the monsoon. Top soil shall be safely kept aside and restored after completion of work. The levelling operation will also involve piling up of backfill materials. Use of dust suppressant spraying to minimize fugitive dust during construction activities is recommended.

4.2.5.1 MITIGATION MEASURES

Construction wastes will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.

Litter disposal and collection points will be established around the work sites.

Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc. will be disposed through local recyclers.

The construction spoils will be temporarily stored at designated located inside the plant premises.

Discharge of any kind of pollutant will be strictly prohibited during construction period.

4.2.6 IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

The land is already in possession of ACL. Hence no R&R issues are involved with the project. There are no cultural and archeological sites present within 10 km of the site hence an impact on the religious or archeological site is not anticipated.

However, some positive impacts are also associated with the project. This project will provide employment opportunities for the local people. In terms of gross economic yield will accrue on account of the project. The gross economic yield will increase through increase in high economic group and subsequent market multiplier effect and indirect employment opportunities will generate due to indirect job opportunities in the area. In this regards the project will generate direct permanent employment for 30 people and 125 contractual during operational phase. During construction phase direct and indirect employment (construction labor, trucking industry, indigenous machinery suppliers/manufacturers and construction industry) for approx. 1530 people.

- The social impact during the construction phase will be beneficial in nature as it generates local employment in the region including ancillary development and supporting infrastructure.
- Local people will be given preference for employment based on their skill and experience.

4.3 ANTICIPATED IMPACTS DURING OPERATION PHASE AND PROPOSED MITIGATION MEASURES

The process has varying impacts on the different components of the environment. All these impacts will be considered for impact assessment and accordingly the mitigation measures will be adopted. The design basis for all process units will lay special emphasis on measures to minimize the impact at source itself.

4.3.1 IMPACT ON LAND TOPOGRAPHY AND SUGGESTED MITIGATION MEASURES

Topography of the plant site is undulating to almost flat. Total land available with company is 9.28 hectare. There will be minimal or no loss of top soil due to leveling of parcel of land. plant site is devoid of any vegetation. Hence, there is no tree cutting involved for the development of the proposed site. The development of greenbelt would help in preventing soil erosion. The construction of proposed plant will change the land use of the project site. However, the green belt plantation along project boundary will improve the aesthetic appeal of the site.

4.3.1.1 IMPACT ON AIR QUALITY AND SUGGESTED MITIGATION MEASURES

The major pollutants of air are the suspended particulate matters from the stacks and fugitive emissions due to material handling. SO₂ and NO_X also add to the pollutant level. ACL is presently taking effective measures to control the air emissions through Bag filters and same is verified through periodic monitoring of the stack emissions & ambient air quality.

Causes of fugitive emissions

Fugitive emissions are the air pollutants (fine dust) get air borne in the air due to various activities carried out in the cement grinding project.

Factors that influence emissions

Factors affecting emissions include the following:

- Type of material processed.
- Type of equipment. Operating practices employed.

Sources of Fugitive Emissions & Mitigation Measures

In plant, the fugitive dust is emitted primarily from the following operations:

- **Transportation:** Movement of heavy trucks/vehicles on the roads generates substantial quantity of fine dust.
- **Raw Material Handling:** Raw materials like clinker, fly ash, gypsum etc. when transferred within the premises by road, will lead to the fugitive dust emissions.
- **Material Transfer:** Dust is/will be generated from all the transfer points of belt conveyors. This is/will be controlled by providing bag filters at material transfer points.
- **Fly Ash Handling:** the fly ash contaminant is significant addition due to new installation. Fly ash has the tendency to disperse in the environment as soon as it comes in contact with air, as such loading of fly ash causes unavoidable dispersion in and around nearby areas.
- **Storage of Raw Materials & Finished Product:** Dust may be generated due to carryover by wind. However, to avoid this, the raw materials will be stored in covered shed.

4.3.2 IMPACTS OF AIR EMISSIONS

Emissions remain in environment for long hours, as such inhalation by humans can cause accumulation inside respiratory systems and can cause inhalation problems. The flora present in the area will get affected by long term deposition on leaves surfaces and can cause blockage of stomatal pores. Wilting of leaves of plants primarily exposed to cement may happen.

TABLE 4. 2 IMPACT MATRIX FOR AIR CONTAMINANTS

Impact evaluation element	Change of air quality due to operational phase of project		
Potential effect/ concern	Impact on health of humans and nearby biological/ecological receptors due to line and point sources of air emissions including fugitive dust emissions.		
Characteristics of Impacts			
Nature	Positive	Negative	Neutral
		<input type="checkbox"/>	
Type	Direct	Indirect	Cumulative
	<input type="checkbox"/>		<input type="checkbox"/>

Extent	Project Area <input type="checkbox"/>	Local <input type="checkbox"/>	Zonal	Regional
Duration	Short - term <input type="checkbox"/>	Long - term <input type="checkbox"/>		
Intensity	Low	Medium <input type="checkbox"/>	High	
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C) <input type="checkbox"/>
Significance of Impact				
Significance	Insignificant	Minor	Moderate <input type="checkbox"/>	Major

4.3.2.1 IMPACT EVALUATION FOR AMBIENT AIR QUALITY MITIGATION MEASURES

Stack Emissions (Source Emission)

- All pollution control systems are connected to energy meters and the records are maintained for run hours, failure time and efficiency.
- Clean technologies/measures are/will be implemented in the following way: -
 - All major sources of air pollution (Cement Mill & Packing Mill) will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms i.e.30 mg/Nm³ for particulate matter emission from the stacks.
 - Bag filters will be provided at all loading /unloading points and transfer points.
 - Fixed Water sprinkling is carried out in the plant at suitable location and intervals to control fugitive dust generation. This effort will be continued along with avenue plantations in-and-around the plant premises and both side of road. Dust suppression is adopted to control the fugitive dust emanated during raw materials unloading operations.
 - Proper schedule and preventive maintenance of vehicles will be tested regularly for vehicle entering plant premise.
 - 34.81 % of the total area to be developed as greenbelt & plantation within premises surrounding plant boundary.
 - Ambient Air Quality and stack emission shall be regularly monitored to ensure that emission level remain within the ambient air and flue gas emissions quality standards maintain.

List of air pollution control equipment attached to the major sources of air pollution are given in Table 4.3 below:

TABLE 4.3 AIR POLLUTION CONTROL EQUIPMENT

Name of Unit	Air Pollution Control System
Clinker Silo	Bag Filter
Fly ash Silo	Bag Filter
Gypsum/Wet fly ash Stacker	Bag Filter
Cement Mill	Bag Filter
Cement Silo	Bag Filter
Gypsum Crusher	Bag Filter
Packer	Bag Filter

4.3.2.2 AIR QUALITY PREDICTIONS

Emission from Point Source (Stacks)

Dust and gaseous emission from flue gases stacks emit pollutants like PM, SO₂, NO_x into atmosphere.

Emission from Area Source (Fugitive Emission)

Fugitive emissions are expected from storage, handling and conveying of coal, clinker, gypsum, fly ash, and during handling and transportation of cement. Dust is generated during unloading, loading, transportation of material through conveyor belts, crushing and screening. Fugitive emission is also generated due to vehicular movement in the premises.

4.3.3 AIR POLLUTION DISPERSION MODELING STUDIES

4.3.3.1 MODEL INPUTS

Atmospheric dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. It is performed with computer programs that solve the mathematical equations and algorithms which simulate the pollutant dispersion. The dispersion models are used to estimate or to predict the downwind concentration of air pollutants emitted from sources such as industrial plants and vehicular traffic. Such models are important to governmental agencies tasked with protecting and managing the ambient air quality. The models are typically employed to determine whether existing or proposed new industrial facilities are or will be in compliance with the National Ambient Air Quality Standards (NAAQS). The models also serve to assist in the design of effective control strategies to reduce emissions of harmful air pollutants.

In the present study prediction of impacts on the air environment has been carried out employing U.S. EPA AERMOD Cloud, Envitran Version 24.0.0.64 and designed for multiple sources for predicting the maximum ground level concentration (GLC).

The major air emissions at the site is PM, SO₂ and NO_x from process and DG set stacks. The Proponents have proposed to install Bag filters to control PM in flue gas emissions. The site-specific monitored data was used as input to the software AERMOD Cloud, Envitran Version 24.0.0.64 is used for prediction of GLC emission in ambient air. The proposed stack and emission data for model study is given in Table-4.4.

TABLE 4. 4 PROPOSED STACK DETAILS

	Vol. Flow Rate (Nm ³ /hr.)	Stack height (m)	Stack dia, m	Stack temp, (K)	Stack velocity (m/s)	Stack Emission Rate (g/s)		
						PM	SO ₂	NO _x
Stack -1	2038.329	13	0.25	314	12.35	0.016	NA	NA
Stack -2	1110.91	11.05	0.2	312	10.45	0.015	NA	NA
Stack -3	624.887	9	0.15	312	10.45	0.016	NA	NA
Stack - 4	1961.57	11.5	0.27	310	9.8	0.018	NA	NA

4.4 METEOROLOGICAL DATA

For the prediction of rise in Ground Level concentrations of pollutants, the actual hourly meteorological data recorded at the site during the study period (1st October 2023 to 31st December 2023) is converted to mean meteorological hourly data as specified by CPCB and the same is used in the model.

4.4.1 PRESENTATION OF RESULTS

The simulations were made to evaluate incremental short-term concentrations due to proposed project. In the short-term simulations, the incremental concentrations were estimated to obtain an optimum description of variations in concentrations within study area of 10 km radius. The predicted (maximum) concentration levels & the incremental concentrations at various locations due to the proposed industry are shown in Isopleths. Isopleths showing stack & baseline monitoring locations (8 receptors/blacks square dots) are appended subsequently. The plotted Wind rose is also shown vide same the images.

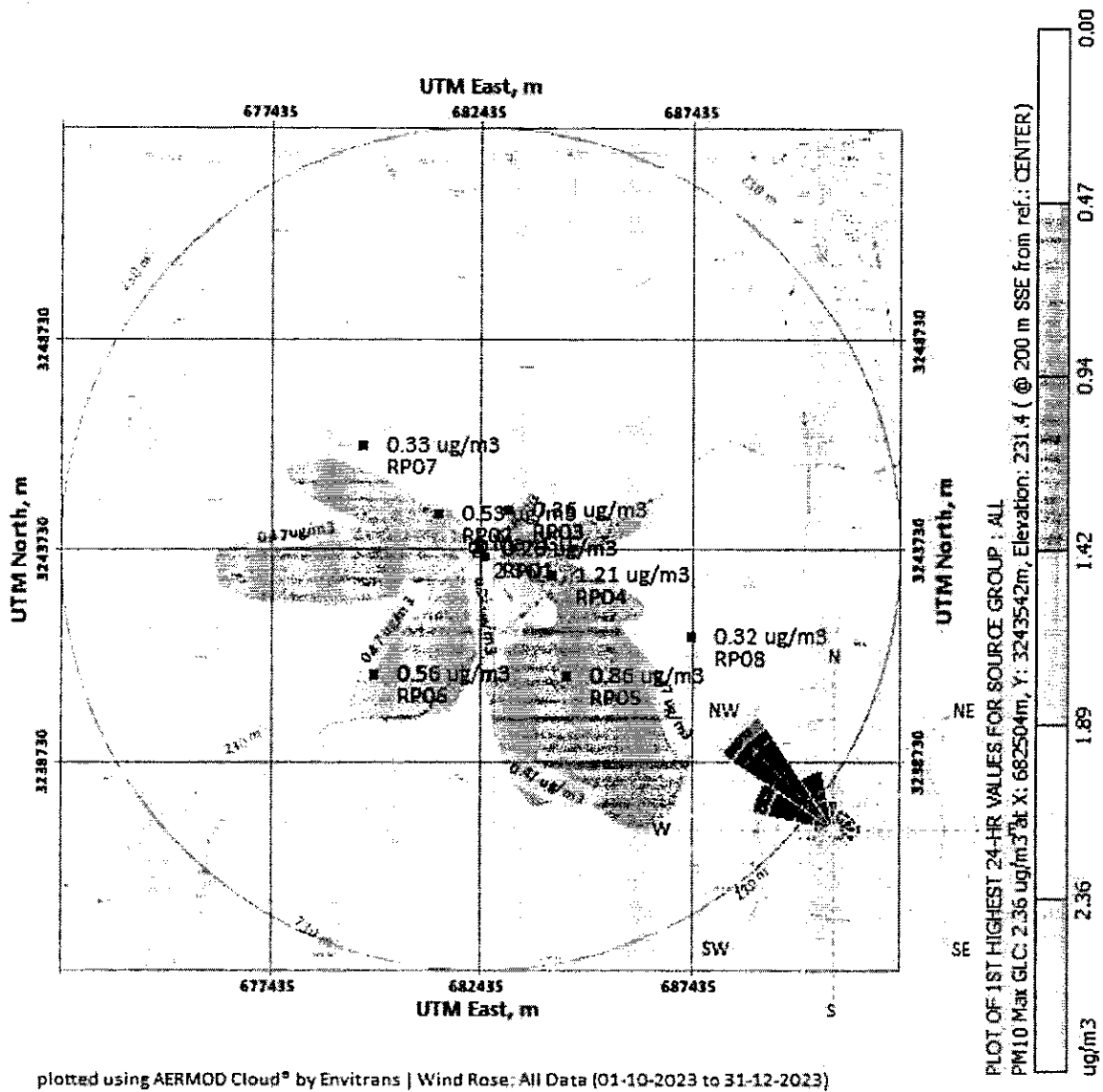


FIGURE 4. 1 PREDICTED 24-HRS GLC'S OF TPM FOR THE PROPOSED PROJECT

TABLE 4.5 AS PER THE ISOPLETHS, NET RESULTANT CONCENTRATION

Pollutant	Receptor (location)	Max Baseline Conc.(ug/m3) at respective receptor	Estimated max incremental conc. (ug/m3)	Net resultant Conc. (ug/m3)	NAAQ standards (ug/m3)
TSP	1	70.6	0.26	70.86	100
	2	67.4	0.53	67.93	
	3	74.0	0.36	74.36	
	4	62.6	1.21	63.81	
	5	55.1	0.86	55.96	
	6	67.2	0.56	67.76	
	7	60.8	0.33	61.13	
	8	58.66	0.32	58.98	

From above Table 4.5 it is evident that the total concentration for TPM are within NAAQ for all receptor locations analyzed.

4.4.2 INTERPRETATION OF RESULTS

- Under controlled conditions, the predicted cumulative concentrations of PM₁₀ at all baseline monitoring locations were found to be meeting the prescribed standards.
- The predicted cumulative concentrations of SO₂ at all baseline monitoring locations were found to be meeting the prescribed standard of 80 µg/m³.
- The predicted cumulative concentrations of NO₂ at all baseline monitoring locations were found to be meeting the prescribed standard of 80 µg/m³.

4.4.3 CONCLUSION

From the results of the model, it is concluded that the maximum cumulative concentrations of PM₁₀, SO₂ and NO₂ due to proposed project are expected to comply with the prescribed NAAQ Standards. This also indicate that if we operate pollution control equipment holistically than there is enough assimilation capacity available for industries in this space.

4.4.4 AIR POLLUTION CONTROL AND MONITORING PHILOSOPHY

- All pollution control equipment as detailed already shall be checked on half yearly basis for any wear and tear and suitable repair/maintenance shall be carried out.
- System shall be put in place to report equipment failure immediately. Emergency plan shall be laid out tackle pollution control equipment failures. All equipment failures shall be reported to CPCB/SPCB/Regional Office of MoEF&CC on 6 monthly bases with investigation report and corrective actions. Guidelines / Code of Practice for pollution prevention for Plants (GSR 414 dated 30th May 2008) and GSR277(E) dated 31st March, 2012 shall be implemented.

- The site environmental/designated officer shall certify the emission data on daily basis. The records shall be maintained and submitted as part of half yearly compliance report.
- Asphaltting of all roads/surfaces within the plant premises.
- Covered conveyor belts gallery to prevent fugitive emissions
- All conveyor transfer points in material handling areas will have a provision of dust extraction systems – connect to ducts, dust extraction across a bag filter.
- Greenbelt development is/shall be done within the project area along the boundary walls and any other suitable areas.
- Regular ambient air quality monitoring by third party shall be performed at all baseline stations for checking compliance with NAAQ standards. Online monitoring systems – 2 Nos continuous emission monitoring systems on stacks connected to process and 3 Nos Continuous Ambient Air Quality monitoring systems shall be established as per MoEF&CC guidelines. These continuous emission and ambient monitoring systems will be connected to the state PCB network.

4.5 IMPACT ON WATER ENVIRONMENT& MITIGATION MEASURES

The water consumption for grinding unit will be low as the requirements are only for cooling system and the water will be re-circulated in a closed system. Only make up water will be required for meeting the evaporation losses in the cooling circuit. The source of water would be from the surface /ground water. Water for drinking and domestic purposes will be needed additionally. Total water requirement is 400 KLD.

4.5.1 MITIGATION MEASURES

- The company will install roof top rainwater harvesting structures inside the plant premises to re-charge the groundwater.
- Cement making is a dry process wastewater shall be generated from domestic only. Total 10 KLD wastewater of sewage quality shall be generated and treated in STP of capacity 15 KLD. Following the treatment, the treated water from STP will be used for green belt plantation and the dried sludge will be used as manure in green belt.
- The domestic wastewater generated from the toilets, washrooms and canteen of the plant shall be treated in STP.
- The network of storm water drains and wastewater drains inside the plant will be made separate. The storm water drain will have sedimentation pits and oil
- water interceptors located at suitable points. During monsoon, the storm water will be discharge outside the premises into common drain.
- Plant should ensure that the treated effluent quality shall comply with norms set by SPCB.

4.6 MANAGEMENT OF SOLID WASTES

Most of the process waste generated in cement industry is reused in process. Dust collected from air pollution control equipment will be totally recycled in process. Sludge from Modular Sewage Treatment Plant (STP) will be used as manure for green belt development. A part of used oil will be utilized for lubrication purpose & remaining will be sold to authorized PCB vendors. Following type of waste will be generated

TABLE 4. 6 SOLID WASTE GENERATION AND MANAGEMENT

Waste	Quantity (TPA)	Collection method	Treatment / disposal method
	Proposed		
Organic Waste (Including Sewage sludge)	25	Bins	Organic waste is composted and used as manure for greenbelt development
In Organic	15	Bins	Authorized PCB vendors

TABLE 4. 7 HAZARDOUS WASTE GENERATION AND MANAGEMENT

Sl. No.	Name of materials	Schedule	Proposed Quantity	Handling & Storage	Method of disposal
1	Used Oil	5.1	1 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
2	Cotton rags	33.2	2 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
3	VRLA (sealed battery)	-	0.5 TPA	In isolated area with non-permeable concrete flooring	To OEM through buy-back/ through authorized recycler
4	Used Oil Containers @30 x200L capacity	-	0.4 TPA	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)

4.6.1 MITIGATION MEASURES

- Dust collected from various pollution control equipment's (Bag filters) will be recycled into the process.
- Sewage sludge generated from STP will be used as manure in greenbelt development plantation.
- Used or Spent oil will be generated will be generated as per Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, which will be sold to CPCB authorized recycler.
- Municipal Solid waste generated from plant canteen & colony will be collected, segregated, and disposed of scientifically in compliance of Solid Waste Management Rules, 2016.
- Used Lead acid batteries will be stored in the designated storage area and will be sold to

registered vendors as per Battery waste

4.7 PREDICTION OF IMPACTS DUE TO NOISE

Noise will be produced during grinding, materials handling, vehicular movement and DG sets. With increasing distance from the source, the noise level decreases due to wave divergence. Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths. Baseline Ambient Noise levels recorded at village outside the plant was found to be more than 30 dBA but less than 55 dBA during daytime and less than 45 dBA during night time, which is well within the permissible residential area limit. The predicted noise level at 500 m distance from source is 30 dBA. Therefore, there will be insignificant impact on the ambient noise quality of the surrounding villages. The standards for occupational exposures - tolerable level is 90 dB(A) for 8-hour exposure. To avoid over exposure found inside working area, workers will be provided with ear plugs/ earmuffs for use. The predicted main source of sound from the Plant is mentioned below:

TABLE 4. 8 MAIN SOURCE OF SOUND FROM THE PLANT

Source ID	X-Coordinate	Y-Coordinate	SPL dB(A)
Compressor	29°18'26.58"N	76°52'28.30"E	70
Ball Mill	29°18'22.51"N	76°52'45.23"E	85
Blower	29°18'29.93"N	76°53'2.97"E	80
Grinding Mill	29°18'42.37"N	76°52'32.85"E	90
Total point source- 4			

4.7.1 RESULT AND DISCUSSION

The Noise Contour Map prepared using the baseline data and Point sources is plotted below:

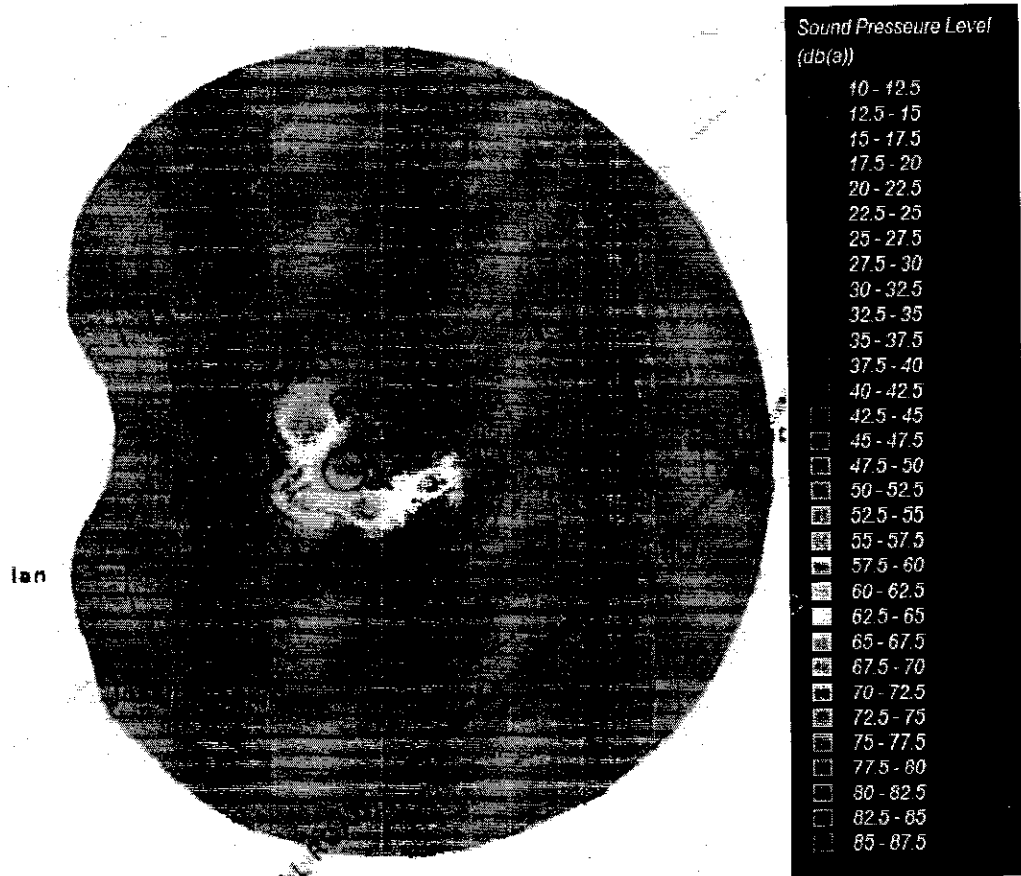


FIGURE 4. 2 NOISE CONTOUR MAP OF THE PLANT IN DAY

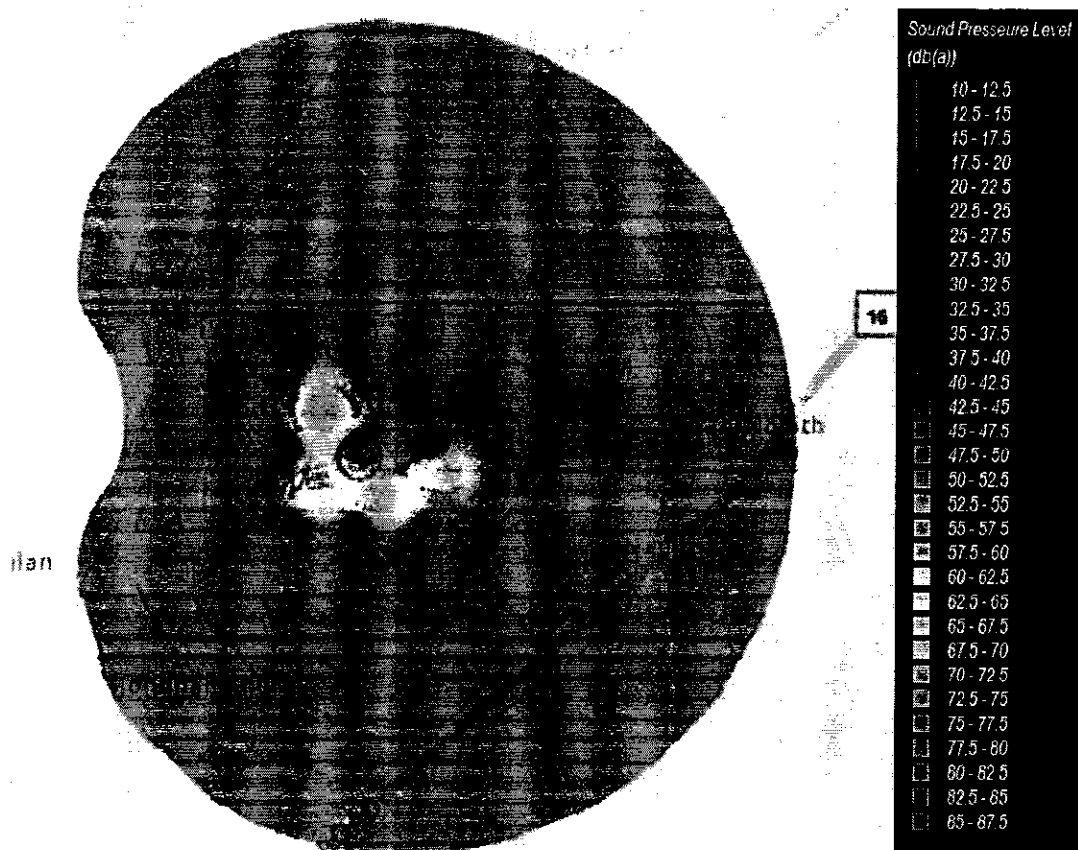


FIGURE 4. 3 NOISE CONTOUR MAP OF THE PLANT IN NIGHT

The noise modelling conducted at seven strategic locations around the project site provided detailed insights into the spatial distribution of noise levels and their potential impacts. Below are the results from each location given below Table 4.9.

TABLE 4. 9 RESULT OF NOISE MODELLING OF DAY & NIGHT TIME

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level dB(A)	Baseline dB(A)	Resultant dB(A)
DAY TIME					
N1	29° 17' 47.443" N	76° 52' 3.639" E	33.6	59.5	59.5
N2	29° 16' 59.307" N	76° 51' 5.990" E	18.6	50.2	50.2
N3	29° 19' 55.193" N	76° 50' 59.020" E	21.8	56.5	56.5
N4	29° 18' 26.720" N	76° 51' 41.369" E	17.1	45.2	45.2
N5	29° 18' 33.491" N	76° 52' 41.307" E	7.8	48.9	48.9
N6	29° 19' 0.928" N	76° 52' 4.998" E	6	56.9	56.9
N7	29° 18' 13.289" N	76° 53' 44.698" E	6.2	47	47
N8	29° 19' 3.857" N	76° 53' 7.661" E	6	46.2	46.2
NIGHT TIME					
N1	29° 17' 47.443" N	76° 52' 3.639" E	33.6	54	54
N2	29° 16' 59.307" N	76° 51' 5.990" E	18.6	41.7	41.7
N3	29° 19' 55.193" N	76° 50' 59.020" E	21.8	49.9	49.9

N4	29° 18' 26.720" N	76° 51' 41.369" E	17.1	39.8	39.8
N5	29° 18' 33.491" N	76° 52' 41.307" E	7.8	41.6	41.6
N6	29° 19' 0.928" N	76° 52' 4.998" E	6	48.6	48.6
N7	29° 18' 13.289" N	76° 53' 44.698" E	6.2	39.9	39.9
N8	29° 19' 3.857" N	76° 53' 7.661" E	6	40.6	40.6

The predicated level of Noise for the greenfield project is not impacting selected location. The noise levels monitored at all residential areas are within the norms prescribed for Residential Zone. The results of our noise modelling study indicate that the noise levels from the cement grinding unit do not significantly impact the surrounding areas. The predicted noise levels are well within the regulatory limits, ensuring minimal disturbance to nearby communities and the environment. However, it is recommended to use hearing protection equipment during drilling operations and while operating heavy machinery.

4.7.2 MITIGATION MEASURE

- Acoustic enclosures shall be provided wherever required to control the noise level below 85 dB(A).
- Wherever it is not possible technically to meet the required noise levels, the personnel protection shall be provided.
- Provision of plantation in available spaces, wherever feasible, will further help in reducing the noise levels.
- To protect the workers within the construction area and plant area, adequate protective measures in the form of ear-muffs/ ear plugs/ masks shall be provided, which will minimize/eliminate adverse impacts.

4.8 PREDICTION OF IMPACT ON 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 proposed development in the region that are stated below.

4.8.1 POSITIVE IMPACTS - NO REHABILITATION

The villages and their inhabitants in the study area will not be disturbed from their settlements as the project is coming in agriculture fallow land. As the project operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.

4.8.2 INCREASE IN JOB OPPORTUNITIES

As per the survey it has been observed that the population in general do not have opportunities of earnings from employment and the non-worker population is higher in the region so the project in general will help to provide direct and indirect job opportunities for auxiliary and ancillary works etc. The proposed project may provide employment to personnel directly and persons indirectly.

4.8.3 ADVERSE IMPACTS ON HUMAN HEALTH

The key issue from the proposed unit is the air contaminants generated from the plant. The project may have small impact due to air pollution on the buffer zone villages near to the Project site. The impact from the air emissions is controlled efficiently using air pollution control equipment and stacks

will be designed in such a manner that in future after the implementation of the project, the air emissions will be well within the prescribe Ambient Air Quality limits set forth by CPCB/SPCB. The proponents of this facility will adopt effective control systems at all the identified sources of emission

TABLE 4. 10 QUALITATIVE EFFECTS ON SOCIO-ECONOMIC ENVIRONMENT

Parameter	Local	Regional	Direct	Indirect	Reversible	Irreversible
Employment	+	.	+	+	.	+
Income	+	.	+	+	.	+
Transport	+	+	+	+	.	+
Education	+	.	+	.	.	+
Medical facilities	+	.	+	.	.	+
Communication	+	+	+	.	.	+
Sanitation	-	.	-	.	.	-
Housing	+	.	+	.	.	+
Health	-	.	-	-	.	-
Recreation	+	+	.	+	.	+

4.8.4 MITIGATION MEASURES

- Adequate measures have been envisaged in the project design to control air & noise pollution which include dust suppression.
- Awareness programs shall be arranged on health, hygiene and sanitation.
- Job oriented training courses will be organized through industrial/technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be conducted to make people aware about the environmental protection, need of water conservation etc.
- 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 during emergency
- Sufficient supply of potable water at suitable places.
- Sanitary facilities shall be provided at accessible place within the work zone and kept in a good condition.

**TABLE 4. 11 SOCIO-ECONOMIC IMPACTS OF PROPOSED PROJECT ARE
PREDICTED AS FOLLOWS:**

Sl. No.	Impact Parameter	Predicted Impacts		Budget Allocation/ Remark
		Positive	Negative	
1	Human Settlement	No displacement of people or habitations would occur.	Nil	
2	Livelihoods	No loss of existing livelihoods. Direct or indirect employment is expected to occur.	An insignificant influx of people in construction and operation phases.	Priority will be given to local people in employment
3	Employment Generation	Creation of additional employment of skilled, semi-skilled & unskilled workers during project operation.	Nil	----
		Indirect employment of persons during construction phases of the project. Majority of them will be local women and youth.		
4	Income and Revenue	Improvement of incomes of locals engaged in tertiary businesses.	Nil	----

4.9 GREENBELT DEVELOPMENT

4.9.1 GUIDELINES FOR GREENBELT DEVELOPMENT

According to the stipulations of MoEF&CC, green belt is to be given all around the industry limit by planting trees and the aggregate green territory region will be 1/3rd (About 33%) of the plant region. This will incorporate Lay down region which will be later on changed over into green territory. Following guidelines will be followed for the Greenbelt Development Plan in the project area:

- The greenbelt development / plantation will be done.
- Soil and other environment are encouraging and the expected survival/growth rate will be about 80 - 85%.
- Trees growing to a height of 5 m or more will be planted.
- Plantation of trees will be undertaken in around the area in alternating rows to prevent horizontal pollution dispersion.
- Trees will be planted along road sides, to arrest auto-exhaust and noise pollution, and in such a way that there is no direct line of sight to the installation when viewed from a point outside the foliage perimeter.
- Since, tree trunks are normally devoid of foliage (up to 3 m), it will be appropriated to have shrubbery in form of such trees to give coverage to this portion.

- Fast growing trees with thick perennial foliage will be grown, as it will take many years for trees to grow to their full height.
- Local species will be preferred
- Mono culture and invasive species will be avoided
- Three tier plantations will be undertaken all along the Plant boundary.

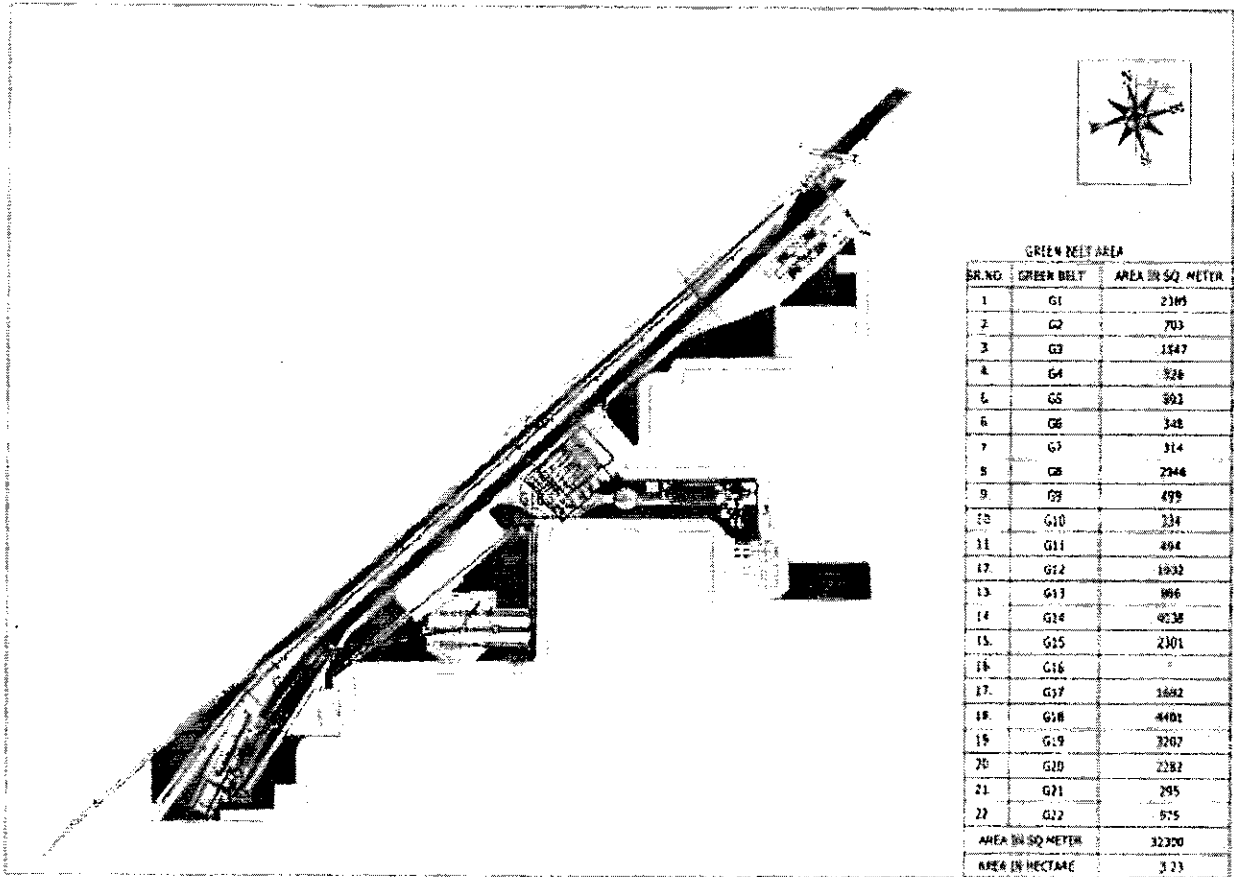


FIGURE 4. 4 GREEN BELT PLANT LAYOUT

4.9.2 GREENBELT & PLANTATION PROGRAMME

Total project area is 9.28 Ha and out of the total project area, 3.23 Ha area (i.e., ~34.81%) will be developed under greenbelt & plantation in accordance with CPCB guidelines. It is proposed to plant about 2500 saplings per hectare considering the survival rate of 80%. The company will invest Rs.60 Lakhs (Capital cost) and Rs.25 Lakhs per annum for greenbelt development / plantation.

Proposed action plan for greenbelt development & plantation within plant area is given in table 4.12.

TABLE 4. 12 PROPOSED ACTION PLAN FOR GREENBELT DEVELOPMENT & PLANTATION WITHIN PLANT AREA

SN	Year as per planning	Area Covered under greenbelt (Hectare)	No. of Saplings (Nos.)	Location in Plant area
1	1 st Year	1.02	2550	All along the Plant Boundary
2	2 nd Year	1.02	2550	Internal roads, Machinery area, CCR Office
3	3 rd Year	1.02	2550	Other plant area and gap filling in the plant area
Total		3.06	7650	

4.9.3 SPECIES TO BE PLANTED

Following plant species will be planted for Ecological enhancement, pollution absorber & Carbon sequestration:

TABLE 4. 13 DETAILS OF PROPOSED PLANTATION

SA	Species Name/ Hindi Name	Ecological Characters DC- Dust Control, NC - Noise Control, AG – Absorptions of Gases, DR-Drought resistance, FR - Fire Resistance
Tree species		
1	<i>Azadirachta indica</i> (Neem)	NC, AG, DR & FR
2	<i>Polyalthia longifolia</i> (Ashok)	DC, NC & DR
3	<i>Mangifera indica</i> (Mango)	DC, NC & DR
4	<i>Cassia fistula</i> (Amaltas)	DC, NC & DR
5	<i>Syzygium cumini</i> (Jamun)	DC, NC & DR
6	<i>Populus indica</i> (Poplar)	DC, NC & DR
7	<i>Tectona grandis</i> (Teak)	DC, NC & DR
8	<i>Boswellia serrata</i> (Salai Guggul)	DC, NC & DR
9	<i>Annogeissus latifolia</i> (Dhaora)	DC, NC & DR
10	<i>Jacaranda mimosifolia</i> (Blue gulmohar)	DC, NC & DR
Understory plantation		
11	<i>Murraya paniculate</i>	DC, NC
12	<i>Tecoma stans</i>	DC, NC
13	<i>Nerium oleander</i>	DC, NC
14	<i>Thevetia peruviana</i>	DC, NC
15	<i>Bougainvillea sp</i>	DC, NC

4.9.4 GREENBELT & PLANTATION MANAGEMENT PLAN

In order to facilitate the proper growth of plants, limited measures involving preparation of seed bed with suitable number of fertilizers and treatment with mulches will be taken. The topsoil will be used for greenbelt development. The following characteristics will be taken into consideration while selecting plant species for greenbelt development and tree plantation:

- They should be fast growing and tall trees.
- They should be mix of perennial evergreen and deciduous trees.
- They should have thick canopy cover.
- The planting should be in appropriate alternate rows around the site to prevent lateral pollution dispersion.
- The trees should maintain regional ecological balance and conform the soil and hydrological conditions. Indigenous species will be preferred.
- Company will provide all necessary facilities/equipment for greenbelt development.
- Horticulturist with the member of team will be assigned for proper management and care for the greenbelt development.
- Timely use of fertilizers for the healthy and dense greenbelt development will be done. For replantation, if required, company will acquire sapling from local private/government nursery.

4.10 OCCUPATIONAL HEALTH CARE

Hazards associated with cement industry are as follows:

- Exposure to dust,
- Exposure to high temperatures,
- Noise exposure,
- Physical hazards,
- Chemical hazards and other industrial hygiene issues, and others.

These mainly impact on those working within the industry, although health hazards can also impact on local communities.

4.10.1 EXPOSURE TO DUST

Exposure to fine particulates is associated with work in most of the dust-generating stages of a cement grinding unit, but most notably from clinker / cement grinding. Workers with long term exposure to fine particulate dust are at risk of pneumoconiosis, emphysema, bronchitis, and fibrosis.

Methods to prevent and control exposure to dust include the following:

- Control of dust through implementation of good housekeeping and maintenance;
- Use of air-conditioned, closed cabins;
- Use of dust extraction and recycling systems to remove dust from work areas, especially near & inside the grinding mills;
- Use of PPE, as appropriate (e.g., masks and respirators) to address residual exposures following adoption of the above-referenced process and engineering controls.

4.10.2 EXPOSURE TO HIGH TEMPERATURES

The principal exposures to heat in this sector occur during operation & maintenance of hot equipment heated-up due to movement of machineries. Recommended prevention and control techniques include the following:

- Shielding surfaces where worker's proximity and close contact with hot equipment is expected, using Personal Protective Equipment (PPE), as needed (e.g., insulated gloves and shoes);

4.10.3 NOISE AND VIBRATION EXPOSURE

Exhaust fans and grinding mills, compressors, and motors are the main sources of noise and vibrations in cement grinding unit.

Following risks are involved:

- Hearing Impairment, Hypertension, Increase Pulse rate
- Annoyance, Tinnitus, Sleep Disturbances

4.10.3.1 MITIGATION MEASURES

- Use of silencers for ID fans, room enclosures for mill operators, noise barriers
- Personal hearing protection (ear plugs/muffs) at high noise level area
- Proper maintenance of machineries, DG sets
- Installation of compressors in closed buildings
- Regular monitoring of noise level
- Display of noise level with permission level
- Display instruction to use of PPEs at high noise level area
- Periodic health checkup for Audiometry for the person working in high noise

4.10.4 PHYSICAL HAZARDS

Injuries during Project operation are typically related to slips, trips, and falls; contact with falling / moving objects; and lifting / over-exertion.

Other injuries may occur due to contact with, or capture in, moving machinery (e.g., dump trucks, front loaders, forklifts). Activities related to maintenance of equipment, including crushers, mills, mill separators, fans, coolers, and belt conveyors, represent a significant source of exposure to physical hazards. Such hazards may include the following:

- Falling / impact with objects
- Transportation and;
- Contact with allergic substances.

Following management measures will be ensured to prevent the physical hazards in the plant:

- Any person working on equipment with moving parts personally ensures the equipment is de-energized, isolated and locked/tagged out.
- Any person working from a position with the potential risk for a fall from height uses fall protection.
- Prescribed PPE will be provided to all workers exposed to open processes or systems.
- In case of any accident immediate & proper medical care will be provided at the plantsite.

High-Risk Categories:	Prevention
Contractors	Contractor Safety Management
Young/Temporary Employees	Special Safety Induction
Direct Causes	
Traffic and Mobile Plant	Driver Training
Falls from Heights, Objects falling from Heights	Safety Procedures for Work at Heights, Overhead Protection
Caught in Starting/Moving Equipment	Plant Isolation Procedures

4.11 ANTICIPATED IMPACT DUE TO TRANSPORTATION OF RAW MATERIAL AND FINISHED PRODUCT AND MITIGATION MEASURES

4.11.1 ANTICIPATED IMPACTS

- Increase in the Road traffic density which will result in deteriorating the ambient air quality.
- Rapid Movement of heavy-duty vehicles will cause in increase noise level.
- No direct impact is envisaged on the flora and fauna of the vicinity area due to noise/ or the vibrations, slight impact could be observed on the nearby biodiversity.
- Increased traffic volume may increase the probability of accidental incidences in the area.
- Increased transportation can also lead to impacts on public health.

4.11.1.1 MITIGATION MEASURES

- Vehicles with PUC Certificate will be hired and allowed inside the plant premises.
- Vehicles will be covered with a tarpaulin and not over loaded.
- Un- necessary blowing of horn will be avoided.
- Roads will be maintained in good condition to reduce noise due to traffic.
- Greenbelt & Plantation in 36% of plant area is developed along the periphery and inside the plant premises.
- To avoid accidents, the speed of vehicles will be low near habitation areas.

4.12 TRAFFIC MANAGEMENT

About 90% of the raw materials and cement shall be transported by rail rack and only 10% of the material (mainly fly ash and Cement) will be transported by road. This will be increasing minor traffic on the existing roads. This would disturb local people of the area and also increase chances of road accidents. The traffic management plan includes the following elements:

- Transport management planning.
- Driver training.
- Access road maintenance.
- Vehicle management and maintenance, and
- Community liaison and safety.

The traffic management action plan covers the following aspects:

- Drivers' training and approval,
- Hours of driving and rest periods,
- Driver, vehicle and load security arrangements,
- Driver communication with control point and vehicle equipment,
- Language/communication,
- Source of suitable vehicles,
- Vehicle quality and specification,
- Vehicle management and preventative maintenance programme,
- Vehicle routes, route planning and alternative routes,
- Overall vehicle movements – access route selection and management,
- Strategic vehicle parking locations – to minimize impact of vehicles on local community, villages, roads, and Inspection and audit of the project traffic.
- GPS enabled trucks and control tower/RDF for effective management.

4.13 ASSESSMENT OF SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

4.13.1 GENERAL

The assessment of effects of a particular action judgment must be made as to whether these effects are "Significant". Significance is a relative concept, which reflects the degree of importance placed on the impact in question. Having identified the events associated with

the proposed activity and their potential consequences, the next issue required to be addressed is the extent to which these make the proposed activity environmentally significant. In developing the criteria for determining this, the criteria outlined in the different guidelines for determining the level of environmental impact were considered.

These criteria entail an assessment of the level of certainty in the prediction of an activity's potential environmental consequences (Predictability Criterion), combined with an assessment of the degree to which these consequences can be managed (Manageability Criterion).

The predictability criterion involves determining the level of certainty in the prediction of different issues for each of the events and their potential environmental consequences associated with the activity.

The manageability criterion focuses on the extent to which the potential environmental consequences can be either avoided or minimized in terms of size, scope and duration. It is based on the recognition that minimizing the environmental impact of an activity primarily entails managing the environmental consequence(s) of those activities by either avoiding them in the first place or by mitigating them to as low as reasonably practical. From the significance scores for the predictability and manageability criteria, the level of environmental significance for each of the potential events associated with the proposed activity can then be determined as either High, Medium or Low on the basis of environmental significance matrix. The steps followed for assessing the significance are presented schematically in Figure 4.7 below. The aspect of environment and their environmental consequences considered are presented in table 4.14.

TABLE 4. 14 EVENTS AND THEIR ENVIRONMENTAL CONSEQUENCES

Aspect of Environment	Category of Impact	Type of Event	Likely Consequences
Natural Environment	Soil Impact	Soil earthworks	Reduction in visual amenity of area.
	Air Impacts	Emissions to air (eg. Dust, SO ₂ , NO _x gases etc)	Health risk to local community;
			Greenhouse effect.
	Surface & Ground Water Impacts	Water extraction	Water shortage to local community, agriculture and ecosystem.
		Spills into water bodies (eg. Oil or chemical spills)	Inconsumable water to the local community and ecosystem.
		Altering drainage patterns	Reduced water capacity of natural water bodies. Increased soil erosion.
	Fauna Impacts	Disturbing terrestrial or aquatic species	Endangering species; Displacing species
	Flora Impacts	Disturbing native flora Clearing native vegetation	Threaten biological diversity Destroy fauna habitats; Threaten biodiversity
	Sensitive Area Impacts	Disturbance of National or Conservation Parks Disturbance of World Heritage areas Disturbance of areas under national or international registers /conventions	Loss of conservation value
			Loss of world heritage value of area
Loss of register/convention values			
Social Environment	Community Resource Impacts	Use of public resources	Degradation of public infrastructure (eg. Roads)
		Change in land use	Disadvantage groups within the community; Loss of recreational amenity of a region
		Change visual attributes of area	Reduction in aesthetic and recreational value of area
	Cultural Impacts	Change demographic structure of an area	Changes to community make up;
			Changes in community cultural identity and values
	Heritage Impacts	Disturbance to natural or manmade features of an area Disturbance to aboriginal sites	Changes to aesthetic value of area;
			Changes to historical value of area Loss of aboriginal affiliation with an area
	Community Health	Air emissions Noise and vibration	Health problems in the community
Discomfort to local community;			
Economic Environment	Impacts	Water contamination	Health risk to local community
		Potentially hazardous operations (eg. High pressure pipelines, hazardous substance storage)	Health and safety risk to local community
	Community	Altering economy of a region	Changes to the standard of living in the region;

	Welfare Impacts	Altering employment rate within a community	Changes to the standard of living; Social instability/stability Changes in employment levels;
	Natural Resource Impacts	Disturbance of natural resources of other industries in the region	Changes in level of viability of other industries, Changes to industry types within Region
		Altering existing land use.	Changes to land value;

4.13.2 CRITERIA FOR DETERMINING SIGNIFICANCE

Issues considered under the predictability criterion are given in Table 4.15.

TABLE 4. 15 ISSUES CONSIDERED UNDER PREDICTABILITY CRITERION

a)	Size of event(s) & consequence(s): The accuracy of the predicted quantity of potential pollution discharge on a unit or total basis, the amount of population, land, fauna and flora disturbed, and the size of the potential consequences of such events.
b)	Scope of consequence(s): For example, the accuracy of the predicted extent to which the potential consequences extend beyond the confines of the area or region of direct disturbance.
c)	Duration of event(s) & consequence(s): This includes the accuracy of the predicted timeframe (i.e. short or long term) over which the event and their potential consequences are expected to last.
d)	Likelihood of events The likelihood at which the events that can potentially result in the consequences are estimated to occur.
e)	Stakeholder Concerns of event(s) & consequence(s) The extent to which the stakeholder perceptions, views and concerns of the events and their consequences associated with the activity is known.

As a first step, the level of certainty in the prediction of these issues has been determined as either Low, Medium or High as defined below.

Level of Certainty in the Prediction of Activity Events and them Associated Consequences

Low	Extreme uncertainty in the prediction of the issue. Well-informed decision-making is very difficult to make.
Medium	Some uncertainty in the prediction of the issue. Sufficient confidence in the accuracy of the data to make informed decision-making possible.
High	Insignificant uncertainty in the prediction of the issue. Confidence in making an informed decision is very high.

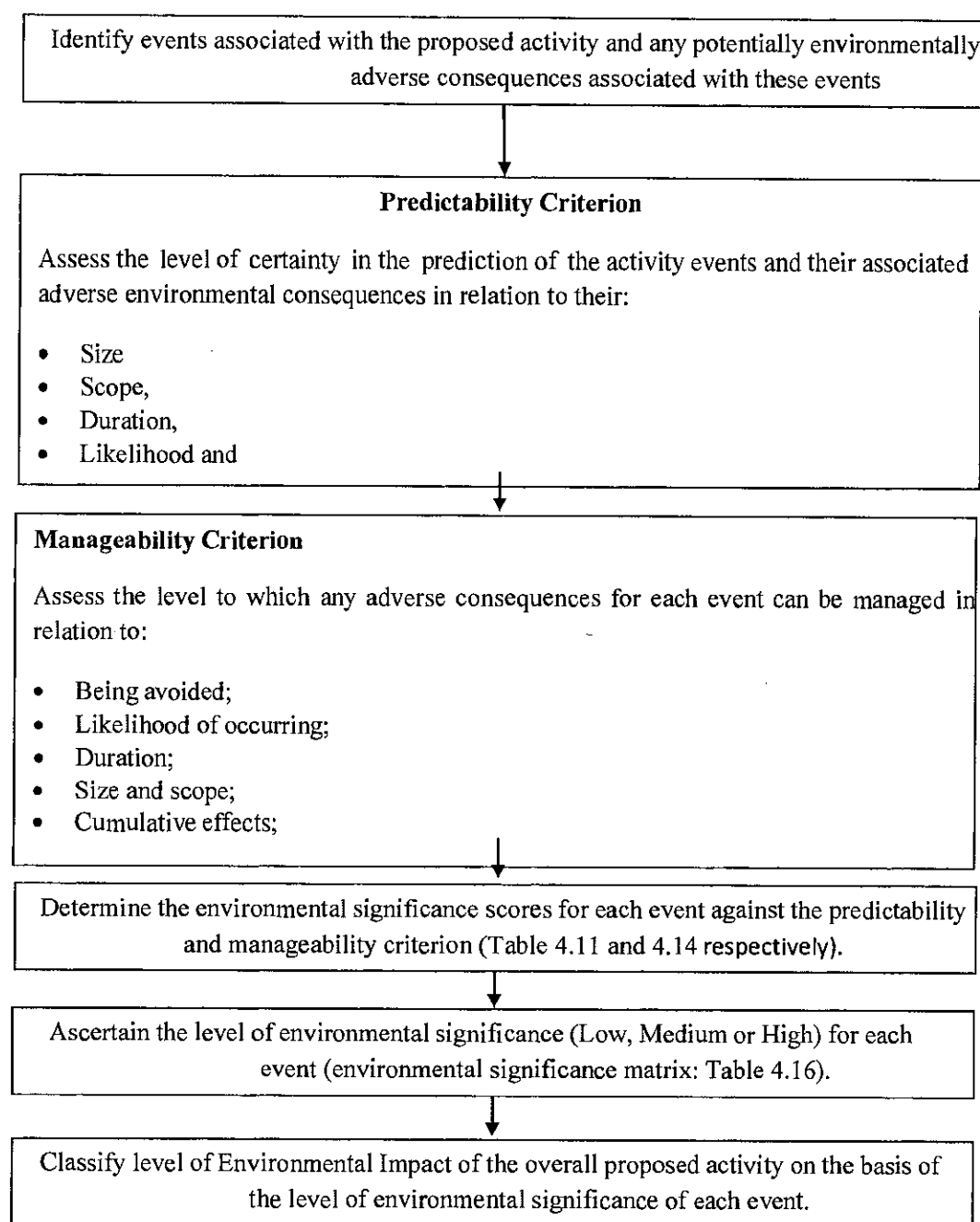


FIGURE 4. 5 STEPS FOR ASSESSMENT OF SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

4.13.3 ENVIRONMENTAL SIGNIFICANCE AGAINST PREDICTABILITY CRITERION

Once the level of certainty of each of the issues is determined, it is then possible to assess the environmental significance of each of the events associated with the activity against the predictability criterion. The environmental significance is determined and assessed on a scale of 1 to 5 as described in Table 4.16. The significance score can then be tabled into the "significance score" column of the predictability criterion Table 4.17.

TABLE 4. 16 PREDICTABILITY CRITERION SIGNIFICANCE SCORE

Significance Score	Predictability Criterion
1	All of the issues outlined in Table 4.4 have been fully addressed; all events and their consequences associated with the activity have been accurately predicted to a high level of confidence.
2	There is a mixture of high and medium certainty of the issues. No issue is of low certainty.
3	All issues are of medium certainty.
4	There is low certainty in at least 1 of the issues for either the events or their potential environmental consequence(s).
5	There is low certainty in all of the issues for either the events or consequences.

TABLE 4. 17 PREDICTABILITY CRITERION TABLE

Step 1 Each of the events of the proposed activity and their associated consequences are assessed against certainty (Low, Medium or High as described) in the prediction of: •the size; •scope; •duration; •likelihood; and •stakeholder concerns Step 2 Significance Score of 1 to 5 is assigned for each event		Size	Scope	Duration	Frequency	Stakeholder Concerns	Significance score
NATURAL ENVIRONMENTAL IMPACTS							
Impact on Soil	Earthworks	High	High	High	High	High	1
	Contamination (eg spills)	High	High	High	High	High	1
Air Impacts	Air emissions	Med.	Med.	Med	Med.	High	2
Surface/Ground Water Impacts	Water contamination	Med.	Med.	Med.	Med..	High	2
	Water extraction	High	High	High	High	High	1
	Altering drainage patterns	High	High	High	High	High	1

Step 1 Each of the events of the proposed activity and their associated consequences are assessed against certainty (Low, Medium or High as described in the prediction of: •the size; •scope; •duration; •likelihood; and •stakeholder concerns Step 2 Significance Score of 1 to 5 is assigned for each event	Size	Scope	Duration	Frequency	Stakeholder Concerns	Significance score
NATURAL ENVIRONMENTAL IMPACTS						
Fauna Impacts						
Disturbance to species	High	High	High	High	High	1
Disturbance to habitats	High	High	High	High	High	1
Flora Impacts						
Disturbing native flora species	High	High	High	High	High	1
Clearing extensive areas of native vegetation	High	High	High	High	High	1
Sensitive Area Impacts						
Disturbance to National Parks	High	High	High	High	High	1
Disturbance to World Heritage Areas	High	High	High	High	High	1
National and/or worldwide register or	High	High	High	High	High	1
SOCIAL IMPACTS						
Community Resource Impacts						
Public infrastructure	High	High	High	High	High	1
Land use	High	High	High	High	High	1
Changes to visual attributes of area	High	High	High	High	High	1
Cultural Impacts						
Changes to demographic structure of area	High	High	High	High	High	1
Heritage Impacts						
Disturbance to natural features	High	High	High	High	High	1
Disturbance to manmade features	High	High	High	High	High	1
Disturbance to aboriginal sites	High	High	High	High	High	1
Community Health Impacts						
Air quality changes	Medium	Med.	Med.	Med.	High	2
Noise and vibration	High	High	High	High	High	1
Changes to water quality	High	High	High	High	High	1
Hazardous operations introduced	Medium	Med.	Med.	Med.	High	2
ECONOMIC IMPACTS						
Community Welfare Impacts						
Wealth and employment	High	High	High	High	High	1
Natural Resource Impacts						
Disturbance of natural resources of other industries	High	High	High	High	High	1

Step 1 Each of the events of the proposed activity and their associated consequences are assessed against certainty (Low, Medium or High as described in the prediction of: •the size; •scope; •duration; •likelihood; and •stakeholder concerns Step 2 Significance Score of 1 to 5 is assigned for each event	Size	Scope	Duration	Frequency	Stakeholder Concerns	Significance score
NATURAL ENVIRONMENTAL IMPACTS						
Altering existing land use	High	High	High	High	High	1

4.13.4 MANAGEABILITY CRITERION

This criterion focuses on the extent to which the potential environmental consequences can be either avoided or minimized in terms of size, scope and duration. It is based on the recognition that minimizing the environmental impact of an activity primarily entails managing the environmental consequence(s) of those activities by either avoiding them in the first place or by mitigating them to as low as reasonably practical. That is, any event will have an impact of some sort on the natural, social or economic aspects of the environment within which it occurs. However, the severity of the impact(s) depends on the extent to which the consequences to the environment can be eliminated or minimized. Therefore, the manageability criterion assesses the level to which the environmental consequences of each event can be either avoided or mitigated.

4.13.4.1 ISSUES UNDER MANAGEABILITY CRITERION

In assessing the level to which the environmental consequences can be managed the issues given in table 4.18 may need to be addressed.

TABLE 4. 18 ISSUES CONSIDERED UNDER MANAGEABILITY CRITERION

a)	Avoidance of Consequences The extent to which the associated consequences of the various activity events can be totally avoided.
b)	Likelihood of Event Occurring The likelihood or probability of an event occurring must also be addressed. If the likelihood of such an event or sequence of events occurring has been managed so as to be very low and acceptable to other stakeholders, then it could be said that this is being managed appropriately and therefore of low significance If the likelihood of such an event or sequence of events occurring has been managed so as to be very low and acceptable to other stakeholders, then it could be said that this is being managed appropriately and therefore of low significance
c)	Duration of Consequences

	Whether the consequences can be managed to be short-term needs to be addressed – short-term needs to be defined in the context of the environment within which the potential consequences are likely to occur. That is, concepts such as the resilience of the environment would come into consideration.
D)	Size and Scope Consideration should be given to the extent to which the size and scope of the consequences can be managed, for example area of land, amount of flora and fauna or number of people affected by an activity. Consideration should be given to the size and intensity of the impacted environment relative to the undisturbed surroundings. Also whether the consequences are potentially catastrophic in terms of human and environmental wellbeing, for example wide scoping and irreversible consequences.
e)	Cumulative Effects This includes any cumulative effects of the consequences, for example, the number of individual activities, which individually may not pose a significant environmental risk but collectively their potential consequences may be very significant in a particular region.
f)	Stakeholder Concerns The level of severity of the environmental consequences perceived by stakeholders (e.g. the outrage effect).

Table 4.19 outlines some basic questions, which can be used to address the above issues.

TABLE 4. 19 QUESTIONS FOR ADDRESSING ISSUES UNDER MANAGEABILITY CRITERION

Issues	Questions
Avoidance of consequences	Can the potential adverse environmental consequences be avoided; or are there is no such consequence? (Yes or No)
Likelihood of event	What is the probability of an event occurring, which may result in the adverse environmental consequence(s)? (Low, Medium or High on the basis of the results of the risk assessment carried out in accord with relevant standards)
Duration of consequences	Are the consequences likely to be Short, Medium or Long term?
Size and scope	Can the consequences be managed so as to be small or confined to a designated area? (Small or Confined?) If they are not small or confinable are the consequences potentially catastrophic? (wide Scoping and Irreversible).
Cumulative effects	Is it likely that the potential consequences of the proposal in conjunction with those of other existing activities are likely to pose a higher and unacceptable risk to the environment than if the individual activities were carried out on their own?
Stakeholder concerns	Is there any major concern of other stakeholders on any of the consequences of the proposed activity?

4.13.5 ENVIRONMENTAL SIGNIFICANCE AGAINST MANAGEABILITY CRITERION

Once the potential environmental consequences have been addressed in relation to the above issues, the level of environmental significance of each of the events associated with the proposed activity can then be assessed against the manageability criterion. As with the predictability criterion, the environmental significance for the manageability criterion is assessed on a scale of 1 to 5 as described in table 4.20.

TABLE 4. 20 MANAGEABILITY CRITERION SIGNIFICANCE SCORE

Insignificance Score	Manageability Criterion
1	Adverse consequences of the various events associated with the proposed activity can be totally avoided, or it is highly unlikely that the events will ever occur.
2	Adverse consequences can be managed to be short-term. Short-term needs to be defined in the context of the environment within which the potential consequences are likely to occur.
3	Adverse consequences are not or cannot be managed to be short-term, but they can be confined so as to be insignificant in terms of size and scope relative to the surroundings.
4	Adverse consequences in conjunction with those of existing activities pose significant cumulative effects. Or Consequences are significant in terms of duration and/or size and scope relative to surroundings.
5	Consequences are potentially catastrophic. Or There is high stakeholder concern on the severity of the consequences. Catastrophic in this context means wide scope and long term or irreversible consequences such as death or serious injury to many individuals or permanent adverse change to the environment.

A step-by-step outline to assess the level of environmental significance for each of the events associated with the proposed activity against the manageability criterion is suggested as follows.

Step1: Where potential adverse consequences can be totally avoided; or where there are no adverse consequences associated with the events of the activity; or where there is a low likelihood of an event occurring which would lead to adverse consequences being minimized, then the event can be considered as being of low significance. In this case a significance score of 1 should be assigned.

Step 2: Where potentially adverse consequences cannot be totally avoided or where their likelihood of being minimized is not low, consideration needs to be given to the duration of the consequences. If the consequences can be managed to occur only for short term in the context of the environment within which they will occur. In such cases a significance score of 2 should be assigned.

Step 3: If the consequences are not short term, then the question of whether or not they can be confined within a designated area, which is relatively small, compared to the surrounding environment needs to be addressed. If they can be confined to being small, then a significance score of 3 is assigned. If they cannot be confined to being small and are significant in terms of size and scope relative to surroundings and/or duration, then a significance score of 4 is assigned.

Step 4: Before assigning a 2 or 3 significance score, the question as to whether the consequences may pose a significant risk to the environment as a result of the cumulative effects with the consequences of other existing activities needs to be considered. If it is considered that the cumulative effects are a significant risk, a significance score of 4 should be assigned.

Step 5: In the case where the consequences are potentially catastrophic in terms of being wide scoping and irreversible, or where there are major concerns by other stakeholders of the consequences, then a significance score of 5 should be assigned.

The significance score can then be entered into the "significance score" column of the manageability criterion.

TABLE 4. 21 MANAGEABILITY CRITERION TABLE

<i>Step 1</i> The associated consequences of each of the impacts are assessed against the following issues: •the extent to which they can be avoided; •the likelihood of events occurring which result in the impacts being realized •their duration; •the size and scope the consequences; •the cumulative effects of the consequences; and •stakeholder concerns <i>Step 2</i> Each of these issues are addressed using the questions <i>Step 3</i> Significance Score of 1 to 5 is assigned for each impact-using Table 4.11.	Avoidance	Likelihood	Duration	Size & Scope	Cumulative Effects	Stakeholder Concerns	Significance Score
Soil Impacts							
Earthworks	Yes	Low	Med.	Small	No	No	2
Contamination (eg spills)	Yes	Low	Med.	Small	No	No	2
Air Impacts							
Air emissions	Yes	Low	Med.	Small	No	No	2
Surface/Ground Water Impacts							
Water extraction	No	Low	Med.	Small	No	No	1
Water contamination	Yes	Low	Med.	Small	No	No	2
Altering drainage patterns	No	-	-	-	-	-	1
Fauna Impacts							
Disturbance to species	No	-	-	-	-	-	1
Disturbance to habitats	No	-	-	-	-	-	1
Flora Impacts							

Disturbing native flora species	No	-	-	-	-	-	1
Clearing extensive areas of native vegetation	No	-	-	-	-	-	1
Sensitive Area Impacts							
Disturbance to National Parks	No	-	-	-	-	-	1
Disturbance to World Heritage Areas	No	-	-	-	-	-	1
National and/or worldwide register or convention areas	No	-	-	-	-	-	1
SOCIAL IMPACTS							
Community Resource Impacts							
Sxe3Public infrastructure	No	-	-	-	-	-	1
Land use	No	-	-	-	-	-	1
Changes to visual attributes of area	No	-	-	-	-	-	1
Cultural Impacts							
Changes to demographic structure of area	No	-	-	-	-	-	1
Heritage Impacts							
Disturbance to natural features	No	-	-	-	-	-	1
Disturbance to manmade features	No	-	-	-	-	-	1
Disturbance to aboriginal sites	No	-	-	-	-	-	1
Community Health Impacts							
NATURAL ENVIRONMENTAL IMPACTS							
Air quality changes	Yes	Low	Med.	Small	No	No	2
Noise and vibration	No	-	-	-	-	-	1
Changes to water quality	Yes	Low	Med.	Small	No	No	2
Hazardous operations introduced	Yes	Low	Med.	Small	No	No	2
ECONOMIC IMPACTS							
Community Welfare Impacts							
Wealth and employment	No	-	-	-	-	-	1
Natural Resource Impacts							
Disturbance of natural resources of other industries	No	-	-	-	-	-	1
Altering existing land use	No	-	-	-	-	-	1

4.13.6 ENVIRONMENTAL SIGNIFICANCE

From the significance scores for the predictability and manageability criteria, the level of environmental significance for each of the potential events associated with the proposed activity can then be determined as either High, Medium or Low on the basis of environmental significance matrix presented in table 4.22.

TABLE 4. 22 MATRIX FOR DETERMINING LEVEL OF ENVIRONMENTAL SIGNIFICANCE

	Scores	Manageability Criterion				
		1	2	3	4	5
Predictability Criterion	1	L	L	L	M	H
	2	L	L	L	M	H
	3	L	M	M	H	H
	4	L	M	M	H	H
	5	L	M	M	H	H

H = High; M = Medium; L = Low

As observed in table 4.23, it is proposed that where adverse environmental consequences can be avoided or where it is very unlikely that an event will occur which would result in such consequences (i.e a Score of 1 against the manageability criterion), then the significance of the individual event associated with the proposed activity can be considered to be low regardless of the predictability score. The significance matrix provided for the proposed project can be developed so as to set the three levels of significance at other positions within the matrix.

TABLE 4. 23 ACTIVITY ENVIRONMENTAL SIGNIFICANCE TABLE

NATURAL ENVIRONMENTAL IMPACTS	Predictability Criterion Score 1-5 (Table 4.8)	Manageability Criterion Score 1-5 (Table 4.12)	Level of Environmental Significance H: High M: Medium L: Low (Table 4.13)
Soil Impacts			
Earthworks	1	2	L
Contamination (eg spills)	1	2	L
Air Impacts			
Air emissions	2	2	L
Surface/Ground Water Impacts			
Water extraction	1	1	L
Water contamination	2	2	L
Altering drainage patterns	1	1	L
Fauna Impacts			
Disturbance to species	1	1	L
Disturbance to habitats	1	1	L
Flora Impacts			
Disturbing native flora species	1	1	L
Clearing extensive areas of native vegetation	1	1	L

Chapter 4	Draft EIA/EMP of Proposed Naulatha Cement Grinding Unit With Cement Production Capacity of 1 X 4.0 MMTPA at Naulatha Village, Panipat District, Haryana by M/s Ambuja Cements Limited
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Sensitive Area Impacts			
Disturbance to National Parks	1	1	L
Disturbance to World Heritage Areas	1	1	L
National and/or worldwide register or convention areas	1	1	L
SOCIAL IMPACTS			
Community Resource Impacts			
Public infrastructure	1	1	L
Land use	1	1	L
Changes to visual attributes of area	1	1	L
Cultural Impacts			
Changes to demographic structure of area	1	1	L
Heritage Impacts			
Disturbance to natural features	1	1	L
Disturbance to manmade features	1	1	L
Disturbance to aboriginal sites	1	1	L
Community Health Impacts			
Air quality changes	2	2	L
Noise and vibration	1	1	L
Changes to water quality	1	2	L
Hazardous operations introduced	2	2	L
ECONOMIC IMPACTS			
Community Welfare Impacts			
Wealth and employment	1	1	L
Natural Resource Impacts			
Disturbance of natural resources of other industries	1	1	L
Altering existing land use	1	1	L

CHAPTER -5 ANALYSIS OF ALTERNATIVES

5.1 ANALYSIS OF ALTERNATIVES

As per EIA Notification dated 14th Sept. 2006 and as amended thereof; the Chapter on “Analysis of Alternatives (Technology & Site)” is applicable only, if the same is recommended at the Scoping stage.

5.2 NO PROJECT SCENARIO

The “No Project” scenario serves as a useful benchmark to determine the significant developmental or detrimental effects on existing environmental and social factors (if any) after the proposed activity is implemented. The “No Project” scenario means there will be no changes to the current situation, maintaining the status quo and preserving resources such as land, water, ecology, soil, infrastructure, health, and education in their current state. The ministry mandates consideration of all possible alternatives for the proposed project, including the “No Project” scenario. When considering the “No Project” scenario, it is crucial to evaluate existing environmental and social conditions through primary and secondary investigations. Current environmental legislations protect natural resources and restore ecosystem services by adopting eco-friendly technologies across sectors, contributing to the nation's economic interests. India's EIA practices are stringent in protecting the environment and promoting local welfare, involving experts and new technologies. Project proponents are encouraged to develop basic infrastructure, provide local employment, and improve education and health facilities through CER and CSR funds during pre- and post-project initiatives.

5.3 ALTERNATIVE TECHNOLOGY EXAMINED FOR CEMENT PRODUCTION

The proposed technology for the grinding unit is horizontal VRM and this method is more economically feasible for small grinding units. As the cement production capacity of the proposed grinding unit is 4.0 MMTPA, VRM is analyzed as the most suitable method for the project. Detailed description of Technology is given in Chapter - 2 of this EIA/EMP Report.

5.4 ALTERNATIVE SITES

Consideration of alternatives to a project proposal is a requirement of the EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environment friendly and cost-effective options. The selection of the site is based on the following considerations which are feasible in terms of location, road facilities, labour availability, requirement of health and safety and environmental concerns, production scheduling, scope of mechanization/automation, operating and capital cost estimates.

TABLE 5. 1 DETAILS OF ALTERNATIVE SITES CONSIDERED:

Site 1: Israna, District Panipat, State: Haryana	Site 2: Village Naulatha, Taluka Israna, District Panipat, State: Haryana	Site 3: Mehrana, District Panipat, State: Haryana
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5.4.1 SELECTED SITE

Site 2: Village Naulatha, Taluka Israna, District Panipat, State: Haryana

Selected site is suitable due to road and rail connectivity. 90% of raw materials are expected by rail to arrive at project site and 90% product will be transported by road. Since the selected site of Village Naulatha scores over other two, same has been considered. The selected site is a fallow land with no agriculture and the land is already converted for industrial purposes. The selected site is already under possession of Group company Adani Agri Logistics Panipat Limited (AALPL) further MOU is signed between Ambuja Cements Limited and Adani Agri Logistics Panipat Limited (AALPL) to setup cement grinding unit on respective land.

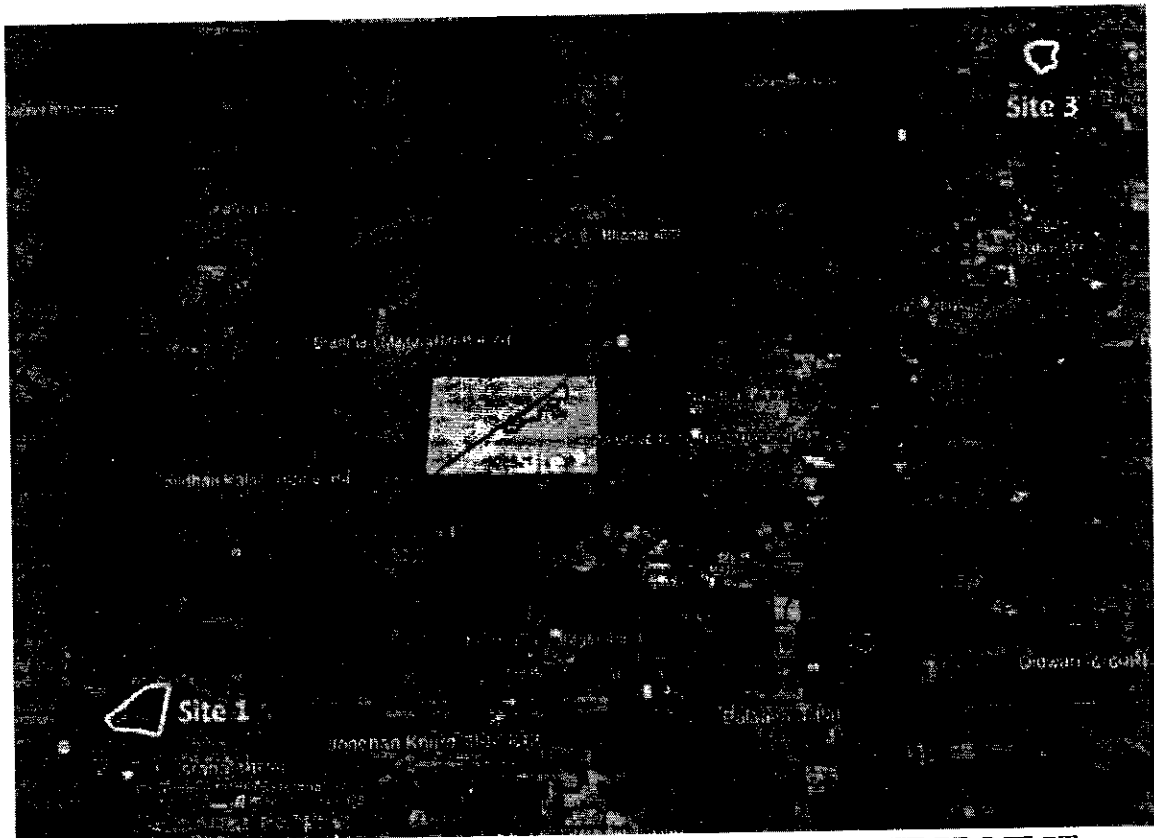


FIGURE 5. 1 GOOGLE IMAGE OF ALTERNATE SITE OF THE PROJECT

TABLE 5. 2 COMPARISON OF ALTERNATIVE SITES

S. No.	Parameters	Site 01	Site 02 (Alternative Site 1)	Site 03 (Alternative Site 2)
1.	Name of the village	Naulatha	Israna	Binjhol
2.	Elevation of site, (AMSL)	244-247 m	241-247m	250-255
3.	Distance from nearest village (Km)	Brahman Majra 1.4 Km, WNW Bhadaur 3.8 Km, N Dohar 4.9 Km, NE	Israna-0.2km Jondhan kalan- 2.km,	Binjhol-0.05,N Mehrana-0.6,E
4.	Topo sheet No.	H43Q15	H43Q15	H43Q15
5.	Land Availability (ha)	9.28 Ha	14.90	13.20
6.	Private/Govt.	Private	Private	Private
7.	Type of Land Use	Fallow Land	Agricultural land	Agricultural land
8.	Resettlement Issues	Nil	Nil	Nil
9.	Source of Water	Groundwater	Groundwater	Groundwater
10	Nearest Highway	NH -709, 1.6 Km, N SH-14, 8.3 Km, N	NH-709,0.9 Km, S	SH-16-0.8,E NH-709, 2.1,S
Ecological Sensitivity within 10 Km				
11.	Flood plain of Riverine/ Marinesystem	Nil	Nil	Nil

Site -1 is chosen over site -2 and 3 because the land of site -1 owned by Adani Agri Logistics Panipat Ltd, a group company of Adani. Ambuja Cements Limited, the applicant is another group company of Adani and presently there is MOU between Adani Agri Logistic and Ambuja Cements, for utilization of 9.28 Ha of land for proposed Project.

5.5 SOCIAL CONCERN

The site has been selected by keeping in view the social concerns i.e., site is at a proximal distance to NH 709 (Adjacent to the project site) thereby reducing the impact on village road due to non-availability of highway, free from any habitation, free from environmental sensitive features viz. requiring minimum clearance of vegetation, water bodies, non-involvement of any forest area etc., has adequate ground water at the proposed site and has availability of reliable power. The major social concerns in the study area are (1) Unemployment (2) Industrial growth (3) Health related. The details to address the social concerns are given in Chapter- 8 of this EIA/EMP Report.

5.6 CONCLUSION

M/s ACL Pvt Ltd. has analyzed all the aspects related to alternative technology and site in terms of environment and social consideration and it has been found that the proposed technology is best suited for this project. Based on the analysis, VRM is the best proven technology which is best and economically feasible for grinding units with less production capacities. It will result in cost effective project and will lead to minimum social concern as all the environment aspects has been analyzed by the company before selecting the suitable and efficient technology and site for this proposed cement Grinding unit project.

CHAPTER -6 ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

Regular monitoring in a systematic manner provides information on operational performance of installed pollution control facilities, checks the extent of environmental degradation taking place and adequacy of mitigation measures applied. The monitoring plan also ensures compliance with the environmental legislation. The objectives of the monitoring plan are as follows:

- To verify the results of the EIA Report.
- To study the trend of various pollution parameters, which are identified as critical.
- To check the efficacy of pollution control equipment.
- To ensure that any additional parameters, other than those identified in the EIA, do not become critical after the commissioning of plant.

The effectiveness of monitoring program depends mainly how best the objective of the monitoring is addressed through its core elements, for example.

- Monitoring network
- Manpower and Instruments
- Parameters to be monitored
- Frequency of monitoring
- Method and duration of sampling
- Method of analysis

To know the effectiveness of environmental mitigation measures, post project environmental monitoring program will be strictly followed as per the statutory requirement. Environmental Monitoring will be carried out at the plant site as per the norms of CPCB/SPCB. Environmental Monitoring Programme is being/will be conducted for various environmental components as per the conditions stipulated in consent to operate letter issued by SPCB.

6.2 FORMATION OF ENVIRONMENT MANAGEMENT CELL (EMC)

In order to maintain the Environmental Quality within the standards, regular monitoring of various environmental components is necessary. The company shall form Environmental Management Cell (EMC) for environmental monitoring and management. The EMC team shall take care of environmental pollution monitoring aspects and implementation of control measures. A group of qualified and efficient engineers and officers with technicians have shall be deputed for maintenance, up keeping and monitoring the pollution control equipment, to keep them in working at the best of their efficiencies.

6.2.1 RESPONSIBILITIES OF EMC

The responsibilities of the EMC include the following:

- Environmental monitoring of the surrounding area through third party.
- Timely Commissioning of pollution control equipment and facilities.
- Ensuring that applicable standards are maintained.
- Schedule maintenance of pollution control equipment.
- Development & Maintenance of the greenbelt & plantation.
- Proper implementation of the Environmental Management Plan.
- Co-ordination for all statutory requirements like submission of application/reports for obtaining Consents, & authorization etc.

6.3 PERFORMANCE MONITORING AND SCHEDULE FOR ALL POLLUTION CONTROL DEVICES

6.3.1 INSTRUMENTS TO BE USED

The following instruments will be used for data collection work in the monitoring Schedule:

- Weather Monitoring Station (WMS) – for meteorological observations
- Respirable Dust Sampler (RDS) - PM10
- Fine Particulate Sampler (FPS) - PM2.5
- Stack Monitoring Kit for PM, SO₂, NO₂ measurement
- Sound Level Meter
- Water Level Indicator
- Water meter etc.

6.3.2 MONITORING PROGRAMME

The post-project environmental monitoring will include details of any major/ minor impact in the core zone and area within buffer zone for the following parameters:

- Micro-meteorological data
- Ambient air quality monitoring
- Stack monitoring
- Noise level monitoring
- Water quality and level monitoring
- Medical Check-up of the employees

6.4 MONITORING SCHEDULE

Details of the environmental monitoring schedule / frequency, which will be undertaken for various environmental components, as per conditions of EC / CTE / CTO.

6.4.1 LOCATIONS OF MONITORING STATIONS

The location of the monitoring stations will be selected based on prevailing micro- meteorological conditions of the area like Wind direction and Wind speed, Relative Humidity, Temperature and sensitive receptor.

AAQM stations will be selected in consultation with SPCB to assess Ambient Air Quality of the area. Noise level monitoring will be carried out at 8 locations in surrounding of plant boundary. Water sampling locations has been decided based on general slope of the area and drainage pattern. Locations for the post-project monitoring are given in table 6.1:

TABLE 6.1 LOCATIONS FOR POST PROJECT MONITORING

Sl. No.	Description	Location
1.	Meteorological data	Plant Site
2.	Ambient Air Quality	Plant boundary in up wind, Cross wind and down wind direction
3.	Stack emissions	Plant site & other stacks
4.	Water Level and Quality	Nearby Ground water sources & as per EC /CTO
5.	Noise Level Monitoring	Plant Boundary & as per EC / CTO conditions
6.	Health Check-up	Health Management Centre

6.4.2 MONITORING SCHEDULE

A monitoring schedule is very important in order to ensure that the wastewater and emissions conform to the standard for which control measures have been designed. As it is required that installation and operation of water pollution control facilities should limit concentration and quantum of pollutants released to the environment properly, regular continuous monitoring of flow and pollutants should be done. A comprehensive monitoring program for construction phase and operation phase is suggested in table-6.2 and table-6.3 respectively. The environmental attributes will be monitored as given below:

6.4.3 AMBIENT AIR QUALITY AND METEOROLOGY

- The ambient air quality will be monitored as per National Ambient Air Quality Emission Standards issued by the MoEF&CC vide GSR No.826 (E) dated 16th November, 2009;
- The ambient air quality will be monitored twice in a month in line with the guidelines of CPCB in and around the proposed project as per the parameters specified by CPCB;
- The fugitive emission in and around of the individual unit should also be measured for particulate matter regularly and as per the latest CPCB guidelines; and
- Automatic weather monitoring station will be used to monitor wind speed, wind direction, temperature, relative humidity, atmospheric pressure, rainfall, evaporation rate, solar radiation and cloud cover. The parameters will be recorded at one-hour frequency. The same data will be used for the improvement of environment.

6.4.3.1 STACK EMISSIONS

Air pollution parameters of process stacks will be undertaken on a regular basis as per the consent conditions of CPCB. It will be ensured that these parameters are within the permissible limits specified by CPCB. Preventive and corrective action will be taken if parameters are exceeded in any case.

6.4.3.2 WATER QUALITY

The storm water will be analyzed in the rainy season. The ground and surface water quality will be monitored in every season at selected locations. The water depths will be monitored in the wells of surrounding villages in every season.

6.4.3.3 NOISE LEVELS

Noise levels in the work zone environment and ambient will be monitored regularly. The frequency of noise monitoring will be once in a month in the work zone. The ambient noise levels in the surrounding villages will be monitored on seasonal basis.

TABLE 6.2 POST-PROJECT MONITORING MEASUREMENT METHOD& TEST PROCEDURE

Attributes	Measurement Method	Test Procedure
Pollutant Monitoring		
PM10	Gravimetric method	
PM2.5	Gravimetric method	-
SO ₂	EPA Modified West & Geake method	Absorption in Potassium Tetra Chloro mercurate followed by Colorimetric estimation using p-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part - II).
NO ₂	Sodium Arsenite modified Jacob & Hochheiser	Absorption in dil. NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nephthyle) Ethylene diamine Dihydrochloride and Hydrogen Peroxide (CPCB Method).
PM	As Per CPCB Guidelines	Gravimetric method
pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese	As per IS 10500-2012	Samples for water quality should be collected and analyzed as per: IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents. Standard methods for examination of water and wastewater analysis published by American Public Health Association.
Waste water (pH, BOD, COD, fecal coliforms)	As per ISO 3025	Standard methods for examination of water and waste water analysis published by American Public Health Association.
Noise levels at Day & night time -Leq dB (A)	As per CPCB norms	As per CPCB norms

Spirometry, Audiometer, Biochemical Parameter (Sugar, Blood), Circulatory and Vision Test	As per factory Act 2013	-
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6.4.4 METHODOLOGY ADOPTED

Post-project monitoring will be carried out as per conditions stipulated in Environmental Clearance Letter issued by MOEF&CC, New Delhi; Consent issued by SPCB, while following the CPCB guidelines. Plant site is considered as core zone and the area lying within 10 km radius from the plant site is considered to be the buffer zone, where slight impacts may be observed on physical and biological environment and that too is occasional. Details of Post Project Monitoring Programme are indicated in Table 6.3.

TABLE 6. 3 POST PROJECT MONITORING

Sl. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Waste water quality				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on Quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	STP Inlet &Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) and Once in a month		PM, SO ₂ & NO _x
B.	Ambient Air quality (CAAQMS)	Continuous and Quarterly Once	Continuous 24 hours	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient Noise levels	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels

6.4.5 ANALYSIS

Monitoring data analysis will be done by NABL/SPCB approved laboratory as per CPCB guidelines & timely submitted to concerned authority (specified in Environment Clearance Letter issued by MOEFCC and Consent issued by SPCB) on regular basis.

6.4.6 REPORTING SCHEDULE

Six monthly compliances on EC conditions will be submitted to the regional office of MoEF & CC and CFO conditional Compliance will be submitted to SPCB. Copies of the reports will be maintained in the plant and will be made available to the concerned inspecting authorities as and when required.

CHAPTER -7 ADDITIONAL STUDIES

7.1 INTRODUCTION

As per the Terms of Reference (ToRs) issued on dated 6th April, 2024 following additional studies required to be carried out for the proposed project.

- i. Public Consultation.
- ii. Risk Assessment
- iii. Emergency Responses & Preparedness Plan

7.2 PUBLIC CONSULTATION

The Draft EIA/EMP report will submit to SEIAA, Haryana for public hearing. Action plan will be prepared and submit after the conduction of public hearing.

7.3 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

7.3.1 RISK ASSESSMENT & METHODOLOGY

Risk assessment is the measure of quantitative or qualitative value of risk related to a concrete situation and a recognized threat. Accidental risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events resulting into fire, explosion or toxic hazards to human health and environment. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and incident are both onsite and off-site.

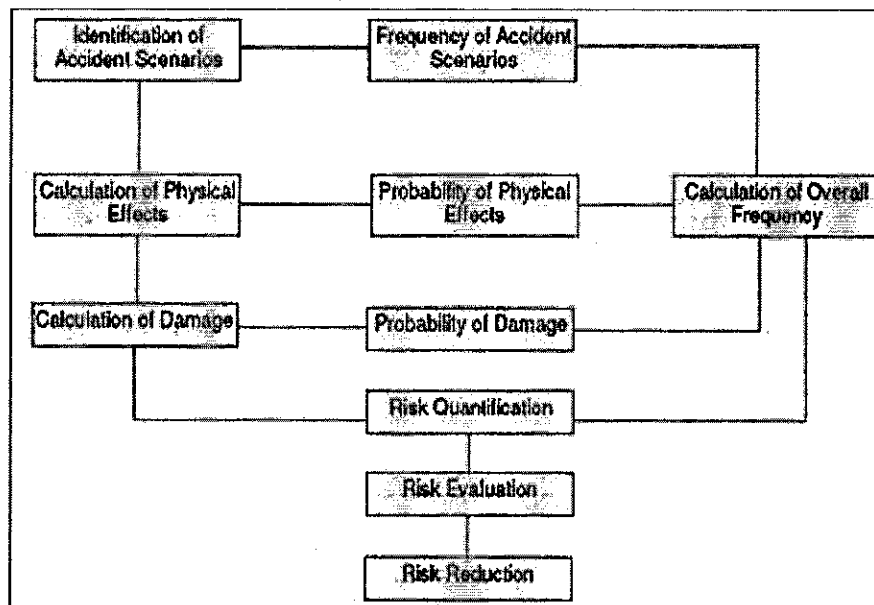


FIGURE 7. 1 RISK ANALYSIS STRATEGY

7.3.2 HAZARD IDENTIFICATION & RISK ASSESSMENT (HIRA) FOR GRINDING UNIT

Hazard Identification and Risk Analysis (HIRA) is a collective term that encompasses all activities involved in identifying hazards and evaluating risk at facilities, throughout their life cycle, to make certain that risks to employees, the public, or the environment are consistently controlled within the organization's risk tolerance.

Possible hazards in Grinding Unit are as follows:

- Physical Hazards
- Events pertaining to Manufacturing Process
- Exposure to High temperatures
- Electrocutation
- Natural & Manmade Hazards
- Noise and Vibration

These Hazards, mainly impact on those working within the industry, although health impacts can also be envisaged on local communities. The potentially hazardous areas and the likely incidents with the concerned area have been enlisted below in table - 7.1. Details of Possible Hazards, their Cause and safety measures to be adopted is given in table 7.2.

TABLE 7. 1 POSSIBLE HAZARDOUS LOCATIONS

S.No.	Hazardous Area	Hazards /Impact
1.	Electrical rooms	Fire and electrocutation
2.	Transformer area	Fire and electrocutation
3.	Cable tunnel	Fire and electrocutation
4.	Clinker Silo	Collapse and Material spillage
5.	Cement Mill	Fatal accident, High Noise
6.	Fuel storage area	Fire and spillage
7.	Packing plant	Fire, Collapse and Material spillage

TABLE 7. 2 HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA) AND SAFETY MEASURES TO BE ADOPTED AT GRINDING UNIT

S. No.	Possible Hazard	Cause of Hazard	Safety Measures
1.	Physical Hazards <ul style="list-style-type: none"> Falling / impact with objects. Transportation Contact with allergic substances 	<ul style="list-style-type: none"> Slips, Trips and fall. Contact with falling / moving objects and lifting / over exertion. Contact with, or capture in, moving machinery. Maintenance of equipment, including mills, mill separators, fans, coolers, and belt conveyors 	<ul style="list-style-type: none"> It will be ensured that the equipment with moving parts are de-energized, isolated and locked/tagged out. Fall protection system will be used by workers working at an elevation more than or equal to 1.8 meters. PPEs will be provided to the person dealing with welding, gas cutting or brazing. Safety helmets will be provided to workers for protection from any fall of material incidents. Barriers will be provided to prevent slipping or being knocked off the edge of a structure. Danger areas will be marked clearly with suitable warning signs to avoid any accident. Proper medical care will be provided at the project site in case of any accidental issues.
2.	Events Pertaining to Manufacturing Process		
i.	Handling of Cement	Cement is a fine dust requiring proper care and handling during material transfer.	<ul style="list-style-type: none"> Proper care will be taken by providing PPEs like mask, goggles, hand gloves etc., while handling, storage and packing of Cement.
ii.	Handling of Fuel -HFO	<ul style="list-style-type: none"> Material Spillage. Flammable, ignitable, and reactive property of fuel. 	<ul style="list-style-type: none"> Storage area will be designed to withstand the load of material stocked and any damage from the material spillage. Adequate fire-fighting systems will be provided for the storage area, along with the areas in the facility.
iii.	Electrocution	Carelessness during working hours, Damage of equipment/tools, Electrical Room	<ul style="list-style-type: none"> Proper care will be taken while working on such equipment and implement periodical internal inspection at site. Proper earthing of panel must be checked.

TABLE 7.3 NATURAL AND MANMADE CALAMITIES WHICH CAN LEAD TO EMERGENCY

S. No.	Calamity / Activity	Mitigation Measures
1)	Earthquake	<ul style="list-style-type: none"> • Project site falls in Seismic Zone II. Construction of buildings as per IS 1893 Part 4:2005 Criteria for Earthquake Resistant Design of Structures (Industrial Structures Including Stack-Like Structures) and IS 13920:1993 Ductile Detailing of Reinforced Concrete Structures Subjected to Seismic Forces to minimize the risk of Seismic loads. • Identification and Constitution of Emergency Response Team. • Equipping the Control Centers with Communication facilities, emergency vehicles, emergency contact and supplies, etc. • Assembling of persons at assembly points will be ensured during emergency • Shut down of grinding unit will be ensured and first aid to victims will be provided.
2)	Storm and Lightning	<ul style="list-style-type: none"> • Regular contacts will be established with local meteorological department. • The factory operations installations will be evaluated time to time. • Availability of tools, batteries, non-perishable other materials that might be required will be checked. • All the systems will be shut down; metallic sheets, loose material, empty drums etc., will be secured properly. • Drainage Systems will be flushed down properly. • Office will not be sealed completely as the suction created by the difference in atmospheric pressure inside and outside can rip open a window or door by breaking window glass panels. • Special precautions in driving vehicles will be taken as the under-pavement could cave in due to the weight of automobile.
3)	Flood	<ul style="list-style-type: none"> • There is no HFL is present in the proximity of the plant. The plant is situated in a no-flood zone.
4)	Air Raid	<ul style="list-style-type: none"> • Air raid warning will be obtained from District Emergency Authority or Defense Authorities, during which total blackout of the entire complex should be considered. • Aviation lights, Street lights, lightning will be switched off.

S. No.	Calamity/Activity	Mitigation Measures
5)	Food and Water Poisoning	<ul style="list-style-type: none"> Regular testing of potable drinking water will be done as per IS standard (twice a year) & periodic hygiene audit of canteen will be carried out. Medical Officer will be immediately informed by senior most person available at site.
		<ul style="list-style-type: none"> Adequate inventory/ supply of medicines, saline water etc. will be maintained and awareness as well as training regarding food/ water poisoning will be provided. Contaminated Source will be identified and seized to avoid its further circulation and alternate supplies will be arranged. Detailed epidemiological investigation to identify cause of contamination will be conducted.

High Risk Categories and Preventive Measures are given in table - 7.4.

TABLE 7. 4 HIGH RISK CATEGORIES AND PREVENTIVE MEASURES

High Risk Categories	Prevention
Contractors	Implementation of Contractor Safety Management
Young/Temporary Employees	Special Safety Induction Training & Supervision
Direct Causes	
Traffic and Vehicular movement inside the plant	Driver Training and OEM training
Falls from Heights, Objects falling from Heights	Safety Procedures for Work at Heights, Overhead structure Protection, in house training & Rescue arrangement for critical activities
Caught in Starting/Moving Equipment	Plant Isolation Procedures, Machine Guarding

7.3.3 DISASTER MANAGEMENT PLAN

i) Definition

A major emergency in a work 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 work. It would require the assistance of emergency services to handle it in effective manner.

ii) Scope

The aim of hazard control and disaster management is concerned with preventing incidents through good design, operation, maintenance and inspection, by which it is possible to reduce the risk of an incident, but it is not possible to eliminate it. Since, absolute safety is not achievable; an essential part of major hazard control must also include mitigating the effects of a major incident. An important element of mitigation is emergency planning i.e.,

identifying accidents as soon as possible, evaluating the consequences of such incidents and selection of the emergency procedures, both on-site and off-site, that should be adopted in the event of an emergency.

iii) **Objective**

The objectives of the emergency plan will be:

- a) To protect grinding unit personnel and general public.
- b) To prevent and minimize damage to property and to the environment.
- c) To help persons at site in a systematic manner meeting a disaster situation.
- d) To restore the affected areas back to normal as soon as possible.
- e) To review accident after it has occurred and to evaluate company's efforts in order to improve emergency management response in the future.

Elimination of the disaster requires prompt action and work emergency personnel with fire-fighting equipment, water sprays, etc. Minimizing the impacts may include rescue, first aid, evacuation, rehabilitation and providing information promptly to people living nearby. To deal with the below emergencies, the Emergency Plan has been prepared.

TABLE 7.5 EMERGENCY PLAN

S. No.	Disaster/Activity	Area	Mitigative steps to be adopted
a)	Fire and Explosion	Stores	<ul style="list-style-type: none"> • Suitable fire extinguishers, fire hydrant system and fire buckets will be provided for firefighting during emergency. • Training will be provided to Stores staff for first aid firefighting to prevent/extinguish the fire at initial stage.
b)		Packing Plant	<ul style="list-style-type: none"> • The packing plant will be declared as "No Smoking Zone" area. • Suitable fire extinguishers and fire hydrant system for fire - fighting in emergency situation. • Permission for working with welding/gas cutting in that area. • Adequate drainage to immediately drain out the water used in fire - fighting to avoid water logging and the sheds will be properly ventilated.
c)		Silos	<ul style="list-style-type: none"> • Structural Soundness of silos will be ensured. • Installation of lightning arrestor at the top of silos & at highest structure.

d)		Fuel Storage and Handling	<ul style="list-style-type: none"> Area will be declared as "No Smoking Zone" area. Suitable fire extinguishers and fire hydrant system for fire - fighting in emergency situation.
e)		Electrical Transformer	<ul style="list-style-type: none"> Predictive interlocks will be provided which will automatically give an alarm/trip the system. In case oil pressure inside the transformer tank increases, Buchholz relay provided will give an alarm and if necessary, will trip the transformer and thus avoid oil explosion. A diaphragm will be provided at the bottom of explosion vent to vent out high oil pressure whenever pressure is increased beyond limit. Fire extinguishers and sand buckets will be provided in the transformer room for firefighting due to explosion or during an emergency.
f)		Transformer Yard and HT/LT Sub-Station	<ul style="list-style-type: none"> Transformers will be separated by brick wall up to height of transformer. Soak pits of suitable capacity to collect the leaked oil from transformer in case of fire and explosion. Periodic maintenance of all electrical machinery/apparatus will be done. In case of fire in HT transformer, first of all 33/132 kV input breaker will be switched off. In case of LT transformer fire/explosion, the transformer feeder from HT line will be switched off. Soundness of insulation, proper ventilation and earthing arrangements will be checked regularly by department. Emergency control room will be Informed for fire brigade and other actions.
g)		Electrical Cable Tunnels	<ul style="list-style-type: none"> Provision of suitable fire extinguishers for fire-fighting. Good housekeeping to avoid any fire hazards. Exhaust fans will be provided for proper air exchange inside the tunnel.
h)		Conveyor Belts	<ul style="list-style-type: none"> Provision of suitable fire extinguishers for each transfer towers for firefighting during emergency and suitable fire equipment will be kept at hand during gas cutting / welding. Pull cord system will be provided throughout its

			<p>length to stop it in any emergency and preventive checks to</p> <ul style="list-style-type: none"> • ensure pull chord interlocking functioning.
i)	Injury to person and damage to equipment	Failure of Lifting Tools and Tackles and Pressure Vessels	<ul style="list-style-type: none"> • All lifting tools & tackles and pressure vessels will be tested/examined by competent person authorized by chief inspector of factories, Govt. of Haryana as per statutory requirement and at defined frequency • Safe working pressure range will be maintained in the Air receiver tank/pressure vessels • Safe Working Load will not be violated while using cranes, hoists, ropes, chains and other lifting tools and tackles, only authorized personnel will be allowed to handle the same • Regular and periodic internal inspection and maintenance will be done.
j)	Falling from Height	Any Working Area	<ul style="list-style-type: none"> • Information will be immediately given to Emergency Control Room/ OHC • Information will be immediately given to the Job Execution In-charge • Rescue team member will rush at site with rescue kit • Emergency team will be allotted to act as per Emergency organization structure • Rescuer to access the probable risk for rescuing the victim • Rescuer has to use double fall protection as precaution (One rope grab falls arrestor/Winch fall arrestor and another is descender) • Rescuer to use full body safety harness for rescue • Operation
k)	Engulfment in Stockpile	Stockpiles	<ul style="list-style-type: none"> • Only authorized person will be allowed to enter into the stockpile after getting permission from the production team. • If a person buried under stockpiles, stop the job immediately and related equipment by pushing emergency button if applicable, activate the Emergency Respond team. Cordon off the affected area, take out the material with the help of section in-charge, rescue the affected persons and send to • hospital

Onsite Emergency Plan

The Onsite Emergency Management Plan is a master plan which contains the emergency organization structure, responsibilities of key members, communications mean and emergency response strategies to control a range of major incidents.

Risk Scenarios at Grinding Unit: Potential and high hazard situation will be treated as major emergency. Emergency will be declared by the Head-EHS after assessing the situation. The major risk scenarios as evaluated from hazard identification are:

Fires: Fire at fuel storage yard, Trash catching fire, diesel fire, cable fire, Paint fires, construction waste fires, electrical fire in panels, transformer oil fire, Fire in administrative building, combustible gas fire, and flammable liquid fire, etc.

Explosion: LPG cylinder explosion in canteen, air receiver cylinder bursting, etc.

Leakage: Leakages of gases, combustible gases etc.

Spillage: Spillages of acids / chemicals / flammable liquids/ non-flammable liquids etc.

Contamination: Drinking water contamination.

Construction disasters: Building collapse, form work collapse, rubbish chute choke, scaffolding collapse, tower crane collapse, mobile crane/crawler crane topple, Major electrical shutdown (during night time)

Road emergencies: Road accidents

Others: Cyclonic winds, Flooding, Food poisoning, epidemics, earthquake, Landslides etc

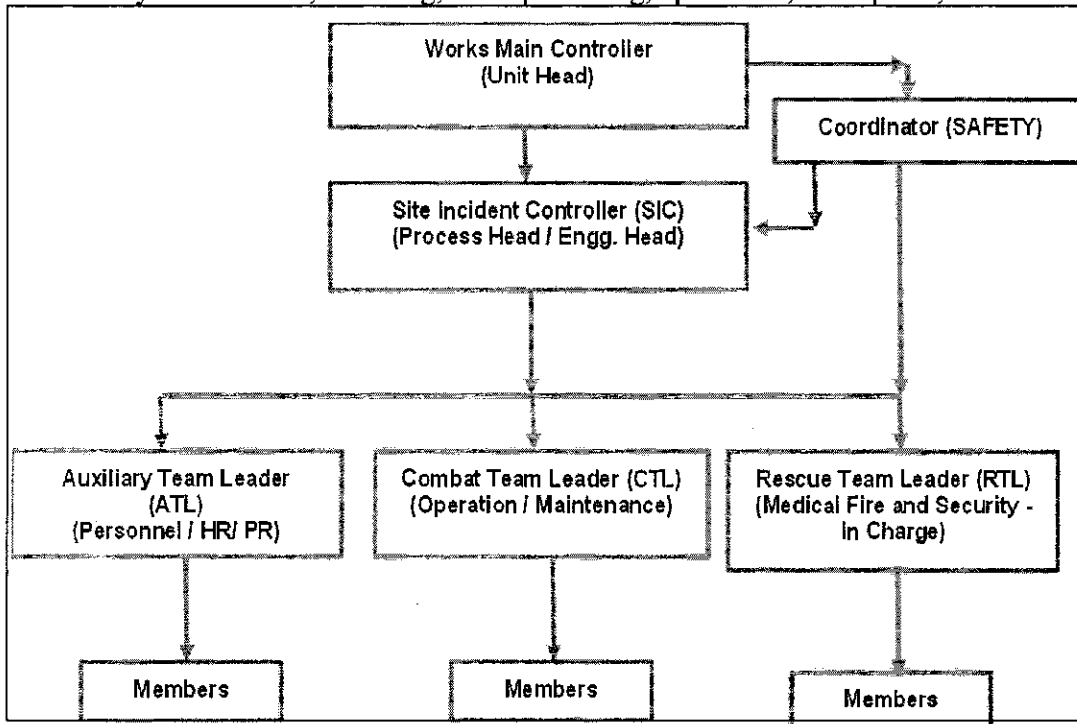


FIGURE 7. 2 EMERGENCY ORGANIZATION AND ITS RESPONSIBILITIES

TABLE 7. 6 EMERGENCY COMMAND STRUCTURE

S. No.	Designated roles of Emergency Command Structure	Responsibilities
1	Work site main controller	<ul style="list-style-type: none"> • Ensuring rehabilitation of affected areas. • Communication to ACL personnel followed by a written report about the accident, including mitigation measure taken. • Maintaining a speculative continuous review of possible developments and assess these to determine most probable course of events.
2.	Site Incident Controller (SIC)	<ul style="list-style-type: none"> • Assessment of Scale of emergency and activation of subsequent major emergency procedure. • Ensuring safety of personnel. • Minimizing the damage / loss of equipment, property, material and environment. • Reporting all significant development to the site main controller and providing advice and information, as required, to the senior officer of the Fire Brigade in case of fire. • Ensure that the outside emergency services and key personnel are called in. • Maintenance of record of emergency Chronology wise. • Direct instructions about the "ALL CLEAR" communication through mobile phones and walkie-talkie.
3.	HR & ADMIN – Head	<ul style="list-style-type: none"> • Handling the evacuation of personnel from emergency situation to Assemble point. • Taking Head count of the Evacuated personnel. • Assisting the Site Controller in liaise with the local emergency authorities. • Managing traffic movement towards the incident area and clearing the way to Emergency vehicles.
4.	Electrical – Head	<ul style="list-style-type: none"> • Heading the shutdown and arrangement to stop the power supply to the site after receiving the instructions from Incident Controller. • Resuming of Power Supply to site after receiving "ALL CLEAR" instruction from the Incident Controller.
5.	Mechanical – Head	<ul style="list-style-type: none"> • Heading the heavy equipment and arranging proper access at site after receiving instructions from Incident Controller. • Resuming the tool tackles (welding machine, cutting machine, grinding machine, etc.) at site after receiving "ALL CLEAR" instructions from Incident Controller.

6.	Fire Fighting Team	<ul style="list-style-type: none"> • Immediately reporting at the site after receiving communication from Incident Controller. • Controlling the fire and Gas leakages.
7.	First Aid Team / EMR team (Emergency medical response team)	<ul style="list-style-type: none"> • Immediately reporting at site after receiving communication from Incident Controller. • Removing the casualties from incident area to the safe place and providing immediate first-aid to the casualties.
8.	Area in-charge of Emergency Affected Area	<ul style="list-style-type: none"> • Immediate movement to the site of incident for conformation and assessment of situation.

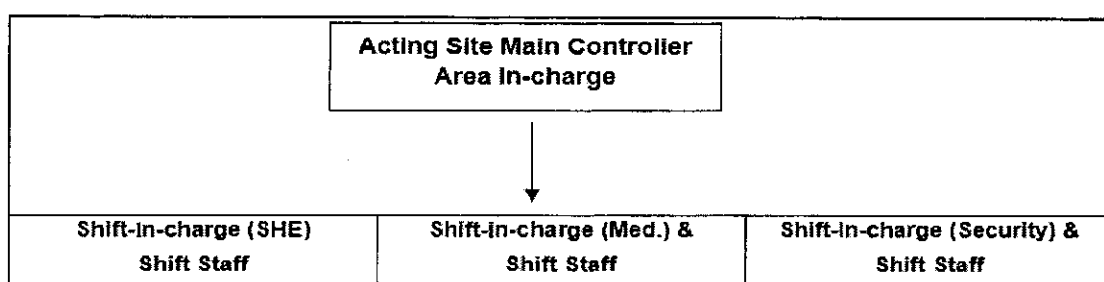


FIGURE 7.3 EMERGENCY COMMAND STRUCTURE & EMERGENCY ORGANIZATION

During silent hours, the duty team will carry out their functions with available manpower until full-fledged organization is available at the site.

Responsibilities and Duties of Personnel

TABLE 7.7 RESPONSIBILITIES AND DUTIES OF PERSONNEL

S. No.	Designated roles of Emergency Command Structure	Responsibilities
1.	Works/Site Main Controller	<ul style="list-style-type: none"> • Exercising direct operational control of those parts of the work outside the affected area. • Maintaining a speculative continuous review of possible developments and assess these to determine most probable course of events. • Direct the shutting down of equipment and evacuation of areas in consultation with the site incident controller and key personnel. • Communicate with Chief Officers of the fire and police services and with the experts on fire, safety, health etc. provide advice on possible effects on areas outside works.

		<ul style="list-style-type: none"> • Notifying the nature of emergency to fire station and security office to inform SIC and concerned persons. • Ensuring that all hot jobs including welding, cutting, grinding, chipping, open fire heating, etc. are stopped in the area. • He will be in constant touch with emergency post. • The person can ask for spare manpower from other area in-charge of unaffected areas
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7.3.3.1 EMERGENCY CONTROL POST

Emergency control post will be set up at the time of any major emergency, by the in-charge of the concerned area, for team leaders of assistance groups, from where the control and directions of the emergency operation is safe. Communication media e.g., telephone will also be provided at the control post.

a) Assembly Points

The assembly points will be provided so as to cover the whole site area with the consideration of wind direction, nearby paging facility and more than one road approach on each point.

b) Communication System

Communication is crucial factor in handling an emergency. It is the practice at many plants that any employee can raise an emergency alarm, so allowing the earliest possible action to be taken to control the situation. The possible communication can be given by -

- a) By telephone,
- b) By shouting,
- c) By messenger,
- d) By walkie - talkie

Concerned SHE In-charge will inform the Fire Station through the quickest way possible for quick response and Security Office for passing of the information to the concerned persons and services. The following persons and services inside the work place will be informed in case of major emergencies like – major fire, major accident, major spillage, gas leak, cyclone, etc. These authorities and services will be notified by Security Officer as per the direction by the Head - SHE of the Site.

- a) Fire Station
- b) Medical Centre / Medical In-charge
- c) Grinding Unit head
- d) SHE Staff
- e) Security Staff

7.3.3.2 ONSITE EMERGENCY PLANNING FOR GRINDING UNIT

The Onsite Emergency Management Plan is a master plan which contains the emergency organization structure, responsibilities of key members, communication means and emergency response strategies to control a range of major incidents.

i) Objectives of Onsite Emergency Plan

- To contain and ultimately control the incident, localize and eliminate the hazards in minimum time.
- To minimize damage to property, personnel and environment.
- To give treatment and secure the safe rehabilitation of the affected persons.
- To speed-up the rescue operation.
- To safe guard other personnel in the premises.
- To inform and assist relatives of the affected persons.
- To inform the press media and statutory authorities, if so required.
- To preserve relevant records and equipment for subsequent investigation of the causes and circumstances of emergency.
- To take step to prevent recurrence, and
- To restore normalcy.

Following onsite measures will be taken to avoid/ minimize the risk of accidents and other hazards in the grinding unit are:

ii) Alarm and Communication Systems

Communication is crucial factor in handling an emergency. It is the practice at many plants that any employee can raise an emergency alarm, so allowing the earliest possible action to be taken to control the situation.

Alarm system varies and depends on the size of the proposed project. There shall be an adequate number of points for an audible warning, alarm shall be alert the people to implement appropriate emergency procedures. In areas where a high level of noise; it may be necessary to install more than one audible alarm transmitter or flashing lights.

There shall be a reliable system for informing the emergency services as soon as the alarm is raised on site. The details of the communication arrangements shall be agreed locally; in some cases, it may be advisable to have a direct line to the fire bridge. Predetermined code works to indicate the scale and type of the emergency may be valuable.

iii) Fire-fighting System

In view of vulnerability to fire, effective measures will be taken to minimize fire hazard. Fire protection is envisaged through hydrant and sprinkler system, designed as per the recommendation of Tariff Advisory Committee. The following areas in the power station are mainly susceptible to fire:

- Cable galleries
- Electrical switchgear/ MCC room
- Transformers and turbine oil tank

For containment of fire and preventing it from spreading in cable galleries, section wise fire barriers with self - closing fire resistant doors will be provided. The ventilation systems, if any, provided in cable galleries will be interlocked with the fire alarm system, so that in event of a fire, the ventilation system will be automatically switched off. In order to avoid spreading of fire all cable entries opening. In cable galleries, tunnels, channels, floors, barriers etc. will be sealed with non-inflammable/Fire resistant sealing materials.

For detection and protection of the project against fire hazard, any one or a combination of the following systems will protect susceptible areas:

- Hydrant system
- Automatic high velocity water spray system
- Medium velocity water spray system
- Portable fire extinguishers
- Fire Detection & alarm systems

Fire hydrant points will be provided throughout the premises. Automatic high velocity spray system will be provided for protection of transformers and cable galleries. Manual medium velocity spray system will be provided for protection of fuel oil and turbine oil storage tanks.

Water for hydrant, spray and sprinkler system will be supplied from the firewater pumps located in firewater pump house adjacent to Raw Water Reservoir. Adequate number of portable and mobile chemical fire extinguishers will be provided at strategic locations throughout the project. Fire detection and alarm system will be provided at strategic locations throughout the project. Fire detection and alarm system will be provided to detect fire/ smoke in vulnerable areas of the grinding unit through smoke /heat detectors.

TABLE 7. 8 LIST OF EXTINGUISHERS TO BE USED AS CHEMICAL/MATERIAL SPECIFIC

S.No.	Chemical Name	Type of Extinguisher to be used
1.	Fuel Oil	Water spray, foam, dry powder or carbon dioxide Do Not Use: water jet as an extinguisher, as this will spread the fire
2.	HSD	Foam, Carbon dioxide, Dry Chemical Powder. Water may be used to cool fire-exposed containers
3.	LDO	water fog, foam, dry chemical or carbon dioxide (CO ₂) to extinguish flames
4.	Gypsum	Non- Flammable

TABLE 7. 9 LIST OF EXTINGUISHERS TO BE USED AS SITE SPECIFIC

S. No.	Location	Type of Extinguisher
1.	Cable galleries	CO2 and Foam type, Dry chemical powder
2.	High voltage panel	CO2 and Foam type, Dry chemical powder
3.	Control rooms	CO2 and Foam type, Dry chemical powder
4.	MCC rooms	CO2 and Foam type, Dry chemical powder
5.	Pump Houses	CO2 and Foam type, Dry chemical powder
6.	Guest houses and offices	Dry chemical powder, foam type
7.	Empty Bag Godown	Hydrant, Automatic type water sprinkler
8.	Bunkers, Silo, enclosed dust collector	CO2 type, N2 type, automatic sprinkler, fixed spraynozzle (unless water reactive)

TABLE 7. 10 LIST OF EXTINGUISHERS TO BE USED AS CASE SPECIFIC

Types of Extinguishers	Type of Fire
CO2 Extinguisher	Office fire & Electronic equipment fire
DCP & ABC Type Extinguisher	Multipurpose
Water type	For fire of Ply/ paper/ wood etc.
Foam Type	For Petrol/Diesel / Lubricants
Water Buckets	'A' category
Sand Buckets	For Petrol/ Diesel/ Lubricants
Fire Hydrant System	For Class A, B & C

1) Escape Routes and Evacuation Procedure

The escape route from each and every unit shall be clearly marked. The escape route is the shortest route to reach out of the operation area to open area, which leads to assembly point. This route should be depicted on the layout plan attached to the On-site Emergency Plan. 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 people working very close to the fire hazard area.

2) First Aid

A first aid center with adequate facilities will be provided. It will be maintained round the clock by a medical staff. An auxiliary first aid squad will be identified, the members of which will be spread in each shift in different departments. In the event of an emergency this squad will augment medical services. An Ambulance which will be available at site to carry affected people to hospital. Assistance of nearby hospitals will be taken in case of any necessity.

3) Safety

The safety wing led by a Safety officer will meet the requirement of emergencies round the clock. The required safety appliances will be distributed at different locations of the project to meet any eventualities. Poster/placards indicating safety awareness will be kept

at different locations in the project area.

4) Emergency Drills

The emergency response plans and emergency preparedness level would be tested through the following drills:

- a. Table-top exercise (TTE)
- b. Functional exercise (FE)
- c. Full-scale exercise (FSE)
- d. EMR drills for multiple injuries/electrocution /burn cases etc.

All elements/procedures of the On-Site Emergency Plan would be first tested through TTE and perfected to the extent possible. The Plan then would be modified/ updated. Functional Exercises basically to ensure proper functioning of various equipment such as the fire-fighting equipment and the fire hydrant system. The Full-Scale Drill would be conducted to know the level of preparedness of all teams. Initially, TTE and FE would be conducted periodically.

The following drills are conducted periodically:

- a. Emergency Drill for fire
- b. Fire Drills at offices and admin building
- c. Plant Emergency Drills (fire scenario involving evacuation)

5) Personal Protective Equipment's (PPEs)

Personal protective equipment plays 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 - 7.11.

TABLE 7. 11 SUMMARY OF RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT AS PER HAZARD ONSITE

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, 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	Safety helmets with top and side impact protection
Hearing protection	Noise, ultra-sound	Hearing protectors (ear plugs or ear muffs)
Foot protection	Falling or rolling objects, point objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and falling 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

Apart from this, all the employees will be provided with helmets and safety shoes. It is statutory on the part of the company employees to wear the appropriate safety gear and PPEs given while attending duty in the factory.

7.3.3.3 BASIC STEPS FOR HANDLING THE VARIOUS

1. Emergencies Emergency Evacuation Procedure

- On receipt of evacuation instructions, the personnel in the affected area shall proceed to designated assembly point.
- On receipt of evacuation, personnel shall close all the working gadgets, taking care that closing or shutting down operations does not lead to additional hazards.
- When the emergency is announced, one security guard at the site gate will be posted by security section and will ensure halting all routine traffic and material movement into the site. Guard shall clear the road from the main gate so that if outside emergency vehicles are needed then the road needs to be clear.
- All personnel of the site will remain at their announced assembly points until the clear signal is announced.
- When the emergency announcement has been made, outside contractors on site will be instructed to report to the gate. Their supervisors should make a count of all personnel and report this data to the security at the gate.
- Evacuation of the people will be especially in the opposite direction of exposure / wind direction.

TABLE 7. 12: EMERGENCY MITIGATION MEASURES

S. No.	Emergency	Mitigation Measures
1.	Fire	In case of emergency, if required, help would be taken from nearby city fire station and industries under mutual aid arrangement, in addition to own firefighting systems as fixed installations and other firefighting equipment's.
2.	Collapse Building, Shed Structure	<ul style="list-style-type: none"> • In case of Collapse of Building, Shed or structure, and emergency alarm will be raised, all the Head - SHE will be informed and area will be evacuated. • Fire Brigade will be called to assist the removal debris from site and all medical help will be arranged immediately.

3.	Liquid Spill	<ul style="list-style-type: none"> The spillage will be localized and cordoned off immediately. Vehicular traffic will be stopped by the security staff in the affected area of the grinding unit.
4.	Storm	<ul style="list-style-type: none"> Removal of all loose, light objects, buckets, ladders, maintenance material etc. from the site will be ensured. Hydra, trucks, welding machines, etc. will be placed at safe positions/places and the material that can't be moved to a safe location, will be lashed in place in the best possible manner known.
5.	Riot or Civil Disturbances Procedure or Bomb Threat or Terrorist Attack	<ul style="list-style-type: none"> Information will be given to SH (P&A) / SH (Security) regarding the suspected person/activity. On duty staff or other personnel assigned under emergency notification of company will be immediately called for alertness. All the site entry gates will be locked and entry of any unauthorized person to the project site will be prohibited. Emergency vehicles, medical staff, first aid and safety staff and all area in-charge will be kept alerted / ready.

7.3.3.4 OFF-SITE EMERGENCY PLANNING

An integral and non-separable part of any hazard control system is an off-site emergency plan. 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.

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), 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.

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.

2. Communications

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

3. Special Emergency Equipment

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

4. Voluntary Organizations

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

5. Non – government Organizations (NGOs)

NGOs 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 rallying posts and parking yards
- Rehabilitation of evacuated persons

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. Meteorological information

Micro-meteorological data collection arrangements at site shall be provided.

8. Humanitarian Arrangements

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

9. Public Information

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

10. Assessment

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

11. Role of local authority

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

12. Duty of Police

- Concerned Police will be available for controlling and guidance at the accident site, organizing evacuation and removing of any seriously injured people to hospitals.
- Co-ordination with the transport authorities, civil defence and home guards
- Co-ordination with army, navy, air force and state fire services
- Arrange for post mortem of dead bodies
- Establish communication centre with easy contact with ECC

13. Role of Fire Brigade

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

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.

15. Role of health care authorities

- Hospitals and doctors must be ready to treat all types of injuries to casualties during emergency
- Co-ordinate the activities of Primary Health Centres and Municipal Dispensaries & District Hospital 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.

7.4 CONCLUSION

It is concluded that there are minor risks hazards due to setting up and operation of proposed cement grinding unit by ACL. Suitable Risk Control Measures with respect to Risk Assessment will be implemented to minimize the risk to an acceptable level. Regular Training, Implementation of SOPs and all the personnel will be provided with Personal Protective Equipment (PPEs) which will help to minimize the health hazards and accidental casualties.

CHAPTER -8 PROJECT BENEFITS

8.1 INTRODUCTION

The proposed project will help to improving the cement availability in the region and also improving the socio-economic status in the area like occupation, communication, education, development of infrastructure etc. It improves the living standard of the people, supports for education employment and communication.

8.2 IMPROVEMENT IN THE PHYSICAL INFRASTRUCTURE

The proposed project is expected to positive impact on the socio-economic environment within the study area. Once the proposed activity is commissioned, the socio- economic status of the local people will further improve by infrastructure facilities like communication systems further improve. It helps to sustain the development of this area including further development of physical infrastructural facilities.

8.3 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

8.3.1 EMPLOYMENT POTENTIAL

The manpower requirement of the proposed plant is 1530 personnel during construction phase and 155 personnel in operation phase. The employment will be given mostly to the locals [from nearby villages]. This will enhance their income and lead to overall economic growth of the surrounding area.

8.3.2 INFRASTRUCTURE FACILITY TO THE WORKERS

The management will actively participate in the efforts by the local bodies and the Government to improve the health and social status of the population living in the buffer zone villages. However, management allocates some percent of the profit towards community developmental activities in the buffer zone villages to improve the facilities such as school, health, road, infrastructure etc.,

8.3.3 REACHING OUT TO THE COMMUNITY

Community development activities are very important aspects for any big organization because people of the villages surrounding the plant are the indirect stakeholders. Marginal positive impact on socio-economic environment is foreseen due to direct and indirect employment, opportunity of business and social welfare taken up by the company. The mostly rural population may see development of educational, medical and infrastructural facilities.

ACL will join hands with village panchayat, district administration, government agencies as well as non-profit & non-governmental organizations to undertake various social development programmes under the banner of Corporate Social & Environment Responsibility (CSER).

8.3.4 OTHER BENEFITS

There will be social benefits from the proposed project. The underlying benefits through the project are:

- Aesthetics improvement by general green belt development with emphasis on floral biodiversity.
- Cultural, recreation and aesthetic facilities are being improved.
- Improvement in communication, transport, education, community development and medical facilities.
- Overall change in employment from proposed project and income opportunity for nearby villages.
- The State and Central Exchequer will also benefit directly from the project, through increased revenue from Royalties, Taxes, Cess, etc.

8.4 CORPORATE SOCIAL RESPONSIBILITY

Social and community infrastructure and services would be provided in response to the need of communities. This will help in enhancement of the overall quality of life in the area. The company will also undertake community development in surrounding villages in the field of sport, drinking water, road development and greenbelt development in Panchayat land with consultation of the Gram Panchayat.

M/s Ambuja Cement Limited (ACL) is fully conscious of its Corporate Social and Environment Responsibility towards community as well as environment. ACL has already planned to play a leading and meaningful role in bringing qualitative improvement in the life of community and the surrounding environment.

Following strategies / methodology have been adopted for social study by ACL.

- Detailed questionnaire / Interview checklist / Observation / Group discussion
- Reconnaissance surveys to observe environmental and social characteristics surrounding villages within 3 km area.
- Establishment of environmental and social baseline conditions around the project site / project affected persons
- Discussions with the local community / local bodies and identification of hot spots and issues raised by people and to understand their perceptions about the project, anticipated changes due to the proposed power plant
- Livelihood / work alteration, Agricultural dependent Rural & SC / ST communities
- Employment, Income, Cultural, Bank & Other sources of credit
- Educational Institutes & skill level
- Environment (the quality of air & water people uses, the availability & quality of food they eat, the level of hazard or risk, dust & noise they are exposed to, the adequacy of sanitation, their physical safety, & their access to & control over resources.)
- Health nutritional status & well-being (health is a state of complete physical, mental, social & spiritual wellbeing & not merely the absence of diseases)
- Influx of work force / Pressure on infrastructure / Roads etc.
- Role of NGO (if any) in welfare & development schemes

8.5 PROPOSED CER ACTIVITIES AND ANNUAL ALLOCATION OF FUNDS

As per the MOEF&CC Office Memorandum vide letter F. No. 22-65/2017-IA.III dated 30th September 2020. Budgetary allocation will be made after public hearing/consultation by M/s Ambuja Cements Limited. CER fund will be spent under the part of Environmental Management Plan. As per the issues that will be raised during PH and agreed by ACL management, the activities to be taken up and the deadline will be listed in the Final EIA

CHAPTER -9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 INTRODUCTION

Project economic analysis is based on estimating and comparing costs and benefits during the economic life of the project. Analysis is usually limited to those costs and benefits internal to the project. Occasionally, external costs and benefits of projects dealing with natural resources have been valued and included in the analysis. Inclusion of environmental benefits and costs would improve significantly the reliability of the economic analysis. More comprehensive environmental cost-benefit analysis would: Improve the estimate of a project's development impact; provide information to project proponent on the benefits associated with specific environmental investments; and enlarge the information base available to public by estimating the benefit and identifying the beneficiaries of environmental investments.

This chapter assess the environment and economic viability of the project. It looks at:

- Net present value of the project
- Internal rate of return due to the project
- Benefit to cost analysis ratio
- Cost effectiveness analysis

9.2 OBJECTIVE OF STUDY

The main objective of the study was to investigate the feasibility of developing a practical method to calculate, in economic terms, the major impacts of environmental investment undertaken by the proposed project.

9.3 INVESTMENT COSTS

The total investment cost estimate for the project works out to around INR 1059 Crores. This includes the capital costs for the cement project and the working capital requirements. The estimated Investment Cost for the project has been based on the requirement of fixed and non-fixed assets.

Environment Management Protection Cost:

- Capital Cost for EMP: Rs. 55 Crores
- Recurring Cost/annum: Rs. 12.5 Crores/annum

9.3.1 EFFECTS ON ENVIRONMENTAL PARAMETERS

The environmental impact evaluation of possible effects as a result of plant site activities and operation on various environmental parameters is primarily based on careful study of Grinding unit operations, surrounding environment etc. Effective 'Control Technology' has been suggested with a view to mitigate the adverse impact of unit operation on environmental parameters. The company will install State of the art air pollution & equipment and implement best practices across the sector to maintain the air quality within the prescribed norms. Regarding water; the company will maintain ZLD and will implement the artificial recharge structure to augment the Groundwater resources. However, groundwater will be the source of water requirement which will not have any significant

negative impact as the area falls under the Safe zone.

The noise generating equipment like apparatus, D.G. set, etc. will be installed in close buildings to mitigate the effect of noise in the nearby surrounding area. The local trees will be protected and further the biodiversity of the area will be increased by changing the present barren land use of the project site into ecological habitat for many tree species. of the area will be maintained under greenbelt development/plantation which will help in mitigation of climate change and will improve the local ecological footprint.

Social Impact Assessment

The present land is cent percent industrial area. Various Indirect employment opportunities in the form of small business will also be provided to the locals of the nearby area. Considering, all the above impacts and mitigative measures on Environment parameters such as air, water, noise, etc., has been observed that the activities under construction and operation phase of the proposed project will generate some negligible impacts on the environment resulting in the eco-friendly grinding unit by M/s. Ambuja Cement Ltd.

Detailed anticipated impacts and mitigations measures on Environment parameters are given in Chapter - 4 of this EIA/EMP report.

9.4 REVENUE

On the basis of the market coverage, prevailing market prices for cement as well as logistics cost estimated to cater to the markets of interest, the estimated ex-factory realization for M/s. Ambuja Cement Ltd. Estimated sales volumes for Initial 3 years of the Plant operation are given in Table 9.1.

TABLE 9. 1 SALES VOLUME & CAPACITY UTILIZATION

Year	1 st Year	2 nd Year	3 rd Year	4 th Year onwards
Capacity Utilization- Cement	100%	100%	100%	100%

9.5 CONCLUSION

The proposed Project will not cause any negative impacts on the land use, water resources, air quality, noise level, natural habitat of the area. Project will provide Job opportunity to the local people, attract business opportunities and indirect employment which will improve the Socio-economic status of the area. The local trees will be protected and further the biodiversity of the area will be increased by changing the present barren land use of the project site into ecological habitat for many tree species. 34.81 % of the area will be developed under greenbelt plantation which will help in mitigation of climate change and will improve the local ecological footprint. Overall, it can be concluded that the Proposed Project will be economically, environmentally as well as financially viable.

CHAPTER -10 ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION

The environmental management plan consists of a set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of a plant to eliminate adverse environmental impacts or reduce them to acceptable levels.

The environmental management plan addresses the components of environment affected during the different activities forming part of the processes of Grinding unit.

Based on the evaluation of impacts and baseline conditions, an Environmental Management Plan (EMP) has been delineated to mitigate the adverse impacts on environment of the area due to the project. EMP includes planning, implementation, monitoring & data analysis & corrective action.

The EMP is herein outlined after considering the various Acts, Rules and Regulations / Standards concerned with the environmental management.

Environmental Management Plan is detailed under the following heads to meet the regulatory compliances:

- Air Quality Management plan
- Noise Level Management plan
- Waste Water (Effluent) Management plan
- Storm Water Management plan
- Rainwater Harvesting plan
- Solid & Hazardous Waste Management plan
- Energy Conservation
- Greenbelt Development & Plantation Programme
- Occupational Health & Safety Management plan.
- Socio- Economic Management Plan (Brief description has been provided in Chapter – of this EIA/EMP Report)
- Total capital cost and recurring cost/annum for environmental Pollution Control Measures

Purpose of EMP:

- To control emission and waste minimization and proper disposal of waste to meet statutory requirement of appropriate technology.
- To support & implement best technology to achieve environmental standards.
- Judicious use of natural resources and water.
- To ensure good working condition for safety, welfare, and good health of the work force.
- Ensure effective operation of all control measures.
- Vigilance towards probable disasters and accidents.
- Monitoring of cumulative and long-term impacts.
- To reduce accident hazards.

- Allocation of funds for environment management supplies.
- To promote greenbelt development & Plantation Programme.

Elements of EMP:

EMP includes four major elements: -

- 1. Planning:** This includes identification of environmental impacts, legal requirement, commitments, and policies, setting environmental objectives and environment, health, safety and social compliance requirements;
- 2. Implementation:** This comprises of resources available for the project, accountability of employees, contractors, and documentation of measures to be taken;
- 3. Checking (Measurement & Evaluation):** This includes regular inspection, audits, monitoring corrective actions and record keeping; and
- 4. Management Review:** Actions are taken to continually improve the environment, health, safety, and social performance of the organization.

The following Policies & programs will be developed to ensure proper implementation of EMP for the Grinding unit:

- Formulating Corporate Environment Policy (CEP)
- Formation of Environment Management Cell (EMC)
- Implementation of CPCB Guidelines for control of Fugitive Emissions
- Compliance of CREP Guidelines
- Concept of Waste Minimization, 3Rs Concept
- Energy and Natural Resource Conservation
- Greenbelt Development/plantation programme
- Occupational Health and Safety Measures
- Budgeting of Environmental Mitigation Measures

10.2 AIR QUALITY MANAGEMENT PLAN

Fugitive Emissions

Fugitive emissions are the air pollutants released in the air. Fugitive dust may be defined as "any solid particulate matter that becomes airborne by natural or man-made activities, excluding particulate matter emitted from an exhaust stack.

Factors that influence emissions

Factors affecting emissions include the following:

- Moisture content of the material
- Type of material processed
- Type of equipment
- Operating practices employed.

Measures to Control Emissions

Transportation

- ✓ Transportation of clinker to the clinker silo will be done through covered conveyor belt in a very controlled manner.

- ✓ Movement of heavy trucks/vehicles on the non-metallic road generates substantial quantity of dust emission. This is due to the presence of dust over the road, which is carried away by wind. To control the generation of dust, all the roads inside the plant premises is/will be concreted.
- ✓ Regular sweeping of all the roads and floors will be done by vacuum sweeping machine.
- ✓ Sprinkling of water through tankers is being/will be done on bare lands and roads.
- ✓ Speed of vehicles within the plant premises is/will be limited to 10 km/hr.

Compliance as per CPCB guidelines

- ✓ For achieving effective prevention and control of potential fugitive emission sources in cement manufacturing plants, specific requirements along with guidelines have been laid down by CPCB, which will be followed specifically in the project operation.
- ✓ Regular inspection is will be carried out for all fugitive control system and records will be maintained as per CPCB guidelines.

Measures in accordance to the CPCB guidelines that will be implemented in the Grinding unit to control the dust emission are given as below:

TABLE 10. 1: CPCB GUIDELINES AND CONTROL MEASURES

S. No.	Guidelines	Control Measures to be Provided
1.	The enclosures for the unloading sides could be flexible curtain type material covering up to height of dumpers discharge from the roof.	Enclosures of flexible curtain is will be provided for all unloading operations covering height of dumpers from the roof.
2.	A dust suppression system should be provided to spray water. The amount of water sprayed should preferably be optimized by employing proper design of spray system. Suitable systems may be adopted to reduce the problems like choking, jamming of the moving parts.	Use of water sprinklers in the unloading section will affect the quality of the raw material and product as the cement is hygroscopic in nature. The entire unit will be operating inside closed shed and will ensure minimum dispersion of particulate matter.

1. Material Handling Section (Including Transfer Points)

TABLE 10. 2 MATERIAL HANDLING AND CONTROL MEASURES

S. No.	Guidelines	Control Measures to be Provided
1.	The enclosures from all sides with the provision for access doors, which shall be kept, closed during operation. Spillages should be periodically removed.	Transfer point locations will be fully enclosed for the proposed project and spillage of cement will be removed regularly.

2.	Either water spray system should be provided for suppressing the air borne dust or dry extraction cum bag filter with adequate extraction volume should be installed.	One Bag filter (Exhaust- Packing Plant) will be provided at all the material handling & transfer points and required locations to avoid fugitive emissions.
3.	Spray sufficient quantity of water to moist the top layer to avoid wind blowing of fine particles.	The raw materials will be stored in closed sheds. Water sprayers are not preferred as it affects the quality of raw material and product.

2. Clinker Stock Piles Section

TABLE 10. 3: CLINKER STOCK PILES SECTION CONTROL MEASURES

S. No.	Guidelines	Control Measures to be provided
1.	Bag filter may be provided before venting out the gases.	Bag filters will be provided before venting out the gases.
2.	The enclosures should have venting arrangement located at transfer point where clinker is dropped to the stockpile. The extraction /venting should be sufficient. Clinker stockpile access door should be covered by mechanical gate or by flexible rubber curtain. The access doors shall be kept closed at all possible times.	Clinker will be stored in silo which will have venting arrangement along with a bag filter.
3.	Extracted dust should be captured in bag filter and the collected dust should be avoided to feed back to the clinker stockpile, if layout permits. It may be recycled at last possible destination i.e., cement mill section through suitable arrangement, if possible.	The dust extracted and captured in bag filter will be avoided to feedback/recycled to the clinker stockpile, if possible.
4.	Generally open storage of clinker should be avoided.	Only in case of emergency clinker would be stored in open with following control measures.
a	After earmarking the open storage area of clinker, a board should be erected to display the area earmarked.	No open storage of clinker will be done and proper silo will be provided for storage of clinker.
	During the period when the openly stored clinker is inactive, it should be	Cover will be provided if clinker would be stored in open to prevent

b	covered fully by HDPE or tarpaulin type sheets to prevent wind blowing of fugitive dust.	wind blowing of fugitive dust.
c	Install three sided enclosures, which extend to average height of the stockpile, where ever feasible.	Wind break walls on three sides of open stock piles will be provided.
	Flexible type wind breaking enclosure should be provided covering the clinker retrieval area as wind barrier to prevent dust carry over by wind.	Partial enclosure for retrieving area will be provided.
d	The enclosure could be of light weight material like molded plastic material or similar, which could be dismantled/assembled and shifted from one place to other.	
e	Travel areas path used by the front-end pay loader shall be paved with concrete. It should be regularly swept by high efficiency vacuum sweeper to minimize the material build-up.	The travel path of pay loaders would be paved and frequently swept by sweeping machine.
f	The possibilities especially in Grinding unit may be explored for the following: An enclosure fitted with bag filter could be located at the most central place adjacent to the clinker storage area. The pay loader moves to the fixed loading area from one end of the enclosure and the truck/trailer enters the enclosure from another end.	Loading of clinker by pay loaders into trucks/trailers will be carried out in an enclosure fitted with a bag filter.

3. Storage of Gypsum and other additives

TABLE 10. 4: STORAGE OF GYPSUM AND OTHER ADDITIVES

S. No.	Guidelines	Control Measures to be Provided
1.	The enclosure walls shall cover minimum two sides up to roof level.	The clinker and finished product storage will be under covered shed.

2.	Fly ash shall be pumped directly from the tankers to silos pneumatically or mechanically such that fugitive emissions do not occur.	Not applicable (there is no Fly ash generated in a plant)
3.	The silo vent will be provided with a bag filter type system to vent out the air borne fines.	Silos only provided with a bag filter system to vent out air borne fines.
4.	If possible, the dry fly ash should be sent to closed silos. Otherwise, fly ash should be transported through closed belt conveyors to avoid wind carryover of fly ash.	Not applicable (there is no Fly ash generated in a plant)

4. Cement Packing Section

TABLE 10. 5: CEMENT PACKING SECTION AND ITS CONTROL MEASURES

S. No.	Guidelines	Control Measures to be Provided
1.	The packing machines should be equipped with dust extraction arrangement such that the packing operation is performed under negative pressure. The dust may be captured in bag filters.	Dust extraction arrangement for packing machines will be provided and dust collected in Bag filters will be recycled back to the process.
2.	Adequate ventilation for the packing hall should be provided for venting out suspended particulate thereby ensuring dust free work environment.	Adequate ventilation for the packing hall will be provided to ensure dust free work environment.
3.	The spilled cement from the packing machines should be collected properly and sent for recycling. The spilled cement on the shop floor should be swept by vacuum sweeping machines periodically. Proper engineering controls to prevent the fugitive emissions may include arrangements like providing guiding plate, scrapper brush for removing adhered dust on cement bag etc.	The spilled cement from the packing machine will be collected properly and sent for recycling in the process. Spillage of cement on floor will be minimized and swept by vacuum sweeping machines periodically to prevent fugitive emissions.
4.	The vibratory screen provided for screening/ recycling spilled cement should be provided with a dust extraction arrangement to prevent fugitive emission from that section.	Emissions from the recycling screen will be prevented by installing appropriate dust extraction system.

5. Silo Section

TABLE 10. 6: SILO SECTION AND ITS CONTROL MEASURES

S. No.	Guidelines	Control Measures to be Provided
1.	The bag filter should be operated and maintained properly, especially the cleaning of bags to avoid pressurization of silos thereby causing fugitive emissions from leakages etc.	The silo vent will be provided with a bag filter type system to vent out the air borne fines.

6. Roads

TABLE 10. 7: ROAD AND ITS CONTROL MEASURES

S. No.	Guidelines	Control Measures to be Provided
1.	The paved roads should be maintained as always paved and necessary repairs to be done immediately after damages to the road if any.	All roads in the plant premises on which vehicle movement of raw materials or products take place will be paved and will be repaired immediately after damage.
2.	Limit the speed of vehicle to 10 Km/h for heavy vehicles within the plant premises to prevent the road dust emissions.	Limit the speed of vehicle will be limited to 10Km/hr for heavy vehicles within the plant premises to prevent the road dust emissions.
3.	Preventive measures include covering of trucks and paving of access areas to unpaved areas.	Preventive measures will be employed to minimize dust build upon roads.
4.	Mitigative controls include vacuum sweeping, water flushing.	Regular sweeping of roads will be done to minimize fugitive dust emissions.

10.3 COMPLIANCE OF CREP GUIDELINES

Following recommendations as mentioned in Corporate Responsibility for Environment Protection (CREP) guidelines of CPCB for Cement Plants is given in Table-10.8.

TABLE 10. 8 IMPLEMENTATION OF CREP GUIDELINES

S. No.	CONDITIONS	STATUS
1.	Cement Plants which are not complying with notified standards: <ul style="list-style-type: none"> o Augmentation of existing Air Pollution Control Devices - by July 2003. o Replacement of existing Air Pollution Control Devices - by July 2004. 	Ambuja Cements Pvt Ltd. will comply with all the Stipulated standards given by MoEF&CC/TSPCB.
2.	Cement plants located in critically polluted or urban areas (including 5km distance outside urban boundary) will meet 100 mg/Nm ³ limit of particulate matter by December 2004 and continue working to reduce the emission of particulate matter to 50 mg/ Nm ³ . As per Gazette Notification MoEF&CC G.S.R 497(E) dated 10 th May, 2016, emission standards for PM have been prescribed as 30 mg / Nm ³	Emission levels will be maintained <30mg/Nm ³ for PM.
3.	The new cement kilns to be accorded NOC/Environmental Clearance w.e.f. 01.04.2003 will meet the limit of 50 mg/Nm ³ for particulate matter emissions	Not Applicable.
4.	CPCB will evolve load-based standards by December 2003.	Ambuja Cements Pvt Ltd. will be complying with all the Stipulated standards given by MoEF&CC, New Delhi.
5.	CPCB and NCBM will evolve SO ₂ and NO ₂ emission standard by June 2004. The above referred Notification has stipulated emission standards for SO ₂ - 100 mg / Nm ³ and NO _x - 600 mg / Nm ³	Ambuja Cements Pvt Ltd. will comply all the Stipulated standards given by MoEF&CC, New Delhi.

6.	The cement industries will control fugitive emissions from all the raw material and products storage and transfer points by December 2003. However, the feasibility for the control of fugitive emissions from limestone and coal storage areas will be decided by the National Task Force (NTF). The NTF shall submit its recommendation within three months.	Ambuja Cements Pvt Ltd. will take the following measures to control Fugitive dust emission. <ul style="list-style-type: none"> o Clinker will be transported in sealed jumbo bags and stored in the silos. o Gypsum, dolomite, will be stored in the covered sheds. o Bag filters will be provided at packing plants and the entire plant operations will be working in closed shed. o All movement area will be concreted to avoid fugitive dust emission. o Vacuum sweeping machines will be deployed for better housekeeping.
7.	CPCB, NCBM, BIS and Oil refineries will jointly prepare the policy on use of petroleum coke as fuel in cement kiln by July 2003.	Not Applicable as there is no use of pet coke is involved in the process.
8.	After performance evaluation of various types of continuous monitoring equipment and feedback from the industries and equipment manufacturers, NTF will decide feasible unit operations/sections for installation of continuous monitoring equipment. The industry will install the continuous monitoring systems (CMS) by December 2003.	Opacity meters will be installed at stack of kiln, coal mill and clinker cooler. Online monitoring for PM emission at the stack of kiln and boiler.
9.	Tripping in ESP to be minimized by July 2003 as per recommendation of NTF.	No ESP is used as APCEs. Only bag filter will be installed at the exhaust of packing plant of the grinding unit
10.	Industries will submit the target date to enhance the utilization of waste material by April 2003.	Ambuja Cement Ltd. will continuously put efforts to use waste materials: <ul style="list-style-type: none"> o Dust collected in APCEs will be used back in the manufacturing of cement. Hazardous waste will be sold to CPCB authorized recyclers.
11.	NCBM will carry out a study on hazardous waste utilization in cement kiln by December 2003.	Not Applicable.
12.	Cement industries will carry out feasibility study and submit target dates to CPCB for co-generation of power by July 2003.	Not Applicable.

10.4 SOLID & HAZARDOUS WASTE MANAGEMENT PLAN

10.4.1 SOLID WASTE MANAGEMENT

Solid waste generation from the Grinding unit and their end use is given in Table-10.2.

TABLE 10. 9 SOLID WASTE GENERATION AND THEIR END USE

Sr. No.	Type of Waste	End Use/Disposal Plan
1	Dust collected from air pollution control equipment	Will be totally recycled back to process.
2	Sludge from Sewage Treatment Plant (~10 Kg/annum)	Will be used development as manure for greenbelt
3	Municipal waste (domestic and orcommercial wastes)	Organic waste will be composted and will be used as manure. Inorganic waste shall be disposed of properly
4	Redundant equipment machinery	Occasionally, scraps as and when generated segregated, stored & sold to vendors.
5	Horticultural waste	Horticultural wastes generated from gardens/greenbelt will be composted.

10.4.2 HAZARDOUS WASTE MANAGEMENT PLAN

The hazardous waste that will be generated shall be temporarily stored at earmarked place and handled as per Hazardous and other Waste (Management & Trans-boundary Movement) Rules, 2019. Details are given in Table-10.10.

TABLE 10. 10 HAZARDOUS WASTE GENERATION

Sl. No.	Name of the Hazardous waste	Stream	Disposal Option
1	Used or Spent Oil	5.1 of Schedule-1	Will be sold to CPCB Authorized recycler
2	Waste Residue containing oil	5.2 of Schedule-1	
3	Empty barrels/ Containers/liners	33.1 of Schedule-1	
4	Cotton rags or other cleaning materials	33.2 of Schedule-1	
5	E-waste	--	Will be sold to registered vendors as per E- Waste Management Rules, 2016

10.5 CONCEPT OF WASTE MINIMIZATION, 3R'S (REUSE, RECYCLE AND RECOVER TECHNIQUES)

10.5.1 REUSE

- Waste generated from the construction activity will be utilized in leveling of land.
- STP Sludge (~1 Kg/month) will be used as manure in greenbelt development/ plantation.
- Waste will be collected & segregated into bio- degradable & non- degradable. Further, biodegradable waste will be converted into compost for utilization in greenbelt development and non-degradable waste will be sold to authorized vendor from CPCB/SPCB as per scientifically in compliance of Solid Waste Management rules 2016, as amended thereof.

10.5.2 RECYCLE

- Dust collected from various pollution control equipment will be completely recycled in the process.

10.5.3 RECOVERY

- No Waste Heat Recovery Boiler (WHRB) is applicable for this plant as there will be no heat generated.

10.6 ENERGY & NATURAL RESOURCE CONSERVATION MEASURES

10.6.1 ENERGY CONSERVATION

Cement manufacturing is an energy-intensive process. Ambuja Cement Ltd. has proposed following energy conservation measures in the Grinding unit to conserve the resources which will be implemented for numerous process control measures as well as energy efficient technologies which will further ensure proficient management of its energy resources.

- Procurement of energy efficient machineries and new technologies.
- Energy Audits will be conducted at regular intervals.
- Power saving by interlocking of Equipment.
- APFC (Automatic Power Factor Control) panel for HT and LT line to improve powerfactor (Unity) of the system.
- Minimizing idle running of vehicle, machines and electrical appliances.
- Optimizing loads and periodic preventive maintenance and lubrication.
- Prevention of leakages of compressed air.
- Installation of Solar based LED lights instead of conventional lighting in Plant and Colony area.
- Energy saving by using day light by installing light pipe and using transparent sheet [day light] in Workshop, Store and raw materials yard.
- Switching off unnecessary lights by micro based timer.
- Automatic Star Delta starter for load varying application like conveyer belts etc.
- Installation of Variable Frequency Drive for all the auxiliary bag filter fans for energy saving.
- Installation of power less bag diverters for packing plant instead of conventional motorized bag diverters.
- Installation of Solar Geyser at guest house.

- Internal & external training and awareness programs on energy conservation.

TABLE 10. 11 ENERGY CONSERVATION OPTION AND POSSIBLE SAVINGS

S. No.	Energy Conservation Option	Possible Savings
Energy Efficient technology and equipment		
1.	Ball Mills	Upto 20% on electrical energy
2.	Roller press	4-8 kWh/t of cement in pre-grinding system
3.	High efficiency separators	Upto 30% on electrical energy
4.	Variable-speed AC drives	Upto 30% on power consumption of the drive
5.	Solid state motor controllers and soft starters	Upto 2% on power consumption of the drive
6.	Energy efficient motor	Upto 5% on power consumption of the drive
7.	Mechanical conveying systems overpneumatic conveying systems for dry raw meal and cement	Upto 5% on power consumption of the drive
8.	High efficiency fans	10-30% on power consumption of the drive
Input Substitution and Output Modification		
11.	Manufacture of cement	Heat energy in kcal/kg cement: 20% in for PPC
Organizational Measures		
S. No.	Energy Conservation Option	Possible Savings
1.	Proper maintenance, monitoring and preventive maintenance to minimize downtime of machinery and plant	Depends on the extent of equipment availability and on-stream days of the plants
2.	Depends on the extent of equipment availability and on-stream days of the plants	Upto 10% on thermal energy and upto 2% on electrical energy depending on extent of false air
3.	Regular inspection and maintenance of capacitor banks and installing additional banks, if required	Dependent on extent of power factor improvement
4.	Effective load management	Upto about 15% in maximum demand
5.	Regular inspection of motors for identifying under loading, and reshuffling of the same	Depends on extent of under loading and size of motor

10.6.2 NATURAL RESOURCE CONSERVATION

Effluent management / Water Conservation

The following measures will be adopted to minimize fresh water consumption:

- ✓ In the proposed project of Grinding unit majority of the water requirement (>90 %) for non-potable industrial applications for the project will be met from ground water. The remaining will be met from treated water from STP

- ✓ Periodic preventive maintenance of water distribution systems.
- ✓ Use of water efficient and saving devices such as Low flow high efficiency faucet aerators, Automatic shutoff nozzles, and low flow water efficient water heads.
- ✓ Water will be used via water sprinkler for Horticulture activity, at various storage facilities and transportation purpose activity to conserve the water demand.
- ✓ Water conservation and awareness programmes within the premises as well as in the nearby schools and village for fresh water conservation.
- ✓ To conserve water and to replenish ground water resources of the area, rain water harvesting system will be installed for long term sustenance of the industry.

Storm water/ Rainwater Harvesting Plan

Rainwater harvesting is to be done to minimize the undesirable effect on groundwater status. It is necessary that groundwater storage of an area must be arranged by rainwater harvesting so that the existence of any industry does not adversely affect the groundwater situation. The Summarization of Rainfall Run-off within Industrial Premises in table 10.12.

TABLE 10. 12 ANNUAL RUNOFF AVAILABLE FOR RAINWATER HARVESTING

Annual Runoff Available for Rainwater Harvesting					
S. No	Land use type	Area (Sq. m.)	Average Annual Rainfall (mm)	Runoff Coefficient	Quantity of Rainfall Runoff (Cum/annum)
1	Roof-top of building/shed	20000	680	0.85	11560
2	Green Belt	30000	680	0.06	1224
3	Open Land	41000	680	0.30	8364
Total					21148

Storm water Management Plan

- Rainwater harvesting will be done as per the elevation of the site as per the contours profile of the project site, and then the storm water will be directed towards the rainwater harvesting pond base on the elevation profile.
- Since the storm water collected on site will be harvested for direct use, proper management of this resource is necessary to prevent contamination.
- Regular inspection and cleaning of storm drains will be carried out. Use of fertilizers and pesticides will be avoided prior to and during monsoon months.

10.7 NOISE QUALITY MANAGEMENT PLAN

Construction Phase

- Equipment will be kept in good condition to keep the noise level within the prescribed norms.
- Workers will be provided necessary protective equipment e.g. ear plugs, earmuff

during construction.

Operation Phase

- Exposure of high noise level to workers for long duration may lead to certain occupational diseases. To mitigate the high noise level, following measures will be adopted.
- Walls and ceilings of the concerned buildings will be lined with sound absorbing materials
- Properly insulated enclosures will be provided to equipment making excessive noise.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Personal Protective Equipment like earplugs and earmuffs will be provided to the workers exposed to high noise level.
- Greenbelt of appropriate width at the project boundary will be developed.
- Regular monitoring of noise level will be carried out and corrective measures in concerned machinery will be adopted accordingly to the possible extent.

10.8 DECARBONIZATION STRATEGY

The cement industry is a building block of modern society, and currently responsible for around 7% of global CO₂ emissions. While facing global competition and a challenging business environment, the cement sector needs to decarbonize its production processes to comply with the ambitious 2030 and 2050 climate targets.

Scenarios affecting the cement industry suggest different pathways towards decarbonization by 2050: Several technologies are expected to contribute to the decarbonization ambition of the cement industry with their mitigation potential. The production of low-CO₂ cement is drawing increasing attention at global level. Industrial actors are coming forward with targets to achieve climate neutrality by 2050.

To this end, Ambuja Cement Ltd has considered all options of reducing the CO₂ emissions. The clinkerization and the pyro process is the main source of CO₂ emission in any cement industry and this process is not included in the proposed project, as it is a stand-alone grinding unit, which totally eliminates the CO₂ emissions and the major need of decarbonization.

Further, the following measures are already incorporated in the project proposal which are aimed at residual decarbonization:

- Adoption of energy efficiency processes/ measures
- Development of 33 % green belt / plantation of the total plant area for both pollution abatement and carbon sequestration
- Usage of additives such as Gypsum & Dolomite to reduce the Clinker to Cement ratio
- Consideration of renewable energy consumption

10.9 GREENBELT DEVELOPMENT & PLANTATION PROGRAMME/MANAGEMENT PLAN

10.9.1 OBJECTIVE

Greenbelt is a set of rows of trees planted such a way that they form an effective barrier between the plant and the surroundings. The main purpose of greenbelt development is to contribute to the following factors:

- To attenuate noise levels generated from the plant;
- To improve the aesthetics of the plant area;
- To trap the vehicular emissions and fugitive dust emissions;
- To maintain ecological homeostasis;
- To prevent soil erosion and to protect the natural vegetation; and
- To utilize the treated effluents.

Provision of wide greenbelt around the plant has been foreseen to reduce any adverse impacts on the surrounding population due to emissions from the grinding unit. Plantation of grass, flowers, bushes and trees will be taken-up to reduce generation of dust from bare earth and to enhance the aesthetic/scenic value.

10.9.2 GUIDELINES FOR GREENBELT & PLANTATION DEVELOPMENT

Following guidelines will be followed for the Greenbelt Development & plantation Plan in the project area:

- Soil and other environment should be very encouraging and the expected growth rate will be about 90%.
- Trees growing to a height of 5 m or more will be planted.
- Plantation of trees will be undertaken in around the area in alternating rows to prevent horizontal pollution dispersion.
- Trees will be planted along road sides, to arrest auto-exhaust and noise pollution, and in such a way that there is no direct line of sight to the installation when viewed from a point outside the foliage perimeter.
- Since, tree trunks are normally devoid of foliage (up to 3 m), it will be appropriated to have shrubbery in form of such trees to give coverage to this portion.
- Fast growing trees with thick perennial foliage will be grown, as it will take many years for trees to grow to their full height.
- Three tier plantations will be undertaken all along the Plant boundary.

i. Greenbelt & Plantation Programme

Out of the total plant area, approx. 34.81 % (i.e., 3.23 ha) of the total project area will be developed under greenbelt/plantation.

ii. Greenbelt/Plantation Management Plan

In order, to facilitate the proper growth of plants, limited measures involving preparation of seed bed with suitable number of fertilizers and treatment with mulches will be taken. The topsoil will be used for greenbelt development. The following characteristics will be taken into consideration while selecting plant species for greenbelt development and tree plantation.

- They should be fast growing and tall trees.
- They should be mix of perennial evergreen and deciduous trees.
- They should have thick canopy cover.
- The planting should be in appropriate alternate rows around the site to prevent lateral pollution dispersion.
- The trees should maintain regional ecological balance and conform the soil and hydrological conditions. Indigenous species will be preferred.
- Company will provide all necessary facilities/equipment for greenbelt development & plantation.
- Horticulturist with the member of team will be assigned for proper management and care for the greenbelt development.
- Timely use of fertilizers for the healthy and dense greenbelt development will be done.
- For replantation, if required, company will acquire sapling from local private/government nursery.

10.10 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PLAN

To control and minimize the risks at workplace, M/s Ambuja Cement Ltd will implement Health, Safety and Environment Policy (HSE) with the following objectives:

- To prevent hazards.
- To provide safe and healthy environment to all the employees.

The company, therefore, will adopt the HSE policy set below for the purpose of creating and maintaining safe and healthy environment.

10.10.1 HEALTH AND SAFETY POLICY

- Health, Safety and Environmental Protection (HSE) is a vital part of Ambuja Cement Ltd. commitment to conduct the activities in harmony with society and nature. The company expects all its employees to implement the HSE Policy.
- Integration process of H&S must start at the inception of a project since HSE consideration must be addressed at the design stage, which also helps in optimizing the support process.
- Ambuja Cement Ltd. has Integrated Health, Safety and Environment Protection (HSE) into the business strategies to add value to the enterprise, to manage risk and to enhance the reputation.
- The health and safety of the employees, neighbors, customers and consumers, and the protection of the environment are company's priorities consistently pursued throughout.
- Each employee will be made to comply with the HSE guidelines and the laws applicable to her or his area of operational responsibility.

10.10.2 OCCUPATIONAL HEALTH AND SAFETY HAZARDS

Following are the Occupational Health and safety Hazards from the project activity:

- Dust
- Noise

- Electrical Hazards
- Fire and Explosion
- Other Hazards

1. Dust

Risks involved

- Cement & other dust may cause pulmonary disease, Respiratory disease, Skin diseases, Eyes burning etc.

Management Plan

- Adequate dust control systems will be implanted and good housekeeping will be practiced. Protective masks and respirators will be provided at areas where high dust exposure is going to be encountered even for a very short duration.

TABLE 10. 13 EXPOSURE LEVELS AS PER NORMS WILL BE MAINTAINED

Description	Personal Exposure, time weighted average 8hr - RSPM in $\mu\text{g}/\text{m}^3$	Norms
Cement Dust	5000	

Source: CPCB guidelines

2. Noise

Risks involved

Following risks are involved:

- Hearing Impairment, Hypertension, Increased Pulse rate
- Annoyance, Tinnitus, Sleep Disturbances

Management Plan

- Proper maintenance of machineries
- Installation of compressors in closed buildings
- Regular monitoring of noise level
- Display of noise level with permission level
- Display instructions for using PPEs at high noise level area
- Periodic health checkup for Audiometry for the individuals working in high noise area.

TABLE 10. 14 EXPOSURE LEVELS AS PER NORMS WILL BE MAINTAINED

S.No.	Area	dB(A)
1.	Compressor House	85 dB(A) as per Factory Act 1948
2.	Cement Mill	
3.	Packing Area	
4.	D.G. Sets	

3. Electrical Hazards

Risks involved

Following risks are involved such as Electric Shock, Electric Burns, Fires and Explosions which can lead to loss of life/organs. These electric hazards can be caused due to:

- Insulation Failure, Equipment Failure, Poor Maintenance.

- Wrong Work Methods, Substandard Material and workmanship
- Unauthorized personnel & Lack of Training and Knowledge, etc.

Management Plan

Following protection measures will be taken:

- Proper Earthing as per IS 3043 will be done
- Low Voltage Supply will be ensured
- Isolating Transformers
- Double Insulated Tools
- Over Load Protection
- Protection Against Leakages (G.F.C.I.)
- Flame- Proof Equipment
- Lightning Protection
- Protection against Static Electricity and safely using ladders and scaffolds

4. Fire and Explosion

Risks involved

Fire catching in store, bag go-down, conveyors, cable tunnel, oil storage area and, transformers and HT/LT substation etc. can results in facility/ material damage, lossof life.

Management Plan

- Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with clinker storage area. Fire tender is to be kept ready at plant main gate.
- Oil storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area"
- Permit and safety instruction will be given to use welding / gas cutting in the areaof oil, and bag go down.
- Predictive interlock in transformers to give alarm and trip the system.
- Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done.

5. Other Hazards

Risks involved

Following risks are involved:

- Silo and Building Collapse
- Person falling from height, Dropping of tools and object
- Failure of lifting pressure vessel, tools and tackles
- Occupational injuries
- Hit by moving, flying or falling object

Management Plan

Following protection measures will be taken:

- Silos and buildings will be constructed as per the structural design as per ISCodes.
- Installing light arrestors at all tall buildings.
- Permit to be taken to work at height with work instruction to use safety beltsetc.
- Testing of all lifting tools, tackles and pressure vessel to avoid failure.
- Safe working pressure maintained in air receiver.
- Safe working load on cranes and ropes etc.
- Good housekeeping & Speed limit of vehicles will be 10 km/hr. inside the plantarea.
- Display of emergency number at all suitable location.
- Fire tender, ambulance, and emergency staff ready at the plant main gate atall the time
- First aid kits are kept at the sites and training provided
- Use of mobile while driving, alcohol, smoking etc. are ban inside the plant area.

10.10.3 OCCUPATIONAL HEALTH SURVEILLANCE

In Grinding unit, the occupational health surveillance of the employee will be done on aregular basis and records of the same will be maintained as per the Factories Act. The occupational health surveillance Programme will include lung function; sputum analysis andaudiometric analysis on regular basis to observe any contraction due to exposure to dust andnoise and corrective measures will be taken accordingly. Vocational training programmes will also be conducted. Under vocational training the workersare will be given training related to all safety and health aspects pertaining to their vocation and thereafter every quarter special training courses/ Awareness Programme for Malaria eradication, HIV and health effects on exposure to dust, heat, noise, chemicals will be organized for employed person. Periodical medical camps with specialized doctors of various disciplines will be organized to provide the specialized medical assistance to employees as well as neighboring communities.

A. List of Equipment for Occupational Health Monitoring

- ECG
- Noise Monitoring device (dosimeter)
- Spiro meter
- X-ray machine
- Audiometric device
- Vision screener
- Tele Medicine Facility

B. Pre-Placement and Periodical Health Status

Pre / Post-employment Periodical checkup will be carried out and following test will beconducted:

- BMI (Body Mass Index)
- Chest x ray PA view
- Vision testing (Far & Near vision, color vision and any other ocular defect)
- ECG
- Hemogram (examination of the blood)
- Blood Pressure & Blood Sugar Fasting
- Serum Cholesterol

- Liver Function Test (enzymes test [ALP, ALT etc.], SGOT and SGPT)
- Complete physical examination
- Post-employment Periodical occupational health check-up such as lung function, audiometry, CBC, Blood Sugar, Lipid Profile etc.
- Medical records of each employee will be maintained separately and will be updated as per finding during monitoring.
- Medical records of the employee at the end of his / her term will be updated.

C. Frequency of Medical Examination

Yearly and half- yearly medical examination of workers working at highly dusty /hazardous area.

D. Personal Protective Devices and Measures

- Industrial Safety helmets,
- Face shield
- Safety goggles and Gas Cutting Goggles
- Welders equipment for eye and face protection i.e., welding shield
- Ear muffs and Ear Plugs
- Full body Safety harness
- Hand gloves, Asbestos hand gloves, Electrical hand gloves, Heat Resistive handgloves, Chemical hand gloves and Cut resistance hand gloves
- Safety net, Barricading net
- Industrial safety shoes with steel toe
- Electrical safety shoes without steel toe and Gum boots
- Retractable and fall arrestors
- Reflective Jackets
- Protective clothing, Dangri Suits etc.
- Safety belt / line man's safety belt
- Rope grabs fall arrestor.

E. Anticipated Occupational & Safety Hazardous

- Heat Stress and Stroke
- Physical activity
- Dehydration
- Skin disorders
- Dust Exposure
- Noise
- Burns and shocks due to electricity

10.10.4 IMPLEMENTATION OF OHS STANDARDS AS PER OSHAS/USEPA

The overall objective of the company is to provide a system that is capable of delivering healthy and safe workplace. Following measures is being/will be adopted for implementation of OHS standards.

- ✓ Well-equipped Occupational Health Centre with adequate paramedical staff
- ✓ Routine and special investigation related to occupational health
- ✓ Health surveillance and maintenance of health record
- ✓ Rules and procedure for effective implementation of Safety Health and Environment policy and made to know all employees
- ✓ Round the clock Ambulance facility
- ✓ Sufficient number of First aid boxes
- ✓ Implementation of OHSAS 18001 for Occupational Health and Safety Management System
- ✓ Implementation of ISO 14001 for Environment Management System
- ✓ Formulation of OHS implementation team/ cell
- ✓ Risk assessment of each and every activity
- ✓ Implementation of OHS management program
- ✓ Displaying the safety and health policy and instructions at various locations
- ✓ Display of safe operating procedure (SOP) at various locations
- ✓ Job safety analysis
- ✓ Carry out daily plant safety inspection by internal safety department
- ✓ Investigation of fatal, serious accidents and near miss accident
- ✓ Investigation of reports of occupational diseases
- ✓ Monthly safety meeting of all employees & workers to discuss last month accident if any, reason and corrective measures taken.
- ✓ Organize campaigns, competitions, contests etc. to promote safety
- ✓ Organize safety training, seminars for safe working and safe vehicle and traffic movement within the plant premises and regular training for safe driving outside the plant premises
- ✓ Prepare annual reports of accidents and occupational diseases.
- ✓ Ensure use of PPEs according to the job like helmet, safety shoes, goggle, dust mask, ear plug and hand gloves etc.
- ✓ Establishment of Occupational Health Centre for pre and periodic medical examination of workers and staff to detect any onset of occupational disease and corrective manures
- ✓ Display Material Safety Data Sheets (MSDS) for use of every hazardous substance
- ✓ Periodic Safety Audits both internal and external, review and implementation of recommendations.

10.10.5 SAFETY COMMITTEE

A safety committee will be formed and manned by equal participation from management and workers with the following functions:

- a) Accident prevention and control including ensuring the use of safety appliances.
- b) Publicity, propaganda, education and training.
- c) Assisting and cooperating with the management in achieving the aims and objectives outlined in the "Health and Safety Policy" of the occupier.
- d) Carrying out health and safety surveys for identifying unsafe working condition/practices, which causes accident.

10.10.6 MEDICAL FACILITIES

The medical facility will adequately be manned by doctors and paramedical staff to provide round the clock services in case of any emergency.

10.10.7 INVESTIGATION FACILITY

Full-fledged pathological laboratory, X-ray machine with routine and specialized investigation facilities will be made available at the plant.

10.10.8 AMBULANCE SERVICES

The Health Centre will be provided with an ambulance to bring the patients to Health Centre in case of emergency.

10.10.9 FIRST AID BOXES

First aid boxes will be provided at prominent places with following items:

- Small size sterilized dressing.
- Medium size sterilized dressing.
- Large size sterilized dressing.
- Burnol Ointment.
- Packets of sterilized cotton wool.
- Bottle (120 ml) of cetrimide solution (1%) of suitable antiseptic solution.
- Mercurochrome solution (in 2% water).
- Scissors.
- Adhesive plaster (2cm x 1 m).
- Sterilized eye pads in separate sealed packets.
- Aspirin tablets.
- Potassium Permanganate crystals.

First aid boxes will be kept in every department for emergency. First aid training will be organized for the employees.

10.11 ACTION PLAN FOR E-WASTE MANAGEMENT

General Measures

- All the e-waste generated (electrical and electronic) as listed in Schedule I of E-waste management rules, 2016 shall be channelized through collection center or dealer of authorized producer or dismantler or recycler or through the designated take back service provider of the producer to authorized dismantler or recycler;
- Records of e-waste generated by the company will be maintained in Form-2 and the same will be made available for scrutiny by the concerned State Pollution Control Board;
- It will be ensured that such end-of-life electrical and electronic equipment are not admixed with e-waste containing radioactive material as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made there under;
- ACL will file annual returns in Form-3, to the State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates.

Storage of e-waste:

E-waste shall be stored at a central collection centre within the plant premises. During storage of e-

waste care shall be taken:

- ✓ To avoid damage to refrigerators and air-conditioner so as to prevent release of refrigerant gases such as CFC, HFS, HCFC etc. and to prevent spillage of oils (mineral or synthetic oil) and other emissions.
- ✓ To avoid damage to Cathode Ray Tube
- ✓ To avoid damage to fluorescent and other mercury containing lamps
- ✓ To avoid damage to equipment containing asbestos or ceramic fibers to avoid release of asbestos or ceramic fibers in the environment.

After collection of fluorescent and other mercury containing lamps, it shall be sent only to a recycler or to a TSDF in case no recycler is available. Loading, transportation, unloading and storage of E-Waste / end of life products shall be carried out in such a way that its end use such as re-use after refurbishing or recycling or recovery is unaffected.

Transportation of E-waste:

- Ambuja Cement Ltd. shall identify transporter or make arrangements for a transporting e-waste in such a manner that environmental consequences of hazards associated with its transport could be kept at minimum.
- Transport of E-Waste should be carried out as per the manifest system as per the provisions made in rule 19 of the E-Waste (M) Rules, 2016 and the transporter will be required to carry a document (three copies) as per form 6 of the rules provided by the sender.
- The responsibility of safe transportation of E-waste shall be with JSW Cement.
- Fluorescent and other mercury containing lamps may be transported to TSDF in the cases where no recyclers of CFL are available
- The manufacturers and recyclers while transporting waste generated from manufacturing or recycling destined for final disposal to a treatment, storage and disposal facility will follow the provisions under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

10.12 ORGANIZATION POLICY

The importance of environmental Management has been recognized by plant Management at very early stage and has taken necessary steps to identify environmental aspects and control those aspects which generate pollution in the plant, respond to impacts on its own captive population and also in the peripheral areas.

Ambuja Cement Ltd. (ACL) shall ensure following action items to be complied with throughout the life cycle of the project:

- Formulate/ implement Environmental Health & Safety Policy
- Document the organization structure, roles and responsibilities for implementation and for functioning of Environmental Management System (EMS) and Safety Management System (SMS) Procedures.
- Develop standard operating process and procedures to bring into focus any infringement / deviation / violation of the environment or forest norms/conditions.
- Obtain ISO 9001, 14001 and 18001 Certification
- Carry out regular inspections, monitoring and auditing.

- Carry out periodical review and issuing amendments.
- Reporting and communication (including internal and external reporting);
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- Conducting Environmental Awareness Program for the employees on, Water management, and Energy conservation.

The above objective will be attempted to be achieved through the following and improvement in the quality and appropriateness of raw materials as per design philosophy.

- Using automation & Computer control to have improvement on technology and on working condition
- Pollution Monitoring and environmental management
- Implementation of occupational health set up including regular medical monitoring of employees
- A well-developed safety management system
- Preparation of Emergency/Disaster Management Plan and a properly trained group to meet the emergency situations
- Green belt development inside the plant and township
- Development of awareness among employees and public including student population towards environmental conservation
- R & D activities with respect to specific pollution problems

Management has given maximum importance for adopting latest technologies for keeping the pollution to minimum levels. This is well evident from the fact that a separate Environment Management Department exists in existing plant headed by General Manager with an Environmental Laboratory well equipped with latest monitoring instruments.

10.13 ORGANISATIONAL SET UP

10.13.1 ADMINISTRATIVE SET UP

A senior officer, of the rank of General Manager will be the head of the EMD. In his day to day work he is assisted by two Sr. Managers / DGMS. GM (EMD) reports to the Executive Director (ED)/ Director (In charge). The organizational chart of EMD (proposed setup) is given in Figure 10.1. A laboratory has been proposed to carry out the environmental monitoring and surveillance programme of the plant.

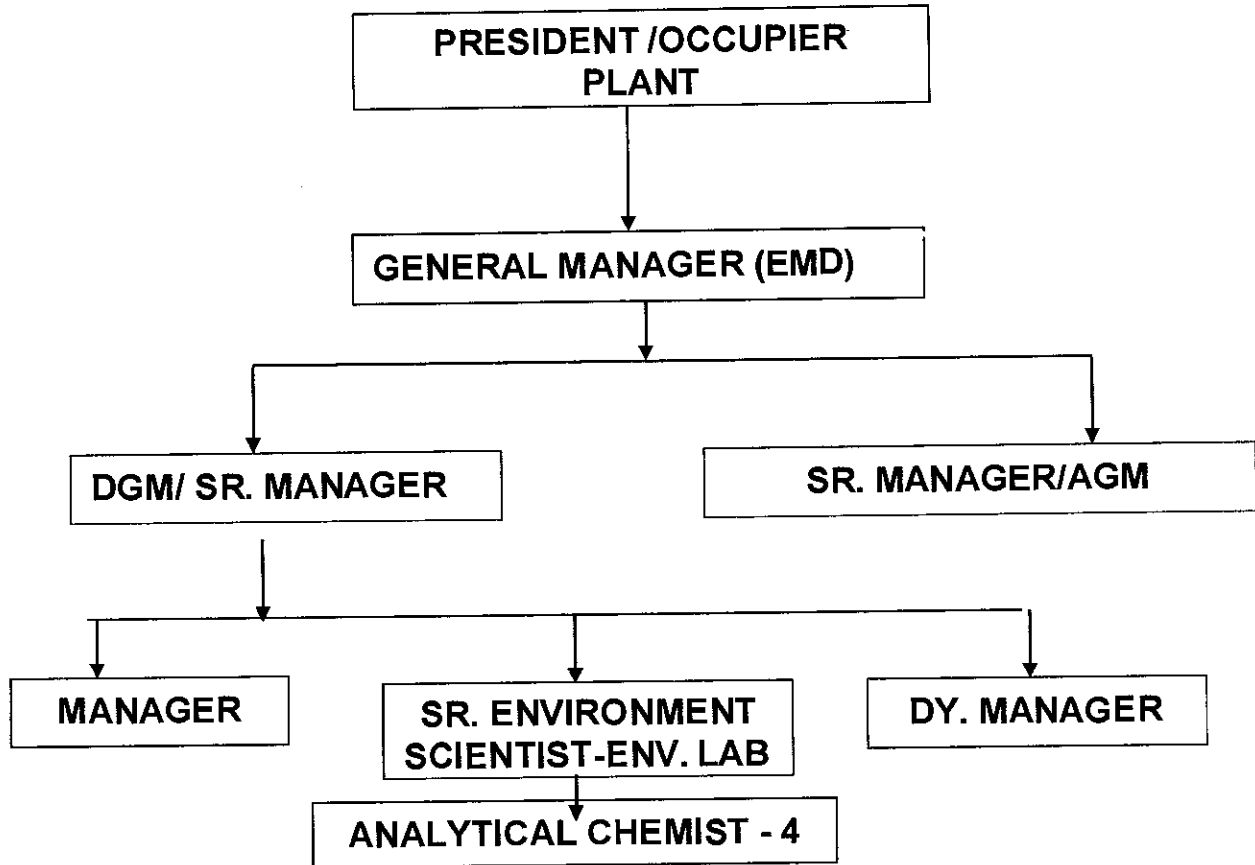


FIGURE 10. 1 ORGANIZATION CHART OF ENVIRONMENT MANAGEMENT DEPARTMENT

10.13.2 ENVIRONMENTAL LABORATORY SET UP

A well-equipped environmental laboratory will be set up inside the plant premises. All the technical personnel deployed in the laboratory are given training to carry out necessary environmental monitoring as well as analysis as per statutory requirement. The requirement of equipment's for carrying out environmental monitoring and frequency of the use of different equipment's (as required for the environmental compliances) are given in Table-10.15.

TABLE 10. 15 MONITORING / ANALYTICAL EQUIPMENT'S / USAGE FOR EXISTING / PROPOSED PLANT

SN	Monitoring Equipment's		Parameter / Function	Frequency	Ambient air / Fugitive Emission	Stack Gas Source Emission
	Equipment's	Nos Required				
Air / Stack / Noise Monitoring						
			SO ₂ , NO _X , O ₃ ,	24 hr.		
			As, Ni &	continuous;		
1.	PM 10 Sampler	4	Benzo-a-pyrine (BaP) -	Once per month	Yes	-

2.	PM10 Sampler	4	sampling PM2.5	24 hr. continuous; Once per month	Yes	-
3.	Stack Monitoring Kit (manual)	2	PM,SO2, NOx	All stack Once per month	No	Yes
	On line stack monitoring along		Particulate Matter, SO2,	Continuous		
4.	with accessories for monitoring	2	NOx, CO2 & CO		No	Yes
	SO2, NOx, CO2, CO & PM10					
5.	On Line AAQ Monitoring Station	2	PM 10, PM 2.5	Continuous	Yes	No
	Flue Gas Analyzer		O2% CO% SO2 mg/m ³	Once per month for coke oven		
6.		1	NOX mg/m ³ NO mg/m ³ CXHY PPM Ambient temp	battery stacks	No	Yes
7.	Sound Level Meter	1	Noise Level	As and when required	-	-
8.	CO Analyzer (NDIR)	1	CO	Once per month	Yes	-
9.	Gas Chromatograph	1	Benzene (C6H6)	Once per month	Yes	-
10.	High Pressure Liquid Chromatograph (HPLC)	1	Benzo-a- pyrine (BaP) particulate phase only	Once per month	Yes	-
11.	Automatic Weather Monitoring Station	1	Meteorological parameters	Continuous	-	-
Water Monitoring & Chemical Analysis						
12.	Ion Analyzer with auto-titrate	1	NH3, CN, F	Daily in coke oven sample	-	-
13.	Hot Air Oven	1	NH3, CN, F	Regularly	-	-
14.	Hot Plate	2	O&G Iron & various purpose like boiling & digestion of sample	Regularly	-	-
15.	Muffle Furnace	1	Digestion at higher temp, up to 1000°C	As and when required	-	-
16.	BOD Incubator	1	BOD	Twice in a week	-	-
17.	BOD Apparatus, Oxitop	1 set of 6	BOD	Twice in a week	-	-
18.	DO Meter	1	BOD	As and when required	-	-
19.	Spectrophotometer	1	COD,	Daily	-	-

	with COD Digestion Assembly		Phenol NO ₃ - N PO ₄ - P			
20.	pH meter	2	pH	Daily	-	-
21.	Conductivity Meter	1	TDS	Daily	-	-
22.	Digital Micro- Balance	1	Weighing	Daily	-	-
23.	Digital Top Load Balance (Range 1 to 500g)	1	Weighing	Daily	-	-
24.	Filtration Apparatus	2	SS / MLSS	Daily	-	-
25.	Heating mental	2	Distillation	Daily	-	-
26.	Refrigerator	1	Preservation of chemicals and samples	Regularly	-	-
27.	Fuming Chamber	1	For exhaust	As and when required	-	-
28.	Water Bath	1	Evaporation of sample	As when required	-	-
29.	Vacuum pump	1	Hardness alkalinity etc.	As and when required	-	-
30.	Turbidity Meter	1	Turbidity	As and when required	-	-
31.	Filter Papers, Glassware, Plastic wares, chemical	In Lot				

10.13.3 FUNCTIONING

Environmental monitoring programme and its reporting has been designed to provide a close watch on the surrounding natural environment and provide early warnings of any adverse changes that may be related to some dimension of the plant's operations.

EMD is functioning in the plant to look after all environmental aspects, carry out day to day environmental monitoring / inspection requirements and maintain records. Part of the environmental monitoring programme is carried out through external agencies on a part time basis. However, casual laborers etc. is employed for plantation, drain cleaning etc. as and when required.

The EMD carries out complete Air Monitoring, Noise Level Monitoring, Special monitoring on water and air, effluent, special surveys, solid waste management etc. Safety management & Occupational health aspects will be dealt by Safety Engineering & Fire Services / Factory Medical Officer (FMO). Green belt development aspects will be dealt by horticulture department. Community welfare & peripheral development aspects will be dealt by Personnel Department. The officers of EMD shall frequently analyses the data and periodically assess the progress of the EMP implementation arrangement.

10.13.4 INSTITUTIONAL IMPLEMENTATION ARRANGEMENTS

The proposed plant authorities will be responsible for implementation of all the mitigation and management measures suggested in Environmental Monitoring Programme. "Environmental Management Department" (EMD) will look after all environmental related matters of the plant and proposed expansion. In addition to this higher Management will also monitor the smooth implementation of Environment Management Plan. The in-charge of EMD (General Manager) will report all the environmental matters to higher management as per the reporting schedule on prescribed formats. The higher management will supervise the reported activity from time to time for smooth implementation of Environmental Mitigation and Management measures and will take necessary actions, if required.

The pollution levels in the plant area and as per continuous emission and ambient monitoring stations, will be displayed in front of the factory main gate for the knowledge of the public. Electronic display boards will be used for the purpose. Any environmental non-compliances issued by the regulatory authorities at the state or central level will be immediately brought to the notice of ED by GM(EMD). Root cause analysis will be carried out and corrective actions will immediately be initiated. Compliance will be communicated by the GM(EMD) to the regulatory authorities.

For successful implementation of the environmental management plan other agencies of the State may also be involved, if required (for regulatory requirement or technical support). The coordinating agencies, which may be involved for specific environmental related activities, are given in Table-10.16.

TABLE 10. 16 LIST OF COORDINATING AGENCIES, WHICH MAY BE INVOLVED FOR SPECIFIC ENVIRONMENTAL ACTIVITIES

State Level Agency	SFD	HSPCB	DOH
		Chairman	Chief Engineer
District Level	DFO	D.E.E	Ex. Engr.
Project Area: Plantation Programme	<input type="checkbox"/>		
Study Area: Air, noise, water quality, waste water discharge quality monitoring.		<input type="checkbox"/>	
Project Area: Stack monitoring, work-zone air, work-zone noise, effluents from outlet of effluent treatment plants, fugitive emissions		<input type="checkbox"/>	
Project Area: Solid / Hazardous Waste Utilization & Dumping		<input type="checkbox"/>	
Project Area: Human Health			<input type="checkbox"/>

Index: SFD – State Forest Department

HSPCB – Haryana State Pollution Control Board

DOH – Department of Health

DFO – District Forest Officer

DEE – District Environmental Engineer

Local NGOs will also be identified at the district and block level to provide help and advice for implementation of EMP especially on matters related to community development programmes.

10.13.5 CO-ORDINATION WITH OTHER DEPARTMENTS

The Environment Management Department (EMD) also co-ordinates with other departments like Occupational Health, Safety Management, Project Engineering, Horticulture, CSR, Water Supply Department etc. and also do the liaison work with external agencies like State & Central Pollution Control Boards.

10.13.5.1 INTERACTION WITH STATE POLLUTION CONTROL BOARD /CPCB / MOEF

EMD shall be in regular touch with HSPCB and shall send them monthly progress reports in the prescribed format, as per the prevailing practice. Any new regulations considered by State/Central Pollution Control Board for the Industry shall be taken care of by EMD of the plant. Also, half yearly compliance reports will be sent to MoEF&CC as per the guidelines in the prescribed format.

Training

The EMD, who would be responsible for the implementation of the EMP, needs to be trained on the effective implementation of the environmental issues. To ensure the success of the implementation set up proposed, there is a high requirement of training and skill up- gradation. For the proposed project, training facilities will be developed for environmental control. For proper implementation of the EMP, the officials responsible for EMP implementation will be trained accordingly. To achieve the overall objective of pollution control it is essential not only to provide latest pollution control and monitoring systems but also to provide trained man power resources to operate and maintain the same. Specialized courses at various Research / Educational institutes will be organized.

The training will be given to employees to cover the following fields:

- Awareness of pollution control and environmental protection to all.
- Operation and maintenance of specialized pollution control equipment to specific personnel.
- Field monitoring, maintenance and calibration of pollution monitoring instruments.
- Laboratory testing of pollutants.
- Repair of pollution monitoring instruments.
- Occupational health/safety.
- Environmental management.
- Afforestation / plantation and post care of plants.
- Knowledge of norms, regulations and procedures.
- Risk assessment and Disaster Management.

10.14 ENVIRONMENTAL AUDITING

The proposed project will be audited by third party after commissioning in phases. This will help in identifying any non-compliance through structured internal /external audits in the area of environment and occupational safety & health areas and to take corrective action.

10.15 WATER AND ENERGY CONSERVATION MEASURES

Rain water harvesting measures will be implemented in the proposed project to reuse the rain water or to recharge the ground water as part of water conservation measures. Proper functioning of the systems will be ensured by regular monitoring. Energy conservation measures as per the design plan will be implemented so as to bring energy saving.

10.16 OTHER MEASURES

The following activities will be carried out in a structured way for the benefit of the surrounding people through close co-ordination with Personnel Department:

- Improvement of social infrastructure through CSR activities like school buildings, drinking water facilities, street lights, roads, sanitary facilities etc.
- Community education & training.
- Medical welfare.
- Sports activities.

10.17 DETAILED BUDGET

The budget proposed for the project is 1059 crores. The cost breaks up of Capital and Recurring expenditure is indicated in the below Table 10.17.

TABLE 10. 17 COST BREAK UP OF PROPOSED EMP

Sl. No.	Particulars	Estimated Cost (Rs. In Crore)	
		Capital	Recurring
1	Air pollution Control Measures	40.3	7.7
2	Water Pollution Control Measures	4.1	0.7
3	Occupational Health and Safety	2.9	1.1
4	Environmental Monitoring & RWH	5.5	2.2
5	Green Belt Development	2.2	0.7
	Total	55	12.5

10.18 CORPORATE ENVIRONMENT POLICY

The company has well laid down Environment Policy, approved by Management which are as follows:

Concern and consciousness towards environment are embedded in our Environmental Policy which covers all our functions & operations. The structure, process and monitoring have been significantly reshaped in past few years, keeping in view the need of the time and the company's objectives towards corporate sustainability. The effective execution and adherence to the policy principles are accorded high importance in the agenda of the board of the company. We commit to:

- Adopt environmentally safe mining and process technologies along with best operating practices for prevention & control of risks and adverse effects of the release of our pollutants to the environment (air, water, and soil) so as to protect health and safety of our employees, contract employees, and community.
- Appropriately rehabilitate/restore/reclaim mines or disturbed areas for overall benefit to community and biodiversity. Quarry rehabilitation plan will be in place for all extraction sites. A Biodiversity Management Plan will be prepared for all extraction sites according to the level of management needed based on the risks and opportunities.
- Optimize use of key resources including minerals, energy, and water.
- Conduct environmental and social impact assessment in selection of greenfield sites or major modifications in the existing sites.

- Conduct analysis of impacts our products and solutions through the Life Cycle Assessment.
- Reduce our impact on climate change by developing, manufacturing or promoting sustainable products and solutions, undertaking energy efficiency and recovery, use of renewable and non-conventional sources of energy, and utilizing alternative raw materials and fuels.
- Comply with applicable legal and other requirements including environment and forest clearances, consents, permits, licenses, standards, and leading industry initiatives.
- Implement and maintain environment management systems all across our operations along with monitoring, reporting and continually improving our environmental performance.
- Be reliable provider of sound waste management solutions by co- processing qualified wastes as alternative fuels and alternative raw materials from other industries and waste service providers.
- Promote sustainable water management practices, including efficient water consumption, recycling, treatment and zero wastewater discharge, across all our operations, along with rainwater harvesting to minimize freshwater withdrawal.
- Assess the environmental practices and policies of our critical suppliers as part of selection process and expect them to respect and comply with our environmental policies and procedures.
- Develop and propagate environmental awareness amongst employees and other stakeholders including surrounding communities.
- Set corporate objectives and targets, and monitor our environmental performance.
- Conduct environmental due diligence of all new acquisitions.
- Set corporate objectives and targets, and monitor our environmental performance.
- Conduct environmental due diligence of all new acquisitions.
- Be open, transparent, and accountable to our stakeholders regarding our environmental performance and periodic reporting. This policy will be communicated to all persons working for or on behalf of the company and will also be made available on the website of the company.
- This Policy was approved by Executive Committee of the Company on 20th March 2017 and will come into force on 21st March 2017.

10.18.1 SUSTAINABILITY INITIATIVES BY AMBUJA CEMENTS LIMITED (ACL)

- We intend to become a carbon-neutral building materials and construction solutions business by 2050.
- Accordingly, we are investing in a whole range of sustainability initiatives – from Waste Heat Recovery System (WHRS) to clinker factor reduction, energy efficiency (thermal and electrical), and the use of renewable energy, especially waste-derived resources/ alternative fuels.
- We have also developed and validated our 2030 carbon emission reduction targets by the Science Based Targets initiative (SBTi), in alignment with the required reductions to limit global warming to well below 2°C.
- We are committed to reducing Scope 1 and Scope 2 GHG emissions by 21% per tonne of cementitious materials by 2030 from a 2020 base year. With this target, Ambuja Cement commits to reduce Scope 1 GHG emissions by 20% per ton of cementitious material and Scope 2 GHG emissions by 43% per ton of cementitious materials in this timeframe.
- It is imperative for us to push the decarbonization agenda. Today, we have the knowledge

and the means to combat climate change.

- To mainstream sustainability and effect impactful change for the benefit of the planet and its people, we have launched the 'Change The Story' platform. It showcases technology-led solutions that take us closer to realizing our vision of a better tomorrow.
- To begin with, we have taken the responsibility of addressing the pressing challenge of plastic pollution in India's rivers. Using the 'bubble curtain' technology, the pilot project at Yamuna River (Mantola canal) in Agra is expected to aste. Such bubble barriers can be extended to other rivers across the country.
- We will continue to focus on resource conservation, utilizing green/ clean energy sources, driving energy efficiency in all our plants and building an inclusive and equitable world.
- We are on the cusp of exciting change, and we are happy to play our role in strengthening the nation's ambitions while contributing to the concerted global efforts to create a sustainable future.
- The positive changes made through our sustainability efforts positioned us 5th in the Dow Jones Sustainability Index (DJSI) 2021 among construction materials companies globally.
- We are emerged as 8 times water positive and 3.5 times plastic negative.
- Waste heat recovery projects in progress across plants.

10.18.2 SUSTAINABLE DEVELOPMENT PLAN 2030 FOR ACL

Our Sustainable Development Ambition provides a broad framework to undertake strategic interventions in order to meet challenges across four thematic areas – Climate and Energy, Circular Economy, Water & Nature and People & Communities.

TABLE 10. 18 CLIMATE AND ENERGY, CIRCULAR ECONOMY, WATER & NATURE AND PEOPLE & COMMUNITIES.

Thematic areas	Climate and Energy	Circular Economy	Water & Nature	People & Communities
Lead metrics	CO2 Reduced (kg CO2/t of cementitious material)	WASTE Re-used (million tonnes)	WATER Saved (Fresh water consumption: L/t of cementitious material)	VALUE Shared (million beneficiaries)
Performance 2021	528.8	8.6	58	2.8
Target 2030	453 (excluding CPP)	21	62	3.5

CHAPTER -11 SUMMARY AND CONCLUSION

11.1 JUSTIFICATION OF THE PROJECT

Industrialization is the better way for growth & employment & also it is a strategic location connecting Indian markets. The industrialization and infrastructure growth must go hand in hand. Cement is major component in infrastructure growth. Total Cement production in the area and nearby state does not match the demand growth and hence new capacities must come up concurrently. The proposed plant will ensure that the supply situation in Haryana and neighboring state is comfortable in the coming times, as growth is expected to propel demand.

To meet the supply-demand gap of cement in the region, Ambuja Cements Ltd, is proposing to establish a cement grinding and bagging unit of 4.0 million tons per annum capacity. The technology chosen for the cement plant is state-of-the-art with optimum resource and energy consumption. Fly ash, and gypsum which are waste products from other industries, will be utilized along with clinker supplied from a sister plant of the group to manufacture of OPC, PPC, PSC grades of cement. The unit is proposed in a fallow land belonging to Adani Logistics group, after the land transfer is done in the name of ACL. An MOU is already entered for the purpose. The land is an already converted industrial parcel and does not have any agricultural crop or vegetation.

Adani group is known for its environment friendly initiatives across sectors it operates in and strong reputation for sustainable growth. In line with the existing agenda to make India Power sufficient in the future sustainably, cement manufacturing unit are being planned close to coal based thermal power plants. Disposal of fly ash is an environmental concern which is faced by all coal based thermal power generating plants. Cement can consume up to thirty-five percent of fly ash produced in the power plants and thus reduce environmental concern. The proposed cement grinding units will this help in reducing the fly ash burden of nearby coal based thermal power plants of Haryana and neighboring states.

The project planned by group would also generate immense employment opportunities and significant contribution to the state & central exchequer., improvement of socio economics of the area by way of education, vocational training, animal husbandry, improving infrastructure facilities such as roads, transport, improvement in Drinking water supply, medical facility etc. The Adani Group is committed to the development of the country and will put all efforts for comprehensive development of this area also as being practiced by us at other establishments.

11.2 MITIGATION OF ADVERSE IMPACTS

11.2.1 AIR ENVIRONMENT

a) Construction Phase

There will be several activities during the construction phase, which are likely to generate fugitive dust and gaseous pollutant. Such activities include removal and stockpiling of soil generated during preparation of site for civil construction, storage and handling of construction materials, civil & mechanical working & movement of vehicles and operation of construction equipment /machinery.

Mitigation Measures

- Water sprinkling will be done on the approach roads and near excavation / clearance / stockpiling areas at suitable intervals to control dust generation.
- Schedule & Preventive maintenance of vehicles and machineries will be done and combustion efficiency of vehicles & machineries will be tested regularly to reduce emission of contaminants.
- Approach roads and internal roads will be repaired and maintained periodically.

b) Operation Phase

The main air pollution sources in proposed industries are Grinding Mill, silo etc. Gaseous emission like SO₂, NO_x, CO and particular matter shall be generated from process stacks and DG sets. Other emissions include fugitive emissions due to raw material handling and movement of vehicles.

Mitigation Measures

- Grinding Mill will be provided with bag house of >99.9% efficiency to trap PM emission. The outlet PM concentration will be less than 30 mg/Nm³. The details of the pollution control system are given below:

TABLE 11. 1 DETAILS OF AIR POLLUTION GENERATION UNITS AND ITS MANAGEMENT

Name of Unit	Air Pollution Control System
Clinker Silo	Bag Filter
Fly ash Silo	Bag Filter
Gypsum/Wet fly ash Stacker	Bag Filter
Grinding Mill	Bag Filter
Cement Silo	Bag Filter
Gypsum Crusher	Bag Filter
Packer	Bag Filter

- DG sets will be used during only power break down.
- Mechanized truck unloading/ loading system shall be provided. Raw material and finished product shall be stored in covered and paved surface.
- Sprinkling of water to control fugitive dust emission.
- Speed of vehicles inside the factory premises will be controlled.
- Greenbelt will be maintained to attenuate the air pollution.
- Proper personal protective equipment will be provided to the workers.
- Dust collectors will be in line with unloading hoppers.
- All the trucks being used for transportation of raw material and final product shall be checked for "Pollution under Control" certificate prior to their entry to the plant premises.

11.2.2 WATER ENVIRONMENT:

The water requirement of about 200 KLD will be sourced from ground water. The construction will be sustaining about 19 months approx. Application for ground water extraction will be submitted to Haryana state /CGWA and permission shall be processed progressively.

Mitigation measures

- Construction of storm water diversion channels to divert storm run-off from flowing over the construction areas.
- Disposal of construction debris in approved areas.
- As far as possible, construction activities will be avoided during rainy days to mitigate the small impacts on soil/water quality caused due to construction activity.

Operation Phase

The total water requirement of the plant is 400 KLD. It will be met from ground water/surface water.

Mitigation Measures

No industrial wastewater will be generated during cement manufacturing process. Domestic wastewater generated from office toilets will be treated in modular STP and used for dust suppression and plantation.

11.2.3 NOISE ENVIRONMENT**Construction Phase**

During the construction phase, low level noise will be generated from various construction activities such as movement of vehicles carrying materials, Excavation machines, concrete mixer etc.

Mitigation Measures

- Provision of rubber padding/noise isolators/silencers to modulate the noise generated by machinery/equipment, wherever possible.
- Provision of protective devices like ear muff/ plugs to the workers.
- Preventive maintenance of machinery/equipment and vehicles.
- Regular monitoring of ambient noise level as per monitoring plan shall be carried out.

Operation phase

During operation, the major noise generating sources from the plant complex are the Rotating equipment like Fans, Feed Water Pumps, Compressors etc.

Mitigation Measures

- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- Provision of silencers will be made wherever possible. The operators will be provided with necessary safety and protection equipment such as ear plugs, ear muffs etc.
- The high noise zones at site shall be demarcated and enclosures & barriers, if required shall be provided.
- By provision of green belt / plantation in and around the plant premises.
- Noise levels at various areas shall be regularly monitored and reviewed.

11.2.4 SOIL ENVIRONMENT**Construction Phase**

During construction phase, solid waste such as excavated soil, debris, metal waste and oil & grease from construction machinery/equipment will be generated. Oil & grease may contaminate soil at construction site temporarily and would be restricted to a small area. Excavated topsoil will be used

for plantation and on completion of construction all waste will be cleared and disposed of suitably as soon as possible.

There is a chance of accidental spillage while re-fueling or servicing vehicles. Solid waste like debris, metal pieces, cotton waste etc. so generated will be collected and segregated and will be disposed of as per standard practice. Lubricating waste oil will be collected separately in drums and will be handed over to the outside agency authorized by SPCB/CPCB as per guidelines.

Operation Phase

No solid waste will be generated from the cement manufacturing process. Dust collected from air pollution control equipment will be totally recycled in process. Sludge from Modular Sewage Treatment Plant (STP) will be used as manure for green belt development. A part of used oil will be utilized for lubrication purpose & remaining will be sold to authorized PCB vendors.

Mitigation Measures

- Proper records of the solid waste to be generated and their usages for different purposes will be maintained.
- Suitable drainage system has been available for surface runoff water during monsoon and at places settling/catch pits will be provided to arrest any solid particles before it will be flowing over to natural drainage system of the area.
- Lubricating waste oil will be collected separately in drums and shall be sold to authorized external agency for further treatment.

11.2.5 SOCIO-ECONOMIC ENVIRONMENT

Construction Phase

In addition to direct employment, several opportunities for locals will be available in terms of supply of construction materials & machinery, vehicles and other essential commodities. Project will have positive impact on socio-economic status of the area due to construction employment.

Operation Phase

With the coming up of the proposed plant new sources of income and employment will be generated. The cement situation will improve in study area and will open up opportunities for new economic activities. The literacy rate is likely to improve. Many will find employment in service sector and marketing of day-to-day needs viz. poultry and other agricultural products. The project will improve the basic infrastructure and the people of nearby villages can also use these amenities.

11.2.6 BIOLOGICAL ENVIRONMENT

Construction Phase

Construction activities at the site involving human and vehicular movement will disturb terrestrial micro flora and fauna at the site. The construction work will be undertaken in two phases. There is no significant impact is expected on biological environment as this is a running plant.

Operation Phase

Air emissions and increase in dust levels during the operational phase may result in restricted growth, less regeneration and degradation of sensitive vegetation in study area.

Mitigation Measures

- The raw materials storage yard will be regularly sprinkled with water.
- The vehicles entering in the project site will not use pressure horns during night time as it may

distract the fauna or animals near to the site in study area.

11.2.7 GREENBELT DEVELOPMENT

Green belt is/will be developed over 34.81 % area of the total plant area. This greenbelt will serve as a buffer between the peripheries and the industry, there by controlling the air emissions and noise levels.

11.2.8 RAIN WATER HARVESTING

M/s. Ambuja Cements Limited is promoting rain water harvesting through creation of rainwater harvesting and recharging it into ground. The rain water harvesting scheme will be weighted by Central ground water Board.

11.3 CONCLUSION

In the plant design itself, latest state-of-art technology has been envisaged so as to achieve the desired air emissions and noise levels from plant operation levels. No effluent will be generated from the plant. Further, all generated solid waste will be either recycled back into the respective plant operations. This EIA study highlights that the judicious implementation of proposed Environmental Management Plan will ensure negligible negative impacts on the environment with direct and indirect positive development to the society due to the proposed project.

CHAPTER 12.0 DISCLOSURE OF CONSULTANTS

M/s Ecomen Mining Private Limited, Lucknow is an Environmental Consultant and is having well-equipped laboratory for field studies as well as for testing and monitoring of Air, Water, Noise, Soil and other related activities of Environment and Industries.

Ecomen is specialized in Environmental Services as mentioned below: -

- Environmental Impact Assessment (EIA).
- Environmental Risk Analysis and Assessment.
- Monitoring of Air, Water, Noise and Soil.
- Preparation of Documents for Clearance of Forest Land.
- Environmental Management Plan.
- Environment Audit Statement.
- Disaster Management Plan.
- Study and Treatment of Industrial Effluents.
- Design, Engineering and Commissioning of Effluent Treatment Plant, Sewage Treatment Plant and Water Treatment Plant.
- Designing, Engineering and Commissioning of Air Pollution Control Devices.
- Dust Suppression.
- Dealing with Solid Waste Management.
- Planning on Waste Recycle, Reuse and Control
- Preparation of "ON SITE" and "OFF SITE" emergency plans and health survey.
- Geo Hydrological, Ground and Surface Water Survey and Transit Survey.
- Rain water harvesting including design and execution.

Ecomen is involved in Clearing of development Project form Ministry of Environment and Forest, New Delhi (MOEF&CC), SEAC, SEIAA and State Pollution Control Board (SPCB).

Ecomen had prepared and cleared Rapid Environmental Impact Assessment(EIA) Report, as well as Comprehensive EIA Report from Ministry of Environment and Forest; New Delhi.

It is for your kind information that we are having qualified and experience staff comprising of trained professionals in their respective fields. We are backed by the services of retired Scientists and Engineers from both public and private sectors. We are also having computers and software facility for modelling purposes.

Ecomen has been accredited by NABET certificate no. NABET/EIA/22-25/SA 0219 and valid till 22/03/2025.




National Accreditation Board for Education and Training

Certificate of Accreditation

Ecomen Mining Pvt. Ltd. (formerly known as Ecomen Laboratories Pvt Ltd.)

Second Floor Hall, House no. B -1/8, Sector -H, Aliganj, Lucknow - 226024

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3 for preparing EIA/EMP reports in the following Sectors

S. No	Sector Description	Sector (as per)		
		NABET	MoEFCC	Gen.
1	Mining of minerals including open cast / underground mining	1	1 (a) (i)	A
2	Waste water plants	3	1 (c)	A
3	Thermal power plants	4	1 (d)	A
4	Mineral beneficiation	7	2 (b)	A
5	Manufacture of iron/steel	8	7 (a)	A
6	Cement plants	9	1 (d)	A
7	Coke oven plant	11	4 (b)	A
8	Asbestos mining and asbestos-based products	12	4 (f)	A
9	Sugar industry	25	5 (a)	B
10	Industrial activities: Parks, Composites, Aerial, export processing zones (EPZ), Special economic zones (SEZ), free trade parks, leather complex	31	7 (c)	B
11	Common hazardous waste treatment, storage and disposal facilities (TSDF)	32	7 (d)	A
12	Highways	35	7 (f)	A
13	Building and construction projects	36	6 (a)	B
14	Township and Area development projects	39	8 (a)	B

Note: Names of approved EIA Consultants and Functional Area Experts are mentioned in SAAC minutes dated February 02, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENR/ACC/24/3184 dated Mar. 27, 2024. The accreditation needs to be renewed before the expiry date of Ecomen Mining Pvt. Ltd. according to following the process of accreditation.

Issue Date
Mar. 27, 2024



Valid up to
Mar. 22, 2025



Mr. Ajay Kumar Jha
Sr. Director - NABET

Certificate No.
NABET/EIA/22-25/SA 0219



Prof. (Dr.) Varinder S. Kanwar
CEO - NABET

For the updated list of accredited EIA Consultant Organizations with their seat nos. please refer to QCI-NABET website.

FIGURE 12.1 NABET CERTIFICATE OF CONSULTANCY



सत्यमेव जयते

File No.:
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Level Expert Appraisal
Committee(SEAC), HARYANA)



Dated



To,

M/s Ambuja Cement Limited a group company of Adani Group,
Adani Corporate House, Shantigram, S. G. Highway, Khodiyar, AHMADABAD, GUJARAT, , 382421
anurag.solankey@ambujacement.com

Subject: Standard Terms of Reference (ToR) to the proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana.

Sir/Madam,

This is in reference to your application submitted to SEAC vide proposal number SIA/HR/IND1/441923/2023 dated 05/04/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO23B1103HR5990664N
(ii) File No.	
(iii) Clearance Type	Fresh ToR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	3(b) Cement plants
(vii) Name of Project	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, State: Haryana by M/s. AMBUJA CEMENTS LIMITED (ACL), a group company of Adani Group
(viii) Name of Company/Organization	Ambuja Cement Limited
(ix) Location of Project (District, State)	PANIPAT, HARYANA
(x) Issuing Authority	SEAC
(xii) Applicability of General Conditions	YES

3. The SEAC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification,

2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of Reference to the instant proposal of M/s.Ambuja Cement Limited under the provisions of the aforementioned Notification.

4. The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
5. The Ministry reserves the right to stipulate additional TORs, if found necessary.
6. The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
7. The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

Copy To

anurag.solankey@ambujacement.com
 scy.seachr@gmail.com

Annexure 1

Standard Terms of Reference

1. Preliminary requirements

S. No..	Terms of Reference
1.1	EIA/EMP report cover page shall consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.
1.2	Besides, following points shall be compiled as per QCI/NABET norms: a. Disclaimer by the EIA consultant. b. Declaration by the Functional Area Experts contributed to the EIA study and declaration by the head of the accredited consultant organization/authorized person. c. Undertaking by the project proponent owning the contents (information and data) of the EIA/EMP report. d. Undertaking by the EIA consultant regarding compliance of ToR issued by MoEF&CC. e. Consultant shall submit the Plagiarism Certificate for the EIA/EMP Report.

2. Executive Summary

S. No..	Terms of Reference
2.1	Table of Contents of the EIA report including list of tables/figures/annexures/abbreviations/symbols/notations.
2.2	Point wise compliance to the ToR issued by MoEF&CC.

3. Executive Summary

3.1. Introduction

S. No..	Terms of Reference
3.1.1	Name of the project along with applicable schedule and category as per EIA, 2006.
3.1.2	Location and accessibility

4. Executive Summary

4.1. Project description

S. No..	Terms of Reference
4.1.1	Resource requirements (Land; water; fuel; manpower)
4.1.2	Operational activity
4.1.3	Key pollution concerns

5. Executive Summary

5.1. Baseline Environment Studies

S. No..	Terms of Reference
5.1.1	Ambient air quality
5.1.2	Ambient Noise quality
5.1.3	Traffic study
5.1.4	Surface water quality
5.1.5	Ground water quality
5.1.6	Soil quality
5.1.7	Biological Environment
5.1.8	Land use
5.1.9	Socio-economic environment

6. Executive Summary

6.1. Anticipated impacts

S. No..	Terms of Reference
6.1.1	Impact on ambient air quality
6.1.2	Impact on ambient noise quality

S. No..	Terms of Reference
6.1.3	Impact on road and traffic
6.1.4	Impact on surface water resource and quality
6.1.5	Impact on ground water resource and quality
6.1.6	Impact on terrestrial and aquatic habitat
6.1.7	Impact on socio-economic environment

7. Executive Summary

7.1. Alternative analysis

S. No..	Terms of Reference
7.1.1	

8. Executive Summary

8.1. Environmental Monitoring program

S. No..	Terms of Reference
8.1.1	Ambient air, noise, water and soil quality
8.1.2	Noise quality management plan
8.1.3	Emission and discharge from the plant
8.1.4	Green Belt
8.1.5	Social Parameters

9. Executive Summary

9.1. Additional Studies

S. No..	Terms of Reference
9.1.1	Risk assessment
9.1.2	Public consultation
9.1.3	Action plan to address the issues raised during public consultation as per MoEF&CC O.M. dated 30/09/2020

10. Executive Summary

10.1. Environment management plan

S. No..	Terms of Reference
10.1.1	Air quality management plan
10.1.2	Solid and hazardous waste management plan
10.1.3	Effluent management plan
10.1.4	Storm water management plan
10.1.5	Occupational health and safety management plan
10.1.6	Green belt development plan
10.1.7	Socio-economic management plan
10.1.8	Project cost and EMP implementation budget.

11. Introduction

S. No..	Terms of Reference
11.1	Background about the project
11.2	Need of the project
11.3	Purpose of the EIA study
11.4	Scope of the EIA study

12. Project description

12.1. Site Details

S. No..	Terms of Reference
12.1.1	Location of the project site covering village, Taluka/Tehsil, District and State.
12.1.2	Site accessibility
12.1.3	A digital toposheet in pdf or shape file compatible to google earth of the study area of radius of 10km and site location preferably on 1:50,000 scale. (including all eco-sensitive areas and environmentally sensitive places).
12.1.4	Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.
12.1.5	Environment settings of the site and its surrounding along with map.
12.1.6	A list of major industries with name, products and distance from plant site within study area (10km radius)

S. No..	Terms of Reference
	and the location of the industries shall be depicted in the study area map.
12.1.7	In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If it's near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.
12.1.8	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated 14/02/2022.
12.1.9	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.
12.1.10	Type of land, land use of the project site needs to be submitted.
12.1.11	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated 7/10/2014 shall be furnished.
12.1.12	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
12.1.13	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.
12.1.14	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.
12.1.15	Details of drone survey for the site, needs to be included in report and presented before the EAC during appraisal of the project.

13. Project description

13.1. Forest and wildlife related issues (if applicable)

S. No..	Terms of Reference
13.1.1	Status of Forest Clearance for the use of forest land shall be submitted.
13.1.2	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive

S. No..	Terms of Reference
	Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.
13.1.3	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.
13.1.4	Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.

14. Project description

14.1. Salient features of the project

S. No..	Terms of Reference
14.1.1	Products with capacities in Tons per Annum for the proposed project.
14.1.2	If expansion project, status of implementation of existing project, details of existing/proposed products with production capacities in Tons per Annum.
14.1.3	Site preparatory activities.
14.1.4	List of raw materials required and their source along with mode of transportation.
14.1.5	Other than raw materials, other chemicals and materials required with quantities and storage capacities.
14.1.6	Manufacturing process details along with process flow diagram of proposed units.
14.1.7	Consolidated materials and energy balance for the project.
14.1.8	Total requirement of surface/ ground water and power with their respective sources, status of approval.
14.1.9	Water balance diagram
14.1.10	Details of Emission, effluents, hazardous waste generation and mode of disposal during construction as well as operation phase.
14.1.11	Man-power requirement.
14.1.12	Cost of project and scheduled time of completion.
14.1.13	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.
14.1.14	Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby

S. No..	Terms of Reference
	<p>industries. c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall switch over to 100 % use of surface water from nearby source. d. Copy of all the Environment Clearance(s) including Amendments/validity of extension/transfer of EC, there to obtained for the project from MoEF&CC/SEIAA shall be attached as Annexures. A Certified Compliance Report (CCR) of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change/ or concerned authority as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022 on the status of compliance of conditions stipulated in all the existing environment clearances including amendments shall be provided. A Certified Compliance Report (CCR) issued by the concerned Authority shall be valid for a period of one year from the date of inspection. e. In case the existing project has not obtained Environment Clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. A proper justification needs to be submitted along with documentary proof. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 1994 or 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of CTO from the Regional Office of the SPCB shall be submitted, as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022. CCR on CTO conditions issued by the concerned SPCBs/PCCs shall be valid for a period of one year from the date of inspection of the project.</p>

15. Description of the Environment

S. No..	Terms of Reference																																																			
15.1	Study period																																																			
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S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Zoo plankton <p>For River Bodies</p> <ul style="list-style-type: none"> • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH4 • Boron • Sodium Absorption Ratio • Electrical Conductivity <p>For Ground Water</p> <p>Traffic Study</p> <p>Type of vehicles</p> <ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project <p>Soil</p> <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability • Water holding capacity • Porosity <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code <p>Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies</p> <ul style="list-style-type: none"> • Yield of water sources to be measured during critical season • Standard methodology for collection of surface water (BIS standards) <p>Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/existing current records) from the study area and shall be included.</p> <p>Land Environment</p> <p>Soil samples be collected as per BIS specifications</p>

S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Total project area • Topography • Drainage (natural) <p>Cultivated, forest, plantations, water bodies, roads and settlements</p> <p>Biological Environment</p> <p>1. Aquatic</p> <ul style="list-style-type: none"> • Primary productivity • Aquatic weeds • Enumeration of phyto plankton, zoo plankton and benthos • Fisheries <p>Diversity indices</p> <ul style="list-style-type: none"> • Trophic levels • Rare and endangered species • Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) <p>2. Terrestrial</p> <ul style="list-style-type: none"> • Vegetation-species list, economic importance, forest produce, medicinal value • Importance value index (IVI) of trees • Fauna • Avi fauna • Rare and endangered species • Sanctuaries / National park / Biosphere reserve • Migratory routes <p>socio-economic</p> <ul style="list-style-type: none"> • 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. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species. • Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity site. • For forest studies, direction of wind should be considered while selecting forests. • Secondary data to collect from Government offices, NGOs, published literature.

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S. No..	Terms of Reference
15.3	Interpretation of each environment attribute shall be enumerated and summarized as given below: • Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality • Biological Environment • Land use • Socio-economic environment
15.4	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

16. Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessment shall be carried out)

S. No..	Terms of Reference												
16.1	<p>Identification of potential impacts in the form of a matrix for the construction and operation phase for all the environment components</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Environment</th> <th>Ecological</th> <th>Socio-economic</th> </tr> </thead> <tbody> <tr> <td>Construction phase</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Operation phase</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Environment	Ecological	Socio-economic	Construction phase				Operation phase			
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Construction phase													
Operation phase													
16.2	Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase • Details of stack emissions from the existing as well as proposed activity. • Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period • Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions.												
16.3	Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.4	Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.5	Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.6	Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.7	Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.8	Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.9	Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												

S. No..	Terms of Reference
16.10	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.11	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase

17. Analysis of Alternatives (Technology & Site)

S. No..	Terms of Reference
17.1	No project scenario
17.2	Site alternative
17.3	Technical and social concerns
17.4	Conclusion

18. Environmental Monitoring Program

S. No..	Terms of Reference																		
18.1	Details of the Environment Management Cell																		
18.2	Performance monitoring schedule for all pollution control devices shall be furnished.																		
18.3	<p>Corporate Environment Policy</p> <p>a. 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.</p> <p>b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environment or forest norms / conditions? If so, it may be detailed in the EIA.</p> <p>c. What is the hierarchical system or Administrative order of the company to deal with the environment issues and for ensuring compliance with the environment clearance conditions? Details of this system may be given. Page 9 of 10</p> <p>d. Does the company have system of reporting of non compliances / violations of environment 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</p>																		
18.4	<p>Action plan for post-project environment monitoring matrix:</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Aspect</th> <th>Monitoring Parameter</th> <th>Location</th> <th>Frequency</th> <th>Responsibility</th> </tr> </thead> <tbody> <tr> <td colspan="6">Construction phase</td> </tr> <tr> <td colspan="6">Operation phase</td> </tr> </tbody> </table>	Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility	Construction phase						Operation phase					
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19. Additional Studies

S. No..	Terms of Reference																	
19.1	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitorable with defined time frames.																	
19.2	Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of "net Zero" emission.																	
19.3	Implementation status/measures adopted for avoiding the generation of single used plastic waste.																	
19.4	In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22-23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.																	
19.5	Public consultation details (Entire proceedings as separate annexure along with authenticated English Translation of Public Consultation proceedings).																	
19.6	As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.																	
19.7	<p>Summary of issues raised during public consultation along with action plan to address the same as per MoEF&CC O.M. dated 30/09/2020</p> <table border="1"> <thead> <tr> <th rowspan="2">S.No</th> <th rowspan="2">Name of the Physical Activity</th> <th rowspan="2">Physical plan of the Physical Targets</th> <th colspan="3">Year of implementation (Budget in INR)</th> <th rowspan="2">Total Expenditure (Rs. in Crores)</th> </tr> <tr> <th>1st</th> <th>2nd</th> <th>3rd</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S.No	Name of the Physical Activity	Physical plan of the Physical Targets	Year of implementation (Budget in INR)			Total Expenditure (Rs. in Crores)	1st	2nd	3rd							
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		1st	2nd	3rd														
19.8	<p>Risk assessment</p> <ul style="list-style-type: none"> • Methodology • Hazard identification • Frequency analysis • Consequence analysis • Risk assessment outcome 																	
19.9	Emergency response and preparedness plan																	

20. Project Benefits

S. No..	Terms of Reference
20.1	Environment benefits
20.2	Social infrastructure
20.3	Employment and business opportunity
20.4	Other tangible benefits

21. Environment Cost Benefit Analysis

S. No..	Terms of Reference
21.1	Net present value
21.2	Internal rate of return
21.3	Benefit cost ratio
21.4	Cost effectiveness analysis

22. Environment Management Plan (Construction and Operation phase)

S. No..	Terms of Reference
22.1	Action plan for hazardous waste management
22.2	Action plan for solid waste management
22.3	Action plan for e-waste management.
22.4	Action plan for plastic waste management, considering the Plastic Waste Management Rules 2016.
22.5	Action plan for construction and demolition waste management.
22.6	Rain water harvesting plan
22.7	Plan for maximum usage of waste water/treated water in the Unit
22.8	Green belt development plan: An action plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.
22.9	Wildlife conservation plan (In case of presence of schedule I species)
22.10	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.

S. No..	Terms of Reference
22.11	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demand and waste disposal.
22.12	An Action Plan for improving the house-keeping activities in the raw material handling area need to be submitted
22.13	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap run off material shall be submitted.
22.14	Action plan to limit the dust emission from all the stacks below 30 mg/Nrn3 shall be furnished.
22.15	Action plan for fugitive emission control in the plant premises shall be provided.

Standard Terms of Reference for conducting Environment Impact Assessment Study for Cement plants and information to be included in EIA/EMP report

1.

Sr. No.	Terms of Reference
1.1	Limestone and coal linkage documents along with the status of environment clearance of limestone and coal mines.
1.2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;
1.3	Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.
1.4	If the raw materials used have trace elements, an environment management plan shall also be included.
1.5	Plan for the implementation of the recommendations made for the cement plants in the Corporate Responsibility for Environmental Protection (CREP) guidelines shall be prepared.
1.6	Energy consumption per ton of clinker and cement grinding
1.7	Provision of waste heat recovery boiler
1.8	Arrangement for co-processing of hazardous waste in cement plant.
1.9	Provision of Alternate fuels.

Sr. No.	Terms of Reference
1.10	Details of Implementation of Fly Ash Management Rules
1.11	Emission/Effluent norms as per GSR 496 (E) dated 9/5/2016 [EPA Rules 1986].
1.12	Action plan to limit the particulate matter emission from all the stacks below 30 mg/Nm ³ shall be furnished.
1.13	PP shall explore the possibility of plastic waste utilization in the Plant/Unit process.
1.14	Action plan for 100 % solid waste utilization shall be submitted.
1.15	PM (PM ₁₀ and P _{2.5}) present in the ambient air must be analysed for source analysis – natural dust/RSPM generated from plant operations (trace elements) of PM ₁₀ to be carried over.

Additional Terms of Reference

N/A

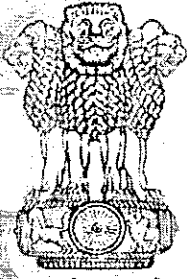
Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Ordinary Portland Cement (OPC)/ Portland Pozzolana Cement (PPC) and other cement	Product	4	MMTPA	Road	RCC silo- 1 No. of 10000 Tons.



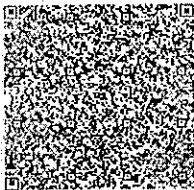
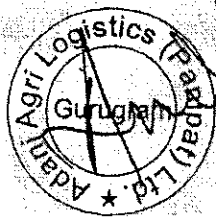
IN-GJ20968805578427V



सत्यमेव जयते

INDIA NON JUDICIAL
Government of Gujarat
Certificate of Stamp Duty

Certificate No. : IN-GJ20968805578427V
Certificate Issued Date : 09-Aug-2023 03:51 PM
Account Reference : IMPACC (AC)/ gj13001011/ GULBAI TEKRA/ GJ-AH
Unique Doc. Reference : SUBIN-GJGJ1300101167254943697854V
Purchased by : AMBUJA CEMENTS LIMITED
Description of Document : Article 5(h) Agreement (not otherwise provided for)
Description : Agreement
Consideration Price (Rs.) : 0
(Zero)
First Party : Adani Agri Logistics Panipat Limited
Second Party : AMBUJA CEMENTS LIMITED
Stamp Duty Paid By : AMBUJA CEMENTS LIMITED
Stamp Duty Amount(Rs.) : 300
(Three Hundred only)



0010009469

MEMMORANDUM OF UNDERSTANDING

THIS MEMMORANDUM OF UNDERSTANDING ("MoU") is made at Ahmedabad, on this 14th day of August, 2023

BETWEEN

ADANI AGRI LOGISTICS PANIPAT LIMITED (AALPL), a company incorporated under the Companies Act, 1956, having its Office at Adani Corporate House, Shantigram, Near Vaishnav Devi Circle, S. G. Highway, Khodiyar, Ahmedabad, Gujarat 382421 (hereinafter referred to as "AALPL", which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and permitted assigns) of the ONE PART.

AND

AMBUJA CEMENTS LIMITED (ACL), a company incorporated under the provisions of the Indian Companies Act, 1913, having its Registered Office at Adani Corporate House, Shantigram, Near Vaishnav Devi Circle, S.G. Highway, Khodiyar, Ahmedabad, Gujarat 382421, hereinafter called as "ACL" (which expression shall, unless repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns) of the OTHER PART.

WHEREAS,

- (1) ACL is desirous of setting up a cement grinding unit with 6 MMTPA capacity at the land measuring approximately **22.94 Acres**, situated at village Naultha, Tehsil- Israna, Dist- Panipat in Haryana.
- (2) AALPL is the owner of a portion of the aforesaid land, measuring approximately **22.94 Acres**.
- (3) ACL is desirous of taking the aforesaid portion of the land owned by AALPL on lease hold basis and AALPL is willing to make available the said land to ACL on leasehold basis; and
- (4) The Parties are desirous of recording their broad understanding concerning the same as herein after appearing in this MoU.

NOW THIS MEMMORANDUM OF UNDERSTANDING WITNESSES AS FOLLOWS:

1. ACL is desirous of setting up a cement grinding unit with 6 MMTPA capacity at the land measuring approximately **22.94 Acres** (as provided in Annexure A), situated at village Naultha, Tehsil- Israna, Dist- Panipat in Haryana. AALPL is the owner of a portion of the aforesaid land, measuring approximately **22.94 Acres** situated at Naultha, Tehsil- Israna, Dist- Panipat in Haryana. (Herein after referred to as the said Land) as provided in detail in the Schedule and **Annexure-A** hereinafter appearing. ACL is desirous of

having the possession of the said Land for the purpose of its aforesaid cement grinding unit and AALPL is willing to make the said land available to ACL on a leasehold basis, subject to the execution of a registered lease deed and approvals, if any required by AALPL under the applicable laws for the said transaction.

2. The Parties agree that this MoU shall be valid for a period of five Year with effect from 14th August 2023 or till the execution of the lease deed and other required documentations if any, whichever is earlier.
3. ACL shall take all the required permissions and NOCs to set up the cement grinding unit in the said Land and shall use the said Land in accordance with such approvals and NOCs. It shall duly adhere to all statutory compliances and shall not do any act / omission in connection with the said Land which may cause nuisance, annoyance, or safety threat.
4. ACL here by agrees to indemnify and hold AALPL harmless against any and all claims, demands, fines, losses, damages, costs, penalties, expenses, actions, suits or proceedings, injuries, monetary liability on account of death of / injury to any person, cost of response to any governmental inquiry, liability for loss of or damage to property and reasonable attorney and consulting fees and costs relating to any of the foregoing, arising from any statutory noncompliance / acts or omissions or breach of the terms and conditions herein by ACL / its personals.
5. Either party shall have the right to terminate this MoU by giving not less than 30 Days' notice in writing or in such an event this MoU shall stand terminated on the expiry of the said 30 days' period.
6. This MoU shall be subject to exclusive jurisdiction of the courts in Ahmedabad.
7. The railway line developed on the land of AALPL Naultha shall be utilized by ACL on mutual agreed terms for the proposed cement grinding unit

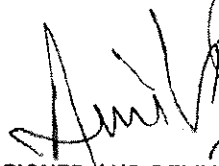

Schedule

All that piece and parcel of the land measuring approximately **22.94 Acres** area, situated at Mouza Naultha, Tehsil- Israna, Dist- Panipat in Haryana in the survey numbers as provided in "Annexure A" with boundaries as follows:

East - Agri Land
West - Railway Line
North - Naultha - Brahman Majra Village Road
South - Agri Land and Adani Silo Plant

IN WITNESS WHEREOF the parties hereto have executed this MoU the day, month and year first hereinabove written.

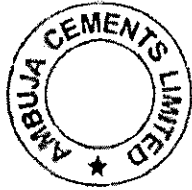


SIGNED AND DELIVERED by the within named
ADANI AGRI LOGISTICS PANIPAT LIMITED by its Authorized Signatory
Mr. Amit Garg
GM - Adani Agri Logistics Ltd



SIGNED AND DELIVERED by the within named
AMBUJA CEMENTS LIMITED by its Authorized Signatory
Mr. Sukuru Ramarao
Chief Operating Officer
Ambuja Cements Limited

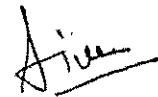


In the presence of

1. Mr. Bhimsi Kachhot



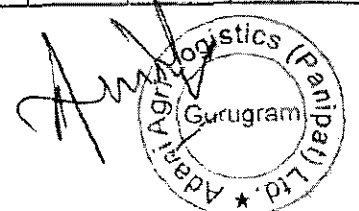
2. Mr. Amit Sinha



"ANNEXURE A"

LAND DETAIL in VILLAGE NAULTHA TEHSIL ISRANA, PANIPAT.									
Sr. No.	Village Name	Area From Sale Deed No.			Khawat No.	Khasra No.	Area		Area (in Acre)
		Sale Deed Date	Sale Deed No	Area from Sale Deed			Kanal	Marla	
1	Naultha	15/05/2020	56	2 - 3	278//232	126//8	2	3	
		15/05/2020	56	10 - 6		13	10	6	
		15/05/2020	56	8 - 0		14	8	0	
		15/05/2020	56	6 - 0		17/1	6	0	
		15/05/2020	56	6 - 0		18/1	6	0	
		15/05/2020	56	7 - 2		19/1	7	2	
				39 - 11	Kitta	6	39	11	4.94375
2	Naultha	28/05/2019	287	1 - 1.375	273//228	126//19/2/2	2	17	
		28/05/2019	288	1 - 15.625		21/1	3	5	
		28/05/2019	287	1 - 4.375			21/2	4	
		28/05/2019	288	2 - 0.625		22/1/1		0	
		28/05/2019	287	1 - 10.75			22/1/2	1	
		28/05/2019	288	2 - 11.25					
		28/05/2019	287	0 - 6.75					
		28/05/2019	288	0 - 11.25					
		28/05/2019	287	0 - 8.625					
		28/05/2019	288	0 - 14.375					
				12 - 5	Kitta		5	12	5
3	Naultha	8/5/2019	178	0 - 4	271//228	125//25/2/1	0	4	
		8/5/2019	178	2 - 2		25/2/2	2	2	
		8/5/2019	178	7 - 12		154//1	7	12	
		8/5/2019	178	10 - 14		155//5	10	14	
				20 - 12	Kitta	6	20	12	2.575
4	Naultha	8/5/2019	177	7 - 11	268//228/1	154//2/2	7	11	
		8/5/2019	177	5 - 17		3/2/1	5	17	
		8/5/2019	177	5 - 0		7/2	5	0	
		8/5/2019	177	8 - 0		8	8	0	
				26 - 8	Kitta	4	26	8	3.3
5	Naultha	3/8/2017	587	7 - 18	216//568 Min	155//21	7	18	
		3/8/2017	587	8 - 0		22	8	0	
				15 - 18	Kitta	2	15	18	1.9875
6	Naultha	15/06/2018	400	8 - 0	515//447	155//6	8	0	

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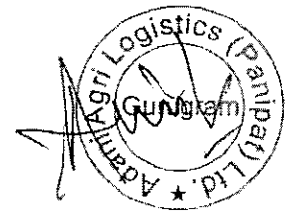
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	10 - 16				
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	10 - 18				
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	8 - 0				
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	8 - 0				
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	4 - 16				
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					

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		5/12/2018	944						
		15/06/2018	400						
		25/06/2018	436						
		3/7/2018	484						
		25/07/2018	555	11 - 0		19	11	0	
		30/07/2018	569						
		13/08/2018	603						
		5/12/2018	944						
				61 - 10	Kitta	7	61	10	7.6875
7	Naultha	20/07/2022	816	1 - 11		126//5/1	1	11	This Area comes from Exchange Deed with Gram Panchayat Village Naultha
		20/07/2022	816	5 - 16		7	5	16	
					Kitta 2		7	7	0.91875
Total Area (in Acres)									22.943

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Land Details

SN	Village Name	Khawat No/ Jamabandi No	Land Owner	Khasra No./Kila No	Kanal	Marla	Total Area Acer
1.	Naultha	278//232	Adani Agri Logistics Panipat Limited (AALPL)	126//8	2	3	0.26875
				126//13	10	6	1.2875
				126//14	8	0	1
				126//17/1	6	0	0.75
				126//18/1	6	0	0.75
				126//19.1	7	2	0.8875
			Total Land	39	11	4.94375	
2.	Naultha	273//228	Adani Agri Logistics Panipat Limited (AALPL)	126//19/2/2	2	17	0.35625
				126//21/1	3	5	0.40625
				126//21/2	4	2	0.5125
				126//21/1/1	0	18	0.1125
				126//21/1/2	1	3	0.14375
			Total Land	12	5	1.53125	
3.		271//228	Adani Agri Logistics Panipat Limited (AALPL)	125//25/2/1	0	4	0.025
				125//25/2/2	2	2	0.2625
				125//154/1	7	12	0.95
				125//155/5	10	14	1.3375
			Total Land	20	12	2.575	
4.	Naultha	268//228/1	Adani Agri Logistics Panipat Limited (AALPL)	154//2/2	7	11	0.94375
				3/2/1	5	17	0.73125
				7/2	5	0	0.625
				8	8	0	1
			Total Land	26	8	3.3	
5.	Naultha	216//568 Min	Adani Agri Logistics Panipat Limited (AALPL)	155//21	7	18	0.9875
				22	8	0	1
			Total Land	22	8	1.9875	
6.	Naultha	515//447	Adani Agri Logistics Panipat Limited (AALPL)	155//6	8	0	1
				7	10	16	1.35
				13	10	18	1.3625
				14	8	0	1
				15	8	0	1
				18/2	4	1	0.6
			Total Land	61	10	7.687501	
7	Naultha	126//5/1	Adani Agri Logistics Panipat Limited (AALPL)	126//5/1	1	11	0.19375
				126//7	5	16	0.725
			Total Land	7	7	0.91875	
Grand Total							22.943

1 kanal=0.125 Acer, 1 Marla= 0.00625001 Acer, 1 Kanal=20 marla

08520230008025

गौव : Nautha

हटवस्त न. : 38

जिना : पानीपत

तहसील : इसराना

साल : 2019-2020

नकल जमाबंदी (पड़त पटवार)

1	2	3	4	5	6	7	8	9	10	11
खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कारतकार	रुप या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रक्बा और किसम जमीन	दर और संख्या के ब्यारे के साथ लगान जो मुबारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का टंग	अभियुक्ति

कच्चा

8659 बै

126//

8

13

14

17/1

18/1

19/1

किते 6

कुल मजराआ

39-11

39-11 नहरी

2-3 नहरी

10-6 नहरी

8-0 नहरी

6-0 नहरी

6-0 नहरी

7-2 नहरी

39-11

P.T.O

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Nakal Fees Total Charges: 20 Rupees Only (Fee: 10 + Computer Service Charges:10)



नकल को वेरीफाई करने के लिए QR कोड को स्कैन करें



085202300008022

गाँव : Nauitha

नकल जमाबंदी (पड़त पटवार)

हदबस्त न. : 38

जिला : पानीपत

तहसील : इसराना

साल : 2019-2020

1	2	3	4	5	6	7	8	9	10	11
खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्नी नाम	विवरण सहित मालिक नाम	विवरण सहित कासतकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरबे और किले का नम्बर	रक्बा और किरम जमीन	तर और संख्या के ब्यारे के साथ तगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
273	314	पाना इंगरानडोला भाना	मै. अडानी एपी. लोजी पानीपत लि.	शुदकारत	राज न- 8	126// 19/2/2	2-17 नहरी	कब्ज़ा	8483 बे	
//			पानीपत लि.		राज न- 8	21/1	3-5 नहरी		8484 फकूल रहन	
228		भरतुनम्बदार	मै. अडानी एपी. लोजी पानीपत लि.		राज न- 8	21/2	4-2 नहरी		8517 बे	
			3/8 भाग वसीदेह		राज न- 8	22/1/1	0-18 नहरी			
					राज न- 8	22/1/2	1-3 नहरी			

किते 5

कुल मलरजा

12-5

12-5 नहरी

P.T.O

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Report Generation Date : 31/05/2023 10:29 AM

Nakal Fees Total Charges: 20 Rupees Only (Fee: 10 + Computer Service Charges: 10)



नकल को वरीफाई करते के लिए QR कोड को स्कैन करें

085202300008023

गाँव : Naulkha

हदबस्त नं. : 38

जिला : पानीपत

तहसील : इंसराना

साल : 2019-2020

नकल जमाबंदी (पड़त पटवार)

1	2	3	4	5	6	7	8	9	10	11
खेचट या जमाबंदी नं.	खतौनी नं.	नाम तरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कातकार	कुर या सिचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रक्बा और किसम जमीन	दर और सख्या के ब्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का टंग	अभियुक्ति

271	312	पाना इंगरानहोला	नै.अडानी एपी.	खुदकारत	125//	0-4 नहरी	8463 बै	कब्जा	— लाल आरम्भ—
//		भाना	लोजी.पानीपत लि.		25/2/1	2-2 नहरी	9162 तबादला		—लाल समाप्त—
228		भरतुनम्बरवार	वासीदेह		25/2/2	7-12 नहरी			
					154//	7-7 नहरी			
					1	10-14 नहरी			
					4/3				
					155//				
					5				

किले	5	27-19
कुल मजखगा		27-19
कुल मजखगा		27-19 नहरी

27-19 नहरी

31/5/23





085202300008020

गाँव : Naultha

नक़ल जमाबंदी (पड़त पटवार)

हदबस्त नं. : 38

जिला : पानीपत

तहसील : इसराना

साल : 2019-2020



1	2	3	4	5	6	7	8	9	10	11
खेबट या जमाबंदी नं.	खतौनी नाम सरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कारतकार	कुए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाड का ढंग	अभियुक्ति	
268	309	पाना इंगरामठोला	शुदकारन	154/1	7593 तकसीम	8484 षे	कच्चा	7593 तकसीम		
//		भाना	मै. अडाणी एग्री.	राज नं- 8	2/2	7-11 नहरी				
228/1		भरतुनम्बरदार	लौबी. पानीपत लि.	राज नं- 8	3/2 / 1	7-11 नहरी (5-14)				
			वासीदेह	राज नं- 8	7/2	5-0 नहरी				
				राज नं- 8	8	8-0 नहरी				

किते 4 28-2
कुल मजकूआ 28-2
28-2 नहरी

Handwritten notes and signatures in Hindi, including a large signature and the number 2125.



नक़ल को वेरीफाई करने के लिए QR कोड को स्कैन करें



085202300008019

गाँव : Naultha

नकल जमाबंदी (पड़त पटवार)

हदबस्त नं. : 38

जिला : पानीपत

तहसील : इसराना

साल : 2019-2020



1	2	3	4	5	6	7	8	9	10	11
खेच या जमाबंदी नं.	खतौनी नं.	नाम तरफ या पत्नी नाम तरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कारतकार	कुर या सिचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्जे और किले का नम्बर	रकबा और किस्म जमीन	दर और संध्या के ब्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाड का ढंग	अभियुक्ति

216 250 पाना इगरजठोला में अडानी एसी.
 // हटासअमृत लोली पानीपत सि.
 568 मिन नम्बरदार, सरबरा वासी
 रचबीर
 सिंरनम्बरदार

155//
 21 7-18 चाही
 22 8-0 चाही
 किले 2 15-18
 कुल मजकआ
 15-18
 15-18 चाही

7938 है
 8322 पारिवारिक हस्तंतरण

P.T.0



Issued to : sushil

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Report Generation Date : 31/05/2023 10:22 AM

Nakal Fees Total Charges: 20 Rupees Only (Fee: 10 + Computer Service Charges: 10)

नकल को वेरीफाई करने के लिए QR कोड को स्कैन करें



085202300008026

गाँव : Naultha

नक़ल जमाबंदी (पड़त पटवार)

रदबस्त नं. : 38

जिला : पानीपत

तहसील : इसरता

साल : 2019-2020

1	2	3	4	5	6	7	8	9	10	11
खेट या जमाबंदी नं.	खतौनी नं.	नाम तरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कारतकार	हुप या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाण का ढंग	अभियुक्ति
515	997	पाना इगरान	सतपाल,	खुदकारन व	राज नं-8	155//	8-0 नहरी	कच्चा .	8319दस्त8320बैय	
//		ठोलदुदयाण	ईशवर सिंह पुत्रान	मकबूजा	राज नं-8	6	10-16 नहरी	8317विरास्त	— लाल आरम्भ—	
447		दुलीचन्दनन्दरदर	रामसरूप पुत्र	मालकांन	राज नं-8	7	10-18 नहरी	शर नं: 20	— लाल समाप्त—	
			भोला		राज नं-8	13	8-0 नहरी	— लाल आरम्भ—		
			हर दो समभाग		राज नं-8	14	8-0 नहरी	— लाल समाप्त—		
			2/9 भाग		राज नं-8	15	8-0 नहरी	— लाल आरम्भ—		
			वसोदेह		राज नं-8	16	8-0 नहरी	बदर नं: 13	— लाल समाप्त—	
			सतबौर सिंह,		राज नं-8	17	8-0 नहरी	— लाल समाप्त—		
			जगबीर सिंह पुत्रान		राज नं-8	18	8-0 नहरी	— लाल आरम्भ—		
			रामकुवार पुत्र		राज नं-8	19	11-0 नहरी	बदर नं: 1	— लाल समाप्त—	
			रामसरूप		राज नं-8	24/2	2-0 नहरी	— लाल समाप्त—		
			हर दो समभाग		राज नं-8	25	8-0 नहरी	8341 बै	8571 पारिवारिक हस्तांतरण	
			2/27 भाग		राज नं-8			— लाल आरम्भ—		
			वासी		राज नं-8			8816 बै	— लाल समाप्त—	
			श्रीमति बाला देवी		राज नं-8			— लाल समाप्त—		
			विधवा व		राज नं-8			— लाल आरम्भ—		
			विशाल,		राज नं-8			8932 बै	— लाल समाप्त—	
			विकारा पुत्रान व		राज नं-8			— लाल आरम्भ—		
			सीमा देवी,		राज नं-8			— लाल समाप्त—		
			पूजा देवी पुत्रियां		राज नं-8			— लाल आरम्भ—		
			सत्यवान पुत्र		राज नं-8			— लाल समाप्त—		
			ताराबन्द		राज नं-8			8983 बै	— लाल आरम्भ—	
			हर पाँच समभाग		राज नं-8			— लाल समाप्त—		
			157/3815 भाग		राज नं-8			— लाल आरम्भ—		
			श्रीमति राजबाला पत्नी		राज नं-8			9040 पारिवारिक हस्तांतरण	— लाल समाप्त—	
			कृष्ण सिंह पुत्र		राज नं-8					

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Generated by pat_amlhoda1 from Web-Hairs

Report Generation Date : 31/05/2023 10:26 AM

Nakal Fees/Total Charges: 35 Rupees Only (Fee: 10 + Computer Service Charges:25)

Issued to : sushil

नक़ल को डीकोफ़ई करने के लिए QR कोड को स्कैन करें



08820230008026



नकल जमाबंदी (पड़त पटवार)

गाँव : Naulitha

हदबस्त न. : 38

जिला : पानीपत

तहसील : इसराना

साल : 2019-2020

खेट या जमाबंदी नं.	खतौली नं.	नाम तरफ या पत्नी	विवरण सहित मालिक नाम	विवरण सहित कासतकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुब्बे और किले का नम्बर	रकबा और किसम जमीन	दर और संख्या के न्यरि के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का हंग	अभियुक्ति
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रामसरूप

1048/3615 भाग

रणधीर सिंह,

महावीर सिंह पुत्रान

लखमीचन्द पुत्र

भोला

पाना इरान चालू

हर दो समभाग

13/63 भाग

सोना देवी पुत्री

लखमीचन्द पुत्र

1/126 भाग

रेखा देवी बिधवा

कुलदीप पुत्र

बेगराज

13/1008 भाग

वासीदेह

विरेन्द्र सिंह पुत्र

बेगराज पुत्र

लखमीचन्द

2873/342846 भाग

रणधीर सिंह पुत्र

लखमीचन्द पुत्र

भोला

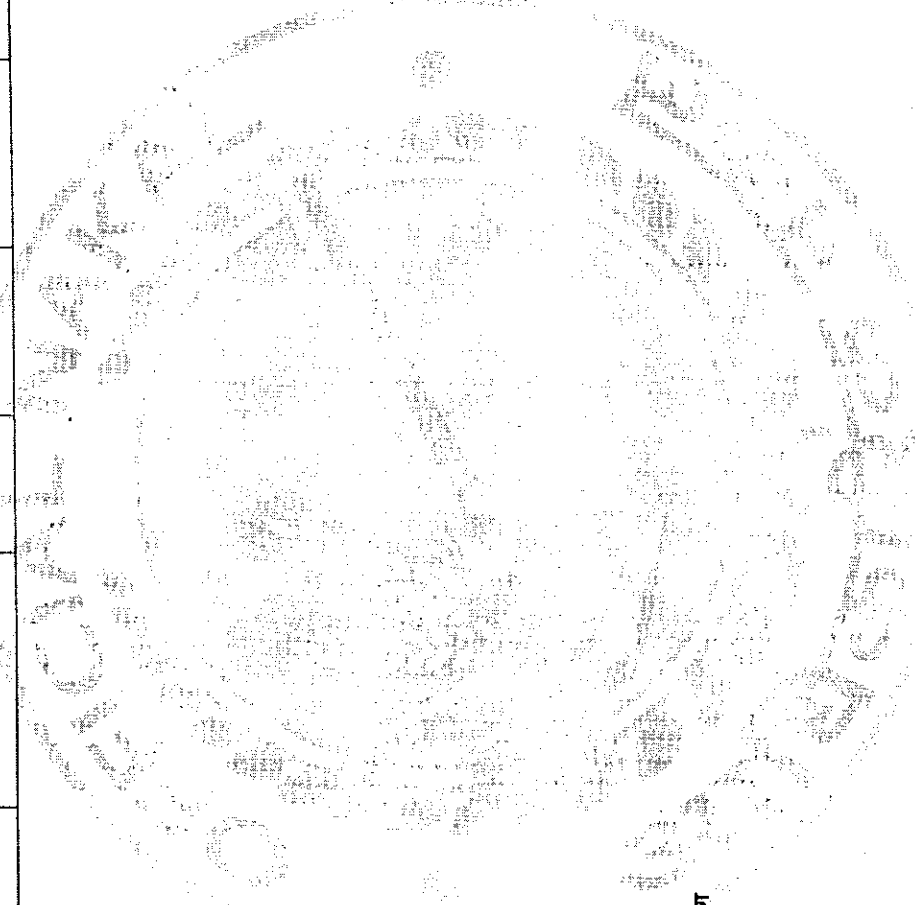
1/189 भाग

वासी

विकास कुमार,

मनदीप पुत्रान

515चालू



P.T.O

Issued to : sushil

Generated vide Entry/Receipt No. 08520230008026 : Dated:31-05-2023 00:00:00

Generated by pat_Lamithoda1 from Web-Halis

Report Generation Date : 31/05/2023 10:28 AM

Nakal Fees/Total Charges: 35 Rupees Only (Fee: 10 + Computer Service Charges:25)

नकल को वेरीफाई करने के लिए QR कोड को स्कैन करें



085202300008026

नकल जमाबंदी (पड़त पटवार)

गाँव : Naulitha

हदबस्त न. : 38

जिला : पानीपत

तहसील : इसराना

साल : 2019-2020

खेवट या जमाबंदी न.	खतौली नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित कारखाना	कुंए या सिंचाई के अन्य साधन का नाम	नाम्बर खसरा या मुराबे और किले का नम्बर	रकबा और किसम जमीन	दर और संख्या के ब्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
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महाबीर सिंह पुत्र
लखमीचन्द
हर दो सतभाग
1/189 भाग
वासी
सचिन पुत्र
कुल्दीप पुत्र
बेगराल
117/45350 भाग
सचिन पुत्र
कुल्दीप पुत्र
बेगराल
12/22675 भाग
सचिन पुत्र
कुल्दीप पुत्र
बेगराल
117/22675 भाग
विरन्द्र सिंह पुत्र
बेगराल पुत्र
लखमीचन्द
1/378 भाग
श्री.अडानी एचो.
सोनी.पानीपत लि.
209203/2742768 भाग
जगबीर सिंह,
सतबीर सिंह पुत्रान
रामकुमार पुत्र

515घालू पाना इगराल चालू

P.T.O

Issued to : sushil

Generated vide Entry/Receipt No. 065202300008026 . Dated:31-05-2023 00:00:00

Generated by pat_amithooda1 from Web-Haris

Report Generation Date : 31/05/2023 10:28 AM

Nakal Fees/Total Charges: 35 Rupees Only (Fee: 10 + Computer Service Charges:25)



नकल को वेरीफाई करने के लिए QR कोड को स्कैन करें

08520230008026

नक़ल जमाबंदी (पड़ल पटवार)

गाँव : Naulitha

खिबा : पत्तीपत

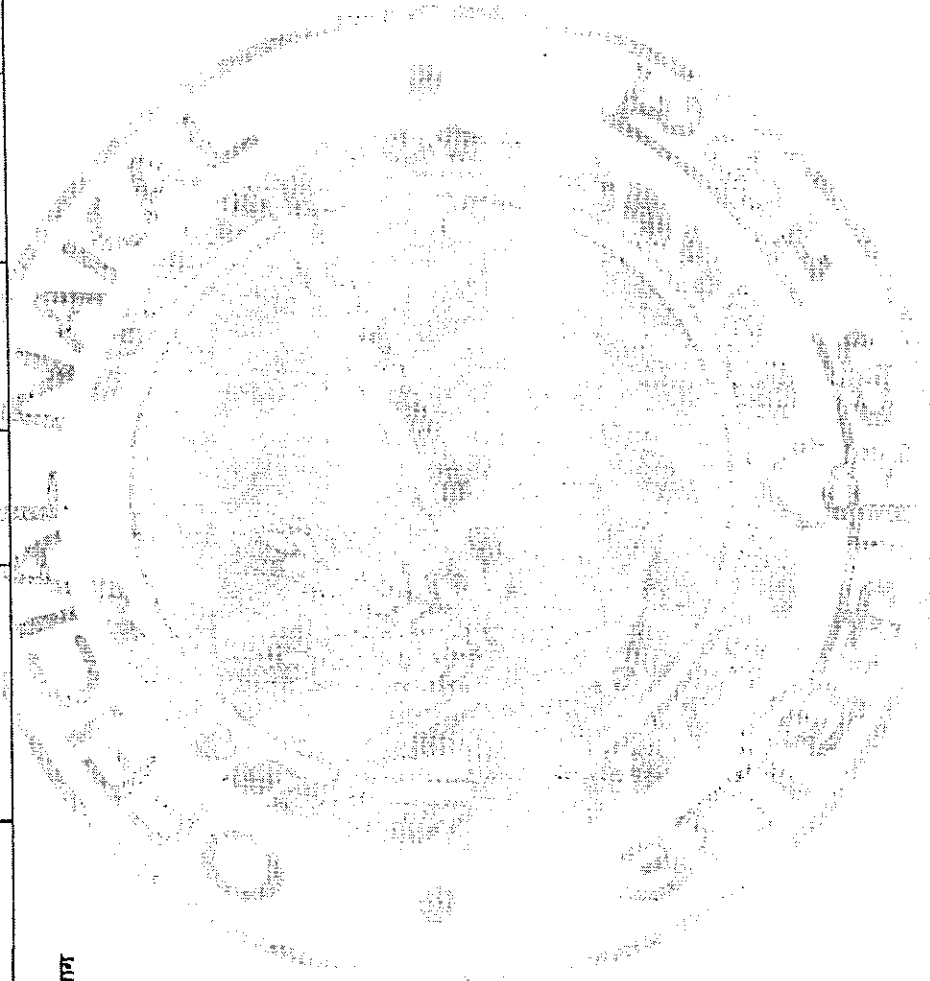
हदवस्त न. : 38

तहसील : इसराना

साल : 2019-2020

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित कातकार	कुष या सिंचाई के अन्य सापन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रखबा और किसम जमीन	दर और संख्या के ब्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीपत का पैमाना और बाड का ढंग	अभियुक्ति
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रामसरप
 हर दो समभाग
 1/27 भाग
 वासीदेह



P.T-2



Issued to : sushil

Generated vide Entry/Receipt No. 08520230008026 : Date:31-05-2023 00:00:00

Generated by pat_arnithooda1 from Web+Helris

Report Generation Date : 31/05/2023 10:28 AM

Nakal Fees Total Charges: 35 Rupees Only (Fees: 10 + Computer Service Charges:25)

नक़ल को वरीफाई करने के लिए QR कोड को स्कैन करें

रजिस्टर इंतकाल

हदबसत नंबर : 38 तहसील : इसराना जिला : पानीपत तर्क संख्या : 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
नंबर	शुमार खाला	नाम तरफा या चाह	नाम मातिक व विवरण	नाम काशतकार व विवरण	नाम मातिक व विवरण	नाम कारातकार व विवरण	नंबर खाता जमाबंदी जदीद	ग्राम पंचायत नौल्या बदस्तूर	इंगरान वासीदेह	नंबर व नाम खेत व रकबा व किस्म जमीन	नाम भागला या लगान	किस्म या तारीख इंतकाल मय बै जरहन	फिस दाखिला या तसदीक खारज गिरदावर कानूनगो	रिपोर्ट पटवारी
9162	268/1	पाना इंगरान	मै.अडानी एग्री. व लोडी.पानीपत ति. वासीदेह	बदस्तूर	154//	3/2	7-11 नहरी	ग्राम पंचायत नौल्या बदस्तूर	इंगरान वासीदेह	154//	3/2/2	816/1	20-07-2022	पटवारी
268		मिन टोला माना भरतु खेत न. नम्बरदार			किते 1	7-11				नहरी				
271/1		पाना इंगरान	मै.अडानी एग्री.	बदस्तूर	154//	4/3	7-7 नहरी	ग्राम पंचायत नौल्या बदस्तूर	इंगरान वासीदेह	154//	4/3	4593750/-	23/7/22	
271		मिन टोला माना भरतु खेत न. नम्बरदार			किते 1	7-7				नहरी				

(Handwritten signatures and stamps)
 15/11/2022
 15/11/2022
 15/11/2022
 15/11/2022

रजिस्टर इंतकाल

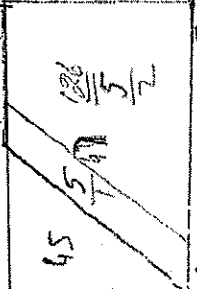
हदबसत नंबर : 38

तहसील : इसराना

जिला : पानीपत

वर्क संख्या : 2

नंबर	नंबर खाला	नाम सरफा या चाह	नाम मालिक व विवरण	नाम काशतकार व विवरण	नाम मासिक व विवरण	नाम काशतकार व विवरण	नाम व नाम खेत व रकबा व किस्म जमीन	मासला या लगान	मासला या लगान	किस्म या तारीख इंतकाल मय बे जरहल	कीस दाखिला या खारज	रिपोटपटवारी या तसदीक गिरदावर कानूनगो
9162	1800/1	खाली	पंचायतदेह नौल्या दुंगरांग खाली	बदस्तर	मै अडानी एग्री बोली बदस्तर	हिस्सा मुन्तकिला	सालम 126//	154	34	34	34	31
	मिन				पानीपत लि		5/1	3/2	34x31			
	खेत नं.				वसीदेह		1-11-	2/3/2	34	34	34	9
	1800		88971/192406				नहरी 7		34x9			7
			भाग वसीदेह				5-16 नहरी	126	45	8	9	1-12
			पंचायत देह नौल्या खाली				नहरी	5	99(5+6)			7
			103435/192406				किते 2	5/2	5/1	5/2		7
			भाग वसीदेह				7-7					7



पंडाल रचना की जाई
 126
 5
 5/1
 5/2
 किते 2
 7-7
 मजरा
 9-1-0
 जोड़
 मुन्तकिला

Tahsil Sandh
 39

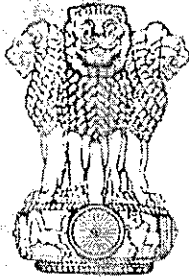
39

154
 5
 30.8
 31

34 x 9 = 306



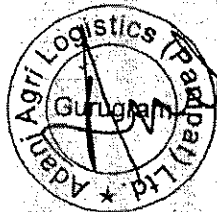
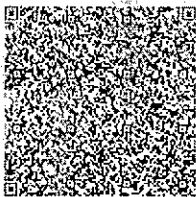
IN-GJ20968805578427V



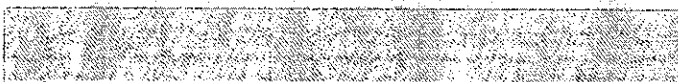
सत्यमेव जयते

INDIA NON JUDICIAL
Government of Gujarat
Certificate of Stamp Duty

Certificate No.	IN-GJ20968805578427V
Certificate Issued Date	09-Aug-2023 03:51 PM
Account Reference	IMPACC (AC)/ gj13001011/ GULBAI TEKRA/ GJ-AH
Unique Doc. Reference	SUBIN-GJGJ1300101167254943697854V
Purchased by	AMBUJA CEMENTS LIMITED
Description of Document	Article 5(h) Agreement (not otherwise provided for)
Description	Agreement
Consideration Price (Rs.)	0 (Zero)
First Party	Adani Agri Logistics Panipat Limited
Second Party	AMBUJA CEMENTS LIMITED
Stamp Duty Paid By	AMBUJA CEMENTS LIMITED
Stamp Duty Amount(Rs.)	300 (Three Hundred only)



0010009469



MEMMORANDUM OF UNDERSTANDING

THIS MEMMORANDUM OF UNDERSTANDING ("MoU") is made at Ahmedabad, on this 14th day of August, 2023

BETWEEN

ADANI AGRI LOGISTICS PANIPAT LIMITED (AALPL), a company incorporated under the Companies Act, 1956, having its Office at Adani Corporate House, Shantigram, Near Vaishnav Devi Circle, S. G. Highway, Khodiyar, Ahmedabad, Gujarat 382421 (hereinafter referred to as "AALPL", which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and permitted assigns) of the ONE PART.

AND

AMBUJA CEMENTS LIMITED (ACL), a company incorporated under the provisions of the Indian Companies Act, 1913, having its Registered Office at Adani Corporate House, Shantigram, Near Vaishnav Devi Circle, S.G. Highway, Khodiyar, Ahmedabad, Gujarat 382421, hereinafter called as "ACL" (which expression shall, unless repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns) of the OTHER PART.

WHEREAS,

(1) ACL is desirous of setting up a cement grinding unit with 6 MMTPA capacity at the land measuring approximately **22.94 Acres**, situated at village Naultha, Tehsil- Israna, Dist- Panipat in Haryana.

(2) AALPL is the owner of a portion of the aforesaid land, measuring approximately **22.94 Acres**.

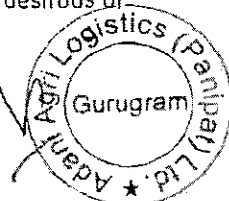
(3) ACL is desirous of taking the aforesaid portion of the land owned by AALPL on lease hold basis and AALPL is willing to make available the said land to ACL on leasehold basis; and

(4) The Parties are desirous of recording their broad understanding concerning the same as herein after appearing in this MoU.

NDW THIS MEMMORANDUM OF UNDERSTANDING WITNESSES AS FOLLOWS:

1. ACL is desirous of setting up a cement grinding unit with 6 MMTPA capacity at the land measuring approximately **22.94 Acres** (as provided in Annexure A), situated at village Naultha, Tehsil- Israna, Dist- Panipat in Haryana. AALPL is the owner of a portion of the aforesaid land, measuring approximately **22.94 Acres** situated at Naultha, Tehsil- Israna, Dist- Panipat in Haryana. (Herein after referred to as the said Land) as provided in detail in the Schedule and **Annexure-A** hereinafter appearing. ACL is desirous of

[Handwritten signature]

[Handwritten signature]


- having the possession of the said Land for the purpose of its aforesaid cement grinding unit and AALPL is willing to make the said land available to ACL on a leasehold basis, subject to the execution of a registered lease deed and approvals, if any required by AALPL under the applicable laws for the said transaction.
2. The Parties agree that this MoU shall be valid for a period of five Year with effect from 14th August 2023 or till the execution of the lease deed and other required documentations if any, whichever is earlier.
 3. ACL shall take all the required permissions and NOCs to set up the cement grinding unit in the said Land and shall use the said Land in accordance with such approvals and NOCs. It shall duly adhere to all statutory compliances and shall not do any act / omission in connection with the said Land which may cause nuisance, annoyance, or safety threat.
 4. ACL here by agrees to indemnify and hold AALPL harmless against any and all claims, demands, fines, losses, damages, costs, penalties, expenses, actions, suits or proceedings, injuries, monetary liability on account of death of / injury to any person, cost of response to any governmental inquiry, liability for loss of or damage to property and reasonable attorney and consulting fees and costs relating to any of the foregoing, arising from any statutory noncompliance / acts or omissions or breach of the terms and conditions herein by ACL / its personals.
 5. Either party shall have the right to terminate this MoU by giving not less than 30 Days' notice in writing or in such an event this MoU shall stand terminated on the expiry of the said 30 days' period.
 6. This MoU shall be subject to exclusive jurisdiction of the courts in Ahmedabad.
 7. The railway line developed on the land of AALPL Naultha shall be utilized by ACL on mutual agreed terms for the proposed cement grinding unit

Schedule

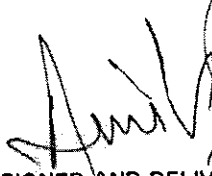
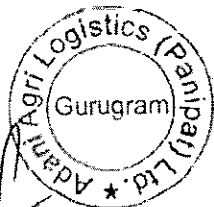
All that piece and parcel of the land measuring approximately **22.94 Acres** area, situated at Mouza Naultha, Tehsil- Israna, Dist- Panipat in Haryana in the survey numbers as provided in "Annexure A" with boundaries as follows:

East - Agri Land
West - Railway Line
North - Naultha - Brahman Majra Village Road
South - Agri Land and Adani Silo Plant

IN WITNESS WHEREOF the parties hereto have executed this MoU the day, month and year first hereinabove written.

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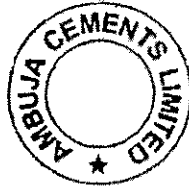


SIGNED AND DELIVERED by the within named
ADANI AGRI LOGISTICS PANIPAT LIMITED by its Authorized Signatory
Mr. Amit Garg
GM – Adani Agri Logistics Ltd



SIGNED AND DELIVERED by the within named
AMBUJA CEMENTS LIMITED by its Authorized Signatory
Mr. Sukuru Ramarao
Chief Operating Officer
Ambuja Cements Limited



In the presence of

1. Mr. Bhimsi Kachhot



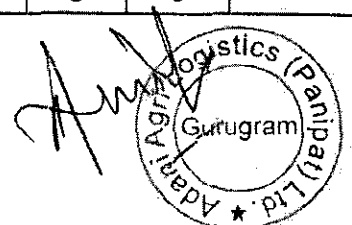
2. Mr. Amit Sinha



"ANNEXURE A"

LAND DETAIL in VILLAGE NAULTHA TEHSIL ISRANA, PANIPAT.									
Sr. No.	Village Name	Area From Sale Deed No.			Khawat No.	Khasra No.	Area		Area (In Acre)
		Sale Deed Date	Sale Deed No	Area from Sale Deed			Kanal	Marla	
1	Naultha	15/05/2020	56	2 - 3	278//232	126//8	2	3	
		15/05/2020	56	10 - 6		13	10	6	
		15/05/2020	56	8 - 0		14	8	0	
		15/05/2020	56	6 - 0		17/1	6	0	
		15/05/2020	56	6 - 0		18/1	6	0	
		15/05/2020	56	7 - 2		19/1	7	2	
				39 - 11	Kitta	6	39	11	4.94375
2	Naultha	28/05/2019	287	1 - 1.375	273//228	126//19/2/2	2	17	
		28/05/2019	288	1 - 15.625		21/1	3	5	
		28/05/2019	287	1 - 4.375		21/2	4	2	
		28/05/2019	288	2 - 0.625		22/1/1	0	18	
		28/05/2019	287	1 - 10.75		22/1/2	1	3	
		28/05/2019	288	2 - 11.25					
		28/05/2019	287	0 - 6.75					
		28/05/2019	288	0 - 11.25					
		28/05/2019	287	0 - 8.625					
		28/05/2019	288	0 - 14.375					
				12 - 5	Kitta	5	12	5	1.53125
3	Naultha	8/5/2019	178	0 - 4	271//228	125//25/2/1	0	4	
		8/5/2019	178	2 - 2		25/2/2	2	2	
		8/5/2019	178	7 - 12		154//1	7	12	
		8/5/2019	178	10 - 14		155//5	10	14	
				20 - 12	Kitta	6	20	12	2.575
4	Naultha	8/5/2019	177	7 - 11	268//228/1	154//2/2	7	11	
		8/5/2019	177	5 - 17		3/2/1	5	17	
		8/5/2019	177	5 - 0		7/2	5	0	
		8/5/2019	177	8 - 0		8	8	0	
				26 - 8	Kitta	4	26	8	3.3
5	Naultha	3/8/2017	587	7 - 18	216//568 Min	155//21	7	18	
		3/8/2017	587	8 - 0		22	8	0	
				15 - 18	Kitta	2	15	18	1.9875
6	Naultha	15/06/2018	400	8 - 0	515//447	155//6	8	0	

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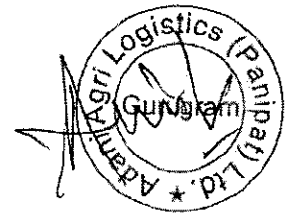
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	10 - 16		7	10	16
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	10 - 18		13	10	18
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	8 - 0		14	8	0
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	8 - 0		15	8	0
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					
5/12/2018	944					
15/06/2018	400	4 - 16		18/2	4	16
25/06/2018	436					
3/7/2018	484					
25/07/2018	555					
30/07/2018	569					
13/08/2018	603					

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		5/12/2018	944						
		15/06/2018	400	11 - 0	Kitta	19	11	0	
		25/06/2018	436						
		3/7/2018	484						
		25/07/2018	555						
		30/07/2018	569						
		13/08/2018	603						
		5/12/2018	944						
				61 - 10		7	61	10	7.6875
7	Naultha	20/07/2022	816	1 - 11		126//5/1	1	11	This Area comes from Exchange Deed with Gram Panchayat Village Naultha
		20/07/2022	816	5 - 16		7	5	16	
					Kitta 2		7	7	0.91875
Total Area (in Acres)									22.943

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ECOMEN MINING PRIVATE LIMITED

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Second Floor Hall, House No. B-1/8, Sector-H, Allganj, Lucknow - 226 024

Phone No. : 0522 - 4079201/2746282

E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1Z1

An approved Laboratory from Ministry of Environment, Forest and Climate Change & CPCB Govt. of India, New Delhi

AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
		Name of Sample: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Sampling Location: Within Project Site
Date of Sample Receipt:	31.12.2023	Completion Date: 05.01.2024
Date of Analysis:	31.12.2023	Issued On : 07.01.2024
Sample Drawn By:	ELPL Representative	Sampling Method: IS 5182
Sample Received By:	ELPL Representative	Sample Condition: Satisfactory
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
03.10.2023	66.21	32.94	11.68	25.62	0.50
06.10.2023	63.49	30.41	12.11	32.14	0.53
10.10.2023	70.56	35.62	14.56	22.35	0.37
13.10.2023	60.26	33.63	15.02	21.47	0.68
17.10.2023	64.93	37.56	13.23	23.84	0.47
20.10.2023	61.07	29.89	10.86	20.06	0.47
24.10.2023	63.34	30.03	13.00	21.69	0.54
27.10.2023	43.85	33.51	12.17	24.07	0.51
03.11.2023	68.21	36.04	11.58	26.35	0.55
07.11.2023	65.30	38.02	9.36	20.01	0.63
10.11.2023	61.24	29.25	11.08	21.32	0.50
14.11.2023	46.45	26.39	15.64	28.05	0.57
17.11.2023	47.49	23.41	12.98	23.16	1.06
21.11.2023	57.72	32.54	10.88	26.53	0.63
24.11.2023	65.19	31.26	12.62	16.84	0.65
28.11.2023	62.82	36.57	10.39	18.23	0.96
01.12.2023	49.48	32.19	12.24	19.02	0.72
04.12.2023	54.06	35.75	10.89	21.02	0.46
08.12.2023	57.02	33.44	12.15	20.85	0.71
11.12.2023	53.51	28.16	11.19	26.52	0.78
15.12.2023	55.14	23.65	12.63	23.00	0.68
18.12.2023	60.78	33.63	12.73	27.21	0.55
23.12.2023	62.51	32.90	15.43	26.88	0.96
25.12.2023	60.32	29.53	14.05	23.48	0.52

	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	70.16	36.54	7.10	23.05	0.56
GEOMETRIC MEAN	58.86	31.75	12.23	22.90	0.63
STD. GEO. DEVN. (24 HRS.)	7.26	4.11	1.47	3.56	0.18
98th PERCENTILES	87.20	54.93	8.2	34.02	0.79
MAXIMUM CONCENTRATION	79.6	38.0	15.6	32.1	1.06
MINIMUM CONCENTRATION	40.4	23.1	0.4	16.0	0.37

PERCENTILE VALUE										
	10	25	50	75	90	95	98	99	99.5	99.8
PM ₁₀	45.42	54.66	57.37	60.26	60.92	62.51	63.42	65.19	67.21	68.48
PM _{2.5}	24.40	29.24	30.15	32.00	32.74	33.63	34.73	35.64	37.07	37.81
SO ₂	10.87	11.00	11.54	12.05	12.16	12.34	12.08	12.31	14.27	15.50
NO ₂	19.33	20.53	21.91	21.51	22.68	23.43	24.25	26.42	27.81	27.74
CO	0.47	0.46	0.50	0.55	0.60	0.65	0.71	0.80	0.94	1.01

Note: All units are µg/m³ except CO is mentioned in ppm

---End of Report---

Verified By
[Signature]
Technical Manager

Authorized By
[Signature]
Quality Manager



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AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Name of Sample: AAQ
Date of Sample Receipt:	31.12.2023	Sampling Location: Brahman Majra
Date of Analysis:	31.12.2023	Completion Date: 05.01.2024
Sample Drawn By:	ELPL Representative	Issued On : 07.01.2024
Sample Received By:	ELPL Representative	Sampling Method: IS 5182
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		Sample Condition: Satisfactory

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
03.10.2023	65.20	29.66	14.26	26.62	0.16
06.10.2023	62.52	31.42	14.94	19.41	0.48
10.10.2023	65.43	33.42	17.20	24.16	0.46
15.10.2023	62.14	36.11	13.65	26.87	0.54
17.10.2023	59.56	29.64	14.24	27.58	0.33
20.10.2023	47.94	21.42	14.95	27.12	0.33
21.10.2023	64.28	32.08	9.98	26.92	0.56
27.10.2023	60.88	27.86	12.58	20.62	0.18
02.11.2023	53.96	30.62	16.40	21.62	0.31
07.11.2023	58.06	27.18	16.42	23.72	0.42
10.11.2023	67.56	33.13	14.29	26.53	0.54
14.11.2023	59.46	29.68	14.26	24.02	0.39
17.11.2023	56.14	34.19	15.54	26.35	0.42
21.11.2023	62.36	29.16	11.37	25.09	0.29
24.11.2023	62.86	31.44	14.24	22.36	0.36
28.11.2023	67.14	32.62	14.84	24.97	0.41
01.12.2023	55.68	25.65	14.01	19.62	0.46
04.12.2023	56.92	28.60	15.48	21.35	0.46
08.12.2023	61.42	26.36	14.16	20.52	0.56
11.12.2023	45.26	21.42	16.41	22.06	0.39
15.12.2023	57.11	32.68	13.33	24.16	0.26
18.12.2023	55.02	33.15	11.43	25.48	0.46
22.12.2023	59.16	28.74	11.82	25.54	0.51
25.12.2023	63.18	30.12	13.81	23.62	0.46

	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	59.16	30.54	14.10	23.05	0.56
GEOMETRIC MEAN	60.25	29.23	13.86	24.01	0.45
STD. GEO. DEVN. (24 HRS.)	1.77	2.79	1.74	2.11	0.09
98th PERCENTILES	57.29	34.93	6.2	34.62	0.79
MAXIMUM CONCENTRATION	67.4	34.2	17.2	27.6	0.56
MINIMUM CONCENTRATION	47.9	21.4	10.9	19.4	0.26

PERCENTILE VALUE										
	10	20	30	40	50	60	70	80	90	95
PM ₁₀	53.49	56.14	57.83	59.26	61.15	62.36	63.52	65.24	67.25	67.39
PM _{2.5}	26.12	27.86	28.89	29.66	30.27	31.42	31.73	32.62	33.15	33.71
SO ₂	11.55	12.84	13.24	13.68	14.05	14.25	14.56	14.50	16.36	16.83
NO ₂	20.55	21.58	23.51	24.05	24.20	24.09	25.56	26.57	26.84	26.95
CO	0.32	0.36	0.36	0.42	0.46	0.46	0.47	0.51	0.55	0.56

Note: All units are µg/m³ except CO is mentioned in ppm

----End of Report----

Verified By

A. K. S. K.
Technical Manager

Authorized By

A. K. S. K.
Quality Manager





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AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Name of Sample: AAQ
Date of Sample Receipt:	31.12.2023	Sampling Location: Near Nathulatha Station
Date of Analysis:	31.12.2023	Completion Date: 05.01.2024
Sample Drawn By:	ELPL Representative	Issued On : 07.01.2024
Sample Received By:	ELPL Representative	Sampling Method: IS 5182
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		Sample Condition: Satisfactory

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
07.10.2023	66.55	35.26	11.12	21.35	0.55
12.10.2023	70.16	31.65	13.52	25.94	0.41
14.10.2023	63.52	28.56	9.82	21.56	0.54
19.10.2023	72.69	28.60	10.72	29.66	0.47
21.10.2023	68.21	31.25	11.56	27.41	0.52
26.10.2023	51.2*	27.19	13.56	32.10	0.50
28.10.2023	70.16	37.18	10.74	23.60	0.47
31.10.2023	72.50	35.20	9.56	19.47	0.54
01.11.2023	68.36	36.18	9.68	21.50	0.41
06.11.2023	72.58	38.55	10.02	22.98	0.59
08.11.2023	67.40	34.86	11.36	24.96	0.50
13.11.2023	65.82	39.40	12.35	28.53	0.46
15.11.2023	67.16	33.78	11.20	27.43	0.36
20.11.2023	64.80	28.48	10.56	29.18	0.35
22.11.2023	69.36	31.56	10.30	24.26	0.41
27.11.2023	59.86	34.62	13.62	25.52	0.42
05.12.2023	61.80	48.24	10.51	21.18	0.74
09.12.2023	64.19	28.78	9.16	26.20	0.56
12.12.2023	65.22	36.22	11.62	33.47	0.37
16.12.2023	74.00	38.71	11.65	27.38	0.37
19.12.2023	71.94	37.56	13.68	30.16	0.62
23.12.2023	69.26	36.79	10.94	25.90	0.39
26.12.2023	71.42	27.13	8.68	28.10	0.30
30.12.2023	73.42	33.20	9.14	21.24	0.45

	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	70.16	36.54	7.10	23.05	0.56
GEOMETRIC MEAN	67.36	34.02	10.95	25.10	0.47
STD. GEO. DEVN. (24 HRS.)	5.05	3.83	1.44	3.58	0.09
98th PERCENTILES	87.29	54.93	8.2	34.02	0.79
MAXIMUM CONCENTRATION	74.0	49.1	13.7	32.1	0.74
MINIMUM CONCENTRATION	51.2	27.1	8.7	18.5	0.35

PERCENTILE VALUE										
	10	20	30	40	50	60	70	80	90	98
PM ₁₀	60.83	64.19	65.52	67.16	68.29	69.46	70.79	72.50	73.06	73.74
PM _{2.5}	27.84	28.75	32.43	33.78	35.23	36.16	36.98	38.24	38.66	39.08
SO ₂	9.28	9.76	10.27	10.59	10.84	11.18	11.57	11.93	13.54	13.65
NO ₂	21.27	21.54	23.42	24.38	25.71	26.15	27.41	28.27	29.15	31.12
CO	0.37	0.39	0.39	0.42	0.46	0.49	0.52	0.54	0.58	0.68

Note: All units are µg/m³ except CO is mentioned in ppm

---End of Report---

Verified By

[Signature]
Technical Manager

Authorized By

[Signature]
Quality Manager





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Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Name of Sample: AAQ
Date of Sample Receipt:	31.12.2023	Sampling Location: Naulatha
Date of Analysis:	31.12.2023	Completion Date: 05.01.2024
Sample Drawn By:	ELPL Representative	Issued On : 07.01.2024
Sample Received By:	ELPL Representative	Sampling Method: IS 5182
Environmental Condition:	Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH	Sample Condition: Satisfactory

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
03.10.2023	53.53	27.15	12.88	21.14	0.73
06.10.2023	57.41	24.37	10.23	19.08	0.40
10.10.2023	44.84	21.99	13.07	20.76	0.38
13.10.2023	55.97	29.72	10.31	23.81	0.79
17.10.2023	62.52	35.60	13.42	18.96	0.44
20.10.2023	49.83	20.94	15.04	23.88	0.78
24.10.2023	58.27	28.61	10.23	19.77	0.39
27.10.2023	62.57	31.72	11.04	22.33	0.56
03.11.2023	62.12	33.94	11.88	20.88	0.36
07.11.2023	55.89	31.32	11.74	21.76	0.60
10.11.2023	51.90	27.61	11.00	21.15	0.94
14.11.2023	58.94	30.34	12.48	20.63	0.65
17.11.2023	57.09	26.35	10.99	23.68	0.27
21.11.2023	50.54	22.21	11.02	28.00	0.41
24.11.2023	54.10	24.62	13.52	21.12	0.33
28.11.2023	55.44	27.00	12.73	18.25	0.87
01.12.2023	61.12	29.83	10.78	19.74	0.40
04.12.2023	53.20	22.15	11.83	23.17	1.02
08.12.2023	50.87	28.25	10.08	19.03	0.12
11.12.2023	57.72	31.89	11.17	27.56	0.75
15.12.2023	56.11	29.30	16.82	18.62	0.39
18.12.2023	54.02	28.70	10.64	22.30	0.84
22.12.2023	55.71	28.26	12.06	26.16	0.53
25.12.2023	59.55	28.90	14.08	19.17	0.35

	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	70.16	36.54	7.10	23.05	0.56
GEOMETRIC MEAN	54.94	26.83	11.94	21.98	0.53
STD. GEO. DEVN. (24 HRS.)	4.57	3.66	1.64	3.74	0.22
98th PERCENTILES	87.29	54.93	8.2	34.02	0.79
MAXIMUM CONCENTRATION	62.6	33.9	16.8	34.8	1.02
MINIMUM CONCENTRATION	43.8	20.3	10.1	18.2	0.27

PERCENTILE VALUE										
	10	20	30	40	50	60	70	80	90	95
PM ₁₀	47.69	51.90	53.26	54.10	55.80	56.11	57.57	58.94	61.62	62.26
PM _{2.5}	21.46	22.45	25.11	26.35	27.38	28.64	29.51	30.34	31.81	33.00
SO ₂	10.25	10.72	11.00	11.97	11.78	12.02	12.75	13.21	13.93	16.00
NO ₂	18.96	19.13	19.77	20.78	21.13	22.07	23.22	23.84	27.14	37.14
CO	0.36	0.38	0.38	0.41	0.49	0.59	0.73	0.76	0.86	0.98

Note: All units are µg/m³ except CO is mentioned in ppm

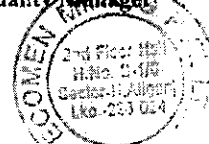
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Technical Manager

Authorized By

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ECOMEN MINING PRIVATE LIMITED

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E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1Z1

An approved Laboratory from Ministry of Environment, Forest and Climate Change & CPCB Govt. of India, New Delhi

AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Name of Sample: AAQ
Date of Sample Receipt:	31.12.2023	Sampling Location: Balana
Date of Analysis:	31.12.2023	Completion Date: 05.01.2024
Sample Drawn By:	ELPL Representative	Issued On : 07.01.2024
Sample Received By:	ELPL Representative	Sampling Method: IS 5182
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		Sample Condition: Satisfactory

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
07.10.2023	46.52	26.60	13.29	24.40	0.39
12.10.2023	53.69	22.39	11.02	24.01	0.36
14.10.2023	41.96	21.86	8.99	29.24	0.36
19.10.2023	48.64	24.77	9.64	27.12	0.39
21.10.2023	45.64	27.66	12.63	24.27	0.53
26.10.2023	38.09	24.29	14.38	31.95	0.26
28.10.2023	50.61	26.87	11.98	22.98	0.79
31.10.2023	54.87	23.92	13.63	24.82	0.52
01.11.2023	55.05	21.16	8.79	29.06	0.31
06.11.2023	52.47	19.71	8.78	21.46	0.32
08.11.2023	48.64	21.54	12.19	23.08	0.54
13.11.2023	52.96	18.14	9.70	27.72	0.42
15.11.2023	52.81	17.24	14.06	29.58	0.34
20.11.2023	46.76	23.99	11.83	26.80	0.39
22.11.2023	47.26	22.77	11.62	25.78	0.53
27.11.2023	71.29	26.93	11.27	23.63	0.40
05.12.2023	48.84	23.79	9.01	19.92	0.72
09.12.2023	50.09	26.32	8.43	24.24	0.65
12.12.2023	46.67	24.62	8.66	21.88	0.31
16.12.2023	51.87	19.98	11.92	24.25	0.46
19.12.2023	47.56	17.41	13.33	27.64	0.37
23.12.2023	60.89	22.39	11.34	25.26	0.42
26.12.2023	36.21	27.54	9.45	25.87	0.41
30.12.2023	54.00	21.73	10.09	19.97	0.35

NUMBER OF OBSERVATIONS	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
24	50.16	26.44	7.16	24.05	0.56
MEAN	19.06	22.84	10.83	24.41	0.41
GEOMETRIC MEAN	44.97	23.05	1.90	2.95	0.14
STD. GEO. DEVN. (24 HRS.)	87.29	41.94	8.2	31.62	0.79
98th PERCENTILES	55.1	5.7	14.3	31.1	0.79
MAXIMUM CONCENTRATION	55.1	17.2	8.0	19.9	0.26
MINIMUM CONCENTRATION					

PERCENTILE VALUE	10	20	30	40	50	60	70	80	90	98
PM ₁₀	43.45	46.52	47.01	48.64	49.46	50.69	52.12	52.96	53.19	54.74
PM _{2.5}	17.78	19.88	21.45	22.69	23.24	24.29	24.81	26.12	27.24	27.66
SO ₂	5.47	9.63	9.68	10.28	11.31	13.79	12.91	12.55	13.61	14.14
NO ₂	29.10	21.72	22.97	24.95	24.88	25.27	25.79	26.93	27.69	30.52
CO	0.42	0.33	0.33	0.36	0.38	0.40	0.42	0.50	0.64	0.76

Note: All units are µg/m³ except CO is mentioned in ppm

---End of Report---

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AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
		Name of Sample: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Sampling Location: Israna
Date of Sample Receipt:	31.12.2023	Completion Date: 05.01.2024
Date of Analysis:	31.12.2023	Issued On : 07.01.2024
Sample Drawn By:	ELPL Representative	Sampling Method: IS 5182
Sample Received By:	ELPL Representative	Sample Condition: Satisfactory
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
03.10.2023	63.25	31.26	11.68	24.13	0.53
06.10.2023	56.92	27.56	10.47	22.81	0.60
10.10.2023	58.24	30.20	11.02	19.23	0.40
13.10.2023	56.36	23.14	11.42	25.77	0.43
17.10.2023	53.14	28.20	12.02	24.01	0.50
20.10.2023	62.58	31.03	13.37	29.59	0.49
24.10.2023	55.51	26.42	11.38	20.90	0.75
27.10.2023	61.24	26.74	17.66	23.29	0.71
05.11.2023	63.21	21.93	12.36	19.06	0.49
07.11.2023	67.24	31.66	14.92	30.49	0.62
10.11.2023	64.24	32.58	11.36	21.93	0.51
14.11.2023	63.94	29.42	11.86	26.33	0.44
17.11.2023	58.58	39.66	13.36	28.10	0.62
21.11.2023	59.41	27.84	11.24	25.16	0.47
24.11.2023	49.14	32.62	11.04	24.49	0.51
28.11.2023	66.24	28.86	14.26	22.47	0.45
01.12.2023	57.24	27.11	13.04	18.92	0.69
04.12.2023	58.34	29.62	11.42	23.02	0.65
08.12.2023	56.24	28.11	12.39	20.79	0.68
11.12.2023	55.03	24.62	11.37	23.98	0.57
15.12.2023	59.14	29.56	12.40	26.26	0.43
18.12.2023	61.17	24.08	10.76	24.00	0.52
22.12.2023	58.24	30.53	11.63	24.57	0.52
25.12.2023	50.48	24.77	11.68	18.97	0.41

	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	59.16	26.54	12.16	23.05	0.56
GEOMETRIC MEAN	58.82	25.82	12.19	23.09	0.53
STD. GEO. DEVN. (24 HRS.)	3.55	2.46	1.47	2.53	0.16
98th PERCENTILES	87.29	54.93	8.2	34.02	0.79
MAXIMUM CONCENTRATION	67.2	31.1	17.4	29.5	0.75
MINIMUM CONCENTRATION	49.1	24.1	10.5	18.9	0.40

	PERCENTILE VALUES									
	10	20	30	40	50	60	70	80	90	
PM ₁₀	51.81	55.24	56.84	58.24	58.48	59.41	62.03	63.94	65.24	66.78
PM _{2.5}	24.70	26.42	27.70	28.20	29.18	29.62	30.15	31.20	32.30	32.88
SO ₂	11.04	11.29	11.42	11.64	11.77	11.99	12.31	12.16	12.68	12.88
NO _x	19.11	20.68	21.82	22.83	23.60	24.01	24.50	25.58	26.31	26.72
CO	0.44	0.45	0.45	0.50	0.51	0.53	0.60	0.62	0.64	0.73

---End of Report---

Verified By

Abhishek
Technical Manager

Authorized By

Abhishek
Quality Manager





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An approved Laboratory from Ministry of Environment, Forest and Climate Change & CPCB Govt. of India, New Delhi

AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ Name of Sample: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Sampling Location: Kalkha
Date of Sample Receipt:	31.12.2023	Completion Date: 05.01.2024
Date of Analysis:	31.12.2023	Issued On : 07.01.2024
Sample Drawn By:	ELPL Representative	Sampling Method: IS 5182
Sample Received By:	ELPL Representative	Sample Condition: Satisfactory
Environmental Condition: Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH		

DATE	24 HOURS				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
03.10.2023	45.63	35.31	9.99	22.14	0.53
06.10.2023	47.57	18.65	11.07	22.94	0.32
10.10.2023	38.67	22.28	12.94	21.06	0.34
13.10.2023	54.94	31.39	14.37	19.17	0.57
17.10.2023	57.11	27.16	11.91	14.44	0.35
20.10.2023	56.34	24.55	10.45	24.05	0.40
24.10.2023	69.75	27.42	12.69	22.90	0.30
27.10.2023	54.08	20.42	12.86	18.20	0.30
03.11.2023	56.36	26.40	13.15	18.85	0.32
07.11.2023	51.18	21.10	10.16	20.16	0.35
10.11.2023	55.17	21.47	11.74	17.30	0.31
14.11.2023	52.94	19.51	10.53	19.34	0.46
17.11.2023	54.99	20.13	12.09	16.35	0.28
21.11.2023	56.34	25.44	10.05	16.17	0.27
24.11.2023	48.72	30.63	16.39	22.67	0.31
28.11.2023	47.13	24.42	12.94	18.96	0.40
01.12.2023	47.75	24.33	14.39	18.34	0.35
04.12.2023	51.10	23.10	11.48	15.53	0.35
08.12.2023	49.94	21.88	13.04	18.35	0.42
11.12.2023	54.01	22.40	10.28	21.09	0.35
15.12.2023	51.96	22.73	14.84	22.15	0.27
18.12.2023	43.94	28.96	11.83	17.29	0.42
22.12.2023	44.91	25.63	13.25	19.99	0.30
25.12.2023	40.94	34.68	9.09	22.94	0.30

NUMBER OF OBSERVATIONS	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
24	24	24	24	24	24
MEAN	50.16	25.54	7.10	23.05	0.36
GEOMETRIC MEAN	51.10	24.36	12.40	19.20	0.47
STD. (GEO. DEVN. (24 HRS.))	4.79	2.67	1.95	2.26	0.08
98th PERCENTILES	87.29	54.93	8.2	14.02	0.79
MAXIMUM CONCENTRATION	60.8	29.0	16.4	25.0	0.57
MINIMUM CONCENTRATION	40.9	18.6	10.0	15.2	0.27

PERCENTILE VALUE :	10	20	30	40	50	60	70	80	90	98
PM ₁₀	44.12	47.13	48.21	49.94	51.63	54.08	54.51	56.34	58.76	59.68
PM _{2.5}	20.62	21.10	21.44	22.26	23.42	24.55	25.36	26.13	27.34	28.29
SO ₂	10.68	10.50	11.34	11.78	12.59	12.94	13.26	13.82	14.34	16.34
NO ₂	15.09	16.27	17.20	18.45	19.26	20.11	21.19	22.45	22.08	27.13
CO	0.29	0.31	0.31	0.35	0.35	0.36	0.40	0.43	0.46	0.56

Note: All units are µg/m³ except CO is mentioned in ppm

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---End of Report---

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AMBIENT AIR QUALITY MONITORING DATA

Name & Address of the Customer	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Sample Type: AAQ
Date of Sample Collection	03.10.2023 to 25.12.2023	Name of Sample: AAQ
Date of Sample Receipt:	31.12.2023	Sampling Location: Didwari
Date of Analysis:	31.12.2023	Completion Date: 05.01.2024
Sample Drawn By:	ELPL Representative	Issued On : 07.01.2024
Sample Received By:	ELPL Representative	Sampling Method: IS 5182
Environmental Condition:	Temperature: 25 ± 2 °C; Humidity: 30 - 80 % RH	Sample Condition: Satisfactory

DATE	24 HOURLY				
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
07.10.2023	58.66	24.32	12.01	23.20	0.45
12.10.2023	45.96	27.42	11.42	29.53	0.35
14.10.2023	49.27	29.52	11.09	28.63	0.63
19.10.2023	53.62	28.11	12.50	24.40	0.59
21.10.2023	54.58	23.80	12.48	28.52	0.40
26.10.2023	50.96	27.52	13.41	31.05	0.54
28.10.2023	53.36	24.50	18.01	26.74	0.38
31.10.2023	52.56	26.39	11.56	31.91	0.59
01.11.2023	47.88	22.15	12.88	19.44	0.56
06.11.2023	51.12	24.21	13.90	30.60	0.54
08.11.2023	51.76	22.46	10.58	24.98	0.40
13.11.2023	46.13	24.90	12.41	24.77	0.37
15.11.2023	56.13	32.84	12.83	27.45	0.65
20.11.2023	52.96	27.20	7.81	25.24	0.36
22.11.2023	46.73	22.91	11.71	26.67	0.51
27.11.2023	57.61	25.59	13.51	27.13	0.41
05.12.2023	32.19	24.96	12.75	29.78	0.34
09.12.2023	33.03	23.96	11.03	23.21	0.40
12.12.2023	35.30	22.19	13.45	21.56	0.36
16.12.2023	48.56	25.92	12.48	24.65	0.42
19.12.2023	46.78	25.02	13.86	22.98	0.35
23.12.2023	33.58	25.61	11.52	26.86	0.36
26.12.2023	36.68	26.35	12.53	28.31	0.38
30.12.2023	41.22	24.47	11.00	22.41	0.18
NAAQMS Standards	100.00	60.00	80.00	80.00	2.00

	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
NUMBER OF OBSERVATIONS	24	24	24	24	24
MEAN	45.56	25.56	12.25	25.76	0.43
GEOMETRIC MEAN	45.56	25.56	12.25	25.76	0.43
STD. GEO. DEVN. (24 HRS.)	7.89	2.42	1.74	3.21	0.09
98th PERCENTILES	87.88	54.22	23.46	34.39	0.82
MAXIMUM CONCENTRATION	58.66	32.84	18.01	31.91	0.65
MINIMUM CONCENTRATION	32.19	22.15	7.81	19.44	0.34

PERCENTILE VALUE										
	10	20	30	40	50	60	70	80	90	98
PM ₁₀	33.03	36.68	43.14	46.73	48.22	50.96	52.16	53.62	55.25	57.51
PM _{2.5}	22.32	23.96	24.39	24.90	25.30	25.80	26.77	27.52	28.81	31.07
SO ₂	11.01	11.26	11.09	12.09	12.47	12.52	12.84	13.43	15.76	16.12
NO ₂	22.58	23.21	23.59	24.67	25.82	26.84	27.54	28.93	30.36	34.78
CO	0.35	0.36	0.36	0.40	0.41	0.34	0.48	0.52	0.55	0.64

Note: All units are µg/m³ except CO is mentioned in ppm

---End of Report---

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TEST REPORT

FORMAT NO. ECO/QS/FORMAT/13

NAME & ADDRESS OF CUSTOMER:	Cement Grinding Unit M/s Ambuja Cements Limited Village-Naulatha, Taluk-Israna, Dist- Panipat, Haryana	Test Report No.	ECO/LAB/AN/0009/12/2023
		Issue Date of Test Report	03.01.2024
Type of Sample	Ambient Noise		
Sample Registration No.	0015	Name of Location	-
Sampling Method	IS:9989	Sample Collected By	ELPL Representative
Date of Sample Collection	01.12.2023 to 30.12.2023	Time of Sample Collection	-
Date of Sample Received	-	Time of Sample Received	-
Start Date of Analysis	01.12.2023 to 30.12.2023	End Date of Analysis	03.01.2024
Weather Condition	Clear	Sampling Duration	24 Hourly Basis
Laboratory Environmental Condition	Temperature: 25±2 °C	Sample ID Code	ECO/LAB/0009/12/2023
	Humidity: 52 %		
Instrument Name & Lab ID	Sound Level Meter	ECO/LSM/02 Calibration Due Date: (31.05.2024)	

Noise Level Monitoring (Oct 2023-Dec 2023)

Location	Area Type	Day (0600-2200 hours)				Night (2200-0600 hours)			
		Norm	Max	Min	Mean	Norm	Max	Min	Mean
N1: Within Project Site	Industrial	75	66.8	43.8	59.5	70	61.2	40.9	54.0
N2 : Barhman Majra	Residential	55	53.1	37.8	50.2	45	44.2	39.8	41.7
N3: Nr. Naulatha Station	Commercial	65	63.4	45.6	56.5	55	53.2	39.3	49.9
N4: Naulatha	Residential	55	51.8	39.2	45.2	45	42.5	36.4	39.8
N5 : Balana	Residential	55	51.6	42.3	48.9	45	42.8	40.1	41.6
N6 : Israna	Commercial	65	61.4	44.8	56.9	55	53.2	43.5	48.6
N7: Kalkha	Residential	55	49.8	39.7	47.0	45	41.7	37.8	39.9
N8 : Didwari	Residential	55	50.6	39.5	46.2	45	43.2	37.3	40.6

All values in dB(A); * Logarithmic Averages

Opinion/Observation: Noise Level is meeting requirements as per CPCB Guidelines.

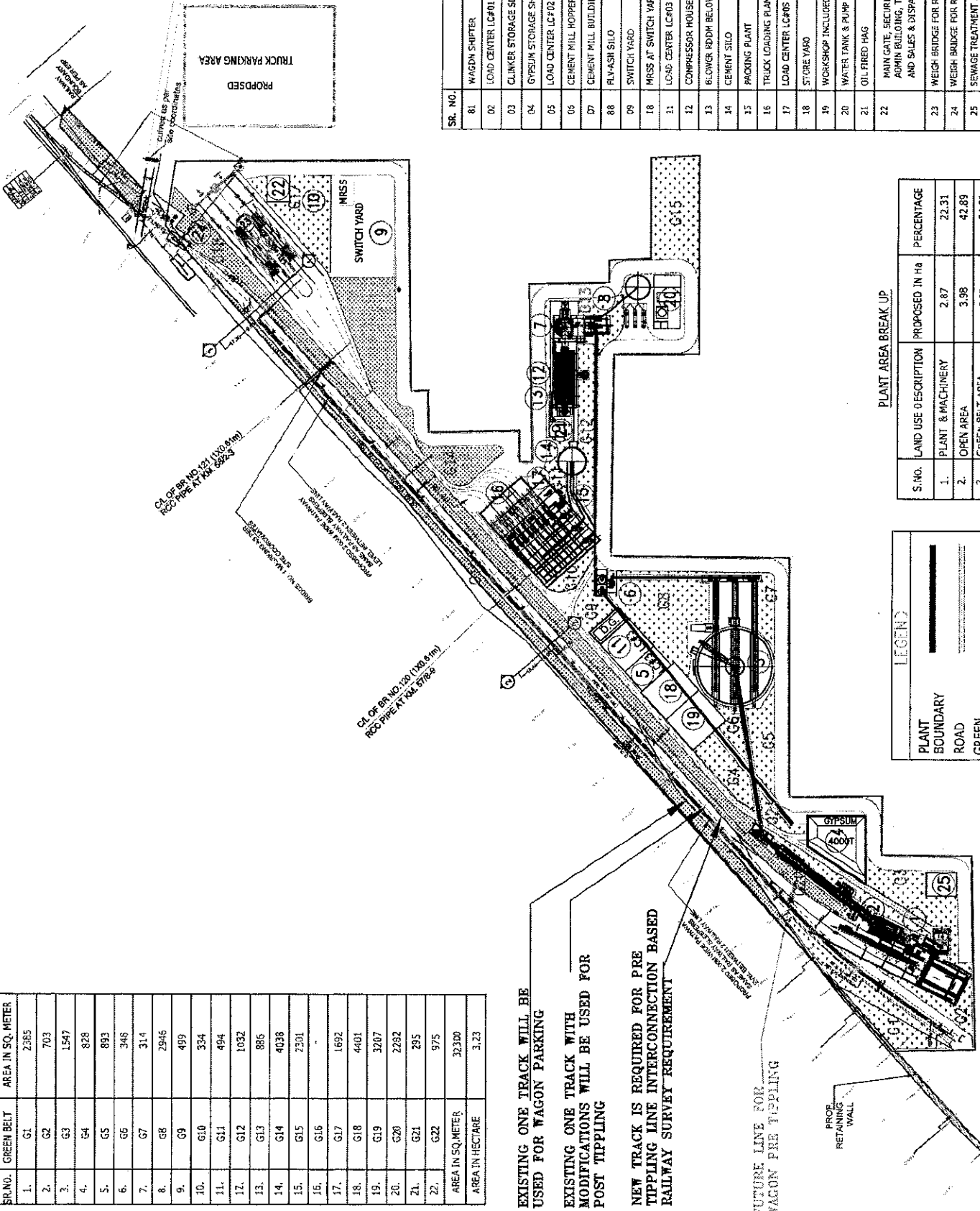
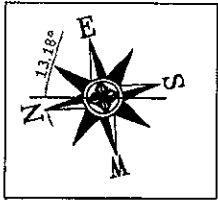
---End of Report---

Verified By

Technical Manager

Authorized By

Quality Manager



GREEN BELT AREA

SR. NO.	GREEN BELT	AREA IN SQ. METER
1.	G1	2385
2.	G2	703
3.	G3	1547
4.	G4	828
5.	G5	893
6.	G6	348
7.	G7	314
8.	G8	2946
9.	G9	499
10.	G10	334
11.	G11	494
12.	G12	1032
13.	G13	886
14.	G14	4038
15.	G15	2301
16.	G16	-
17.	G17	1692
18.	G18	4401
19.	G19	3207
20.	G20	2282
21.	G21	295
22.	G22	975
AREA IN SQ. METER		32320
AREA IN HECTARE		3.23

EXISTING ONE TRACK WILL BE USED FOR WAGON PARKING

EXISTING ONE TRACK WITH MODIFICATIONS WILL BE USED FOR POST TIPPLING

NEW TRACK IS REQUIRED FOR PRE TIPPLING LINE INTERCONNECTION BASED RAILWAY SURVEY REQUIREMENT

FUTURE LINE FOR WAGON PRE TIPPLING

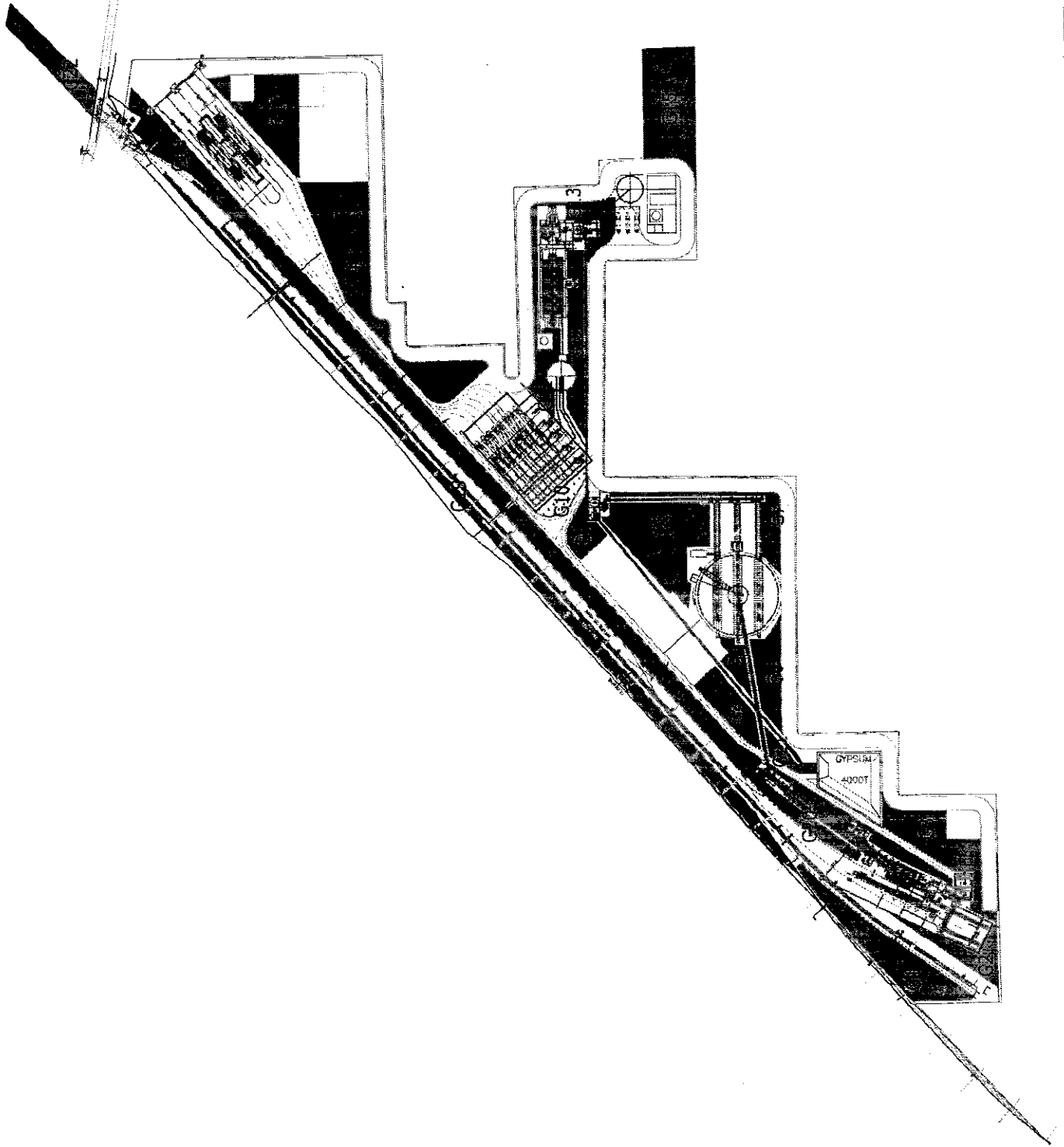
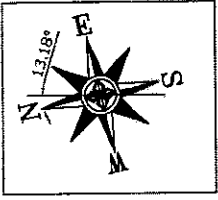
PLANT AREA BREAK UP

S. NO.	LAND USE DESCRIPTION	PROPOSED IN Ha	PERCENTAGE
1.	PLANT & MACHINERY	2.87	22.31
2.	OPEN AREA	3.98	42.89
3.	GREEN BELT AREA	3.23	34.81
TOTAL		9.28	100.0

LEGEND

- PLANT BOUNDARY
- ROAD
- GREEN BELT

SR. NO.	DESCRIPTION	AREA IN SQ. METER
81	WAGDN SHIFTER	1703
02	LOAD CENTER LC#01 @ WAGON TIPPLER	143
03	CLINKER STORAGE SILO	3984
04	GYPSUM STORAGE SHED	1520
05	LOAD CENTER LC#02 @ MATERIAL HANDLING INCLUDED IN CM LC	-
06	CEMENT MILL HOPPER BUILDING	229
07	CEMENT MILL BUILDING	1445
88	FLY-ASH SILO	346
09	SWITCH YARD	2806
18	MRS AT SWITCH YARD	-
11	LOAD CENTER LC#03 @ CEMENT MILL	1092
12	COMPRESSOR HOUSE BELDW CM BAGHOUSE	-
13	BLOWER ROOM BELDW CM BAGHOUSE	-
14	CEMENT SILO	538
15	PACKING PLANT	376
16	TRUCK LOADING PLANT	2376
17	LOAD CENTER LC#05 @ PACKING PLANT	-
18	STORE YARD	325
19	WORKSHOP INCLUDED IN STREGO YARD	1573
20	WATER TANK & PUMP HOUSE	648
21	OIL FIRED HOG	100
22	MAIN GATE, SECURITY & SAFETY OFFICE ADMIN BUILDING, TIME OFFICE, OCCUPATIONAL HEALTH CENTER AND SALES & DISPATCH OFFICE INCLUDED IN MAIN GATE	263
23	WEIGH BRIDGE FOR ROAD	788
24	WEIGH BRIDGE FOR RAIL (IN MOTION)	88
25	SEWAGE TREATMENT PLANT	320
AREA IN SQ. METER		20691
AREA IN HECTARES		2.07



GREEN BELT AREA

SR.NO.	GREEN BELT	AREA IN SQ. METER
1.	G1	2385
2.	G2	703
3.	G3	1547
4.	G4	828
5.	G5	893
6.	G6	348
7.	G7	314
8.	G8	2946
9.	G9	499
10.	G10	334
11.	G11	494
12.	G12	1032
13.	G13	886
14.	G14	4038
15.	G15	2301
16.	G16	-
17.	G17	1692
18.	G18	4401
19.	G19	3207
20.	G20	2282
21.	G21	295
22.	G22	975
AREA IN SQ.METER		32300
AREA IN HECTARE		3.23

DRAINAGE MAP OF THE PROPOSED NAULATHA CEMENT GRINDING UNIT WITH CEMENT PRODUCTION CAPACITY OF 1 X 4.0 MMTPA AT VILLAGE NAULATHA, TEHSIL ISRANA, DISTRICT PANIPAT, STATE HARYANA

76°50'0"E

76°55'0"E

77°0'0"E

29°20'0"N

29°20'0"N

29°15'0"N

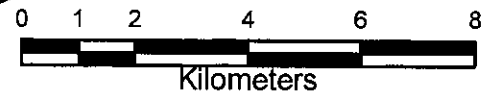
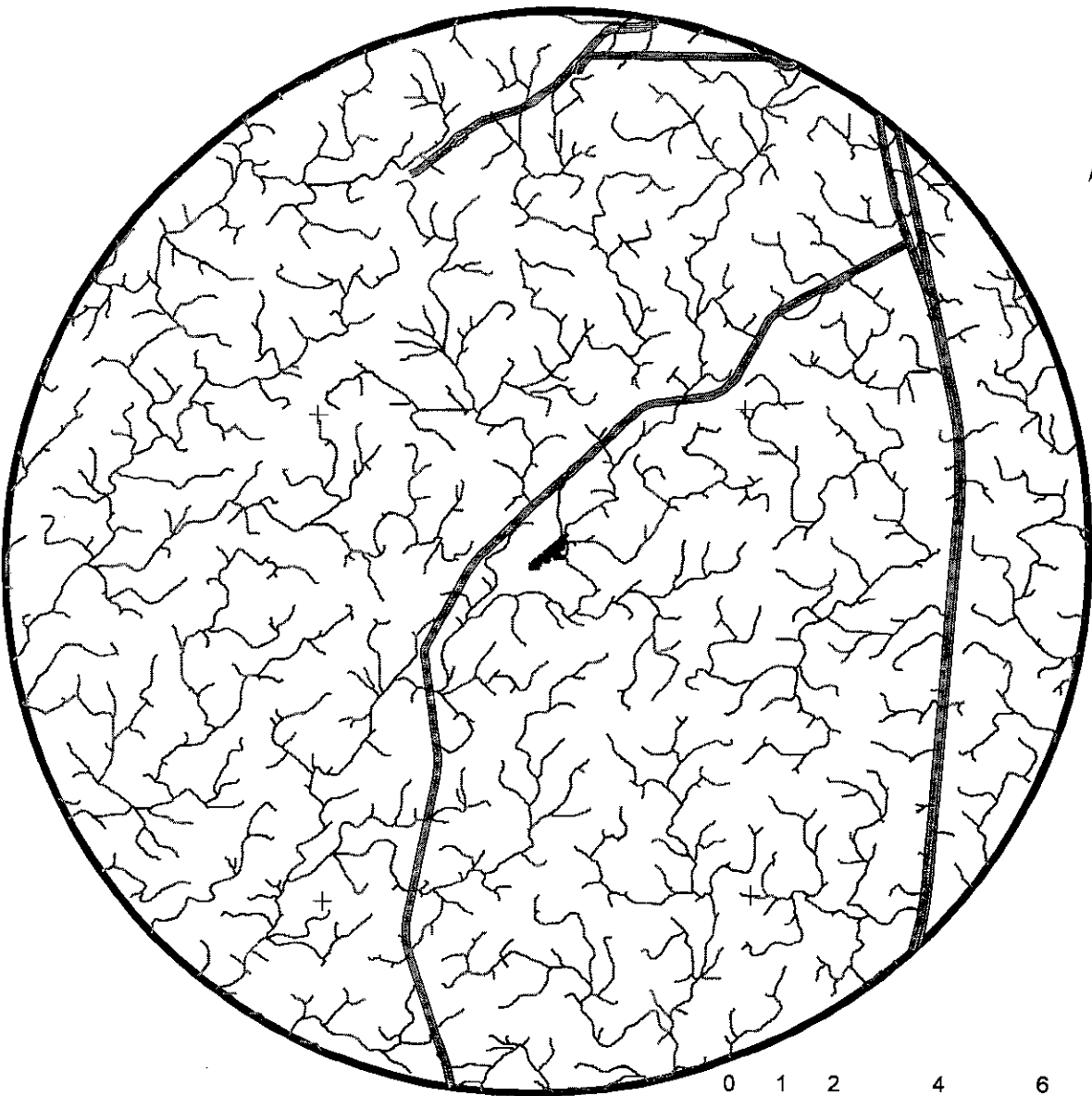
29°15'0"N

29°10'0"N

29°10'0"N

76°50'0"E

76°55'0"E

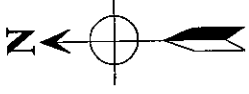


Legend




- Drainage Pattern
- canal
- Proposed Grinding Unit
- 10 KM Buffer Zone

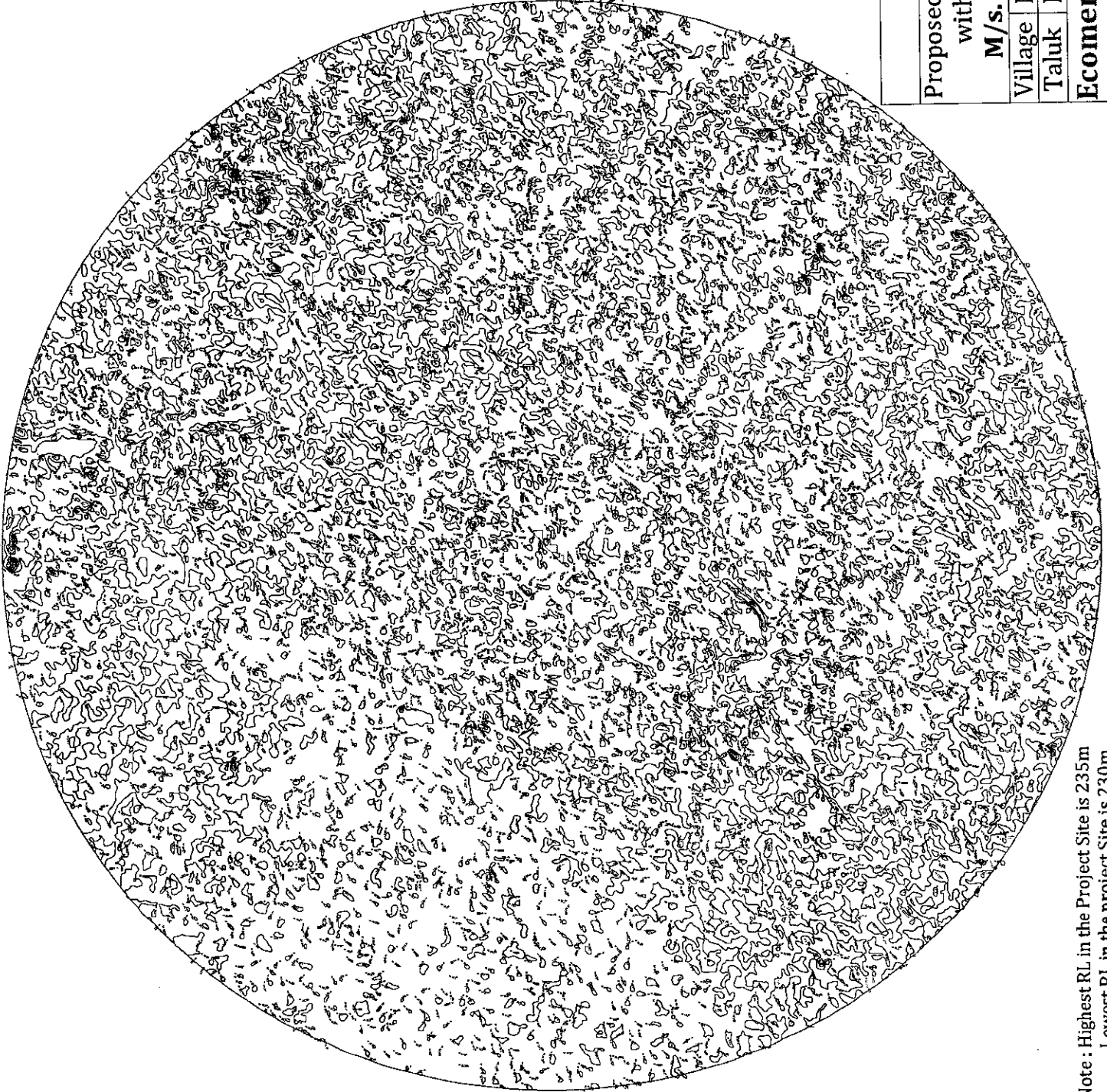
ECOMEN MINING PVT. LTD., LUCKNOW
PROPOSED NAULATHA CEMENT GRINDING PLANT WITH CAPACITY OF 1X4 MTPA
M/S AMBUJA CEMENTS LIMITED VILL.-NAULATHA, TALUKA:-ISRANA, DISTRICT:- PANIPAT, HARYANA
DRAINAGE MAP

PLATE No.-



I N D E X

-  QUARRY BOUNDARY
-  10Kms RADIUS CIRCLE
-  CONTOURS



CONTOUR MAP

Proposed Naulatha Cement Grinding Plant
with Capacity of 1 X 4.0 MTPA of

M/s. AMBUJA CEMENTS LIMITED

Village	Naulatha	Dist	Panipat
Taluk	Israna	State	Haryana

Ecomen Mining Pvt. Ltd. Lucknow

Note : Highest RL in the Project Site is 235m
Lowest RL in the project Site is 230m

CONVENTIONAL SYMBOLS

- Express highway: with toll; with bridge with distance shown
- Road unimproved: according to importance
- Roads to be built: according to importance
- Unimproved road: Car-track; Plaster-track with pebbles; Foot-path
- Streams: with track in bed; unclassified; Canal
- Ditch: masonry or rock-filled; earthenwork; Weir
- River: dry with water channel with island & rocks; Tidal river
- Submerged rocks; Shoal; Swamp; Reeds
- Wells: lined; Unlined; Tube-well; Spring; Trench perennial; dry
- Embankments: road or rail; embankment; broken ground
- Railways, broad gauge: double; single with station; under construction
- Railways, other gauges: double; single with distance shown; do.
- Mineral: line or stamery; Mts. Cutting with tunnel
- Contours with sub-features; Rocky slopes; Cliff
- Grid features: (Hill, Cliff, Hill, Government, (S) (M) (K) (L) (B) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z) (AA) (AB) (AC) (AD) (AE) (AF) (AG) (AH) (AI) (AJ) (AK) (AL) (AM) (AN) (AO) (AP) (AQ) (AR) (AS) (AT) (AU) (AV) (AW) (AX) (AY) (AZ) (BA) (BB) (BC) (BD) (BE) (BF) (BG) (BH) (BI) (BJ) (BK) (BL) (BM) (BN) (BO) (BP) (BQ) (BR) (BS) (BT) (BU) (BV) (BW) (BX) (BY) (BZ) (CA) (CB) (CC) (CD) (CE) (CF) (CG) (CH) (CI) (CJ) (CK) (CL) (CM) (CN) (CO) (CP) (CQ) (CR) (CS) (CT) (CU) (CV) (CW) (CX) (CY) (CZ) (DA) (DB) (DC) (DD) (DE) (DF) (DG) (DH) (DI) (DJ) (DK) (DL) (DM) (DN) (DO) (DP) (DQ) (DR) (DS) (DT) (DU) (DV) (DW) (DX) (DY) (DZ) (EA) (EB) (EC) (ED) (EE) (EF) (EG) (EH) (EI) (EJ) (EK) (EL) (EM) (EN) (EO) (EP) (EQ) (ER) (ES) (ET) (EU) (EV) (EW) (EX) (EY) (EZ) (FA) (FB) (FC) (FD) (FE) (FF) (FG) (FH) (FI) (FJ) (FK) (FL) (FM) (FN) (FO) (FP) (FQ) (FR) (FS) (FT) (FU) (FV) (FW) (FX) (FY) (FZ) (GA) (GB) (GC) (GD) (GE) (GF) (GG) (GH) (GI) (GJ) (GK) (GL) (GM) (GN) (GO) (GP) (GQ) (GR) (GS) (GT) (GU) (GV) (GW) (GX) (GY) (GZ) (HA) (HB) (HC) (HD) (HE) (HF) (HG) (HH) (HI) (HJ) (HK) (HL) (HM) (HN) (HO) (HP) (HQ) (HR) (HS) (HT) (HU) (HV) (HW) (HX) (HY) (HZ) (IA) (IB) (IC) (ID) (IE) (IF) (IG) (IH) (II) (IJ) (IK) (IL) (IM) (IN) (IO) (IP) (IQ) (IR) (IS) (IT) (IU) (IV) (IW) (IX) (IY) (IZ) (JA) (JB) (JC) (JD) (JE) (JF) (JG) (JH) (JI) (JJ) (JK) (JL) (JM) (JN) (JO) (JP) (JQ) (JR) (JS) (JT) (JU) (JV) (JW) (JX) (JY) (JZ) (KA) (KB) (KC) (KD) (KE) (KF) (KG) (KH) (KI) (KJ) (KL) (KM) (KN) (KO) (KP) (KQ) (KR) (KS) (KT) (KU) (KV) (KW) (KX) (KY) (KZ) (LA) (LB) (LC) (LD) (LE) (LF) (LG) (LH) (LI) (LJ) (LK) (LL) (LM) (LN) (LO) (LP) (LQ) (LR) (LS) (LT) (LU) (LV) (LW) (LX) (LY) (LZ) (MA) (MB) (MC) (MD) (ME) (MF) (MG) (MH) (MI) (MJ) (MK) (ML) (MN) (MO) (MP) (MQ) (MR) (MS) (MT) (MU) (MV) (MW) (MX) (MY) (MZ) (NA) (NB) (NC) (ND) (NE) (NF) (NG) (NH) (NI) (NJ) (NK) (NL) (NM) (NO) (NP) (NQ) (NR) (NS) (NT) (NU) (NV) (NW) (NX) (NY) (NZ) (OA) (OB) (OC) (OD) (OE) (OF) (OG) (OH) (OI) (OJ) (OK) (OL) (OM) (ON) (OO) (OP) (OQ) (OR) (OS) (OT) (OU) (OV) (OW) (OX) (OY) (OZ) (PA) (PB) (PC) (PD) (PE) (PF) (PG) (PH) (PI) (PJ) (PK) (PL) (PM) (PN) (PO) (PP) (PQ) (PR) (PS) (PT) (PU) (PV) (PW) (PX) (PY) (PZ) (QA) (QB) (QC) (QD) (QE) (QF) (QG) (QH) (QI) (QJ) (QK) (QL) (QM) (QN) (QO) (QP) (QQ) (QR) (QS) (QT) (QU) (QV) (QW) (QX) (QY) (QZ) (RA) (RB) (RC) (RD) (RE) (RF) (RG) (RH) (RI) (RJ) (RK) (RL) (RM) (RN) (RO) (RP) (RQ) (RR) (RS) (RT) (RU) (RV) (RW) (RX) (RY) (RZ) (SA) (SB) (SC) (SD) (SE) (SF) (SG) (SH) (SI) (SJ) (SK) (SL) (SM) (SN) (SO) (SP) (SQ) (SR) (SS) (ST) (SU) (SV) (SW) (SX) (SY) (SZ) (TA) (TB) (TC) (TD) (TE) (TF) (TG) (TH) (TI) (TJ) (TK) (TL) (TM) (TN) (TO) (TP) (TQ) (TR) (TS) (TT) (TU) (TV) (TW) (TX) (TY) (TZ) (UA) (UB) (UC) (UD) (UE) (UF) (UG) (UH) (UI) (UJ) (UK) (UL) (UM) (UN) (UO) (UP) (UQ) (UR) (US) (UT) (UU) (UV) (UW) (UX) (UY) (UZ) (VA) (VB) (VC) (VD) (VE) (VF) (VG) (VH) (VI) (VJ) (VK) (VL) (VM) (VN) (VO) (VP) (VQ) (VR) (VS) (VT) (VU) (VV) (VW) (VX) (VY) (VZ) (WA) (WB) (WC) (WD) (WE) (WF) (WG) (WH) (WI) (WJ) (WK) (WL) (WM) (WN) (WO) (WP) (WQ) (WR) (WS) (WT) (WU) (WV) (WW) (WX) (WY) (WZ) (XA) (XB) (XC) (XD) (XE) (XF) (XG) (XH) (XI) (XJ) (XK) (XL) (XM) (XN) (XO) (XP) (XQ) (XR) (XS) (XT) (XU) (XV) (XW) (XX) (XY) (XZ) (YA) (YB) (YC) (YD) (YE) (YF) (YG) (YH) (YI) (YJ) (YK) (YL) (YM) (YN) (YO) (YP) (YQ) (YR) (YS) (YT) (YU) (YV) (YW) (YX) (YZ) (ZA) (ZB) (ZC) (ZD) (ZE) (ZF) (ZG) (ZH) (ZI) (ZJ) (ZK) (ZL) (ZM) (ZN) (ZO) (ZP) (ZQ) (ZR) (ZS) (ZT) (ZU) (ZV) (ZW) (ZX) (ZY) (ZZ)



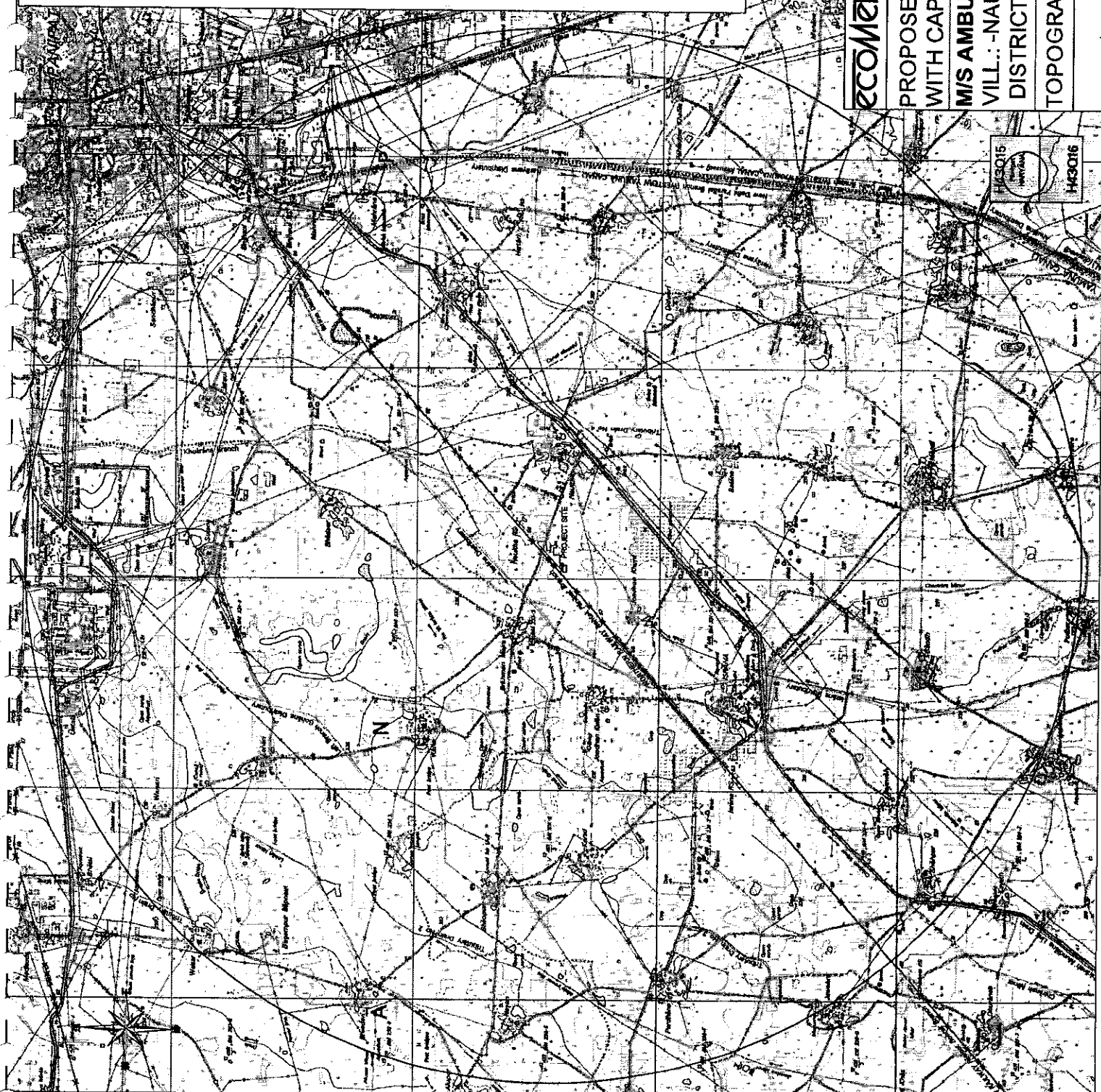
ecomen MINING PVT. LTD., LUCKNOW

PROPOSED NAULATHA CEMENT CEMENT GRINDING PLANT WITH CAPACITY OF 1X4 MTPA

MIS AMBUJA CEMENTS LIMITED

VILL.: -NAULATHA, TALUKA: -ISRANA, DISTRICT:- PANIPAT, HARYANA

TOPOGRAPHICAL MAP





**EXECUTIVE SUMMARY OF DRAFT
ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL
MANAGEMENT PLAN
FOR**

**Proposed Naulatha Cement Grinding Unit with Cement Production
Capacity of 1 x 4.0 Million Metric Tons Per Annum (MMTPA) at Village
Naulatha, Tehsil Israna, District Panipat, State Haryana.**

ToR Identification No.: TO23B1103HR5990664N जारीकर्ता SEAC 06.04.2024



**PROJECT PROPONENT
M/s AMBUJA CEMENTS LIMITED**
Address: Adani Corporate House, Shantigram, SG Highway, Ahmedabad, Pin code- 382421
Email: bhimsi.kachhot@adani.com/sanjeewkumar.singh@adani.com

Prepared by



ECOMEN MINING PVT. LTD

(formerly known as Ecomen Laboratories Pvt. Ltd)

Accredited by QCI/NABET Certificate No. NABET/EIA/22-25/SA 0219 valid till March 22, 2025

Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow -226 024 (U.P.)

Phone: (0522) 2746282, 4079201, E-mail: contactus@ecomen.in

3 (b) Cement Plants type of activity, Category 'B1' - Green Field Project

Baseline Data Generation carried out during Oct 2023- Dec 2023 by

NABL Approved Lab: Ecomen Mining Private Limited (Certificate No.: TC 12751)

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 Project

Ambuja Cements Limited (ACL), a member company of the Adani Group, has developed a large number of Cement Projects (Integrated Cement Plant, Grinding Units & Limestone Mines). Currently, Ambuja Cement has a cement capacity of 31 million tonnes with six integrated cement manufacturing plants and eight cement grinding units across the country.

Ambuja Cements Limited (ACL) has proposing to establish a Greenfield Cement Grinding Unit with a production capacity of 4.0 million metric tons per annum (MMTPA) in Naulatha Village, Israna Tehsil, Panipat District, Haryana. The project was considered in the State Environment Appraisal Committee, Haryana (SEAC) and Standard ToR was issued on 6th April, 2024 for the preparation of the Environmental Impact Assessment report and Environment Management Plan (EIA/EMP). As per EIA Notification 2006 and subsequent amendments, the project can be classified under Schedule 3(b) Cement Plants. All standalone grinding units are classified under Category 'B1' and must obtain environmental clearance from the SEAC/SEIAA.

1.2 Details of the Project

1.2.1 Location and accessibility

The location of the project is at Naulatha Village, Israna Tehsil, Panipat District Haryana. Location map & Salient features / Environmental setting map for the proposed project is given in Figure 1& Table 1.

**Executive
Summary of Draft
EIA/EMP**

**Proposed Naulatha Cement Grinding Unit with Cement Production
capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna,
District: Panipat, Haryana by M/s Ambuja Cements Limited**

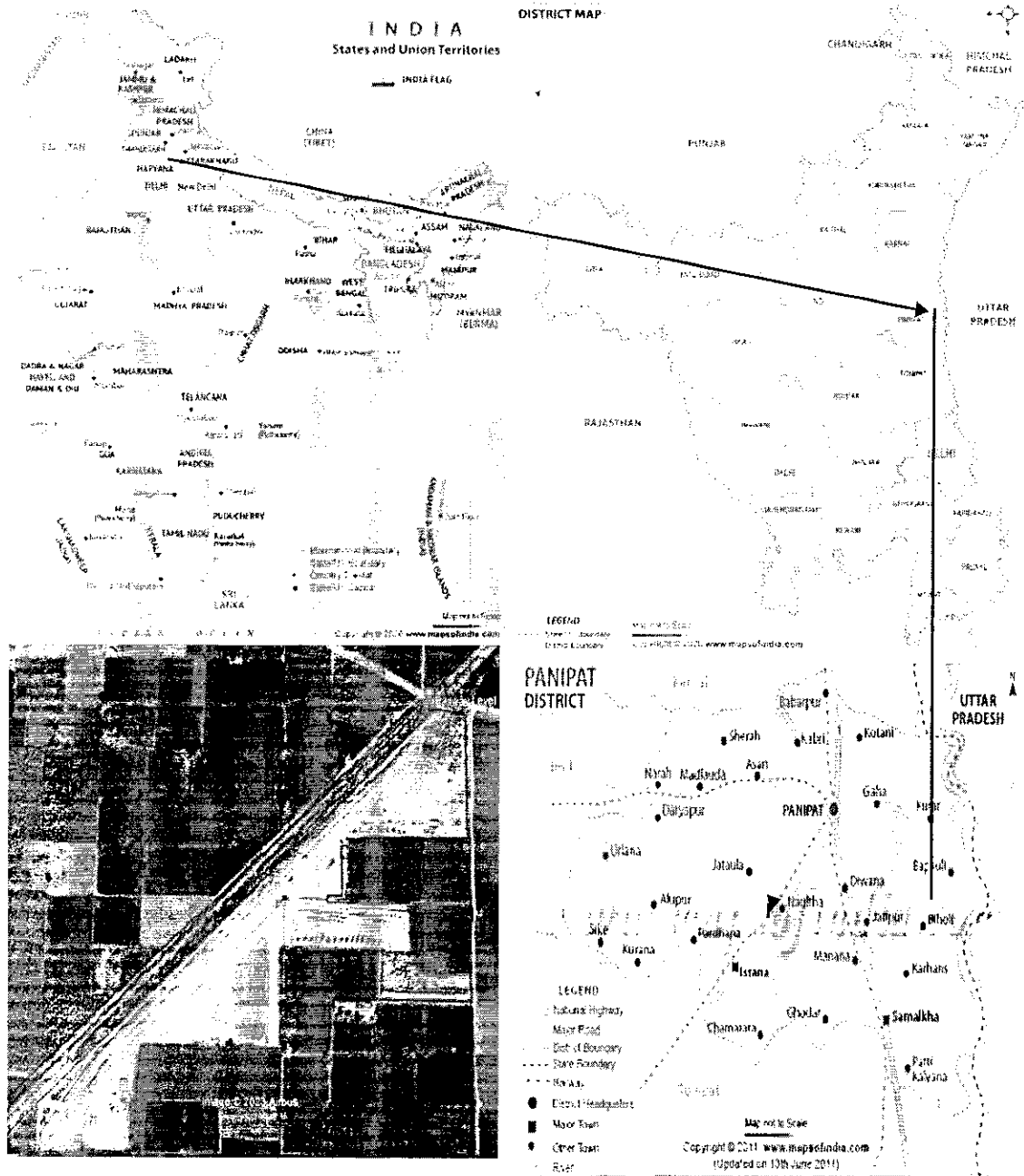


FIGURE 1: LOCATION MAP OF THE PROJECT SITE

TABLE 1: SALIENT FEATURES & ENVIRONMENTAL SETTINGS OF PROJECT SITE

S. No	Salient Features/Environmental Features	Distance W.r.t Site/Remarks
1.	Type of Project	Proposed Cement Grinding & Packing unit.
2.	National Park/ Wild life sanctuary /Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	None
3.	Historical places / Places of Tourist importance / Archaeological sites.	Panipat museum 8.9 km, NE
4.	Industrial areas/cluster /Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010.	None`
5.	Defence Installations	None`
6.	Nearest village	Naulatha, 1.3 km, E
		Balana, 3.6 km, SE
		Israna 3.8 km, SSW
		Jondhan Kalan 2.3 km, WSW
		Brahman Majra 1.4 km, WNW
		Bhadaur 3.8 km, N
		Dohar 4.9 km, NE
7.	Forests	Nil
8.	Water body	Western Yamuna canal- 7.3 km, in E direction
9.	Highway	NH -709, 1.6 km, N
		SH-14, 8.3 km, N
10.	Railway Station	Naulatha railway station, 0.7 km, NE
11.	Fort facility	Nil
12.	Airport/Airstrip	Karnal Airport, 48.30 km, NE
13.	Interstate Border	None within 15 km radius from the project site.
14.	R & R	None
15.	Litigation / court case is pending against	None

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
---	--

2.0 PROJECT DESCRIPTION

2.1 Resource Requirements for Project Activity

2.1.1 Land Requirement

The total project area is 9.28 Ha out of which 3.23 Ha will be developed as green belt/plantation. Plant area Break- up is given in Table 2.

TABLE 2: LAND BREAKUP DETAILS

Sl. No.	Land use Description	Proposed in Ha	Percentage
1.	Plant & Machinery	2.07	22.31
2.	Open area	3.98	42.89
3.	Green Belt Area	3.23	34.80
	Total	9.28	100

2.1.2 Water Requirement

The total water requirement for grinding unit will be 400 KLD which will be sourced from ground water, no water will be utilized in plant processes. Break -up of water requirement is given in Table 3.

TABLE 3: BREAK UP OF WATER REQUIREMENTS

Description	Consumption in KLD
Potable water consumption	10
Process water consumption(Mill Spray)	280
Water consumption in lab	5
Equipment cooling Evaporation + Blow down losses	90
Total water consumption	385
Total waste water from process and cooling	
Loss in CT blow down	15
Losses in water treatment	15
Regeneration from sewerage water treatment plant	6
Total for dust suppression system and green belt	36

2.1.3 Power Requirement

Total power requirement for the proposed grinding unit will be 23 MW which will be sourced from nearest sub-station at Naulatha at 132 KVA/66 KVA switch yard with suitable step- down transformer, if required.

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
---	--

2.1.4 Fuel Requirement

The fuel is required for the operation of 1250 KVA DG set and HGG which will be used for emergency purpose only. It will be directly sourced from nearby authorized local retailers. The estimated requirement of the fuel will be 125 liters per hour.

2.1.5 Raw Materials Requirement

The maximum annual requirement of major raw materials and their probable sources of procurement are given below in Table 4. Raw material requirement shall vary with the type of cement (OPC/PPC & other types as per market demand) manufacturing.

TABLE 4: RAW MATERIAL DETAILS

Sl. No.	Raw material for each line (Dry basis)			Source & Distance	Mode of Transport	Storage for both lines
	Particulars	Max	Min			
1.	Clinker	1 X 3.8 MTPA	1 X 1.2 MTPA	In house/ Domestic Plants (Marwar Mundwa or any other in house sources) ~600Km	Road & Rail	Clinker Silo 50000 MT
2.	Gypsum	1 x 0.32 MTPA	1 x 0.20 MTPA	Bikaner, Rajasthan or any other domestic sources ~500Km	Road & Rail	Covered Shed 4000 MT
3.	Fly ash	1 x 1.4 MTPA	1 x 1.2 MTPA	Nearby thermal Power plant (Hissar Panipat/ NPL Rajpura/Talwandi Sabo) ~210 Km	Road & Rail	RCC Silo 1 x 4000 MT

2.1.6 Manpower Requirement

The total manpower requirement for the project is estimated around 1685 persons. Details of manpower required during construction and operation phase are given as below in Table 5.

Executive Summary of Draft EIA/EMP	Proposed Naulatha Cement Grinding Unit with Cement Production capacity of 1 x 4.0 Million MTPA at Village: Naulatha, Tehsil: Israna, District: Panipat, Haryana by M/s Ambuja Cements Limited
---	--

TABLE 5: MANPOWER DETAILS

Description		Construction Phase	Operation Phase
Proposed	Permanent	30	30
	Contractual	1500	125
Total (A)		1530	155

2.2 Operational Activity

Major steps involved in the process of Grinding unit are given as below:

- Clinker storage and handling
- Gypsum storage and handling
- Fly ash storage and handling
- Cement production
- Cement packing and dispatch

2.2.1 Cement Manufacturing Process

Clinker, gypsum and Fly ash will be loaded into their respective hoppers using a suitable material handling system. Clinker grinding will be achieved using either a Vertical Roller Mill (VRM) or a combination of a ball mill and roller press. The cement grinding circuit will include arrangements for clinker storage, gypsum storage, fly ash storage, and other raw material storages as required by BIS standards for different types of cement, as well as cement storage and a packing plant. Clinker unloading and the loading of bagged cement for road transport will be carried out by trucks and bulkers.

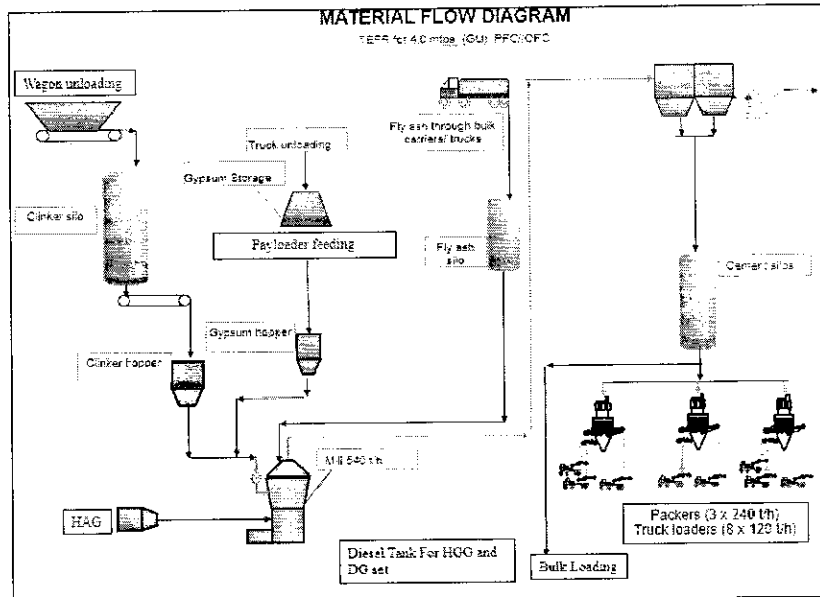


FIGURE 2: MATERIAL FLOW DIAGRAM

2.3 Key Pollution Concerns

The source of pollution that are expected from the proposed projects are described in this section. Identification of source of pollution is required for management of the emissions, effluents, solid and hazardous waste generation from the plant so as to meet the environmental standards and environmental operating conditions. The major sources of pollution from the proposed cement grinding unit are given below:

- Fugitive emission
- Stack emission
- Noise from the plant operation

Details of solid and Hazardous waste generation are given in Table 6.

TABLE 6: DETAILS OF THE SOLID AND HAZARDOUS WASTE GENERATION

Sl. No.	Name of materials	Schedule	Proposed Quantity (TPA)	Handling & Storage	Method of disposal
1	Used Oil	5.1	1	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)

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2	Cotton rags	33.2	2	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB authorized agency (TSDF)
3	Lead Acid Batteries	-	0.5	In isolated area with non-permeable concrete flooring	To OEM through buy-back/through authorized recycler
4	Used Oil Containers @30 x200L capacity	-	0.4	In isolated area with non-permeable concrete flooring	Through CPCB/SPCB Authorized agency (TSDF)

3.0 BASELINE ENVIRONMENT STUDIES

As per the EIA guidelines, study was conducted within 10 km radius from the periphery of the proposed project site. Baseline data for the environmental attributes like meteorology, ambient air, water, hydrology, soil, geology, noise, socio-economic, ecology and bio-diversity were collected. The study was conducted during the post monsoon season from October 2023 to December 2023. The Baseline data monitoring was carried out by M/s Ecomen Mining Pvt Ltd. in house team.

3.1 Land Use

The land use/ land cover map has been generated on 1:50,000 scale using digital classification of LISS-IV. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories. The proposed Land use /Land cover of the study area given in Table 7.

TABLE 7: PROPOSED LAND USE/ LAND COVER OF THE STUDY AREA

SL No	Category	Area in Ha	% of the Study Area
1	Agricultural Land	22176.74	66.68
2	Fallow Land	4151.92	12.48
3	Water bodies/Canal/Nala	1182.33	3.56
4	Plantation	278.67	0.84
5	Settlements/Built-up Land	5468.08	16.44
	Total	33257.74	100

3.2 Meteorological Data

The site meteorological data is described below in the Table 8.

TABLE 8: METEOROLOGICAL DATA AVERAGES DURING THE STUDY PERIOD

Period	Mean Temperature (°C)			Relative Humidity (%)			Mean Wind Speed m/s			Rainfall (mm)
	Max	Min	Avg	Max	Min.	Avg	Max	Min.	Avg	Total Average
	October	35.54	16.92	25.11	98	32	71.4	5.73	0.08	2.40
November	31.37	3.51	20.05	100	38	76.51	5.19	0.05	1.80	0.44
December	25.02	6.57	14.65	100	41	82.3	5.16	0.14	1.96	1.09
Oct-Dec	30.64	9.01	19.93	99.33	37	76.73	5.36	0.09	2.05	0.69

3.3 Ambient Air Quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including plant site during October 2023 to December 2023. Based on the monitoring & analysis of the results, the concentration of PM_{2.5} varied from maximum 39.4 µg/m³ to minimum 17.2 µg/m³ and the concentration of PM₁₀ varied from maximum 74.0 µg/m³ to minimum 32.19 µg/m³. NO₂ concentration is maximum from 34.8 µg/m³ to minimum 15.2 µg/m³. CO is under the 2 mg/ m³. All the parameters were observed within the permissible limits as prescribed by CPCB standards. (PM₁₀ =100, PM_{2.5} =60, gaseous pollutants 80)

3.4 Water Quality

3.4.1 Surface Water Quality

The pH of the surface water sample was observed from 7.53 to 7.73. The observed value of surface water quality indicators like total hardness varied from 236 mg/l to 148 mg/l, alkalinity varied from 216 mg/l to 136 mg/l, total dissolved solids varied from 659 mg/l to 398 mg/l, BOD varied from 5.6 mg/l to 3.2 mg/l, COD varied from 28 mg/l to 10 mg/l. The level of DO is varied from 5.5 to 4.0 mg/litre. The concentration of Chloride, Magnesium, Calcium and Fluoride is found varied from 44.0 mg/l to 26.0 mg/l, 19.44 mg/l to 14.58 mg/l, 62.4 mg/l to 35.2 mg/l and 0.45 mg/l to 0.33 mg/l respectively.

3.4.2 Ground Water Quality

The Ground water / Drinking water samples were collected from 8 locations. The Physio-Chemical quality of ground water was compared with drinking water standard (IS:10500-2012). The pH of the ground water sample was observed from 7.95 to 7.5. The observed value of groundwater quality indicators like total hardness varied from 272 mg/l to 212 mg/l, alkalinity varied from 260 mg/l to 192.0 mg/l, total dissolved solid varied from 712 mg/l to 526 mg/l. Thus it can be concluded that the ground water samples were observed to be good and complying to the drinking water standard (IS:10500-2012).

3.5 Noise Quality

Ambient noise levels were measured at eight locations in and around the project area. During the day, the noise level varies from a minimum of 45.2 dB (A) to a maximum of 59.5 dB (A) During the night, the noise level varies from a minimum of 39.8 dB (A) to a maximum of 54.0 dB (A). The results were found to be well within the standards.

3.6 Soil Quality

Soil sampling was carried out at seven locations, and the analysis results show that the soil is slightly acidic to slightly alkaline in nature. The pH of the soil samples varies from 7.27 at Brahman Majra village to 8.12 at Village Jondhan khurd, which indicates the soil samples are slightly acidic to slightly alkaline in nature. The texture of the soil samples mainly consists of sandy clay and sandy loam.

3.7 Traffic study

Due to the proposed project, there will be addition of Heavy and Light motor vehicles in the existing traffic. The LOS value is 0.24. According to this the performance will be in the category of very good. The present road capacity is good enough to bear the increased traffic load due to proposed project. However, internal roads and feeder roads will be maintained to facilitate transportation.

3.8 Socioeconomic Environment

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. Male and female ratio of study area is a major concern. It was also found that a part of population was suffering from lack of earning source. Their expectation is to earn some income for their sustainability on a long-term basis. The infrastructure and amenities available in the area denotes the economic wellbeing of the region. The study area as a whole possesses an average level of infrastructural facilities. This area lacks higher level of amenities like higher education, health, drinking water and communication network. In terms of education and health facilities, the area is less than moderate. The area needs more medical facilities. Though the area is well connected with road transport and communication facilities still more frequent bus service is required. The overall socio-economic status of the target population is average in terms of literacy, work participation rate etc.

3.9 Ecological Biodiversity

Based on a study conducted in the project area and information from the Divisional Forest Officer, Panipat, it has been determined that there are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, or Tiger/Elephant Reserves within 10 kilometers of the project site. The topographical map of the core area and its 10 kilometer radius confirms the

absence of these ecological entities. The nearest ecologically sensitive area is the Bir Bara Ban Wildlife Sanctuary, located 56 kilometers west of the proposed plant site. No rare, endangered, or threatened species were observed in the core area during the study. The diversity survey revealed that the variety of trees, shrubs, and herbs is higher in the buffer zone compared to the core zone. The core zone, characterized by fallow land, has lower vegetation value compared to the buffer zone.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Impacts on Air Quality

Airborne dust will be the primary pollutant, originating from site development activities and vehicular traffic on the road. The exhaust emissions from vehicles and equipment used during construction are expected to lead to a slight rise in levels of PM, SO₂, NO_x, and CO. PM concentrations are anticipated to be highest during active construction periods on the site. However, this impact is expected to be short-lived and localized, confined within the boundaries of the plant site, with negligible effects outside the plant perimeter. Overall, the impact is projected to be minimal and temporary.

Mitigation measures

- Proper schedule maintenance of vehicle and construction equipment will help in controlling the emissions.
- Construction equipment having PUC Certificate will be deployed during the activity to restrict exhaust emission.
- Proper training of the drivers so as to ensure adherence to speed limit.
- Covered storage facilities for storage of construction materials.
- Water sprinkling on roads and construction site to prevent fugitive dust getting air borne.
- Proper greenbelt development and plantation inside and outside the plant premises.
- A separate storage area will be demarcated for construction material to confine the dust dispersion.
- Proper PPEs will be provided to workers to prevent air borne diseases.
- All major sources of air pollution (Cement Mill) will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms i.e.30 mg/Nm³ for particulate matter emission from the stacks.
- Bag filters will be provided at all loading /unloading points and transfer points.
- Clinker will be transported by truck/conveyor and fed directly/through Bulk Reception Unit; Gypsum and slag will be stored in covered shed at proposed plant and cement in cement silo. Fly ash will be transported through bulkers and stored in fly ash silo.

- Proper maintenance of vehicles will be done to reduce gaseous emissions.
- Operators will be provided with personal protective equipment like safety Goggles, dust mask, ear plugs, helmets, shoes etc.
- Periphery of plant and surrounding areas of office building will be covered by thick green belt to attenuate the pollutants emitted by the Plant.
- Ambient air quality and stack emissions will be regularly monitored to keep emission levels below the prescribed limits.

4.2 Impacts on Noise Quality

Noise will be generated due to movement/ operation of transport and construction vehicles, equipment's, materials and people. Other important activities involved in construction stage such as excavation, earthmoving, compaction, concrete mixing, crane operation, steel erection, mechanical/electrical installation.

The noise generated will be high due to construction activities, high noise levels can cause irritation and gradual hearing loss to construction laborer's if high levels of noise exposure are continuously experienced. Sudden exposure can cause irritation in ear drums and sudden loss in hearing whereas long term exposure will result in gradual ENT problems. Though the noise generation during construction phase will be temporary and will be limited to the project site but workers who are directly exposed can have related problems.

Mitigation measures

- The vehicles used for movement will be ensured for schedule & preventive maintenance to reduce noise generation.
- The construction labors will be provided with adequate personal protective equipment like earmuffs and earplugs.
- The high noise zones at site will be demarcated and provided with enclosures & barriers.
- Construction activities and Heavy equipment's operations will be carried out only during the daytime.

4.3 Impacts on Water Environment

Water requirement at construction phase of proposed plant activities will be fulfilled from the existing source of surface /ground water. This water requirement during the construction phase will be temporary in nature and limited to short period only. Therefore, water requirement will not have a significant impact on the ground water availability in the region.

Drinking water facility will be provided to the construction workers and domestic waste water

being treated in septic tanks followed by soak pit. There will not be any discharge from the site, which can have any impact on the surrounding water quality.

Mitigation measures

- Domestic waste water will be treated in septic tanks followed by soak pit.
- No discharge of any kind will be done inside or outside plant premises in any water body. Thus, there will not be any discharge from the site which can have any impact on the water quality of the surrounding areas.

4.4 Impacts on Land Environment

The soil and debris will be generated due to the project activity. Before the monsoon season begins, efforts will be made to stabilize disturbed slopes effectively. Topsoil will be carefully stored and reinstated after the completion of the work. Additionally, the levelling process will entail the placement of backfill materials. It is advisable to utilize dust suppressant spraying to reduce fugitive dust emissions during construction activities.

Mitigation measures

- Construction wastes will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.
- Litter disposal and collection points will be established around the work sites.
- Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc. will be disposed through local recyclers.
- The construction spoils will be temporarily stored at designated located inside the plant premises.
- Discharge of any kind of pollutant will be strictly prohibited during construction period.

4.5 Impacts on Road and Traffic

Increase in the Road traffic density which will result in deteriorating the ambient air quality. Rapid Movement of heavy-duty vehicles will cause in increase noise level. No direct impact is envisaged on the flora and fauna of the vicinity area due to noise/ or the vibrations, slight impact could be observed on the nearby biodiversity. Increased traffic volume may increase the probability of accidental incidences in the area. Increased transportation can also lead to impacts on public health.

Mitigation measures

- Vehicles with PUC Certificate will be hired and allowed inside the plant premises.
- Vehicles will be covered with a tarpaulin and not over loaded.

- Un- necessary blowing of horn will be avoided.
- Roads will be maintained in good condition to reduce noise due to traffic.
- Greenbelt & Plantation in 36% of plant area is developed along the periphery and inside the plant premises.
- To avoid accidents, the speed of vehicles will be low near habitation areas.

4.6 Impact on Socio-economic Environment

All industrial projects have social and economic linkages. Therefore, putting up a new project has impact on the socio-economic environment of the locality around it. This impact may be marginal or non-marginal. The intensity of impact may depend upon the various social and environmental factors associated with it and the extent of change caused by the project to alter the existing equilibrium of the socio-economic system. The various activities of the proposed projects are likely to stimulate the existing socio-economic environment in the surrounding area. The influx of money and various construction activities may not only change the economic status of the area but also influence the existing cultural scenario. This impact is expected to be more in the area closer to the site, which decreases with increase of distance from the site.

Mitigation measures

- In addition to direct employment, several opportunities for locals will be available in terms of supply of construction materials & machinery, vehicles and other essential commodities.
- Project will have positive impact on socio-economic status of the area due to construction employment.
- The cement situation will improve in study area and will open up opportunities for new economic activities. The literacy rate is likely to improve.
- Many will find employment in service sector and marketing of day-to-day needs viz. poultry and other agricultural products.
- The project will improve the basic infrastructure and the people of nearby villages can also use these amenities.

5.0 ALTERNATIVE ANALYSIS

ACL has analyzed all the aspects related to alternative technology and site in terms of environment and social consideration and it has been found that the proposed technology is best suited for this project. Based on the analysis, VRM is the best proven technology which is best and economically feasible for grinding units. It will result in cost effective project and will lead to minimum social concern as all the environment aspects has been analyzed by the company before selecting the suitable and efficient technology and site for this proposed cement Grinding unit project.

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TABLE 9: DETAILS OF ALTERNATIVE SITES

Site 1: Israna, District Panipat, State: Haryana	Site 2: Village Naulatha , Taluka Israna, District Panipat , State: Haryana	Site 3: Mehrana, District Panipat , State: Haryana
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The selected site is site 2. Selected site is suitable due to road and rail connectivity. 90% of raw materials are expected by rail to arrive at project site and 90% product will be transported by road. Since the selected site of Village Naulatha scores over other two, same has been considered. The selected site is a fallow land with no agriculture and the land is already converted for industrial purposes.

6.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF & CC and are tabulated below in Table 9. A monitoring schedule is very important to comply with the standards for which control measures have been designed.

TABLE 10: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Sl. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1.Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
2.Air Quality				
	A.Stack Monitoring	Online monitors (all stacks) and Once in a month		PM, SO ₂ & NO _x
	B.Ambient Air quality (CAAQMS)	Continuous and Quarterly Once	Continuous 24 hours	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
	C.Fugitive emissions	Quarterly Once	8 hours	PM
3.Water & Waste water quality				
	A.Water quality in the area	Once in a month except for heavy metals which will be monitored on Quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
	B.STP Inlet &Outlet	Twice in a month	Grab sampling	Asper EPA Rules

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			(24 hourly)	1996
4.Noise level monitoring				
	Ambient Noise levels	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels
5. Soil Quality Monitoring				
	Soil levels	Quarterly Once	7 location in and around grinding unit (with respect to the downwind direction and 3 locations each at 120° directions.	Ph, Electrical conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus. Chloride etc..
6. Medical Check-up				
	Check up	Yearly as per factory act	-	Spirometry, Audiometry, biochemical parameter, ECG, Vision test and chest x ray

6.1 Emissions and discharge from plant

The details of proposed emission monitoring system installation are given in Table 11.

TABLE 11: DETAILS OF EMISSION MONITORING SYSTEM INSTALLATION

Particulars	Frequency of Monitoring	Duration of Sampling	Parameters
A. Stack Monitoring			
Grinding Mill	Online monitors (all stacks) and	once in a month	PM, SO ₂ & NO _x
B. Industrial Waste waters			
STP Inlet &Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996

6.2 Green Belt

The extent project is 9.28 Ha out of which approximately 3.23 Ha i.e. 34.80% of total project area) will be developed under greenbelt plantations. This greenbelt will serve as a buffer between the peripheries and the industry, there by controlling the air emissions and noise levels.

6.3 Social Parameters

The socio economic development activities for the proposed project will be provided to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness is being/ will be created among people by organizing awareness camps. Keeping the view of achieving the national objective of sustainability, developmental activities will be carried out.

7.0 ADDITIONAL STUDIES – RISK ASESMENT & DISASTER MANAGEMENT PLAN

Disaster management facilities and risk assessment for the proposed project activity has been done by identifying the risk involved & then preparation of action plan for handling internal emergencies.

7.1 Risk Assessment

Risk assessment is the measure of quantitative and qualitative value of risk related to a concrete situation and a recognized threat. The details are explained in Table 12.

TABLE 12: RISK HAZARD ASSESSMENT AND MITIGATION MEASURES

S. No	Activity	Associated hazards	Associated risk/ health impact	Mitigation Measures
1	Storage, handling of raw material, fuel, etc.	Heat, Fire & dust	Exposure above threshold limits, physical injuries, burning, air pollution due to fugitive emissions.	<ul style="list-style-type: none"> - Use of PPEs. - Regular water sprinkling on the haul roads. - Safety and technical training to workers for proper handling of equipment. - Proper system for loading and unloading operations. - Firefighting and first aid facilities. - Storage should be away from ignition sources. - Proper housekeeping facilities.
2	Onsite	Heat, Fire, Dust,	Physical injuries,	<ul style="list-style-type: none"> - Firefighting and first aid facilities. - Use of PPEs.

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	working	Smoke & Explosion	burning, air pollution	<ul style="list-style-type: none"> - Installation of APCEs like bag houses and bag filters. - Inspection and regular monitoring. - Training workers for proper handling of raw materials and fuels.
3	APCE failure	Release of PM in ambient air	Air pollution	<ul style="list-style-type: none"> - CEMS & inspection - Plant shall shut down immediately on APCE failure.
4	Working at height	Slip, trips & falls of operators	Physical injuries	<ul style="list-style-type: none"> - Alertness of the workers. - First aid boxes shall be provided in a dedicated place.
5	Electrical maintenance work	Electric shock, short circuits in power room	Electrical shocks, Injury or burn.	<ul style="list-style-type: none"> - Regular checking and maintenance of electrical equipment - Use of PPEs - Provision of First aid box.
6	Working near D.G. sets during emergency	High noise	Noise induced hearing losses	<ul style="list-style-type: none"> - PPEs to the workers. - Silent DG sets/Acoustic enclosures will be used.

7.2 Public consultation

The Draft EIA/EMP report has been submitted to concerned authority, Haryana for public hearing.

Action plan will be prepared and submitted after the conduction of public hearing.

8.0 PROJECT BENEFITS

The proposed project aims to enhance the socio-economic landscape of the area by improving various facts such as employment opportunities, infrastructure, and access to education. It

endeavors to elevate living standards, provide avenues for education, and foster adaptability to changing circumstances. Additionally, the project aims to strengthen essential community infrastructure, thereby promoting overall economic advancement within the region.

8.1 Employment Benefits (Direct & Indirect) due to the Project

During the construction phase, an estimated 1530 personnel will be required, with approximately 155 individuals will employ during the operational phase. Emphasis will be on recruiting locals from nearby villages, leading to increased income levels and driving economic growth in the surrounding area.

8.2 Economic benefits

Special emphasis on financial benefits will be planned for local people by providing them business opportunities in allied activities. They will be engaged for internal/local movements, maintenance and housekeeping on contractual work.

8.3 Social Benefits

The company will bring social and economic awareness among local peoples. It will supplement the existing government programmes. Environment awareness will be created by organizing awareness camps etc.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

The major source of pollution in a cement plant are stack. Air pollution will be the major concern to be looked upon for the project activity. No major water, noise & soil pollution is envisaged from the project activity. Various mitigation measures have been proposed to take care of the environment in respect of air, water, noise, soil & the green cover of the project.

9.1 Air quality management plan

- Development of sufficient vegetation
- Construction equipment having valid PIC certificate will be deployed during the activity to restrict exhaust emission.
- Proper up keep and maintenance of vehicles
- All vehicles will be maintained in well condition by regular preventive maintenance to reduce the exhaust level.
- Treated sewage water will be used for dust suppression.

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9.2 Solid and hazardous waste management plan

Solid waste generation from the Grinding unit and their end use is given Table 13.

TABLE 13: SOLID WASTE GENERATION AND THEIR END USE

S. No.	Type of Waste	End Use / Disposal Plan
1	Dust collected from air pollution control equipment	Will be totally recycled back to process.
2	Sludge from Sewage Treatment Plant (~10 Kg/annum)	Will be used development as manure for greenbelt
3	Municipal waste (domestic and orcommercial wastes)	Organic waste will be composted and will be used as manure. Inorganic waste shall be disposed of properly
4	Redundant equipment machinery	Occasionally, scraps as and when generated segregated, stored & sold to vendors.
5	Horticultural waste	Horticultural wastes generated from gardens/greenbelt will be composted.

TABLE 14: HAZARDOUS WASTE GENERATION

Sl. No	Name of the Hazardous waste	Stream	Disposal Option
1	Used or Spent Oil	5.1 of Schedule-1	Will be sold to CPCB Authorized recycler
2	Waste Residue containing oil	5.2 of Schedule-1	
3	Empty barrels/ Containers/liners	33.1 of Schedule-1	
4	Cotton rags or other cleaning materials	33.2 of Schedule-1	
5	E-waste	--	Will be sold to registered vendors as per E- Waste Management Rules, 2016

9.3 Effluent management plan

- In the proposed project of Grinding unit majority of the water requirement (>90 %) for non-potable industrial applications for the project will be met from ground water. The remaining will be met from treated water from STP
- Periodic preventive maintenance of water distribution systems.
- Use of water efficient and saving devices such as Low flow high efficiency faucet aerators, Automatic shutoff nozzles, and low flow water efficient water heads.
- Water will be used via water sprinkler for Horticulture activity, at various storage facilities and transportation purpose activity to conserve the water demand.
- Water conservation and awareness programmes within the premises as well as in the nearby schools and village for fresh water conservation.
- To conserve water and to replenish ground water resources of the area, rain water harvesting system will be installed for long term sustenance of the industry.

9.4 Storm water management plan

- Rainwater harvesting will be done as per the elevation of the site as per the contours profile of the project site, and then the storm water will be directed towards the rainwater harvesting pond base on the elevation profile.
- Since the storm water collected on site will be harvested for direct use, proper management of this resource is necessary to prevent contamination.
- Regular inspection and cleaning of storm drains will be carried out. Use of fertilizers and pesticides will be avoided prior to and during monsoon months.

9.5 Occupational health and safety management plan

- Adequate dust control systems will be implanted and good housekeeping will be practiced. Protective masks and respirators will be provided at areas where high dust exposure is going to be encountered even for a very short duration.
- Proper maintenance of machineries
- Installation of compressors in closed buildings
- Regular monitoring of noise level
- Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with clinker storage area. Fire tender is to be kept ready at plant main gate.
- Oil storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area"
- Permit and safety instruction will be given to use welding / gas cutting in the area of oil,

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and bag go down.

- Predictive interlock in transformers to give alarm and trip the system.
- Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done.
- Silos and buildings will be constructed as per the structural design as per ISCodes.
- Installing light arrestors at all tall buildings.
- Permit to be taken to work at height with work instruction to use safety beltsetc.
- Testing of all lifting tools, tackles and pressure vessel to avoid failure.
- Safe working pressure maintained in air receiver.

9.6 Greenbelt development plan

- Plantation will be done in and around the plant premises.
- 70% survival rate will be maintained with all possible efforts.
- The trees will be planted at suitable grid spacing to encourage proper growth.
- Local plant species will be preferred

9.7 Socio economic management plan

- Environmental Cell formation to be responsible for mitigation of impacts during construction phase though they are transient and temporary.
- All possible air pollutants will be minimised by installation of pollution control equipments before emitting into atmosphere. The norms will be maintained through regular monitoring and analysis of gases.
- Short term positive impacts will result in better quality of life. The project proponent/contractors shall ensure that most of the workforce shall be engaged from the nearby villages/town.

9.8 Project Cost and EMP Implementation budget

The total investment for the proposed project works out to approximately INR 1059 Crores for 4 MMTPA Naulatha Cement Grinding Unit. The breakup of cost of the project is given in the Table 15.

TABLE 15: PROJECT COST BREAKUP

Particulars	Amount (INR in Crore)
Land & Site development	18.0
Engineering know-how & project management	17.0
Civil works & structure	360.0
Plant & machinery	435.0
Expense on training	5.0
Misc. fixed asset	7.0

**Executive
Summary of Draft
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Pre-operative expenses including interest during construction	102.0
EMP cost	55.0
Contingency @ 6%	60.0
Total Capital Budget	1059.0

The cost breaks up of EMP is indicated in the Table 16.

TABLE 16: PROPOSED EMP COST

Sl. No.	Particulars	Estimated Cost (Rs. In Crore)	
		Capital	Recurring
1	Air pollution Control Measures	40.3	7.7
2	Water Pollution Control Measures	4.1	0.7
3	Occupational Health and Safety	2.9	1.1
4	Environmental Monitoring, RWH & maintenances	5.5	2.2
5	Green Belt Development	2.2	0.7
	Total	55.0	12.5

10.0 CONCLUSION

In the plant design itself, latest state-of-art technology has been envisaged so as to achieve the desired air emissions and noise levels from plant operation levels. No effluent will be generated from the plant. Further, all generated solid waste will be either recycled back into the respective plant operations. This EIA study highlights that the judicious implementation of proposed Environmental Management Plan will ensure negligible negative impacts on the environment with direct and indirect positive development to the society due to the proposed project.