Draft Environmental Impact Assessment & Environmental Management Plan Report

(Submitted for Public Hearing as per the provisions of EIA Notification 2006 & amendments thereof)

For

PROPOSED 3.0 MTPA CEMENT GRINDING & PACKING UNIT (Project Area: 26.10 Ha)

Located at Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra)

Project Proponent:

Ultratech Cement Limited Registered Address: B-Wing, Ahura Center, 2nd Floor, Mahakali Caves Road, Andheri (E), Mumbai

UltraTech

Environmental Consultant Creative Enviro Services

Accredited under the QCI-NABET Scheme for EIA Consultant NABET No. 33 Head Office: Address: SR – 4, Shri Ram Kunj, E – 8 Bharat Nagar, Shahpura, Bhopal (MP) – 462039 E-mail: creative.bpl@gmail.com

July 2020

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1.1 PURPOSE OF THE REPORT

The UltraTech Cement Limited has applied for Environmental Clearance for its proposed 3.0 MTPA Cement Grinding & Packing Unit located in 26.10 Ha area in Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra. The Maharashtra State Govt. through its undertaking Maharashtra Industrial Development Corporation (MIDC) has allotted land admeasuring 2,56,400 Sq. Mts. to UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-353/4435 dated 28th September 2015,. MIDC has also allotted land admeasuring 4,647 Sq. Mts. To UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-1/1006 dated 31st March, 2016, agreement has been signed on 8th October 2018 **Annexure 3**. The land will be used to set up Cement Grinding & Packing Unit. The main purpose of this report is to provide a coherent statement after analyzing all significant impact of the proposed cement grinding and packaging project and measures that should be taken to eliminate and mitigate them.

It contains essential information for:

- The proponent to implement the proposal in an environmentally and socially responsible way; and
- The responsible authority to make an informed decision on the proposal, including the terms and conditions that must be attached to an approval or authorization;

Applicability of EIA Notification for Environmental Clearance: EIA Notification 2006:

The proposal is for establishing a Cement grinding & Packing unit of 3.0 MTPA capacity in an area of 26.10 Ha. As per EIA Notification 2006 and subsequent amendments, the project falls in Schedule 3 (b) in Category 'B' and needs Environmental Clearance from SEIAA.

Application for Environmental clearance was submitted to SEAC, Maharashtra under category 'B' 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 -1 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 vide letter dated 29th May, 2020 for



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preparation of the EIA report and Environmental Management Plan. The TOR is enclosed as **Annexure 1** and its compliance as **Annexure 2**.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

1.2.1 Identification of Project Proponent

UltraTech Cement Ltd is the largest manufacturer of grey cement, ready mix concrete (RMC) and white cement in India. It is also one of the leading cement producers globally, and the only cement company globally (outside of China) to have more than 100 million tonne capacity in one country.

It has a consolidated capacity of 117.35 Million Tonnes Per Annum (MTPA) of grey cement. UltraTech Cement has 23 integrated plants, 1 clinkerisation plant, 27 grinding units and 7 bulk terminals. Its operations span across India, UAE, Bahrain, Bangladesh and Sri Lanka.

In the white cement segment, UltraTech goes to market under the brand name of Birla White. It has a white cement plant with a capacity of 0.56 MTPA and 2 Wall Care putty plants with a combined capacity of 0.8 MTPA.

With 100+ Ready Mix Concrete (RMC) plants in 35 cities, UltraTech is the largest manufacturer of concrete in India. It also has a slew of speciality concretes that meet specific needs of discerning customers. Our Building Products business is an innovation hub that offers an array of scientifically engineered products to cater to new-age constructions.

| Registered Office | Site Office: | | |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| M/s. UltraTech Cement Ltd B-Wing, Ahura Center, 2nd Floor, Mahakali Caves Road, Andheri (E), Mumbai | M/s. UltraTech Cement Ltd Village Malich & Waghode Plot No. 3, MIDC Area Nardana Phase-I, Tehsil Sindkheda, District Dhule, Maharashtra | | |

Address for communication:



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1.2.2 Identification of Project

The proposal is for establishing a Cement grinding & Packing unit of 3.0 MTPA capacity in an area of 26.10 Ha. The project will be established in Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra). The project will be established adjacent to the upcoming Thermal Power plant being setup by M/s Shirpur Power Pvt. Ltd (SPPL) at MIDC Area Nardana Phase-I, Tehsil Sindkheda, District Dhule, Maharashtra.

The required clinker shall be sourced from Cement Unit of UltraTech Cement Located in Madhya Pradesh (Manawar, Dhar & Vikram Cement Neemuch) and Maharashtra (Awarpur) and other units of UTCL by road/railway to the proposed grinding unit. The clinker will be unloaded through truck tipplers/wagon tippler and a surface feeder which is further conveyed to clinker storage silo of capacity (30,000 Ton) through Conveyor Belt.

Required Fly ash will be received by means of pneumatic conveying system / bulk tankers at plant site from M/s Shirpur Power Pvt. Ltd (SPPL) into the silo/hopper (5000 t) or received through closed tanker from nearest TPP and further pumped to silo/hoppers.

M/s. UltraTech Cement Ltd, is the project proponent for the proposed Cement grinding & Packing unit.

The Maharashtra Government has conferred the status of "Mega Project" to the proposed project vide letter No. HPC/2015/CR 210/IND-8 dated 10.03.2016 (Annexure 4).

The project will be implemented in 24 months' time from zero date as 6 months for pre project activities till main machinery order placement and another 18 months for project activities from main machinery order placement.

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

1.3 LOCATION OF THE PROJECT

The Cement grinding & Packing unit will be located in Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District -Dhule (Maharashtra). The nearest railway station is Nardana Railway Station, 3.25 km, NW, Nearest Highway from the project area is State Highway 6 at 0.8



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km S and NH3 Mumbai Agra National Highway at 3.5 Km W. The district headquarter Dhule is located at 28 Km in S direction from project site. The area is included in survey of India Toposheet no. 46 K/16 while in open series it falls in F43016 on R.F. 1:50,000. The Geographical coordinates of proposed project site are given in **Table 1.1**.

| Corner | Latitude | Longitude |
|--------|---------------|---------------|
| А | 21° 8'53.71"N | 74°51'03.04"E |
| В | 21° 9'23.76"N | 74°51'13.82"E |
| С | 21° 9'27.48"N | 74°51'02.07"E |
| D | 21° 8'57.44"N | 74°50'51.43"E |

Table 1.1 : Geographical Coordinates of the proposed project site

The location map of the project site is presented in **Figure 1.1**, Study Area (10 Km radius) is shown in **Figure 1.2** and Google Earth map of the proposed Project site is given in **Figure 1.3**. The environmental setting of the project site is presented in **Table 1.2**. There is no critically polluted cluster identified by CPCB/MOEF in the vicinity of the project.



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FIGURE 1.1: LOCATION MAP



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FIGURE 1.2: Toposheet map of (10 Km. Radius Study Area)



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FIGURE 1.3: Google Earth Map

1.3.1 Site Selection

The proposed project site has been selected in MIDC area Nardana Phase I of District Dhule, considering the market need and opportunities for a Clinker Grinding Unit. Following are the main criteria, considered for locating a clinker grinding unit of desired capacity:-

- Steady supply of raw materials viz. Clinker, Gypsum, Fly ash and additives for blended cement.
- Availability of adequate water & power
- Multiple sources for fly ash at short distances.
- Proximity to proper connectivity of the unit with national transport network.
- Proximity to rail head to optimize transportation costs.
- No Forest land involved.
- There is no National Park, Wild Life Sanctuary, Biosphere Reserve, Reserved / Protected Forests etc. within 10 km radius of study area.

From the above considerations, the proposed site has been found suitable for locating the proposed new project subject to environmental clearance.

Photographs of the proposed project area are given in **Plate-1.1**.



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PLATE 1.1: PHOTOGRAPHS OF THE PROJECT SITE

| Sr. | Particulars | Details |
|-----|--------------------------|-------------------------------------------------|
| No. | | |
| 1. | Project Location | Plot No. 3, |
| | | MIDC Area Nardana Phase I, |
| | | Village- Malich & Waghode |
| | | Tehsil- Sindkheda, |
| | | District – Dhule, Maharashtra |
| 2. | Latitude/Longitude | Latitude: N 21° 8'53.71" to N 21° 9'27.48" |
| | | Longitude: E 74°50'51.43" to E 74°51'13.82" |
| 3. | Toposheet No | 46 K/16 |
| | | Open Series F43016 |
| 4. | Climatic Conditions | IMD data, Jalgaon |
| | | • Avg. Ambient air temp 19.9°C – 34.8°C |
| | | Avg. annual rainfall 729.7mm |
| 5. | Site elevation above MSL | 187 m aMSL - 192 m aMSL |
| 6. | Land use at the proposed | Industrial land falling under MIDC area Nardana |
| | project site | Phase I. |

TABLE 1.2: ENVIRONMENTAL SETTING OF PROJECT SITE



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| Sr. | Particulars | Details | |
|-----|---------------------------|---------------------------------------------------|--|
| No. | | | |
| 7. | Site topography | Flat land with slight slope. | |
| 8. | Nearest roadway | State Highway 6: 0.8 km S | |
| | | Mumbai Agra National Highway, NH-3 : 3.5Km | |
| | | W | |
| 9. | Nearest Railway Station | Nardana Railway Station, 3.25 km, NW | |
| | | Betawad Railway Station, 3.5 km, NE | |
| 10. | Nearest Railway line | Bhusaval Surat Railway line | |
| 11. | Nearest Air Port | Shirpur Airport : 25 km N | |
| | | Dhule Airport: 30 km S | |
| | | Indore airport : 200 km N. | |
| 12. | Nearest village/major | Waghode village: 0.6 km. S | |
| | town | Jatoda Village : 1.25 km. N | |
| | | Nardana Town 4.25 km. NW | |
| | | Sindkheda Town : 17km. NW | |
| | | Dhule City: 28 km S | |
| 13. | Hills/valleys | Project and nearby area is mostly flat land with | |
| | | slight undulations. | |
| 14. | Ecologically sensitive | No notified ecologically sensitive zone within 10 | |
| | zone | km radius | |
| 15. | Reserved/Protected | R.F.: 8.2 km SW | |
| | forests | | |
| 16. | Historical/tourist places | Songir Fort, 10 km SW | |
| 17. | Nearest Industries | Project site falls within MIDC area. Thermal | |
| | | Power plant is being established by M/s Shirpur | |
| | | Power Pvt. Ltd (SPPL) adjacent to the proposed | |
| | | Cement Grinding & Packing Plant. | |
| 18. | Nearest water bodies | Panjhra River (4.0 km in East Direction) | |
| | | o Lendi Nadi (3.5 km in West Direction) | |
| | | o Tapi River (12.0 km in North direction) | |
| | | o Sagarmoti Nallah (0.5 km in South Direction) | |
| | | o Lav ki Nadi (9.0 km in SE Direction) | |
| | | o Gundal Nallah (1.5 km in East Direction) | |
| | | o Doka Nallah: (3.0 km in North Direction) | |
| | | o Gangadi Nallah (9.5 km in NE Direction) | |
| | | o Pond Near Dongargaon (8.5 km in South | |
| | | Direction) | |
| | | o Pond Near Babhalde – (97.5 km in SW Direction) | |



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| Sr. | Particulars | Details |
|-----|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. | | |
| 19. | Seismic zone | The area is not known for these natural hazards. Seismically, this area is categorized under Zone-III as per IS-1893 (Part-1)-2002 having Moderate Damage Risk Zone. In Medvedev–Sponheuer–Karnik scale (MSK) the area falls in MSK VII. |
| 20. | Project Costs Capital Cost Environmental Protection Cost | Rs. 315 Crore Capital cost for EMP: Rs. 25 Crore Recurring Expenses for EMP: Rs. 1.25 Crore/annum |

*all distances mentioned in the above table are aerial distances.

1.4 IMPORTANCE TO THE COUNTRY & REGION

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



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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.

Regional Importance of the Project:

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.

The Proposed Cement Grinding Unit Project will generate Direct Employment for about ~ 120 Regular employees during the operational phase and $\sim 200-250$ contractual labors. During the Implementation phase of the project, approx. 500 labors will be given employment based on the eligibility criteria.

Unskilled/ semi-skilled manpower will be sourced from the local area whereas skilled manpower will be sourced from outside as well also from the local. Apart from the direct employment, Apart from the direct employment, indirect employment opportunities are also envisaged by the way of transportation, workshops, petty contractors, shopkeepers, network of retailers (Cement Stockists) throughout the state.

1.5 SCOPE OF THE STUDY

1.5.1 Details of the EIA Consultant including NABET accreditation

M/s UltraTech Cement Limited has hired the services of M/s Creative Enviro Services for conducting the Environmental Impact Assessment Studies and for preparation of EIA/EMP report for the proposed Cement Grinding & Packing Project located at MIDC area Nardana Phase – I, Dhule. Details of the EIA Consultant are given in Chapter 12 of the EIA/EMP report.

1.5.2 Scope of the Study

In line with the Auto Generated TOR issued by SEAC-1, Maharashtra, the area comprising of 10 km radius around the project area was considered as the study area for the project. The EIA/EMP report has been prepared for the Proposed Cement Grinding & Packing Unit. The detailed studies were conducted as per prescribed ToR. Scope of this study covers all the points given in the Terms of references granted by SEAC, Maharashtra vide letter no.



SIA/MH/IND/52929/2020 dated 29/05/2020 in favor of M/s. UltraTech Cement Limited.

The scope of study broadly covered:

- Literature review and collection of data relevant to the study area;
- Establishing the baseline environmental scenario in and around the proposed project site;
- Identifying various existing pollution loads due to various industrial activities;
- Predicting incremental levels of pollutants in the study area due to the proposed cement grinding & Packing unit;
- Evaluating the predicted impacts on various environmental attributes in the study area by using scientifically developed and widely accepted environmental impact assessment methodologies;
- Preparing an Environment Management Plan (EMP) outlining the measures for improving the environmental quality; and
- Identifying critical environmental attributes that are required to be monitored in the post-project scenario.

The EIA/EMP report is prepared for the Proposed Cement Grinding & Packing Unit which is a standalone cement unit classified as **"Category B"** by Ministry of Environment & Forest, New Delhi, as per the EIA notification dated on 14th September, 2006. The draft report is prepared incorporating the Standard ToR conditions.



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2.1 TYPE OF PROJECT

UltraTech Cement limited proposes to install a standalone Grinding Unit to produce 3.0 MTPA of Cement (Portland Pozzolana Cement & Ordinary Portland Cement) along with packing unit. Cement will be produced by grinding ready clinker, gypsum and fly ash.

Plant will be located in an area of 26.10 Ha in Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra.

2.2 NEED FOR PROJECT

India is the second largest producer of cement in the world. No wonder, India's cement industry is a vital part of its economy, providing employment to more than a million people, directly or indirectly.

India has a lot of potential for development in the infrastructure and construction sector and the cement sector is expected to largely benefit from it.

UltraTech Cement Ltd. is the largest manufacturer of grey cement, RMC, and white cement in India. It is also one of the leading cement producers globally. UltraTech as a brand embodies 'strength', 'reliability' and 'innovation'. Together, these attributes inspire engineers to stretch the limits of their imagination to create homes, buildings and structures that define the new India.

The Government of India is strongly focused on infrastructure development to boost economic growth and is aiming for 100 smart cities. The Government also intends to expand the capacity of railways and the facilities for handling and storage to ease the transportation of cement and reduce transportation cost. These measures would lead to an increased construction activity, thereby boosting cement demand. As per Union Budget 2019-20, the Government expected to upgrade 1,25,000 kms of road length over the next five years, which would boost the demand for cement.

Demand and Supply Gap:

Following assumptions govern the demand of cement and its supply.

Growth in demand for cement is due to Central government liberalization policies and development of housing, road and infrastructure projects.



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A cement deficit situation is envisaged in the coming years but the situation may change depending upon the infrastructure growth in the coming years.

For the cement supply of these units, the region is predominantly dependent on Vidarbha Cluster (Chandrapur) which makes it prone to erratic supply due to poor rake availability in Chandrapur cluster.

Imports vs. Indigenous Production

The proposed project will utilize raw material namely Clinker, Fly ash, Slag and Gypsum. However, some imports will be required for Imported Coal and Chemical Gypsum sourced from the Middle East though the nearest port Kandla.

Export Possibility

Currently there are no export plans from the project. Major production will be consumed in the state of Maharashtra itself.

Domestic / Export Markets

The Target marketing area will be Khandesh and Maharashtra Market (Nashik, Thane, Nandurbar, Dhule & Aurangabad)

2.3 LOCATION OF THE PROJECT

The proposed plant will be located in an area of 26.10 Ha in Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra.

The toposheet & topographical map (10 km radius) is given in **Figure 2.1** & **Figure 2.2**, Google Image is given in **Figure 2.3**. The plant layout is given in **Figure 2.4**.



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Source: SOI Toposheet

Figure 2.1: Toposheet Map



Chapter 2: Project Description



Source: SOI Toposheet





Chapter 2: Project Description



Source: Google Earth







Figure 2.4: Plant Layout

Codes used in the Layout Plan

| Sr. No. | Description |
|---------|---------------------------------------------|
| 1. | Main Gate for Plant |
| 2. | Security Hub |
| 3. | Time Office and Logistics |
| 4. | Canteen |
| 5. | Admin Building |
| 6. | Stores and Offices |
| 7. | Car Parking |
| 8. | Weigh Bridge Control Room for Packing |
| 9. | Weigh Bridges at Main Gate |
| 10. | Material Gate |
| 11. | Weigh Bridge Control Room Material Handling |
| 12. | Weigh Bridges at Material Gate |
| 13. | Security Hub at Material Gate |
| 14. | BRU for Gypsum/Clinker with Ramp |
| 15. | Crusher for Gypsum |
| 16. | Gypsum storage shed |
| 17. | Clinker Silo |
| 18. | Gypsum storage yard |
| 19. | Hopper Building |
| 20. | Flyash Silo |
| 21. | Cement Mill |
| 22. | CCR & Lab |
| 23. | Compressor Room below Hopper Building |
| 24. | Cement Silo |
| 25. | Packing Plant |
| 26. | DG Set |
| 27. | Truck Loading |
| 28. | Wagon Tippler |
| 29. | Cooling Tower |
| 30. | Electrical Room for Wagor Tippler |
| 31. | Electrical Room for Material Handling |
| 32. | Electrical Room for Cement Mill / Packing |
| | Plant |
| 33. | Truck parking with other buildings |
| 34. | STP |



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2.4 Size and magnitude of operation

M/s. UltraTech Cement Ltd. (Unit: Dhule Cement Works) is proposing a Cement Grinding of 3.0 MTPA capacity and Packaging Unit (Stand Alone grinding unit) at Plot No. 3, Nardana MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra).

2.5 Proposed schedule for approval and implementation

| S. No. | Activity description | Aug., 2020 | Sep., 2020 | Oct., 2020 | Nov., 2020 | Dec., 2020 |
|-----------|------------------------------------|---------------|---------------|---------------|---------------|---------------|
| 1. | Application submission to SEAC | Comple | eted on 2 | 21/04/202 | 20 | |
| 2. | Grant of ToR | Comple | eted on 2 | 29/05/202 | 20 | |
| 3. | Submission of PH documents to MPCB | | | | | |
| 4. | Conducting Public Hearing | | | | | |
| 5. | Consideration for EC by SEAC-I | | | | | |
| 6. | Recommendation of SEAC-I | | | | | |
| 7. | Consideration of SEIAA | | | | | |
| 8. | Grant of EC by SEIAA | | | | | |

2.6 RESOURCE REQUIREMENT FOR THE PROJECT

2.6.1 Raw Material

The major raw materials required for the proposed grinding unit are Clinker, Gypsum and Flyash. The details of the input materials required, their sources, transportation mode and their quantities for proposed cement plant are as given below in the **Table 2.1**. Typical compositions of raw material are given in **Annexure 5**.



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| Sr. | Raw | Quantity | Source | Distance | Mode of | Basis f | or assess | sment | |
|-----|----------|----------|---------------------|----------|-----------|---------|-----------|-------------|-----------|
| No. | Material | MTPA | | in Km. | Transport | РРС | ОРС | PSC Slag | Composite |
| 1. | Clinkor | 1.5 to | UTCL Plants – Dhar, | ~250 | Rail & | | 050/ | 450/ | |
| | CIIIKEI | 2.0 | Vikram etc. | km | Road | 05% | 95% | 45% | 55% |
| 2. | Elwach | 0.4 to | Dowor Dlanta | 10 to | Road | 28- | | | 200/ |
| | Fly ash | 0.80 | rower rialits | 200 km | | 35% | - | - | 20% |
| 3. | Gypsum | 0.15 | Rajasthan/Chemical | 600 km | Road | 5% | 5% | 5% | 5% |
| | ajpeum | 0.20 | Gypsum | | | | - 70 | - 70 | |
| 4. | Slag | 0.35 to | Essar Steel/other | ~350 | Rail & | | | E00/ | 200/ |
| | Jiag | 0.70 | steel plants | km | Road | - | - | 50% | 20% |

TABLE 2.1: REQUIREMENT & SOURCES OF RAW MATERIAL

Raw Material Storage

Material's storage is required at various stages of production for ensuring sufficient buffer stocks for continuous operation of the plant. The Storage capacities and type of storages are given in **Table 2.2**.

| Sr. No. | Material | Grinding Unit Stock in days | Storage capacity | Type of Storage |
|---------|----------|--------------------------------|------------------|------------------|
| 1. | Clinker | 10 | 30,000 T | Covered RCC Silo |
| 2. | Gypsum | 15 | 5,000 T | Covered Shed |
| 3. | Fly ash | 4 | 5,000 T | Covered RCC Silo |
| 4. | Cement | 3 | 2 x 7,500 T | Covered RCC Silo |

TABLE 2.2: PROPOSED MATERIAL STORAGE ARRANGEMENT

All raw materials will be stored in RCC silos except Gypsum, which will be stored in covered shed and top and stable liner on floor to avoid leaching of material to ground water. Stock piles will have to be on top of a stable liner to avoid leaching of materials to ground water.

2.6.2 Land

Total land available with UltraTech is 26.10 Ha. The Maharashtra State Govt. through its undertaking Maharashtra Industrial Development Corporation (MIDC) has allotted land admeasuring 2,56,400 Sq. Mts. to UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-353/4435 dated 28th September 2015,. MIDC has also allotted land admeasuring 4,647 Sq. Mts. To UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-1/1006



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dated 31st March, 2016, agreement has been signed on 8th October 2018 **Annexure 3**.

Topography of the project site is flat with elevation range varying from 187 m aMSL - 192 m aMSL. The site does not require any filling. The material excavated will be utilized within the plant area for cut - fill balancing. No material will be brought from outside for meeting the filling requirement of the plant area.

The layout of the proposed Cement Grinding & Packing Unit is shown in **Figure 2.1.** Details of proposed land use plan of the total area are given in **Table 2.3**.

| Sr. No. | Description | Area in Ha. | Area in % |
|---------|--------------------------|-------------|-----------|
| 1. | Plant & Building | 7.80 | 29.9 |
| 2. | Roads & Open Space | 4.50 | 17.3 |
| 3. | Future Railway Provision | 2.80 | 10.7 |
| 4. | Truck Parking | 2.40 | 9.2 |
| 5. | Green Belt | 8.60 | 33 |
| | Total | 26.10 | 100.0 |

TABLE 2.3: LAND USE PLAN



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2.6.3 Water Requirement & Source

Total water requirement has been estimated as 350 m3/ day. Water is required for process, equipment cooling, drinking, sanitation, etc. Primarily, water requirements for the unit shall be met by MIDC supply water (treated) or if required in future Ground water shall be used with prior Permission.

For plant equipment, water shall be re-circulated after cooling to avoid any wastage and only losses shall be making up from fresh water. The flow diagram showing water requirement at various facilities in the Cement Grinding & Packing Unit is given in **Figure 2.5**.





2.6.4 Rain Water Harvesting

UltraTech Cement has designed the storm water network for the entire area of 26.10 Ha.

| Rainwater Harvesting Potential Estimation | | | |
|-------------------------------------------|---------------------|--|--|
| Total Plot area | : 26.10 Ha | | |
| Annual rainfall of the area | : 729.7mm | | |
| Rainfall Incident over area | : 190451.7 m³/annum | | |



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Water available for Harvesting after 20%: 152361.36 m³/annumevaporation and percolation loss: 122361.36 m³/annum

Number of rainy days in a year (Average)

: 43

Average Water available for Harvesting per day : 3543.29 m³/day

The rain water will be guided through network of storm water drains inside the boundary into a holding tank of about 5000 cum capacity and pumped into percolation pits provided in the premises.

2.6.4 Power

The power demand for grinding unit has been estimated at about 15 MVA. The power requirement for the grinding unit shall be met by the nearest 132 KV or 33 KV switch yard of Grid Power with suitable step down transformer or possibility will be explored to take the power from SPPL power plant.

Based on the technical concept, specific power consumption has been considered as 32kWh/t for OPC and 30kWh/t for PPC.

2x 6 MW DG Set will be installed for power back-up in emergency situation.

2.6.5 Manpower

The Proposed Clinker Grinding Unit project will generate Direct Employment for about ~ 120 Regular employees during the operational phase and $\sim 200-250$ contractual labors. Employment based on the eligibility criteria. Unskilled/ semi skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local. A summary of the manpower requirement for the proposed Cement Grinding & Packing Unit is given in **Table 2.4**.

| Particulars | Requirement | |
|----------------------|-------------|--|
| Regular Manpower | | |
| High-Skilled | 10 | |
| Skilled | 25 | |
| Semi – Skilled | 40 | |
| Unskilled | 45 | |
| Total - | 120 | |
| Contractual Manpower | 200-250 | |

TABLE 2.4: MANPOWER REQUIREMENT

2.7 **PROCESS DESCRIPTION**

2.7.1 Main Machinery Sizing

The main machines involved in the Cement Grinding & Packing Unit are Cement mill and packing plant. The details are given in **Table 2.5**.



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| Sr. | Department | Operating | Operating days | Safety Factor | |
|-----|-------------------------|---------------|----------------|---------------|--|
| No. | | hours per day | per year | | |
| 1. | Cement mill (Ball Mill/ | 21 | 345 | 1.15 | |
| | VRM) with Roller press | | | | |
| 2. | Packing Plant | 16 | 365 | 1.25 | |

TABLE 2.5: DETAILS OF MAIN MACHINES

2.7.2 System Details

The schematic flow diagram of the Cement manufacturing process from clinkers is given in **Figure 2.6.** The material balance of the raw materials and finished product is also given in the figure. The detailed process is explained in following paragraphs:



FIGURE 2.6: PROCESS FLOW DIAGRAM WITH MATERIAL BALANCE (MTPA)



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Clinker transport & storage:

Clinker will be transported from the integrated Cement Unit of UltraTech Located in Madhya Pradesh (Manawar, Dhar & Vikram Cement Neemuch) and Maharashtra (Awarpur) and other units of UTCL by road/railway to the proposed grinding unit. The clinker will be unloaded through truck tipplers/wagon tippler and a surface feeder which is further conveyed to clinker storage silo of capacity (30,000 Ton) through Conveyor Belt.

Gypsum transport & storage: Gypsum received will be transported through road/rail and unloaded by truck tippler/wagon tippler to belt conveyor and stacked in the covered gypsum stock yard of Capacity (5000 Ton). The required quantity of gypsum will be fed to steel hoppers through series of belt conveyors.

Fly ash: Fly ash can be sourced from the adjacent Power plant (SPPL) through the pneumatic conveying system into the silo/hopper (5000 t) or received through closed tanker from nearest other TPPs and further pump to silo/hoppers.

Slag Storage & Handling: Slag will be received through road and will be unloaded and transported to storage by a belt conveyor. Slag will reclaim by pay loader / dozer and fed to hopper for further conveying to Mill hoppers.

Cement Production, Storage and Packaging- Clinker, Fly ash/Slag and Gypsum is grounded in Ball Mill/VRM and Roller Press. UTCL has proposed to install Ball Mill/VRM with roller press. The required quantities of Raw materials will be fed to the roller press in proportion, high efficiency separator and then to the ball mill. The fly ash shall be fed into the separator directly. The 70 -75 % of the grinding will be done by the roller press and the grounded material will be separated by High efficiency separator and the rejects from the separator will be fed to the ball mill for further grinding. 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 minimise 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 storage: Two nos. RCC silo each of capacity 7500 t shall be constructed for storage of cement.

Cement packing: The cement from silos will be extracted and fed to the installed 4 no's of electronic packers, eight spout, single discharge with a capacity of 120


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TPH each through air slides, bucket elevators and screens. Each packer will be connected with 6 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 also be available to load bulk cement through closed tankers. Railway siding is also proposed for the transportation of raw material and final product through wagon loaders. The construction of railway siding will be done in the Phases. Within the First phase, Railway siding with only basic needs required to facilitate the transportation will be constructed and later in the second phase, Extension of the same is planned. A full flagged railway loading and unloading system will be considered in Phase-II.

Phase-II

In first phase, railway siding is considered with only basic needs, in second phase extension are planned. A full fledged railway loading and unloading system will be considered in Phase-II. Detail equipment and process are as follow:

Wagon Tippler: Raw material for the plant shall be received from railway siding. The received material shall be unloaded through wagon tippler of 25 tips/hr capacity. Unloaded material shall be transported to their storage stockpile by using belt conveyor.

Wagon Loader: A separate wagon loading platform with 8 wagon loader of 120 shall be considered for finished product transportation. To fulfill the Wagon loading demand we have to consider additional packing machine.

Packers: The cement from silos will be extracted and fed to the installed 4 more no's of electronic packers, eight spout, single discharge with a capacity of 120 TPH each through air slides, bucket elevators and screens. Each packer will be connected with 8 wagon 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.

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

• For Chemical Analysis

Technology laboratory are envisaged.

- X-ray diffractometer (XRD)
- Conventional chemical analysis equipment.



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• For Physical Analysis

Facilities for testing the physical properties like sieve analysis, setting time, soundness, fineness, CCS, Grindability, moisture content, drying shrinkage, etc.

• Particle Size Distribution (PSD)

For determining the PSD of the clinker, cements, etc. a laser diffraction type PSD analyzer may be installed having typical particle size range of 0.3 mm 400 micron.

• Quality Control Plan

To produce good quality cement, it is imperative that sampling & testing of various raw materials like clinker, gypsum, flyash 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 taken into account.

- 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, flyash and cement.



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2.8 UTILITIES

2.8.1 Compressed Air Supply-

Compressors and blowers have been -envisaged for operation of process equipment. The compressed air is also used for various bag filters installed to minimise air pollution and diverting gates, valves, blasters etc. Blowers are mainly used for aeration of silos.

2.8.2 Central Control Room (CCR)

A CCR building is envisaged to be constructed at site. This building can be located above the MCC room near cement mill section. Operation of the cement mill & Packing Plant will be carried out from this control room.

2.8.3 Maintenance

Workshop: A mechanical and an electrical workshop is envisaged to take care of the regular maintenance/ repair jobs in the plant.

Central stores: A store building needs to be constructed for storing tools, spare parts, consumables, etc. Open area to be earmarked for storing machinery and construction materials for the proposed grinding unit site.

Cranes, Monorails and Pulley blocks: Adequate sized maintenance cranes/ hoists, monorails and pulley blocks to be provided at all suitable locations at the plant site for ease of maintenance and operation.

2.8.4 Miscellaneous services

- **Technical & Laboratory/QC office**: A suitable technical office & laboratory / QC office shall be constructed for the project activities and operation phase.
- **Administrative & Time and Security office**: A suitable administrative, time & security office shall be constructed for the project activities and operation phase.
- **Dispensary**: A small dispensary with first aid facilities will be provided in the plant premises.
- **Fire fighting system**: Fire detection and extinguishing system shall be provided in all buildings.
- **Weighbridge**: Two nos. electronic weighbridges are envisaged to take care of the incoming and outgoing materials at site. These may be located near the main entrance of the the plant sites.
- **Bags Godown**: Space shall be provided in the packing plant for the storage of empty bags.



- **Parking**: The adequate parking area for trucks may be planned outside the main gate.
- **Restrooms**: Adequate restroom facility with urinals, toilets and drinking water facilities will be provided for truck drivers, regular and contractual workers, etc. within the plant premises.
- **Canteen**: A canteen will be established within the plant premises.
- **First Aid station**: First aid facilities will be available at main office and time office. First aid boxes will also be made available in each sections.
- **Drinking water**: Drinking water coolers / taps will be provided at easily accessible locations in each section.
- **Toilets & Urinals**: Toilets and urinals will be provided in each section. Separate toilets will be provided for ladies workers.

2.8.5 Environment

Plant landscape and green belt:

Due care has to been taken to keep-up the natural settings/ greenery in and around the plant .A thick green belt shall be developed in and around the plant.

Pollution control equipment: The installation of the following pollution control equipment is foreseen:

- High efficiency Bag house will be provided for Cement mill
- Bag filters will be provided at all the material transfer points
- Covered conveyor belt will be provider
- Closed sheds/RCC silos for raw and finished materials, Bag filters at transfer points, water spraying etc.
- Regular monitoring of ambient air quality and ground water quality and suitable measures shall be planned time to time to minimize the impacts.

2.8.6 List of Major Industries

Proposed Cement Grinding & Packing Unit of M/s Ultratech Cement Ltd. will be located in an area of 26.10 Ha in Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra). Other industries located / proposed in the 10 km radius study area are listed below:

| Sr. No. | Industry | Location |
|---------|---------------------------------------|-------------|
| 1. | 2 x 150 MW Thermal Power Plant of M/s | Adjacent, E |
| | Shirpur Power Private Ltd. | |

TABLE 2.6: LIST OF INDUSTRIES IN THE STUDY AREA



Chapter 2: Project Description

| 2. | Wire Drawing Plant of M/s Bedmutha | 6.0 km SW |
|----|---------------------------------------|-----------|
| | Industries Ltd. | |
| 3. | MIDC Babhale | 5.3 km SW |
| 4. | Shreeji Wire Industry | 3.8 km NW |
| 5. | Nandkrishna chemical Pvt. Ltd. | 3.7 km NW |
| 6. | 2x2 MTPA Clinker Grinding Unit of M/s | 1.2 km N |
| | Wonder Cement Ltd. | |



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3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies are required to know the existing environmental status of the area so that the impacts from proposed industrial activities can be superimposed to predict the post project scenario and to assess if the proposed industry can be established in the area without causing any detrimental effect on the environment.

Baseline environmental studies were carried out within 10 km radius of the proposed Cement Grinding & Packing Unit area to assess the existing environmental scenario in the area. For the purpose of EIA studies, proposed Cement Grinding & Packing Unit site was considered as the 'Core Zone' and area outside the proposed Cement Grinding & Packing Unit upto 10 km radius was considered as 'Buffer Zone'. The core zone and buffer zone together formed 'Study Area' for the project. Map showing 10 km radius study area for the project is given in Figure 3.1. The baseline environmental monitoring for various components of environment, viz. Air, Noise, Water, Soil, etc. was carried out during Post monsoon season i.e. October 2019 to December 2019 in the study area covering 10 km radial distance from the proposed Cement Grinding & Packing Unit. Data on other environmental parameters such as flora and fauna, land-use pattern, forest etc. were generated through field surveys and also secondary information collected from different state Govt. departments. Also Socio-economic survey was conducted, through discussions with the villagers, sarpanch, teachers and medical officers through questionnaires and the collected information was supported by census data for demographic structures, amenities and infrastructure availability within the study area.

3.1.1 Methodology

Appropriate methodologies are followed in developing the EIA-EMP report. The methodology adopted for the study is outlined below:

- Conducting reconnaissance of the study area;
- Selecting sampling locations for conducting various baseline environment monitoring studies;

The sampling locations were selected on the basis of the following:

- Existing topography;
- Predominant wind directions recorded by the IMD Jalgaon observatory;
- Location of villages/towns/ sensitive areas;



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- Drainage pattern and location of existing surface water bodies like lakes/ponds, rivers and streams; and
- Areas, which represent baseline conditions;



FIGURE 3.1: MAP SHOWING 10 KM RADIUS STUDY AREA



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3.2 AIR ENVIRONMENT

3.2.1 Meteorology

The meteorological data recorded during the monitoring period is very useful for proper interpretation of the baseline information as well as input for air quality prediction. Historical data on meteorological parameters also plays an important role in identifying the general meteorological regime of the region.

The year may broadly be divided into four seasons:

| Winter | : | December to February |
|--------------|---|----------------------|
| Pre-Monsoon | : | March to May |
| Monsoon | : | June to September |
| Post-Monsoon | : | October to November |

Sources of Information

Secondary information for the last 30 years (1971-2000) on meteorological conditions was collected from the nearest IMD station at Jalgaon. Pressure, temperature, relative humidity, rainfall, wind speed and direction are measured twice a day viz., at 0830 and 1730 hr. The climatologically data of IMD Jalgaon is presented in **Table 3.1**

Analysis of IMD Jalgaon Data

The Indian Meteorological Department records the data at two times a day viz. 0830 hr and 1730 hr, while the site-specific data was recorded at an hourly interval. Comparison of the site specific data generated during the study period vis-à-vis the data monitored by IMD shows that by and large these are comparable.

Temperature

The winter season starts from December and continues till the end of February. The maximum daily average temperature recorded 32.8°C in the month of February and minimum daily average temperature recorded 12.1°C in the months of December & January. The day and night temperatures increase rapidly during the onset of summer season from March to May. During summer season, the maximum daily average temperature was observed 42.5°C in the month of May with the minimum daily average temperature 18.6°C in the month of March. The maximum daily average temperature in the monsoon season was observed to be 38.1°C whereas the minimum temperature was observed to be 22.9°C. In the month of October with the onset of post-monsoon, day temperatures decrease slightly with the maximum temperature 34.7°C and the minimum temperature 15.1°C.



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Relative Humidity

The average monthly minimum and maximum relative humidity was observed around 19% to 58% during summer period. In the monsoon period the relative humidity ranged between 46% - 88%. During the post-monsoon season, the mean humidity was observed between 36% -70% and during winter season, the mean humidity was observed between 30% - 67%.

Rainfall

The average annual rainfall based on the IMD data was 729.7 mm. The monsoon generally sets in during the first week of June. The rainfall gradually decreases after September. The maximum numbers of rainy days were observed in the month of August with 213.6 mm rainfall.

| Month | Temperat | ure (°C) | Relative Hu | midity (%) | Rainfall (mm) |
|-----------|-------------|----------|--------------------|------------|---------------|
| | Min | Max | 8:30 hrs. | 17:30 hrs. | Mean |
| January | 12.1 | 30.4 | 66 | 36 | 4.0 |
| February | 14.0 | 32.8 | 57 | 30 | 3.5 |
| March | 18.6 | 37.7 | 46 | 22 | 7.2 |
| April | 24.1 | 41.4 | 45 | 19 | 2.3 |
| Мау | 26.9 | 42.5 | 58 | 23 | 7.0 |
| June | 25.9 | 38.1 | 74 | 46 | 128.0 |
| July | 24.2 | 32.9 | 84 | 67 | 210.1 |
| August | 23.4 | 31.0 | 88 | 73 | 213.6 |
| September | 22.9 | 33.0 | 84 | 60 | 90.8 |
| October | 19.8 | 34.7 | 70 | 42 | 41.2 |
| November | 15.1 | 32.6 | 63 | 36 | 16.9 |
| December | 12.1 | 30.2 | 67 | 40 | 5.3 |
| Range | 12.1 - 42.5 | 5 | 19 - 88 | | 729.7 |

TABLE 3.1: CLIMATOLOGICAL DATA FOR IMD, JALGAON

Source: Climatological Normals IMD, Jalgaon. (1971-2000)

Analysis of Meteorological Data Recorded Near the Project Site

On-site monitoring was undertaken for various meteorological parameters as per BIS and IMD guidelines to generate the site-specific data. The generated data was then compared with the meteorological data obtained from IMD Jalgaon.

The automatic meteorological data recording instrument was installed on top of a building near to the project site to record wind speed, wind direction, relative humidity and temperature. Rainfall was monitored by rain gauge. Hourly



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average, maximum, and minimum values of wind speed, direction, relative humidity, rainfall, and temperature were recorded continuously at this station for Post monsoon season i.e. during October 2019 to December 2019. The meteorological data recorded at the project site is summarised in **Table 3.2** and the summary of wind pattern during the monitoring period is given in **Table 3.3** whereas the wind roses drawn are presented in **Figure 3.2**.

| Month | Temperature (°C) | | Relative Humidi | ty (%) |
|-------------------|------------------|----------|-----------------|--------|
| | Min | Max | Min. | Max |
| October 2019 | 16.8 | 25.7 | 43 | 89 |
| November 2019 | 15.5 | 20.4 | 28 | 94 |
| December 2019 | 19.2 | 33.9 | 45 | 96 |
| Range 16.8 - 33.9 | | 8 - 33.9 | 28 | - 96 |

TABLE 3.2: SUMMARY OF THE METEOROLOGICAL DATA GENERATED AT SITE

| TABLE 3.3: WIND | DIRECTION AN | D WIND SPEEL | AT PRO | ECT SITE |
|-----------------|--------------|--------------|--------|----------|
| | DIRECTION | | | |

| Wind Direction | Frequency % |
|---------------------------------|-------------|
| West | 17.30% |
| WSW | 14.80% |
| Frequency of clam winds: 29.11% | |
| Average wind speed: 2.47 m/s | |



FIGURE - 3.2: SITE SPECIFIC WINDROSE (Oct to Dec 2019)



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3.2.2 Baseline Ambient Air Quality

The ambient air quality status within the study area was monitored for post monsoon season 2019 at 8 locations including the proposed Cement Grinding & Packing Unit site and in the nearby villages. The monitoring locations are given in **Table 3.4** and are shown in **Figure 3.3**.

The study area mostly represent rural background. The dominant sources of air pollution in the region are domestic activities, vehicular traffic on National Highway and State Highways and agriculture activities in the nearby villages. The prime objective of the baseline air quality study was to assess the existing air quality of the area. The regional climatologically data (Source: IMD Jalgaon, 30 years average), was used as a guide to know the predominant wind direction during study period. The monitoring locations were selected keeping in view predominant wind directions prevailing during study period, sensitive receptors, human settlements and other pollution sources. The levels of Respirable Particulate Matter (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂) and Oxides of Nitrogen (NO_x), Carbon Monoxide (CO) were monitored for establishing the baseline status. PM₁₀ were sampled with the help of Respirable Dust Samplers on filter papers and SO₂ & NOx were absorbed in the respective absorption media in the impingers attached to RD samplers and analysed spectro-photometrically. PM_{2.5} was monitored with the help of Fine Particulate Samplers.

The minimum, maximum, average and 98th percentile values have been computed from the observed raw data for all the AAQ monitoring stations and the results are summarized in **Table 3.5** and the detailed results are given in **Annexure 6**.

| Sr. | Station | Description | Geographical C | oordinates | Dist. & dir. |
|-----|---------|------------------|----------------|----------------|-------------------|
| No. | Code | | Latitude | Longitude | w.r.t. Plant site |
| 1 | A1 | Project Site | 21°09'13.5" N | 074°51'01.7" E | - |
| 2 | A2 | VilageMalich | 21°09'12.7" N | 074°49'31.4" E | 2.35 km W |
| 3 | A3 | Village Kalmadi | 21°08'14.0" N | 074°49'01.6" E | 3.4 km SW |
| 4 | A4 | Village Vaghadi | 21º06'22 6" N | 074°40'20 2" F | 5.3 km SSW |
| | | Budrukh | 21 00 22.0 N | 074 49 29.2 E | |
| 5 | A5 | Village Vaipur | 21°08'19.2" N | 074°46'47.1" E | 7.1 km WSW |
| 6 | A6 | Village Nardana | 21°11'32.8" N | 074°49'34.0" E | 4.5 km NW |
| 7 | A7 | Village Pashte | 21°12'31.8"N | 074°54'01.8" E | 7.5 km NE |
| 8 | A8 | Village Shahapur | 21°09'47.1" N | 074°56'09.8" E | 8.5 km ENE |

 TABLE 3.4: Details of Ambient Air Quality Monitoring Locations



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FIGURE 3.3: MAP SHOWING AIR MONITORING LOCATIONS



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| Station | Location | Description | PM ₁₀ , | PM _{2.5} , | SO ₂ | NOx | CO |
|---------|------------|-------------|--------------------|---------------------|------------------------|---------|----------------------|
| code | | | (µg/m³) | (µg/m³) | (µg/m³) | (µg/m³) | (mg/m ³) |
| A 1 | Plant Site | Minimum | 46.6 | 21.4 | 11.1 | 17.1 | 0.307 |
| ۸1 | | Maximum | 63.3 | 31.5 | 19.9 | 27.9 | 0.474 |
| A1 | | Average | 52.9 | 25.7 | 15.6 | 23.2 | 0.401 |
| | | 98th %tile | 63.05 | 31.15 | 19.8 | 27.7 | 0.472 |
| | Malich | Minimum | 41.8 | 22.6 | 9.1 | 9.5 | 0.245 |
| 12 | village | Maximum | 58.5 | 31.5 | 17.1 | 18.6 | 0.453 |
| A2 | | Average | 48.1 | 25.9 | 12.5 | 14.8 | 0.353 |
| | | 98th %tile | 58.2 | 31.3 | 16.6 | 18.6 | 0.444 |
| | Kalmadi | Minimum | 40.8 | 23.5 | 9.5 | 13.6 | 0.287 |
| A 3 | village | Maximum | 52.5 | 30.3 | 16.3 | 23.9 | 0.404 |
| | | Average | 48.2 | 27.1 | 12.1 | 17.6 | 0.349 |
| | | 98th %tile | 52.0 | 30.3 | 15.9 | 23.4 | 0.400 |
| | Vaghadi | Minimum | 37.6 | 20.2 | 7.1 | 13.9 | 0.304 |
| A 4 | Budruk | Maximum | 49.3 | 26.5 | 12.4 | 21.4 | 0.397 |
| | village | Average | 45.1 | 24.2 | 9.8 | 17.6 | 0.348 |
| | | 98th %tile | 49.0 | 26.2 | 12.25 | 21.3 | 0.396 |
| A5 | Vaipur | Minimum | 42.7 | 22.2 | 7.6 | 12.9 | 0.274 |
| | village | Maximum | 59.4 | 31.8 | 21.2 | 31.5 | 0.457 |
| | | Average | 49.0 | 25.8 | 11.9 | 20.0 | 0.361 |
| | | 98th %tile | 59.2 | 31.7 | 19.6 | 30.5 | 0.450 |
| | Nardana | Minimum | 45.6 | 27.2 | 13.3 | 23.7 | 0.234 |
| 16 | village | Maximum | 60.9 | 35.7 | 22.9 | 37.4 | 0.453 |
| A O | | Average | 51.5 | 30.8 | 17.6 | 28.8 | 0.342 |
| | | 98th %tile | 59.9 | 35.45 | 22.25 | 36.2 | 0.443 |
| | Pashte | Minimum | 38.8 | 23.3 | 9.7 | 11.1 | 0.209 |
| A 7 | village | Maximum | 50.2 | 29.7 | 16.2 | 24.9 | 0.396 |
| | | Average | 45.5 | 27.2 | 13.1 | 20.0 | 0.318 |
| | | 98th %tile | 49.7 | 29.65 | 16.05 | 24.8 | 0.392 |
| A 8 | Shahapur | Minimum | 42.8 | 23.2 | 9.1 | 12.1 | 0.306 |
| | village | Maximum | 54.2 | 29.1 | 14.1 | 20.7 | 0.397 |
| | | Average | 49.6 | 26.6 | 11.2 | 15.8 | 0.350 |
| | | 98th %tile | 53.9 | 29 | 13.95 | 20.5 | 0.394 |
| NAAQ S | tandard (2 | 24 hrs) | 100 | 60 | 80 | 80 | 4 |

TABLE 3.5: SUMMARY OF AMBIENT AIR QUALITY RESULTS



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Observations on Primary Data:

- PM_{10} concentration in the study area varied from 37.6 to $63.3\mu g/m^3$ during the study period.
- $PM_{2.5}$ concentration in the study area varied from 20.2 to $35.7\mu g/m^3$ during the study period.
- SO_2 concentration in the study area varied from 7.1 to $22.9\mu g/m^3$ during the study period.
- NOx concentration in the study area varied from 9.5 to 37.4µg/m³during the study period.
- CO concentration in the study area varied from 0.209 to 0.474 mg/m³ during the study period.

From the above results, it is observed that the ambient air quality with respect to PM_{10} , $PM_{2.5}$, SO_2 , NOx and CO at all the monitoring locations was within the permissible limits as per National Ambient Air Quality Standards.

3.3 NOISE ENVIRONMENT

3.3.1 Baseline Status

Ambient noise level monitoring was carried out at the 8 monitoring locations, those were selected for ambient air quality monitoring. The details of noise monitoring locations are given in **Table 3.6** and are shown in **Figure 3.4**. The noise level monitoring results are given in **Table 3.7**.

| Sr. | Station | Description | Geographica | l Coordinates | Dist. & dir. |
|-----|---------|------------------|------------------------------|----------------|--------------|
| No. | Code | | Latitude | Longitude | w.r.t. Plant |
| | | | | | site |
| 1 | N1 | Project Site | 21°09'13.5" N | 074°51'01.7" E | - |
| 2 | N2 | Vilage Malich | 21°09'12.7" N | 074°49'31.4" E | 2.5 km W |
| 3 | N3 | Village Kalmadi | 21°08'14.0" N | 074°49'01.6" E | 3.4 km SW |
| 4 | N4 | Village Vaghadi | 21°06'22 6" N 074°40'20 2" F | | 5.3 km SSW |
| | | Budrukh | 21 00 22.0 N | 074 49 29.2 E | |
| 5 | N5 | Village Vaipur | 21°08'19.2" N | 074°46'47.1" E | 7.1 km WSW |
| 6 | N6 | Village Nardana | 21°11'32.8" N | 074°49'34.0" E | 4.5 km NW |
| 7 | N7 | Village Pashte | 21°12'31.8"N | 074°54'01.8" E | 7.5 km NE |
| 8 | N8 | Village Shahapur | 21°09'47.1" N | 074°56'09.8" E | 8.5 km ENE |

 TABLE 3.6: NOISE MONITORING LOCATIONS IN THE STUDY AREA



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FIGURE 3.4: MAP SHOWING NOISE MONITORING LOCATIONS



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| Time (Hrs) | | | Stations Code | | | | | | |
|------------|----------|--------|---------------|--------|--------|--------|--------|--------|--------|
| | | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
| | 600 | 43.6 | 42.9 | 43.9 | 39.8 | 40.7 | 43.3 | 39.8 | 42.3 |
| | 700 | 42.8 | 44.6 | 45.1 | 41.6 | 42.7 | 44.7 | 41.4 | 44.8 |
| | 800 | 45.7 | 46.1 | 46.8 | 42.6 | 44.1 | 47.1 | 43.6 | 45.8 |
| | 900 | 49.4 | 50.4 | 50 | 44.1 | 47.1 | 50.6 | 45.8 | 49.9 |
| | 1000 | 53.5 | 52.2 | 51.6 | 48.3 | 50 | 53.7 | 48 | 51.9 |
| | 1100 | 51.3 | 52.7 | 50.3 | 47.5 | 47.1 | 52.6 | 46 | 50.8 |
| | 1200 | 52.9 | 51.6 | 49.6 | 47 | 46 | 51.6 | 45.5 | 51.5 |
| | 1300 | 51.5 | 52.5 | 51.8 | 44 | 42.9 | 51.6 | 44.1 | 49.7 |
| Day Time | 1400 | 50.5 | 50.2 | 48.6 | 45 | 45.1 | 50.2 | 45 | 46.7 |
| | 1500 | 49.6 | 50.1 | 48.3 | 43.9 | 44.5 | 49 | 45.8 | 47.6 |
| | 1600 | 45.8 | 47.4 | 49.4 | 43.6 | 42.9 | 47.4 | 48.1 | 49.3 |
| | 1700 | 47 | 50.2 | 48.6 | 42.3 | 42.3 | 50.5 | 45.8 | 50.6 |
| | 1800 | 47.6 | 48.4 | 47.5 | 45.8 | 43.8 | 51.6 | 44.9 | 49.5 |
| | 1900 | 48.9 | 46.1 | 47.9 | 42.7 | 42.3 | 48.9 | 43.3 | 47.3 |
| | 2000 | 46.3 | 45.3 | 46.9 | 41.5 | 41.8 | 47.2 | 42.7 | 47.2 |
| | 2100 | 47.3 | 47.9 | 45.5 | 40.7 | 41.8 | 45.9 | 41.7 | 46.5 |
| | 2200 | 47.2 | 47.5 | 45.3 | 42.3 | 41.7 | 45 | 41 | 46.2 |
| | 2300 | 45.3 | 46.7 | 44.3 | 40.4 | 41.3 | 43.8 | 40.4 | 43.5 |
| | 2400 | 43.3 | 44.4 | 43.4 | 39.6 | 40.7 | 43.3 | 40 | 43 |
| Night | 100 | 43.4 | 43.1 | 42.2 | 38.5 | 40.2 | 42.1 | 39.7 | 41.6 |
| Time | 200 | 42.5 | 41.1 | 40.6 | 38.6 | 38.8 | 41.4 | 39.9 | 41 |
| | 300 | 41.9 | 40.9 | 40.6 | 38.3 | 38.2 | 41.2 | 38.5 | 40 |
| | 400 | 41.6 | 40.1 | 41.6 | 37.9 | 39.3 | 42.2 | 38.1 | 40.1 |
| | 500 | 43.1 | 42.1 | 43.2 | 38.8 | 39.8 | 42.9 | 39 | 41.6 |
| Range | ` | 41.6 - | 40.1 - | 40.6 - | 37.9 - | 38.2 - | 41.2 - | 38.1 - | 40.0 - |
| | • | 53.5 | 52.7 | 51.8 | 48.3 | 50.0 | 53.7 | 48.1 | 51.9 |
| Ld | | 48.28 | 48.59 | 48.06 | 43.68 | 43.92 | 48.87 | 44.26 | 48.09 |
| Ln | | 43.01 | 42.62 | 42.27 | 38.87 | 39.75 | 42.41 | 39.37 | 41.54 |

Table 3.7: Ambient Noise Level Monitoring Results, [Leq in dB(A)]

Observations:

From the above table, it is observed that the ambient noise levels at all the monitoring locations were well within the permissible limits of 55dB(A) for day time and 45 dB(A) for night time.



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3.3.2 Traffic Density

To assess the impacts of the proposed project on the traffic infrastructure of the area, existing traffic density was monitored on Amalner – Sindkheda State Highway-6. The existing traffic density on the Amalner – Sindkheda State Highway-6 is summarised in **Table 3.8**.

| Table 3.8: Existing Traffic Density on | Amalner – Sindkheda State Highway-6 |
|----------------------------------------|-------------------------------------|
|----------------------------------------|-------------------------------------|

| Sr. No. | Type of Vehicle | No. of vehicles / day |
|---------|------------------------------|-----------------------|
| 1 | HMV | 108 |
| 2. | LMV | 156 |
| 3. | Four wheelars (Cars/Jeeps) | 324 |
| 4. | Three wheelars/ Two wheelars | 517 |
| | Total | 1105 |

From the above table, it can be seen that there is a moderate traffic on the Amalner – Sindkheda State Highway-6 with a traffic density of about 46 vehicles per hour. The road is observed to be in good condition.

3.4 WATER ENVIRONMENT

3.4.1 Topography & Drainage Pattern

The area for proposed Cement Grinding & Packing Unit comprising of vacant land owned by the MIDC and allotted to M/s UltraTech Cement Ltd. for establishing the Cement Grinding & Packing Unit. The area is almost flat with general elevation of 187m to 192 m above MSL. The area is devoid of vegetation except some bushes and there is no habitation in or adjacent to the applied area. A 2x150MWThermal Power Plant of M/s Shirpur Power Pvt. Ltd. is being constructed adjacent to the applied project area. There is no perennial or seasonal surface water body within the proposed project site. The surface run-off during monsoon season joins nearby seasonal streams.

The study area around the project site is mostly flat except some hillocks in the south western part. Elevation of the study area varies from 155 m in the north eastern part to 282 m MSL in the south western part. The general slope of the area is towards north. Western Railway broad gauge line (Tapi valley Branch) passes through the middle of the study area from SE to NW. Mumbai Agra NH-3 passes through the middle of the study area from south to north.

Panjhra river and Lendi nadi form the major drainage of the study area. Panjhra river flows at 4.0 km E of project site from south to north east and joins Tapi river at about 12 km NE of the project area. Lendi Nadi flows at 3.5 km W of the



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project site from south to north and joins Tapi river at about 15 km N of the project site.

The topography and drainages of the study area are shown in **Figure 3.5**.

3.4.2 Rainfall

The Dhule district receives low to medium rainfall. The rainfall is typically very late, however very heavy when it starts, receiving mainly from the south-west monsoon which usually sets in the third/ fourth week of June and spread over a period from mid-June to mid-September with heaviest shower in the month of July and August. The average rainfall in the district is around 729.7 mm. The average annual rainfall data is presented in **Table 3.9**.

| Taluka | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Average |
|-----------|------|------|------|------|------|------|------|------|------|------|---------|
| Dhule | 412 | 718 | 851 | 318 | 727 | 668 | 492 | 568 | 641 | 500 | 589.5 |
| Sakri | 457 | 701 | 633 | 687 | 880 | 798 | 538 | 634 | 608 | 546 | 648.2 |
| Shirpur | 702 | 1175 | 889 | 605 | 1195 | 1061 | 624 | 922 | 965 | 610 | 874.8 |
| Sindkheda | 513 | 863 | 762 | 386 | 970 | 747 | 398 | 748 | 533 | 533 | 645.3 |

 Table 3.9: Taluka-wise Annual Rainfall Data (Period: 2002-2011)

(Source: CGWB Report, Dhule District)

Most of the rainfall, about 80% of the annual value, occurs during monsoon months of June to September. August is the rainiest month followed by July. With the withdrawal of monsoon in September, the intensity of rainfall rapidly decreases. The decrease continues till November, which is practically rainless month. Winter precipitation is associated with the passage of the Western disturbances and is in the form of rains or cold showers.



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FIGURE 3.5: TOPOGRAPHY & DRAINAGE MAP



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3.4.3 Hydrogeology GEOLOGY OF AREA:

The project area comprises of Sindkheda Tehsil, District-Dhule (Maharashtra) while 10 Km radius study area comprises of AmalnerTaluka of Jalgaon District. Geologically the area comprises mainly of Deccan Trap Formation of Igneous origin. Deccan Trap formation is made up of layers of lava flows with thickness of individual flow varying from few meters to 40m. These rocks have been considered to be a result of fissure type of lava eruption during the Cretaceous – Eocene period. The age of Deccan Trap is 45 million years. The individual lava flows can be differentiated into three zones. 1) The upper amygdule zone. 2) The middle vesicular zone and 3) bottom massive lava flow. The vesicles are filled with secondary minerals of Zeolitic group Stilbite, Natrolite Calcite, and other varieties of quartz. (Agate, Amethyst, Zeolite) The Great Trap region of the Deccan covers the whole district. It is entirely of volcanic formation.

DECCAN TRAP FORMATION:

Basalt is the major rock type of Deccan Trap Formation and occupies the whole 10 km study area. The rock formed after solidification of flows is named as Basalt. They are dense fine-grained rocks that are of very dark color- green or black and form when molten lava from deep in the earth's crust rises up and solidifies. Slightly coarser old sheets of basalt, now partially altered but still dark in color, are extensively quarried, crushed, and sold as "trap rock". Basalt is a hard, dense, dark volcanic rock composed chiefly of plagioclase, pyroxene, and olivine, and often having a glassy appearance.

LOCAL GEOLOGY

Geologically the area comprises Deccan Trap of Upper Cretaceous to Lower Eocene age rock like Basalt. The outcrops of weathered basalt which are pale yellow in colour with presence of small fracture and weak planes are exposed in study area.

HYDROLOGY:

The study area is drained by Tapi River Basin. Dendritic type of drainage pattern is observed in study area. While there are many others small water bodies i.e. Village ponds occur within 10 Km radius. The average annual rainfall observed in the study area is only 729.7mm (Source: Nearest IMD, Jalgaon).

HYDROGEOLOGY:

Ground water occurs under phreatic conditions in the exposed lava flows and in semi-confined to confined state in the subsurface flows. Ground water is present



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in pore spaces in the vesicular unit of each flow and in the jointed and fractured portions of massive unit. Hydro-geologically, the aquifer is unconfined to semiconfined type. In the Deccan Traps the rocks do not have primary porosity. Secondary porosity has been developed due to vesicles, weathering, jointing and fracturing. The water bearing capacity depends on the degree and depth of weathering, intensity of jointing and fracturing and thickness of sheared zones. However, secondary porosity and permeability developed on account of weathering, fracturing and joints play a very important role in the storage and movement of ground water. This has given rise to good aquifers. Weathering not only produces granular materials but also widens the fractures, joint and shear zones.

ASSESSMENT OF WATER RESOURCES:

The groundwater is used through open dug wells, primarily used for domestic use by the inhabitants whereas the deep bore wells are used for irrigation purpose. Depth of groundwater level has been varied from 5 to 10m during post monsoon while in pre-monsoon it is up to 20 m in study area (Source: Dhule and Jalgaon District, CGWB).

In Sindkheda Taluka of Dhule District the net annual ground water availability for future irrigation is 10897.09 ham/yr., whereas the allocation for domestic and industrial requirements is 405.97 ham/yr. Stage of ground water development is 42.52 % while in Amalner Taluka of Jalgaon District stage of ground water development is 60.44 %. Entire 10 km radius study area falls in safe category of groundwater development. Since the stage of ground water development is less than 70%. (*Source: CGWB Report, Dhule District*)

Hydro-geological map of Dhule district is shown in the **Figure. 3.6**.



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Figure 3.6: Hydrogeological Map of Dhule District

3.4.4 Water requirement

Total water requirement for the proposed Cement Grinding & Packing Unit is estimated to be 350 m³/d. Water will be supplied from MIDC supply water (treated) or from SPPL extension water line or if required in future Ground water shall be used with prior Permission.

3.4.5 Baseline Status

The existing status of groundwater and surface water quality was assessed by identifying8 ground water (Bore wells) samples in different villages and 5 surface water samples as depicted in **Figure 3.7** and listed in **Table 3.10**.

The physico-chemical & bacteriological characteristics of ground and surface water are given in the **Tables 3.11& 3.12** respectively.



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FIGURE 3.7: MAP SHOWING WATER SAMPLING LOCATIONS



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| Sr. | Station | Description | Geographical | Coordinates | Dist. & dir. |
|-----|---------|-------------------------------------------------------|---------------|----------------|-------------------|
| No. | Code | | Latitude | Longitude | w.r.t. Plant site |
| | Surface | Water Sampling Locat | tions | | |
| 1 | SW1 | Sagarmoti Nala Near Vaghode Village | 21°08'29.4" N | 74°50'56.0"E | 0.8 km S |
| 2 | SW2 | Panjara River Near Valkheda Village (Upstream) | 21°06'23.6" N | 74°52'21.3"E | 5.2 km SE |
| 3 | SW3 | Panjra River Near Betawad Village (Down Stream) | 21°09'23.2" N | 74°54'22.2"E | 5.5 km E |
| 4 | SW4 | Lendi River Near Varud Village | 21°11'27.0" N | 74°51'21.2"E | 3.8 km N |
| 5 | SW5 | GundalNala Near Gorhane Village | 21°09'48.7" N | 74°48'22.8"E | 4.6 km W |
| | | | | | |
| | Ground | Water Sampling Loca | tions | | |
| 6 | GW1 | VaghodeVillage Bore Well | 21°08'29.4" N | 74°50'56.0"E | 0.8 km S |
| 7 | GW2 | Varud Village Bore Well | 21°11'27.0" N | 74°51'21.2"E | 3.8 km N |
| 8 | GW3 | Pimprad Village Bore Well | 21°11'32.8" N | 074°49'34.0"E | 4.5 km NW |
| 9 | GW4 | Malich Village Bore Well | 21°09'05.8" N | 074°49'35.1" E | 2.2 km. W |
| 10 | GW5 | Kalmadi Village Bore Well | 21° 8'13.55"N | 74°49'2.52"E | 4.0 km. SW |
| 11 | GW6 | Valkheda Village Bore Well | 21°06'23.6" N | 74°52'21.3"E | 5.2 km SE |
| 12 | GW7 | Bamhna Village Bore Well | 21° 9'9.19"N | 74°54'8.72"E | 4.5 km E |
| 13 | GW8 | Betawad Village Bore Well | 21°09'23.2" N | 74°54'22.2"E | 5.5 km E |

TABLE-3.10: DETAILS OF WATER SAMPLING LOCATIONS



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| Sn No | Danamatana | Unito | CW/1 | CMD | CW2 | CW/A | CWE | As Per IS 10 |)500 of 2012 |
|----------|---------------------------------------|----------------|------|------|------|-------|-------|--------------|--------------|
| 51°. NO. | Parameters | Units | 3111 | 3W2 | 3103 | 3W4 | 3103 | Acceptable | Permissible |
| Physica | l Parameters | | | | | | | | |
| 1 | Temperature | ⁰ C | 26.8 | 26.6 | 26.9 | 27.2 | 26.5 | - | - |
| 2 | Colour | Hazen | CL | CL | CL | CL | CL | 5 | 25 |
| 3 | Odour | - | AG | AG | AG | AG | AG | UO | UO |
| 4 | Taste | - | AG | AG | AG | AG | AG | AG | AG |
| 5 | Turbidity | NTU | <5 | <5 | <5 | <5 | <5 | 5 | 10 |
| 6 | pH at 25°C | - | 8.2 | 8.1 | 8.1 | 7.8 | 7.2 | 6.5 – 8.5 | NR |
| Inorgan | ic Parameters | | | | | | | | |
| 7 | Electrical Conductivity | μS/cm | 723 | 486 | 452 | 1820 | 1245 | - | - |
| 9 | Total Dissolved Solids | mg/l | 412 | 239 | 274 | 823 | 667 | 500 | 2000 |
| 10 | Total Suspended Solids | mg/l | <5 | <5 | <5 | <5 | <5 | - | - |
| 11 | Total Alkalinity as CaCO ₃ | mg/l | 165 | 182 | 123 | 308 | 257 | 200 | 600 |
| 12 | Total Hardness as CaCO ₃ | mg/l | 132 | 148 | 127 | 364 | 246 | 300 | 600 |
| 13 | Calcium Hardness as CaCO ₃ | mg/l | 78 | 63 | 60 | 154 | 137 | - | - |
| 14 | Calcium as Ca++ | mg/l | 34.3 | 37.5 | 24.8 | 68.9 | 62.8 | 75 | 200 |
| 15 | Magnesium as Mg++ | mg/l | 18.2 | 21.6 | 21.4 | 56.8 | 26.1 | 30 | 100 |
| 16 | Sodium as Na | mg/l | 20.6 | 23.8 | 32.7 | 121.4 | 52.3 | - | - |
| 17 | Potassium as K | mg/l | 13.8 | 16.2 | 12.9 | 85.3 | 89.3 | - | - |
| 18 | Chlorides as Cl | mg/l | 33.2 | 36.8 | 35.9 | 294.5 | 132.7 | 250 | 1000 |
| 19 | Sulphates as SO ₄ | mg/l | 18.7 | 21.9 | 54.6 | 78.1 | 54.8 | 200 | 400 |
| 20 | Nitrates as NO ₃ | mg/l | 0.21 | 0.3 | 0.14 | 0.29 | 0.45 | 45 | NR |

TABLE 3.11: Physico-chemical characteristics of Surface Water



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| Sn No | Danamatana | Unita | CW/1 | CMD | CW/2 | CIAZA | SWE | As Per IS 10 |)500 of 2012 |
|----------|-----------------------------------------|-------|--------|--------|--------|--------|--------|--------------|--------------|
| 51°. NO. | Parameters | Units | 3111 | 3002 | 3003 | 3114 | 3113 | Acceptable | Permissible |
| 21 | Fluoride as F | mg/l | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 | 1 | 1.5 |
| 22 | Dissolved Oxygen | mg/l | 4.9 | 6.5 | 6.6 | 5.8 | 4.8 | - | - |
| Pollutar | nts | | | | | | | | |
| 23 | Amonical Nitrogen as NH ₃ -N | mg/l | 0.29 | 0.42 | 0.38 | 0.14 | BDL | - | - |
| 24 | Nitrite Nitrogen as NO ₂ -N | mg/l | BDL | BDL | BDL | BDL | BDL | - | - |
| 25 | H ₂ S | mg/l | BDL | BDL | BDL | BDL | BDL | - | - |
| 26 | Total Phosphate as PO ₄ -P | mg/l | 0.28 | 0.18 | 0.24 | 0.28 | 0.13 | - | - |
| 27 | Cyanide as CN | mg/l | BDL | BDL | BDL | BDL | BDL | 0.05 | NR |
| 28 | Phenolic Compounds | mg/l | BDL | BDL | BDL | BDL | BDL | 0.001 | 0.002 |
| 29 | Total Oil & Grease | mg/l | BDL | BDL | BDL | BDL | BDL | 0.01 | 0.03 |
| 30 | B O D 3 days 27 °C | mg/l | 10 | <3 | <3 | 4 | 14 | - | - |
| 31 | C O D | mg/l | 88 | 74 | 68 | 82 | 113 | - | - |
| 32 | Pesticides | mg/l | Absent | Absent | Absent | Absent | Absent | Absent | 0.001 |
| 33 | Poly Nuclear Hydrocarbon (PAH) | mg/l | BDL | BDL | BDL | BDL | BDL | - | - |
| Trace M | letals | | | | | | | | |
| 34 | Aluminium as Al | mg/l | BDL | BDL | BDL | BDL | BDL | 0.03 | 0.2 |
| 35 | Arsenic as As | mg/l | BDL | BDL | BDL | BDL | BDL | 0.01 | NR |
| 36 | Boron as B | mg/l | 0.07 | 0.10 | 0.50 | 0.15 | 0.53 | 1 | 5 |
| 37 | Cadmium as Cd | mg/l | BDL | BDL | BDL | BDL | BDL | 0.01 | NR |
| 38 | Chromium as Cr ⁶⁺ | mg/l | BDL | BDL | BDL | BDL | BDL | 0.05 | NR |
| 39 | Copper as Cu | mg/l | BDL | 0.09 | 0.07 | 0.09 | BDL | 0.05 | 1.5 |
| 40 | Iron as Fe | mg/l | 0.14 | 0.17 | 0.11 | 0.23 | 0.57 | 0.3 | 1 |



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| Sr No | Parameters | Unite | SW1 | CIN/2 | SW3 | SWA | SWE | As Per IS 10500 of 2012 | | |
|---------|-----------------|---------------|------|--------|------|------|-------|-------------------------|-------------|--|
| 51. NO. | Falameters | Units | 31/1 | 3 88 2 | 3113 | 3114 | 3103 | Acceptable | Permissible | |
| 41 | Lead as Pb | mg/l | BDL | BDL | BDL | BDL | BDL | 0.05 | NR | |
| 42 | Manganese as Mn | mg/l | 0.02 | 0.03 | 0.01 | 0.31 | 0.05 | 0.1 | 0.3 | |
| 43 | Mercury as Hg | mg/l | BDL | BDL | BDL | BDL | BDL | 0.001 | NR | |
| 44 | Selenium as Se | mg/l | BDL | BDL | BDL | BDL | BDL | 0.01 | NR | |
| 45 | Zinc as Zn | mg/l | 0.05 | 0.08 | 0.02 | 0.10 | 0.03 | 5 | 15 | |
| 46 | Nickel as Ni | mg/l | BDL | BDL | BDL | BDL | BDL | 0.02 | NR | |
| Microbi | ology | | | | | | | | | |
| 47 | Coliform | MPN/100 ml | 1100 | 180 | 120 | 490 | >1100 | - | - | |

Note:-BDL is Below Detectable Limit ; Minimum Detectable Limit For parameters tested are as Under

 $(NO_2-0.1,PO_4-0.05,Oil \& Grease-5,BOD-1,COD-5,Al-0.02,AS-0.02,B-0.01,Cd-0.01,Cr^{+6}-0.05,Cu-0.03,Fe-0.05,Pb-0.05,Mn-0.02,Hg-0.001,Zn-0.01, Se = 0.005)$ (Unit mg/l)

NTU – nephalometery turbitity unit;; NR - no relaxation; MPN - most probable number UO - unobjectionable: AG - agreeable; NA- not applicable

TABLE 3.12: GROUND WATER QUALITY

| Sr. No. | Parameters | Units (| GW1 | GW2 | GW3 | GW4 | GW5 | GW6 | CMIT | CMO | As Per IS 10500 of 2012 | |
|---------|---------------------|---------|------|------|------|------|------|------|------|------|----------------------------|-----------------|
| | | Units | | | | | | | uw / | uwo | Accept able | Permiss ible |
| Physica | l Parameters | | | | | | | | | | | |
| 1 | Ambient Temperature | 0C | 25.2 | 26.1 | 26.3 | 25.4 | 26.1 | 25.4 | 25.9 | 25.3 | - | - |
| 2 | Colour | Hazen | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 5 | 25 |



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| | | | | | | | | | | | As Per l | S 10500 |
|----------|------------------------------------------|-------|------|------|------|------|------|------|------|------|--------------|---------|
| Sr. No. | Parameters | Units | GW1 | GW2 | GW3 | GW4 | GW5 | GW6 | GW7 | GW8 | Accept | Permiss |
| | | | | | | | | | | | able | ible |
| 3 | Odour | - | AG | UO | UO |
| 4 | Taste | - | AG | AG |
| 5 | Turbidity | NTU | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 10 |
| 6 | pH at 25 °C | - | 7.2 | 7.1 | 7.3 | 7.4 | 7.2 | 7.3 | 7.1 | 7.5 | 6.5 – 8.5 | NR |
| Inorgan | ic Parameters | | | | | | | | | | | |
| 7 | Electrical Conductivity | μS/cm | 532 | 569 | 734 | 664 | 704 | 724 | 526 | 723 | - | - |
| 8 | Total Dissolved Solids | mg/l | 308 | 389 | 567 | 608 | 475 | 513 | 664 | 564 | 500 | 2000 |
| 9 | Total Alkalinity as CaCO3 | mg/l | 187 | 236 | 242 | 254 | 296 | 324 | 212 | 225 | 200 | 600 |
| 10 | Total Hardness as CaCO3 | mg/l | 216 | 231 | 452 | 632 | 645 | 627 | 308 | 287 | 300 | 600 |
| 11 | Calcium Hardness as CaCO ₃ | mg/l | 157 | 124 | 149 | 156 | 134 | 129 | 112 | 108 | - | - |
| 12 | Calcium as Ca++ | mg/l | 43.8 | 42.6 | 45.2 | 53.4 | 54.7 | 54.2 | 43.4 | 38.2 | 75 | 200 |
| 13 | Magnesium as Mg ⁺⁺ | mg/l | 27.4 | 31.7 | 31.4 | 32.1 | 37.9 | 36.1 | 27.8 | 29.7 | 30 | 100 |
| 14 | Sodium as Na | mg/l | 31.5 | 36.4 | 35.8 | 49.7 | 34.2 | 34.1 | 35.2 | 42.1 | - | - |
| 15 | Potassium as K | mg/l | 10.2 | 13.2 | 27.6 | 15.2 | 26.3 | 40.1 | 12.3 | 15.2 | - | - |
| 16 | Chlorides as Cl | mg/l | 44.2 | 45.8 | 48.7 | 39.7 | 38.9 | 42.3 | 41.6 | 48.7 | 250 | 1000 |
| 17 | Sulphates as SO ₄ | mg/l | 38.9 | 41.1 | 52.3 | 72.3 | 62.9 | 32.1 | 50.7 | 42.1 | 200 | 400 |
| 18 | Nitrates as NO ₃ | mg/l | 3.5 | 2.8 | 2.6 | 3.6 | 2.1 | 1.3 | 2.3 | 3.1 | 45 | NR |
| 19 | Fluoride as F | mg/l | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.2 | 0.3 | 1 | 1.5 |
| Pollutar | nts | | | | | | | | | | | |



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| Sr. No. | Demonstration | 11 | CW/4 | <u>cwa</u> | CW2 | CINA | CINE | CIVIC | CINE | CIVIO | As Per I of 2 | S 10500 012 |
|---------|-----------------------------------------|-------|--------|------------|--------|--------|------|-------|------|-------|------------------|-----------------|
| 5r. no. | Parameters | Units | GWI | GW2 | GW3 | GW4 | GW5 | GWO | GW / | GW8 | Accept able | Permiss ible |
| 20 | Amonical Nitrogen as NH ³ -N | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | - | - |
| 21 | Nitrite Nitrogen as NO ² -N | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | - | - |
| 22 | H_2S | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | - | - |
| 23 | Total Phosphate as PO ₄ -P | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | - | - |
| 24 | Cyanide as CN | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.05 | NR |
| 25 | Phenolic Compounds | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.001 | 0.002 |
| 26 | Total Oil & Grease | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.01 | 0.03 |
| 27 | Pesticides | mg/l | Absent | Absent | Absent | Absent | Abse | Abse | Abse | Abse | Absent | 0.001 |
| 28 | Poly Nuclear Hydrocarbon (PAH) | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | - | - |
| Trace M | letals | | | | | | | | | | | |
| 29 | Aluminium as Al | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.03 | 0.2 |
| 30 | Arsenic as As | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.01 | NR |
| 31 | Boron as B | mg/l | 0.05 | 0.05 | 0.15 | 0.05 | 0.05 | 0.04 | 0.04 | 0.05 | 1 | 5 |
| 32 | Cadmium as Cd | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.01 | NR |
| 33 | Chromium as Cr ⁶⁺ | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.05 | NR |
| 34 | Copper as Cu | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.05 | 1.5 |
| 35 | Iron as Fe | mg/l | 0.18 | 0.13 | 0.09 | 0.09 | 0.14 | 0.16 | 0.14 | 0.18 | 0.3 | 1 |
| 36 | Lead as Pb | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.05 | NR |



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| Sr. No. | Parameters | Units | GW1 | GW1 GW2 | GW3 | GW4 | GW5 | CWG | CW7 | CWO | As Per IS 10500 of 2012 | |
|------------------|-----------------|----------------|------|---------|------|------|------|------|------|------|----------------------------|---------|
| 5 r . no. | Parameters | Units | GWI | GW2 | GW3 | GW4 | GW 5 | GWO | GW/ | GWδ | Accept | Permiss |
| 27 | Managana | | 0.10 | 0.10 | 0.24 | 0.20 | 0.22 | 0.22 | 0.10 | 0.22 | | |
| 37 | Manganese as Mn | mg/I | 0.18 | 0.10 | 0.24 | 0.29 | 0.32 | 0.23 | 0.18 | 0.22 | 0.1 | 0.3 |
| 38 | Mercury as Hg | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.001 | NR |
| 39 | Selenium as Se | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.01 | NR |
| 40 | Zinc as Zn | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 5 | 15 |
| 41 | Nickel as Ni | mg/l | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.02 | NR |
| Microbi | iology | | | | | | | | | | | |
| 42 | Coliform | MPN/10 0 ml | - | - | - | - | - | - | - | - | - | - |

Note:- BDL is Below Detectable Limit ; Minimum Detectable Limit For parameters tested are as Under

(NO₂-0.1,PO₄-0.05,Oil & Grease-5,BOD-1,COD-5,Al-0.02,As-0.02,B-0.01,Cd-0.01,Cr⁺⁶-0.05,Cu-0.03,Fe-0.05,Pb-0.05, Mn-

0.02,Hg-0.001,Zn-0.01, Se =0.005) (Unit mg/l)

NTU –nephalometery turbitity unit; NR - no relaxation; MPN - most probable number UO - unobjectionable: AG - agreeable; NA- not applicable



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3.4.6 Result Discussion

Surface Water Quality

The results of the surface water samples analysed are presented in **Table 3.11** and are compared with the IS-10500 standards. The pH of the surface water samples collected was 7.2 to 8.2 and within the acceptable limit of 6.5-8.5. The total dissolved solids were found to be 239 - 823 mg/l. Total hardness was observed between 127 - 364 mg/l. Sulphates concentration in the surface water samples varied from 18.7 mg/l to 78.1 mg/l. Iron content in all samples was found in the range of 0.11-0.57 mg/l, concentration of nitrate was 0.14 - 0.45 mg/l. The fluoride concentration was found to be 0.3 to 0.4 mg/l and chloride concentration was varied between 33.2 – 294.5 mg/l. The variation in alkalinity recorded was in the range of 123 - 308 mg/l, magnesium was found to be in the range of 18.2 to 56.8 mg/l in all samples. Dissolved oxygen was observed to be 4.8 to 6.6 mg/l. BOD of the surface water samples was observed in the range of <3 to 14 mg/l and COD was recorded as 68 to 113 mg/l. It was observed from the analysis that, the physico-chemical characteristics of the surface water samples are within the permissible limits of drinking water standards.

Groundwater Quality

The physico-chemical characteristics of groundwater are presented in **Table-3.12** and are compared with the IS-10500 standards. The pH of the water samples collected ranged from 7.1 to 7.5 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 308 - 668 mg/l in all samples. The total hardness varied between 216 - 645 mg/l for all samples collected at 8 locations.

In all samples, iron content varied in between 0.09 - 0.18 mg/l, Nitrate in between 1.3–3.6 mg/l, fluoride varied between 0.2 - 0.4 mg/l, chloride 38.9–48.7 mg/l, Sulphate 32.1–72.3 mg/l, alkalinity 187 - 324 mg/l, calcium 38.2–54.7 mg/l and magnesium in between 27.4–37.9 mg/l. The overall ground water quality was found to be mineralized with respect to TDS & hardness with moderate buffering capacity. The levels of heavy metals content were found to be within permissible limits.

Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Water samples were analysed for total and faecal coliform by membrane filtration technique respectively. Surface water was found to be contaminated by coliform bacteria.



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From the results, it was observed that, groundwater is suitable for drinking and domestic uses in absence of alternate drinking water source whereas surface water was not suitable for drinking uses without treatment.

3.5 LAND ENVIRONMENT

3.5.1 Soil Characteristics

Soil differs from the parent material in the morphological, physical, chemical and biological properties. Also, soils differ among themselves in some or all the properties, depending on the differences in the genetic and environmental factors. Thus some soils are red, black; deep and some are shallow; coarse-textured and some are fine-textured. It serves in varying degree as a reservoir of nutrients and water for crops.

For studying soil profile of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 90 cm. Total 3 samples within the study area were collected and analyzed. The details of the soil sampling locations are given in **Table 3.13** and shown in **Figure-3.8**. The sampling was carried out once in the study period during winter season.

| Samplo | Description of | GPS Coordinat | es | Dist. & Dir. |
|--------|-------------------------------------|----------------------|----------------|----------------------|
| Code | monitored stations | Latitude | Longitude | w.r.t. Plant site |
| S 1 | Project Site Waste Land | 21°09'06.5" N | 074°51'04.0" E | |
| S 2 | Vaghode Village Agriculture Land | 21°08'13.9" N | 074°50'53.8" E | 1.3 S |
| S 3 | Malich Village Agriculture Land | 21°09'05.8" N | 074°49'35.1" E | 2.2 W |

TABLE 3.13: DETAILS OF SOIL SAMPLING LOCATIONS

The collected soil samples were analysed in the laboratory for physico-chemical and nutrition parameters and the results are given in **Table 3.14**.



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FIGURE 3.8: MAP SHOWING SOIL SAMPLING LOCATIONS



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| Sr. | Parameters | Unit | Project Site (S1) | | | Vagho | ode Vil | l. (S2) | Malich Vill. (S3) | | | |
|-------------|---------------------------------|--------------|-------------------|--------------|--------------|--------------|-----------------------|--------------|-------------------|--------|--------|--|
| No. | | | 00.0 - | 30.0 - | 60.0 - | 00.0 - | 30.0 - | 60.0 - | 00.0 - | 30.0 - | 60.0 - | |
| | | | 30.0 | 60.0 | 90.0 | 30.0 | 60.0 | 90.0 | 30.0 | 60.0 | 90.0 | |
| | | | cm | cm | cm | cm | cm | cm | cm | cm | cm | |
| A. P | HYSICAL PROPE | RTIES | | | | | | | | | | |
| 1 | Color | | Brown | Brown | Brown | Gray | Gray | Gray | Gray | Gray | Gray | |
| 2 | Soil Texture | | Silt loam | Silt loam | Silt loam | Clay loam | Silty clay loam | Silt loam | Loam | Loam | Loam | |
| 3 | Grain Size Distribution % | Gravel | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | Sand | 16 | 17 | 17 | 22 | 20 | 18 | 33 | 28 | 27 | |
| | | Silt | 56 | 57 | 57 | 49 | 51 | 54 | 46 | 48 | 48 | |
| | | Clay | 26 | 24 | 24 | 27 | 27 | 26 | 19 | 22 | 23 | |
| 4 | Moisture Content | % | 9 | 10 | 13 | 17 | 19 | 20 | 15 | 17 | 19 | |
| 5 | Bulk Density | gm/cc | 1.32 | 1.45 | 1.43 | 1.51 | 1.53 | 1.55 | 1.53 | 1.54 | 1.56 | |
| 6 | Liquid Limit | % | 50 | 48 | 45 | 52 | 53 | 52 | 44 | 48 | 43 | |
| 7 | Plastic Limit | % | 25 | 23 | 22 | 24 | 24 | 23 | 22 | 23 | 24 | |
| 8 | Porosity | % | 43.8 | 46.2 | 50.8 | 43.1 | 44.5 | 45.4 | 44.8 | 42.3 | 45.8 | |
| 9 | Water Retention Capacity | % | 46.0 | 50.2 | 53.8 | 53.4 | 54.2 | 51.0 | 53.8 | 54.0 | 50.6 | |
| B, C | HEMICAL PROPI | ERTIES | | | 1 | 1 | | 1 | | 1 | 1 | |
| 1 | nH | - | 7.3 | 7.4 | 7.2 | 7.0 | 7.1 | 7.0 | 7.0 | 6.8 | 7.2 | |
| 2 | Electrical Conductivity | mmhos/c m | 0.354 | 0.318 | 0.284 | 0.476 | 0.513 | 0.372 | 0.236 | 0.276 | 0.183 | |
| 3 | Organic Matter | % | 0.20 | 0.34 | 0.15 | 1.46 | 1.33 | 1.18 | 0.54 | 0.49 | 0.72 | |
| 4 | Calcium as Ca++ | mg/kg | 118.0 | 95.6 | 106.0 | 78.2 | 64.5 | 57.9 | 54.3 | 69.3 | 45.2 | |
| 5 | Magnesium as Mg++ | mg/kg | 32.1 | 37.8 | 34.9 | 24.8 | 28.2 | 35.6 | 45.1 | 35.5 | 38.4 | |
| 6 | Chlorides as Cl | mg/kg | 56.2 | 48.7 | 48.9 | 25.3 | 19.2 | 20.8 | 14.2 | 12.6 | 16.9 | |
| 7 | Sulphates as SO ₄ | mg/kg | 458.0 | 621.0 | 436.0 | 348.0 | 287.0 | 325.0 | 248.0 | 237.0 | 261.0 | |
| 8 | Total Nitrogen as N | kg/ha | 83.0 | 148.0 | 62.0 | 570.0 | 538.0 | 468.0 | 210.0 | 200.0 | 275.0 | |
| 9 | Total Phosphorous as P | kg/ha | 27.8 | 32.3 | 28.7 | 45.2 | 47.9 | 42.7 | 45.6 | 43.6 | 37.3 | |
| 10 | Total Potassium as K | kg/ha | 108.2 | 150.8 | 123.2 | 219.6 | 270.2 | 234.2 | 295.0 | 226.2 | 257.2 | |

Table 3.14: Soil Quality Analysis Results

Observations:

- pH of the soil samples varied from 6.8 to 7.4 indicating normal soils
- Texture of the soil was observed as Silt Loam, Silt Clay Loam and Loam.



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- Bulk density of the soil samples varied from 1.32 to 1.56 g/cc indicating hard soils difficult for germination.
- Organic matter in the soil samples varied from 0.15 to 1.46%
- Total Nitrogen in the soil samples varied from 62 to 570 kg/Ha
- Total Phosphorus in the soil samples varied from 27.8 to 47.9 kg/Ha
- Total potassium in the soil samples varied from 108.2 to 295.0kg/Ha

From the analysis results of the soil samples, it was observed that the soil was low to medium fertile and having low productivity. The soil in the study area needs additional fertilizers for improving the fertility status and increase in crop productivity. The Bulk Density was found in the range of 1.32 to 1.56gm/cc indicating dense soils difficult for germination. Overall the soil quality in the area was found to poor to medium fertile with moderate productivity.

3.6 **BIOLOGICAL ENVIRONMENT**

3.6.1 Introduction:

Biological environment of any area constitutes all living beings of that area, it is an integral part of the environment. Biodiversity is often considered synonymous with species richness of the area. Flora is basically the plant and fauna the animal life that are present in a particular region Flora and fauna together represent biodiversity of the region. Any change in the surrounding environment could cause loss of species or decrease in biodiversity of the area. In the last few decades, anthropogenic activities has caused serious threat to the biological environment. Conservation of biological diversity is of paramount importance to the survival of man and to preserve the continuity of food chains. Biodiversity sustains human livelihoods and life itself. Hence study of biological environment is undertaken in EIA.

Objectives of the study

The objective of the study was to

- assess the vegetation types, identify the flora and fauna, rare and endangered species (if any) and assess the impact of the proposed project activities on these biodiversity.
- prepare list of Flora and Fauna of the study area along with classification for fauna as per Schedule given in the Wildlife (Protection) Act, 1972.
- Prepare a comprehensive conservation plan for the endangered / endemic / economically important biotic species found in the study area.



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Study Area

Selection of biological sampling locations was made with reference to topography, landuse and vegetation pattern in the study area. The area includes few villages comprising of agricultural land, scrubland and barren land where most of the vegetation is aggregated on agricultural bunds, nearby human settlements and in the roadsides. The study area around the proposed site comprises of terrestrial ecosystem. Topography of the area in dicates mostly flat area with some barren hilly region in south western part. The terrain is slopping towards north direction with elevation varrying from 155 m to 282 m aMSL. Panjara river flows towards east at distance of about 4 km from the proposed plant. Tapiriver flows at 12 km North of the project site. The surrounding area is moderately irrigated with irrigation canals. This region to wards river side is quite spacious, fertile and is good for cultivation. The soil is brown to black in colour with loamy, silty loam in nature when wet. Murom in combination with clay material occurs as infillings along joint planes. Major Crops Cultivated in Kharif season are jowar, bajra, maize, green gram, black gram, tur, sovabean, sesamum, groundnut and cash crops like cotton and sugarcane, where as in rabi major crops cultivated are wheat, gram, jowar, sunflower and in summer season groundnut and bajra are cultivated.

Study Approach & Methodology adopted

The baseline study for existing ecological environment was carried out during **post monsoon season 2019**. A participatory and consultative approach was followed. Field visits were undertaken for survey of the vegetation and animals in the study area. The study area was divided into two parts considering project area as Core zone and the buffer zone covering the 10 km radius of the project site beyond core zone.

Methodology:

Flora: A floral study was conducted in study area in and around the project site. Sampling locations were randomly selected assuming that plants are randomly distributed. The structure and composition of vegetation cover was studied by using phytosociological methods to analyze and estimate biodiversity, density, dominance, and frequency of different members of plant population. Sampling locations were randomly selected assuming that plants are randomly distributed in the area. The density and diversity was calculated by using quadrate method. It may be single sample plot or may be divided into several subplots. Quadrate size of 1m x 1m, 5m x 5m and 10m x 10m were taken for herbs, shrubs and trees respectively. The count of individuals of each species and the total count of individuals of all species per plot, the basal area are the major parameters. The


derived parameters i.e. Frequency, Density, Abundance, Important value Index (IVI), Simpson's Diversity Index (SDI) gives a clear picture of community structure in quantitative terms. The values of a parameter as estimated from the representative samples is the estimate which is close to the real value. The specific parameters in the study of biological environment are biological characteristics through quadrate method (Rau and Wooten, 1980). Formulae for analyzing phytosociological characteristics of vegetation is presented as below:

 $Density = \frac{\text{Number of Individual Species A}}{\text{Area Sampled}}$ $Relative Density = \frac{Density of Species A}{Total Density of all species} \times 100$ $Dominance = \frac{\text{Total cover of basal area of Species A}}{\text{Area Sampled}}$ $Relative Dominance = \frac{Dominance of Species A}{\text{Total Density of all species}} \times 100$ $Frequency = \frac{\text{Number of plots in which Species A occurs}}{\text{Total no. of plots Sampled}}$ $Relative Frequency = \frac{\text{Frequency value of Species A}}{\text{Total frequency value of all species}} \times 100$

Importance Value Index = $\frac{\text{R. Density} + \text{R. Dominance} + \text{R. Frequency}}{3}$

Simpson's Diversity Index =
$$\sum_{i=1}^{n} \left(\frac{ni(ni-1)}{n(n-1)} \right)$$

ni - is the number of individuals of the ith species in the sample and
n - is the total number of individuals in the sample
Ranges of SDI plant diversity
<0.060: very good biodiversity; 0.060 - 0.100: good biodiversity;
0.110 - 0.200: medium biodiversity; > 0.200 - 1.0: low biodiversity



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3.6.2 Floral Biodiversity of the Study Area

To characterize vegetation in the study area, the primary data was collected and analyzed for describing the characteristics of vegetation with reference to species composition and structural attributes. The diversity measurement reflect as to how many diverse species are present, the density measurement indicate number of individuals of a species. The proposed project site is located in barren land of industrial area. The project site is devoid of vegetation except some grasses.

Core Zone: The core zone is a barren land plot in industrial area. There is no vegetation except some grasses. There is no forest land in or nearby the proposed project site.

Study area: During the floristic survey a total of 135 plant species were recorded. Out of these a total plant species of 93 trees, 18 shrubs, 9 herbs, 6 climbers and 5 species of grasses and bamboo were recorded. The dominant plant species found in the area are *Ficus religiosa, Ficus bengalensis, Azadirachta indica, Mangiferaindica, Acacia leucophloea, Acacia nilotica, Acacia farnesiana, Termarindus indica* and other trees like Gulmohar, Bel, Bor, Jambul, etc. The major shrubs that grow over here are Lantana camara, Calotropisgigantea Ricininae communis, Adhatodavasica and Sitafal, Peru, etc.

The common grasses found in this area are Marvel, Kusal, and Durva. The tree species, herbs and shrubs were documented during this baseline study. The list of floral species documented in the study area is enlisted in **Table No. 3.15**.

| S. No. | Common Name | Botanical name | Family | |
|--------|----------------------|----------------------|---------------|--|
| | Trees | | | |
| 1. | Khair | Acacia catechu | Mimosaceae | |
| 2. | Hiwar | Acacia leucophloea | Mimosaceae | |
| 3. | DeoBabhul | Acacia farnesiana | Mimosaceae | |
| 4. | Babhul | Acacia nilotica | Mimosaceae | |
| 5. | Gorakh Chinch | Adansoniadigitata | Bombacaceae | |
| 6. | Haldu(Kadamb) | Adina cordifolia | Rubiaceae | |
| 7. | Bel | Aeglemarmelos | Rutaceae | |
| 8. | Maharukh | Ailanthus excelsa | Simaroubaceae | |
| 9. | Shirish(Black) | Albizzialebbeck | Mimosaceae | |
| 10. | Chichwa | Albizziaodoratissima | Mimosaceae | |
| 11. | Sirus/Shirish(White) | Albizziaprocera | Mimosaceae | |
| 12. | Satvin(Saptaparna) | Alstoniasololaris | Apocynaceae | |

 TABLE 3.15: LIST OF FLORA IN THE STUDY AREA



| S. No. | Common Name | Botanical name | Family |
|--------|-------------------------------|------------------------|-----------------|
| 13. | Ramphal | Annonaraticulata | Annonaceae |
| 14. | Sitaphal | Annonasquamosa | Annonaceae |
| 15. | Dhawada | Anogeissuslatifolia | Caesalpiniaceae |
| 16. | Kaduamba | Anthocephaluscadamba | Rubiaceae |
| 17. | Chrismas tree | Araucaria excelsa | Araucariaceae |
| 18. | MakadLimbu | Atlantiarecemosa | Rutaceae |
| 19. | Phanas | Atocarpusheterophyllus | Moraceae |
| 20. | Kadulimba | Azardirachtaindica | Melliaceae |
| 21. | Orchid tree | Bauhinia blakeana | Caesalpiniaceae |
| 22. | Raktakanchan | Bauhinia purpurea | Caesalpiniaceae |
| 23. | Kanchan/Kachanar | Bauhinia variagata | Caesalpiniaceae |
| 24. | Amta/Kachnar | Bauhinia malabarica | Caesalpiniaceae |
| 25. | Apta/Kachnar | Bauhinia racemosa | Caesalpiniaceae |
| 26. | Katesavari (silk cotton tree) | Bombaxceiba | Bombacaceae |
| 27. | Tad | Borassusflabellifer | Arecaceae |
| 28. | Salai | Boswelliasettata | Bureseraceae |
| 29. | Umbrella tree | Brassaiaactinophylla | Araliaceae |
| 30. | Palas | Buteamonosperma | Fabaceae |
| 31. | Bottle Brush | Callistemon citrinus | Myrtaceae |
| 32. | Bhokar | Cardiadichotoma | Baraginace |
| 33. | Kailashpati | Cauroupitaguianesis | Lecythidaceae |
| 34. | Bahava/Amaltas | Cassia fistula | Caesalpiniaceae |
| 35. | Karu(kassod) | Cassia siamea | Caesalpiniaceae |
| 36. | Pink shower | Cassia grandis | Caesalpiniaceae |
| 37. | Java pink | Cassia jivanica | Caesalpiniaceae |
| 38. | Kashid | Cassia siama | Caesalpiniaceae |
| 39. | Tarwat | Cassia surattensis | Caesalpiniaceae |
| 40. | Bhirra | Chloroxylonswietenia | Rutaceae |
| 41. | Limbu | Citrus aurantifolia | Rutaceae |
| 42. | Anantura | Citharexylumspinosum | Verbinaceae |
| 43. | Garari | Cleistanthuscollinus | Euphorbiaceae |
| 44. | Dhoban/Bahawa | Dalbargiapaniculata | Caesalpiniaceae |
| 45. | Shisav | Dalbargiasissoo | Fabaceae |
| 46. | Gulmohar | Delonixregia | Caesalpiniaceae |
| 47. | Parijatak | Diospyrosarbora | Ebenaceae |
| 48. | Tendu | Diospyrosmelanoxylon | Ebenaceae |
| 49. | Awala | Emblicaoficinalis | Eubhorbiaceae |
| 50. | Pangara | Erythrinavariagata | Fabaceae |
| 51. | Nilgiri | Eucapyptuscitridora | Myrtaceae |
| 52. | Vad | Ficusbengalensis | Moraceae |



| S. No. | Common Name | Botanical name | Family |
|--------|----------------------------|-----------------------|-----------------|
| 53. | Anjeer | Ficuscarica | Moraceae |
| 54. | Umbar | Ficusrecemosa | Moraceae |
| 55. | Pimpal/Pipal | Ficusreligiosa | Moraceae |
| 56. | Giripushpa | Gillricidiasepium | Fabaceae |
| 57. | Haldu | Haldenacardifolia | Rubiaceae |
| 58. | Kadukavath | Hydrocarpuspentandra | Flacourtiaceae |
| 59. | Modhal/Moyan | Lanneacoromandelica | Anacardiaceae |
| 60. | Subabhul | Leuccenaleucocephala | Mimosaceae |
| 61. | Kavath | Limoniaacidissima | Rutaceae |
| 62. | Mahuva/Moha | Madhucalongifolia | Sapotaceae |
| 63. | Amba | Mangiferaindica | Anacardiaceae |
| 64. | Son Chapha | MicheliaChampaka | Magnoliaceae |
| 65. | Akashneem(jasmine) | Millingtoniahortensis | Bignonicaceae |
| 66. | Kadamb | Mirragynaparviflora | Rubiaceae |
| 67. | Khirni | Monikarahexandra | Sapotaceae |
| 68. | Chiku | Monikarazapota | Sapotaceae |
| 69. | Shevaga | Moringaoleifera | Moringaceae |
| 70. | Bartondi (Indian malberry) | Morindatinctoria | Rubiaceae |
| 71. | Tuti (silkworm tree) | Morus alba | Moraceae |
| 72. | Tiwas | Ougeiniaoojeinensis | Fabaceae |
| 73. | Shindi | Phoenix sylvestris | Arecaceae |
| 74. | Vilayati Chinch | Pithocellobiumdulce | Mimosaceae |
| 75. | PandharaChampa | Plumeria alba | Apocynaceae |
| 76. | Champa | Plumeriaacuminata | Apocynaceae |
| 77. | Bibla, Bija, Karanj | Pongamiapinnata | Apocynaceae |
| 78. | Vedibabhul | Prosopisjuliflora | Mimosaceae |
| 79. | Peru | Psidium Guava | Myrtaceae |
| 80. | Bija | Pterocarpusmarsupium | Fabaceae |
| 81. | Chandan | Santalumalbun | Santalaceae |
| 82. | Ritha | Sapindusemarginatus | Sapindaceae |
| 83. | Ashok | Sarccaasoka | Caesalpiniaceae |
| 84. | Biba/Bhilava | Semecarpusanacardium | Anacardiaceae |
| 85. | Jambhul | Syzygiumcuminii | Myrtaceae |
| 86. | Chinch | Tamarindusindica | Caesalpiniaceae |
| 87. | Behada | Terminaliabellirica | Combretaceae |
| 88. | Sag/Teak | Tectonagrandis | Verbinaceae |
| 89. | JangliBadam | Terminaliacataqppa | Combretaceae |
| 90. | Hirda/Harra | Terminaliachebula | Combretaceae |
| 91. | ArjunSadada | TerminaliaCuneata | Combretaceae |
| 92. | Ghoti/Ghot/Ghatbor | Zyzyphusglaberrima | Rhamnaceae |



| S. No. | Common Name | Botanical name | Family |
|--------|------------------------|-----------------------------|-----------------|
| 93. | Bor | Ziziphusmauratiana | Rhamnaceae |
| | | | |
| | Shrubs | | |
| 94. | Adulsa | Adhatodavassica | Acanthaceae |
| 95. | Korat (Vajradanti) | Barleriaprionitis | Acanthaceae |
| 96. | Ankda (Rui) | Calotropisgigantea | Asclepiadaceae |
| 97. | Waghoti | Capparishorrida | Capparidaceae |
| 98. | Kari Korando (Karwand) | Carrissaspinarium | Apocyanaceae |
| 99. | Dikamali | Gardenia resinifera | Rubiaceae |
| 100. | Kharoti | Grewiahirsuta | Tiliaceae |
| 101. | Bharati | Gymnosporiaspinosa | Celastraceae |
| 102. | Muradshend/Maorphal | Helicteresisora | Sterculiaceae |
| | | Holarrhenaantydysenteric | |
| 103. | Kuda (Indrajav) | a | Apocyanaceae |
| 104. | Besaram | Ipomeafistulosa | Convolvulaceae |
| 105. | Ghaneri (Gochidi) | Lantana camara | Verbenaceae |
| 106. | Chillari | Mimosa rubicaulia Mimosacea | |
| 107. | Dalimb | Punjcagranatum | Punicaceae |
| 108. | Nirgudi | Vitexnegundo Verbenaceae | |
| 109. | Dhavati (Dhyati) | Woodfordia floribunda | Lythraceae |
| 110. | Dudhi/kalakuda | Wrightiatinctoria | Apocyanaceae |
| 111. | Gokru | Xanthium strumarium | Tiliaceae |
| | | | |
| | Herbs | | |
| 112. | Tarota | Cassia tora | Caesalpiniaceae |
| 113. | PivaliTilwan | Cleome viscosa | Cleomaceae |
| 114. | Dhatura | Datura metal | Solanaceae |
| 115. | Rantulasi | Hyptissuaveolens | Lamiaceae |
| 116. | Neel | Indigoferacassioides | Papilionaceae |
| | Gajargawat (Congress | | |
| 117. | grass) | Partheniumhysterophorus | Astraceae |
| 118. | Divali | Tephrosiahamiltonii | Fabaceae |
| 119. | Ghokhru | Tribulusterrestris | Zygophyllaceae |
| 120. | Kambarmodi | Tridaxprocumbens | Asteraceae |
| | | | |
| | Climbers | | |
| 121. | Gunj/Gunchi | Arbusprecatorius | Papilionaceae |
| 122. | Satova/Satawari | Asparagus racemosus | Liliaceae |
| 123. | Mahulbel/Mahul | Bauhinia vahlli | Caesalpiniaceae |
| 124. | Palaswel | Butea superb | Fabaceae |
| 125. | Kawavel/Dudhi/Nagbel | Cryptolepisbuchanani | Asclepiadaceae |



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| S. No. | Common Name Botanical name | | Family | |
|--------|----------------------------|----------------------|-----------|--|
| 126. | Ramdaton | Smilax zeylanica | Liliaceae | |
| | | | | |
| | Grasses and Bamboo | | | |
| 127. | Marwel/Guhar | Andropogonannulatus | Poaceae | |
| 128. | Tikhdi/Rusa/Rosha | Cymbopogon martini | Poaceae | |
| 129. | Durwa/Doob | Cynodondactylon | Poaceae | |
| 130. | Kusal | Heteropogoncontortus | Poaceae | |
| 131. | Khas | Vetiveriazizanioides | Poaceae | |

The most dominant tree species are Azardirachtaindica, Dalbergiasisoo, Tectonagrandis, Mangiferaindica, Acacia catechu and associated with Adhatodavasica, Ipomeafistulosa, Vitexnegundo, Xanthium strumarium. Simpson's Diversity Index for trees, shrubs and herbs is given in **Table 3.16.** The SDI values for tree computed as 0.108, shrubs 0.172 and herbs 0.148 indicate medium biodiversity.

| Sr. No. | Category | Simpson's Diversity Index (SDI) | |
|---------|----------|---------------------------------|--|
| 1 | Trees | 0.108 | |
| 2 | Shrubs | 0.172 | |
| 3 | Herbs | 0.148 | |

Table 3.16: Simpson's Diversity Index for Flora

Rare and Endangered Flora in the Study Area

With reference to the IUCN Red List, no flora species observed in the study area was assigned any threat category, by RED data book of Indian Plants. (Nayar and Sastry, 1990) and Red list of threatened Vascular plants (IUCN, 2010; BSI, 2003)

Endemic Plants of the Study Area

The flora species observed in the study area are commonly found in other parts of the state and none of the flora species recorded is endemic in nature.

3.6.3 Faunal diversity in the study area

A baseline survey was conducted in order to document the faunal biodiversity of the study area with respect to mammals, birds and reptiles species.

Fauna observed in core zone

The core zone is a barren land plot in industrial area. There is no vegetation except some grasses. There is no forest land in or nearby the proposed project



site. Hence, no wild animals are observed in the core zone. Some birds like house crow, myna, house sparrow, cattle egret, blue rock pigeon, etc. are observed occasionally in the core zone. Reptiles like Garden lizard, three stripped squirrel are also observed sometimes in the area.

Buffer Zone

The wild mammals observed in the buffer zone of the study area is documented in **Table 3.17**

| Sr. | | | | |
|-----|-----------------------|----------------|-------------------|--------------|
| No. | Scientific Name | Local Name | Common name | Schedule |
| | Mammals | | | |
| 1. | Axis axis | Chital | Spotted Deer | SCHEDULE III |
| 2. | Bendicotabengalensis | Undir | Field Rat | |
| 3. | Canisaureus | Kolha | Jackal | SCHEDULE II |
| 4. | Cervus unicolor | Sambhar | Sambhar | SCHEDULE III |
| 5. | Felischaus | JangliManjar | Jungle Cat | SCHEDULE II |
| | | | Three striped | |
| 6. | Funambuluspennati | Khar | squirrel | |
| 7. | Herpestesedwardsii | Mungus | Common mongoose | |
| 8. | Hystrixindica | Salu | Indian porqupine | SCHEDULE IV |
| 9. | Lepusnigricollis | Sasa | Indian Hare | |
| 10. | Persbytis entellus | Makad | Common Langur | SCHEDULE II |
| 11. | Soiurns species | Khar | Malabar squirrel | |
| 12. | Susscrofa | Randukkar | Indian Wild Boar | SCHEDULE III |
| | | Mouse Deer / | | |
| 13. | Tragulysmeminna | Bhekar | Indian Chevrotain | |
| 14. | Vulpesbengalensis | Kolha | Indian Fox | SCHEDULE II |
| | | | | |
| | Birds | | | |
| | Acridotheresginginian | | | SCHEDULE IV |
| 15. | US | Ganga-Mayna | Black Mayna | |
| 16. | Acridotherestristis | Myna | Indian Myna | SCHEDULE IV |
| 17. | Bubulcus ibis | Gai-Bagala | Cattle Egret | SCHEDULE IV |
| 18. | Columba livia | Kabutar | Blue rock Pigeon | SCHEDULE IV |
| 19. | Coraciasmelanotos | Nilkanth | Blue jay (Roller) | SCHEDULE IV |
| 20. | Corvusmacrorhynchos | JungliKawala | India Jungle crow | SCHEDULE IV |
| 21. | Corvussplendens | Kawala | House Crow | SCHEDULE IV |
| | | Bhujanga (King | | |
| 22. | Dicrurusadmisssiil | Crow) | Black Drongo | SCHEDULE IV |
| 23. | Egrettagarzetta | Bagala | Little Egret | SCHEDULE IV |

Table 3.17: .Fauna observed in study area



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| <u>C</u> n | | | | |
|------------|---------------------|---------------|--------------------|-------------|
| No | Scientific Name | Local Name | Common name | Schedule |
| 24 | Eudvnamvsscolonacea | Kokil | Koel | SCHEDULE IV |
| 21. | Dudynamysseolopaeea | nom | Small green Ree- | SCHEDULE IV |
| 25. | Meropsorientalis | Patringa | eater | SUILDULLIV |
| 26. | Milvusmigrans | Ghar | Common Pariah Kite | SCHEDULE IV |
| 27. | Passer domesticus | Chimani | House Sparrow | SCHEDULE IV |
| 28. | Pycnonotuscafer | Bulbul | Red Vented BulBul | SCHEDULE IV |
| | | | | |
| | Reptiles | | | |
| 29. | Agamidi | Sarda | Garden Lizard | |
| 30. | Bungaruscaeruleus | Manyar | Common Krait | SCHEDULE IV |
| 31. | Bungarusfasciatus | PatteriManyar | Banded Krait | SCHEDULE IV |
| 32. | Najanaja | Nag | Cobra | SCHEDULE II |
| | | Diwad (Pan | | |
| 33. | Natrixpiscator | sarpa) | Water Snake | |
| 34. | Ptyasmucosus | Dhaman | Rat Snake | SCHEDULE II |
| 35. | Varanus spp. | Ghorpad | Monitor Lizard | |
| 36. | Viper russelli | Ghonas | Russel's Viper | SCHEDULE II |

Rare and Endangered fauna of the study area:

• As per IUCN RED (2013) list

Among the reported animals, all are categorized under least concern category as per IUCN.

• As per Indian Wild Life (Protection) Act, 1972

No Schedule I fauna species were observed within the study area.

1. Endemic Fauna of the Study Area

None of the sighted animal species were assigned as endemic species category of the study area.

2. Status of the Forest, their Category in the Study Area

A Reserved Forest is located at 8.2 km SW of the project site. There is no other forest observed in the study area.

3. Protected area Near the Project site:

No protected area near the site and within 10 km radius from the project site.



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3.7 SOCIO-ECONOMIC ENVIRONMENT

The proposed project is to install a 3.0 MTPA Cement Grinding & Packing Plant. Project site is falling in Nardana MIDC area, tehsil Sindkheda, district Dhule, Maharashtra state. Socio-demographic features/ survey are very useful for understanding social and economic problems and identifying potential solutions. To understand the socio-demographic status and the trends of the communities in the 10 km radius, primary survey was carried out in villages and secondary data was collected from Census Handbook 2011.

An assessment of socio - economic environment forms an integral part of the EIA/EMP study. In order to improve the quality of life of the people affected by the project activities, it is necessary to understand the socio- economic aspects and its trends in the villages falling in the study area.

3.7.1 Methodology Adopted for the Study

Desktop research is the major methodology adopted for the study which involves researching, compiling and analyzing the data. The villages falling within 10 km radius study area map were identified and demarcated to assess demographic, infrastructure and landuse details.

The sociological aspects including human settlements, demography, and infrastructure aspect for education, health, drinking water, power supply, communication and the land use aspect were collected compiled and analyzed with the help of primary survey and Census Handbook 2011 of Maharashtra state.

The details of the study area contain points are as follows:

- Demographic details
- Employment details
- Infrastructure facilities
- > Classification of Landuse
- Socio-economic survey methodology
- Survey Observations

3.7.2 Demographic Highlights of the Study Area

The demographic aspects of the study area comprises of various features of the population across to the study area. The population composition is described herein



term of basic demographic features like, house hold status, age, Social composition, education, etc. The distribution of population reflected here are based on the geographic boundaries.

In the 10 km radial study area, total 34 villages were located within 02 tehsils namely Sindkhede and Sirpur. Total 32 villages were from Sindkhede tehsil and2 villages were from Sirpur tehsil. The summary of Demographic pattern of the villages within study area is given in **Table 3.18**. The caste-wise distribution of population in study area is shown in pie-chart in **Figure 3.9**. Village-wise demographic pattern is given in **Annexure 7A**.

TABLE3.18: DEMOGRAPHIC PATTERN OF THE STUDY AREA

| No of | Total | Total | Total | Population | Population | Population |
|-----------|------------|-------|--------|------------|------------|------------|
| household | Population | Male | Female | SC | ST | Literate |
| 14962 | 70642 | 36243 | 34399 | 5200 | 15689 | 47891 |

Source: Census Handbook 2011, District Dhule, State Maharashtra



Figure 3.9: Caste-wise distribution of Population

POPULATION DETAILS

- Total 14,962 household were residing in the study area and average family size was about 5 persons per family
- > Total population in the study area was 70,642
- > Total male population was 36243 (51.3%) of total population
- > Total female population was 34399(48.7%) of total population
- > Total Scheduled Cast population was 5,200 (7.3%) of total population
- > Total Scheduled Tribe population was 15,689(22.2%) of total population



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Sex Ratio

The sex ratio is the ratio of female to male in the population (normalize to 1000). The sex ratio in the study area showed unevenly distributed trends. Overall sex ratio was 949.1 female to thousand male. The sex-wise population distribution is shown in **Figure 3.10**.



Figure 3.10: Sex-wise distribution of population

Literacy Rate

- Total literate population was 47,891(67.8%)
- > Out of total literate population male literates were 26,694(55.7%)
- > Out of total literate population female literate population was 21,197(44.3%)
- ▶ Total illiterate population was 22,751(32.2%)

Literacy status of the study area is shown in **Figure 3.11**.



Figure 3.11: Literacy rate of population within study area



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3.7.3 Employment Pattern in the Study Area

The identification of the current economic characteristics of the study area is also an important part of defining the employment pattern of the study area. There are different types of employment pattern, that may be classified as: Those persons who had worked for at least six months or 183 days are treated as Main workers, on the other hand if persons categorized as workers participated in any economic or productive activity for less than six months or 183 days during the last one year are treated as Marginal workers and Non workers are those who have not worked any time at all in the year.

Main worker employment pattern is classified in 04 types namely cultivator, agricultural workers, household industry workers and other workers.

Employment pattern in the study area is given in **Table 3.19** and classification of workers is given in **Table 3.20** and Distribution of main workers is shown in **Figure 3.12**.Village-wise employment pattern is given in **Annexure 7B**.

| Total Population | Total workers | Total main | Total Marginal Workers | Total Non |
|-------------------------|---------------|------------|-------------------------------|-----------|
| | | Workers | | Workers |
| 70,642 | 35630 | 30924 | 4706 | 35012 |

TABLE 3.19: EMPLOYMENT PATTERN IN THE STUDY AREA

Source: Census Handbook, 2011, Dhule District, Maharashtra State

- According to census 2011, out of total population, total workers were 35630(50.5%).Male workers were 20,654(58%) and female workers were 14,976(42%)
- Main worker population were 30,924 (43.8%)
- ➤ Total marginal workers were 4,706 (6.7%)
- ➢ Total non workers were 35,012 (49.5%)

From the above mentioned statistics of employment pattern indicates, total working population was50.5% of total population, indicating about two persons from each family are working.

| Cultivators | Agricultural Labors | Household industry workers | Other workers |
|-------------|------------------------|-------------------------------|---------------|
| 9009 | 16780 | 900 | 4235 |

TABLE 3.20 : MAIN WORKERS CLASSIFICATION IN THE STUDY AREA

Source: Census Handbook, 2011, Dhule District, Maharashtra State



- According to census 2011, out of total main workers, 9,009(29.1%) were cultivator workers
- > 16780(54.3%) workers engaged as agricultural labors
- > Total 900(2.9%) were involved in household industry related work
- ➢ Other working population was 4235 (13.7%)

From the above, it can be seen that most of the major workers are engaged in agriculture related occupation.



Figure 3.12: Distribution of Main workers based on occupation

3.7.4 Land Use Pattern

The study of land-use of the project area is an integral part of the EIA. Baseline data on land-use was generated using information available with census data, which is presented in details in **Annexure- 7**. Details of landuse pattern of the study area is given in **Table 3.21**. The following prominent land use classes were observed in the study area. Village-wise landuse pattern is given in **Annexure 7C**.

| Land Use | Area in Ha | % |
|------------------------------------|------------|--------|
| Forest Area | 764 | 2.93 |
| Irrigated Area | 882 | 3.38 |
| Unirrigated Area | 20,869 | 80.03 |
| Culturable Waste | 730 | 2.80 |
| Area not available for cultivation | 2,833 | 10.86 |
| Total | 26,078 | 100.00 |

 TABLE 3.21: LAND USE PATTERN (Area in ha)

Source: Census Handbook 2011, Dhule District, Maharashtra State



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• Forest Land

Forest area occupied about 764 ha, which is only about 2.93% of the total study area.

• Land Under Cultivation

Altogether 21751 ha land (irrigated and un-irrigated) was used for cultivation, which is about 83.41% of the total land in the study area.

• Cultivable Waste Land

This category of land mainly consists of the land suitable for cultivation, which however have not been brought under cultivation at any time. The area under this category worked out to be 730- ha, i.e. 2.8% of the study area. This indicates the moderate use of available land for cultivation purpose.

• Land Not Available For Cultivation

The area not covered under any of the above categories of land uses as well as land cover under urban population forms this type. Altogether 2833 ha (10.86%) area in the study area is classified under this. Land use pattern is shown in **Figure 3.13**



FIGURE 3.13: LAND USE PATTERN IN THE STUDY AREA

3.7.5 Socio-economic survey

Primary Socio-Economic Survey Methodology

The study was carried out with a participatory approach by involving the stakeholders, particularly the project beneficiaries and probable affected persons through a series of consultative process. The population groups that were consulted include beneficiary group of people in the project influence area, particularly the shopkeepers, farmers, school teachers, Gram Panchayat



Sarpanch/members and village elders etc. This was helped to know the exact situation and views of the people about the project.

Proportionate and purposive sampling methods were used for selecting respondents (male and female) for household survey. For official information of village, sarpanch/Gram panchayat member were chosen. Structured questionnaire were used for survey. For group discussion, panchayat bhavan, Aanganwadi bhavan, community halls were used.

Major observations of the Survey/ Study Area

- House pattern: Types of housing varied from thatched to pakka houses. About 40% houses were in pakka form, 40% in semi pakka and 20% houses were observed in kaccha form.
- Employment: Main occupation in the study area was agriculture and its allied activities eg. Cattle rearing, dairy farming etc. Agricultural activity was mainly depending on monsoon season. Other income generation sources of the area were labour work, small business; private jobs etc. The labour are getting daily in the range of Rs. 100-300, depending on type of work they get.
- Fuel: The primary sources of cooking fuel were firewood, cow dung cake, Kerosene, etc. Very few villagers are using LPG facility.
- Main crops: Major crops cultivated in Kharif season are jowar, bajra, maize, green gram, black gram, tur, soyabean, sesamum, groundnut and cash crops like cotton, whereas in rabi major crops cultivated are wheat, gram, jowar, sunflower and in summer season groundnut and bajra are cultivated.
- Sanitation: Toilet facility was one of the most basic facilities required in a house. There was no proper drainage line in the villages. Open defection was in practice in most of the villages.
- Drinking water Facilities: During the survey, it was observed that diverse sources of drinking water supply were available in villages. Major source of drinking water in the study area was ground water (hand pumps, tap water and dug wells). During survey respondents reported shortage of water in summer season.



- Education facilities: Most of the villages were having education facilities in the form of anganwadi and primary schools. Higher education facilities were available in the range of 5-10km. Colleges and other diploma courses were available at Shirpur, Sindkheda, Nardana towns.
- Transportation facility: For transportation purpose auto, jeep and private bus services were available in the study area; however villagers reported that transportation facilities are not frequently available in interior villages. Private vehicles like bicycles & motor cycles were also used by villagers for transportation purpose. Railway connectivity is available in some villages.
- Road connectivity: Most of the roads wereof pakkanature and the few pakka roads are badly in need of repair and maintenance.
- Communication facilities: For communication purpose, mainly mobile phones, news papers& post offices were present in the villages.
- Medical facilities: There are few healthcare facilities available in the study area. In some of the villages, primary health sub centres were available. Hospitals and other better health centres were available in the range of 5-10 km at towns like Sirpur, Nardana, Sindkheda, etc.
- Electricity: All villages were availing electricity facility for domestic and agriculture purposes.
- Market facility: Study area was predominantly rural. In villages, small shops were available for daily needs things. Weekly market facility was available in some villages.
- Recreation facilities: Television and radio are the main recreation facilities in the study area.

3.7.6 Awareness and Opinion of the Respondents about the Proposed Project Public opinion is the aggregate of individual attitudes or beliefs. It is very important to take opinion of the villagers about the project. The awareness will not only promote community participation but also enable them to understand the importance of the project and encourage them to express their view. To know the awareness and opinion of the villagers about the project, group discussion, meeting with school teachers/village leaders were carried out in the study area.



- In villages located within 0-3 km, majority of the respondents were aware about the project site and about the project activity
- The respondents were happy to know about the proposed project and they opined positively because the activity would definitely contribute development in the study area
- > Village leaders were demanding employment opportunities to local people
- Main demands of villagers in study area were for medical facility, drinking water and employment opportunity.



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CHAPTER 4: ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 IDENTIFICATION OF IMPACTS

This chapter describes the identification of impacts, appraisal of various impacts and mitigation measures during construction phase and operational phase. Any developmental activity will bring about some impacts associated with its origin, which can be broadly classified as reversible, irreversible, long and short-term impacts. In this chapter, an endeavor has been made to identify various Environmental Impacts associated with the plant operation and other activities wherein, there may be a chance of pollution.

Based on the possible worst case emissions and waste generation from the proposed project and also taking into consideration the baseline Environmental status at the proposed project site, the environmental factors that are likely to be affected are assessed. The prediction of impacts helps in the preparation of Environmental Management Plan, which has to be executed during the on-going activities for the proposed project to minimize the adverse impacts on environmental.

The mathematical models were used to quantitatively describe the cause-effect relationships between the sources of pollution and different components of environment.

4.1.1 Methodology

The potential impacts on the environment from the proposed project are identified based on the nature of the various activities associated with the project implementation and operation and on the current status of the environmental quality at the project site.

Potential Impacts

All the potentially significant environmental impacts from the project are grouped as below.

Air Environment

- Impacts on ambient air quality
- Impacts on ambient noise

Traffic

• Impacts on traffic density



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Water Environment

- Impacts on surface & ground water quality
- Impacts on aquatic life

Land Environment

- Impacts on land use
- Impacts on soil fertility
- Impacts on agriculture

Socio Economics

- Impacts on demand supply
- Impacts on natural resources
- Impacts on infrastructure
- Impacts on employment

Indirect Impacts

- Impacts on public health and safety
- Impacts on cultural resources
- Impacts on ecology and biodiversity
- Impacts on aesthetics

Environmental Management plan of the proposed grinding unit provides details of the environmental quality control measures to be taken during construction phase and operation phase. EMP also details the post project monitoring to be undertaken by the plant authorities in order to maintain environmental quality within the stipulated standard limits specified by State Pollution Control Board, CPCB and Ministry of Environment and Forests.

4.2 ENVIRONMENTAL IMPACTS AND MANAGEMENT PLAN DURING CONSTRUCTION PHASE

4.2.1 Air Environment

Impacts

- The construction activities would involve usage of machinery like poclain, JCB, Dozer, Payloader, Tippers / Trucks etc.
- It is expected that at least 5 to 6 tippers / trucks per hour will move at site at peak time.
- It would result in the increase of Particulate Matter (PM) concentrations due to emission of fugitive dust.

Mitigation Measures

• Frequent water sprinkling in the vicinity of the construction sites would be undertaken and will be continued after the completion of plant construction, as there is scope for heavy truck mobility.



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- It will be ensured that both gasoline and diesel powered vehicles are properly maintained to comply with exhaust emission requirements.
- Material transport would be ensured through covered trucks to minimise fugitive emissions.
- Also, spillage / leakages will be checked to control fall of material on road thereby causing dust generation.

4.2.2 Noise Environment

- High Noise levels may be generated during construction activity due to the operation of earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials and people.
- The major construction activity resulting in high noise levels will be restricted to day time. The effect of the noise will be mainly on the construction labour present near the noisy equipment and construction site.
- All the workers working in the high noise levels prone area will be provided with ear plugs. The construction equipment will be maintained periodically to minimise noise.

4.2.3 Water Environment

- Construction activities result in water consumption and waste water generation during the construction phase. Consumption is mainly for construction. Next to construction, the water usage will be for domestic usage for construction workers.
- The wastewater generated from the domestic usage if not handled properly will lead to unhygienic conditions resulting in water borne diseases.
- During construction phase, provision for infra-structural services including water supply, sewage, drainage facilities and electrification will be made.
- Water for construction activities will be supplied from MIDC supply line or use of ground water with due permission form concerned authority or through tankers from nearby villages.
- The construction site would be provided with suitable toilet facilities for the workers to allow proper standards of hygiene.
- These facilities would be connected to a septic tank and maintained to ensure minimum impact on the environment.
- Surface run-off from the construction site will be collected in a settling tank through storm water drains.



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• The properly settled water will be used for dust suppression and construction activities.

4.2.4 Land Environment

The 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 Cement Grinding & Packing Unit 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.

4.2.5 Socio-Economic Environment

During construction phase, employment will be generated for highly skilled, semi-skilled and unskilled workers from the nearby villages. Most of the construction labor will be sourced from nearby villages. UltraTech Cement will extend the benefits like providing drinking water supply, rest shelter, temporary on-site accommodation, health care and sanitation to the construction labour. Management of UltraTech Cement will give preference to local people through both direct and indirect employment.

4.2.6 Safety and Health during Construction Phase

- Vehicular traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust emissions, noise and accidents.
- All the construction labor will be provided with personal protection devices like helmets, safety shoes etc. First aid facilities will be kept readily available with the site supervisors.
- The safety department will supervise the safe working of the contractor and their employees. Work spots will be maintained clean, provided with optimum lighting and enough ventilation to eliminate dust/fumes. Workers employed at construction site will compulsorily wear helmets. All contractors will be directed for use of safety equipment and devices for all the workers employed at site.

4.3 ENVIRONMENTAL IMPACTS AND MANAGEMENT PLAN DURING OPERATIONAL PHASE

UltraTech Cement has designed Environmental Management plan as per CPCB's Charter on Corporate Responsibility for Environmental Protection (CREP).



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Details of the identified environmental impacts and corresponding environmental management plan for proposed Cement Grinding & Packing Unit are discussed in following paragraphs:

4.3.1 Air Environment

The major sources of emissions from the proposed Cement Grinding & Packing Unit are Clinker grinding process and fugitive emissions from material storage and transport activities.

4.3.1.1 Sources of Emissions

Major pollutant emitted from the proposed cement grinding unit is Particulate matter. Emissions released from the plant during operation phase will be get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. Emissions from various chimneys have been considered as point sources. There are about 3 point source emissions from the proposed plant. Each point source is identified based on the location of the each stack and emission strength and flue gas properties. All the following sources are provided with Bag filters.

- Hydraulic Truck Tipplers hopper
- Clinker hopper
- Weigh feeders for Clinker, Gypsum and Solid flow meter for flyash.
- Clinker Grinding mill
- Packing machines

For the purpose of air pollution modeling, controlled emissions at the outlet of each pollution control system have been considered.

All the pollution control equipment in the proposed plant will be designed for an outlet emission of less than 30 mg/Nm³. The dust collected from the various pollution control equipment will be recycled in the cement manufacturing process.

4.3.1.2 Estimation of Cumulative Impact

Shirpur Power Pvt Ltd (SPPL) is implementing 2 X 150 MW Thermal Power plant at Nardana Phase-I, Tehsil Sindkheda, District Dhule, Maharashtra adjacent to the subject grinding unit. In order to assess cumulative impact, the emissions from 2 X 150 MW power plant were also considered. The emissions from the proposed Grinding unit of 3.0 MTPA Cement Grinding & Packing Unit and packing plant are mainly Particulate



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Matter. No sources of sulphur dioxide or oxides of nitrogen are proposed within the grinding unit. Hence for estimation of cumulative impact dust/PM emission from 2 X 150 MW power plant were considered. The particulate emission details considered from the proposed 3.0 MTPA Cement Grinding & Packing Unit and adjacent 2 X 150 MW power plant are given in **Table 4.1**.

| SI. | Stack name | Height | Dia | Temp | Exit | Exit | Emission rate (µg/s) | |
|-----|----------------------------------|--------|------|------|-----------------------------|----------------|----------------------|-------------------|
| No | | (m) | (m) | (°C) | Vol. (m ³ /s) | Velo. (m/s) | PM ₁₀ | PM _{2.5} |
| 1 | Cement Mill (3.0 MTPA) | 45 | 3.0 | 90 | 125.0 | 15.54 | 1762655 | 660996 |
| 2 | Coal Mill | 40 | 1.6 | 90 | 44.45 | 3.75 | - | - |
| 3 | D.G Set 2 x 6 MW | - | - | - | - | - | - | - |
| | Adjacent 2x150 MW TPP of SPPL | | | | | | | |
| 2 | TPP Stack 1 | 150 | 3.75 | 132 | 265.8 | 24.07 | 3359417 | 1259781 |
| 3 | TPP Stack 2 | 150 | 3.75 | 132 | 265.8 | 24.07 | 3359417 | 1259781 |
| 4 | D.G. Set (750 KVA) | 15 | 0.24 | 180 | 1.196 | 26.45 | 13519 | 5070 |
| 5 | D.G. Set (750 KVA) | 15 | 0.24 | 180 | 1.196 | 26.45 | 13519 | 5070 |

TABLE 4.1: STACK DATA OF PROPOSED 3.0 MTPA CEMENT GRINDING & PACKINGUNIT AND EXISTING 2 X 150 MW TPP FOR CUMULATIVE MODELLING

4.3.1.3 Meteorological Data

The meteorological data recorded continuously during Post monsoon 2016 on hourly basis on wind speed, wind direction and temperature has been processed to extract the 24 - hourly mean meteorological data as per the guidelines of IMD and MoEF for application of Multi stack dispersion model. Stability classes computed for the mean hours are based on guidelines issued by CPCB on modeling. Mixing heights representative of the region have been taken from the available published literature.

4.3.1.4 Scenarios Considered For Estimation Of Groundlevel Concentrations.

The ground level concentrations are estimated for the Particulate matter Ground level concentrations due to emissions from various sources of clinker grinding unit and adjacent power plant. The model employed for prediction of impacts is Multi-Stack Dispersion Modelling using Double



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Gaussian Diffusion Equation : IS 8829-1978 and as per the directions given in 'Assessment of Impact to Air Environment : Guidelines for Conducting Air Quality Modelling' by CPCB, Delhi, (PROBES/70/1997-98).

4.3.1.5 Simulation Model for Prediction

The pollutants released in to the atmosphere will disperse in the down wind direction and finally reach the ground at farther distance from the source. The surrounding area is almost plain. The concentration of ground level concentrations mainly depends up on the strength of the emission source and micrometeorology of the study area.

Ground Level Concentration (GLC) of Particulate Matter has been calculated for multi-stack dispersion modelling using double Gaussian diffusion equation : IS 8829-1978 and as per 'Assessment of Impact to Air Environment : Guidelines for Conducting Air Quality Modelling' by CPCB, Delhi, (PROBES/70/1997-98).

$$X_{(x,y,z)} = \frac{Q}{2\pi\sigma_{y}\sigma_{z}Up} \exp(-\frac{1}{2}\frac{(y^{2})}{\sigma_{y}} [\exp\{-\frac{1}{2}\frac{(z-he)^{2}}{\sigma_{z}^{2}}\}] + [\exp\{-\frac{1}{2}\frac{(z+he)^{2}}{\sigma_{z}^{2}}\}]$$

Where :

- $X_{(x, y, z)}$ = Ground level concentration of pollutant in micro g/cum at the point with co-ordinates (x,y,z).
- *x* = Down wind distance in m.
- *y* = Cross wind distance in m.
- *z* = Vertical distance in m.
- *he* = Effective stack height in m.
- Q = Pollutant emission rate in µg/sec.
- σ_y = Standard deviation of pollutant plume width in cross wind direction in m.
- σ_z = Standard deviation of pollutant plume width in vertical direction in m.
- *Up* = Mean stack top wind speed in m/sec.

BASIC CONDITIONS

The hourly mixing heights for the site has been taken from "Atlas of hourly mixing height and assimilative capacity of atmosphere in India", published by Environmental Monitoring and Research Centre, India Meteorological



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Department, New Delhi 2008 for the period of 0700 HRS to 1900 HRS for post monsoon season whereas the rest of the time it has been taken from CPCB published data for Mumbai for the same season as given in **Table 4.2**.

| Hour | Mixing height range (m) | Hour | Mixing height range (m) |
|-------|-------------------------|-------|-------------------------|
| 01:00 | 25 - 205 | 13:00 | 1400 - 1615 |
| 02:00 | 5 – 195 | 14:00 | 1500 - 1755 |
| 03:00 | 0 - 185 | 15:00 | 1530 - 1865 |
| 04:00 | 0 - 175 | 16:00 | 1400 - 1835 |
| 05:00 | 0 - 165 | 17:00 | 1375 - 1715 |
| 06:00 | 0 - 165 | 18:00 | 800 - 980 |
| 07:00 | 50 – 70 | 19:00 | 595 - 735 |
| 08:00 | 95 – 125 | 20:00 | 375 - 595 |
| 09:00 | 320 - 390 | 21:00 | 300 - 500 |
| 10:00 | 700 – 950 | 22:00 | 230 - 420 |
| 11:00 | 1120 - 1350 | 23:00 | 195 - 380 |
| 12:00 | 1125 - 1325 | 24:00 | 150 - 370 |

 Table 4.2: Hourly Mixing Height Range considered for modelling

The stack details with emissions are given in **Table 4.1**. The maximum of 24 hrs average Ground Level Concentrations has been calculated for PM_{10} and $PM_{2.5}$ and are given in **Table 4.3**. The details of model used, meteorological conditions considered, receptors considered and predicted concentrations at the receptors are given in **Annexure 8**.

TABLE 4.3: CALCULATED MAXIMUM GROUND LEVEL CONCENTRATION (µg/m³)

| Predominant wind directions | Max. Concentrations at receptors from predominant wind directions (μg/m³) | | | | | |
|-----------------------------------|---------------------------------------------------------------------------|---------------|-------------------|-------------|--|--|
| | PM ₁₀ | | PM _{2.5} | | | |
| | 3.0 MTPA | Cumulative | 3.0 MTPA | Cumulative | | |
| Е | 0.15 | 0.25 | 0.06 | 0.09 | | |
| ENE | 0.22 | 0.37 | 0.08 | 0.14 | | |
| SSW | 0.10 | 0.15 | 0.04 | 0.05 | | |
| | | | | | | |
| | Maximum total GLC at particular receptor | | | | | |
| | | 0.79 | | | | |
| | 0.49 (E-31) | (E-27 & E-28) | 0.19 (E-31) | 0.30 (E-28) | | |



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Incremental Ground Level concentration due to Proposed Cement Grinding & Packing Unit:

From the air quality modeling results, it is observed that the maximum incremental ground level concentration of PM10 only due to the operation of proposed Cement Grinding & Packing Unit will be $0.49 \ \mu g/m^3$ at about 10.0 km E. Similarly, the incremental concentration of PM2.5 only due to the operation of proposed Cement Grinding & Packing Unit will be $0.19 \ \mu g/m^3$ at about 10 km E. Thus, no significant impact is envisaged on the ambient air quality of the area due to proposed cement grinding and packing plant. The study area map showing predicted GLC's for PM10 & PM2.5 due to proposed cement grinding and packing plant are given in **Figure 4.1** & **Figure 4.2** resp.

Cumulative Incremental Ground Level concentration due to Proposed Cement Grinding & Packing Unit and 2 x 150 MW Thermal Power Plant:

From the air quality modeling results, it is observed that the maximum cumulative incremental ground level concentration of PM10 due to the operation of proposed Cement Grinding & Packing Unit and thermal power plant will be $0.79 \ \mu g/m^3$ at about 4.0 km E. Similarly, the incremental concentration of PM2.5 due to the operation of proposed Cement Grinding & Packing Unit and thermal power plant will be $0.30 \ \mu g/m^3$ at about 5 km E. Thus, no significant impact is envisaged on the ambient air quality of the area due to simultaneous operation of proposed cement grinding and packing plant and thermal power plant. The study area map showing predicted cumulative GLC's for PM10 & PM2.5 due to operation of proposed cement grinding and packing plant and thermal power plant are given in **Figure 4.3** & **Figure 4.4** resp.



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Figure 4.1: Map showing Predicted GLC for PM10 due to Cement Grinding Unit



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Figure 4.3: Map showing Predicted Cumulative GLC for PM10 due to Cement Grinding Unit & Thermal Power Plant



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Figure 4.4: Map showing Predicted Cumulative GLC for PM2.5 due to Cement Grinding Unit & Thermal Power Plant



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TABLE 4.4: PREDICTED CUMULATIVE GROUND LEVEL CONCENTRATIONS AND OVERALL SCENARIO, $\mu g/m^3$

Emission Sources : Grinding Unit and adjacent power plant

| 24-Hourly Concentrations | Particulate | Fine Particulate | |
|-----------------------------------------------|-------------------------|------------------------|--|
| | Matter (PM 10) | Matter (PM 2.5) | |
| Baseline concentration, (Max) | 63.3 μg/m ³ | 35.7 μg/m ³ | |
| Predicted Ground level | 0.79 µg/m ³ | 0.30 μg/m ³ | |
| Concentration (Max) | 0.79 µg/m ³ | | |
| Overall Scenario | 64.09 μg/m ³ | 36.0 μg/m ³ | |
| NAAQ Standard is for Industrial, Residential, | $100 \mu g / m^3$ | 60 ug/m^3 | |
| Rural and other areas. | 100 μg/ m ^o | ου μg/ m ^s | |

The ambient air quality values have not exceeded the stipulated standards when cumulative ground level concentrations due to the proposed grinding unit and adjacent power plant are worked out and superimposed on the baseline value i.e when the cumulative ground level concentrations are added to the background air quality.

4.3.1.6 AIR POLLUTION CONTROL MEASURES

The following control measures listed will be implemented/operate from Day -1 of operation of the Cement Grinding & Packing Unit to comply with GSR. No. 826(E) dated 16th November, 2009.

- Installation of high efficiency bag house for cement mill stack and bag filter at various material transfer points along with ventilation systems to control the fugitive dust generated from the material handling areas.
 - Hydraulic Truck Tipplers hopper
 - RCC silos for Clinker storage
 - Weigh feeders for Clinker, Gypsum and Solid flow meter for flyash.
 - Clinker Grinding mill
 - Packing machines
- All the flue gas outlets will be provided with state of art air pollution control equipment to maintain the particulate emission level below 30 mg/Nm³.
- The cement mill will be provided with a Bag filter with an outlet emission of less than 30mg/Nm³.
- The dust collected in the pollution control devices is recycled back to the grinding unit.
- The roads in the plant will be paved to prevent dust emissions and regular cleaning by vacuum sweeping machines



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- To control the dust emissions from dropping/transfer points of the belt and bucket conveyors, Bag filters will be provided at various locations of the transfer points.
- Fly ash and cement will be stored in RCC Silos and clinker will be stored in closed RCC silo.

A. FUGITIVE DUST CONTROL IN THE PLANT

The source of fugitive dust emissions:

- a. Raw material storage yards
- b. Transfer points
- c. Cement Packing and loading areas.

UltraTech Cement will implement the following measures for control of Fugitive dust as per the CPCB standards:

- 1. Dust suppression system for stock yards
- 2. All belt conveyors transfer points hoods sealing with belt curtains and metal sheets
- 3. Laying of Concrete/blacktopped roads for vehicle movement
- 4. Dust collectors for hopper venting
- 5. Fly ash transportation by closed tankers / pneumatic pipeline
- 6. Regular sweeping of roads.
- 7. Automatic dust cleaning system will be employed for removing the dust on the floors.
- 8. Development of greenbelt all around the plant boundary.

B. FUGITIVE DUST PROTECTION FOR WORKERS

All the dust reduction measures for the process units to meet the environmental standards will be employed.

The following measures for workers from fugitive dust will be taken up:

- Pre-Employment medical examination of all the workers, assessment of fitness for the particular type of work with due regard for adaption of work place to the worker taking into account individual susceptibility.
- Provision of dust masks, goggles, safety shoes and helmet
- Review of health status of workers by maintaining the health record & their occupation.



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4.3.2 Noise Environment, Vibration & Traffic Density

4.3.2.1 Impact on Ambient Noise Levels & Sources of Vibrations

During installation of the grinding unit, no significant impact is envisaged as most of the construction equipment produce noise level below 90 dB(A). The noise generated is expected to be intermittent and of short duration.

During the plant operation phase, major noise generation sources are:

- Plant equipment and machineries like Crushers, conveyors, Compressors, etc.
- Loading, Unloading & cement transportation vehicles
- DG sets (occasional)

The identified stationary noise sources in the proposed plant, their location and their corresponding estimated noise levels are given in **Table 4.5**.

| | Coordinates | | |
|----------------|-------------|------|-----------------------------|
| Noise sources | Χ | У | Source noise level in dB(A) |
| Cement Mill | 60 | 225 | 100 |
| ID Fan | 80 | 205 | 95 |
| Conveyor | 20 | 190 | 90 |
| Packing Plant | 115 | 295 | 95 |
| Compressor | 40 | 255 | 90 |
| DG Sets | 20 | 220 | 75 |
| Truck Loading | 85 | 335 | 90 |
| Wagon Tipler | 85 | 565 | 100 |
| Gypsum Crusher | -30 | -10 | 110 |
| Truck Parking | -100 | -345 | 95 |
| Railway Siding | -75 | 130 | 95 |

Table 4.5: Major Noise Sources in the proposed Cement Grinding & Packing Unit

Noise modeling has been carried out to assess the impact on surrounding ambient noise levels. Plant machinery as mentioned above generate noise in the working areas. Predictions have been carried out to compute the noise level at various distances around the Sugar plant and proposed distillary unit due to these major noise-generating sources. 'DHWANI' Noise Modelling Software developed by NEERI and recommended by MoEF was used to predict the ambient noise levels around the plant boundary.

Prediction of anticipated noise levels have been computed using point source model. A basic phenomenon of the model is the geometric attenuation of sound.



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Noise at a point generates spherical waves which are propagated outward from the source through the air at a speed of 1,100 ft/sec, with the first wave making an ever increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere.

The assumption of the model is based on point source relationship i.e. for every doubling of the distance the noise levels are decreased by 6 dB(A). Point source propagation is defined by the following equation:

$$Lp2 = Lp1 - 20 \log_{10} (R2/R1)$$

Where Lp1 and Lp2 are sound pressure levels at points located at distances R1 and R2, respectively, from the source.

The summation of different resultant noise levels at receptors are carried out by mathematical equation as given below:

 $L = 10 \log_{10}(10^{L1/10} + 10^{L2/10} + \dots + 10^{Ln/10})$

Where L1, L2 and Ln are noise level dB(A)

The resultant noise isolines obtained from the noise modeling are superimposed on topographical map of the study area to identify the areas under impact due to the increase in noise levels from the proposed plant operations. The map showing predicted noise level isolines is given in **Figure 4.5**.

From the modeling results, it is observed that the maximum resultant noise levels near the plant boundary will be about 65 dB(A). The noise levels will be further reduced and the predicted resultant noise levels at the nearest village habitation i.e. Vaghode village will be about 50 dB(A).

However, this model does not take into account the attenuation of noise levels due to noise barriers like vegetation, boundary walls, building shed, etc and also the natural factors like altitude, wind direction, temperature, etc. Thus, the actual noise levels will be lower than the estimated noise levels using this model. Further adequate noise control measures, as described below, will be adopted to minimize the noise generation in the proposed plant.



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Vibrations

Vibrations will be generated due to operation of heavy equipments and machinery such as crushers, Ball Mill, pumps and rotors, etc. and most of the times, the operators of these equipments are subjected to the vibrations. Necessary protective measures will be adopted in the Cement Grinding & Packing Unit to minimise generation of the vibrations and to minimise exposure of persons to hazardous levels of vibrations.







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4.3.2.2 Impact on Traffic Density

The proposed Cement Grinding & Packing Unit is well connected with road and rail network. Mumbai – Agra National Highway -3 is located at 3.5 km W of the plant site and State Highway -6 is located at 0.8 km South of the plant site. The state highway is connected to the plant site through MIDC road. Also, there is a proposal of railway siding for transport of raw material and finished product for the Cement Grinding & Packing Unit. Till the construction of railway siding, the raw materials and finished product (cement) and gypsum will be transported by Road. Fly ash will be transported through pneumatic pipelines from adjacent thermal power plant of SPPL.

About 220 trips per day of 25 Tonne capacity truks will be required for transport of cement produced from the plant during initial phase of the project. The road network is sufficient to cater to this increase in traffic as there are no other major industries in the area. Also, the increase in traffic density will be temporary till construction of the railway siding. Thereafter, most of the raw material and finished product will be transported through rail mode. The existing and post project traffic scenario is presented in **Table 4.6**.

| Sr. | Type of Vehicle | Existing No. of | Additional no. | Total no. of |
|-----|---------------------|-----------------|-----------------|--------------|
| No. | | vehicles / day | of vehicles/day | vehicles/day |
| 1 | HMV | 108 | 220 | 328 |
| 2. | LMV | 156 | 10 | 166 |
| 3. | Four wheelers | 324 | 40 | 364 |
| | (Cars/Jeeps) | | | |
| 4. | Three wheelers/ Two | 517 | 150 | 667 |
| | wheelers | | | |
| | Total | 1105 | 420 | 1525 |

TABLE 4.6: IMPACT ON TRAFFIC DENSITY DUE TO PROPOSED PROJECT

From the above table, it can be seen that the major increase in traffic density will be due to heavy transport vehicles required for transportation of raw material and finished products. Once the railway siding gets operational, there will not be any significant impact on the traffic infrastructure of the area.


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4.3.2.3 Noise Pollution & Vibration Control Measures

Following noise control measures are proposed to be undertaken in the plant to maintain the noise levels within permissible limits and to control vibrations:

- During selection of equipments and machines, their source noise will be kept minimum as per standards.
- Provision of acoustic & vibration dampeners in foundations and insulators in the interiors
- DG sets will be housed in a separate building / accoustic enclosure with insertion loss of 25 DB(A).
- A scientifically designed greenbelt will be developed all around the plant boundary to act as noise attenuator.
- Personnel working near high noise level generating sources will be provided with earmuffs and ear plugs.
- Acoustically insulated cubicles will be provided to operators working near high noise generation sources.
- Effective preventive maintenance and vibration measurement of all rotating equipment will help in the improvement of plant life and also reduce noise.
- Vibration absorbing platforms will be provided for heavy machines which generates vibrations.
- Periodic job rotation of workers engaged in operations that involve exposure to high noise or vibration.
- Most of the raw material and finished product will be transported through rail. Hence, noise due to vehicular traffic will be minimum.
- During initial phase when rail infrastructure is not complete, truck transport in batch system will be implemented to minimise disturbance to local people.
- Periodic monitoring of ambient noise levels in the plant premises and in surrounding villages to monitor the efficacy of pollution control measures adopted in the plant and accordingly additional control measures will be adopted, if required.

4.3.2.4 Traffic Management Plan

Internal roads within the plant premises will be maintained sufficiently wide to allow free flow of incoming and outgoing transport vehicles. All the internal roads will be blacktopped / concreted to control fugitive emissions. Proper signboards and signalling will be arranged to avoid traffic congestion. Separate gates will be provided for incoming and outgoing vehicles. Parking arrangement for transportation vehicles will be made within the plant premises. Thus, there will not be any truck parking along public road.



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The plant lay out showing traffic movement directions and parking spaces is given in **Figure 4.6**.



Figure 4.6: Plant Layout showing Flow of vehicles within plant premises

Following measures will be adopted to minimise impacts on traffic infrastructure, air quality and ambient noise levels as well as to avoid nuisance to the other commuters and population residing along the transport roads:

- Regulating speed of the transport vehicles. Over speeding will be strictly prohibited.
- Transportation of material through trucks covered with tarpaulin. No open transport will be permitted.
- Overloading will be strictly prohibited.
- Periodic maintenance of transport roads from plant site to State Highway.
- Periodic water sprinkling on transport road from plant to state highway to control dust emission.
- Posting of traffic regulator at MIDC road State highway Junction to avoid traffic jams.
- Construction of speed breakers at strategic locations such as near village habitation, school, etc.
- Batch transport system will be adopted to minimise traffic congestion.
- Railway siding work will be taken up simultaneously and material transport through railway will be commenced as early as possible.



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4.3.3 Water Environment

4.3.3.1 Impact on Water Resources

There is no surface water stream flowing in or adjacent to the proposed Cement Grinding & Packing Unit. There is no proposal for use of surface water or ground water in the proposed plant.

The water requirement for the proposed Cement Grinding & Packing Unit has been estimated as 350 m³/day considering for phase-II of wagon loading. This requirement will be met from the MIDC supply water (treated) or from SPPL extension water line with prior approvals. Hence, no impact is envisaged on the water resources of the area.

4.3.3.2 Impact on Water Quality

It is proposed cement grinding unit and the cement manufacturing is based on the dry process technology, hence no effluent will be generated form the cement manufacturing process. In grinding unit, water is used for cooling at various stages. This water is totally absorbed in the process which undergoes evaporation and hence no process effluent will be released outside the plant premises. Only domestic effluent will be generated from the proposed Cement Grinding & Packing Unit. Water balance for the proposed plant is given in **Table 4.7**.

| S. No | Requirement | Consumption | Effluent | Treatment proposed |
|-------|-------------|-------------|------------|-------------------------------|
| | | | Generation | |
| 1. | Process | 195 | 0 | None |
| 2 | cooling | 15 | 0 | |
| 2. | Dust | 50 | 0 | None |
| | Suppression | | | |
| 3. | Domestic | 15 | 12 | STP. Treated effluent will be |
| | Consumption | | | used for gardening. |
| 4. | Greenbelt | 50 | 0 | |
| | Development | | | |
| 5. | Others | 25 | 0 | - |
| | TOTAL | 350 | 12 | |

Table 4.7: Water Balance (m³/day)



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4.3.3.3 Water Pollution Control Measures

No waste water will be generated form cement manufacturing process, as the cement manufacturing is dry base process technology. There is no process effluent generation in the proposed Cement Grinding & Packing Unit. Hence, no industrial wastewater treatment system is required. Domestic waste water generated from the plant premises will be treated in the STP and treated water will be used for green belt development.

Details of proposed STP:

Capacity of STP: 15 KLD

Technology adopted: Membrane Bioreactor (MBR) technology Use of treated water: For gardening and green belt purpose.



Figure 4.7: Process Flow sheet for Sewage Treatment Plant

4.3.3.4 Rain Water Harvesting

UltraTech Cement has designed the storm water network for the entire area of 26.10 Ha.

Rainwater Harvesting Potential Estimation

| Total Plot area | : 26.10 Ha |
|------------------------------------------------|------------------|
| Annual rainfall of the area | : 729.7mm |
| Rainfall Incident over area | : 190451.7 |
| m³/annum | |
| Water available for Harvesting after 20% | : 152361.36 |
| m ³ /annum | |
| evaporation and percolation loss | |
| Number of rainy days in a year (Average) | : 43 |
| Average Water available for Harvesting per day | : 3543.29 m³/day |



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The rain water will be guided through network of storm water drains inside the boundary into a holding tank of about 5000 cu.m capacity and pumped into percolation pits provided in the premises. A schematic drawing of rainwater harvesting pit is given in **Figure 4.8**.



Figure 4.8: Schematic Diagram of Rainwater Harvesting Pit

4.3.3.5 Water Conservation Measures

UltraTech Cement Ltd. will use state of the art technology to minimise water requirement in the plant and to conserve water. Efforts will be made to utilise treated effluent to maximum extent.

UltraTech Cement will harvest the rainwater incident in the plant area. The rainwater will be collected in a holding tank through a network of storm water drains. The collected water will be passed to the percolation tanks for recharging the ground water table. The volume of rainwater harvesting tank will be about 5000 m^3 .



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4.3.4 Land Environment

4.3.4.1 Impact on Land Environment

The grinding unit will be located in an area of 26.10 Ha located in MIDC area Nardana Phase-I in Dhule District. The land is already acquired by MIDC for industrial use and is allocated to UltraTech Cement Ltd. for establishing Cement Grinding & Packing Unit. There is no habitation and hence, no displacement of people is involved. The site is free from vegetation and no cutting and uprooting of trees is involved. Thus, no significant impact is envisaged on the land environment of the project site. No activity is proposed outside the plant premises. Hence, there will not be any impact on the land environment outside the plant site.

4.3.4.2 Land Environment Management Plan

M/s UltraTech Cement Ltd. will carry out thick plantation on more than 7.5 Ha area. Plantation will be carried out along the plant boundary along internal roads, around site office, sheds, railway siding, etc. Thus, a good amount of green cover will be developed in the area. Thus the aesthetic view of the plant site will be improved.

Top Soil Management

Top soil from the area proposed for construction will be separately scrapped and will be directly spread over area proposed under green belt. Thus, the loss of fertile soil cover will be avoided and the soil will be beneficial for improving the survival rate of the plantation. Immediate plantation will be taken up in the green belt area from 1st year itself. This will minimise soil erosion from the plant premises.

4.3.5 Solid & Hazardous Waste Generation & Management

4.3.5.1 Solid Waste generation & Management

The main solid waste generated from the grinding unit is cement dust (approx. 0.5 T/day) collected from various pollution control devices which will be recycled back to the process. Hence no solid waste for disposal will be available in the plant.

Sludge cakes generated from Sewage Treatment Plant (STP) will be spread in green belt area as manure. No fly ash, muck, slurry, sludge material disposal are involved in the project. No other solid waste is generated from the plant operations and processes.



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Ash Handling

The ash will be transported by means of Pneumatic conveying system/ bulk closed tankers with Pneumatic handling facilities for better control over unloading operations. Fly ash will be mainly obtained from adjacent thermal power plant of M/s SPPL or nearby other thermal power plant located at Bhusawal.

4.3.5.2 Hazardous Waste Management

Used Oil from the gear boxes and automobile batteries will be disposed to the authorized recycling vendors as per the Hazardous Wastes (Management and Handling) Amendment Rules, 2016.

4.3.5.3 Waste Minimisation

UltraTech Cement practices Waste minimization as a policy. The wasteminimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation have been considered and detailed below.

• **Waste minimization**: The plant will utilize 0.4 to .80 MTPA of fly ash which otherwise is treated as waste and needs disposal. UltraTech Cement will utilize the Fly Ash generated in adjacent power plant of M/s SPPL for manufacturing Pozzolona Cement. This will also result in energy conservation per tonne of Cement production.

• **Energy conservation:** The grinding of clinker to an extent of 0.4 to 08 mtpa will be reduced thus saving of energy to the tune of 25 million Kwh will be achieved.

• **Carbon Credit:** Production of 3.0 Million TPA of PPC will result in saving of clinker consumption up to 0.4 to 0.8 Million TPA thereby elimination in CO_2 generation to the tune of 23,000 TPA.

The proposed plant comprises grinding of Clinker, Ash and Gypsum. No combustion process is involved generating waste heat. Hence, waste heat recovery system is not proposed.



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4.3.6 Impacts on Biological Environment & Management Plan

4.3.6.1 Impacts on Biological Environment

The area proposed for Cement Grinding & Packing Unit is located in MIDC industrial area and comprise of industrial land. There is no forest land in or adjacent to the proposed Cement Grinding & Packing Unit site. The plant is proposed in MIDC area and is surrounded by industrial land. There is no vegetation in the area proposed for Cement Grinding & Packing Unit. A Reserved Forest is located at 8.2 km SW of the project site.

There is no Schedule I fauna observed in the study area. Thus, no significant impact is envisaged on the biological environment due to the proposed project. In fact, the proposed plantation over more than 7.24 Ha area would improve the green cover and attract small animals and birds towards it, thereby improving the biological environment of the area.

However, the dust emissions from plant operation and material transportation activities may affect agriculture crops located in the vicinity of plant area and along transport road, if adequate control measures are not adopted.

4.3.6.2 Management Plan for Biological Environment

It is proposed to develop a thick green belt in 33% of plot area. Trees of various species will be used for development of green belt. Thus a good biodiversity will be developed within the plant site and this will attract small animals and birds towards it.

Adequate air pollution control measures will be adopted in the Cement Grinding & Packing Unit to control dust emissions. Also, material transport will be carried out through covered trucks to avoid fugitive emissions. Overloading and overspeeding will be strictly prevented to minimise spillage and dust emissions.

Green Belt Development

UltraTech Cement Ltd. has earmarked 8.6 Ha of the plant area for development of greenbelt. Apart from this, plantation will also be carried out along internal roads, railway siding, around office buildings and other site infrastructure. Thus, more than 33% of the plant area will be covered by plantation. Plantation will be carried out @2500 saplings per hectare. Survival rate of more than 75% will be maintained. Diseased saplings will be replaced with new saplings. Proposed plantation program for the Cement Grinding & Packing Unit is given in **Table 4.8**.



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Layout plan showing green belt and plantation in the proposed Cement Grinding & Packing Unit is given in **Figure 4.9**.

| ruble norr roposed dreenbelt runation rogram | | | |
|----------------------------------------------|-----|--------------------|--|
| Year Area (Hectare) | | Number of saplings | |
| 1 st Year | 3.0 | 6,250 | |
| 2 nd year | 3.0 | 6,250 | |
| 3 rd Year | 2.6 | 5,600 | |
| Total | 8.6 | 18,100 | |

Table 4.8: Proposed Greenbelt Plantation Program



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FIGURE 4.9: PROPOSED GREENBELT DEVELOPMENT PLAN

Criteria for selection of tree species:

Species to be selected should fulfil the following specific requirements of the area:

- Tolerance to specific conditions or alternatively wide adaptability to eco-physiological conditions;
- Fast growing;
- Low water demanding and resistant to extreme climatic conditions;
- Different heights and growth habits;
- Pleasing appearances;
- Dense canopy cover;
- Ability of fixing atmospheric nitrogen;
- Improving soil quality;

Species recommended for plantation:

- Acacia auriculiformis (Maha babool/ Australian Babhool)
- Aegle marmelos (Bel)
- Anogeissus latifolia (Dhawra)
- Azadirachta indica (Neem/Kadunimb))



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- Bauhinia variegata (Kachnar/Kanchan)
- Borassus flabellifer (Palmyra Palm)
- Butea monosperma (Palash/Palas)
- Cassia fistula (Amaltas/Bahava)
- Dalbergia sissoo (Shisam / Shisav)
- Delonix regia (Gulmohar)
- Emblica officinalis (Amla/Awla)
- Ficus benghalensis (Bargad/Wad)
- Ficus religiosa (Peepal/Pimpal)
- Hibiscus rosa-sinensis (Gurhal/Jaswand)
- Mimusops elengi (Bakul)
- Mangifera indica (Aam/Amba)
- *Peltophorum pterocarpum (Peela gulmohar)*
- Pterocarpus marsupium (Bijasal)
- Pongamia pinnata (Karanj)
- Syzygium cumini (Jamun/Jambhool)
- Senna siamea (Kassod tree)

Initially, the saplings will be taken from the nursery of Forest Department. A small nursery will be developed at the plant site to cater the need of plantation at plant.

4.3.7 Socio Economic Environment

Socio Economic Status in the study area is found to be moderate with respect to livelihood, amenities etc. Employment potential both direct and indirect coupled with business opportunities and strong social commitment of the company in the form of better educational and medical facilities would result in enhancement in the status and standard of living of the local populace resulting in positive impact.

The management of UltraTech Cement Limited has proposed to give preference to local people for recruitment in Skilled, semi skilled and unskilled categories.

The Proposed Clinker Grinding Unit project will generate Direct Employment for about ~ 120 Regular employees during the operational phase and $\sim 200-250$ contractual labors. Employment based on the eligibility criteria. Unskilled/ semi skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local.



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Apart from the jobs, the company will provide medical and educational facilities to the employees which can also be availed by the people around the plant. There will be significant growth in the infrastructure of the area.

Adequate recreational facilities for the staff of the company and the local people will be created. Details of the various socio-economic welfare measures proposed by UltraTech Cement Ltd. are given in Chapter - 8.

4.3.8 Occupational Safety & Health Management

M/s Ultratech Cements Ltd.'s Safety, Occupational Health & Environment (SHE) responsibilities are driven by a desire to protect people they work with, society at large and environment. It is integral to the way they do business, as part of their organizational value. The Safety, Occupational Health & Environment Policy of the company is given in **Annexure 9**.

The exposure to various operations in the Cement Grinding & Packing Unit involves Occupational & Safety Hazards to the employed workforce. Protective measures for Occupational Safety & Health hazards to keep exposure within permissible exposure level so as to protect health of workers are given below:



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Occupational Health Hazards

| Hazard | Area | Mitigation | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Dust | | | |
| Respiratory Infection Bronchial Diseases Gastrointestinal Diseases Skin Allergy Pulmonary Disorder | Raw Material Yard Crushers Storage Silos Grinding Mills Packing Plant | Water Sprinkling Sealed Silos Storing in Covered Areas & Bins Adequately Designed Bag Filters & Pollution Control Equipment Periodic Medical Check- ups Adequate Medical Facilities Continuous Medical | |
| | | Surveillance | |
| Noise • Nausea • Headaches • Loss of Hearing | •Grinding Mills •Packing Plant | Provision of Insulation Use of Damping Material Shock Absorption Techniques will be adopted Ear Muffs will be provided Greenbelt developed along the periphery of the Plant. | |

Following health checkups will be carried out for the employees periodically:

- Periodic medical examination
- Lung function test
- Audiometry
- Chest X-ray
- Eye test

Occupational Health Survelliance

- a) Once before employment, to ascertain physical fitness of the person to do a particular job;
- b) Once in a year, to ascertain the health status of all the workers in respect of occupational health hazards to which they are exposed.

After receiving medical fitness from doctor then only UltraTech Cement Ltd., will allow individual inside the factory and giving him Identity Card, which is valid for six months, after six month again individual will have to undergo same procedure.



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For Permanent Staff

Any new incumbent joining the organization will have to undergo full premedical examination and after receiving the fitness report then he can join organization.

All permanent employees undergo medical examination on yearly basis.

To control and minimize the risks at the workplace, UltraTech Cement Ltd. has developed a Safey, Occupational Health & Environment (SHE) Policy. The policy is enclosed as **Annexure 9**.

Rules and Procedures

The Rules and procedures for effective implementation of safety and health policy of the company will be properly communicated and made known to all employees.

Safety Committee

A safety committee will be formed and manned by equal participation from management and workers with the following functions:

- a. Publicity, propaganda, education and training.
- b. Assisting and cooperating with the management in achieving the aims and objectives outlined in the "Health and Safety Policy" of the occupier.
- c. Carrying out health and safety surveys for identifying unsafe working condition/practices, which causes accident.

First Aid Boxes

First aid boxes will be provided at prominent places

Occupational Health & Safety of all Contract and Sub-Contract Workers

UltraTech Cement Limited proposes to formulate an integrated management plan for safeguarding the occupational health and safety of all personnel working in the grinding unit including contract and sub contract workers.

The Plant Manager will ensure that Health (H) and Safety (S) clauses are included in contractors agreements, and that contractors' personnel H & S behaviour and performance on site is properly monitored, evaluated and made a criterion for contractors' selection

All persons working for or on behalf of the organization including of contractor, sub-contractor & their employees by displaying at all strategic locations and distributed them. Regular Training Programs are held for "Understanding" by all



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the functions throughout the organization including contractors. Contractors will be trained to work safety and manage Health & Safety in their area.

It will be ensured that everyone working, including Contractors respect Health Safety rules. In case of violation, action will be taken to Suspend or ban from site any contractor's employee who do not comply with H&S standards and/or also Terminate the contract of any contractor whose employees do not comply with H&S standards.

UltraTech Cement Ltd. will allocate an amount of Rs 50 lakhs towards Occupation Health and Safety which includes health measures, personnel protective equipment etc.

4.3.9 Conservation of Resources

The plant will be operated on the principal of conservation of natural resources. The principal of 3 R's i.e. Reduce, Reuse & Recycle will be adopted in the Cement Grinding & Packing Unit.

Conservation of material:

All the raw material used in the manufacturing of cement i.e. clinker, gypsum and fly ash will be consumed completely in the cement manufacturing process. Thus, there will not be any solid waste generation from cement grinding process. Dust collected at the air pollution control equipments will be recycled in cement grinding process. Fly ash, which is otherwise waste product of thermal power plant, will be utilised in manufacturing PPC thereby reducing waste and conserving the resources.

Conservation of water:

State of the art technology will be adopted in the Cement Grinding & Packing Unit. Since cement grinding is dry process, water is only required for cooling purposes. Efforts will be made to minimise water requirement in the process. Due care will be taken to avail water losses through leakages. Domestic effluent from plant premises will be treated in STP and treated water will be reused for gardening, thereby reducing water demand. Also, rainwater harvesting measures will be implemented in the plant premises and the harvested water will be recharged to ground, thereby improving the ground water table of the area.



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Conservation of Energy:

All the equipments and machinery installed in the plant will be of latest make and will be less power consuming. Also, efforts will be made to harvest renewable energy for non-process purposes such as street lighting, office lighting, water heaters, etc. For this, solar panels will be installed in the plant premises. Solar panel based street lights will be installed along the internal roads in the plant premises. Also, efforts will be made to use solar energy in plant operations, wherever possible, to minimise use of grid power.



Chapter 5: Analysis of Alternatives

CHAPTER 5: ANALYSIS OF ALTERNATIVES

5.1 SITE ALTERNATIVES

The proposed 3.0 MTPA Cement Grinding & Packing Unit will be located in 26.10 Ha area in Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra. The Maharashtra State Govt. through its undertaking Maharashtra Industrial Development Corporation (MIDC) has allotted land admeasuring 2,56,400 Sq. Mts. to UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-353/4435 dated 28th September 2015,. MIDC has also allotted land admeasuring 4,647 Sq. Mts. To UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-1/1006 dated 31st March, 2016, agreement has been signed on 8th October 2018.

No alternate sites have been explored. The present site has been selected in view of the following advantages:

- Availability of Industrial Land.
- Commitment of water supply from MIDC for industrial use
- Availability of reliable power supply.
- Proximity or proper connectivity of the unit with national transport network.
- The land sub-strata have good load bearing capacity to minimize the construction cost.
- The available land is as far as possible, free from encumbrances such as:
 - o Farmland
 - Forest land
- Nearness to railway station (3.25 Km) makes it easier to transport raw materials & final product at market.
- There is no National Park, Wild Life Sanctuary, Biosphere Reserve etc. within 10 km radius of study area.
- The site have ample flat land

5.2 ANALYSIS OF ALTERNATIVE TECHNOLOGY

Two technologies are available for grinding of cement. After analyzing the equipment, it is proposed to install a ultramodern ball mill for the following reasons:

- a. Energy saving by minimum 20 %
- b. Less space requirement



Chapter 5: Analysis of Alternatives

- c. Minimum Maintenance
- d. Availability of Higher capacity
- e. Ease of operation and handling the material

Saving of energy by 20 % will reduce in generation of power to that extent thereby avoiding coal firing and emissions

Availability of high capacity results in minimum loss of material compared to other lower capacity equipment.



Chapter 6: Environmental Monitoring Programme

CHAPTER 6: ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

This chapter presents the details of environmental monitoring schedule, institutional arrangements for pollution control and cost for environmental monitoring program for the proposed project.

Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following:

- State of pollution within the plant and in its vicinity;
- Generate data for predictive or corrective purpose in respect of pollution;
- Examine the efficacy of Pollution Control Systems installed in the complex
- To assess and monitor environmental impacts

Regular environmental monitoring will be carried out at the proposed cement grinding plant and in surrounding villages as per the conditions stipulated in Environmental Clearance and Consent to Establish/operate issued for the project. The Environmental Monitoring program scheduled for the proposed cement Grinding & Packing Unit will be as given below:

6.1.1 Meteorology

UltraTech Cement Ltd. will collect data for weather through automatic weather monitoring station which will be installed within plant premises, for a proper measurement and record of meteorological parameters. Meteorological parameters such as Temperature, Relative Humidity, Wind Speed, Wind Direction, Atmospheric Pressure, Rainfall will be monitored on hourly basis. The data collected would be used for interpretation of air quality of the area.

6.1.2 Ambient Air Quality Monitoring

Ambient Air Quality Monitoring Stations will be monitored at as per the location suggested by the SPCB on the basis of prevailing micrometeorological conditions of the area like wind direction, wind speed, etc., as per the CPCB guidelines. AAQ monitoring will be carried out as specified in NAAQM Notification of Nov. 2009.

6.1.3 Continuous Emission Monitoring Instruments

UltraTech Cement will install Continuous Emission Monitoring system for cement mill to monitor the emission of particulate matter. The instrument will continuously record emissions released from the stacks.



Chapter 6: Environmental Monitoring Programme

6.1.4 Water Quality Monitoring

There will not be any effluent/ waste water discharge. Ground water samples from nearby villages will be collected and analysed as per the conditions stipulated in Environmental clearance and CTE/CTO conditions.

6.1.5 Noise Level Monitoring

Regular ambient noise level monitoring will be carried out within the plant premises and in surrounding villages. Apart from this, periodic work zone noise levels will also be monitored to determine the noise exposure to workers. Periodic audiometry tests will be conducted on all the workers employed at the plant.

6.1.6 Soil Quality Monitoring

Periodic soil quality monitoring will be conducted in the plant premises and in surrounding villages. This will provide information on the impacts on the soil quality of the area due to plant operations, if any.

6.1.7 Plantation growth and survival rate

Periodic monitoring will be conducted on growth of the plantation conducted in the plant premises and survival rate of the plantation will be estimated. Diseased saplings will be replaced with new saplings.

Summary of the proposed Environmental Monitoring Programme is given in **Table 6.1**.

| Discipline | Locations | Parameter | Frequency |
|---------------------|-------------------|-------------------------------------------------------------------|--------------------|
| Meteorology | One | Max. and Min. Temp, Rain | Hourly |
| (Met-station) | | fall, Relative Humidity, Atm. | |
| | | Pressure, Wind speed and | |
| | | wind direction | |
| Ambient Air Quality | Plant boundary | PM ₁₀ , PM _{2.5} , SO ₂ , NOx, CO, | As per NAAQS, Nov. |
| | | | 2009 |
| Stack Emissions | One | РМ | Monthly and |
| | | | Continuous online |
| | | | monitoring |
| Ground Water | Four locations in | As per IS:10500 standards | Quarterly |
| Quality | nearby villages | | |
| Ambient Noise | Plant boundary | Day-and Night time noise | monthly |
| Levels | | Levels | |
| | | | |

 Table 6.1: Proposed Environmental Monitoring Programme



Chapter 6: Environmental Monitoring Programme

6.2 ORGANISATION SET-UP

UltraTech Cement Ltd. is committed to environmental stewardship and the company believe that environment protection is the management's responsibility as well as the responsibility of each and every employee of the organization. The Corporate Environment Policy of the company is given in **Annexure 10**.

The company has clearly defined duties and responsibilities for the employees. The organization set up of the Cement Grinding & Packing Unit in hierarchical order for implementation of Environmental Management Plan is given in **Figure 6.1**.



Figure 6.1: Organizational Set up for Implementation of EMP

6.2.1 Environmental Management Cell

An Environmental Management Cell (EMC) will be established in the plant under the guidance of Project Head. The EMC will be headed by an Environmental scientist having adequate qualification and experience in the field of environmental management. The responsibilities of EMC will be as follows:

- 1. Implementation of pollution control measures as suggested in Environmental Management Plan and recommended in EC
- 2. Conducting environmental monitoring as per EMP and EC stipulation through external laboratories approved by MoEF/MPCB and NABL
- 3. Ensuring compliance with other conditions stipulated in Environmental Clearance for the project.
- 4. Ensuring compliance with the conditions stipulated in 'Consent to Operate' for the project.
- 5. Timely submission of compliance status to MoEF/ MPCB



Chapter 6: Environmental Monitoring Programme

- 6. Seeking experts guidance, as and when required.
- 7. Conducting CSR activities in nearby villages.

6.2.2 Audit & Review

Review and audit is essentially a management tool. However, its application is crucial at the operational level for verification and feedback on the effectiveness of organization system and environmental performance. Basically, auditing involves in the following items:

- Line management system
- Awareness and training
- Procedures: standards, targets
- Plans: Waste, contingency, pollution control compliance
- Verify environmental impact assessment
- Verify mitigation
- Reporting and communication
- Documentation
- Feedback

Internal Audit:

A system of auditing will be undertaken for plant operations and includes the use of trained internal and external auditors. In addition, auditing should be undertaken to ensure compliance with all the applicable legislations.

The company shall depute internal / external auditors who are trained and certified as competent EMS auditors by an independent and external standard organization. The results of monitoring and auditing shall be regularly reported through the senior management team to ensure that action items are addressed.

6.2.3 Non-conformity, Corrective Action and Preventive Action

As per the Environmental Policy of the company, non-conformities, corrective actions and preventive actions shall be managed in accordance with *Nonconformance, Preventive and Corrective Action Procedure.* This procedure, which relates to all projects of the company, details the processes to be utilized with respect to the identification of non-conformances, the application of appropriate corrective actions(s) to address non-conformances. The key elements of the process include:



Chapter 6: Environmental Monitoring Programme

- i. identification of Non-conformance and /or Non-compliances
- ii. Recording of Non-conformance and/or Non-compliance
- iii. Evaluation of the Non-conformance and/or Non-compliance to determine specific corrective and preventive actions
- iv. Corrective and preventive actions to be assigned to responsible persons and
- v. Management Review of corrective actions to ensure the status and effectiveness of the actions

6.2.4 Management Review

A comprehensive review of the objectives and targets associated with the individual project of the company shall be undertaken on an annual basis via the business planning (1 year outlook) and business strategy (5 year outlook) processes. These reviews, which include involvement from the senior site management and other key personnel, assess the performance of the plant over the previous year and develop goals and targets for the following period.

6.3 OCCUPATIONAL HEALTH AND SAFETY

Occupational Health and Safety is very closely related to productivity and good employer-employee relationship. The main factors of occupational health in Cement Grinding & Packing Unit are fugitive dust and noise. Safety of employees during operation and maintenance of equipment and handling of materials is to be taken care. To avoid any adverse effects on the health of workers due to dust, heat, noise and vibration, sufficient measures are proposed in the EMP. These include:

- Provision of dust collectors;
- Provision of personnel protection devices for the workers;
- Rotation of job for workers exposed to high noise areas;
- Closed control room in /Cement Mill/Packing unit with proper ventilation; and
- First-aid facilities.
- Occupational Health Survey of the employees will be carried out at regular intervals.

6.4 BUDGET ALLOCATION FOR ENVIRONMENTAL MONITORING

Proposed budget for implementation of Environmental Monitoring Program is given in **Table 6.2**.



Chapter 6: Environmental Monitoring Programme

Table 6.2: Budget for Environmental Monitoring Program

| Sr. No. | Description | Capital Cost | Recurring cost/annum |
|---------|-----------------------------------|---------------------|----------------------|
| | | (Rs. In Lakh) | (Rs. In Lakh) |
| 1 | Monitoring of Meteorological | 5.00 | 0.60 |
| | Parameters | | |
| 2 | Ambient Air Quality Monitoring | 15.0 | 6.00 |
| 3 | Continuous Stack Monitoring | 25.0 | 6.00 |
| 4 | Ambient Noise Level Monitoring | 5.00 | 1.20 |
| 5 | Water Quality Monitoring | 2.00 | 2.40 |
| 6 | Soil Quality monitoring | 1.00 | 1.20 |
| 7 | Plantation growth & Survival rate | | 1.20 |
| 8 | Occupational Health & Safety | 5.00 | 10.00 |
| | Monitoring | | |
| | Total | 58.00 | 28.60 |



Chapter 7: Additional Studies

CHAPTER 7: ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION

The draft EIA/EMP report for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra is prepared as per the standard TOR issued by SEAC-1, Maharashtra and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the issues raised and commitment of Project Proponent during the public hearing will be incorporated in the final EIA/EMP report.

7.2 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

7.2.1 Risk Assessment for the Project

The grinding units experiences lower accident rates compared with some other manufacturing industries. Physical hazards are likely to occur in Clinker Grinding Unit. These mainly impact on those working within the industry, although health hazards can also impact on local communities.

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 mills, mill separators, fans and belt conveyors, represent a significant source of exposure to physical hazards. Such hazards may include the following:

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

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



- Any person working on equipment with moving parts will personally ensure 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 will use fall protection.
- Any person doing flame welding, cutting or brazing in the proximity of any flammable material will use PPE.
- 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 plant site.

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

7.2.2 Disaster Management Plan

Introduction

With the growing complexity of Industrialization in our country and increasing use of machinery & danger to the human being as well as property it is necessary to prevent occurrence of any incident.

It must be realized that any incident may develop into a major emergency even with the best safety measures and programmes in any industry. Hence, an Emergency procedure will be planned properly and documented to help in reducing time loss, chaos and confusion at the hour of need by assigning person who will engage in meeting emergency smoothly and effectively.

Any accident which has potential to develop into a major emergency can threaten large number of person or large area of the plant on the site may affect safety of the public, property and environment. Hence, it is absolutely essential that emergency procedures will be properly planned and documented:-

- To protect plant personnel and private citizens.
- To prevent or minimize damage of property or the environment.



- To help the person at site in a systematic manner.
- To restore the effective areas as soon as possible.
- To review incident after it has occurred and to evaluate the company's efforts in order to improve emergency management response in the future.

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 normally require the assistance of emergency services to handle it effectively.

Scope

The aim of hazard control and disaster management is concerned with preventing accidents through good design, operation, maintenance and inspection, by which it is possible to reduce the risk of an accident, 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 accident.

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

Objective

The objective of DMP is to describe the company's emergency preparedness/ response

organization, the resources available and response actions applicable to deal with various types of emergencies that may occur at the unit with organization structure being deployed in shortest time possible during an emergency. Thus, the objectives of DMP are summarized as:

- a. Rapid control and containment of Hazardous situation
- b. Minimizing the risk and impact of event/ accident.
- c. Effective prevention of damage to the property

In order to effectively achieve the objectives of emergency planning, the critical elements that form the backbone of DMP are:



- Elimination will require prompt action by operations and works emergency staff using, for example, fire-fighting equipment, water sprays etc.
- Minimizing the effects may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby.
- Reliable and early detection of an emergency and careful planning
- The command, coordination and response organization structure along with efficient trained personnel.
- The availability of resources for handling emergencies.
- Appropriate emergency response action.
- Effective notification and communication facilities
- Regular review and updating of DMP.
- Proper training of the concerned personnel.

Identification and Assessment of Hazards/Risks - Proposed Cement Grinding & Packing Unit

This stage is crucial to both on-site and off-site emergency planning and requires systematic identification of Risks which could arise in the grinding unit. These should range from small events which can be dealt with by plant personnel without outside help to the largest event for which it is practical to have a plan. Experience has shown that for every occasion that the full potential of an accident is realized, there are many occasions when some freak event occurs or when a developing incident is made safe before reaching full potential. Most major hazard accidents come within the following categories:

(A) Events pertaining to the manufacturing process

The following areas are identified as hazard prone in case of Clinker Grinding Unit where Disaster Management Plan is required.

- Handling of raw material viz. Clinker, Fly Ash & Gypsum
- **Handling of Cement:** Cement is the fine dust which requires proper care in handling, storage and packing to avoid any health hazards.

7.2.3 Disaster Management and Emergency Preparedness Plan Onsite Emergency Plan

The onsite emergency management for the proposed Cement Grinding & Packing Unit is given below:

Fire Fighting and Safety training arrangements:

• One hall will be made available for safety trainings.



- Training schedule per month including demonstration will be carried out for all staff, workers and contractor workers.
- Fire fighting training will be done once every year with mock drill.

A) Fire Fighting Equipment

The following fire fighting equipments will be provided in the plant:

- i. Portable fire extinguishers
- ii. (a) Fire Hydrant system
 - (b) Sprinkler system employed near fire prone areas

All the fire extinguisher system will be controlled by the Safety Department.

Safety department will consist of qualified safety manager, safety officer and supporting staff. It will be equipped with all the necessary instruments and equipments for carrying out the above job.

B) Emergency Alarm

Alarm System

A siren (with 5 km range) will be provided under the control of Time office in the plant premises to give warning. In case of emergencies, this will be used on the instructions of shift in-charge who is positioned round the clock. The warning signal for emergency will be as follows:

- Emergency Siren: Waxing and waning sound for 1.5 minutes.
- All clear signal: Continuous siren for one minute.

Emergency control Centre:

A. Main gate security office

- B. Conversion security office
- The above control centres will be equipped with personal protective equipment.
- Communication system with a person round the clock available on phone.
- Fire fighting arrangements.

C) Emergency Communication

In view of the possible hazards that can arise out of the daily operations in the unit, various measures will be adopted to prevent the occurrence of a major accident. This comprises of:

a) Built in safety measures, alarms, trips and interlocks etc.

b) Standard safe operating and maintenance procedures permit system etc.



c) Training of all the involved staff in normal and emergency operating procedures.

d) Training of all employees in safety, fire fighting and first aid.

However, in spite of these precautions, it is required to foresee situation of major accident and plan for taking timely action to minimize the effects of such incident on the safety and health of persons working in the plant as well as those situated around the premises. Hence the present unit will be drawn up to serve as the manual of handling major emergencies.

Internal telephone systems will be provided at work places. Shift In-charge at site and other Incharge will also be given on call handset (Walkie Talkie) for immediate communication to all concerned. The shift in-charge /Site in-charge will immediately inform Department Head / In-Charge & Security. The Department Head In-charge will inform Functional Head and Factory Manager who, according to severity of emergency, will inform about the emergency to Unit Head.

In case of fire / major accident or hazard, immediate information will be given as per need to following through telephone operators who will be available round the clock over phone.

D) Evacuation Procedure

In case of occurrence of fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

E) First Aid

A first aid center with adequate facilities will be provided. 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 will be made available at site to carry affected people to hospital. Assistance of these hospitals will be taken in case of any necessity.

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 unit to meet any eventualities. Poster/placards reflecting safety awareness will be placed at different locations in the unit area.



Chapter 7: Additional Studies

Emergency Control Centre

An Emergency Control Centre (ECC) will be established from which emergency operations will be directed and coordinated. This center will be activated as soon as on-site emergency is declared. The ECC will consist of one room, located in an area that offers minimal risk being directly exposed to possible accidents. During an emergency, the Emergency Management Staff, including the main controller will gather in the ECC. Therefore, the ECC will be equipped with adequate communication systems in the form of telephones and other equipments to allow unhampered organization and other nearby facility personnel.

The ECC will provide shelter to its occupants against the most common accidents; in addition, the ECC's communication systems will be protected from possible shutdown. The ECC will have its own emergency lighting arrangement and electric communication systems operation. Only a limited and prearranged number of people will be admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion. The ECC will always be ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the On-site Disaster Management Plan
- Emergency telephone numbers
- The names, phone number, and address of external agencies, response organizations and neighbouring facilities
- The adequate number of telephones
- Emergency lights
- List of fire extinguishers with their type no. and location, capacity, etc
- Personal protective equipments
- Safety helmets
- Clock
- Material safety data sheets for chemicals handled at the facility
- Several maps of the facility including drainage system for surrounding area showing:
 - Areas where hazardous materials are stored
 - $\circ\,$ Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
 - \circ $\;$ The locations where personal protective equipment are stored
 - The position of pumping stations and other water sources
 - \circ Roads and plant entrances
 - o Assembly areas
 - Lay out of Hydrant lines



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Personal Protective Equipments (PPEs)

PPE is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. Various PPE will be issued to employees viz.

- 1. Hand Gloves Leather
- 2. Hand Gloves Cotton
- 3. Hand gloves Asbestos
- 4. Hand Gloves Rubber
- 5. Grinding goggles
- 6. Ear Plugs
- 7. Ear Muffs
- 8. Safety Belts
- 9. Dust Mask
- 10. FPR Face Shields
- 11. Head Bands / Straps
- 12. Wind Socks
- 13. Fluorescent vests
- 14. Helmets

Apart from this, all the employees will be provided with helmets and safety shoes. It will be statutory on the part of the company employees to wear the appropriate safety gear given while attending duty in the factory.

7.2.4 Off-Site Emergency Planning

The off-site emergency plan is an integral part of any hazard control system. It should be 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 should therefore complement each other. The key feature of a good off-site emergency plan is flexibility in its application to emergencies other than those specifically included in the formation of the plan. 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.

Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. An early decision will be required in many cases on the advice to be given to people living "within range" of the accident – in particular whether they should be evacuated or told to go indoors. Consideration of evacuation may include the following factors:



- a) In the case of a fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation, although a severe smoke hazard may require this to be reviewed periodically.
- b) But if the fire is escalating it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire.

Organization

Details of command structure, warning systems, implementation procedures, emergency control centers, Name and appointments of incident controller, site main controller, their deputies and other key personnel.

Communications

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

Special Emergency Equipment

Details of availability and location of specified fire-fighting equipment, fire tenders, etc.

Voluntary Organizations

Details of organizers, telephone numbers, resources, etc.

Chemical information

Details of the hazardous substances, if any, stored or processed on each site and a summary of the risks associated with them.

Meteorological information

Arrangements for obtaining details of weather conditions prevailing at the time and weather forecasts.

Humanitarian Arrangements

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

Public Information

Arrangements for a) Dealing with the media-press office b) Informing relatives, etc.

Assessment

Arrangements for:

(a) Collecting information on the causes of the emergency.

(b) Reviewing the efficiency and effectiveness of all aspects of the emergency plan.



Chapter 8: Project Benefits

CHAPTER 8: PROJECT BENEFITS

8.1 **PROJECT BENEFITS**

The Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra would bring about development in area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the region and especially in the area around the project site.

8.1.1 Employment Potential

Direct and indirect employment will be generated due to the project. Direct Employment for about ~ 120 Regular employees during the operational phase and $\sim 200-250$ contractual labors. Employment based on the eligibility criteria. Unskilled/ semiskilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local. The employment potential will ameliorate economic conditions of these families directly and provide employment to many other families indirectly who are involved in business and service oriented activities.

The employment of local people in project will upgrade the prosperity of the region. These will in-turn marginally improve the socio-economic conditions of the area.

| Particulars | Requirement |
|----------------------|-------------|
| Regular Manpower | |
| High-Skilled | 10 |
| Skilled | 25 |
| Semi – Skilled | 40 |
| Unskilled | 45 |
| Total - | 120 |
| Contractual Manpower | 200-250 |

8.1.2 CSR Activities

The CSR activities aims at strengthening the bond between the project authorities and the local population in the vicinity of project area. In line with this CSR policy, M/s UltraTech Cement Ltd. will carry our community welfare activities in the following areas:



Chapter 8: Project Benefits

- Community development
- Education
- Health& medical care
- Drainage and sanitation
- Roads & Infrastructure
- Drinking water supply

M/s UltraTech Cement Ltd. would contribute in implementing social welfare activities in collaboration with local Gram Panchayat, Block Development Office etc. for better development of area around the project. To minimize strain on existing infrastructure, adequate provision of basic amenities, viz. education, health, transport etc. would be made available considering the needs of workforce and migrating population.

8.2 NEED BASED ASSESSMENT

Socio-economic survey conducted in the villages located within 10 km radius of the proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra brings out that villages are lacking in basic amenities like healthcare, transportation, treated drinking water, higher education and sanitation facilities etc. The survey also reveals that the literacy rate in the area is low and the people are mostly engaged in rainfed agriculture related activities. On the basis of socio-economic survey, the following are expectations of local people from the proposed 3.0 MTPA Cement Grinding & Packing Unit:

- Employment / Vocational training to unemployed youth
- Medical facilities
- Drinking water facilities
- Improvement in education facilities
- Control of dust pollution
- Improvement of roads
- Emergency ambulance facility

8.3 CORPORATE SOCIAL RESPONSIBILITY

In accordance with the notification issued by the Ministry of Corporate Affairs dated 27th February 2014 under Section 135 of the Companies Act 2013, the Company's Corporate Social Responsibility (CSR) is enunciated. The Corporate Social Responsibility policy also conforms to the National voluntary Guidelines on Social, Environment and Economic Responsibilities of Business released by the Ministry of Corporate Affairs, Government of India in collaboration with FICCI



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Aditya Birla CSR Centre for Excellence (July 2011). The Company CSR policy was outlined in 2010 in the Companies' Annual Reports and on its website. The CSR policy of the company is given in **Annexure 11**.

UltraTech Cement Limited is a part of Aditya Birla Group. For every Company in the Aditya Birla Group, reaching out to underserved communities is part of our DNA. The company believe in the trusteeship concept. This entails transcending business interests and grappling with the "quality of life" challenges that underserved communities face, and working towards making a meaningful difference to them.

The Company's vision is - "to actively contribute to the social and economic development of the communities in which we operate. In so doing build a better, sustainable way of life for the weaker sections of society and raise the country's human development index"

(Mrs. Rajashree Birla, Chairperson, Aditya Birla Centre for Community Initiatives and Rural Development).

Following CSE activities are proposed to be taken up in the villages located nearby the proposed Cement Grinding & Packing Unit located in MIDC Area Nardana Phase-I, Tehsil Sindkheda, District Dhule.

8.3.1 Sustainable Development & Livelihood

- Formation and sustain of the SHGs/Societies
- Vocational training (high yield agriculture, poultry, animal husbandry, aviculture, sericulture, tailoring, driver, workshop mechanic, mobile and computer repair, carpenter, plumber, barber, iron smith, eateries, hotels and restaurants, grocery shops and convenience centres, etc.).
- Market linkage for selling the products through training centre
- Financial assistance for livelihood activities for backward class population
- Financial assistance for animal husbandry

8.3.2 Education

- Installation of water filters in schools
- Donation of desk/benches, computers, sports equipments, etc. in schools
- Financial assistance for maintaining school building
- Distribution of books for school library
- Donation of stationary, books, uniforms to needy students
- Provision of scholarships to meritorious students
- Providing scholarships for higher studies to interested students from economically backward families


Chapter 8: Project Benefits

8.3.3 Health & medical facilities

- Regular medical camps in villages, distribution of medicines to patients
- Conducting eye check up camps, spectacles distribution to senior citizens
- Donation of medical equipments to health centers
- Provision of Mobile dispensary

8.3.4 Drinking Water facility

- Installation of hand pumps /bore wells in villages & their maintenance & repair in case of non-operational
- Water supply through water tankers in summer season
- Watershed development/rainwater harvesting programme

8.3.5 Drainage and sanitation

- Construction of toilets in schools in nearby villages under 'Swachha Bharat Abhiyan'
- Construction/ Financial assistance for drainage facility/dustbins etc.
- Awareness programme about sanitation in school, Gram panchayats etc.

8.3.6 Roads

• Periodic maintenance of village roads

8.3.7 Budget for Socio-Economic Welfare Measures

The company has allocated a budget of 1.5% of the project cost i.e. Rs. 4.725 Crore (as per MoEF Office Memorandum dated 1.05.2018) of Capital Cost (i.e. Rs. 315 Crore) for carrying out socio-economic welfare activities as mentioned in the above paragraphs. The amount earmarked in the budget will be separately kept and will not be used for any other purposes. The budget may be increased as per the actual requirement during the implementation stage.

8.4 SUMMARY

The residents of nearby villages will benefit from direct and indirect employment opportunities. Also, the CSR activities conducted by the company will help in improving the quality of life of the nearby villages. Apart from the above, the management will also undertake various pollution control measures to restrict the pollution within the specified limit so that the local population is not affected. The management is committed towards various socio-economic welfare activities as listed above in consultation with gram panchayat improving the basic facilities in the nearby villages.



Chapter 9: Environmental Cost Benefit Analysis

CHAPTER 9: ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th September 2006; the Chapter on the "Environmental Cost Benefit Analysis" is applicable only, if the same is recommended at the Scoping stage.

As per the 'Terms of Reference' issued by SEAC-1, Maharashtra for the proposed project, the 'Environmental Cost Benefit Analysis' is not required.



Chapter 10: Environmental Management Plan (EMP)

CHAPTER 10: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

10.1 INTRODUCTION

The environmental management plan delineates various pollution control measures for mitigating environmental impacts identified during the construction and operation phases of the proposed Cement Grinding & Packing Unit at Plot No. 3, Nardana Industrial Area, MIDC Phase 1 Village : Waghode, Tehsil : Shindkhede District - Dhule Maharashtra. The impact assessment study has examined the extent to which these impacts likely to occur and can be controlled through the adoption of mitigation measures. The Environment Management Plan describes both standard and site-specific pollution control measures so as to mitigate potential impacts associated with the proposed activities.

The management of M/s UltraTech Cement Ltd. is committed to take necessary steps to control and mitigate the environmental pollution in the designing stage of the project itself. This environmental management plan briefs all the elements of environment pollution controlling systems proposed by the management in both construction and operational phases.

The environmental management plan consists of the set of waste minimization, impact mitigation, management, monitoring, and institutional measures to be taken during implementation and operation to eliminate the adverse environmental impacts or reduce them to acceptable levels. The proposed environmental management plan addresses, the components of environment which are likely to be affected by the proposed project activity.

The EMP is herein outlined after taking into account the various Acts, Rules and Regulations /Standards concerned with the environmental management.

Objectives of Environmental Management Plan (EMP):

- > Overall conservation of the environment.
- Minimization of waste generation and pollution.
- > Judicious use of natural resources and water.
- Safety, welfare and good health of the work force.
- > Ensure effective operation of all control measures.
- > Vigilance against probable disasters and accidents.
- > Monitoring of cumulative and long-time impacts.



Chapter 10: Environmental Management Plan (EMP)

10.2 ENVIRONMENTAL MANAGEMENT PLAN

10.2.1 Air Quality Management

The major pollutants of air in a Cement grinding & Packing unit are the particulate matters from various stacks and fugitive emissions due to material handling. For the purpose of effective prevention and control of particulate matter emissions, following measures will be taken as per the CPCB guidelines:

1. UNLOADING SECTION

| S. | Guidelines | Control Measures to be |
|-----|--------------------------------------------------|-----------------------------------|
| No. | | Provided |
| 1. | The enclosures for the unloading sides could | Enclosure will be provided for |
| | be flexible curtain type material covering up to | all unloading operations |
| | height of dumpers discharge from the roof. | |
| 2. | A dust suppression system should be provided | All the raw materials & finished |
| | by spraying water. The amount of water | products will be stored in silo & |
| | sprayed should preferably be optimized by | covered systems. Water will be |
| | employing proper design of spray system. | sprayed on roads for dust |
| | Suitable systems may be adopted to reduce | suppression. |
| | the problems like choking, jamming of the | |
| | moving parts. | |

2. MATERIAL HANDLING SECTION (INCLUDING TRANSFER POINTS)

| S. | Guidelines | Control Measures to be |
|-----|-------------------------------------------------|-----------------------------------|
| No. | | Provided |
| 1. | The enclosures from all sides with the | Transfer point locations will be |
| | provision for access doors, which shall be | fully enclosed. Periodic cleaning |
| | kept, closed during operation. Spillages should | will be done to remove |
| | be periodically removed. | accumulated dust. |
| 2. | Either water spray system should be provided | Air borne dust at all transfer |
| | for suppressing the air borne dust or dry | operations/points will be |
| | extraction cum bag filter with adequate | controlled by providing bag |
| | extraction volume. | filters. Water will be sprayed on |
| | | roads for dust suppression. |
| 3. | Spray sufficient quantity of water to moist the | All the raw materials & finished |
| | top layer to avoid wind blowing of fines. | products will be stored in silo & |
| | | covered systems. |



Chapter 10: Environmental Management Plan (EMP)

| S. | Guidelines | Control Measures to be | |
|------------|--------------------------------------------------------------------------------|-------------------------------------|--|
| No. | | Provided | |
| 1. | Bag filter may be provided before venting out | Bag filters will be provided at | |
| | the gases. | the cement silos & transfer | |
| | | points | |
| 2. | The enclosures should have a venting | Clinker will be stored in silo | |
| | arrangement located at transfer point where | which will be provided with a | |
| | clinker is dropped to the stockpile. The | bag filter | |
| | extraction /venting should be sufficient | | |
| | enough. Clinker stockpile access door should | | |
| | be covered by mechanical gate or by flexible | | |
| | closed at all possible times | | |
| 3 | Every first and possible times. | The dust extracted and cantured | |
| 5. | and the collected dust should be avoided to | in hag filter will be recycled back | |
| | feed back to the clinker stocknile, if layout | to the system. | |
| | permits. It may be recycled at last possible | | |
| | destination i.e., cement mill section through | | |
| | suitable arrangement, if possible. | | |
| 4. | Generally open storage of clinker should be avoided. Only in case of emergency | | |
| | clinker would be stored in open with following o | control measures. | |
| A. | After earmarking the open storage area of | Clinker will be stored in the | |
| | clinker, a board should be erected to display | silos. | |
| | the area earmarked. | | |
| B. | During the period when the openly stored | Clinker will be stored in the | |
| | clinker is inactive, it should be covered fully by | silo& bag filter will be provided | |
| | HDPE or tarpaulin type sheets to prevent wind | at the silo to control the dust | |
| 6 | blowing of fugitive dust. | emissions. | |
| <u>с</u> . | Install three sided enclosures, which extend to | There will be no clinker | |
| | average neight of the stockpile, where ever | stockpiles. | |
| D | Elevible type wind breaking analogure should | Dartial anglogura will be | |
| D. | he provided covering the clinker retrieval area | provided for clinker retrieval | |
| | as wind barrier to prevent dust carryover by | area | |
| | wind | | |
| | The enclosure could be of lightweight material | | |
| | like moulded plastic material or similar, which | | |

3. CLINKER SILO SECTION



Chapter 10: Environmental Management Plan (EMP)

| S. | Guidelines | Control Measures to be | |
|-----|-----------------------------------------------------|---------------------------------|--|
| No. | | Provided | |
| | could be dismantled assembled and shifted | | |
| | from one place to other. | | |
| E. | Travel areas path used by the front-end pay | The travel path of pay loaders | |
| | loader shall be paved with concrete. It should | will be paved and frequently | |
| | be regularly swept by high efficiency vacuum swept. | | |
| | sweeper to minimize the material build –up. | | |
| F. | The possibilities especially in new cement | Clinker storage silo will be | |
| | plant may be explored for the following: | provided with the bag filter to | |
| | An enclosure fitted with bag filter could be | arrest the dust emissions | |
| | 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 other end. | | |

4. STORAGE OF GYPSUM, FLY ASH

| S. | Guidelines | Control Measures to be |
|-----|--------------------------------------------------|------------------------------------|
| No. | | Provided |
| 1. | The enclosure walls shall cover minimum two | Clinker & fly ash will be stored |
| | sides up to roof level. | in silo & gypsum in covered |
| | | shed. |
| 2. | Fly ash shall be pumped directly from the | Dry fly ash shall be transported |
| | tankers to silos pneumatically in closed loop or | by pneumatic pipeline from |
| | mechanically such that fugitive emissions do | adjacent power plant and |
| | not occur. | through closed bulkers from |
| | | other power plants & will be |
| | | handled pneumatically in closed |
| | | loop. |
| 3. | The silo vent will be provided with a bag filter | Bag filter will be provided at all |
| | type system to vent out the air borne fines. | silos to arrest the air borne |
| | | fines. |
| 4. | If possible, the dry fly ash should be sent to | Fly ash in the dry form will be |
| | closed silos. Otherwise, fly ash should be | used & stored in silo. |
| | transported through closed belt conveyors to | |
| | avoid wind carryover of fly ash. | |



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5. CEMENT PACKING SECTION

| S. | Guidelines | Control Measures to be |
|-----|----------------------------------------------|-----------------------------------|
| No. | | Provided |
| 1. | The packing machines should be equipped | Dust extraction arrangement |
| | with dust extraction arrangement such that | (bag filters) for packing |
| | the packing operation is performed under | machines will be provided. |
| | negative pressure. The dust will be captured | |
| | in bag filters. | |
| 2. | Adequate ventilation for the packing hall | Adequate ventilation for the |
| | should be provided for venting out | packing hall will be provided. |
| | suspended particulate thereby ensuring dust | |
| | free work environment. | |
| 3. | The spilled cement from the packing | Spillage of cement on floor shall |
| | machine should be collected properly and | be minimized and will be cleared |
| | sent for recycling. | daily to prevent fugitive |
| | The spilled cement on the shop floor should | emissions. |
| | be swept by vacuum sweeping machines | Vacuum sweeping machines will |
| | periodically. | be provided for collection of |
| | Proper engineering controls to prevent the | spilled cement and collected |
| | fugitive emissions may include | cement will be recycled. |
| | arrangements like providing guiding plate, | Necessary arrangements will be |
| | scrapper brush for removing adhered dust | made to prevent spillages and |
| | on cement bag etc. | removing dust adhered on |
| | | cement bags. |
| 4. | The vibratory screen provided for | Appropriate dust extraction |
| | screening/ recycling spilled cement should | system will be installed to |
| | be provided with a dust extraction | prevent emissions from the |
| | arrangement to prevent fugitive emission | recycling screen. |
| | from that section. | |

6. SILO SECTION

| S. | Guidelines | Control Measures to be |
|-----|----------------------------------------------|------------------------------------|
| No. | | Provided |
| 1. | The bag filter should be operated and | The silo vent will be provided |
| | maintained properly, especially the cleaning | with a bag filter type system to |
| | of bags to avoid pressurization of silos | prevent the fugitive emissions. |
| | thereby causing fugitive emissions from | Maintenance of bag filters will be |
| | leakages etc. | done on regular basis for their |
| | | efficient working. |



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7. ROADS

| S. | Guidelines | Control Measures to be | | |
|-----|------------------------------------------------|------------------------------------|--|--|
| No. | | Provided | | |
| 1. | The paved roads should be maintained as | All internal roads on which | | |
| | paved at all times and necessary repairs to be | movement of raw materials or | | |
| | done immediately after damages to the road if | products will take place, will be | | |
| | any. | paved by blacktopping / | | |
| | | concreting. | | |
| 2. | Limit the speed of vehicle to 10 Km/h for | Speed of vehicles will be strictly | | |
| | heavy vehicles within the plant premises to | regulated at 10kmph to avoid | | |
| | prevent the road dust emissions. | road dust emissions. | | |
| 3. | Preventive measures include covering of | All material transport will be | | |
| | trucks and paving of access areas to unpaved | carried out through covered | | |
| | areas | trucks / closed wagons only. | | |
| | | Parking areas and access roads | | |
| | | will be paved to prevent fugitive | | |
| | | dust emissions. | | |
| 4. | Mitigative controls include vacuum sweeping, | Regular sweeping of roads will | | |
| | water flushing. | be done to minimize emissions. | | |
| | | Vacuum sweeping machines will | | |
| | | be deployed in internal roads. | | |
| | | Water flushing will be carried | | |
| | | out wherever required. | | |

10.2.2 Noise Management Plan

To maintain the noise level well within the prescribed limit inside the plant {85 dB (A)} and at the plant boundary {day time 75 dB (A) and Night Time 70 dB (A)}, the following measures will be adopted:-

- Suitable acoustic enclosures will be provided to high noise generating machines, wherever practical.
- Noise proof cabins will be provided to operators of high noise generating machines /section, where acoustic enclosures can not be provided.
- Personal protective equipment viz. Earplugs / Earmuffs will be provided to all operators and employees working near the machinery.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- > Adequate silencers will be provided in all the diesel engines.



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- Green Belt of appropriate width will be maintained inside the plant premises and along the plant boundary.
- Regular monitoring of noise level will be carried out and corrective measures in concerned machinery/sections will be adapted, wherever required.

10.2.3 Water Management Plan

The total water requirement for the proposed project is 350 KLD (including Cement Grinding Unit, plantation and domestic use) which will be sourced from MIDC or from ground water in future if required with due permission from the concerned authority.

- No industrial waste water will be generated from the clinker grinding process.
- Domestic waste water generated will be treated in STP and the treated effluent will be used for plantation.
- Rain Water Harvesting will be practiced within the premises of proposed project as well as in the nearby areas.

Water Conservation Plan

The following measures will be adopted to minimize use of fresh water and promoting water conservation-

- > Reuse of domestic wastewater after treatment.
- > Periodic preventive maintenance of water distribution systems.
- Rain water harvesting at plant site.
- > Training and awareness on water conservation measures.

Rain Water Harvesting at Proposed Project Site

Based on the availability of the water for recharge as well as suitability of sites for artificial recharge, it is proposed to construct roof top rain water harvesting & artificial recharge structures. The rain water harvesting potential of the area is 152361.36 m³/annum.

10.2.4 Solid & Hazardous Waste Management

- > No solid waste will be generated in the cement grinding process.
- > Maintenance will be done to prevent spillage and leakage.
- Dust collected from various air pollution control equipment will be totally recycled in process.
- Used oil & grease will be generated from plant machinery/Gear boxes and D.G set as hazardous waste which will be sold out to the CPCB authorized recycler.



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Concept of Waste Minimization, 3R's (Reuse, Recycle & Recover Techniques), Energy & Natural Resource Conservation Measures:

Waste Minimization

- **REUSE:** Waste generated from construction activity will be utilized in leveling of land.
- **RECYCLE:** Dust collected from Bag House / Bag Filters will be recycled back in the process.

Energy Conservation

Clinker Grinding & Packing Unit is an energy-intensive process. Various measures will be implemented to make the project more energy efficient. Following measures have been proposed by UltraTech Cement for further reduction in specific energy consumption:

- Use of solar energy for street lighting and other lighting, wherever practical
- Installation of energy efficient lightings. Use of energy saving light fittings
- Installing low watt tube lights
- Procurement of energy efficient machineries
- > Minimizing idle running of vehicle , machines and electrical appliances
- > Optimizing loads and periodic preventive maintenance & lubrication
- Prevention of leakages of compressed air
- Periodic energy audits
- > Training, awareness and motivational programmes.

Natural Resource Conservation

Rain water harvesting system will be installed to conserve water & to replenish ground water resources of the area for long term sustenance of the industry. Rain Water Harvesting will be carried out by the following methods:

- Roof top rainwater harvesting
- Surface rainwater runoff available from paved area, green area and open land will be used for recharging through recharge pits.
- > Natural rainfall recharge to open land.

10.2.5 Greenbelt Development & Plantation Programme

Out of the total project area (i.e. 26.10 Ha), about 8.6 Ha will be developed under green belt / plantation in order to reduce dust & noise pollution levels & to increase aesthetic beauty of the area.



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A thick greenbelt all along the roads and plant will be developed & local native species will be planted in consultation with local horticulturist & Forest Department.

Plants will be planted approx. @ 2000 trees/Ha. Survival rate of 85% will be maintained. Plantation will be done in appropriate alternate rows around the site to prevent lateral pollution dispersion. The trees form the important part of the biosphere in the Eco-system and help in maintaining regional ecological balance and conform to soil and hydrological conditions.

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 green belt development is to contribute to the following factors:

- > To trap the vehicular emissions and fugitive dust emissions;
- > To attenuate noise levels generated from the plant;
- > To improve the aesthetics of the plant area;
- To maintain ecological balance;
- > To prevent soil erosion and to protect the natural vegetation; and
- > To utilize the treated effluents.

Provision of wide green belt around the plant has been foreseen to reduce any adverse impacts on the surrounding population due to emissions from the proposed activity. Plantation of grass, herbs, bushes and trees will be taken-up to reduce generation of dust from bare earth and to enhance the aesthetic/scenic value.

Green Belt Development / Plantation Plan

Green Belt Development / Plantation details are given in table below:

| Year | Area (Hectare) | Number of saplings | |
|----------------------|----------------|--------------------|--|
| 1 st Year | 3.0 | 6,250 | |
| 2 nd year | 3.0 | 6,250 | |
| 3 rd Year | 2.6 | 5,600 | |
| Total | 8.6 | 18,100 | |

TABLE - 10.1: PROPOSED GREENBELT PLANTATION PROGRAM

Name of Species to be planted: Species proposed to be planted are Maha babool, Bel, Dhawra, Neem, Kachnar, Palmyra Palm, Palas, Amaltas, Shisam, Gulmohar, Amla, Wad, Pimpal, Jaswand, Bakul, Amba, Peela gulmohar, Bijasal, Karanj, Jambhool, Kassod tree, etc.



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Guidelines for Green Belt Development

CPCB guidelines for Greenbelt development will be followed and following points will be considered to mitigate the level of pollutants in the surrounding area.

- All the barren areas will be vegetated. Saplings will be purchased from the local Forest Department and plantation preparation are taken up out before every monsoon. Suitable people having track record in such a field will be entrusted with the nursery job and plantation and after care as well.
- > Trees growing to a height of 5m 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 roadsides, to arrest vehicle-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 appropriate 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.

In order to facilitate the proper growth of vegetation, limited measures involving preparation of seedbed with suitable amount of fertilizers and treatment will be taken.

10.2.6 Occupational Health And Safety Measures

Healthy & Safe working environment for employees is the prime concern of the company. M/s UltraTech Cement Ltd. is committed to create & maintain safe & healthy work environment for employees, against hazards & risks through:

- > Continuously developing & maintaining safe work practices.
- > Focusing on operational & occupational hazards & risks.
- > Creating awareness about preventive health & safety measures.

A self-contained First Aid Center will be provided within the plant premises to take care of minor injuries and ailments. First aid box will be provided at all sections. An ambulance with driver will be made available to take care of emergency situations. Health check-up of all employees is done once in a year.



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All employees will be provided with all PPEs (Personal Protective Equipment's). Training to all employees will be given on Safety, Health and Environment throughout the year.

Safety plan for occupational health hazards:

The following precautions shall be taken to avoid accident like spillage and fire hazards and to minimize the effect of any such accident and to combat the emergency at site level.

- Employees working in dust prone area will be provided with dust mask. Their Lungs Function Test will be conducted on regular basis to assess their condition for taking suitable corrective & preventive measures.
- Workers working in noisy area will be provided with ear plug/ear muffs and it will ensure that they use it regularly.
- > Employees will be provided with appropriate/adequate PPEs.
- Protective equipments will be regularly checked and kept easily accessible place and easily workable during emergency.
- Various emergency spots in plant area will be identified and kept in sharp and alert watch.
- ➢ Fire bucket and hose reels will be provided to withstand the fire or explosion conditions.
- Various types of fire extinguishers such as (Foam type, water CO₂ type, CO₂ type) will be provided inside the plant premises.
- Regular training and awareness programmes will be conducted on Occupational Health, Safety and Environment etc.
- The required PPEs for each area/operation will be identified and the necessary PPEs like, helmets, goggles, hand gloves, mask, PVC suit, Self Containing Breathing Apparatus, safety belts, ear muff and plug, etc. will be made available to the personnel.
- > The workers should be trained for proper use of PPEs.
- The system will exist for replacement/issue of PPEs by testing and as per requirement.
- Lockers will be provided to the workers for safe custody and storage of PPEs.

Plan of Pre-Placement and Periodical Health check-up of Workers

Pre-employment check-up will be made mandatory and following tests will be conducted:

- Chest X rays
- > Audiometry
- Spirometry



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- Vision testing (Far & Near vision, color vision and any other ocular defect)
- ≻ ECG
- Haemogram (examination of the blood)
- Urine (Routine and Microscopic)
- Complete physical examination

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.

Occupational Health Surveillance Programme:

| Routine investigation | Special investigation | Frequency |
|-------------------------|-----------------------|-----------------------------------------|
| Physical checkup, Blood | X-Ray | Occupational Health |
| and | Audiometry | Survey of the employees |
| Urine etc. | Spirometry | will be carried out at |
| | Vision Test | regular intervals |
| | Sputum Analysis | Medical records of each |
| | Auto Analyzer | employee will be |
| | | maintained separately |
| | | and will be updated |
| | | from time to time |

The occupational health surveillance of the employee will be done on a regular basis and records of the same will be maintained as per the Factories Act, 1948. The occupational health surveillance programme will include lung function; sputum analysis and audiometric analysis on regular basis to observe any contraction due to exposure to dust and noise and corrective measures will be taken accordingly.

Vocational training programmes will also be conducted. Under vocational training the workers 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, noise, chemicals will be organized for employed person.

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.



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- 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 safety surveys for identifying unsafe working condition/practices, which causes accident.

Medical Facilities

Necessary care will be taken to provide medical aids to the workers and villagers around the project site. Necessary first aid facilities will be made available at plant and will also be extended to the surrounding communities.

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 cetramide 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.

Corporate Safety, Occupational Health & Environmnt Policy

M/s UltraTech Cements Ltd.'s Safety, Occupational Health & Environment (SHE) responsibilities are driven by a desire to protect people they work with, society at large and environment. It is integral to the way they do business, as part of their organizational value. The Safety, Occupational Health & Environment Policy of the company is given in **Annexure 9**.

10.2.7 Vehicular Pollution Control and Its Management

UltraTech Cement will take care of all the measures to take up the vehicular pollution control in addition to the pollution from the plant processes. All the vehicles will be kept environmentally compliant. The details are as below:



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Vehicular Pollution Control Measures:

- 1. **Inspection and maintenance (I&M) programme for vehicles:** The first and most important step towards emission control for the large in-use fleet of vehicles is the formulation of an inspection and maintenance system. It is possible to reduce 30-40% pollution loads generated by vehicles through proper periodical inspections and maintenance of vehicles. It should include testing of various elements of safety, road worthiness and compliance to pollution norms, renewal of permits and registration.
- **2. Emission norms:** Emission norms for all categories of petrol and diesel vehicles will be followed. Bharat stage emission standards are emission standards instituted by Government of India to regulate the output of air pollutants from internal combustion engine equipments, including motor vehicles. The standards and the timeline for implementation are set by the Central Pollution Control Board under the MoEF.

3. Appropriate Fuel:

- > Diesel with lower sulphur content should be used.
- > Pre-mixed fuels (petrol and oil mixture) for use of two stroke vehicles.

4. Periodical Checking of Vehicles

Vehicles will be checked internally or outsourced for the safety check as per the guidelines. Corrective measures will be taken for the 'Unfit vehicles'.

5. Management Measures

- > Traffic will be minimized inside and outside the premises
- Adequate inspection and maintenance facilities
- > Older vehicles will be timely replaced
- Keep a check on adulteration of fuel
- Proper traffic management system
- Concretization/blacktopping of internal roads
- Development of Green belt and plantation around roads and project periphery as a mitigative measure.
- > Awareness programmes in the proposed project and nearby villages.

10.3 BUDGET FOR IMPLEMENTATION OF EMP

The capital cost of the proposed Cement Grinding and Packing project is estimated to be approx. Rs.315 Crore. A budget has been proposed for implementation of the Environmental Management Plan for the project. The summary of the budget for Environmental Management Plan is given in **Table**



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10.2. The budget may be increased as per the actual requirement at site. The amount earmarked for the purpose will be kept separately and will not be diverted for any other purposes.

| Sr. No. | Description of Item | Capital Cost | Recurring Expenditure /annum |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------|
| | Environmental Pollution Control Measures | | |
| 1 | (Bag House, Bag filters, Vacuum Sweepers, AC cabins, Accoustic Enclosures, STP, Water sprinkler, road construction, Covered Shed and Covered conveyor etc) | 21.00 | 0.50 |
| 2 | Rain water harvesting measures | 1.00 | 0.20 |
| 3 | Environmental Monitoring | 0.58 | 0.28 |
| 4 | Occupational Safety and Health | 0.40 | 0.05 |
| 5 | Socio-Economic Welfare Measures | 1.00 | 0.10 |
| 6 | Green belt & Plantation | 0.80 | 0.08 |
| 7 | Miscellaneous | 0.22 | 0.04 |
| | Total | 25.00 | 1.25 |

Table 10.2: Budget Provision for implementation of EMP (Crores)



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11.1 INTRODUCTION

UltraTech Cement Ltd is the largest manufacturer of grey cement, ready mix concrete (RMC) and white cement in India. It is also one of the leading cement producers globally, and the only cement company globally (outside of China) to have more than 100 million tonne capacity in one country.

It has a consolidated capacity of 117.35 Million Tonnes Per Annum (MTPA) of grey cement. UltraTech Cement has 23 integrated plants, 1 clinkerisation plant, 27 grinding units and 7 bulk terminals. Its operations span across India, UAE, Bahrain, Bangladesh and Sri Lanka.

In the white cement segment, UltraTech goes to market under the brand name of Birla White. It has a white cement plant with a capacity of 0.56 MTPA and 2 WallCare putty plants with a combined capacity of 0.8 MTPA.

With 100+ Ready Mix Concrete (RMC) plants in 35 cities, UltraTech is the largest manufacturer of concrete in India. It also has a slew of speciality concretes that meet specific needs of discerning customers. Our Building Products business is an innovation hub that offers an array of scientifically engineered products to cater to new-age constructions.

UltraTech pioneered the UltraTech Building Solutions (UBS) concept to provide individual home builders with a one-stop-shop solution for building their homes. This is the first pan-India multi-category retail chain catering to the needs of individual home builders (IHBs). The purpose of this initiative is to engage with home builders at all stages of the construction cycle, empower them with quality construction products and services, and assist in the completion of their dream homes.

M/s UltraTech Cement Limited has applied for Environmental Clearance for its proposed 3.0 MTPA Cement Grinding & Packing Unit located in 26.10 Ha area in Plot No. 3, MIDC Area Nardana Phase-I, Tehsil Sindkheda, District Dhule, Maharashtra. The Maharashtra State Govt. through its undertaking Maharashtra Industrial Development Corporation (MIDC) has allotted land admeasuring 2,56,400 Sq. Mts. to UltraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-353/4435 dated 28th September 2015, MIDC has also allotted land admeasuring 4,647 Sq. Mts. To UlraTech Cement Limited vide letter No. MIDC/RO(DHL)/NAR/LMS-1/1006 dated 31st March, 2016, agreement has been signed on 8th October 2018. As per EIA Notification 2006 and subsequent amendments, the project falls in Schedule 3 (b) in Category 'B' and needs Environmental Clearance from SEIAA.



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The salient features of the project are given below:

| Name of the Project | Compate Crinding & Packing Plant |
|-----------------------------|--------------------------------------------------------|
| | |
| Capacity | |
| Project Area | 26.10 Hectare |
| Type of Land/Ownership | Industrial Land (MIDC Nardana, Phase – I) |
| Site Elevation | 187m to 192 m AMSL |
| Location | Plot No. 3, MIDC Area Nardana Phase I, Village- Malich |
| | & Waghode, Tehsil- Sindkheda, District – Dhule, |
| | Maharashtra |
| Geographical Co-ordinates | 1. 21° 8'53.71"N, 74°51'03.04"E |
| | 2. 21° 9'23.76"N, 74°51'13.82"E |
| | 3. 21° 9'27.48"N, 74°51'02.07"E |
| | 4. 21° 8'57.44"N, 74°50'51.43"E |
| Nearest village/major town | Waghode village: 0.6 km S |
| | Jatoda Village : 1.25 Km, N |
| | Sindkheda Town : 17Km NW |
| | Dhule City: 28 Km S |
| | Nardana Town 4.25 kms NW |
| Approch Road | State Highway 6: 0.8 km S |
| | Mumbai Agra National Highway, NH-3 : 3.5Km W |
| Nearest Railway Station | Nardana Railway Station, 4 km, NW |
| | Betawad Railway Station, 3.5 km, NE |
| Nearest Airport | Shirpur Airport : 25 km N |
| | Dhule Airport: 30 km S |
| | Indore airport : 200 km N. |
| Ecologically sensitive zone | No notified ecologically sensitive zone within 10 km |
| | radius |
| Reserved/ Protected forests | R.F.: 8.2 km SW |
| Historical/tourist places | Songir Fort, 10 km SW |
| Nearest Industries | Project site falls within MIDC area. Thermal Power |
| | plant is being established by M/s Shirpur Power Pvt. |
| | Ltd (SPPL) adjacent to the proposed Cement Grinding |
| | & Packing Plant. |
| Nearest water bodies | Panjhra River (4.0 Km in East Direction) |
| | o Lendi Nadi (3.5 Km in West Direction) |
| | o Tapi River (12.0 Km. in North direction) |

Salient Features of the Project



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| | o Sagarmoti Nallah (0.5 Km in South Direction) | | | | |
|--------------|---------------------------------------------------------|--|--|--|--|
| | o Lav ki Nadi (9.0 km in SE Direction) | | | | |
| | o Gundal Nallah (1.5 km in East Direction) | | | | |
| | o Doka Nallah: (3.0 km in North Direction) | | | | |
| | o Gangadi Nallah (9.5 km in NE Direction) | | | | |
| | o Pond Near Dongargaon (8.5 Km in South Direction) | | | | |
| | o Pond Near Babhalde – (97.5 Km in SW Direction) | | | | |
| Seismic zone | The area is not known for these natural hazards. | | | | |
| | Seismically, this area is categorized under Zone-III as | | | | |
| | per IS-1893 (Part-1)-2002 having Moderate Damage | | | | |
| | Risk Zone. In Medvedev–Sponheuer–Karnik scale | | | | |
| | (MSK) the area falls in MSK VII. | | | | |

11.2 PROJECT DESCRIPTION

11.2.1 Raw Material requirement & Source

The major raw materials required for the proposed grinding unit are Clinker, Gypsum and Flyash.

| Sr. | Raw | Quantity | Source | Distance | Mode of | Basis for assessment | | | |
|-----|----------|------------|------------------------------|-----------|-----------|----------------------|------|-------------|-----------|
| No. | Material | MTPA | | in Km. | Transport | PPC | OPC | PSC Slag | Composite |
| 1. | Clinkor | 15 to 20 | UTCL Plants – Dhar, | ~250 km | Rail & | | 050/ | 450/ | |
| | CHIKEI | 1.5 to 2.0 | Vikram etc. | | Road | 65% | 95% | 45% | 55% |
| 2. | Elw och | 0.4 to | Dowor Dlants | 10 to | Road | 28- | | | 200/ |
| | FIY asii | 0.80 | rower rialits | 200 km | | 35% | - | - | 20% |
| 3. | Gypsum | 0.15 | Rajasthan/Chemical Gypsum | 600 km | Road | 5% | 5% | 5% | 5% |
| 4. | Slag | 0.35 to | Eccar Stool | | Rail & | | | F00/ | 200/ |
| | Sidg | 0.70 | | ~330 KIII | Road | - | - | 50% | 20% |

REQUIREMENT & SOURCES OF RAW MATERIAL

11.2.2 Process Details

Clinker transport & storage: Clinker will be transported from the integrated Cement Unit of UltraTech Cement Located in Madhya Pradesh (Manawar, Dhar & Vikram Cement Neemuch) and Maharashtra (Awarpur) and other units of UTCL by road/railway to the proposed grinding unit. The clinker will be unloaded through truck tipplers/wagon tippler and a surface feeder which is further conveyed to clinker storage silo of capacity (30,000 Ton) through Conveyor Belt.

Gypsum transport & storage: Gypsum received will be transported through road/rail and unloaded by truck tippler/wagon tippler to belt conveyor and



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stacked in the covered gypsum stock yard. The required quantity of gypsum shall be fed to steel hoppers through series of belt conveyors.

Fly ash: Fly ash can be sourced from the adjacent Power plant (SPPL) through the pneumatic conveying system into the silo/hopper or received through closed tanker from nearest TPP and further pump to silo/hoppers.

Cement grinding: Clinker and Gypsum shall be filled in to the respective hoppers through suitable material handling system. UTCL proposed to install 1 no. Ball Mill/VRM with roller press having capacity of 225 tph for PPC grinding. The required quantities of Raw materials shall be fed to the roller press in proportion, high efficiency separator and then to the ball mill. The fly ash shall be fed into the separator directly. The 70 -75 % of the grinding will be done by the roller press and the grounded material will be separated by High efficiency separator and the rejects from the separator will be fed to the ball mill for further grinding. 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 minimise 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 storage: Two nos. RCC silo each of capacity 7500 t shall be constructed for storage of cement.

Cement packing: The cement from silos will be extracted and fed to the installed 4 no's of electronic packers, eight spout, single discharge with a capacity of 120 tph each through air slides, bucket elevators and screens. Each packer will be connected with 6 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 tankers. Railway siding is also considered for raw material and final product transportation through wagon loaders.



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Phase-II

In first phase, railway siding is considered with only basic needs, in second phase extension are planned. A full fledged railway loading and unloading system will be considered in Phase-II.

Employment Potential:

The Proposed Clinker Grinding Unit project will generate Direct Employment for about ~ 120 Regular employees during the operational phase and ~ 200 -250 contractual labors. Employment based on the eligibility criteria. Unskilled/ semi skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local.

Water Requirement

The water requirement for the proposed Cement Grinding & Packing Unit has been estimated as 350 m³/ day considering for phase-II of wagon loading etc. Water is required for process, equipment cooling, drinking, sanitation, etc. Primarily, water requirements for the unit shall be met by MIDC supply water (treated) or from SPPL extension water line with prior approvals. In addition to this further requirement some more raw water will be sourced from the ground. Necessary permission will be obtained from CGWA for drawal of ground water in future, if any required.

11.3 DESCRIPTION OF THE ENVIRONMENT

The existing environmental status of the area surrounding the project area of proposed Cement Grinding & Packing Unit for various environmental attributes has been studied for the core zone and buffer zone of the project. For environmental monitoring, the proposed plant area was considered as the 'core zone' and area within 10 km radius from the plant boundary was considered as the 'buffer zone'. The Core zone and Buffer zone together forms the study area of the project. Baseline data for the project was collected during the Post Monsoon season of 2019 (October– December 2019) for various environmental attributes.



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WIND ROSE DIAGRAM: POST MONSOON SEASON 2019 (OCT-DEC 2019)

11.3.1 Air Environment

Baseline Ambient Air Quality was monitored at 8 locations including 1 in core zone and 7 in nearby villages. The summary of ambient air quality results for post monsoon season 2019 is given below:

| Code | Monitoring Location | PM ₁₀ , | PM _{2.5} , | SO ₂ , | NO _x , |
|------|-------------------------|--------------------|---------------------|--------------------------|-------------------|
| | | μg/m ³ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ |
| A1 | Project Site | 63.3 | 31.5 | 19.9 | 27.9 |
| A2 | Vilage Malich | 58.5 | 31.5 | 17.1 | 18.6 |
| A3 | Village Kalmadi | 52.5 | 30.3 | 16.3 | 23.9 |
| A4 | Village Vaghadi Budrukh | 49.3 | 26.5 | 12.4 | 21.4 |
| A5 | Village Vaipur | 59.4 | 31.8 | 21.2 | 31.5 |
| A6 | Village Nardana | 60.9 | 35.7 | 22.9 | 37.4 |
| A7 | Village Pashte | 50.2 | 29.7 | 16.2 | 24.9 |
| A8 | Village Shahapur | 54.2 | 29.1 | 14.1 | 20.7 |
| | NAAQ Standards | 100 | 60 | 80 | 80 |

The ambient air quality observed during the study period is well within the



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prescribed National Ambient Air Quality Standards.

Impacts on Ambient Air Quality

Cumulative air pollution modelling have been carried out for the study period for proposed Cement Grinding & Packing unit and adjacent 2x150 MW thermal power plant using multi-stack dispersion modelling using double Gaussian diffusion equation : IS 8829-1978 as per guidelines issued by CPCB. The maximum predicted increase in Ground Level Concentration of PM_{10} due to proposed cement grinding unit and thermal power plant would be about 0.79 μ g/m³ at a distance of about 4.0 km E. Thus, it was observed that no significant impact will be caused on ambient air quality of the area.

Proposed Air Pollution Control Measures

- Installation of bag filter systems for the following main equipments along with ventilation systems to control the fugitive dust generated from the material handling areas.
 - Hydraulic Truck Tipplers hopper
 - Clinker hopper
 - Weigh feeders for Clinker, Gypsum and Solid flow meter for flyash.
 - Clinker Grinding mill
 - Packing machines
- All the flue gas outlets will be provided with state of art air pollution control equipment to maintain the particulate emission level below 50 mg/Nm³.
- The cement mill will be provided with a Bag filter with an outlet emission of less than 50 mg/Nm^{3.}
- The dust collected in the pollution control devices is recycled back to the grinding unit.
- The roads in the plant will be paved to prevent dust emissions.
- To control the dust emissions from dropping/transfer points of the belt and bucket conveyors, Bag filters will be provided at various locations of the transfer points.
- Fly ash and cement will be stored in RCC Silos and clinker will be stored in covered stockpile.
- Development of thick green belt inside and around the plant premises, around tailing dump to arrest fugitive dust emissions.
- Provision of dust masks, goggles to workers exposed to high dust generating areas.



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- Conducting Health and safety awareness and training programmes for plant employees.
- Regular air quality monitoring inside plant area and in nearby villages

11.3.2 Noise Environment & Traffic Infrastructure

The ambient noise levels were measured at 8 locations. The results obtained are given below:

| Station | Monitoring stations | Noise levels [Leq in dB (A)] | | | |
|---------|-------------------------|------------------------------|------|--------|-----------------------|
| Code | | Min | Max | Leqday | L _{eq} night |
| N1 | Project Site | 41.6 | 53.5 | 48.28 | 43.01 |
| N2 | Vilage Malich | 40.1 | 52.7 | 48.59 | 42.62 |
| N3 | Village Kalmadi | 40.6 | 51.8 | 48.06 | 42.27 |
| N4 | Village Vaghadi Budrukh | 37.9 | 48.3 | 43.68 | 38.87 |
| N5 | Village Vaipur | 38.2 | 50.0 | 43.92 | 39.75 |
| N6 | Village Nardana | 41.2 | 53.7 | 48.87 | 42.41 |
| N7 | Village Pashte | 38.1 | 48.1 | 44.26 | 39.37 |
| N8 | Village Shahapur | 40.0 | 51.9 | 48.09 | 41.54 |

Summary of Noise Levels (Post Monsoon Season 2019)

It is observed that the noise values recorded were well within the prescribed Ambient Air Quality Standards with respect to Noise.

Impact on Ambient Noise Levels

Noise modeling has been carried out to assess the impact on surrounding ambient noise levels. Mining machinery like drills, loaders, dozers and dumpers generate noise in the working areas. 'DHWANI' Noise Modelling Software developed by NEERI and approved by CPCB was used to predict the ambient noise levels around the mine lease boundary. From the modeling results, it is observed that the maximum resultant noise levels near the plant boundary will be about 65 dB(A). The noise levels will be further reduced and the predicted resultant noise levels at the nearest village habitation i.e. Vaghode village will be about 50 dB(A). However, this model does not take into account the attenuation of noise levels due to noise barriers like vegetation, hillocks, etc and also the natural factors like altitude, wind direction, temperature, etc. Thus, the actual noise levels will be lower than the estimated noise levels using this model.



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Impacts on Traffic Infrastructure

The proposed Cement Grinding & Packing Unit is well connected with road and rail network. Mumbai – Agra National Highway -3 is located at 3.5 km W of the plant site and State Highway -6 is located at 0.8 km South of the plant site. The state highway is connected to the plant site through MIDC road. Also, there is a proposal of railway siding for transport of raw material and finished product for the Cement Grinding & Packing Unit, for which, In-principal approval has been granted by Western Railway. Till the construction of railway siding, the raw materials and finished product (cement) and gypsum will be transported by Road. Fly ash will be transported through pneumatic pipelines from adjacent thermal power plant of SPPL. About 220 trips per day of 25 Tonne capacity truks will be required for transport of cement produced from the plant during initial phase of the project.

Proposed Control Measures for Noise Pollution

- During selection of equipments and machines, their source noise will be kept minimum as per standards.
- Provision of acoustic & vibration dampeners in foundations and insulators in the interiors
- DG sets will be housed in a separate building / accoustic enclosure.
- Plantation of thick greenbelt around the plant boundary to act as noise attenuator.
- Provision of earmuffs and ear plugs to personnel working in high noise areas.
- Acoustically insulated cubicles will be provided to operators working near high noise generation sources.
- Effective preventive maintenance and vibration measurement of all rotating equipment will help in the improvement of plant life and also reduce noise.
- Vibration absorbing platforms will be provided for heavy machines.
- Periodic job rotation of workers engaged in operations that involve exposure to high noise or vibration.
- During initial phase when rail infrastructure is not complete, truck transport in batch system will be implemented to minimise disturbance to local people.
- Periodic monitoring of ambient noise levels in the plant premises and in surrounding villages.

Proposed Traffic Management Measures

• Regulating speed of the transport vehicles. Overspeeding will be strictly prohibited.



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- Transportation of material through trucks covered with tarpaulin. No open transport will be permitted.
- Overloading will be strictly prohibited.
- Periodic maintenance of transport roads from plant site to State Highway.
- Periodic water sprinkling on transport road from plant to state highway to control dust emission.
- Posting of traffic regulator at MIDC road State highway Junction to avoid traffic jams.
- Construction of speed breakers at strategic locations such as near village habitation, school, etc.
- Batch transport system will be adopted to minimise traffic congestion.
- Railway siding work will be taken up simultaneously and material transport through railway will be commenced as early as possible.

11.3.3 Water Resources & Quality

Topography & Water Resources

There is no perennial or seasonal surface water body within the proposed project site. The surface run-off during monsoon season joins nearby seasonal streams. The study area around the project site is mostly flat except some hillocks in the south western part. Elevation of the study area varies from 155 m in the north eastern part to 282 m MSL in the south western part. The general slope of the area is towards north.

Panjhra river and Lendi nadi form the major drainage of the study area. Panjhra river flows at 4.0 km E of project site from south to north east and joins Tapi river at about 12 km NE of the project area. Lendi Nadi flows at 3.6 km W of the project site from south to north and joins Tapi river at about 15 km N of the project site. Apart from these, Sagarmoti Nala (0.5 Km S), Gul Nadi (8.1 km S), Gundal Nala (1.9 km W), Doka Nala (1.9 km N), Lavki Nadi (6.3 km E), Gangadi Nala (7.5 km NE), Dongargaon Village Pond (8.20 Km S) and Babhalde Village Pond (7.2 Km SW) are major sources of surface water in the study area. Also, there are some irrigation canals developed in the study area. The groundwater is used through open dug wells, primarily used for domestic use by the inhabitants whereas the deep bore wells are used for irrigation purpose. Depth of groundwater level has been varied from 5 to 10m during post monsoon while in pre-monsoon it is up to 20 m in study area.



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Water Quality

For assessing the existing water quality in the area, five surface water and eight ground water samples were collected during the study period. Physicochemical analysis of water samples was carried out.

Groundwater Quality

The pH of the water samples collected ranged from 7.1 to 7.5 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 308 - 668 mg/l in all samples. The total hardness varied between 216 - 645 mg/l for all samples collected at 8 locations.

In all samples, iron content varied in between 0.09 - 0.18 mg/l, Nitrate in between 1.3–3.6 mg/l, fluoride varied between 0.2 - 0.4 mg/l, chloride 38.9–48.7 mg/l, Sulphate 32.1–72.3 mg/l, alkalinity 187 - 324 mg/l, calcium 38.2–54.7 mg/l and magnesium in between 27.4–37.9 mg/l. The overall ground water quality was found to be mineralized with respect to TDS & hardness with moderate buffering capacity. The levels of heavy metals content were found to be within permissible limits.

Surface Water Quality

The pH of the surface water samples collected was 7.2 to 8.2 and within the acceptable limit of 6.5-8.5. The total dissolved solids were found to be 239 - 823 mg/l. Total hardness was observed between 127 - 364 mg/l. Sulphates concentration in the surface water samples varied from 18.7 mg/l to 78.1 mg/l. Iron content in all samples was found in the range of 0.11-0.57 mg/l, concentration of nitrate was 0.14 - 0.45 mg/l. The fluoride concentration was found to be 0.3 to 0.4 mg/l and chloride concentration was varied between 33.2 – 294.5 mg/l. The variation in alkalinity recorded was in the range of 123 - 308 mg/l, magnesium was found to be in the range of 18.2 to 56.8 mg/l in all samples. Dissolved oxygen was observed to be 4.8 to 6.6 mg/l. BOD of the surface water samples was observed in the range of <3 to 14 mg/l and COD was recorded as 68 to 113 mg/l. It was observed from the analysis that, the physico-chemical characteristics of the surface water samples are within the permissible limits of drinking water standards.

Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Water samples were analysed for total and faecal coliform by membrane



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filtration technique respectively. Surface water was found to be contaminated by coliform bacteria.

From the results, it was observed that, groundwater is suitable for drinking and domestic uses in absence of alternate drinking water source whereas surface water was not suitable for drinking uses without treatment.

Impacts on Water Resources & Quality

There is no surface water stream flowing in or adjacent to the proposed Cement Grinding & Packing Unit. There is no proposal for use of surface water or ground water in the proposed plant.

The water requirement for the proposed Cement Grinding & Packing Unit has been estimated as 350 m^3 /day considering for phase-II of wagon loading. This requirement will be met from the MIDC supply water (treated) or from SPPL extension water line with prior approvals. Hence, no impact is envisaged on the water resources of the area.

In grinding unit, water is used for cooling at various stages. This water is totally absorbed in the process which undergoes evaporation and hence no process effluent will be released outside the plant premisses. Only domestic effluent will be generated from the proposed Cement Grinding & Packing Unit, which will be treated in STP. Hence, no impact is envisaged on ground water quality of the area.

Proposed Water Pollution Control Measures

There is no process effluent generation in the proposed Cement Grinding & Packing Unit. Hence, no industrial wastewater treatment system is required. Domestic waste water generated from the plant premises will be treated in the STP and treated water will be used for green belt development.

Rainwater Harvesting:

UltraTech Cement has designed the storm water network for the entire area of 26.10 Ha. This will have a potential of harvesting 152361.36 m³/annum rainwater into the ground. This will help in recharging the ground water table of the area.

11.3.4 Soil Quality

Soil samples were collected from 3 locations from the core and buffer zone to evaluate the soil quality in the study area.



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- pH of the soil samples varied from 6.8 to 7.4 indicating normal soils
- Texture of the soil was observed as Silt Loam, Silt Clay Loam and Loam.
- Bulk density of the soil samples varied from 1.32 to 1.56 g/cc indicating hard soils difficult for germination.
- Organic matter in the soil samples varied from 0.15 to 1.46%
- Total Nitrogen in the soil samples varied from 62 to 570 kg/Ha
- Total Phosphorus in the soil samples varied from 27.8 to 47.9 kg/Ha
- Total potassium in the soil samples varied from 108.2 to 295.0kg/Ha

From the analysis results of the soil samples, it was observed that the soil was low to medium fertile and having low productivity. The soil in the study area needs additional fertilizers for improving the fertility status and increase in crop productivity. The Bulk Density was found in the range of 1.32 to 1.56gm/cc indicating dense soils difficult for germination. Overall the soil quality in the area was found to poor to medium fertile with moderate productivity.

11.3.5 Land Environment

Proposed Plant Area

The grinding unit will be located in an area of 26.10 Ha located in MIDC area Nardana Phase-I in Dhule District. The land is already acquired by MIDC for industrial use and is allocated to UltraTech Cement Ltd. for establishing Cement Grinding & Packing Unit. There is no habitation and hence, no displacement of people is involved. The site is free from vegetation and no cutting and uprooting of trees is involved. Thus, no significant impact is envisaged on the land environment of the project site.

Land Use pattern of Study Area

Land use pattern of the villages in the study area was studied based on the published data in Census Handbook. The category-wise break up of the land use pattern of the study area is given below:

| S. No. | Category | Area (Hectares) | % |
|--------|------------------------------------|-----------------|--------|
| 1 | Forest Area | 764 | 2.93 |
| 2 | Irrigated Area | 882 | 3.38 |
| 3 | Unirrigated Area | 20,869 | 80.03 |
| 4 | Culturable Waste | 730 | 2.80 |
| 5 | Area not available for cultivation | 2,833 | 10.86 |
| | Total | 26,078 | 100.00 |

Land Use Pattern of Study Area (Based on Census Handbook 2011)



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Impact on Land Environment

The proposed land utilization pattern of the plant area is given below:

| Sr. No. | Description | Area in Ha. | Area in % | | | |
|---------|--------------------------|-------------|-----------|--|--|--|
| 1. | Plant & Building | 7.80 | 29.9 | | | |
| 2. | Roads & Open Space | 4.50 | 17.3 | | | |
| 3. | Future Railway Provision | 2.80 | 10.7 | | | |
| 4. | Truck Parking | 2.40 | 9.2 | | | |
| 5. | Green Belt | 8.60 | 33 | | | |
| | Total | 26.10 | 100.0 | | | |

Proposed Land Use Pattern of the Plant Area

Proposed Measures for Land Environment

M/s UltraTech Cement Ltd. will carry out thick plantation in 8.60 Ha area. Plantation will be carried out along the plant boundary along internal roads, around site office, sheds, railway siding, etc. Thus, a good amount of green cover will be developed in the area. Thus the aesthetic view of the plant site will be improved.

Top Soil Management

Top soil from the area proposed for construction will be separately scrapped and will be directly spread over area proposed under green belt. Thus, the loss of fertile soil cover will be avoided and the soil will be beneficial for improving the survival rate of the plantation. Immediate plantation will be taken up in the green belt area from 1st year itself. This will minimise soil erosion from the plant premises.

11.3.6 Biological Environment

The core zone is a barren land plot in industrial area. There is no vegetation except some grasses. There is no forest land in or nearby the proposed project site. A Reserved Forest is located at 8.2 km SW from the project site. Hence, no wild animals are observed in the core zone. Some birds like house crow, myna, house sparrow, cattle egret, blue rock piegeon, etc. are observed occassionaly in the core zone. Reptiles like Garden lizard, three stripped squirrel are also observed sometimes in the area. There is no Schedule I Fauna observed in the study area. No endemic or endangered flora species were observed within the study area.

Impacts on Biological environment

The area proposed for Cement Grinding & Packing Unit is located in MIDC industrial area and comprise of industrial land. There is no forest land in or adjacent to the proposed Cement Grinding & Packing Unit site. The plant is



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proposed in MIDC area and is surrounded by industrial land. There is no vegetation in the area proposed for Cement Grinding & Packing Unit. Thus, no significant impact is envisaged on the biological environment due to the proposed project. In fact, the proposed plantation over 8.6 Ha area would improve the green cover and attract small animals and birds towards it, thereby improving the biological environment of the area.

However, the dust emissions from plant operation and material transportation activities may affect agriculture crops located in the vicinity of plant area and along transport road, if adequate control measures are not adopted.

Biological Environment Protection Measures

It is proposed to develop a thick green belt over 8.6 Ha area. Trees of various species will be used for development of green belt. Thus a good biodiversity will be developed within the plant site and this will attract small animals and birds towards it.

Adequate air pollution control measures will be adopted in the Cement Grinding & Packing Unit to control dust emissions. Also, material transport will be carried out through covered trucks to avoid fugitive emissions. Overloading and overspeeding will be strictly prevented to minimise spillage and dust emissions.

11.3.7 Waste Management

Solid Waste Generation & Management

The main solid waste generated from the grinding unit is cement dust (approx. 0.5 T/day) collected from various pollution control devices which will be recycled back to the process. Hence no solid waste for disposal will be available in the plant.

Sludge cakes generated from Sewage Treatment Plant (STP) will be spread in green belt area as manure. No fly ash, muck, slurry, sludge material disposal are involved in the project. No other solid waste is generated from the plant operations and processes.



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Hazardous Waste Management

UltraTech Cement Ltd. will store the hazardous waste in a designated area. This area will be isolated from the other utility areas. The storage area will have concrete floor to avoid percolation of spillage to ground.

Used Oil from the gear boxes and automobile batteries will be disposed to the authorized recycling vendors as per the Hazardous Wastes (Management and Handling) Amendment Rules, 2010.

11.3.8 Socio-Economic Environment

There is no private land or habitation within the proposed plant area. The information on socio-economic aspects of the study area (10 km radius) has been compiled from field studies and various secondary sources including various government and semi-government offices and Census Handbook 2011. A summary of the same is given below:

| Description | Numbers | % |
|---------------------------|---------|-------|
| Demography | | |
| Total Revenue Villages | 34 | |
| Total no. of House Hold | 14962 | |
| Total Population | 70642 | |
| Total Male Population | 36243 | 51.3% |
| Total Female Population | 34399 | 48.7% |
| Total ST Population | 15689 | 22.2% |
| Total SC Population | 5200 | 7.3% |
| Literacy Level | | |
| Total Literate Population | 47891 | 67.8% |
| Employment Pattern | | |
| Total Main Workers | 30924 | 43.8% |
| Cultivators | 9009 | 29.1% |
| Agricultural Labour | 16780 | 54.3% |
| House Hold Workers | 900 | 2.9% |
| Other Workers | 4235 | 13.7% |
| Total Marginal Workers | 4706 | 6.7% |
| Total Non-Workers | 35012 | 49.5% |

Socio-Economic Details of the Study Area (As per Census 2011)



Chapter 11: Summary & Conclusion

Impacts on Socio-economy

There is no private land or habitation in the proposed project area. Hence, there is no rehabilitation and resettlement is involved in the project. The proposed project will cause positive impacts on the socio-economic status of the nearby villages. The proposed Cement grinding & Packing plant project activities may cause following impacts on the villagers in the nearby villages.

- The Proposed Clinker Grinding Unit project will generate Direct Employment for about ~ 120 Regular employees during the operational phase and ~ 200-250 contractual labors. Employment based on the eligibility criteria. Unskilled/ semi-skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local. Secondary employment in the form of transport business, eateries, garages, hotels, rented accommodation, etc. will be available for local people. Also, local people may get contractual works in the plant.
- Jobs in plant will increase the per capita income of the villagers.
- Increase in infrastructure facilities in the nearby villages.
- Financial assistance will be provided for conducting local sports, religious and cultural activities. Medical camps will be arranged regularly for the villagers.

Proposed Socio-Economic Welfare Measures

As per the Corporate Social Responsibility and need based assessment carried out in the surrounding villages, the company will work in following sectors to improve the socio-economic status of the villages:

- Sustainable Development & Livelihood
- Education
- Health & medical facilities
- Drinking Water facility
- Drainage and sanitation
- Roads

"As per the MoEF&CC Office memorandum dated 1st May 2018, the budget of Rs. 4.725 has been earmarked for Corporate Environment Responsibility (CER) i.e. 1.5% of the project cost". The amount earmarked in the budget will be separately kept and will not be used for any other purposes. The budget may be increased as per the actual requirement during the implementation stage.



Chapter 11: Summary & Conclusion

11.3.9 Occupational Health and Safety

The exposure to various operations in the Cement Grinding & Packing Unit involves Occupational & Safety Hazards to the employed workforce. Necessary protective measures for Occupational Safety & Health hazards to keep exposure within permissible exposure level so as to protect health of workers will be implemented. Pre-employment and periodic health check ups will be conducted for every worker employed in the plant.

UltraTech Cement Limited proposes to formulate an integrated management plan for safeguarding the occupational health and safety of all personnel working in the grinding unit including contract and sub contract workers.

The Plant Manager will ensure that Health (H) and Safety (S) clauses are included in contractors agreements, and that contractors' personnel H & S behaviour and performance on site is properly monitored, evaluated and made a criterion for contractors' selection

All persons working for or on behalf of the organization including of contractor, sub-contractor & their employees by displaying at all strategic locations and distributed them. Regular Training Programs are held for "Understanding" by all the functions throughout the organization including contractors.

| Discipline | Locations | Parameter | Frequency |
|---------------------|-----------------------|---------------------------------------------------------------|--------------------|
| Meteorology | One | Max. and Min. Temp, | Hourly |
| (Met-station) | | Rain fall, Relative | |
| | | Humidity, Atm. | |
| | | Pressure, Wind speed | |
| | | and wind direction | |
| Ambient Air Quality | Plant boundary | PM ₁₀ , PM _{2.5} , SO ₂ , NOx, | As per NAAQS, Nov. |
| | | CO, | 2009 |
| Stack Emissions | One | РМ | Monthly and |
| | | | Continuous online |
| | | | monitoring |
| Ground Water | Four locations in | As per IS:10500 | Quarterly |
| Quality | nearby villages | standards | |
| Ambient Noise | Plant Area and Nearby | Day-and Night time | monthly |
| Levels | villages | noise Levels | |

11.4 ENVIRONMENTAL MONITORING PROGRAMME



Chapter 11: Summary & Conclusion

11.5 PROJECT BENEFITS

This project has a substantial benefit in the form of revenue to the State Government. There shall be employment generation and business opportunities for the local populace that would reduce migration. There will also be a noticeable improvement in the socio-economic index of the villages around the project site. The local people will benefit from the project in following ways:

- Preference to local people in employment in plant and transport related activities
- Conducting other economic upliftment measures
- Formation of Community Groups/ Self Help Groups
- Improvement in educational facilities
- Improvement in healthcare facilities
- Improvement in drinking water and irrigation facilities
- Improvement in drainage and sanitation facilities
- Improvement in roads and transport facilities

11.6 BUDGET FOR ENVIRONMENTAL MANAGEMENT PLAN Budget Provision for Implementation of EMP (Rs. in Crores)

| Sr. No. | Description of Item | Capital Cost | Recurring Expenditure /annum | |
|------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------|--|
| | Environmental Pollution Control Measures (Bag House, Bag filters, Vacuum | | | |
| 1 | Sweepers, AC cabins, Accoustic Enclosures, STP, Water sprinkler, road construction, Covered Shed and Covered conveyor etc.) | 21.00 | 0.50 | |
| 2 | Rain water harvesting measures | 1.00 | 0.20 | |
| 3 | Environmental Monitoring | 0.58 | 0.28 | |
| 4 | Occupational Safety and Health | 0.40 | 0.05 | |
| 5 | Socio-Economic Welfare Measures | 1.00 | 0.10 | |
| 6 | Green belt & Plantation | 0.80 | 0.08 | |
| 7 | Miscellaneous | 0.22 | 0.04 | |
| | Total | 25.00 | 1.25 | |

* Average cost per year
Draft EIA/EMP for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra) **Project Proponent:** M/s. UltraTech Cement Limited (Unit : Dhule Cement Works)



Chapter 11: Summary & Conclusion

11.7 CONCLUSION

The proposed Cement Grinding & Packing Plant will primarily help in the sustainable development of the nearby areas. There will be improvement of road, educational, medical and infrastructural facilities in the area. The plant and allied activities will provide direct and secondary employment opportunities for local people. This will lead to the improvement of economic status of the nearby villages. The plant will also benefit the state Govt. by way of excise duty.

During the plant operation, the pollution will be controlled within permissible limits by way of adopting various pollution control and mitigation measures.

A sum of Rs.25 Crores as capital cost and Rs.1.25 Crores/annum as recurring budget for environmental protection has been proposed to achieve the environmental quality as desired. Hence, it can be summarized that the development of the plant will have a positive impact on the socio-economic environment of the area and will lead to sustainable development of the region. Draft EIA/EMP for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra) **Project Proponent:** M/s. UltraTech Cement Limited (Unit : Dhule Cement Works)



Chapter 12: Disclosure of Consultant

CHAPTER 12: DISCLOSURE OF CONSULTANT

M/s Creative Enviro Services having offices in Bhopal, M.P., has been entrusted by M/s UltraTech Cement Limited for carrying out the EIA study for proposed project. CES is one of the oldest environmental consulting firms in MP and CES has a full-fledged division for environmental impact assessment and audits with chemical engineers, environmental planners, environmental engineers, civil engineers, ecologist and chemists (including persons specializing in fieldwork pertaining to sampling). The company has its own air, water, biological and soil laboratory as well as association with other laboratories which have been approved by MoEF/NABL for analyzing physicochemical and bacteriological parameters including heavy metals. CES is an accredited Environment Consultant organization by NABET (QCI-MoEF) vide certificate number NABET/EIA/1619/RA0071.

NABET CERTIFICATE

| 20 | National Accreditation Bo | ard fo | r 🕺 | AB |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|-------------------------|
| | Education & Training | g | | 0-327 |
| 9 | CERTIFICATE OF ACCREI | DITA | FION | |
| re ai onsu | <u>Creative Enviro Services</u> SR-4, Shri Ram Kunj, E-8, Bharat Nag Shahpura, Bhopal (MP) credited as Category - A organization under the QCI-NABET tant Organizations: Version 3 for preparing EIA-EMP reports in the | ar Scheme for following Se | Accreditati | on c |
| SI. No. | Sector Description | Sector | (as per) | Ca |
| 1 | Mining of minerals including opencast / underground mining | 1 | 1 (a) (i) | A |
| 2 | Thermal power plants | 4 | 1 (d) | В |
| 3 | Mineral beneficiation | 7 | 2 (b) | B |
| 4 | Metallurgical industries (ferrous & non-ferrous) | 8 | 3 (a) | Á |
| 5 | Cement plants | 9 | 3 (b) | A |
| 6 | Chemical fertilizers | 16 | 5 (a) | В |
| 7 | Distilleries | 22 | 5 (g) | A |
| 8 | Building and construction projects | 38 | 8 (a) | В |
| e Ac entio | creditation shall remain in force subject to continued compila eed in QCI-NABET's letter of accreditation bearing no. QCI/NABE e accreditation needs to be renewed before the expiry date by g due process of assessment. | nce to the T/ENV/ACO/ Creative Ei | terms and 17/0422 da nviro Servico | conc ted (es, Bi |
| | olowat: | | | |

Draft EIA/EMP for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra) **Project Proponent:** M/s. UltraTech Cement Limited (Unit : Dhule Cement Works)



Chapter 12: Disclosure of Consultant



National Accreditation Board for Education and Training (Member - International Accreditation Forum & Pacific Accreditation Cooperation)



Feb 25, 2020

QCI/NABET/EIA/ACO/20/1245

Creative Enviro Services

42, Doorsanchar Colony, Near Savoy Complex, Behind UCO Bank, E-8, Extension, Bhopal, 462039

Sub: Validity of Accreditation

Dear Sir/Madam,

This has reference to the accreditation of your organization under QCI-NABET EIA Scheme, the validity of **Creative Enviro Services** is hereby extended till May 24, 2020 or completion of assessment process, whichever is earlier.

The above extension is subject to the submission of required information/documents related to assessment on time to NABET.

You are requested not to use this letter after expiry of the above stated date.

With best regards,

A.K Jha

Senior Director| NABET

Draft EIA/EMP for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana (Industrial Area), MIDC Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule (Maharashtra) **Project Proponent:** M/s. UltraTech Cement Limited (Unit : Dhule Cement Works)



Chapter 12: Disclosure of Consultant



National Accreditation Board for Education and Training (Member - International Accreditation Forum & Pacific Accreditation Cooperation)



QCI/NABET/ENV/ACO/20/1307

May 06, 2020

То

Creative Enviro Services 42, Doorsanchar Colony, Near Savoy Complex, Behind UCO Bank, E-8, Extension, Bhopal, 462039

Sub.: Extension of Validity of Accreditation till 05 August, 2020 - regarding

Dear Sir/Madam

In view of the outbreak of Corona Virus (COVID-19) and subsequent lockdown declared for its control vide order dated 24th March 2020, issued by Ministry of Home Affairs, Govt. of India, NABET hereby extends the Validity of your Accreditation till 05 August, 2020.

As soon as, NABET office opens/resumes its operation necessary action regarding issuance of certificate/extension of validity letters / other may be initiated, therefore, ACO to ensure their complete application with NABET, if applicable.

Meanwhile, you may enclose this with your EIA reports along with the certificate/validity letter. The EAC/SEIAA/SEAC/Other are hereby requested to consider the same as a valid document for the preparation of EIA/EMP report.

| With best regards. | | | | | |
|------------------------------------------|---|---|---|---|--|
| Sd/- (A K Jha) Sr. Director, NABET | A | B | E | Т | |

Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-1 10 002, India Tel. • +9 11 -233 23 4 1 6, 417, 18, 419, 420, 421, 423 E-mail : ceo.nabet@qcin.org Website : www.qcin.org

State Environment Impact Assessment Authority

No. SIA/MH/IND/52929/2020 Environment Department, 217(Annex), Mantralaya, Mumbai- 400 032. Date :29 /05/2020

To, M/s. UltraTech Cement Limited Plot No. 3, Nardana (Industrial Area), MIDC, Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule

> Subject : Environment Clearance for Proposed 3.0 MTPA Cement Grinding & Packing Unit (Project Area: 26.10 Ha) located at Plot No. 3, Nardana (Industrial Area), MIDC, Phase 1, Village : Waghode, Tehsil : Shindkhede District - Dhule – Terms of Reference – Reg

Ref. : Your application no. SIA/MH/IND/52929/2020

This has reference to your proposal No **SIA/MH/IND/52929/2020** submitted to State Environment Impact Assessment Authority (SEIAA) for seeking Terms of Reference (ToR) in terms of the provisions of the Environment Impact Assessment (EIA) Notification, 2006 under the Environment (Protection) Act, 1986.

| 1. | Name of project | Proposed 3.0 MTPA Cement Grinding & |
|----|---------------------------------------|--------------------------------------------|
| | | Packing Unit (Project Area: 26.10 Ha) |
| | | located at Plot No. 3, Nardana (Industrial |
| | | Area), MIDC, Phase 1, Village : Waghode, |
| | | Tehsil : Shindkhede District - Dhule |
| | | (Maharashtra) |
| 2. | Type of Institution | Limited Company |
| 3. | Name of Project Proponent | UltraTech Cement Limited |
| 4. | Name of consultants | Pollution and Ecology Control Services |
| | | Near Dhantoli Police Station, Dhantoli, |
| | | Nagpur - 440012 |
| | | E-mail: pecs_nagpur@rediffmail.com |
| 5. | Type of project: Housing | Industrial |
| | Project/Industrial Estate/SRA scheme | |
| | /MHADA/Township or other | |
| 6. | New project/expansion in exiting | New |
| | project/modernization/diversification | |
| | in existing project | |
| 7. | If expansion/diversification, whether | NA |
| | environmental clearance has been | |
| | obtained for existing project | |
| 8. | Location of project (Survey Number | Plot No. 3 |
| | must be provided) | |
| | Plot no. additional: | Nardana (Industrial Area), MIDC |
| | Taluka: | Phase 1, Village : Waghode, |
| | Village: | Tehsil : Shindkhede |
| | District | District - Dhule |
| 9. | Whether in | MIDC, Nardana (Industrial Area), |
| | Corporation/Municipal/Other area | |

2. ToR for the said project is issued as per details of the project, which are as given below:-

| 10. | IOD/ IOA | / Concessio | n document or | Not Applicable | | | | |
|------------|------------------------------------------------|--------------------|----------------------|---------------------------------------|-----------|-----------------|------------|----------------|
| | any other f | form or doc | sument as | | | | | |
| | applicable | (Clarifying | g its conformity | | | | | |
| | with local | planning ru | lles & provision) | | | | | |
| 11. | IOD/IOA/ | Concession | /Plan Approval | Not A | Applic | able | | |
| | Number | | | | | | | |
| 12. | Approved | Build up a | rea | - | | | | |
| 13. | Note on th | e initiated | work (if | Not A | Applic | able, the wo | rk will be | e initiated |
| | applicable |) | | after | receiv | ving Environ | mental C | learance and |
| | | | | Cons | ent | | | |
| | | | | to Es | tablisi | n | | |
| 14. | LOI/NOC | /IOD from | MHADA/ Other | Not A | Applic | able | | |
| | approvals | (if applicab | ole) | | | | | |
| 15. | Total Plot | area | | 26.10 | Ha | | | |
| 16. | Deduction | S | | Not a | pplica | able | | |
| 17. | Net Plot a | rea | | Not a | pplica | able | | |
| 18. | FSI Area (| <u>(m²)</u> | | Not a | pplica | able | | |
| 19. | Non FSI A | Not a | pplica | able | | | | |
| 20. | Total proposed BUA area (FSI + Non $FSI = 2$) | | | | pplica | able | | |
| | FSI) (m ²) | NT . | 1. | | | | | |
| 21. | Total grou | Not a | pplica | able | | | | |
| 22. | Ground –c | Not a | pplica | able | | | | |
| | (Note: Per | | | | | | | |
| 22 | SKY) | ast of the m | naiaat (*in | B ₀ 215000000 | | | | |
| 23. | Estimate C | ost of the p | roject (*in | Ks. 315000000 | | | | |
| | A mount to | ha naid . | | | | | | |
| 24 | Number | n of Duildi | ngg and its config | motion | | | | |
| | | Number o | igs and its comig | nfigura | 1 tion | | | |
| | Serial | Building N | Name & number | iniguia | | Number of | floors | Height of the |
| | number | Dunung | | | | | 110015 | building (Mtrs |
| | 1. | Industrial S | Shed | | | - | | - |
| | | | | | | | | |
| 25 | Number of | f tenants an | d shops | | Not | Applicable | | |
| 26 | Number of | f expected 1 | esidents/users | About 250 no. users including workers | | | | |
| | | | | | & st | aff. | | |
| 27 | Tenant der | nsity per he | ctor | | Not | Applicable | | |
| | Height of | the building | 7 | | | | | |
| 28 | Right of w | vay (width o | of the road from the | e | Not | Applicable | | |
| | nearest fire | e station to | the proposed build | ings) | | | | |
| 29 | Turning ra | dius for eas | sy access of the ten | der | Inter | rnal road of | sufficient | width will be |
| | movement | trom all ar | ound the building | | cons | structed for | heavy vel | hicle and Fire |
| 2 0 | excluding | width for th | ne plantation. | | Ten | der in case o | t emerger | ncy. |
| 30 | Existing st | tructures (s) |) it any | | Nil | | | |
| 31 | Details of | the demolit | ion with disposal (| 11 | Not | 1' | | |
| | applicable |) | | | App | llC | | |
| - 22 | | D : " | | | able | X T 4 | | |
| 32 | Production | n Details | | | | NA | | |
| | Product | ~ · · | Existing (MT/M) | Pr | opose | <u>d (MT/M)</u> | Total (N | 417/M) |
| | Cement C | Jrinding | - | 3.0 |) MTI | ΡA | 3.0 MTI | PA |
| | and Pack | ing Unit | | | | | | |

| 33 | Total water requirement | | | | | | | | | | | |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------|------------|------------|----------|-------------|--------------|------------|----------|-------|--|
| | DETAILS | | | DRY SEASON | | | WET S | EASON | | | | |
| | I. Sou | rce | | | | MID | C/Ground | water | MIDC/ | Ground | water | |
| | II. Fres | sh water (in 1 | m3/day) incl | luding | | | 338 | | | 288 | | |
| | swii | mming pool. | | - | | | | | | | | |
| | III. Recycled water (Flushing) | | | | | | 12 | | | 12 | | |
| | IV. Rec | ycled water | (Gardening) | | | | - | | | - | | |
| | V. Swi | mming pool | | | | | - | | | - | | |
| | VI. Total water requirement | | | | | | 350 | | | 300 | 1 | |
| | VII. Fire | fighting (und | derground w | vater ta | nk) | | - | | | - | | |
| | VIII. Fire | fighting (ove | erhead water | r tank) | , | | | | | _ | | |
| | IX. Exc | ess treated w | vater | , | | | | | | | | |
| | Details of St | wimming | nool (if on | | norLos | rout D | - 10n | | | | | |
| | Details of S | winning | p001 (11 all | ly) As | s per Lay | outr | Iall | | | | | |
| 34 | Details of T | otal Water | consume | d | | | | | | | | |
| - | Particulars | Consump | tion (CMD) | | Loss | s (CMI |)) | | Effluent | (CMD) | | |
| | Water | Existing | Proposed | Tota | l Exis | ting | Proposed | Total | existing | Proposed | Total | |
| | requirement | 0 | | | | U | • | | | | | |
| | Industrial | - | 195 | 195 | - | | 195 | 195 | - | - | - | |
| | Cooling | - | 15 | 15 | - | | 15 | 15 | - | - | - | |
| | Dust | - | 50 | 50 | - | | 50 | 50 | - | - | | |
| | Suppression | + | 15 | 15 | | | 2 | 2 | + | 12 | ++-+ | |
| | Domestic | - | 15 | 15 | - | | 5 | 50 | - | 12 | - | |
| | Othors | | 25 | 25 | - | | 25 | 25 | - | - | | |
| 25 | Dain matan | | | 23 | - | | 43 | 20 | - | - | | |
| 55 | Kalli watti Halvestillg (KWH) $I = I aval of the ground water table. Dro monscorn \cdot \frac{9}{10} mtro hal & Doot more and \cdot$ | | | | | | | | | | | |
| | I. Level of the ground water table: Pre-monsoon : 8 -12 mtrs bgl & Post-monsoon : | | | | | | | | | | | |
| | 4 - 8 | 4-8 mtrs bgl | | | | | | | | | | |
| | | | | | | | | | | | | |
| | II. Size | and no of F | RWH tank(s | s) and | Quality : | Will | be elabora | ted in fin | al EIA rej | oort | | |
| | | | | | | | | | _ | | | |
| | III. Loca | tion of RW | H trank(s): | Will | l be elabo | orated | in final EL | A report | | | | |
| | | | | | | | | | | | | |
| | IV Quar | ntity of rech | narge nits n | ronose | ed Wil | l he el | aborated in | final EL | A report | | | |
| | | itity of feel | lui 50 pito pi | Topose | | 1 00 01 | uoorutea m | | riepon | | | |
| | V Sizo | of the real | orgo nite V | V:11 ha | alaborat | ad in t | Sincl EIA r | nort | | | | |
| | v. Size | of the recha | arge pit: v | viii be | eradorat | | | epon | | | | |
| | | | | | | | | | | | | |
| | VI. Capi | tal cost: W | /ill be elabor | orated | in final I | EIA re | port | | | | | |
| | | | | | | | | | | | | |
| | VII. O & | M cost: W | /ill be elabo | orated | in final I | EIA re | port | | | | | |
| | * | | | | | | | | | | | |
| 36 | UGT TANK | UGT TANK | | | | | | | | | | |
| | Details of I | - [GT tanks] | if anv | | | | | | | | | |
| | Under group | d water to | n uny. mk will be | nrou | ided for | fira f | ighting as | nor norr | na | | | |
| | | | | piov | | IIIC I. | ignning as | per nom | 115 | | | |
| | | UGT Nan | ne | | | In | KLD | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 37 | Storm water | r drainage | | | | | | | | | | |
| | I. Natu | ral water of | drainage n | attern | 1 | Storn | n water dra | ain will | be constr | ucted | | |
| | | | | | - | arour | d the nlan | it area | | | | |
| | II Ouo | ntity of sto | rm watar | | | Will k | a alaborate | nd in fina | 1 FIA rong | ort | | |
| | | nity of sto | mi watel. | | | Will 1 | e elaborat | d in fina | 1 EIA rep | ort | | |
| | | COULD | | | | ۷۷ III (| ~ ciaudiatt | .u iii iilia | i Lin iep | 511 | | |
| | III. Size of SWD : | | | | | | | | | | | |
| | | 015WD. | | | | | | | | | | |
| | | 015WD. | | | | | | | | | | |
| 38 | Sewage and | waste wat | ter Deman | d | | | | | | | | |

| | II. | STP technology : MBBR | | | | | | |
|----|----------|----------------------------------------------------|-------------------------------------------------------|--|--|--|--|--|
| | III. | No and capacity of STP : 1 nos of 15 | KLD | | | | | |
| | IV. | Location and area of the STP: Within the Plot Area | | | | | | |
| | V. | Capital cost: Rs. 20 Lacs | | | | | | |
| | VI. | O & M cost: Rs. 2.0 Lacs/ Year | | | | | | |
| 39 | Solid | waste management (Construction Phas | e) | | | | | |
| 57 | I | Waste generation : | Construction waste debris | | | | | |
| | 1. | Waste generation . | Will be utilized in making of | | | | | |
| | п | Disposal of the construction waste de | bris internal road | | | | | |
| 40 | Waste | e generation in (Operation Phase) | | | | | | |
| | iii uste | generation in (operation r hase) | | | | | | |
| | I. | Dry waste | Cement dust | | | | | |
| | II. | Wet waste | NA | | | | | |
| | III. | Hazardous waste | Used Oil | | | | | |
| | IV. | Biomedical waste (if any) | NA | | | | | |
| | V. | STP sludge | Yes | | | | | |
| | VI. | Others if any | NA | | | | | |
| 41 | Mode | of Disposal of waste | | | | | | |
| 41 | I | Dry weste | Recycled back to the process | | | | | |
| | 1. | Dry waste | Recycled back to the process | | | | | |
| | II. | Wet waste | NA | | | | | |
| | III. | Hazardous waste | Used oil will be give to authorized recycling vendors | | | | | |
| | IV. | Biomedical waste (if any) | NA | | | | | |
| | V. | STP sludge | Used as Manure | | | | | |
| | VI. | Others if any | NA | | | | | |
| 42 | Area | requirement: | | | | | | |
| | I | Location | NA | | | | | |
| | | Looudon | | | | | | |
| | II. | Area for the storage of waste & other material | NA | | | | | |
| | | | NA | | | | | |
| | III. | Area for machinery | | | | | | |
| | | - | NA | | | | | |
| | IV. | Capital cost | NA | | | | | |
| | V. | O &M cost | 1111 | | | | | |

| | 1 | | | | | | | - |
|----|-----------------|-----------------|----------------------|-------------------------------|---------------|--------------|------------|-------|
| | | | | | | | | |
| 43 | Effluent Charac | cteristics | | | | | | |
| | Parameters | Unit | Inlets effluen | t Oute | r Effluent | Effluent | discharge | |
| | | | characteristic | s Char | acteristics | standard | ls | |
| | | | | | | (MPCB) |) | |
| | NA | NA | NA | NA | | NA | | - |
| 44 | ETP: Not Appl | icable | | >> > > > > | | | | |
| | I. Amoun | t of effluent g | generation (CMI |)): NA | | | | |
| | II. Capacit | y of the ETP: | NA | | | | | |
| | III. Amount | t of treated ef | fluent recycled: | NA | | | | |
| | IV. Amount | t of water sen | t to the CETP | : NA | | | | |
| | V. Membe | rship of CET | P (if require) | : NA | | | | |
| | VI. Note on | ETP technol | ogy to be used | NA | | | | |
| | VII. Disposa | ll of the ETP | sludge | NA | | | | |
| 45 | | te Deteiler N | | | | | | - |
| 45 | Hazardous Was | Cat U | A OM F | xisting | Proposed | Total | Method of | |
| | beenon & unit | eu e | | misting | Toposed | Total | Disposal | |
| | Used Oil | NA N | A N | JA | NA | NA | Secondary | y use |
| | | | | | | | and | |
| | | | | | | | sale to | |
| 46 | Stacks emission | n Details: | | | | | recyclers | |
| -0 | Section & unit | Fuel used with | n Stack | Height | t from | Internal dia | ameter (m) |] |
| | | Quantity | No. | ground | l level (m) | | ~ / | e |
| | Cement Mill | NA | 1 | 45 | | 3.0 | | |
| 47 | Details of Fuel | to be Used | | | | | | |
| ., | I. Type of | Fuel | Existing | Р | roposed | То | tal | |
| | Coal | | C | 20,00 | 0 tones /ann | um 20 | 0,000 | |
| | Ton/annum | | | | | | | |
| | II. source of | of Fuel : Indi | genous importe | d/ | | | | |
| | III. Mode o | f Transportat | ion of fuel to sit | e: Road | Rail | | | |
| 48 | Energy | | | | | | | - |
| 10 | a) Power s | supply | | | | | | |
| | i) Sou | rce of power | supply – 132 K | V or 33 K | V switch ya | urd | | |
| | ii) Dur | ing construct | ion Phase: (Den | nand Load | d) NA | | | |
| | iii) DG | set as power | back up during | construct | ion phase : | NA | | |
| | iv) Dur | ing operation | phase (connected | ed Load)- | ·: 15 MVA | - | | |
| | v) Dur | ing operation | Phase (maxim | um dema | nd)- : 15 M | ٧A | | |
| | vii) DC | isioriner – : f | NA hack-Un during | oneratio | n nhase ?v | 6 MW | | |
| | viii) | Fuel used · D | iesel | operation | n phase. 28 | NO 1VI VV | | |
| | ix) Det | ails of high te | ension line passi | ng throug | h the plot if | anv – : N | A | |

| | b) Energy saving by non –conventional method: NA Enter Details | | | | | | | | | |
|----|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------|----------------------------------------|------------------------------------------|--------------------|-----------|
| | | | S | olar Ene | rgy | | Convent | ional Energy | | |
| | Sr. No | Description | Units Saved (Kw-hr/ y | / year ear) | Energy cost savings/ Yea (Rs./year) | Units Saved/ r Day (Kw-hr/ Day) | Units / year (Kw- hr/ year | Energy cost / Year Rs./year | % Ener; Saving/ | gy /yr |
| | | | | | | | | | | |
| | c) Energ d) | Details perc y conservatio Budgetary a Capital cost: I O & M cost: R | entage of sa n Measures Illocation (ca Rs. Ss. | ving: - apital C | े : Cost and O & | k M cost): | | | | |
| 49 | Green Belt Development: I. Total RG area:- 7.24 HA | | | | | | | | | |
| | II. No of trees to be cut : NA | | | | | | | | | |
| | III. | Number of | trees to plan | ted:1 | 8,100 | | | | | |
| | IV. V. List | List of prop Palmyra Pa Jaswand, B tree, etc. Timeline fo of proposed F | osed native lm, Palas, A akul, Amba, r completior Plantation on | trees: 1 maltas Peela of pla ground | Maha babo s, Shisam, G gulmohar, ntation: 3 Y d | ol, Bel, Dha ulmohar, A Bijasal, Kar ears | wra, Ne amla, Wa canj, Jan | em, Kachna ad, Pimpal, ìbhool, Kas | ar, sod | |
| | No. | Botanical | Name | Com | mon | Character Importanc | istics & | Ecological | | |
| | Tre | es | | 1 (uiii | | <u>Importune</u> | | | | |
| | 1. | Millettia | pin | Kara | nj | Semi-Deci roadside p | duous, S lantatio | Shady green | 1, good fo | or |
| | 2. | Aegle ma | armelos | Bel | | Semi-Decioroadside p | duous, S lantatic | Shady green n. | n, good fo | or |
| | 3. | Mangifer | a Indica | Man | go | Semi-Decie tree. | duous, l | arge tree, le | ong lived | ł |
| | 4. | Azadirac | hta indica | Neer | n | Deciduous plantation | , Large | tree, good f | or roads | side |
| 50 | Detai | ls of pollution | control syst | ems | | | | | | |
| | Sourc | e | | Exis pollu cont | ting ution rol system | Proposed | to be Ins | stalled | | |
| | Air | | | - | | Bag Hous water Spr | e, Vaccu inklers | ım Sweeper | rs, | |
| | Water | r | | - | | Packaged | Type S | ГР | | |
| | Noise | Noise | | - Accoustic Enclosures | | | | | | |

| 51 | Environme a) Du | ent Mana | gement platering gement platering gement platering generation platering generation platering generation platering generation generat | an Budgeta se (with Br | ary Allocation eak-up): | | | |
|----|---------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------|----------------------------|
| | Sr. No. | | At | tributes | Parameter | Total annum (H | Cost per Rs. In Lacs) | |
| | 1 | Environr (Bag Hou Accousti Drains & | nental Pollu use, Vaccur c Enclosure c Settling ta | ution Contro n Sweepers es, STP, Wa nks, etc) | ol Measures s, AC cabins, ater sprinkler, | | | |
| | 2 | Environr | nental Mon | itoring | | | 25 Crores | |
| | 3 | Occupati | onal Safety | and Health | 1 | | Recurring | cost 1.25 |
| | 4 | Socio-Ec | conomic We | elfare Meas | ures | | crores. | |
| | 5 | Green be | een belt & Plantation | | | | | |
| | 6MiscellaneousTOTAL | | | | | | | |
| | | | | | | | | |
| 52 | Storage of | chemica | ls (inflamr | nable expl | osive/hazardo | us/toxic substa | ances) NA | |
| | Description | n status | location | Storage capacity in MT | Maximum quantity of storage at any point of time in MT | Consumption /month in MT | Source of supply | Means of transportation |
| | | | | | | | | |
| 53 | Traffic Ma | anagemer | it | ation to th | | design of som | fluonoo. 7 | |
| | | l. INOS. | . of the jun | C or control C | e main road & | t of MIDC ro | illuence: | the said |
| | п | piot Num | 15 III MID | c area. The | mont : NA | It of MIDC TO | au 18 50 M | ur. |
| | | I. INUII | ber and a | rea of podi | 1110111. NA | | | |
| | | I. INUII I. Tota | loci allu al | $rea \cdot 2.40^{\circ}$ | um NA Ha | | | |
| | I V V | · Tota | a per car – | $N\Delta$ | i i a | | | |
| | V | I Nun | ber of 2 w | wheelers ar | proved by cor | npetent author | ity · NA | |
| | VI | I. Nun | ber of 4-v | vheelers as | approved by | competent aut | hority: | |
| | VII | I. Publ | lic transpor | rt – NA | approved of | competent aut | | |
| | IX. | Width o | f all intern | al roads : | 5m wide road | | | |
| 54 | Other Info | rmation: | NA | | | | | |
| | I. CF | RZ/RRZ c | learance o | btain, if ar | ny : | | | |
| | II. Di | stance fro | om protecte | ed areas : | | | | |
| | III. Ca | tegory as | per sched | ule of EIA | Notification s | sheet : | | |
| | IV. Co | ourt cases | pending if | f any : | | | | |
| | V. Ot | her inform | nation: Ap | plication f | for Environme | ntal Clearance | .: | |
| | VI. Ha | ve you p | reviously s | submitted a | application onl | line on MoEF | website: A | lo/Yes |
| | Attach for | m-I | Atta | ch form-I | (A) | Attach EIA re | port | |

3. The project/ activity is covered under category 3 (b) of the schedule attached to the EIA Notification, 2006.

4. ToR is recommended to the above mentioned project as specified by the Ministry as Standard ToR in April 2015 for preparation of EIA-EMP report. SEIAA hereby accords ToR to for preparation of the Environment Impact Assessment (EIA) Report and Environment Management Plan (EMP) the following conditions –

1 Executive summary of the project – giving a *prima facie* idea of the objectives of the proposal, use of resources, justification, *etc.* In addition, it should provide a compilation of EIA report, including EMP and the post-project monitoring plan in brief.

Project description:

| 2 | Justification for selecting the proposed product and unit size. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Land requirement for the project including its break up for various purposes, its availability and |
| | optimization. |
| 4 | Details of proposed layout clearly demarcating various units/industries within the plant. |
| 5 | Complete process flow diagram describing each unit, its processes and operations, along with |
| | material and energy inputs and outputs (material and energy balance). |
| 6 | Details of proposed source-specific pollution control schemes and equipments to meet the national |
| | standards. |
| 7 | Details on requirement of raw materials, its source and storage at the plant. |
| 8 | Details on locating the residential colonies on upwind direction. |
| 9 | Details of the proposed methods of water conservation and recharging. |
| 10 | Management plan for solid/hazardous waste generation, storage, utilization and disposal. |
| 11 | In case, hazardous waste is proposed to be charged in kilns, details on type of waste, its |
| | characteristics and monitoring of emissions of gases, heavy metals, VOCs, dioxins and furans. |
| 12 | Scheme of proper storage of fly ash, gypsum, clinker. |
| 13 | Analysis report of Sulphur content in fuels and Sulphur balance data. |
| 14 | Details of heat and noise emission sources from the proposed project and proposed measures. |
| 15 | Details of CO2 emissions including its quantum per tonne of cement. |
| 16 | Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, etc. to the workers |
| | during construction and operation phase. |
| 17 | In case of expansion of existing industries, remediation measures adopted to restore the |
| | environmental quality if the groundwater, soil, crop, air, etc., are affected and a detailed |
| | compliance to the prior environmental clearance/consent conditions. |
| 18 | Any litigation pending against the project and /or any direction /order passed by |
| | any Court of Law related to the environmental pollution and impacts in the last two |
| | years, if so, details thereof. |
| Des | scription of the environment: |
| | |
| 19 | The study area shall be up to a distance of 10 km from the boundary of the proposed project site. |
| 19 20 | The study area shall be up to a distance of 10 km from the boundary of the proposed project site. Location of the project site and nearest habitats with distances from the project site to be |
| 19 20 | The study area shall be up to a distance of 10 km from the boundary of the proposed project site. Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale). |
| 19 20 21 | The study area shall be up to a distance of 10 km from the boundary of the proposed project site. Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale). Land-use based on satellite imagery including location specific sensitivities such as national parks / |
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| $ \begin{array}{c} 19\\20\\\\ \hline 21\\\\ \hline 22\\\\ \hline 23\\\\ \hline 24\\\\ \hline 25\\\\ \hline 26\\\\ \hline 27\\\\ \hline 28\\\\ \hline 29\\\\ \hline 30\\\\ \hline \end{array} $ | The study area shall be up to a distance of 10 km from the boundary of the proposed project site. Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale). Land-use based on satellite imagery including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, etc. for the study area. Demography details of all the villages falling within the study area. Topography details of the project area. The baseline data to be collected from the study area w.r.t. different components of environment viz. air, noise, water, land, and biology and socio-economic. Details of geological features of the study area and mine area. Hydrological regime plan shall be prepared and incorporated. Interception of mining with the groundwater, if any. Surface water quality of nearby water sources and other surface drains. Details on ground water quality. Details on existing ambient air quality and expected, stack and fugitive emissions for PM10, PM 2.5, SO ₂ * and other sulphur compounds, NOx* and other nitrogen compounds, carbon oxides (CO and CO ₂) etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet AAQ standards. (* - As applicable) Details on other pollutants also to be considered in relation to the production of cement, especially with secondary fuels are VOC, polychlorinated dibenzodioxins and dibenzofurans (PCDDs and PCDFs), metals and their compounds, Hydrogen Fluoride, Hydrochloric Acid (HCl), <i>etc</i> . |
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| 36 | Proposed baseline monitoring network for the consideration and approval of the Competent Authority |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 37 | Ecological status (terrestrial and equatic) of the study area such as habitat type and quality species |
| 57 | diversity rarity fragmentation ecological linkage age abundance etc |
| | If any incompatible land-use attributes fall within the project area, proponent shall describe the |
| | sensitivity (distance, area and significance) and propose the additional points based on significance |
| | for review and acceptance by the SEAC. Incompatible land-use attributes include: |
| | a. Public water supply areas from rivers/surface water bodies, from ground water |
| | b. Scenic areas/tourism areas/hill resorts |
| | c. Religious places, pilgrim centers that attract over 10 lakh pilgrims a year |
| | d. Protected tribal settlements (notified tribal areas where industrial activity is not permitted) |
| | e. CRZ |
| | f. Monuments of national significance. World Heritage Sites |
| | g. Cyclone, Tsunami-prone areas (based on last 25 years) |
| | h. Airport areas |
| | i. Any other feature as specified by the State or local government and other features as locally |
| | applicable, including prime agricultural lands, pastures, migratory corridors, <i>etc.</i> |
| 39 | If ecologically sensitive attributes fall within the project area, proponent shall describe the sensitivity |
| | (distance, area and significance) and propose the additional points based on significance for review |
| | and acceptance by the SEAC. Ecological sensitive attributes include: |
| | a. National parks |
| | b. Wild life sanctuaries, Game reserve |
| | c. Tiger reserve/elephant reserve/turtle nesting ground |
| | d. Mangrove area |
| | e. Wetlands |
| | f. Reserved and Protected forests, <i>etc</i> . |
| | g. Any other closed/protected area under the Wild Life (Protection) Act, 1972, any other area |
| | locally applicable |
| 40 | If the location falls in a valley, studies on specific issues connected to the natural resources |
| | management. |
| 41 | Identification of CRZ area: A CRZ map duly authenticated by one of the authorized agencies |
| | demarcating LTL(Low Tide Level), HTL (High Tide Level), CRZ area, location of the project and |
| | associate facilities w.r.t. CRZ, coastal features such as mangroves, if any. The route of the pipeline, |
| | etc., passing through CRZ, if any, should also be demarcated. Recommendations of the State Coastal |
| | Management Authority for the activities to be taken up in the CRZ. |
| | – Provide the CRZ map in 1:10000 scale in general cases and in 1:5000 scale for |
| | specific observations. |
| | - Proposed site for disposal of dredged material and environmental quality at the point |
| | of disposal/impact areas. |
| A 101 | - Fisheries study should be done w.r.t. Benthos and Marine organic material and coastal fisheries. |
| An 42 | incipated environmental impacts and mitigation measures : |
| 42 | Anticipated generic environmental impacts due to this project may be evaluated for significance and based on corresponding likely impacts Valued Environmental Components (VECs) may be |
| | identified Paseline studies may be conducted for all the concerned VECs and likely impacts will |
| | have to be assessed for their magnitude in order to identify mitigation measures |
| 13 | Impact prediction tools used for the appropriate assessment of environmental impacts |
| | While identifying the likely impacts also include the following for analysis of significance and |
| | required mitigation measures. |
| | a impacts due to transportation of raw materials and end products on the surrounding environment |
| | b impacts on surface water, soil and groundwater |
| | c impacts due to air pollution |
| | d impacts due to odour pollution |
| | e impacts due to noise |
| | f impacts due to fugitive emissions |
| L | |

| 1 | g impact on health of workers of | lue to proposed project activities | | | | | |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 45 | Proposed odour control measures | | | | | | |
| 46 | Action plan for the greenbelt deve accordance to CPCB published gu | elopment – species, width of plantations, planning schedule, <i>etc.</i> , in uidelines. | | | | | |
| 47 | In case of likely impact from the conservation of wild fauna in con | proposed project on the surrounding reserve forests, Plan for the sultation with the State Forest Department. | | | | | |
| 48 | Mitigation measures - for source | control and treatment. | | | | | |
| 49 | Air quality modeling for the ceme installed should be elaborated upo | ent plant should be incorporated. Air pollution control system to be on to control emissions within 50 mg/Nm ³ . | | | | | |
| 50 | Details on rainwater harvesting at | the cement plant site. | | | | | |
| Ana | alysis of alternative resources and | technologies: | | | | | |
| 51 | Comparison of alternate sites con of the site with the prescribed gui | sidered and the reasons for selecting the proposed site. Conformity delines in terms of CRZ, river, highways, railways, <i>etc</i> . | | | | | |
| 52 | Details on improved technologies. | | | | | | |
| Env | vironmental monitoring program | 1: | | | | | |
| 53 | Specific programme to monitor Nickel and Vanadium emissions be included, incase of use of pet- coke. | | | | | | |
| 54 | An action plan to control and more | nitor secondary fugitive emissions as per the CPCB guidelines. | | | | | |
| 55 | Monitoring programme for pollut | ion control at source | | | | | |
| 56 | Monitoring pollutants at receiving | g environment for the appropriate notified parameters – air quality, | | | | | |
| | groundwater, surface water, gas q | uality, <i>etc</i> . during operational phase of the project. | | | | | |
| 57 | Specific programme to monitor sa | afety and health protection of workers | | | | | |
| 58 | Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs. | | | | | | |
| 59 | Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting | | | | | | |
| | monitoring. | | | | | | |
| Ad | ditional studies: | | | | | | |
| 60 | Clearances/approvals from the IB | M and State government for the linked mining component. | | | | | |
| 61 | Details on risk assessment and da safeguard measures. | mage control during different phases of the project and proposed | | | | | |
| 62 | Details on socio-economic develo jobs, education, social conflicts, c | opment activities such as commercial property values, generation of pultural status, accidents, etc. | | | | | |
| 63 | Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as far as possible. | | | | | | |
| 64 | Details on compensation package | for the people affected by the project, considering the socio- | | | | | |
| <u> </u> | economic status of the area, homestead oustees, land oustees, and landless labourers. | | | | | | |
| 65 | Points identified in the public hearing and commitment of the project proponent to the same. Detailed | | | | | | |
| 66 | action plan addressing the issues raised, and the details of necessary allocation of funds. | | | | | | |
| 00 | Administrative and technical organizational structure to ensure proposed post-project monitoring | | | | | | |
| 67 | FMD deviced to mitigate the adverse impacts of the project should be provided | | | | | | |
| 07 | along with item-wise cost of its it | nplementation (Capital and recurring costs) | | | | | |
| 68 | Allocation of resources and respo | nsibilities for plan implementation | | | | | |
| 69 | Details of the emergency prepared | dness plan and on-site and off-site disaster management plan | | | | | |
| Ab | ove points shall be adequately a | ddressed in the EIA report at corresponding chapters, in | | | | | |
| add | lition to the contents given in the | e reporting structure as below: | | | | | |
| Sr | EIA Structure | Contents | | | | | |
| 1 | Introduction | Purpose of the report | | | | | |
| - | | | | | | | |
| | | Identification of project & project proponent | | | | | |
| 1 | | Identification of project & project proponent Brief description of nature, size, location of the project and its | | | | | |
| | | Identification of project & project proponent Brief description of nature, size, location of the project and its importance to the country, region | | | | | |

| Ī | 2 | Project Description | Condensed description of those aspects of the project (based on project feasibility study), likely to cause environmental effects. Details should be provided to give clear picture of the following: |
|---|---|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | Type of project Need for the project |
| | | | Location (maps showing general location, specific location, project boundary & project site layout) |
| | | | Size or magnitude of operation (incl. Associated activities required by / for the project) |
| | | | Proposed schedule for approval and implementation |
| | | | Technology and process description |
| | | | Project description including drawings showing project layout, |
| | | | components of project etc. Schematic representations of feasibility |
| | | | drawings which give information important for EIA purpose |
| | | | Description of mitigation measures incorporated into the project to |
| | | | meet environmental standards, environmental operating conditions, |
| | | | or other EIA requirements (as required by the scope) |
| | | | Assessment of New & untested technology for the risk of technological failure |
| - | 3 | Description of the | Study area, period, components & methodology |
| | e | Environment | Establishment of baseline for VECs, as identified in the scope |
| | | | Base maps of all environmental components |
| F | 4 | Anticipated | Details of Investigated Environmental impacts due to project |
| | | Environmental | location, possible accidents, project design, project construction, |
| | | Impacts & Mitigation | regular operations, final decommissioning or rehabilitation of a |
| | | Measures | completed project |
| | | | Measures for minimizing and / or offsetting adverse impacts identified |
| | | | Irreversible and irretrievable commitments of environmental components |
| | | | Assessment of significance of impacts (Criteria for determining significance, Assigning significance) |
| | | | Mitigation measures |
| _ | 5 | Anglasia af | |
| | 3 | Analysis of Alternatives | Description of each alternative |
| | | (Technology & Site) | Summary of adverse impacts of each alternative |
| | | (Teenhology & Site) | Mitigation measures proposed for each alternative and selection |
| | | | of alternative |
| ſ | 6 | Environmental | Technical aspects of monitoring the effectiveness of mitigation |
| | | Monitoring Program | measures (incl. measurement methodologies, frequency, location, |
| | | | data analysis, reporting schedules, emergency procedures, detailed |
| Ļ | 7 | | budget & procurement schedules) |
| | 1 | Additional Studies | Public consultation |
| | | | KISK assessment |
| ┝ | 0 | Drojaat Danafita | Jocial impact assessment, K&K action plans |
| | 0 | r roject benefits | Improvements in physical infrastructure |
| | | | Employment potential –skilled: semi-skilled and unskilled |
| | | | Other tangible benefits |
| | | | |

| 9 | Environmental Cost Benefit Analysis | If recommended at the scoping stage |
|----|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | EMP | Description of the administrative aspects that ensures proper implementation of mitigative measures and their effectiveness monitored, after approval of the EIA |
| 11 | Summary & Conclusion (This will constitute the summary of the EIA | Overall justification for implementation of the project |
| | Report) | Explanation of how, adverse effects have been mitigated |
| 12 | Disclosure of Consultants engaged | Names of the Consultants engaged with their brief resume and nature of Consultancy rendered |

- 5. The above ToR should be considered for the above mentioned project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006.
- 6. The project proponent shall submit the detailed final EIA/EMP prepared as per ToR to the SEIAA for considering the proposal for environmental clearance within 3 years as per the MoEF & CC O.M. No. J-11013/41/2006-IA-II (I) (Part) dated 29.08.2017.
- 7. The consultants involved in preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/ Laboratories including their status of approvals etc. vide Notification of the MoEF&CC dated 19.07.2013.
- 8. The prescribed ToR would be valid for a period of three years for submission of the EIA/EMP Reports.

(Anil Diggikar) Principal Secretary & Member Secretary, SEIAA

Copy to:

- 1. Chairman, SEIAA (Maharashtra), Mumbai.
- 2. Principal Secretary, Environment, Room no.217, Annex. Bldg., Mantralaya, Mumbai.
- 3. Member Secretary, SEAC-1, 15th floor, New Administrative Building, Mantralaya, Mumbai.
- 4. The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Point, 3rd and 4thFloor, Opp. Cine Planet, Sion Circle, Mumbai 400 022.

TOR COMPLIANCE

| Sr. | Condition | Compliance |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. | | |
| 1. | Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide a compilation of EIA report, including EMP and the post-project monitoring plan in brief. | The summary of the proposed project is given in Chapter 11 of the EIA Report. |
| 2 | Institution for selecting the proposed product and unit size | Datails are provided in |
| 2. | Justification for selecting the proposed product and unit size. | Chapter no. 1 heading no. 1.3.1, & 1.4 and Chapter point no. 2.2. |
| 3. | Land requirement for the project including its break up for various purposes, its availability and optimization | Details of land requirement for project are provided in Chapter no. 2 heading no.2.6.2 and table 2.3. |
| 4. | Details of proposed layout clearly demarcating various units/industries within the plant. | Layout of project is shown in Chapter no. 2 Figure no. 2.4. |
| 5. | Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material and energy balance). | Process flow diagram is shown in Chapter no. 2 figure no.2.6. Raw Material balance is provided in Chapter no.2 Table no.2.1 |
| 6. | Details of proposed source-specific pollution control schemes and equipments to meet the national standards. | Details for Air Pollution Source and Control measures are provided in chapter no 4 under heading no 4.3. |
| 7. | Details on requirement of raw materials, its source and storage at the plant. | Raw Material balance is provided in Chapter no.2 Table no. 2.1 |
| 8. | Details on locating the residential colonies on upwind direction. | There are no colonies proposed at the project site. The habitation in the 10 km radius of the project site is shown in Topographical map given in Chapter no. 2 in Figure no. 2.2. |
| 9. | Details of the proposed methods of water conservation and recharging. | Details are given in Chapter no. 2, heading no. 2.6.4 and chapter no. 4, heading no. 4.3.3.4 |

| 10. | Management plan for solid/hazardous waste generation, storage, | Details are provided in |
|-----|-------------------------------------------------------------------------|----------------------------------------|
| | utilization and disposal. | chapter no 4, heading no. |
| | | 4.3.5 and chapter no. 10 |
| | | heading no.10.2.4. |
| 11. | In case, hazardous waste is proposed to be charged in kilns, | The only hazardous waste will |
| | details on type of waste, its characteristics and monitoring of | be used oil which will be |
| | emissions of gases, heavy metals, VOCs, dioxins and furans. | disposed to the authorized |
| | | recycling vendors as per the |
| | | Hazardous Wastes |
| | | (Management and |
| | | Handling) Amendment |
| 10 | | Rules, 2016. |
| 12. | Scheme of proper storage of fly ash, gypsum, clinker. | Scheme for storage of fly |
| | | ash, gypsum, clinker is given |
| 10 | | in chapter no.2 Table no.2.2 |
| 13. | Analysis report of Sulphur content in fuels and Sulphur balance | - |
| 14 | Details of heat and noise emission sources from the proposed | Source of noise is given in |
| 17. | project and proposed measures | chapter no 4 heading |
| | project and proposed measures. | $n_0 4 3 2$ and management |
| | | plan for noise is give in |
| | | chapter no 10 heading no. |
| | | 10.2.2. |
| 15. | Details of CO ₂ emissions including its quantum per tonne of | No CO ₂ emission will occur |
| | cement. | during production process. |
| 16. | Details regarding infrastructure facilities such as sanitation, fuel | Details for storage sanitation |
| | storage, restroom, etc. to the workers during construction and | and rest room during |
| | operation phase. | operation phase are shown in |
| | | layout plan. Local labour will |
| | | be appointed during |
| | | construction phase. |
| 17. | In case of expansion of existing industries, remediation | This is green field project. |
| | measures adopted to restore the environmental quality if the | |
| | groundwater, soil, crop, air, etc., are affected and a detailed | |
| | compliance to the prior environmental clearance/consent | |
| | conditions. | |
| 18. | Any litigation pending against the project and /or any direction | None. |
| | /order passed by any Court of Law related to the environmental | |
| | pollution and impacts in the last two years, if so, details thereof. | |
| 10 | Description of the environment: | |
| 19. | The study area shall be up to a distance of 10 km from the | Study area is shown in |
| | boundary of the proposed project site. | chapter no. 3, figure n.3.1 |
| 20. | Location of the project site and nearest habitats with distances | Location on Toposheet is |
| 1 | 1 from the project site to be demarcated on a toposheet (1: 50000 | snown in chapter no. 2 figure |

| | scale). | no. 2.1 |
|-----|----------------------------------------------------------------------|--------------------------------------|
| 21. | Land-use based on satellite imagery including location specific | Details of nearest habitation |
| | sensitivities such as national parks / wildlife sanctuary, villages, | and information are provided |
| | industries, etc. for the study area. | in chapter no.1 Table no.1.2. |
| 22. | Demography details of all the villages falling within the study | Demographic details are |
| | area. | provided in chapter no. 3 |
| | | heading no.3.7.2 |
| 23. | Topography details of the project area. | Topography details of the |
| | | project area in given in |
| | | chapter no.3, heading |
| | | no.3.4.1. |
| 24. | The baseline data to be collected from the study area w.r.t. | The baseline data to be |
| | different components of environment viz. air, noise, water, land, | collected is given in chapter |
| | and biology and socio-economic. | no.3 |
| | | Air: 3.2 |
| | | Noise: 3.3 |
| | | Water: 3.4 |
| | | Land: Heading no. 3.5 and |
| | | 3.7.4 |
| | | Biology:3.6 |
| | | Socioeconomic: Heading |
| | | no.3.7.5 |
| 25. | Details of geological features of the study area and mine area. | Details of Hydrogeology are |
| | Hydrological regime plan shall be prepared and incorporated. | provided in chapter no.3 |
| | Interception of mining with the groundwater, if any. | heading no.3.4.3. |
| 26. | Surface water quality of nearby water sources and other surface | Provided in Chapter no. 3 |
| _ | drains. | Table no.3.11 |
| 27. | Details on ground water quality. | Provided in Chapter no. 3 |
| | | Table no.3.12 |
| 28. | Details on existing ambient air quality and expected, stack and | The parameters given in |
| | fugitive emissions for PM10, PM 2.5, SO2* and other sulphur | Standard ToR for Cement |
| | compounds, NOx* and other nitrogen compounds, carbon | Industries published by |
| | oxides (CO and CO2) etc., and evaluation of the adequacy of the | MoEF&CC are monitored. |
| | proposed pollution control devices to meet standards for point | Details on existing ambient |
| | sources and to meet AAQ standards. (* - As applicable) | air quality is provided in |
| | | chapter no.2 Table no.3.5 and |
| | | expected incremental |
| | | emission is provided in |
| | | chapter no. 4 Table no.4.2 and 4.2 |
| | Detaile on other collectories also to be a site of the last | 4.5 |
| 29. | Details on other pollutants also to be considered in relation to | Ine parameters given in |
| | VOC polyphorizated diherradianing and diherradianing | Juductrian multiplied |
| | (PCDDs and PCDEs) metals and their someounds Higher | MoEE CC and manifested by |
| | (PCDDs and PCDFs), metals and their compounds, Hydrogen | MOEFACC are monitored |

| | Fluc | oride, Hydrochloric Acid (HCl), etc. | The proposed project does not |
|-----|----------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------|
| | | | include use of any secondary |
| | | | fuels, hence not applicable. |
| 30. | The | air quality contours may be plotted on a location map | Provided in chapter no.4 |
| | show | ving the location of project site, habitation nearby, sensitive | figure no. 4.1 to 4.5 |
| | rece | ptors, if any and wind roses. | |
| 31. | Che | mical characterization of RSPM data. | RSPM is not done, as per the |
| | | | Standard ToR for Cement |
| | | | Industries published by |
| | | | MoEF&CC PM ₁₀ and PM _{2.5} is |
| | | | monitored in place of RSPM. |
| 32. | Deta | ails on baseline data on silicosis in buffer and core zone. | The parameters given in |
| | | | Standard ToR for Cement |
| | | | Industries published by |
| | | | MoEF&CC are monitored. |
| 33. | Deta | ails on noise levels at sensitive/commercial receptors. | The baseline data to be |
| | | | collected is given chapter no.3 |
| | | | heading no. 3.3 Table no.3.7 |
| 34. | Site | -specific micro-meteorological data including mixing height. | Details are provided in |
| | | | chapter no. 3 heading no. |
| | | | 3.2.1 Table no.3.1, 3.2 and 3.3 |
| 35. | One | season site-specific data excluding monsoon season. | Details are provided in |
| | | | chapter no. 3 heading no. |
| | | | 3.2.1 Table no.3.1, 3.2 and 3.3 |
| 36. | Prop | bosed baseline monitoring network for the consideration and | - |
| 27 | appi | oval of the Competent Authority. | |
| 37. | Eco. | logical status (terrestrial and aquatic) of the study area such | Details are provided in |
| | as habitat type and quality, species, diversity, rarity, | | chapter no. 3 heading no. 3.6 |
| 20 | Irag | mentation, ecological linkage, age, abundance, etc. | Not appliable Details of |
| 38. | II a | ny incompatible land-use attributes fail within the project | Not applicable. Details of |
| | area | , proponent shall describe the sensitivity (distance, area and | 10 km radius are provided in |
| | significance) and propose the additional points based on | | chapter no. 1 Table no.1.2 |
| | Inco | micance for review and acceptance by the SEAC. | |
| - | | Public water supply group from rivers/surface water bodies | |
| | а. | from ground water | |
| | h | Scenic areas/tourism areas/hill resorts | |
| | 0. C | Religious places, pilgrim centers that attract over 10 lakh | |
| | С. | nilorims a year | |
| | d. | Protected tribal settlements (notified tribal areas where | |
| | | industrial activity is not permitted) | |
| | e. | CRZ | |
| | f. | Monuments of national significance, World Heritage Sites | |
| | g. | Cyclone, Tsunami-prone areas (based on last 25 years) | |

| | h. | Airport areas | |
|-----|--------|----------------------------------------------------------------|------------------------------|
| | i. | Any other feature as specified by the State or local | |
| | | government and other features as locally applicable, | |
| | | including prime agricultural lands, pastures, migratory | |
| | | corridors, etc. | |
| 39. | If e | cologically sensitive attributes fall within the project area, | No notified ecologically |
| | prop | onent shall describe the sensitivity (distance, area and | sensitive zone within 10 km |
| | sign | ificance) and propose the additional points based on | radius. |
| | sign | ificance for review and acceptance by the SEAC. Ecological | |
| | sens | itive attributes include: | |
| | a N | ational parks | |
| | b W | Vild life sanctuaries, Game reserve | |
| | c T | ger reserve/elephant reserve/turtle nesting ground | |
| - | d M | langrove area | |
| | e W | Vetlands | |
| | f R | eserved and Protected forests, etc. | |
| | g A | ny other closed/protected area under the Wild Life | |
| | (F | Protection) Act, 1972, any other area locally applicable | |
| 40. | If the | ne location falls in a valley, studies on specific issues | Project and nearby area is |
| | conr | nected to the natural resources management. | mostly flat land with slight |
| | | | undulations. |
| 41. | Iden | tification of CRZ area: A CRZ map duly authenticated by | Not applicable |
| | one | of the authorized agencies demarcating LTL(Low Tide | |
| | Leve | el), HTL (High Tide Level), CRZ area, location of the | |
| | proj | ect and associate facilities w.r.t. CRZ, coastal features such | |
| | as n | hangroves, if any. The route of the pipeline, etc., passing | |
| | thro | ugh CRZ, if any, should also be demarcated. | |
| | Reco | ommendations of the State Coastal Management Authority | |
| | for t | he activities to be taken up in the CRZ. | |
| | – I | Provide the CRZ map in 1:10000 scale in general cases and | |
| | iı | n 1:5000 scale for specific observations. | |
| | – I | Proposed site for disposal of dredged material and | |
| | e | nvironmental quality at the point of disposal/impact areas. | |
| | – Fi | sheries study should be done w.r.t. Benthos and Marine | |
| | 0 | rganic material and coastal fisheries. | |
| | Ant | icipated environmental impacts and mitigation measures : | |
| 42. | Anti | cipated generic environmental impacts due to this project | Anticipated environmental |
| | may | be evaluated for significance and based on corresponding | impacts and mitigation |
| | likel | y impacts Valued Environmental Components (VECs) may | measures are mention in |
| | be i | dentified. Baseline studies may be conducted for all the | chapter no. 4 |
| | cond | erned VECs and likely impacts will have to be assessed for | |
| | their | magnitude in order to identify mitigation measures. | |
| 43. | Imp | act prediction tools used for the appropriate assessment of | Details are provided in |
| | envi | ronmental impacts. | Annexure 8 |

| 44. | While identifying the likely impacts, also include the following | Details are provided in | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| | for analysis of significance and required mitigation measures: | Chapter no. 4 | | | |
| | a. Impacts due to transportation of raw materials and end | Given in Heading 4.3.2.2 | | | |
| | products on the surrounding environment | | | | |
| | b. Impacts on surface water, soil and groundwater | Given in Heading 4.3.3 & | | | |
| | | 4.3.4 | | | |
| | c. Impacts due to air pollution | Given in Heading 4.3.1 | | | |
| | d. Impacts due to odour pollution | - | | | |
| | e. Impacts due to noise | Given in Heading 4.3.2 | | | |
| | f. Impacts due to fugitive emissions | Given in Heading 4.3.1 | | | |
| | g. Impact on health of workers due to proposed project activities | Given in Heading 4.3.8 | | | |
| 45. | Proposed odour control measures | - | | | |
| 46. | Action plan for the greenbelt development – species, width of plantations, planning schedule, <i>etc.</i> , in accordance to CPCB published guidelines. | Greenbelt Development & Plantation Programme is provided in chapter no. 10 heading no.10.2.2 | | | |
| 47. | In case of likely impact from the proposed project on the surrounding reserve forests, Plan for the conservation of wild fauna in consultation with the State Forest Department. | No schedule I animal is found in the 10 km radius of the proposed project. | | | |
| 48. | Mitigation measures - for source control and treatment. | Mitigation measures for pollution control are provided in chapter no.4 | | | |
| 49. | Air quality modeling for the cement plant should be incorporated. Air pollution control system to be installed should be elaborated upon to control emissions within 50 mg/Nm3. | Air quality modeling is carried out and results are provided in chapter no.4 figure no. 4.1 to 4.4 and Table no.4.3 & 4.4. | | | |
| 50. | Details on rainwater harvesting at the cement plant site. | Details are provided in chapter no. 4 heading no.4.3.3.4 | | | |
| | Analysis of alternative resources and technologies: | | | | |
| 51. | Comparison of alternate sites considered and the reasons for selecting the proposed site. Conformity of the site with the prescribed guidelines in terms of CRZ, river, highways, railways, etc. | No alternative site was considered. The site selection criteria are given in Chapter 5. | | | |
| 52. | Details on improved technologies. | Provided in chapter no.5 | | | |
| | Environmental monitoring program: | | | | |
| 53. | Specific programme to monitor Nickel and Vanadium emissions be included, incase of use of pet- coke. | Not applicable as no petcoke is being used. | | | |
| 54. | An action plan to control and monitor secondary fugitive emissions as per the CPCB guidelines. | Environmental Monitoring program is given in chapter no.6 Table no.6.1 | | | |

| 55. | Monitoring programme for pollution control at source | Environmental Monitoring program is given in chapter no.6 Table no.6.1 |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 56. | Monitoring pollutants at receiving environment for the appropriate notified parameters – air quality, groundwater, surface water, gas quality, <i>etc.</i> during operational phase of the project. | Environmental Monitoring program is given in chapter no.6 |
| 57. | Specific programme to monitor safety and health protection of workers | Occupational Health And Safety details are provided in chapter no.6 heading no. 6.3 |
| 58. | Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs. | - |
| 59. | Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring. | Environmental Management Cell is shown in chapter no. 6 heading no. 6.2.1 Figure no. 6.1 |
| | Additional studies: | |
| 60. | Clearances/approvals from the IBM and State government for the linked mining component. | Not applicable |
| 61. | Details on risk assessment and damage control during different phases of the project and proposed safeguard measures. | Details are provided in chapter no. 7 |
| 62. | Details on socio-economic development activities such as commercial property values, generation of jobs, education, social conflicts, cultural status, accidents, etc. | Details are provided in chapter no. 8 |
| 63. | Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as far as possible. | Details are provided in chapter no. 8 |
| 64. | Details on compensation package for the people affected by the project, considering the socio-economic status of the area, homestead oustees, land oustees, and landless labourers. | There will be no project affected people. As the proposed project will be located in notified Industrial area. Additional income source will be generated die to proposed project in nearby villages. |
| 65. | Points identified in the public hearing and commitment of the project proponent to the same. Detailed action plan addressing the issues raised, and the details of necessary allocation of funds. | Points identified in the public hearing and commitment of the project proponent to the same with time bound action plan and budgetary allocation will be included after the conduction of Public Hearing. |
| 66. | Administrative and technical organizational structure to ensure proposed post-project monitoring programme for approved | Environmental Management Cell is shown in chapter no. 6 |

| | mitigation measures. | heading no.6.2.1 Figure no. |
|-----|-----------------------------------------------------------------|-----------------------------|
| | | 6.1 |
| 67. | EMP devised to mitigate the adverse impacts of the project | Budget Allocation For |
| | should be provided along with item-wise cost of its | Environmental Monitoring is |
| | implementation (Capital and recurring costs). | shown in chapter no.6 Table |
| | | no.6.2 |
| 68. | Allocation of resources and responsibilities for plan | Details are provided in |
| | implementation. | Chapter no. 6 |
| 69. | Details of the emergency preparedness plan and on-site and off- | Details are provided in |
| | site disaster management plan. | Chapter no. 7 |

Maharashtra Industrial Development Corporation

(A Government Of Maharashtra Undertaking)

Tel: 02562-239030, Fax: 02562-281030 E-mail: rodhule@midcindia.org Regional Office, Dhule Opp. Sub-Division Office, MIDC, Addl. Dhule MIDC, Avadhan, DHULE - 424006

Letter No.:MIDC/RO(DHL)/NAR/LMS-353/ 4435 Date: 28 SEP 2015

Subject :- NARADHANA INDUSTRIAL AREA

Plot No. 3 Allotment of Land

:ORDER:

Sanction is hereby accorded to the allotment of land admeasuring 256400 Sq. Mts. at the rate of Rs. 75/- per Sq. Mts. Comprising of Plot No. 3 in NARADHANA INDUSTRIAL AREA to M/S ULTRATECH CEMENT LIMITED a Company incorporated under the Companies Act-1956 and having its registered office at B-WING, AHURA CENTRE, 2ND FLOOR, MAHAKALI CAVES ROAD, ANDHERI (E), MUMBAI for setting up your industrial unit for manufacturing of GREENFIELD CEMENT GRINDING UNIT subject to the payment of the premium of 20191500/- (Rs.Two Crore One Lakh Ninety One Thousand Five Hundred) (including 5% additional charge for road having 30 Mtr. road width i.e. 19230000* 5% = Rs.961500 as additional charges) and subject to the following conditions.

1. The amount of earnest money received with the application will be appropriated towards the amount of premium. The allottee shall pay the sum of Rs. 15384000/- (Rs. One Crore Fifty Three Lakh Eighty Four Thousand Only) balance amount of the premium within a period of 30 days from the date of receipt of this order, by DD, drawn in favor of EXECUTIVE ENGINEER MIDC, Dhule Payable at Dhule

2. In case the allottee fails to pay the balance amount of premium within a period mentioned above (period of 30 days from the date of receipt of allotment order), the allotment shall be liable to be cancelled without further notice.

3. In the event of the allotment being cancelled as aforesaid the corporation shall forfeit the whole of the earnest money received with application.

4. The terms & conditions of allotment of land will be those contained in the standard form of Agreement to Lease and the lease annexed thereto & in substance are as follows.

a) The allottee shall enter into an Agreement to Lease in the form prescribed by Corporation & on performance of the conditions will be entitled to lease for the term of ninety five (95) years to be computed from the date of execution of the Agreement to Lease and renewable for one further term of 95 years on payment of premium and on such terms and conditions as may be determined by the Corporation at the time of renewal.

b) The annual ground rate rent of Rupee 1/- per annum is payable in respect of the plot of land allotted.

c) The allottee shall get the plan and specification of the proposed factory building duly approved from the Executive Engineer of the said Industrial area and complete the said building in accordance



with approved plans and shall obtain a Building Completion Certificate (B.C.C) from the Executive Engineer of the said industrial area within a prescribed period.

d) The allottee shall not directly or indirectly transfer or assign the benefits of interest in the Agreement to Lease or part with possession of the land or any part there of without previous consent of the Corporation who may refuse or grant it subject to such condition as the Corporation may think fit including a condition for payment of additional premium.

e) The allottee shall be entitled to use land for the purpose of a factory but not for the purpose of a factory for any of the obnoxious industries specified in the annexure set out in for any other purpose and not for the purpose of any factory which may be obnoxious, offensive by reason of emission of odor, liquid effluvia, dust, smoke, gas, nuisance, vibration or fire hazards.

f) The other terms and conditions of allotment shall be those contained in the prescribed form of Agreement to Lease and the Lease.

g) The stamp duty in respect of preparation & execution of the Agreement to Lease & its duplication as also the Lease & its duplication in respect of the allotted plot of land as also the legal costs for the preparation and execution of these documents including the registration fees shall be borne and paid by the allottee alone.

h) If there any encroachment on the plot the same should be removed by you, at your own risk and cost.

i) Please note that if MSEB's line is passing through your plot, you will have to shift the line at your own cost and risk, also concern with MSEB and Telephone Department.

j) In case any changes after final measurement of plot area and if the area is found to be increased the charges towards excess area, shall be recovered as per prevailing rate at that time.

k) The infrastructure of water supply is provided by MIDC, considering the water requirement of your plot at the rate of the 25 m3 per hect. Per day. For the requirement in excess of 25 m3 per Hect. Per day of your plot, you will be required to pay the capital contribution at rate of Rs.15,000/- per m3 or the actual rate of capital contribution of water supply scheme of the industrial area whichever in more.

1) You will have to obtain a clearance from Maharashtra Pollution Control Board before commencing the Production.

The allottee may submit his application to the concern telephone & electricity authority immediately, after taking over the possession of the plot. This will enable the concern authorities to build up a waiting list & ensure proper planning to provide timely telephone & electric connection to the industrial units in the area. Please note that, MIDC is not responsible for supplying electricity. Hence, you should ensure the availability of such infrastructure with concerned MSEDCL authorities.

Please also note that AtoL will be signed with you within 30 days from the date of payment of balance amount of plot.

Special Conditions (If Any) : i. The land to be allotted to you on as is where is basis and MIDC will not be responsible about the nature of land. ii. You will have to develop all the internal infrastructure in your plot like Water Supply, Approach Road, Solid Waste Disposal and Effluent Treatment etc. at your own cost and responsibility. The MIDC will not be responsible for any of these infrastructure facilities within the internal area of the plot.



iii. Please note that if, the natural nalla is passing through your plot. Hence you will have to make a planning of construction of factory building as per D.C. Rules of MIDC without disturbing this nalla, If it is necessary to divert the nalla at another location in your plot, then it should be done at your own risk & cost and in consultation with SPA of MIDC.

Regional Officer, MIDC, DHULE.

To,

- X. M/S ULTRATECH CEMENT LTD. B-WING AHIRA CENTRE, 2ND FLOOR, MAHAKALI CAVES ROAD, ANDHERI (E), MUMBAI.
- 2. THE GENERAL MANAGER DIC DHULE.
- 3. THE EXECUTIVE ENGINEER MIDC DHULE.



Maharashtra Industrial Development Corporation

(A Government Of Maharashtra Undertaking)

Tel: 02562-239030, Fax: 02562-281030 E-mail: rodhule@mideindin.org Regional Office, Dhule Opp. Sub=Division Office, MIDC, Addl. Dhule MIDC, Avadhan, DHULE - 424006

Letter No.:MIDC/RO(DHL)/NAR/LMS-1/ 1006 Date: 31 3 2016

To,

MS ULTRATEACH CEMENT LITD

Subject :- NARADHANA INDUSTRIAL AREA-PHASE-1 Offer of land Read :- Letter dated 27/02/2015

Sir/Madam,

Please refer to your application dated 27-FEB-2015 for plot in NARADHANA INDUSTRIAL AREA-PHASE-1 for manufacturing of items as per the details contained in the application.

2. Your application has been scrutinized by Land Allotment Committee of the Corporation and has decided to offer you land admeasuring 4637 Square Meters. On this date of issue of "OFFER LETTER" for land, the rate of premium for land applicable is Rs.100/- (Rs.One Hundred Only) per Sq.Meter. You are hereby requested to submit the enclosed "BLUE APPLICATION" duly completed in all respects with Demand Draft of: Rs.115925/- (Rs.One Lakh Fifteen Thousand Nine Hundred Twenty Five Only) towards the earnest money within 15 days from the date of receipt of this letter.

Please note that non-receipt of Blue application duly completed and/or payment of Earnest Money Amount by demand draft within the stipulated period, the application shall be rejected summarily.

3. The rate of premium payable in respect of the land in this area is Rs.100/- (Rs.One Hundred Only) per Sq. Meters. If you are fail to deposit the Earnest Money Deposit(EMD) within 15 days from the date of this Offer Letter, the revised rate of Premium, if any, will be applicable. However, this offer is subjected to Regulation No.9 of MIDC Disposal of Land Regulations, 1975.

4. If the plot which may be finally allotted to you in this industrial area is facing Road having width between 20.0 M to 30.0 M then you will have to pay 5% additional premium, else if Road having width between 30.0 M to 45.0 M then you will have to pay 10% additional premium, else if more than 45.0 M then you will have to pay 15% additional premium over and above the usual premium applicable to the respective industrial area at the time of allotment. Moreover you will have to obtain neccessary permission from concerned competent authorities before you start constuction on such plot allotted to you.

5. If the plot which may be finally allotted to you in this industrial area contains any fencing or tree plantation or any such development carried out by the Corporation prior to allotment, you are required to pay to the Corporation the cost of such development which will be in addition to the

Page 1 of 3

premium mentioned above and the amount payable on this account will be communicated to your separately alongwith the allotment order.

6 The amount referred in paragraph 2 should be puid by a Bank D.D. Drawn in favor of the EXECUTIVE ENGINEER, MIDC, Dhule, payable at Dhule

Application received without D.D./Payorder will not be entertained.

7 In case, you fail to accept the final allotment after it is communicated to you or fail to pay the balance of premium amount or to execute the Agreement to Lease, the Corporation shall forfeit the entire amount of Earnest Money.

8. The Corporation reserves the right to reject your application all together without assigning any reason.

9. This offer for land given in this letter is valid only for 15 days from the receipt of this letter during which Earnest money deposit can be accepted by demand draft by this office along with t. Blue application duly completed. At the end of 15 days this offer letter stands lapsed and no further correspondence in this connection will be entertained thereafter.

10. You will have to obtain a clearance from Maharashtra Pollution Control Board before commencing the Production.

11. You will have to obtain IEM from Govt. of India

12. You will have to obtain clearance from MOEF, Govt. of India and E.C. from state level export appraisal Committee before starting Production.

13. You will have to produce an Undertaking on **Rs.100/-** Stamp Paper, duly notarized, stating that effluent if generated, shall be properly treated in your own ETP and treated effluent shall be recycled for the tree plantation, gardening, etc.

14. You should become member of C.E.T.P. after construct by M.I.D.C. in NARADHAN INDUSTRIAL AREA-PHASE-1.

15. You should contact the authorized person of concerned Department for connection and installation of Elecricity/Telephone.

Page 2 of 3

Cher

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16. You have to produce an Affidavit, to be typed on Rs.100/- Stamp Paper, regarding commencing if building construction with in 6 months and if fail, Corporation is authorized to take back the possession of Plot

17. If there any encroachment on the plot the same should be removed by you, at your own risk and cost.

18. Please note that if MSEB's line is passing through your plot, you will have to shift the line at your own cost and risk, also concern with MSEB and Telephone Department.

19. In case any changes after final measurement of plot area and if the area is found to be increased the charges towards excess area, shall be recovered as per prevailing rate at that time

20. The infrastructure of water supply is provided by MIDC, considering the water requirement of your plot at the rate of the 25 m3 per hect. Per day. For the requirement in excess of 25 m3 per Hect. Per day of your plot, you will be required to pay the capital contribution at rate of Rs.15,000/- per m3 or the actual rate of capital contribution of water supply scheme of the industrial area whichever in more.

Special Conditions (If Any) : a) The land offered to you on as is where is basis and MIDC will not be responsible about the nature of land. b)The demarcation of the land is to be carried out and executed by you, at your own cost and own responsibility. c)You are also abide to follow all the laws, rules and regulations of the MIDC and by the State Government of Maharashtra which will be implemented from time to time in future. d) As Approved in the LAC Meeting dated 18/03/2016.

Yours faithfully Regional Officer KMIDC, DHUI 51313112

Encl: 1. Application Form (Blue Form)

| - सूची - २) | | |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| | | F |
| 08/10/2018 | सूची क्र.2 | दुय्यम निबंधक : दु.नि. सिंदखेड दस्त क्रमांक : 3853/2018 |
| | | नोदंणी : Regn:63m |
| · · · | गावाचे नाव : नरडाणा | |
| (1)विलेखाचा प्रकार | भाडेकरार | |
| (2)मोबंदला | 20678400 | |
| (3) बाजारभाव(भाडेपटटयाच्या बावतितपटटाकार आकारणी देतो की पटटेदार ते नमुद करावे) | 20678400 | |
| (4) भू-मापन,पोटहिस्सा व घरक्रमांक (असल्यास) | 1) पालिकेचे नावःधुळे इतर वर्णन :, इतर माहि एरीयातील प्लॉट नं 3 ये क्षेत्र 261057.00 चौ | तीः भौजे नरडाणा एम.आय.डी.सी.वाघोदे मी.((Plot Number : 3 ;)) |
| (5) क्षेत्रफळ | 261057.00 चौ.मीटर | |
| (6)आकारणी किंवा जुडी देण्यात असेल तेव्हा. | | _ |
| (7) दस्तऐवज करुन देणा-या/लिहून ठेवणा-या पक्षकाराचे नाव किंवा दिवाणी न्यायालयाचा हुकुमनामा किंवा आदेश असल्यास,प्रतिवादिचे नाव व पत्ता. | 1): नाव:-मे.अल्ट्राटेक सिमेंट लि.चे तर्फे श्री.वि -, माळा नं: -, इमारतीचे नाव: -, ब्लॉक नं: -, पिन कोड:-303108 पॅन नं:- | जयकुमार छाबरा वयः-50; पत्ताः-प्लॉट नं: रोड नं: मोहनपुरा,जयपुर, राजस्थान, JAIPUR. |
| (8)दस्तऐवज करुन घेणा-या पक्षकाराचे व किंवा दि्वाणी न्यायालयाचा हुकुमनामा किंवा आदेश असल्यास,प्रतिवादिचे नाव व पत्ता | 1): नाव:-नरडाणा एम.आय.डी.सी.एरीया मॅनेज प्लॉट नं: -, माळा नं: -, इमारतीचे नाव: -, ब्ल DHULE. पिन कोड:-425404 पॅन नं:- | र श्री.महेंद्र डी.पटेल(मालक) वय:-38; पत्ता:- ॉक नं: -, रोड नं: नरडाणा ता.शिदखेडा, महाराष्ट्र, |
| (9) दस्तऐवज करून दिल्याचा दिनांक | 24/09/2018 | |
| (10)दस्त नॉदणी केल्याचा दिनांक iSarita v1.7.0 | 08/10/2018 | RSHREN |
| 15atia v1.7.0 | # Firedest * | |

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| Index-2(सूची - २) | | | |
|-------------------------------------|-----------|--|--|
| (11)अनुक्रमांक,खंड व पृष्ठ | 3853/2018 | | |
| (12)बाजारभावाप्रमाणे मुद्रांक शुल्क | 400 | | |
| (13)बाजारभावाप्रमाणे नोंदणी शुल्क | 30000 | | |
| (14)शेरा | | | |
| | | | |

-मुल्यांकनासाठी विचारात घेतलेला तपशील:-:

मुंद्रांक शुल्क आकारताना निवडलेला अनुच्छेद :- : 🔹

If relating to Order of High Court W.R.T. amalgamation or reconstruction of companies under section 394 of Companies Act 1956 or under the order of Reserve Bank of India under section 44A of the Banking Regulation Act 1949.



910 दुय्यम निबंधक श्रेणी -9 शिंदखेडा.



iSarita v1.7.0



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CHALLAN MTR Form Number-6



| | | | III Dat | Date 08/10/2018-16:01:25 Form ID | | | | | | | |
|------------------------------------------|-----------------------------------|-------------------------------------------|------------------------------------|----------------------------------|------------------|-------|------|-------|----------|----------|--|
| Department Inspector General C | Payer Details | | | | | | | | | | |
| Registration Fees | | TAX ID (If A | (ny) | | | | | | | | |
| Type of Payment Ordinary Collections IGR | | | PAN No.(It Applicable) AAACL6442L | | | | | | | | |
| Office Name SKD_SINDKHED SUB REGISTRAR | | Full Name | Full Name ULTRATECH CEMENT LIMITED | | | | | | | | |
| Location DHULE | | | | | | | | | | | |
| Year 2018-2019 One Tin | ne | | Flat/Block | No. | PLOT NO. 3 NARI | DANA | MIDO | NAF | | 4 | |
| Account Head De | tails | Amount In Rs. | Premises/B | uliding | | | | | | | |
| 0030063301 Amount of Tax | 0030063301 Amount of Tax 30000.00 | | Road/Street 261067 | | | | | | | | |
| | | | Area/Locali | ity | SINDKHED | | | | | | |
| | | | Town/City/ | District | | | | | | | |
| | | | PIN | | | 4 | 2 | 5 | 4 | 0 6 | |
| | | | Remarks (I | f Any) | | | | | | | |
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| | | | Amount in | Thirty Th | ousand Rupees Or | ily | | | | | |
| Total | | 30,000.00 | Words | | | | | | | | |
| Payment Details BANK OF BARODA | | FOR USE IN RECEIVING BANK | | | | | | | | | |
| Cheque | -DD Details | | Bank CIN | Ref. No. | 02003942018100 | 08007 | 67 9 | 74328 | 52 | | |
| Cheque/DD No. | | | Bank Date | RBI Date | 08/10/2018-16:03 | 3:02 | N | ot Ve | rified v | vith RBI | |
| Name of Bank | Name of Bank | | Bank-Branch BANK OF BARODA | | | | | | | | |
| Name of Branch | | Scroll No., Date Not Verified with Scroll | | | | | | | | | |

Department ID : NOTE:- This challan is valid for document to be registered in Sub Registrar office only. Not valid for unregistered document सदद चलन केवळ दुख्यम निबंधक कार्यालयात नोदणी करावयाच्या दस्तांसाठी लाग आहे - नोदणी न करावयाच्या त्यात्साठी सद नाही -8722804650 खेलन लागु



Print Date 08-10-2018 04:02:53

Department of Stamp & Registration, Maharashtra

| Receipt of Document Handling Charges | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|------------|--|--|--|--|--|--|--|
| PRN | 0810201907031 | Date | 08/10/2018 | | | | | | | |
| Received from ALTRATEK CIMENT LI FOR VIJAYKUMAR CHABRA, Mobile number 8722804650, an amount of Rs.980/-, towards Document Handling Charges for the Document to be registered(iSARITA) in the Sub Registrar office S.R. Sindkhed of the District Dhule. | | | | | | | | | | |
| Bank Name | SBIN | Date | 08/10/2018 | | | | | | | |
| Bank CIN | 10004152018100805521 | REF No. | IGAENIKYN2 | | | | | | | |
| This is computer generated receipt, hence no signature is required. | | | | | | | | | | |



Received Adjudication fee (Rs.100/-)
 Vide challan No./Receipt No. 7415993 Dated- 09/07/2018.



Certificate u/s 32 (2) of the Bombay Stamp Act, 1958.

24-09 EVN/5200900/07-18/ /2018 Office of the Collector of Stamps, Dhule, Date 18 03/2018

avange)

Collector of Stamps,

Certified under Section 32 (2) of The Bombay Stamp Act. 1958 that this instrument not chargable with stamp duty because Government Notification No. Stamp-2013/UDR No. 19/CR 235 (2) M-1 Dated 14/05/2013 & Stamp-2013/UDR No. 19/CR 235 Mi-1 Dated 18/07/2018.

This Certificate is subject to the provision of section 53 (A) of The Bombay Stamp Act. 1958.

Valuation Rs. 2,06,78,400/-

Place : DHULE. Date 20/08/2018.

- 7



Dhule "बरील प्रमाणपत्र हे मुंबई मुद्रांक अधिनियम १९५८ अन्वये असलेल्या नियमान्वये निर्गमित केलेले आहे. परंतु उक्त दस्त नोंदणीसाठी नोंदणी अधिकाऱ्यासमोर दाखल झाल्यास, नोंदणी अधिनियम १९०८ च्या अधिनियमातील तरतूदीनुसार नोंदणी अधिकारी दस्त नोंदणींची कार्यवाही करतील."

Collector of/Stamps, Dhule

श्री. के आर दवंगे, मुद्रांक जिल्हाधिकारी, धुळे यांचे कडील, मुबंई मुद्रांक अधिनियम १९५८ चे अंतर्गत कलम ३१ खालील प्रकरणांतील आदृष्ट्र (स्पिकिंग ऑर्डर)



प्लॉ.नं. ०३, एम.आय.डी.सी., नरडाणा इंडस्ट्रिज् वसाहत फेज-१, नरडाणा, ता. शिदखेडा, जि.धुळे

> विषय :- मौजे नरडाणा, ता. शिंदखेडा, जि.धुळे, नरडाणा एमआयडीसी औदयोगीक वसाहतीतील प्लॉट क्र. ३ क्षेत्र २६१०५७ चौ.मी. या मिळकतीचा भाडेपट्टा हस्तांतरण संलेख आंभार्ताणत करणेबाबत.

संदर्भ :- १) आपण दि. ०९/०७/२०१८ रोजी दाखल केलेले अभिनिर्णय प्र.क्र. ०७/२०१८.

- २) या कार्यालयाचे पत्र जा.क्र.कक्ष-३/मु.शु. मार्फी/प्रमाणपत्र/२२४८/२०१८ दि. ३१/०७/२०१८
- ३) जिल्हा उद्योग केंद्र धुळे यांचेकडील जा.क्र.जिउकेंधु विशाल/साप्रोयो-२०१३/२०१८/ २६६९ दिनाक १३/०८/२०१८ रोजीचे पत्र.

महाशय,

वरील संदर्भिय विषयान्वये प्रस्तुत अर्जासोबत प्राप्त कागदपत्रे व दस्तऐवजांचे अवलोकन केले असता प्राप्त भाडेपट्टयाच्या दस्तऐवजात नमुद मिळकत ही मौजे वाघोदे, प्लॉट नंबर ३ चे क्षंत्र २,६१,०३७ चौ.मी.. अर्शा असून महाराष्ट्र औद्योगिक विकास महामंडळ यांचे मालकीची आहे. एमआयडींसी यांनी सदरचा प्लॉट नंबर ३ हा आपत्या उद्योग घटकासाठी वाटप केलेला आहे. यास्तव महाराष्ट्र मुद्रांक आंधानयम १९५८ मधाल तरतुदीनुसार सदर करारनाम्यास आवश्यक असलेले मुद्रांक शुल्क वसुल करणे आवश्यक आहे.

महाराष्ट्र औद्योगिक विकास महामंडळ ही राज्य शासनाची संस्था असल्याने. (मुंबई मुद्रांक (संपत्तीचे वास्तविक मूल्य) आणि विक्री नियम १९९५ चे नियम ४(६) चे परंतुकानूसार) ज्या व्यक्तीस अथवा संस्थेस प्लॉट/गाळा वितरीत केला असेल, त्याचेशी प्रथम करार अथवा प्रथम कराराच्या अनुषंगाने भाडेपट्टा करन दिल्यास. त्यामधील प्रिमियमची रक्कम ही संबंधित प्लॉट/गाळयाचे खरे बाजारभावमुल्य म्हणून ग्राह्य धरणे आवश्यक असल्याने भाडेपट्टयाच्या दस्तऐवजात नमुद प्रिमीयम/मोबदला ची रक्कम रु २,०६,७८,४००/- इतकी नमुद असल्याने हीच रक्कम मुल्यॉकन म्हणून ग्राह्य धरुन मुंबई मुद्रांक अधिनियम १९५८ चे अंतर्गत अनुच्छेद ३६(iv) अन्वये सदर मिळकत मौजे वाघोदे ग्रामिण क्षेत्रातील असल्याने उक्त अनुच्छेदात तरतुद केले नुसार उक्त अधिनियमाच्या अनु २५(ब) प्रमाणे सदरील मुल्यांकन रक्कमंवर ४% = ८,२७,२००/- इतके मुद्रांक शुल्क अर्जदार यांनी सादर केलेल्या भाडेपट्टा संलेखास आकारणे आवश्यक आहे.

परंतु आपण मा. अतिरीक्त उद्योग संचालक, मुख्य कार्यालय. मुंबई यांचेकडील गय क्र. No.DI/HO/PSI-२०१३/SDEC/Dhule/Mega/New/०९६२४/२०१८/В-७०४४ दिनांक १९/०६/२०१८ सोबत सादर केलेले आह. त्याअनुषंगाने मा. अतिरीक्त उद्योग संचालक, मुख्य कार्यालय, मुंबई यांचेकडील पत्राचं अवलोकन केले असना सदर करारनामा भाडेकराराचे (Agreement to Lease) नविन उद्योग घटक म्हणुन प्रमाणित केलेला आहे. परंतु सदरच्या प्रमाणपत्राची वैधता पडताळणीसाठी या कार्यालयाने संदर्भ क्र.२ अन्वये मा. जिल्हा उद्योग केंद्र, धुळे यांचेकडे पत्र सादर Dr2-STPStamp Casesta d J noting/Conversion Cases 2014 Doc
केलेले होते. त्यानुसार त्यांनी सदर प्रमाणपत्र वैध असलेबाबत संदर्भ क्र.३ अन्वये कळविले आहे. सदर करारनामा महाराष्ट्र मुद्रांक अधिनियम १९५८ चे अनुच्छेद ३६ मध्ये मोडतो व त्यास जिल्हा उद्योग संचालनालय यांचेकडुन अनुच्छेद ३६ प्रमाण भाडेपट्टा करार निष्पादित करणेसाठी प्रमाणपत्र देण्यात आले आहे. त्याअनुषंगाने सामुहित प्रोत्साहन योजना अंतगंत महाराष्ट्र शासन राजपत्र क्र. मुद्रांक -२०१३-अनौ.सं.क्र.-१९- प्र.क्र.२३५-म-१ दिनांक १८/०७/२०१८ अन्वये सामुहिक प्रोत्साहन योजना -२०१३ यांत दिनांक ३०/०९/२०१८ पर्यंत अथवा नबीन धोरण अंमलात येइंपर्यंत बाढ केलेली आहे. म्हणुन संदर करारनाम्यास मुद्रांक शुल्क आकारणीपासुन संवलत देण्यात येत आहे.

त्यानुसार मुंबई मुद्रांक अधिनियम १९५८ चे परिशिष्ठ १ चे अनुच्छेद ५ (ह) नुसार करारनामा करोता **रु.१००/-** इतके मुद्रांक शुल्क आवश्यक आहे. तसेच दि.७/०५/२००५ रोजीच्या राज्य शासनाचा आदेश सन २००५ चा महाराष्ट्र अध्यादेश क्र.०२ सुधारणा अन्वये मुंबई मुद्रांक अधिनियम १९५८ चे अनुच्छेद २७ अन्वये जादा प्रती प्रमाणीत करुन देणे करीता जादा प्रतनिहाय रु.१००/- प्रमाणे एकुण तीन जादा प्रतीचे रु. ३००/- <u>इतके मुद्रांक शुल्क सदर दस्तास आकारावे</u> लागेल. तसेच असे एकुण ३००/- + १००/- = <u>४००/-</u> इतके मुद्रांक शुल्क आवश्यक आह.

म्हणजेच आपणांस वरील ४००/- इतके आवश्यकआहे.

वरिल प्रमाणे मिळकतीचे मुल्यांकन व मुद्रांक शुल्क मान्य असल्यास किंवा नसल्यास हे पत्र प्राप्त होताच लेखी खुलासा सात दिवसांच्या आत सादर करावा. तसेच मान्य असल्यास वरिल प्रमाणे मुद्रांक शुल्काचा भरणा ग्रास प्रणालीद्वारे अभिनिर्णय प्रकरणांतील मुद्रांक शुल्क ००३००५१७०१ या शिर्षाखाली सदर रक्कमेचा भरणा या कार्यालयाच्या नावाने शासन जमा करण्यात यावे व एक प्रत या कार्यालयास सादर केल्यानंतर उपरोक्त अधिनियमा अंतर्गत कलम ३२ नुसार सदर दस्तऐवज प्रमाणित करण्यात येईल.



२/- महाशय, आपणांस वरील आदेश मान्य नसल्सास खालील कार्यालयाकडे ६० दिवसांचे आत अपिल दाखल करु शकता.

अपिलीय अधिकारी :- मा. नोंदणी उपमहानिरीक्षक व मुद्रांक उपनियंत्रक, नाशिक विभाग, नाशिक पत्ता :- नविन प्रशासकिय इमारत, नियोजन भवन, दुसरा मजला जिल्हाधिकारी कार्यालय आवार, नाशिक



D.\2-STP\Stamp Cases\a d | noting\Conveyence Cases 2013.Doc

Page (90 of 190



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| - | GRN MHO | 05284016201819E | BARCODE | EL LING O AL L INGD A OR H ELL LI EL C | HAN KAN KANA KU MU IN | illi Dat | e 21/08/2018-16:12:08 | Fam 10 | |
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| | Department Inspector General Of Registration | | | | | Payer Details | | | |
| - ' | Payment of Stamp Duty in Adjudication Case Type of Payment Stamp Duty in Adjudication Case | | | | | ny) | | | |
| | | | | | | PAN No.(# Applicable) AAACL5442L | | | |
| | Office Name DUD_JT DISTRICT REGISTRAR DHULE | | | | Full Name | | UltraTech Cement LIMITED Dhule Unit | | |
| | Location DHULE | | | | | | | | |
| | Year 2018-2019 One Time | | | | | No. | | | |
| S. | Account Head Details Amount In | | | Amount In Rs | Premises/Building | | | | |
| -00 | 009005170 | Stamp Duty | | 40 0.0 | 0 Road/Stree | t | | | |
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| Contraction of the local division of the loc | | | | | PIN | | | | |
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| | | | | | SecondPart | SecondPartyName≂MIDC REGIONAL | | | |
| | · | | | | DHULE-Ad | ulcationCa | lseNo.≃07/2018 | | |
| ~ | | | | | | | | | |
| LEC | | | | | | | | | |
| N | 20 | | | | Amount In | Four Hu | ndred Rupees Only | | |
| ALC: NO | Total | | | 400.0 | abroW 0 | | | | |
| IN Dist. | Payment Details BANK OF BARODA | | | | FOR USE IN RECEIVING BANK | | | | |
| 1 | Cheque-DD Details | | | | | Ref. No. | 0200394201808210090 | 94475950 | |
| -+) | grieque/DD No. | | | | Bank Date | RBI Date | 21/08/2018-16:13:36 | Not Vetilied with RBI | |
| | Name of Bank | (| | Bank-Branc | h | BANK OF BARODA | | | |
| | Name of Branch | | | | Scroll No. , | Date | Not Verified with Scroll | | |

Department ID : NOTE:- This chaftan is valid for reason mentioned in Type of payment only. Not valid for other reasons or unregistered document सदर चलन "टाइए ऑफ पेकेंट" सध्ये नमुद कारणासाठीच लागु आहे.इतर कारणांसाठी किंवा नोदणी न करावयाच्या दस्तांसाठी लागु नाठी.



Print Date 21-58-2518 04:13:33

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CHALLAN MTR Form Number-6



| GRN MHO | 05284016201819E | BARCODE | II)(M) I)I (IM)(I KIN)) M(I II M) (I II | SCOM OPERATION IN T | HII Dat | e 21/08/2018-16 12 08 f | Form ID | | |
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| Department Inspector General Of Registration | | | | | Payer Details | | | | |
| Payment of Stamp Duty in Adjudication Case Type of Payment Stamp Duty in Adjudication Case | | | | | Any) | | | | |
| | | | | | Applicable) | AAACL5442L | | | |
| Office Name DUD_JT DISTRICT REGISTRAR DHULE | | | | | | UltraTech Cement LIMITED Dhule Unit | | | |
| Location | Location DHULE | | | | | | | | |
| Year 2018-2019 One Time | | | Flat/Block No. | | | | | | |
| Account Head Details | | | Amount In Rs. | Premises/E | Building | | | | |
| 0030051701 | Stamp Duty | | 400.00 | Road/Stree | Road/Street | | | | |
| COR | | | | Area/Local | ity | | | | |
| - 9/ | | 41 | | Town/City/ | District | | | | |
| 1 | | | | PIN | | | | | |
| OLLECTO | | | | Remarks (If Any) SecondPartyName=MIDC REGIONAL OFFICE | | | | | |
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| Serve | | | | | | | | | |
| ₹400.00 | ISIN | | | | | | | | |
| | | | | Amount In Four Hundred Rupees Only | | | | | |
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| Payment Details BANK OF BARODA | | | | FOR USE IN RECEIVING BANK | | | | | |
| Cheque-DD Details | | | | Bank CIN | Ref No | 0200394201808210090 | 1 94475950 | | |
| Cheque/DD No | 0. | | | Bank Date | R8I Date | 21/08/2018-16:12:08 | 23/08/2018 | | |
| Name of Bank | | | Bank-Branch BAN | | BANK OF BARODA | JANK OF BARODA | | | |
| Name of Branch | | | Scroll No., Date 1.23/08/2018 | | | | | | |

Department ID : Mobile No. 8722804650 NOTE:- This challen is valid for reason mentioned in Type of payment only. Not valid for other reasons or unregistered document सदर: चलन "टाइप ऑफ पेर्केट" अध्ये लभुद कारणासाबीच लागु आहे .इतर कारणासाबी किंगा लोदेणी ले फलवसारसा दरन्मवाठी लागु आहे .

Challan Defaced Details

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| Sr. No. | Remarks | Defacen | ment No. | nt No. Defacement Date | | Defacement Amount | | |
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| 1 | 69.6 | 00028010 | 2201819 | 24/08/2018-11 48:15 | IGR310 | 400.00 | | |
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GOVERNMENT OF MAHARASHTRA

DIRECTORATE OF INDUSTRIES

उदयोग संचालनालय

NO. DI/HO/PSI-2013/SDEC/Dhule/Mega/New/09524/2018 /B->044 दिनांक:19/06/2018

<u>प्रमाणपत्र</u>

M/s. UltraTech Cement Limited, हा उदयोग घटक Nardane, तालुका - Sindkhede, जिल्हा - Dhule (एकूण जमीन क्षेत्र 251057 चौ.मी.) येथै नवीन उद्योग प्रस्थापित करीत आहे. सदर घटकास महाराष्ट्र मुद्रांक शुल्क अधिनियम-१९५८ अंतुर्गत शासन अधिसूचना क्र. मुद्रांक- २०१३/अनौ सं.क्र.१९/प्र.क्र.२३५/म-१, दिनांक १४.०५.२०१३, व क्र. मुद्रांक-2013/अनौ सं.क्र.19/ प्र.क्र.235(2)/म-1, दिनांक 4/09/2013 व त्यानंतरचा आदेश दिनांक 16/10/2017 अंतर्गत अनुसूचीतीन अनुक्रमांक १ नुसार "जवीन उद्योग घटक" म्हणून प्रमाणित करण्यात येत आहे.

सदर मुद्रांक शुल्क सवलत प्रमाणपत्र हे उपरोल्लेखित प्लॉट न Plot no.3,3/1 MIDC Industrial Area Phase-I Nardana,Nerdane (एकूण जमीन क्षेत्र 261057 चौ.मी.) च्या माडेपट्टा करारासाठी महाराष्ट्र मुद्रांक शुल्क अधिनियम - १९५८ (१९५८ चा अधिनियम ६०) यांचे कलम ९ च्या खंड (अ) प्रमाणे (अनुच्छेद ३६ खालील) भाडेपट्टाकरार निष्पादित करणेसाठी देण्यात

येत आहे

勁

सोबत जोडलेल्या प्रपंत्रतील माहिती दस्तऐवज निष्पादित केल्या कार्यात्रहरू या कार्यालयास सादर करा

रिक्त उद्योग संचालक ड्य कार्यालय, Mumbai

<u> जियांलयाचा पत्ता :-</u>

M/s. UltraTech Cement Limited,

A Wing Ahura Center 1st Floor Mahakali Caves, Mumbal, নান্জা - Mumbai, জিল্हা - Mumbai, 400093.

<u>कारखान्याचा पत्ता :-</u>

M/s. UltraTech Cement Limited,

Plot no.3,3/1 MIDC Industrial Area Phase-1 Nardana, Nardane, মাৰ্কা - Sindkhede, जिल्हा - Dhule, 425404.

भा जिल्हा सह निबंधक तथा मुद्रांक जिल्हा अधिकारी, Dhules . 577, 2) महाव्यवस्थापक, जिल्हा उद्योग केंद्र, Dhule. 9 24 2

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Directorate of Industries, Il Floor, New Administrative Building, Opposite Manualaya Mo Cama Road, Mumbel - 400032.

Ter IVS (022) 22028100 / (022) 22025004 - Skitaki diper@itreherositure govier Fisi in vicini Trinitation



(Agreement to Lease)



An Agreement made at Dhule the <u>8</u> day of <u>OC</u>/Ob Two Thousand Seventicen. BETWEEN MAHARASHTRA INDUSTRIAL DEVELOPMENT CORPORATION, a Corporation constituted under the Maharashtra Industrial Development Act. 1961 (Mah III of 1962) and having its Head Office at Udyog Sarathi. MIDC. Marol Industrial Area. Mahakali Caves Road, Andheri (E), Mumbai-400 093 hereinafter called "the Grantor" (which expression shall, unless the context does not so admit, include its successors and assigns) of the One Part.

AND

M/S. ULTRATECH CEMENT LTD. a Company incorporated under the Companies Act 1956/Companies Act, 2013 and having its registered office at B-Wing, Ahura Centre, 2nd floor, Mahakali Caves Road, Andheri (E), Mumbai hereinafter called the "Licensee" (which expression shall, unless the context does not so admit include its successor or successors in business and permitted assigns) of the Other Part.



For ULTRATECH CEMENT LIMITED,



WHEREAS, The Grantor/Lessor is a Govt. of Maharashtra undertaking constituted under the provisions of aforesaid MID Act, 1961 is holding the land acquired by the State Govt. under Chapter VI of MID Act for the purpose of securing rapid & orderly establishment of Industrial area & Industrial estates in the State of Maharashtra & to assist generally in the growth, development, management & organization of Industrial area/ estates & is empowered by the Govt. of Maharashtra to make available the Plot of land/sheds/ units / gallas on such land, to entrepreneurs/ undertakings to establish themselves in such areas on payment of premium to Grantor/Lessor, on certain terms & conditions as prescribed by & on behalf of the State Government.

WHEREAS the Licensee have applied to the Grantor for the grant to it of a Lease of land and premises heremafter described which the Grantor has agreed to grant to him upon certain terms and conditions.

AND WHEREAS the Licensee has agreed to fulfill & perform the terms & conditions contained in Offer letter dated 03/09/2015, Allotment. letter dated 28/09/2015 & the other terms & conditions mentioned in this agreement and further agreed to observe & perform the following additional terms & conditions.

a) That, it would be sole responsibility of Licensee to obtain all required statutory, regulatory clearances from respective



GISTR. That the present granted subject to the conditions of Tertrary treatment of efficients with Vero Discharge", "Odour Masking". MPCB Consent for proceeding of Greenfield Cement Grinding

develop a Buffer Zone of trees in That between its plant and other industries.

AND WHEREAS before signing this Agreement, the Licensee have paid to the Chief Executive Officer, Maharashtra Industrial Development-Corporation . Mumbai (Herein after called " The Chief Executive Officer)". the sum of Rs. 2,06,78,400/- (Rs. Two Crore Six Lakh Seventy Thousand Four Hundred Only) being the amount of premium payable by the Licensee including additional 5% charge for road having 20-30 Mtr. road width i.e. 1.96.93.700 X 5% = Rs. 9.84.700/-.

NOW IT IS HEREBY MUTUALLY AGREED as follows:

1. During the period of Five years from the date Possession the Licensee shall have license and authority only to enter upon the piece of MENT LIMITED.

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Recitals

Grant of

License.

uthorised Signatories.

land bearing Plot No. 3 admeasuring 2,61,037 sq.m. in Nardhana Industrial Area (hereinafter referred to as the "Demised Premises"), more particularly described in the first schedule hereunder - written and delineated on the plan annexed hereto and thereon surrounded by a red coloured boundary line for the purpose of building and executing works thereon as hereinafter provided and for no other purpose whatsoever and until the grant of such Lease as is hereinafter referred to, the Licensee shall be deemed to be a bare Licensee only of the Demised Premises at the same rent and subject to the same terms as if the Lease had been actually executed.

2.Nothing in these presents contained shall be constructed as demise in law of the said Demised land hereby agreed to be demised or any part thereof. So as to give to the Licensee any Legal interest therein until the Lease hereby contemplated shall be executed and registered but the Licensees shall only have a License to enter upon the said Demised Land for the purpose of performing this Agreement.

3. The Licensee hereby agree to observe and perform the following stipulations that is to say :-

(a) The Maharashtra Industrial Development Corporation is declared as Special Planning Authority (SPA) for its industrial areas in accordance with the Section 40(1A) of MR&TP Act- 1966. Accordingly the Licensee as far as possible within 6 months from the date hereof will submit to "the SPA". of the said industrial area (hereinafter called "the SPA" which expression shall include any other officer to whom the duties and functions of the said SPA may be assigned) for its approval the specifications, plans, elevations. sections and details of the factory building hereby agreed by the Licensee to be creeted on the said Demised Land and the Licensee shall at their own cost and as often as Licensee may be called upon to do so amend all or any such plans and elevations and if so required will produce the same before SPA and will supply Bin such details as may be ealled for the the specifications and when such plans, elevations, details and specifications 93 K shall be mal approved by the SA and signed by him the Licensee shall ign and fare with SPA three pies thereof and also three signed copies G of any further conditions we superlations which may be agreed upon between ensee and the SPA.

(b) The said Demised Land shall be fenced in during construction by the Licensee at its expense in every respect.

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Fencing during construction

Signatories

ULTRATECH CEMENT LIMITED

Submission of plans for approval

Not to demise



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(c) No work shall be commenced which infringes any of the Building Regulations set out in the Second Schedule hereunder written as also Municipal regulations so far as the same are applicable to the Demised Land the subject of these presents nor until the No Objection Certificate shall have been obtained from the Maharashtra Pollution Control Board as provided in the said Building Regulation and said plans and elevations shall have been so approved as aforesaid and thereafter. Licensee shall not make any alterations or additions thereto unless such alterations and additions shall have been previously in like manner approved.

(d) (i)That Licensee as far as possible within 6 months from the date of possession will commence and within a period of Five years from the said date at Licensees own expense and in a substantial and workman like manner and with new and sound materials and in compliance with the Building Regulations set-out in the Second Schedule applicable thereto and strictly in accordance with the plans, elevations details and specifications to the satisfaction of the SPA and conformably to the building lines marked on the plan hereto annexed and Building Regulations set out in the Second Schedule hereunder written, build and complete at least 20% of the construction of a building together with all requisite drains and other proper conveniences thereto, shar production and obtain BCC/Occupancy Certificate. The Licensee shall also complete the balance construction within a period of 10 years from the date of expiry of development period as aforesaid (regardless to the extension period granted if any) as per the Detailed Project Report (DPR) submitted try the Receive and/or as modified from time to time With fur approval of the Gran or. In the event the Licensee does not 28 80 comply with this condition ne rantor shall have the right to resume the tomised hand of any my divided portion thereof in accordance with the prevailing policy na DIS

Na work to begin until plans are approved

Time limit for commencement and completion at construction work

tir) The Licensee also agrees that in the event during the term of the lease the Licensee utilizes the Demised Land for the purpose other than specified herein without prior permission of the Grantor, the Grantors shall have right to resume the Demised Land or any unutilized portion thereof in accordance with the prevailing policy,

(c) The Licensee shall at its own expense within a period of one year from the date hereof plant trees in the periphery of the said plot to be kept open to sky of the Denmard Land within the Demised Promises and shall maintain the trees so planted in good condition throughout the term hereby created under these presents. At least one troe shall be present CEMENT LIMITED,

Planung of Trees the periphery of the plot.

and uttorised Signatories.

per 200 Square Meters and one tree at a distance of 15 Meters on the frontage of road or part thereof but within the Demised Premises.

- (1) The lessee shall pay all existing and future central, state or local duties, taxes, levies, assessments or other outgoings of every description whatsoever for the time being payable either by Grantor/ Licensee or by the occupier of the demised premises and anything for the time being thereon including service tax or any other tax of a like nature in respect of the property of lease/license thereof wherever applicable including but not limited to any duties, taxes, levies, assessments, interest, penalties or other outgoings of any description that may become payable whether pursuant to a change in law or any demands made by any authority or consequent to any order passed by a Court, Tribunal or other authority since the commencement of the lease deed or Agreement to lease.
- (g) (i) That the Licensee shall from time to time pay to the Grantor such recurring fees in the nature of service or other charges as may be prescribed by the Government of Maharashtra under the Maharashtra Industrial Development Act, 1964 or Rules and Regulations framed there under in respect of the amenities or common facilities provided by the Grantor and in default of such payment within thirty days from the date of service on the Licensee of notice in that behalf such recurring fees or service charges may be recovered from the Licensee as an arrears of land revenue under the provisions of the Maharashtra Land Revenue Code 1966 (X1) of 1966) together with interest thereon at prevailing rule from the date of default payment.

(ii) All charges including and, recurring fees, service charges due and payable the Licensee if not paid within time limit, shall be recovered alongwith delay of prometric harges at the rate prescribed by the Grantor from time to time.

(h) That Licensee shall keep the Grantor indemnified against any and all claims for damages which may be caused to any adjoining buildings or other premises by such building or in consequences of the execution of the aforesaid works and also against all payments whatsoever which during the progress of the work may become payable or be demanded by the Municipality or any Local Authority in respect of the said works or of anything done under the authority herein contained.

FOR ULTRATECH CEMENT LIMITED.

Fees or Service Charges to be paid by the licensee

Indemnity

d Signatories

Rates and Taxes

- (i) Not at any time during the period of this demise cause any damage to any of the infrastructure provided by the Grantor in the said Industrial Area or to Grantor's property. In the event such of damage the Grantor may by notice to the Licensee call upon them to rectify the damages and upon Licensee failure to do so within a reasonable time. Grantor may rectify the same at expense in all respect of the Licensee.
- (j) That Licensee shall observe and conform to all rules, regulations and bye-laws of the Local Authority concerned or any other statutory regulations in any way relating to public health and sanitation in force for the time being and shall provide sufficient latrine accommodation and other sanitary arrangement for the laborers and workman employed during the construction of the building on the said Demised Land in order to keep the said Demised land and its surroundings clean and in good condition to the entire satisfaction of the SPA and shall not, without the consent in writing of the SPA, permit any laborers or workman to reside upon the said Demised Land and in the event of such consent being given shall comply strictly with the terms thereof.
- (k) (i) The Licensee shall observe fulfilled to rules and regulations bye-laws of Local authorities or others. The Licensee shall duly comply with the provision on the Water (Prevention & Control of Pollution) Act, 1974. The Air (Prevention & Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986 and amendments issued from time to time and the rules and regulations made there under as also with any conditions which may from time to time be imposed by the Maharashtra Pollution Control. Board, constituted under the said Act as regards the collection treatment and disposal or discharge of effluent or waste or otherwise howsonver and shuft indemnify and keep indemnified the mantor agarost the consectences of any breach or non-compliance of any such provision or condition as aforesaid.

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ii) If applicable the Grantor/SPA shall-direct the Licensee to become a member of Common Effluent Treatment plant (CETP) and the Licensee shall follow such direction of the SPA/ Grantor and observe the Criteria/ Rules and Regulations prescribed for the disposal of effluent and produce the proof thereof to the Grantor.

(1) The Licensee shall not make any excitation upon any part of the said Demised Land nor remove any stones, earth or other material there from except so far as may, in the opinion of the officer authorized by the Not to cause any damage.

Sanitation

with the PIDVISION OF the Wata (Prevention) of million) 1974 Act. The Ar , 980 of El Act, 1981 crite ilie environment (Protection) Art 1986 and amendments issued from time to time.

comply

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Membership of CETP

Excavation

ed Signatories.

FOR ULTRATECH CEMENT LIMITED,

Grantor, be necessary for the purpose of forming the foundations of the building and compound walls and executing the works authorized by this Agreement.

- (m) That Licensee shall as soon as any building to be crected on the said Demised Land shall be rooted insure and keep insured the same in the names of the Licensee against damage by fire in an Insurance Company having an office in Mumbai for an amount equal to the cost of such building and will on request produce to the Chief Executive Officer. Policy or Policies of insurance and receipts for the payment of last premium and will forthwith apply all moneys received by virtue of such insurance in re-building or reinstating the building.
- (n) (i) That Licensee shall not directly or indirectly transfer, assign, sell, encumber or part with its interest under or the benefit of this Agreement or any part thereof in any manner whatsoever without the previous consent in writing of the Chief Executive Officer and it shall be open to the Chief Executive Officer to refuse such consent or grant the same subject to such conditions including the condition for payment of additional premium as he may in his absolute discretion think fit.
- (ii)If the Licensee have not taken prior consent from the Grantor for transfer of interest in whatsoever manner the Grantor may give show cause notice in writing to the Licensee and after giving them a reasonable opportunity, the Grantor shall be entitled to terminate the Agreement and resume the possession of the Demised Land in case the Licensee fails to show sufficient cause to the satisfaction of the Grantor.

agreement not assignable

Benefit of

Insurance

Nuisance

(o) That Licensee shall not at any time do, cause or permit any muisance in or upon the said Demised had and in particular shall not use or permit the said Demised hand to be used for any industry set out in the Indicative first as sinced in Thigd Schedule hercunder written for any purpose which may be offersive by reason of emission or odour. liquideffluvia. dist, smoke gas noise, vibrations or fire-hazards and shall duly comply with the directions which may from time to time be issued by the said Maharashtra Pollution Control Board. Central Pollution Control Board & Ministry of Environment & Forest, Govi, of India with atmost promptitude for the purpose of preventing any air pollution by reason of any such emission of odour, liquid-effluvia dust, smolle, gas, or otherwise howsoever.

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FOR ULTRATECH CEMENT LIMITED, Authorised Signatories.

- (p) That Licensee will at own cost construct and maintain an access road leading from the Estate Road to the said Demised Land in strict accordance with the specifications and details prescribed by the SPA.
- Access Road

Provision of

EHV Sub-Station

Power to terminate

Agreement.

Power of Grantor

To enter

or inspect

(q)(i)That in employing skilled and unskilled labour, the Licensee shall give Preference in first preference to the persons who are able-bodied and fulfilling general qualifications as prescribed by the Licensee and whose lands are acquired for the purpose of the said Industrial Area.
Preference in employment of labour

ii) The Licensee shall also endeavor to employ the local persons considering their knowledge of handling and operating the equipment/machineries used by the Licensee and fulfilling the general qualifications as prescribed by the Licensee.

- r) EHV Sub-Station: In the event the power requirement of the Licensee is more than 5 MVA, the Licensee shall provide space within the Demised Premises of an area having the required size and shall at its own costs construct the EHV-132/220KV Sub-Station and for that purpose the Licensee shall plan the land requirement considering the land requirement of EHV Sub-Station.
- 4. Should the SPA not approve the plans, elevations, details and specifications whether originally submitted or subsequently required or if the same shall not be submitted within the time hereinbefore stipulated the Grantor may issue a show cause notice in writing to the Licensee and after giving them a reasonable opportunity terminate this Agreement if the Licensee fails to show sufficient cause to the satisfaction of the Grantor. In the event the possession of the Demised Land has been given to the Licensee, the Grantor may re-enter upon the Demised Land and thereinpon the Demised Land hall be resumed by the Grantor.

185. Until the factory building and, work have been completed and certified as completed an accordance with clause-7 hereof the Grantor shall have the following rights and porcers: -

- (a) The right of the Chief Executive Officer, the Executive Engineer and the Officers and Servants of the Grantor acting under the directions either of them at all reasonable times to enter upon the said Demised Land to view the state and progress of the work and for all other reasonable purpose.
- (b) (i) In Case the Licensee fails to complete the said factory building within the time as specified in this Agreement and in accordance with the stipulation hereinbefore contained (time-in this respect being the For ULTRATE.

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To resume land.

CH CEMENT LIMITED,

Authorised Signatories.

S.P

essence of the contract) or shall not proceed with the works with due diligence or shall commit default in payment to the Grantor of the recurring fees in the nature of service or other charges as hereinabove provided or shall fail to observe any of the stipulations on Licensee's part herein contained, right and power to re-enter through the Chief Executive Officer, upon and resume possession of the said Demised Land and everything thereon and there upon this Agreement shall cease and terminate and all erections and materials, plant and things upon the said Demised Land shall notwithstanding any enactment for the time being in force to the contrary belong to the Grantor without making any compensation or allowance to the Licensee for the same and without making any payment to the Licensee for refund or repayment of the premium aforesaid or any part thereof but without prejudice nevertheless to all other legal rights and remedies of the Grantor against the Licensee.

- (ii) To continue the said Demised Land in the Licensee occupation on payment of such additional premium as may be decided upon by the Grantor or the Chief Executive Officer and
- (iii) To direct removal or alteration of any building or structures crected or used contrary to the conditions of the grant within the time prescribed in that behalf and on such removal or alteration not being carried out within the time prescribed cause the same to be carried out and recover
 the cost of carrying out the same from the Licensee/Licensees as an



Il building materials and plant which shall have been brought upon the child Demised Land by or for the Licensee for the purpose of crecting such building as at resaid shall be considered as immediately attached to the said plot of Demised Land and no part thereof other than defective or improper materials (removed for the purpose of being replaced by proper material) shall be removed from the said Demised Land without the previous consent of the Grantor until after the grant of the completion certificate mentioned in clause 7 thereof.

6. Notwithstanding any such default as aforesaid, the Chief Executive Officer, may in his discretion either give show cause notice to the Licensee of his intention to terminate the Licensee's Agreement herein contained and after giving it a reasonable opportunity if the Licensee fails to show sufficient cause to the satisfaction of the Chief Executive

By.

FOR ULTRATECH CEMENT LIMITED, d Signatories

Extension

of time

Officer then the Chief Executive Officer shall be entitled to terminate the Agreement or the Grantor or may fix any extended period for the completion of the factory building and the works for said period mentioned in this Agreement if he is satisfied that the building and works could not be completed within the prescribed time for reasons beyond the control of the Licensee or force Majeure events such as floods, earthquake, stroms and such other natural disasters and thereupon the obligations there under of the Licensee to complete the factory building and to accept a lease shall be taken to refer to such extended period without charging any additional premium. However, in the event the Licensee is unable to complete the building and works within the prescribed time for reasons other than situation beyond the control of the Licensee or the Force Majeure events then the Grantor shall be entitled to charge additional premium at the rate to be determined by the Grantor at the relevant time.

7. As soon us the SPA has certified that the factory building and works have been erected in accordance with the terms hereof and if the Licensee shall have observed all the stipulations and conditions hereinbefore contained, the Grantor will grant and the Licensee will accept a Lease (which shall be executed by the parties in duplicate) of the said Demised Land for the term of Ninety five years from the date hereof or from the date of possession whichever is earlier at the yearly rent of Rupee one.

8. The Lease shall be prepared in duplicate in accordance with the form of WREGIS Annoure annex hereto-written with such sel cas x 5 mod fic tions conditions and ditions thereto as may be agreed upon Sharpenne and expenses of and incidental to the execution of and 2018 nt and its duplicate also the lease and its duplicate shall be dell Condition Press, Pr boi 25-05 alone. e and

9. All notices, consents, approvals be given under this Agreement shall be in writing and shall unless otherwise provided herein be signed by the Chief Executive Officer or any other Officer authorized by him and any notice to be given to the Licensee/Licensees shall be considered as duly served if the same shall have been delivered to, left, or posted, addressed to the Licensee or the Engineer or the Architect of the Licensee at the usual or last known place of residence or business or on the said Demise Land hereby agreed to be demised or if the same shall have been affixed to any building or erection whether temporary or otherwise upon the said Demised Land.

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For ULTRATECH CEMENT LIMITED

forised Signatories.

Grant of Lease

Lease

Form

of

Notices

- 10. The Grantor in the capacity of Special Planning Authority may at any time and from time to time alter the layout, Building Regulations, General Estate Regulations relating to the other parts of the Estate of the Grantor of which the said Demised Land forms part and the Licensee shall have no right to require the enforcement thereof or any of them at any time against the Grantor or any person claiming under the Grantor.
- That the Licensee shall observe and confirm the provisions of MID Act.
 1961 as well as all rules, regulations and policies of the Grantor framed under the said Act from time to time.
- 12. The stamp duty and registration charges in respect of the preparation and execution of this Agreement and its duplicate including the costs, charges and expenses of attorneys of the Grantor shall be born and paid wholly and exclusively by the Licensee.
- 13. The marginal notes do not from part of this Agreement and they shall not be referred to for the construction and interpretation thereof.
- 14. Should there be any conflict between the terms contained in this Agreement and the terms contained in the Grantors Development Control Regulations the latter shall prevail.
- 15. For the purpose of this Agreement to Lease the expression Chief Executive Officer shall include the Deputy Chief Executive Officer/Regional Officer/Area Manager and any other officer specially authorized by the Chief Executive Officer.

IN WITNESS WHEREOF SHRI M. D. Pale,

<u>Arreal Manager</u>. The Area Manager of the Maharashtra Industrial Development Corporation, has for and on behalf of the aforesaid, of the Maharashtra Industrial Development Corporation, set his hand and affixed the Common Seal of the Corporation hereto on its behalf

SHRI USony KUMar chaabs has for and

on behalf of the aforesaid M/S. ULTRATECH CEMENT LTD. the

Licensee hath hereinto affixed the common seal of the Company the day

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and lear first above written.

GIEDAU

Grantor may alter Estate Rules

> Provisions of MID Act applicable

Cost and Charges to be borne by the Licensee.

Marginal Notes.

Conflict between Agreement and Rules.

For ULTRATECH CEMENT LIMITED,



FIRST SCHEDULE

(Description of Demised Land)

All the piece of land known as Plot No. 3 in the Nardhana Industrial Area, within the village limits of Waghode and outside the limits of Shindkheda Municipal Council, Taluka Shindkheda, District Dhule containing by admeasurements 2,61,037 Square Meters or thereabouts and bounded as follows, that is to say:

| On or towards the North by | 32 | MIDC Road 30 Mtr. |
|----------------------------|----|------------------------|
| On or towards the South by | | 5 Mtr. Villagers Strip |
| On or towards the East by | 1 | MIDC Road 30 Mtr. |
| On or towards the West by | | MIDC Boundary |

SECOND SCHEDULE

(Building Regulations)

- The Development Control Regulations prescribed by the Grantor and amendments made thereto from time to time applicable in MIDC Industrial Area shall be applicable for development of plot in this Industrial Area.
- The Licensee shall utilize the periphery of the plot for the purpose of planting trees. Al least one tree shall be planted per 200 Square Meters and one tree at a distance of 15 Meters on the frontage of road or part thereof but within the demised premises.

the consection shall have the land for any purpose except the envisable usedactivity traved by the Grantor. It shall not be used or a monitous industries. In adjective list whereof is set out in the third schedule hereundor written.

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The License shall shall and a No Objection Certificate from the Department of Environment/ Maharashtra Pollution Control Board constituted under the Water (Prevention and Control of Pollution) Act1974 and Air (Prevention and Control of Pollution) Act 1981 as regards water pollution as also air pollution and shall duly comply with the directions which may from time to time be issued by the said pollution Board shall not commence any construction on the said plot before obtaining such No Objection Certificate.

FOR ULTRATECH CEMENT LIMITED. Anthonised Signatories.

- 5. No construction work shall be commenced unless the plans, elevations and sections have been approved by the Officer authorized by the Granter and no addition or alteration to buildings. the plans of which have been so approved, shall at any time be made except with the similar previous approval of the said Officer.
- 6. All survey boundary marks demarcating the boundaries of plots shall be properly preserved and kept in good repair by the Licensee during the period of construction of buildings. Where more than one Licensee is concerned with the same boundary mark, the officer authorized by the Grantor shall allocate this obligation suitably.
- 7. No temporary or semi-permanent structure shall be build on the plot except during the period of construction (or reconstruction in future). set of the specifications, plans elevations and sections as approved submitted to the Executive Engineer for record RAshat and to enable him to grant No Objection.

1. Incineration, reduction or dumping of offal, dead animal, garbage or refuse on a commercial basis.

JHURD SCHEDULE

Muclicative List of Obnoxious Industries)

- 2. Cement Manufacture.
- 3. Gelatine or glue manufacture of processes involving recovery from fish or animal offal.
- 4. Manufacture or storage of explosives or fire-works.
- 5. Fat rendering.
- 6. Fat, tallow, grease or lard refining or manufacture.
- 7 Pyroxylin manufacture.
- 8. Garbage, offal or dead animals reductions, dumping or incineration.

9. Stock-yard and/or for the exclusive purpose of slaughter of animals or fowls.

10. Tanning, curing or storage of raw hides or skins.

11. Wool pulling or scouring.

12. In general those uses which may be obnoxious or offensive by reason of emission of odour, liquid-effluvia, dust, smoke, gas, noise, vibration or fire-hazarda.

For UltraTech Cement Limited

Authorised Signatories.



Extension to the Package Scheme of Incentives, 2013 till 30th September 2018 or upto the New Scheme came in force.

GOVERNMENT OF MAHARASHTRA INDUSTRIES, ENERGY AND LABOUR DEPARTMENT Government Resolution No. PSI-2013/CR-54/Ind.8 Mantralaya, Mumbai – 400 032.

Dated : 19th April, 2018.

Read :

Government Resolutions of Industries, Energy and Labour Department.

- 1. No.PSI-2013/(CR-54)/IND-8, dtd.1st April 2013.
- 2. No.PSI-2013/(CR-152)/IND-8, dtd.13th October 2013
- 3. No.PSI-2013/(CR-54)/IND-8, dtd.7th May 2016
- 4. No.PSI-2013/(CR-54)/IND-8, dtd.25th October 2016.
- 5. No.PSI-2016/C.R.305/IND-8, dtd. 20th January 2017.
- 6. No. MIP-2017/C.R.229/IND-2, dtd. 14th February 2018.

GOVERNMENT RESOLUTION:

The provisions of Package Scheme of Incentives, 2013 came into force from 1st April 2013 for a period up to 31st March, 2018.

2. Government has now decided to extend the period of Package Scheme of Incentives- 2013 (as amended from time to time) up to 30th September 2018 or till new policy is issued.

3. Accordingly, in Resolution and in para. 1.1, 7.1(1) of Government Resolution, Industries, Energy & Labour Department No.PSI-2013/(CR-54)/ND-8, dtd.1st April 2013 shall stand substituted by the date "30th September 2018 or till new policy come in force."

4. This Resolution issued in connection with the consent of Planning Department and Finance Department while giving extension to the Industrial Policy-2013.

This Government resolution of Maharashtra Government is available at the website <u>www.maharashtra.gov.in</u>. Reference no. for this is 201804211558119510. This order has been signed digitally.



Sanjay Shankarrao Ingle

(Sanjay Ingle) Deputy Secretary to Government of Maharashtra

1. Principal Secretary (Finance), Finance Department, Mantralaya Mumbai.

2. Principal Secretary (Planning), Planning Department, Mantralaya Mumbai.





- A Charles and a
- 3. Principal Secretary (UD-2), Urban Development Department, Mantralaya Mumbai
- 4. Principal Secretary (R & R), Revenue & Forest Development Department, Mantralaya Mumbai
- 5. Principal Secretary (Labour), Industries, Energy & Labour Development Department, Mantralaya Mumbai
- Principal Secretary (Energy), Industries, Energy & Labour Development Department, Mantralaya Mumbai
- 7. Commissioner of Sales Tax, Mumbai.
- 8. Development Commissioner (Industries), New Administrative Building, Mumbai
- 9. Managing Director, Maharashtra Small Scale Industries Development corporation ltd., Mumbai.
- 10. Chief Executive Officer, Maharashtra Industrial Development Corporation Mumbai.
- 11. All Joint Director of Industries, Directorate of Industries, Mumbai.
- 12. All General Managers, District Industries Centers.









Maharashtra Industrial Development Corporation

(A Government Of Mahazashtra Undertsking)

Tel: 02562-239030, Fax: 02562-281030 E-mail: rodhule@mideindia.org Regional Office, Dhule Opp. Sub-Division Office, MIDC, Addl. Dhule MIDC, Avadhan, DHULE - 424006

Letter No .: MIDC/RO(DHL)/NAR/LMS-353/ 4435 Date: 2 8 SEP 2015

Subject :- NARADHANA INDUSTRIAL AREA Plot No. 3 Allotment of Land

:ORDER:

Sanction is hereby accorded to the allotment of land admeasuring 256400 Sq. Mts. at the rate of **Rr**. 75/- per Sq. Mts. Comprising of Plot No. 3 in NARADHANA INDUSTRIAL AREA to M/S **ULTRATECH CEMENT LIMITED** a Company incorporated under the Companies Act-1956 and having its registered office at B-WING, AHURA CENTRE, 2ND FLOOR, MAHAKALI CAVES ROAD, ANDHERI (E), MUMBAI for setting up your industrial unit for manufacturing of GREENFIELD CEMENT GRINDING UNIT subject to the payment of the premium of 20191500/- (Rs.Two Crore One Lakh Ninety One Thousand Five Hundred) (including 5% additional charge for road having 30 Mtr. road width i.e. 19230000* 5% = Rs.961500 as additional charges) and subject to the following conditions.

1. The amount of earnest money received with the application will be appropriated towards the amount of premium. The allottee shall pay the sum of Rs. 15384000/- (Rs. One Crore Fifty Three Lakh Eighty Four Thousand Only) balance amount of the premium within a period of 30 days from the date of receipt of this order, by DD, drawn in favor of EXECUTIVE ENGINEER MEDC, Dhule Payable at Dhule

2 In case the allottee fails to pay the balance amount of premium within a period mentioned above (period of 30 days from the date of receipt of allotment order), the allotment shall be liable to be cancelled without further notice.

3. In the event of the allotment being cancelled as aforesaid the corporation shall forfeit the whole of the earnest money received with application.

4. The terms & conditions of allotment of land will be those contained in the standard form of Agreement to Lease and the lease annexed thereto & in substance are as follows.

a) The allottee shall enter into an Agreement to Lease in the form prescribed by Corporation & on performance of the conditions will be entitled to lease for the term of ninety five (95) years to be computed from the date of execution of the Agreement to Lease and renewable for one further term of 95 years on payment of premium and on such terms and conditions as may be determined by the Corporation at the time of renewal.

b) The annual ground rate rent of Rupee 1/- per annum is payable in respect of the plot of land allotted.

c) The allottee shall get the plan and specification of the proposed factory building duly approved from the Executive Engineer of the said Industrial area and complete the said building in accordance





with approved plans and shall obtain a Building Completion Certificate (B.C.C) from the Executive ¹ Engineer of the said industrial area within a prescribed period.

d) The allottee shall not directly or indirectly transfer or assign the benefits of interest in the Agreement to Lease or part with possession of the land or any part there of without previous consent of the Corporation who may refuse or grant it subject to such condition as the Corporation may think fit including a condition for payment of additional premium.

e) The allottee shall be entitled to use land for the purpose of a factory but not for the purpose of a factory for any of the obnoxious industries specified in the annexure set out in for any other purpose and not for the purpose of any factory which may be obnoxious, offensive by reason of emission of odor, liquid effluvia, dust, smoke, gas, nuisance, vibration or fire hazards.

f) The other terms and conditions of allotment shall be those contained in the prescribed form of Agreement to Lease and the Lease.

g) The stamp duty in respect of preparation & execution of the Agreement to Lease & its duplication as also the Lease & its duplication in respect of the allotted plot of land as also the legal costs for the preparation and execution of these documents including the registration fees shall be borne and paid by the allottee alone.

h) If there any encroachment on the plot the same should be removed by you, at your own risk and cost.

i) Please note that if MSEB's line is passing through your plot, you will have to shift the line at your own cost and risk, also concern with MSEB and Telephone Department.

i) In case any changes after final measurement of plot area and if the area is found to be increased the charges towards excess area, shall be recovered as per prevailing rate at that time.

k) The infrastructure of water supply is provided by MIDC, considering the water requirement of your plot at the rate of the 25 m3 per hect. Per day. For the requirement in excess of 25 m3 per Hect. Per day of your plot, you will be required to pay the capital contribution at rate of Rs.15,000/- per m3 or the actual rate of capital contribution of water supply scheme of the industrial area whichever in more.

1) You will have to obtain a clearance from Maharashtra Pollution Control Board before commencing the Production.

The allottee may submit his application to the concern telephone & electricity authority immediately, after taking over the possession of the plot. This will enable the concern authorities to build up a waiting list & ensure proper planning to provide timely telephone & electric connection to the industrial units in the area. Please note that, MIDC is not responsible for supplying electricity. Hence, you should ensure the availability of such infrastructure with concerned MSEDCL authorities.

Please also note that AtoL will be signed with you within 30 days from the date of payment of balance amount of plot.

Special Conditions (If Any) : i. The land to be allotted to you on as is where is basis and MIDC will not be responsible about the nature of land. ii. You will have to develop all the internal infrastructure in your plot like Water Supply, Approach Road, Solid Waste Disposal and Effluent Treatment etc. at your own cost and responsibility. The MIDC will not be responsible for any of these infrastructure facilities within the internal area of the plot.









MAHARASTHRA INDUSTRIAL DEVELOPMENT CORPORATION

(A Government of Maharashtra Undertaking)

Tel : 02562-239030 Fax : 02562-281030 E-mail: rodhule@midcindia.org No. MIDC/ROD/Nardhanu/L/ 1743

Office of the Regional Officer, Opp. Sub-Division Office, MIDC Addl. Dhule MIDC, Avadhan, Dhule -424006.

6 JUL 2017

Date :

To. M/s. Ultratech Cement Ltd. B-Wing, Ahura Centre, 2nd Floor, Mahakali Caves Road, Andheri (E), Mumbai-93.

> Sub: Nardhana Industrial Area Plot No. 3 Execution of Agreement of Lease

Sir/ Madam,

8.5.5

Please find enclosed tow copies on ledger paper of above said Agreement to Lease. ۰. You are requested to have the original and duplicate copies on Ledger paper duly stamped by paying proper stamp duty. For this please refer to the circular issued by Hon" Inspector General of Registration & Controller of Stamps, M. S. Pune dated 08/05/2012

We hereby confirm that the Corporation has received premium Rs. 2,01,91,500/- (Rs. Two Crore One Lakh Ninety One Thousand Five Hundred Only) at the rate of Rs. 10/- m2 for area 2,61,037 m2 for said plot.

The Licensees / Lessor's share of Municipal or Village Panchayat Tax for the purpose of reliation of stamp duty is estimated at Rs. 4,03,900/- per annum.

After payment of the stamp duty both the copies may kindly be returned to this office for further action. A suitable date matually convenient will thereafter to be fixed for the execution of the documents.

Please note that as per Section 52B of the Bombay Stamp Act. The stamps stamped papers have to be used within six month from the date on which the stamp duty is paid by you.

Please ensure that the documents is executed and registered within six months from the date of payment of stamp duty. Otherwise the stamp duty paid by you will be invalid and the document will become null and void and we will not be responsible for the same.

A format of undertaking to be given by you to this office regarding making good any shortfall in stamp duty is enclosed herewith.

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Area Maraper. MIDC, Dhule.



KNOW ALL MEN by these presents that we, UltraTech Cernant Limited, a Company incorporated and registered under the provisions of the Companies Act, 1956, and having its Registered Office tat "B" Wing, Ahura Centre, 2nd floor, Mahakali Caves Road, Andheri (Eest), Mumbai 400093, in the state of Maharashtra (hereinafter called "the Company") through Mr. Kailash Chandra Jhanwar, Ceputy Managing Director and Chief Manufacturing Officer of the Company (hereinafter called the "Deputy Managing Director and Chief Manufacturing Officer"), SEND GREETINGS:



Senar Mar Dent - 2 Annexure - 11. (Senar Mar Dent 4-SEP 2017 CHUST NO.L. (Mainer of entroyet) Cast all and apprent sult and tWhather is in to be registered. Missultra Tech Coment Lit Andreas and the second registerious (A there explore a second registerious) B. Wing, Ahuri Centre, 2nd Finor, Maharati Caves Road, Angheri (East), Mambal - 400 093. If that with other sale of then light: Address Starters Address Starters Starts Reading to a Higher an other is by monionical P Cut a second オール Album di Paratana Rama di Paratana Rama di Paratana ſ 2 arter it y ST. अंगेर्टा होई 7033, क्याइग्राह्याद्वाद्व 2.2. USB ATEL ANDER 1. 16.6. (7)86 अंध्यत्वान आहे. · · · · · TRUE COPY WAR YEN LLEC इंडे ग्रेम ल.द.उ. GISTRAR .55 410 a m Gp DHL 843 348 0 grad 9 0 6 डा. जि. १ DHI THEDADIS 1- 17

Now by virtue of the powers vested in the Deputy Managing Director and Chief Manufacturing Officer by the Company as its Deputy Managing Director and Chief Manufacturing Officer, pursuant to the Board Resolution dated 20th January, 2016 and in particular of the powers to delegate any powers, extinuities and discretions for the time being vested in the Deputy Managing Director and Chief Manufacturing Officer thereunder, the Deputy Managing Director and Chief Manufacturing Officer DO HEREBY NOMINATE, CONSTITUTE AND APPOINT Mr. Vijay Kumar Chhabra, Son of Mr. Nirmal Kumar Chhabra, Joint President of the Company (hereinafter called the "Attorney") as the and Tawful attorney of the Company to do, perform and execute in particular, the following acts matters, deeds and things mentioned hereunder in connection with the work connected to Dhar Project, Madhya Pradesh and Dhate (Nardhana) Stingting Chit (bareinafter referred to as the said Units).

1 To authorize payment and sign and/or cently cash, bank and journal voitchere.

To sign and execute sale or purchase or contract for purchase or sale, in ordinary course of business, of any immovable property for an amount not exceeding Rs. 1 crore in a single transaction, for and on behalf of the Company which are / will be necessary or useful for the business of the Company and to take possession of land and to execute lease agreement(s), lease-cum sale agreement(s) or any other agreement(s)/undertakings or deeds or documente as may be required in connection with taking possession of the land for the Company's projects.

To sign, execute and register any deed / document / agreement for purchase, take on lease, leave and licence, him purchase, deferred sale or otherwise acquire any moveable property and assets for an amount not exceeding Rs. 1 crore in a single transaction and whether tangible or not in the name of the Company and on behalf of the Company.

To apply for prospecting license / Mining Leases for acquiring mining rights relating to different minerals and in relation thereto to sign applications, lease agreements, execute bonds / undertakings in favour of Statutory / Regulatory bodies and any other agreement(s), undertaking(s) or deed(s) or document(s) as may be necessary and to do unitarily for the purposes of renewing the existing mining leases under the provisions of the Mines Act, 1952; Coal Mines (Special Provisions) Act, 2015; Mines and Minerals (Davelopment and Regulation) Act, 1957 and Rules and Regulations made thereunder including any amendment, modification or re-enactment thereof.

To sign, endorse, accept, execute or authenticate all cheques, hundles, pay orders, bills of entry, bills of exchange, usance bills, pro-notes, bills and delivery orders, negotiable instruments, stock report, vouchers including journal vouchers, debit and credit notes, receipts, or discharges whether for money or for goods, balance confirmation, acknowledgements, assignments of insurance policies and or cover notes, bills of lading, railway receipts, motor receipts, and other documents of title of goods and letters of credit, counter guarantee, trust receipt and other documents.

- 6 To withdraw moneys payable to or due to the Company from the Government authorities or any other department of the Government of India or State Government or any other public authority.
 - a) To apply for the registration and to deal with all matters relating to Local and Central Tax Laws, Central Excise, Entry Tax, Service Tax, Octrol and other Statutory Authonities in any State / Union Territory and to obtain various corressions / benefits by way of exemption and/or deferment of sales tax, electricity duty and any other levies and taxes from the concerned statutory authorities and to avail incentives provided by the Central / State Government(s) under the various schemes and to appear and act on behalf of the Company before all such authorities.

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- To make, sign, execute and file all statutory declaration forms, applications or any b) other documents expedient or necessary to be made, signed or to be presented or filed in relation to any of the purposes aforesaid and to receive back such documents.
- C) To receive notice from Statutory Authorities and to reply the same. d)
- To collect any statutory forms from the Sales Tax Department and any other departments, as and when required.

To purchase or contract for purchase and to take or give on loan hire purchase, lease in any part of India or elsewhere, for threediate or future delivery of raw materials, auxiliary materials, packing materials and old plant and machinery stores materials, chernicals, spares and things and other articles and things; necessary or desirable to enable the company to carry on its normal activities in the ordinary course of business (hereinalter for previty's sake referred to as the said goods and things') and to sell back, reself or takend for sale to any part of India or elsewhere all of any of the said goods and things.

In order to purchase or contract for purchase as provided in the preceding clauses, to make advances or leans in the ordinary course of business to the suppliers of the said goods and things on such terms and conditions as are usual or as may accord with the practice and custom of the market.

- 10 To sell or contract for sale in the ordinary course of business in any part of India or elsewhere for immediate or future delivery of the Company's products and to appoint brokers, stockists, sales promoters, agents etc. for this purpose and to settle the terms and conditions of their services and remunetation and to terminate or vary any such: appointment
 - To get repaired and keep in repairs movable and immovable properties, plant and machinery of the Company, and to insure the same against damage by fire, tempest; accident, riot, lightning and other risks and also to use and take all such lawful ways and means as may be necessary for defending and protecting the said movable and immovable properties, plant and machinery of the Company.
- 12 To sign correspondence, statements, returns, applications, sales bills and invoices, and/or other forms including AR-I Form as required or necessary under the Central Excise, Service Tax, or Customs Laws and Rules framed thereunder and also to sign the accounts and Registers maintained by the Company for the purpose of the Excise, Service Tax and Customs as and when necessary or required by the concerned Authonities, and attest any corrections which may be made in the said accounts, registers, statements, returns, applications forms and other records.

13 To finalise, negotiate, sign, execute and deliver on behalf of the Company all papers, applications, letters, forms, undertakings, returns, deeds, documents, writings, correspondence, agreements including mining lease agreement, fuel supply agreement for sourcing of fuel for the Company, receipts, bills of lading, forwarding notes, railway receipts, customs house warrants and other documents of Title and all other deeds and assurance and documents, as may be required from time to time, with / to various authorities, including central / state government, municipal authorities, pollution control boards, excise and customs departments; sales tax authorities, electricity and telephone authorities, railways and/or any other firms, bodies corporate or agencies and to take all steps as may be required in this regard and to receive the benefits and the incentives, including subsidy and interest free loan from the banks / financial institutions / concerned authorities / agencies of the Certifial / State Government(s) and to deal in power through energy exchanges or private parties for the due completion and performances of all transactions in the ordinary course of business of the said Mine of the Company and to make / sign applications, submit expression(s) of interest / bid / application for any tenders

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floated by the Central / State Government(s) or any statutory / regulatory authority(ies) or corporation or any other entity, government or non-government.

In the name of the Company and on its behalf to ask, demand, sue for, recover and receive every person and every body politic or corporate whom it shall or may concern, all sums of money debts, dues, goods, wares, merchandise, chattels, effects and things of whatsoever nature or description which now any or which at any time, during the subsistence of these presents, shall or may have or become due, owing or belonging to the company in or by any right, title, ways or means howsoever, or otherwise become due or payable to the company and upon receipt, therefore or of any part thereof in the name of the company or in his name or other discharges for the same howsoever because the Attorney shall think fit or be advised.

To examine all books, papers, documents or other records relating to the business of the Company in possession of any third party and where such books, papers, documents or other records is the property of the Company to take possession of the same and to ensure compliance with the provisions of all legislations governing the affairs of the said Mine of the Company including the provisions of corporate governance and to do all such acts, deeds and things as may be necessary or expedient to ensure compliance with such laws as also to appear and represent the Company before any officer or authority or court / bench appointed under any such laws for the time being in force.

To commence, prosecute, enforce, defend, answer, oppose or appear or appeal in, all actions and other legal proceedings and demands whether civil, criminal, political, administrative or revenue, or proceedings relating to the customs or excise duties, service sales tax, entry tax, income tax, super tax, wealth tax, registered firms tax, tax. professional tax and all taxes on income or otherwise and to accept service of notices or processes touching any of the matters aforesaid or any other matters in which the company is or hereafter be interested or concerned and also if thought fit to compromise, refer to arbitration, submit to judgement, proceed to judgement and execute or become non-suited In any such action of proceedings as aforesaid and also to enforce by execution, attachment distress, suil or otherwise any decree or award in favour of the company and to defend or resist any such process issued against the company, in any such action or proceedings as aforesaid to retain, employ, engage and remunerate advocates, attorneys, chartered accountants, validis and pleaders and to sign and give warrants, validatinemas and other necessary authorities and to revoke such relainers and authorities from time to time at pleasure.

To appear, represent before all and every or any Court or Courts, Magistrates, Government or Public Officer, Customs, Excise, Abkan, Electricity Board, Revenue, Railway, Police, Port Trust, Improvement Trust, Income Tax, Sales Tax, Reserve Bank of India, Import of Foreign Trade Control authorities or Export Promotion Council, Central / State regulatory authorities and any other authorities whatsoever and to make, sign, execute, swear, declare, register and advertise all declarations, effidavits, applications, letters, papers and writings and to do all acts, deeds or things whatspever necessary or expedient for the business of the company under Factories Act, Payment of Wages Act, Boilers Act, Explosives Act and Rules, Employees State Insurance Act. Employees Provident Fund Act, Indian Electricity Act, State Electricity Board, State Electricity Act, The Legal Metrology Act, 2009, The Legal Metrology (Packaged Commodities) Rules, 2011. Motors Vehicles Act, Income Tax Act, Sales Tax Acts, Service Tax Act, Professional Tax Act, Post and Telegraph Act, Foreign Exchange Management Act, Coal Mines (Special Provisions) Act, 2015 and Rules, Companies Act and Rules and Regulations of the above mentioned Acts and any other Acts, Rules, Regulations or notifications of the Central or State Government (including making applications for obtaining sales fax declaration forms), Municipal Bodies, Excise Reserve Bank of India or Customs or Import ade Control Authorities or Foreign

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Trade Control Authorities, or Export promotion Councils and to appear on behalf of the company before any authority under the above mentioned laws, rules or notifications and to represent the company in all correspondence matters and proceedings before them of any native whatsoever.

To make, sign, execute, swear, declare, register and advertise all declarations, affidavits, applications, letters, papers, petition and writings and to do all acts, deeds or things whatsoever necessary or expedient for the business of the company under Factories Act, Payment of Wages Act, Boilers Act, Explosives Act and Rules, Employees State Insurance Act, Employees Provident Fund Act, Indian Electricity Act, Motors Vehicles Act, Income Tax Act, Service Tax Act, Sales Tax Acts, Professional Tax Act, Poreigo Exchange Management Act and Rules, and any other Acts, Rules or notifications of the Central of State Government (including making applications for obtaining sales tak declaration forms), Municipal Bodies, Backe, Reserve Bank of India or Distants of Import Trade Control Authonities of Fareign Trade Control Authonities of Export premotion Councils and Management of India 17 and 18 and 19 an to appear on behalf of the company before any authority under the above mentioned laws, rules or notifications and to represent the company in all correspondence matters and proceedings before them of any nature whatsoever.

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To appear before any Registrar or Sub-Registrar or any other registering officer of authority and to present for registration any deed or document already executed or signed or which may hereafter be executed and signed on the Company's behalf and to admit the execution. of such document or documents and otherwise to do all acts deeds matters and things to get such deed or documents registered according to law.

20 To adjust, settle, compromise or submit to arbitration any accounts, debts, claims, demands or disputes toucking any of the matters herein provided for or any other matters which are now subsisting or may hereafter arise between the company or between the Attomey on the one hand and any other person, firm, company or corporation on the other hand to give time for payment to any of the debtors of the firm.

To execute any Bond or Bill for and on behalf of the Company as required under any law or statute or rules or regulations of Central Government, State Government or any competent or concerned authority, body or association in the forms prescribed under any such law, statute; rules or regulations or otherwise.

To look after and supervise the working of the said Units of the Company and to do or cause to be done all such acts, deeds, things as may be necessary or expedient to ensure smooth working of factories, other offices and establishments of the said Units.

To negatize with the workers and employees of the said Units of the Company or with the trade uplons or federations, on demands made by such workmen and employees and to participate in all proceedings relating to the industrial matters, before the Labour officers. Concillation Officers, Labour Commissioners, Labour Tribunals, Industrial Tribunals, Wage Board and other authorities appointed by the Central or State Government and to agree to refer such disputes to Arbitrator or to Industrial Court or Tribunal and to make on behalf of the Company suitable or necessary representations and to present the case of the company and to agree and come to any settlement with such workmen, Employees. Trade Unions or Federations as the attorney may in this discretion deem fit,

To apply for, in any State in India or to Government of India, and obtain and renew 24 certificates of approval prospecting licenses, mining leases, import licenses, incenses under the Industrial Development and Regulation Act, FIPB, Export Promotion Council etc. for setting up industrial tindettakings, all matters relating to the grant of minarel concession to the company, sanctions of the Reserve Bank of India and/or the Government of India and in respect of all matters requiring the sanction of the Governments and in general all

REGISTRAR - UB 62 . मिंदखेडा,वि WORHEDA DI



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Icenses, permits, agreements etc. with the Governments that may be necessary for carrying on the company's business and to execute the aforesaid documents on behalf of the Company.

To acquire on rent or otherwise such premises as may be necessary for the purpose of the Company's offices, godowns, depots, show-rooms and similar other uses and to maintain and keep in repairs such premises and to insure the same against damage by fire, tempest, accident, riot, lightning and other risks and also to use and take all such lawful ways and means as may be necessary for defending and protecting such premises.

To concur in deing any of the acts and things herein mentioned in conjunction with any other person of persons similarly authorized.

27 GENERALLING do all such ects and things as may be conducive of insidental to the exercise of the powers and authorities hereby given AND. THE COMPANY DO HEREBY AGREES to ratio and comform all acts, deeds and things as our said Attorney shall tawfully do or cause to be done during the continuance of these presents in respect of the matters atoresaid by virtue hereof.

AND. Deputy Managing Director and Chief Manufacturing Officer agrees to ratify and confirm all acts deeds and things as the said Attorney shall lawfully do or cause to be done during the confirmance of these presents in respect of the matters aforesaid by virtue hereof.

This Letter of Authority shall cease to be operative on the expiry of one year from the date hereof .

IN WITNESS WHEREOF Mr. Kallash Chandra Jhanwar, Deputy Managing Director and Chief Manufacturing Officer of the Company, has set and subscribed his name and signature on behalf of the Company as its only constituted agent on this 25 day of Sectember 2017.

Signature of Mr. Kailash Chandra Joanwar, Deputy Managing Director and Chief Manuf

Left hand Thumb Impression and pluctograph of Nr. Kallash Chandra Jhanwar, Deputy Managing Director and Chief Manufacturing Officer

Signature of the Constituted Attomey

Mr. Vijay Kumar Chhabre

DHU

Left hand Thumb impression and photograph of Mr. Vijay Kumar Chhabra

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K C Jhanwar Depety Managing Director

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.n. ir. 7 7. S. S. S. P. TAR Contraction and Before me 1 the All Mr. April 17 1.5 14.18 24 D.R. KUDRIGI rest and dee 1.46.4 Holory Guezare Muni BEFORE ME Thans Old Make 12.5 19-9.11 REGIST NO. 6597 2 2. 2018 18 IND भेग हाक Ţ, D. R. KUDRIG* Notary Strater Montel Lei a Citt र्विखेडा जि. पु 1.5 POICHEDA DI

.1 1. 4 CHARTER CONTRACTOR - Government of India-State ntact.Addressinin Contact Address in State Shi Vie Davas - State Dy. Director of Industriate the Bland Bland Commerce & Industry New Address is the Bland Bland Bland Bland Bland Bland Description - 400 032 - Secretariat for Industrial Assistance Telephone : 20227086 - State Tar State Transformer - Books 20 Telephone : 20227086 - State Tar State Transformer - Books 20 Telephone : 20227086 - State Tar State Transformer - Books 20 Telephone : 20227086 - State Tar State Transformer - Books 20 Telephone : 20227086 - State Tar State Transformer - Books 20 Telephone : 20227086 - State Tar Stat Č ٠ . 1978 12 1974 17 -Industrial-Entrepreneurs-Memorandum-Section No. Neo Delhi: Date: Chapter Freihnum wit Gesuff with Wark Steve Fund You, Ch. 40 Min 199 St. The weep of your memoralism for the manufacture of proving with the start of the start o 142092 2015 ø Protoset Tish - PORTLAND PORTLAND CONTINIAG -CONTINET OF MERLIFECTORE MIC - DECEM COMENT AND STREET A 4 (1) -----This address ledgement is subject to the polythics of at Press, Note MG, a saled 29th July 1993, Press Note No 17 dated 28th November 1997 and Press Reference 21:1701-2012 If No.7(7)/2011-16 feed first is said and sale is a sale of the sale of th 175 31 0 2 209 GHE 0 . M78 DUTRA TECH CEMENT LIMITED. NARDANA MIDE AREA. PHARE-I. PLOT NO.3. 9 HIND, 2ND FLOOR, AHURA CENTRE, MAHAKALI CAVES TEHOIL BINKHEDA व्यापना-स्थल 9 DHULE, (DHULIA) Located at Piece Town MAHARABHTRA 6 जहसीला/ताल्लुक 811110185 Tunik Telok

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| Receipt of Document Handling Charges | | | | | | |
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CHALLAN MTR Form Number-6



| GRN MH006975185201819E BARCO | | | | Date 08/10/2018-16:01:25 Form ID | | | | | | |
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| Registration Fees | | TAX ID (lf A | ny) | | | | | | | |
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| Account Head Details | Amount in Rs. | Premises/B | uliding | | | | | | | |
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| Name of Bank | | Bank-Branch BANK OF BARODA | | | | | | | | |
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| 141/3853 दस्त गोषव प्रोमवार,08 ऑक्टोबर 2018 5:33 ब.नं. | | षवारा भाग-1 संदड <u>हिंह- ६८</u> दस्त क्रमांक: 3853/2018 | | |
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| ULTRATION CEMENT LIMITED. | | नोंदणी फी दस्त हाताळणी फी डाटा एन्ट्री पृष्टांची संख्याः 48 | ক. 30000.00 ক. 960.00 ক. 20.00 | |
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दस्ताचा प्र<u>कृ</u>तुः आडेकरार

मुद्रांक शुल्क: If relating to Order of High Court W.R.T. amalgamation or reconstruction of companies under section 394 of Companies Act 1956 or under the order of Reserve Bank of India under section 44A of the Banking Regulation Act 1949.

शिक्का क्रं. 1 08 / 10 / 2018 05 : 08 : 57 PM ची वेळ: (सादरीकरण)

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| ोल ट कक्ता ळखः लील बु 1 | नं: -, रोड नं: मोहनपुरा,जयपुर, राजस्थान पॅन नंबर: ह्ला (स्तऐवज करुन देणार तथाकथीत) आडेकरार क्र.3 ची वेळ:08 / 10 / 2018 05 : 13 : 5 - इसम असे निवेदीत करतात की ते दस्तऐवज पक्षकाराचे नाव व पत्ता नाव:संजय गुप्ता वयू:41 पत्ता:नरडाणा पिन कोड:425404 नाव:अरुण निळंकठ महाजन | r, JAIPUR. चा दक्स ऐवर 8 PM करुन देणा-यान | ज करून दिल्याचे कल त करून दिल्याचे कल त व्यक्तीशः ओळखत स्वाक्षरी | बुल करतात. बुल करतात. आयाचित्र छायाचित्र | वेतात अंगठ्याचा ठसा | | |
| ोल ट कका ळखः लील मु :. 1 | नं: -, रोड नं: मोहनपुरा,जयपुर, राजस्थान पॅन नंबर: हिंद (स्तऐवज करुन देणार तथाकथीत) आडेकरार क्र.3 ची वेळ:08 / 10 / 2018 05 : 13 : 54 - इसम असे निवेदीत करतात की ते दस्तऐवज पक्षकाराचे नाव व पत्ता नाव:संजय गुप्ता वयू:41 पत्ता:नरडाणा पिन कोड:425404 नाव:अरुण निळंकठ महाजन वय:27 | r, JAIPUR. चा दस्त एवउ 8 PM करुन देणा-यान | द्धां डांग्रावेगेडः ज करुन दिल्याचे कल तं व्यक्तीशः ओळखत स्वाधारी | कुल करतात. त करतात. आयाचित्र छायाचित्र रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट्रिक्ट् | वेतात अंगठ्याचा ठसा रिजिजिजि | | |
| ोल द क्का कि ालील न्नु 5. 1 | नं: -, रोड नं: मोहनपुरा,जयपुर, राजस्थान पॅन नंबर: हरा प्रिंग करतऐवज करून देणार तथाकथीत आडेकरार क्र.3 ची वेळ:08 / 10 / 2018 05 : 13 : 5 इसम असे निवेदीत करतात की ते दस्तऐवज पक्षकाराचे नाव व पत्ता नाव:संजय गुप्ता वयू:41 पत्ता:नरडाणा पिन कोड:425404 नाव:अरुण निळंकठ महाजन वय:27 पत्ता:धुळे | r, JAIPUR. चा दक्स ऐवर 8 PM करुन देणा-यान | उद्यात्रविगेडः ज करुन दिल्याचे कर् ां व्यक्तीशः ओळखत स्वाक्षरी स्वाक्षरी | कुल करतात. त, व त्यांची ओळख पटवि छायाचित्र िर्ह्लायाचित्र | वेतात अंगठ्याचा ठसा विताल विताल | | |
| कि कि लि गि ग ग र 1 | नं: -, रोड नं: मोहनपुरा,जयपुर, राजस्थान पॅन नंबर: ह्ला प्रिंतऐवज करुन देणार तथाकथीत आडेकरार क्र.3 ची वेळ:08 / 10 / 2018 05 : 13 : 5 - इसम असे निवेदीत करतात की ते दस्तऐवज पक्षकाराचे नाव व पत्ता नाव:संजय गुप्ता वयू_41 पत्ता:नरडाणा पिन कोड:425404 नाव:अरुण निळंकठ महाजन वय:27 पत्ता:धुळे पिन कोड:424001 | r, JAIPUR. चा दस्स ऐवर 8 PM करुन देणा-यान | द्धावितिव्याचे कर् त करुन दिल्याचे कर् ा व्यक्तीशः ओळखत स्वाक्षरी स्वाक्षरी | कुल करतात. त, व त्यांची ओळख पटनि छायाचित्र रिक्लिजिजिजि | वेतात अंगठ्याचा ठसा विवाल | | |

शिक्का क्र.5 ची वेळ:08 / 10 / 2018 05 : 17 : 41 PM नौदणी पुस्तक 1 मध्ये

Sub Registrar Sindkhed

EPayment Details.

iSarita v1.5.0

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Summary-2(दस्त गोषवारा भाग - २)

86-86

| sr. | Epayment Number |
|-----|--------------------|
| 1 | 0810201807031 |
| 2 | MH006975185201819E |

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Defacement Number 0810201807031D 0003831708201819

3853 /2018

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"प्रभाणित करण्यात येते की मध्ये दस्त क. दुय्यम निबंधव र्शेदखेडा पुस्तक क्र. 2ंबर 35 नीदला 71.06/90/2016 दुण्यम निकंधक शिदखेडा

iSarita v1.5.0



Apurva Chandra, I.A.S. Principal Secretary (Industries)

Dear Sui Somani

Industries, Energy Bha2015/G Po2 10/ Inderst

Mantralaya Madam Cama Road, Mumbai 400 032 Tel : 91 (22) 2202 53 93 Fax : 91 (22) 2282 44 46 E-mail : psec.industry@maharashtra.gov.in

Date:- 10th March , 2016.

Kindly refer to your letters dated 1/10/2015,26/10/2015 and 9/2/2016 vide which you have proposed for setting up a project for the manufacture of OPC/PPC (Portland Cement) (2 MTPA) at Village Malich and Waghode, Plot No. 3, MIDC Industrial Area, Phase I, Nardana, Shindkheda, District- Dhule [a 'D' zone under the Package Scheme of Incentives (PSI) 2013], wherein you have proposed to invest Rs.550 crores and to provide employment to around 600 persons.

2. I am happy to inform you that the Government of Maharashtra has decided to confer the status of "Mega Project" on your proposed project on the basis of level of fixed capital investment and to offer the following incentives, subject to compliance of the conditions of the PSI, 2013:-

- 1) Electricity Duty exemption for a period of 9 years from the date of commencement of commercial production.
- 2) 100% exemption from payment of Stamp Duty in accordance with the dispensation in this regard under the Government Notification Revenue and Forest Department No.Mudrank 2013/UOR- No.19/C.R.-235/M-I dated 14/5/2013.
- 3) Industrial Promotion Subsidy (IPS) equivalent to 100% of eligible investments under PSI 2013 made within a period of 5 years from the date of possession of land i.e. 31/10/2015. But, the IPS will, however, be limited to 100% of eligible investment, less the amount of benefits availed at Sr. No. 2 (1) and 2 (2) as per period prescribed therein or to the extent of amount of taxes payable under the Maharashtra Value Added Tax Act, 2002 and the Central Sales Tax Act, 1956 by the Project in respect of sale of finished products eligible for incentives before adjustment of set off or other credit available (i.e. Gross VAT received by the GoM without marketing companies + CST) within a period of 9 years, whichever is lower.

- The IPS as a Mega Project will be admissible only after the Company invests Rs. 250 crores in eligible fixed assets at the site, from the date of possession of land i.e. 31/10/2015, failing which the project will not be treated as a Mega Project but as a normal unit under PSI, 2013, if otherwise eligible under that Scheme.
- 2) The Company will determine the starting period of availing IPS within a period of three years from the date of commencement of commercial production in the project.
- 3) The benefits granted under this Offer Letter will be protected in the event of any changes in the tax structure in future to the extent that they relate to taxes on such goods finally received by the Government of Maharashtra.

4. Kindly forward your application in the prescribed format to the Development Commissioner (Industries) for availing the above-mentioned benefits after completion of all effective steps [as per para 7.1(3) of PSI 2013] along with the requisite documents as required under PSI 2013.

5. Upon confirmation of your decision on the proposed project, a formal Memorandum of Understanding (M o U), confirming the above package will be executed between the State Government and your Company. Kindly convey your consent within 1 month.

Yours sincerely,

(Apurva Chandra)

Shri. Rajesh Somani, Sr.Vice President, M/s.Ultra Tech Cement Ltd, 'B' Wing, Ahura Centre, 2nd Floor, Mahakali Caves Road, Andheri(East), Mumbai-400 093.

CC to,

The Development Commissioner (Industries), M. S., New Administrative Building, Opp. Mantralaya, Mumbai.

Composition of raw material to be used in Cement manufacturing Process

1. Clinker

Clinker shall be sources from nearby cement plant of Dhar/Awarpur. Clinker shall be added @ 67.5 % in Portland Pozzolana Cement (PPC) and @95.5% in Ordinary Portland Cement. Clinker shall be transported in trucks/train. The clinker composition is considered given below:

| Clinker Specification | | | |
|--------------------------------|-----------------------|--|--|
| SiO ₂ | 21 - 22% | | |
| Al ₂ O ₃ | 5-5.50% | | |
| Fe ₂ O ₃ | 4 - 4.50% | | |
| CaO | 65.50 - 66.20% | | |
| MgO | 1.50 % Max. | | |
| SO ₃ | 1.00 % Max. | | |
| Loss on ignition | 0.75 % Max. | | |
| Total Alkalies | 0.70 % Max. | | |
| Insoluble Residue | 0.40 % Max. | | |
| Free Lime | 2.00 % Max. | | |
| LSF | 94 - 96 % | | |
| C3S | 53 – 57 % | | |
| C2S | 10 - 18 % | | |
| СЗА | 6 - 8 % | | |
| Bulk Density | 1.2 – 1.35 (Gm. /Ltr) | | |
| Moisture | 5 % Max. | | |
| Size | + 3 mm - Min. 70 % | | |
| | – 3 mm – Min. 30 % | | |

2. Gypsum

Gypsum shall be obtained from market for grinding unit. Gypsum shall be added @ 4.5% in Portland Pozzolana Cement (PPC)/ Ordinary Portland Cement (OPC). Gypsum shall be transported in trucks.

Considered quality of gypsum is as follows:

| Source | SiO ₂ | Al ₂ O ₃ | Fe ₂ O ₃ | CaO | MgO | Na ₂ O | K ₂ O | SO ₃ | CI |
|--------|------------------|--------------------------------|----------------------------------------------|--------|-------|-------------------|------------------|------------------------|-------|
| Market | 15.11% | 2.63% | 0.89% | 27.28% | 1.22% | 0.44% | 0.50% | 33.22% | 0.01% |

3. Flyash

Fly Ash shall be sources from nearby power plant. Fly Ash shall be added @ 28% in Portland Pozzolana Cement (PPC). Clinker shall be transported in trucks/train. Considered quality of fly ash is as follows:

| Sr. No. | Particulars | Percentage |
|---------|--------------|------------|
| 1 | Silica | 53.2 |
| 2 | Alumina | 21.3 |
| 3 | Ferric Oxide | 7.8 |

Fly Ash Specifications

| 4 | Titania | 1 |
|---|----------------------|-----|
| 5 | Phosphoric Anhydride | 0.1 |
| 6 | Lime | 9.6 |
| 7 | Magnesia | 1.9 |
| 8 | Undermined (By Diff) | 1.5 |
| | Total | 100 |

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LABORATORY TEST REPORT

| Company Name | : M/s Ultra Tech Cement Limited | Address | : Village-Malich & Vaghode MIDC Area Phase-1, Tal Nardana, Dist Dhule (MH) |
|------------------|----------------------------------------------|---------------------|----------------------------------------------------------------------------------|
| Client Name | : Pollution & Ecological Control Services | Address | : Nagpur |
| Lab ref. No. | : NL-127 | Date of Monitoring | : 1/10/2019 To 01/01/2020 |
| Date of Analysis | : 02/11/2019 To 15/01/2020 | Material Identified | : Air Sample |
| Date of Report | : 20/01/2020 | Sampled By | : Nilawar Laboratories |

DESCRIPTION OF AMBIENT AIR MONITORING STATIONS

| Sr. | Station | Description | Geographical Coordinates | | Dist. & dir. w.r.t. |
|-----|---------|------------------|--------------------------|--------------------------|---------------------|
| No. | Code | | Latitude | Longitude | Plant site |
| 1 | A1 | Project Site | 21°09'13.5" N | 074°51'01.7" E | - |
| 2 | A2 | VilageMalich | 21°09'12.7" N | 074°49'31.4" E | 2.35 km W |
| 3 | A3 | Village Kalmadi | 21°08'14.0" N | 074°49'01.6" E | 3.4 km SW |
| 4 | A4 | Village Vaghadi | 21º06'22 6" N | በ7 <i>ሊ</i> º/10'20 2" F | 5.3 km SSW |
| | | Budrukh | 21 00 22.0 N | 074 47 27.2 L | |
| 5 | A5 | Village Vaipur | 21°08'19.2" N | 074°46'47.1" E | 7.1 km WSW |
| 6 | A6 | Village Nardana | 21°11'32.8" N | 074°49'34.0" E | 4.5 km NW |
| 7 | A7 | Village Pashte | 21°12'31.8"N | 074°54'01.8" E | 7.5 km NE |
| 8 | A8 | Village Shahapur | 21°09'47.1" N | 074°56'09.8" E | 8.5 km ENE |

Off.: First Floor, 'Pratibha Sankul', Beside Alankar Cinema, Dharampeth, Nagpur - 10, Ph.: +91-712-2542261, Fax: +91-712-2542291, E-mail: nilawarlabs@rediffmail.com Laboratory : At Km 16.5, Nilawar Motors Complex, Amravati Road, Waddhamna, Nagpur - 440 023. Mob.: +91-9922409055, 9552550955

Annexure 6



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CIN No. U74140MH2009PTC196108



Nilawar Laboratories (A Unit of MNEC Consultants Pvt. Ltd)

AIR 1/9

ANALYSIS RESULT

| | Project Site | | | | | | | |
|------------------|--------------|-------------------------|--------------------------|------------------------|-------------------|-------------------|--|--|
| | | | A-1 | | | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NO _x | СО | | |
| week | Date | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | | |
| \A/ 1 | 1/10/2019 | 52.9 | 30.8 | 16.4 | 19.6 | 0.307 | | |
| VV-T | 2/10/2019 | 63.3 | 26.6 | 13.4 | 23.6 | 0.338 | | |
| W/ 2 | 8/10/2019 | 50.3 | 26.4 | 15.2 | 18.3 | 0.351 | | |
| VV-Z | 9/10/2019 | 53.5 | 23.8 | 12.7 | 21.4 | 0.369 | | |
| W/ 2 | 15/10/2019 | 49.5 | 23.8 | 12.1 | 21.7 | 0.375 | | |
| VV-5 | 16/10/2019 | 51.7 | 22.7 | 14.2 | 17.1 | 0.381 | | |
| | 22/10/2019 | 46.6 | 21.4 | 15.9 | 20.8 | 0.385 | | |
| VV- 4 | 23/10/2019 | 51.2 | 24.9 | 14.6 | 23.3 | 0.393 | | |
| W/ E | 1/11/2019 | 59.5 | 30.1 | 15.2 | 18 | 0.395 | | |
| 0-2 | 2/11/2019 | 61.7 | 29.4 | 11.5 | 23.1 | 0.399 | | |
| MG | 8/11/2019 | 58.6 | 28.2 | 13.5 | 24.4 | 0.404 | | |
| VV-0 | 9/11/2019 | 54.1 | 25.2 | 18.9 | 22.8 | 0.406 | | |
| M/ 7 | 15/11/2019 | 51.6 | 24.1 | 16.9 | 20.3 | 0.411 | | |
| VV-7 | 16/11/2019 | 47.1 | 22.9 | 14.5 | 24.7 | 0.417 | | |
| \M/ Q | 22/11/2019 | 53.7 | 25.7 | 15.3 | 22.8 | 0.425 | | |
| VV-0 | 23/11/2019 | 49.4 | 23.6 | 17.7 | 24.5 | 0.427 | | |
| W 0 | 29/11/2019 | 48.2 | 22.5 | 11.1 | 27.3 | 0.343 | | |
| VV-9 | 30/11/2019 | 51.9 | 27.6 | 19.9 | 27.9 | 0.444 | | |
| \ ₩_10 | 5/12/2019 | 54.6 | 27.2 | 19.4 | 24.7 | 0.451 | | |
| VV-10 | 6/12/2019 | 54.2 | 25.4 | 17.2 | 27.1 | 0.454 | | |
| \\/_11 | 12/12/2019 | 50.8 | 25.6 | 15.8 | 25.8 | 0.469 | | |
| VV-11 | 13/12/2019 | 53.9 | 26.1 | 18.0 | 22.3 | 0.470 | | |
| \\\/ 10 | 19/12/2019 | 62.8 | 25.4 | 19.7 | 27.5 | 0.474 | | |
| VV-1Z | 20/12/2019 | 49.2 | 31.5 | 17.1 | 24.2 | 0.398 | | |
| \W/_13 | 26/12/2019 | 48.0 | 25.6 | 15.2 | 26.9 | 0.315 | | |
| VIJ | 27/12/2019 | 48.2 | 22.7 | 14.3 | 22.4 | 0.432 | | |
| | Minimum | 63.3 | 31.5 | 19.9 | 27.9 | 0.307 | | |
| | Maximum | 46.6 | 21.4 | 11.1 | 17.1 | 0.474 | | |
| | Average | 52.9 | 25.7 | 15.6 | 23.2 | 0.401 | | |
| 9 | 8 percentile | 63.05 | 31.15 | 19.8 | 27.7 | 0.472 | | |

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Soil Testing for all types of Foundation Designs.

 Chemical Analysis of Soil & Water

 Micro-biological Analysis of Soil & Water

 Testing of Construction Material

 Environment Consultants

 Environment Monitoring & Analysis

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CIN No. U74140MH2009PTC196108

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|--------|------|
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Nilawar Laboratories (A Unit of MNEC Consultants Pvt. Ltd)

| | Malich village | | | | | | | | | |
|---------------|----------------|-------------------------|-------------------|-----------------|-------------------|-------------------|--|--|--|--|
| | | | A-2 | | | | | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NOx | СО | | | | |
| week | Dale | µg/m³ | µg/m ³ | µg/m³ | µg/m ³ | mg/m ³ | | | | |
| \ N/ 1 | 1/10/2019 | 48.1 | 25.8 | 9.6 | 15.2 | 0.245 | | | | |
| VV-1 | 2/10/2019 | 58.5 | 31.2 | 12.6 | 12.2 | 0.307 | | | | |
| W/ 2 | 8/10/2019 | 45.5 | 24.4 | 11.4 | 13.5 | 0.313 | | | | |
| VV-Z | 9/10/2019 | 48.7 | 26.2 | 9.1 | 11.6 | 0.319 | | | | |
| W/ 2 | 15/10/2019 | 44.7 | 23.9 | 11.1 | 12.8 | 0.323 | | | | |
| VV-5 | 16/10/2019 | 46.9 | 25.3 | 10.8 | 14.3 | 0.333 | | | | |
| | 22/10/2019 | 41.8 | 22.6 | 12.7 | 18.1 | 0.331 | | | | |
| VV-4 | 23/10/2019 | 46.2 | 24.9 | 11.2 | 11.3 | 0.337 | | | | |
| | 1/11/2019 | 54.7 | 29.3 | 11.6 | 13.2 | 0.342 | | | | |
| VV-5 | 2/11/2019 | 56.9 | 30.6 | 11.3 | 9.5 | 0.344 | | | | |
| M C | 8/11/2019 | 53.8 | 28.9 | 10.1 | 12.3 | 0.368 | | | | |
| VV-0 | 9/11/2019 | 49.3 | 26.6 | 15.7 | 17.1 | 0.349 | | | | |
| M/ 7 | 15/11/2019 | 46.2 | 24.9 | 13.7 | 15.1 | 0.407 | | | | |
| VV-/ | 16/11/2019 | 42.3 | 22.6 | 10.3 | 13.7 | 0.355 | | | | |
| \M/ Q | 22/11/2019 | 48.2 | 25.9 | 11.7 | 17.2 | 0.365 | | | | |
| VV-0 | 23/11/2019 | 44.6 | 24.1 | 14.3 | 18.6 | 0.412 | | | | |
| W 0 | 29/11/2019 | 43.4 | 23.5 | 10.2 | 13.2 | 0.436 | | | | |
| VV-9 | 30/11/2019 | 47.1 | 25.5 | 17.1 | 18.6 | 0.389 | | | | |
| W/ 10 | 5/12/2019 | 49.8 | 26.8 | 16.1 | 16.4 | 0.363 | | | | |
| VV-10 | 6/12/2019 | 49.4 | 26.6 | 14.9 | 13.9 | 0.289 | | | | |
| \\\/ 11 | 12/12/2019 | 46.7 | 24.6 | 11.8 | 15.7 | 0.453 | | | | |
| VV-11 | 13/12/2019 | 49.1 | 26.4 | 14.4 | 14.2 | 0.408 | | | | |
| W/ 12 | 19/12/2019 | 58.0 | 31.5 | 15.9 | 18.3 | 0.392 | | | | |
| VV-12 | 20/12/2019 | 44.4 | 24.7 | 13.9 | 15.1 | 0.276 | | | | |
| \W/_12 | 26/12/2019 | 43.2 | 23.3 | 11.8 | 16.4 | 0.382 | | | | |
| VV-13 | 27/12/2019 | 43.4 | 23.3 | 10.5 | 17.7 | 0.412 | | | | |
| | Minimum | 58.5 | 31.5 | 17.1 | 18.6 | 0.245 | | | | |
| | Maximum | 41.8 | 22.6 | 9.1 | 9.5 | 0.453 | | | | |
| | Average | 48.1 | 25.9 | 12.5 | 14.8 | 0.353 | | | | |
| 98 | percentile | 58.2 | 31.3 | 16.6 | 18.6 | 0.444 | | | | |

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CIN No. U74140MH2009PTC196108



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| | | Kalm | adi village | | | |
|-----------------|--------------|-------------------|-------------------|------------------------|-------------------|------------|
| | | | A-3 | | | |
| Week | Data | PM10 | PM _{2.5} | SO ₂ | NOx | СО |
| week | Date | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m^{3} |
| \ \ / 1 | 1/10/2019 | 47.0 | 24.2 | 11.4 | 16.6 | 0.287 |
| VV-T | 2/10/2019 | 40.8 | 27.1 | 12.4 | 18.2 | 0.299 |
| W/ 2 | 8/10/2019 | 41.5 | 23.5 | 15.5 | 22.8 | 0.347 |
| vv-z | 9/10/2019 | 42.8 | 24.3 | 10.0 | 14.5 | 0.357 |
| W/ 2 | 15/10/2019 | 45.1 | 25.4 | 10.3 | 15.1 | 0.351 |
| VV-5 | 16/10/2019 | 47.6 | 27.7 | 9.9 | 14.3 | 0.365 |
| | 22/10/2019 | 46.2 | 26.1 | 9.5 | 13.6 | 0.365 |
| VV-4 | 23/10/2019 | 50.4 | 28.1 | 10.8 | 15.6 | 0.365 |
| \ \ /_5 | 1/11/2019 | 51.2 | 26.5 | 11.3 | 16.4 | 0.374 |
| VV-5 | 2/11/2019 | 50.1 | 30.3 | 12.7 | 18.4 | 0.377 |
| W 6 | 8/11/2019 | 52.5 | 30.3 | 13.8 | 20.1 | 0.381 |
| VV-0 | 9/11/2019 | 50.2 | 26.4 | 15.4 | 22.5 | 0.393 |
| \ <i>\\</i> / 7 | 15/11/2019 | 46.8 | 26.9 | 11.6 | 16.8 | 0.394 |
| VV-/ | 16/11/2019 | 47.1 | 29.5 | 9.6 | 14.2 | 0.396 |
| \\/\ Q | 22/11/2019 | 49.3 | 29.2 | 10.4 | 14.5 | 0.404 |
| VV-0 | 23/11/2019 | 51.3 | 27.3 | 16.3 | 23.9 | 0.314 |
| W 0 | 29/11/2019 | 48.9 | 27.8 | 12.8 | 18.5 | 0.309 |
| VV-9 | 30/11/2019 | 51.4 | 24.4 | 15.1 | 21.8 | 0.315 |
| W/ 10 | 5/12/2019 | 48.5 | 26.1 | 12.9 | 18.8 | 0.318 |
| VV-10 | 6/12/2019 | 49.8 | 28.2 | 13.8 | 20.1 | 0.322 |
| \\\/ 11 | 12/12/2019 | 50.3 | 28.2 | 11.6 | 17.3 | 0.329 |
| VV-11 | 13/12/2019 | 51.3 | 29.5 | 10.2 | 14.5 | 0.335 |
| W/ 10 | 19/12/2019 | 48.5 | 27.4 | 10.4 | 15.1 | 0.344 |
| VV-12 | 20/12/2019 | 48.2 | 27.4 | 11.6 | 16.8 | 0.355 |
| W/ 12 | 26/12/2019 | 48.4 | 25.5 | 13.3 | 19.4 | 0.387 |
| VV-13 | 27/12/2019 | 49.2 | 27.8 | 11.6 | 16.9 | 0.306 |
| | Minimum | 52.5 | 30.3 | 16.3 | 23.9 | 0.287 |
| | Maximum | 40.8 | 23.5 | 9.5 | 13.6 | 0.404 |
| | Average | 48.2 | 27.1 | 12.1 | 17.6 | 0.349 |
| 9 | 8 percentile | 52.0 | 30.3 | 15.9 | 23.4 | 0.400 |

AIR 4/9

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CIN No. U74140MH2009PTC196108



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| | Vaghadi Budruk village | | | | | | | | | | |
|----------------|------------------------|-------------------------|--------------------------|------------------------|-------------------|-------------------|--|--|--|--|--|
| | | | A-4 | | | | | | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NO _x | СО | | | | | |
| week | Date | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | | | | | |
| \\\/ 1 | 3/10/2019 | 43.8 | 23.5 | 11.2 | 14.3 | 0.362 | | | | | |
| VV-1 | 4/10/2019 | 37.6 | 20.2 | 7.8 | 19.3 | 0.368 | | | | | |
| W 2 | 10/10/2019 | 38.3 | 20.6 | 8.1 | 17.1 | 0.391 | | | | | |
| VV-Z | 11/10/2019 | 39.6 | 21.3 | 9.4 | 13.9 | 0.396 | | | | | |
| M/ 2 | 17/10/2019 | 41.9 | 22.4 | 10.6 | 14.9 | 0.304 | | | | | |
| W-3 18/10/2019 | | 43.8 | 23.6 | 7.5 | 18.3 | 0.322 | | | | | |
| | 24/10/2019 | 43.8 | 23.6 | 8.2 | 15.6 | 0.328 | | | | | |
| VV-4 | 25/10/2019 | 47.2 | 25.4 | 12.1 | 21.2 | 0.334 | | | | | |
| W/ E | 3/11/2019 | 48.6 | 25.8 | 10.5 | 18.5 | 0.338 | | | | | |
| VV-5 | 4/11/2019 | 46.9 | 25.3 | 11.8 | 21.2 | 0.346 | | | | | |
| M G | 10/11/2019 | 49.3 | 26.5 | 8.6 | 15.9 | 0.348 | | | | | |
| VV-0 | 11/11/2019 | 47.2 | 25.3 | 7.1 | 13.9 | 0.351 | | | | | |
| \ <i>\\</i> 7 | 17/11/2019 | 42.8 | 23.1 | 9.3 | 17.2 | 0.352 | | | | | |
| VV-7 | 18/11/2019 | 43.9 | 23.5 | 10.5 | 17.8 | 0.357 | | | | | |
| \M/ Q | 24/11/2019 | 46.1 | 24.8 | 12.4 | 21.4 | 0.359 | | | | | |
| VV-0 | 25/11/2019 | 48.1 | 25.9 | 10.9 | 19.4 | 0.364 | | | | | |
| W 0 | 1/12/2019 | 45.7 | 24.7 | 10.1 | 18.7 | 0.347 | | | | | |
| VV-9 | 2/12/2019 | 47.8 | 25.8 | 10.8 | 20.9 | 0.378 | | | | | |
| W/ 10 | 8/12/2019 | 45.3 | 24.4 | 9.4 | 17.1 | 0.348 | | | | | |
| VV-10 | 9/12/2019 | 46.6 | 25.1 | 11.1 | 19.9 | 0.385 | | | | | |
| \\/ 11 | 15/12/2019 | 46.8 | 25.9 | 8.8 | 15.5 | 0.397 | | | | | |
| VV-11 | 16/12/2019 | 48.1 | 25.8 | 10.1 | 14.3 | 0.304 | | | | | |
| W/ 10 | 22/12/2019 | 45.3 | 24.3 | 7.8 | 19.1 | 0.307 | | | | | |
| VV-12 | 23/12/2019 | 45.1 | 24.3 | 8.4 | 15.9 | 0.322 | | | | | |
| W/ 12 | 29/12/2019 | 45.2 | 24.3 | 11.1 | 19.7 | 0.323 | | | | | |
| VV-12 | 30/12/2019 | 46.6 | 24.7 | 10.1 | 17.7 | 0.327 | | | | | |
| | Minimum | 49.3 | 26.5 | 12.4 | 21.4 | 0.304 | | | | | |
| | Maximum | 37.6 | 20.2 | 7.1 | 13.9 | 0.397 | | | | | |
| | Average | 45.1 | 24.2 | 9.8 | 17.6 | 0.348 | | | | | |
| 98 | 8 percentile | 49.0 | 26.2 | 12.25 | 21.3 | 0.396 | | | | | |

AIR 5/9

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| | | Vaip | ur village | | | |
|----------------|--------------|-------------------------|-------------------|------------------------|-------------------|------------|
| | | | A-5 | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NOx | СО |
| week | Date | µg/m ³ | µg/m ³ | µg/m³ | µg/m ³ | mg/m^{3} |
| \ \ / 1 | 3/10/2019 | 49.6 | 25.8 | 11.4 | 15.2 | 0.349 |
| VV-T | 4/10/2019 | 59.4 | 31.8 | 9.9 | 20.5 | 0.333 |
| W/ 2 | 10/10/2019 | 46.4 | 24.2 | 13.5 | 22.2 | 0.339 |
| vv-z | 11/10/2019 | 49.6 | 26.1 | 16.1 | 26.4 | 0.317 |
| W/ 2 | 17/10/2019 | 45.6 | 23.7 | 14.5 | 29.4 | 0.387 |
| VV-5 | 18/10/2019 | 47.8 | 25.1 | 18 | 23.4 | 0.380 |
| M/ A | 24/10/2019 | 42.7 | 22.7 | 21.2 | 31.5 | 0.347 |
| VV-4 | 25/10/2019 | 47.1 | 24.7 | 9.2 | 15.4 | 0.406 |
| W/ F | 3/11/2019 | 55.6 | 29.7 | 12.1 | 22.5 | 0.417 |
| VV-5 | 4/11/2019 | 57.8 | 31.1 | 13.3 | 20.4 | 0.288 |
| W 6 | 10/11/2019 | 54.7 | 29.2 | 7.6 | 12.9 | 0.329 |
| VV-0 | 11/11/2019 | 50.2 | 26.6 | 8.1 | 20.3 | 0.348 |
| \M_7 | 17/11/2019 | 47.1 | 24.7 | 12.2 | 14.6 | 0.396 |
| VV-/ | 18/11/2019 | 43.2 | 22.2 | 10.3 | 17.2 | 0.274 |
| \ \ /_Q | 24/11/2019 | 49.1 | 25.8 | 9.8 | 16.9 | 0.279 |
| VV-0 | 25/11/2019 | 45.5 | 23.8 | 9.4 | 24.2 | 0.412 |
| W O | 1/12/2019 | 44.3 | 23.1 | 14.9 | 18.9 | 0.375 |
| VV-9 | 2/12/2019 | 48 | 25.4 | 8.6 | 20.2 | 0.359 |
| W/ 10 | 8/12/2019 | 50.7 | 26.8 | 12.3 | 17.4 | 0.382 |
| VV-10 | 9/12/2019 | 50.3 | 26.6 | 13.4 | 20.2 | 0.366 |
| \\\/ 11 | 15/12/2019 | 46.9 | 24.5 | 10.4 | 21.7 | 0.275 |
| VV-11 | 16/12/2019 | 50.1 | 26.4 | 9.4 | 15.7 | 0.402 |
| W/ 12 | 22/12/2019 | 58.9 | 31.6 | 8.7 | 14.5 | 0.428 |
| VV-12 | 23/12/2019 | 45.3 | 23.7 | 11.6 | 18.4 | 0.443 |
| \\\/_12 | 29/12/2019 | 44.1 | 22.9 | 13.4 | 17.9 | 0.457 |
| VV-12 | 30/12/2019 | 44.3 | 23.4 | 10.1 | 22.4 | 0.298 |
| | Minimum | 59.4 | 31.8 | 21.2 | 31.5 | 0.274 |
| | Maximum | 42.7 | 22.2 | 7.6 | 12.9 | 0.457 |
| | Average | 49.0 | 25.8 | 11.9 | 20.0 | 0.361 |
| 9 | 8 percentile | 59.2 | 31.7 | 19.6 | 30.5 | 0.450 |

AIR 6/9

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Nilawar Laboratories (A Unit of MNEC Consultants Pvt. Ltd)

| | | Nardan | a village | | | |
|-----------------------------|--------------|-------------------------|-------------------|-------------------|-------------------|-------------------|
| | | | \-6 | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NOx | СО |
| week | Date | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ |
| \ \ /_1 | 3/10/2019 | 50.1 | 29.9 | 21.4 | 34.9 | 0.391 |
| VV-1 | 4/10/2019 | 60.9 | 35.7 | 18.9 | 30.8 | 0.312 |
| W/_2 | 10/10/2019 | 47.5 | 28.4 | 17.1 | 28.1 | 0.402 |
| VV-Z | 11/10/2019 | 50.7 | 30.3 | 16.8 | 25.7 | 0.328 |
| W/ 2 | 17/10/2019 | 45.6 | 27.2 | 14.4 | 26.4 | 0.312 |
| VV-5 | 18/10/2019 | 48.9 | 29.3 | 15.1 | 24.9 | 0.321 |
| W A | 24/10/2019 | 47.1 | 28.2 | 19.1 | 28.8 | 0.365 |
| W-4 25/10/2019 3/11/2019 | | 48.2 | 28.8 | 17.1 | 28.1 | 0.382 |
| W/ 5 | 3/11/2019 | 56.7 | 33.8 | 21.4 | 34.3 | 0.312 |
| VV-5 | 4/11/2019 | 58.9 | 35.2 | 18.7 | 30.8 | 0.294 |
| W 6 | 10/11/2019 | 55.8 | 33.3 | 16.2 | 26.6 | 0.297 |
| VV-0 | 11/11/2019 | 51.3 | 30.7 | 15.3 | 24.8 | 0.356 |
| 14/ 7 | 17/11/2019 | 48.2 | 28.9 | 18.1 | 29.7 | 0.343 |
| VV-7 | 18/11/2019 | 53.1 | 31.6 | 21.6 | 34.1 | 0.351 |
| \ <u>\</u> | 24/11/2019 | 50.2 | 30.2 | 18.3 | 29.9 | 0.324 |
| VV-0 | 25/11/2019 | 48.3 | 28.9 | 19.5 | 31.9 | 0.351 |
| W 0 | 1/12/2019 | 49.5 | 29.7 | 17.2 | 24.2 | 0.298 |
| VV-9 | 2/12/2019 | 49.1 | 29.5 | 13.3 | 27.6 | 0.234 |
| W/ 10 | 8/12/2019 | 51.8 | 31.6 | 15.3 | 25.2 | 0.337 |
| VV-10 | 9/12/2019 | 51.4 | 30.8 | 14.3 | 23.7 | 0.246 |
| \A/ 11 | 15/12/2019 | 48.3 | 28.6 | 15.2 | 24.9 | 0.341 |
| VV-11 | 16/12/2019 | 51.1 | 30.5 | 16.8 | 27.5 | 0.376 |
| W/ 12 | 22/12/2019 | 58.2 | 34.6 | 15.3 | 25.1 | 0.362 |
| VV-12 | 23/12/2019 | 55.9 | 33.4 | 20.3 | 33.3 | 0.369 |
| \ <u>\</u> /_12 | 29/12/2019 | 53.1 | 31.7 | 22.9 | 37.4 | 0.453 |
| VV-12 | 30/12/2019 | 50.1 | 29.9 | 18.5 | 30.2 | 0.434 |
| | Minimum | 60.9 | 35.7 | 22.9 | 37.4 | 0.234 |
| | Maximum | 45.6 | 27.2 | 13.3 | 23.7 | 0.453 |
| | Average | 51.5 | 30.8 | 17.6 | 28.8 | 0.342 |
| 98 | 8 percentile | 59.9 | 35.45 | 22.25 | 36.2 | 0.443 |

AIR 7/9

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| | Pashte village | | | | | | | | | | |
|----------------|----------------|-------------------------|-------------------|------------------------|-------------------|-------------------|--|--|--|--|--|
| | | | A-7 | | | | | | | | |
| Week | Data | PM ₁₀ | PM _{2.5} | SO ₂ | NOx | СО | | | | | |
| week | Date | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | | | | | |
| \ \ /_1 | 5/10/2019 | 38.8 | 23.3 | 15.7 | 17 | 0.388 | | | | | |
| VV-1 | 6/10/2019 | 41.6 | 24.5 | 13.9 | 21.3 | 0.372 | | | | | |
| W 2 | 12/10/2019 | 40.7 | 24.2 | 11.6 | 24.6 | 0.378 | | | | | |
| VV-Z — | 13/10/2019 | 42.4 | 27.2 | 10.3 | 16.5 | 0.356 | | | | | |
| M/ 2 | 19/10/2019 | 43.8 | 25.6 | 12.6 | 19.3 | 0.326 | | | | | |
| VV-5 – | 20/10/2019 | 44.5 | 26.6 | 14.6 | 22.9 | 0.319 | | | | | |
| | 26/10/2019 | 47.8 | 28.6 | 15.1 | 22.2 | 0.286 | | | | | |
| VV-4 | 27/10/2019 | 44.4 | 26.5 | 11.1 | 15.5 | 0.345 | | | | | |
| | 5/11/2019 | 49.1 | 29.2 | 9.7 | 11.1 | 0.356 | | | | | |
| VV-5 | 6/11/2019 | 45.8 | 27.5 | 11.2 | 17.5 | 0.378. | | | | | |
| M/C | 12/11/2019 | 43.4 | 26.1 | 16.2 | 24.9 | 0.268 | | | | | |
| VV-0 | 13/11/2019 | 45.5 | 27.3 | 14.9 | 22.1 | 0.287 | | | | | |
| M/ 7 | 19/11/2019 | 46.9 | 28.1 | 12.5 | 19.4 | 0.335 | | | | | |
| VV-/ | 20/11/2019 | 46.5 | 27.1 | 11.9 | 18.3 | 0.213 | | | | | |
| \A/ Q | 26/11/2019 | 50.2 | 29.6 | 12.3 | 19.2 | 0.209 | | | | | |
| VV-0 | 27/11/2019 | 49.2 | 29.2 | 14.2 | 21.9 | 0.351 | | | | | |
| W/ 0 | 2/12/2019 | 48.3 | 29.7 | 13.4 | 20.8 | 0.314 | | | | | |
| VV-9 – | 3/12/2019 | 48.7 | 29.4 | 12.1 | 18.9 | 0.298 | | | | | |
| W 10 | 9/12/2019 | 46.4 | 27.6 | 15.9 | 24.5 | 0.321 | | | | | |
| VV-10 | 10/12/2019 | 44.6 | 26.5 | 14.6 | 18.2 | 0.305 | | | | | |
| \\\/ 11 | 16/12/2019 | 48.2 | 28.2 | 11.9 | 22.5 | 0.214 | | | | | |
| VV-11 | 17/12/2019 | 44.7 | 26.5 | 12.3 | 19.6 | 0.341 | | | | | |
| W/ 10 | 23/12/2019 | 45.7 | 26.9 | 13.7 | 21.1 | 0.367 | | | | | |
| VV-12 | 24/12/2019 | 47.9 | 28.6 | 12.1 | 18.8 | 0.382 | | | | | |
| W/ 12 | 30/12/2019 | 44.5 | 26.6 | 14.4 | 22.2 | 0.396 | | | | | |
| VV-13 | 1/01/2020 | 43.1 | 25.5 | 13.2 | 20.3 | 0.237 | | | | | |
| l | Minimum | 50.2 | 29.7 | 16.2 | 24.9 | 0.209 | | | | | |
| | Maximum | 38.8 | 23.3 | 9.7 | 11.1 | 0.396 | | | | | |
| | Average | 45.5 | 27.2 | 13.1 | 20.0 | 0.318 | | | | | |
| 98 | B percentile | 49.7 | 29.65 | 16.05 | 24.8 | 0.392 | | | | | |

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| | | Shahaj | our village | | | |
|------------------|--------------|-------------------------|-------------------|------------------------|-------------------|-------|
| | | | A-8 | | 1 | |
| Week | Date | PM ₁₀ | PM _{2.5} | SO ₂ | NOx | CO |
| Week | | µg/m³ | µg/m ³ | µg/m³ | µg/m ³ | mg/m³ |
| \\/_1 | 5/10/2019 | 42.8 | 23.2 | 13.4 | 19.8 | 0.349 |
| VV-T | 6/10/2019 | 45.2 | 24.2 | 11.2 | 16.6 | 0.361 |
| W/ 2 | 12/10/2019 | 44.5 | 23.9 | 9.1 | 12.8 | 0.368 |
| vv-2 | 13/10/2019 | 46.4 | 24.9 | 10.1 | 14.2 | 0.371 |
| W/ 2 | 19/10/2019 | 47.2 | 25.2 | 9.7 | 14.3 | 0.376 |
| VV-5 | 20/10/2019 | 48.7 | 26.2 | 12.5 | 18.1 | 0.377 |
| W/ 4 | 26/10/2019 | 52.2 | 28.1 | 13.2 | 18.9 | 0.383 |
| VV- 1 | 27/10/2019 | 48.6 | 26.1 | 9.9 | 12.1 | 0.384 |
| W/ E | 5/11/2019 | 53.1 | 28.5 | 9.1 | 12.5 | 0.391 |
| vv-5 | 6/11/2019 | 50.4 | 27.2 | 9.5 | 12.4 | 0.397 |
| W-6 | 12/11/2019 | 47.6 | 25.6 | 14.1 | 20.7 | 0.306 |
| VV-0 | 13/11/2019 | 49.9 | 26.9 | 13.3 | 18.6 | 0.309 |
| \M_7 | 19/11/2019 | 51.3 | 27.6 | 10.6 | 14.5 | 0.313 |
| vv-/ | 20/11/2019 | 49.9 | 26.6 | 9.8 | 13.1 | 0.317 |
| \M/_Q | 26/11/2019 | 54.2 | 29.1 | 10.1 | 14.6 | 0.319 |
| VV-0 | 27/11/2019 | 53.4 | 28.7 | 12.1 | 17.3 | 0.327 |
| W/_Q | 2/12/2019 | 52.9 | 28.5 | 11.7 | 16.1 | 0.327 |
| vv-9 | 3/12/2019 | 53.5 | 28.9 | 10.6 | 14.2 | 0.327 |
| W_10 | 9/12/2019 | 50.6 | 27.2 | 13.8 | 20.2 | 0.336 |
| VV-10 | 10/12/2019 | 48.4 | 26.1 | 12.7 | 18.1 | 0.339 |
| \M/_11 | 16/12/2019 | 51.8 | 27.7 | 9.2 | 13.2 | 0.343 |
| VV-II | 17/12/2019 | 48.7 | 26.2 | 10.2 | 14.8 | 0.349 |
| \ <u>//</u> _12 | 23/12/2019 | 49.5 | 26.5 | 11.2 | 16.3 | 0.355 |
| VV-12 | 24/12/2019 | 52.3 | 28.1 | 10.2 | 13.8 | 0.356 |
| W_13 | 30/12/2019 | 48.7 | 26.2 | 12.3 | 17.7 | 0.358 |
| VV-T2 - | 1/01/2020 | 46.9 | 25.2 | 10.7 | 15.5 | 0.366 |
| | Minimum | 54.2 | 29.1 | 14.1 | 20.7 | 0.306 |
| | Maximum | 42.8 | 23.2 | 9.1 | 12.1 | 0.397 |
| | Average | 49.6 | 26.6 | 11.2 | 15.8 | 0.350 |
| 98 | 3 percentile | 53.9 | 29 | 13.95 | 20.5 | 0.394 |

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| | | | | | | | | SCHEDULED | LIT | ERATE |
|------|-------------|-----------|-------|-------|----------|--------|-------|-----------|-------|--------|
| | NAME OF | | NO OF | | | | CASTE | TRIBE | | |
| | THE | | HOUSE | P(|)PULATI(| DN | | | | |
| S.N. | VILLAGE | TALUKA | HOLDS | TOTAL | MALE | FEMALE | | | MALE | FEMALE |
| 1 | Ajande Bk | Sirpur | 738 | 3378 | 1723 | 1655 | 259 | 958 | 1109 | 821 |
| 2 | Hol | Sirpur | 774 | 3859 | 1969 | 1890 | 399 | 758 | 1472 | 1137 |
| 3 | Bamhane | Sindkhede | 628 | 2821 | 1455 | 1366 | 457 | 432 | 1094 | 844 |
| 4 | Mandal | Sindkhede | 480 | 2258 | 1197 | 1061 | 203 | 682 | 757 | 504 |
| 5 | Kumbhare | Sindkhede | 126 | 549 | 284 | 265 | 61 | 163 | 205 | 133 |
| 6 | Shirale | Sindkhede | 40 | 182 | 102 | 80 | 16 | 44 | 83 | 58 |
| 7 | Gavhane | Sindkhede | 272 | 1185 | 596 | 589 | 60 | 129 | 473 | 415 |
| 8 | Dattane | Sindkhede | 272 | 1230 | 647 | 583 | 2 | 192 | 487 | 398 |
| 9 | Dhandarne | Sindkhede | 208 | 1151 | 593 | 558 | 11 | 280 | 355 | 265 |
| 10 | Dabli | Sindkhede | 311 | 1412 | 745 | 667 | 132 | 152 | 525 | 408 |
| 11 | Vitai | Sindkhede | 221 | 993 | 509 | 484 | 21 | 235 | 411 | 293 |
| 12 | Pashte | Sindkhede | 734 | 3196 | 1622 | 1574 | 126 | 765 | 1172 | 964 |
| 13 | Pimprad | Sindkhede | 440 | 1892 | 958 | 934 | 91 | 334 | 783 | 664 |
| 14 | Nardane | Sindkhede | 1356 | 6609 | 3340 | 3269 | 696 | 1278 | 2545 | 2250 |
| 15 | Warud | Sindkhede | 961 | 4503 | 2337 | 2166 | 416 | 895 | 1734 | 1311 |
| 16 | Melane | Sindkhede | 141 | 826 | 428 | 398 | 0 | 194 | 314 | 242 |
| 17 | Jatode | Sindkhede | 267 | 1499 | 729 | 770 | 27 | 172 | 531 | 454 |
| 18 | Malich | Sindkhede | 336 | 2160 | 1187 | 973 | 127 | 652 | 930 | 634 |
| 19 | Gorane | Sindkhede | 324 | 1363 | 701 | 662 | 126 | 374 | 564 | 468 |
| 20 | Pimparkheda | Sindkhede | 205 | 848 | 435 | 413 | 24 | 84 | 347 | 295 |
| 21 | Kalmadi | Sindkhede | 430 | 2128 | 1104 | 1024 | 171 | 251 | 803 | 600 |
| 22 | Babhalde | Sindkhede | 207 | 1078 | 575 | 503 | 21 | 364 | 395 | 261 |
| 23 | Kanchanpur | Sindkhede | 351 | 1558 | 765 | 793 | 84 | 492 | 524 | 464 |
| 24 | Dongargaon | Sindkhede | 257 | 1270 | 649 | 621 | 21 | 442 | 521 | 463 |
| 25 | Padhawad | Sindkhede | 473 | 2200 | 1131 | 1069 | 202 | 509 | 892 | 786 |
| 26 | Betawad | Sindkhede | 1618 | 7692 | 3918 | 3774 | 803 | 1041 | 2804 | 2303 |
| 27 | Ajande Bk | Sindkhede | 347 | 1392 | 713 | 679 | 124 | 141 | 548 | 392 |
| 28 | Vaghode | Sindkhede | 239 | 1078 | 524 | 554 | 9 | 146 | 418 | 373 |
| 29 | Valkhede | Sindkhede | 671 | 3237 | 1656 | 1581 | 197 | 1190 | 1280 | 1026 |
| 30 | Chandgad | Sindkhede | 212 | 1027 | 550 | 477 | 5 | 1002 | 344 | 227 |
| 31 | Vaipur | Sindkhede | 406 | 1802 | 921 | 881 | 74 | 644 | 667 | 500 |
| 32 | Sarwe | Sindkhede | 180 | 997 | 500 | 497 | 37 | 233 | 351 | 285 |
| 33 | Waghadi Kh | Sindkhede | 230 | 1033 | 531 | 502 | 106 | 277 | 355 | 252 |
| 34 | Waghadi Bk | Sindkhede | 507 | 2236 | 1149 | 1087 | 92 | 184 | 901 | 707 |
| | Total | | 14962 | 70642 | 36243 | 34399 | 5200 | 15689 | 26694 | 21197 |

Dempgraphic pattern of villages within the study area

| | | | Employment pattern er ting | | | | | | | | | | 1 | | | |
|------|-------------|-----------|----------------------------|----------------|--------|--------|--------------|----------------|---------------|---------------|-----------|-------------|------------|---------------|--------|--------|
| | NAME OF | | TOTAL WOR | L MAIN KERS | CULTIV | ATORS | AGRIC LAP | ULTURE BORS | HOUSI INDU | EHOLD STRY | OT WOR | HER KERS | MAR WOI | GINAL RKER | NON WO | ORKERS |
| | THE | | MALE | FEMALE | MALE | FEMALE | MALE | FEMALE | MALE | FEMALE | MALE | FEMALE | MALE | FEMALE | MALE | FEMALE |
| S.N. | VILLAGE | TALUKA | | | | | | | | | | | | | | |
| 1 | Ajande Bk | Sirpur | 888 | 539 | 178 | 46 | 521 | 441 | 39 | 11 | 150 | 41 | 78 | 59 | 757 | 1057 |
| 2 | Hol | Sirpur | 1061 | 610 | 127 | 29 | 729 | 541 | 63 | 18 | 142 | 22 | 45 | 41 | 863 | 1239 |
| 3 | Bamhane | Sindkhede | 799 | 595 | 264 | 157 | 347 | 396 | 12 | 10 | 176 | 32 | 38 | 57 | 618 | 714 |
| 4 | Mandal | Sindkhede | 647 | 460 | 203 | 69 | 349 | 328 | 29 | 36 | 66 | 27 | 86 | 149 | 464 | 452 |
| 5 | Kumbhare | Sindkhede | 169 | 173 | 1 | 2 | 166 | 167 | 0 | 0 | 2 | 4 | 0 | 0 | 115 | 92 |
| 6 | Shirale | Sindkhede | 42 | 16 | 15 | 1 | 7 | 10 | 10 | 3 | 10 | 2 | 17 | 18 | 43 | 46 |
| 7 | Gavhane | Sindkhede | 271 | 199 | 178 | 148 | 51 | 36 | 28 | 6 | 14 | 9 | 183 | 191 | 142 | 199 |
| 8 | Dattane | Sindkhede | 327 | 30 | 231 | 7 | 56 | 13 | 12 | 0 | 28 | 10 | 98 | 210 | 222 | 343 |
| 9 | Dhandarne | Sindkhede | 317 | 175 | 161 | 55 | 125 | 104 | 1 | 2 | 30 | 14 | 6 | 10 | 270 | 373 |
| 10 | Dabli | Sindkhede | 364 | 340 | 244 | 106 | 87 | 213 | 5 | 4 | 28 | 17 | 66 | 64 | 315 | 263 |
| 11 | Vitai | Sindkhede | 268 | 245 | 130 | 109 | 113 | 101 | 8 | 10 | 17 | 25 | 28 | 27 | 213 | 212 |
| 12 | Pashte | Sindkhede | 686 | 417 | 157 | 13 | 367 | 252 | 16 | 131 | 146 | 21 | 201 | 160 | 735 | 997 |
| 13 | Pimprad | Sindkhede | 466 | 170 | 145 | 8 | 148 | 135 | 17 | 7 | 156 | 20 | 26 | 11 | 466 | 753 |
| 14 | Nardane | Sindkhede | 1611 | 522 | 145 | 32 | 490 | 288 | 99 | 10 | 877 | 192 | 191 | 295 | 1538 | 2452 |
| 15 | Warud | Sindkhede | 1232 | 692 | 370 | 28 | 721 | 628 | 49 | 13 | 92 | 23 | 56 | 133 | 1049 | 1341 |
| 16 | Melane | Sindkhede | 236 | 233 | 144 | 145 | 75 | 80 | 1 | 1 | 16 | 7 | 4 | 5 | 188 | 160 |
| 17 | Jatode | Sindkhede | 361 | 206 | 114 | 16 | 182 | 181 | 7 | 3 | 58 | 6 | 27 | 51 | 341 | 513 |
| 18 | Malich | Sindkhede | 488 | 372 | 259 | 248 | 109 | 89 | 17 | 11 | 103 | 24 | 22 | 75 | 677 | 526 |
| 19 | Gorane | Sindkhede | 371 | 157 | 166 | 35 | 148 | 112 | 7 | 2 | 50 | 8 | 9 | 5 | 321 | 500 |
| 20 | Pimparkheda | Sindkhede | 221 | 197 | 152 | 48 | 54 | 122 | 0 | 5 | 15 | 22 | 16 | 35 | 198 | 181 |
| 21 | Kalmadi | Sindkhede | 568 | 472 | 296 | 101 | 206 | 350 | 12 | 7 | 54 | 14 | 35 | 64 | 501 | 488 |
| 22 | Babhalde | Sindkhede | 327 | 269 | 54 | 14 | 153 | 206 | 3 | 1 | 117 | 48 | 6 | 2 | 242 | 232 |
| 23 | Kanchanpur | Sindkhede | 311 | 266 | 177 | 122 | 119 | 132 | 1 | 3 | 14 | 9 | 158 | 206 | 296 | 321 |
| 24 | Dongargaon | Sindkhede | 385 | 351 | 206 | 18 | 149 | 307 | 7 | 9 | 23 | 17 | 38 | 68 | 226 | 202 |
| 25 | Padhawad | Sindkhede | 636 | 564 | 300 | 41 | 286 | 511 | 1 | 0 | 49 | 12 | 5 | 5 | 490 | 500 |
| 26 | Betawad | Sindkhede | 2147 | 1244 | 341 | 90 | 1250 | 916 | 42 | 30 | 514 | 208 | 119 | 293 | 1652 | 2237 |
| 27 | Ajande Bk | Sindkhede | 373 | 283 | 95 | 23 | 225 | 252 | 2 | 1 | 51 | 7 | 22 | 15 | 318 | 381 |
| 28 | Vaghode | Sindkhede | 301 | 304 | 186 | 148 | 94 | 150 | 1 | 3 | 20 | 3 | 1 | 2 | 222 | 248 |
| 29 | Valkhede | Sindkhede | 963 | 677 | 347 | 94 | 507 | 527 | 11 | 16 | 98 | 40 | 34 | 75 | 659 | 829 |
| 30 | Chandgad | Sindkhede | 169 | 104 | 54 | 3 | 106 | 96 | 0 | 0 | 9 | 5 | 120 | 182 | 261 | 191 |
| 31 | Vaipur | Sindkhede | 526 | 419 | 249 | 108 | 211 | 303 | 9 | 3 | 57 | 5 | 52 | 41 | 343 | 421 |
| 32 | Sarwe | Sindkhede | 292 | 169 | 131 | 13 | 105 | 135 | 5 | 3 | 51 | 18 | 2 | 5 | 206 | 323 |
| 33 | Waghadi Kh | Sindkhede | 213 | 96 | 104 | 71 | 50 | 18 | 16 | 1 | 43 | 6 | 114 | 199 | 204 | 207 |
| 34 | Waghadi Bk | Sindkhede | 686 | 636 | 488 | 449 | 162 | 172 | 7 | 3 | 29 | 12 | 29 | 21 | 434 | 430 |
| | Total | | 18722 | 12202 | 6412 | 2597 | 8468 | 8312 | 537 | 363 | 3305 | 930 | 1932 | 2774 | 15589 | 19423 |

Employment pattern of villages within the study area

Annexure 7C

| | | | | OTHER | TOTAL | | | AREA NOT |
|--------|-------------|-----------|--------|-----------|-----------|--------------|------------|-----------|
| | VILLAGE | | FOREST | IRRIGATED | IRRIGATED | UN-IRRIGATED | CULTURABLE | AVAILABLE |
| Sr.No. | NAME | TALUKA | LAND | LAND | LAND | LAND | WASTE LAND | FOR |
| 1 | Ajande Bk | Sirpur | 0.00 | 0.00 | 64.00 | 431.00 | 60.00 | 6.00 |
| 2 | Hol | Sirpur | 0.00 | 0.00 | 87.00 | 362.00 | 21.00 | 35.00 |
| 3 | Bamhane | Sindkhede | 0.00 | 0.00 | 50.00 | 1198.00 | 17.00 | 64.00 |
| 4 | Mandal | Sindkhede | 0.00 | 0.00 | 40.00 | 1282.00 | 6.00 | 285.00 |
| 5 | Kumbhare | Sindkhede | 0.00 | 0.00 | 35.00 | 322.00 | 7.00 | 63.00 |
| 6 | Shirale | Sindkhede | 0.00 | 0.00 | 3.00 | 128.00 | 7.00 | 1.00 |
| 7 | Gavhane | Sindkhede | 0.00 | 0.00 | 18.00 | 397.00 | 14.00 | 16.00 |
| 8 | Dattane | Sindkhede | 0.00 | 0.00 | 22.00 | 526.00 | 8.00 | 82.00 |
| 9 | Dhandarne | Sindkhede | 0.00 | 0.00 | 4.00 | 703.00 | 0.00 | 351.00 |
| 10 | Dabli | Sindkhede | 0.00 | 0.00 | 3.00 | 450.00 | 0.00 | 121.00 |
| 11 | Vitai | Sindkhede | 0.00 | 0.00 | 3.00 | 187.00 | 0.00 | 34.00 |
| 12 | Pashte | Sindkhede | 0.00 | 0.00 | 5.00 | 1112.00 | 9.00 | 52.00 |
| 13 | Pimprad | Sindkhede | 0.00 | 0.00 | 20.00 | 436.00 | 32.00 | 43.00 |
| 14 | Nardane | Sindkhede | 0.00 | 0.00 | 37.00 | 350.00 | 62.00 | 122.00 |
| 15 | Warud | Sindkhede | 0.00 | 0.00 | 0.00 | 2063.00 | 47.00 | 78.00 |
| 16 | Melane | Sindkhede | 0.00 | 0.00 | 12.00 | 339.00 | 11.00 | 42.00 |
| 17 | Jatode | Sindkhede | 0.00 | 0.00 | 5.00 | 576.00 | 53.00 | 42.00 |
| 18 | Malich | Sindkhede | 0.00 | 0.00 | 8.00 | 443.00 | 15.00 | 18.00 |
| 19 | Gorane | Sindkhede | 0.00 | 0.00 | 12.00 | 945.00 | 40.00 | 75.00 |
| 20 | Pimparkheda | Sindkhede | 0.00 | 0.00 | 20.00 | 243.00 | 8.00 | 32.00 |
| 21 | Kalmadi | Sindkhede | 0.00 | 0.00 | 13.00 | 447.00 | 13.00 | 29.00 |
| 22 | Babhalde | Sindkhede | 58.00 | 0.00 | 5.00 | 251.00 | 77.00 | 337.00 |
| 23 | Kanchanpur | Sindkhede | 0.00 | 0.00 | 50.00 | 478.00 | 59.00 | 36.00 |
| 24 | Dongargaon | Sindkhede | 0.00 | 0.00 | 70.00 | 312.00 | 43.00 | 37.00 |
| 25 | Padhawad | Sindkhede | 0.00 | 0.00 | 22.00 | 545.00 | 0.00 | 97.00 |
| 26 | Betawad | Sindkhede | 0.00 | 0.00 | 119.00 | 1194.00 | 5.00 | 174.00 |
| 27 | Ajande Bk | Sindkhede | 0.00 | 0.00 | 17.00 | 413.00 | 0.00 | 21.00 |
| 28 | Vaghode | Sindkhede | 0.00 | 0.00 | 17.00 | 398.00 | 0.00 | 22.00 |
| 29 | Valkhede | Sindkhede | 86.00 | 0.00 | 20.00 | 1350.00 | 0.00 | 196.00 |
| 30 | Chandgad | Sindkhede | 373.00 | 0.00 | 0.00 | 548.00 | 116.00 | 68.00 |
| 31 | Vaipur | Sindkhede | 179.00 | 0.00 | 4.00 | 869.00 | 0.00 | 57.00 |
| 32 | Sarwe | Sindkhede | 0.00 | 0.00 | 0.00 | 196.00 | 0.00 | 45.00 |
| 33 | Waghadi Kh | Sindkhede | 68.00 | 0.00 | 45.00 | 633.00 | 0.00 | 0.00 |
| 34 | Waghadi Bk | Sindkhede | 0.00 | 0.00 | 52.00 | 742.00 | 0.00 | 152.00 |
| | TOTAL | | 764.00 | 0.00 | 882.00 | 20869.00 | 730.00 | 2833.00 |

LAND USE PATTERN OF VILLAGE WITHIN STUDY AREA (Area in Hectare)

DISPERSION MODEL FOR ANTICIPATING THE GROUND LEVEL CONCENTRATION (GLC'S) OF AIR POLLUTANTS FROM 3.0 MTPA CEMENT GRINDING UNIT OF M/S ULTRA TECH CEMENT LTD.

Ground Level Concentration (GLC) of SPM has been calculated for multi-stack dispersion modelling using double Gaussian diffusion equation : IS 8829-1978 and as per 'Assessment of Impact to Air Environment : Guidelines for Conducting Air Quality Modelling' by CPCB, Delhi, (PROBES/70/1997-98).

$$X_{(x,y,z)} = \frac{Q}{2\pi\sigma_y\sigma_z Up} \exp(-\frac{1}{2}\frac{(y^2)}{\sigma y^2}) \left[\exp\{-\frac{1}{2}\frac{(z-he)^2}{\sigma z^2}\right\}] + \left[\exp\{-\frac{1}{2}\frac{(z+he)^2}{\sigma z^2}\right\}]$$

Where :

- $X_{(x, y, z)}$ = Ground level concentration of pollutant in micro g/cum at the point with co-ordinates (x,y,z).
- x =Down wind distance in m.
- y = Cross wind distance in m.
- z = Vertical distance in m.
- *he* = Effective stack height in m.
- Q = Pollutant emission rate in μ g/sec.
- σ_y = Standard deviation of pollutant plume width in cross wind direction in m.
- σ_z = Standard deviation of pollutant plume width in vertical direction in m.
- *Up* = Mean stack top wind speed in m/sec.

BASIC CONDITIONS

The hourly mixing heights for the site has been taken from "Atlas of hourly mixing height and assimilative capacity of atmosphere in India", published by Environmental Monitoring and Research Centre, India Meteorological Department, New Delhi 2008 for the period of 0700 HRS to 1900 HRS for post monsoon season whereas the rest of the time it has been taken from CPCB published data for Mumbai for the same season as given below:

| Hour | Mixing height range (m) | Hour | Mixing height range (m) |
|-------|-------------------------|-------|-------------------------|
| 01:00 | 25 - 205 | 13:00 | 1400 - 1615 |
| 02:00 | 5 - 195 | 14:00 | 1500 - 1755 |
| 03:00 | 0 - 185 | 15:00 | 1530 - 1865 |
| 04:00 | 0 - 175 | 16:00 | 1400 - 1835 |
| 05:00 | 0 - 165 | 17:00 | 1375 - 1715 |
| 06:00 | 0 - 165 | 18:00 | 800 - 980 |
| 07:00 | 50 - 70 | 19:00 | 595 - 735 |
| 08:00 | 95 - 125 | 20:00 | 375 - 595 |
| 09:00 | 320 - 390 | 21:00 | 300 - 500 |
| 10:00 | 700 - 950 | 22:00 | 230 - 420 |
| 11:00 | 1120 - 1350 | 23:00 | 195 - 380 |
| 12:00 | 1125 - 1325 | 24:00 | 150 - 370 |

The stack details with emissions are given in Table 1, the assumed receptors are given in Table 2. The surrounding area is almost plain. The stability classes are

given in Table 3. The maximum of 24 hrs average Ground Level Concentrations has been calculated for PM_{10} and $PM_{2.5}$ are given in Table 4.

TABLE 1

STACK DATA OF PROPOSED 3.0 MTPA CEMENT GRINDING UNIT AND EXISTING 2 X 150 MW TPP NEARBY

| SI. | Stack name | Height | Dia | Temp | Exit gas | Exit gas | Emission | rate (μg/s) |
|-----|----------------------------------|--------|------|------|----------------|----------------|------------------|-------------------|
| No | | (m) | (m) | (°C) | Vol. (m³/s) | Velo. (m/s) | PM ₁₀ | PM _{2.5} |
| 1 | Cement Mill (3.0 MTPA) | 45 | 3.0 | 90 | 125.0 | 15.54 | 1762655 | 660996 |
| 2 | Coal Mill | 40 | 1.6 | 90 | 44.45 | 3.75 | - | - |
| 3 | D.G Set 2 x 6 MW | - | - | - | - | - | - | - |
| | Adjacent 2x150 MW TPP of SPPL | | | | | | | |
| 2 | TPP Stack 1 | 150 | 3.75 | 132 | 265.8 | 24.07 | 3359417 | 1259781 |
| 3 | TPP Stack 2 | 150 | 3.75 | 132 | 265.8 | 24.07 | 3359417 | 1259781 |
| 4 | D.G. Set (750 KVA) | 15 | 0.24 | 180 | 1.196 | 26.45 | 13519 | 5070 |
| 5 | D.G. Set (750 KVA) | 15 | 0.24 | 180 | 1.196 | 26.45 | 13519 | 5070 |

TABLE 2

DESCRIPTION OF ASSUMED RECEPTORS DISTANCE FROM STACK

| Receptor | Distance | Direction | Recepto | Distance | Direction | Receptor | Distance | Direction |
|----------|-----------|-----------|----------------|-----------|-----------|----------|-----------|-----------|
| name | from | (deg.) | r name | from | (deg.) | name | from | (deg.) |
| | stack (m) | | | stack (m) | | | stack (m) | |
| N-1 | 100.0 | 0.00 | ESE -12 | 1200.0 | 112.50 | SW-23 | 2600.0 | 225.00 |
| N-2 | 200.0 | 0.00 | ESE -13 | 1300.0 | 112.50 | SW-24 | 2800.0 | 225.00 |
| N-3 | 300.0 | 0.00 | ESE -14 | 1400.0 | 112.50 | SW-25 | 3000.0 | 225.00 |
| N-4 | 400.0 | 0.00 | ESE -15 | 1500.0 | 112.50 | SW-26 | 3500.0 | 225.00 |
| N-5 | 500.0 | 0.00 | ESE -16 | 1600.0 | 112.50 | SW-27 | 4000.0 | 225.00 |
| N-6 | 600.0 | 0.00 | ESE -17 | 1700.0 | 112.50 | SW-28 | 5000.0 | 225.00 |
| N-7 | 700.0 | 0.00 | ESE -18 | 1800.0 | 112.50 | SW-29 | 6000.0 | 225.00 |
| N-8 | 800.0 | 0.00 | ESE -19 | 1900.0 | 112.50 | SW-30 | 8000.0 | 225.00 |
| N-9 | 900.0 | 0.00 | ESE-2 0 | 2000.0 | 112.50 | SW-31 | 10000.0 | 225.00 |
| N-10 | 1000.0 | 0.00 | ESE -21 | 2200.0 | 112.50 | WSW-1 | 100.0 | 247.50 |
| N-11 | 1100.0 | 0.00 | ESE-22 | 2400.0 | 112.50 | WSW-2 | 200.0 | 247.50 |
| N-12 | 1200.0 | 0.00 | ESE-23 | 2600.0 | 112.50 | WSW-3 | 300.0 | 247.50 |
| N-13 | 1300.0 | 0.00 | ESE-24 | 2800.0 | 112.50 | WSW-4 | 400.0 | 247.50 |
| N-14 | 1400.0 | 0.00 | ESE -25 | 3000.0 | 112.50 | WSW-5 | 500.0 | 247.50 |
| N-15 | 1500.0 | 0.00 | ESE -26 | 3500.0 | 112.50 | WSW-6 | 600.0 | 247.50 |
| N-16 | 1600.0 | 0.00 | ESE -27 | 4000.0 | 112.50 | WSW-7 | 700.0 | 247.50 |
| N-17 | 1700.0 | 0.00 | ESE-28 | 5000.0 | 112.50 | WSW-8 | 800.0 | 247.50 |
| N-18 | 1800.0 | 0.00 | ESE-29 | 6000.0 | 112.50 | WSW-9 | 900.0 | 247.50 |
| N-19 | 1900.0 | 0.00 | ESE-3 0 | 8000.0 | 112.50 | WSW-10 | 1000.0 | 247.50 |
| N-20 | 2000.0 | 0.00 | ESE-31 | 10000.0 | 112.50 | WSW-11 | 1100.0 | 247.50 |
| N-21 | 2200.0 | 0.00 | SE-1 | 100.0 | 135.00 | WSW-12 | 1200.0 | 247.50 |
| N-22 | 2400.0 | 0.00 | SE-2 | 200.0 | 135.00 | WSW-13 | 1300.0 | 247.50 |
| N-23 | 2600.0 | 0.00 | SE -3 | 300.0 | 135.00 | WSW-14 | 1400.0 | 247.50 |
| N-24 | 2800.0 | 0.00 | SE-4 | 400.0 | 135.00 | WSW-15 | 1500.0 | 247.50 |
| N-25 | 3000.0 | 0.00 | SE -5 | 500.0 | 135.00 | WSW-16 | 1600.0 | 247.50 |
| N-26 | 3500.0 | 0.00 | SE- 6 | 600.0 | 135.00 | WSW-17 | 1700.0 | 247.50 |
| N-27 | 4000.0 | 0.00 | SE- 7 | 700.0 | 135.00 | WSW-18 | 1800.0 | 247.50 |
| N-28 | 5000.0 | 0.00 | SE-8 | 800.0 | 135.00 | WSW-19 | 1900.0 | 247.50 |
| N-29 | 6000.0 | 0.00 | SE -9 | 900.0 | 135.00 | WSW-20 | 2000.0 | 247.50 |
| N-30 | 8000.0 | 0.00 | SE-10 | 1000.0 | 135.00 | WSW-21 | 2200.0 | 247.50 |
| N-31 | 10000.0 | 0.00 | SE-11 | 1100.0 | 135.00 | WSW-22 | 2400.0 | 247.50 |

| Receptor | Distance | Direction | Recepto | Distance | Direction | Receptor | Distance | Direction |
|----------|-------------------|-----------|---------|-------------------|-----------|----------|-------------------|-----------|
| name | from stack (m) | (deg.) | r name | from stack (m) | (deg.) | name | from stack (m) | (deg.) |
| NNE-1 | 100.0 | 22.50 | SE-12 | 1200.0 | 135.00 | WSW-23 | 2600.0 | 247.50 |
| NNE-2 | 200.0 | 22.50 | SE-13 | 1300.0 | 135.00 | WSW-24 | 2800.0 | 247.50 |
| NNE-3 | 300.0 | 22.50 | SE-14 | 1400.0 | 135.00 | WSW-25 | 3000.0 | 247.50 |
| NNE-4 | 400.0 | 22.50 | SE-15 | 1500.0 | 135.00 | WSW-26 | 3500.0 | 247.50 |
| NNE-5 | 500.0 | 22.50 | SE-16 | 1600.0 | 135.00 | WSW-27 | 4000.0 | 247.50 |
| NNE-6 | 600.0 | 22.50 | SE-17 | 1700.0 | 135.00 | WSW-28 | 5000.0 | 247.50 |
| NNE-7 | 700.0 | 22.50 | SE-18 | 1800.0 | 135.00 | WSW-29 | 6000.0 | 247.50 |
| NNE-8 | 800.0 | 22.50 | SE-19 | 1900.0 | 135.00 | WSW-30 | 8000.0 | 247.50 |
| NNE-9 | 900.0 | 22.50 | SE-20 | 2000.0 | 135.00 | WSW-31 | 10000.0 | 247.50 |
| NNE-10 | 1000.0 | 22.50 | SE-21 | 2200.0 | 135.00 | W-1 | 100.0 | 270.00 |
| NNE-11 | 1100.0 | 22.50 | SE-22 | 2400.0 | 135.00 | W-2 | 200.0 | 270.00 |
| NNE-12 | 1200.0 | 22.50 | SE-23 | 2600.0 | 135.00 | W-3 | 300.0 | 270.00 |
| NNE-13 | 1300.0 | 22.50 | SE-24 | 2800.0 | 135.00 | W-4 | 400.0 | 270.00 |
| NNE-14 | 1400.0 | 22.50 | SE-25 | 3000.0 | 135.00 | W-5 | 500.0 | 270.00 |
| NNE-15 | 1500.0 | 22.50 | SE-26 | 3500.0 | 135.00 | W-6 | 600.0 | 270.00 |
| NNE-16 | 1600.0 | 22.50 | SE-27 | 4000.0 | 135.00 | W-7 | 700.0 | 270.00 |
| NNE-17 | 1700.0 | 22.50 | SE-28 | 5000.0 | 135.00 | W-8 | 800.0 | 270.00 |
| NNE-18 | 1800.0 | 22.50 | SE-29 | 6000.0 | 135.00 | W-9 | 900.0 | 270.00 |
| NNE-19 | 1900.0 | 22.50 | SE-30 | 8000.0 | 135.00 | W-10 | 1000.0 | 270.00 |
| NNE-20 | 2000.0 | 22.50 | SE-31 | 10000.0 | 135.00 | W-11 | 1100.0 | 270.00 |
| NNE-21 | 2200.0 | 22.50 | SSE-1 | 100.0 | 157.50 | W-12 | 1200.0 | 270.00 |
| NNE-22 | 2400.0 | 22.50 | SSE-2 | 200.0 | 157.50 | W-13 | 1300.0 | 270.00 |
| NNE-23 | 2600.0 | 22.50 | SSE-3 | 300.0 | 157.50 | W-14 | 1400.0 | 270.00 |
| NNE-24 | 2800.0 | 22.50 | SSE-4 | 400.0 | 157.50 | W-15 | 1500.0 | 270.00 |
| NNE-25 | 3000.0 | 22.50 | SSE-5 | 500.0 | 157.50 | W-16 | 1600.0 | 270.00 |
| NNE-26 | 3500.0 | 22.50 | SSE-6 | 600.0 | 157.50 | W-17 | 1700.0 | 270.00 |
| NNE-27 | 4000.0 | 22.50 | SSE-7 | 700.0 | 157.50 | W-18 | 1800.0 | 270.00 |
| NNE-28 | 5000.0 | 22.50 | SSE-8 | 800.0 | 157.50 | W-19 | 1900.0 | 270.00 |
| NNE-29 | 6000.0 | 22.50 | SSE-9 | 900.0 | 157.50 | W-20 | 2000.0 | 270.00 |
| NNE-30 | 8000.0 | 22.50 | SSE-10 | 1000.0 | 157.50 | W-21 | 2200.0 | 270.00 |
| NNE-31 | 10000.0 | 22.50 | SSE-11 | 1100.0 | 157.50 | W-22 | 2400.0 | 270.00 |
| NE-1 | 100.0 | 45.00 | SSE-12 | 1200.0 | 157.50 | W-23 | 2600.0 | 270.00 |
| NE-2 | 200.0 | 45.00 | SSE-13 | 1300.0 | 157.50 | W-24 | 2800.0 | 270.00 |
| NE-3 | 300.0 | 45.00 | SSE-14 | 1400.0 | 157.50 | W-25 | 3000.0 | 270.00 |
| NE-4 | 400.0 | 45.00 | SSE-15 | 1500.0 | 157.50 | W-26 | 3500.0 | 270.00 |
| NE-5 | 500.0 | 45.00 | SSE-16 | 1600.0 | 157.50 | W-27 | 4000.0 | 270.00 |
| NE-6 | 600.0 | 45.00 | SSE-17 | 1700.0 | 157.50 | W-28 | 5000.0 | 270.00 |
| NE-7 | 700.0 | 45.00 | SSE-18 | 1800.0 | 157.50 | W-29 | 6000.0 | 270.00 |
| NE-8 | 800.0 | 45.00 | SSE-19 | 1900.0 | 157.50 | W-30 | 8000.0 | 270.00 |
| NE-9 | 900.0 | 45.00 | SSE-20 | 2000.0 | 157.50 | W-31 | 10000.0 | 270.00 |
| NE-10 | 1000.0 | 45.00 | SSE-21 | 2200.0 | 157.50 | WNW-1 | 100.0 | 292.50 |
| NE-11 | 1100.0 | 45.00 | SSE-22 | 2400.0 | 157.50 | WNW-2 | 200.0 | 292.50 |
| NE-12 | 1200.0 | 45.00 | SSE-23 | 2600.0 | 157.50 | WNW-3 | 300.0 | 292.50 |
| NE-13 | 1300.0 | 45.00 | SSE-24 | 2800.0 | 157.50 | WNW-4 | 400.0 | 292.50 |
| NE-14 | 1400.0 | 45.00 | SSE-25 | 3000.0 | 157.50 | WNW-5 | 500.0 | 292.50 |
| NE-15 | 1500.0 | 45.00 | SSE-26 | 3500.0 | 157.50 | WNW-6 | 600.0 | 292.50 |
| NE-16 | 1600.0 | 45.00 | SSE-27 | 4000.0 | 157.50 | WNW-7 | 700.0 | 292.50 |

| Receptor | Distance | Direction | Recepto | Distance | Direction | Receptor | Distance | Direction |
|----------|-------------------|-----------|---------|-------------------|-----------|----------|-------------------|-----------|
| name | from stack (m) | (deg.) | r name | from stack (m) | (deg.) | name | from stack (m) | (deg.) |
| NE-17 | 1700.0 | 45.00 | SSE-28 | 5000.0 | 157.50 | WNW-8 | 800.0 | 292.50 |
| NE-18 | 1800.0 | 45.00 | SSE-29 | 6000.0 | 157.50 | WNW-9 | 900.0 | 292.50 |
| NE-19 | 1900.0 | 45.00 | SSE-30 | 8000.0 | 157.50 | WNW-10 | 1000.0 | 292.50 |
| NE-20 | 2000.0 | 45.00 | SSE-31 | 10000.0 | 157.50 | WNW-11 | 1100.0 | 292.50 |
| NE-21 | 2200.0 | 45.00 | S-1 | 100.0 | 180.00 | WNW-12 | 1200.0 | 292.50 |
| NE-22 | 2400.0 | 45.00 | S-2 | 200.0 | 180.00 | WNW-13 | 1300.0 | 292.50 |
| NE-23 | 2600.0 | 45.00 | S-3 | 300.0 | 180.00 | WNW-14 | 1400.0 | 292.50 |
| NE-24 | 2800.0 | 45.00 | S-4 | 400.0 | 180.00 | WNW-15 | 1500.0 | 292.50 |
| NE-25 | 3000.0 | 45.00 | S-5 | 500.0 | 180.00 | WNW-16 | 1600.0 | 292.50 |
| NE-26 | 3500.0 | 45.00 | S-6 | 600.0 | 180.00 | WNW-17 | 1700.0 | 292.50 |
| NE-27 | 4000.0 | 45.00 | S-7 | 700.0 | 180.00 | WNW-18 | 1800.0 | 292.50 |
| NE-28 | 5000.0 | 45.00 | S-8 | 800.0 | 180.00 | WNW-19 | 1900.0 | 292.50 |
| NE-29 | 6000.0 | 45.00 | S-9 | 900.0 | 180.00 | WNW-20 | 2000.0 | 292.50 |
| NE-30 | 8000.0 | 45.00 | S-10 | 1000.0 | 180.00 | WNW-21 | 2200.0 | 292.50 |
| NE-31 | 10000.0 | 45.00 | S-11 | 1100.0 | 180.00 | WNW-22 | 2400.0 | 292.50 |
| ENE-1 | 100.0 | 67.50 | S-12 | 1200.0 | 180.00 | WNW-23 | 2600.0 | 292.50 |
| ENE-2 | 200.0 | 67.50 | S-13 | 1300.0 | 180.00 | WNW-24 | 2800.0 | 292.50 |
| ENE-3 | 300.0 | 67.50 | S-14 | 1400.0 | 180.00 | WNW-25 | 3000.0 | 292.50 |
| ENE-4 | 400.0 | 67.50 | S-15 | 1500.0 | 180.00 | WNW-26 | 3500.0 | 292.50 |
| ENE-5 | 500.0 | 67.50 | S-16 | 1600.0 | 180.00 | WNW-27 | 4000.0 | 292.50 |
| ENE-6 | 600.0 | 67.50 | S-17 | 1700.0 | 180.00 | WNW-28 | 5000.0 | 292.50 |
| ENE-7 | 700.0 | 67.50 | S-18 | 1800.0 | 180.00 | WNW-29 | 6000.0 | 292.50 |
| ENE-8 | 800.0 | 67.50 | S-19 | 1900.0 | 180.00 | WNW-30 | 8000.0 | 292.50 |
| ENE-9 | 900.0 | 67.50 | S-20 | 2000.0 | 180.00 | WNW-31 | 10000.0 | 292.50 |
| ENE-10 | 1000.0 | 67.50 | S-21 | 2200.0 | 180.00 | NW-1 | 100.0 | 315.00 |
| ENE-11 | 1100.0 | 67.50 | S-22 | 2400.0 | 180.00 | NW-2 | 200.0 | 315.00 |
| ENE-12 | 1200.0 | 67.50 | S-23 | 2600.0 | 180.00 | NW-3 | 300.0 | 315.00 |
| ENE-13 | 1300.0 | 67.50 | S-24 | 2800.0 | 180.00 | NW-4 | 400.0 | 315.00 |
| ENE-14 | 1400.0 | 67.50 | S-25 | 3000.0 | 180.00 | NW-5 | 500.0 | 315.00 |
| ENE-15 | 1500.0 | 67.50 | S-26 | 3500.0 | 180.00 | NW-6 | 600.0 | 315.00 |
| ENE-16 | 1600.0 | 67.50 | S-27 | 4000.0 | 180.00 | NW-7 | 700.0 | 315.00 |
| ENE-17 | 1700.0 | 67.50 | S-28 | 5000.0 | 180.00 | NW-8 | 800.0 | 315.00 |
| ENE-18 | 1800.0 | 67.50 | S-29 | 6000.0 | 180.00 | NW-9 | 900.0 | 315.00 |
| ENE-19 | 1900.0 | 67.50 | S-30 | 8000.0 | 180.00 | NW-10 | 1000.0 | 315.00 |
| ENE-20 | 2000.0 | 67.50 | S-31 | 10000.0 | 180.00 | NW-11 | 1100.0 | 315.00 |
| ENE-21 | 2200.0 | 67.50 | SSW-1 | 100.0 | 202.50 | NW-12 | 1200.0 | 315.00 |
| ENE-22 | 2400.0 | 67.50 | SSW-2 | 200.0 | 202.50 | NW-13 | 1300.0 | 315.00 |
| ENE-23 | 2600.0 | 67.50 | SSW-3 | 300.0 | 202.50 | NW-14 | 1400.0 | 315.00 |
| ENE-24 | 2800.0 | 67.50 | SSW-4 | 400.0 | 202.50 | NW-15 | 1500.0 | 315.00 |
| ENE-25 | 3000.0 | 67.50 | SSW-5 | 500.0 | 202.50 | NW-16 | 1600.0 | 315.00 |
| ENE-26 | 3500.0 | 67.50 | SSW-6 | 600.0 | 202.50 | NW-17 | 1700.0 | 315.00 |
| ENE-27 | 4000.0 | 67.50 | SSW-7 | 700.0 | 202.50 | NW-18 | 1800.0 | 315.00 |
| ENE-28 | 5000.0 | 67.50 | SSW-8 | 800.0 | 202.50 | NW-19 | 1900.0 | 315.00 |
| ENE-29 | 6000.0 | 67.50 | SSW-9 | 900.0 | 202.50 | NW-20 | 2000.0 | 315.00 |
| ENE-30 | 8000.0 | 67.50 | SSW-10 | 1000.0 | 202.50 | NW-21 | 2200.0 | 315.00 |
| ENE-31 | 10000.0 | 67.50 | SSW-11 | 1100.0 | 202.50 | NW-22 | 2400.0 | 315.00 |
| E-1 | 100.0 | 90.00 | SSW-12 | 1200.0 | 202.50 | NW-23 | 2600.0 | 315.00 |

| Receptor | Distance | Direction | Recepto | Distance | Direction | Receptor | Distance | Direction |
|----------|-----------|-----------|---------|-----------|-----------|----------|-----------|-----------|
| name | from | (deg.) | r name | from | (deg.) | name | from | (deg.) |
| | stack (m) | | | stack (m) | | | stack (m) | |
| E-2 | 200.0 | 90.00 | SSW-13 | 1300.0 | 202.50 | NW-24 | 2800.0 | 315.00 |
| E-3 | 300.0 | 90.00 | SSW-14 | 1400.0 | 202.50 | NW-25 | 3000.0 | 315.00 |
| E-4 | 400.0 | 90.00 | SSW-15 | 1500.0 | 202.50 | NW-26 | 3500.0 | 315.00 |
| E-5 | 500.0 | 90.00 | SSW-16 | 1600.0 | 202.50 | NW-27 | 4000.0 | 315.00 |
| E-6 | 600.0 | 90.00 | SSW-17 | 1700.0 | 202.50 | NW-28 | 5000.0 | 315.00 |
| E-7 | 700.0 | 90.00 | SSW-18 | 1800.0 | 202.50 | NW-29 | 6000.0 | 315.00 |
| E-8 | 800.0 | 90.00 | SSW-19 | 1900.0 | 202.50 | NW-30 | 8000.0 | 315.00 |
| E-9 | 900.0 | 90.00 | SSW-20 | 2000.0 | 202.50 | NW-31 | 10000.0 | 315.00 |
| E-10 | 1000.0 | 90.00 | SSW-21 | 2200.0 | 202.50 | NNW-1 | 100.0 | 337.50 |
| E-11 | 1100.0 | 90.00 | SSW-22 | 2400.0 | 202.50 | NNW-2 | 200.0 | 337.50 |
| E-12 | 1200.0 | 90.00 | SSW-23 | 2600.0 | 202.50 | NNW-3 | 300.0 | 337.50 |
| E-13 | 1300.0 | 90.00 | SSW-24 | 2800.0 | 202.50 | NNW-4 | 400.0 | 337.50 |
| E-14 | 1400.0 | 90.00 | SSW-25 | 3000.0 | 202.50 | NNW-5 | 500.0 | 337.50 |
| E-15 | 1500.0 | 90.00 | SSW-26 | 3500.0 | 202.50 | NNW-6 | 600.0 | 337.50 |
| E-16 | 1600.0 | 90.00 | SSW-27 | 4000.0 | 202.50 | NNW-7 | 700.0 | 337.50 |
| E-17 | 1700.0 | 90.00 | SSW-28 | 5000.0 | 202.50 | NNW-8 | 800.0 | 337.50 |
| E-18 | 1800.0 | 90.00 | SSW-29 | 6000.0 | 202.50 | NNW-9 | 900.0 | 337.50 |
| E-19 | 1900.0 | 90.00 | SSW-30 | 8000.0 | 202.50 | NNW-10 | 1000.0 | 337.50 |
| E-20 | 2000.0 | 90.00 | SSW-31 | 10000.0 | 202.50 | NNW-11 | 1100.0 | 337.50 |
| E-21 | 2200.0 | 90.00 | SW-1 | 100.0 | 225.00 | NNW-12 | 1200.0 | 337.50 |
| E-22 | 2400.0 | 90.00 | SW-2 | 200.0 | 225.00 | NNW-13 | 1300.0 | 337.50 |
| E-23 | 2600.0 | 90.00 | SW-3 | 300.0 | 225.00 | NNW-14 | 1400.0 | 337.50 |
| E-24 | 2800.0 | 90.00 | SW-4 | 400.0 | 225.00 | NNW-15 | 1500.0 | 337.50 |
| E-25 | 3000.0 | 90.00 | SW-5 | 500.0 | 225.00 | NNW-16 | 1600.0 | 337.50 |
| E-26 | 3500.0 | 90.00 | SW-6 | 600.0 | 225.00 | NNW-17 | 1700.0 | 337.50 |
| E-27 | 4000.0 | 90.00 | SW-7 | 700.0 | 225.00 | NNW-18 | 1800.0 | 337.50 |
| E-28 | 5000.0 | 90.00 | SW-8 | 800.0 | 225.00 | NNW-19 | 1900.0 | 337.50 |
| E-29 | 6000.0 | 90.00 | SW-9 | 900.0 | 225.00 | NNW-20 | 2000.0 | 337.50 |
| E-30 | 8000.0 | 90.00 | SW-10 | 1000.0 | 225.00 | NNW-21 | 2200.0 | 337.50 |
| E-31 | 10000.0 | 90.00 | SW-11 | 1100.0 | 225.00 | NNW-22 | 2400.0 | 337.50 |
| ESE-1 | 100.0 | 112.50 | SW-12 | 1200.0 | 225.00 | NNW-23 | 2600.0 | 337.50 |
| ESE-2 | 200.0 | 112.50 | SW-13 | 1300.0 | 225.00 | NNW-24 | 2800.0 | 337.50 |
| ESE-3 | 300.0 | 112.50 | SW-14 | 1400.0 | 225.00 | NNW-25 | 3000.0 | 337.50 |
| ESE-4 | 400.0 | 112.50 | SW-15 | 1500.0 | 225.00 | NNW-26 | 3500.0 | 337.50 |
| ESE-5 | 500.0 | 112.50 | SW-16 | 1600.0 | 225.00 | NNW-27 | 4000.0 | 337.50 |
| ESE-6 | 600.0 | 112.50 | SW-17 | 1700.0 | 225.00 | NNW-28 | 5000.0 | 337.50 |
| ESE-7 | 700.0 | 112.50 | SW-18 | 1800.0 | 225.00 | NNW-29 | 6000.0 | 337.50 |
| ESE-8 | 800.0 | 112.50 | SW-19 | 1900.0 | 225.00 | NNW-30 | 8000.0 | 337.50 |
| ESE-9 | 900.0 | 112.50 | SW-20 | 2000.0 | 225.00 | NNW-31 | 10000.0 | 337.50 |
| ESE-10 | 1000.0 | 112.50 | SW-21 | 2200.0 | 225.00 | | | |
| ESE-11 | 1100.0 | 112.50 | SW-22 | 2400.0 | 225.00 | | | |

| HOUR | | OCCURREN | ICE OF STA | BILITY CLA | SSES (in %) | |
|-------|--------|----------|------------|------------|-------------|--------|
| | Α | В | С | D | E | F |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 4.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.89 | 98.11 |
| 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 6.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 7.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10.00 | 98.08 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12.00 | 97.83 | 2.17 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15.00 | 91.30 | 8.70 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16.00 | 93.48 | 6.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17.00 | 0.00 | 91.30 | 8.70 | 0.00 | 0.00 | 0.00 |
| 18.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 21.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 22.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| 23.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| AVG. | 31.87 | 20.88 | 0.34 | 0.00 | 0.08 | 46.83 |

TABLE 3 HOURLY STABILITY FREQUENCY

TABLE 4 24 HOURS AVERAGE GROUND LEVEL CONCENTRATIONS (µg/m³) FROM THREE MOST PREDOMINANT DOWNWIND DIRECTIONS & TOTAL GLC AT PARTICULAR RECEPTORS

| Receptor | Distance | Direction | GLC fro | om three i | nost pred | domina | nt wind o | directio | ns and | total | CUM | ULATI | VE GL | C from t | three n | nost pi | edomi | nant |
|----------|----------|-----------|---------|------------|-----------|---------|-----------|----------|--------|-------|------|--------|-------------|----------|---------|---------|----------|-------|
| | (m) | (deg.) | GLC at | particula | r recepto | rs from | 3.0 MTP | A CEME | NT PL | ANT | w | ind di | rection | s and to | otal GL | C at p | articula | ir |
| | from | | | | | | | | | | re | ceptor | 's from | (CEME | NT PL | ANT W | ITH TP | P) |
| | Cement | | | PM | 0 | | _ | PM2 | .5 | | | PI | 1 10 | | | PN | 2.5 | |
| | Mill | | E | ENE | SSW | Total | E | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| NE-1 | 100.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.12 | 0.00 | 0.01 | 0.00 | 0.05 |
| NE-2 | 200.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.13 | 0.00 | 0.01 | 0.00 | 0.06 |
| NE-3 | 300.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.12 | 0.00 | 0.01 | 0.00 | 0.06 |
| NE-4 | 400.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.11 | 0.00 | 0.01 | 0.00 | 0.04 |
| NE-5 | 500.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.10 | 0.00 | 0.01 | 0.00 | 0.04 |
| NE-6 | 600.0 | 45.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.09 | 0.00 | 0.01 | 0.00 | 0.03 |
| NE-7 | 700.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.09 | 0.00 | 0.01 | 0.00 | 0.03 |
| NE-8 | 800.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.10 | 0.00 | 0.01 | 0.00 | 0.04 |
| NE-9 | 900.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.19 | 0.00 | 0.01 | 0.00 | 0.06 |
| NE-10 | 1000.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.31 | 0.00 | 0.01 | 0.00 | 0.11 |
| NE-11 | 1100.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.28 | 0.00 | 0.02 | 0.00 | 0.12 |
| NE-12 | 1200.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.21 | 0.00 | 0.02 | 0.00 | 0.08 |
| NE-13 | 1300.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-14 | 1400.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.17 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-15 | 1500.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.17 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-16 | 1600.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-17 | 1700.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-18 | 1800.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-19 | 1900.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.06 | 0.00 | 0.19 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-20 | 2000.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.06 | 0.00 | 0.19 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-21 | 2200.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-22 | 2400.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-23 | 2600.0 | 45.0 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-24 | 2800.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.16 | 0.00 | 0.02 | 0.00 | 0.06 |
| NE-25 | 3000.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.16 | 0.00 | 0.02 | 0.00 | 0.06 |
| NE-26 | 3500.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.06 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.16 | 0.00 | 0.02 | 0.00 | 0.06 |
| NE-27 | 4000.0 | 45.0 | 0.00 | 0.02 | 0.00 | 0.07 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.05 | 0.00 | 0.17 | 0.00 | 0.02 | 0.00 | 0.06 |
| NE-28 | 5000.0 | 45.0 | 0.00 | 0.03 | 0.00 | 0.11 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.06 |

| Receptor | Distance | Direction | GLC fro | om three | most pred | dominaı | nt wind o | direction | ns and | total | CUM | ULATI | VE GL | C from t | three n | nost pr | edomi | nant |
|----------|----------|-----------|---------|-----------|-----------|---------|-----------|-----------|--------|-------|------|--------|-------------|-----------|---------|---------|----------|-------|
| | (m) | (deg.) | GLC at | particula | r recepto | rs from | 3.0 MTP | A CEME | NT PL | ANT | w | ind di | rection | is and to | otal GL | C at pa | articula | ir |
| | from | _ | | | | | | | | | re | ceptor | s from | (CEME | NT PL | ANT W | ITH TP | P) |
| | Cement | _ | | PM | 10 | | | PM2 | .5 | | | PN | / 10 | | | PN | 2.5 | |
| | Mill | | E | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | |] | Conc. |
| NE-29 | 6000.0 | 45.0 | 0.00 | 0.03 | 0.00 | 0.12 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-30 | 8000.0 | 45.0 | 0.00 | 0.03 | 0.00 | 0.13 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.05 | 0.00 | 0.19 | 0.00 | 0.02 | 0.00 | 0.07 |
| NE-31 | 10000.0 | 45.0 | 0.00 | 0.03 | 0.00 | 0.13 | 0.00 | 0.01 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.18 | 0.00 | 0.02 | 0.00 | 0.07 |
| ENE-1 | 100.0 | 67.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.04 | 0.00 | 0.16 | 0.02 | 0.02 | 0.00 | 0.06 |
| ENE-2 | 200.0 | 67.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.04 | 0.00 | 0.17 | 0.02 | 0.02 | 0.00 | 0.07 |
| ENE-3 | 300.0 | 67.5 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.00 | 0.18 | 0.02 | 0.02 | 0.00 | 0.07 |
| ENE-4 | 400.0 | 67.5 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.05 | 0.05 | 0.00 | 0.20 | 0.02 | 0.02 | 0.00 | 0.08 |
| ENE-5 | 500.0 | 67.5 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.05 | 0.06 | 0.00 | 0.22 | 0.02 | 0.02 | 0.00 | 0.08 |
| ENE-6 | 600.0 | 67.5 | 0.00 | 0.03 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.04 | 0.06 | 0.00 | 0.20 | 0.01 | 0.02 | 0.00 | 0.07 |
| ENE-7 | 700.0 | 67.5 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.01 | 0.03 | 0.07 | 0.00 | 0.19 | 0.01 | 0.02 | 0.00 | 0.06 |
| ENE-8 | 800.0 | 67.5 | 0.00 | 0.06 | 0.00 | 0.06 | 0.00 | 0.02 | 0.00 | 0.02 | 0.03 | 0.08 | 0.00 | 0.20 | 0.01 | 0.03 | 0.00 | 0.07 |
| ENE-9 | 900.0 | 67.5 | 0.00 | 0.07 | 0.00 | 0.07 | 0.00 | 0.03 | 0.00 | 0.03 | 0.03 | 0.10 | 0.00 | 0.21 | 0.01 | 0.04 | 0.00 | 0.08 |
| ENE-10 | 1000.0 | 67.5 | 0.00 | 0.08 | 0.00 | 0.09 | 0.00 | 0.03 | 0.00 | 0.03 | 0.03 | 0.12 | 0.00 | 0.24 | 0.01 | 0.05 | 0.00 | 0.09 |
| ENE-11 | 1100.0 | 67.5 | 0.00 | 0.09 | 0.00 | 0.10 | 0.00 | 0.03 | 0.00 | 0.03 | 0.03 | 0.14 | 0.00 | 0.24 | 0.01 | 0.05 | 0.00 | 0.08 |
| ENE-12 | 1200.0 | 67.5 | 0.00 | 0.09 | 0.00 | 0.10 | 0.00 | 0.04 | 0.00 | 0.04 | 0.03 | 0.15 | 0.00 | 0.25 | 0.01 | 0.06 | 0.00 | 0.09 |
| ENE-13 | 1300.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.12 | 0.00 | 0.04 | 0.00 | 0.05 | 0.04 | 0.16 | 0.00 | 0.27 | 0.01 | 0.06 | 0.00 | 0.09 |
| ENE-14 | 1400.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.12 | 0.00 | 0.04 | 0.00 | 0.05 | 0.04 | 0.17 | 0.00 | 0.29 | 0.01 | 0.07 | 0.00 | 0.11 |
| ENE-15 | 1500.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.13 | 0.00 | 0.04 | 0.00 | 0.05 | 0.04 | 0.18 | 0.00 | 0.30 | 0.02 | 0.07 | 0.00 | 0.12 |
| ENE-16 | 1600.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.13 | 0.00 | 0.04 | 0.00 | 0.05 | 0.04 | 0.19 | 0.00 | 0.31 | 0.02 | 0.07 | 0.00 | 0.12 |
| ENE-17 | 1700.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.13 | 0.00 | 0.04 | 0.00 | 0.05 | 0.04 | 0.19 | 0.00 | 0.31 | 0.02 | 0.07 | 0.00 | 0.12 |
| ENE-18 | 1800.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.13 | 0.00 | 0.04 | 0.00 | 0.05 | 0.05 | 0.20 | 0.00 | 0.33 | 0.02 | 0.07 | 0.00 | 0.12 |
| ENE-19 | 1900.0 | 67.5 | 0.01 | 0.10 | 0.00 | 0.13 | 0.01 | 0.04 | 0.00 | 0.06 | 0.05 | 0.20 | 0.00 | 0.33 | 0.02 | 0.07 | 0.00 | 0.12 |
| ENE-20 | 2000.0 | 67.5 | 0.02 | 0.10 | 0.00 | 0.14 | 0.01 | 0.04 | 0.00 | 0.06 | 0.05 | 0.20 | 0.00 | 0.33 | 0.02 | 0.08 | 0.00 | 0.13 |
| ENE-21 | 2200.0 | 67.5 | 0.02 | 0.10 | 0.00 | 0.14 | 0.01 | 0.04 | 0.00 | 0.06 | 0.05 | 0.21 | 0.00 | 0.34 | 0.02 | 0.08 | 0.00 | 0.13 |
| ENE-22 | 2400.0 | 67.5 | 0.02 | 0.10 | 0.00 | 0.14 | 0.01 | 0.03 | 0.00 | 0.05 | 0.05 | 0.22 | 0.00 | 0.34 | 0.02 | 0.08 | 0.00 | 0.13 |
| ENE-23 | 2600.0 | 67.5 | 0.03 | 0.10 | 0.00 | 0.15 | 0.01 | 0.04 | 0.00 | 0.06 | 0.06 | 0.22 | 0.00 | 0.35 | 0.02 | 0.08 | 0.00 | 0.13 |
| ENE-24 | 2800.0 | 67.5 | 0.03 | 0.10 | 0.00 | 0.15 | 0.01 | 0.04 | 0.00 | 0.06 | 0.06 | 0.22 | 0.00 | 0.35 | 0.02 | 0.08 | 0.00 | 0.13 |
| ENE-25 | 3000.0 | 67.5 | 0.04 | 0.10 | 0.00 | 0.17 | 0.01 | 0.04 | 0.00 | 0.06 | 0.07 | 0.22 | 0.00 | 0.36 | 0.03 | 0.08 | 0.00 | 0.14 |
| ENE-26 | 3500.0 | 67.5 | 0.06 | 0.10 | 0.00 | 0.19 | 0.02 | 0.04 | 0.00 | 0.07 | 0.08 | 0.23 | 0.00 | 0.38 | 0.03 | 0.08 | 0.00 | 0.14 |
| ENE-27 | 4000.0 | 67.5 | 0.07 | 0.11 | 0.00 | 0.21 | 0.03 | 0.04 | 0.00 | 0.08 | 0.10 | 0.23 | 0.00 | 0.40 | 0.04 | 0.09 | 0.00 | 0.16 |
| ENE-28 | 5000.0 | 67.5 | 0.10 | 0.13 | 0.00 | 0.27 | 0.04 | 0.05 | 0.00 | 0.10 | 0.13 | 0.23 | 0.00 | 0.43 | 0.05 | 0.09 | 0.00 | 0.17 |

| Receptor | Distance | Direction | GLC fro | m three | most pree | domina | nt wind o | directio | ns and | total | CUM | ULATI | VE GL | C from t | hree n | nost pr | edomi | nant |
|----------|----------|-----------|---------|-----------|-----------|---------|-----------|----------|--------|-------|------|--------|--------------|----------|---------|---------|----------|-------|
| | (m) | (deg.) | GLC at | particula | r recepto | rs from | 3.0 MTP | A CEME | NT PL | .ANT | W | ind di | rection | s and to | otal GL | C at pa | articula | ir |
| | from | | | | | | | | | | re | ceptor | 's from | (CEME | NT PL | ANT W | ІТН ТР | P) |
| | Cement | | | PM | 10 | | | PM2 | 2.5 | | | PI | VI 10 | | | PN | 12.5 | |
| | Mill | | E | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| ENE-29 | 6000.0 | 67.5 | 0.13 | 0.14 | 0.00 | 0.31 | 0.05 | 0.05 | 0.00 | 0.12 | 0.16 | 0.23 | 0.00 | 0.46 | 0.06 | 0.09 | 0.00 | 0.18 |
| ENE-30 | 8000.0 | 67.5 | 0.15 | 0.15 | 0.00 | 0.35 | 0.06 | 0.06 | 0.00 | 0.14 | 0.18 | 0.23 | 0.00 | 0.48 | 0.07 | 0.08 | 0.00 | 0.17 |
| ENE-31 | 10000.0 | 67.5 | 0.15 | 0.15 | 0.00 | 0.35 | 0.06 | 0.06 | 0.00 | 0.14 | 0.18 | 0.22 | 0.00 | 0.46 | 0.07 | 0.08 | 0.00 | 0.17 |
| E-1 | 100.0 | 90.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.02 | 0.00 | 0.15 | 0.02 | 0.01 | 0.00 | 0.06 |
| E-2 | 200.0 | 90.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.03 | 0.00 | 0.13 | 0.01 | 0.01 | 0.00 | 0.04 |
| E-3 | 300.0 | 90.0 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.09 | 0.01 | 0.01 | 0.00 | 0.04 |
| E-4 | 400.0 | 90.0 | 0.01 | 0.03 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.01 | 0.04 | 0.08 | 0.00 | 0.21 | 0.02 | 0.03 | 0.00 | 0.08 |
| E-5 | 500.0 | 90.0 | 0.01 | 0.04 | 0.00 | 0.06 | 0.00 | 0.01 | 0.00 | 0.01 | 0.07 | 0.09 | 0.00 | 0.42 | 0.03 | 0.03 | 0.00 | 0.16 |
| E-6 | 600.0 | 90.0 | 0.02 | 0.04 | 0.00 | 0.07 | 0.01 | 0.02 | 0.00 | 0.03 | 0.12 | 0.27 | 0.00 | 0.60 | 0.05 | 0.10 | 0.00 | 0.23 |
| E-7 | 700.0 | 90.0 | 0.02 | 0.06 | 0.00 | 0.10 | 0.01 | 0.02 | 0.00 | 0.04 | 0.13 | 0.30 | 0.00 | 0.63 | 0.05 | 0.11 | 0.00 | 0.24 |
| E-8 | 800.0 | 90.0 | 0.04 | 0.09 | 0.00 | 0.16 | 0.01 | 0.03 | 0.00 | 0.05 | 0.12 | 0.26 | 0.00 | 0.53 | 0.05 | 0.10 | 0.00 | 0.21 |
| E-9 | 900.0 | 90.0 | 0.05 | 0.11 | 0.00 | 0.20 | 0.02 | 0.04 | 0.00 | 0.08 | 0.12 | 0.24 | 0.00 | 0.50 | 0.04 | 0.09 | 0.00 | 0.18 |
| E-10 | 1000.0 | 90.0 | 0.06 | 0.13 | 0.00 | 0.24 | 0.02 | 0.05 | 0.00 | 0.09 | 0.12 | 0.23 | 0.00 | 0.50 | 0.04 | 0.09 | 0.00 | 0.18 |
| E-11 | 1100.0 | 90.0 | 0.07 | 0.15 | 0.00 | 0.27 | 0.03 | 0.05 | 0.00 | 0.10 | 0.13 | 0.23 | 0.00 | 0.51 | 0.05 | 0.09 | 0.00 | 0.19 |
| E-12 | 1200.0 | 90.0 | 0.07 | 0.16 | 0.00 | 0.28 | 0.03 | 0.06 | 0.00 | 0.11 | 0.14 | 0.23 | 0.00 | 0.53 | 0.05 | 0.09 | 0.00 | 0.20 |
| E-13 | 1300.0 | 90.0 | 0.08 | 0.16 | 0.00 | 0.29 | 0.03 | 0.06 | 0.00 | 0.11 | 0.16 | 0.24 | 0.00 | 0.57 | 0.06 | 0.09 | 0.00 | 0.21 |
| E-14 | 1400.0 | 90.0 | 0.09 | 0.17 | 0.00 | 0.31 | 0.03 | 0.06 | 0.00 | 0.11 | 0.17 | 0.24 | 0.00 | 0.49 | 0.06 | 0.09 | 0.00 | 0.18 |
| E-15 | 1500.0 | 90.0 | 0.09 | 0.17 | 0.00 | 0.31 | 0.03 | 0.06 | 0.00 | 0.11 | 0.18 | 0.25 | 0.00 | 0.51 | 0.07 | 0.09 | 0.00 | 0.19 |
| E-16 | 1600.0 | 90.0 | 0.09 | 0.17 | 0.00 | 0.31 | 0.03 | 0.06 | 0.00 | 0.11 | 0.19 | 0.26 | 0.00 | 0.53 | 0.07 | 0.10 | 0.00 | 0.20 |
| E-17 | 1700.0 | 90.0 | 0.09 | 0.17 | 0.00 | 0.31 | 0.04 | 0.06 | 0.00 | 0.12 | 0.19 | 0.27 | 0.00 | 0.55 | 0.07 | 0.10 | 0.00 | 0.20 |
| E-18 | 1800.0 | 90.0 | 0.10 | 0.17 | 0.00 | 0.32 | 0.04 | 0.06 | 0.00 | 0.12 | 0.20 | 0.28 | 0.00 | 0.57 | 0.08 | 0.10 | 0.00 | 0.21 |
| E-19 | 1900.0 | 90.0 | 0.10 | 0.16 | 0.00 | 0.31 | 0.04 | 0.06 | 0.00 | 0.12 | 0.21 | 0.29 | 0.00 | 0.59 | 0.08 | 0.11 | 0.00 | 0.22 |
| E-20 | 2000.0 | 90.0 | 0.10 | 0.16 | 0.00 | 0.31 | 0.04 | 0.06 | 0.00 | 0.12 | 0.21 | 0.30 | 0.00 | 0.60 | 0.08 | 0.11 | 0.00 | 0.23 |
| E-21 | 2200.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.29 | 0.04 | 0.06 | 0.00 | 0.12 | 0.22 | 0.31 | 0.00 | 0.63 | 0.08 | 0.12 | 0.00 | 0.24 |
| E-22 | 2400.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.30 | 0.03 | 0.06 | 0.00 | 0.11 | 0.23 | 0.33 | 0.00 | 0.67 | 0.09 | 0.12 | 0.00 | 0.25 |
| E-23 | 2600.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.30 | 0.04 | 0.06 | 0.00 | 0.12 | 0.24 | 0.34 | 0.00 | 0.70 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-24 | 2800.0 | 90.0 | 0.10 | 0.14 | 0.00 | 0.29 | 0.04 | 0.05 | 0.00 | 0.11 | 0.24 | 0.35 | 0.00 | 0.72 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-25 | 3000.0 | 90.0 | 0.10 | 0.14 | 0.00 | 0.29 | 0.04 | 0.05 | 0.00 | 0.11 | 0.24 | 0.36 | 0.00 | 0.74 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-26 | 3500.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.32 | 0.04 | 0.05 | 0.00 | 0.12 | 0.25 | 0.36 | 0.00 | 0.76 | 0.09 | 0.14 | 0.00 | 0.29 |
| E-27 | 4000.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.33 | 0.04 | 0.06 | 0.00 | 0.13 | 0.25 | 0.37 | 0.00 | 0.79 | 0.09 | 0.14 | 0.00 | 0.29 |
| E-28 | 5000.0 | 90.0 | 0.11 | 0.18 | 0.00 | 0.40 | 0.04 | 0.07 | 0.00 | 0.15 | 0.24 | 0.36 | 0.00 | 0.79 | 0.09 | 0.14 | 0.00 | 0.30 |

| Receptor | Distance | Direction | GLC fro | om three I | nost pree | dominaı | nt wind | directio | ns and | total | CUM | ULATI | VE GL | C from t | three n | nost pr | edomi | nant |
|----------|----------|-----------|---------|------------|-----------|---------|---------|----------|--------|-------|------|---------|-------------|----------|---------|---------|----------|-------|
| | (m) | (deg.) | GLC at | particula | r recepto | rs from | 3.0 MTP | A CEME | NT PL | ANT | W | vind di | rection | s and to | otal GL | C at pa | articula | ar |
| | from | | | | | | | | | | re | ceptor | s from | (CEMEN | NT PL | ANT W | ITH TP | P) |
| | Cement | | | PM | 10 | | | PM2 | .5 | | | PN | / 10 | | | PN | 2.5 | |
| | Mill | | E | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| E-29 | 6000.0 | 90.0 | 0.12 | 0.19 | 0.00 | 0.44 | 0.04 | 0.07 | 0.00 | 0.16 | 0.23 | 0.35 | 0.00 | 0.78 | 0.08 | 0.13 | 0.00 | 0.28 |
| E-30 | 8000.0 | 90.0 | 0.12 | 0.21 | 0.00 | 0.47 | 0.05 | 0.08 | 0.00 | 0.18 | 0.21 | 0.33 | 0.00 | 0.74 | 0.08 | 0.12 | 0.00 | 0.28 |
| E-31 | 10000.0 | 90.0 | 0.12 | 0.22 | 0.00 | 0.49 | 0.05 | 0.08 | 0.00 | 0.19 | 0.19 | 0.31 | 0.00 | 0.70 | 0.07 | 0.12 | 0.00 | 0.26 |
| ESE-1 | 100.0 | 112.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.14 | 0.02 | 0.00 | 0.00 | 0.06 |
| ESE-2 | 200.0 | 112.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.09 | 0.01 | 0.00 | 0.00 | 0.03 |
| ESE-4 | 400.0 | 112.5 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.06 |
| ESE-5 | 500.0 | 112.5 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.32 | 0.07 | 0.00 | 0.00 | 0.12 |
| ESE-6 | 600.0 | 112.5 | 0.02 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.01 | 0.18 | 0.00 | 0.00 | 0.31 | 0.07 | 0.00 | 0.00 | 0.12 |
| ESE-7 | 700.0 | 112.5 | 0.02 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.02 | 0.14 | 0.00 | 0.00 | 0.24 | 0.05 | 0.00 | 0.00 | 0.09 |
| ESE-8 | 800.0 | 112.5 | 0.03 | 0.00 | 0.00 | 0.05 | 0.01 | 0.00 | 0.00 | 0.02 | 0.11 | 0.00 | 0.00 | 0.19 | 0.04 | 0.00 | 0.00 | 0.07 |
| ESE-9 | 900.0 | 112.5 | 0.03 | 0.00 | 0.00 | 0.05 | 0.01 | 0.00 | 0.00 | 0.02 | 0.09 | 0.00 | 0.00 | 0.16 | 0.03 | 0.00 | 0.00 | 0.06 |
| ESE-10 | 1000.0 | 112.5 | 0.04 | 0.00 | 0.00 | 0.07 | 0.01 | 0.00 | 0.00 | 0.02 | 0.09 | 0.00 | 0.00 | 0.16 | 0.03 | 0.00 | 0.00 | 0.06 |
| ESE-11 | 1100.0 | 112.5 | 0.04 | 0.00 | 0.00 | 0.07 | 0.02 | 0.00 | 0.00 | 0.03 | 0.09 | 0.00 | 0.00 | 0.17 | 0.03 | 0.00 | 0.00 | 0.06 |
| ESE-12 | 1200.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.08 | 0.02 | 0.00 | 0.00 | 0.03 | 0.09 | 0.00 | 0.00 | 0.18 | 0.04 | 0.00 | 0.00 | 0.07 |
| ESE-13 | 1300.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.10 | 0.00 | 0.00 | 0.20 | 0.04 | 0.00 | 0.00 | 0.07 |
| ESE-14 | 1400.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.11 | 0.00 | 0.00 | 0.22 | 0.04 | 0.00 | 0.00 | 0.08 |
| ESE-15 | 1500.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.11 | 0.00 | 0.00 | 0.23 | 0.04 | 0.00 | 0.00 | 0.08 |
| ESE-16 | 1600.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.12 | 0.00 | 0.00 | 0.24 | 0.04 | 0.00 | 0.00 | 0.09 |
| ESE-17 | 1700.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.12 | 0.00 | 0.00 | 0.25 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-18 | 1800.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.13 | 0.00 | 0.00 | 0.26 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-19 | 1900.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.13 | 0.00 | 0.00 | 0.27 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-20 | 2000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.13 | 0.00 | 0.00 | 0.27 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-21 | 2200.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-22 | 2400.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.03 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-23 | 2600.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.04 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-24 | 2800.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.04 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-25 | 3000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.04 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-26 | 3500.0 | 112.5 | 0.05 | 0.00 | 0.0 | 0.10 | 0.02 | 0.00 | 0.00 | 0.04 | 0.14 | 0.00 | 0.00 | 0.29 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-27 | 4000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | 0.04 | 0.13 | 0.00 | 0.00 | 0.27 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-28 | 5000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.12 | 0.02 | 0.00 | 0.00 | 0.05 | 0.12 | 0.00 | 0.00 | 0.26 | 0.05 | 0.00 | 0.00 | 0.10 |
| ESE-29 | 6000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.13 | 0.02 | 0.00 | 0.00 | 0.05 | 0.11 | 0.00 | 0.00 | 0.25 | 0.04 | 0.00 | 0.00 | 0.09 |

| Receptor | Distance | Direction | GLC fro | om three | most pree | dominaı | nt wind | direction | ns and | total | CUM | ULATI | VE GL | C from t | three n | nost pr | edomi | nant |
|----------|----------|-----------|---------|-----------|-----------|---------|---------|-----------|--------|-------|------|---------|-------------|----------|---------|---------|----------|-------|
| | (m) | (deg.) | GLC at | particula | r recepto | rs from | 3.0 MTP | A CEME | NT PL | ANT | w | vind di | rection | s and to | otal GL | C at pa | articula | ar |
| | from | _ | | | | | | | | | re | ceptor | s from | (CEMEN | NT PLA | ANT W | ITH TP | P) |
| | Cement | _ | | PM | 10 | | | PM2 | .5 | | | P | / 10 | | | PN | 12.5 | |
| | Mill | | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| ESE-30 | 8000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.13 | 0.02 | 0.00 | 0.00 | 0.05 | 0.10 | 0.00 | 0.00 | 0.23 | 0.04 | 0.00 | 0.00 | 0.09 |
| ESE-31 | 10000.0 | 112.5 | 0.05 | 0.00 | 0.00 | 0.14 | 0.02 | 0.00 | 0.00 | 0.05 | 0.09 | 0.00 | 0.00 | 0.21 | 0.03 | 0.00 | 0.00 | 0.08 |
| SSW-1 | 100.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.20 | 0.00 | 0.00 | 0.02 | 0.08 |
| SSW-2 | 200.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.23 | 0.00 | 0.00 | 0.02 | 0.09 |
| SSW-3 | 300.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.25 | 0.00 | 0.00 | 0.02 | 0.10 |
| SSW-4 | 400.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.22 | 0.00 | 0.00 | 0.01 | 0.08 |
| SSW-5 | 500.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.19 | 0.00 | 0.00 | 0.02 | 0.08 |
| SSW-6 | 600.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.17 | 0.00 | 0.00 | 0.01 | 0.05 |
| SSW-7 | 700.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.18 | 0.00 | 0.00 | 0.02 | 0.08 |
| SSW-8 | 800.0 | 202.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.15 | 0.00 | 0.00 | 0.02 | 0.06 |
| SSW-9 | 900.0 | 202.5 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.18 | 0.00 | 0.00 | 0.03 | 0.08 |
| SSW-10 | 1000.0 | 202.5 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.20 | 0.00 | 0.00 | 0.03 | 0.08 |
| SSW-11 | 1100.0 | 202.5 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.20 | 0.00 | 0.00 | 0.03 | 0.08 |
| SSW-12 | 1200.0 | 202.5 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.09 | 0.22 | 0.00 | 0.00 | 0.03 | 0.07 |
| SSW-13 | 1300.0 | 202.5 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.09 | 0.23 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-14 | 1400.0 | 202.5 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.09 | 0.23 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-15 | 1500.0 | 202.5 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.10 | 0.24 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-16 | 1600.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.10 | 0.24 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-17 | 1700.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.10 | 0.24 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-18 | 1800.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.11 | 0.25 | 0.00 | 0.00 | 0.04 | 0.09 |
| SSW-19 | 1900.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.11 | 0.25 | 0.00 | 0.00 | 0.04 | 0.10 |
| SSW-20 | 2000.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.11 | 0.25 | 0.00 | 0.00 | 0.04 | 0.10 |
| SSW-21 | 2200.0 | 202.5 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.11 | 0.25 | 0.00 | 0.00 | 0.04 | 0.10 |
| SSW-22 | 2400.0 | 202.5 | 0.00 | 0.00 | 0.04 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.12 | 0.26 | 0.00 | 0.00 | 0.04 | 0.10 |
| SSW-23 | 2600.0 | 202.5 | 0.00 | 0.00 | 0.04 | 0.05 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.12 | 0.16 | 0.00 | 0.00 | 0.05 | 0.07 |
| SSW-24 | 2800.0 | 202.5 | 0.00 | 0.00 | 0.04 | 0.05 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.12 | 0.16 | 0.00 | 0.00 | 0.04 | 0.06 |
| SSW-25 | 3000.0 | 202.5 | 0.00 | 0.00 | 0.05 | 0.06 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.12 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-26 | 3500.0 | 202.5 | 0.00 | 0.00 | 0.06 | 0.07 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.13 | 0.17 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-27 | 4000.0 | 202.5 | 0.00 | 0.00 | 0.06 | 0.07 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.13 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-28 | 5000.0 | 202.5 | 0.00 | 0.00 | 0.08 | 0.09 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-29 | 6000.0 | 202.5 | 0.00 | 0.00 | 0.09 | 0.10 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |

| Receptor | Distance | Direction | GLC from three most predominant wind directions and total | | | | | | CUMULATIVE GLC from three most predominant | | | | | | | | | |
|----------|----------|-----------|-----------------------------------------------------------|------|------|-------|-------|------|---------------------------------------------|-------|----------------------------------------|------|------|-------|-------|------|------|-------|
| | (m) | (deg.) | GLC at particular receptors from 3.0 MTPA CEMENT PLANT | | | | | | wind directions and total GLC at particular | | | | | | | | | |
| | from | | | | | | | | | | receptors from (CEMENT PLANT WITH TPP) | | | | | | | |
| | Cement | - | PM10 | | | | PM2.5 | | | | PM10 | | | | PM2.5 | | | |
| | Mill | | Е | ENE | SSW | Total | E | ENE | SSW | Total | Е | ENE | SSW | Total | E | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| SSW-30 | 8000.0 | 202.5 | 0.00 | 0.00 | 0.10 | 0.11 | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.15 | 0.17 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-31 | 10000.0 | 202.5 | 0.00 | 0.00 | 0.10 | 0.11 | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |

Note : The concentrations as calculated on other receptors are Nil.

CONCLUSIONS

From Table 4, it can be observed that based on meteorological data of Post Monsoon season, the maximum anticipated 24 hours average GLC's will be as given below :

| Receptor | Distance (m) from | Direction (deg.) | GLC from three most predominant wind directions and total GLC at particular receptors from 3.0 MTPA CEMENT PLANT | | | | | | Cumulative GLC from three most predominant wind directions and total GLC at particular receptors from (CEMENT PLANT WITH TPP) | | | | | | | | | |
|----------|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|------|-------------------------------------------------------------------------------------------------------------------------------------|-------|--------------|------|------|-------|-------|------|------|-------|
| | Cement | - | | PM | 10 | | PM2.5 | | | | PM 10 | | | | PM2.5 | | | |
| | Mill | | E | ENE | SSW | Total | E | ENE | SSW | Total | Е | ENE | SSW | Total | Е | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| ENE-30 | 8000.0 | 67.5 | 0.15 | 0.15 | 0.00 | 0.35 | 0.06 | 0.06 | 0.00 | 0.14 | 0.18 | 0.23 | 0.00 | 0.48 | 0.07 | 0.08 | 0.00 | 0.17 |
| ENE-31 | 10000.0 | 67.5 | 0.15 | 0.15 | 0.00 | 0.35 | 0.06 | 0.06 | 0.00 | 0.14 | 0.18 | 0.22 | 0.00 | 0.46 | 0.07 | 0.08 | 0.00 | 0.17 |
| E-22 | 2400.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.30 | 0.03 | 0.06 | 0.00 | 0.11 | 0.23 | 0.33 | 0.00 | 0.67 | 0.09 | 0.12 | 0.00 | 0.25 |
| E-23 | 2600.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.30 | 0.04 | 0.06 | 0.00 | 0.12 | 0.24 | 0.34 | 0.00 | 0.70 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-24 | 2800.0 | 90.0 | 0.10 | 0.14 | 0.00 | 0.29 | 0.04 | 0.05 | 0.00 | 0.11 | 0.24 | 0.35 | 0.00 | 0.72 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-25 | 3000.0 | 90.0 | 0.10 | 0.14 | 0.00 | 0.29 | 0.04 | 0.05 | 0.00 | 0.11 | 0.24 | 0.36 | 0.00 | 0.74 | 0.09 | 0.13 | 0.00 | 0.27 |
| E-26 | 3500.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.32 | 0.04 | 0.05 | 0.00 | 0.12 | 0.25 | 0.36 | 0.00 | 0.76 | 0.09 | 0.14 | 0.00 | 0.29 |
| E-27 | 4000.0 | 90.0 | 0.10 | 0.15 | 0.00 | 0.33 | 0.04 | 0.06 | 0.00 | 0.13 | 0.25 | 0.37 | 0.00 | 0.79 | 0.09 | 0.14 | 0.00 | 0.29 |
| E-28 | 5000.0 | 90.0 | 0.11 | 0.18 | 0.00 | 0.40 | 0.04 | 0.07 | 0.00 | 0.15 | 0.24 | 0.36 | 0.00 | 0.79 | 0.09 | 0.14 | 0.00 | 0.30 |
| E-30 | 8000.0 | 90.0 | 0.12 | 0.21 | 0.00 | 0.47 | 0.05 | 0.08 | 0.00 | 0.18 | 0.21 | 0.33 | 0.00 | 0.74 | 0.08 | 0.12 | 0.00 | 0.28 |
| E-31 | 10000.0 | 90.0 | 0.12 | 0.22 | 0.00 | 0.49 | 0.05 | 0.08 | 0.00 | 0.19 | 0.19 | 0.31 | 0.00 | 0.70 | 0.07 | 0.12 | 0.00 | 0.26 |
| SSW-23 | 2600.0 | 202.5 | 0.00 | 0.00 | 0.04 | 0.05 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.12 | 0.16 | 0.00 | 0.00 | 0.05 | 0.07 |

Calculated Maximum GLC's From Top Three Predominant Wind Directions and Total GLC at Particular Receptors (µg/m³

| Receptor | Distance | Direction | GLC from three most predominant wind directions and total | | | | | | | Cumulative GLC from three most predominant wind | | | | | | | | |
|----------|----------|-----------|-----------------------------------------------------------|--------------------------------------------------------|------|-------|-------|------|------|-------------------------------------------------|-------------------------------------------------------|------|------|-------|-------|------|------|-------|
| | (m) | (deg.) | GLC at | GLC at particular receptors from 3.0 MTPA CEMENT PLANT | | | | | | | directions and total GLC at particular receptors from | | | | | | | |
| | from | | | | | | | | | | (CEMENT PLANT WITH TPP) | | | | | | | |
| | Cement | - | | PM 1 | 0 | | PM2.5 | | | | PM10 | | | | PM2.5 | | | |
| | Mill | - | Е | ENE | SSW | Total | Е | ENE | SSW | Total | Ε | ENE | SSW | Total | Ε | ENE | SSW | Total |
| | stack | | | | | Conc. | | | | Conc. | | | | Conc. | | | | Conc. |
| SSW-25 | 3000.0 | 202.5 | 0.00 | 0.00 | 0.05 | 0.06 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.12 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-26 | 3500.0 | 202.5 | 0.00 | 0.00 | 0.06 | 0.07 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.13 | 0.17 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-27 | 4000.0 | 202.5 | 0.00 | 0.00 | 0.06 | 0.07 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.13 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-28 | 5000.0 | 202.5 | 0.00 | 0.00 | 0.08 | 0.09 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-29 | 6000.0 | 202.5 | 0.00 | 0.00 | 0.09 | 0.10 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-30 | 8000.0 | 202.5 | 0.00 | 0.00 | 0.10 | 0.11 | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.15 | 0.17 | 0.00 | 0.00 | 0.05 | 0.06 |
| SSW-31 | 10000.0 | 202.5 | 0.00 | 0.00 | 0.10 | 0.11 | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.14 | 0.16 | 0.00 | 0.00 | 0.05 | 0.06 |
| Max | | | | | | | | | | | | | | | | | | |
| values | | | 0.15 | 0.22 | 0.10 | 0.49 | 0.06 | 0.08 | 0.04 | 0.19 | 0.25 | 0.37 | 0.15 | 0.79 | 0.09 | 0.14 | 0.05 | 0.30 |

CALCULATED MAXIMUM GROUND LEVEL CONCENTRATION (µg/m³

| Predomina nt wind directions | Max. Concentrations at receptors from predominant wind directions (µg/m ³) | | | | | | | | | | | |
|------------------------------------|----------------------------------------------------------------------------------------|---------------|-------------|-------------|--|--|--|--|--|--|--|--|
| | P | M2.5 | | | | | | | | | | |
| | 3.0 MTPA | Cumulative | 3.0 MTPA | Cumulative | | | | | | | | |
| E | 0.15 | 0.25 | 0.06 | 0.09 | | | | | | | | |
| ENE | 0.22 | 0.37 | 0.08 | 0.14 | | | | | | | | |
| SSW | 0.10 | 0.15 | 0.04 | 0.05 | | | | | | | | |
| | | | | | | | | | | | | |
| | Maximum total GLC at particular receptor | | | | | | | | | | | |
| | | 0.79 | | | | | | | | | | |
| | 0.49 (E-31) | (E-27 & E-28) | 0.19 (E-31) | 0.30 (E-28) | | | | | | | | |

Above results show that the emissions from the plant will marginally increase pollution in the ambient air but it will still be far below the permissible limits.



Safety, Occupational Health & Environment (SHE) Policy

Our Safety, Occupational Health & Environment (SHE) responsibilities are driven by a desire to protect people we work with, society at large and environment. It is integral to the way we do business, as part of our organization value.

- 1. We will work to protect people and environment with a fundamental belief that all injuries, emissions and discharge can be prevented. This responsibility rests with every one of us.
- 2. We are committed to provide a safe work place and technology for efficient use of energy and natural resources, reduce and prevent pollution, promote waste avoidance and recycle wastes.
- 3. We will continue to identify, assess and manage our Safety & Occupational Health hazard / risk and Environmental impact and regular monitor, review and report progress.
- 4. We will develop the "Will", Knowledge and skill among employees / contractors / partners to demonstrate their involvement, responsibility and accountability to achieve sound Safety, Occupational Health and Environment practices & performance.
- 5. We are committed to continual improvement in our SHE performance by setting objectives/targets, developing, deploying and maintaining standards and systems, and go beyond compliance to relevant industry standards, legal and other requirements.
- 6. We will continue to strengthen our systems and procedures for preventing and mitigating any potential emergency situations.

We are responsible and accountable for deployment of this policy and will truly succeed only when we achieve and sustain our SHE goal and are valued by the communities in which we work.

Head, Cement Business & Chairman, EHS Board

Factory Occupier

1^{er} April 2010
ADITYA BIRLA

Policy UltraTech Corporate Environment Policy (CEP) Applicability: To all employees of UltraTech Cement Limited and its subsidiaries

The policy has been adopted by the Board of Directors of UltraTech Cement Limited at its meeting held on 19th July, 2014

UltraTech Cement Ltd. is committed to environmental stewardship and we believe that environment protection is the management's responsibility as well as the responsibility of each and every employee of the organisation.

The Corporate Environment Policy is at the core of our decesion making, functions and both existing and new operations. We commit to:-

- 1. Conduct our operations in compliance with applicable Environmental laws, regulations and standards.
- 2. Adoption of State of the Art technology for prevention and control of our environmental impacts.
- 3. Continually improve our environmental management system, related policies, programs and performance, based on the results of our periodic reviews and taking into account regulatory changes, customer needs, technical developments, scientific understanding and community expectations.
- 4. Operate facilities and conduct activities taking into consideration the efficient use of natural resources.
- 5. Reduce waste and where possible eliminate waste through reuse, recycle and recovery and handle and dispose waste through safe and responsible methodologies.
- 6. Influence our suppliers to adopt practices for resource conservation and waste reduction.
- 7. Promote employee awareness of environmental concerns, actions and responsibilities through our programs and various communication channels.
- 8. Working with community to address the environmental challenges.

For effective and efficient implementation of Corporate Environmental Policy, we shall:-

- a. Ensure the allocation of sufficient financial, human and technological resources along with organisational infrastructure, for its implementation.
- b. Ensure our contractors follow the Corporate Environment Policy.
- c. Prepare and maintain site specific, list of all the applicable regulations, legal records, compliance requirements and compliance status.
- d. Develop and implement innovative processes focused on reducing consumption of energy and water and minimising quantity of waste disposed.
- e. Review facilities and programs on a regular basis and establish monitorable targets, quantified as appropriate, for continual imrovement of our environmental performance.

- f. As far as practicable, purchase products and services that will have minimum impact on the environment.
- g. Involve the community in our environmental initiatives where reasonably practicable.
- h. Communicate the environmental commitment and performance of the organisation to our stakeholder.
- i. Provide for monitoring and review of Corporate Environmental performance at Corporate level, along with the reporting of non-compliances.
- j. Establish an organisational structure to oversee the effective implementation of Corporate Environment Policy. Define key responsibilities within the various levels of organisation for policy implementation.



Hierarchical System to address Environmental Issues

We are responsible and accountable for deployment of this policy. We shall remain committed at all times for its effective implementation.

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Mr. O. P. Puranmalka

Whole-time-Director

19 JUL 2014

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Corporate Social Responsibility Policy

Introduction:

In accordance with the notification issued by the Ministry of Corporate Affairs dated 27th February 2014 under Section 135 of the Companies Act 2013, the Company's Corporate Social Responsibility (CSR) is enunciated. Our Corporate Social Responsibility policy also conforms to the National voluntary Guidelines on Social, Environment and Economic Responsibilities of Business released by the Ministry of Corporate Affairs, Government of India in collaboration with FICCI Aditya Birla CSR Centre for Excellence (July 2011). The Company CSR policy was outlined in 2010 in the Companies' Annual Reports and on its website.

UltraTech Cement Limited is a part of Aditya Birla Group. For every Company in the Aditya Birla Group, reaching out to underserved communities is part of our DNA. We believe in the trusteeship concept. This entails transcending business interests and grappling with the "quality of life" challenges that underserved communities face, and working towards making a meaningful difference to them.

Our vision is - "to actively contribute to the social and economic development of the communities in which we operate. In so doing build a better, sustainable way of life for the weaker sections of society and raise the country's human development index" (Mrs. Rajashree Birla, Chairperson, Aditya Birla Centre for Community Initiatives and Rural Development).

Implementation process: Identification of projects

All projects are identified in consultation with the community in a participatory manner, literally sitting with them and gauging their basic needs. We recourse to the participatory rural appraisal mapping process. Subsequently, based on a consensus and in discussion with the village panchayats, and other stakeholders, projects are prioritized.

Arising from this the focus areas that have emerged are Education, Health care, Sustainable livelihood, Infrastructure development, and espousing social causes. All of our community projects/programmes are carried out under the aegis of The Aditya Birla Centre for Community Initiatives and Rural Development. The activities are in line with Schedule VII of the companies Act, 2013 as indicated –

In **Education**, our endeavour is to spark the desire for learning and knowledge at every stage through • Formal schools • Balwadis • Quality elementary education • Aditya Bal Vidya Mandirs • Girl child education • Non formal education.

In **Health care** our goal is to render quality health care facilities to people living in the villages and elsewhere through our Hospitals. • Primary health care centres • Mother and Child care projects • Immunization programmes with a thrust on polio eradication •Programmes to address malnutrition. • Anganwadi • Adolescent health • Health care for visually impaired, and differently abled • Preventive health care through awareness programmes • Non communicable diseases.

In **Sustainable Livelihood** our programmes aim at providing livelihood in a locally appropriate and environmentally sustainable manner through • Formation of Self Help Groups for women empowerment • Skill Enhancement and Vocational training • Partnership with Industrial Training Institutes • Agriculture development and better farmer focus • Animal Husbandry • Soil and Water conservation • Watershed development. •Agro Forestry

In **Infrastructure Development** we endeavour to set up essential services that form the foundation of sustainable development through • Basic infrastructure facilities • Housing facilities • Safe drinking water • Sanitation & hygiene • Renewable sources of energy.

To bring about **Social Change**, we advocate and support • Dowry less marriage • Widow Remarriage • Awareness programmes on anti social issues • De-addiction campaigns and programmes • Espousing basic moral values. • Gender equality.

Activities, setting measurable targets with timeframes and performance management.

Prior to the commencement of projects, we carry out a baseline study of the villages. The study encompasses various parameters such as – health indicators, literacy levels, sustainable livelihood processes, and population data - below the poverty line and above the poverty line, state of infrastructure, among others. From the data generated, a 1-year plan and a 5-year rolling plan are developed for the holistic and integrated development of the marginalized. These plans are presented at the Annual Planning and Budgeting meet. All projects/programmes are assessed under the agreed strategy, and are monitored every quarter, measured against targets and budgets. Wherever necessary, midcourse corrections are affected. The surplus arising out of the projects/programmes does not form part of the business profit of the Company.

Organizational mechanism responsibilities

The Aditya Birla Centre for Community Initiatives and Rural Development provides the vision under the leadership of its Chairperson, Mrs. Rajashree Birla. The CSR committee of Directors at the Board level comprises of:

- Mrs. Rajashree Birla, Chairperson
- Mr. G. M. Dave, Independent Director
- Mr. O. P. Puranmalka, Managing Director
- Permanent Invitee: Dr. (Mrs.) Pragnya Ram, Group Executive President, Corporate Communications and CSR

All projects/programmes are placed before the CSR committee, specifying modalities of execution of such projects/programmes and the implementation schedules.

A robust implementation structure, monitoring process and a team of professionals is in place at the Company units.

The Company takes all actions to comply with Section 135 of the Companies Act, 2013 and the rules made thereafter.

To measure the impact of the work done, a social satisfaction social audit / impact assessment study is carried out by a third party.

Partnerships

Collaborative partnerships are formed with the Government, the District Authorities, the village panchayats, NGOs and other like-minded stakeholders. This helps widen the Company's CSR reach and leverage upon the collective expertise, wisdom and experience that these partnerships bring to the table.

In collaboration with FICCI, we have set up Aditya Birla CSR Centre for Excellence to make CSR an integral part of corporate culture.

The Company engages with well established and recognized programs and national platforms such as the CII, FICCI, ASSOCHAM to name a few, given their commitment to inclusive growth.

Budgets

A specific budget is allocated for CSR activities. This budget is project/ programme driven.

Information dissemination

The Company's engagement in this domain is disseminated on its website, Annual Reports, inhouse journals and through the media.

Management Commitment

Our Board of Directors, our Management and all of our employees subscribe to the philosophy of compassionate care. We believe and act on an ethos of generosity and compassion, characterized by a willingness to build a society that works for everyone. This is the cornerstone of our CSR policy.

O. P. Puranmalka Managing Director