EXECUTIVE SUMMARY

Rapid Environmental Impact Assessment of Cement Plant at Bhogiram goan, Doboka

Prepared for:
Dragon Cement Industries Pvt. Ltd.
Doboka, Nagaon, Assam

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1. **PROJECT DESCRIPTION**

   Dragon Cement Industries Pvt. Ltd. are setting up 200 TPD Clinker (240 TPD Cement) with VSK technology cement plant at Bhogiram gaon, P.O. Doboka, Dist. Nagaon, Assam. The total capital outlay including working capital, margin money of Rs. 55.37 lakhs has been estimated at Rs. 497.00 lakhs.

**Location**

   A plot of land measuring around 17 bighas at Bhogiram gaon, Mouza Jamunamukh, Circle Doboka, District Nagaon, Assam has been acquired for the proposed project. The project site is 2 Km from Doboka town, 10 Km from the Jamunamukh railway station, 1 Km from the National Highway 54. Nagaon town is 36 Km away from the project site on North West direction.

**Technology and process description**

**Raw Materials**: The main raw materials used in the cement manufacturing process are limestone, sand, shale, clay, and iron ore. The main material, limestone, will be collected from the neighbouring places.

**Raw Material Preparation**: Depending on size, the raw materials may or may not be crushed before being stored in separate areas until required.

**Raw Grinding**: In this step the raw material is proportioned to meet a desired chemical composition and fed to either a rotating ball mill or vertical roller mill. The raw materials are dried with waste process gases and ground to a size where the majority of the materials are less than 75 microns. The dry materials exiting either type of mill are called "kiln feed". The kiln feed is pneumatically blended to insure the chemical composition of the kiln feed is well homogenized and then stored in silos until required.

**Pyroprocessing**: Whether the process is wet or dry, the same chemical reactions take place. Basic chemical reactions are: evaporating all moisture, calcining the limestone to produce free calcium oxide, and reacting the calcium oxide with the minor materials (sand, shale, clay, and iron). This results in a final black, nodular product known as "clinker" which has the desired hydraulic properties.
**Finish Grinding and Distribution:** The black, nodular clinker is stored on site in silos or clinker domes until needed for cement production. Clinker, gypsum, and other process additions are ground together in ball mills to form the final cement products. Fineness of the final products, amount of gypsum added, and the amount of process additions added are all varied to develop a desired performance in each of the final cement products.

Each cement product is stored in an individual bulk silo until needed by the customer. Bulk cement can be distributed in bulk by truck, rail, or water depending on the customer's needs. Cement can also be packaged with or without colour addition and distributed by truck or rail.

2. **DESCRIPTION OF ENVIRONMENT**

**STUDY AREA, PERIOD, COMPONENTS & METHODOLOGY**

The project site falls under Bhogiram gaon and Sutargaon gram panchayat, Binnakandi C.D. Block in Nagaon district. The geographical location of Nagaon district is 25°56' North Latitude and 92°57' East Longitude.

The average gradient is gentle with a moderate slope. The mean daily maximum temperature during winter is about 25° C and minimum is 11° C. The mean daily maximum temperature during summer is 34° C and the minimum is 24° C. The relative humidity varies from month to month and increases from 76% to 84% during the South west monsoon and is about 77% in rest of the year. The humidity varies throughout the year but seldom drops down below 67%. The average annual rainfall is 1541.7 mm. Rainfall is confined mainly during the monsoon season. Winds are generally light to moderate being 2-8 Km per hour.

**AIR QUALITY**

The average concentrations for all 16 AQMS ranged widely from 84.25 to 56.25 µg/m³. The low dust concentration is due to occasional rain in the surrounding vicinity and due to higher density of surrounding vegetation resulting in overall high humidity. A high concentration is due to the influence of other industries releasing smoke at ground level.

In the present investigation out of the 16 AQMS the SPM concentration did not exceed the limit at most of the sites. At most of the sites the SPM concentrations (90 percentile) is above 100 µg/m³ which can also be considered as background of the region because some build up is due to the vehicular traffic and the work going on in the industrial units within the zone. The respiratory
suspended particulate matters (RSPM) ranged from 26.75 to 42.50 µg/m³. The level of NOₓ as per CPCB limit for residential, rural and other areas is 60 µg/m³. At all the stations the minimum and maximum concentration was in the range of 7 to 22 µg/m³.

The minimum and maximum SO₂ concentration was 7 and 15 µg/m³ respectively.

**NOISE ENVIRONMENT**

*In plant Noise Levels*: About 16 important noise level stations were set up within and around the area of the proposed cement plant complex. The maximum sound level was 60 dB(A) and the minimum was 28 dB(A).

*Noise Level Due To Other Industries*: The nearest industries are stone crushers and perfumery. Only some of these units were operational during our study period. Hence, the noise from these sources may not be as high as expected.

*Noise Level Due To Vehicular Activity*: The villages are located at a distance of 1 Km from the plant. The vehicular traffic density is quite high because of the closeness to the NH-54. Nevertheless, the background road side noise level was within the permissible limits.

**WATER ENVIRONMENT**

The site of the cement plant as stated earlier, is very near to the NH-54. The Jamuna river is flowing about 2 Km from the project site. The proposed cement plant proposes not to discharge any effluent outside the site. The water will be recycled and used.

*Water Balance*: Average annual rainfall in the area is estimated to be 1541.70mm. Considering 10% of seepage to subsoil water, the water recharge potential of the area within 5 km radius can thus be calculated. This quantity of recharge water is much more than the maximum required for the proposed cement plant and the population of the area.

*Water quality*: 11 sampling stations were selected. All the values of turbidity, alkalinity and hardness, chloride, sulphate and nitrate are well within permissible limit. Water quality assessment data indicates that both surface and ground water are suitable for human consumption.
**LAND ENVIRONMENT**

Impact of industrial activity on land environment is primarily attributed to perpetual fallout of the harmful gaseous emission along with the natural atmospheric pollutants.

*Land Use Pattern and Soil Characteristics:* Present status of the land-use pattern of the area clearly projects that though it is more or less plain with high potential of shrub growth, it is mostly being used for agricultural purposes. The forest cover in the area is not very high. The lands are cultivated for both domestic and commercial purpose. The soil is slightly acidic in nature and the texture is clayey.

*Seismic Status:* If we study the seismic map of the North-East India, it is observed that the Kamrup district falls under the seismic magnitude of less than 5.5 which is the lowest as far as the magnitude of earthquake intensity in the entire North-eastern region is concerned.

**BIOLOGICAL ENVIRONMENT**

The estimated faecal coli form density is reported in terms of MPN per 100 ml.

*Flora and Fauna (General Vegetation And Animals):* The entire area is characterized by the presence of deciduous plants. The main plant species found in the area are shrubs.

*Agriculture:* The main source of income of the majority of the population is agriculture. The agro-climatic condition of the area is most congenial for cultivation of paddy and seasonal vegetables.

*Fisheries:* Fishing is an important small scale industry of the area and many families are dependent on it for their livelihood.

**SOCIO-ECONOMIC ENVIRONMENT**

The proposed cement plant is at Bhogiram gaon, under Jamunamukh Mouza of Nagaon district,

*Socio -Economic Profile of Demographic Structure:* The people of the area mostly belong to the agricultural class and their behaviour towards us shows that they are honest and people of integrity.

*Socio-economic Profile of Basic Amenities:* Most of the villages in the study zone have primary schools. Few villages have middle as well as English medium schools also. There is a college (Haji Anwar Ali College) within 5 Km radius of the cement plant.

There is one 30 bedded community health centre which is 2.5 Km from the project site. As regards power supply, it is a developed sector in this area. All
the villages are well connected with pitched as well as kutcha roads. Post office, sub post office and telegraph office are available in the area which designates the area as being on the process of development.

3. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

In this section the impacts of the project activities on the environment of the project site are assessed.

VISUAL IMPACTS AND AESTHETICS: Improper selection and operation of the plant area might result in visual impacts in the surrounding.

IMPACT TO AIR QUALITY: The impact of these emissions will be limited to a very short distance. The prime source of air pollution from the cement plant is the stack emission. EMP measures have been proposed to mitigate long term as well as short term impact so that general air pollution is brought down and forest vegetation will not be affected to any significant extent due to the proposed cement plant.

NOISE ENVIRONMENT

In a cement plant, the noise sources are generally scattered within the boundary of the plant. Mitigation measures as control at the source as well as control through green belt (inside and out-side) shall keep the impact marginal.

As regards the impact prediction on noise component of air environment, the levels of 40-45 dB (A) are expected within the boundary of the cement plant which will be attenuated to 32-25 dB(A) after minimal green belt (Inplant) recommendations are implemented.

WATER ENVIRONMENT

Industrial wastewater, if discharged to surface water, can give rise to significant deterioration in its water quality. Since there will be almost negligible amount of treated effluent from the proposed cement plant therefore there will be no impact on river water within the impact zone. Surface water quality will not be affected as there will be no discharge of wastewater from the proposed cement plant into the nearby river.

Ground Water: Water quality of village well/ponds will not be affected by effluent of the proposed cement plant.
BIOLOGICAL ENVIRONMENT

Green Belt Development

In order to predict the impact on air environment and to device mitigation strategy for further emissions, noise besides reusing the treated solid wastes, green belt design approach through modelling was adopted. Trees growing up to 10 meters or more in height should be planted around the cement plant installation. Impact shall be kept minimum on land environment.

4. Environmental monitoring Programme

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Environmental indicator</th>
<th>Monitoring parameter</th>
<th>Period &amp; Frequency</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Terrestrial habitat / vegetation cover</td>
<td>Number of matured trees to be felled</td>
<td>During site planning</td>
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<td></td>
<td></td>
<td>Species Diversity Index</td>
<td></td>
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<tr>
<td>2</td>
<td>Topsoil</td>
<td>Area planned for storage</td>
<td>Weekly during site preparation</td>
</tr>
<tr>
<td>3</td>
<td>Fugitive emission of dust during site preparation</td>
<td>Visual observation of dust in air by haziness</td>
<td>Daily during site preparation</td>
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<tr>
<td>4</td>
<td>Supervision of movement of heavy vehicles within site</td>
<td>Number of vehicles reported with movement outside platform area and access road</td>
<td>Daily</td>
</tr>
<tr>
<td>5</td>
<td>Fugitive emission of dust during material handling and storage</td>
<td>Visual observation of dust in air by haziness</td>
<td>Daily</td>
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<tr>
<td>6</td>
<td>Soil fertility</td>
<td>Fertility parameters like pH, NPK ratio, total carbon</td>
<td>Once during site preparation</td>
</tr>
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<td>7</td>
<td>Quality of water</td>
<td>Visual observation, Analysis of parameters as per CPCB standards</td>
<td>Monthly</td>
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<tr>
<td>8</td>
<td>Ambient air quality</td>
<td>Visual observation, Odour/smell Measurement of SPM, SO$_2$, NO$_x$, CO</td>
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<td>9</td>
<td>Ambient noise quality</td>
<td>Hearing/perception Measurement of noise level in dB(A)</td>
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<td>10</td>
<td>Condition of natural habitat</td>
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<td>11</td>
<td>Solid waste</td>
<td>Mass of waste generated Storage and disposal details</td>
<td>Daily</td>
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<td>12</td>
<td>Groundwater quality</td>
<td>Analysis of parameters as per standard</td>
<td>Monthly</td>
</tr>
</tbody>
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5. PROJECT BENEFITS

Positive impacts can be enumerated as:

- Employment opportunities to the local people would increase considerably due to the construction and operation of the plant.
- Increased facilities in the field of medicine, water supply, housing, sanitation etc. would definitely crop up.
- The cement plant will fill the gap of supply. This will augment the process of industrial development of the area as well as it carries higher revenue for the concerned Government authorities.

Based on our findings, it is anticipated that the positive impacts would outweigh the negative ones and thus a net positive impact on socio-economic environment is visualized.

6. ENVIRONMENT MANAGEMENT PLAN

AIR POLLUTION SOURCES AND CONTROL MEASURES

All pollution control equipment in the proposed cement plant is designed for an outlet emission of less than 50 mg/m³ of suspended particulate matter.

**Hammer mill**

420 cfm (714 m³/hr) (3 HP)
Cyclone separator with multicyclone collector or pulse jet bag filter system.

**Raw mill**

1280 cfm (2175 m³/hr) (5HP)
Reverse pulse jet bag filter system

**Cement mill**

1280 cfm (2175 m³/hr) (5HP)
Reverse pulse jet bag filter system

**Kiln**

820 cfm (1393 m³/hr) (7.5 HP) output 1000mm diameter chimney
Impingement plate scrubber i.e. air jet wash system with 4000 cfm twin lobe rotary compressor.
NOISE ENVIRONMENT

Monitoring of noise levels is essential to assess the efficiency of maintenance schedules undertaken to reduce noise levels and noise protection measures. A good quality sound pressure level meter is essential for this purpose. Dragon Cement Pvt. Ltd. is procuring Compressors and Generators with acoustic enclosure.

WATER ENVIRONMENT

There will be no waste water generated due to the process. The sanitary waste is diverted into a septic tank followed by soak pit. Therefore, suggestions regarding their disposal and treatment have not been covered in details. Here, we can at least say that the pollution control measures regarding wastewater discharge should be followed in accordance with the norms of the State Pollution Control Board. Whatever wastewater is generated from the plant will be recycled.

Rain water harvesting: Based on the available data on roof area one rain harvesting pit have been envisaged, to ensure surging of ground water. Pits will be made with gravel and sand filled in as filtering media.
LAND ENVIRONMENT

At times suspended solids and also dissolved solids may contaminate the soil. This may cause soil pollution. To mitigate this proper drainage system should be made all along the boundary of the proposed cement plant in order to discharge any kind of waste to the river outlet by all possible means. Soil parameters like pH, conductivity, NPK ratio etc. Soil testing should be done on case to case basis.

Solid waste generation is mainly from the pollution control equipments which is negligible but periodically recycled after the containers placed beneath the rotary valve of the respective dust collectors are adequately filled in.

7. SUMMARY AND CONCLUSION

Dragon cement Pvt. Ltd. is a firm believer in eco-friendly industrialization which leads to the development of the area. It will follow the norms and guidelines of State and Central Pollution Control Boards. They are also planning to undertake many socio-economic development activities in the area to bring about overall improvements in the area. Therefore, the project may be accorded environmental clearance.