

**EXECUTIVE SUMMARY
OF
ENVIRONMENTAL IMPACT
ASSESSMENT REPORT
FOR
PUBLIC HEARING
OF**

**Expansion of Integrated Cement Plant
Clinker (2 x 2.6 to 3 x 4.5 Million TPA),
Cement (2 x 3.0 to 3 x 5.5 Million TPA),
Captive Power Plant (25 to 125 MW) and
Waste Heat Recovery Power Plant (30 to 100 MW)**

At

**Village: Khapradih, Tehsil: Simga,
District: Balodabazar - Bhatapara (Chhattisgarh)**

APPLICANT



**M/s. Shree Raipur Cement Plant
(A Unit of Shree Cement Ltd.)**

**Village: Khapradih, Tehsil: Simga,
District: Balodabazar - Bhatapara (Chhattisgarh)**

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EXECUTIVE SUMMARY

1.0 PROJECT DESCRIPTION

1.1 Introduction

Shree Cement Limited (SCL) is energy conscious and environment friendly business organization, started its journey in the year 1979, and today it is among India's leading cement manufacturing companies. Having witnessed an exponential growth since last three decades, their endeavour continues to expand their capacity in the cement and power sector.

M/s. Shree Raipur Cement Plant has an existing Integrated Cement Plant at Village- Khapradih, Tehsil – Simga, District –Balodabazar- Bhatapara (Chhattisgarh). Environmental Clearance for the same has been obtained from MoEFCC, New Delhi vide letter no. J-11011/235/2008-IA-II (I) on 05th Sept., 2016 (Copy enclosed as Annexure - 1)

Now, the company is proposing for an expansion of Integrated Cement Plant - Clinker (2 x 2.6 to 3 x 4.5 MTPA), Cement (2 x 3.0 to 3 x 5.5 MTPA), CPP (25 to 125 MW), WHRB (30 to 100 MW) at Village- Khapradih, Tehsil- Simga, District- Balodabazar – Bhatapara (Chhattisgarh).

Details of the production capacities before and after expansion are as below:

Particular	Unit	Existing Status	Existing Granted Capacity	Additional Proposed Capacity		Total Capacities After Proposed Expansion
				Phase - 1	Phase - 2	
Clinker* (Million TPA)	Unit - I	Running	2.6	2.6 to 3.5 (by internal modifications)	3.5 to 4.5 (by installation of additional preheater)	4.5
	Unit - II	Running	2.6	2.6 to 4.0 (by internal modifications)	4.0 to 4.5 (by internal modifications)	4.5
	Unit - III	Proposed	Nil	Nil	4.5	4.5
	Total	-	5.2 (2 x 2.6)	2.3	6.0	13.5 (3 x 4.5)
Cement (Million TPA)	Mill - I	Running	3.0	3.0 to 4.4 (by modification in VRM)	4.4 to 5.5 (by installation of Ball Mill / VRM)	5.5
	Mill - II	Yet to install	3.0	3.0 to 4.4 (by installation of VRM)	4.4 to 5.5 (by installation of additional Ball Mill / VRM)	
	Mill - III	Proposed	Nil	Nil	1 x 5.5 (4.4 MTPA by VRM & balance 1.1 MTPA by installation of Ball Mill / VRM)	5.5
	Total	-	6.0	2.8	7.7	16.5
CPP (MW)	-	Running	25	2 x 25	2 x 25	125
Waste Heat Recovery Power Plant	-	Running	30	25	45	100

Particular	Unit	Existing Status	Existing Granted Capacity	Additional Proposed Capacity		Total Capacities After Proposed Expansion
				Phase - 1	Phase - 2	
(MW)						
Synthetic Gypsum Unit (TPH)	-	Yet to install in 2 nd Phase	65	Nil	Nil	65
D.G. Set (KVA)	-	2*250 KVA running; balance yet to be installed in phased manner	2000	Nil	Nil	2000

*Clinker will also be sent to the sister grinding units, market sale and also receive from outside if clinker unit is not in operation or shortfall of clinker.

As per EIA Notification dated 14th Sept., 2006, as amended from time to time; the project falls under Category 'a', Project or Activity '3 (b)'.

Application (Form-1/ToR and Pre-Feasibility Report) for obtaining Environmental Clearance for this expansion project was submitted to MoEFCC, New Delhi on 5th June, 2017.

The project was considered in front of Expert Appraisal Committee (EAC) (Industry- 1) for its First Technical Presentation (for ToR approval) on 10th July, 2017.

ToR Letter was issued by MoEFCC, New Delhi vide letter no. J-11011/235/2008-IA-II (I) on 6th Nov., 2017.

1.2 Brief Description of the Project

Brief description about the Project is given in Table - 1.

Table - 1
Brief Description of the Project

S. No.	PARTICULARS	DETAILS
A.	Nature of the Project	Expansion Project
B.	Size of the Project	<ul style="list-style-type: none"> ○ Clinker (2 x 2.6 to 3 x 4.5 MTPA) ○ Cement (2 x 3.0 to 3 x 5.5 MTPA) ○ Captive Power Plant (25 to 125 MW) ○ WHRB (30 to 100 MW)
C.	Location Details	
1.	Village	Khapradih
2.	Tehsil	Simga
3.	District	Balodabazar - Bhatapara
4.	State	Chhattisgarh
D.	Geographical Extent of the Plant Site	
1.	Latitude	21°35' 41.84" N to 21°36' 29.06" N

S. No.	PARTICULARS	DETAILS
2.	Longitude	82°02' 14.24" E to 82°3' 6.17" E
3.	Toposheet No.	64 K/2
E.	Area Details	
1.	Total Plant area	159.256 ha
2.	Greenbelt / Plantation area	out of the total existing plant area i.e. 159.256 ha, 33% (i.e. 52.55 ha) will be developed under greenbelt / plantation; out of which 37.1 ha area has already been covered under greenbelt development / plantation and rest 15.45 ha area will be developed. Additional 6.5 ha will also be developed under greenbelt/ plantation.
F.	Environmental Setting Details (with approximate aerial distance and direction from the plant site)	
1.	Nearest Town / City	Balodabazar (12.5 km in ENE direction)
2.	Nearest National / State Highway	<ul style="list-style-type: none"> o SH-10 (9.0 km in NNE direction) o NH -200 (30 km in WNW direction)
3.	Nearest Railway station	Bhatapara (18 km in NW direction)
4.	Nearest Airport	Raipur Airport (55 km in SSW direction)
5.	National Parks, Wildlife Sanctuaries, Biosphere Reserves within 10 km radius	No National Park, Wildlife Sanctuary, Biosphere Reserve exists within 10 km radius of the plant site.
6.	Reserve Forests (RF) / Protected Forests (PF) etc. within 10 km radius	Dhabadih Reserve Forest (4.0 Km in NE direction)
7.	Water Bodies within 10 km radius	<ul style="list-style-type: none"> o Mahanadi Canal (0.5 km in East direction) o Banjari Nala (3.0 km in NW direction) o Chitawar Nala (3.0 km in SE direction) o Ameri Diversion Canal (4.8 km in West direction) o Kukardih Talav (6.5 km in NE direction) o Khorsi Nala (6.5 km in SE direction) o Jhorki Nala (6.5 km in SSE direction) o Tengna Nala (9.0 km in ESE direction)
8.	Seismic Zone	Zone - II [as per IS 1893 (Part-I) :2002]
G.	Cost Details	
1.	Total Cost of the Project	Rs. 4489.12 Crores; out of which Rs. 2282.75 Crores is for proposed expansion and Rs. 2206.37 Crores is existing cost.
2.	Cost for Environmental Protection Measures	<ul style="list-style-type: none"> o Capital Cost - Rs. 140 Crores o Recurring Cost - Rs. 150 Lacs/annum

Source: Pre-Feasibility Study Report

1.3 Location Map

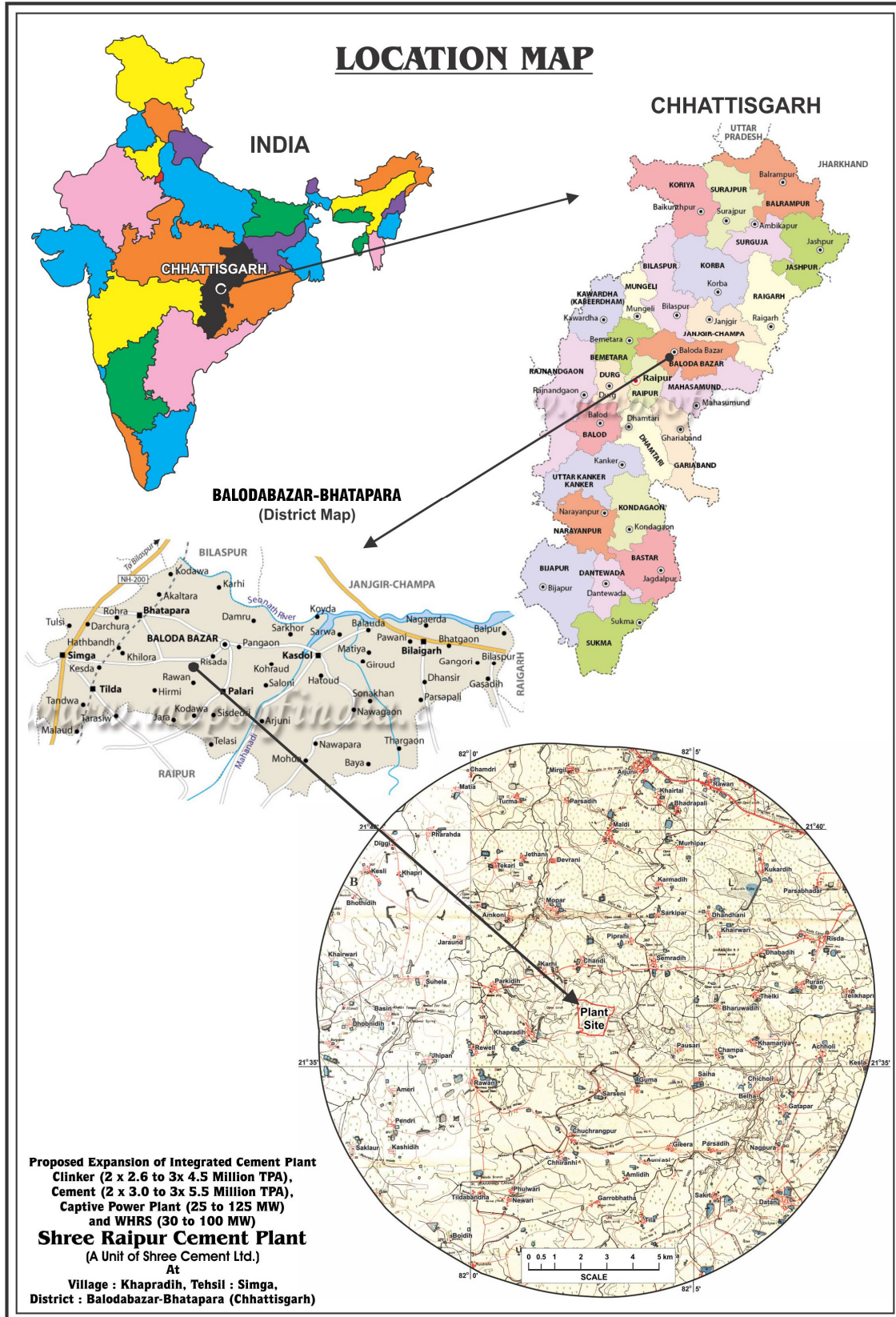


Figure - 1.1: Location Map

1.4 Major Requirements for Proposed expansion Project

1.4.1 Raw Material Requirement

Major raw materials required for cement production are Limestone, Gypsum, Fly ash, Clay, Red Ochre / Iron Ore & Silica Sand.

Details regarding quantity of raw materials required, their source along with distance & mode of transportation for proposed expansion project are given in Table - 2

Table - 2
Raw Materials Requirement, Source and Transportation

Raw Material	Quantity (MTPA)				Source	Mode of Transportation
	Basis	Existing	Proposed	Total		
Limestone	1.6 T/T of Clinker	8.32	13.28	21.6	Captive Limestone Mine (Samradih-Bharuwadih Mine and Karhi-Chandi Mine)	Adjacent; Covered Conveyor belt
Iron ore & Red Mud	0.015 T/T of Clinker	0.08	0.13	0.21	Shri Bajrang Power & Ispat Ltd. Tilda / Bharat Aluminium Company Ltd.(Balco-Korba)	Tilda - 47, Korba - 151 Road / Rail
Indian, Imported Mineral gypsum, synthetic and chemical Gypsum	0.07 T/T of Cement	0.42	0.73	1.15	Swiss Singapore Overseas Pvt. Ltd. Oman Vizag; Coromondal Inter National Ltd. Visakhapatnam Vizag; Synthetic gypsum plant	Vizag - 573; Road / Rail
Fly Ash	0.35 T/T of Cement	2.10	3.67	5.77	CPP, GMR Chhattisgarh Energy Ltd Tilda, Sarda Energy & Minerals Ltd Siltara, NSPCL Limited Bhilai, NTPC Limited Sipat, KSK Mahanadi Power Co. Ltd Akaltara, Chhattisgarh Power Gen. Co. Ltd. (CSEB) Marwa, D B Power Limited Raigarh.	Tilda - 47, Siltara - 72, Bhilai - 121, Sipat - 106, Akaltara - 119, Marwa - 120, Raigarh - 154 Road
Slag	0.50 T/T of Cement	3.00	5.25	8.25	Metalman Siltara, Jayaswal Neco Industries Ltd Siltara, Jindal Steel & Power Ltd Raigarh	Siltara - 172, Raigarh - 154 Road / Rail

Source: Pre-feasibility Report

Raw materials Requirement for Synthetic Gypsum Manufacturing

Material	Requirement 65 TPH / 1560 TPD	Source
Limestone	968	Captive Limestone Mine (Semradih-Bharuwadih Mine and Karhi-Chandi Mine)
H ₂ SO ₄ 98%	655	Local Market
Water	546	130 KLD Ground Water + 310 KLD RO Reject water

1.4.2 Fuel Requirement

Details regarding quantity of fuel required, their source along with distance and mode of transportation for proposed expansion project are given in Table -3.

Table - 3
Fuel Requirement

S. No.	Name of Fuel	Quantity (MTPA)			Source	Calorific Value	% Ash	% Sulphur	Distance & Mode of Transportation
		Existing	Additional	Total					
1.	Indian & Imported Petcoke - Cement Plant	0.52	0.83	1.35	Local Petroleum refinery /Jamnagar / USA/ SA/ Indonesia etc.	7936	0.8	3.5	Jamnagar / Kandla - 1560 km; Road and Rail
2.	Indian & Imported Coal - Cement Plant	0.83	1.33	2.16	Local market / Nearby Korba, Bilaspur / Raigarh / USA/SA/ Indonesia etc.	3890	41.7	0.5	Raigarh - 154 km, Bilaspur - 57 km, Jamnagar / Kandla - 1560 km; Road and Rail
3.	Indian & Imported Coal - CPP	0.16	0.67	0.83					

Source: Pre-Feasibility Report

1.4.3 Other Basic Requirement

Other basic requirements for the proposed expansion project are given in Table - 4.

Table - 4
Basic Requirements for the Project

S. No.	Particular	Existing	Additional	Total	Source
1.	Water (m ³ /day)	915	3020	3935	Ground Water
2.	Power (MW)	47.5	135.8	183.3	Captive Power Plant, Power Grid, WHRB & D.G. Set (for Back - Up)
3.	Manpower	1600	650	2250	Unskilled/ semi-skilled manpower from local area and skilled from outside/local.

Source: Pre-feasibility Report

1.5 Manufacturing Process

1.5.1 Cement Manufacturing Process

The Cement Plant is based on Dry Process Technology for Cement manufacturing with Pre-Heating and Pre-Calcliner Technology.

The company is proposing expansion in unit - 1 and unit- 2 by internal modifications and de-bottlenecking in existing lines and new installation of Unit -3.

The cement manufacturing process largely comprises of the following steps:

- Crushing of limestone at the mine site.
- Pre-blending of crushed limestone.
- Drying – cum-grinding of raw materials.
- Homogenization of raw meal in a blending silo.
- Clinkerisation of the raw meal in a rotary kiln with pre-heater and pre-calcinator.
- Grinding, storage and packing

1.5.2 Captive Power Plant (Coal)

M/s. Shree Raipur Cement Plant is proposing expansion of Captive Power Plant from 25 to 125 MW. The generating unit consists of Circulating Fluidized Bed Combustion (CFBC) boiler using Coal as primary fuel, one condensing steam turbine and generator, one air cooled condenser and other necessary auxiliary equipment including balance of plant equipment.

The generating station is designed to operate with high efficiency and availability at various modes throughout the lifetime of the project considering the nature of cement plant loading.

1.5.3 Waste Heat Recovery Power Plant

M/s. Shree Raipur Cement Plant is also proposing expansion in production capacity of Waste Heat Recovery Power Plant from 30 to 100 MW. Waste Heat Recovery System will consist of two types of boilers i.e. PH Boiler & AQC boilers to recover the heat from pre-heater and Kiln.

2.0 DESCRIPTION OF ENVIRONMENT

2.1 Presentation of Results (Air, Noise, Water and Soil)

Baseline study of the study area was conducted during Post-Monsoon Season (Oct., to Dec., 2017). Ambient air quality monitoring has been carried out at 15 stations in the study area on 24 hourly basis. The concentration of PM_{2.5} ranges between 24.3 to 43.2 µg/m³, PM₁₀ ranges between 59.7 to 84.2 µg/m³, SO₂ ranges between 5.3 to 13.5 µg/m³ and NO₂ ranges between 12.5 to 28.5 µg/m³.

Ambient noise levels were measured at 15 locations around the project site. Noise levels vary from 49.5 to 65.6 Leq dB (A) during day time and from 38.2 to 58.8 Leq dB(A) during night time.

The ground water analysis for all the 10 sampling stations shows that pH varies from 7.36 to 8.02, Total hardness varies from 216.46 to 552.29 mg/l, Total dissolved solids vary from 234 to 801 mg/l.

Soil monitoring was carried out at 10 locations and the analysis results show that soil is neutral to moderately alkaline in nature, pH value ranging from 7.60 to 8.05, with organic matter from 0.87% to 1.18%. Total nitrogen ranges from 215.45 kg/ha to 306.54 kg/ha and Phosphorous in less amount i.e. from 30.22 kg/ha to 55.6 kg/ha, whereas the Potassium is found to be ranging from 215.9 kg/ha to 492.07 kg/ha.

2.2 Biological Environment

Flora: Most common species found in the area are *Mangifera indica* (Aam), *Acacia nilotica* (Babool), *Syzygium cumini* (Jamun), *Azadirachta indica* (Neem), *Phoenix sylvestris* (Khajoor), *Calotropis procera* (Aak), *Ziziphus jujuba* (Ber), *Ocimum sanctum* (Tulsi) etc.

Fauna: Commonly found species in the study area are *Semnopithecus entellus* (Common Langur), *Boselaphus tragocamelus* (Nilgai), *Cervus unicolor* (Sambar), *Vulpes bengalensis* (Common Fox), *Canis aureus* (Jackal), *Naja naja* (Indian cobra), *Hemidectilus flavivrdis* (House Lizard), *Duttaphrynus melanostictus* (Common Indian Toad), *Bubulcus ibis* (Cattle Egret) etc.

Socio-Economic Environment

The population as per 2011 Census records is 406539 (for 10 km radius). Scheduled Caste fraction of the population of the study area is 94251 (23.18 %) and Scheduled Tribe 51595 (12.70%). Literacy rate of the area is 71.01%. Population of the workers engaged in occupation is 45%. Of these 29 % are main workers and 16% are marginal workers. Remaining 55% of the total population is considered as non-workers.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Anticipated environmental impacts due to proposed project along with mitigation measures are given in Table - 5:

Table - 5
Anticipated Environmental Impacts and Mitigation Measures

Discipline	Anticipated Impact	Mitigation Measures
Construction Phase		
Air	Increase in dust and NO _x concentration due to Leveling activity and Heavy vehicular movement	<ul style="list-style-type: none"> * Sprinkling of water in the construction area and on unpaved roads * Proper maintenance of vehicles will be done. Use of vehicles meeting PUC norms
Noise	Increase in noise level due to Construction Equipment	<ul style="list-style-type: none"> * Equipment will be kept in good condition to keep the noise level within 90 dB(A) * Workers will be provided necessary protective equipment e.g. ear plugs, earmuffs
Water	Increase in suspended solids due to soil run-off during heavy precipitation due to Loose soil at construction site	<ul style="list-style-type: none"> * Adequate drainage system for runoff water during construction phase

Operation Phase		
Air	Increase in concentration of Particulate Matter Emissions	<ul style="list-style-type: none"> * Better maintenance and installation of pollution control equipment like ESP / Bag House / Bag Filters * Covered storage facilities for raw material and product * All the roads inside the plant premises are / will be concreted. * Water sprinkling to reduce the PM emission level * CPCB and CREP guidelines are being / will be followed
	Increase in NO ₂ emissions	<ul style="list-style-type: none"> * Low NO₂ burners
Noise	Increase in noise level within the plant area	<ul style="list-style-type: none"> * Equipment are / to be installed is designed to conform to occupational noise levels prescribed by regulatory agencies * Earmuffs/ Earplugs are being / will be provided to persons working in high noise zone * Properly insulated enclosures are / will be provided to equipment making excessive noise * Greenbelt development/ plantation will help in attenuating noise
Water	Generation of waste water	<ul style="list-style-type: none"> * Domestic waste water from plant and colony is being / will be treated in STP and treated water is being / will be utilized for greenbelt development/plantation. * RO reject water will be used in manufacturing of Synthetic Gypsum and for dust suppression.
Soil	Degradation of soil quality due to settling of air borne dust	<ul style="list-style-type: none"> * Use of efficient pollution control systems * Maintained proper stack height * Soil samples are being/ will be collected periodically and soil quality is being/ will be tested
Biological Environment		
a. Terrestrial Ecology	Positive as greenbelt of appropriate width has been developed and maintained by M/s. Shree Raipur Cement Plant in the area	-
b. Aquatic Ecology	No impact as no effluent is being / will be discharged outside the plant premises	-
Socio-economic Environment	Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc.	-

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Details of the environmental monitoring schedule / frequency, which will be undertaken for various environmental components, as per conditions of EC / CTE / CTO are given in Table - 11.5.

Table - 11.5
Post Project Monitoring

S. No.	Description	Frequency of Monitoring
1.	Meteorological Data	Hourly
2.	Ambient Air Quality	Twice a Week & Continuous Online Monitoring
3.	Stack Monitoring	Monthly & Continuous Online Monitoring
4.	Water Quality	Quarterly & as per EC / CTO
5.	Noise Level Monitoring	Quarterly & as per EC / CTO
6.	Medical Checkup of Employee	Yearly

5.0 ADDITIONAL STUDIES

Additional Studies conducted as per ToR Letter no. J-11011/235/2008-IA-II (I) on 06th Nov., 2017, issued by MoEFCC, New Delhi are Hydro-geological Study & Rain water Harvesting Plan and Risk Assessment & Disaster Management Plan.

6.0 PROJECT BENEFITS

The proposed expansion project will help in combating the growing demand of cement in the market & hence will help in the economic growth of the country. M/s. Shree Raipur Cement Plant is/will be actively involved in the ESC activities in the nearby villages of the project site. Infrastructure development in the nearby villages, creating educational facilities, empowering women through self-help groups, gainful employment for rural, health awareness programmes & surgical camps, assistance in social forestry programmes in the area, are some of the activities further to be undertaken under ESC plan in phase manner for the development and upliftment of the society.

7.0 ENVIRONMENT MANAGEMENT PLAN

The major sources of pollution in Integrated Cement Plant are Particulate Matter. Air pollution is the major concern to be looked upon for the project activity. No major water, noise and soil pollution is envisaged from the project activity. Various mitigation measures have been proposed to take care of the environment in respect of air, water, noise, soil and the green cover of the plant site and nearby villages.

Particulars	Details
Air Quality Management	<ul style="list-style-type: none"> ⌘ Bag filters is being / will be provided to control dust emitted from various dust generating points in the plant and at all material transfer points ⌘ Dry fly ash is being / will be transported in closed tankers. ⌘ Clinker and Fly Ash is being / will be stored in silos and Gypsum in covered sheds ⌘ Greenbelt is being / will be developed around/ within the premises of the plant site to arrest the fugitive emissions ⌘ Unloading of trucks is being / will be carried out with proper care avoiding dropping of the materials from height ⌘ Sprinkling of water is being / will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles. ⌘ Proper maintenance of vehicles is being / will be done to reduce gaseous emissions. ⌘ Low NO₂ burners ⌘ Regular ambient air quality and stack emission monitoring is being / will be carried out as per CPCB / CECEB norms to ensure that ambient air quality standards are being met all the time.
Water Management	<ul style="list-style-type: none"> ⌘ No waste water is being / will be generated from the Integrated Cement Plant. ⌘ RO reject water will be used in manufacturing of Synthetic Gypsum and for dust suppression. ⌘ Blow down water from cooling towers and boiler is being / will be treated in neutralization pit and treated water is being / will be utilized in dust suppression ⌘ Domestic waste water from plant and colony is being / will be treated in STP and treated water is being / will be utilized for greenbelt. development/plantation. ⌘ Rain Water Harvesting is being / will be practiced within the plant premises.
Noise Management	<ul style="list-style-type: none"> ⌘ Personal Protective Equipment (PPEs) like earplugs and earmuffs is being / will be provided to the workers exposed to high noise level. ⌘ Proper maintenance, oiling and greasing of machines at regular intervals is being / will be done to reduce generation of noise. ⌘ Greenbelt development all along the plant boundary. ⌘ Regular monitoring of noise levels is being / will be carried out and corrective measures in concerned machinery is being / will be adopted accordingly to the possible extent. ⌘ As per new technology now Vertical Roller Mills are installed which help to reduces the Noise level. ⌘ Silencer has been provided to all safety valves of the plant and Turbine vent valves to control the Noise level.
Solid & Hazardous Waste Management	<ul style="list-style-type: none"> ⌘ No solid waste will be generated from the cement manufacturing process. ⌘ Dust collected from various air pollution control equipment is being / will be recycled in the process.

Particulars	Details
	<ul style="list-style-type: none"> ⌘ STP Sludge is being / will be utilized as manure for greenbelt development / plantation within the plant premises. ⌘ Used oil generated from plant machinery / gear boxes and D.G. set as hazardous waste is being / will be sold to the CPCB authorized recycler.
Green Belt Development / Plantation	<ul style="list-style-type: none"> ⌘ Out of the total existing plant area i.e. 159.256 ha, 33% (i.e. 52.55 ha) will be developed under greenbelt / plantation; out of which 37.1 ha area has already been covered under greenbelt development / plantation and rest 15.45 ha area will be developed. Additional 6.5 ha will also be developed under greenbelt/ plantation. ⌘ Species planted are Pleitophorum (yellow colour), Karang, Tecoma (yellow colour), Bougin vilya (red colour), Kadam, Moulshree, Amaltas, Casiya Samiya, Neem (Azadirachta indica), Royal palm, Kachanar, Gulmohar & Ficus Black (Panda) etc.

8.0 CONCLUSION

As discussed, it is safe to say that the proposed expansion project is an environmental friendly project, as adequate preventive measures will be adopted to maintain the various pollutants within permissible limits. Green belt development around the area would also be taken up as an effective pollution mitigation technique.

