EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

FOR

PUBLIC HEARING

OF

DATIMA COAL MINE

(UNDERGROUND MINING METHOD)

(CAPACITY: NORMATIVE (RATED): 0.36 MILLION TONNES PER ANNUM
PEAK: 0.54 MILLION TONNES PER ANNUM
ML AREA: 807.91 HECTARE)

AT

VILLAGE RAI, TALUKA BHATGAON; VILLAGES DATIMA & KHARSURA, TALUKA SURAJPUR & VILLAGES KUMDA & LAXMANPUR, TALUKA LATORI, DISTRICT SURAJPUR, CHATTISGARH

OF

Project Proponent:

Shree Cement

SHREE CEMENT LIMITED

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ToR Granted: Letter no. IA-J-11015/44/2023-IA-II(I) dated 29th January 2023
Project as per Schedule of EIA Notification 2006 : 1(a)

Baseline data period: 1st October 2023 to 31st December 2023
Collected by: Min Mec R&D Laboratory, New Delhi
(NABL Certificate No. TC-14312 valid till 18.08.2026)

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An ISO 9001:2015 approved company

Accredited by NABET, QCI vide Certificate No. NABET/ EIA/2225/IA 0096 (Rev. 01) valid till 29.03.2025

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EXECUTIVE SUMMARY OF EIA/EMP

1.0 INTRODUCTION

1.1 General background

Shree Cement Limited (SCL) is a Public Limited Company and environment friendly business organization incorporated under the Companies Act, 1956 on 25th October 1979. The Company's Integrated Cement Plants are located at Beawar, Ras & Nawalgarh in Rajasthan, Balodabazar- Bhatapara in Chhattisgarh, Sedam in Karnataka, Guntur in Andhra Pradesh and Ras Al Khaimah (RAK) in United Arab Emirates (UAE). It has Clinker grinding units at Eleven locations viz. Khushkhera, Suratgarh, Jobner in Rajasthan, Roorkee in Uttarakhand, Aurangabad in Bihar, Bulandshahr in Uttar Pradesh, Panipat in Haryana, Hansda in Jharkhand, Cuttack in Odisha, Patas in Maharashtra and Purulia in West Bengal.

Presently, the cement production capacity of SCL group stands at 56.4 Million TPA. The company currently has a power generation capacity of 1002.8 megawatts (MW), with half of that capacity coming from renewable sources. This includes 245 MW from waste heat recovery plants, 199 MW from solar power plants, and 56 MW from wind turbines. The remaining power is generated by captive thermal power plants, which include 300 MW Independent Power Plant (IPP) at Beawar, Rajasthan.

Ministry of Coal, Government of India has allotted Datima Coal Mine vide its vesting order no. NA-104/12/2023-NA dated 08.06.2023 in favour of Shree Cement Limited for sale of coal produced from this mine in open market including sale to affiliates and related parties and utilisation for any purpose including but not limited to captive consumption, coal gassification, coal liquefaction and export of coal.

The total block area of Datima coal mine is 807.91 Ha and the proposed project area and mine lease area are also same. The Mining Plan and Mine Closure Plan for this Block was approved by MoC vide letter no. "Application No. Datima Coal Mine CT/APP00267/2023" dated 08.04.2024. The mine will be operated by underground mining method. The normative (rated) production capacity is 0.36 million tonnes per annum (MTPA) and the peak capacity is 0.54 MTPA. The total life of mine will be 15 years. Total project cost of the project is 250 Crores. Capital cost for environment protection measures is proposed as Rs. 1.90 crores and recurring cost shall be Rs 2.25 crores/annum.

As per Schedule of Environmental Impact Assessment (EIA) Notification dated 14th September 2006, proposed Datima coal mine project falls under serial 1(a) "Mining of Minerals" under category A. Thus, it requires prior

Environmental Clearance (EC) from Ministry of Environment, Forest & Climate Change (MoEF&CC).

Shree Cement Ltd. had submitted the TOR application along with Project-Feasibility Report to Ministry of Environment & Forest and Climate Change, the Terms of Reference (TOR) was issued vide letter no. IA-J-11015/44/2023-IA-II(M) dated January 29, 2024 and additional TORs vide letter dated 09.09.2024. The TORs directed to undertake detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006.

1.2 Location of the Project

Datima Coal Mine is located in village Rai of Taluka Bhatgaon, villages Datima & Kharsura of Taluka Surajpur, villages Kumda & Laxmanpur of Taluka Latori, District Surajpur, Chhattisgarh. The mining lease area falls in the Survey of India Toposheet no. 64I/15 and 64I/16. The area is bounded by Latitude 23°13' 48.083" to 23°15' 59.435" N and Longitude 82°57' 41.843" to 82°59' 14.152" E. Location of the project can be seen in **Fig. 1**.

The area is well connected by an all-weather road to NH-43 (Ambikapur to Shahdol). NH-43 is located at a distance of 5 km to South (aerially & by road). Karonji is the nearest railway station and siding at a distance of 3.9 km northwest (aerially) of Datima Coal block on the Bijuri-Bisrampur branch line. The nearest airport is Jharsuguda (aerially 190 km, by road 250 km).

2.0 PROJECT DESCRIPTION

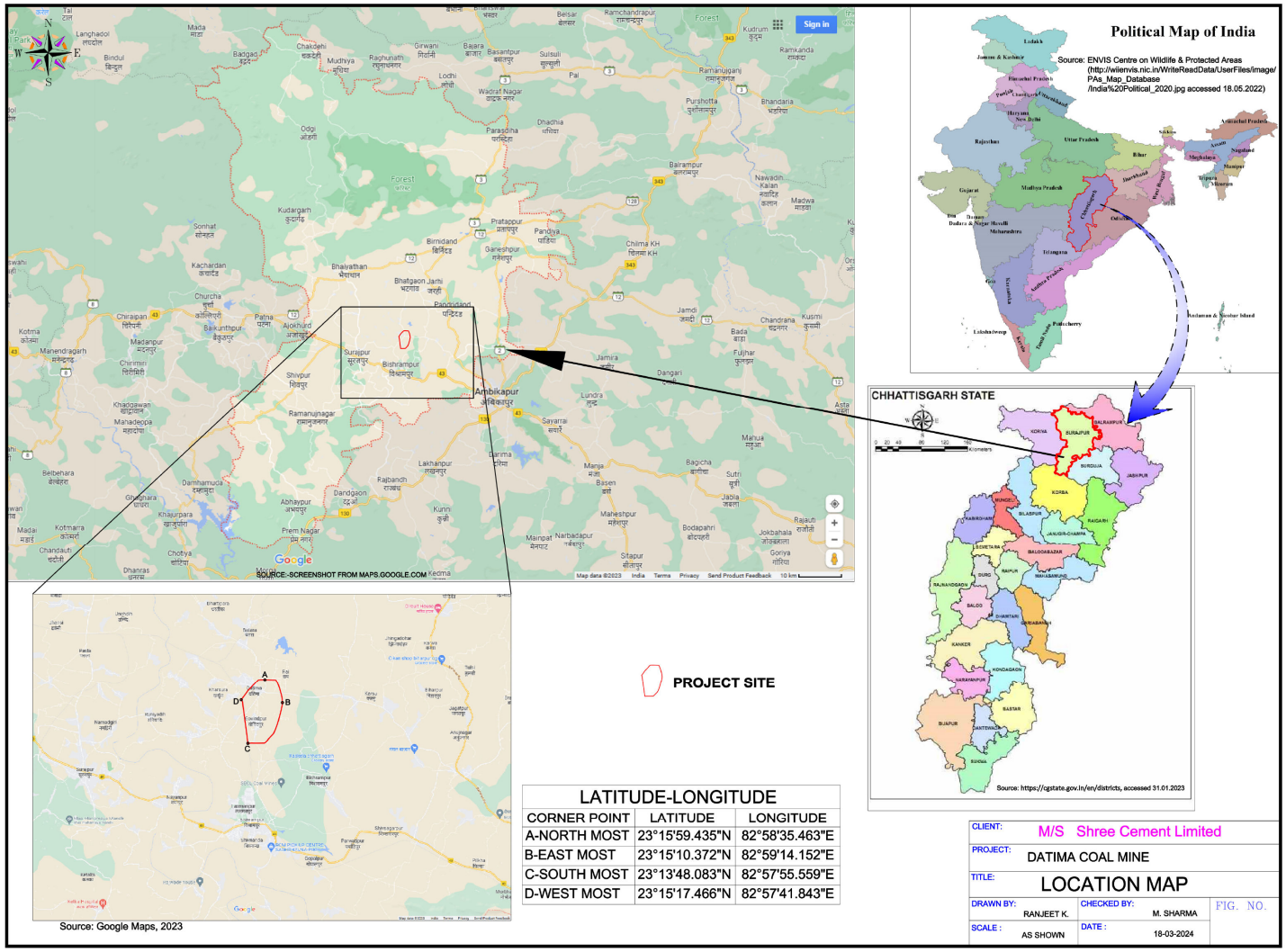
2.1 Geology and reserves

Datima Block with an area of 807.91 hectares is located in the south western corner of Bisrampur Coalfield. It is situated to the west of Balrampur Incline Extension Coal mine. The geology of the block is in conformity with the regional geological setup of the coalfield in general and that of Balrampur extension block in particular. Only the Barakars are exposed in this block. The entire area in and around Datima block, is completely covered by soil and alluvium.

The Barakar Formation are dominantly sandstones with subordinate shales, carbonaceous shale and coal seams. The sandstones are generally light grey in colour varying from fine to medium grained to gritty in texture. All the coal seams (Seam-V to VII) of Datima Block are confined to Barakar Formation only.

There are three (3) coal seams in the block viz., seam -VII, Seam-VI and Seam-V / Pasang seam but only one of them- Seam V, is workable and Mining Plan is provided for this seam only.

FIG. 1: LOCATION MAP OF THE PROJECT



The shallowest depth of intersection (roof) of Seam V in any borehole is 55.50 m and the deepest is 147.00 m. Seam V is separated from Seam VI by fine to medium grained sandstone, occasionally sandy shale or shale or alternating shale and sandstone. The general thickness of Seam V is 0.90 m -1.80 m. The seam does not exhibit any splitting behaviour except in one borehole. The range of GCV of seam in Bcs is 3228-6075 k.cal/kg and in I_{30} is 4430k.cal/kg (1 sample only). The gross Geological Reserves in the block as per Geological Report are 14.777 million tonnes and net geological reserves are 13.300 million tonnes. The blocked reserves are 4.865 million tonnes and net mineable reserves are 8.435 million tonnes. Corresponding extractable reserves in the block as per the approved Mining Plan are 4.208 million tonnes.

2.2 Mining

To achieve 0.360 MTPA Normative (Rated) / 0.540 MTPA (Peak) of coal production and to extract coal as much as possible, it is proposed to adopt underground mining method on three-shift basis per day. Life of mine will be 15 years.

The underground mining operations will be started in 2027-28 (1st year) or earlier, if possible, and will continue for 15 years lasting upto 2041- 42 (15th year).

The block has been divided into 5 nos. of Sectors (Sector-I to Sector-V) by the faults present within the block. All sectors are proposed to be mined by underground method of mining.

Mine Entries: The entry to the underground mine workings is proposed through a pair of inclines (Intakes) in sector-3. An upcast ventilation shaft, also in Sector-3, will be sunk in the initial stage along with the inclines. The pair of inclines is located west of Kumda village, almost near the centre of the western boundary of the block aligned almost towards north-east direction. These inclines-1 and 2 will be driven by Road Headers and touch the floor of Section-V at FRL 480 m. The inclines are parallel to each other and placed 30 m apart. The bottom area of inclines at floor of Seam-V will serve as hub of the UG mining operations almost throughout the life of the mine. All the workable sectors of the block will be connected to this hub through haul routes.

Sequence of developing and mining the Seams, Sectors and Panels: It is proposed to mine only one seam (Seam-V). This seam will be developed and depillared in caving system. Mechanised bord and pillar underground mining method is proposed to be used and the development and extraction layout has been planned accordingly. The work of developing sectors and panels will be taken up just after completing the drivage of inclines and sinking of the shaft.

Crossing the Faults by Drifting: It is proposed to keep 15 m wide safety pillars on either side of the faults. The faults will be crossed by driving Drifts across them at a maximum gradient of 1 in 5 unless the throw is so small and it can be negotiated through a flatter drivage.

Stowing during coal extraction: No stowing is envisaged.

Blasting: During operation, no blasting will be required for mining, since coal mining will be carried out by Continuous Miners. Hence, no provision of storage of explosives has been made. During construction (development) phase, although inclines will be driven by Road headers, just in case some blasting will be required, temporary arrangement shall be made for explosives and detonators, therefore.

Coal will be dispatched from the pit head bunkers of coal loading point into the consumers' trucks for onwards transportation to their destination or to the nearest railway siding, as the case may be.

2.3 Site services

Core infrastructure like power, road, telecommunication, service buildings viz. office, store, first aid centre, canteen, truck parking area, etc., shall be established at the mine site.

Total requirement of water is 362 KLD. Of this 36 KLD will be potable and 326 KLD for industrial & other purposes. Potable water requirement will be met from bore well. The industrial water requirement will be met from mine sump water after treatment.

The total power requirement for the proposed mine will be about 5 MVA. It will be acquired from the nearest substation of Chattisgarh Power Company Limited (CGPCL) located at Bisrampur. An emergency arrangement for power supply will be made by providing 2x500 KVA DG sets, which will take care of ventilation and pumping.

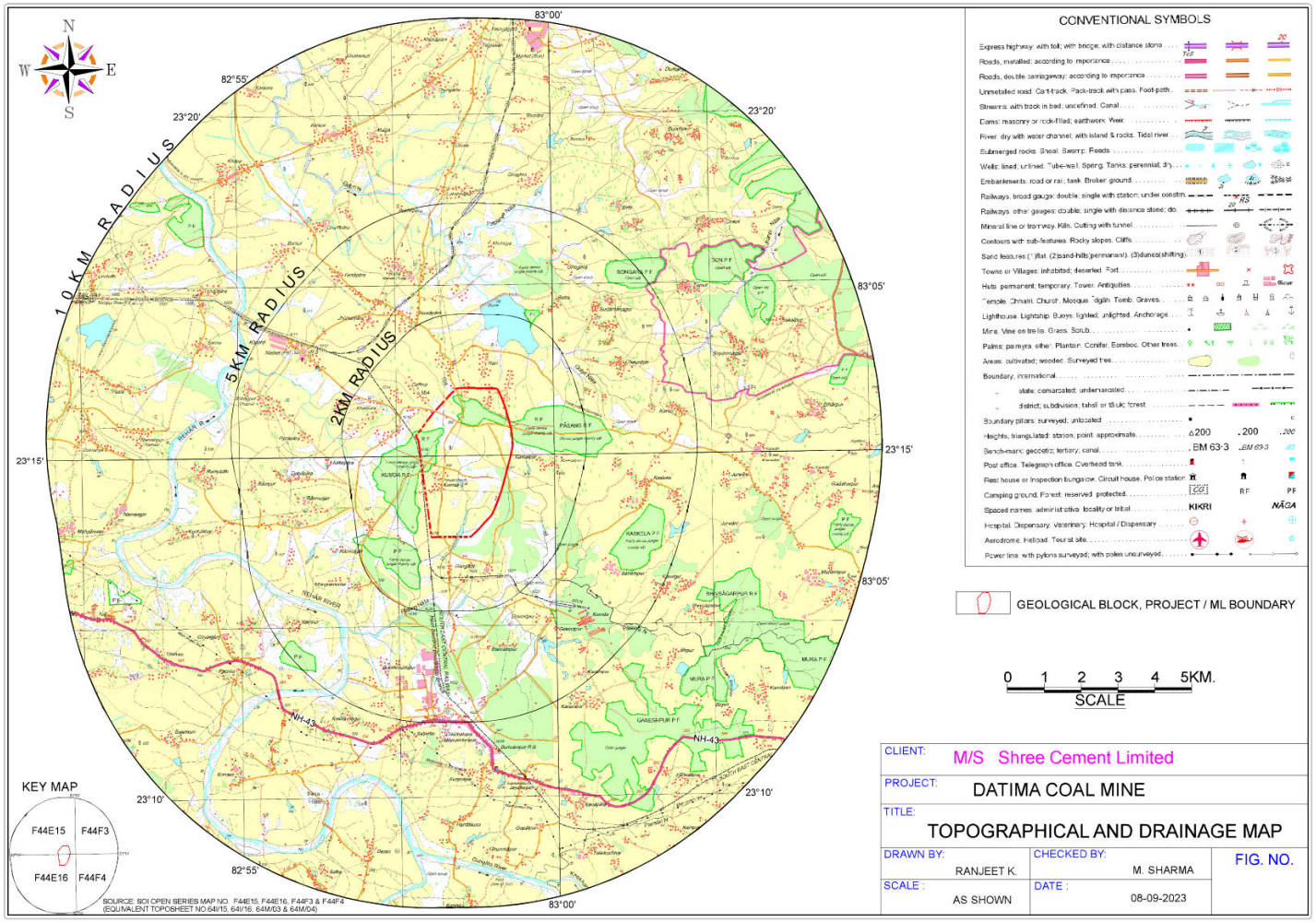
2.4 Manpower

Total manpower requirement will be 358 persons and a maximum manpower in a shift is estimated to be 210.

3.0 PRESENT ENVIRONMENTAL SCENARIO

The lease area is referred to as "core zone" and the area falling within 10 km from boundary of core zone is referred to as "buffer zone". Together, both of them form the "study area". The map showing the study area is given in **Fig. 2**.

FIG. 2: MAP OF 10 KM STUDY AREA



3.1 Topography and drainage

Core zone: The Datima Coal mine has an almost flat topography with few undulations and general slope towards northwest. The variation in surface elevations is from around 537.43 m in the southern part to about 562.04 m above mean sea level in the northern part of the block. As per toposheet, seven seasonal 1st order drains, two 2nd order and one 3rd order drain originate within the mine lease. One permanent water body is present in southeastern part within mine boundary created by the void in the empty open cast quarry of the adjoining Bisrampur OC mine.

Buffer zone: The study area has a flat and partly undulating topography with general slope towards west. The elevation of study area varies from 508 m to 574 m above mean sea level.

The perennial Rehar river, located 3.1 km in the southwest of the block, constitutes the main drainage of the buffer area. Its tributaries within the study area are Pasanga nala (1.5 km, south), Gobri nala (1.6 km, northeast) and other small seasonal streams. The drainage network in study area is dendritic in nature.

3.2 Climate and micro-meteorology

The climate of the study area is of tropical type and is characterised by an extreme hot summer, a mild winter and well distributed rainfall during June to September. Long term data is available from nearest IMD station - Ambikapur, located at a distance of 28 km from the project, in east southeast. Monthly mean of temperatures ranges from 8.9°C to 39.8°C. The annual average rainfall is 1379.2 mm.

Micro-meteorological data were recorded at site for winter season from 1st October to 31st December 2023. The temperature recorded varied from 6.62 to 37.0°C with an average of 19.99°C. Relative humidity varied from 32.30 to 100% with an average of 71.14%. The predominant wind direction was observed from north with 18.52% readings.

3.3 Ambient air quality

Ambient air quality was studied at twelve locations from 01.10.2023 to 31.12.2023. One station was established in project area and eleven stations in the buffer zone. These locations were Kumda village (core zone), Gangikot (1.0 km,S), Shanti Nagar, Bisrampur (5.1 km, S), Rai (0.7 km, N), Kaskela (3.1 km, E), Piparpara (2.6 km, W), Datima (0.2 km, NW), Asanpara (0.2 km, NE), Patrapara (2.2 km, SW), Balrampur (3.6 km, SE), Karonji (4.1 km, NW) and Tamor 5.7 km, NE) villages.

The PM_{10} concentration of the study area ranged from 38.2 to 72.9 µg/m^3, $PM_{2.5}$ from 21.3 to 42.2 µg/m^3, SO_2 from BDL (<0.6 µg/m^3) to 19.9 µg/m^3

and NO_2 from BDL to 27.8 µg/m^3. The CO level ranged from 0.115 to 0.802 mg/m^3, Nickel, Arsenic and Lead were observed Below Detectable Limit (BDL) of 0.6 ng/m^3, 0.4 ng/m^3 and 0.07 µg/m^3, respectively Thus, all values of air quality parameters were within the permissible limits of National Ambient Air Quality Standard 2009.

3.4 Water environment and quality

There is no major surface water body in core zone except one pond. The drainage pattern of study area is dendritic in nature. The study area is majorly drained by Rehar river which is a part of Ganges River drainage basin. Ground water survey has also been carried out in 17 open wells located within 10 km radius around the project during post monsoon season of 2023 and pre monsoon season of 2024. The water table varied from 0.77 to 8.56 m below ground level in post monsoon period while pre-monsoon levels ranged from 4.35 to 10.45 meter below ground level (mbgl). The fluctuation is reported as an average of 3.62 meter varying from 0.33 to 7.1 meter. Over the mine lease area, the depth of water table in wells at Datima and Kumada villages was recorded as 1.85 and 2.10 m below ground level (mbgl). during post monsoon 2023.

During study, fourteen ground water samples from handpumps and borewells were collected from Datima and Kumda villages in core zone and Asanpara, Datima, Ramnagar, Gangikot, Runiyadih, Shanti nagar (Bisrampur), Kuruwa, Kanakpur, Karwan, Lakshmipur and Khopa villages, six surface water samples were collected from Pond near Kumda village in core zone, Nala near Gangikot village, Pasang nala near Bisrampur, Batra dam near Batra village, Rehar river up stream near Kuruwa and downstream near Khopa villages and mine sump water from near Kamalpur village in core zone and near Gangikot village. All the parameters of ground water are well within the permissible limits as per IS 10500: 2012. Surface water quality ranges from A to E as per standards of surface water classification

3.5 Land use pattern and soil quality

Land use: Total project area is 807.91 hectare. The ML area is also same i.e. 807.91 ha. Presently, the land use of core zone comprises of 477.87 ha under agriculture land, 245.83 ha under forest land (Revenue + Reserved + Protected Forest), 54.03 ha under Barren land and 30.18 ha under built up. In buffer zone, as per Census data 2011, within the 10 km radius study area of 43218.66 ha, net sown area accounts for a major portion of 54.89% followed by 14.58% area under non-agricultural use. Forest land in the study area is 8.29%, fallows & other fallow land 15.98%, culturable waste land 0.48%, grazing and other pasture land 4.12% and others 1.67.%.

Soil Quality*:* The soil samples were collected from core & buffer zone. The samples from five locations were collected. Samples were collected in core

zone from (1) Kumda Forest, (2) Kumda village and (3) backfilled area of the closed opencast Bisrampur Mine in Kamalpur village. In buffer zone, sample was collected from (4) Gangikot and (5) Rai villages. Particle size analysis shows that the texture of the soil is of medium grained sand with red to brown colour. pH has been observed to be slightly acidic with normal electrical conductivity.

3.6 Noise and Traffic density

The noise levels were measured at twelve stations in core and buffer zone located in residential areas. The noise levels varied between 43.86 to 54.06 dB(A) during daytime and 37.01 to 48.48 dB(A) during nighttime. All the noise values observed are well within the limits prescribed by National Ambient Air Quality Standards for Noise 2000.

0.36 million tonnes per annum coal dispatch shall take place over the initial distance through road. Hence, the traffic density survey was conducted at three locations namely, (1) On Bisrampur road at Nitin petrol pump near Kumda village (within mine lease), (2) Bisrampur road near Bisrampur town (2.7 km, South of mine lease) and (3) NH-43 near Keshavnagar village (5.7 km, south southwest of mine lease). Peak traffic volume recorded was 2245, 2611 and 8507 passenger car units per day, respectively. Based on observed traffic data and road width, current utilisation of maximum capacity of the road was only 7.48%, 8.70% and 28.35% respectively at three monitored locations.

3.7 Ecology

Forest: There is 245.83 hectare forest land (108.28 hectare Revenue Forest + 59.81 hectare Protected Forest + 77.74 hectare Reserved Forest) within lease area (core zone). Application for seeking Stage-I Forest Clearance has been submitted by company and under process for approval. Total forest in the study (buffer) area as per Census 2011 is 3583.76 hectare (8.29%). The project area mainly comprises of Sal Forest and falls under the Surajpur Forest Division. There are no national parks, wildlife sanctuaries, biospheres reserves or migratory routes within 10 km radius of mine lease area. The nearest National Park is Guru Ghasi Das (Sanjay) at a distance of 47.491 km in north-west direction. The nearest wildlife sanctuary is Tamor Pingla at a distance of 28.352 km in north.

Flora: Within core zone 22 species of trees, 17 of shrubs and herbs, 6 of climbers and 3 of grasses are present. Common native species such as Sal, Tendu, Amla, Imli etc. are present in the core area. In the buffer zone, different plant species are present, which includes 56 tree species and 33 shrubs & herbs, 11 climbers & 9 grasses.

Fauna: In core zone, common avifauna found includes house crow, rock pigeon, common myna, etc. Mammals such as bat, hare, mongoose, jackal,

etc. could be seen. Amongst reptiles, gecko, common krait, cobra etc. are found. In core zone, a total of 15 species of mammals, 42 of birds and 6 of reptiles have been identified. In buffer zone, total of 26 species of mammals, 75 species of birds, 11 species of reptiles and 21 species of aquatic fauna (fishes and prawn). 3 species of mammals, 4 species of reptiles and 1 species of aves of Schedule I category are present in core zone. In buffer zone 11 species of mammals, 6 species of reptiles and 2 species of aves has been reported. Domestic animals such as cow, goats, poultry, etc. are also observed in the study area.

Cropping pattern: The main seasons for crops are Kharif & Rabi. The food crops in Kharif season are rice, maize, pigeon pea while in Rabi season are wheat and mustard. Besides this, vegetables and fruits such as tomato, potato, brinjal, mango, etc. are grown. Pulses are also grown in the study area. Out of total study area, net sown area in the buffer zone as per Census 2011 is 23723.79 Ha (54.89%).

3.8 Socio-economic condition

As per Census 2011, total population in study area is 1,72,490 with 87,296 males and 85,194 females. There are 976 females per 1000 males. 55.84% of the total population is literate. The schedule castes comprise 5.8% and scheduled tribes comprise 27.58% of total population. The average family size is 4-5 persons/ family. 57.56% of the total population are non-workers while main workers are 19.87% and marginal workers are 22.57%.

The proposed coal mining project is located in revenue land five villages, namely, Kharsura, Datima, Rai, Kumda and Laxmanpur. Out of these, part of habitation of villages Datima, Rai, Kumda and Laxmanpur fall within the proposed mine lease area. The mining operations shall be executed by underground method as per approved mining plan. Hence, no habitation will be displaced for mining activity, only small area of 16.04 Ha of land will be required and this will be utilized for locating the Facility Area. The land shall be purchased directly from landowners at mutually agreed rates, terms and conditions.

3.9 Industries around the project area

Datima coal mine has no past history of any mining activity, since it is a new greenfield mine. There are 9 Coal Block (explored/ partially explored) and 8 industrial undertakings within 10 km radius of the project.

3.10 Places of archaeological/ historical/ tourist/ religious importance

There is no archeological monument within study area. The nearest temple is at 3.0 km in south. Temples and other places of worship are present in almost every village.

4.0 ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

4.1 Topography and drainage

Impact on Topography: The mine has 807.91 Ha of lease area. It will be mined by underground method. The area disturbed on the surface will be only 16.04 hectare for establishment of infrastructure facilities. The disturbed area within the infrastructure area will comprise of waste dump (0.2 ha), coal stock yard (0.24 ha), settling pond (0.03 ha), Facility area (0.44 ha), roads (0.55 ha) and open area (1.05 ha). This will cause marginal change in topography. However, this is only 1.98% of the entire mine lease area. Due to underground mining, a minor impact may be felt on the surface in the form of subsidence. A three-dimensional subsidence modelling has been carried out by CSIR-Central Institute of Mining & Fuel Research, Dhanbad, Jharkhand and the anticipated impact (2.68 mm/m tensile strain upto 15th year) due to proposed underground mining is anticipated which is within safe limits (< 3 mm/m).

Management: At this mine only, the seam V will be developed and depillared in caving system. The expected subsidence shall always be within limits. During mine closure period, the limited area over which infrastructure facilities will be located will be freed from construction and land restored to the agricultural status.

Impact on Drainage*:* Seven seasonal first order drains, two second order and one third order drain originate within the mine lease. None of these drains will be disturbed or diverted. Furthermore, sheet flow in the infrastructure area (16.04 hectares) may get hindered due to structures and other construction related activities, if proper drainage system is not made. Proper drainage arrangement will be made taking the construction in the infrastructural area into account. Mining activities will not affect the drainage system outside the facility area.

Management: No changes shall occur in drainage pattern due to underground mining in the mine lease area. Subsidence may cause temporary water accumulation in depressed areas on the surface, which will be monitored and leveled, if required

The impact on drainage in the facility area shall be managed adequately by providing garland drains around the incline openings, shaft opening, on roadside, around coal stock yard and around waste dump. The rainwater will be conveyed to the settling pond for settlement of suspended solids. The water from settling pond will be reused to the extent possible and excess water will be released into the nearby natural stream or given to surrounding villages for gainful utilization.

4.2 Climate and meteorology

Impact: As normal the climatic conditions including temperature variations, wind direction and speed, rainfall and humidity, will be are governed by regional factors and the monsoon. As such coal mining and other allied activities will not tend to influence the climate. However, emission of greenhouse gases due to combustion of fossil fuels shall be there during transportation of manpower and mineral as well as energy consumption but nature of mining uperation being underground mining, its impact will be only marginal.

Management: Development of 150 m greenbelt in the facility area within the mine lease area will contribute in a positive manner towards mitigation of greenhouse gases. Total plantation is envisaged on 13.53 hectares. The company will be undertaking all possible measures to minimise the CO_2 emissions. These include regular maintenance of transportation vehicles, minimising energy consumption, renewable energy (solar power) harnessing as well as carbon offsetting through plantation (33,825 trees).

4.3 Air quality

Impact: Underground mining operations generally have very low levels of particulate matter and gaseous pollutants. During construction, sources of air pollutants will be some minor blasting during driving of inclines, if required. During operation, coal loading, transportation and operation of DG set during power failure will be sources of air pollutant. Air quality prediction modelling has been carried out to estimate ground level concentrations (GLCs) of various pollutants. Air quality prediction models called AEROMOD has been used. At Kumda village (near mine activity area), incremental values due to mining & operation of DG set and material handling at coal stock yard have been estimated as 0.42 µg/m^3 for PM_{10}, 0.06 µg/m^3 for $PM_{2.5}$, 0.0009 µg/m^3 for SO_2 and 0.082 µg/m^3 for NO_2. The coal will be transported over initial distance by road by trucks. The incremental values at Kumda village due to transportation have been estimated as 0.13 µg/m^3 for PM_{10}, 0.05 µg/m^3 for $PM_{2.5}$, 0.0008 µg/m^3 for SO_2 and 0.242 µg/m^3 for NO_2. When these incremental GLC are added to the baseline air quality level, the resultant air quality has been found well within the limits specified in the national Ambient Air Quality Standards.

Management: Although adequate control measures are proposed to be taken during mining operation, transportation and loading operations, PM_{10} and $PM_{2.5}$ management need additional attention in core zone. Dust suppression systems (like fixed sprinklers without time controllers & mobile water sprinkling systems) will be adopted on roads, at loading point of coal. Road gradient shall be maintained as per statutory norms and as flat as possible taking into consideration the ground contour 150 m wide green belt as a barrier against dust and for environment protection measure shall be planted around the mine and around loading point. Trucks used for coal

transportation shall be covered with tarpaulin, have PUC check with optimum loading and the gate shall have tyre washing facility. PPE kit containing dust masks will be provided to the workers. The ambient air quality will be regularly monitored, and corrective action will be adopted to ensure all air pollutants remains within limits.

4.4 Water environment

The impact and mitigation measures on surface water and drainage have been described in section 4.1 on pre-page. No further impact on the surface water resources is envisaged as no water will be drawn specifically from any surface water resources.

Impact on ground water: Water table will be intersected during mining operation. During the first year of incline development, there will be meagre seepage. Only when the mine will become operational in seam-V, there will be seepage from deeper aquifer. However, the local people use the shallow water table to meet their day-to-day needs. In this case, underground mining will occur within depth range of 55 m to 147 m in Seam V only. Hence, the impact due to dewatering of deeper aquifer will not be felt on the shallow water table due to intervening partings of sandstone, low permeability shale and two layers of low permeability coal in Seams VI and VII, which overlie seam V.

Management: All effluent from mine as well as domestic sewage will be treated as norms prescribed by regulatory agencies prior to discharge into the drainage system. Underground mine water will be collected in the sump pits. After settlement, it will then be pumped to surface reservoir for gainful utilization. The suspended solids bearing surface run-off from coal stock area, waste dump area, along roads, around mine entry and infrastructure will be collected via garland drains and sent to settling tank for sedimentation of suspended solids. The water from the mine sump will also be sent to the sedimentation tank. Thereafter, it will be reutilised and balance released to natural drain or given to surrounding villages for gainful utilization. The workshop effluents will be treated in oil & grease trap followed by sedimentation tank. The domestic wastewater from facilities in the mines will be treated in sewage treatment plant.

The water table in the ML area is very shallow. Hence, the preference is towards reutilization of the water instead of recharge since water tables <8 m bgl are avoided for recharge due to risk of water logging. Only rooftop rainwater recharge is proposed.

4.5 Land environment

Impact: Mining activities introduce changes in the land use pattern. Non mining land use changes into mining related land use. The area disturbed on the surface will be 16.04 hectare for accommodating of infrastructure

facilities. However, this is only 1.98% of the entire mine lease area, which is only marginal. The disturbed area within the infrastructure area will comprise of waste dump (0.2 ha), coal stock yard (0.24 ha), settling pond (0.03 ha), Facility area (0.44 ha), roads (0.55 ha) and open area (1.05 ha). Land degradation is even less and is over only 2.51 hectare, which is 15.6% of infrastructure area and 0.3% of proposed mining lease area. However, mitigation measures will restore the land & ecological status of the area.

Management: At the end of mine life, the limited area (2.51 hectares) over which infrastructure facilities will be located will be freed from construction and land restored to the agricultural status. After mine closure, land use break up will comprise of area reclaimed from facility (2.51 hectares), greenbelt (13.53 hectares) and undisturbed area (791.87 hectares). Thus, the land will be restored to its original use in 2.51 hectares and converted into green belt in 13.53 hectares, permanently.

4.6 Noise and ground vibration

Impact: Noise will be generated from mining operations, fans, pumps, moving machinery parts, DG sets and mineral /material transportation. The impact of noise will be limited to the mine development and operation area only. It will be temporary and reversible. Small amount of vibrations will also be generated on surface during operation of coal loading plant and truck movement, which will be negligible. Only during construction, although inclines will be driven by road headers, some blasting will be required temporarily. Blasting may cause flying fragments and secondary cracking of structures on the surface, if the blasts are not regulated as per control blasting techniques. Blasting if at all required will be carried out with minimum quantity of Explosives and by following scientific and time-tested system to obviate these.

Management: The noise will be mitigated by development of peripheral green belt along mine lease boundary. Plantation will act as a noise absorbing medium. For noise control in operations, all the noise generating activities shall be monitored & reported as per norms of Directorate General of Mine Safety. All the mining equipment will be adequately maintained. All the mine workers will be provided with personal protective equipment such as earmuffs/ ear plugs. Entry shall be restricted into high noise zones. Entry restriction signs and speed limit signs will be displayed. During construction at appropriate places of inclines if blasting does become necessary, controlled blasting technique with delay shall be followed. All the DGMS norms shall be followed and complied with regularly.

4.7 Traffic

Impact: Coal transportation from project area to company's own plant in District Baloda Bazar-Bhatapada, Chhattisgarh or other consumers is proposed by road through trucks or through public railway siding at Karonji

located at a distance of 3.9 km. There will be movement of maximum 40 trips of trucks (30 tons capacity) per day to and fro considering 1200 tonnes coal production per day. The impact of traffic will be felt on the roadside habitations and forests enroute to consumer for reducing which appropriate measure will be taken.

Management of traffic: Trucks will carry optimum weight, undergo periodic maintenance, undergo "Pollution Under Control (PUC)" checks periodically and be covered with tarpaulin. Water sprinkling & maintenance of roads within lease area shall be done to mitigate dust. Plantation will be carried out along the transportation routes within project.

4.8 Solid waste impact & management

Impact: As the mining is proposed by underground method, no OB will be be generated. Small quantity of stone (13,392 cum) will be excavated in course of drivage of 2 inclines and a vertical shaft, which will be created for access and exit of manpower and entry of Equipment and exit of coal. Topsoil removed prior to construction of road, waste dump, coal stack yard, facility area and settling tank has been estimated as 7,300 cum.

The other wastes generated will be various sludges from settling pond, oil water separator and settling tank in workshop, sludge from sewage treatment plant (1.6 tonnes per annum), municipal solid waste (11.8 tonnes per annum), used batteries (0.5 tonnes per annum), plastic (1.2 tonnes per annum), e-waste (0.01 tonnes per annum), biomedical waste (0.05 tonnes per annum) and used/ spent oil (2.5 tonnes per annum). From time to time, there will be some redundant machinery & equipment components also.

Management: The stone will be stacked separately in external dump in an area of 0.20 ha. This stone will be reused for various purposes such as raising plinth, construction of a structure, etc. to the extent possible. At the end of the life of mine, the stone will be reutilised for sealing of the entries and leveling of the area to make it re-usable. Topsoil will have to be laid over this land to make it suitable for agriculture. 100% of the topsoil will be simultaneously reused in the proposed plantation & greenbelt development on an area of 13.53 hectare, hence, no topsoil storage area is proposed.

For municipal solid waste, segregation shall be done. The biodegradable component shall be composted and utilized as manure in greenbelt. The recyclable component of the waste shall be sold to authorised recycling vendors. The sludge from settling ponds will be periodically removed and dumped in the waste dump area. Plastic, e-waste, batteries, oil and grease from oil-water separator of workshop and used/ spent oil shall be sent to CPCB/ SPCB authorised recyclers. STP sludge shall be used as manure.

4.9 Ecology

Impact: Ecological impacts from underground mining will be minimal, very limited and restricted only to the area disturbed for accommodating the facility area i.e. 2.51 hectare. There will be no loss of vegetation in terms of cutting of trees existing on the agricultural field in this 2.51 hectare. On 13.53 hectare, green belt shall be established. No forest area will be disturbed or impacted even though the permission for forest de-reservation over 245.83 hectares has been sought through online proposal no. FP/CG/MIN/QRY/456133/2023 dated 20.12.2023. Since the tensile strain due to subsidence will only be 2.68 mm/m at end of 15th year, no impact on forest is anticipated. There are 9 Schedule I species in core zone and 19 Schedule I species in buffer zone which will require conservation measures.

Management: Greenbelt having width of 150 m will be developed on 13.53 hectare land. Peripheral greenbelt & plantation in facility area shall also be undertaken along with construction of the facilities and completed within 2 years. An estimated 33,825 trees shall be planted. The plantation will attract small fauna and birds and serve as micro habitats. Site Specific Wildlife Conservation Plan has been prepared for the Schedule I species in the project and study area and a separate budget has been kept for promoting this activity. The company shall participate in wildlife conservation through schemes of Forest Department. Awareness activities for villagers related to wildlife protection shall be a part of the social welfare activities.

4.10 Occupational Health

The Company will have qualified mining engineers and mine managers. They will plan, supervise, control, manage and direct mining operations as per mining regulations. First aid rooms with necessary medicines shall be provided and run as per DGMS norms. A mine rescue team shall be trained and will always be in readiness. All safety norms shall be followed. Personal protective equipment (PPE) will be issued to workers. A safety officer, medical officer and Environmental officer will also be appointed for effective implementation of environment, health & safety rules and regulations. Regular Safety Committee meetings will be held at the mine to review the status of implementation of statutes. Regular safety training will be conducted. Safety posters and pamphlets in English and Hindi shall be displayed and distributed among workers. Company shall put in all possible efforts for achieving a zero-accident potential.

4.11 Socio-economics - Impact and Management

The mine lease area has land of five villages, namely, village Rai in Taluka Bhatgaon, villages Datima & Kharsura in Taluka Surajpur, villages Kumda & Laxmanpur in Taluka Latori, District Surajpur, Chhattisgarh. Only 16.04 hectare land of village Kumda will be purchased directly for the facility area from land owners at mutually agreed rates, terms and conditions. No other

land will be required. No rehabilitation of inhabited villages is envisaged although there is habitation of four villages located within the block boundary, but no residential house will be vacated nor shall it have to be shifted on account of subsidence which has been studied and the operations will be so conducted to ensure that the residential house would not be affected.

Mining and allied activities will also provide job opportunities for eligible persons, and many will find employment in service sector. Preference will be given to the land sellers and local people for employment at the mine. Facilities and amenities like dispensary and communication will be set up for the project, which can also be used by the people of the nearby villages also. The proposed long-term activity will open up market and opportunities for growth of self-employed and small businesses. Corporate social responsibility activities shall be undertaken in the surrounding areas which also help the local population improving their living standards.

5.0 ANALYSIS OF ALTERNATIVES

Mining industry is a site-specific activity, and mineral has to be mined at the place where it exists in economically feasible quality and quantity. Therefore, no alternative site can be chosen. Mining will be done through underground mining method considering economic viability and conservation of minerals. In terms of technology alternatives, underground mining system “Bord and Pillar” has been chosen. Continuous cutting technology using continuous miner shall be used.

With respect to the UG facility location on the surface, analysis of three alternatives was carried out in compliance to the directions in Terms of Reference given by MOEF&CC. Amongst the three locations, the location west of Kumda village was found to be the best suited from efficiency of mining, safety and environment points of view.

6.0 ENVIRONMENTAL CONTROL AND MONITORING ORGANISATION

An environmental management and reporting system shall be put in place to monitor and implement the environmental management programme by the company. At the project level, Project Manager (Mines) of Datima Coal Mine will have the responsibility for environmental compliances within the project area. Project Manager (Mines) will be assisted by Head (Medical & Occupational Health Dept.), Head (Safety and Environment Dept.) and Head (Administration). The various heads in turn will be assisted by various staff such as Environmental Engineer, Safety Officer, Medical Officer and supporting staff such as safety supervisors, STP/ OWS operators, water sprinkler operators, housekeeping staff Horticulturist etc. Project Manager (Mines) will be reporting to the Project (Head) at corporate level who will look after Crucial matters that need attention at Corporate Office. An Environment Management Cell shall be formed to evaluate the effectiveness of

environmental management programme and for regular monitoring of important environmental parameters.

The capital investment on environmental monitoring activities for the proposed project is assessed as Rs. 40.75 lakhs. The recurring cost on environmental monitoring activities for project is estimated as Rs. 16.53 lakhs per year.

The capital investment on environmental management for the proposed project is envisaged as Rs. 190.91lakhs. The recurring cost on environmental management for project is estimated as Rs. 225.11 lakhs per year.

7.0 ADDITIONAL STUDIES: DISASTER MANAGEMENT PLAN

There are various factors which can cause a disaster in a mine. In underground mine, the hazards are accidents due to subsidence, roof fall, inundation, mine gases, etc. A Disaster Management Plan is proposed to be formulated with an aim of taking precautions to control hazard propagation and avert disasters. It will also cover the steps to be taken in the most unlikely event of a disaster occurunace in the mine. To tackle the situation, a disaster control room will be established having links with all control rooms of the mine. An up-to-date communication facility will be provided to control rooms. Project Manager (Mines) shall be the Emergency Coordinator.

8.0 PROJECT BENEFITS

Primary benefit from the project for the Nation is the additional coal production which will enable it to reduce its dependence in import and for the local people it will be availability of additional employment opportunity. Total manpower required will be 358 persons. Preference will be given to land losers and local people to meet the manpower requirement.

Improvement is expected in terms of improvement in educational facilities, health care services, infrastructure, drinking water facilities, skill development etc. through proposed Corporate Social Responsibility (CSR). The company will undertake activities under Corporate Social Responsibility (CSR) as per the Companies Act 2013. Under this, Shree Cement Ltd. is obligated to spend at least 2% of its previous three years average profit from the project on CSR activities around the project.

9.0 CONSULTANTS

The consultants engaged for the preparation of the EIA/EMP of the project are Min Mec Consultancy Pvt. Ltd. It was registered in July 1983 with the Registrar of Companies, Delhi & Haryana, India. In 1994, Min Mec established a modern R&D Laboratory. Min Mec is ISO 9001: 2015 certified

under ANZ-JAS. In June 2006, the laboratory received accreditation from NABL (latest certificate no. TC-14312), which has been renewed as per procedure since. In 2012, lab had been accredited under Environment Protection Act (EPA) by Ministry of Environment, Forest & Climate Change, Government of India and renewed till October 2024. The laboratory also has ISO 14001:2015 and ISO 45001:2018 certification. On 25.02.2021, Min Mec Consultancy was accredited by QCI-NABET as Mine Plan Preparing Agency (MPPA). Min Mec is preparing EIA/EMP Reports vide Accreditation Certificate No. NABET/ EIA/2225/IA 0096 (Rev. 01) valid till 29.03.2025.