

EXECUTIVE SUMMARY

OF

**DRAFT ENVIRONMENTAL IMPACT
ASSESSMENT REPORT**

FOR

**Sijimali Bauxite Mine (Auctioned Block) (Area: 1549.022 ha)
with Proposed Bauxite Production Capacity: 9.00 Million TPA,
Top Soil: 0.18 Million TPA, Waste: 7.40 Million TPA &
Subgrade: 1.42 Million TPA; (Total Excavation: 18.00 Million TPA)
along with installation of 2 Crushers (2 x 1200 TPH)**

At
Tehsils: Thuamul Rampur & Kashipur,
Districts: Kalahandi & Rayagada,
State: Odisha

APPLICANT



M/s. Vedanta Ltd.

**1st Floor, 'C' wing, Unit 103, Corporate Avenue Atul Projects,
Chakla, Andheri (East), Mumbai City, Maharashtra- 400 093
Email- shuvrendu.choudhury@vedanta.co.in**

INDEX

S. NO.	PARTICULAR	PAGE NO.
1.0	PROJECT DESCRIPTION	1
1.1	INTRODUCTION OF PROJECT PROPONENT	1
1.2	STATUS OF PROJECT	1
1.3	NEED FOR THE PROJECT	2
1.4	BRIEF DESCRIPTION OF THE PROJECT	2
1.5	LOCATION MAP	5
1.6	MINE DESCRIPTION	6
1.6.1	MINING LEASE DETAILS	6
1.6.2	MINING DETAILS	6
1.6.3	MINING METHOD	6
1.6.4	YEAR WISE PRODUCTION & EXCAVATION DETAILS	7
2.0	DESCRIPTION OF THE ENVIRONMENT	7
2.1	AMBIENT AIR QUALITY	7
2.2	NOISE LEVELS	7
2.3	SURFACE WATER QUALITY	8
2.4	GROUND WATER QUALITY	8
2.5	SOIL QUALITY	8
3.0	ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES	8
3.1	AIR ENVIRONMENT	8
3.2	WATER ENVIRONMENT	9
3.3	NOISE & VIBRATION	9
3.4	SOLID WASTE GENERATION AND MANAGEMENT	10
3.5	LAND ENVIRONMENT	10
4.0	ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)	11
5.0	POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME	11
6.0	ADDITIONAL STUDIES	11
6.1	HYDRO-GEOLOGICAL STUDY	11
6.2	BIOLOGICAL ENVIRONMENT	12
6.3	RESETTLEMENT & REHABILITATION	12
6.4	LAND USE AND LAND COVER STUDY	12
7.0	PROJECT BENEFITS	13
8.0	ENVIRONMENT MANAGEMENT PLAN	13
9.0	CONCLUSION	14

LIST OF TABLES

TABLE NO.	NAME	PAGE NO.
1.	BRIEF DESCRIPTION OF THE PROJECT	2
2.	MINING DETAILS	6
3.	EXCAVATION DETAILS (IN MILLION TONNES)	7
4.	POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME	11

LIST OF FIGURES

FIGURE NO.	NAME	PAGE NO.
1.	LOCATION MAP (SHOWING GENERAL AS WELL AS SPECIFIC LOCATION OF THE PROPOSED MINE)	5



EXECUTIVE SUMMARY

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION OF PROJECT PROPONENT

Vedanta Limited is a leading global natural resources company and is one of the world's foremost natural resources conglomerates, with primary interests in Aluminium, Zinc-lead-silver, Oil and Gas, Iron Ore, Steel, Copper, Power, Nickel and Ferro alloys.

Vedanta Limited is amongst the world's top Aluminium producers, and India's largest producer of Aluminium, catering to discerning customers in nearly 50 countries. In FY22, Vedanta produced more than half of India's Aluminium @ 2.27 million tonnes.

Vedanta has some of the world's largest Aluminium assets in Eastern India - in the states of Odisha and Chhattisgarh. Vedanta operates a 2 MTPA capacity Alumina Refinery in Lanjigarh, Kalahandi district of Odisha) since 2007 and an associated 75 MW Captive Power Plant. The refinery feeds their large Aluminium smelters at Jharsuguda, in Odisha, and BALCO, in Chhattisgarh. Vedanta's aluminium finds applications across critical sectors like aerospace, aviation, defense, transportation, electricity distribution, packaging etc. and in sunrise sectors such as electric vehicles, renewable energy and more. With a view to catering to the growing demand for this strategic metal Vedanta embarked on expansion of their Aluminium production facilities to add new product lines. Vedanta Limited has been allocated with Sijimali Bauxite mine spread over Kalahandi and Rayagada districts of Odisha in Mar' 2023, having estimated reserve of around 311 MT. For meeting the increased requirement of raw material, Vedanta intends to operate Sijimali block for dispatching Bauxite from mines to its Refinery.

1.2 STATUS OF PROJECT

M/s. Vedanta Ltd. is proposing for Sijimali Bauxite Mine (Auctioned Block) (Area: 1549.022 ha) with Proposed Bauxite Production Capacity: 9.00 Million TPA, Top Soil: 0.18 Million TPA, Waste: 7.40 Million TPA & Subgrade: 1.42 Million TPA; (Total Excavation: 18.00 Million TPA) along with installation of 2 Crushers (2 x 1200 TPH) located at Tehsils: Thuamul Rampur & Kashipur, Districts: Kalahandi & Rayagada, State: Odisha.

Vedanta Limited had obtained Letter of Intent (LoI) for mining of bauxite over an area of 1549.022 ha dated 01.03.2023.

Mining Plan along with Progressive Mine Closure Plan (PMCP) for Sijimali Bauxite Deposit for 1549.022 ha area was approved by Indian Bureau of Mines vide letter no. No. MCDR-MiFLoBXT/4/2023-BBS-IBM_RO_BBS on 16.08.2023.

Application for Environment Clearance was submitted on Parivesh 2.0 Web Portal on 25.03.2023. Technical Presentation for ToR was held during 15th Meeting of Expert Appraisal Committee (EAC) (Non-Coal Mining) on 30.05.2023 (Agenda Item No. 1.1).

ToR Reconsideration Presentation was held before 17th Meeting of Expert Appraisal Committee (EAC) (Non-Coal Mining) on 11.07.2023 (Agenda Item No. 1.5). ToR has been issued by MoEF&CC, dated 14.08.2023.

As per EIA Notification dated 14th September, 2006 as amended from time to time, the project falls under Category “A”, Project or Activity 1(a) mining of minerals.

Conventional opencast fully mechanized mining method will be adopted which includes drilling, blasting, ripping, dozing, loading, crushing and transportation to its Alumina Refinery.

1.3 NEED OF THE PROJECT

- Vedanta Limited has an existing Alumina Refinery Plant is running at 2.0 Million TPA capacity for which 6.0 Million TPA of bauxite is required.
- As in future, the plant will be operated at granted EC capacity i.e. 6.0 Million TPA, then total bauxite requirement will be 18.0 Million TPA. To meet the partial requirement of the bauxite Vedanta Ltd. is proposing the Sijimali Bauxite Mine with 9.0 Million TPA Capacity.
- This would not only help in bridging the demand-supply gap of bauxite in the region, the project will bring about gains in gross domestic product which will add to the gains in the GDP/GSDP. The mine shall be contributing around Rs. 2511.6 Cr/ annum to the State & Central Govt. exchequers by way of mining revenue (Royalty, DMF, NMET and Auction Premium) at 9 MTPA).
- About 600 personnel of various skills will be deployed directly for the proposed mining. With the proposed development in and around the area, there will be supporting facilities, infrastructure, allied activities, CSR etc eventually leading to the development of the area. This will upgrade the economic status of the region and people living therein.

1.4 BRIEF DESCRIPTION OF THE PROJECT

Table - 1
Brief Description of the Project

S. No.	Particular	Details
A.	Nature of the project	Opencast Mechanized Bauxite Mine
B.	Size of the project	
1.	LOI Area	1549.022 ha (As per auction documents; Govt. Land is 1257.311 Ha, Private Land is 133.810 Ha & Forest Land is 157.901 Ha whereas as per revised certified land schedule; 722.9 Ha is Govt Land, 699.7 Ha is Forest Land and 127.9 Ha is Pvt. Land)
2.	Proposed Production capacity	<ul style="list-style-type: none"> ➤ Bauxite: 9.0 Million TPA ➤ Top Soil: 0.18 Million TPA ➤ Waste: 1.0 Million TPA ➤ Overburden: 7.40 Million TPA ➤ Subgrade/ Mineral Reject: 1.42 Million TPA Installation of Crusher: 2 x 1200 TPH Capacity
C.	Project Location	
1.	Villages	Malipadar, Dumerpadara, Katibhata, Kutamal,

Sijimali Bauxite Mine (Auctioned Block) (Area: 1549.022 ha) with Proposed Bauxite Production Capacity: 9.00 Million TPA, Top Soil: 0.18 Million TPA, Waste: 7.40 Million TPA & Subgrade: 1.42 Million TPA; (Total Excavation: 18.00 Million TPA) along with installation of 2 Crushers (2 x 1200 TPH) At Tehsils: Thuamul Rampur & Kashipur, Districts: Kalahandi & Rayagada, State: Odisha

Executive Summary

		Pelanakona, Aliguna, Bundel, Shagabari (Tehsil: Kashipur in Rayagada District) Tijmali, Chulbadi, Ambajhola, Mahajal, Nakarundi, Taramundi, Uparambpadar, Salebali, Tadadei, Talambpadar (Tehsil: Thuamul–Rampur in Kalahandi District)
2.	Taluka	Tehsil: Thuamul Rampur of Kalahandi District Tehsil: Kashipur of Rayagada district
3.	District	Kalahandi & Rayagada
4.	State	Odisha
5.	Corner Coordinates	Latitude: 19°28'42.42" to N 19°32'02.35" N Longitude: 83°06'04.66" E to 83°09'49.81" E
6.	Toposheet No.	Core zone: E44F2 & E44F3 Buffer zone: E43F2 & E43F3, E44F14 & E44F15
D.	Environmental Settings Details (with approx. aerial distance & direction from the mine boundary)	
1.	Nearest Village	Village: Malipadara & Tijmali (Within Mine Lease)
2.	Nearest Town/ City	Town: Kashipur (~17 Km in South Direction), City: Bhawanipatna (~39 km in North Direction)
3.	Nearest State Highway	SH-44 (~1.5 km in West direction)
4.	Nearest Railway Station	Sikarpai (~20 km in SE direction)
5.	Nearest Airport	Visakhapatnam International Airport (~194 km in SSE Direction)
6.	National Parks, Wild Life Sanctuaries, Biosphere Reserves etc. within 10 Km radius study area	None
7.	Reserved/ Protected Forests within 10 km radius of study area	No Protected Forest fall within 10 km radius of the study area. 21 Reserved Forest exist within 10 km radius: <ul style="list-style-type: none">➤ Reserved Forest (~1.0 km in NW direction)➤ Melaghara RF (~1.5 km in NNE direction)➤ Songer RF (~2.0 km in SW direction)➤ Katibhata RF (~2.0 km in SSW direction)➤ Mohanagiri RF (~2.5 km in NE direction)➤ Khakes RF (~4.0 km in NNW direction)➤ Mohanagiri RF (~4.0 km in ESE direction)➤ Bijaynagara RF (~4.0 km in ESE direction)➤ Ladakhman RF (~4.0 km in WSW direction)➤ Dhanda RF (~4.5 km in South direction)➤ Kalagan RF (~5.0 km in South direction)➤ Ajaygarh RF (~6.0 km in ESE direction)➤ Ampadar RF (2.0 km in NNW direction)➤ Kospari RF (~6.0 km in NNW direction)➤ Kharkhaman RF (~7.0 km in North direction)➤ Indravati RF (~7.5 km in NW direction)➤ Mandibishi RF (~7.5 km in SSE direction)

Sijimali Bauxite Mine (Auctioned Block) (Area: 1549.022 ha) with Proposed Bauxite Production Capacity: 9.00 Million TPA, Top Soil: 0.18 Million TPA, Waste: 7.40 Million TPA & Subgrade: 1.42 Million TPA; (Total Excavation: 18.00 Million TPA) along with installation of 2 Crushers (2 x 1200 TPH) At Tehsils: Thuamul Rampur & Kashipur, Districts: Kalahandi & Rayagada, State: Odisha

Executive Summary

		<ul style="list-style-type: none"> ➤ Bijaynagar RF (~8.0 km in ESE direction) ➤ Reserved Forest (~9.0 km in NNW direction) ➤ Bijepur RF (~9.5 km in NE direction) ➤ Rastugurha RF (~9.5 km in SSE direction)
8.	Water Bodies within 10 km radius	<ul style="list-style-type: none"> ➤ Chauladhoba Nallah (~0.4 km in South direction) ➤ Naragul Nallah (~1.0 km in ESE direction) ➤ Barha Nadi (~ 1.5 km in NNE direction) ➤ Panamunda Nallah (~3.0 km in NE direction) ➤ Khadiapani Nallah (~5.0 km in SSW direction) ➤ Dundapata Nallah (~6.0 km in NE direction) ➤ Naghulu Nadi (~6.5 km in WSW direction) ➤ Ghudhughudnua Nadi (~8.0 km in WSW direction) ➤ Sujingabandha Nallha (~8.0 km in SW direction)
9.	Seismic Zone	zone – II (As per IS: 1893 (Part-I)-2002)
E.	Cost Details	
1.	Project Cost	Rs. 792 Crore/-
2.	Cost for EMP	<ul style="list-style-type: none"> ➤ Capital Cost: 32 Crore ➤ Recurring Cost: 3.0 Crore/Annum

Source: Site Visit, Google Earth Pro & Pre- Feasibility Report

1.5 LOCATION MAP

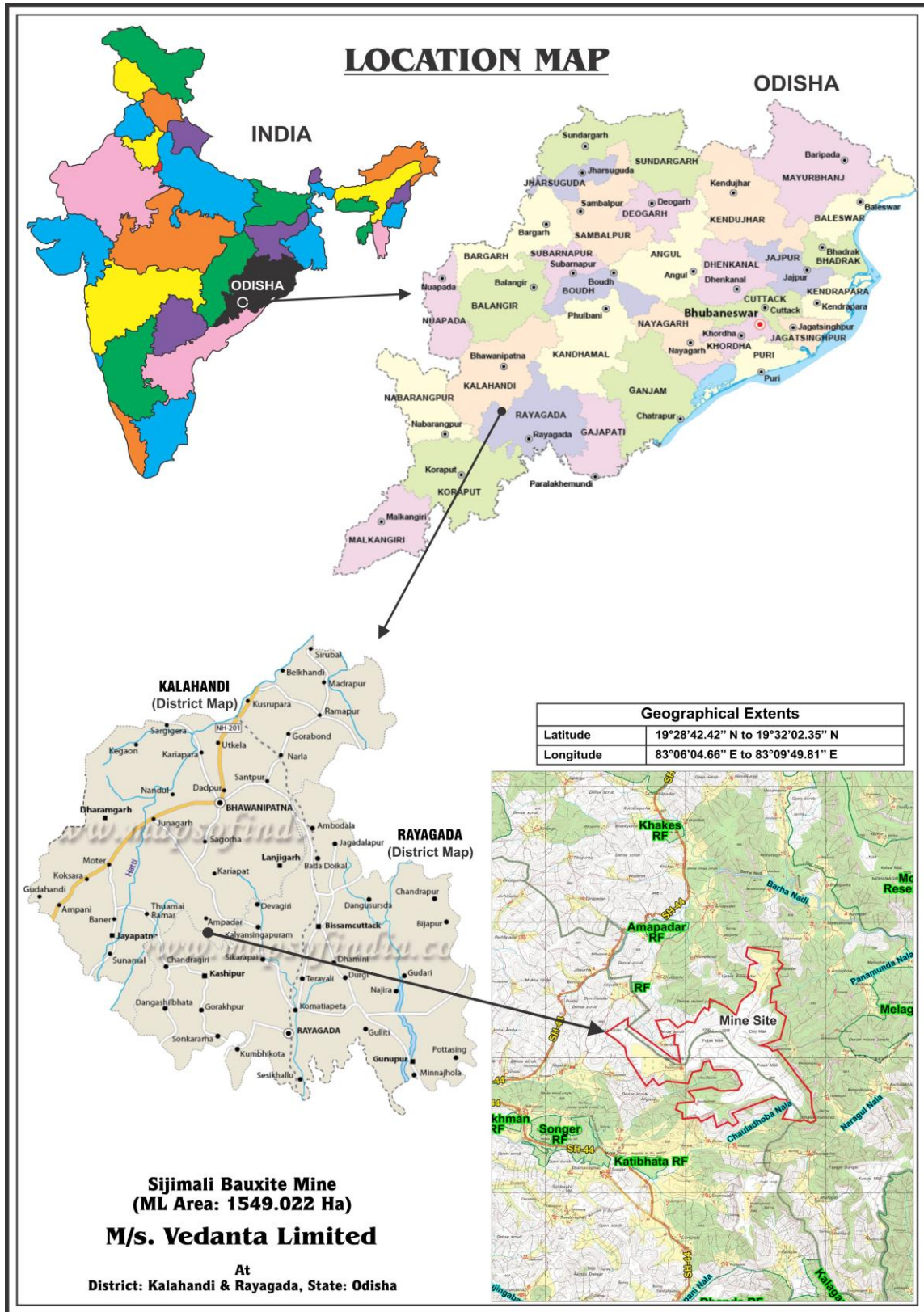


Figure 1 Location map (Showing general as well as specific location of the Proposed Mine)

1.6 MINE DESCRIPTION

1.6.1 MINING LEASE STATUS

Auction process was conducted in accordance with the tender document for the Sijimali Mineral Block and Vedanta Limited was declared as the “Preferred Bidder” under Rule 9(9)(iii) or Rule 10(1A) of Auction Rules dated 09.02.2023. Accordingly, pursuant to Rule 10(2) of the Auction Rules and the terms of the tender document, the Govt. of Odisha Steel & Mines Dept., issued Letter of Intent for grant of mine lease for Sijimali Bauxite Block over an area of 1549.022 ha vide letter no. SM-MC2-MC-0006-2023/2103/S&M, Bhubaneswar, dated 01.03.2023. LOI is valid for a period of 3 years from the date of issuance i.e. valid up to 28.02.2026

1.6.2 MINING DETAILS

Table - 2
Mining Details

S. No.	Particular	Details
1.	Mining Method	Fully Mechanized Opencast Method
2.	Total Geological Resources	311.01 Million Tonnes
3.	Total Mineable Reserves	299.58 Million Tonnes
4.	Extractable Reserves	260.92 Million Tonnes
5.	Production Capacity	Bauxite: 9.0 Million TPA
6.	Life of Mine	~31 years
7.	Bench Height	8 m
8.	Bench Width	20 m
9.	Ultimate Pit Slope	45°
10.	Elevation Range	900 m AMSL to 1217 m AMSL
11.	Ultimate working depth	45 mbgl
12.	ROM/Waste Ratio (Tonnes : Tonnes)	1:0.4
13.	Number of Working days	300
14.	Number of Working Shifts	3 Shift

Source: Approved Mining Plan with progressive mine closure plan

1.6.3 MINING METHOD

Mining operations will be carried out by fully mechanized opencast method. Initially it has been proposed to remove the top soil/over burden/subgrade to gain mineral access the bauxite benches in respective active working areas. The top soil will be stacked separately in earmarked areas for future use in backfilled to reclaim areas by plantation & greenbelt development. The overburden/subgrade strips are planned to be loosened by using rippers and drilling & blasting. The loosened material will be piled up by dozer and the same will be loaded into rear dump trucks of higher capacity by front end loader and hydraulic excavators for transportation of overburden/subgrade dump. The bench height in overburden and bauxite benches will be maximum 8 meter and width will be minimum 20 meter.

The bauxite will be transported from mine face to crusher or ROM ore stock pile by rear dump trucks. The bauxite will be loaded by front end loaders or hydraulic excavators. Crushed bauxite will be transported up to the railway siding by covered trucks and from the railway siding up to Plant by rail.

1.6.4 YEAR WISE PRODUCTION & EXCAVATION DETAILS

Table – 3

Excavation Details (In Million Tonnes)

Year	Total Excavation	Bauxite	Top Soil	Overburden	Subgrade/ Mineral Reject
1 st	5.71	3.0	0.01	2.45	0.25
2 nd	5.17	3.0	0.01	2.07	0.09
3 rd	8.62	6.0	0.06	2.21	0.35
4 th	7.61	6.0	0.09	1.35	0.17
5 th	14.35	9.0	0.16	4.96	0.23
Total	41.46	27.0	0.33	13.04	1.09

Source: Approved Mining Plan with progressive mine closure plan

Note: Bulk density of Bauxite/ROM is 2.0 t/cum, Top soil is 2 t/cum & OB is 2.0 t/cum as per GSI Report

At Peak Stage: Bauxite Production Capacity: 9.00 Million TPA, Top Soil: 0.18 Million TPA, Waste: 7.40 Million TPA & Subgrade: 1.42 Million TPA; (Total Excavation: 18.00 Million TPA)

Note: 5th year onwards peak bauxite production will be 9.0 Million TPA

2.0 DESCRIPTION OF THE ENVIRONMENT

PRESENTATION OF RESULTS (AIR, NOISE, WATER & SOIL)

Baseline study of the study area was conducted during Summer Season March to May, 2023.

2.1 Ambient Air Quality

The concentrations of PM_{2.5} and PM₁₀ for all the 10 AAQM stations were found between 16.9 to 43.8 µg/m³ and 33.7 to 69.2 µg/m³ respectively. The concentrations of SO₂ and NO₂ were found in range from 4.2 to 10.1 µg/m³ and 7.3 to 20.6 µg/m³ respectively. CO concentration was found in range of 0.52 to 0.60 mg/m³. AAQ parameters in the study area have been found well within prescribed standards of NAAQS; though the values were found more at Tentulisahi Village due to the transportation activities, vehicular emissions etc. & minimum results were found at proposed mine site as there is no major source of air pollution.

2.2 Noise Levels

Ambient noise levels were measured at 10 locations around the project site. Noise levels varied from 45.2 to 52.0 Leq dB (A) during day time and from 35.0 to 42.0 Leq dB(A) during night time.

Maximum noise levels during day time as well as night time were found at Tentulisahui Village.

From the above study and discussions, it can be concluded that noise levels in the study area are well within the standards as prescribed by the CPCB.

2.3 Surface Water Quality

Surface Water Monitoring has been carried out for 2 sampling stations. The pH of collected water sample for these 2 sampling stations varies from 7.39 to 7.55 indicating slightly alkaline & productive to water body. Total hardness (95.08 to 115.25 mg/l), Total dissolved solids (256 to 308mg/l), Alkalinity (60 to 91.0 mg/l), conductivity (365 to 438 μ S/cm), COD (13.5 to 19.0mg/l) and BOD (4.3 to 6.2 mg/l) were found within standards.

The nutrients were also found in sufficient quantity viz. sulphate (17.16 to 38.79 mg/l), nitrate (2.09 to 4.19 mg/l), calcium (29.65 to 58.08 mg/l), magnesium (5.09 to 7.27mg/l), Iron (0.10 to 0.16 mg/l) indicated clean water bodies. Dissolved oxygen (7.0 to 7.6 mg/l) indicated that the water bodies are safe for aquatic biodiversity.

2.4 Ground Water Quality

The ground water analysis for all the 10 sampling stations shows that pH varied from 6.79 to 7.46, total hardness varies from 118 to 207.2 mg/l & total dissolved solids varies from 198 to 380.0 mg/l. The water samples contain, chloride from 39.6 to 90.9 mg/l, SO₄ varied from 20.20 to 57.23 mg/l, Ca from 21.45 to 48.1 mg/l, Mg varied from 13.18 to 21.2 mg/l.

Thus, can be conclude from the baseline sampling results for groundwater that all the samples, were observed within the permissible limits and complies to the drinking water standard (IS: 10500-2012).

2.5 Soil Quality

Samples collected from identified 10 soil locations indicate pH value ranging from 6.58 to 7.36. The soil is reddish brown in color and texture is sandy loam. Organic Matter ranges from 1.31 % to 1.67 % in the soil samples. All the essential nutrients were observed to be present in a higher amount than the other micro nutrient and macro nutrient such as Nitrogen (459.9 to 832.27 kg/ha), Phosphorous (27.0 to 70.32 kg/ha), Potassium (253.2 to 561.65 kg/ha), Magnesium (350.24 to 570.75 mg/kg), Calcium (1062.34 to 2058.64mg/kg). These results indicate that the soil quality within the study area is of a good quality and contains sufficient macronutrients which are vital for healthy plant life.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

3.1 Air Environment

The key air emissions from the mining activities (drilling, blasting, loading, unloading, crushing and transportation) are Particulate Matter, Oxides of Nitrogen (NO₂) and Sulphur dioxide (SO₂). Gaseous emissions will be generated from HEMM & transportation of vehicles.

In the study area, pre-dominant wind direction throughout year was observed from South, according to which, the locations for ambient air quality monitoring were selected. Impact prediction modelling through AERMOD will be done on air quality considering all the meteorological features of the mine site.

To mitigate the fugitive dust & gaseous emissions, proper mitigation measures like controlled blasting, water sprinkling before drilling, blasting & during transport activities, use of Rock Breaker to avoid secondary blasting, development of greenbelt/plantation etc along with

continuous emission monitoring will be undertaken to control & reduce the emissions. Better maintenance of equipment & HEMMs, optimum loading to avoid spillage, PUC checking of mining equipment & vehicles helps to reduce emissions. Proper protection measures i.e. use of Bag filters & Screening Plant, Regular water spraying (dry fog system) on Crusher hopper to arrest dust from becoming air-borne, Construction of wind breaking walls especially at charging hopper & crushing place, wheel (tyre) washing facility for trucks.

3.2

Water Environment

Surface Water

Seasonal water bodies viz. Chauladhoba Nallah, Naragul Nallah, Barha Nadi, Panamunda Nallah, Khadiapani Nallah, Dundapata Nallah, Naghulu Nadi, Ghudhughudua Nadi, Sujingabandha Nallah exist in the study area. The lease area doesn't have any major water body and study area doesn't have any major river and has dendritic drainage pattern.

During mining operations, waste water of about (60 KLD) generated from workshop which will be treated using oil-grease separator and treated water will be reused in dust suppression & vehicle washing. About 120 KLD of sewage waste water generated from canteen, mine office & toilets-bathroom etc. will be collected in tank and treated in modular STP and treated water will be reused for plantation.

There will be no discharge of wastewater outside the lease area, Therefore, no significant impact of proposed mining on surface water. Regular monitoring will be carried out.

There will be no discharge of wastewater outside the lease area, during rain excess water passed through siltation pond and settling pits and separate storm water drains are developed along with check dams for proper sedimentations to join natural streams or nallahs for gainful utilization. Regular monitoring will be carried out.

Ground Water

According to groundwater level monitoring data, depth of water level is varying from 585 to 345 m bgl (680 to 581 AMSL) during pre-monsoon season and 582 to 343 m bgl (683 to 584 AMSL) during post-monsoon. The mineral availability and depth of mine working will go up to 45m bgl at conceptual stage; therefore, ground water will not be intersected due to mining activities. Necessary permission will be obtained from CGWA before Ground water withdrawal.

The mineral Bauxite and associated rocks do not contain any toxic substances so that there will not be any adverse impact on ground water quality. During monsoon or post monsoon time, excess water needs to be discharged, it will pass through sedimentation pond / check dams / filters for proper sedimentation prior to join natural streams or nallahs.

3.3

Noise & Vibration

Major noise generating sources of the mining activities are drilling, blasting and HEMM deployed for loading & transportation of bauxite.

Various measures will be undertaken to control noise & vibration. Drilling will be carried out with the help of sharp drill bits using wet process. Controlled blasting techniques using delay detonators through proper blast design and explosive selection will be used to reduce the noise & vibrations to a greater extent. Hydraulic rock breaker will be used in place of secondary blasting.

All DGMS guidelines will be followed strictly to monitor & reduce the impact of blasting on nearby habitation. HEMMs equipped with acoustic a/c cabins will be provided for the operators. Regular proper maintenance, oiling and greasing of HEMMs will be done. Noise from crushing activities will be mitigated by measures like, insulators & closed acoustic systems. Noise mapping shall be done in area, High noise area will be marked and controlled by using noise barriers, noise braking walls. PPEs like earplugs/earmuffs will be provided to mine workers. Audiometric test will done for all operators and accordingly work area will be deployed. Development of green belt/plantation along the mining boundary will help in reducing noise level propagation.

Crushing will also generate noise pollution. Proper mitigation measures i.e. insulators & closed acoustic systems will be provided to control the noise pollution. Plantation will be done around the crusher which will also help to control noise pollution.

3.4 Soil & Solid Waste Generation & Its Management

Top Soil

- The soil is clay and buff yellow and brownish colour soil found in ML area.
- Annually about 0.18 million tonnes of top soil will be generated & same will be used for greenbelt & plantation.
- During the Plan Period 0.33 Million Tonnes of top soil will be generated and which will be utilized for greenbelt/plantation.
- At conceptual stage, 4.78 Million Tonnes of top soil will be generated & same will be utilized for greenbelt/plantation.

Waste

- Annually 7.40 million tonnes of waste and 1.42 million tonnes of subgrade will be generated.
- During the plan period 13.04 Million Tonnes of waste will be generated and 1.09 Million Tonnes of subgrade will be generated which will be used in backfilling.
- At Conceptual Stage 204.29 Million Tonnes of waste will be generated & same will be used for backfilling.

3.5 Land Environment

The land use of the mine area will be altered from agricultural land to mining area including pits, temporary dumps, greenbelt etc but will not have any significant effect on the surface features of the surrounding areas.

At conceptual stage, out of the total mine area i.e. 1549.022 ha; 1205.13 ha will be excavated, out of which 1205.13 ha will be backfilled & rehabilitated by plantation & regrassing.

Greenbelt along 7.5 m periphery will be carried out on 32.87 ha. An area of 311.022 ha will remain undisturbed.

Greenbelt will be carried out along the 7.5m periphery of mine covering an area of 32.87 ha area within initial 5 years of mining operation. Local & fruit bearing species will be planted in consultation with local forest officer and as per CPCB Guideline. Total Cost for the Greenbelt/Plantation: Rs. 25.74 Crores. Density of Trees will be @ 1000 to 2500 trees/ha & survival rate shall be maintained 90%.

4.0 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

As this is a site-specific mining project and the site has been selected based on detailed exploration under G2 level carried out bauxite is available in this area. Therefore, no alternative site has been selected.

5.0 POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME

Table – 4
Post Project Environmental Monitoring Programme

S. No.	Description	Frequency of Monitoring
1.	Micro-Meteorological Data	Hourly
2.	Ambient Air Quality Monitoring	Online CAAQMS & Manual as per CPCB Guideline
3.	Personal Dust Monitoring & Free Silica Analysis/Area dust sampling /Static dust sampling/Fugitive Emission	Monthly/ As per DGMS
4.	Ground Water Quality & Level Monitoring	Quarterly & As per CGWA NOC condition
5.	Surface Water Monitoring	Monthly & as per EC & CTO condition
6.	Mine Seepage Water	Monthly & as per EC & CTO condition
7.	Treated Waste Water Inlet & Outlet – ETP/STP	Monthly & as per EC & CTO condition
8.	Ambient Noise Level Monitoring	Monthly & as per EC/CTO/ Continuous Hourly for 24 hrs
9.	Occupational Noise Level Monitoring	Monthly/ As per DGMS
10.	Ground Vibration& whole Body Vibration (WBV) of HEMMS Monitoring	As per DGMS & other norms
11.	Soil Quality Monitoring	Half Yearly
12.	Medical Checkup of employees	Annually

6.0 ADDITIONAL STUDIES

Additional Studies i.e. Land Use Land Cover Study, Hydro–Geological Study, Biological Study & Wild Life Conservation Plan, Rehabilitation and Resettlement Plan and Risk Assessment & Disaster Management Plan are covered in Draft EIA/EMP Report as per the Terms of References issued letter no. IA-J-11015/6/2023-IA-II (NCM), dated 14.08.2023.

6.1 Hydro-Geological Study

Total water requirement will be 725 KLD. Water will be sourced from Groundwater, Surface water and Mine sump. The annual average rainfall in the region is 1551.6 mm/annum.

According to groundwater level monitoring data, depth of water level is varying from 585 to 345 m bgl (680 to 581 AMSL) during pre-monsoon season and 582 to 343 m bgl (683 to 584 AMSL) during post-monsoon. The mineral availability and depth of mine working will go up to 45m bgl at conceptual stage; therefore, ground water will not be intersected due to mining activities. Necessary permission will be obtained from CGWA before Ground water withdrawal.

6.2 Biological Environment

Dominant species of trees and shrubs prevailing in the buffer area are Sal (*Shorea robusta*), Saguan (*Tectona grandis*), Mango (*Mangifera indica*), Neem (*Azadirachta indica*), Khajur (*Phoenix sylvestris*), Desmodium (*Desmodium laxifolium*), Girdi (*Indigofera cassiodies Rottl.ex*), Junglee Baigana (*Solanum viarum Dunal*) etc. There is no National Park, Wildlife Sanctuary, Biosphere Reserves, Tiger Reserves, Wildlife Corridors etc. within 10 km radius of study area. There are No Protected Forest fall within 10 km radius of the study area and 21 Reserved Forests within the 10 km radius of the study area. Location Map has been authenticated by the Forest Dept., Kalahandi South Division and Rayagada Division. List of flora & fauna separately for core zone and buffer zone submitted for Authentication to DFO, Kalahandi, and to DFO, Rayagada Vide Letter No. VL/EC/SIJIMALI/10, Dated 31.08.2023 and Vide Letter No. VL/EC/SIJIMALI/11, Dated 31.08.2023.

6.3 Resettlement & Rehabilitation

The area of proposed mine is 1549.022 ha which falls in 18 villages namely Malipadar, Dumerpadara, Katibhata, Kutamal, Pelanakona, Aliguna, Bundel, Shagabari (Tehsil: Kashipur in Rayagada District) Tijmali, Chulbadi, Ambajhola, Mahajal, Nakarundi, Taramundi, Uparambpadar, Salebali, Tadadei, Talambpadar (Tehsil: Thaumul–Rampur in Kalahandi District). Out of the total mining area, 722.9 ha is Govt. Land, 699.7 ha is Forest Land and 127.9 ha is Private Land.

For the mine site various land shall be acquired Govt. of Odisha facilitates acquisition, through Odisha Industrial Infrastructure Development Corporation (IDCO). Vedanta Limited will acquire the private land through IDCO as per the provisions and the R & R shall be done as per the applicable Laws.

6.4 Land Use and Land Cover Study

Land Use/Land Cover classes that were identified are Agriculture Land, Forest Land, Water Bodies and Built-up Land.

Core Area

- Core area mainly comprises of Vegetation/Plantation (726 ha), Open Scrub/Waste Land (685 ha), Agriculture land (119 ha), Road (17 ha), Settlement (2.01 ha) & Surface water bodies (0.01 ha) with 46.81%, 44.29%, 7.71%, 1.11%, 0.06%, 0.02% of area falling under respectively.
- There is no National Park, Wild Life Sanctuary, Biosphere Reserve etc. within the core area.
- Major part of the mine area is in the form of Forest land & Open Scrub/Waste Land, which makes 91.1% of the core zone.
- Since this is a Greenfield proposal, it will eventually result in increased built-up area in terms of rainwater harvesting structures, office/workplace, haul roads, workshop etc.

Buffer Zone

- Water Bodies like surface water bodies & mine sump comprises of 0.27% of the total buffer area. As per the primary survey and SOI Toposheet, there is one major water body (Barha

Nadi) is present in the 10 km radius of the study area. The agriculture fields of the buffer area are majorly rainfed.

- The study area mainly comprises of Vegetation/plantation (2046759.28 ha), Open Scrub/Waste Land (1537080.633 ha), Forest (1266891.96 ha), Agriculture land (464019.52 ha) Road (51290.01 ha), Settlement (15007.48 ha), Surface Water Bodies (35465.78 ha) with 37.39%, 28.38%, 23.39%, 8.57%, 0.95%, 0.65% and 0.27% of area falling under respectively.
- The buffer zone studied has no ecological sensitive area (National Park, Wildlife Sanctuary, Biosphere Reserve etc).
- There is no National Park, Wild Life Sanctuary and Biosphere Reserve etc. within 10 km radius of the study area.
- 21 Reserved Forests within the 10 km radius of the study area.

7.0

PROJECT BENEFITS

Total direct employment, envisaged from the proposed mine, is about 600 persons. Preference will be given to the locals as per their requirement & eligibility. Apart from that, various indirect employment opportunities will be generated like transportation, workshops establishment, petty contracts, horticulture, commercial establishments (shops), canteen etc.

The project activity will help in meeting the growing demand of aluminum & hence help in the economic growth of the country. The mine shall be contributing around Rs. 2511.6 Crore/year to the State & Central Govt. exchequers by way of mining revenue (Royalty, DMF, NMET). Proposed bauxite mine will result in growth of the surrounding areas by community development to be undertaken by the company.

It will be helpful in the development of basic needs of the local area like education, Health & family welfare, women empowerment, Natural resource management, water conservation, Infrastructure Development etc. It will result in growth of the surrounding areas by increasing direct and indirect employment opportunities in the region including ancillary development, overall improvement in Human Development Index and supporting infrastructure.

Based on the Public hearing issues various community developmental activities in the form of medical facilities, education and creation of self-help groups will be taken up for the betterment of the locals. Medical facilities will be provided for employee as well as people of nearby villages as well as medical camps will be organized in surrounding area for locals. The project will help in the overall growth of the region. No significant adverse effect on environment is envisaged as the required/recommended mitigation measures will be undertaken and will be monitored regularly.

8.0

ENVIRONMENT MANAGEMENT PLAN

Vedanta Limited has a full-fledged Environmental Management Cell (EMC) for environmental monitoring and control. A group of qualified and efficient engineers with technicians will be deputed for maintenance, up keeping and monitoring the pollution control equipment, to keep them in working mode at the best of their efficiencies. The EMC shall oversee and implement the various functions to ensure that environmental status of the area remains will within the statutory standard of MoEF&CC and SPCB. Total cost of the project is Rs. 792 crores. Capital cost for EMP is

Rs. 32 Crore and recurring cost for the EMP is Rs. 3.0 Crore/Annum is also envisaged for implementation of the proposed project.

9.0 CONCLUSION

The proposed Sijimali Bauxite mine a green field project has certain level of impacts on local environment and has various significant beneficial effects in terms of providing the employment opportunity, and various CSR practices to be followed by the Vedanta Ltd. Growth, Development, in harmony with the environment has always been the approach of Vedanta.

The EIA/EMP study is prepared in compliance of ToR issued by MoEF&CC. Baseline data of land, air, water, noise, biological and socio-economic environment were duly assessed by conducting field investigation as well as by having an access to the available secondary information. The prediction of impacts was identified & evaluated and EMP is suggested to mitigate the environmental concerns arising from the proposed project. There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done.

The project will prove beneficial to the local people as direct and indirect employment opportunity will be generated. There will be increase in revenue generation to the government by way of royalty, excise and government taxes etc. Further improvement in infrastructure will take place like education, roads, availability of drinking water, medical facilities in adjacent villages. There will be increase in earnings of local villagers, as they will get employment in the proposed mine, which ultimately will result in better standard of living of the villagers. There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done. Increased social welfare measures taken by the company will bring development in the near-by villages.

