

Ref: SRL/2017/CU-ECC-1

Date: 20.05.2016

To,
The Additional Director (South)
Ministry of Environment and Forest
Regional Office (Southern Zone)
Kendriya Sadan, IVth Floor, E & F Wings
17th Main Road, II Block, Kormangala
Bangalore – 560 034

Sub: Six monthly compliance report of Curpem Iron Ore Mine (T.C. No. 3 Of 1951 & 40 of 1954), Goa for the period October 2015 to March 2016.

Respected Sir,

We are herewith submitting the condition wise compliance report as per the conditions laid down in the Environmental Clearance Letter No. J-11015/155 /2005-IA-II (M) dated 17/11/2005 for the period **October 2015 to March 2016.**

Thanking you,

Yours faithfully,

Prakash Chandra

Mines Manager

Curpem iron ore Mine

fravashchandre

Enclosed: Annexures of Six monthly compliance report of Curpem Iron Ore Mine for the period October 2016 to March 2017.

C.C: 1. Member Secretary, Goa State Pollution Control Board

2. CGWB

SESA RESOURCES LIMITED: Surla-Sonshi Mine, Post Dignem, (Goa) - 403 505 India T+91 (0)832 6414905 | Website: www.sesagoaironore.com CIN: U13209GA1965PLC000030

Compliance report to conditions of environmental clearance issued by

Ministry of Environment & Forests, Govt. of India, for Curpem Iron Ore Mine (T.C. No. 3 of 1951 & 40 of 1954)

Letter No. J-11015/155/2005-IA.II(M)

Production: 0.2 MTPA as per Environment clearance, however the current production limit is 0.09 MTPA as per capping imposed by state govt.

Period – October 2016- March 2017

. No	Condition of clearance	Status of compliance	Remarks
. NO	Specific Conditions		
i)	The environmental clearance is accorded only for two years	Hydro geological report was prepared and submitted to MoEF and based on the same extension of validity EC was granted vide letter No. J-11015/155/2005-IA-II(M) dated 02.01.2008	
(ii)	Prior approval of the Chief whather warden, Government of the Chief white warden, Government of the Chief warden, Government of the	The provisions of wild life protection Act is not applicable as the mines falls out of eco-sensitive zones notified by MoEF for the state of Goa.	
(iii)	No dumping of OB where natural slopes already exceeding 28° angle.	Dumping is not carried out on land having natural slope exceeding 30°. Dumping is carried out as per the IBM approved Mining Plan. There is only one dump covering an area of 12.1 ha area; out of which 2.3 ha is afforested. The average height of dump is around 20m (2 steps)	

(iv)	Top soil should be stacked properly with adequate measures at earmarked sites. It should be used for reclamation and rehabilitation' of the mined out areas.	The mine lease is situated on a laterite plateau and there is no top soil available with the current working area. However any top soil encountered during future working/ development will be preserved and used for reclamation and rehabilitation.
(v)		OB and other waste are stacked at the earmarked site as per approved mining plan. Step dumping method is adopted. Finalized portions of the dump slopes are covered with geotextiles and then afforested. Garland drains are provided to channelize the water in the mine pit. All the mine runoff water is channelized through garland drains and pipes into the mine pit. Rock walls and settling ponds are constructed at the toe of the dump. Rainfall data is considered while designing and constructing settling ponds. The settling ponds are desilted every year before the onset of monsoons.

vii)		Geotextiles are used for erosion control and stabilizing the dump slopes. Rock walls and settling ponds are constructed at the toe of the dump. Environment protective measures like de-silting of settling ponds and drains are carried out before the onset of monsoon. Laterite boulder check dams are constructed across trenches to arrest silt flow. All the monsoon run-off water is channelized through garland drains and pipes in to the mine pit. If required the pit water is treated with flocculent and lime and clean water is pumped out.	
(viii)	Drills should be wet operated or with dust extractors.	No drilling and blasting is carried out at Curpen mines	
(ix)	Measures shall be taken for proper maintenance of vehicles used in mining operations and in transportation of mineral ore and in ensuring that emissions are within prescribed norms. The vehicles should be covered with tarpaulin and should not be overloaded.	Regular maintenance of company vehicles is carried out to keep a check on emissions. All HEMM and Vehicles used for the mining operations are hired. The Maintenance and P.U.C. check (Pollution under control) is done by the Individual vehicle owners. PUC check certificate of all the truck plying for the transportation of the ore is checked and kept as record. All the ore carrying trucks are covered with tarpaulin before leaving the mining premises. Free board is provided & load is kept within the limits.	er e

(x)	Plantation shall be done which includes a green belt of adequate	Natural green belt exists around the lease area.	Attached list of plant
0	width around the ML area, along roads, OB dumps and non	Finalized areas on mines such as dump slopes, road	saplings planted as
	mineralized areas identified for plantation by planting suitable	sides, embankments etc are taken up for plantating	Annexure 03
	native species in consultation with the local DFO/Agriculture	native as well as fast growing species. Spacing of	
	Department. The density of trees should be around 2500 plants	around 2m*2m is maintained. Saplings required for	
	per hectare. Substantial allocation of funds shall be made for	plantation are taken from forest/agriculture	
	afforestation and reclamation and details furnished to the Ministry	department nurseries. Details of the afforestation	
	and to the MOEF RO, Bangalore.	are submitted to MoEF on six monthly basis. The	
		necessary provisions of funds are made in our	
		annual operational budget.	
(xi)	A Progressive Mine closure plan clearly indicating the year of	A Progressive Mine Closure Plan is approved by	,
	backfilling, area to be backfilled, quantum of OB to be backfilled	IBM as part of mining Plan.	
	and area to be reclaimed with plantation shall be prepared and	The state of the s	
	implemented.	The status of the same is submitted to IBM	
		annually.	
(xii)	Mine water discharged from the lease shall be treated to prescribe	The rain water falling within the mining lease area	The Pumping operation is
	standards and to ensure that there is no adverse impacts on River	is channelized in to the mine pit, treated if required	started in the month of
	Kushavati.	with lime and flocculent and discharged only when	January'17. The Reports
		required. The results are submitted to MOEF and	of the ground water level
			and discharge water
			quality is attached in the
			annexure 02.
(xiii)	Water harvesting measures should be taken up in and around mine	All the monsoon run-off water is channelized in to	
	site. Further, desiltation shall be done every year before the onset	mining pit. This harvested rain water is later used	
	of monsoon.	for dust suppression activities. The settling ponds	
		constructed at dump toe also acts as means to	
		harvest rain water. The settling ponds are de-silted	

		every year before the onset of monsoon.	
(iv)	No additional groundwater shall be used for mining operations. Prior approval of the MOEF and CGWA shall be obtained for	water is harvested in the mine pit and the same is used for dust suppression activities.	Permission from WRD for pumping water from Mine pit is renewed for Curpem Mine via registration certificate
	using groundwater for mining operations. Additional water requirement, if any, shall be met from recycling of water from mining/processing operations and from water harvesting measures.		No. WRD/WDXIII/Ren/Cert /Reg/Que&Sang/F.100/1 6-17/03 Dated 02/12/2016.
xv)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers at suitable locations in project area. The frequency of monitoring should be minimum four times a year – January, pre monsoon (April/May), monsoon (August), post monsoon (November), and winter (January) seasons for groundwater level and in May for quality, particularly for heavy metals. Data generated from groundwater regime monitoring will be submitted to CGWB, Regional office on an annual basis. The monitoring shall include levels of heavy metals including iron.	Mining Operations resumed in March 2017, the quality of Ground water is submitted to SPCB.	The Reports of the ground water level and discharge water quality i attached in the annexure 02.
(xvi)	Discontinuo de la Corpus Fund	Final mine closure plan approved by IBM would be submitted to MOEF in due course of time in accordance with Rule 23(c) of MCDR 1988.	

	Consent to Operate shall be obtained from the SPCB for expansion of mining operations.	Consent to operate from GSPCB is granted on 07/09/2015 vide letter No. 5/5001/15-PCB/CI-581 and is valid till 20/05/2017.	Application given to the board for renewal of consent.
(xviii	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation vs Union of India in Civil Writ Petition No. 460 of 2004, as may be applicable to this project.	Noted	
	to the regional Office of the Ministry within 6 months.	The finalized areas on dump sloped are covered with geotextiles to prevent erosion. Garland drains, boulder walls and settling ponds are constructed at the toe of dump. The status of the same is submitted to Ministry regional office.	
,	Harvesting of mine pit discharge and rain water to recharge the aquifers shall be undertaken. Implementation details on the same shall be submitted to the regional office of the Ministry within six months. The result of such harvesting scheme shall be periodically submitted to the Ministry.	All the mine run-off water is channelized in to mining pit. This harvested rain water is later	

В.	General Conditions		8
S. No	Condition of clearance	Status of compliance	Remarks
	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Mining is being carried out as per mining plan approved by Indian Bureau of Mines	
(ii)	No change in the calendar plan including excavation, quantum of iron ore, waste dumps should be made.	Mining is being carried out as per mining plan approved by Indian Bureau of Mines.	
	Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for monitoring RPM, SPM, NOX and SO ₂ . Location of the ambient air quality stations should be decided based on meteorological data, topographical features and environmentally and ecologically sensitive targets and the frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	The second of th	Reports are attached in Annexure 01.
	Data on environmental quality should be regularly submitted to the Ministry including its Regional Office at Bangalore and the State Pollution Control Board/Central Pollution Control Board once in six months.		Reports are attached in Annexure 01 & 02.

(v)	Adequate measures for control of fugitive emissions should be taken during drilling & blasting operations, loading and transportation of mineral, etc. Fugitive dust emission should be regularly monitored and data recorded properly. Water spraying arrangement over haul roads, loading and unloading points and transportation of minerals, etc. should be provided and properly maintained.	possible measures are adopted some of which are as below: (a) Water sprinkling on haul roads, loading and unloading points (b) Ore	
(vi)	Adequate measures should be taken for control of noise levels below 85 db A in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM, etc., should be provided with ear plugs / muffs.	Adequate measures for control of noise levels like: Regular maintenance of Hired mining machineries and vehicles, regular monitoring of noise levels. PPE's are provided to all workmen.	
(vii)	Industrial waste water (workshop and wastewater from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time. Oil and grease trap should be installed in the mine for treatment before discharge of effluents from the workshop. There shall be no discharge of wastewater from the mine site even during peak monsoon season.	There is no workshop within the mining lease, hence there is no industrial waste water generation or discharge.	
	adequate training and information on safety and health	All the workmen and staff working in mines are provided with PPE's .Training and information on safety and health aspects is imparted periodically.	

	measures taken, if required.	X	1 1 A
ix)	analysed either through an in-house environmental laboratory established with adequate number and type of	Willing operations results	Reports attached as Annexure 01& 02.
(x)	A separate environmental management cell with suitable qualified personnel should be set up under the control of a senior executive who will report directly to the head of the organization.	There is an Environment Management Cell with multidisciplinary staff suitably qualified in occupational health, safety and environment headed by Head-HSE who reports directly to the CEO of the company.	
(xi)	The funds earmarked for environmental protection measures should be kept in separate account and not diverted for any other purpose. Year-wise expenditure should be reported to the Ministry of Environment & Forests.	earmarked under various needs and	The environment expenditure for financial year 2016-17 for Curpem Mines is attached as Annexure 04. Environment cost = 1546526
(xii)	The project authorities should inform to the Regional Office located at Bangalore regarding date of financial closures and final approval of the project by the concerned authorities, and the date of start of land development work.	This is an ongoing mining project.	

(xiii)	The Regional Office of this Ministry located at Bangalore shall monitor compliance of the stipulated environmental conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data/information/ monitoring reports.	Necessary support will be provided to the regional officer for the visit, furnishing requisite data etc.	
(xiv)	A copy of the clearance letter should be marked to concerned Panchayat/local NGO, if any, from whom any suggestion/ representation has been received while processing the proposal.	Clearance Letter has been already given to Local Panchayat/ SPCB.	
(xv)	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the collector's/Tehsildar's Office for 30 days.		
	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within 7 days of issuance of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at web site of the Ministry of Environment and forests at http://envfor.nic.in.	The issuance of EC was advertised on NavHind Times and Lokmat on 22/11/2005	

Vedanta Limited , Mining Division , Codli Mines, P.O. Kirlapale , Goa-403727

Recognised by Ministry of Environment, Forests and Climate change, Govt. of India Vide Notification .S.O.137(E). dated 12 th January 2015, Valid up to 11.01.2020 * Certified by ISO 9001: 2008 and OHSAS 18001:2007

Ambient Air Quality Monitoring Report

Mine Name: Curpem Mine

Instruments used: Fine Particulate Sampler APM550 MFC, Respirable Dust Sampler 460 NL, Gaseous Pollutant Sampler

Calibration date: 28.09.2016

Validity of calibration: 27.09.2017

Standard method used for analysis: PM10 PM2.5 - Gravimetric method

SO2 -Improved west & Gaeke
NOx - Modified Jacob & Hoccheiser

	NUX	- Modified Jacob &		2	2	. 3		
	$PM_{2.5}$ in $\mu g/m^3$	PM_{10} in $\mu g/m^3$	SO_2 in $\mu g/m^3$	NOx in μg/m ³	$PM_{2.5}$ in $\mu g/m^3$	PM_{10} in $\mu g/m^3$	SO_2 in $\mu g/m^3$	NOx in μg/m ³
Monitoring Date	(24 hourly)	(24 hourly)	(24 hourly)	(24 hourly)	(24 hourly)	(24 hourly)	(24 hourly)	(24 hourly)
Location Name : R	ajadhax wada Villa				Location Name :Su	lcornem Village		
03.03.2017	32	87	6	4	34	56	2	4
07.03.2017	35	72	4	6	35	62	4	6
10.03.2017	33	62	2	4	32	66	2	4
14.03.2017	39	56	4	6	32	67	4	6
17.03.2017	. 44	69	2	4	27	70	2	4
21.03.2017	49	66	4	6	23	55	4	6
24.03.2017	46	64	6	8	26	53	4	6
28.03.2017	40	65	6	8	33	51	6	6
31.03.2017	44	66	4	8	31	55	4	6
	Deobhat Village	00			Location Name:	Wagremol- vichundr	em Village	
		40	4	6	36	54	6	4
03.03.2017	37	48	2	6	48	55	6	4
07.03.2017	36	52		4	33	53	2	4
10.03.2017	33	53	4		37	52	2	4
14.03.2017	37	51	4	6	42	62	2	4
17.03.2017	38	60	2	4			4	6
21.03.2017	46	56	4	6	39	49		8
24.03.2017	44	51	2	3	37	53	6	8
28.03.2017	46	55	6	8	31	44	6	8
31.03.2017	41	54	2	4	34	46	50. 80 ug/m3	NO., 80 ug/m3

NAAQS Limits:

PM_{2.5}.60 μg/m3

PM₁₀ 100 μg/m3 SO

SO₂.80 μg/m3 NO_X.80 μg/m3

n3

PM2.5-60 in μg/m3 PM₁₀ 100 μg/m3

SO_{2.}80 µg/m3

 $NO_{x}.80 \mu g/m3$

Gout Analyst

Vedanta Limited ,Mining Division ,Codli Mines,P.O. Kirlapale ,Goa-403727

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.S.O.137(E).dated 12 th January 2015 , Valid up to 11.01.2020

* Certified by ISO 9001:2008 and OHSAS 18001:2007

Ambient Air Quality Monitoring Report

Location Name: Curpem Mine

Instruments used: Respirable Dust Sampler 460NL

Calibration date: 28.09.2016

Validity of calibration: 27.09.2017

Standard method used for analysis: Particulate Matter Gravimetric method

Monitoring	Particulate	Emission	
Mi	ne Face/Service	Roads	
07.03.2017	341		
10.03.2017	312		
14.03.2017	283		
17.03.2017	314	4000 / 0	
21.03.2017	316	1200 µg/m3	
24.03.2017	317	1	
28.03.2017	338		
31.03.2017	376		

Govt. Analyst

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Vedanta Limited ,Mining Division ,Codli Mines,P.O. Kirlapale ,Goa-403727

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Dated 12th January 2015, valid up to 11.01.2020

*Certified by ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007

Well Water Analysis Report

Mine Name: Curpem Mine

Date of Sample collection: 18.03.2017

Standard method used for analysis: APHA Standard

Test Report No: 259

Date of Receipt of sample: 18.03.2017 Analysis completion date: 20.03.2017

/* *	Unit	Desirable Limit	Location			
Parameter			Velipwada Village Well	Deobhat Village Well	Rajadyaxwada village well	
Colour	Hazen	<5.0	<5	<5	<5	
pH	-	6.5-8.5	6.55	6.52	6.64	
Furbidity	NTU	1	1	1:4	1	
Conductivity	μs/cm	-	48	212	48	
Dissolved Solids	mg/lit	500	24	106	24	
Suspended Solids	mg/lit	-	1	1	1	
Chloride	mg/lit	250	7	8	7	
Total Hardness as CaCO3	mg/lit	200	16	89	14	
Calcium as Ca++	mg/lit	75	4.0	26	3.2	
Magnesium as mg++	mg/lit	30	1	5.9	1	
Sulphate as SO4	mg/lit	200	2	5	2	
Nitrate as NO3	mg/lit	45	0.1	0.1	0.1	
Alkalinity	mg/lit	200	19	25	20	
Iron as Fe	mg/lit	0.3	0.15	0.10	0.1	
Manganese as Mn	mg/lit	0.1	0.05	0.02	0.03	
MPN/100ml		Absent	17	Absent	20	

BDL- Below Detection Limit

Govt. Analyst

SESA *

Vedanta Limited Mining Division ,Codli Mines,P.O. Kirlapale ,Goa#103727 Recognised by Ministry of Environment, Forests and Climate change, Govt. of India Vide Notification .S.O.137(E). Dated 12th January 2015, Valid up to 11.01.2020

* Certified by ISO 9001:2008, ISO 14001 :2004 and OHSAS 18001:2007

Surface Water Analysis Report for the Month of March 2017

Mine Name: Curpem Mine

Date of Sample collection: 18.03.2017

Standard method used for anarysis: APHA Standard

Test Report No: 258

Date of Receipt of sample: 18.03.2017 Analysis completion date: 20.03.2017

	·····································				
Parameter	Unit	Permissible limits	Pit Discharge	River Khazara	River Water Deobhat Village
Colour ·	Hazen		<5	<5	<5
рН		5.5 to 9.0	5.89	6.81	6.78
Turbidity	NTU		0.9	1.0	1.0
Dissolved Solids	mg/lit		21	36	44
Conductivity	μS/cm		42	72	88
Suspended Solids	mg/lit	100	2	2	1
Chlorides	mg/lit		6	6	7
Total Hardness as CaCO3	mg/lit		14	28	34
Calcium as Ca ⁺⁺	mg/lit		3	5.7	6.5
Magnesium as Mg ⁺⁺	mg/lit		1.5	3.4	4.4
Sulphate as SO4	mg/lit		1.0	1	3
Phosphate as PO ₄	mg/lit	5	BDL	BDL	0.1
Nitrate as NO3	mg/lit	10	BDL	0.1	0.1
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	<3
C.O.D	mg/lit	250	<10	<10	<10
Total Iron	mg/lit	3.	0.15	0.11	. 0.16
	mg/lit	2	0.07	0.07	0.08
Manganese as Mn	mg/lit		7	7	7
D.O Oil & Grease	mg/lit =	10	Nil	<1	<1

Note:-No Water Flow near Velipwada village Nallah & Seasonal Nallah Near Chimutwada village BDL- Below Detection Limit

sesa sterlite

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Well water level Report

Mine Name:Curpem Mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well	Depth of Water level from the reference point in mtrs		Water Column in mtrs	
			26.11.2016	29.12.2016	26.11.2016	29.12.2016
1	Velipwada Village Well	8.4	6	6.2	2.4	2.2
2	Deobhat Village Well	7.6	4.4	5.45	3.2	2.15
3	Rajadyaxwada village well	3	1.5	1.55	1.5	1.45

Sr.No	Location	Total	Depth of Water level from the		Water Column in mtr	
		Depth of	18.02.2017	18.03.2017	18.02.2017	18.03.2017
1	Velipwada Village Well	8.4	6.8	7.1	1.6	1.3
2	Deobhat Village Well	7.6	6	6.3	1.6	1.3
3	Rajadyaxwada village well	3	2	2.1	1	0.9

Govt Analyst

sesa sterlite

PLANTATION DETAILS FOR THE FINANCIAL YEAR 2016-2017 Curpem Iron ore Mine

Sr. No.	Name of the	Species	WML		
	Botanical Name	Common Name	Nos.	Area in Ha.	
1)	Sapindus Mukorossi	Reetha	10		
2)	Phyllanthus emblica	Awla	20		
3)	Tamarindus indica	Tamarind	20		
4)	Peltophorum	Peltophorum	10		
5)	Bauhinia Racemosa	Apta	10		
6)	Bambusoideae	Bamboo	100		
7)	Sapindus mukorossi	Reetha	10		
TOTA	AL		200	0.08	