

Encl: As above

Bachachn Kumar  
President (Mines)



For M/s Balasore Alloys Ltd

Yours faithfully,

Thanking you,

We are herewith enclosed the compliance report on the status of the conditions stipulated in the Environmental Clearance Vide No. J-11015/139/2012-IA.II (M) dated 22.08.2014 for the of April to October, 2016 with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd (ML area 64.463 ha) for your kind perusal.

Dear Sir,

Ref: Environment Clearance No. J-11015/139/2012-IA.II (M) dated 22.08.2014

Sub: Six-monthly Compliance Report of conditions of Environment Clearance Vide no No. J-11015/139/2012-IA.II (M) dated 22.08.2014 with respect to Kaliapani Chromite Mines of M/s- Balasore Alloys Ltd for the period of April to October, 2016.

The Director (S),  
Ministry of Environment & Forests,  
Eastern Regional office,  
A/3, Chandrasekharpur,  
BHUBANESWAR - 751023

To,

BAL/Mines/MoEF & CC/3914

Dated: 28.11.2016



**Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 30.09.2016**

**A. Specific Conditions & their Status**

- i. Mining shall not commence without necessary permissions for drawl of water and intersection of ground water table.**

**Status-** Permission has been obtained for drawl of water and intersection of ground water table during mining activities from Central Ground Water Authority, Govt.Of India ,Ministry Of Water Resource, vide CGWA/NOC/MIN/ORIG/2015/2122 Dated 10.12.2015 , for drawl of ground water of for 3293 m<sup>3</sup>/Day (3188 m<sup>3</sup>/Day from Mine Dewater & 105 m<sup>3</sup>/Day from Bore well). Copy of the same is attached as **Annexure-I.**

- ii. Mitigation measures such as well-designed ventilation network within underground mine, provision of Personal Protective Equipment should be ensured and necessary training and awareness programs for mine workers should be undertaken.**

**Status-** Ventilation fan shall be provided within underground mine in order to control the air pollution. Necessary PPEs viz helmet, Dust mask etc shall be provided to the employees. Training and awareness programme for mine worker regarding health Safety and Environment is going on regular basis and shall be continued.

- iii. Continuous monitoring of Mine water should be done and reports furnished.**

**Status-** Mine water from mine pit is channelized to up graded ETP designed as per the recommendation of IIT, Kharagpur for proper treatment, continuous monitoring of quality and quantity of Mine water (viz parameters pH, TSS, Cr+6, Flow Rate) is going on through online monitoring system installed at ETP Outlet and Inlet as per the Guidelines by CPCB for Real-time Effluent Quality Monitoring System. The monitoring data also transferred to OSPCB website through Real data Acquisition System.

- iv. Continuous monitoring of all drinking water sources for Cr(VI) of Mine water should be done and reports furnished.**

**Status-** Monitoring of drinking water sources inside mine are being done continuously for all the parameters as per IS10500 standards along with Cr(VI). The analysis report is confirming the drinking water standard of CPCB. The analysis report of the same is given in **Table-1.**

  
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[Table-1: Drinking Water Analysis Report]

**Drinking Water Analysis Report (April-2016 to September 2016)**

**M/s Balasore Alloys Limited  
Kaliapani Chromite Mines**

Station 1:Administrative Building									
SL · N O	PARAMET ERS	UNITS	STANDAR DS	Period					
			(IS:10500)	16-Apr	16-May	16-Jun	16-July	16-Aug	16-Sept
1	pH	-	6.5-8.5	7.13	7.24	7.32	7.48	7.53	7.64
2	Odour	-	Agreeable	AL	AL	AL	AL	AL	AL
3	Colour	Hazen	5(max)	CL	CL	CL	CL	CL	CL
4	Taste	-	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	1(max)	0.6	0.4	0.4	0.6	0.4	0.8
6	Chloride(as Cl)	Mg/L	250(max)	6.4	6.7	6.7	6.9	6.2	7.3
7	Residual Free Chlorine	Mg/L	0.2(min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	Mg/L	500(max)	84	87	75	88	84	81
9	Total Hardness(a s CaCO <sub>3</sub> )	Mg/L	200(max)	38	32	30	34	36	35
10	Iron(as Fe)	Mg/L	0.3(max)	0.18	0.15	0.18	0.15	0.12	0.22
11	Calcium(as Ca)	Mg/L	75(max)	13.2	12.7	13.4	12.7	12.4	13.4
12	Magnesium (as Mg)	Mg/L	30(max)	5.6	5.7	5.2	5.5	5.8	5.0
13	Sulphate(as SO <sub>4</sub> )	Mg/L	200(max)	12.1	12.8	13.1	13.3	12.7	12.1
14	Manganese (as Mn)	Mg/L	0.1(max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
15	Nitrate(as NO <sub>3</sub> )	Mg/L	45(max)	0.20	0.20	0.25	0.29	0.25	0.33
16	Alkalinity(a s CaCO <sub>3</sub> )	Mg/L	200(max)	26	30	36	33	38	35
17	Chromium( as Cr <sup>6+</sup> )	Mg/L	§	0.010	0.008	0.010	0.006	0.012	0.011
18	Fluorides(a s F)	Mg/L	1.0(max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

  
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19	Cadmium(as Cd)	Mg/L	0.003(max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
20	Copper(as Cu)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc(as Zn)	Mg/L	5(max)	0.10	0.12	0.14	0.12	0.08	0.18
22	Lead(as Pb)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium(as Se)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	Mg/L	0.5(max)	ND	ND	ND	ND	ND	ND
25	Mercury(as Hg)	Mg/L	0.001(max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
26	Cyanide(as CN)	Mg/L	0.05(max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron	Mg/L	0.5(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic(as As)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorous	Mg/L	§	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

### Station 2: Mines Canteen

SL · N O	PARAMET ERS	UNITS	STANDAR DS	Period					
			(IS:10500)	16-Apr	16-May	16-Jun	16-July	16-Aug	16-Sept
1	pH	-	6.5-8.5	7.56	7.51	7.57	7.36	7.44	7.18
2	Odour	-	Agreeable	AL	AL	AL	AL	AL	AL
3	Colour	Hazen	5(max)	CL	CL	CL	CL	CL	CL
4	Taste	-	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	1(max)	0.2	0.6	0.8	0.4	0.8	0.2
6	Chloride(as Cl)	Mg/L	250(max)	4.5	4.0	4.4	4.1	4.5	4.7
7	Residual Free Chlorine	Mg/L	0.2(min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	Mg/L	500(max)	88	76	72	79	76	85
9	Total Hardness(as CaCO <sub>3</sub> )	Mg/L	200(max)	52	56	48	42	40	44
10	Iron(as Fe)	Mg/L	0.3(max)	0.32	0.28	0.27	0.24	0.21	0.28
11	Calcium(as Ca)	Mg/L	75(max)	12.5	13.1	13.9	14.2	14.7	15.3

  
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12	Magnesium (as Mg)	Mg/L	30(max)	5.3	5.5	5.0	5.2	5.0	5.3
13	Sulphate(as SO <sub>4</sub> )	Mg/L	200(max)	12.7	13.4	12.7	12.4	11.8	11.5
14	Manganese (as Mn)	Mg/L	0.1(max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
15	Nitrate(as NO <sub>3</sub> )	Mg/L	45(max)	0.24	0.24	0.29	0.32	0.34	0.30
16	Alkalinity(as CaCO <sub>3</sub> )	Mg/L	200(max)	32	34	31	37	41	43
17	Chromium(as Cr <sup>6+</sup> )	Mg/L	§	0.018	0.014	0.006	0.008	0.010	0.012
18	Fluorides(as F)	Mg/L	1.0(max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	Mg/L	0.003(max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
20	Copper(as Cu)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc(as Zn)	Mg/L	5(max)	0.16	0.16	0.10	0.16	0.12	0.22
22	Lead(as Pb)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium(as Se)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	Mg/L	0.5(max)	ND	ND	ND	ND	ND	ND
25	Mercury(as Hg)	Mg/L	0.001(max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
26	Cyanide(as CN)	Mg/L	0.05(max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron	Mg/L	0.5(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic(as As)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorus	Mg/L	§	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

**v. Morbidity pattern which is a sensitive indicator of ill health with regard to Cr related diseases need to be done.**

**Status-** A morbidity pattern study has been done by engaging Asian Institute of Public Health, Bhubaneswar with overall aim to create baseline data base on current status of occupational health risks especially morbidity pattern with regard to Chromium and air born dust associated with the facility & identify unhealthy behaviour of exposures. The major findings and morbidity pattern are given below.

**MAJOR FINDINGS:**

- With regards to availability of medical facilities, as per majority (72.85%) of the population the

  
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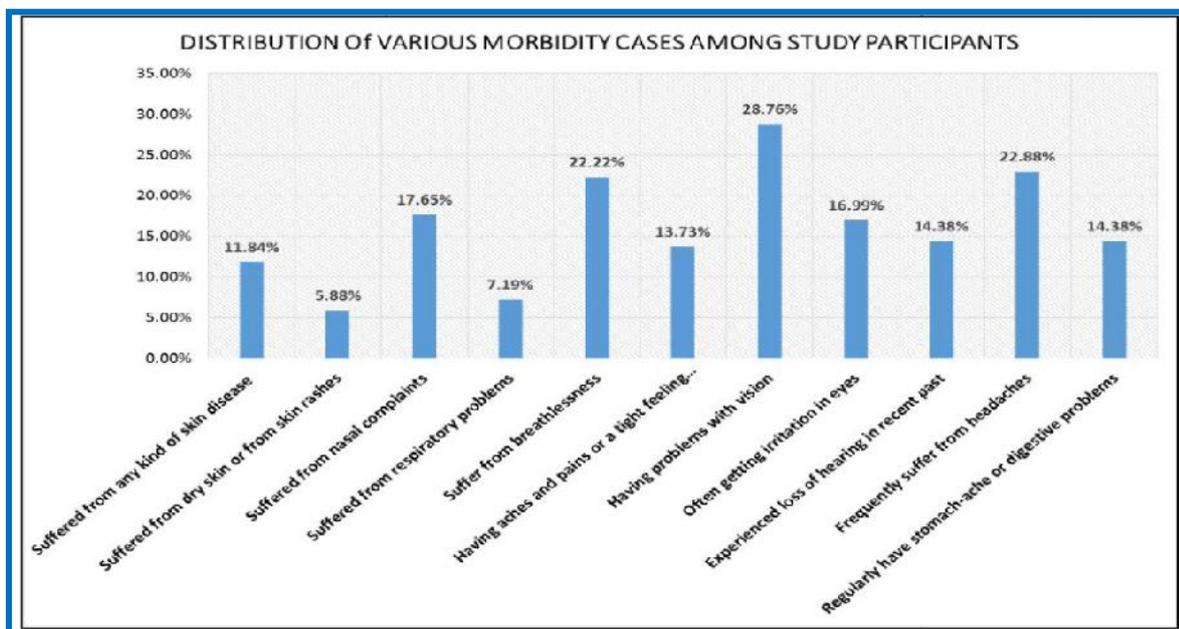
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facilities were not adequate. And only 27% participants responded positively.

- 55% of the respondents reported that the canteen facility was adequate and according to the rest the facility was inadequate.
- According to one fourth of the respondents, the cold drinking water facility was inadequate.
- Around 21% of the respondents say that, availability of washing facility was inadequate.
- As per 66% of the respondents the toilet facility was inadequate only 33% respondents were satisfied by the facility
- According to only 28% of the employees the physical working environment was adequate and suitable.
- The analysis revealed that 53% of the employees believed that the steps taken against dust generation were adequate, while the others felt it was inadequate.
- 22% participants revealed that they usually suffer from breathlessness while performing physical activities.
- After the analysis it came to light that in the last five years, muscular problems or joint problems was the greatest cause of morbidity among the study participants; followed by long-term neck or back complaints, high blood pressure and stomach complaints.

### MORBIDITY PATTERN:

The assessment on the morbidity status among the study participants shows the following morbidity pattern:



The findings of assessment show that, problems with vision (28%), Breathlessness (22%), Headache (22%) are the major contributors towards the current morbidity conditions. Hence it is hereby concluded that, there is no definite pattern/figure to be mentioned as the key indicator of the morbidity resulting from chrome related exposure rather it indicate that the pattern of morbidity follows the general trend of villages or urban areas elsewhere.

Based upon the outcome of result, action is being taken.

- iv. **Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The runoff from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.**

  
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**Status-** Mine water discharge is channelized to Effluent Treatment Plant present at mines to remove the Cr+6 and some of treated water are used for Dust Suppression, Plantation, COBP and rest discharged outside. Regular monitoring of treated water is going on through Online analyser and report transferred to OSPCB website through RTDAS . Report for the period of April 2016 to September 2016 is provided as **Annexure-II**. The photos of Present ETP given below

**Photo-1 New up-graded ETP**



**Photo-02: On-Line Monitoring System installed at In-let & Out-Let of ETP**



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The Run-off from OB dumps and other surface run off are properly collected through garland drains, settling pond & channelized to ETP by pump & pipeline facility for proper treatment before discharge to outside. Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period. Report of the surface runoff analysis given in **Table-2**. The photo of the same is shown as **Photo: 3**.

[Table-2: Surface Run-off analysis Report]

KALIAPANI CHROMITE MINES									
M/s BALASORE ALLOYS LTD.									
SURFACE RUN OFF ANALYSIS REPORT (July 2016 – September 2016)									
Period				July-16		Aug-2016		Sept-2016	
Sl No	Parameter	Unit	Prescribed standard	SRF-1	SRF-2	SRF-1	SRF-2	SRF-1	SRF-2
1	Ph	.....	5.5-9.0	7.56	7.21	7.72	7.21	7.64	7.35
2	TSS	mg/L	100	<b>78</b>	84	91	96	82	87
3	Cr <sup>+6</sup>	mg/L	0.1	0.056	0.068	0.062	0.074	0.054	0.062

**PHOTO-3: Showing Channelization of Surface Run-off to ETP through Settling Pit From Dumping Area**



  
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## PHOTO SHOWING CHANELISATION OF SURFACE RUNOFF



**SURFACE RUN-OFF  
MANAGEMENT FROM  
COMMON DUMPING  
AREA TO ETP**



**vi. The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.**

**Status-** Consent to establish has obtained from SPCB, Odisha vide letter No. 18196/ IND-II-NOC- 5723 dated 08.10.2013 & subsequently Consent to Operate has obtained from SPCB, Odisha vide letter No. 15398/ IND-I-CON-2576 dated 20.10.2016. Copy of the same are attached as **Annexure- II & III**. All the conditions stipulated in Consent to Establish and Consent to Operate are effectively implemented.

**vii. Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with compliance report.**

**Status-** Traffic density is being monitored on the route of mineral transportation at three locations and the monitoring report is given in **Table-3**.

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[Table-3: Traffic Density Monitoring Report]

Kaliapani Chromite Mines										
Traffic Density Study Report										
Station	Working Days				Non Working Days			Market Days		
	Result	Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle
<b>Mines main Gate</b>	Total Nos	3274	1236	2391	1228	265	307	3727	1310	1115
	Avg Traffic Load/Hr	136.41	51.5	99.62	51.16	11.04	12.79	155.9	54.58	46.45
	Passenger Car Unit(PCU) Factor	0.75	2.0	3.7	0.75	2.0	3.7	0.75	2.0	3.7
	PCU/Hr	102.30	103.0	368.59	38.37	22.08	47.32	116.46	109.16	171.86
<b>Kalarngiatta</b>	Total Nos	3242	1517	2212	2464	852	515	3077	927	684
	Avg Traffic Load/Hr	135.08	63.20	92.16	102.66	35.5	21.45	128.20	38.62	28.5
	Passenger Car Unit(PCU) Factor	0.75	2.0	3.7	0.75	2.0	3.7	0.75	2.0	3.7
	PCU/Hr	101.31	126.4	340.99	76.99	71.0	79.36	96.15	77.24	105.45
<b>Kansa</b>	Total Nos	660	219	938	662	131	147	920	196	376
	Avg Traffic Load/Hr	27.5	9.12	39.08	27.58	5.45	6.12	38.33	8.16	15.66



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Passenger Car Unit (PCU) Factor	0.75	2.0	3.7	0.75	2.0	3.7	0.75	2.0	3.7
PCU/Hr	20.62	18.24	144.59	20.68	10.9	22.64	28.74	16.32	57.94

viii. As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analysed for their mineralogical composition and records maintained.

**Status-** Mineralogical composition as part of Ambient air is being monitored in six locations of core and buffer zone of the lease area. The air samples are also being analysed for all the 12 parameters as per CPCB guideline and data recorded. The analysis report of the same is given in the **Table-4**.

AMBIENT AIR QUALITY FOR THE PERIOD April 2016- September 2016																	
M/s BALASORE ALLOYS LIMITED																	
KALIAPANI CHROMITE MINES																	
S I. N o.	Monitoring Stations	Station Code	Month	Range	CONCENTRATION in µg/m <sup>3</sup>				CO (Result in mg/CuM)	O <sub>3</sub> (Micro Gram/CuM)	NH <sub>3</sub> (Micro Gram/CuM)	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	Benzo(a) Pyrene ng/m <sup>3</sup>	As ng/m <sup>3</sup>	
					PM 10	PM 2.5	SO <sub>2</sub>	NO <sub>x</sub>									
1	Rooftop of Administrative Building (Core Zone) Elevation- 123M N21002 '47" E85045 '14.2"	AAQ-1	Apr-16	AVERAGE	62.1	24.9	7.0	11.2	0.3	6.2	26.4	0.04	0.4	0.4	0.3	<0.1	
				MAX. VALUE	68.5	26.6	7.2	11.5	0.4	6.8	31.0	0.1	0.5	0.7	0.5	<0.1	
				MIN. VALUE	54.6	22.4	6.8	1	0.3	5.2	21.0	0.01	0.1	0.1	0.1	<0.1	
			May-16	AVERAGE	59.6	24.3	7.2	11.0	0.3	6.0	25.9	0.03	0.3	0.3	0.3	0.3	<0.1
				MAX. VALUE	65.3	27.1	7.9	11.8	0.4	6.8	29.0	0.04	0.4	0.4	0.4	0.5	<0.1
				MIN. VALUE	44.3	20.3	6.7	9.7	0.3	3.9	21.0	0.01	0.1	0.2	0.1	0.1	<0.1
			June-16	AVERAGE	56.1	22.1	6.8	9.8	0.3	5.9	26.5	0.02	0.2	0.3	0.2	0.2	<0.1
				MAX. VALUE	66.2	26.2	7.6	11.9	0.4	6.7	38.0	0.04	0.3	0.3	0.2	0.2	<0.1
				MIN. VALUE	40.2	17.3	5.8	5.3	0.3	4.8	15.0	0.01	0.1	0.2	0.1	0.1	<0.1
			Sept-16	AVERAGE	59.0	28.0	6.1	13.7	0.3	5.3	BDL	0.0025	BDL	0.8	BDL	BDL	BDL
				MAX. VALUE	66.0	31.0	6.3	14.9	0.4	6.0	BDL	0.0028	BDL	0.8	BDL	BDL	BDL

  
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2	Roof top of Bachel or Barrack Elevati on-127M N21002 '5.7" E85045 '34.2"	A A Q-2	Apr-16	MIN.V ALUE	51.0	24.0	5.8	12.6	0.2	4.9	BDL	0.00022	BDL	0.7	BDL	BDL
				AVERAGE	63.1	25.7	7.4	11.5	0.3	6.4	27.4	0.02	0.4	0.4	0.3	<0.1
				MAX. VALUE	68.8	27.1	7.8	11.8	0.4	6.8	32.0	0.04	0.5	0.7	0.5	<0.1
			May-16	MIN.V ALUE	55.6	23.4	7.1	11.1	0.3	5.8	22.0	0.01	0.1	0.1	0.1	<0.1
				AVERAGE	61.1	24.9	7.4	11.3	0.3	6.2	24.6	0.02	0.3	0.3	0.2	<0.1
				MAX. VALUE	69.3	27.8	7.9	11.9	0.3	6.9	31.0	0.04	0.4	0.4	0.3	<0.1
			June-16	MIN.V ALUE	45.2	20.2	7.1	10.1	0.3	5.7	16.0	0.01	0.1	0.2	0.2	<0.1
				AVERAGE	59.1	23.5	7.1	10.2	0.3	6.0	23.8	0.03	0.3	0.2	0.2	<0.1
				MAX. VALUE	64.2	25.4	7.6	11.5	0.3	6.8	29.0	0.04	0.3	0.2	0.2	<0.1
			Sept-16	MIN.V ALUE	47.3	20.6	6.3	5.6	0.3	5.1	16.0	0.01	0.2	0.1	0.1	<0.1
				AVERAGE	63.8	29.5	6.6	13.1	0.3	5.8	BDL	0.00020	BDL	0.7	BDL	BDL
				MAX. VALUE	74.0	35.0	7.1	14.9	0.4	7.0	BDL	0.00025	BDL	0.72	BDL	BDL
3	Open cast quarry (Core Zone) Elevati on-155M N21° 01' 57.8" E85° 46' 01.2"	A A Q-3	Apr-16	MIN.V ALUE	69.8	32.8	7.3	13.2	0.4	5.9	23.0	0.01	0.1	0.2	0.1	<0.1
				AVERAGE	75.4	36.4	7.6	14.3	0.4	6.7	26.4	0.02	0.4	0.4	0.3	<0.1
				MAX. VALUE	79.5	37.9	8.1	15.8	0.4	7.2	31.0	0.04	0.6	0.7	0.5	<0.1
			May-16	MIN.V ALUE	42.4	18.6	9.5	11.3	0.3	5.4	16.0	0.01	0.2	0.2	0.1	<0.1
				AVERAGE	68.3	31.3	1.0	13.3	0.3	6.4	23.4	0.02	0.4	0.3	0.3	<0.1
				MAX. VALUE	78.3	37.1	1.7	14.8	0.5	7.8	31.0	0.04	0.5	0.4	0.5	<0.1
			June-16	MIN.V ALUE	40.2	22.6	6.5	12.1	0.3	5.1	17.0	0.01	0.1	0.1	0.1	<0.1
				AVERAGE	66.0	31.7	9.9	13.6	0.4	6.4	22.5	0.02	0.2	0.2	0.2	<0.1
				MAX. VALUE	79.4	38.8	1.8	14.4	0.5	7.4	26.0	0.04	0.3	0.3	0.3	<0.1
			Se	MIN.V ALUE	40.2	22.6	6.5	12.1	0.3	5.1	17.0	0.01	0.1	0.1	0.1	<0.1
			AVERAGE	64.8	29.0	6.6	13.7	0.3	5.4	BDL	0.00027	BDL	0.8	BDL	BDL	

  
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4	Village Kaliapani (Buffer Zone) Elevations - 122M N21° 03' 42.0" E85° 46' 19.3"	A A Q-4	pt-16	MAX. VALUE	73.0	36.0	7.7	14.9	0.4	6.3	BDL	0.00029	BDL	0.8	BDL	BDL
				MIN. VALUE	56.0	19.0	5.5	12.2	0.2	4.2	BDL	0.00022	BDL	0.7	BDL	BDL
			Apr-16	AVERAGE	64.8	26.5	7.6	11.9	0.3	6.6	28.8	0.02	0.4	0.4	0.2	<0.1
				MAX. VALUE	70.2	28.2	8.1	12.2	0.4	6.9	33.0	0.03	0.6	0.7	0.5	<0.1
				MIN. VALUE	55.8	23.8	7.3	11.6	0.3	5.6	23.0	0.01	0.3	0.1	0.1	<0.1
			May-16	AVERAGE	59.5	27.3	7.1	11.0	0.3	6.3	27.1	0.02	0.2	0.2	0.2	<0.1
		MAX. VALUE		71.3	34.2	7.7	12.1	0.3	6.8	42.0	0.03	0.3	0.3	0.4	<0.1	
		MIN. VALUE		40.5	17.3	5.3	7.8	0.2	5.7	17.0	0.01	0.2	0.1	0.1	<0.1	
		June-16	AVERAGE	60.5	26.9	7.1	10.2	0.3	6.2	27.6	0.02	0.3	0.2	0.2	<0.1	
			MAX. VALUE	63.2	28.5	7.6	10.8	0.3	6.9	33.0	0.03	0.4	0.3	0.3	<0.1	
			MIN. VALUE	57.6	26.1	6.2	9.8	0.3	5.4	22.0	0.01	0.1	0.1	0.1	<0.1	
		Sept-16	AVERAGE	51.3	22.8	5.2	12.3	0.2	5.3	BDL	0.00023	BDL	0.8	BDL	BDL	
MAX. VALUE	55.0		25.0	5.7	13.6	0.3	5.8	BDL	0.00026	BDL	0.9	BDL	BDL			
MIN. VALUE	48.0		20.0	4.5	10.9	0.2	4.4	BDL	0.00022	BDL	0.7	BDL	BDL			
5	Village Ransol (Buffer Zone) Elevations - 113M N21° 03' 43.1" E85° 44' 32.2"	A A Q-5	Apr-16	AVERAGE	69.7	33.1	6.3	11.8	0.4	5.7	27.8	0.02	0.3	0.3	0.2	<0.1
				MAX. VALUE	72.1	36.3	7.9	12.6	0.5	6.9	32.0	0.03	0.5	0.6	0.5	<0.1
				MIN. VALUE	66.6	30.1	0.1	11.1	0.3	5.1	24.0	0.01	0.1	0.1	0.1	<0.1
			May-16	AVERAGE	67.3	31.2	7.6	11.3	0.4	5.8	26.8	0.02	0.2	0.2	0.2	<0.1
				MAX. VALUE	72.6	34.6	8.3	12.3	0.4	6.8	32.0	0.03	0.3	0.3	0.3	<0.1
				MIN. VALUE	42.3	18.2	7.1	10.2	0.3	5.1	19.0	0.01	0.1	0.1	0.1	<0.1
		June-16	AVERAGE	60.1	25.8	7.7	10.8	0.3	5.7	27.5	0.02	0.2	0.2	0.2	<0.1	
			MAX. VALUE	68.8	31.7	8.8	11.4	0.4	6.4	34.0	0.03	0.4	0.3	0.3	<0.1	
			MIN. VALUE	53.2	21.1	6.1	9.1	0.3	5.1	22.0	0.02	0.1	0.1	0.1	<0.1	
		Se	AVERAGE	48.8	20.0	5.2	34.7	0.2	5.6	BDL	0.00020	BDL	0.6	BDL	BDL	

  
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			pt-16	MAX. VALUE	54.0	23.0	5.9	106.0	0.2	6.2	BDL	0.00026	BDL	0.7	BDL	BDL	
				MIN.V ALUE	42.0	15.0	4.7	10.1	0.2	5.0	BDL	0.00016	BDL	0.6	BDL	BDL	
6	Village Sukran gi (Buffer Zone) Elevati on-153M N21° 02' 44.5" E85° 48' 16.3"	A A Q-6	Apr-16	AVER AGE	70.0	33.2	7.1	11.5	0.4	5.7	28.3	0.02	0.3	0.3	0.2	<0.1	
				MAX. VALUE	73.2	35.6	7.8	12.3	0.5	6.8	33.0	0.03	0.5	0.5	0.4	<0.1	
				MIN.V ALUE	65.6	28.8	6.1	11.2	0.3	5.1	26.0	0.01	0.1	0.1	0.1	<0.1	
			May-16	AVER AGE	64.4	29.9	7.4	11.4	0.3	5.5	26.2	0.02	0.2	0.2	0.2	0.2	<0.1
				MAX. VALUE	71.1	35.3	8.1	12.3	0.4	6.3	31.0	0.03	0.3	0.3	0.4	<0.1	
				MIN.V ALUE	42.3	18.4	6.9	10.5	0.2	5.1	19.0	0.01	0.1	0.1	0.1	<0.1	
			June-16	AVER AGE	54.7	25.8	7.3	10.3	0.3	5.9	22.8	0.02	0.2	0.2	0.2	<0.1	
				MAX. VALUE	61.8	29.1	7.8	10.8	0.3	6.8	26.0	0.03	0.3	0.3	0.3	<0.1	
				MIN.V ALUE	47.2	19.7	6.3	9.4	0.3	5.2	18.0	0.01	0.1	0.1	0.1	<0.1	
			Sept-16	AVER AGE	51.3	20.5	4.9	10.5	0.2	5.3	BDL	0.00024	BDL	0.8	BDL	BDL	
				MAX. VALUE	57.0	25.0	5.3	11.3	0.2	6.2	BDL	0.00032	BDL	0.9	BDL	BDL	
				MIN.V ALUE	46.0	17.0	4.6	9.5	0.2	4.6	BDL	0.00020	BDL	0.7	BDL	BDL	
NORMS(ANNUAL)					60.0	40.0	50.0	40.0	4(1Hr)	180(1Hr)	100.0	0.5	20	5	1	6	
NORMS(24HOURS)					100.0	60.0	80.0	80.0	2.0	100(8Hr)	400.0	1					

ix. Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.

**Status-** Mineral handling plant in the form of chrome ore beneficiation is in operation and working in wet process. However water sprinkling is going on through fixed sprinkler inside COB area and through water tankers at loading and unloading points including transfer points regularly to control the generation of dust. Photo of COB Plant as Photo-4 fixed sprinkler given as Photo-5 & water tankers as Photo-6.

  
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**PHOTO-4 : SHOWING COB PLANT**



**PHOTO-5 : SHOWING FIXED SPRINKLER**



Fixed Sprinkler at COB Plant a



Fixed Sprinkler at Haul Road

**PHOTO-6 : SHOWING MOBILE SPRINKLERS INSIDE MINES**



  
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- x. **Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.**

**Status-** Regular water sprinkling has been going on engaging two nos of water tankers of 12 KL capacity at critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed near COB plant to arrest the fugitive dust. Photo of the same is shown as **Photo- 5 & 6.**

Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conform to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period April 2016 to September 2016 is given in **Table-4.**

- xi. **The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.**

**Status-** Rooftop rain water harvesting structure has implemented to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board and construction of another structure is in process. The photo of the same is shown as **Photo: 7.** The schematic diagram and technical details attached as **Annexure—IV.**

**PHOTO- 7: SHOWING ROOFTOP RAIN WATER HARVESTING STRUCTURE**



- xii. **Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezo meters during the mining operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April- May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting**

  
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depleted due to the mining activity; necessary corrective measures shall be carried out.

**Status-** Regular monitoring of ground water level & quality has been monitored on quarterly basis at core and buffer zone at six different locations & data has been sent to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board on regular basis.

We have installed four nos of Piezometers inside Core Zone and One piezometric at Vimtanger village to measure the ground water level .

Report of Ground water level and quality are given in **Table-5** & 6 respectively.

However monitoring report reveals that there is no significant impact on ground water table due to mining activity.

[Table-5: Ground water level in buffer zone ]

<b>Ground Water Level report (April 2016- September 2016)</b>						
<b>M/S Balasore Alloys Ltd</b>						
<b>Kaliapani Chromite mines</b>						
<b>Station</b>	<b>Water Table</b>					
	<b>(MBGL)</b>	<b>(MBGL)</b>	<b>(MBGL)</b>	<b>(MBGL)</b>	<b>(MBGL)</b>	<b>(MBGL)</b>
	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>
<b>Buffer Zone</b>						
<b>kaliapani-1</b>	3.5	3.7	3.5	3.3	2.9	3.2
<b>kaliapani-2</b>	4.1	4.3	4.2	3.9	3.3	3.7
<b>Tisco Hutting</b>	6.4	6.7	6.5	6.1	5.8	6.0
<b>Sukrangi</b>	3.9	4.0	3.9	3.3	2.9	3.1
<b>Core Zone</b>						
<b>Piezohole-1</b>	27.4	27.8	27.2	26.9	26.4	27.4
<b>Piezohole-2</b>	28.3	28.9	28.2	27.8	27.0	27.4

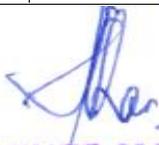
[Table-6: Ground water Quality Analysis Result]

<b>Kaliapani Chromite Mines ,M/s BALASORE ALLOYS LTD</b>				
<b>GROUND WATER QUALITY</b>				
<b>Period- PRE MONSOON (APRIL 2016)</b>				
<b>Date of Sampling- 11.04.2016</b>				
<b>Sl No</b>	<b>PARAMETER S</b>	<b>Unit</b>	<b>STANDARD S</b>	<b>Results of Pre Monsoon period</b>
			<b>(IS:10500)</b>	

  
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				GW1	GW2	GW3	GW4	GW5	GW6
1	pH	....	6.5-8.5	7.15	7.02	7.35	7.46	6.73	7.22
2	Odour	....	Agreeable	AL	AL	AL	AL	AL	AL
3	Colour	Haze n	5(Max)	CL	CL	CL	CL	CL	CL
4	Taste	....	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity,	NTU	1(Max)	0.5	0.3	0.2	0.7	0.4	0.5
6	Chloride (as Cl)	mg/l	250(Max)	10.8	11.1	9.9	7.0	13.1	8.5
7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	105	115	154	171	109	120
9	Total Hardness	mg/l	200(Max)	52	48	61	56	53	47
10	Iron as Fe	mg/l	0.3(Max)	0.22	0.23	0.14	0.20	0.23	0.18
11	Calcium(as Ca)	mg/l	75(Max)	15.3	14	14.1	12.5	12.1	11.7
12	Magnesium(a s Mg)	mg/l	30(Max)	9.5	8.9	9.1	7.4	8.2	7.7
13	Sulphates(as SO4)	mg/l	200(Max)	15.5	16.1	15.2	12.2	12.9	12.0
14	Manganese(a s Mn)	mg/l	0.1(Max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
15	Nitrate(as NO3)	mg/l	45(Max)	0.72	0.54	0.56	0.64	0.60	0.65
16	Alkalinity as CaCO3	mg/l	200(Max)	22	44	26	38	36	29
17	Chromium(as Cr+6)	mg/l	\$	0.010	0.014	0.016	0.022	0.026	0.010
18	Fluoride as F	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	mg/l	0.003(Max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
20	Copper (as Cu)	mg/l	0.05(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc (as Zn)	mg/l	5(Max)	0.15	0.12	0.24	0.23	0.25	0.20
22	Lead (as Pb)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium (as Se)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	mg/l	0.5(Max)	ND	ND	ND	ND	ND	ND
25	Mercury (as Hg)	mg/l	0.001(Max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
26	Cyanide(as CN)	mg/l	0.05(Max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

  
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27	Boron(as B)	mg/l	1(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic(as As)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorous as P	mg/l	\$	0.60	0.54	0.62	0.52	0.55	0.64

**Period- MONSOON (AUGUST 2016)**

**Date of Sampling- 22.08.2016**

Sl No	PARAMETERS	Unit	STANDARDS	Results of Monsoon Period					
			(IS:10500)						
				GW1	GW2	GW3	GW4	GW5	GW6
1	pH	....	6.5-8.5	7.53	7.24	7.31	7.56	6.85	7.09
2	Odour	....	Agreeable	AL	AL	AL	AL	AL	AL
3	Colour	Haze n	5(Max)	CL	CL	CL	CL	CL	CL
4	Taste	....	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity,	NTU	1(Max)	0.4	0.2	0.8	0.4	0.6	0.2
6	Chloride (as Cl)	mg/l	250(Max)	11.3	12.4	9.5	8.3	12.7	8.8
7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	127	135	159	168	143	136
9	Total Hardness	mg/l	200(Max)	58	42	64	42	50	66
10	Iron as Fe	mg/l	0.3(Max)	0.18	0.20	0.16	0.26	0.30	0.14
11	Calcium(as Ca)	mg/l	75(Max)	16.4	14.3	14.7	12	11.9	10.2
12	Magnesium(as Mg)	mg/l	30(Max)	9.7	9.3	8.6	7.3	8.5	7.4
13	Sulphates(as SO4)	mg/l	200(Max)	14.1	16.9	15.7	11.4	13.7	12.2
14	Manganese(as Mn)	mg/l	0.1(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Nitrate(as NO3)	mg/l	45(Max)	0.62	0.50	0.52	0.68	0.62	0.66
16	Alkalinity as CaCO3	mg/l	200(Max)	28	45	20	42	30	26

  
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17	Chromium(as Cr+6)	mg/l	\$	0.026	0.010	0.018	0.008	0.024	0.016
18	Fluoride as F	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	mg/l	0.003(Max)	<0.000 01	<0.000 01	<0.000 01	<0.000 01	<0.000 01	<0.000 01
20	Copper (as Cu)	mg/l	0.05(Max)	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1
21	Zinc (as Zn)	mg/l	5(Max)	0.11	0.16	0.22	0.28	0.20	0.25
22	Lead (as Pb)	mg/l	0.01(Max)	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1
23	Selenium (as Se)	mg/l	0.01(Max)	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1
24	Mineral Oil	mg/l	0.5(Max)	ND	ND	ND	ND	ND	ND
25	Mercury (as Hg)	mg/l	0.001(Max)	<0.000 01	<0.000 01	<0.000 01	<0.000 01	<0.000 01	<0.000 01
26	Cyanide(as CN)	mg/l	0.05(Max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron(as B)	mg/l	1(Max)	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1
28	Arsenic(as As)	mg/l	0.01(Max)	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1	<0.000 1
29	Phosphorous as P	mg/l	\$	0.62	0.50	0.64	0.46	0.42	0.68

STATION	CODE
TISCO CAMP	GW-1
VILLAGE KALIAPANI	GW-2
VILLAGE SUKRANGI	GW-3
INSIDE MINES	GW-4
VILLAGE CHINGUDIAPAL	GW-5
VILLAGE KALRANGI	GW-6

GW- GROUND WATER
U/O- UNOBJECTIONABLE
CL- COLOURLESS
ND- NOT DETECTED
BDL- BELOW DETECTION LIMIT

  
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xiii. The project proponent shall regularly monitor the flow rate of the natural water streams flowing adjacent to the mine lease and maintain the records.

**Status-** The flow rate of Damsala Nallah is being regularly monitored at both upstream and downstream on quarterly basis and record has maintained. The flow rate in Pre-Monsoon (April 2016) and Monsoon (April'2016) season is given in the **Table-07**

[Table-7: Flow rate of up-stream & down-stream at Damsala Nallah]

<b>Flow rate of up-stream &amp; down-stream at Damsala Nallah</b>					
<b>Kaliapani Chromite Mines of M/s Balasore Alloys Limited</b>					
SI No	Location	Co-ordinate of the location	Month of Monitoring	Flow rate m <sup>3</sup> /s	Flow rate IN CUSEC
1	Damsala U/S	21 <sup>0</sup> 02'35.9"N 85 <sup>0</sup> 45'27.01"E	April 2016	1.99	70.14
2	Damsala D/S	21 <sup>0</sup> 02'10.47"N 85 <sup>0</sup> 44'31.92"E		2.59	91.45
3	Damsala U/S	21 <sup>0</sup> 02'35.9"N 85 <sup>0</sup> 45'27.01"E	August 2016	5.65	199.63
4	Damsala D/S	21 <sup>0</sup> 02'10.47"N 85 <sup>0</sup> 44'31.92"E		6.29	222.07

xiv. The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.

**Status-** Total 37100 Sqm area of dump slope has been covered by Geotextile and 16550 Sqm area covered with grass turffing & 78540 nos of saplings planted at dump slope , roadside in side ML area since 2010-11. The details of the same is given in **Table-8,9 &10** .

**Photo of Plantation,coirmatting & Grass turffing attached as Photo 8,9 &10.**

Regular Monitoring and management of rehabilitated areas is being done. Six monthly report of the same is being submitted to respective authority regularly.

**DETAILS OF COIR MATTING & GRASS TURFING ON DUMP SLOPE**  
**KALIAPANI CHROMITE MINES,M/s BALASORE ALLOYS LIMITED**

  
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**Table-8: Details of Coirmatting**

<b>DETAILS OF COIRMATTING</b>		
<b>YEAR</b>	<b>LOCATION</b>	<b>AREA (SQM)</b>
2010-11	Dump 2	5000
2011-12	Dump-3(IMFA side)	4500
2012-13	Dump-3(IMFA side)	4500
2013-14	Dump-3( Mahagiri side)	8600
2014-15	Dump-1 (North)	8500
2015-16	Dump 3 (North side)	6000
<b>Total</b>		<b>37100</b>

**Table-9: Details of Grass Turfing**

<b>DETAILS OF GRASS TURFING</b>		
<b>YEAR</b>	<b>LOCATION</b>	<b>AREA (SQM)</b>
2013-14	Dump-1 (Access road) slope	5000
2014-15	Dump-1 (Access road) slope	5200
2015-16	Washing Bay to View Point and common Boundary with IMFA	6350
<b>Total</b>		<b>16550</b>

**[Table-10: Details of Plantation inside ML area]**

<b>DETAILS OF INSIDE ML AREA PLANTATION</b>					
<b>M/s BALASORE ALLOYS LIMITED</b>					
<b>KALIAPANI CHROMITE MINES</b>					
<b>YEAR</b>	<b>LOCATION</b>	<b>AREA (Ha.)</b>	<b>NOS.</b>	<b>SURVIVAL %</b>	<b>SPECIES</b>
2010-11	Dump-1	2	11020	87%	Acacia, Rain tree, Alstonia, C siamia, Pongamia,, Golmohur, Cashew, Teak, Jamun, Mango, Guava, Polyalthia, Thivetia, Citrus, Jackfruit, Albizzia, Neem & Bamboo)
	Inside mines premises (COB, Canteen & weigh bridge)		95	87%	


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2011-12	Dump-3	0.8	1600	87%	C siamia, Pongamia, Albizzia, Bamboo, Sisoo, Teak, Casuarina, T chebula, Babul, Simuli, Bombax, Gmelina, Neem, Acacia, A mangium, Jackfruit, Guava, Citrus, Cashew, Pomegranate, Sapota and Alstonia
	Dump-1	1.2	8375	87%	
2012-13	Dump-3	0.2	250		C siamea, Pongamia, Albizzia, Bamboo, Sisoo, Teak, Jamun, Casuarina, Golmohur, Peltophorum, Alstonia, Neem, Gmelina, Acacia, Mimosups, Mango, Jackfruit, Guava, Citrus, Pomegranate, Sapota, Cashew and A mangium
	Dum-1	1.8	8150		
2013-14	Dump-3, slope	0.8	6882	85%	Peltophorum, Acacia, Albizzia, Pongamia, Tamarind, Almond, Neem and Arjun
	Safety zone, Dump-3	0.5	3018	85%	
	Dump-1 (Access road)	0.7	2085	87%	
2014-15	Dump-1 (Access road) slope and safety zone	1	2565	86%	Peltophorum, Acacia, A mangium, C siamia, Albizzia, Mango, Custard apple, Guava
	Dump-1 (North)	1.25	4000	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Dump-2 slope and safety zone	4	12000	88%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
2015-16	Admin. Office premises & Access road Jindal side from Old washing platform to View point (Dump-1)	1.25	5000	85%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Common boundary with IMFA Area ( Mines Pit )	1	4000	89%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
	Access road Jindal side along with Aloe vera Plantn (Dump-1)	0.3	1200	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Over coirmatting of dump-3, 2nd terrace (mines pit side)	0.1875	750	85%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
	Dump-3(Jindal site Boundary area)	1.2	4800	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun



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	Dump-3 Slope	0.18	750	90%	Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
2016-17	Dump-3 slope	0.2	2000	90%	Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
<b>TOTAL</b>			<b>78540</b>		

**PHOTO-8: SHOWING PLANTATION INSIDE ML AREA**



**PHOTO-9: SHOWING COIR MATTING OVER DUMP SLOPE**



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**PHOTO-10: SHOWING GRASS TURFING OVER DUMP SLOPE**



- xv. **Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data.**

**Status-** Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation are based on the rain fall data. The details of the structures dump wise is given in **Table- 11**. Photo of the same is attached as **Photo- 9 to 10**.

**[Table- 11: Environmental management measures of Over burden Dumps]**

<b>Environmental Measures</b>	<b>Dump-1</b>	<b>Dump-2</b>	<b>Dump-3</b>
Retaining wall	360M×20M×15M	116M×2M×1M	380M×1M×2M, 150M×1M×5M
Garland drain	224 M	116 M	830 M

  
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Coirmatting	8500 Cum	5000 Cum	16500 Cum
Plantation	36190 nos	12000 nos	15750 nos
Grass Turffing	10200 Cum		
Settling Pit	Two nos 90 Cum & 192 Cum		Two nos 972 Cum & 288 Cum

- xvi. **Plantation shall be raised in an area of 36.156 Ha. including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of excavated void to be converted in to water body, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per Ha.**

**Status-** Year wise plantation programme is being undertaken on dump slopes and safety zone area. The details of the plantation year wise is given in **Table- 10. The density of trees planted is around 3000 nos/ha.**

Presently only one quarry is in operation, hence all measures as per the condition will be undertaken at the cessation of the quarry operations..

- xvi. **Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.**

**Status-** Regular water sprinkling is being done by deploying two no 12 KL mobile water tanker in critical areas prone to air pollution and having high levels of SPM & RPM such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed near COB plant to arrest the fugitive dust.

Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conform to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period April to September,2016 is given in **Table-4.**

- xvii. **Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.**

**Status-** Process water in COB plant is completely reused and the treated water from the ETP is used as make-up quantity. However the quantity of water dewatered from mine pit is properly treated through an up graded Effluent Treatment Plant of capacity 445KL/Hr established with the recommendation of IIT, Kharagpur. The treated water has been monitored regularly and meeting the prescribed standards before reuse/discharge. The analysis report of treated water is given in **Table-12.**

Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period at two different station inside ML area with the analysis of the iron concentration in surface run-off.

  
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However channelization of all surface run-off water to ETP for proper treatment is made through settling pit and pumping arrangement. Report of the surface runoff analysis of last monsoon(April-September,2016) given in **Table-2**. The surface run-off management photos and layout is given in **Photo-3** .

**Table-12**  
**ETP ANALYSIS REPORT**  
**KALIAPANI CHROMITE MINES**  
**April to September,2016**

Sl. No.	Period	ETP INLET*		ETP OUTLET*	
		pH	Cr <sup>6+</sup> (mg/L)	pH	Cr <sup>6+</sup> (mg/L)
1	01.04.2016-07.04.2016	7.30-8.60	0.812-5.317	8.09-8.40	0.005-0.019
2	08.04.2016-14.04.2016	7.34-8.62	0.263-5.530	7.98-8.42	0.002-0.016
3	15.04.2016-21.04.2016	7.07-8.09	2.102-7.593	8.06-8.60	0.003-0.018
4	22.04.2016-30.04.2016	7.21-8.23	2.844-8.122	8.04-8.46	0.002-0.017
5	01.05.2016-09.05.2016	7.32-8.55	0.012-4.729	8.20-8.43	0.001-0.008
6	10.05.2016-16.05.2016	7.15-8.52	0.561-4.958	7.09-8.50	0.007-0.039
7	17.05.2016-23.05.2016	6.14-8.42	2.029-4.980	6.41-8.80	0.009-0.039
8	24.05.2016-31.05.2016	6.96-8.03	2.167-4.995	6.97-8.30	0.007-0.035
9	01.06.2016-07.06.2016	6.96-7.98	1.944-4.003	7.42-7.93	0.011-0.025
10	08.06.2016-14.06.2016	6.99-7.98	2.791-4.995	6.94-7.98	0.006-0.033
11	15.06.2016-21.06.2016	7.07-8.19	1.068-4.701	6.88-7.35	0.009-0.020
12	22.06.2016-30.06.2016	7.67-7.97	0.688-2.077	6.84-6.94	0.007-0.013
13	01.07.2016-07.07.2016	7.83-8.27	2.071-3.186	6.24-6.51	0.007-0.016
14	08.07.2016-14.07.2016	7.54-7.83	0.162-0.946	6.19-6.51	0.006-0.015
15	15.07.2016-21.07.2016	6.77-7.84	0.287-4.323	6.00-7.75	0.002-0.031
16	22.07.2016-31.07.2016	6.76-7.78	2.133-4.849	7.19-7.97	0.013-0.035
17	01.08.2016-07.08.2016	6.79-7.97	1.395-4.284	7.36-7.98	0.008-0.038



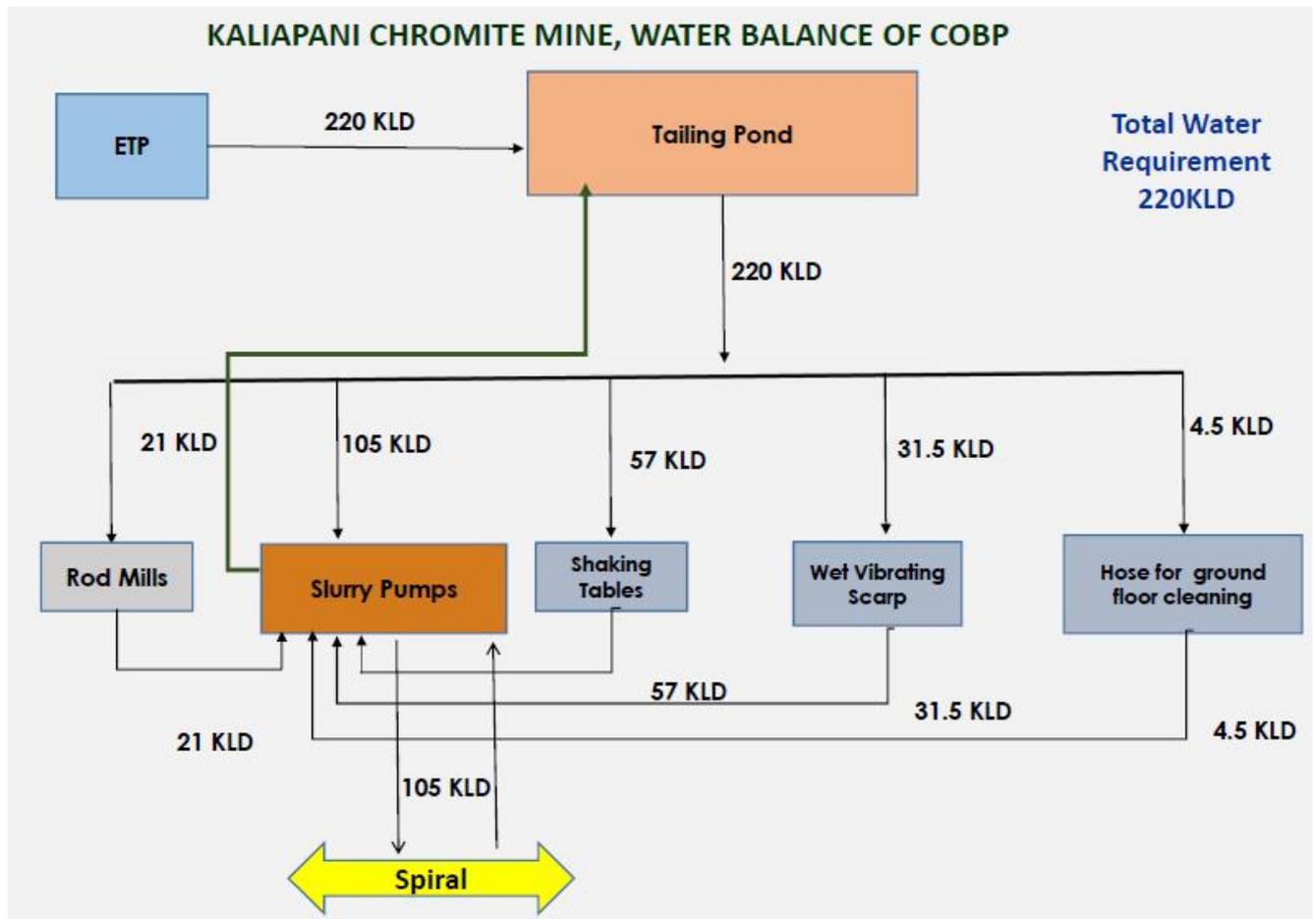
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18	08.08.2016-14.08.2016	7.06-7.97	2.608-4.780	7.04-7.88	0.007-0.034
19	15.08.2016-21.08.2016	6.85-8.03	0.668-4.610	7.57-7.99	0.013-0.032
20	22.08.2016-31.08.2016	6.79-7.88	1.309-3.293	7.51-8.10	0.009-0.040
21	01.09.2016-07.09.2016	7.63-8.22	1.251-2.799	7.92-8.14	0.015-0.030
22	08.09.2016-14.09.2016	7.32-8.24	1.577-3.711	7.59-8.12	0.012-0.026
23	15.09.2016-21.09.2016	7.02-8.11	1.49-3.53	7.86-8.23	0.007-0.039
24	22.09.2016-31.09.2016	6.81-8.08	0.568-2.575	7.9-8.23	0.015-0.032

xviii. The decanted water from the beneficiation plant and slime/tailing pond shall be re circulated within the mine and there shall be zero discharge from the mine.

Status- Total decanted water from the beneficiation plant & tailing/slimes pond is reused in COB plant; hence no discharge of decanted effluents from the same. The water balance of the beneficiation plant is given below.



  
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- xix. **Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.**

**Status-** The flow rate of Damsala Nallah is being regularly monitored and record has maintained. The flow rate in pre-monsoon (April,2016) and Monsoon (Aug,2016) season is given in the **Table-7**.

- xx. **Regular monitoring of water quality, upstream and downstream of natural water bodies shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.**

**Status-** Monitoring of water quality, upstream and downstream of natural water bodies i.e Damsala Nallah is being carried out on quarterly basis and report submitted to Ministry of Environment and Forests & CC Regional Office, Bhubaneswar, Central Ground Water Board & State Pollution Control Board on regular basis. The analysis report of the same is given in **Table-13**.

[Table- 13: Surface water analysis result]

<b>Kaliapani Chromite Mines</b> <b>M/s BALASORE ALLOYS LTD</b> <b>SURFACE WATER QUALITY</b> <b>Period-Pre Monsoon (APRIL 2016)</b> <b>Date of Sampling:12.04.2016</b>						
Sl No.	PARAMETERS	Unit	STANDARDS	Results of Pre monsoon period -		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	Colourless	Colourless	Colourless	Colourless
2	pH	...	5.5-9.0	7.10	7.19	7.57
3	Iron as Fe	mg/l	3	0.52	0.50	0.44
4	Chloride (as Cl)	mg/l	\$	15.7	14.2	15.3
5	Fluoride as F	mg/l	2	0.09	0.05	0.16
6	Total Dissolved Solids	mg/l	\$	83	76	88
7	Total Suspended Solids	mg/l	100	38	52	52
8	Manganese(as Mn)	mg/l	2	0.048	0.035	0.046
9	Sulphates(as SO4)	mg/l	\$	16.1	014.4	14
10	Nitrate(as NO3)	mg/l	1	0.44	0.36	0.42

  
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11	Phenolic Compound as C <sub>6</sub> H <sub>5</sub> OH	mg/l	1	<0.001	<0.001	<0.001
12	Mercury(as Hg)	mg/l	0.01	<0.00001	<0.00001	<0.00001
13	Cadmium(as Cd)	mg/l	2	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr+6)	mg/l	0.1	0.032	0.026	0.030
15	Total Chromium	mg/l	2	0.048	0.052	0.064
16	Selenium(as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic(as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide(as CN)	mg/l	0.2	<0.002	<0.002	<0.002
19	Lead(as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	5	<0.0001	<0.0001	<0.0001
21	Nickel as Ni	mg/l	3	0.44	0.30	0.22
22	Oil & Grease	mg/l	10	ND	ND	ND
23	Free Ammonia (NH <sub>3</sub> )	mg/l	5	0.14	0.12	0.18
24	Coliform Organism	MPN/100ml	\$	142	126	164
25	Bio-Assay Test	.....	90% of survival of fish after 96 hours in 100% effluent	98.00%	98.00%	98.00%
26	Dissolved Oxygen as O <sub>2</sub>	mg/l	\$	5.6	6.2	6.8
27	BOD, 3 days at 27°C	mg/l	30	1.8	2.0	2.6
28	COD	mg/l	250	5.4	6.2	5.6
29	Electrical Conductivity	µmhos/ms	\$	114	120	126
30	Phosphorous as P	mg/l	\$	0.22	0.26	0.30

**Period- Monsoon (August 2016)**

**Date of Sampling: 22.08.2016**

Sl No.	PARAMETERS	Unit	STANDARDS	Results of Monsoon Period		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	300	Colourless	Colourless	Colourless
2	pH	....	6.5-8.5	7.35	7.56	7.88
3	Iron as Fe	mg/l	50	0.40	0.56	0.48
4	Chloride (as Cl)	mg/l	600	16.3	15.4	13.8

  
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5	Fluoride as F	mg/l	1.5	0.08	0.06	0.14
6	Total Dissolved Solids	mg/l	1500	95	89	98
7	Total Suspended Solids	mg/l	.....	56	60	54
8	Manganese(as Mn)	mg/l	.....	0.042	0.036	0.032
9	Sulphates(as SO <sub>4</sub> )	mg/l	400	17.4	13.8	13.2
10	Nitrate(as NO <sub>3</sub> )	mg/l	50	0.43	0.32	0.40
11	Phenolic Compound as C <sub>6</sub> H <sub>5</sub> OH	mg/l	0.005	<0.001	<0.001	<0.001
12	Mercury(as Hg)	mg/l	.....	<0.00001	<0.00001	<0.00001
13	Cadmium(as Cd)	mg/l	0.01	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr+6)	mg/l	0.05	0.038	0.030	0.042
15	Total Chromium	mg/l	.....	0.052	0.064	0.070
16	Selenium(as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic(as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide(as CN)	mg/l	0.05	<0.002	<0.002	<0.002
19	Lead(as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	15	<0.0001	<0.0001	<0.0001
21	Nickel as Ni	mg/l	.....	0.40	0.36	0.22
22	Oil & Grease	mg/l	0.1	ND	ND	ND
23	Free Ammonia (NH <sub>3</sub> )	mg/l	.....	0.18	0.10	0.12
24	Coliform Organism	MPN/100ml	5000	157	138	149
25	Bio-Assay Test	.....	90% of survival of fish after 96 hours in 100% effluent	98.00%	98.00%	98.00%
26	Dissolved Oxygen as O <sub>2</sub>	mg/l	4	6.3	6.6	6.8
27	BOD, 3 days at 27°C	mg/l	3	2.2	2.6	2.4
28	COD	mg/l	.....	5.8	6.6	5.0



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29	Electrical Conductivity	µmhos/ms	.....	142	136	145
30	Phosphorous as P	mg/l	.....	0.26	0.32	0.30

STATION	CODE	CO-ORDINATE	RL
DAMSALA NALLAH NEAR CHIRIGUNIA U/S	SW1	N21 <sup>0</sup> 02'39.1" E85 <sup>0</sup> 46'21.4"	102
DAMSALA NALLAH NEAR CHINGUDIAPALA D/S	SW2	N21 <sup>0</sup> 02'8.8" E85 <sup>0</sup> 44'27.8"	84
NEAR MINE BOUNDARY DISCHARGE	SW3	N21 <sup>0</sup> 02'18.1" E85 <sup>0</sup> 45'33.2"	81

ABBREVIATIONS
SW- SURFACE WATER
U/O- UNOBJECTIONABLE
CL- COLOURLESS
ND- NOT DETECTED
BDL- BELOW DETECTION LIMIT

**xxi. Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.**

**Status-** Rooftop rain water harvesting structure has implemented to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board. Photo of the same is given as **Photo-7**. Another rooftop rain water harvesting structure construction proposal is in progress. The copy of schematic diagram of proposed structure attached as **Annexure-IV**

**xxii. Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.**

**Status-** Periodical maintenance of the vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant is being ensured. Regular monitoring of vehicular emission also being done. For outside trucks carrying mineral from mine to plant are ensured valid Pollution Under Control Certificate. The transporting trucks are being covered with tarpaulin and are allowed to take only the prescribed load i.e. below 10.5 Ton. Sample copy of the PUC certificate of truck carrying material is attached as **Annexure-V & Vehicular emission report given in table -14**. Photographs showing vehicles covered with tarpaulin is given as **Photo-11**.

  
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**Table:-14: Vehicular Emission Result**

Sl.No.	Vehicle No.	Engine Make & Model	CO (%)	HC (ppm)	NOx (%)	Smoke (HSU)
1	OD-04-B-8780	MAN D-0836	0.010	63	25.38	34.56
2	OD-04-B-8779	MAN D-0836	0.016	82	34.21	42.58
3	OD-04-B-8782	MAN D-0836	0.027	56	32.58	55.01
4	OD-04-B-8778	MAN D-0836	0.047	86	39.47	56.55
5	OD-04-B-8784	MAN D-0836	0.066	35	40.52	61.25
6	OD-04-B-8785	MAN D-0836	0.053	42	22.96	44.37
7	OD-04-B-8781	MAN D-0836	0.062	97	32.30	36.21
8	OD-04-B-8783	MAN D-0836	0.081	67	25.57	33.41
9	OD-04-B-8776	MAN D-0836	0.116	112	48.21	56.84
10	OD-04-B-8777	MAN D-0836	0.024	46	23.58	32.12
<b>Standard</b>			3.0	1500	--	65

**PHOTO- 11: SHOWING VEHICLE COVERED WITH TARPAULINE**



**xxiii. Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.**

**Status-** We have no colony within the lease area. However for the treatment of the canteen waste water and organic waste STP of 40 KLD capacity is installed at site .The photo of same is given as Photo 12.

The waste water generated during mining operation is properly treated through an up graded Effluent Treatment Plant of capacity 445 KL/Hr established with the recommendation of IIT, Kharagpur. The

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treated water has been monitored on daily basis and meeting the prescribed standards before reuse/discharge.

Oil and Grease trap has been Installed at discharge of workshop effluents which is working efficiently. Photo of same is given as **Photo-13**.

**Photo-12 Oil & Grease Trap at Service Centre**



**PHOTO-13: SHOWING VEHICLE SERVICING CENTER WITH OIL & GREASE TRAP**



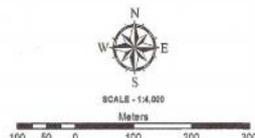
xxiv. Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

  
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Status- Digital processing of the entire lease area using remote sensing technique is carried out for monitoring land use pattern and the report & Map is given below .

AREA STATISTICS		
SL.NO	LAND FEATURE	AREA IN Ha
1	MINING AREA	10.601
2	QUARRY	21.577
4	DUMP	30.047
<b>TOTAL AREA</b>		<b>62.225</b>

DGPS SURVEYED MAP OF KALIAPANI CHROMITE MINES  
OVER AN AREA 153.76 Ac. OR 62.225 Ha.  
M/S BALASORE ALLOYS LTD. UNDER SUKINDA TAHASIL OF JAJPUR DISTRICT , ODISHA



xxv.  
xxvi.



SL.NO	PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
1	DUMP-1	85°48'51.8850"	21°02'01.6374"	371099.130	232617.827
2	DUMP-12	85°48'47.2625"	21°02'08.7684"	371472.643	232606.568
3	DUMP-18	85°48'36.5818"	21°02'13.6571"	371443.551	232610.118
4	DUMP-17	85°48'36.8955"	21°02'16.3709"	371443.551	232616.607
5	DUMP-16	85°48'30.7565"	21°02'16.3709"	371443.551	232630.238
6	DUMP-12	85°48'50.4511"	21°02'01.6374"	371454.854	232630.850
7	DUMP-20	85°48'52.3716"	21°02'03.8087"	371456.318	232632.038
8	DUMP-21	85°48'52.6539"	21°02'03.8087"	371456.318	232645.511
9	DUMP-22	85°48'56.6217"	21°02'03.8087"	371456.318	232648.363
10	DUMP-23	85°48'56.6544"	21°02'03.8087"	371456.318	232650.203
11	DUMP-24	85°48'56.6544"	21°02'03.8087"	371456.318	232652.043
12	DUMP-25	85°48'42.3718"	21°02'07.4891"	371373.131	232627.541
13	DUMP-26	85°48'44.8387"	21°02'07.4891"	371385.079	232626.766
14	DUMP-27	85°48'45.8037"	21°02'07.4891"	371426.395	232628.088
15	DUMP-28	85°48'50.8958"	21°02'06.8794"	371519.857	232630.848
16	DUMP-3	85°48'50.4511"	21°02'03.8087"	371456.318	232612.839
17	DUMP-4	85°48'56.6544"	21°02'03.8087"	371456.318	232610.118
18	DUMP-5	85°48'56.6544"	21°02'03.8087"	371456.318	232616.607
19	DUMP-6	85°48'56.6544"	21°02'03.8087"	371456.318	232623.096
20	DUMP-7	85°48'56.6544"	21°02'03.8087"	371456.318	232629.585
21	DUMP-8	85°48'56.6544"	21°02'03.8087"	371456.318	232636.074
22	DUMP-9	85°48'56.6544"	21°02'03.8087"	371456.318	232642.563
23	DUMP-10	85°48'56.6544"	21°02'03.8087"	371456.318	232649.052
24	DUMP-11	85°48'56.6544"	21°02'03.8087"	371456.318	232655.541
25	DUMP-12	85°48'56.6544"	21°02'03.8087"	371456.318	232662.030
26	DUMP-13	85°48'56.6544"	21°02'03.8087"	371456.318	232668.519
27	DUMP-14	85°48'56.6544"	21°02'03.8087"	371456.318	232675.008
28	DUMP-15	85°48'56.6544"	21°02'03.8087"	371456.318	232681.497
29	DUMP-16	85°48'56.6544"	21°02'03.8087"	371456.318	232687.986
30	DUMP-17	85°48'56.6544"	21°02'03.8087"	371456.318	232694.475
31	DUMP-18	85°48'56.6544"	21°02'03.8087"	371456.318	232700.964
32	DUMP-19	85°48'56.6544"	21°02'03.8087"	371456.318	232707.453
33	DUMP-20	85°48'56.6544"	21°02'03.8087"	371456.318	232713.942
34	DUMP-21	85°48'56.6544"	21°02'03.8087"	371456.318	232720.431
35	DUMP-22	85°48'56.6544"	21°02'03.8087"	371456.318	232726.920
36	DUMP-23	85°48'56.6544"	21°02'03.8087"	371456.318	232733.409
37	DUMP-24	85°48'56.6544"	21°02'03.8087"	371456.318	232739.898
38	DUMP-25	85°48'56.6544"	21°02'03.8087"	371456.318	232746.387
39	DUMP-26	85°48'56.6544"	21°02'03.8087"	371456.318	232752.876
40	DUMP-27	85°48'56.6544"	21°02'03.8087"	371456.318	232759.365
41	DUMP-28	85°48'56.6544"	21°02'03.8087"	371456.318	232765.854
42	DUMP-29	85°48'56.6544"	21°02'03.8087"	371456.318	232772.343
43	DUMP-30	85°48'56.6544"	21°02'03.8087"	371456.318	232778.832
44	DUMP-31	85°48'56.6544"	21°02'03.8087"	371456.318	232785.321
45	DUMP-32	85°48'56.6544"	21°02'03.8087"	371456.318	232791.810
46	DUMP-33	85°48'56.6544"	21°02'03.8087"	371456.318	232798.299
47	DUMP-34	85°48'56.6544"	21°02'03.8087"	371456.318	232804.788
48	DUMP-35	85°48'56.6544"	21°02'03.8087"	371456.318	232811.277
49	DUMP-36	85°48'56.6544"	21°02'03.8087"	371456.318	232817.766
50	DUMP-37	85°48'56.6544"	21°02'03.8087"	371456.318	232824.255
51	DUMP-38	85°48'56.6544"	21°02'03.8087"	371456.318	232830.744
52	DUMP-39	85°48'56.6544"	21°02'03.8087"	371456.318	232837.233
53	DUMP-40	85°48'56.6544"	21°02'03.8087"	371456.318	232843.722
54	DUMP-41	85°48'56.6544"	21°02'03.8087"	371456.318	232850.211
55	DUMP-42	85°48'56.6544"	21°02'03.8087"	371456.318	232856.700
56	DUMP-43	85°48'56.6544"	21°02'03.8087"	371456.318	232863.189

SL.NO	LAND FEATURE	AREA IN Ha
1	MINING AREA	10.601
2	QUARRY	21.577
4	DUMP	30.047
<b>TOTAL AREA</b>		<b>62.225</b>

PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
ML-A	85°49'29.21991"	21°02'05.84880"	370655.080	232658.513
ML-B	85°49'59.48908"	21°01'56.87878"	371247.884	232646.861
ML-C	85°49'57.50958"	21°02'01.48843"	371157.866	232637.874
ML-D	85°49'18.26988"	21°01'53.81428"	372308.266	232552.072
ML-E	85°49'21.27997"	21°01'58.84865"	372452.584	232560.977
ML-F	85°49'28.12122"	21°01'40.88113"	372848.447	232571.711
ML-G	85°49'07.85099"	21°02'11.18513"	372071.506	232674.021
ML-H	85°49'44.10137"	21°01'57.85178"	371582.696	232626.202
ML-I	85°49'35.89543"	21°02'09.84676"	371148.720	232636.980
ML-J	85°49'30.76423"	21°02'03.59987"	370989.089	232644.823
ML-K	85°49'16.72559"	21°01'57.15264"	371119.876	232624.260
ML-L	85°49'44.27818"	21°01'53.82463"	371968.838	232619.334
ML-M	85°49'50.36169"	21°01'57.18734"	371963.024	232624.523
ML-N	85°49'02.78547"	21°01'53.22480"	371821.043	232612.902
ML-O	85°49'08.86678"	21°01'47.87376"	372288.816	232697.598
ML-P	85°48'11.70296"	21°01'46.50376"	372175.431	232678.685
ML-Q	85°49'24.57373"	21°01'46.09328"	372548.313	232668.765
ML-R	85°49'19.72559"	21°01'54.79843"	372361.748	232616.778
ML-S	85°49'13.62611"	21°02'02.19142"	372222.850	232647.234
ML-T	85°49'53.17987"	21°02'02.81402"	371846.002	232619.800
ML-U	85°49'41.72163"	21°02'01.19669"	371314.826	232637.703

Boys 16/10/15  
16/10/15  
REVENUE INSPECTOR  
KANKADIPAL

Mrs. Tahasildar  
SUKINDA  
Forest  
Ranol Section

Joint Forest Officer  
Balasore  
District Forest Officer  
Cuttack Forest Division

LEGEND	DESCRIPTION
●	ML-PILLAR
○	DUMP
□	ML BOUNDARY
■	DUMP AREA
▨	QUARRY

DGPS SURVEY CONDUCTED BY

**AKASH**

DIGITAL CARTOGRAPHY AND SERVICES (DCS) PVT.LTD  
1015, Bhubaneswar, Odisha  
GGP Canal Road, Ravalpurk, Bhubaneswar-751025

**MINES MANAGER**  
**KALIAPANI CHROMITE MINES**  
**BALASORE ALLOYS LTD.**

xxvii. Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.

**Status-** Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained. The details of IME & PME is given in **Table-15**.

[Table-18: Details of IME & PME status]

KALIAPANI CHROMITE MINES,M/S BALASORE ALLOYS LIMITED					
DETAILS OF IME /PME CARRIED OUT DURING 2016-17					
COMPANY NAME	M POWER	IME DONE	PME DONE	IME DUE	PME DUE
BAL	190	98	76	10	6
SUKANTA NAYAK	33	33	0	0	0
G.C.MOHANTA	245	161	33	1	50
BISWAJIT NAYAK	21	21	0	0	0
S.B. TRIPATHY	1	1	0	0	0
CREDESCENCE	323	226	97	0	0
<b>TOTAL</b>	<b>813</b>	<b>540</b>	<b>206</b>	<b>11</b>	<b>56</b>

xxviii. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife Conservation Plan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

**Status-** Site Specific Wildlife Conservation Plan has been prepared and approved by PCCF(WL) & Chief Wild Life warden ,Odisha Vide Memo 8478/1WL(C)-SSP-425/2014 Dated 7<sup>th</sup> Nove-2014. Copy of same is attached as **Annexure- VI**.

In addition to that a sum of Rs 27,71,909/- was deposited towards payment for implementation of Regional Wildlife Management Plan. Acknowledgement regarding the same is given in **Annexure VII**.

xxix. A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

**Status-** Final Mine Closure Plan will be submitted to the ministry 5 years before the anticipated final mine closure.

xxx. The project proponent shall undertake all the commitments made during the public hearing and effectively address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.

  
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**Status-** All the commitments made during public hearing are being undertaken by incorporating in the CSR activities. There was expenditure of Rs 67.60 lakh incurred during 2015-16 toward various activities under CSR . The photos of the same is shown as **photo-14**.

**Photo-14 (Photos Showing CSR Activities)**



**distribution of blankets**



**inauguration of drinking water project**



**celebration of Birsha jayanti**



**distribution of saplings**



*[Signature]*  
**MINES MANAGER**  
**KALIAPANI CHROMITE MINES**  
**BALASORE ALLOYS LTD.**

## General Conditions & their Status:

- i. **No change in Chrome Ore Processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.**

**Status-** Chrome ore Mining method practiced in the project is both opencast & underground fully mechanized. There is/will be no change in Chrome Ore Processing/Beneficiation technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.

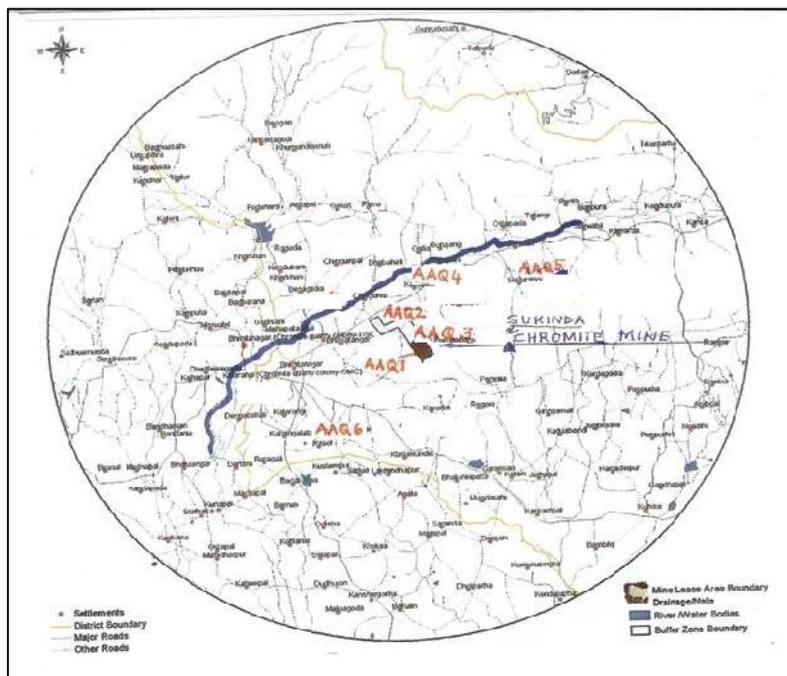
- ii. **No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste should be made.**

**Status-** No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste shall be made.

- iii. **At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.**

**Status-** Air quality monitoring for the parameters viz PM10, PM2.5, SO<sub>2</sub>, NO<sub>x</sub>, CO, NH<sub>3</sub> & O<sub>3</sub> are being done by establishing 6 ambient air monitoring stations on the basis of meteorological data, topographical features after consultation with SPCB in the core & Buffer zone. The data so recorded is being regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months. The monitoring data for the period April to September, 2016 is given in **Table-4**.

Location showing AAQ monitoring stations shown given below



  
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- iv. Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.

**Status-** Maintenance of all HeMM are being carried out on regular basis to suppress the Noise generation. Regular monitoring is being carried out for noise level in the work environment. Ear plugs / muffs are provided to all workers engaged in operations of HEMM etc. Noise level monitoring results are given below in **Table 16**.

Photographs showing use of PPEs are given as **Photo-15**.

**KALIAPANI CHROMITE MINES, M/s BALASORE ALLOYS LTD**  
**Noise Level Monitoring Report**

Sl No	Location	Station Code	Apr 16		May 16		June 16		Jul 16		Aug 16		Sept 16	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
<b>Buffer Zone Ambient Noise (Results in dBA) Norm : Day-55, Night-45</b>														
1	Mines Office	ANL 1	47.8	31.8	46.2	32.1	46	32	47.1	31.7	45.6	30.8	45.1	31.4
2	Village Kaliapani	ANL 2	50	32	49.1	33	49.3	33.3	47.9	31.9	48.9	31.4	48.9	31.8
3	Village Sukrangi	ANL 3	45.3	31.8	45.2	30.9	45.3	31.2	46.0	31.3	47.3	32.0	47.2	31.9
4	Village Ransol	ANL 4	45.6	30.9	44.5	30.2	44.7	31.4	48.5	32.9	45.4	33.0	45.1	32.1
5	Village Tisco Hutting	ANL 5	47.7	32.8	48.5	32.9	49.5	33	48.4	32.7	48.1	33.9	48.4	33.7
<b>Core-Zone Work zone (Results in dBA) Norm:Day:75, Night:70</b>														
1	O/C Quarry	WNL 1	65.8	60.1	32.1	61.8	63.8	61.6	64.9	64.3	63.5	61.8	63.7	61.9
2	Dumper Operation	WNL 2	68.1	61.9	33	66.4	65.9	65.2	68.8	66.0	66.1	65.6	66.3	64.3
3	Loader Operation	WNL 3	70.4	67.9	30.9	67.9	69.9	67.8	70.6	66.9	71.0	67.5	70.9	66.5
4	DG Set	WNL 4	70.9	67.7	30.2	65.2	68.9	66.6	68.7	64.8	68.9	65.3	68.4	65.1
5	Electric Pump	WNL 5	64.2	59.8	32.9	64.7	67.1	65.2	69.1	67.3	68.0	64.3	67.7	63.6
6	Loading Point	WNL 6	71.9	67.9	68.9	63.9	70.2	67.4	70.9	67.0	70.6	63.9	71.1	63.7
7	COB Plant	WNL 7	66.7	61.7	66.3	63	68.3	62.7	69.0	65.3	67.3	63.3	67.1	63.3

  
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**Photo-16: SHOWING WORKERS WORKING WITH PPE**



- v. **There will be zero waste water discharge from the plant.**

**Status-** Total decanted water from the beneficiation plant & tailing/slime pond is reused in COB plant; hence there is zero waste water discharge from the plant.

- vi. **Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.**

**Status-** Personal protective equipments are being provided to all workers respective to the nature of the job. Initial and periodical awareness training is being imparted to all workers in the Company's Vocational Training Centre located within the lease area on Safety and Health Aspects. Periodical health check up as per DGMS guideline is being carried out for all employees .

- vii. **Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.**

**Status-** Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained for corrective measures.

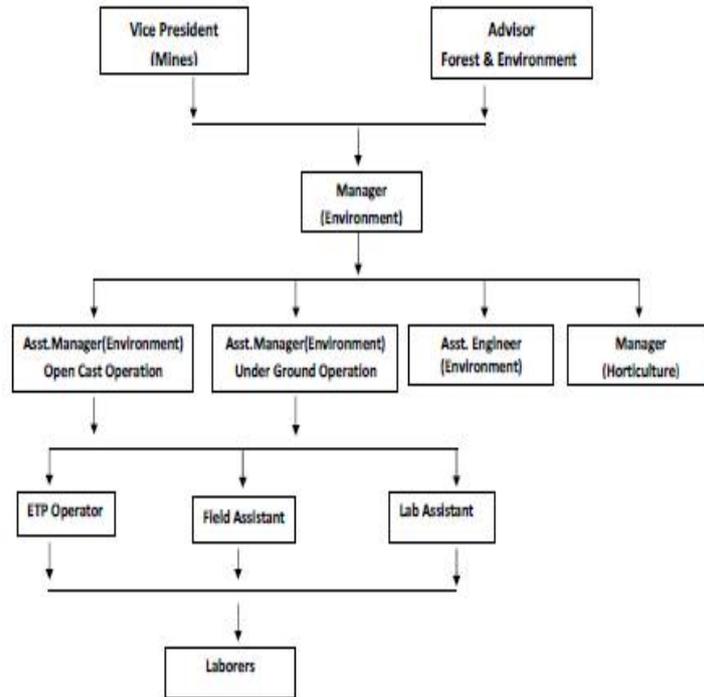
- viii. **A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.**

**Status-** A separate Environment management cell under the control of President (Mines) has been set up. Organizational Chart of Environmental Management Cell is given below.

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**KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.**

## Organization chart showing Environment Management Cell



- ix. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.

**Status-** Separate funds is being earmarked for environmental protection measures. Year wise Expenditure also been reported to Regional Office, MoEF,BBSR. The detail of the expenditure is given in Table-17.

[Table-17: Expenditure on EMP]

<b>Kaliapani Chromite Mines/s Balasore Alloys Ltd</b>			
<b>Details of Expenditure Made Towards Protection of Environment(Rupees in Lakh)</b>			
Sl No	Activity	Sub-Activities	April.16 to September,2016
1	Protection Measures for Airr Pollution	Fixed type water sprinklers installation/maintenance	0.15
		Dry-fog system installation / maintenance	0.10
		Expenditure towards deployment of water tankers for water sprinkling including recurring expenditure	10.00
2	Dump Management	Construction /Maintenance of check dams, garlanding drain& Retaining wall,etc	8.0

  
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		Coirmatting	0.5
		Grass turffing	3.0
3	Plantation	Inside ML area Plantation(Dump slope, Safety zone incl maintenance)	7.0
		Out ML area plantation(Avenue & Block)	6.0
4	Protective Measures for Water Pollution	ETP Operation and Maintenance(incl Chemical Cost)	20.6
		Surface Run Off Management	2.0
5	Training & Awareness	Training	0.15
		Awareness	0.2
6	Occupational Health & Hygiene	IME/PME	1.20
		Drinking Water facility	2.0
		Medicine/First aid	1.2
8	Environmental Monitoring	Water,Air,Soil, Noise	6.5
		Maintenance of Equipment	0.5
9	Other Expenses	Statutory Payment	2.5
Total			71.6

- x. **The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.**

**Status-** This is an ongoing project since Sept' 2000.

- xi. **The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data / information/monitoring reports.**

**Status-** We are abide by the condition and shall extend full cooperation to the officer(s) of regional office by furnishing the requisite data / information/monitoring reports during their monitoring of compliance of the stipulated conditions.

- xii. **The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall**

  
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KALIAPANI CHROMITE MINES  
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update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.

**Status-** Six monthly compliance report is being submitted on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The status of compliance of the environmental clearance conditions, including results of monitored data is uploaded on company website periodically. The submission details of the six monthly compliance is given in **Table-18**.

[Table-18: The status of six monthly EC compliance submissions]

Period	Letter no.	Date of submission
Oct,2015 to March,2016	BAL/Mines/141	30.05.2016
April,2015 to September,2015	BAL/Mines/387	1.12.2015
October 2014 to March 2015	BAL/MINES/2376	28.05.2015
April 2014 to September 2014	BAL/MINES/1825	29.11.2014
October 2013 to March 2014	BAL/MINES/161	28.05.2014
April 2013 to September 2013	BAL/MINES/394	30.11.2013
October 2012 to March 2013	BAL/MINES/202	14.05.2013
April 2012 to September 2012	BAL/MINES/459	19.11.2012
October 2011 to March 2012	BAL/MINES/198	29.05.2012
April 2011 to September 2011	BAL/MINES/394	18.11.2011
October 2010 to March 2011	BAL/MINES/168	16.05.2011
April 2010 to September 2010	BAL/MINES/358	03.11.2010
October 2009 to March 2010	BAL/MINES/166	25.05.2010
April 2009 to September 2009	BAL/MINES/362	29.10.2009
October 2008 to March 2009	BAL/MINES/134	05.05.2009
April 2008 to September 2008	BAL/MINES/275	19.11.2008

- xiii. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

**Status-** Copy of the clearance letter has been sent to concerned Panchayat. The clearance letter also been uploaded on the website of the Company. The copy of letter to panchayat is attached as **Annexure-VI**. The URL for the same is [http://www.balasurealloys.com/webpage.php?title=Environment+Policy&p\\_type=1&parent=36&cat\\_id=78](http://www.balasurealloys.com/webpage.php?title=Environment+Policy&p_type=1&parent=36&cat_id=78). The screenshot of the company website showing the clearance letter is given below as **Figure- 12**.

  
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xiv. The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.

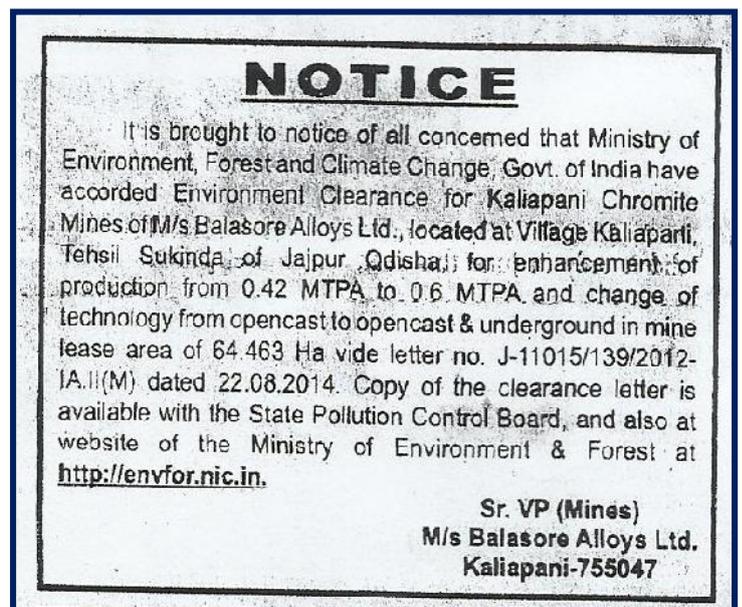
Status- Agreed.

xv. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.

Status- The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V is being submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, also uploaded on the website of the company along with the status of compliance of environmental clearance conditions and also sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail. The copy of the last environmental statement for financial year ending 31<sup>st</sup> March 2015-16 is attached as **Annexure- VIII**.

xvi. The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue 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 also at web site of the Ministry of Environment and Forests at <http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.

Status- The clearance letter informing that the project has been accorded environmental clearance is advertised in "The Sambad" (Odia daily) & The Pioneer (English daily) newspaper, the copy of which is shown below.



  
MINES MANAGER  
KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.

## ANNEXURE-I: NOC FOR GROUND WATER WITHDRAWAL



Member Secretary

भारत सरकार  
केन्द्रीय भूमि जल प्राधिकरण  
जल संसाधन मंत्रालय

Government of India  
Central Ground Water Authority  
Ministry of Water Resources

CGWA/IND/Proj/2013-1408

No.21-4(44)/SER/CGWA/2008- 1845

Dated:-

10 OCT 2013

M/s Balasore Alloys Ltd.,  
Kaliapani Chromite Mine  
At/Po Kalipani  
District Jajpur-755047, Odisha

**Sub: - NOC for ground water withdrawal by M/s Balasore Alloys Ltd., in respect of their Kaliapani Chromite Mine located at Village Kalipani, Block & Tehsil Sukinda, District Jajpur, Odisha – reg.**

Refer to your letter dated 28.5.2013 on the above cited subject. Based on recommendations of Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar vide their office letter no. 5-22/SER/CGWA/2013-758 dated 13.8.2013 & 12.9.2013 and further deliberations on the subject, the NOC of Central Ground Water Authority is hereby accorded to **M/s Balasore Alloys Ltd., in respect of their Kaliapani Chromite Mine located at Village Kalipani, Block & Tehsil Sukinda, District Jajpur, Odisha.** The NOC is, however subject to the following conditions:-

1. The firm may withdraw 294.2 m<sup>3</sup>/day water for mine dewatering due to intersection of water table by mining activity through suitable ground water withdrawal structures under intimation to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar. Firm is also permitted to withdraw 53 m<sup>3</sup>/day for industrial & domestic use through existing one (1) & proposed one (1) borewell (to be kept as standby) and no additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA. Thus, the total withdrawal allowed is **347.2 m<sup>3</sup>/day (not exceeding 1,26,728 m<sup>3</sup>/year)**.
2. The wells to be fitted with water meter by the firm at its own cost and monitoring of ground water abstraction to be undertaken accordingly on regular basis, at least once in a month. The ground water quality to be monitored twice in a year during pre monsoon and post monsoon periods.
3. **M/s Balasore Alloys Ltd.**, shall, in consultation with the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar implement ground water recharge measures to the tune of **15,000 m<sup>3</sup>/year** as proposed for augmenting the ground water resources of the area.
4. The photographs of the recharge structures after completion of the same are to be furnished immediately to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for verification and under intimation to this office.

West Block - 2, Wing - 3, Sector - 1, R.K. Puram, New Delhi - 110066

Tel : 011-26175362, 26175373, 26175379 • Fax : 011-26175369

Website : www.cgwb.gov.in, www.mowr.gov.in

स्वच्छ सुरक्षित जल - सुन्दर खुशहाल कल

CONSERVE WATER - SAVE LIFE

MINES MANAGER

KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.

**ANNEXURE-II: CONSENT TO ESTABLISH FROM SPCB, ODISHA**



BY REGD POST

OFFICE OF THE  
STATE POLLUTION CONTROL BOARD, ODISHA  
Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII,  
Bhubaneswar - 751 012

No. 18196/

IND-II-NOC-5723

Date 08-10-13

**OFFICE MEMORANDUM**

In consideration of the application for obtaining Consent to Establish for **Kaliapani Chromite Mines of M/s Balasore Alloys Ltd.**, the State Pollution Control Board has been pleased to convey its Consent to Establish under section 25 of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 for enhancement of production capacity of Chrome ore from 0.42 MTPA to 0.6 MTPA and Change of mining from opencast to underground mining, over mining lease hold area of 64.463 ha., At – Kaliapani, Sukinda in the district of Jajpur with the following conditions.

**GENERAL CONDITIONS:-**

1. This consent to establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this consent to establish order. If the proponent fails to commence mining activities for the proposal within five years then a renewal of this consent to establish shall be sought by the proponent.
2. Adequate effluent treatment facilities are to be provided such that the quality of sewage and trade effluent satisfies the standards as prescribed under Environment Protection Rule, 1986 or as prescribed by the Central Pollution Control Board and/or State Pollution Control Board or otherwise stipulated in the special conditions.
3. All emission from the mining activities as well as the ambient air quality and noise shall conform to the standards as laid down under Environment (Protection) Act, 1986 or as prescribed by Central Pollution Control Board/State Pollution Control Board or otherwise stipulated in the special conditions.
4. Appropriate method of disposal of solid waste is to be adopted to avoid environmental pollution.
5. The mine shall comply to the provisions of Environment Protection Act, 1986 and the rules made there under with their amendments from time to time such as the Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2008, Hazardous Chemical Rules /Manufacture, Storage and Import of Hazardous Chemical

**MINES MANAGER  
KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.**

# ANNEXURE-III COPY OF CONSENT TO OPERATE



CONSENT ORDER  
KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Page 1 of 12

BY REGD. POST WITH AD

## STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012  
Phone-2561909, Fax: 2562872, 2568955 E-mail: garibeshi@ospboard.org, Website: www.ospboard.org

### CONSENT ORDER

No. 15393 / IND-I-CON-2576 Dt. 20-10-2016

CONSENT ORDER NO. 1239

Sub: Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.

Ref: Your online application No. 432290 dated 11.12.2015 and your letter No. BAL/2016/3819 Dated 01.10.2016.

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Name of the Occupier & Designation: SRI BACHCHAN KUMAR, SR. VICE PRESIDENT (MINE)

Address: AT/PO: KALIAPANI, DIST: JAJPUR

This consent order is valid for the period up to 31.12.2016

*This consent order supersedes the earlier consent order issued vide letter No. 14777 dated 01.10.2016*

#### Details of Products Manufactured

Sl. No	Product	Quantity
01.	Chrome ore(ROM)	0.6 MTPA

#### Details of Mineral Handling/Processing Plants

01.	COB Plant of capacity	1x20 TPH
-----	-----------------------	----------

This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

  
MINES MANAGER

KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.

**ANNEXURE-V COPY OF PUC CERTIFICATE**

1370

**COMPUTERISED EMISSION TEST CERTIFICATE**  
 Authorised By : Transport Dept, Govt. of Orissa  
 [ See Rule 119-A (B) (B) of O.M.V. Rules, 1993 ]  
**NAYAK POLLUTION TESTING CENTER**  
 SINGUDA, CHANDIKHOLE, DIST-JAIPUR ORISSA  
 Licence No-S.T.A./C.T.C./Poll/03/2004

**Vehicle Pass Certificate**

HSU/Freq	85
HSU/Avn	12.0
PucNo	28494
Reg. No	OR09E 0423
Reg Year	2004
Make	TATA
Model	1613
Veh Type	TRUCK
Fuel	DIESEL
Test Date	10/May/2016
Test Time	02:57:40 PM
Valid Till	10-Nov-2016
Owner Name	SANATAN ROUT

This Vehicle meets the Emission Standards Prescribed by Rule 115(2) of Central motor Vehicle Rules, 1980 and accordingly The Certificate is valid for Six months.

**TEST RESULTS:**

Flushing Cycle					
Avg.	RPM Min.	RPM Max.	Temp.		
	799	2245	78		
S.No.	RPM Min.	RPM Max.	Km <sup>-1</sup>	HSU%	Temp.
1	745	2145	0.20	8.97%	
2	777	2150	0.20	9.07%	
3	745	2195	0.20	8.97%	
4	769	2001	0.21	8.97%	
Mean	Pass		0.13	12.0	

Time on the Date on: 10/05/2016



TUSHAR KANTA NAYAK

Tested by  
  
 Signature with Seal  


-11462

**COMPUTERISED EMISSION TEST CERTIFICATE**  
 AUTHORIZED BY :  
**MAA CHANDI POLLUTION TESTING CENTRE**  
 KALIAPANI, JAIPUR, ODISHA

ID Number : OR09S063  
 Year Of Registration : 1995  
 Vehicle Registration No : OR09A-0331  
 Speedometer Reading (Kms) : 0  
 Engine Number : 1151  
 Chassis Number : 3359  
 Vehicle color : RED  
 Vehicle Make : TATA  
 Vehicle Model : TATA-1612-TC  
 Type Of Vehicle : GVN Test Station Code : 123  
 Test Result : Free Acceleration

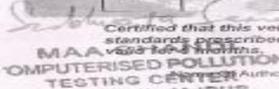
Licence No. : STA-CTC-POLL-05/2014  
 Date : 14-MAY-2016  
 Time : 07:00AM  
 Owner : B MAHANTA  
 Driver : J

Fuel : Diesel  
 Simk cell Temp : 58.0  
 Oil Temp : 105.0  
 Valid Up To : 13-NOV-2016  
 Grade : A  
 Validity 6 Months

No. of R	Kval	Min Rpm	Max Rpm	Interval	Oil Temp	Test Time
1	0.15	1780	1780	2.8	62.0	09:23:34
2	0.15	1970	1750	2.8	62.0	09:23:45
3	0.15	1900	1850	2.8	62.0	09:23:55
4	0.15	1800	1610	2.8	62.0	09:24:00
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
K_Avg	0.15	-	-	-	-	-
HSU	6.24	-	-	-	-	-

Certified that this vehicle's K-Mean and HSU% value conform to the standards prescribed under Rule-115(2) of CMV Rules 1980. This certificate is valid for 6 months.

MAA CHANDI POLLUTION TESTING CENTRE  
 KALIAPANI, JAIPUR, ODISHA

Authorized Signatory With Signature  
  
 Seal of Testing Centre

**MINES MANAGER**  
**KALIAPANI CHROMITE MINES**  
**BALASORE ALLOYS LTD.**

**ANNEXURE-VI: APPROVAL LETTER OF SITE SPECIFIC WILDLIFE CONSERVATION PLAN**

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)  
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5<sup>TH</sup> FLOOR,  
PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BHUBANESWAR-12  
Ph. No.0674-2564587, FAX No.0674-2565062  
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. 8175 71 WL(C)SSP-425/2014  
Dated, Bhubaneswar, the 7<sup>th</sup> Nov, 2014

To  
The Principal Chief Conservator of Forests, Odisha,  
Bhubaneswar

**Sub: Site specific Wildlife Conservation Plan in respect of Kaliapani Chromite Mines of M/s Balasore Alloys Ltd. in Jajpur District under Cuttack Forest Division**

It is to inform you that M/s Balasore Alloys Ltd. has to implement a site specific wildlife conservation plan for its Kaliapani Chromite Mine in Jajpur District, Odisha in compliance to the General condition No.(iii) stipulated in the Environment Clearance granted by Govt. of India, MoEF vide their letter No.J-11015/341/2006-IA.II(M) dt 3.7.2007.

2. The Site Specific Wildlife Conservation Plan in respect of the above project in Cuttack Forest Division has been approved by the undersigned with financial forecast of **₹254.18 lakh** (Rupees two crore fifty-four lakh eighteen thousand) only for the following activities.

- |   |                     |
|---|---------------------|
| (i) For activities to be implemented in project area by the User Agency in Cuttack Division | ₹64.82 lakh         |
| (ii) For activities to be implemented by DFO, Cuttack Division in project impact area       | ₹189.36 lakh        |
| <b>Grand Total:</b>   | <b>₹254.18 lakh</b> |

3. Various activities in the lease hold area will be executed by the Project proponent under the guidance of the Divisional Forest Officer, Cuttack Divn. A sum of ₹189.36 lakh only may be deposited in the CAMPA fund meant for the purpose for implementation of various activities within the project impact area by the Forest Deptt. as envisaged in the plan.

4. The User Agency may be advised to note the following conditions for future compliance.

- This Plan may be revisited after 5 years and the User Agency will give undertaking to contribute towards the revised cost of the conservation plan till the project period, if any.
- The project proponent has to prepare and submit the Conservation Plan for the next 10 years of their lease period (balance period for which forest land remains diverted) at least one year before the expiry of the present Conservation Plan and deposit the outlay amount upon its approval. In case of delay, the project operation will be automatically stopped.

**Encl: 2 copies of approved site specific WL Conservation Plan**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

P T O

**MINES MANAGER  
KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.**

**ANNEXURE-VI:ACKNOWLEDGEMENT FROM DFO FOR PAYMENT FOR REGIONAL WILD LIFE MANAGEMENT PLAN**

**OFFICE OF THE DIVISIONAL FOREST OFFICER: CUTTACK FOREST DIVISION  
GHATAKULA: NUAPARA: CUTTACK**

Memo 7581 /SF (Misc.)  
Dated, Cuttack, the 2<sup>ND</sup> September 2013

To  
The Addl.Chief Conservator of Forests,  
Forest Diversion and Nodal Officer, FC Act,  
O/O-the Pr. Chief Conservator of Forests,  
Odisha Bhubaneswar.

Sub: Implementation of Wildlife Management Plan in the Mining area  
at Project cost.

X-Sub: Payment of cost of Wildlife Management Plan in respect of lease  
for Chromite Mines of M/S Ispat Alloys now renamed as  
M/S Balasore Alloys Ltd.

Ref: Letter No.10F (Cons)-81/2004-6495/F&E Dt.23.03.2008 of Govt.  
of Orissa Forest & Environment Department & your office memo  
no.8664 Dt.02.05.2008.

As per the instruction contained in the above memo, the User Agency, M/S Balasore Alloys Ltd. Dist. - Jajpur was asked to submit the cost of Wildlife Management Plan to make payment towards cost of Wildlife Management Plan over 64.463 ha. (64.743 ha. mentioned in the demand notice which is a typographical error) of M.L area in respect of Kaliapani Chromite Mines. Accordingly the User Agency has deposited the cost of Wildlife Management Plan through RTGS in favour of "Compensatory Afforestation Fund (CAF)-Orissa. Account No. C.A-25222 in Corporation Bank, Lodhi Road, New Delhi amounting to Rs. 1289260 /- (Rupees twelve lakh eighty nine thousand two hundred sixty) only" and the copy of the receipt is sent herewith for favour of kind information and necessary action.

Encl: As above

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION

Memo No. \_\_\_\_\_ /Dt.

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul for favour of kind information and necessary action.

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION

Memo No. 7581 /Dt. 02-9-13

Copy forwarded to the Vice -President (Mines), M/S Balasore Alloys Pvt. Ltd., 199, Forest Park, Bhubaneswar for information and necessary action with reference to his letter No.BAL/MINES/716/2013 Dt.16.08.2013.

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION

  
MINES MANAGER

**KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.**

ANNEXURE-VII: ENVIRONMENT STATEMENT SUBMITTED FOR THE YEAR 2015-16

**BALASORE ALLOYS LIMITED**



Ref No: BAL/Mines/241

Dated: 27.9.2016

The Member Secretary,  
State Pollution Control Board  
Paribudh Bhawan, A/118  
Nilakantha Nagar Unit-VIII  
Bhubaneswar -751012

Sub: Submission of Environmental Statement in Form-V with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd for the financial year 2015-16.

Ref: *Consent to Operate Vide No No: 4712/IND\_1-CON-2576 dated 17.3.2016 Consent Order No. 1239*

Dear Sir,

Please find enclosed herewith the Environmental Statement in Form - V for the financial year 2015-16 with respect to our Kaliapani Chromite Mines, M/S Balasore Alloys Ltd, Kaliapani, Jajpur for your kind perusal.

Thanking you with regards

Yours faithfully  
For M/s Balasore Alloys Ltd

Amarnath Dhar  
Mines Manager

Encl: As above

Copy to: The Regional Officer, Kalinganagar, OSPCB.



Received  
27-09-2016



Kaliapani Chromite Mines, Kaliapani, Jajpur, Odisha - 755 047, India, Phone No: (06726) 268298 \* Fax No: (06726) 268520  
Email: [sukinda\\_mines@balasorealloys.com](mailto:sukinda_mines@balasorealloys.com); [emines@yafico.com](mailto:emines@yafico.com) \* Website: [www.balasorealloys.com](http://www.balasorealloys.com)  
CIN - L27101 OR1 1984PLC 001354

**MINES MANAGER**

**KALIAPANI CHROMITE MINES  
BALASORE ALLOYS LTD.**