Name of the Project : Ostapal Chromite Mines, Project Code: MINE(Non-Coal)

Clearance Letter No. with date : No. J-11015/183/2007-IA-II(M) dt.13-05-09

Period of Compliance Report : April 2016 to September 2016

Specific Condition :

Sl. No.	Condition	Compliance Status
1	All the conditions stipulated by the State Pollution control Board, in their Consent to establish should be effectively implemented.	All the stipulated conditions are being effectively implemented.
2	Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 4.07 ha forest land shall be obtained before starting mining operation in that area. Till such time mining activities shall be restricted to an area of 64.354 ha for which in principle forestry clearance has been obtained from the Ministry on 03.10.2005	This area is left as Safety Zone area for greenbelt around periphery of forest land of M.L. area and mining operations in this area will not be done.
3	Top soil should be stacked properly with proper slope at earmarked site(s) with adequate measures and should be used for reclamation and rehabilitation of mined out area.	No top soil has been generated during the period April,2016 to September, 2016 where as till 31.03.2016 54,168M^3 of top soil had been generated and total quantity of top soil has already been utilized for filling in plantation pits and spreading over plantation area. As the quarry area is active, there is no scope of reclamation and rehabilitation of mined out area during the period of April,2016 to September, 2016.
4	Over burden shall be stacked at earmarked dump site(s) only and should not be kept active for long period. The total height of the dump(s) should not exceed 45m in three stages of 15 m each, keeping overall slope of the dumps below 28^0. The proponent shall carry out slope stability study and submit report to the Ministry. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be taken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.	The OB is being dumped at earmarked sites only. The OB dump is not kept active for long period. The present height of the dump is 41m with overall slope 25^0. In future also the overall slope will be maintained below 28 degrees. The inactive benches are being vegetated by suitable native species and massive grass plantation to prevent erosion & surface runoff. The management of the rehabilitated areas of the dumps have been continuing until the vegetation becomes self sustaining.

5	Trace Metals such as Ni, Co, As, and Hg should be analyzed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards then with prior approval of MOEF this specific monitoring could be discontinued.	Collection and analysis of dust & soil samples were continued since summer 2002 and the results of the same is being submitted to MOEF regularly. The results of summer and monsoon is enclosed in Annexure-1. There is no standards for Ni, Co, As and Hg for dust fall and soil samples.
6	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, plantation etc. The drains should be regularly de-silted and maintained properly. Garland drain (siz e, gradient and length) shall be constructed for both mine pit & waste dump and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall / super cyclone period. A separate storm water sump for this purpose should be created.	Catch drains around OB dumps and mineral stockyard have already been constructed with siltation ponds at regular intervals to arrest silt and sediments. Whenever required the silts and sediments are being cleaned from catch drains and siltation ponds and maintained regularly. Mine pumped out water is sufficient for dust suppression and plantation purposes. Hence catch drain water is discharging outside ML area through upgraded ETP. Hence there is no need for collection of water from catch drains from mine area, roads, plantation etc.. Garland drains of width 2m, depth 1.5m and length 4250m with gradient have been constructed for maximum discharge of rainfall in the adjoining areas. There is no chance of flow of storm water into the effluent treatment plant during high rain fall/super cyclone period became the plant is at high reduced level (RL). Hence storm water return system is not required.
7	Dimensions of retaining wall at the toe of OB dumps & benches within the mine to check run-off and siltation should be based on the rainfall data.	Retaining wall of width 1.5m and height 1.2m has already been constructed all around the toe of dumps upto a length of 2710m to check the run-off and siltation.
8	Effluents containing of Cr^{+6} shall be treated to meet the prescribed standards before reuse/discharge. Effluent Treatment plant should be provided for treatment of mine water discharge and wastewater generated from the workshop and mineral separation plant. Run off from OB dumps and other surface run off should be analysed for Cr^{+6} and in case its concentration is found higher than the permissible limit the water should be treated before reuse/discharge.	An Effluent Treatment Plant has been commissioned for treatment of Mines discharge water. The conc. of Cr^{+6} in treated discharge water is <0.005 mg/l. The tailing water (waste water of mineral separation plant) also is being treated by adding $FeSO_4$ before discharge into tailing pond. The treated tailing pond water is being collected in a intake pond and being re-used in beneficiation plant. Thus zero discharge from Beneficiation Plant is being maintained.

		Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. of vehicles. The major repairing of these vehicles are being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil. The total surface runoff water is being collected in two settling pits which is pumped to the ETP for treatment before final discharge.
9	Separate impervious concrete pits for disposal of sludge shall be provided for the safe disposal of sludge generated from the mining operations.	The sludge generated from mining operations contains chrome ore. It is being fed in Beneficiation Plant to separate the Chrome.
10	The Project proponent shall ensure that the quality of decanted effluents from the tailing pond conform to the prescribed standards before discharge.	The effluents from tailing pond are not discharged outside. The supernated water of the tailing pond is being collected in a sump adjacent to the tailing pond and re-circulated in Beneficiation Plant
11	The Project proponent shall explore the possibility to reduce concentration of Cr^{+6} in the tailing pond in consultation with an Expert Scientific Institution like NEERI.	The Conc. of Cr^{+6} in tailings is being reduced by adding $FeSO_4$ solution and disposed in the tailing pond.
12	Plantation shall be raised in an area of 33.02 Ha including green belt in an area of 6.56 Ha by planting native species around ML area, OB dumps, roads around worked out area etc. in consultation with local DFO/ Agriculture Department. The density of the trees should be around 2000 plant species per hectare.	Plantation has been done over inactive benches of OB dumps, Road side, around C.O.B Plant and inside the colony in an area of 25.21 Ha. out of proposed 33.02Ha. Plantation is being carried out in consultation with local Forest Department.
13	Regular monitoring of ground water level & quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground Water Board.	Monitoring of ground water level & quality is being carried out in 6 Nos. of existing wells (2 Nos. bore wells in Core Zone & 2 Nos. open wells & 2 Nos. of tube well in Buffer Zone.) and 3 Nos. of piezometer holes have been constructed inside the Mine. One bore well near Tarini Temple of the Ostapal Mines inside the Core Zone and 2 Nos. of tube wells (one is inside of the Shiva Temple of Gurujanga and other is outside of the Shiva Temple) are in Buffer Zone. Above three wells are in network system. The monitoring data for the period from April,2016 to September, 2016 is given in **Annexure-2 to 11.**

14	The project proponent shall carry out regular monitoring of ground water quality in all the 14 wells. The frequency of monitoring in 8 wells where concentration of Cr^{+6} is within permissible limits, will be quarterly while in the remaining 6 wells it will be on monthly basis.	The monitored results of ground water quality in 9 Bore wells are enclosed in **Annexure-12**. Other 5 Nos. of Bore wells have been damaged due to quarry expansion.
15	Project Authorities should meet water requirement of the peripheral village(s), especially, if the village wells go dry due to mine de-watering.	It is established by our ground water level monitoring that the water level of nearby village wells (Ostia, Gurujanga & Ostapal) has not gone dry even during summer seasons. However as a part of peripheral development the Project Authority has constructed Bore wells at nearby villages and also potable water is being provided to nearby villages by water tankers.
16	Permission from the competent authority should be obtained for drawal of ground water for domestic use.	Permission obtained from Central Ground Water Authority, Ministry of Water Resources, New Delhi vide letter no.21-4(13)/SER/CGWA/2007-1460 dated 6.12.2007 and the same has been submitted to Eastern Regional Office of M.O.E.F., Bhubaneswar.
17	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, CGWB.	Rain water has been collected in different pits for suitable rain water harvesting measures.
18	Drills should be wet operated or operated with dust extractors.	Drilling operation is being carried out with dust extractors.
19	Blasting operation should be carried out only during the day time. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting operation is being carried out in day time only. Controlled blasting is being practiced by following nonel & muffle blasting. Delay detonators are used for providing delay timings between rows and within rows of holes. Numbers of rows in a blast are restricted to less than three to get good fragmentation and to reduce flyrocks and ground vibration.
20	The voids created at the end of mining shall be converted into water Body with shallow depths not exceeding 30m. The higher benches of the excavated void/mine pit shall be terraced and plantation done to stabilise the slopes. Peripheral fencing shall be done along the excavated area.	The same will be implemented at the end of mining operation.
21	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining	Vehicular emission of all machinery used in mining operations are being monitored regularly and kept under control of rigorous maintenance of all

	operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be over loaded.	engines and changing of lubricants as per the recommendation of the manufacturer. Which HEMMs have valid PUC Certificate are only allowed for operation inside the Mines. All the transporting vehicles are being covered with tarpaulin and over loading is strictly avoided.
22	Consent to operate should be obtained from SPCB before enhancing Production capacity of the mine.	Consent to operate has been obtained from SPCB, Bhubaneswar before enhancing production capacity of the mine.
23	Sewage treatment Plant should be installed for the colony. ETP should also be provided for workshop and waste water generated from Mining operations.	There is no colony inside the ML area. Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. of vehicles. The major repairing of these vehicles are being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil. An ETP has already established for treatment of mines water.
24	A final mines closure plan along with details of corpus fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	The same will be submitted in due time to MOEF for approval

GENERAL CONDITIONS:

Sl. No.	Condition	Compliance Status
1	No change in mining technology & scope of working should be made without prior approval of the Ministry of Environment & Forests.	The Mining technology & scope of working has not been changed.
2	No change in the calendar plan including excavation, quantum of mineral Chromite and waste should be made.	The calendar plan including excavation, quantum of mineral Chromite and waste over burden has not been changed. The calendar plan including excavation, quantum of mineral chromite and waste over burden has been generated during the period (April, 2016 to September, 2016) is given in **Annexure-13**.
3	*Conservation measures for protection of flora & fauna in the Core & Buffer Zone should be drawn up in consultation with local forest & wild life department.*	As per the advise of Forest Department, we are maintaining vehicles, watchman and infrastructural facility as measures to protect Flora & Fauna in core & buffer zone.
4	*Four ambient air quality-monitoring stations should be established in the Core zone as well as in the Buffer zone for RPM, SPM, SO_2 & NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.*	Ambient Air quality monitoring stations has already been established in consultation with SPCB.
5	*Data on ambient Air Quality (RPM, SPM, SO_2 & NO_x) should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.*	Data's on Ambient Air Quality monitoring with respect PM_{10}, $PM_{2.5}$, SO_2, NO_x & CO for the period April,2016 to September, 2016 is enclosed in **Annexure – 14A & 14B**. The copy of the same has been submitted to the Ministry and SPCB, Bhubaneswar. In future also the same will be continued.
6	*Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading & unloading and at transfer points should be provided and properly maintained.*	Control of fugitive dust emissions is being carried out by water spraying on haul roads, loading and unloading points and Ore handling yard regularly. The monitored results of the same are enclosed in **Annexure – 15**.
7	Measures should be taken for control of noise levels below 85 dB(A) in work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	Control measures such as maintenance of all machines including checking of silencers regularly, controlled blasting using delay detonators, installing immovable machinery on foundations

		with suitable rubber pad and closed rooms is being followed-up. The workers engaged at noise generating areas are allowed to work on rotation basis with providing ear plugs/muffs. The present noise level of work environment is below 72 dB(A). Location wise noise level at work environment is enclosed in **Annexure – 16**.
8	*Industrial waste water (workshop & waste water from the Mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil & grease trap should be installed before discharge of workshop effluents*.	The Mines waste water is being pumped out directly in to the intake tank of the ETP for treatment of Cr^{+6} and part of the treated water is used in our COB Plant, Plantation, dust suppression and surplus treated water is finally discharged to outside ML area. The analysis of this water shows that all parameters are well within the prescribed limit. The analysis report of Mines final discharge water after treatment in E.T.P., for the period from April,2016 to September, 2016 is enclosed in **Annexure -17**. Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. of vehicles. The major repairing of these vehicles are being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil.
9	*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.* *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.*	In addition to water spraying to suppress dust generation, workers engaged in dusty areas such as drillers, dumper drivers, HEMM Operators are being provided with nose masks as a precautionary measure. Training & information on safety, health hazards are being given to all categories of deserved workers. Occupational health surveillance programme of all categories of workers and employees are being conducted periodically by lung function test, audiometry test, vision tests and other tests. The defects workers/employees are advised for suitable treatment or engaged on suitable rotation duty
10	*A separate Environment 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.*	A separate Environment Management Cell with qualified personnel and well equipped Environment Engineering Laboratory are functioning since 1989 under the control of Senior Executive.

11	*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.*	The final approval of the Project is 06.12.2006. It is a mining industry. Hence, land development work is continuous process.
12	*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.*	Separate funds provision is made to carryout environmental protection measures. Details of expenses during the year 2015-16 and proposed budgeted amount for the year 2016-17 are given in **Annexure -18**.

ANNEXURE-1

SOIL AND DUSTFALL SAMPLE ANALYSIS REPORT

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

1-SOIL SAMPLE Unit : Mg/Kg(PPM)

Sl. No.	L O C A T I O N	S E A S O N	PARA METERS			
			Ni	Co	As	Hg
1	Soil sample from eastern side of the lease hold area	Summer	108	<0.05	<0.01	<0.01
		Monsoon	115	<0.05	<0.01	<0.01
2	Soil sample from western side of the lease hold area	Summer	73	<0.05	<0.01	<0.01
		Monsoon	70	<0.05	<0.01	<0.01
3	Soil sample from Northern side of the lease hold area	Summer	196	<0.05	<0.01	<0.01
		Monsoon	190	<0.05	<0.01	<0.01
4	Soil sample from Southern side of the lease hold area	Summer	92	<0.05	<0.01	<0.01
		Monsoon	95	<0.05	<0.01	<0.01

2- DUST FALL SAMPLE :

Sl. No.	L O C A T I O N	S E A S O N	PARA METERS			
			Ni	Co	As	Hg
1	Dust fall sample from Roof top of the Type –I Building	Summer	<0.05	<0.05	<0.01	<0.01
		Monsoon	<0.05	<0.05	<0.01	<0.01

ANNEXURE -2

MONITORING DETAILS OF GROUND WATER LEVEL FROM SURFACE

PROJECT : OSTAPAL CHROMITE MINES

PERIOD : APRIL, 2016 TO SEPTEMBER, 2016

SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

Sl. No.	L O C A T I O N	Collar RL(Mtr)	Depth of the Well/Hole (Mtr)	APRIL.,2016 In mtr.	AUG.,2016 In mtr.	Quality of Water enclosed as Annexure
I	**TUBE WELL**					
1	Near 2R Qrts, OCM	135	45.0	16.25	8.16	3
2	Bore well near main gate of OCM	135	50.0	16.38	8.58	4
3	Near Ostia Village (Open Well)	135	10.0	9.24	6.70	5
4	Near Ostapal Village(Open well)	152	15.0	13.84	5.45	6
5	Tube well inside the Shiva Temple of Village Gurujanga	132	50	13.78	5.54	7
6	Tube well outside of the Shiva Temple of Village Gurujanga	132	45	13.66	5.35	8
II	**PIEZO METER HOLES**					
1	Eastern side of the quarry, (PZ-1)	126	15.00	10.62	0.26	9
2	Southern side of the quarry, (PZ-2)	112	16.00	4.04	2.22	10
3	Western side of the quarry, (PZ-3)	117	18.00	11.06	9.50	11

ANNEXURE - 3

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES

LOCATION : 2-R COLONY BORE WELL WATER

PERIOD : APRIL, 2016 TO SEPTEMBER, 2016

SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	151	153
06.	pH value	6.5 – 8.5	7.8	7.9
07.	Total hardness ($CaCo_3$)mg/l	300	173	169
08.	Calcium (Ca)mg/l	75	28.7	29.2
09.	Magnesium(Mg),mg/l	30	23.22	23.84
10.	Iron (Fe)mg/l	0.3	0.028	0.024
11.	Chlorides(Cl)mg/l	250	35	37
12.	Sulphates(SO_4)mg/l	150	5.40	5.73
13.	Nitrates(NO_3) mg/l	45	5.88	5.97
14.	Anionic detergent (MBAS) mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 4

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION: BOREWELL NEAR TARINI TEMPLE OF THE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	155	123
06.	p^H value	6.5 – 8.5	7.9	7.6
07.	Total hardness ($CaCo_3$)mg/l	300	177	142
08.	Calcium (Ca)mg/l	75	33	25.80
09.	Magnesium(Mg),mg/l	30	23.05	18.25
10.	Iron (Fe)mg/l	0.3	0.029	0.03
11.	Chlorides(Cl)mg/l	250	39	26
12.	Sulphates (SO_4)mg/l	150	4.63	3.06
13.	Nitrates(NO_3) mg/l	45	6.29	4.88
14.	Anionic detergents (MBAS)mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 5

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : OPEN WELL WATER FROM VILLAGE OSTIA
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	142	151
06.	pH value	6.5 – 8.5	7.8	7.9
07.	Total hardness ($CaCo_3$)mg/l	300	174	181
08.	Calcium (Ca)mg/l	75	28.8	26.2
09.	Magnesium(Mg),mg/l	30	24.05	25.41
10.	Iron (Fe)mg/l	0.3	0.024	0.026
11.	Chlorides(Cl)mg/l	250	34	36
12.	Sulphates(SO_4)mg/l	150	5.40	4.90
13.	Nitrates(NO_3) mg/l	45	5.78	5.88
14.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 6

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : OPENWELL WATER OF VILLAGE OSTAPAL
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	140	144
06.	pH value	6.5 – 8.5	7.8	7.9
07.	Total hardness ($CaCo_3$)mg/l	300	157	160
08.	Calcium (Ca)mg/l	75	22.1	28.2
09.	Magnesium(Mg),mg/l	30	21.12	23.59
10.	Iron (Fe)mg/l	0.3	0.026	0.029
11.	Chlorides(Cl)mg/l	250	33	35
12.	Sulphates(SO_4)mg/l	150	4.26	4.52
13.	Nitrates(NO_3) mg/l	45	5.36	5.41
14.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 7

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : TUBE WELL INSIDE THE SHIVA TEMPLE OF VILLAGE GURUJANGA
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	147	122
06.	pH value	6.5 – 8.5	7.8	7.6
07.	Total hardness ($CaCo_3$)mg/l	300	159	126
08.	Calcium (Ca)mg/l	75	27.18	22.54
09.	Magnesium(Mg),mg/l	30	21.62	16.68
10.	Iron (Fe)mg/l	0.3	0.026	0.02
11.	Chlorides(Cl)mg/l	250	29	23
12.	Sulphates(SO_4)mg/l	150	4.72	3.04
13.	Nitrates(NO_3) mg/l	45	5.96	4.48
14.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 8

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : TUBE WELL OUTSIDE OF THE SHIVA TEMPLE OF VILLAGE GURUJANGA
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016

SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	145	119
06.	pH value	6.5 – 8.5	7.6	7.5
07.	Total hardness ($CaCo_3$)mg/l	300	164	126
08.	Calcium (Ca)mg/l	75	27.51	21.46
09.	Magnesium(Mg),mg/l	30	22.36	16.92
10.	Iron (Fe)mg/l	0.3	0.024	0.02
11.	Chlorides(Cl)mg/l	250	33	22
12.	Sulphates(SO_4)mg/l	150	4.58	3.04
13.	Nitrates(NO_3) mg/l	45	5.84	4.44
14.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
15.	Residual Chlorine(Cl) Mg/l	0.2		
16.	Coliform organisms MPN/100ml	Absent		
17.	Copper (Cu) mg/l	0.05	All are below detection limit	
18.	Manganese(Mn)mg/l	0.1		
19.	Fluorides(F)mg/l	0.6 – 1.2		
20.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
21.	Mercury (Hg) mg/l	0.001		
22.	Cadmium (Cd) mg/l	0.01		
23.	Selenium(Se)mg/l	0.01		
24.	Arsenic (As)mg/l	0.05		
25.	Cyanide (CN) mg/l	0.05		
26.	Lead (Pb) mg/l	0.1		
27.	Hexavalent Chromium (Cr^{+6})mg/l	0.05		
28.	Zinc (Zn) mg/l	5.0		
29	Mineral oil mg/l	0.01		

ANNEXURE - 9

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES

LOCATION : PIEZOMETER HOLE (EASTERN SIDE OF THE QUARRY AT 126 RL)

PERIOD : APRIL, 2016 TO SEPTEMBER, 2016

SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	145	118
06.	pH value	6.5 – 8.5	7.9	7.6
07.	Total hardness ($CaCo_3$)mg/l	300	158	136
08.	Calcium (Ca)mg/l	75	27.68	23.36
09.	Magnesium(Mg),mg/l	30	21.76	18.14
10.	Iron (Fe)mg/l	0.3	0.025	0.024
11.	Chlorides(Cl)mg/l	250	33	24
12.	Sulphates(SO_4)mg/l	150	4.75	3.29
13.	Nitrates(NO_3) mg/l	45	4.45	4.26
14.	Hexavalent Chromium (Cr^{+6}), mg/l	0.05	0.15	0.11
15.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
16.	Residual Chlorine(Cl) Mg/l	0.2		
17.	Coliform organisms MPN/100ml	Absent		
18.	Copper (Cu) mg/l	0.05	All are below detection limit	
19.	Manganese(Mn)mg/l	0.1		
20.	Fluorides(F)mg/l	0.6 – 1.2		
21.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
22.	Mercury (Hg) mg/l	0.001		
23.	Cadmium (Cd) mg/l	0.01		
24.	Selenium(Se)mg/l	0.01		
25.	Arsenic (As)mg/l	0.05		
26.	Cyanide (CN) mg/l	0.05		
27.	Lead (Pb) mg/l	0.1		
28.	Zinc (Zn) mg/l	5.0		
29.	Mineral oil mg/l	0.01		

ANNEXURE - 10

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : PIEZOMETER HOLE (SOUTHERN SIDE OF THE QUARRY AT 112RL)
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	148	119
06.	pH value	6.5 – 8.5	7.9	7.6
07.	Total hardness ($CaCo_3$)mg/l	300	174	132
08.	Calcium (Ca)mg/l	75	28.74	23.21
09.	Magnesium(Mg),mg/l	30	24.04	17.30
10.	Iron (Fe)mg/l	0.3	0.03	0.026
11.	Chloride(Cl)mg/l	250	36	24
12.	Sulphate(SO_4)mg/l	150	4.76	3.22
13.	Nitrates(NO_3) mg/l	45	5.46	4.26
14.	Hexavalent Chromium (Cr^{+6})mg/l	0.05	0.16	0.12
15.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
16.	Residual Chlorine(Cl) Mg/l	0.2		
17.	Coliform organisms MPN/100ml	Absent		
18.	Copper (Cu) mg/l	0.1	All are below detection limit	
19.	Manganese(Mn)mg/l	0.6 – 1.2		
20.	Fluorides(F)mg/l	0.001		
21.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
22.	Mercury (Hg) mg/l	0.01		
23.	Cadmium (Cd) mg/l	0.01		
24.	Selenium(Se)mg/l	0.05		
25.	Arsenic (As)mg/l	0.05		
26.	Cyanide (CN) mg/l	0.1		
27.	Lead (Pb) mg/l	0.05		
28.	Zinc (Zn) mg/l	0.01		
29	Mineral oil mg/l	0.01		

ANNEXURE - 11

GROUND WATER ANALYSIS REPORT AS PER IS-10500

PROJECT : OSTAPAL CHROMITE MINES
LOCATION : PIEZOMETER HOLE (WESTERNSIDE OF THE QUARRY AT 117RL)
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-10500	RESULTS	
			II Season April-June	III Season July -Sept.
01.	Colour	10	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Taste	Agreeable	Agreeable	Agreeable
04.	Turbidity	10	Transparent	Transparent
05.	Dissolved solids, mg/l	500	153	121
06.	pH value	6.5 – 8.5	7.7	7.5
07.	Total hardness ($CaCo_3$)mg/l	300	173	144
08.	Calcium (Ca)mg/l	75	29.94	24.34
09.	Magnesium(Mg),mg/l	30	23.34	19.52
10.	Iron (Fe)mg/l	0.3	0.029	0.03
11.	Chloride(Cl)mg/l	250	37	26
3.80	4.15	150	4.82	3.34
13.	Nitrates(NO_3) mg/l	45	5.66	5.13
14.	Hexavalent Chromium (Cr^{+6})mg/l	0.05	0.11	0.13
15.	Anionic detergents (MBAS) mg/l	0.2	All are absent	
16.	Residual Chlorine(Cl) Mg/l	Absent		
17.	Coliform organisms MPN/100ml	0.05	All are below detection limit	
18.	Copper (Cu) mg/l	0.1		
19.	Manganese(Mn)mg/l	0.6 – 1.2		
20.	Fluorides(F)mg/l	0.001		
21.	Phenolic Compounds (C_6H_5OH) mg/l	0.001		
22.	Mercury (Hg) mg/l	0.01		
23.	Cadmium (Cd) mg/l	0.01		
24.	Selenium(Se)mg/l	0.05		
25.	Arsenic (As)mg/l	0.05		
26.	Cyanide (CN) mg/l	0.1		
27.	Lead (Pb) mg/l	0.05		
28.	Zinc (Zn) mg/l	0.01		
29.	Mineral oil mg/l	0.01		

ANNEXURE -12

MONITORING OF GROUND WATER QUALITY (Cr^{+6}) IN 9 BORE HOLES AROUND TAILING POND

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY : ENVIRONMENTAL ENGINEERING LABORATORY – FACOR

1) GROUND WATER QUALITY OF 5 BOREHOLES WHERE Cr^{+6} CONCENTRATION IS WITHIN PERMISSIBLE LIMIT

HOLE No.	Location w.r.t. Tailing Pond/Collar RL (Mtr)	Distance from Tailing Pond (Mtr.)	CONCENTRATION OF Cr^{+6} IN mg/l	
			II Season April-June	III Season July -Sept.
T1	SW/135	30	<0.005	<0.005
T2	SW/136	40	<0.005	<0.005
T3	E/139	10	0.07	0.01
T12	E/140	30	<0.005	<0.005
T14	S/136	30	<0.005	<0.005

2) GROUND WATER QUALITY OF 4 BORE HOLES WHERE Cr^{+6} CONCENTRATION IS BEYOND PERMISSIBLE LIMIT:

HOLE No.	Location w.r.t. Tailing Pond/Collar RL (Mtr)	Distance from Tailing Pond (Mtr)	CONCENTRATION OF Cr^{+6} IN mg/l					
			April'16	May'16	June'16	July'16	Aug.'16	Sept.'16
T4	E/140	05	0.14	0.16	0.13	0.12	0.09	0.05
T8	S/136	20	0.16	0.14	0.14	0.10	0.10	0.06
T9	E/140	20	0.17	0.13	0.12	0.10	0.09	0.07
T13	S/136	10	0.14	0.16	0.17	0.12	0.12	0.09

ANNEXURE – 13

CALENDAR PLAN INCLUDING EXCAVATION, QUANTUM OF MINERAL CHROMITE AND WASTE GENERATED DURING THE PERIOD FROM APRIL, 2016 TO SEPTEMBER, 2016 IN OUR OSTAPAL CHROMITE MINES

SL. NO.	MATERIALS	CALENDER PLAN PER ANNUM	QUANTITY GENERATED DURING THE PERIOD FROM APRIL, 2016 TO SEPTEMBER, 2016
01.	CHROME ORE	1.0 LAKH TONNES	55,939.179 TONNES
02.	WASTE OVER BURDEN	4.8 LAKH M^3	92,486 M^3

ANNEXURE-14A

AIR QUALITY (CORE ZONE)

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

UNIT-µg/M^3

Sl.No.	S T A T I O N	PARAMETERS	II Season April-June	III Season July -Sept.	NAAQ STD
1.	Near Type-II Quarters	PM_{10}	37.18	35.81	100
		$PM_{2.5}$	16.32	16.43	60
		SO_2	4.26	4.19	80
		NOx	10.05	10.85	80
		CO	<1000	<1000	2000
2.	Near Weighbridge	PM_{10}	42.63	40.72	100
		$PM_{2.5}$	17.30	18.43	60
		SO_2	4.95	5.10	80
		NOx	11.20	12.11	80
		CO	<1000	<1000	2000
3.	Middle of the Opencast Quarry	PM_{10}	63.42	38.61	100
		$PM_{2.5}$	24.71	23.89	60
		SO_2	5.99	6.22	80
		NOx	13.71	12.44	80
		CO	<1000	<1000	2000
4.	Middle of the COB Plant	PM_{10}	52.21	50.52	100
		$PM_{2.5}$	19.20	20.12	60
		SO_2	4.31	5.09	80
		NOx	11.32	10.44	80
		CO	<1000	<1000	2000

FREQUENCY: i) For residential area twice in a week 24 hourly continuous for a month of a season
ii) For Industrial area/work environment twice in a week 8 hourly continuous for a month of a Season.

ANNEXURE-14B

AIR QUALITY (BUFFER ZONE)

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED B Y: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

UNIT-µg/M^3

Sl.No.	S T A T I O N S	PARAME-TERS	II Season April-June	III Season July -Sept.	NAAQ STD.
1.	VILLAGE – OSTIA	PM_{10}	32.18	34.58	100
		$PM_{2.5}$	11.91	12.32	60
		SO_2	2.42	2.84	80
		NOx	5.13	5.91	80
		CO	<1000	<1000	2000
2.	VILLAGE – OSTAPAL	PM_{10}	36.21	37.62	100
		$PM_{2.5}$	13.12	12.48	60
		SO_2	2.91	3.21	80
		NOx	6.91	5.92	80
		CO	<1000	<1000	2000
3.	KALIAPANI TOWNSHIP	PM_{10}	48.12	46.31	100
		$PM_{2.5}$	17.30	17.94	60
		SO_2	5.72	6.12	80
		NOx	10.81	11.23	80
		CO	<1000	<1000	2000
4.	VILLAGE KOIPOSI	PM_{10}	49.81	50.28	100
		$PM_{2.5}$	19.10	18.34	60
		SO_2	6.05	7.28	80
		NOx	11.95	11.09	80
		CO	<1000	<1000	2000

FREQUENCY: For residential area twice in a week 24 hourly continuous for a month of a season.

ANNEXURE – 15

FUGITIVE DUST EMISSION DATA

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016

SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

UNIT-µg/M^3

Sl. No.	Stations	Season	PARAMETERS	
			PM_{10}	$PM_{2.5}$
1.	Mines Ore Plot Area	II	59.12	22.34
		III	24.34	9.84
2.	COB Plant area	II	53.28	19.03
		III	19.10	8.94
3.	Near Loading point	II	58.86	22.04
		III	59.64	22.12

ANNEXURE – 16

SOUND PRESSURE LEVEL MEASUREMENT
(WORK ENVIRONMENT)

PROJECT : OSTAPAL CHROMITE MINES
PERIOD : APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

UNIT : dB(A)

Sl.No.	Area / Location	Position	Measured Noise Level	
			II Season April-June	III Season July -Sept.
1.	Opencast quarry	Middle of the Manual working face	46.50	47.2
2.	Workshop & Garage	Middle	68.8	69.3
3.	COB Plant Area	Middle	75.0	75.6

ANNEXURE- 17

EFFLUENT WATER ANALYSIS REPORT AS PER IS-2490 &MOEF GUIDELINE 19.05.93

PROJECT : OSTAPAL CHROMITE MINE
STATION : MINES FINAL DISCHARGE WATER AFTER TREATMENT IN ETP
PERIOD APRIL, 2016 TO SEPTEMBER, 2016
SURVEY CONDUCTED BY: ENVIRONMENTAL ENGINEERING LABORATORY, FACOR

SL. NO.	CHARACTERISTICS	Limit as Per IS-2490 & MOEF Guideline	R E S U L T	
			II Season April-June	III Season July -Sept.
01.	Colour	-	Colourless	Colourless
02.	Odour	Unobjectionable	Unobjectionable	Unobjectionable
03.	Suspended solids mg/l	100	16	16
04.	Particle size of suspended solids	Shall pass 850 micron IS sieve	100% passed	100% passed
05.	pH Value	5.0 – 9.0	7.5	7.6
06.	Total residual chlorine(Cl)mg/l	1.0	Absent	Absent
07.	Ammonical Nitrogen(N) mg/l	50	1.3	1.2
08.	Total Kjeldahl Nitrogen(N)mg/l	100	5.5	4.3
09.	BOD(O_2)mg/l(3 days at 27^{o}C)	30	1.3	1.2
10.	COD (O_2) mg/l	250	5.8	5.0
11.	Total Chromium(Cr)mg/l	2.0	0.43	0.52
12.	Nitrate Nitrogen(N)mg/l	10	1.43	1.19
13.	Iron (Fe) mg/l	3.0	1.73	1.39
14.	Bio-Assay Test	90% survival of fish in 100% effluent after 96 hrs.	100% survived	100% survived
16.	Oil & grease mg/l	10	All are below detection limit	
16.	Free Ammonia(NH_3)mg/l	5		
17.	Arsenic(As)mg/l	0.2		
18.	Mercury(Hg),mg/l	0.01		
19.	Lead(Pb)mg/l	0.1		
20.	Cadmium(Cd),mg/l	2.0		
21.	Hex. Chromium(Cr^{+6})mg/l	0.1		
22.	Copper(Cu)mg/l	3.0		
23.	Zinc (Zn),mg/l	5.0		
24.	Selenium(Se)mg/l	0.05		
25.	Nickel mg/l	3.0		
26.	Cyanide (CN)mg/l	0.2		
27.	Fluorides(F) mg/l	2.0		
28.	Dissolved Phosphate(P)mg/l	5.0		
29.	Sulphide(S) mg/l	2.0		
30.	Phenolic compounds (C_6H_5OH),mg/l	1.0		
31.	Manganese(Mn),mg/l	2.0		
32.	Vanadium(V) mg/l	0.2		

ANNEXURE - 18

DETAILS OF EXPENSES FOR ENVIRONMENT PROTECTION MEASURES DURING THE YEAR 2016-16 AND PROPOSED BUDGETED AMOUNT FOR THE YEAR 2016-17

PROJECT : OSTAPAL CHROMITE MINE

Sl. No.	I T E M	Expenses during the Year 2016-16 (in Rs.)	Proposed budgeted amount for the year 2016-17 (in Rs.)
01	**AFFORESTATION**		
a	Seedlings @ Rs.40/- each	3,00,000	83,200
b	Fertilizer/Insecticide/Cow-dung	1,80,000	1,04,000
c	Digging of Pits/Planting	2,40,000	1,04,,000
d	Post Plantation care (Watering, Watching & Weeding etc.)	7,80,000	3,18,240
	Sub-Total	**16,00,000**	**6,09,000**
02	**WATER MANAGEMENT & TREATMENT**		
a	Drains/Settling ponds management	1,75,000	2,00,000
b	Sewage management	60,000	70,000
c	ETP Operation & Maintenance (including costs of chemical & Manpower)	13,97,000	14,00,000
d	Water sample analysis	2,58,000	2,60,000
	Sub-Total	**18,90,000**	**19,30,000**
03	**DUST SUPRESSION & AIR MONITORING**		
a	Water spraying at dust generating points by 4 Nos. of water tanker around 205 days in a year @ Rs.350/- per trip costing 10 trips per day (10 x 360 x 205)	7,38,000	7,50,000
b	Air monitoring charges @ Rs.1600/- per sample for 320 samples in a year.	5,16,000	5,25,000
c	Noise level measurement	37,000	40,000
	Sub-Total	**12,90,000**	**13,16,000**
	Grand Total	**46,80,900**	**42,00,000**