

**NUASAH CHROMITE MINES**  
**M/S INDIAN METALS & FERRO ALLOYS LTD**

**Conditions of MoEF**, Govt. of India, New Delhi vide MoEF Letter No - J-11015/4/2003-IA.II (M), Dated 9<sup>th</sup> July 2004 issued with Environmental Clearance with reference to NUASAH CHROMITE MINES of M/s IMFA and **the Status of compliance** for same for the period from October'2011 to March' 2012

SI No	Specific Conditions	Status
(i)	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.	There is no top soil generated from Underground mines and the availability of top soil is not expected from Underground mine. However, the top soil is being procured from outside for fruitful utilisation of plantation purpose.
(ii)	Two external OB dumps exist OB should be stacked at earmarked dump site(s) only. The total height of the dump (s) should not exceeds 10-15 m keeping maximum overall slope of not more than 28 <sup>o</sup> .	This has already been complied as per the condition and there is no plan for future dumping of OB.
(iii)	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 season. If concentrations of these metals are found below the standards then with prior approval of MOEF this specific monitoring could be discontinued.	The trace metals such as Ni, Co, As & Hg are analysed in dust fall and soil samples for one year during Summer, Post-Monsoon, & Winter season. Analysis results have already been sent to MoEF, New Delhi vide our office letter No.NCM/12/ 411 dated 10.04.2012 & No.NCM/12/432 dated 17.04.2012.
(iv)	<p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediments flows from soil, OB and mineral dumps. The drains should be regularly de-silted and maintained properly</p> <p>Garland drains (size, gradient &amp; length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provided adequate retention period to allow proper settling of silt material.</p> <p>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.</p>	<p>The catch water drains (garland drains) and siltation sumps of appropriate sizes has already been constructed with a length of 350 mtrs to arrest silt and sediment flow from soil and ore stack yard. Periodical cleaning &amp; proper maintenance of these drains are being carried out for de-siltation.</p> <p>To avoid heavy rush of water due to sudden rainfall or maximum discharge of water in the area adjoining the mines site, the garland drains have been designed to cater at least 50% more water. Sumps have been constructed so as to allow adequate retention period for water facilitating, proper settling of silt materials.</p>

(v)	Dimension of retaining wall at the tow of OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.	The OB dump inside the mine has already been utilised for back filling of old opencast workout quarries. A sump has been constructed at worked out area of opencast quarry for de-watering after proper settling of silt materials during rainy season.
(vi)	Ground water abstraction for domestic use should not exceeds 96.17m <sup>3</sup> / day. Balance water requirement (3215 m <sup>3</sup> /day) of the project should be met only from the mine pit water.	Water for domestic use including losses and other water requirement of the project is being made from Bore Wells and Underground mine respectively limiting within the approved limit.
(vii)	A green belt of adequate width should be raised by planting the native species around ML area. Plantation should also be carried out along roads. OB dump sites etc. in consultation with the local DFO/Agriculture Department raising the total area under afforestation to 24.858 ha. The density of the trees should be around 2500 plants per ha.	Plantation on road side, safety zone and reclamation area is being done in consultation with local D.F.O./Agricultural department and shall be continued in the reclamation area in future. Efforts shall be made to maintain the density of the trees around 2500 plants per ha. The following table shows the achievements.

Years	Species planted in Nos.		Area planted in Hects.		Survival/Density in Nos.		% of Survival		Name of the species	Remarks
	CZ (including safety zone)	BZ	CZ	BZ	CZ	BZ	CZ	BZ		
99-00	2246	43367	0.60	16.13	1276	41244	57	95	Sishu, Akashia, Sunari, Krushna Chda, Mahaneem, Sirisa, Chakunda, Grouping Debadaru, Harida, Bahad a, Mango, Coconut, Bela, Orange etc.	Plantation made in Core Zone @ 3000 Nos./Hects. And in Buffer Zone @ 2600 Nos./Hects on an average.
00-01	2599	27442	0.70	11.00	2079	26852	80	97		
01-02	29382	-	8.23	-	23573	-	80	-		
02-03	31484	3990	8.49	1.65	22038	1999	77	50		
03-04	14547	4933	4.10	1.80	9165	3532	63	72		
04-05	30069	5678	-	3.00	20748	3300	69	58		
05-06	10144	7241	4.06	4	7205	5512	71	76		
06-07	7000	3200	-	1.30	6737	2304	96	72		
07-08	9022	4319	-	2	7282	3153	81	73		
08-09	7170	5878	2	2.5	6258	4173	87	71		
09-10	5456	3543	2	1.75	4687	2586	86	73		
10-11	3585	1890	1.2	1	2366	1453	91	74		
11-12	3552	470	1.46	0.50	2987	409	84	87		
Total	156256	111951	32.84	46.63	116401	96517	74	86		

(viii)	<p>Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers. The monitoring should be done for quantity four time a year in Pre-monsoon (April/May), Monsoon(August), Post-monsoon (November) and Winter (January) seasons and for quality in May. Data thus collected should be submitted to the Ministry of Environment &amp; Forests and the Central Ground Water Authority quarterly.</p>	<p>The regular monitoring of ground water level and quality is being carried out by us through authorised outside agency of M/s- Environmental Research and Services (India) Pvt. Ltd., Bhubaneswar &amp; the results are being submitted to the Ministry seasonal wise. During 2011-12 we have submitted the monitoring reports vide our letter No. NCM/12/411 dated 10.04.2012 &amp; No. NCM/12/432 dated 17.04.2012. The said data for monitoring of ground water level (mRL) during 2011-12 is appended in table below.</p> <table border="1" data-bbox="1115 513 2026 802"> <thead> <tr> <th>Season of 2011-12</th> <th>Water Depth From Surface of Bore Well No.1(in Mtr)</th> <th>Water Depth From Surface of Bore Well No.3(in Mtr.)</th> </tr> </thead> <tbody> <tr> <td>Summer</td> <td>29.36</td> <td>28.52</td> </tr> <tr> <td>Monsoon</td> <td>5.45</td> <td>16</td> </tr> <tr> <td>Post Monsoon</td> <td>11.89</td> <td>16.46</td> </tr> <tr> <td>Winter</td> <td>13.72</td> <td>19.81</td> </tr> </tbody> </table>	Season of 2011-12	Water Depth From Surface of Bore Well No.1(in Mtr)	Water Depth From Surface of Bore Well No.3(in Mtr.)	Summer	29.36	28.52	Monsoon	5.45	16	Post Monsoon	11.89	16.46	Winter	13.72	19.81
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(ix)	<p>The project authorities should meet water requirement of the peripheral village(s), especially, if the village wells go dry due to mine de-watering.</p>	<p>No such case has been reported as on date. In case the village wells go dry the water requirement shall be made by the project authority.</p>															
(x)	<p>Mine water discharge and/or any waste water containing Cr+6 should be properly treated to meet the prescribed standards before reuse/discharge.</p> <p>Surface Run-off from the OB dumps &amp; other surface run-off should be continuously monitored and analysed for Cr+6 and in case its concentration is found higher than the permissible limit, the water should be treated before discharge/re-use.</p>	<p>The mine water and other surface run-off water etc. are being analysed regularly and found free from Cr+6 . Hence no treatment has been necessitated.</p>															
(xi)	<p>Vehicular emissions should be kept under control and regularly monitored.</p>	<p>Being maintained and monitored.</p>															
(xii)	<p>Recommendations made by the Central Mining Research Institute in their study report on dump slopes stabilisation should be implemented.</p>	<p>As per the EIA &amp; EMP, we have closed the Opencast operation from 2005-06. Only operation activity is going on for back filling of old Opencast pits.</p>															

(xiii)	"Consent to Operate" should be obtained from SPCB before restarting mining activities.	Consent to Operate of Air & Water has been obtained from OPCB vide letter No.1778/IND-I-CON-256 Dtd.04.02.2012, valid up to 31.03.2014.
(xiv)	A detailed mine de-commissioning plan should be submitted to the Ministry of Environment & Forests five years in advance for approval.	The mine shall continue may be for another 40/50 years from now. As per the conditions, the de-commissioning plan shall be submitted before five years of mine de-commissioning.
(xv)	All mining related ditches(excavated benches) created on the hill slopes should be filled up by back filling within a period of two years and reclaimed by plantation / afforestation.	Up to March'2012, 11,15,036.407 M <sup>3</sup> of Overburden back filled in the old working pits of opencast mines and total area of 5.144 ha. Has been reclaimed and rehabilitated by plantation.
(xvi)	For any depredation by elephants within a radius of 20 Kms from this mining areas, ex-gratia and compassionate payment to people affected at all future times should be paid for by the mining agencies.	This will be implemented in case of occurrence.
(xvii)	The mining agency should bear the cost of habitat improvement and corridor development in respect of Hadagarh sanctuary.	Shall be done after hearing from competent authority.
(xviii)	No opencast operation shall be carried out from 2005-06 onwards when the project will change to Underground method of mining. Only rehabilitation of voids from opencast mining will be completed thereafter.	Is being followed.

SI No	B. General Condition	Status																					
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	There is no change in mining technology and scope of working. Prior approval from MoEF shall be obtained if any change is warranted.																					
(ii)	No change in the calendar plan including excavation, quantum of mineral Chromite and waste should be made.	<p>Comprising statement showing details of production, waste handling/ development as per the Approved Scheme of Mining Vs Actual is as follows.</p> <table border="1" data-bbox="1110 526 1978 1078"> <thead> <tr> <th data-bbox="1117 526 1228 656">Year</th> <th data-bbox="1228 526 1415 656">Oct'2011 to March'2012 (Upto 17.02.2012)</th> <th colspan="2" data-bbox="1415 526 1740 656">2011-12</th> <th data-bbox="1740 526 1971 656">Remarks</th> </tr> <tr> <td></td> <td>Actual achieved (as per Mining Scheme)</td> <td>Proposed (as per Mining Scheme)</td> <td>Achieved (as per Mining Scheme) as on 17.02.2012</td> <td rowspan="3">Less production due to the mining operation is kept in abeyance from 17.02.2012('C' shift) as per directives from the Collector &amp; District Magistrate, Keonjhar vide their letter No.177/Res dated 16.02.2012.</td> </tr> </thead> <tbody> <tr> <td>Ore in M.T.</td> <td>39459.000</td> <td>1,20,000</td> <td>89,536</td> </tr> <tr> <td>Overburden/Waste in Cum.</td> <td>4907.000</td> <td>12,708</td> <td>12,551</td> </tr> </tbody> </table>				Year	Oct'2011 to March'2012 (Upto 17.02.2012)	2011-12		Remarks		Actual achieved (as per Mining Scheme)	Proposed (as per Mining Scheme)	Achieved (as per Mining Scheme) as on 17.02.2012	Less production due to the mining operation is kept in abeyance from 17.02.2012('C' shift) as per directives from the Collector & District Magistrate, Keonjhar vide their letter No.177/Res dated 16.02.2012.	Ore in M.T.	39459.000	1,20,000	89,536	Overburden/Waste in Cum.	4907.000	12,708	12,551
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(iii)	<p>For ambient air quality monitoring stations should be established in the core zone as well as the buffer zone for RPM, SPM, SO<sub>2</sub>, Nox and CO monitoring. Location of 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.</p> <p>Data in ambient air quality (RPM,SPM,SO<sub>2</sub>,NO<sub>x</sub> &amp; CO) 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.</p>	<p>Ambient air quality monitoring stations has already been established in both core &amp; buffer zone in consultation with the State Pollution Control Board and the monitoring is being carried out by the authorised agency M/s-Environmental Research and Services (Indian) Pvt. Ltd, BBSR in seasonal wise. The monitoring reports are being submitted to MoEF and OSPCB regularly.</p>																					

(iv)	Drill should wet operated or with dust extractors and control blasting should be practiced	Wet drilling is being carried out. Control blasting technique is also adopted.
(v)	Fugitive dust emissions from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangements on haul roads, wagon loading, dumpers/trucks, loading and unloading points should be provided and maintained.	Monitoring of fugitive dust emissions is being carried out seasonal wise regularly i.e. in Summer, Post-Monsoon & Winter except Monsoon season by the authorised agency M/s- Environmental Research and Services (Indian) Pvt. Ltd, BBSR. The monitoring reports has already been submitted vide our letter No.NCM/12/411 dated 10.04.2012 & No.NCM/12/432 dated 17.04.2012 . The location map for the same has already been submitted vide our letter No. NCM/11/1548 dtd. 23.12.2011 for reference. Regular water sprinkling 3-4 times in a shift in three shifts depending upon the requirements is being done on haul roads, loading & unloading points, ore stack yards and colony etc.
(vi)	Adequate measures should be taken for control of noise levels below 85dBa in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM etc. should be provided with ear plugs/muffs.	Adequate measures have been taken to control the noise levels below 85 dBa by providing acoustic enclosure to the D.G. Sets and Compressors in the work environment. All workers engaged in blasting and drilling operations, operations of HEMM etc. are provided with ear plugs/muffs.
(vii)	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards described under GSR 422(E) dated 19 <sup>th</sup> May'1993 and 31st Dec'1993 or as amended from time to time. Oil and Grease trap should be installed before discharge of workshop effluent.	Being done as per condition
(viii)	Acid mine water if any has to be treated and disposed of after conforming to the standard prescribed by the competent authority.	There is no acid mine water generated at present. Hence no action is warranted.

(ix)	Environmental laboratory should be established with adequate no. and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.	We are monitoring all the environmental parameters by the authorised agency M/s-Environmental Research and Services (Indian) Pvt. Ltd, BBSR in seasonal wise. Apart from this we are also monitoring mine discharge water quality in monthly basis by our own laboratory situated at our Division Office, J.K.Road. The list of equipment used for monitoring has been submitted vide our letter No.NCM/11/1548 dtd.23.12.2011 for reference.
(x)	<p>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.</p> <p>Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures if needed.</p>	<p>Regular in-house training is being conducted for personnel working in the mine to trained them on different safety and health aspects. Personnel, who are working in dust areas, are provided with the protective respiratory devices.</p> <p>Periodical medical check-ups of the mine workers are being under taken to find out the ill effects of dust or any contractions due to exposure to dust. Corrective measures shall be taken if needed. Apart from that we have also got OHSAS 18001-2007 certification in respect of our Nuasahi Chromite Mines.</p>
(xi)	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 Organisations.	A separate environmental cell with suitable qualified personnel has been set up under the control of Senior Executive of Mines.
(xii)	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.	Funds earmarked for environmental protection are exclusively spent for the purpose only. Year wise expenditure is reported to the Ministry which is furnished below.

**STATEMENT SHOWING THE DETAILS OF EXPENDITURE INCURRED FOR THE PERIOD FROM OCT'2011 TO MARCH'2012 TOWARDS THE ENVIRONMENTAL PROTECTION OF CORE ZONE IN RESPECT OF NUASAHI CHROMITE MINES OF M/S-IMFA LTD.**

**1. POLLUTION CONTROL**

Sl.No.	Particulars	Description	Expenditure	Remarks
1	Water Sprayer	One Mobile Water Tanker having capacity 8 KL , 4 trips daily for 5 months @ Rs.400/- per trip	2,20,000/-	
2	Cleaning of settling ponds & garland drain	Periodical cleaning (Twice in a year) of settling pond & garland drain, check dam etc. by the help of Shovel & Tipper combination @ Rs.2,000/- per hour for Excavator, @ Rs.200/- per trip by tipper and manpower engaged & cleaning of sump at DL quarry.	85,000/-	
3	Maintenance of Haul Road	Periodical maintenance of main haul road from main gate to U/G Gate, from U/G to DL Quarry & Weighbridge.	90,000/-	
4	Impervious Pit	Cleaning & maintenance of Soak Pits and old Impervious Pit	20,000/-	
<b>Total :</b>			<b>3,30,000/-</b>	

**2. POLLUTION MONITORING**

Sl.No.	Particulars	Description	Expenditure	Remarks
1	Environmental monitoring	The Annual Environmental Monitoring like Air, Water, Soil, Humidity, Temperature, Rain, Wind etc. and testing as per the EMP carried out by authorised external party M/s-ERSI Pvt. Ltd.	1,46,000/-	
2	Monitoring & Analysis by our J K Road Laboratory	Monthly Water, Air monitoring & analysis done by our J K Road Lab.	40,000/-	
<b>Total :</b>			<b>1,86,000/-</b>	



### **3. OCCUPATIONAL HEALTH & ENVIRONMENT AWARENESS**

Sl.No.	Particulars	Description	Expenditure	Remarks
1	Safety Equipments	a) Helmets, Safety Shoes, Goggles, Gumboot, Hand Gloves, Ear Plug, Ear Muff, Safety Belt, Noise Respirator etc.	1,85,000/-	
		b) Medicine expenditure of occupational health center & expenditure for periodical health checkup.	80,000/-	
		c) Rural Health Camp	15,000/-	
		c) Fire fighting equipments	15,000/-	
		d) Environmental Awareness Programme has been carried out among the employees of both U/G & Surface worker through training, ISO-14001 awareness, poster display, wall painting, demonstration etc., EMAP for the local School students for creating the awareness etc.	35,000/-	
<b>Total :</b>			<b>3,30,000/-</b>	

### **4. GREEN BELT**

Sl.No.	Particulars	Description	Expenditure	Remarks
1	i)Nursery	4,000 nos. of species were grown in nursery like Chakunda, Mahaneem, Sishu, Amla, Grouping Devdaru etc. and the fruit bearing varieties like Mango, Guava, Lichu, Cashew, Lemon etc. during this year for plantation. For this purchase of seeds, polythene, manure, fertilizer, pesticide, polythene pipe etc. and manpower engaged.	60,000/-	
	ii) Plantation	3,552 nos. of species of different varieties have already been planted in safety zone, both side of the haul road & backfilled area etc. engaging labour & maintenance of the saplings planted during the year 2010-11.	90,000/-	
	lii) Watering, Watch & ward, care & maintenance, Supervision etc.	For care & maintenance of the planted species by watering through the Water Tanker, Vat, Fertilizer, Pesticide, Germicide & manure.  Watch & ward for 12 months has been carried out by deploying three nos of Guard in regular basis including Supervision.	3,20,000/-	
<b>Total :</b>			<b>4,70,000/-</b>	

<b>5. RECLAMATION</b>				
Sl.No.	Particulars	Description	Expenditure	Remarks
	Back filling of old opencast quarry	During this period 4,907 Cum. of Underground waste has been back filled in the old opencast quarry by the help of tipper and shovel combination. The waste material leveled by Dozer.	2,34,000/-	
<b>Total :</b>			<b>2,34,000/-</b>	
<b>Grand Total :</b>			<b>15,50,000/-</b>	
(xiii)	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full co-operation to the officer(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.		Full co-operation to the monitoring officials of the regional office of the MoEF is being extended. Any relevant data, as required by them are being provided as available.	
(xiv)	A copy of clearance letter will be marked to concerned panchyat/local NGO, if any, from whom and suggestion/representation has been received while processing the proposal		Copy of clearance letter has been marked to the local Sarapanch(Elected head of the Panchayat) .	
(xv)	The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office / Tahasildar's Office for 30 days.		Complied	
(xvi)	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven 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 may also be seen at Web Site of the Ministry of Environment & Forest at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.		Complied	

**Mines Manager**  
**NUASAH CHROMITE MINES**