RNSB

Madachem Bat Mines Private Limited

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MBMPL/PUR/845/2009-10

16.02.2010

To,
The Chief Conservator of Forests,
Government of India,
Ministry of Environment & Forests,
Regional Office (Southern Zone),
Kendriya Sadan, 4th Floor E & F Wings,
17th Main Road,
2nd Block, Koranmangala,
Bangalore - 560 034.

Kind Attn.: Dr. S. K. Susarla - Director

Dear Madam,

Sub.: Six Monthly Compliance Report for the period (Monsoon and Post-Monsoon Period) ending November '2009.

Ref.: Environmental Clearance from MOEF, New-Delhi vide their Letter No. J-11015/479/2006-IA-II(M) dated 21st January '2008.

Ref: Consent to operate from the Goa State Pollution Control Board dated 17.04.2009 vide their letter No. 6/1880/09-PCB/393, Consent Order No. AIR/1662/2009, under Section 21 of AIR Act 1981 and vide letter No. 5/2848/05-PCB/392, Consent Order No. WATER/2871/2009, under Water Act 1974.

Please find enclosed herewith Six Monthly Compliance Report in respect of our Madachem Bat Iron Ore Mines, held under T.C. No. 8/61, situated in Pale Village, Bicholim Taluka, North-Goa District, Goa State, alongwith Environmental Monitoring Datas for Air, Water, Noise and Soil monitored by Environmental Laboratory of M/s. Mineral Engineering Services, Bellary, Karnataka, recognized by the Government of India, MOEF, New-Delhi, for the period from June 2009 to November 2009.

Thanking you,

Yours faithfully,
For MADACHEM BAT MINES PRIVATE LIMITED

MOHAN GAJALEKAR
G.M.-PURCHASE & COORDINATION

Encl: as above.

16.02.2010

MADACHEM BAT IRON ORE MINES OF
M/s MADACHEM BAT MINES PRIVATE LIMITED

No.J-11015/479/2006.IA.II (M) dated January 21, 2008

Six Monthly Compliance Report: Period ending 30th November 2009

A. Specific conditions

i **Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority.**

Management Plan for conservation has ben forwarded to CCF on 12th October, 2009, Letter No MBMPL/PUR/502/2009-10

ii **Environment clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ petition (Civil) No. 460 of 2004 as may be applicable to this project.**

We will accept and honour the court verdict.

iii **Conceptual mining plan for every 5years interval for the life of the mine shall be submitted to the ministry within six months..**

Already submitted to IBM along with mining plan and obtained the necessary approval.

iv **No mining zone of 100 m width within the mine lease area all along the side of the river Madei shall be demarcated and the area shall be planted with thick native species of trees and shrubs..**

100 m demarcation is made all along the river Madei along the lease boundary and covered with thick vegetation. Wherever necessary more plantation is being made.

v **Wildlife conservation plan prepared shall be duly wetted by the office of the CWLW for implementation and progress of implementation shall be submitted to the Ministry and the Chief Wildlife Warden concerned within six months..**

Wildlife Conservation Plan of flora and fauna, has been prepared and submitted to CWLW for approval, Vide Letter No. MBMPL/PUR/502/2009-10 dated 17.09.2007.

vi **Protection of dumps from erosion shall be made with geo-textile matting or other suitable bio-degradable materials on the dumps and thick plantation of native trees and shrubs shall be carried out at the dump slope. Dumps shall be protected by retaining walls.**

Contd..2/-

The rejection material generated is being utilised for backfilling of exhausted pits. As off now no rejection dumps are created at this mine. In future if any dumps are created the same will be protected using geo-textile matting or other suitable bio-degradable materials on the dumps with thick plantation of native trees and shrubs and the dumps will be protected by retaining walls.

vii **Trenches / garland drains shall be constructed at the foot of the dump and coco filters installed at regular intervals to arrest silts from being carrying carried out to water bodies.**

Trenches/garland drains are made as per the approved mining plans with filters installed at regular intervals to arrest silt. As of now no rejection dumps created at this mines.

viii **Check dams sand gully plugs of adequate nos. shall be constructed across the seasonal nallahs (if any) flowing through the ML area and silts arrested. Desilting shall be carried out at regular intervals.**

Check dams and gully plugs are constructed across the seasonal nallahs. Desilting is carried out at regular intervals. The seasonal nallahs are taken care by providing check dams.

ix **Action plan for abatement and compensation for damaged to agricultural land, common property land (if any) due to mining activity shall be submitted to the Ministry within six months. Annual status of implementation of the plan and expenditure thereon shall be reported to the Ministry as applicable.**

Not applicable as no agricultural land is situated in the vicinity of mining activities.

x **Occupational health and safety measures for the workers including identification of worth related hazards, training on Malaria eradication, HIV, effect on health due to exposure of ore/dust etc. shall be cared out regularly. A full time qualified doctor trained in occupational health shall be employed, who would be responsible for surveillance, monitoring maintenance of records of health of workers etc.**

Occupational health surveillance is undertaken as per ILO specifications and as per directions of the Directorate General of Mines Safety from time to time. No workmen reside in the mining lease.

xi **Top soil / solid waste shall be stacked properly with proper slope and adequate safe guards and shall be utilized for backfilling (wherever applicable) for reclamation and rehabilitation of mined out area.**

No top soil encountered during mining activity as this project is old.

Contd..3/-

xii Over burden (OB) shall be stacked at earmarked dump site(s) only and shall not be kept active for long period. The maximum height of the dump shall not exceed 30 m, each stage shall preferably be of 10 m and overall slope of the dump shall not exceed 28^0. The OB dump shall be backfilled. The OB dump shall be scientifically visited with suitable native species to prevent erosion and surface run-off. 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.

Not applicable as there is no rejection dump located at this mining lease. Fresh rejection if any will be used for backfilling.

xiii Garland drains shall be constructed to arrest the silt and sediments flows from soil and mineral dumps. Coco-filters or other suitable filtration medium shall be placed along the drains at regular intervals. The water so collected shall be utilized for watering the mine areas, roads, green belt development etc. The drains shall be regularly desilted particularly after mansoon and maintained properly, Garland drains of appropriate size, gradient and length shall be constructed for both mine pit and for the waste dumps and sump capacity shall 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 shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pit shall be constructed at the corners of garland drains and desilted at regular intervals.

Garland drains are provided all along the mine benches and mansoon water is collected in the pit which has sufficient capacity to store the water.

xiv Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by IBM.

Slope of the mining bench and ultimate pit limit is maintained as per the mining scheme approved by IBM.

xv Drilling and blasting (if any) shall be conducted by using extractors/ wet drilling .

No drilling and blasting is carried out and will not be carried out in future.

xvi Plantation shall be raised in 16.20 ha in the ML area, haul roads, OB dumps sites etc. Greenbelt development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/Agriculture Department. Herbs & Shrubs shall also form a part of afforstation program besides tree plantation. The density of the trees shall be around 2500 plants/ha. The company shall involve the local people with the help of self help group for plantation program.

Contd..4/-

The free area are already covered under thick vegetation. Continues plantation is being done with native species in consultation with various authorities before the onset of the monsoon season to achieve the density of the trees around 2500 plants/ha.

xvii **The project authority shall implement suitable conservation measures to augment ground water resources (in case any extraction of ground water is made) in the area in consultation with the Regional Director, Central Ground Water Board.**

There is no ground water within the lease area as off now. As and when ground water is encountered suitable conservation measures to augment groud water resources in the area shall be done in consultation with various authorities.

xviii **Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring shall be carried out four times in a years – Pre-mansoon (April-May), mansoon (August), post-mansoon (November) and winter (January) and the data thus collected shall be regularly sent to MoEF, Central Ground Water Authority and Regional Director Central Ground Water Board.**

Regular monitoring of ground water is done four times in a years. We are going to install new Piezometers to study ground water fluctuation. The monitoring is regularly carried out by the Mineral Engineering Services, Bellary, Karnataka, and analysed at their MoEF approved Laboratory. The results of such Monitoring are enclosed for reference. The necessary reports are being sent to MoEF, Central Ground Water Authority and Regional Director Central Ground Water Board.

xix **The waste water from the mine shall be treated to confirm to the prescribed standards before discharging into the natural stream. The discharge water from the tailing dam shall be regularly monitored and report submitted to the MoEF, CPCB and Goa State PCB.**

No discharge of water from the pit into the natural stream, as off now. As and when if any waste water is produced the same will be regularly monitored and report submitted to the prescribed Authorities.

xx **Prior permissions from the competent authority should be obtained for drawal of ground water if any.**

Not applicable as off now. Needful will be done as per your guidelines as and when situation arises.

xxi **Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of ore and others shall have valid permissions as prescribed under Central Motor Vehicle Rules 1989 and its**

Contd..5/-

amendments. Transportation of ore shall be done only during the day times. The vehicles transporting ore shall be covered with a tarpaulin are other suitable enclosure so that no dust particles/ fine matters escape during the course of transportation. No overloading or ore for transportation shall be committed. The trucks transporting the ore shall not pass through Wild Life Sanctuary.

Vehicular emissions are kept under control and regularly monitored.Vehicles used for transportation of ore and others are having valid permissions as prescribed under Central Motor Vehicle Rules 1989 and its amendments All vehicles carrying iron ore outside mining lease are covered with tarpaulin and are not overloaded. We are transporting the ore only during the day time and ore carrying trucks are not passing through Wild Life Sanctuary.

xxii Action plan with respect to suggestions/improvements and recommendations made during public consultation/hearing shall be submitted to the Ministry and the State Government within six months.

The suggestions made during the public hearing and the conditions laid down by the Goa State PCB along with the consent orders are being implemented regularly.

xxiii A final Mine Closure Plan along with details of Corpus Fund, shall be submitted to the MoEF 5 years in advance of Final Mine Closure for approval

Will be submitted to the MoEF five years in advance of final mine closure for approval.

B. General conditions

(i) No changes in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.

No changes in mining technology and scope of working will be made without prior approval of the Ministry of Environment & Forests.

(ii) No changes in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.

No such changes are made.

(iii) 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, 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.

Monitoring stations are fixed in consultation with GSPCB. Monitoring is carried out by M/s Mineral Engineering Services, an agency recognized by MoEF.

Contd..6/-

(iv) **Data on ambient air quality (RPM, SPM, SO_2, NOx) should be regularly submitted to the Ministry including its Regional Office located at Bangalore and the State Pollution Control Board / Central Pollution Control Board once in six months.**

Monitoring data is being submitted to the concerned authority regularly.

(v) **Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on the haul roads, loading and unloading and at transfer points should be provided and properly maintained.**

All haul roads, loading and unloading and at transfer points are properly watered and maintained and dust emissions are kept at minimum.

(vi) **Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operation of HEMM, etc. should be provided with ear plugs / muffs.**

Ear plugs/muffs are provided wherever it is necessary. Noise levels at the machines engaged in our mine are below 85 dBA.

(vii) **Industrial waste water (workshop and 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 and Grease trap should be installed before discharge of workshop effluents.**

There is no industrial waste water. The machines engaged in this mine are hired and they are carrying repairs outside the mining lease. The results of water collected from the mine pit conforms the standards prescribed under GSR 422 (E). and results are enclosed for ready reference.

(viii) **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 measure, if needed.

Personnel working in the mines are provided with protective equipments as prescribed under Mines Act & Rules.

Occupational health surveillance is undertaken as per ILO specifications and as per the direction of the Directorate General of Mines Safety from time to time.

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

Contd..7/-

Environment Management Cell is constituted under the Mines Manager with Qualified persons and directly reporting to the Head of the organisation.

(x) **The Project authorities should inform to the regional Office located at Bangalore regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.**

Is being intimated and will be intimated as and when such approval is obtained.

(xi) **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 Bangalore.**

The necessary funds are being kept separately and expenditure shall be reported to the concerned Authorities.

(xii) **The Project authorities should inform to the regional Office located at Bangalore regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.**

Is being intimated and will be intimated as and when such approval is obtained.

(xiii) **The Regional Office of this Ministry located at Bangalore 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.**

All such data /information /monitoring reports are being submitted and shall be provided to the various inspecting authorities and full cooperation will be extended.

(xiv) **A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom and suggestion / representation has been received while processing the proposal.**

A copy of the clearance is submitted to the various authorities including the Panchayat and the same is advertised in local newspapers including vernacular language.

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

Not applicable.

Contd..8/-

(xvi) The project authorities should advertise at least in two local newspapers 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 information 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 website 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 Bangalore.

Already complied with.

4. The Ministry or any other competent authority may alter / modify the above conditions or stipulate any further condition in the interest of environment protection.

All such modifications /alterations shall be accepted and implemented as the case may be.

ENVIRONMENTAL LABORATORY

A Unit of Mineral Engineering Services

(Recognised by Govt. of India, MOEF, New Delhi vide Gazette Notification No. S.O. 773 (E) dated 17-05-2007 recognition valid upto 16-05-2012)

Table.No. 2

STATISTICAL AIR QUALITY DATA

Project : : Madachem Bat Iron Ore Mine Season : Post Monsoon - 2009

Station Code	: A III - Core Zone				Station Code : A IV -Ambesh village				Station Code : A V - Nanuz village			
	SO2	NOx	SPM	RPM	SO2	NOx	SPM	RPM	SO2	NOx	SPM	RPM
Min.	6	7	39	17	5	7	30	14	6	7	30	13
10%	7	8	43	18	5	7	34	15	6	8	36	15
25%	7	9	46	20	6	7	37	16	7	8	39	17
50%	7	10	58	23	6	8	43	19	7	9	43	19
75%	8	11	63	26	7	8	51	21	7	9	54	20
98%	9	11	76	30	8	9	60	25	8	10	63	23
Max.	9	11	77	30	8	9	61	25	8	10	64	23
Avg.	7	10	57	23	6	8	44	19	7	9	46	18
SD	1	1	13	4	1	1	10	4	1	1	11	3
No.of abs	8				8				8			

M. Narasimha Raju
GOVT. ANALYST

HEAD OF LABORATORY

25/XXV, Club Road, BELLARY - 583 103. Karnataka, Tel / Fax : 08392- 267421
E-mail : mes_msraju@yahoo.co.uk, Website : www.envtest.com

WATER ANALYSIS REPORT

Project : Madachern Bat Iron Ore Mine
Season : Monsoon,2009
Date of sampling : 30.06.2009

Sl.No.	Parameters	Sample code SW12	GSR - 422E Norms (EDS)
1	Colour & Odour	5	--
2	Suspended Solids (mg/l)	1	100
3	Particle size of suspended solids	Pass through 850 micron	Shall pass through 850 micron
4	Dissolved Solids (Inorganic)	14	--
5	pH	6.86	5.5 to 9.0
6	Temperature ^{0} C	26	5^0 C above water temp
7	Oil & Grease (mg/l)	<0.01	10
8	Total Residual Chlorine (mg/l)	<0.05	1
9	Ammonical Nitrogen (mg/l)	<0.1	50
10	Total Kjeldahl Nitrogen (mg/l)	<0.1	100
11	Free Ammonia as NH_3 (mg/l)	<0.1	5
12	BOD [3 days at 27^0C] (mg/l)	<0.5	30
13	COD (mg/l)	5	250
14	Arsenic as As (mg/l)	<0.001	0.2
15	Mercury as Hg (mg/l)	<0.001	0.01
16	Lead as Pb (mg/l)	<0.01	0.01
17	Cadmium as Cd (mg/l)	<0.01	2
18	Hexavalent Chromium as Cr^{+6} (mg/l)	<0.001	0.10
19	Total Chromium as Cr(mg/l)	<0.01	2
20	Copper as Cu (mg/l)	<0.05	3
21	Zinc as Zn (mg/l)	0.01	5
22	Selenium as Se (mg/l)	<0.001	0.05
23	Nickel as Ni (mg/l)	<0.01	3
24	Boron as B (mg/l)	<0.01	--
25	Sodium %	35	--
26	Residual Sodium Carbonate (mg/l)	NA	--
27	Cyanide as CN (mg/l)	<0.05	0.2
28	Chloride as Cl (mg/l)	4	--
29	Fluoride as F (mg/l)	0.01	2
30	Dissolved Phosphates as PO_4 (mg/l)	<0.05	5
31	Sulphates as SO_4 (mg/l)	0.5	--
32	Sulphide as S (mg/l)	<0.01	2
33	Phenolic Compounds as C_6H_5OH (mg/l)	<0.05	1
34	Bio-assay test (90% survival of fish after 96 hrs in 100% effluent)	NA	--
35	Manganese as Mn (mg/l)	<0.05	2
36	Iron as Fe (mg/l)	0.02	3
37	Vanadium as V (mg/l)	<0.001	0.2
38	Nitrate Nitrogen (mg/l)	0.1	10

Note : NA - Not Analysed EDS - Effluent Discharge Standards
SW12 - Pit No. 3 (South)
Samples Analysed at : Environmental Laboratory, Mineral Engineering Services, Bellary

WATER ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
season :Post Monsoon,2009
Date of sampling : 20.10.2009

Sl.No.	Parameters	Sample code SW12	GSR - 422E Norms (EDS)
1	Colour & Odour	5	--
2	Suspended Solids (mg/l)	2	100
3	Particle size of suspended solids	Pass through 850 micron	Shall pass through 850 micron
4	Dissolved Solids (Inorganic)	20	--
5	pH	7.15	5.5 to 9.0
6	Temperature $^{\circ}$ C	28	5^{0} C above water temp.
7	Oil & Grease (mg/l)	<0.01	10
8	Total Residual Chlorine (mg/l)	<0.05	1
9	Ammonical Nitrogen (mg/l)	<0.1	50
10	Total Kjeldahl Nitrogen (mg/l)	<0.1	100
11	Free Ammonia as NH_3 (mg/l)	<0.1	5
12	BOD [3 days at 27^{0}C] (mg/l)	<0.5	30
13	COD (mg/l)	3	250
14	Arsenic as As (mg/l)	<0.001	0.2
15	Mercury as Hg (mg/l)	<0.001	0.01
16	Lead as Pb (mg/l)	<0.01	0.01
17	Cadmium as Cd (mg/l)	<0.01	2
18	Hexavalent Chromium as Cr^{+6} (mg/l)	<0.001	0.10
19	Total Chromium as Cr(mg/l)	<0.01	2
20	Copper as Cu (mg/l)	<0.05	3
21	Zinc as Zn (mg/l)	0.02	5
22	Selenium as Se (mg/l)	<0.001	0.05
23	Nickel as Ni (mg/l)	<0.01	3
24	Boron as B (mg/l)	<0.01	--
25	Sodium %	39	--
26	Residual Sodium Carbonate (mg/l)	NA	--
27	Cyanide as CN (mg/l)	<0.05	0.2
28	Chloride as Cl (mg/l)	4	--
29	Fluoride as F (mg/l)	0.06	2
30	Dissolved Phosphates as PO_4 (mg/l)	<0.05	5
31	Sulphates as SO_4 (mg/l)	0.2	--
32	Sulphide as S (mg/l)	<0.01	2
33	Phenolic Compounds as C_6H_5OH (mg/l)	<0.05	1
34	Bio-assay test (90% survival of fish after 96 hrs in 100% effluent)	NA	--
35	Manganese as Mn (mg/l)	<0.05	2
36	Iron as Fe (mg/l)	0.02	3
37	Vanadium as V (mg/l)	<0.001	0.2
38	Nitrate Nitrogen (mg/l)	<0.1	10

Note : NA - Not Analysed EDS - Effluent Discharge Standards
SW12 - Pit No. 3 (South)
Samples Analysed at : Environmental Laboratory, Mineral Engineering Services, Bellary

21/20/2009

WATER ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
Season : Monsoon,2009
Date of sampling : 30.06.2009

Sl.No.	Parameters	Sample code				IS : 2296, 1982 Class C Norms(SWS)
		SW4	SW7	SW10	SW11	
1	pH	7.10	7.39	7.50	7.48	6.5 to 8.5
2	Colour (Hazen Units)	5	5	5	5	300
3	Conductivity at 25^{0} C	59	72	80	70	--
4	Dissolved Oxygen (mg/l)	6.5	6.8	6.7	6.2	4
5	BOD (mg/l)	0.3	0.5	0.5	0.5	3
6	Total Dissolved Solids (mg/l)	24	28	31	26	1500
7	Chloride as Cl (mg/l)	4	6	6	5	600
8	Boron as B (mg/l)	<0.01	<0.01	<0.01	<0.01	--
9	Sulphates as SO_4 (mg/l)	0.5	0.8	0.7	0.9	400
10	Nitrates as NO$_3$ (mg/l)	0.5	0.8	0.4	1.0	50
11	Free Ammonia as N (mg/l)	<0.01	<0.01	<0.01	<0.01	--
12	Arsenic as As (mg/l)	<0.001	<0.001	<0.001	<0.001	0.2
13	Iron as Fe (mg/l)	0.03	0.04	0.05	0.07	50
14	Fluoride as F (mg/l)	<0.01	<0.01	<0.01	<0.01	1.5
15	Lead as Pb (mg/l)	<0.01	<0.01	<0.01	<0.01	0.1
16	Copper as Cu (mg/l)	<0.05	<0.05	<0.05	<0.05	1.5
17	Zinc as Zn (mg/l)	0.02	0.03	0.02	0.03	15
18	Sodium Absorption Ratio (mg/l)	NA	NA	NA	NA	--
19	Total Coliform (mpn/100ml)	5	7	9	11	5000

SAMPLE CODE :
SW4 - Ambesh stream water
SW7 - Paroda nallah water

Note : SWS -Stream Water Standards
SW10 - Madai river upstream
SW11 - Madai river downstream

NA - Not Analysed

SAMPLES ANALYSED AT : Environmental Laboratory, Mineral Engineering Services, Bellary

WATER ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
Season : Post Monsoon,2009
Date of sampling : 20.10.2009

Sl.No.	Parameters	Sample code				IS : 2296, 1982
		SW4	SW7	SW10	SW11	Class C Norms(SWS)
1	pH	7.50	7.62	7.12	7.35	6.5 to 8.5
2	Colour (Hazen Units)	5	10	5	10	300
3	Conductivity at 25 ^{0} C	16	15	17	16	--
4	Dissolved Oxygen (mg/l)	6.8	6.5	6.6	6.3	4
5	BOD (mg/l)	0.3	0.3	0.4	0.5	3
6	Total Dissolved Solids (mg/l)	38	32	45	52	1500
7	Chloride as Cl (mg/l)	3	5	5	7	600
8	Boron as B (mg/l)	<0.01	<0.01	<0.01	<0.01	--
9	Sulphates as SO_4 (mg/l)	0.3	0.4	0.4	0.6	400
10	Nitrates as NO_3 (mg/l)	0.1	0.2	0.1	0.3	50
11	Free Ammonia as N (mg/l)	<0.01	<0.01	<0.01	<0.01	--
12	Arsenic as As (mg/l)	<0.001	<0.001	<0.001	<0.001	0.2
13	Iron as Fe (mg/l)	0.03	0.04	0.03	0.05	50
14	Fluoride as F (mg/l)	<0.01	<0.01	<0.01	<0.01	1.5
15	Lead as Pb (mg/l)	<0.01	<0.01	<0.01	<0.01	0.1
16	Copper as Cu (mg/l)	<0.05	<0.05	<0.05	<0.05	1.5
17	Zinc as Zn (mg/l)	0.02	0.02	0.03	0.05	15
18	Sodium Absorption Ratio (mg/l)	NA	NA	NA	NA	--
19	Total Coliform (mpn/100ml)	2	5	3	5	5000

SAMPLE CODE :
SW4 - Ambesh stream water-Dry
SW7 - Paroda nallah water-Dry
SW10 - Madai river upstream
SW11 - Madai river downstream

Note : SWS - Stream Water Standards NA - Not Analysed

SAMPLES ANALYSED AT : Environmental Laboratory, Mineral Engineering Services, Bellary

WATER ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
Season : Monsoon,2009
Date of sampling : 30.06.2009

Sl.No.	Parameters	Sample code		Permissible Limit IS: 10500-1991 Norms (DWS)
		GW2	GW6	
1	Colour (Hazen Units)	5	<5	25
2	Odour	Unobjec-tionable	Unobjec-tionable	Unobjec-tionable
3	Taste	Agreeable	Agreeable	Agreeable
4	Turbidity (NTU)	1.0	1.0	10
5	pH	6.58	6.50	6.5 - 8.5
6	Total Hardness as $CaCO_3$ (mg/l)	30	20	600
7	Calcium as Ca (mg/l)	8	4	200
8	Magnesium as Mg (mg/l)	2.4	2.4	100
9	Copper as Cu (mg/l)	<0.05	<0.05	1.5
10	Iron as Fe (mg/l)	0.03	0.02	1.0
11	Manganese as Mn (mg/l)	<0.01	<0.01	0.3
12	Chloride as Cl (mg/l)	4	3	1000
13	Sulphates as SO_4 (mg/l)	0.5	0.5	400
14	Nitrates as NO_3 (mg/l)	0.3	0.2	100
15	Fluoride as F (mg/l)	0.02	0.01	1.5
16	Phenolics as C_6H_5OH (mg/l)	<0.001	<0.001	0.001
17	Mercury as Hg (mg/l)	<0.001	<0.001	0.001
18	Cadmium as Cd (mg/l)	<0.001	<0.001	0.01
19	Selenium as Se (mg/l)	<0.001	<0.001	0.01
20	Arsenic as As (mg/l)	<0.001	<0.001	0.05
21	Cyanide as CN (mg/l)	<0.01	<0.01	0.05
22	Lead as Pb (mg/l)	<0.01	<0.01	0.05
23	Zinc as Zn (mg/l)	0.02	0.02	15
24	Chromium as Cr^{+6} (mg/l)	<0.01	<0.01	–
25	Mineral Oil (mg/l)	<0.01	<0.01	0.03
26	Residual Free Chlorine (mg/l)	<0.05	<0.05	–
27	Total Coliform (mpn/100ml)	4	3	10
28	E-Coli (Nos/100ml)	Absent	Absent	Absent
29	Water levels in well from surface (m)	6.1	6.8	–

Note : DWS - Drinking Water Standards

SAMPLE CODE :
GW2 - Devalwada village open well
GW6 - Ambegal village Open well
SAMPLES ANALYSED AT : Environmental Laboratory, Mineral Engineering Services, Bellary

WATER ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
season : Post Monsoon,2009
Date of sampling : 20.10.2009

Sl.No.	Parameters	Sample code		Permissible Limit IS: 10500-1991 Norms (DWS)
		GW2	GW6	
1	Colour (Hazen Units)	5	5	25
2	Odour	Unobjec-tionable	Unobjec-tionable	Unobjec-tionable
3	Taste	Agreeable	Agreeable	Agreeable
4	Turbidity (NTU)	1.0	1.5	10
5	pH	7.20	7.35	6.5 - 8.5
6	Total Hardness as $CaCO_3$ (mg/l)	20	25	600
7	Calcium as Ca (mg/l)	4	6	200
8	Magnesium as Mg (mg/l)	2.4	2.4	100
9	Copper as Cu (mg/l)	<0.05	<0.05	1.5
10	Iron as Fe (mg/l)	0.05	0.06	1.0
11	Manganese as Mn (mg/l)	<0.01	<0.01	0.3
12	Chloride as Cl (mg/l)	3	5	1000
13	Sulphates as SO_4 (mg/l)	0.3	0.4	400
14	Nitrates as NO_3 (mg/l)	0.1	0.1	100
15	Fluoride as F (mg/l)	0.2	0.03	1.5
16	Phenolics as C_6H_5OH (mg/l)	<0.001	<0.001	0.001
17	Mercury as Hg (mg/l)	<0.001	<0.001	0.001
18	Cadmium as Cd (mg/l)	<0.001	<0.001	0.01
19	Selenium as Se (mg/l)	<0.001	<0.001	0.01
20	Arsenic as As (mg/l)	<0.001	<0.001	0.05
21	Cyanide as CN (mg/l)	<0.01	<0.01	0.05
22	Lead as Pb (mg/l)	<0.01	<0.01	0.05
23	Zinc as Zn (mg/l)	0.03	0.04	15
24	Chromium as Cr^{+6} (mg/l)	<0.01	<0.01	--
25	Mineral Oil (mg/l)	<0.01	<0.01	0.03
26	Residual Free Chlorine (mg/l)	<0.05	<0.05	--
27	Total Coliform (mpn/100ml)	2	3	10
28	E-Coli (Nos/100ml)	Absent	Absent	Absent
29	Water levels in well from surface (m)	4.1	4.7	--

Note : DWS - Drinking Water Standards

SAMPLE CODE :
GW2 - Devalwada village open well
GW6 - Ambegal village Open well
SAMPLES ANALYSED AT : Environmental Laboratory, Mineral Engineering Services, Bellary

MINE EFFLUENT STANDARDS FOR IRON ORE MINE

Project : Madachem Bat Iron Ore Mine
Season : Monsoon,2009
Date of sampling : 30.06.2009

SL. No.	PARAMETER	SW12- Pit No.3 south	Concentration Not to Exceed In mg/l Except pH
1	pH	6.86	5.5 - 9.8
2	Total Suspended Solids (mg/l)	1	200
3	Oil & Grease (mg/l)	<0.01	10
4	Iron as Fe (mg/l)	0.02	5
5	Mercury as Hg (mg/l)	<0.001	0.01
6	Nickel as Ni (mg/l)	< 0.01	0.5
7	Dissolved phosphates as PO_4 (mg/l)	<0.05	5
8	Manganese as Mn (mg/l)	<0.05	2
9	Sulphide as S_2(mg/l)	<0.01	2

Samples Analysed at : Environmental Laboratory, MES, Bellary

MINE EFFLUENT STANDARDS FOR IRON ORE MINE
(AS Per IBM)

Project : Madachem Bat Iron Ore Mine
Season : Post Monsoon,2009
Date of sampling : 20.10.2009

SL. No.	PARAMETER	SW12- Pit No.3 south	Concentration Not to Exceed in mg/l Except pH
1	pH	7.15	5.5 - 9.8
2	Total Suspended Solids (mg/l)	2	200
3	Oil & Grease (mg/l)	<0.01	10
4	Iron as Fe (mg/l)	0.02	5
5	Mercury as Hg (mg/l)	<0.001	0.01
6	Nickel as Ni (mg/l)	< 0.01	0.5
7	Dissolved phosphates as PO_4 (mg/l)	<0.05	5
8	Manganese as Mn (mg/l)	<0.05	2
9	Sulphide as S_3(mg/l)	<0.01	2

Samples Analysed at : Environmental Laboratory, MES, Bellary

Table No. 7

NOISE LEVEL DATA

Project	: Madachem Bat Iron Ore Mine						
Season	: Winter,2008-09						
Date of monitoring	: 19.01.2009						
Code No.	Monitoring stations	Day			Night		
		L_{min}	L_{eq}	L_{max}	L_{min}	L_{eq}	L_{max}
	Bufferzone						
N1	Ambesh village	42.3	48.3	51.3	36.4	38.6	41.6
N2	Nanuz village	36.7	39.5	43.2	33.6	37.8	40.3
N3	Pale village	41.3	46.8	49.3	38.6	40.3	44.3
	Corezone	L_{min}	L_{eq}	L_{max}	**Remarks**		
N4	Near mines office	51.3	53.4	59.3	Vehicle movement		

Permissible limits as per ILO Code of Practice

For Unprotected ear - 8 hrs working shift

Warning limit - *85 dB(A)*

Danger limit - 90 dB(A)

Worker not to be exposed for more than 115 dB(A)

With ear protection -

130 dB(A) 'Impulse' or 120 dB(A) 'Fast'

No entry when noise level exceeds 140 dB(A)

Ambient Noise Levels

	Leq. Limit dB(A)	
	Day	*Night*
Industrial areas	75	70
Residential area	55	45

Table No.7

SOIL ANALYSIS REPORT

Project : Madachem Bat Iron Ore Mine
Season : Summer, 2009
Date of sampling : 01.05.2009

SL.	PARAMETERS	S1	S2	S3	S4	QUALITY	
						Normal	High
1	pH	7.64	7.16	7.98	7.58	6.3	>8.3
2	EC (m. mohs/cm)	0.72	0.62	0.55	0.92	1.0 to 2.0	>2
3	Organic Carbon (%)	0.55	0.35	0.76	0.42	0.5 to 0.75	≥0.75
4	Nitrogen as N (Kg/Ha)	55	36	76	62	--	--
5	Phosphorous as P (Kg/Ha)	20	16	11	28	9 to 22	>22
6	Potassium as K_2O (Kg/Ha)	90	66	87	111	50 to 120	>120
7	Water holding capacity (%)	48	55	36	68	--	--
8	Textural class	Silty sand	Silty clay	Silty clay	Silty clay	--	--
9	Sodium (meq/100 gm)	0.016	0.022	0.011	0.010	--	--
10	Chloride (%)	0.009	0.005	0.010	0.009	--	--
11	Sulphate (%)	0.06	0.11	0.09	0.08	--	--
12	Iron as Fe (%)	23	16	22	18	--	--

Sample Code :
S1- Ambeshi village ag. Soil
S2- Dump afforestation soil
S3- Pale ag. Soil
S4 - Nanuz ag. Soil