

Six monthly compliance reports of conditions laid down vide letter no. J-11015/380/2006-IA.II(M), dated 02.07.2008 of Ministry of Environment & Forests, Govt. of India in respect of Raikela Iron Ore Mines of M/s. Geetarani Mohanty for the period from April 2012 to September 2012 in the district of Sundargarh, Odisha.

SPECIFIC CONDITIONS

SI NO	CONDITIONS	COMPLIANCES
(i)	All the conditions stipulated by the State Pollution Control Board, Orissa in their consent to establish shall be effectively implemented.	Consent to Establish obtained from State Pollution Control Board, vide letter no. - 1764/Ind-NoC-3700, dated 31.01.06. All conditions stipulated by the State Pollution Control Board, Orissa are effectively implemented.
(ii)	Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 66.671 ha. Is forest land shall be obtained before starting mining operation in that area. Environmental clearance is subject to grant of forestry clearance.	Forest Clearance expected shortly. Compliance to the Stage-I conditions has been forwarded to Principal Secretary (Forests) Dept. of Forest & Environment, Govt. of Orissa, from Chief Conservator of Forests (Forest Diversion & Nodal Officer F.C Act).
(iii)	The mining operations shall be restricted to 2m above the reported water table i.e. 672m RL and it should not intersect groundwater table. In case of working below ground water table, prior approval of the Ministry of Environment and Forests and central ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	The present depth of the mining operation 765 m R.L. and the ground water level is 624 m R.L. as per piezometer reading. The mining operation is not intersecting the ground water table.
(iv)	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due any mining operations.	No natural drainage system is being obstructed.
(v)	The top soil, if any, shall temporarily be stored at earmarked site (s) only and it should not be kept unutilized for a period more than 3 years. The topsoil shall be used for land reclamation and plantation.	No top soil produced during the current year, as there is no fresh opening of the bench. However, the top soil will be collected and preserved which will be used for plantation purpose only.

(vi)	<p>The over burden (OB) generated during the mining operation shall be stacked at earmarked dump site(s) only and should not be kept active for long period of time. Proper terracing of OB dump shall be carried out so that the overall slope shall not exceed 28 degree. Out of the total 21,44,567 m of waste to be generated during the life of mine 8,17,002 m shall be disposed off in the form of external dump and 13,27,565 m shall be backfilled in 7ha of mined out area. The backfilled area shall be afforested. The over burden dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dumps. 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 and its Regional office located at Bhubaneswar on six monthly basis.</p>	<p>The OB generated is being stacked at earmarked space and terraced properly. Plantation is under progress along the slope of the dump.</p>
(vii)	<p>Catch drains and siltation ponds of appropriate size shall be constructed around the working pit(s), mineral and OB dumps to prevent run off of water and flow of sedimentations directly into the Suna nallah, Karo nallah, rivers and water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly, after monsoon and maintained properly.</p> <p>Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and temporary over burden dumps to prevent run off of water and flow of sedimentations directly into the Suna nallah, Karo nallah, rivers and water bodies 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</p>	<p>Settling pond has been constructed to arrest sediments flow from the site of mining operation. The garland drain and retaining wall have been constructed around the dump and the regular cleaning of drain and de-siltation of settling pond is also carried out. The water so collected is being utilized for watering the mine area, roads, green belt development etc.</p>

	retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.	
(viii)	Dimension of the retaining wall at the toe of over burden dump and over burden benches within the mine to check run-off and siltation shall be based on the rain fall data.	Based on the rainfall data, the retaining wall is made having the toe of the dump and adequate measures are taken to check the run off and siltation during rainy season.
(ix)	Plantation shall be raised in an area of 20.276 ha including a 7.5 m wide green belt in the safety zone around the mining lease, backfilled area, quarry benches, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	Native species provided by the Divisional Forest Officer, Bonai is being planted along the safety zone, haul roads, dump slope, crusher area along the banks of nalla. A total of 27850 saplings have been planted within the lease area covering an area of 10.85 ha till 31 st Oct. 2012.
(x)	Regular water sprinkling shall be carried out in critical area prone to air pollution and having high levels of SPM and RPM such as around crushing and screening plant, loading and unloading point and transfer points. Extensive water sprinkling should be carried out on haul roads. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Provision of water tanker to sprinkle water are being carried out regularly at crushing and screening plant, loading and unloading point and on haul roads. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
(xi)	Regular monitoring of water quality upstream and downstream of suna nalla and Karo nalla shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Ground Water Authority, Regional Director, central Ground Water Board, State Pollution Control Board and central Pollution Control Board.	Regular Monitoring of water quality of the nearby water bodies is carried out. The upstream of the nearby nala is not possible as the nala originated near the lease boundary. Monitoring result is enclosed as "Annexure-A."
(xii)	The Project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water board.	We have already employed one consultant for the job and the report will be submitted soon in consultation with the Regional Director, Central Ground Water Board.

(xiii)	Regular monitoring of ground water level and quality should be carried out in and around the mine lease 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 ministry of Environment & forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and regional Director, central Ground Water Board.	Regular monitoring of ground water level is being carried in and around the mine lease area by establishing a network of existing wells. We are enclosing herewith the monitoring report of wells in the buffer zone of mines for the period of March 2012 to October 2012 as "Annexure-B". Piezometer has already installed in the lease area of mines in 627 m R.L. The depth of water level is 624 m.
(xiv)	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) for the project.	No objection certificate for ground water withdrawal has been issued from Central Ground water Authority, New-Delhi. Copy of the same is enclosed as "Annexure-C"
(xv)	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional director, Central Ground Water board.	We have already employed one consultant for the job and the report will be submitted soon in consultation with the Regional Director, Central Ground Water Board.
(xvi)	Appropriate mitigative measures should be taken to prevent pollution of Karo River in consultation with State Pollution Control Board.	Site specific mitigation measures to prevent polluting of the Karo nalla, has been initiated like implementation of surface run off management, guard wall across the bank of nearby nalla. The above are being followed in consultation with State Pollution Control Board, Odisha.
(xvii)	Minerals handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These shall be properly maintained and operated	The effective dry fog system is provided at crushing and screening plants, besides this, fixed water sprinkling arrangement is used to suppress the dust.
(xviii)	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through trucks only and the vehicles carrying the mineral shall not be covered.	The vehicular emission are regularly monitored and kept under control. The vehicle used for mining and transportation of minerals are properly maintained. The ore transported vehicles are covered and not overloaded.

(xix)	Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	The blasting is done at day time only and adopting controlled blasting.
(xx)	Drills shall either be operated with dust extractors or equipped with water injection system.	Drill machine provided with dust extractors with water injection system.
(xxi)	Consent to operate shall be obtained from the State pollution Control Board prior to start of enhanced production from the mine	Consent to operate from State Pollution Control Board enclosed vide our letter, dated 07.09.2012 (Copy enclosed as "Annexure-D")
(xxii)	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated during mining operation.	ETP for workshop has been provided. The capacity of ETP is 2Cum/day. As such we have no colony. The waste water from guest house, etc. is being settled and used for gardening
(xxiii)	The project proponent should all precautionary measures during mining operation for conservation and protection of endangered fauna, if any spotted in the study area and contributes towards the cost of implementation of the plan and/ or regional wildlife Management Plan for conservation of flora and fauna so prepared by the state Forest and Wildlife department. The amount so contributed shall be included in the project cost. A copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months.	Precaution measures are taken for conservation during mining operation. The flora and fauna are protected as indicated in approved site specific wild life conservation plan. For approval of site specific wild life conservation plan for sum of Rs. 72, 00, 000/- (Rupees seventy two lakhs) deposited on 23.08.2010.
(xxiv)	A Final Mine 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.	A final Mine Closure Plan along with details corpus fund will be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

GENERAL CONDITIONS

SINO	CONDITIONS	COMPLIANCES
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	We abide by the said instruction.
(ii)	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made	We abide by the said instruction
(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 & Nox monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	The AAQ monitoring stations are already identified in core and buffer zones in consultations with State Pollution Control Board. The details of the monitoring stations are enclosed vide our letter dated 18.06.2012.
(iv)	Data on ambient air quality (RPM, SPM, SO & Nox) should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board/ Central Pollution control Board once in six months.	Is being submitted in six monthly bases. The data is enclosed as "Annexure-A"
(v)	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and transfer points should be provided and properly maintained.	Water sprinkling is carried out at crushing and screening plant, loading and unloading points. Extensive water sprinkling is carried out through water tanker on haul roads for monitoring of fugitive dust emission.
(vi)	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with era	Adequate measures are being taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations,

	plugs/muffs.	operations of HEMM, etc. has been provided with ear lugs/muffs. The noise level study is carried out which within the permissible limit.
(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 19 th May, 1993 and 31 st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Effluent Treatment Plant is provided at workshop and waste generated during the mine operation.
(viii)	Personal 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.	Personnel working in dusty areas have been provided with dust mask for proper respiration and are being trained in our Vocational Training Centre about information on safety and health aspects. Periodical medical examination of all workers is being systematically at regular intervals.
(ix)	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization	Environment consultant having adequate knowledge and experience is engaged for monitoring the environmental parameters.
(x)	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.	The fund earmarked for environmental protection is being utilized for the same only.
(xi)	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.	Shall be communicated in due course to the concerned authority.
(xii)	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to	Co-operation shall be extended as and when asked for.

	the officer (s) of the Regional office by furnishing the requisite data/information/monitoring reports.	
(xiii)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment & Forests, its Regional office, Bhubaneswar, central Pollution Control Board and State Pollution Control Board.	Is being submitted
(xiv)	A copy of clearance letter will marked to concerned Panchayat /local NGO, if any, from whom suggestion/representation has been received while processing the proposal.	Not applicable.
(xv)	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.	Already complied
(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 informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the state pollution Control Board and also at web site of the Ministry of Environment and Forests at http:// envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubaneswar.	Paper advertisement has been published in Oriya Newspaper "The Khabara" on dated 09.07.2008 and English Newspaper "The Indian Express" on dated 12.07.2008. Copy of the same is already submitted.



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267, Kharavela Nagar, Bhubaneswar-751 001, Ph.: +91-674-2392080, 2391720, 2390687 (Off.)
Cable : 'Geomin' Fax: +91-674-2390687, E-mail : geomin@satyam.net.in, Web : geomin.co.in



Ambient Air Quality Monitoring Data

For
M/s Geetarani Mohanty
Of
Raikela Iron Ore Mines

Lease Area (Core Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM2.5	PM10	SO ₂	NO _x	CO
1	02.05.2012	24	25.9	42.8	13.8	18.5	<1000
2	03.05.2012	24	28.7	47.9	14.2	17.4	<1000
3	09.05.2012	24	28.6	47.2	13.5	20.3	<1000
4	10.05.2012	24	25.3	42.6	15.3	18.7	<1000
5	16.05.2012	24	26.5	44.8	13.6	19.8	<1000
6	17.05.2012	24	27.9	46.9	12.9	17.5	<1000
7	23.05.2012	24	29.7	50.5	15.7	19.6	<1000
8	24.05.2012	24	26.3	45.2	14.5	18.6	<1000

Raikela (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM2.5	PM10	SO ₂	NO _x	CO
1	02.05.2012	24	22.8	39.2	13.7	17.7	<1000
2	03.05.2012	24	24.5	41.9	12.3	19.8	<1000
3	09.05.2012	24	25.3	42.1	14.8	18.5	<1000
4	10.05.2012	24	24.6	41.6	15.5	18.5	<1000
5	16.05.2012	24	23.7	39.5	15.6	19.3	<1000
6	17.05.2012	24	24.9	40.8	16.9	20.5	<1000
7	23.05.2012	24	23.7	39.9	15.7	18.8	<1000
8	24.05.2012	24	25.5	42.2	15.8	19.7	<1000



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Bahamba (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM2.5	PM10	SO2	NOx	CO
1	04.05.2012	24	25.5	42.7	15.9	17.9	<1000
2	05.05.2012	24	25.9	42.9	13.7	19.5	<1000
3	11.05.2012	24	23.7	41.3	12.8	18.6	<1000
4	13.05.2012	24	26.6	43.2	16.8	17.3	<1000
5	18.05.2012	24	25.8	42.9	13.5	18.7	<1000
6	19.05.2012	24	25.3	42.4	14.2	20.5	<1000
7	15.05.2012	24	25.5	42.6	15.3	19.3	<1000
8	26.05.2012	24	23.6	40.8	12.7	18.7	<1000

Tantara (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM2.5	PM10	SO2	NOx	CO
1	04.05.2012	24	27.8	46.3	15.3	19.6	<1000
2	05.05.2012	24	26.2	45.7	14.6	14.6	<1000
3	11.05.2012	24	25.5	43.6	13.9	18.8	<1000
4	13.05.2012	24	24.7	42.7	15.6	17.5	<1000
5	18.05.2012	24	25.3	42.8	14.7	16.4	<1000
6	19.05.2012	24	26.1	43.5	13.3	17.3	<1000
7	15.05.2012	24	25.5	42.4	12.6	15.7	<1000
8	26.05.2012	24	27.3	45.4	11.8	18.9	<1000



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**Surface Water Quality
For
M/s Geetarani Mohanty
Of
Raikela Iron Ore Mines
Season: Summer (May 2012)**

Sl. No.	Parameters	Units	Standards	Karo Nalla	Tantara Pond
1	pH	----	6.5 - 8.5	7.80	7.60
2	Colour	----	Colourless	Colourless	Colourless
3	Odour	----	Odourless	Odourless	Odourless
4	Total solid	mg/l	----	117	64
5	Total suspended solid	mg/l	----	10	12
6	Total dissolved solid	mg/l	1500	107	52
7	Oil and Grease	mg/l	----	0.10	BDL
8	Total residual chlorine	mg/l	0.2	BDL	BDL
9	Total kjeldahl nitrogen as N	mg/l	----	2.5	3.0
10	Free ammonia as NH ₃	mg/l	----	BDL	BDL
11	COD	mg/l	----	4.0	3.5
12	BOD(3 days at 27°C)	mg/l	3	1.5	1.0
13	Arsenic as As	mg/l	0.2	BDL	BDL
14	Mercury as Hg	mg/l	----	BDL	BDL
15	Lead as Pb	mg/l	0.1	BDL	BDL
16	Total chromiomas Cr	mg/l	2.0	BDL	BDL
17	Hexavalent Chromium as Cr	mg/l	0.05	BDL	BDL
18	Copper as Cu	mg/l	3.0	BDL	BDL
19	Zinc as Zn	mg/l	15	BDL	BDL
20	Selenium as Se	mg/l	0.05	BDL	BDL
21	Nickel as Ni	mg/l	----	BDL	BDL
22	Boron as B	mg/l	2.0	BDL	BDL
23	Cyanide as CN	mg/l	0.05	BDL	BDL
24	Chloride as Cl	mg/l	600	25	20
25	Nitrate as NO ₃	mg/l	50	0.50	0.40
26	Flouride as F	mg/l	1.5	BDL	BDL
27	Phosphate (P- PO ₄)	mg/l	5.0	0.25	0.25
28	Sulphate as SO ₄	mg/l	400	2.5	5.0
29	Iron as Fe	mg/l	5.0	1.5	1.2
30	Silica as SiO ₂	mg/l	----	BDL	BDL
31	Phenolic compound	mg/l	0.005	BDL	BDL
32	Residual pesticide	mg/l	Absent	BDL	BDL
33	Sodium(Na)	mg/l	60	0.08	0.25
34	Calcium as Ca	mg/l	75	4.5	3.0
35	Magnesium as Mg	mg/l	30	3.0	3.5
36	Total hardness	mg/l	300	18.0	15.5



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**Ground Water Quality
For
M/s Geetarani Mohanty
Of
Raikela Iron Ore Mines
Season: Summer (May 2012)**

Sl. No.	Parameters	Units	Standards	Tensa Tube well	Tentulidih dug well
1	Colour	----	Colourless	Colourless	Colourless
2	Odour	----	Odourless	Odourless	Odourless
3	pH	----	6.5-8.5	7.5	7.3
4	Dissolved oxygen	mg/l	3.0 (min)	5.0	6.0
5	T.D.S	mg/l	500	125	70
6	Total Suspended solid	mg/l	----	5	5
7	Chloride as Cl	mg/l	250	10	12.5
8	Sulphate as SO ₄	mg/l	200	10	10
9	Cyanide as CN	mg/l	0.05	BDL	BDL
10	Fluoride as F	mg/l	1.0	BDL	BDL
11	Phosphate as PO ₄	mg/l	----	0.02	0.03
12	Free Amonia as NH ₃	mg/l	----	BDL	BDL
13	Boron as B	mg/l	1.0	BDL	BDL
14	Calcium as Ca	mg/l	75	10	5
15	Magnesium as Mg	mg/l	30	5	1
16	Arsenic as As	mg/l	0.2	BDL	BDL
17	Barium as Ba	mg/l	----	BDL	BDL
18	Cadmium as Cd	mg/l	----	BDL	BDL
19	Total Chromium	mg/l	----	BDL	BDL
20	Hexavalent Chromium	mg/l	----	BDL	BDL
21	Copper as Cu	mg/l	0.05	BDL	BDL
22	Iron as Fe	mg/l	0.3	0.20	0.10
23	Selenium as Se	mg/l	0.01	BDL	BDL
24	Silver as Ag	mg/l	----	BDL	BDL
25	Zinc as Zn	mg/l	5.0	BDL	BDL
26	Phenol	mg/l	0.001	BDL	BDL
27	Pesticides	mg/l	Absent	BDL	BDL
28	Radioactive substance	mg/l	----	BDL	BDL



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NOISE LEVEL MONITORING

Season : Summer (May 2012)

Time	Results in dBA (LeQ)			
	Lease	Raikela	Bahamba	Tantara
09.00 A.M.	60.5	64.7	61.7	59.8
10.00 A.M.	58.6	62.8	63.5	59.5
11.00 A.M.	59.9	65.3	65.9	61.5
12.00 P.M.	61.3	62.5	61.2	63.6
01.00 P.M.	55.5	55.6	55.7	65.5
02.00 P.M.	53.8	51.9	52.3	63.3
03.00 P.M.	58.3	58.7	55.5	65.5
04.00 P.M.	61.5	62.5	59.6	66.5
05.00 P.M.	65.7	66.3	60.6	54.5
Date	2	3	4	5





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Ambient Air Quality Monitoring Data

For
M/s Geetarani Mohanty
Of
Raikela Iron Ore Mines

Lease Area (Core Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM _{2.5}	PM ₁₀	SO ₂	NO _x	CO
1	06.08.2012	24	18.9	31.8	13.8	18.5	<1000
2	07.08.2012	24	19.7	32.9	14.2	17.4	<1000
3	13.08.2012	24	20.6	33.2	13.5	20.3	<1000
4	14.08.2012	24	19.3	32.6	15.3	18.7	<1000
5	20.08.2012	24	19.5	32.8	13.6	19.8	<1000
6	21.08.2012	24	19.9	32.9	12.9	17.5	<1000
7	27.08.2012	24	18.7	31.5	15.7	19.6	<1000
8	28.08.2012	24	19.3	32.2	14.5	18.6	<1000

Raikela (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM _{2.5}	PM ₁₀	SO ₂	NO _x	CO
1	06.08.2012	24	22.8	39.2	13.7	17.7	<1000
2	07.08.2012	24	24.5	41.9	12.3	19.8	<1000
3	13.08.2012	24	25.3	42.1	14.8	18.5	<1000
4	14.08.2012	24	24.6	41.6	15.5	18.5	<1000
5	20.08.2012	24	23.7	39.5	15.6	19.3	<1000
6	21.08.2012	24	24.9	40.8	16.9	20.5	<1000
7	27.08.2012	24	23.7	39.9	15.7	18.8	<1000
8	28.08.2012	24	25.5	42.2	15.8	19.7	<1000





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267, Kharavela Nagar, Bhubaneswar-751 001, Ph: +91-674-2392060, 2391720, 2390687 (Off.)
Cable : 'Geomin' Fax: +91-674-2390687, E-mail : geomin@satyam.net.in, Web : geomin.co.in



Bahamba (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM _{2.5}	PM ₁₀	SO ₂	NO _x	CO
1	08.08.2012	24	22.3	37.6	13.8	16.8	<1000
2	09.08.2012	24	20.8	33.9	12.6	17.6	<1000
3	15.08.2012	24	20.9	33.1	11.3	16.6	<1000
4	16.08.2012	24	20.2	33.7	13.4	18.5	<1000
5	22.08.2012	24	21.5	34.5	12.8	19.6	<1000
6	23.08.2012	24	20.4	33.3	13.4	18.5	<1000
7	29.08.2012	24	20.9	33.3	11.5	17.8	<1000
8	30.08.2012	24	21.7	34.2	10.6	19.9	<1000

Tantara (Buffer Zone)

Sl. No.	Date of Monitoring	Duration of Monitoring	In Micro Gram/cubicmeter				
			PM _{2.5}	PM ₁₀	SO ₂	NO _x	CO
1	08.08.2012	24	25.7	42.7	14.9	17.5	<1000
2	09.08.2012	24	24.6	42.3	13.2	15.7	<1000
3	15.08.2012	24	24.3	42.1	12.5	18.6	<1000
4	16.08.2012	24	25.9	43.4	13.3	16.3	<1000
5	22.08.2012	24	23.8	41.8	12.5	17.5	<1000
6	23.08.2012	24	22.5	42.3	11.6	15.6	<1000
7	29.08.2012	24	25.6	43.6	13.5	16.7	<1000
8	30.08.2012	24	26.4	43.8	12.7	17.9	<1000



Provide a total Solution on Geological Exploration, Mining, Forestry, Environment, Geo-hydrology, Socio-economic Survey, Industrial Project Engineering, Assay & Environmental Parameter Analysis



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Surface Water Quality For M/s Geetarani Mohanty Of Raikela Iron Ore Mines Season: Monsoon (Aug 2012)

Sl. No.	Parameters	Units	Standards	Karo Nalla	Tantara Pond
1	pH	----	6.5 - 8.5	7.30	7.10
2	Colour	----	Colourless	Colourless	Colourless
3	Odour	----	Odourless	Odourless	Odourless
4	Total solid	mg/l	----	180	110
5	Total suspended solid	mg/l	----	45	30
6	Total dissolved solid	mg/l	1500	135	80
7	Oil and Grease	mg/l	----	0.10	BDL
8	Total residual chlorine	mg/l	0.2	BDL	BDL
9	Total kjeldahl nitrogen as N	mg/l	----	2.5	3.5
10	Free ammonia as NH ₃	mg/l	----	BDL	BDL
11	COD	mg/l	----	4.5	3.5
12	BOD(3 days at 27°C)	mg/l	3	1.0	1.0
13	Arsenic as As	mg/l	0.2	BDL	BDL
14	Mercury as Hg	mg/l	----	BDL	BDL
15	Lead as Pb	mg/l	0.1	BDL	BDL
16	Total chromium as Cr	mg/l	2.0	BDL	BDL
17	Hexavalent Chromium as Cr	mg/l	0.05	BDL	BDL
18	Copper as Cu	mg/l	3.0	BDL	BDL
19	Zinc as Zn	mg/l	15	BDL	BDL
20	Selenium as Se	mg/l	0.05	BDL	BDL
21	Nickel as Ni	mg/l	----	BDL	BDL
22	Boron as B	mg/l	2.0	BDL	BDL
23	Cyanide as CN	mg/l	0.05	BDL	BDL
24	Chloride as Cl	mg/l	600	25	20
25	Nitrate as NO ₃	mg/l	50	0.40	0.30
26	Fluoride as F	mg/l	1.5	BDL	BDL
27	Phosphate (P- PO ₄)	mg/l	5.0	0.35	0.45
28	Sulphate as SO ₄	mg/l	400	4.0	4.0
29	Iron as Fe	mg/l	5.0	1.7	1.5
30	Silica as SiO ₂	mg/l	----	BDL	BDL
31	Phenolic compound	mg/l	0.005	BDL	BDL
32	Residual pesticide	mg/l	Absent	BDL	BDL
33	Sodium(Na)	mg/l	60	0.05	0.15
34	Calcium as Ca	mg/l	75	4.0	3.5
35	Magnesium as Mg	mg/l	30	2.5	4.0
36	Total hardness	mg/l	300	15.0	13.5



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**Ground Water Quality
For
M/s Geetarani Mohanty
Of
Raikela Iron Ore Mines
Season: Monsoon (Aug. 2012)**

Sl. No.	Parameters	Units	Standards	Tensa Tube well	Tentulidih dug well
1	Colour	----	Colourless	Colourless	Colourless
2	Odour	----	Odourless	Odourless	Odourless
3	pH	----	6.5-8.5	7.5	7.3
4	Dissolved oxygen	mg/l	3.0 (min)	5.0	6.0
5	T.D.S	mg/l	500	125	70
6	Total Suspended solid	mg/l	----	5	5
7	Chloride as Cl	mg/l	250	10	12.5
8	Sulphate as SO ₄	mg/l	200	10	10
9	Cyanide as CN	mg/l	0.05	BDL	BDL
10	Fluoride as F	mg/l	1.0	BDL	BDL
11	Phosphate as PO ₄	mg/l	----	0.02	0.03
12	Free Ammonia as NH ₃	mg/l	----	BDL	BDL
13	Boron as B	mg/l	1.0	BDL	BDL
14	Calcium as Ca	mg/l	75	10	5
15	Magnesium as Mg	mg/l	30	5	1
16	Arsenic as As	mg/l	0.2	BDL	BDL
17	Barium as Ba	mg/l	----	BDL	BDL
18	Cadmium as Cd	mg/l	----	BDL	BDL
19	Total Chromium	mg/l	----	BDL	BDL
20	Hexavalent Chromium	mg/l	----	BDL	BDL
21	Copper as Cu	mg/l	0.05	BDL	BDL
22	Iron as Fe	mg/l	0.3	0.20	0.10
23	Selenium as Se	mg/l	0.01	BDL	BDL
24	Silver as Ag	mg/l	----	BDL	BDL
25	Zinc as Zn	mg/l	5.0	BDL	BDL
26	Phenol	mg/l	0.001	BDL	BDL
27	Pesticides	mg/l	Absent	BDL	BDL
28	Radioactive substance	mg/l	----	BDL	BDL





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NOISE LEVEL MONITORING

Season : Monsoon (Aug. 2012)

Time	Results in dBA (LeQ)			
	Lease	Raikela	Bahamba	Tantara
09.00 A.M.	58.8	62.5	58.8	60.6
10.00 A.M.	57.6	60.6	59.7	61.3
11.00 A.M.	55.3	63.8	61.5	62.8
12.00 P.M.	59.3	60.3	62.6	60.7
01.00 P.M.	55.4	53.5	58.9	61.2
02.00 P.M.	58.9	53.7	54.2	62.5
03.00 P.M.	59.8	54.6	55.5	63.4
04.00 P.M.	60.4	60.3	55.4	59.2
05.00 P.M.	61.6	63.5	59.7	54.3
Date of Aug.	6	7	15	16

