OMC | ODISHA NEW OPPORTUNITIES

Letter No. 7920 ..OMC/F&E/2017
May 20, 2017

To

The Director(S)
Ministry of Environment, Forests & Climate Change
Eastern Regional Office
A/3, Chandrashekharpur,
Bhubaneswar-751 023

Sub.: Submission of six monthly report on the status of compliance to the conditions stipulated in the grant order of EC along-with monitored data pertaining to **Daitari Iron Ore Mines** of OMC Ltd.

Ref.: i) EC Grant Order No. J-11015/1003/2007-IA.II (M) dt. 22.09.2010
ii) MoEF Circular No. J-11013/41/2006-IA.II(I) dt. 30.06.2009

Sir,

Six monthly reports on the status of compliance to EC conditions stipulated by MoEF, Govt. of India, under reference (i) pertaining to Daitari Iron Ore Mines for the period from Oct' 2016 - Mar' 2017 is enclosed as **Annexure-A** for kind perusal.

The environmental monitoring data (Oct' 2016 - Mar' 2017) comprising of air (ambient & fugitive), noise, water (ground & surface), waste water and soil for the above mentioned period is enclosed herewith as **Annexure-B**.

This is for your kind information and necessary action.

Encl.: As above (with a CD)

Yours faithfully,
20.5.17
Executive Director (F&E)

No...../OMC/F&E/2017 May 20, 2017

Copy to:

1. Copy alongwith copies of enclosures (in hard & soft) to Director (IA), Ministry of Environment, Forest & Climate Change, Government of India, 3rd Floor, Vayu Vihar, Indira Paryavaran Bhawan Jorbagh Road, Aliganj New Delhi – 110 003
2. Member Secretary, Central Pollution Control Board, Zonal Office, Kolkata
3. Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar-751 012
4. Regional Manager, Daitari, for kind information & necessary action.

Executive Director (F&E)

COMPLIANCE TO THE CONDITIONS STIPULATED IN THE GRANT ORDER OF ENVIRONMENTAL CLEARANCE GRANTED BY MOEF, GOVT.OF INDIA VIDE LETTER NO. J-11015/1003/2007-IA.II(M) DT 22.09.2010 PERTAINING TO DAITARI IRON ORE MINES OF M/S ODISHA MINING CORPORATION LIMITED

Sl. No.	Conditions Stipulated	Status of compliance made by OMC
A.	**Specific Conditions:**	
i	All the conditions stipulated by the State Pollution Control Board, Orissa in their Consent to Establish shall be effectively implemented.	The conditions stipulated by State Pollution Control Board, Odisha in their Consent to Establish granted vide letter No. 504/IND-II-NOC-4766 dt.12.01.2009 are being implemented.
ii	The project proponent shall obtain Consent to Operate from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated therein.	Consent to operate for 3.0 MTPA granted by SPCB vide letter No. 2569/IND-I-CON-246, dt. 08.02.2016 is valid till 31.03.2020. The conditions stipulated therein are being complied.
iii	The environmental clearance is subject to grant of approval of the State Land use Department, Government of Orissa for diversion of agricultural land for non agricultural use.	No agricultural land is diverted for use against this project. Hence approval of the State Land use Department, Govt. of Odisha may not be required.
iv	Environmental clearance is subject to grant of forestry clearance. Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 1619.937ha forestland involved in the project shall be obtained before starting mining operation in that area. Till such time the mining operation shall be restricted to 95.6ha already broken up forestland for which forestry clearance was obtained on 27.01.2005.No mining shall be undertaken in the forest area without obtaining requisite prior forestry clearance	Complied. Mining Operation is restricted to 95.60 ha of forest area granted by MoEF, Govt. of India vide F.No. 8-164/ 1997- FC dt 27.01.2005. The proposal for balance forest area over 746.3325 Ha has been recommended by State Government on dt. 19.09.2015 to MoEF&CC, Govt. of India. The proposal is pending at the Ministry for grant of Stage – I FC over 746.3325 Ha balance forest area within Daitari ML.
v	Environmental 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.	OMC shall abide by the judgment of Hon'ble Supreme Court.

vi	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as may be applicable to this project.	The Site Specific Wildlife conservation plan has been approved by PCCF (WL) for Daitari Iron Ore Mines & Daitari Extension Area (township) vide Memo No. 9569/1WL(C) SSP-382/2012 dt. 02.12.2013, with a total financial out lay of Rs. 1798.70 Lakhs. OMC has deposited Rs. 1518.35 lakhs (through RTGS mode vide UTR SBINH 14083303067 dt. 22.03.2014) towards the approved activities to be taken up by the DFO, Cuttack Division and DFO, Keonjhar WL Division in the zone of influence (10km radius) to be completed within 10 years of operation.
vii	The mining operations shall be restricted to above ground water table and it should not intersect the groundwater table. In case of working below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	The mining operations are restricted to above ground water table. Iron ore does not continue below ground water table for which mining operation will never intersect the GW table. However if such case arises in future, OMC will seek approval of CGWA.
viii	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the first order and the second order streams, if any emanating/passing through the mine lease area during the course of mining operation.	No natural watercourse or water resources are obstructed. Diversion of seasonal streams is not felt necessary so far.
ix	The top soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	There is no top soil within the present approved working area of 95.60 ha. The top soil will be stored while operating the virgin forest area in future after getting forest clearance over balance forest area.
x	There shall be no external dump(s). Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests	Not applicable in the present situation as no waste is being generated. However, when the mining operation of the balance virgin forest area is commenced after

	and its Regional Office located at Bhubaneswar on six monthly basis.	the grant of forest clearance, adequate steps shall be taken to comply by the same and the compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.
xi	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, sub-grade and mineral dump(s) to prevent run off of water and flow of sediments directly into the agricultural fields, the Kukurangi Nala, the Damsal Nala, the Kusai Nadi and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after the monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and sub-grade and mineral dump(s) to prevent run off of water and flow of sediments directly into the Kukurangi Nala, the Damsal Nala, the Kusai Nadi and other 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 retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.	Garland drains, settling tanks and check dams of appropriate size, gradient and length have been constructed and maintained regularly to control water pollution. The water collected from the settling tank is used for dust suppression purpose. One large size dam (45 Ha.), 58 nos. of boulder packing and 2 nos. of masonary check dams are constructed along the streams in Daitari mines lease area and Daitari extension area to prevent pollution.
xii	Dimension of the retaining wall at the toe of the OB benches within the mine to check run-off and siltation shall be based on the rain fall data.	There is no overburden, hence not applicable.
xiii	Plantation shall be raised in an area of 175.73ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native	Plantation in 7.5 m strip all along the ML boundary in the forest land shall be raised by the State Forest Department by utilizing the fund

	species around reclaimed area, mine benches, along the roads etc. in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	deposited by OMC. Plantation in quarry benches, backfilled and reclaimed area shall be taken up by OMC as per the reclamation schedule approved by IBM after the mineral is exhausted.
xiv	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Regular water sprinkling is being done in and around crushing and screening plants, loading and unloading point, transfer points and on haul roads. It is also being ensured that the ambient air quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard. Environmental monitoring is being carried out regularly to optimize the frequency of water sprinkling.
xv	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.	Water reservoir maintained outside the ML area recharges to the ground water aquifers. Rain water harvesting and recharge of ground water is being undertaken by constructing a pond.
xvi	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezometers during the mining operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is	Regular monitoring of ground water level and quality is being carried out on quarterly basis in and around the mine lease and reflected in monthly monitoring report displayed in our web site: www.orissamining.com.

	getting depleted due to the mining activity; necessary corrective measures shall be carried out.	
xvii	Appropriate mitigative measures should be taken to prevent pollution of the Kusai Nadi in consultation with the State Pollution Control Board.	One dam is constructed up stream of Kusai Nadi to the northern side of the ML area to prevent pollution. The area is coming within the zone of influence (10km radius) for which 50 nos. of check dams and other soil conservation measures have been prescribed in the site specific wildlife conservation plan to be executed by the DFO utilizing the funds deposited by OMC of Rs. 1518.35 lakhs.
xviii	The project proponent shall obtain necessary prior permission/NOC of the competent authorities for drawl of requisite quantity of water required for the project.	Application submitted before Commissioner-cum-Secretary, Dept. of Water Resources, Govt. of Odisha on dt. 10.10.2011 to grant surface water permission. OMC has requested Secretary S&M to recommend the quantum of water required for the project and the request made has been recommended by Secretary S&M, to Water Resource Department. Also the NOC for drawl of 1290 m^3/day of ground water is under consideration by CGWA, New Delhi.
xix	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	One pond has been developed for rain water harvesting and necessary recharge of ground water aquifers.
xx	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded. No transportation of ore outside the mine lease area shall be carried out after the sunset.	Regular maintenance of vehicles as well as monitoring of vehicular emission used in mining operation & transportation of ore is done to control pollution. The mineral transportation is carried out through covered trucks and the vehicles carrying the mineral are not over loaded. Transportation of ore outside the mine lease area is being carried out before the sunset.
xxi	No blasting shall be carried out after the sunset. Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations	Blasting operation is being carried out only during the daytime at 2.00 PM. Controlled blasting is practiced to control ground vibration and to arrest fly rocks.

	and to arrest fly rocks and boulders should be implemented.	
xxii	Drills shall either be operated with the dust extractors or equipped with water injection system.	Drills are being operated with water injection system.
xxiii	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	There is no mineral handling plant at present due to want of forest clearance. Regular water sprinkling is being carried out in and around the present crushing and screening unit, loading and unloading point, transfer points and on haul roads.
xxiv	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and wastewater generated during the mining operation.	The waste water generated from the colony is sent to the soak pit through the septic tank.
xxv	Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to MOEF and its Regional Office, Bhubaneswar.	The digital processing of the entire lease area for the monitoring of land use pattern has been prepared by ORSAC, Dept. of Science & Technology, Govt. of Odisha. The copy of the same is enclosed herewith as **Plate – I.**
xxvi	Effective safeguard measures should be taken to control fugitive emissions so as to ensure that RSPM (PM_{10}) levels are within prescribed limits.	Following protection measures being undertaken to control fugitive dust emission: • Regular maintenance of haul roads • Water sprinkling on roads as well as dust prone areas like crushing and screening plant, loading and unloading point and all transfer points • Transportation of iron ore by trucks only after proper covering by tarpaulin sheets We are ensuring the air quality status by periodically monitoring the ambient air as per the prescribed CPCB norms.
xxvii	Door to door sample survey should be undertaken within the impact zone to access the family based need of the tribals and it should the appropriately addressed in the CSR activities to be undertaken in the area. An action plan in this regard should be prepared and submitted.	The need based requirements of the villagers at the core & buffer zone of the ML area pertaining to health, education, electricity, road, sanitation, water supply etc. is being well addressed under CSR activities by OMC.

xxviii	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	Pre-placement medical examination and periodical medical examination of the workers engaged in the project are being carried out and records maintained.
xxix	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely elephant, pangolin, python, king kobra etc. in the study areafauna found in the study area. Action plan for conservation of flora and fauna prepared shall be implemented in consultation with the State Forest and Wildlife Department. All the safeguard measures brought out in the Wildlife Conservation Plan prepared specific to this project site shall be effectively implemented. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar.	All the precautionary measures are being taken during mining operation for conservation and protection of endangered faunas as per advice of local forest officials. Site specific wildlife conservation plan has been approved by PCCF (WL) for implementation within the core and buffer zone of the ML area. Cost towards implementation of the measures as specified in site specific wildlife conservation plan to be executed by the DFO has been deposited by OMC of Rs. 1518.35 lakhs.
xxx	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	No construction activity is carried out. It is an existing project.
xxxi	The critical parameters such as RSPM (Particulate matter with size less than 10micron i.e., PM10) and NOX in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically . Further, quality of discharged water shall also be monitored [(TDS, DO, PH and Total Suspended Solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as	PM_{10}, $PM_{2.5}$, SO_2 and NOx are being measured regularly (twice a week) in ambient air within the impact zone. There is no waste water discharge from the mining activity except surface run off during monsoon for which adequate measures are being undertaken. However the waste water quality for the said parameters are being carried out and

<table>
<tr><td></td><td>displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.</td><td>monitored regularly.
The monitored data is being up loaded in the web site of OMC. Necessary steps have been taken to install the digital display board at the main gate of OMC.</td></tr>
<tr><td>xxxii</td><td>A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.</td><td>Shall be complied before closure.</td></tr>
<tr><td colspan="3">B. General conditions</td></tr>
<tr><td>i</td><td>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.</td><td>There is no change in the mining technology.</td></tr>
<tr><td>ii</td><td>No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.</td><td>Due to want of forest clearance the production is much below the targeted quantity mentioned in the calendar plan.
<table>
<tr><th rowspan="2">Month</th><th colspan="2">Production in MT</th><th colspan="2">Waste generation in m^3</th></tr>
<tr><th>Planned</th><th>Actual</th><th>Planned</th><th>Actual</th></tr>
<tr><td>Oct'16</td><td>250000</td><td>151124</td><td>0</td><td>0</td></tr>
<tr><td>Nov'16</td><td>250000</td><td>348995</td><td>0</td><td>0</td></tr>
<tr><td>Dec'16</td><td>250000</td><td>396520</td><td>0</td><td>0</td></tr>
<tr><td>Jan'17</td><td>250000</td><td>408907</td><td>0</td><td>0</td></tr>
<tr><td>Feb'17</td><td>250000</td><td>352045</td><td>0</td><td>0</td></tr>
<tr><td>Mar'17</td><td>250000</td><td>359913</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>iii</td><td>Atleast four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.</td><td>Ambient air quality-monitoring at six different locations is being carried out and recorded regularly as per CPCB norm and the monitoring results are being displayed in the web site: www.orissamining.com.</td></tr>
<tr><td>iv</td><td>Data on ambient air quality [(RSPM(Particulate matter with size</td><td>Six monthly data on AAQ is submitted to the Ministry</td></tr>
</table>

	less than 10micron i.e., PM10) and 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.	including its Regional office located at Bhubaneswar and the State Pollution Control Board and the report is displayed in the web site: www.orissamining.com.
v	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Complied.
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 ear plugs / muffs.	Noise level is being maintained below 85 dBA. Workers engaged are provided with adequate safety equipments.
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 waste water generation from the mine except surface run off during monsoon for which garland drain, check dams and boulder walls has been constructed to check the water pollution. Oil & grease trap is installed in workshop & is being maintained.
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 measures, if needed.	Personnel working in dusty areas wear protective respiratory devices and they are also being provided with adequate training and information on safety and health aspects in OMC Vocational Training Centre.
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.	There is one Environmental management cell.
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	Complied. The year wise expenditure is attached herewith as **Annexure-1.**

	Bhubaneswar.	
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.	It will be intimated before closure.
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 the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	OMC renders all support and co-operation during inspection by the officer (s) of the Regional Office.
xiii	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	Complied.
xiv	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied.
xv	The State Pollution Control Board should display a copy of the clearance	Complied

	letter at the Regional office, District Industry Centre and Collector's office/Tahasildar's Office for 30 days.	
xvi	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	
xvii	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.	Complied.

ANNEXURE-1

EXPENDITURE FOR ENVIRONMENTAL PROTECTION MEASURES PERTAINING TO DAITARI IRON ORE MINES MAY KINDLY BE FURNISHED FOR THE PERIOD **(OCTOBER'2016 – MARCH'2017)**

Sl No.	Activities	Expenditure (in Rs.)
1.	Pollution Control	
	• Towards construction of roads, drains, ghat road concrete pavement, check dams	1,24,26,000.00
	• Towards water sprinkling by water tankers and water sprinklers	34,43,900.00
	• Environment Monitoring	2,90,000.00
2.	CSR activities	
	• Financial aid to Women Self Help Group	2,00,000.00
	• Financial aid to Birsa Munda ST/SC Club	32,000.00
	• Financial aid to Birsa Ganesh Sporting Club	15,000.00
	• Financial aid to Birsa Ganesh Sporting Club	20,000.00
3.	Medical activities	
	• Towards medicine expenditure	15,80,795.00
	• Health camp	64,421.00
4.	Observation of Mines Environment and Mineral Conservation Week	2,44,000.00
5.	Plantation	4,78,896.00
	Total	**1,87,95,012.00**

SR MANAGER (MINING)
DAITARI IRON ORE MINES

ANNEXURE - B

Environmental Monitoring Report - Daitari Iron Ore Mine of M/s Odisha Mining Corporation Limited during the period (October 2016 to March 2017)

1. *Ambient Air Quality*

Sl. No	Location	Month	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
1.	Pump House inside Colony Lat. 21°05'38.7"N Long.85°48'42.84"E	October'16	03.10.2016	50	19	4.8	10.5	BDL
			06.10.2016	44	16	4.3	9.8	BDL
			12.10.2016	68	30	6.1	11.4	BDL
			15.10.2016	62	25	5.8	10.8	BDL
			19.10.2016	55	21	5.0	10.2	BDL
			22.10.2016	59	24	5.4	10.4	BDL
			26.10.2016	55	20	5.1	10.2	BDL
			29.10.2016	60	22	5.6	11.0	BDL
		November'16	02.11.2016	62	27	5.6	10.8	BDL
			05.11.2016	49	19	4.6	9.8	BDL
			09.11.2016	69	31	6.4	11.6	BDL
			12.11.2016	72	36	6.8	12.9	BDL
			16.11.2016	60	26	6.0	12.6	BDL
			19.11.2016	59	22	5.8	12.0	BDL
			23.11.2016	51	21	5.2	11.6	BDL
			26.11.2016	67	30	6.1	12.9	BDL
			30.11.2016	53	23	4.9	10.2	BDL
		December'16	03.12.2016	60	23	5.2	12.2	BDL
			07.12.2016	54	20	4.8	11.2	BDL
			10.12.2016	66	26	5.6	12.6	BDL
			14.12.2016	76	31	6.9	13.8	BDL
			17.12.2016	60	23	5.2	12.2	BDL
			21.12.2016	59	21	5.2	11.9	BDL
			24.12.2016	58	20	5.1	11.6	BDL
			28.12.2016	64	25	5.4	12.4	BDL
			31.12.2016	59	21	5.2	13.2	BDL
		January'17	04.01.2017	64	24	5.2	10.4	BDL
			07.01.2017	69	28	5.6	10.8	BDL
			11.01.2017	58	22	4.8	9.8	BDL
			14.01.2017	72	29	6.4	11.2	BDL
			18.01.2017	79	32	7.2	12.8	BDL
			21.01.2017	66	26	5.4	10.9	BDL
			25.01.2017	74	30	6.6	11.9	BDL
			30.01.2017	76	31	6.9	12.1	BDL
		February'17	02.02.2017	74	29	7.0	12.5	BDL
			06.02.2017	66	26	6.9	11.9	BDL

Ecological Development Consultancy Pvt. Ltd. BBSR.

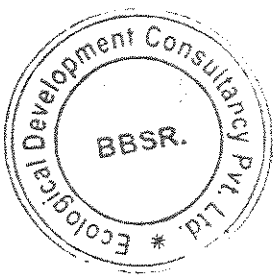
SM(FRE)

26/4/17

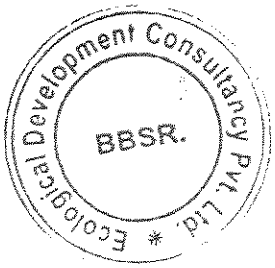
Sl. No	Location	Month	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
			09.02.2017	75	31	7.8	13.4	BDL
			13.02.2017	69	28	7.1	12.3	BDL
			16.02.2017	63	25	6.8	11.8	BDL
			20.02.2017	80	32	7.9	13.2	BDL
			23.02.2017	71	28	7.2	12.9	BDL
			27.02.2017	74	27	7.3	13.1	BDL
		March´17	02.03.2017	78	30	6.9	13.1	BDL
			06.03.2017	72	26	6.4	12.9	BDL
			09.03.2017	80	33	7.2	13.6	BDL
			14.03.2017	84	36	8.1	14.9	BDL
			16.03.2017	81	34	7.6	14.2	BDL
			20.03.2017	69	25	5.9	11.8	BDL
			23.03.2017	70	26	6.2	12.2	BDL
			27.03.2017	81	30	7.9	13.5	BDL
			30.03.2017	74	28	8.1	13.2	BDL
2.	Daitari Guest House Lat. : $21^0 06'34.08"N$ Long.: $85^0 49'29.4"E$	October´16	03.10.2016	58	30	4.7	9.6	BDL
			06.10.2016	49	19	4.4	9.9	BDL
			12.10.2016	54	25	5.2	10.5	BDL
			15.10.2016	61	24	5.6	10.9	BDL
			19.10.2016	69	32	6.8	11.4	BDL
			22.10.2016	67	27	6.1	11.6	BDL
			26.10.2016	50	21	5.9	10.3	BDL
			29.10.2016	51	23	5.0	10.2	BDL
		November´16	02.11.2016	56	25	5.4	11.2	BDL
			05.11.2016	50	19	4.9	10.2	BDL
			09.11.2016	59	22	5.2	10.9	BDL
			12.11.2016	62	27	5.9	11.8	BDL
			16.11.2016	70	32	6.1	12.8	BDL
			19.11.2016	56	25	5.2	10.6	BDL
			23.11.2016	64	29	6.0	12.4	BDL
			26.11.2016	57	25	5.8	11.9	BDL
			30.11.2016	60	26	5.9	12.1	BDL
		December´16	03.12.2016	66	26	5.9	12.6	BDL
			07.12.2016	71	28	6.6	13.2	BDL
			10.12.2016	59	21	5.2	12.2	BDL
			14.12.2016	62	24	5.5	13.9	BDL
			17.12.2016	70	27	6.5	13.7	BDL
			21.12.2016	61	23	5.2	12.3	BDL
			24.12.2016	49	18	4.4	10.5	BDL
			28.12.2016	52	20	4.6	11.6	BDL
			31.12.2016	60	22	5.2	13.3	BDL
		January´17	04.01.2017	67	27	5.8	10.3	BDL

Sl. No	Location	Month	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
			07.01.2017	59	24	4.9	9.6	BDL
			11.01.2017	63	25	5.6	10.2	BDL
			14.01.2017	72	30	6.3	11.6	BDL
			18.01.2017	74	32	6.9	12.9	BDL
			21.01.2017	56	20	4.6	9.6	BDL
			25.01.2017	68	29	5.6	11.2	BDL
			30.01.2017	61	25	5.1	10.2	BDL
		February'17	02.02.2017	59	22	4.8	9.8	BDL
			06.02.2017	60	24	5.2	10.2	BDL
			09.02.2017	72	29	7.3	12.9	BDL
			13.02.2017	79	31	8.4	13.5	BDL
			16.02.2017	75	29	8.2	13.9	BDL
			20.02.2017	67	26	7.6	13.2	BDL
			23.02.2017	74	28	7.9	13.0	BDL
			27.02.2017	61	24	5.9	10.8	BDL
		March'17	02.03.2017	75	26	6.1	13.8	BDL
			06.03.2017	81	35	7.4	13.6	BDL
			09.03.2017	70	27	6.9	12.4	BDL
			14.03.2017	74	29	7.1	12.8	BDL
			16.03.2017	68	22	5.9	11.5	BDL
			20.03.2017	63	20	5.6	11.1	BDL
			23.03.2017	70	26	6.8	12.0	BDL
			27.03.2017	78	33	7.4	12.8	BDL
			30.03.2017	71	31	6.9	12.3	BDL
3.	OMC Office Lat. : 21°06'40.44"N Long.: 85°50'22.86"E	October'16	04.10.2016	53	22	6.1	10.5	BDL
			07.10.2016	56	21	5.2	10.1	BDL
			13.10.2016	70	36	6.8	12.4	BDL
			17.10.2016	74	40	7.2	13.2	BDL
			20.10.2016	68	31	6.6	11.7	BDL
			24.10.2016	59	25	5.9	10.9	BDL
			27.10.2016	Monitoring has not been done due to rain				
			31.10.2016	63	28	6.1	11.3	BDL
		November'16	03.11.2016	49	17	4.6	9.9	BDL
			07.11.2016	46	15	4.2	9.6	BDL
			10.11.2016	53	22	4.9	10.2	BDL
			14.11.2016	69	30	6.2	12.8	BDL
			17.11.2016	62	27	6.0	12.6	BDL
			21.11.2016	60	25	5.8	11.9	BDL
			24.112016	54	23	5.4	11.2	BDL
			28.11.2016	50	20	5.0	11.0	BDL
		December'16	01.12.2016	66	26	5.6	12.6	BDL
			05.12.2016	69	28	6.4	13.5	BDL

Sl. No	Location	Month	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
			08.12.2016	73	30	6.9	13.5	BDL
			12.12.2016	84	34	7.6	14.6	BDL
			15.12.2016	75	32	7.1	14.1	BDL
			19.12.2016	66	26	5.6	13.5	BDL
			22.12.2016	71	29	6.6	13.1	BDL
			26.12.2016	63	25	5.5	12.9	BDL
			29.12.2016	68	27	5.9	13.6	BDL
		January´17	02.01.2017	88	36	8.5	14.6	BDL
			05.01.2017	79	32	7.6	13.8	BDL
			09.01.2017	76	30	7.4	13.1	BDL
			12.01.2017	71	28	6.2	12.8	BDL
			16.01.2017	86	35	8.3	14.2	BDL
			19.01.2017	83	33	8.1	14.0	BDL
			23.01.2017	78	31	7.6	13.6	BDL
			27.01.2017	70	28	6.1	11.0	BDL
			31.01.2017	75	29	7.4	13.2	BDL
		February´17	02.02.2017	88	35	8.8	14.8	BDL
			06.02.2017	81	32	8.4	14.6	BDL
			09.02.2017	92	38	9.2	15.4	BDL
			13.02.2017	75	31	8.1	13.8	BDL
			16.02.2017	67	29	7.3	13.0	BDL
			20.02.2017	73	30	7.4	13.5	BDL
			23.02.2017	85	34	8.5	14.2	BDL
			27.02.2017	83	32	8.2	14.1	BDL
		March´17	02.03.2017	90	41	8.2	13.9	BDL
			06.03.2017	86	38	7.5	13.6	BDL
			09.03.2017	84	35	7.2	13.3	BDL
			14.03.2017	88	40	7.8	13.6	BDL
			16.03.2017	96	44	8.9	14.8	BDL
			20.03.2017	92	42	8.4	14.3	BDL
			23.03.2017	89	39	8.0	14.1	BDL
			27.03.2017	87	36	7.7	13.8	BDL
			30.03.2017	81	32	6.9	13.2	BDL
4.	Baliparbat Township Lat. : 21°06'30.72"N Long.: 85°51'35.7"E	October´16	04.10.2016	54	19	5.9	10.2	BDL
			07.10.2016	69	32	7.1	12.4	BDL
			13.10.2016	62	25	6.3	11.1	BDL
			17.10.2016	58	20	6.0	10.5	BDL
			20.10.2016	66	29	6.8	11.8	BDL
			24.10.2016	53	22	6.2	9.9	BDL
			27.10.2016	Monitoring has not been done due to rain				
			31.10.2016	64	26	6.6	10.9	BDL
		November´16	03.11.2016	75	38	6.8	13.0	BDL



Sl. No	Location	Month	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
			07.11.2016	62	27	6.1	12.1	BDL
			10.11.2016	70	33	6.5	12.6	BDL
			14.11.2016	63	26	5.4	11.3	BDL
			17.11.2016	61	24	5.8	11.9	BDL
			21.11.2016	55	22	5.3	11.2	BDL
			24.112016	64	27	6.0	12.0	BDL
			28.11.2016	69	31	6.2	12.6	BDL
		December´16	01.12.2016	75	32	7.1	14.1	BDL
			05.12.2016	62	24	5.5	13.9	BDL
			08.12.2016	74	31	6.8	14.0	BDL
			12.12.2016	70	27	6.5	13.7	BDL
			15.12.2016	80	32	7.4	14.2	BDL
			19.12.2016	65	24	5.5	12.4	BDL
			22.12.2016	51	20	5.1	10.8	BDL
			26.12.2016	64	23	5.4	13.2	BDL
			29.12.2016	69	28	6.4	13.9	BDL
		January´17	02.01.2017	71	27	6.2	12.9	BDL
			05.01.2017	65	25	5.4	11.2	BDL
			09.01.2017	61	24	5.1	10.9	BDL
			12.01.2017	82	33	6.4	13.6	BDL
			16.01.2017	80	31	6.2	13.1	BDL
			19.01.2017	74	29	7.2	12.9	BDL
			23.01.2017	73	30	6.8	12.3	BDL
			27.01.2017	67	26	6.6	11.6	BDL
			31.01.2017	62	22	6.2	11.2	BDL
		February´17	02.02.2017	70	28	7.6	13.2	BDL
			06.02.2017	86	34	8.8	14.3	BDL
			09.02.2017	76	30	7.3	13.9	BDL
			13.02.2017	84	33	7.9	14.2	BDL
			16.02.2017	79	28	7.6	13.8	BDL
			20.02.2017	81	32	8.1	13.5	BDL
			23.02.2017	70	27	7.4	12.8	BDL
			27.02.2017	68	24	6.8	12.4	BDL
		March´17	02.03.2017	87	38	7.8	13.4	BDL
			06.03.2017	84	32	7.5	13.2	BDL
			09.03.2017	90	39	8.0	14.2	BDL
			14.03.2017	81	40	7.2	13.5	BDL
			16.03.2017	79	35	7.0	12.8	BDL
			20.03.2017	74	32	6.5	12.5	BDL
			23.03.2017	72	30	6.2	12.1	BDL
			27.03.2017	66	20	5.4	11.2	BDL
			30.03.2017	68	22	6.2	11.9	BDL



5.	Pump House Lat. : 21°07'39.06"N Long.: 85°48'43.44"E	October'16	01.10.2016	Monitoring has not been done due to rain				
			05.10.2016	54	24	6.6	10.2	BDL
			08.10.2016	62	27	6.2	12.5	BDL
			14.10.2016	58	25	5.9	11.9	BDL
			18.10.2016	51	20	5.6	11.7	BDL
			21.10.2016	56	26	6.1	11.4	BDL
			25.10.2016	60	32	6.0	12.4	BDL
			28.10.2016	64	34	6.9	12.9	BDL
		November'16	01.11.2016	66	29	5.9	11.9	BDL
			04.11.2016	51	21	5.2	11.3	BDL
			08.11.2016	64	27	6.0	12.2	BDL
			11.11.2016	67	29	6.2	12.6	BDL
			15.11.2016	53	22	5.0	11.8	BDL
			18.11.2016	59	25	5.8	12.4	BDL
			22.11.2016	62	26	5.9	12.6	BDL
			25.11.2016	55	23	5.3	11.9	BDL
			29.11.2016	68	30	6.1	12.7	BDL
		December'16	02.12.2016	66	28	5.4	13.4	BDL
			06.12.2016	71	25	6.6	13.7	BDL
			09.12.2016	75	29	7.1	14.4	BDL
			13.12.2016	67	30	5.9	12.4	BDL
			16.12.2016	70	26	6.6	13.5	BDL
			20.12.2016	65	28	5.5	11.4	BDL
			23.12.2016	62	24	5.5	10.6	BDL
			27.12.2016	64	22	5.4	10.5	BDL
			30.12.2016	73	23	6.8	13.7	BDL
		January'17	03.01.2017	80	33	8.2	13.3	BDL
			06.01.2017	69	26	5.4	11.4	BDL
			10.01.2017	72	28	6.9	12.6	BDL
			13.01.2017	77	31	7.6	13.2	BDL
			17.01.2017	64	25	5.6	11.6	BDL
			20.01.2017	70	28	6.3	12.8	BDL
			24.01.2017	63	24	5.8	11.3	BDL
			28.01.2017	61	21	5.5	11.1	BDL
		February'17	02.02.2017	61	21	5.9	11.5	BDL
			06.02.2017	57	20	4.8	9.6	BDL
			09.02.2017	72	29	7.5	13.3	BDL
			13.02.2017	69	25	7.2	12.5	BDL
			16.02.2017	71	26	7.6	13.2	BDL
			20.02.2017	75	31	7.8	13.6	BDL
			23.02.2017	66	23	6.4	12.2	BDL
			27.02.2017	73	30	7.6	13.8	BDL
		March'17	02.03.2017	78	37	7.2	12.9	BDL
			06.03.2017	71	33	6.8	12.4	BDL
			09.03.2017	69	23	6.2	12.0	BDL

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			14.03.2017	73	35	6.9	13.8	BDL
			16.03.2017	74	37	7.2	13.4	BDL
			20.03.2017	66	28	5.4	11.6	BDL
			23.03.2017	59	20	4.8	10.2	BDL
			27.03.2017	60	23	5.9	11.4	BDL
			30.03.2017	57	18	4.5	9.4	BDL
6.	Near Hospital Lat. : 21°06'43.14"N Long.: 85°49'25.2"E	October'16	01.10.2016	Monitoring has not been done due to rain				
			05.10.2016	47	17	4.2	9.8	BDL
			08.10.2016	45	13	BDL	BDL	BDL
			14.10.2016	50	20	5.6	10.8	BDL
			18.10.2016	49	19	5.1	10.5	BDL
			21.10.2016	55	26	6.2	11.4	BDL
			25.10.2016	57	29	5.9	12.1	BDL
			28.10.2016	53	32	6.0	11.1	BDL
		November'16	01.11.2016	59	25	5.8	12.2	BDL
			04.11.2016	45	16	4.2	9.9	BDL
			08.11.2016	50	20	4.9	10.2	BDL
			11.11.2016	49	18	4.4	10.1	BDL
			15.11.2016	66	28	5.9	12.4	BDL
			18.11.2016	51	21	5.1	11.8	BDL
			22.11.2016	62	24	5.6	12.3	BDL
			25.11.2016	65	26	5.9	12.6	BDL
			29.11.2016	48	17	4.3	10.1	BDL
		December'16	02.12.2016	49	17	4.4	10.5	BDL
			06.12.2016	60	22	5.2	13.1	BDL
			09.12.2016	52	20	4.6	10.9	BDL
			13.12.2016	58	22	4.9	11.2	BDL
			16.12.2016	66	25	5.5	11.6	BDL
			20.12.2016	69	28	5.9	12.4	BDL
			23.12.2016	62	25	5.4	10.6	BDL
			27.12.2016	64	27	5.4	10.4	BDL
			30.12.2016	55	20	4.6	10.8	BDL
		January'17	03.01.2017	70	27	6.8	12.9	BDL
			06.01.2017	65	25	5.8	11.8	BDL
			10.01.2017	72	29	6.1	13.9	BDL
			13.01.2017	69	27	5.2	12.2	BDL
			17.01.2017	61	24	6.2	11.7	BDL
			20.01.2017	55	19	4.2	9.2	BDL
			24.01.2017	60	22	5.4	10.2	BDL
			28.01.2017	57	20	4.4	9.5	BDL
		February'17	02.02.2017	62	22	6.1	11.8	BDL
			06.02.2017	74	30	7.7	12.5	BDL
			09.02.2017	68	28	6.6	12.2	BDL
			13.02.2017	78	33	8.1	13.4	BDL
			16.02.2017	60	21	6.2	10.6	BDL

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			20.02.2017	55	18	4.5	9.4	BDL
			23.02.2017	72	28	6.9	12.2	BDL
			27.02.2017	76	32	7.3	13.4	BDL
		March´17	02.03.2017	82	42	6.9	13.8	BDL
			06.03.2017	78	39	6.3	13.6	BDL
			09.03.2017	74	36	5.9	12.8	BDL
			14.03.2017	69	27	5.5	10.6	BDL
			16.03.2017	62	24	5.3	10.1	BDL
			20.03.2017	58	19	4.7	9.6	BDL
			23.03.2017	81	41	6.5	14.2	BDL
			27.03.2017	75	35	5.7	13.5	BDL
			30.03.2017	78	38	6.1	13.9	BDL
CPCB Standard			**24 Hrly**	**100**	**60**	**80**	**80**	**4 (1Hrly)**
			Annual Average	**60**	**40**	**40**	**50**	**--**

Note: BDL for SO_2 : 4.0 µg/m^3; BDL for NOx : 9.0 µg/m^3; BDL for CO : 0.1mg/m^3.

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2. Fugitive Emission Monitoring ($\mu g/m^3$)

Sl. No.	Month	Mines office at hill-top	Pit (South side)	Haulage road at old crusher	Crusher	Hill-top at weigh bridge	Bali Parbat Stock Yard near weigh bridge
		Lat. : 21°06'10.98"N Long.: 85°48'29.40"E	Lat. : 21°05'57.54"N Long.: 85°48'35.88"E	Lat. : 21°05'52.44"N Long.: 85°48'33.72"E	Lat. : 21°06'24.96"N Long.: 85°48'20.10"E	Lat. : 21°06'17.58"N Long.: 85°51'4.92"E	Lat. : 21°05'42.24"N Long.: 85°48'40.68"E
1	October'16	141	163	128	205	226	284
2	November'16	173	184	151	233	281	304
3.	December'16	194	215	167	271	302	325
4	January'17	208	248	196	299	318	364
5	February'17	224	262	220	346	362	370
6	March'17	250	294	262	380	374	410
Permissible Limit		1200 $\mu g/m^3$					

3. Noise Level (dBA)

A. Ambient noise level

Sl. No.	Location	Coordinates	Day (06:00-22:00 hrs.)			Night (22:00-06:00hrs.)		
			Minimum	Maximum	CPCB Standard	Minimum	Maximum	CPCB Standard
1	Pump house inside colony	Lat. : 21°06'41.90"N Long.: 85°49'48.88"E	35.1	54.9	75	BDL	34.2	70
2	Sector-3 near Bank	Lat. : 21°06'41.52"N Long.: 85°29'35.94"E	40.8	54.4	55	BDL	31.9	45
3	OMC Office (C)	Lat. : 21°06'40.44"N Long.: 85°50'22.86"E	43.2	63.6	65	BDL	38.6	55
4	Baliparbat Township (R)	Lat. : 21°06'30.72"N Long.: 85°51'35.7"E	40.9	64.1	55	BDL	34.8	45
5	Water Reservoir Pump House (R)	Lat. : 21°07'39.06"N Long.: 85°48'43.44"E	34.5	49.9	55	BDL	31.4	45
6	Near Hospital Daitari (S)	Lat. : 21°06'43.14"N Long.: 85°49'25.2"E	34.3	51.2	50	BDL	32.5	40

Note: I – Industrial Area; R – Residential Area; C- Commercial Area; S – Silence Zone; BDL of Noise Level Meter is 30 dBA.

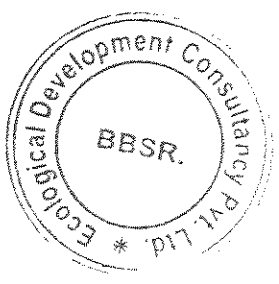
B. Work zone noise level

Sl. No.	Location	Coordinates	Day (08:00-15:00 hrs.)		
			Minimum	Maximum	OSHA Standard
1	Near Narayani Crusher	21°05'52.2"N 85°48'32.64"E	34.3	75.2	90
2	Excavation site	21°06'12.12"N 85°48'26.4"E	48.2	74.6	90
3	Drilling point	21°06'23.28"N 85°48'20.04"E	36.9	78.1	90

4. Surface Water Monitoring

Sl. No.	Parameters	Daitari Dam site	Stream flowing near Pichida	Stream flowing near Old Market	Stream Near Baliparbat
		$21^0$07'39.12"N $85^0$48'42.84"E	$21^0$07'7.56"N $85^0$48'56.7"E	$21^0$06'49.98"N $85^0$49'29.58"E	$21^0$06'24.18"N $85^0$51'35.88"E
1	Colour	Colourless	Colourless	Colourless	Colourless
2	Odour	U/O	U/O	U/O	U/O
3	Suspended Solids	64-95	55-94	57-96	60-95
4	Turbidity	4-16	4-14	4-18	6-10
5	pH value	6.65-7.51	6.85-7.31	6.51-7.95	6.54-7.34
6	Temperature	26-36	24-34	28-34	21-32
7	Oil & Grease	<0.1	<0.1	<0.1	<0.1
8	Ammonical Nitrogen	1.14-1.56	1.12-1.38	1.18-1.50	1.20-1.42
9	Total Kjeldhal Nitrogen	2.0-2.8	2.0-3.0	2.2-3.1	2.8-3.3
10	Total Hardness (as $CaCO_3$)	41-75	45-75	51-84	50-93
11	Iron (as Fe)	0.44-0.74	0.48-0.60	0.52-0.69	0.40-0.71
12	Chloride (as Cl)	19-27	18-25	13-31	21-29
13	Fluoride (as F)	0.12-0.28	0.10-0.26	0.16-0.30	0.12-0.32
14	Total Dissolved Solids	65-95	62-82	52-84	55-93
15	Calcium (as Ca)	13.8-17.8	15.2-18.6	14.9-18.9	14.1-18.6
16	Magnesium (as Mg)	13.8-18.2	12.6-19.2	14.5-18.8	14.6-20.2
17	Copper(as Cu)	<0.0001	<0.0001	<0.0001	<0.0001
18	Nickel(as Ni)	0.016-0.022	0.012-0.018	0.012-0.022	0.010-0.022
19	Manganese (as Mn)	<0.00001	<0.00001	<0.00001	<0.00001
20	Sulfate (as SO_4)	16-26	14-25	18-23	22-26
21	Nitrate (as NO_3)	0.16-0.26.	0.12-0.20	0.16-0.24	0.12-0.22
22	Sulfide(as S)	<0.1	<0.1	<0.1	<0.1
23	Phenolic Compounds (as C_6H_5OH)	<0.001	<0.001	<0.001	<0.001
24	Mercury (as Hg)	<0.00001	<0.00001	<0.00001	<0.00001
25	Cadmium (as Cd)	<0.00001	<0.00001	<0.00001	<0.00001
26	Selenium (as Se)	<0.0001	<0.0001	<0.0001	<0.0001
27	Arsenic (as As)	<0.0001	<0.0001	<0.0001	<0.0001
28	Cyanide (as CN)	<0.002	<0.002	<0.002	<0.002
29	Lead (as Pb)	<0.0001	<0.0001	<0.0001	<0.0001
30	Zinc (as Zn)	<0.0001	<0.0001	<0.0001	<0.0001
31	Hexavalent Chromium(as Cr^{+6})	<0.002	<0.002	<0.002	<0.002
32	Anionic Detergent as MBAS	<0.01	<0.01	<0.01	<0.01
33	Alkalinity (as $CaCO_3$)	39-55	31-72	40-65	41-69
34	Free Ammonia (N)	0.14-0.26	0.10-0.22	0.08-0.34	0.12-0.20
35	Boron (as B)	<0.0001	<0.0001	<0.0001	<0.0001
36	Coli form Organism	140-210	123-172	120-194	115-178
37	Sodium Absorption Ratio	0.20-0.24	0.18-0.32	0.18-0.36	0.18-0.22
38	Dissolved Oxygen as O_2	4.6-5.6	5.2-6.0	4.6-6.4	5.4-6.3
39	BOD, 3 days at 27^0C	2.4-3.0	2.0-2.8	2.2-2.8	1.8-3.0
40	Electrical Conductivity (EC)	106-158	98-140	85-135	96-135
41	COD	5.4-6.0	4.8-5.8	5.0-5.8	5.0-6.4
42	Phosphate	0.28-0.34	0.20-0.26	0.16-0.30	0.20-0.28
43	CO_2	5.0-6.1	5.0-5.8	5.2-6.2	4.9-6.0

Note: U/O-Un objectionable.



5. Ground Water

Sl. No.	Parameter	Unit	Permissible limit	Gumurusahi Village	Daitari (Low Hating)	Daitari (Low Hating)	Bali Parbat (Furlabadi)	Kalpada Village
				$21^0$07'27.7"N $85^0$47'02.8"E	$21^0$06'44.9"N $85^0$49'30.9"E	$21^0$06'45.5"N $85^0$49'30.2"E	$21^0$06'45.0"N $85^0$51'19.3"E	$21^0$07'15.8"N $85^0$47'47.5"E
1	pH	---	6.5-8.5	7.26-7.61	6.98-7.44	7.20-7.51	6.89-7.83	6.85-7.07
2	Odour	---	Agreeable	AL	AL	AL	AL	AL
3	Colour	Hazen	5 (Max)	CL	CL	CL	CL	CL
4	Taste	---	Agreeable	AL	AL	AL	AL	AL
5	Turbidity	NTU	1 (Max)	0.18-0.22	0.24-0.30	0.20-0.26	0.22-0.28	0.34-0.38
6	Chloride (as Cl)	mg/l	250 (Max)	3.5-4.2	3.1-3.8	3.6-3.8	3.0-3.8	3.4-3.7
7	Residual free chlorine	mg/l	0.2 (Min)	ND	ND	ND	ND	ND
8	Total dissolved solid	mg/l	500 (Max)	84-88	85-92	88-95	94-98	91-94
9	Total Hardness (as $CaCO_3$)	mg/l	200 (Max)	69-71	62-66	72--75	58-60	70-74
10	Iron (as Fe)	mg/l	0.3 (Max)	0.20-0.24	0.32-0.36	0.22-0.24	0.16-0.28	0.20-0.22
11	Calcium (as Ca)	mg/l	75 (Max)	22.3-22.6	32.1-34.8	25.2-30.4	24.0-26.0	20.8-26.8
12	Magnesium(as Mg)	mg/l	30 (Max)	15.3-18.3	12.4-14.4	14.7-16.4	11.9-14.2	15.5-18.8
13	Sulfate (as SO_4)	mg/l	200 (Max)	4.4-4.6	4.0-4.2	5.6-5.8	5.7-5.8	6.6-6.8
14	Manganese(as Mn)	mg/l	0.10 (Max)	0.042-0.048	0.052.056	0.040-0.042	0.048-0.051	0.052-0.054
15	Nitrate (as NO_3)	mg/l	45 (Max)	3.0-3.2	3.4-3.6	2.8-3.0	3.2-3.4	2.0-2.2
16	Alkalinity (as $CaCO_3$)	mg/l	200 (Max)	25-30	41-45	27-32	35-38	39-41
17	Aluminum(as Al)	mg/l	0.03 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
18	Fluoride (as F)	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001
19	Anionic Detergent	mg/l	0.2 (Max)	Absent	Absent	Absent	Absent	Absent
20	Cadmium (as Cd)	mg/l	0.003 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
21	Copper (as Cu)	mg/l	0.05 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
22	Zinc (as Zn)	mg/l	5 (Max)	0.012-0.14	0.018-0.21	0.10.0.12	0.22-0.25	0.14-0.16
23	Lead (as Pb)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Selenium (as Se)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
25	Phenolic compound	mg/l	0.001 (Max)	ND	ND	ND	ND	ND
26	Mineral oil	mg/l	0.5 (Max)	ND	ND	ND	ND	ND
27	Total Coliform	MPN/ 100ml	$	NIL	NIL	NIL	NIL	NIL
28	Mercury (as Hg)	mg/l	0.001(Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
29	Cyanide (as CN)	mg/l	0.05 (Max)	<0.002	<0.002	<0.002	<0.002	<0.002
30	Boron (as B)	mg/l	0.5 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
31	Arsenic (as as)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
32	Nickel	mg/l	0.02(Max)	0.004-0.006	0.010-0.018	0.002-0.008	0.006-0.010	0.004-0.008
33	Molybdenum(as Mo)	mg/l	0.07(Max)	ND	ND	ND	ND	ND
34	Poly-nuclear-aromatic hydrocarbons (as PAH)	mg/l	0.0001(Max)	ND	ND	ND	ND	ND
35	Total Chromium(as)	mg/l	0.05(Max)	ND	ND	ND	ND	ND

Note: CL : Colourless; AL : Agreeable; ND : Not Detected,$-Not Specified.

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6. Ground Water Level Monitoring

Sl. No.	Location Name	Coordinates		Water Level (Below ground level, in meters)
		Latitude	Longitude	
1	Gumurusahi village	21°07'27.7" N	85°47'02.8" E	5.08-6.14
2	Daitari (Low Hatting)	21°06'44.9" N	85°49'30.9" E	0.63-1.39
3	Daitari (Low Hatting)	21°06'45.5" N	85°49'30.2" E	1.25-2.07
4	Baliparbat (Furlabadi)	21°06'45.0" N	85°51'19.3" E	7.47-8.45

7. Flow of Water Measurement

Sl. No.	Location Name	Sample code	Coordinates		Flow of Water(m^3/min)
			Latitude	Longitude	
1	Stream Flowing Near Pichida	FW1	21°07'7.56" N	85°48'56.7" E	7.16-11.85
2	Stream Flowing Near Old Market	FW2	21°06'49.98" N	85°49'29.58" E	3.64-6.58
3	Stream near Baliparbat	FW3	21°06'24.18" N	85°51'35.88" E	2.23-5.47

8. Vehicular Emission

Sl. No.	Number of Vehicles monitored	Parameters			
		CO (%)	HC (ppm)	NOx (%)	Smoke (HSU)
1.	18	0.017-0.181	15-58	75.82-80.19	22.08-56.17
Permissible Standard		3.0	1500	--	65

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