



Letter No.:-HIL/EC/GP-IV/4/2018/175

Date: 28.05.2018

Shri Kanwarjeet Singh (IFS)

Additional Principal Chief Conservator of Forest,
Ministry of Environment Forests & Climate Change (MoEF)
Regional Office, (West Central Zone)
Ground Floor, East Wing
New Secretary Building,
Civil Lines, Nagpur -440001

Sub.: Six Monthly Environment Clearance Compliance Status Report for Gare Palma - IV/4 coal mine along with Environmental Monitoring reports of Ambient Air, Water, and Noise etc.

Ref. Environment Clearance No. J-11015/ 183/2010-IA.II (M) Dated: - 16th April 2015.

Sir,

With reference to subject matter on referred letter, we are submitting the six monthly Environmental Clearance Compliance status report along with Environmental Monitoring report for Ambient Air, Water, Noise, during the **period of October 2017 to March 2018**.

This is for your kind information please.

Thanking you,

Yours faithfully,
For Hindalco Industries Limited,


(Raj Kishore Singh)
Asst. Vice President

Gare Palma IV/4, Tamnar, District: Raigarh, Chhattisgarh – 496107.

Encl. : Six Monthly Environmental Clearance Compliance Report as Annexure-A.

CC To:

1. Zonal Officer, Central Pollution Control Board, Sahkar Bhawan, 3rd Floor, North T.T. Nagar, Bhopal – 462 003 (M. P.)
2. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, Raipur Chhattisgarh.
3. Regional Officer, Chhattisgarh Environment Conservation Board (CECB), T.V. Tower Road, Raigarh (C.G.)

Hindalco Industries Limited

Gare Palma Mines (IV / 4 & IV / 5), Vill & PO: Milupara, Tehsil: Tamnar, Dist: Raigarh-496107, Chhattisgarh, T: +91 7762 228212

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Corporate Identity No. L27020MH1958PLC011238.



- ❖ Compliance Report on Environment Clearance for Gare-Pelma IV/4 coal mining project given by Ministry of Environment Forests & Climate Change **vide letter No. – J-11011/183/2010-IA.II (M) Dated: - 16th April 2015** for Under Ground & Opencast Mining of Coal 1.0Million Ton/Annum Production Capacity.

Sr. No.	Conditions	Status
1	Any change in scope of work will attract the provisions of Environment Protection Act (EPA), 1986 and Environment Impact Assessment Notification, 2006 in conjunction with the subsequent amendments/circulars.	Noted please.
2	All conditions stipulated in the EC letter No.J-11015/183/2010-IA.II (M) dated 12 th March, 2013 shall remain unchanged.	Noted please.
3	The successful bidder shall be liable, if any, for any act of violation of the EPA 1986/EIA Notification 2006/subsequent amendments and circulars which it has inherited during the transfer.	Noted please.
4	Successful bidder shall be liable for compliance of all court directions, if any.	Noted please.

- ❖ Compliance Report on conditions of Environment Clearance (EC) Gare-Pelma IV/4 coal mining project given by Ministry of Environment & Forests vide **letter No. – J-11011/183/2010-IA.II (M) Dated: - 12th March 2013** for Open Cast & Under Ground Mining of Coal 1.0 Million Ton/Annum Production Capacity.

Sr. No.	EC Conditions	Compliance status
1	The Maximum production from the mines shall not exceed beyond that for which environmental clearance has been granted for i.e. 0.48 MTPA to 1.0MTPA of which 0.4 MTPA OC and 0.6 MTPA UG in ML area of 701.512 ha)	Production from this Mines for the financial year 2017-18 is 0.388 MTPA from OC and 0.550 MTPA from UG which is in line with EC. This conditions is agreed and same will be complied in future also accordingly.
2	The calendar plan should be uploaded on MOEF website.	As per Calendar plan we have planned production of 0.4 MTPA from OC and 0.6 MTPA from UG which is as per approved Mine Plan). We request MoEF & CC to



		upload the same on their website please. In future if there is any change in calendar plan the same will be intimated to MoEF & CC for its uploading.
3.	The coal transportation by road is up to 270 km at Raipur by road presently with tarpaulin covered trucks and partially by rail up to Bhupdevpur. After new siding comes up which is approximately 3 km away for changing over to rail transport. The coal transportation by road should be by mechanically covered trucks. The mode of transportation shall be shifted to by rail by 2017.	This particular condition is not applicable to us since, as per Vesting order by Ministry of Coal, GOI, Coal will be used in the captive power plant of HIL located at Hirakud and Lapanga District Sambalpur, Odisha and mode of transportation will be by road. We are transporting the coal by road by covered trucks.
4.	Karanj should be deleted from the list of native species for plantation program.	Karanj will not be planted in mining area.
5	Rs. 5/T of coal/annum till the end of life of project with the escalation factor of coal production.	As per condition Rs. 5 /T is being utilized under CSR activities under guidance of district collector Raigarh. Expenditure details enclosed as Annexure-I
6	No external OB dump will be left after mine operation and shall be backfilled in the mine void.	Currently OB dumping is being carried out as per approved Mining Plan. We Agree to the condition that No External OB dump will be left after mine operation and shall be backfilled in the mine void. The OB dumping will be done as per the approved Mining plan.
7	The proponent shall take necessary action on the issues raised during public hearing.	Under the CSR and other activities the issues raised during public hearing is being taken care by the company.
8	The coal will be used in existing steel plant of proponent.	This particular condition is not applicable to us, since as per Vesting order by Ministry of Coal, GOI, Coal will be used in the captive power plant of HIL located



		at Hirakud and Lapanga, District Sambalpur, Odisha.
9	The Mine Planning is done in such manner that underground mining is proposed below forest land and opencast mining under Government waste land /agriculture land. Hence tree cutting from forest land is not proposed during expansion proposal. However if required plantation will be done 10 times of tree felling in the project affected area.	Mining is being done in such manner that underground mining is being done below forest land and opencast mining is being done under Government waste land /agriculture land. Planation in the mine lease area is being carried out @2500 plant/ha. Total 69500 nos. local plants species have been planted till date in mine lease area including OB dump area. Plantation details are enclosed as Annexure- II.
10	Kelo river and Bendra Nallah shall not be disturbed.	Kelo river and Bendra Nallah will not be disturbed.
11	External OB dump of 0.67 million cubic meters will be created as reported in closure plan of first year. This external dump will be re handled and backfilled in subsequent years. There will be no external dump left after the mine operation.	The external dump will be re handled and backfilled in subsequent years. There will be no external dump left after the mine operation. The OB dumping is being carried out and will be done as per approved Mining Plan.
12	Biological reclamation of all external dumps will be done progressively after leveling these dumps. This will provide stability and prevent soil erosion from dumps. The total top soil generated (1.14 m.cum B) during the development of mine will be stacked separately in a soil stack pile in between the pit and the surface dump over an area of 7.12 Ha.	Biological reclamation of all external dumps is being done and also will be done with the progress of mining in future. This will provide stability and prevent soil erosion from dumps. Top soil generated during mining activities are being kept at separate location and during biological reclamation it is being used. In future also top soil will be stacked separately.
13	The report Titled " Flora and Fauna and conservation plan for endangered species of Gare-IV/8 coal block approved by The PCCF (Wildlife) of Chhatisgarh, dated 22.11.2011 states that there is no national park, tiger reserve, eco-sensitive zones within 15 km radius. It was informed that this area is neither affected by elephant corridor exists.	Noted please. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also.



	However, there are occasional presence of elephants and other wild lives.	
14	A Wildlife Conservation Plan for the conservation and protection of wildlife in the study area has been approved at a cost of Rs. 1.0 crore and shall be implemented by the proponent in consultation with Department of Forest and Wildlife, Govt. of Chhattisgarh. The WLCP shall be comprise of components of habitat improvement and conservation of biodiversity, provision of water holes, and augmenting water bodies, nursery and plantation of species of natural food and fodder found in the natural habitat salt licks, measures for the protection against forest fires and poaching, awareness campaign of villagers in the study area and compensation in case of man animal conflicts. The status of implementation of WL Conservation Plan including budgetary provision of various activities and status of expenditure shall be regularly, uploaded on the website of the forest and wildlife Department of Government of Chhattisgarh and of the project proponent and the status shall be regularly reported to this Ministry and the MoEF Regional Office, as part of the compliance report.	Noted please. Rs.One crore has been deposited to state forest department by the prior allottee against Wildlife conservation plan. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also.
15	As per the approved plan of the Flora and Fauna and Conservation plan for endangered species of Gare IV/4 coal block'' and recommended the PCCF (Wildlife), Rs. One crore be deposited, at one time. With the department of forest and wildlife, Govt. of Chhattisgarh for the implementation of the plan.	Rs.One crore has been deposited to state forest department by the prior allottee against Wildlife conservation plan. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also.
16	The project authority shall also participate in a Regional action plan of the State Government for the conservation of flora and fauna found within the study area, in addition to the above funds shall also contribute financially for implementation of RWLCP.Habitat development such as grassland/conservation measures along the migratory route/habitats of elephants found/visiting the area shall form a part of the regional action plan.	The company will participate in regional action plan of the State Government for the conservation of flora and fauna of the area, as per directives of the authority. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also.



17	It will be used for growing plants along the fringes of the side roads and reclamation of external dump and backfilled area. The topsoil stockpile will be low height not exceeding 6 m and will be made use for concurrent filling without keeping the top soil for a long period.	Topsoil is being used for Plantation all along the road side. The topsoil stockpile is low in height not exceeding 6 m and this is being used and will be used for concurrent filling without keeping the top soil for a long period.
18	The OB dump for the South Quarry dump will be spread over 13.75 Ha. area on the south and eastern part of south quarry while the mining operation will start from north and advance towards south and west. Part of OB excavated from the mine from 1st year and part of 2nd year (3.91 Mm3) will be accommodation in it including top soil for afforestation. The height of dump achieved during 1st and 2nd year will be 6 m to 20 m respectively.	The over burden management is being done as per approved mining plan.
19	The O.B. left in external dump will be re handled and backfilled in the void after the extraction of coal is completed, this will make the operation of UG mining safe as no water will be logged in the quarry. The OB will be temporarily stored which primarily consist of sand stone and shale which does not contain any heavy metal. As per the reclamation plan, the entire OB will be re handled and biologically reclaimed with local grass to minimize fugitive emission as well to control surface runoff.	The over burden management is being done as per approved mining plan. As per the reclamation plan, the entire OB will be re handled and biologically reclaimed with local grass to minimize fugitive emission as well to control surface runoff.
20	Topsoil generated in the balance life of mine should be stacked properly with proper slope at earmarked site (s) and should not be kept active and shall be used for reclamation and development of green belt.	Presently topsoil is being stacked properly and topsoil to be generated in the balance life of mine will be stacked properly with proper slope at earmarked site (s) and will not be kept active. The stocked topsoil will be used for reclamation and development of green belt.
21	OB generated in the balance life of mine should be stacked at earmarked one external OB dumpsite within ML area. The ultimate slope of dump shall not exceed 28°. Monitoring and management of reclaimed dumpsite should continue until the	OB dump is being stacked at earmarked dump site within the lease area. The ultimate slope is being maintained. Monitoring and management of reclaimed dump



	vegetation becomes self- sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional offices located at Bhubaneswar on yearly basis. The area of OB dump should be reduced. The grass turfing should be done on OB dumps.	site until the vegetation becomes self- sustaining is being carried out. The compliance report on OB management plan is being submitted in Environmental Statement report to Regional office of MOEF & CC on regular basis.
22	Adequate numbers of sprinklers should be provided on both the side of road to minimize pollution.	Adequate numbers of truck mounted water sprinklers and fixed type sprinklers has been engaged / installed for the haul road and transportation road.
23	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient, length,) and sump capacity should be designed 50 % safety margin over and above the peak sudden rainfall 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.	Catch drains and siltation ponds of appropriate size has been constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected is being utilized for watering the mine area, roads, green belt development, etc. The drains are regularly de-silted and maintained properly. Garland drains has been constructed with proper size, gradient and length. Adequate Sump capacity has been provided along with adequate retention period so as to allow proper settling of silt material.
24	Dimension of retaining wall at the toe of the dumps and OB benches within the mine to check run -off and siltation should be based on rain fall data.	The Dump slope stability study has been carried out by Indian School of Mines, Dhanbad. The provision mentioned herewith will be taken care for designing dimensions of toe wall and OB benches in the mines.
25	Water sprinkling system (mist spray type) shall be provided to check fugitive emission from conveyor system, haulage roads and transfer points.	Water sprinkling arrangement has been maintained at all haul roads, conveyor system, loading and unloading points. Thus fugitive dust emission are under control.



26	Fixed sprinkler shall be installed at pit top truck loading hoppers in all the three mines, siding for dust control during coal loading. Adequate numbers of sprinklers should be provided on both the sides of road to minimize dust pollution.	As per requirement, fixed type water sprinklers as well as truck mounted water sprinklers has been provided in the mines and other places.
27	Drills should be wet operated only.	In coal mining wet drilling is under practice.
28	An action plan for mine closure with details of area, depth, voids and details of abandoned mine should be submitted to the Ministry.	Noted please. Prior allottee has already submitted the mining plan and same has also mentioned in EIA/EMP report submitted to MOEF for EC.
29	Controlled blasting should be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly of rocks and boulders should be implemented.	Controlled blasting is under practice with use of delay detonators.
30	Transportation shall be by covered trucks of higher capacity (25 –tonne) and loading shall be by siding. Mechanically covered trucks should be provided for transportation of coal.	Transportation is being done with tarpaulin covered trucks.
31	Area brought under afforestation from the three mines shall be by planting native species in consultation with local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	Planation in mines area is being done. At present around 69500 nos. of trees have been planted in mine lease area including OB dump. Species planted are Gulmohar, Ashoka Aam, Imli, Shisam, Eucalyptus, Neem, Jamun, Accassia spp. etc. in consultation with local DFO. Plantation is being carried out @2500 per hectare.
32	Extensive plantation should be done near agriculture area to avoid coal dust pollution which may affect the productivity of crop.	Extensive plantation near agriculture land along road side is being done and will be done in future to avoid coal dust pollution which may affect the productivity of crop.
33	Mine discharge water shall be treated to meet the prescribed standards before discharge into the natural water course/agriculture. The quality of water discharge shall be monitored at the outer point and proper records maintained thereof and uploaded regularly on the company website.	Settling ponds with chemical dosing arrangement and sump with adequate capacity (for sedimentation) has been provided for the mine seepage water treatment before discharge for the



		agriculture purpose. The water quality analysis report is enclosed as Annexure –III .
34	No ground water shall be used for mining activities; additional water required if any shall be met from mine water or by recycling /reuse of water from existing activities and from rainwater harvesting measures. The project authority shall meet water requirement of nearby village (s) in case the village wells go dry to dewatering of mine.	For the mining activity only mine seepage water is being used after treatment in ETP. To meet the water requirement of nearby villages company is providing treated water through pipeline and other mode for domestic and irrigation purpose.
35	Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be done four times a year in pre-monsoon (August), Post- monsoon (November), and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data thus collected should be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board /SPCB quarterly within one month of monitoring. Rain water harvesting shall be undertaken in case monitoring of water table indicates a declining trend.	Regular monitoring of groundwater level and quality of the area is being carried out by establishing a network of existing wells. The Ground water level and quality Monitoring report is enclosed as Annexure-IV . The report of Post- monsoon and winter season (Winter 2018) is enclosed as above. The quarterly monitoring report for the ground water will be submitted to the authorities as per schedule. Abandoned mine pit has been developed as rain water harvesting structure in the mines.
36	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural pattern, water bodies, vegetation, structure, roads and surroundings should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures should be taken to avoid loss of life and material. Cracks should be effectively plugged with ballast and clayey soil/suitable material.	In Gare Palma IV/4 coal mine the method of underground coal mining is Board & Pillar. Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural pattern, water bodies, vegetation, structure, roads and surroundings is being done by internal expert team. During the observation no any subsidence movement has been observed. In future, if any subsidence movement, occurred then appropriate effective



		corrective measures will be taken to avoid loss of life and material. Cracks will be effectively plugged with ballast and clayey soil/suitable material.
37	Sufficient coal pillars shall be left un-extracted around the airshaft (within the subsidence influence area) to protect from any damage from subsidence, if any.	Sufficient coal pillars will be left un-extracted around the airshaft (within the subsidence influence area) to protect from any damage from subsidence.
38	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	High root density tree species will be selected and planted over areas likely to be affected by subsidence.
39	Depression due to subsidence resulting in water accumulating within the low laying areas shall be filled up or drained out by cutting drains.	As of now Depression due to subsidence is not observed. In future if such depression gets observed resulting in water accumulating , the same will be filled up or drained out by cutting drains, if any
40	Solid barriers shall be left below the village, roads falling within the blocks to avoid any damage to the roads.	Solid barriers will be left below the village, roads falling within the blocks to avoid any damage to the roads as applicable.
41	No depillaring operation shall be carried out below the roads and habitation area found within the lease.	No depillaring operation will be carried out below the roads and habitation area found within the lease.
42	The proponent shall ensure to undertake and provide the costs incurred for taking up remedial measures in case of soil.	Cost incurred for taking remedial measures in case of soil will be borne by the company.
43	Extensive plantation should be done near agriculture area to avoid coal dust pollution which may affect the productivity of crop.	Extensive planation along road side has been done near the agriculture area to avoid coal dust pollution which may affect the productivity of crop. The same will be continue in other areas also.
44	ETP shall be provided for workshop, CHP, if any. Effluent shall be treated to confirm to prescribe standards in case discharge in to any water course	Water treatment facility has been provided in mines for the seepage water treatment. The quality of



	outside the lease. The quality of water discharged shall be monitored at the outer point and proper records maintained thereof and uploaded regularly on the company website.	treated water is being monitored. The water quality analysis report is enclosed as Annexure –III
45	A detailed plan for CSR with specific budgetary allocation (capital and revenue) for various skill development and alternate livelihood programmes and schemes shall be implemented and the impacts activities under CSR monitored based on in a scientific methodology. An amount of Rs. 5 per tonne of coal produced with escalation factor shall be utilized for the CSR activities for the adjoining villages for the balance life of project apart from one time capital expenditure. The details of CSR undertaken along with budgetary provisions for the village wise various activities and expenditure thereon shall be uploaded on the company website every year. CSR Audit should be carried conducted annually.	Rs. 5/- per ton of coal produce is being utilized for CSR activities under the guidance of District Collector, Raigarh. CSR Expenditure detail is enclosed as Annexure-I.
46	A special corpus fund either at company level or in CIL/MOC be provided for the reclamation of abandoned and degraded areas.	Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease.
47	For monitoring land use pattern and for post mining land use, a time series of land use, maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in the three years (for any one particular season which is consistent in the time series). And the report submitted to MOEF and its regional office at Bhopal. The post mining land use shall be that out of the total 701.512 ha area, 57.73 ha area will be under plantation. 319.65 Ha area for public use, 324.132 ha area shall be undisturbed.	Land use pattern study report has been submitted to MOEF & CC and its regional office on 11.08.2016.
48	A Final Mine closure plan along with a plan for habitat restoration and with details of corpus Fund shall be submitted to the Ministry of Environment & forest five years before mine closure for approval. The species selected for habitat restoration for post mining and shall include a	A Final Mine closure plan along with a plan for habitat restoration and with details of corpus Fund will be submitted to the Ministry of Environment & forest five years before mine closure for approval.



	specific plan for development of agro forestry using a mix native species found in the study area.	The mix species will be selected for habitat restoration as per the conditions set out herewith.
49	A special corpus fund either at company level or in CIL/MOC be provided for reclamation of abandoned and degraded area.	Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease.
50	The possibility of sand stone, wherever is present in the OB as per lithology report, be explored and be provided to locals free of cost.	As per availability the sand stone is being provided to the locals free of cost.
51	After extraction of coal is completed, the OB left will be completely rehandled and backfilled the voids. This will be achieved by rehandling of OB Dumps in the area. Contamination of ground water and surface water and occupational and other diseases due to the mining operation.	After extraction of coal is completed, the OB left will be completely rehandled and backfilled the voids.
52	Corporate Environment Responsibility: a)The company shall have a well laid down Environment Policy approved by the Board of Directors. b)The Environment Policy shall prescribe for standard operating process/ procedures to bring into focus any infringements/deviation/violation of the environmental of forest norms/conditions. c)The hierarchical system or administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. d)To have proper checks and balances, the company shall have a well laid down system of reporting of no-compliances/ violations of environmental norms to the Board of Directors of the company and /or shareholders at large.	Under the corporate responsibility. The company have a well laid down Environment Policy approved by the Board of Directors. The Environment Policy has been prescribe for standard operating process / procedures to bring into focus any infringements/deviation/violation of the environmental of forest norms/conditions. The company Environment policy has been attached herewith Annexure –V.
B.	General Conditions	
1	No change in mining technology and scope of working should be made without prior approval of the ministry of Environment & Forest.	No change in mining technology and scope of working will be made without prior approval of the ministry of Environment & Forest.



2	No change in the calendar plan for quantum of mineral coal and waste should be made.	No change in the calendar plan for quantum of mineral coal and waste will be made.
3	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2, and NOx monitoring. Location of the stations shall be decided based on meteorological data topographical features and environmentally and ecologically sensitive targets in consultation with the state pollution Control Board. Monitoring heavy metals such as Hg, As Ni, Cd, Cr, etc. carried out at least once in six months.	Four ambient air quality monitoring stations have been established and regular monitoring is being carried out. Monitoring Report is enclosed as Annexure – VI.
4	Data on ambient air quality (PM10,PM2.5,SO2, and NOx) and heavy metals such as Hg, As, Ni,Cd, Cr, and other monitoring data shall be regularly submitted to the ministry including its Regional office and to the state pollution Control Board and the Central Pollution Control Board once in six month. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Four ambient air quality monitoring stations have been established and regular monitoring is being carried out. Monitoring Report is enclosed as Annexure – VI.
5	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operation of HEMM, etc should be provided with ear plugs/muffs.	Ear muffs/plugs has been provided to the all workers engaged in blasting and drilling operations. The Noise monitoring report is enclosed as Annexure-VII.
6	Industrial wastewater (workshop and wastewater from the mine) should be properly collected treated so as to conform to the standards under prescribed GSR 422 (E) dated 19 th May 1993 and 31 st December 1993 or as amended from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.	Settling pond with chemical dosing arrangement has been provided for the mine seepage water treatment.
7	Vehicular emission should be kept under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.	Regular monitoring of vehicular emission is being done and it is under control. The PUC certificate has been ensured for all the vehicles engaged in mining activities.



		The vehicle used for transporting the minerals are covered and optimally loaded.
8	Monitoring of Environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the state pollution control board and data got analyzed through a laboratory recognized under EPA Rules,1986.	Monitoring of Environmental quality parameters are carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the state pollution control board through NABL lab.
9	Personnel working in dusty area shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspect.	Personnel working in dusty areas are provided with protective respiratory devices and they have also been provided with adequate training and information on safety and health aspect.
10	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof.	Occupational health surveillance programme of the workers is being undertaken periodically to observe any contraction due to exposure to coal dust and corrective measures will be taken accordingly.
12	A separate environment management cell with suitable qualified personnel shall be set up under the control of a senior Executive, who will report directly to the head of the company.	A separate environment management cell with suitable qualified personnel have been set up under the control of a senior Executive.
13	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this ministry and it's Regional Office at Bhubaneswar.	The funds earmarked for environmental protection measures has been kept in separate account and not been diverted for other purposes. Enclosed as Annexure –VIII.
14	The project authority shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental	Complied.



	clearance and a copy of the clearance letter is available with the State pollution control Board and may also be seen at the website of the ministry of environment & forest at https://envfro.nic.in .	
15	A copy of environmental clearance letter shall be marked to concern panchayat / Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any., from whom any suggestion /representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.	Already Complied.
16	A copy of environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the regional office, District Industry Sector and Collector's office/Tehsildar's office for 30 days.	Not applicable to us.

A handwritten signature in blue ink, consisting of a stylized 'D' followed by a horizontal line and a small flourish.



Annexure -I

M/s Hindalco Industries Limited , Gare Palma Mines IV/4	
CSR -Activity Wise Details FY-2017-18	
Focus Areas/Project Activities	Summary Costs (Lakhs)
Education	29.82
Health & Sanitation	7.79
Sustainable Livelihood	0.23
Infra-structure	40.96
Social	39.77
Total (Rs.)	118.57



Annexure –II

Year wise Plantation Detail for Gare-Palma IV/4 Coal Mines

Sl. No.	Year	Plantation area in Acre	Number of saplings planted. (Approx.)	Species
1	Up to 2015	Coal mine lease area/OB Dump.	53000	<i>Mango, guava, Aola, Neem, Pipal, Ficus sp., Teak, Shivan/Ghamar, Sisham, Sirus, Peltafarm, Nilgiri, Accasis, Casia Samia, Gulmohar etc.</i>
2	2016	Coal mine lease area/OB Dump.	6500	
3	2017	Coal mine lease area/OB Dump.	10000	
Total plantation			69500	



Annexure -III

Result of ETP Treated Water Quality Analysis



GLOBAL ENVIRONMENT & MINING SERVICES
(Consulting Engineers, Mine designers, Geologist & Surveyors)

3rd Main Road, Basaveswara Badavane,
HOSPET - 583201, Dist., Bellary (Karnataka)

Ph : +918394 229433, 651111
e-mail : gems_hpt@yahoo.com
Website : globalmining.in

Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1960			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Palma - IV/4, Coal Mine, Village - Bankheta, Post - Milupara, Distt. - Raichur (C.G.) 496 107.		
Order /References:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Effluent Water		
Sampling Location	ETP Outlet		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen & -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012, 2120-B, 2-6
2	Temperature	°C	27.4	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed. 2012, 2130-B, 2-13
3	pH	-	7.26	5.5 to 9.0	APHA 22 nd Ed. 2012, 4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed. 2012, 4500-CI-G, 4 - 69
5	Total Suspended Solids	mg/Lit	21	100	APHA 22 nd Ed. 2012, 2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.29	2.0	APHA 22 nd Ed. 2012, 4500-F-B & D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed. 2012, 3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed. 2012, 3500-Cd, 3-105



Annexure-IV

Ground water level monitoring in and around the Coal Mine area
(Month: October 2017)

Sr.No.	Location	Types of structure	Water level (MBGL) October 17
1	Bankheta (Near HIL Office)	Borewell	9.0
2	Banjikhol (Near Office)	Dugwell	3.45
3	Milupara (PHC-HIL)	Dugwell	3.50
4	Urba (Near Intermediate school)	Dugwell	4.80
5	Sakta (Near Primary School)	Dugwell	2.20
6	Sidarpara (Primary School compound)	Dugwell	7.0
7.	Beljor Village	Dugwell	5.5

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Surface and ground water analysis Report of Coal Mines Area.



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Water Sample Analysis Report

TEST REPORT			
Report No.:	GEMS/TR/17-18/1956		Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plasma – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Ground Water		
Sampling Location	Borewell Water Near Rescue Room Milupara		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22 nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	Acceptable Limit for Drinking Water (IS 10500:2012)	Method Reference
1	Turbidity	NTU	0.92	1.0 (max)	APHA 22 nd Ed.2012,2130-B,2-13
2	pH	-	7.23	6.5 To 8.5	APHA 22 nd Ed.2012,4500-H ¹ -B, 4-92
3	Electrical Conductivity	µS/cm	428.2	--	IS 3025(part-14):1984, RA 2013
4	Residual Chlorine	mg/Lit	0.1	0.2 (max)	APHA 22 nd Ed.2012,4500-Cl-G, 4 - 69
5	Total Solid	mg/Lit	314	--	APHA 22 nd Ed.2012,2540-B, 2-64
6	Total Dissolved Solids	mg/Lit	304	500 (max)	IS 3025(part-16):1984, RA 2006
7	Total Suspended Solids	mg/Lit	10	--	APHA 22 nd Ed.2012,2540-D, 2-66
8	Alkalinity Total (as CaCO ₃)	mg/Lit	173.0	200 (max)	IS 3025(part-23):1986, RA 2003
9	Total Hardness (as CaCO ₃)	mg/Lit	192.0	200 (max)	APHA 22 nd Ed.2012,2340-C, 2-44,45
10	Calcium Hardness (as CaCO ₃)	mg/Lit	146.0	--	APHA 22 nd Ed.2012,3500-Ca-B, 3-67
11	Magnesium Hardness (as CaCO ₃)	mg/Lit	46.0	--	APHA 22 nd Ed.2012,3500-Mg-B, 3-84
12	Calcium (as Ca)	mg/Lit	58.4	75 (max)	APHA 22 nd Ed.2012,3500-Ca-B, 3-67
13	Magnesium (as Mg)	mg/Lit	11.0	30 (max)	APHA 22 nd Ed.2012,3500-Mg-B, 3-84
14	Chloride (as Cl)	mg/Lit	32.7	250 (max)	APHA 22 nd Ed.2012,4500-Cl-B, 4-72
15	Sulphate (as SO ₄)	mg/Lit	6.4	200 (max)	APHA 22 nd Ed.2012,4500-SO ₄ -E, 4-190
16	Nitrate (as NO ₃)	mg/Lit	2.6	45 (max)	APHA 22 nd Ed.2012,4500-NO ₃ -B, 4-122

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Report No. 1956 Cont....

Sr. No.	Parameter	Unit	Result	Acceptable Limit for Drinking Water (IS 10500:2012)	Method Reference
17	Phosphate (as P)	mg/Lit	N.D.	--	APHA 22 nd Ed.2012,4500-P-C, 4-153
18	Sodium (as Na)	mg/Lit	18.2	--	APHA 22 nd Ed.2012,3500-Na-B, 3-97
19	Potassium (as K)	mg/Lit	4.6	--	APHA 22 nd Ed.2012,3500-K-B, 3-87
20	Boron (as B)	mg/Lit	N.D.	0.5 (max)	APHA 22 nd Ed.2012,4500-B-B, 4-25
21	Iron (as Fe)	mg/Lit	N.D.	0.3 (max)	APHA 22 nd Ed.2012,3111-B,3-18
22	Fluoride (as F)	mg/Lit	0.29	1.0 (max)	APHA 22 nd Ed.2012,4500-F-B & D, 4-84 & 87
23	Manganese (as Mn)	mg/Lit	N.D.	0.1 (max)	APHA 22 nd Ed.2012,3111-B, 3-18
24	Lead (as Pb)	mg/Lit	N.D.	0.01 (max)	APHA 22 nd Ed.2012,3111-B, 3-18
25	Nickel (as Ni)	mg/Lit	N.D.	0.02 (Max)	APHA 22 nd Ed.2012,3500-Ni, 3-108
26	Zinc (as Zn)	mg/Lit	0.24	5.0 (max)	APHA 22 nd Ed.2012,3111-B, 3-18
27	Copper (as Cu)	mg/Lit	N.D.	0.05 (max)	APHA 22 nd Ed.2012,3111-B, 3-18
28	Cadmium (as Cd)	mg/Lit	N.D.	0.003 (Max)	APHA 22 nd Ed.2012,3500-Cd, 3-105
29	Mercury (as Hg)	mg/Lit	N.D.	0.001 (max)	APHA 22 nd Ed.2012,3112-B, 3-23
30	Arsenic (as As)	mg/Lit	N.D.	0.01 (max)	APHA 22 nd Ed.2012,3114-C, 3-38
31	Selenium (as Se)	mg/Lit	N.D.	0.1 (max)	APHA 22 nd Ed.2012,3114-C, 3-38
32	Chromium (as Cr)	mg/Lit	N.D.	0.001 (max)	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
33	Anionic Detergent (as MBAS)	mg/Lit	N.D.	0.02 (max)	APHA 22 nd Ed.2012,5540-C, 5-53
34	Phenolic Compound (as C ₆ H ₅ OH)	mg/Lit	N.D.	0.001 (max)	APHA 22 nd Ed.2012,5540-B & C, 5-47
35	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	N.D.	0.0001 (max)	APHA 22 nd Ed.2012,6440-6-93
36	Mineral Oil	mg/Lit	N.D.	0.05 (max)	IS 3025 (part-39) : 1991, RA 2003, Ed. 2.1
37	Oil & Grease	mg/Lit	N.D.	--	IS 3025 (Part 39):1991, RA 2003, Ed 2.1

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Report No. 1956 Cont....

Sr. No.	Parameter	Unit	Result	Acceptable Limit for Drinking Water (IS 10500:2012)	Method Reference
Microbiological Analysis					
1	Total Coliforms	MPN/100 ML	N.D.	Shall not be detectable in any 100 ml sample	APHA 22 nd Ed.2012,9921-B & C, 9-66 & 69
Pesticides					
1	p,p DDT	µg/L	N.D.	1	US EPA 508-1995
2	o,p DDT	µg/L	N.D.	1	US EPA 508-1995
3	p,pDDE	µg/L	N.D.	1	US EPA 508-1995
4	p,p DDD	µg/L	N.D.	1	US EPA 508-1995
5	O,p DDD	µg/L	N.D.	1	US EPA 508-1995
6	Gamma-HCH (Lindane)	µg/L	N.D.	2	US EPA 508-1995
7	Alpha-HCH	µg/L	N.D.	0.01	US EPA 508-1995
8	Beta-HCH	µg/L	N.D.	0.04	US EPA 508-1995
9	Delta HCH	µg/L	N.D.	0.04	US EPA 508-1995
10	Alpha-Endosulfan	µg/L	N.D.	0.4	US EPA 508-1995
11	Beta-Endosulfan	µg/L	N.D.	0.4	US EPA 508-1995
12	Endosulfansulphate	µg/L	N.D.	0.4	US EPA 508-1995
13	Monocrotophos	µg/L	N.D.	1	US EPA 8141A-1994
14	Ethion	µg/L	N.D.	3	US EPA 8141A-1994
15	Chloropyrifos	µg/L	N.D.	30	US EPA 8141A-1994
16	Phorate	µg/L	N.D.	2	US EPA 8141A-1994
17	Phoratesulphoxide	µg/L	N.D.	-	US EPA 8141A-1994
18	Phoratesulphone	µg/L	N.D.	-	US EPA 8141A-1994
19	2,4-D	µg/L	N.D.	30	US EPA 515.1-1995
20	Alachlor	µg/L	N.D.	20	US EPA 508-1995
21	Atrazine	µg/L	N.D.	2	US EPA 532-2000
22	Methyl parathion	µg/L	N.D.	0.3	US EPA 8141A-1994
23	Methyl paraxone	µg/L	N.D.	-	US EPA 8141A-1994
24	Malathion	µg/L	N.D.	190	US EPA 8141A-1994
25	Malaoxon	µg/L	N.D.	-	US EPA 8141A-1994
26	Aldrin	µg/L	N.D.	0.03	US EPA 508-1995
27	Dieldrin	µg/L	N.D.	0.03	US EPA 508-1995
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services

S. N. Gulhane
Chief (Laboratory)

Note:

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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1951			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	25.10.2017
Sample Received On	27.10.2017		
Start of Analysis	27.10.2017	End of Analysis	01.11.2017
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	Office Area, Banjikhoh		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions					
Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	73	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	31	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	20	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	27	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.1	4	IS 5182(Part 10):1999, RA 2003	
Arsenic as As	ng/m ³	N.D.	6	EPA Method IO-3.2	
Nickel as Ni	ng/m ³	N.D.	20	EPA Method IO-3.2	
Mercury as Hg	ng/m ³	N.D.	-	EPA Method IO-5	
Cadmium as Cd	ng/m ³	N.D.	-	EPA Method IO-3.2	
Chromium as Cr	ng/m ³	N.D.	-	EPA Method IO-3.2	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

For Global Environment & Mining Services

S. N. Gulhane
Chief (Laboratory)



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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1952			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order / Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	25.10.2017
Sample Received On	27.10.2017		
Start of Analysis	27.10.2017	End of Analysis	01.11.2017
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	ETP Area, Banjikhoh		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions

Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near ETP	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	65	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	27	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	19	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	24	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.3	4.0	IS 5182(Part 10):1999, RA 2003	
Arsenic as As	ng/m ³	N.D.	6	EPA Method IO-3.2	
Nickel as Ni	ng/m ³	N.D.	20	EPA Method IO-3.2	
Mercury as Hg	ng/m ³	N.D.	-	EPA Method IO-5	
Cadmium as Cd	ng/m ³	N.D.	-	EPA Method IO-3.2	
Chromium as Cr	ng/m ³	N.D.	-	EPA Method IO-3.2	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

For Global Environment & Mining Services

S. N. Gulhane
Chief (Laboratory)



Note:

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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1953			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	25.10.2017
Sample Received On	27.10.2017		
Start of Analysis	27.10.2017	End of Analysis	01.11.2017
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	Office Area, Bankheta		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions					
Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	71	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	33	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	24	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	31	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.1	4.0	IS 5182(Part 10):1999, RA 2003	
Arsenic as As	ng/m ³	N.D.	6	EPA Method IO-3.2	
Nickel as Ni	ng/m ³	N.D.	20	EPA Method IO-3.2	
Mercury as Hg	ng/m ³	N.D.	-	EPA Method IO-5	
Cadmium as Cd	ng/m ³	N.D.	-	EPA Method IO-3.2	
Chromium as Cr	ng/m ³	N.D.	-	EPA Method IO-3.2	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

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S. N. Gulhane
Chief (Laboratory)



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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1954			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	26.10.2017
Sample Received On	28.10.2017		
Start of Analysis	28.10.2017	End of Analysis	01.11.2017
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	Pit Office Area, Bankheta		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions

Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Pit Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	74	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	35	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	19	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	28	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.4	4.0	IS 5182(Part 10):1999, RA 2003	
Arsenic as As	ng/m ³	N.D.	6	EPA Method IO-3.2	
Nickel as Ni	ng/m ³	N.D.	20	EPA Method IO-3.2	
Mercury as Hg	ng/m ³	N.D.	-	EPA Method IO-5	
Cadmium as Cd	ng/m ³	N.D.	-	EPA Method IO-3.2	
Chromium as Cr	ng/m ³	N.D.	-	EPA Method IO-3.2	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

For Global Environment & Mining Services

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Chief (Laboratory)



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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2927			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	25.01.2018
Sample Received On	27.01.2018		
Start of Analysis	27.01.2018	End of Analysis	30.01.2018
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	Office Area, Banjikhol		
Sampling Procedure	As per fmethod reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions

Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	70	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	38	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	33	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	62	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.0	4.0	IS 5182(Part 10):1999, RA 2003	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

For Global Environment & Mining Services


S. N. Gulhane
Chief (Laboratory)



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Ambient Air Quality Monitoring Report


TEST REPORT

Report No.: GEMS/TR/17-18/2928		Date: 31.01.2018	
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	26.01.2018
Sample Received On	28.01.2018		
Start of Analysis	28.01.2018	End of Analysis	30.01.2018
Monitoring for	Ambient AirQualityMonitoring		
Sampling Location	ETP Area, Banjikhoh		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions

Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near ETP	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	62	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	32	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	28	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	42	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.2	4.0	IS 5182(Part 10):1999, RA 2003	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2929			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	25.01.2018
Sample Received On	27.01.2018		
Start of Analysis	27.01.2018	End of Analysis	30.01.2018
Monitoring for	Ambient Air Quality Monitoring		
Sampling Location	Office Area, Bankheta		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions					
Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	77	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	40	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	22	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	33	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	1.8	4.0	IS 5182(Part 10):1999, RA 2003	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

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Ambient Air Quality Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2930			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	26.01.2018
Sample Received On	28.01.2018		
Start of Analysis	28.01.2018	End of Analysis	30.01.2018
Monitoring for	Ambient AirQualityMonitoring		
Sampling Location	Pit Office Area, Bankheta		
Sampling Procedure	As per method reference		
Sample Quantity/Packing	Filter Paper (PM10 & Hg): 1X1 No., Filter Paper (PM2.5): 1X1 No. SO ₂ : 30mLX1 No. PVC Bottle, NO ₂ : 30mLX1 No. PVC Bottle Rubber Bladder: 1X1 No.		

Meteorological Data/ Environmental Conditions					
Avg. Wind Velocity	Prominent Wind Direction	Relative Humidity (%)		Temperature (°C)	
		Max.	Min.	Max.	Min.
--	--	--	--	--	--
Location	Near Pit Office	Duration of Sampling		24 Hours	
Parameter	Unit	Result	NAAQM Standard	Method Reference	
Particulate Matter size less than 10 microns (PM10)	µg/m ³	80	100	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	
Particulate Matter size less than 2.5 microns (PM2.5)	µg/m ³	54	60	Instrument Manufacturer Operating Instructions.	
Sulphur Dioxide (SO ₂)	µg/m ³	40	80	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	
Nitrogen Dioxide (NO ₂)	µg/m ³	52	80	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	
Carbon Monoxide (CO)*	mg/m ³	2.4	4.0	IS 5182(Part 10):1999, RA 2003	
Remarks: * Except CO, all results are on the basis of 24 hour sampling., N.D. - Not Detected					

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Noise Level Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1963			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order / Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	26.10.2017
Sample Received On	Not Applicable		
Monitoring for	Noise Level Monitoring		
Sampling Location	Inside Coal Mine & Outside Coal Mine (As described below)		
Sampling Procedure	Manufacturer's Instruction		
Sample Quantity/Packing	Not Applicable		

Location	Unit	Result		Limit (Industrial Zone)	
		Day Time	Night Time	Day Time	Night Time
Office Area, Banjikhhol	dB(A)	65	48	75	70
Incline Area, Banjikhhol	dB(A)	71	63		
Bunker Area, Banjikhhol	dB(A)	73	68		
DG Set Area, Banjikhhol	dB(A)	70	62		
Weighbrige Area, Banjikhhol	dB(A)	69	64		
Truck Parking Area, Banjikhhol	dB(A)	68	53		
Office Area, Bankheta	dB(A)	67	51		
Weighbrige Area, Bankheta	dB(A)	68	59		

Location	Unit	Result		Limit (Residential Area)	
		Day Time	Night Time	Day Time	Night Time
Outside Plant					
Banjikhhol Village	dB(A)	51	42	55	45
Beljor Village	dB(A)	48	36		

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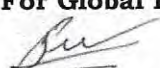
Noise Level Monitoring Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2939			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	26.01.2018
Sample Received On	Not Applicable		
Monitoring for	Noise Level Monitoring		
Sampling Location	Inside Coal Mine & Outside Coal Mine (As described below)		
Sampling Procedure	Manufacturer's Instruction		
Sample Quantity/Packing	Not Applicable		

Location	Unit	Result		Limit (Industrial Zone)	
		Day Time	Night Time	Day Time	Night Time
Office Area, Banjikhhol	dB(A)	68	54	75	70
Incline Area, Banjikhhol	dB(A)	62	50		
Bunker Area, Banjikhhol	dB(A)	67	60		
DG Set Area, Banjikhhol	dB(A)	64	58		
Weighbrige Area, Banjikhhol	dB(A)	52	44		
Truck Parking Area, Banjikhhol	dB(A)	62	60		
Office Area, Bankheta	dB(A)	66	52		
Weighbrige Area, Bankheta	dB(A)	70	63		

Location	Unit	Result		Limit (Residential Area)	
		Day Time	Night Time	Day Time	Night Time
Outside Plant				55	45
Banjikhhol Village	dB(A)	46	39		
Beljor Village	dB(A)	44	40		

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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1959			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Effluent Water		
Sampling Location	ETP Inlet		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22 nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen & -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012, 2120-B, 2-6
2	Temperature	°C	26.5	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed. 2012, 2130-B, 2-13
3	pH	-	7.38	5.5 to 9.0	APHA 22 nd Ed. 2012, 4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	0.1	1.0	APHA 22 nd Ed. 2012, 4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	71	100	APHA 22 nd Ed. 2012, 2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.46	2.0	APHA 22 nd Ed. 2012, 4500-F-B & D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed. 2012, 3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed. 2012, 3500-Cd, 3-105



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Report No. 1959 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	46.8	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	12.2	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services


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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1960			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Effluent Water		
Sampling Location	ETP Outlet		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen & -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	°C	27.4	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	7.26	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	21	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.29	2.0	APHA 22 nd Ed.2012,4500-F-B & D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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Report No. 1960 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	22.4	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	6.8	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services


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Chief (Laboratory)



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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1961			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Effluent Water		
Sampling Location	Sump Water Bankheta		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen & -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	°C	26.8	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	6.94	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	6	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.21	2.0	APHA 22 nd Ed.2012,4500-F-B & D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	1.34	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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Report No. 1961 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	32.6	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	8.4	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003

Remarks: N.D.- Not Detected

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Chief (Laboratory)



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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/1962			Date: 03.11.2017
Name and Address of Customer	Hindalco Industries Limited, Gare Plama – IV/4, Coal Mine, Village – Bankheta, Post - Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	16.10.2017
Sample Received On	18.10.2017		
Start of Analysis	18.10.2017	End of Analysis	24.10.2017
Monitoring for	Effluent Water		
Sampling Location	Mine Water Jaripatra		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22 nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen & -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012, 2120-B, 2-6
2	Temperature	°C	26.8	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed. 2012, 2130-B, 2-13
3	pH	-	7.04	5.5 to 9.0	APHA 22 nd Ed. 2012, 4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed. 2012, 4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	34.2	100	APHA 22 nd Ed. 2012, 2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.18	2.0	APHA 22 nd Ed. 2012, 4500-F-B & D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed. 2012, 3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed. 2012, 3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed. 2012, 3500-Cd, 3-105



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Report No. 1962 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	26.4	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	6.2	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003

Remarks: N.D.- Not Detected

For Global Environment & Mining Services

S. N. Gulhane
Chief (Laboratory)



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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2931			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	23.01.2018
Sample Received On	25.01.2018		
Start of Analysis	25.01.2018	End of Analysis	29.01.2018
Monitoring for	Effluent Water		
Sampling Location	ETP InletBanjikhoh		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen& -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	NTU	22.6	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	6.93	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-CI-G, 4 – 69
5	Total Suspended Solids	mg/Lit	65	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.18	2.0	APHA 22 nd Ed.2012,4500-F-B &D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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Report No. 2931 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	38.0	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	8.5	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services


S. N. Gulhane
Chief (Laboratory)



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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2932		Date: 31.01.2018	
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	23.01.2018
Sample Received On	25.01.2018		
Start of Analysis	25.01.2018	End of Analysis	29.01.2018
Monitoring for	Effluent Water		
Sampling Location	ETP OutletBanjikhoh		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rulejis, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen& -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	NTU	22.9	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	6.82	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	13.0	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.37	2.0	APHA 22 nd Ed.2012,4500-F-B &D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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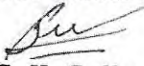
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Report No. 2932 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	18.2	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	4.7	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003

Remarks: N.D.- Not Detected

For Global Environment & Mining Services


S. N. Gulhane
Chief (Laboratory)



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Website : globalmining.in

Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2933			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	23.01.2018
Sample Received On	25.01.2018		
Start of Analysis	25.01.2018	End of Analysis	29.01.2018
Monitoring for	Effluent Water		
Sampling Location	Sump Water Bankheta		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22 nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen& -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	NTU	25.8	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	7.02	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-CI-G, 4 - 69
5	Total Suspended Solids	mg/Lit	4.2	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.23	2.0	APHA 22 nd Ed.2012,4500-F-B &D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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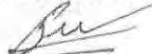
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Report No. 2933 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	38.0	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	9.5	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services


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Chief (Laboratory)



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Effluent Sample Analysis Report

TEST REPORT			
Report No.: GEMS/TR/17-18/2934			Date: 31.01.2018
Name and Address of Customer	Hindalco Industries Limited, GarePlama – IV/4, Coal Mine, Village – Bankheta, Post -Milupara, Distt. - Raigarh (C.G.) 496 107.		
Order /Reference:	N/PO/SRV/1718/0115, dtd. 02.08.2017		
Sample Drawn By	Laboratory	Date of Sampling	23.01.2018
Sample Received On	25.01.2018		
Start of Analysis	25.01.2018	End of Analysis	29.01.2018
Monitoring for	Effluent Water		
Sampling Location	Sump Water Banjikhoh		
Sampling Procedure	IS:3025(Part I):1987 RA 2003; APHA 22 nd Ed. 2012, 1060-B, 1-39		
Sample Quantity/Packing	5 L X 1 No. PVC Can 1 L X 1 No. Glass Bottle		

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
1	Colour and Odour	Hazen& -	Absent	See 6 of Annexure-I	APHA 22 nd Ed. 2012,2120-B,2-6
2	Temperature	NTU	24.6	Shall not exceed 5°C above the receiving water temperature	APHA 22 nd Ed.2012,2130-B,2-13
3	pH	-	7.12	5.5 to 9.0	APHA 22 nd Ed.2012,4500-H ⁺ -B, 4-92
4	Total Residual Chlorine	mg/Lit	N.D.	1.0	APHA 22 nd Ed.2012,4500-Cl-G, 4 – 69
5	Total Suspended Solids	mg/Lit	21.5	100	APHA 22 nd Ed.2012,2540-D, 2-66
6	Dissolved Phosphate (as P)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,4500-P-C, 4-153
7	Fluoride (as F)	mg/Lit	0.29	2.0	APHA 22 nd Ed.2012,4500-F-B &D, 4-84 & 87
8	Lead (as Pb)	mg/Lit	N.D.	0.1	APHA 22 nd Ed.2012,3111-B, 3-18
9	Zinc (as Zn)	mg/Lit	N.D.	5.0	APHA 22 nd Ed.2012,3111-B, 3-18
10	Copper (as Cu)	mg/Lit	N.D.	3.0	APHA 22 nd Ed.2012,3111-B, 3-18
11	Cadmium (as Cd)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cd, 3-105



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Report No. 2934 Cont....

Sr. No.	Parameter	Unit	Result	The Environment (Protection) Rules, 1986 [SCHEDULE-VI] PART-A Inland Surface Water	Method Reference
12	Mercury (as Hg)	mg/Lit	N.D.	0.01	APHA 22 nd Ed.2012,3112-B, 3-23
13	Arsenic (as As)	mg/Lit	N.D.	0.2	APHA 22 nd Ed.2012,3114-C, 3-38
14	Selenium (as Se)	mg/Lit	N.D.	0.05	APHA 22 nd Ed.2012,3114-C, 3-38
15	Total Chromium (as Cr)	mg/Lit	N.D.	2.0	APHA 22 nd Ed.2012,3500-Cr-B, 3-69
16	Chemical Oxygen Demand (COD)	mg/Lit	28.4	250	APHA 22 nd Ed.2012, 5520-B, 5-17
17	Biochemical Oxygen Demand (BOD)	mg/Lit	7.1	30	IS 3025 (Part 44):1993, RA 2003
18	Oil & Grease	mg/Lit	N.D.	10	IS 3025 (Part 39):1991, RA 2003, Ed 2.1
19	Phenoile Compounds (as C ₆ H ₅ OH)	mg/Lit	N.D.	1.0	IS 3025 (Part 43):1992, RA 2003
Remarks: N.D.- Not Detected					

For Global Environment & Mining Services


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Annexure –VIII

Environmental Expenditure Details for FY 2017-18

Particulars	Amount (Rs.)
Environmental expenses including plantation	497195
Environment monitoring expenses	322710
Settling pond stone pitching	651072
Chemical dosing shed for ETP	151545
Truck mounted water tanker for sprinkling	960000
Fixed type water sprinklers	35000
Dump slope stability report	1150500
Total Rs.	3768022