BALASORE ALLOYS LIMITED

ISPAT

CIN-L27101OR1984PLC001354

BAL/Mines/MoEF & CC/4903

Date: 30.04.2018

The Director (S),
Ministry of Environment Forests & Climate Changes
Eastern Regional office, A/3, Chandrasekharpur,
Bhubaneswar – 751023

Sub: Six-monthly Compliance Report of conditions of Environment Clearance Vide No. J-11015/139/2012-IA.II (M) dated 22.08.2014 with respect to Kaliapani Chromite Mines of M/s- Balasore Alloys Ltd for the period of October, 2017 to March, 2018.

Ref: Environment Clearance No. J-11015/139/2012-IA.II (M) dated 22.08.2014.

Dear Sir,

Enclosing herewith six monthly compliance report on the status of the conditions stipulated in the Environmental Clearance Vide No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of the period from October,2017 to March,2018 with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd (ML area 64.463 ha) for your kind perusal.

Thanking you,

Yours faithfully,
For Balasore Alloys Ltd

Swarup Panda
Sr. Vice President (Corporate Affairs)
Encl: As above

Received.
10/5/18
PS to APCCF (Central)
GOI, M/o Envt. & Forests
Eastern Regional Office
Bhubaneswar-751023

Copy to:

1. The Member Secretary, State Pollution Control Board,Paribesh Bhawan A/118 Nilakantha Nagar Unit-VIII, Bhubaneswar -751012.

2. Shri R. C Saxena (Scientist 'E' & In charge), Central Pollution Control Board, Southern Conclave,1582,Raidanga Main Road, Kolkata-700107.

Kaliapani Chromite Mines, At/Po. : Kaliapani - 755047,Dist. : Jajpur, Odisha, Phone : 06726-268297/98, Fax : 06726-268520
E-mail : sukinda_mines@balasorealloys.com. ialmines@yahoo.com, Website : www.balasorealloys.com

Report on

"Status of Compliance to Conditions Stipulated by MoEF &CC in Environmental Clearance Order Vide No J-11015/139/2012-IA.II (M) dated 22.08.2014 in Respect of Kaliapani Chromite Mines."

(ML Area 64.463ha)"

(***Period October, 2017-March, 2018***)

Submitted to:

- Ministry Of Environment, Forest and Climate Changes Regional Office (EZ) A/3 ,Chadrasekharpur, Bhubaneswar, Odisha.

- The Member Secretary, State Pollution Control Board,Paribesh Bhawan A/118 Nilakantha Nagar Unit-VIII,Bhubaneswar -751012.

- Shri R. C Saxena (Scientist'E' & In charge), Central Pollution Control Board, Southemd Conclave,1582,Raidanga Main Road, Kolkata-700107.

Submitted By:

Kaliapani Chromite Mines

M/s Balasore Alloys Ltd

At/Po: Kaliapani,Dist Jajpur,Odihsa

Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.3.2018

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A. Specific Conditions		
Condition No	**Condition**	**Compliance**
i	**Mining shall not commence without necessary permissions for drawl of water and intersection of ground water table**	Permission has been obtained for drawl of water and intersection of ground water table during mining activities from Central Ground Water Authority, Govt. Of India ,Ministry Of Water Resource, vide CGWA/NOC/MIN/ORIG/2015/2122 Dated 10.12.2015 , for quantity of ground water drawl 3293 m^3/Day (3188 m^3/Day from Mine Dewater & 105 m^3/Day from Bore well). Application for renewal of NOC has been submitted at CGWA,Bhubaneswar and same has been recommended for renewal. Copy of recommendation letter from CGWA, South Eastern region BBSR to CGWA,New Delhi attached as **Annexure-I**.
ii	**Mitigation measures such as well-designed ventilation network within underground mine, provision of Personal Protective Equipment should be ensured and necessary training and awareness programs for mine workers should be undertaken**	Underground mining has not been started yet, however Ventilation fan shall be provided within underground mine in order to control the air pollution during same. Necessary PPEs viz helmet, Dust mask etc is being/shall be provided to the employees. Training and awareness programme for mine worker regarding health Safety and Environment is going on regular basis and shall be continued.
iii	**Continuous monitoring of Mine water should be done and reports furnished**	Mine water from mine pit is channelized to up graded ETP designed as per the recommendation of IIT, Kharagpur for treatment, continuous monitoring of quality and quantity of Mine water (viz parameters pH, TSS, Cr+6, Flow Rate) is going on through online monitoring system installed at ETP Outlet and Inlet as per the Guidelines by CPCB for Real-time Effluent Quality Monitoring System. The monitoring data also transferred to OSPCB website through Real data Acquisition System. The data downloaded from OSPCB website for the period of Oct, 2017 to March, 2018 is attached **Annexure-II.**
iv	**Continuous monitoring of all drinking water sources for Cr(VI) of Mine water should be done and reports furnished**	Monitoring of drinking water sources at six different locations including mines are being done on monthly basis and report submitted to State Pollution Control Board. The analysis report of the period of October, 2017

		to March,2018 is attached as **Annexure-III.**
v	**Morbidity pattern which is a sensitive indicator of ill health with regard to Cr related diseases need to be done.**	A study on morbidity pattern has been done by engaging Asian Institute of Public Health, Bhubaneswar with overall aim to create baseline data base on current status of occupational health risks especially morbidity pattern with regard to Chromium and air born dust associated with the facility & identify unhealthy behavior of exposures. The findings of assessment show that, problems with vision (28%), Breathlessness (22%), Headache (22%) are the major contributors towards the current morbidity conditions. Hence it is hereby concluded that, there is no definite pattern/figure to be mentioned as the key indicator of the morbidity resulting from chrome related exposure rather it indicate that the pattern of morbidity follows the general trend of villages or urban areas elsewhere. Based upon the outcome of result, action is being taken.
vi	**Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The runoff from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.**	Mine water discharge is channelized to Effluent Treatment Plant present at mines to remove the Cr+6 and some of treated water are used for Dust Suppression, Plantation, COBP and rest discharged outside. Regular monitoring of treated water is going on through Online analyzer and report transferred to OSPCB website through RTDAS . The Run-off from OB dumps and other surface run off are properly collected through garland drains, settling pond & channelized to ETP by pump & pipeline facility for proper treatment before discharge to outside. Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period. Report of the surface runoff analysis for last rainy season attached **Annexure-IV.**
vii	**The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein**	Consent to establish has obtained from SPCB,Odisha vide letter No. 18196/ IND-II-NOC- 5723 dated 08.10.2013 & subsequently Consent to Operate has obtained from SPCB,Odisha vide letter No. 3749/ IND-I-CON-2576 dated 28.03.2018 valid upto 31.3.2023. Copy of the same are attached as **Annexure- V &VI respectively.** All the conditions stipulated in Consent to Establish and Consent to Operate are effectively implemented

Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.3.2018

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		and compliance being submitted to State Pollution Control Board, Odisha annual basis .
viii	**Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with compliance report.**	Traffic density is being monitored on the route of mineral transportation at three locations and the monitoring report is attached as **Annexure-VII**.
i x	**As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analyzed for their mineralogical composition and records maintained**	The ambient air quality is being monitored at six locations of core and buffer zone of the lease area. The air samples are being analysed for all the 12 parameters as per CPCB guideline engaging third party and data recorded. The analysis report of the same is attached as **Annexure-VIII**
x	**Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated**	There is no crusher and screening Plant running at mines. Mineral handling plant in the form of chrome ore beneficiation is in operation and working in wet process. However water sprinkling is going on through fixed sprinkler inside COB area and through water tankers at loading and unloading points including transfer points regularly to control the generation of dust.
xi	**Effective safeguard measures such as conditioning of ore with water, 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. 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 has been going on engaging two nos of water tankers of 20 KL capacity at critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed at Strategic area viz. COB plant, haul road to arrest the fugitive dust. Photos of same given as **Annexure-IX.** Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conform to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period October, 2017 to March, 2018 is attached as **Annexure-VIII.**
xii	**The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board**	Rooftop rain water harvesting structure has implemented to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board and construction of another structure is in process.

		 
xiii	**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 piezo meters 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 getting depleted due to the mining activity; necessary corrective measures shall be carried out.**	Regular monitoring of ground water level & quality has been monitored on quarterly basis at core and buffer zone at six different locations & data has been sent 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 on regular basis. We have installed four nos of Piezometers inside Core Zone and One piezometric at Vimtangar village to measure the ground water level. Monitoring report reveals that there is no significant impact on ground water table due to mining activity. Report of Ground water level and quality attached as **Annexure- X & XI** respectively.
xiv	**The project proponent shall regularly monitor the flow rate of the natural water streams flowing adjacent to the mine lease and maintain the records**	The flow rate of Damsala Nallah is being regularly monitored at both upstream and downstream on quarterly basis and record has maintained. The monitoring report of same attached as **Annexure-XII**
xv	**The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue**	41100 Sqm area of dump slope has been covered by Geotextile and 16550 Sqm area covered with grass turffing & 78540 nos of saplings planted at dump slope , roadside in side ML area since 2010-11.

	until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis	The details of the same are attached as **Annexure-XIII.** Regular Monitoring and management of rehabilitated areas is being done. Six monthly report of the same is being submitted to respective authority regularly. Photo of Plantation, coirmatting & Grass turffing is given as **Annexure-XIV.**
xvi	**Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data**	Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation are based on the rain fall data. The details of the structures dump wise are attached as **Annexure XV**. photos showing retaining walls, Gabion wall attached as **Annexure-XV.A**
xvii	**Plantation shall be raised in an area of 36.156 Ha. including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of excavated void to be converted in to water body, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per Ha.**	Year wise plantation programme is being undertaken on dump slopes and safety zone area. The details of the plantation year wise is given as **Annexure-XIII** .The density of trees planted is around 3000 nos/ha. Moreover, Our mines is located within cluster of mines such as lease of Sukinda Chromite Mines of M/s IMFA on the Eastern side, Jindal Chromite Mines of M/s Jindal Stainless Ltd (JSL) on Western side, in south Ispat Sukinda Chromite Mine of M/s Balasore Alloys Ltd exists respectively. As per Para 4.7 of guidelines of F/CAct-1980, the Safety Zone of 7.5 m width all around the Lease boundaries should be maintained. At Para 4.7 (ii) " which inter alia says that in case of cluster of mines, the outer boundaries of cluster should be taken as Safety Zone & its maintenance cost has to be borne proportionately by the Lessee operating the Cluster." In North side of ML area vacant area with tree growth is maintained as safety zone with 7.5 m width. In view of above, Plantation has been carried out over 0.17 ha of safety zone in the Northern side only, And joint mining joint mining has been carried out with M/s IMFA in Eastern side with due permission from IBM, DGMS,(Copy attached as **Annexure XIII.A**) Similar permission also granted for Join mining with M/s Jindal,(Copy attached as **Annexure XIII.B**) which is yet to start. At present only one quarry is in operation, hence all measures as per the condition will be undertaken at

		the cessation of the quarry operations
xviii	**Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall 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 by deploying two no 20 KL mobile water tanker in critical areas prone to air pollution and having high levels of SPM & RPM such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed near COB plant to arrest the fugitive dust. Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conforms to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period October, 2017 to March, 2018 is attached as **Annexure-VIII**.
xix	**Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.**	**Process** water in COB plant is completely reused and the treated water from the ETP is used as make-up quantity. However the quantity of water dewatered from mine pit is properly treated through an up graded Effluent Treatment Plant of capacity 445KL/Hr established with the recommendation of IIT, Kharagpur. The treated water has been monitored regularly and meeting the prescribed standards before reuse/discharge. Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period at two different stations inside ML area with the analysis of the iron concentration in surface run-off. However channelization of all surface run-off water to ETP for proper treatment is made through settling pit and pumping arrangement. Report of the surface runoff analysis of last monsoon (April-Septmber,2017) is attached as **Annexure-IV..**
xx	**.The decanted water from the beneficiation plant and slime/tailing pond shall be re circulated within the mine and there shall be zero discharge from the mine.**	Total decanted water from the beneficiation plant & tailing/slime pond is reused in COB plant; hence no discharge of decanted effluents from the same
xxi	**Regular monitoring of the flow**	The flow rate of Damsala Nallah is being regularly

Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.3.2018

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	rate of the springs and perennial nallahs shall be carried out and records maintained.	monitored and record has maintained. The flow rate in monsoon period is attached as **Annexure-XII**.
xxii	**Regular monitoring of water quality, upstream and downstream of natural water bodies shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.**	Monitoring of water quality, upstream and downstream of natural water bodies i.e Damsala Nallah is being carried out on quarterly basis and report submitted to Ministry of Environment and Forests & CC Regional Office, Bhubaneswar, Central Ground Water Board & State Pollution Control Board on regular basis. The report of same attached **Annexure-XV**I
xxiii	**Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.**	Two nos of he Roof Top rain water harvesting structure has been planned and one is being completed and another structure is ongoing. It is calculated to recharge at least 5,000 m3/year of water to be recharged to the underlain fractured aquifer through rooftop rain water harvesting structure.
xxiv	**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 from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.**	Periodical maintenance of the vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant is being ensured. Regular monitoring of vehicular emission also being done. For outside trucks carrying mineral from mine to plant are ensured valid Pollution Under Control Certificate. The transporting trucks are being covered with tarpaulin and are allowed to take only the prescribed load i.e. below 10.5 Ton. In order to air & soil by mineral transporting vehicles wheel washing facility is provided at at mine gate for washing the washing the wheels of transporting vehicle before leaving mines. Copy of Vehicular emission report and photographs showing vehicles covered with tarpaulin & wheel washing systems installed at mines are attached **Annexure-XVII & XVIII**.

Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.3.2018

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xxv	**Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.**	We have no colony within the lease area. However for the treatment of the canteen waste water and organic waste STP of 40 KLD capacity is installed at site. The workshop has been provided with Oil and grease pit for separation for oil and grease from waste water generated during vehicle washing and same has been channelized to ETP. Waste water generating from mining operation also being channelized to ETP. Photos of STP, O & G pit and ETP is attached **Annexure: XIX**
xxvi	**Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.**	Digital processing of the entire lease area using remote sensing technique is being carried out for monitoring land use pattern . The land use pattern of Mines is attached **Annexure-XX and** DGPS map is attached **as Annexure-XXI**
xxvii	**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 is being carried out and records maintained. During 2016-17 IME done for 346 employees and 238 PME done.
xxviii	**The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made**	Site Specific Wildlife Conservation Plan has been prepared and approved by PCCF(WL) & Chief Wild Life warden ,Odisha Vide Memo 8478/1WL(C)-SSP-425/2014 Dated 7th Nove-2014 and amount of Rs 1,89,36,000/- towards implementation of Site Specific Conservation Plan including cost of vehicle to be provided against demand note from DFO, Cuttack vide no 443 dated 21st January,2015 has been deposited in favor of Ad-hoc Body of Compensatory Afforestation Fund Management and Planning Authority(CAMPA) through RTGS No.SBINR52170022300051075724059 ORISSA CAMPA on 23.02.2017 .

	and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife Conservation Pan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	Rs 64.82 lakh has been earmarked for carrying out Interventions inside ML area as per approved Site Specific Wildlife Conservation Plan. The proposed interventions have been carrying out and status being submitted to State Forest department. The details of payments made attached as **Annexure-XXII.**
xxix	**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.**	Final Mine Closure Plan will be submitted to the ministry 5 years before the anticipated final mine closure.
xxx	**The project proponent shall undertake all the commitments made during the public hearing and effectively address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.**	All the commitments made during public hearing are being undertaken by incorporating in the CSR activities. There was expenditure of Rs **4724507** incurred during period 2017-18 toward various activities under CSR **.** The details of CSR activities during 2017-18 are attached as **Annexure-XXIV.**
B.General Conditions		
i	**No change in Chrome Ore Processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.**	Chrome ore Mining method practiced in the project is both opencast & underground fully mechanized. There is/will be no change in Chrome Ore Processing/Beneficiation technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests
ii	**No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste should be made..**	No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste shall be made
iii	**. At least 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 10 micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data,**	Air quality monitoring for the parameters viz PM10,PM2.5, SO_2 , NOx,CO,NH_3 &O_3 are being done by establishing 6 ambient air monitoring stations on the basis of meteorological data, topographical features after consultation with SPCB in the core & Buffer zone. The data so recorded is being regularly submitted to the Ministry including its Regional office located at

	topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded 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.	Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.
iv	**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.**	Maintenance of all HeMM are being carried out on regular basis to suppress the Noise generation**.** Regular monitoring is being carried out for noise level in the work environment. Ear plugs / muffs are provided to all workers engaged in operations of HEMM etc. Noise level monitoring results attached as **Annexure-XXV**.
v	**There will be zero waste water discharge from the plant.**	Total decanted water from the beneficiation plant & tailing/slime pond is reused in COB plant; hence there is zero waste water discharge from the plant.
vi	**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.**	Personal protective equipments are being provided to all workers respective to the nature of the job. Initial and periodical awareness training is being imparted to all workers in the Company's Vocational Training Centre located within the lease area on Safety and Health Aspects. Periodical health check up as per DGMS guideline is being carried out for all employees.
vii	**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.**	Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained for corrective measures

Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.3.2018

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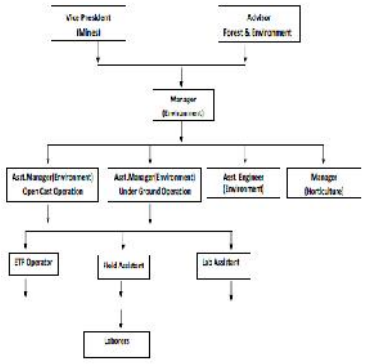
viii	**A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.**	A separate Environment management cell under the control of President (Mines) has been set up. Organizational Chart of Environmental Management Cell is given below 
ix	**The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.**	Separate fund is being earmarked for environmental protection measures. Year wise Expenditure also been reported to Regional Office, MoEF,BBSR. The detail of the expenditure is attached **Annexure -XXVI..**
x	**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.**	This is an ongoing project since Sept' 2000.
xi	**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.**	We are abide by the condition and shall extend full cooperation to the officer(s) of regional office by furnishing the requisite data / information/monitoring reports during their monitoring of compliance of the stipulated conditions.
xii	**The project proponent shall submit six monthly reports on the status of compliance of the stipulated**	Six monthly compliance report is being submitted on the status of compliance of the stipulated environmental clearance conditions including

	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 Bhubaneswar, 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, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The status of compliance of the environmental clearance conditions, including results of monitored data is uploaded on company website periodically.
xiii	**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.**	Copy of the clearance letter has been sent to concerned Panchayat. The clearance letter also been uploaded on the website of the Company. The URL for the same is **http://www.balasorealloys.com/webpage.php?title=Environment+Policy&p_type=1&parent=36&catid=78.**
xiv	**The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.**	Agreed.
xv	**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**	The environmental statement for each financial year ending 31st March in Form-V is being submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, also uploaded on the website of the company along with the status of compliance of environmental clearance conditions and also sent to the respective

	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.	Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail. The copy of the last environmental statement for financial year ending 31st March 2016-17 is attached as **Annexure- XXVII.**
xvi	**The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and 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 at Bhubaneswar.**	The clearance letter informing that the project has been accorded environmental clearance is advertised in "The Sambad" (Odia daily) & The Pioneer (English daily) newspaper.

LIST OF ANNEXURES

ANNEXURE NO **DETAILS**

I. CGWA REC0MENDATION

II. ETP REPORT OCT,17 TO MARCH,18

III. DRINKING WATER QULAITY FOR CR+6

IV. SURFACE RUN OFF ANALYSIS REPORT

V. COPY OF CTE

VI. COPY OF CTO

VII. TRAFFIC DENSITY STUDY REPORT

VIII. AAQ ANALYSIS REPORT

IX. PHOTOS SHOWING DUST SUPRESSION ARRANGEMNETS

X. GROUND WATER LEVEL MONITORING REPORT

XI. GROUND WATER QUALITY ANALYSIS REPORT

XII. FLOW RATE MONITORING REPORT OF DAMSALANALA

XIII. INSIDE ML AREA PLANATION DETAILS

XIII.A: CBD/CBM PERMISSIONS WITH M/S IMFA

XIII.B CBD/CBM PERMSSIONS WITHM/S JINDAL

XIV. PHOTOS SHOWING PLANATION, COIRMATTING ETC INSIDE ML AREA

XV. DETAILS OF GARLAND DRAIN,RETAINING WALL

XVI. PHOTOS SHOWING GABION WALL AND RETAINING WALL CONSTRUCTED AT MINES

XVII. SURFACE WATER QUALITY ANALYSIS REPROT

XVIII. VEHICULAR EMISSION ANALYSIS REPORT

XIX. PHOTOS SHOWNG TRUCKS COVERED WITH TARPAULINE & WHEEL WASHING SYSTEM AT MINES

XX. PHOTOS SHOWING ETP,STP, AND OIL AND GREASE PIT

XXI. LAND USE PATTREN OF MINES

XXII. LAND USE MAP

XXIII. PAYMNET DETAILS OF WLMP/WLCP

XXIV. DETAILS OF CSR ACTVITIES OCT,17 TO MARCH,18

XXV. NOISE LEVEL MONITORING REPORT

XXVI. ENVIRONMNETAL EXPENDITURE

XXVII. COPY OF ENVIORNMENTAL STATEMENT

SPEED POST

No. 5-22/SER/CGWA/2017-18 -344
Govt. of India
Ministry of Water Resources, RD & GR
Central Ground Water Board
South Eastern Region
Bhujal Bhawan
NH – V, Khandagiri
Bhubaneswar –751030

Date: 28.03.2018

To

The Member Secretary
Central Ground Water Authority
Ministry of Water Resources, RD & GR
18/11, Jamnagar House, Mansingh Road
New Delhi-110 011

Sub: Forwarding of application for renewal of CGWA NOC **in respect of** Kaliapani Chromite Mines of M/s Balasore Alloys Limited, Village: Kaliapani, BlocK :Sukinda; Dist.: Jajpur, State:Odisha

Ref : 1. CGWA NOC granted to Kaliapani Chromite Mines of M/s Balasore Alloys Limited – vide CHQ letter No.21-4/819/OR/MIN/2015-1835 Dated:- 10.12.2015

2. Renewal Application submitted by the firm vide letter dated 07.12.2017

Sir,

Please find enclosed an application submitted, in respect of in respect of Kaliapani Chromite Mines of M/s Balasore Alloys Limited, Village: Kaliapani, BlocK :Sukinda; Dist.: Jajpur, State:Odisha seeking renewal of CGWA NOC for ground water withdrawal of 3293 m^3 /day(105 m^3/day through bore well and 3188 m^3/day through mine dewatering) for industrial use along with a Comprehensive Compliance Report and other relevant documents.

The evaluation report duly filled in as per the prescribed "EVALUATION PROFORMA FOR RENEWAL OF NOC IN RESPECT OF INDUSTRY" along with comments & relevant hydrographs, water level data etc. of the area surrounding the said Plant, as well as the ***Industry Inspection Report*** is forwarded herewith for your kind perusal and necessary action please.

Encl: (a) Original renewal Application form, Comprehensive Compliance Report & other relevant Documents etc. submitted by Kaliapani Chromite Mines of M/s Balasore Alloys Limited,
(b) Industry Inspection Report

Yours faithfully,

(Dr. U. Gogoi)
Regional Director

Copy to:

1) The Sr. Vice President(Corporate Affairs), M/s Balasore Alloys Limited, At/PO Kaliapani, Tehsil : Sukinda, District : Jajpur, Odisha - 755047

2) Guard File

28/3

(Dr. U. Gogoi)
Regional Director

Station Id.	Location
EQMS-1	INLET STATION
EQMS-2	OUTLET STATION

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
22/01/2018	EQMS-1	Avg: 1.397 Min: 0.750 Max: 1.886	N/A	Avg: 8.129 Min: 8.105 Max: 8.167	Avg: 71.603 Min: 68.906 Max: 74.812
23/01/2018	EQMS-1	Avg: 1.384 Min: 0.815 Max: 2.364	N/A	Avg: 8.156 Min: 8.122 Max: 8.197	Avg: 71.690 Min: 68.906 Max: 74.594
24/01/2018	EQMS-1	Avg: 1.425 Min: 0.542 Max: 2.280	N/A	Avg: 8.162 Min: 8.109 Max: 8.207	Avg: 72.024 Min: 68.906 Max: 74.812
25/01/2018	EQMS-1	Avg: 1.336 Min: 0.406 Max: 1.975	Avg: 96.802 Min: 1.350 Max: 247.500	Avg: 8.154 Min: 8.119 Max: 8.199	Avg: 72.107 Min: 69.344 Max: 75.250
26/01/2018	EQMS-1	Avg: 1.383 Min: 0.664 Max: 2.042	Avg: 119.450 Min: 6.450 Max: 289.650	Avg: 8.186 Min: 8.142 Max: 8.220	Avg: 72.460 Min: 70.219 Max: 75.906
27/01/2018	EQMS-1	Avg: 1.268 Min: 0.496 Max: 2.028	Avg: 83.967 Min: 1.350 Max: 246.900	Avg: 8.192 Min: 8.137 Max: 8.250	Avg: 72.037 Min: 68.250 Max: 75.250
28/01/2018	EQMS-1	Avg: 1.490 Min: 0.965 Max: 2.090	Avg: 110.163 Min: 1.200 Max: 234.300	Avg: 8.232 Min: 8.183 Max: 8.264	Avg: 72.107 Min: 68.906 Max: 74.594
29/01/2018	EQMS-1	Avg: 1.299 Min: 0.688 Max: 1.837	Avg: 102.415 Min: 1.200 Max: 235.050	Avg: 8.199 Min: 8.166 Max: 8.259	Avg: 72.148 Min: 68.031 Max: 75.031
30/01/2018	EQMS-1	Avg: 1.300 Min: 0.453 Max: 2.100	Avg: 95.809 Min: 1.200 Max: 236.700	Avg: 8.207 Min: 8.153 Max: 8.259	Avg: 72.275 Min: 69.344 Max: 75.906
31/01/2018	EQMS-1	Avg: 1.154 Min: 0.476 Max: 1.896	Avg: 134.234 Min: 1.200 Max: 233.100	Avg: 8.195 Min: 8.157 Max: 8.267	Avg: 72.312 Min: 68.906 Max: 76.344
01/02/2018	EQMS-1	Avg: 1.204 Min: 0.495 Max: 2.081	Avg: 198.346 Min: 1.350 Max: 256.650	Avg: 8.211 Min: 8.170 Max: 8.264	Avg: 72.441 Min: 68.469 Max: 76.125
02/02/2018	EQMS-1	Avg: 1.228 Min: 0.492 Max: 1.950	Avg: 152.729 Min: 1.200 Max: 219.300	Avg: 8.231 Min: 8.177 Max: 8.282	Avg: 72.485 Min: 68.031 Max: 77.000
03/02/2018	EQMS-1	Avg: 1.068 Min: 0.345 Max: 1.745	Avg: 154.273 Min: 1.200 Max: 224.400	Avg: 8.233 Min: 8.180 Max: 8.278	Avg: 72.349 Min: 68.031 Max: 77.000
04/02/2018	EQMS-1	Avg: 1.044 Min: 0.211 Max: 1.793	Avg: 198.636 Min: 1.350 Max: 217.950	Avg: 8.237 Min: 8.177 Max: 8.287	Avg: 72.483 Min: 68.906 Max: 77.000
05/02/2018	EQMS-1	Avg: 0.759 Min: 0.003 Max: 1.414	Avg: 158.728 Min: 1.350 Max: 244.500	Avg: 8.163 Min: 8.055 Max: 8.287	Avg: 79.369 Min: 69.125 Max: 106.312
06/02/2018	EQMS-1	Avg: 0.817 Min: 0.124 Max: 1.471	Avg: 139.225 Min: 15.900 Max: 244.500	Avg: 8.138 Min: 8.096 Max: 8.184	Avg: 76.762 Min: 70.219 Max: 82.688
07/02/2018	EQMS-1	Avg: 0.777 Min: 0.199 Max: 1.548	Avg: 151.311 Min: 7.650 Max: 232.500	Avg: 8.169 Min: 8.129 Max: 8.212	Avg: 75.071 Min: 70.656 Max: 79.406
08/02/2018	EQMS-1	Avg: 0.958 Min: 0.003 Max: 4.702	Avg: 129.099 Min: 1.350 Max: 394.950	Avg: 8.045 Min: 7.090 Max: 8.231	Avg: 81.183 Min: 68.469 Max: 133.438
09/02/2018	EQMS-1	Avg: 1.389 Min: 0.822 Max: 2.006	Avg: 166.462 Min: 1.350 Max: 502.050	Avg: 7.972 Min: 7.915 Max: 8.060	Avg: 75.475 Min: 70.219 Max: 91.656
10/02/2018	EQMS-1	Avg: 1.306 Min: 0.817 Max: 1.864	Avg: 158.200 Min: 1.350 Max: 305.400	Avg: 8.028 Min: 7.989 Max: 8.066	Avg: 71.763 Min: 69.344 Max: 74.812
11/02/2018	EQMS-1	Avg: 1.358 Min: 0.785 Max: 1.892	Avg: 114.633 Min: 1.350 Max: 345.600	Avg: 8.099 Min: 8.065 Max: 8.149	Avg: 70.229 Min: 68.031 Max: 72.625
12/02/2018	EQMS-1	Avg: 1.222 Min: 0.708 Max: 1.847	Avg: 119.239 Min: 1.500 Max: 412.500	Avg: 8.077 Min: 7.772 Max: 8.176	Avg: 72.963 Min: 68.031 Max: 87.719
13/02/2018	EQMS-1	Avg: 1.198 Min: 0.660 Max: 4.549	Avg: 107.378 Min: 1.200 Max: 343.800	Avg: 7.478 Min: 6.959 Max: 7.962	Avg: 93.110 Min: 75.906 Max: 126.875
14/02/2018	EQMS-1	Avg: 1.046 Min: 0.617 Max: 1.537	Avg: 95.255 Min: 1.350 Max: 367.800	Avg: 7.340 Min: 7.139 Max: 7.646	Avg: 97.058 Min: 88.375 Max: 100.625
15/02/2018	EQMS-1	Avg: 1.057 Min: 0.582 Max: 1.583	Avg: 126.629 Min: 1.200 Max: 314.100	Avg: 7.734 Min: 7.528 Max: 7.825	Avg: 99.555 Min: 95.812 Max: 103.250
16/02/2018	EQMS-1	Avg: 1.143 Min: 0.656 Max: 1.589	Avg: 244.682 Min: 1.500 Max: 475.800	Avg: 7.892 Min: 7.825 Max: 7.940	Avg: 103.660 Min: 99.531 Max: 108.500
17/02/2018	EQMS-1	Avg: 0.894 Min: 0.175 Max: 1.724	Avg: 150.055 Min: 1.200 Max: 478.350	Avg: 7.966 Min: 7.928 Max: 8.013	Avg: 106.890 Min: 101.500 Max: 112.000
18/02/2018	EQMS-1	Avg: 0.749 Min: 0.065 Max: 1.345	Avg: 38.610 Min: 1.200 Max: 395.100	Avg: 8.011 Min: 7.952 Max: 8.048	Avg: 109.709 Min: 106.094 Max: 112.656

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
19/02/2018	EQMS-1	Avg: 0.499 Min: 0.002 Max: 1.318	Avg: 71.636 Min: 1.350 Max: 429.000	Avg: 7.952 Min: 7.876 Max: 8.068	Avg: 113.986 Min: 106.312 Max: 131.250
20/02/2018	EQMS-1	Avg: 0.398 Min: 0.003 Max: 1.060	Avg: 113.853 Min: 1.350 Max: 294.000	Avg: 8.001 Min: 7.952 Max: 8.038	Avg: 102.820 Min: 98.438 Max: 108.500
21/02/2018	EQMS-1	Avg: 0.306 Min: 0.002 Max: 1.031	Avg: 81.475 Min: 1.350 Max: 315.300	Avg: 8.062 Min: 8.026 Max: 8.102	Avg: 100.138 Min: 96.469 Max: 103.688
22/02/2018	EQMS-1	Avg: 0.474 Min: 0.014 Max: 0.976	Avg: 102.530 Min: 1.350 Max: 325.350	Avg: 8.104 Min: 8.057 Max: 8.148	Avg: 99.284 Min: 94.500 Max: 103.250
23/02/2018	EQMS-1	Avg: 0.482 Min: 0.064 Max: 0.894	Avg: 141.082 Min: 1.500 Max: 355.500	Avg: 8.127 Min: 8.078 Max: 8.176	Avg: 99.359 Min: 94.938 Max: 103.688
24/02/2018	EQMS-1	Avg: 0.342 Min: 0.001 Max: 0.792	Avg: 131.878 Min: 1.350 Max: 419.100	Avg: 8.129 Min: 8.084 Max: 8.195	Avg: 98.508 Min: 94.500 Max: 104.125
25/02/2018	EQMS-1	Avg: 0.309 Min: 0.002 Max: 0.808	Avg: 236.070 Min: 1.350 Max: 357.300	Avg: 8.162 Min: 8.105 Max: 8.204	Avg: 98.890 Min: 95.375 Max: 101.938
26/02/2018	EQMS-1	Avg: 0.170 Min: 0.000 Max: 0.654	Avg: 167.394 Min: 1.350 Max: 351.450	Avg: 8.175 Min: 8.133 Max: 8.235	Avg: 98.326 Min: 93.625 Max: 104.344
27/02/2018	EQMS-1	Avg: 0.225 Min: 0.000 Max: 0.623	Avg: 119.854 Min: 1.500 Max: 371.700	Avg: 8.208 Min: 8.136 Max: 8.268	Avg: 98.511 Min: 92.969 Max: 101.938
28/02/2018	EQMS-1	Avg: 0.559 Min: 0.003 Max: 1.555	Avg: 199.472 Min: 1.350 Max: 416.400	Avg: 7.432 Min: 6.927 Max: 8.224	Avg: 156.047 Min: 95.156 Max: 298.156
01/03/2018	EQMS-1	Avg: 1.370 Min: 0.075 Max: 2.298	Avg: 94.397 Min: 1.350 Max: 501.600	Avg: 7.498 Min: 7.111 Max: 7.717	Avg: 149.332 Min: 98.656 Max: 209.781
02/03/2018	EQMS-1	Avg: 2.190 Min: 1.440 Max: 2.831	Avg: 138.268 Min: 1.350 Max: 386.250	Avg: 7.854 Min: 7.716 Max: 7.947	Avg: 101.517 Min: 96.688 Max: 136.500
03/03/2018	EQMS-1	Avg: 1.939 Min: 1.026 Max: 2.647	Avg: 118.702 Min: 1.350 Max: 337.050	Avg: 7.955 Min: 7.775 Max: 8.041	Avg: 103.532 Min: 96.250 Max: 115.062
04/03/2018	EQMS-1	Avg: 1.891 Min: 1.099 Max: 2.604	Avg: 44.172 Min: 1.350 Max: 296.250	Avg: 7.987 Min: 7.913 Max: 8.051	Avg: 97.387 Min: 91.656 Max: 103.031
05/03/2018	EQMS-1	Avg: 2.040 Min: 1.450 Max: 2.691	Avg: 151.627 Min: 1.350 Max: 426.750	Avg: 8.100 Min: 8.048 Max: 8.162	Avg: 94.884 Min: 91.219 Max: 98.656
06/03/2018	EQMS-1	Avg: 1.968 Min: 1.338 Max: 2.517	Avg: 134.003 Min: 1.350 Max: 340.350	Avg: 8.161 Min: 8.087 Max: 8.229	Avg: 94.894 Min: 91.000 Max: 99.094
07/03/2018	EQMS-1	Avg: 2.025 Min: 0.797 Max: 3.946	Avg: 97.196 Min: 1.350 Max: 494.250	Avg: 7.747 Min: 7.364 Max: 8.282	Avg: 78.557 Min: 62.562 Max: 188.781
08/03/2018	EQMS-1	Avg: 2.139 Min: 1.655 Max: 2.813	Avg: 125.643 Min: 1.350 Max: 459.900	Avg: 7.766 Min: 7.598 Max: 7.878	Avg: 64.661 Min: 59.062 Max: 68.688
09/03/2018	EQMS-1	Avg: 2.112 Min: 1.490 Max: 2.698	Avg: 131.037 Min: 1.350 Max: 501.600	Avg: 7.927 Min: 7.830 Max: 7.984	Avg: 66.102 Min: 60.594 Max: 74.594
10/03/2018	EQMS-1	Avg: 2.254 Min: 1.731 Max: 2.709	Avg: 193.083 Min: 1.350 Max: 458.550	Avg: 7.911 Min: 7.787 Max: 8.028	Avg: 70.044 Min: 64.750 Max: 77.438
11/03/2018	EQMS-1	Avg: 2.311 Min: 1.490 Max: 2.770	Avg: 156.717 Min: 1.350 Max: 408.600	Avg: 7.951 Min: 7.872 Max: 8.011	Avg: 72.914 Min: 68.031 Max: 82.469
12/03/2018	EQMS-1	Avg: 2.264 Min: 1.561 Max: 2.900	Avg: 154.286 Min: 1.350 Max: 345.000	Avg: 7.949 Min: 7.878 Max: 8.032	Avg: 76.599 Min: 70.438 Max: 84.656
13/03/2018	EQMS-1	Avg: 2.243 Min: 1.321 Max: 2.931	Avg: 228.612 Min: 9.900 Max: 450.900	Avg: 7.934 Min: 7.668 Max: 8.064	Avg: 82.714 Min: 69.562 Max: 112.656
14/03/2018	EQMS-1	Avg: 1.069 Min: 0.001 Max: 2.510	Avg: 178.062 Min: 1.800 Max: 454.050	Avg: 7.386 Min: 7.108 Max: 7.969	Avg: 179.327 Min: 84.000 Max: 345.406
15/03/2018	EQMS-1	Avg: 0.828 Min: 0.001 Max: 2.254	Avg: 184.174 Min: 1.350 Max: 471.000	Avg: 7.396 Min: 7.078 Max: 7.745	Avg: 322.927 Min: 54.250 Max: 734.344
16/03/2018	EQMS-1	Avg: 1.079 Min: 0.527 Max: 1.524	Avg: 186.143 Min: 1.500 Max: 501.900	Avg: 7.870 Min: 7.740 Max: 7.959	Avg: 107.710 Min: 87.500 Max: 115.719
17/03/2018	EQMS-1	Avg: 1.219 Min: 0.444 Max: 1.962	Avg: 152.988 Min: 1.500 Max: 331.050	Avg: 7.798 Min: 7.562 Max: 8.010	Avg: 77.797 Min: 58.406 Max: 101.062
18/03/2018	EQMS-1	Avg: 1.860 Min: 1.329 Max: 2.412	Avg: 196.148 Min: 1.500 Max: 330.750	Avg: 7.914 Min: 7.848 Max: 7.969	Avg: 55.977 Min: 50.531 Max: 62.781
19/03/2018	EQMS-1	Avg: 1.514 Min: 0.685 Max: 2.321	Avg: 184.237 Min: 1.500 Max: 502.500	Avg: 7.790 Min: 7.667 Max: 8.028	Avg: 64.252 Min: 50.313 Max: 93.625
20/03/2018	EQMS-1	Avg: 1.644 Min: 0.929 Max: 2.350	Avg: 150.159 Min: 1.500 Max: 348.600	Avg: 7.729 Min: 7.556 Max: 7.926	Avg: 67.627 Min: 54.031 Max: 91.656

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
21/03/2018	EQMS-1	Avg: 1.245 Min: 0.002 Max: 2.268	Avg: 174.146 Min: 1.350 Max: 332.400	Avg: 7.753 Min: 7.676 Max: 7.859	Avg: 84.215 Min: 64.312 Max: 186.594
22/03/2018	EQMS-1	Avg: 1.326 Min: 0.630 Max: 2.012	Avg: 148.166 Min: 1.650 Max: 496.050	Avg: 7.872 Min: 7.750 Max: 7.950	Avg: 79.574 Min: 73.938 Max: 89.031
23/03/2018	EQMS-1	Avg: 0.991 Min: 0.205 Max: 1.894	Avg: 170.119 Min: 1.650 Max: 353.700	Avg: 7.853 Min: 7.774 Max: 8.002	Avg: 91.697 Min: 76.344 Max: 104.781
24/03/2018	EQMS-1	Avg: 0.913 Min: 0.142 Max: 1.635	Avg: 135.570 Min: 1.500 Max: 311.700	Avg: 7.897 Min: 7.832 Max: 8.013	Avg: 89.971 Min: 78.094 Max: 134.969
25/03/2018	EQMS-1	Avg: 1.082 Min: 0.395 Max: 1.668	Avg: 197.679 Min: 1.500 Max: 323.400	Avg: 7.927 Min: 7.870 Max: 7.991	Avg: 83.958 Min: 77.656 Max: 139.562
26/03/2018	EQMS-1	Avg: 0.918 Min: 0.326 Max: 1.375	Avg: 104.563 Min: 1.500 Max: 304.500	Avg: 7.921 Min: 7.884 Max: 7.962	Avg: 83.785 Min: 78.531 Max: 89.250
01/10/2017	EQMS-2	Avg: 0.011 Min: 0.001 Max: 0.024	Avg: 259.608 Min: 24.438 Max: 364.525	Avg: 6.931 Min: 6.850 Max: 7.049	Avg: 47.271 Min: 32.344 Max: 158.781
02/10/2017	EQMS-2	Avg: 0.012 Min: 0.004 Max: 0.018	Avg: 231.948 Min: 15.775 Max: 299.950	Avg: 6.894 Min: 6.880 Max: 6.918	Avg: 34.412 Min: 33.219 Max: 35.625
03/10/2017	EQMS-2	Avg: 0.012 Min: 0.002 Max: 0.022	Avg: 264.423 Min: 1.262 Max: 356.538	Avg: 6.961 Min: 6.880 Max: 7.017	Avg: 34.416 Min: 33.219 Max: 35.625
04/10/2017	EQMS-2	Avg: 0.010 Min: 0.001 Max: 0.018	Avg: 277.482 Min: 1.375 Max: 353.275	Avg: 7.165 Min: 6.998 Max: 7.323	Avg: 34.457 Min: 33.219 Max: 35.625
05/10/2017	EQMS-2	Avg: 0.010 Min: 0.000 Max: 0.016	Avg: 213.181 Min: 16.338 Max: 301.637	Avg: 7.211 Min: 7.128 Max: 7.362	Avg: 48.199 Min: 32.125 Max: 159.875
06/10/2017	EQMS-2	Avg: 0.014 Min: 0.008 Max: 0.018	Avg: 287.858 Min: 16.900 Max: 358.225	Avg: 7.159 Min: 7.128 Max: 7.193	Avg: 33.684 Min: 32.125 Max: 34.750
07/10/2017	EQMS-2	Avg: 0.010 Min: 0.002 Max: 0.018	Avg: 249.295 Min: 0.138 Max: 405.700	Avg: 7.217 Min: 7.179 Max: 7.294	Avg: 38.376 Min: 32.125 Max: 159.875
08/10/2017	EQMS-2	Avg: 0.010 Min: 0.002 Max: 0.015	Avg: 224.260 Min: 17.463 Max: 273.400	Avg: 7.189 Min: 7.160 Max: 7.278	Avg: 33.683 Min: 32.344 Max: 34.750
09/10/2017	EQMS-2	Avg: 0.008 Min: 0.001 Max: 0.027	Avg: 184.793 Min: 16.338 Max: 294.775	Avg: 7.206 Min: 7.170 Max: 7.225	Avg: 63.422 Min: 56.844 Max: 90.312
16/10/2017	EQMS-2	Avg: 0.015 Min: 0.007 Max: 0.024	Avg: 181.411 Min: 0.700 Max: 378.587	Avg: 7.265 Min: 7.237 Max: 7.305	Avg: 35.291 Min: 33.219 Max: 89.000
17/10/2017	EQMS-2	Avg: 0.012 Min: 0.002 Max: 0.023	Avg: 225.218 Min: 17.125 Max: 374.425	Avg: 7.339 Min: 7.191 Max: 7.495	Avg: 33.885 Min: 32.563 Max: 34.969
18/10/2017	EQMS-2	Avg: 0.015 Min: 0.012 Max: 0.019	Avg: 280.984 Min: 241.562 Max: 294.775	Avg: 7.239 Min: 7.231 Max: 7.260	Avg: 33.824 Min: 33.437 Max: 34.750
24/10/2017	EQMS-2	Avg: 0.010 Min: 0.003 Max: 0.015	Avg: 215.683 Min: 16.450 Max: 935.913	Avg: 6.392 Min: 6.381 Max: 6.824	Avg: 36.210 Min: 34.531 Max: 91.844
25/10/2017	EQMS-2	Avg: 0.010 Min: 0.002 Max: 0.018	Avg: 257.563 Min: 18.025 Max: 373.975	Avg: 6.490 Min: 6.397 Max: 6.564	Avg: 35.142 Min: 34.531 Max: 36.063
26/10/2017	EQMS-2	Avg: 0.011 Min: 0.004 Max: 0.018	Avg: 264.700 Min: 23.875 Max: 369.700	Avg: 6.539 Min: 6.339 Max: 6.631	Avg: 34.933 Min: 34.313 Max: 35.844
27/10/2017	EQMS-2	Avg: 0.009 Min: 0.001 Max: 0.015	Avg: 192.220 Min: 15.775 Max: 346.188	Avg: 6.421 Min: 6.336 Max: 6.482	Avg: 36.189 Min: 33.219 Max: 66.031
28/10/2017	EQMS-2	Avg: 0.011 Min: 0.008 Max: 0.012	Avg: 138.476 Min: 15.212 Max: 292.413	Avg: 6.417 Min: 6.411 Max: 6.421	Avg: 34.695 Min: 34.531 Max: 35.625
08/11/2017	EQMS-2	Avg: 0.019 Min: 0.011 Max: 0.029	Avg: 209.824 Min: 0.025 Max: 333.475	Avg: 4.258 Min: 2.975 Max: 5.027	Avg: 40.229 Min: 38.906 Max: 48.094
09/11/2017	EQMS-2	Avg: 0.022 Min: 0.002 Max: 0.036	Avg: 208.536 Min: 14.425 Max: 292.750	Avg: 2.561 Min: 0.652 Max: 4.025	Avg: 45.637 Min: 36.937 Max: 166.437
10/11/2017	EQMS-2	Avg: 0.022 Min: 0.012 Max: 0.032	Avg: 242.850 Min: 15.212 Max: 303.100	Avg: 2.442 Min: 0.809 Max: 3.884	Avg: 39.964 Min: 38.906 Max: 41.531
14/11/2017	EQMS-2	Avg: 0.015 Min: 0.008 Max: 0.019	Avg: 227.885 Min: 13.412 Max: 298.037	Avg: 6.975 Min: 6.797 Max: 7.291	Avg: 42.263 Min: 41.094 Max: 43.500
15/11/2017	EQMS-2	Avg: 0.019 Min: 0.016 Max: 0.026	N/A	Avg: 6.492 Min: 6.214 Max: 6.793	Avg: 42.220 Min: 41.094 Max: 43.281
16/11/2017	EQMS-2	Avg: 0.017 Min: 0.012 Max: 0.023	Avg: 269.446 Min: 32.987 Max: 336.738	Avg: 6.854 Min: 6.088 Max: 7.023	Avg: 42.182 Min: 41.094 Max: 42.406
17/11/2017	EQMS-2	Avg: 0.017 Min: 0.012 Max: 0.025	Avg: 234.891 Min: 14.538 Max: 296.913	Avg: 6.123 Min: 5.136 Max: 6.661	Avg: 44.524 Min: 41.094 Max: 51.375

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
18/11/2017	EQMS-2	Avg: 0.014 Min: 0.008 Max: 0.025	Avg: 194.264 Min: 1.825 Max: 333.363	Avg: 6.050 Min: 4.474 Max: 6.442	Avg: 44.790 Min: 43.281 Max: 66.031
19/11/2017	EQMS-2	Avg: 0.011 Min: 0.000 Max: 0.018	Avg: 219.614 Min: 15.775 Max: 338.087	Avg: 5.529 Min: 5.074 Max: 5.744	Avg: 51.615 Min: 45.687 Max: 60.344
20/11/2017	EQMS-2	Avg: 0.011 Min: 0.002 Max: 0.026	Avg: 213.812 Min: 14.650 Max: 338.313	Avg: 5.601 Min: 5.287 Max: 5.832	Avg: 60.848 Min: 57.281 Max: 103.000
21/11/2017	EQMS-2	Avg: 0.009 Min: 0.000 Max: 0.016	Avg: 213.884 Min: 14.538 Max: 333.363	Avg: 5.792 Min: 5.434 Max: 6.183	Avg: 68.917 Min: 60.344 Max: 80.469
22/11/2017	EQMS-2	Avg: 0.014 Min: 0.003 Max: 0.023	Avg: 225.946 Min: 14.538 Max: 333.250	Avg: 5.455 Min: 5.069 Max: 5.808	Avg: 56.190 Min: 32.344 Max: 86.156
23/11/2017	EQMS-2	Avg: 0.016 Min: 0.001 Max: 0.028	Avg: 234.812 Min: 15.100 Max: 333.813	Avg: 5.181 Min: 4.747 Max: 5.690	Avg: 51.171 Min: 33.219 Max: 163.156
24/11/2017	EQMS-2	Avg: 0.015 Min: 0.000 Max: 0.028	Avg: 219.484 Min: 13.412 Max: 336.400	Avg: 5.519 Min: 4.859 Max: 6.073	Avg: 52.750 Min: 43.281 Max: 67.125
25/11/2017	EQMS-2	Avg: 0.020 Min: 0.009 Max: 0.032	Avg: 224.137 Min: 14.538 Max: 344.163	Avg: 5.281 Min: 4.895 Max: 5.866	Avg: 42.927 Min: 35.844 Max: 166.437
26/11/2017	EQMS-2	Avg: 0.017 Min: 0.008 Max: 0.029	Avg: 70.130 Min: 2.050 Max: 270.475	Avg: 5.284 Min: 4.706 Max: 6.046	Avg: 72.433 Min: 56.625 Max: 81.562
27/11/2017	EQMS-2	Avg: 0.014 Min: 0.003 Max: 0.032	Avg: 108.296 Min: 16.338 Max: 291.063	Avg: 5.551 Min: 4.792 Max: 6.204	Avg: 48.934 Min: 35.406 Max: 82.656
28/11/2017	EQMS-2	Avg: 0.016 Min: 0.003 Max: 0.031	Avg: 175.094 Min: 15.100 Max: 325.375	Avg: 5.951 Min: 4.563 Max: 6.637	Avg: 40.526 Min: 35.406 Max: 166.656
29/11/2017	EQMS-2	Avg: 0.020 Min: 0.018 Max: 0.024	Avg: 27.127 Min: 14.538 Max: 37.600	Avg: 5.425 Min: 5.357 Max: 5.497	Avg: 36.469 Min: 35.406 Max: 36.937
20/01/2018	EQMS-2	Avg: 0.005 Min: 0.001 Max: 0.012	Avg: 101.339 Min: 14.538 Max: 364.300	Avg: 6.199 Min: 5.947 Max: 6.561	Avg: 32.015 Min: 30.813 Max: 34.531
21/01/2018	EQMS-2	Avg: 0.006 Min: 0.000 Max: 0.019	Avg: 188.490 Min: 14.538 Max: 317.162	Avg: 5.806 Min: 4.886 Max: 6.305	Avg: 38.617 Min: 31.031 Max: 168.844
22/01/2018	EQMS-2	Avg: 0.004 Min: 0.000 Max: 0.015	Avg: 246.927 Min: 16.225 Max: 315.475	Avg: 6.141 Min: 5.504 Max: 6.850	Avg: 41.028 Min: 30.813 Max: 163.156
23/01/2018	EQMS-2	Avg: 0.004 Min: 0.000 Max: 0.016	Avg: 215.677 Min: 22.638 Max: 336.850	Avg: 6.448 Min: 4.894 Max: 7.252	Avg: 50.699 Min: 31.250 Max: 169.937
24/01/2018	EQMS-2	Avg: 0.004 Min: 0.000 Max: 0.012	Avg: 200.543 Min: 15.100 Max: 305.462	Avg: 5.982 Min: 5.227 Max: 6.584	Avg: 37.821 Min: 35.406 Max: 43.719
25/01/2018	EQMS-2	Avg: 0.012 Min: 0.000 Max: 0.019	Avg: 181.128 Min: 13.412 Max: 340.225	Avg: 6.846 Min: 5.670 Max: 7.326	Avg: 33.388 Min: 28.844 Max: 43.500
26/01/2018	EQMS-2	Avg: 0.016 Min: 0.013 Max: 0.023	Avg: 230.356 Min: 15.100 Max: 309.062	Avg: 6.748 Min: 5.989 Max: 7.356	Avg: 30.035 Min: 28.625 Max: 31.250
27/01/2018	EQMS-2	Avg: 0.015 Min: 0.013 Max: 0.019	Avg: 177.570 Min: 14.538 Max: 313.675	Avg: 6.860 Min: 6.155 Max: 7.265	Avg: 29.952 Min: 28.844 Max: 30.156
28/01/2018	EQMS-2	Avg: 0.017 Min: 0.013 Max: 0.024	Avg: 201.023 Min: 15.663 Max: 306.700	Avg: 7.068 Min: 5.871 Max: 8.768	Avg: 30.032 Min: 29.063 Max: 31.250
29/01/2018	EQMS-2	Avg: 0.015 Min: 0.012 Max: 0.020	Avg: 187.802 Min: 15.212 Max: 321.775	Avg: 7.865 Min: 6.949 Max: 8.773	Avg: 29.940 Min: 28.844 Max: 31.250
30/01/2018	EQMS-2	Avg: 0.015 Min: 0.012 Max: 0.023	Avg: 234.833 Min: 14.650 Max: 333.813	Avg: 6.888 Min: 6.080 Max: 7.637	Avg: 29.985 Min: 28.844 Max: 31.250
31/01/2018	EQMS-2	Avg: 0.015 Min: 0.009 Max: 0.023	Avg: 217.161 Min: 16.787 Max: 306.925	Avg: 7.264 Min: 6.465 Max: 8.009	Avg: 29.483 Min: 28.844 Max: 30.813
01/02/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.019	Avg: 285.978 Min: 23.200 Max: 307.825	Avg: 7.708 Min: 6.060 Max: 8.467	Avg: 29.601 Min: 28.844 Max: 30.375
02/02/2018	EQMS-2	Avg: 0.016 Min: 0.010 Max: 0.023	Avg: 259.227 Min: 20.387 Max: 302.988	Avg: 7.780 Min: 6.155 Max: 8.821	Avg: 29.755 Min: 28.625 Max: 31.250
03/02/2018	EQMS-2	Avg: 0.016 Min: 0.009 Max: 0.022	Avg: 273.266 Min: 14.538 Max: 331.562	Avg: 8.057 Min: 6.552 Max: 9.081	Avg: 29.724 Min: 28.625 Max: 31.250
04/02/2018	EQMS-2	Avg: 0.015 Min: 0.009 Max: 0.020	Avg: 276.188 Min: 21.400 Max: 303.775	Avg: 8.353 Min: 6.963 Max: 9.331	Avg: 29.876 Min: 28.625 Max: 31.250
05/02/2018	EQMS-2	Avg: 0.015 Min: 0.009 Max: 0.019	Avg: 254.311 Min: 16.338 Max: 331.338	Avg: 8.723 Min: 7.563 Max: 9.500	Avg: 29.825 Min: 28.844 Max: 31.250
06/02/2018	EQMS-2	Avg: 0.015 Min: 0.008 Max: 0.019	Avg: 211.789 Min: 16.338 Max: 310.975	Avg: 8.122 Min: 7.291 Max: 9.342	Avg: 29.765 Min: 28.625 Max: 30.375

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
07/02/2018	EQMS-2	Avg: 0.014 Min: 0.008 Max: 0.018	Avg: 251.374 Min: 13.525 Max: 472.300	Avg: 7.253 Min: 6.183 Max: 7.923	Avg: 29.791 Min: 28.625 Max: 31.250
08/02/2018	EQMS-2	Avg: 0.013 Min: 0.008 Max: 0.017	Avg: 247.929 Min: 13.412 Max: 340.562	Avg: 7.255 Min: 6.877 Max: 7.517	Avg: 30.291 Min: 28.844 Max: 32.563
09/02/2018	EQMS-2	Avg: 0.014 Min: 0.009 Max: 0.018	Avg: 262.937 Min: 15.100 Max: 382.637	Avg: 6.950 Min: 6.379 Max: 7.240	Avg: 30.992 Min: 29.937 Max: 42.406
10/02/2018	EQMS-2	Avg: 0.014 Min: 0.009 Max: 0.017	Avg: 248.420 Min: 13.750 Max: 344.275	Avg: 7.091 Min: 6.293 Max: 7.894	Avg: 31.214 Min: 29.937 Max: 32.563
11/02/2018	EQMS-2	Avg: 0.014 Min: 0.010 Max: 0.016	Avg: 222.188 Min: 15.663 Max: 351.475	Avg: 7.224 Min: 6.716 Max: 8.011	Avg: 66.468 Min: 31.250 Max: 150.906
12/02/2018	EQMS-2	Avg: 0.012 Min: 0.009 Max: 0.017	Avg: 242.408 Min: 15.775 Max: 314.350	Avg: 7.138 Min: 6.531 Max: 7.877	Avg: 38.904 Min: 29.937 Max: 76.094
13/02/2018	EQMS-2	Avg: 0.013 Min: 0.008 Max: 0.018	Avg: 226.963 Min: 16.787 Max: 340.225	Avg: 7.290 Min: 6.415 Max: 7.890	Avg: 43.191 Min: 29.937 Max: 152.000
14/02/2018	EQMS-2	Avg: 0.014 Min: 0.009 Max: 0.018	Avg: 237.241 Min: 14.650 Max: 322.000	Avg: 6.924 Min: 6.490 Max: 7.448	Avg: 46.622 Min: 29.937 Max: 66.031
15/02/2018	EQMS-2	Avg: 0.014 Min: 0.009 Max: 0.018	Avg: 243.573 Min: 15.212 Max: 320.088	Avg: 7.244 Min: 6.458 Max: 7.882	Avg: 30.829 Min: 29.937 Max: 32.344
16/02/2018	EQMS-2	Avg: 0.014 Min: 0.009 Max: 0.019	Avg: 282.337 Min: 26.125 Max: 464.650	Avg: 7.331 Min: 6.737 Max: 8.012	Avg: 39.877 Min: 29.937 Max: 150.906
17/02/2018	EQMS-2	Avg: 0.014 Min: 0.008 Max: 0.019	Avg: 268.442 Min: 37.150 Max: 405.812	Avg: 7.025 Min: 5.844 Max: 7.688	Avg: 44.273 Min: 29.937 Max: 61.438
18/02/2018	EQMS-2	Avg: 0.013 Min: 0.008 Max: 0.018	Avg: 215.493 Min: 25.563 Max: 341.913	Avg: 6.854 Min: 5.948 Max: 7.911	Avg: 30.936 Min: 29.937 Max: 32.125
19/02/2018	EQMS-2	Avg: 0.012 Min: 0.008 Max: 0.018	Avg: 244.163 Min: 30.287 Max: 362.387	Avg: 7.193 Min: 6.318 Max: 8.027	Avg: 30.973 Min: 29.937 Max: 31.469
20/02/2018	EQMS-2	Avg: 0.012 Min: 0.008 Max: 0.018	Avg: 270.488 Min: 20.387 Max: 351.025	Avg: 7.466 Min: 6.616 Max: 8.055	Avg: 31.984 Min: 29.937 Max: 112.625
21/02/2018	EQMS-2	Avg: 0.012 Min: 0.008 Max: 0.018	Avg: 233.323 Min: 14.650 Max: 365.425	Avg: 7.079 Min: 5.912 Max: 7.529	Avg: 35.198 Min: 29.937 Max: 152.000
22/02/2018	EQMS-2	Avg: 0.012 Min: 0.008 Max: 0.018	Avg: 265.416 Min: 14.875 Max: 309.400	Avg: 7.167 Min: 6.386 Max: 7.915	Avg: 31.106 Min: 29.937 Max: 32.344
23/02/2018	EQMS-2	Avg: 0.011 Min: 0.008 Max: 0.018	Avg: 252.301 Min: 17.012 Max: 340.562	Avg: 7.290 Min: 6.495 Max: 7.970	Avg: 31.077 Min: 29.937 Max: 31.469
24/02/2018	EQMS-2	Avg: 0.010 Min: 0.008 Max: 0.017	Avg: 252.375 Min: 15.775 Max: 339.775	Avg: 7.690 Min: 6.417 Max: 8.250	Avg: 31.668 Min: 29.937 Max: 60.344
25/02/2018	EQMS-2	Avg: 0.012 Min: 0.004 Max: 0.018	Avg: 319.430 Min: 16.338 Max: 481.863	Avg: 7.533 Min: 6.933 Max: 8.063	Avg: 72.533 Min: 30.156 Max: 150.906
26/02/2018	EQMS-2	Avg: 0.010 Min: 0.004 Max: 0.018	Avg: 256.212 Min: 14.650 Max: 357.100	Avg: 7.011 Min: 6.488 Max: 8.179	Avg: 57.806 Min: 30.156 Max: 141.062
27/02/2018	EQMS-2	Avg: 0.013 Min: 0.008 Max: 0.017	Avg: 224.769 Min: 15.212 Max: 347.200	Avg: 6.803 Min: 6.289 Max: 7.288	Avg: 49.873 Min: 32.125 Max: 87.250
28/02/2018	EQMS-2	Avg: 0.010 Min: 0.006 Max: 0.018	Avg: 253.034 Min: 15.100 Max: 330.438	Avg: 7.200 Min: 6.680 Max: 7.379	Avg: 39.300 Min: 33.437 Max: 52.469
01/03/2018	EQMS-2	Avg: 0.016 Min: 0.002 Max: 0.038	Avg: 241.279 Min: 16.338 Max: 355.863	Avg: 7.114 Min: 6.729 Max: 7.596	Avg: 105.490 Min: 46.781 Max: 199.469
02/03/2018	EQMS-2	Avg: 0.018 Min: 0.011 Max: 0.033	Avg: 269.919 Min: 14.650 Max: 344.838	Avg: 7.178 Min: 6.899 Max: 8.119	Avg: 91.086 Min: 73.688 Max: 124.438
03/03/2018	EQMS-2	Avg: 0.026 Min: 0.014 Max: 0.046	Avg: 247.850 Min: 4.525 Max: 343.262	Avg: 7.294 Min: 6.667 Max: 8.301	Avg: 97.918 Min: 74.781 Max: 141.062
04/03/2018	EQMS-2	Avg: 0.019 Min: 0.013 Max: 0.027	Avg: 186.052 Min: 11.838 Max: 309.962	Avg: 7.773 Min: 7.098 Max: 8.731	Avg: 59.367 Min: 51.156 Max: 79.375
05/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.026	Avg: 264.742 Min: 14.650 Max: 329.987	Avg: 8.017 Min: 7.465 Max: 8.775	Avg: 50.684 Min: 48.969 Max: 54.656
06/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.027	Avg: 273.088 Min: 0.250 Max: 379.600	Avg: 7.916 Min: 7.481 Max: 8.508	Avg: 49.414 Min: 46.781 Max: 81.781
07/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.026	Avg: 255.294 Min: 14.650 Max: 329.200	Avg: 7.537 Min: 6.918 Max: 8.346	Avg: 47.867 Min: 46.563 Max: 48.313
08/03/2018	EQMS-2	Avg: 0.020 Min: 0.015 Max: 0.027	Avg: 271.327 Min: 2.838 Max: 410.200	Avg: 7.023 Min: 6.514 Max: 7.549	Avg: 47.964 Min: 46.781 Max: 49.406

Day	Station Id.	Cr6+ *(in mg/l)*	FLOW *(in m3/h)*	PH *(in ph)*	TSS *(in mg/l)*
09/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.027	Avg: 299.517 Min: 13.525 Max: 415.150	Avg: 7.160 Min: 6.617 Max: 7.744	Avg: 48.338 Min: 47.000 Max: 49.406
10/03/2018	EQMS-2	Avg: 0.018 Min: 0.011 Max: 0.024	Avg: 328.645 Min: 15.775 Max: 394.563	Avg: 7.217 Min: 6.809 Max: 7.841	Avg: 48.511 Min: 46.781 Max: 49.406
11/03/2018	EQMS-2	Avg: 0.018 Min: 0.014 Max: 0.026	Avg: 281.577 Min: 17.125 Max: 351.812	Avg: 7.226 Min: 6.841 Max: 7.751	Avg: 48.567 Min: 47.656 Max: 49.406
12/03/2018	EQMS-2	Avg: 0.018 Min: 0.014 Max: 0.023	Avg: 304.031 Min: 14.650 Max: 457.900	Avg: 7.466 Min: 7.018 Max: 7.836	Avg: 48.432 Min: 47.875 Max: 49.406
13/03/2018	EQMS-2	Avg: 0.018 Min: 0.010 Max: 0.023	Avg: 310.293 Min: 22.750 Max: 368.575	Avg: 7.286 Min: 6.910 Max: 7.914	Avg: 48.454 Min: 47.875 Max: 49.406
14/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.026	Avg: 303.130 Min: 59.763 Max: 352.150	Avg: 6.999 Min: 6.715 Max: 7.610	Avg: 52.080 Min: 46.781 Max: 60.781
15/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.026	Avg: 287.422 Min: 14.763 Max: 472.075	Avg: 7.063 Min: 6.488 Max: 7.758	Avg: 52.713 Min: 51.156 Max: 55.750
16/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.022	Avg: 305.522 Min: 36.025 Max: 450.137	Avg: 7.009 Min: 6.863 Max: 7.254	Avg: 51.425 Min: 51.156 Max: 52.469
17/03/2018	EQMS-2	Avg: 0.019 Min: 0.015 Max: 0.022	Avg: 282.097 Min: 16.338 Max: 465.663	Avg: 7.194 Min: 6.747 Max: 7.582	Avg: 50.852 Min: 50.063 Max: 52.469
18/03/2018	EQMS-2	Avg: 0.019 Min: 0.014 Max: 0.024	Avg: 307.592 Min: 19.825 Max: 484.675	Avg: 7.275 Min: 6.679 Max: 7.886	Avg: 50.484 Min: 49.406 Max: 51.594
19/03/2018	EQMS-2	Avg: 0.017 Min: 0.011 Max: 0.022	Avg: 324.726 Min: 15.325 Max: 437.087	Avg: 7.243 Min: 5.475 Max: 7.533	Avg: 40.401 Min: 32.125 Max: 100.812
20/03/2018	EQMS-2	Avg: 0.016 Min: 0.011 Max: 0.021	Avg: 291.027 Min: 17.463 Max: 359.463	Avg: 7.365 Min: 6.944 Max: 7.833	Avg: 32.819 Min: 32.125 Max: 33.875
21/03/2018	EQMS-2	Avg: 0.016 Min: 0.011 Max: 0.020	Avg: 305.214 Min: 15.325 Max: 530.913	Avg: 7.533 Min: 6.858 Max: 7.982	Avg: 33.007 Min: 32.125 Max: 33.875
22/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.021	Avg: 292.419 Min: 15.325 Max: 345.175	Avg: 7.609 Min: 7.127 Max: 8.042	Avg: 33.029 Min: 32.125 Max: 33.875
23/03/2018	EQMS-2	Avg: 0.014 Min: 0.010 Max: 0.021	Avg: 275.390 Min: 4.638 Max: 358.450	Avg: 7.672 Min: 7.252 Max: 8.101	Avg: 34.555 Min: 32.125 Max: 36.281
24/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.018	Avg: 264.047 Min: 17.012 Max: 343.375	Avg: 7.687 Min: 7.155 Max: 8.083	Avg: 38.316 Min: 33.437 Max: 48.313
25/03/2018	EQMS-2	Avg: 0.016 Min: 0.012 Max: 0.018	Avg: 284.826 Min: 15.887 Max: 345.400	Avg: 7.475 Min: 7.289 Max: 7.854	Avg: 36.940 Min: 35.625 Max: 38.250
26/03/2018	EQMS-2	Avg: 0.014 Min: 0.010 Max: 0.019	Avg: 279.814 Min: 0.025 Max: 335.613	Avg: 7.217 Min: 6.834 Max: 7.846	Avg: 36.197 Min: 34.969 Max: 37.375
27/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.019	Avg: 287.378 Min: 0.025 Max: 389.725	Avg: 6.898 Min: 6.448 Max: 7.288	Avg: 35.988 Min: 34.750 Max: 37.375
28/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.020	Avg: 344.460 Min: 0.025 Max: 419.200	Avg: 6.926 Min: 6.534 Max: 7.315	Avg: 35.980 Min: 34.531 Max: 37.156
29/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.020	Avg: 318.052 Min: 15.325 Max: 398.837	Avg: 6.968 Min: 6.687 Max: 7.260	Avg: 35.900 Min: 34.750 Max: 37.156
30/03/2018	EQMS-2	Avg: 0.015 Min: 0.011 Max: 0.018	Avg: 307.322 Min: 14.763 Max: 395.800	Avg: 6.977 Min: 6.706 Max: 7.242	Avg: 35.839 Min: 34.531 Max: 36.937
31/03/2018	EQMS-2	Avg: 0.015 Min: 0.010 Max: 0.021	Avg: 327.084 Min: 18.138 Max: 410.200	Avg: 6.975 Min: 6.733 Max: 7.288	Avg: 35.871 Min: 34.531 Max: 36.937

Annexure-III

KALIAPANI CHROMITE MINES, M/S BALASORE ALLOYS LTD

TEST RESULTS OF DRINKING WATER FOR Cr+6 Con.

Sl. No.	Station Details	Co-ordinates	CPCB Standard	Conc. Of Hexavalent Chromium (Cr^{+6}) – mg/l					
				Oct,17	Nov,17	Dec,17	Jan,18	Feb,18	March,18
1.	TISCO Camp (GW1)	21^0 01'44.8"N 85^0 44'44.6"E	0.05 mg/l	0.010	0.018	0.026	0.018	0.016	0.010
2.	Kaliapani Village (GW2)	21^0 02'39.1"N 85^0 46'21.4"E		0.024	0.022	0.014	0.010	0.018	0.024
3.	Sukurangi Village (GW3)	21^0 02' 18.1"N 85^0 47' 41.7"E		0.022	0.010	0.006	0.012	0.014	0.008
4.	Inside Mine (GW4)	21^0 02'07.7"N 85^0 45'32.6"E		0.016	0.016	0.024	0.036	0.035	0.026
5.	Chingudiapal (GW5)	21^0 02'56.9"N 85^0 45' 04.5"E		0.018	0.026	0.038	0.022	0.024	0.018
6.	Kalarangi Village (GW6)	21^0 00' 47.6"N 85^0 43' 38.1"E		0.026	0.014	0.012	0.008	0.007	0.030

Annexure-IV

Kaliapani Chromite Mines, M/s Balasore Alloys Ltd

Analysis Report of Surface Runoff generating at Mines

July,2017

Sl. No	Parameters	Unit	Prescribed standards	SRF - 1	SRF - 2
1	pH	-	5.5-9.0	6.68	6.94
2	Total Suspended Solids	mg/l	100	87	92
3	Chromium (as Cr^{+6})	mg/l	0.1	0.072	0.064

August,2017

Sl. No	Parameters	Unit	Prescribed standards	SRF - 1	SRF - 2
1	pH	-	5.5-9.0	7.91	8.12
2	Total Suspended Solids	mg/l	100	98	88
3	Chromium (as Cr^{+6})	mg/l	0.1	0.084	0.064

September,2017

Sl. No	Parameters	Unit	Prescribed standards	SRF - 1	SRF - 2
1	pH	-	5.5-9.0	8.24	7.76
2	Total Suspended Solids	mg/l	100	95	91
3	Chromium (as Cr^{+6})	mg/l	0.1	0.062	0.078

BY REGD POST

ODISHA

OFFICE OF THE
STATE POLLUTION CONTROL BOARD, ODISHA
Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII,
Bhubaneswar - 751 012

No. 18196 / **IND-II-NOC-5723** Date 08-10-13

OFFICE MEMORANDUM

In consideration of the application for obtaining Consent to Establish for **Kaliapani Chromite Mines of M/s Balasore Alloys Ltd.,** the State Pollution Control Board has been pleased to convey its Consent to Establish under section 25 of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 for **enhancement of production capacity of Chrome ore from 0.42 MTPA to 0.6 MTPA and Change of mining from opencast to underground mining, over mining lease hold area of 64.463 ha., At – Kaliapani, Sukinda** in the district of **Jajpur** with the following conditions.

GENERAL CONDITIONS:-

1. **This consent to establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this consent to establish order. If the proponent fails to commence mining activities for the proposal within five years then a renewal of this consent to establish shall be sought by the proponent.**
2. Adequate effluent treatment facilities are to be provided such that the quality of sewage and trade effluent satisfies the standards as prescribed under Environment Protection Rule, 1986 or as prescribed by the Central Pollution Control Board and/or State Pollution Control Board or otherwise stipulated in the special conditions.
3. All emission from the mining activities as well as the ambient air quality and noise shall conform to the standards as laid down under Environment (Protection) Act. 1986 or as prescribed by Central Pollution Control Board/State Pollution Control Board or otherwise stipulated in the special conditions.
4. Appropriate method of disposal of solid waste is to be adopted to avoid environmental pollution.
5. The mine shall comply to the provisions of Environment Protection Act, 1986 and the rules made there under with their amendments from time to time such as the Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2008, Hazardous Chemical Rules /Manufacture, Storage and Import of Hazardous Chemical

Rules, 1989 etc. and amendments there under. The mine shall also comply to the provisions of Public Liability Insurance Act, 1991, if applicable.

6. The mine shall apply for grant of Consent to operate under section 25/26 of Water(Prevention & Control of Pollution)Act, 1974 & Air (Prevention & Control of Pollution)Act, 1981 at least 3 (three) months before the commencement of production and obtain Consent to Operate from this Board.

7. **This consent to establish is subject to statutory and other clearances from Govt. of Odisha and/or Govt. of India, as and when applicable.**

SPECIAL CONDITIONS : -

1. **The proponent has to seek environmental clearance as per EIA notification 2006 and mining activity for proposal shall commence after obtaining environmental clearance.**
2. **The mine shall treat all the mine drainage water and surface run-off in the new ETP of capacity 445 m^3/hr designed as per IIT recommendation.**
3. **The surface run-off from OB-dump-I shall be routed through ETP instead of existing practice.**
4. **Toe wall and garland drain shall be provided around all the three dumps and surface run-off shall be routed through the ETP.**
5. **Present development of plantation is less, so more plantation with help of coir matting shall be carried out for slope stabilization in all the existing dumps.**
6. **Presently surface run-off from tailing disposal area is collected in an earthen pond. The mine shall make this pond impervious/concreted and surface run-off shall be routed to ETP.**
7. **The mine shall explore the quantity of mine drainage water to be generated from underground mining.**
8. **The mine shall submit the copy of agreement from M/s IMFA for joint dumping, at the time of consent to operate application.**
9. Sewage Treatment Plant shall be installed for the treatment of domestic effluent generated from the colony and mines so as to meet the prescribed standard such as pH=6.5-8.0, SS=50mg/l, BOD=30mg/l & O&G=5mg/l and shall be reused for green belt development.

10. No change in mining technology and scope of working shall be made without prior approval of the Board.

11. Top soil should be stacked properly with proper slope at earmarked site(s) with adequate measures and shall be used for reclamation and rehabilitation of mined out areas.

12. Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data. The detail specification shall be worked out and submitted to the Board at the time of consent to operate application.

13. Reclamation programme along with the post closure plan is to be submitted within 06 months from the date of issue of this order.

14. Catch drains, and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The drains should be regularly de-silted and maintained properly. The garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.

15. The OB/waste dumps shall be properly dressed benched stopped at low angle with terracing and bamboo barricades in the slopes making retaining walls, stone barriers at the toe of the dumps gully plugging etc. to prevent the solid erosion during monsoon, besides establishing vegetation on dump top as well as its slope surface. In difficult cases, hydro-seedling technique or use of geo-tiles mat embedded with seeds shall be adopted.

16. Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), Monsoon (August), Post-monsoon(November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly. Following heavy metals need to be monitored at least once during post monsoon period whose values shall not exceed as per following standard.

    i) Cd - 2.0 mg/l
    ii) Cr+6 - 0.10 mg/l
    iii) Copper - 3.0 mg/l
    iv) Lead - 0.10 mg/l
    v) Mercury - 0.01 mg/l
    vi) Nickel - 0.50 mg/l
    vii) Zinc - 5.0 mg/

17. Wastewater (workshop, wastewater from the mine i.e. pit water, check dams or any other discharge leaving lease boundary of the mine) should be properly collected, treated so as to conform the prescribed standard i.e. pH = 6 – 9.0, SS = 50 mg/l, & O & G = 5 mg/l and Cr^{+6}= 0.1 mg/l or as amended from time to time. Oil and grease trap should be installed before discharge of effluents from workshop. Domestic effluent shall be discharged to soak pit via septic tank.

18. The mine shall provide full-fledged effluent treatment plant for removal of Hexavalent Chromium from wastewater from mine pit and shall discharge after conforming to the standard prescribed by the Board i.e. pH – 6.0-9.0, total SS=50mg/l & O&G = 5 mg/l and Cr^{+6}= 0.1 mg/l.

19. Two ambient air quality monitoring stations for 24 hours operation should be established in the core zone as well as in the buffer zone for RPM, SPM, SO_2, NO_x and CO monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board (i) Data on ambient air quality (RPM, SPM, SO_2, NO_x and CO) should be regularly submitted to the State Pollution Control Board once in six months.

20. The haulage roads and arterial roads shall be made black topped / concrete with avenue plantation. The speed of dumpers / trucks on haul roads shall be controlled as increased speed increases dust emission. Overloading of transport vehicles shall be avoided. Further, during transportation of ore by trucks through public roads, the truck shall be properly covered with tarpaulin sheets / leak proof coverings and shall ply at safe speed.

21. Dust suppression on mine haul roads, active OB dumps and mine working benches shall be done by spraying water through water sprinklers along with chemical binders/wetting agents at frequent interval in order to reduce water consumption and to improve retention and re-absorption capacity of water. The additive chemicals should not have any adverse impact on the environment. Water sprinklers of fixed type shall also be provided at the mine HEMM maintenance shop, other service centers and approach roads from mines to crusher hopper to prevent the generation of dust to be air borne.

22. Regular collection of spilled over raw material from haul roads shall be practiced to prevent the generation of dust due to movement of dumpers/truck.

23. Air blast level resulting from blasting on any premises or public place must not exceed 90 dB linear, peak at any other premises outside the period between 7 AM and 6 PM on

any day. Noise levels at the boundary line of M.L area shall not exceed 75 dB (A) during day time (6 AM to 10 AM) and 70 dB (A) during night time (10, PM to 6 AM).

24. At stockpile and loading plant area, a network of drains with concrete bottom shall be constructed at a depth of 1.5 meter below the lowest level on the sites parallel to the stockpile area with interconnected box culverts. The sloping of surface shall be given inward to the stockpiles so that surface water will only infiltrate in to the drain.

25. Sedimentation ponds shall be constructed at strategic points in order to guide all surface run-off water containing sediments for settlement of suspended solids before discharge of water in to natural stream/water courses during monsoon.

26. The waste dumps shall be located away from the natural nallas, rivers in the area and on an impervious & non-mineralized area to minimize the water pollution.

27. The completed out slope of the waste dumps should not exceed 20 degrees from horizontal to avoid excessive erosion and easy vegetation.

28. Adequate measures shall be taken to prevent land subsidence.

29. The mine water from the underground mine shall be monitored regularly and be treated to remove Cr^{+6} if found more than the standard of 0.1mg/l.

30. **A green belt of adequate width and density preferably with local species along the periphery of the mine shall be raised so as to provide protection against particulates and noise. It must be ensured that at least 33% of the total land area shall be under permanent green cover, in such a manner that, atleast plantation shall be taken up at least in 20% of the total green belt area and progressively achieve 100% in a span of five years.**

31. Consent to operate shall be obtained from this Board before commencing the mining activities of proposed expansion project.

32. Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.

33. 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.

34. The Board may impose further conditions or modify the conditions stipulated in this order during installation and/or at the time of obtaining consent to operate and may revoke this clearance in case the stipulated conditions are not implemented.

35. The above conditions will be enforced, inter-allia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 the Air (Prevention & Control of Pollution) Act, 1981 the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

MEMBER SECRETARY

To

The Mines Manager,
Kaliapani Chromite Mines of
M/s Balasore Alloys Ltd.,
At/Po- Kaliapani, Dist – Jajpur,
Odisha-755047

Memo No._____/Dt._____/

Copy forwarded to:

1. Secretary Steels & Mines, Govt. of Odisha, Bhubaneswar
2. District Magistrate & Collector, Jajpur
3. District Industries Centre, Jajpur
4. Consent Section, SPC Board, BBSR
5. Director, Factories & Boiler, Bhubaneswar
6. Director of Mines, Odisha, BBSR
7. Regional Officer, SPC Board, Cuttack
8. DFO, Jajpur
9. HSM Cell, SPC Board, BBSR
10. Copy to Guard file

SR. ENV. ENGINEER (N)

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012
Phone-2561909, Fax: 2562822, 2560955 E-mail: paribesh1@ospcboard.org, Website: www.ospcboard.org

CONSENT ORDER

No. 3749 / IND-I-CON-2576 Dt. 28/02/2018 /

CONSENT ORDER NO. 1239

Sub: **Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.**

Ref: **Your online application No. 1946823 dated 26-12-2017 & your online reply dated 8.3.2018 and letter No. BAL/MINE/SPCB/4679 dated 02.01.2018**

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Name of the Occupier & Designation: SRI TARINI PRASAD MOHANTY, AGENT

Address: AT/PO: KALIAPANI, DIST: JAJPUR

This consent order is valid for the period **from 01.04.2018 to 31.03.2023**

This consent order is granted in view of the interim orders dated 16.1.2017 of Honourable High Court in the matter of W.P.(C) No. 4157/2016.

Details of Products Manufactured

Sl. No	Product	Quantity
01.	Chrome ore(ROM)	0.6 MTPA

Details of Mineral Handling/Processing Plants

01.	COB Plant of capacity	1x20 TPH

This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

A. Discharge permitted through the following outlet subject to the standard

Outlet No.	Description of outlet	Point of discharge	Quantity of discharge KL/hr	Pre-scribed Standard							
				pH	TSS (mg/l)	BOD (mg/l)	Fecal Coliform (MPN/100ml)	Oil & Grease (mg/l)	Cr+6 (mg/l)	Total Chromium (mg/l)	Fe (mg/l)
01.	*STP outlet (Domestic effluent)*	*On land for irrigation after treatment in STP*	--	*6.5-9.0*	*<100*	*30*	*<1000*	--	--	--	-
02.	*Mine drainage water / surface run off/ other wastewater*	*On land / inland surface water body*	*199*	*5.5 to 9.0*	*100*	--	--	*10*	*0.05*	*2.0*	*3*

B. Emission permitted through the following stack subject to the prescribed standard

Chimney Stack No.	Description of Stack	Stack height (m)	Quantity of emission	Prescribed Standard				

C. Disposal of solid waste permitted in the following manner

Sl. No.	Type of Solid waste	Quantity generated (TPD)	Quantity to be reused on site(TPD)	Quantity to be reused off site(TPD)	Quantity disposed off (TPD)	Description of disposal site.
01.	Top soil / overburden	As per approved mining plan	--	--	--	As per approved mining plan

D. GENERAL CONDITIONS FOR ALL UNITS

1. The consent is given by the Board in consideration of the particulars given in the application. Any change or alternation or deviation made in actual practice from the particulars furnished in the application will also be the ground liable for review/variation/revocation of the consent order under section 27 of the Act of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 and to make such variations as deemed fit for the purpose of the Acts.

2. The industry would immediately submit revised application for consent to operate to this Board in the event of any change in the quantity and quality of raw material / and products / manufacturing process or quantity /quality of the effluent rate of emission / air pollution control equipment / system etc.

3. The applicant shall not change or alter either the quality or quantity or the rate of discharge or temperature or the route of discharge without the previous written permission of the Board.

4. The application shall comply with and carry out the directives/orders issued by the Board in this consent order and at all subsequent times without any negligence on his part. . In case of non-compliance of any order/directives issued at any time and/or violation of the terms and conditions of this consent order, the applicant shall be liable for legal action as per the provisions of the Law/Act.

5. The applicant shall make an application for grant of fresh consent at least 90 days before the date of expiry of this consent order.

6. The issuance of this consent does not convey any property right in either real or personal property or any exclusive privileges nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State laws or regulation.

7. This consent does not authorize or approve the construction of any physical structure or facilities or the undertaking of any work in any natural water course.

8. The applicant shall display this consent granted to him in a prominent place for perusal of the public and inspecting officers of this Board.

9. An inspection book shall be opened and made available to Board's Officers during the visit to the factory.

10. The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of effluent treatment system / air pollution control system / stack monitoring system any other particulars as may be pertinent to preventing and controlling pollution of Water / Air.

11. Meters must be affixed at the entrance of the water supply connection so that such meters are easily accessible for inspection and maintenance and for other purposes of the Act provided that the place where it is affixed shall in no case be at a point before which water has been taped by the consumer for utilization for any purposes whatsoever.

12. Separate meters with necessary pipe-line for assessing the quantity of water used for each of the purposes mentioned below:

    a) Industrial cooling, spraying in mine pits or boiler feed,

    b) Domestic purpose

    c) Process

13. The applicant shall display suitable caution board at the lace where the effluent is entering into any water-body or any other place to be indicated by the Board, indicating therein that the area into which the effluents are being discharged is not fit for the domestic use/bathing.

14. Storm water shall not be allowed to mix with the trade and/or domestic effluent on the upstream of the terminal manholes where the flow measuring devices will be installed.

15. The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, sewers and drains shall be leak-proof. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas.

16. The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems install or used by him to achieve with the term(s) and conditions of the consent.

17. Care should be taken to keep the anaerobic lagoons, if any, biologically active and not utilized as mere stagnation ponds. The anaerobic lagoons should be fed with the required nutrients for effective digestion. Lagoons should be constructed with sides and bottom made impervious.

18. The utilization of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent gaining access into any drainage channel or other water courses either directly or by overflow.

19. The effluent disposal on land, if any, should be done without creating any nuisance to the surroundings or inundation of the lands at any time.

20. If at any time the disposal of treated effluent on land becomes incomplete or unsatisfactory or create any problem or becomes a matter of dispute, the industry must adopt alternate satisfactory treatment and disposal measures.

21. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.

22. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.

23. The applicant shall provide port holes for sampling the emissions and access platform for carrying out stack sampling and provide electrical outlet points and other arrangements for chimneys/stacks and other sources of emissions so as to collect samples of emission by the Board or the applicant at any time in accordance with the provision of the Act or Rules made therein.

24. The applicant shall provide all facilities and render required assistance to the Board staff for collection of samples / stack monitoring / inspection.

25. The applicant shall not change or alter either the quality or quantity or rate of emission or install, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.

26. No control equipments or chimney shall be altered or replaced or as the case may be erected or re-erected except with the previous approval of the Board.

27. The liquid effluent arising out of the operation of the air pollution control equipment shall be treated in the manner and to ion of standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 (as amended).

28. The stack monitoring system employed by the applicant shall be opened for inspection to this Board at any time.

29. There shall not be any fugitive or episodal discharge from the premises.

30. In case of such episodal discharge/emissions the industry shall take immediate action to bring down the emission within the limits prescribed by the Board in conditions/stop the operation of the plant. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.

31. The applicant shall keep the premises of the industrial plant and air pollution control equipments clean and make all hoods, pipes, valves, stacks/chimneys leak proof. The air pollution control equipments, location, inspection chambers, sampling port holes shall be made easily accessible at all times.

32. Any upset condition in any of the plant/plants of the factory which is likely to result in increased effluent discharge/emission of air pollutants and / or result in violation of the standards mentioned above shall be reported to the Headquarters and Regional Office of the Board by fax / speed post within 24 hours of its occurence.

33. The industry has to ensure that minimum three varieties of trees are planted at the density of not less than 1000 trees per acre. The trees may be planted along boundaries of the industries or industrial premises. This plantation is stipulated over and above the bulk plantation of trees in that area.

34. The solid waste such as sweeping, wastage packages, empty containers residues, sludge including that from air pollution control equipments collected within the premises of the industrial plants shall be disposed off scientifically to the satisfaction of the Board, so as no to cause fugitive emission, dust problems through leaching etc., of any kind.

35. All solid wastes arising in the premises shall be properly classified and disposed off to the satisfaction of the Board by :
    i) Land fill in case of inert material, care being taken to ensure that the material does not give rise to leachate which may percolate into ground water or carried away with storm run-off.
    ii) Controlled incineration, wherever possible in case of combustible organic material.
    iii) Composting, in case of bio-degradable material.

36. Any toxic material shall be detoxicated if possible, otherwise be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The detoxication or sealing and burying shall be carried out in the presence of Board's authorized persons only. Letter of authorization shall be obtained for handling and disposal of hazardous wastes.

37. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard, vary all or any of such condition and thereupon the applicant shall be bound to comply with the conditions so varied.

38. The applicant, his/heirs/legal representatives or assignees shall have no claim whatsoever to the condition or renewal of this consent after the expiry period of this consent.

39. The Board reserves the right to review, impose additional conditions or condition, revoke change or alter the terms and conditions of this consent.

40 Notwithstanding anything contained in this conditional letter of consent, the Board hereby reserves to it the right and power under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Act by the Board.

41. The conditions imposed as above shall continue to be in force until revoked under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 A of Air (Prevention & Control of Pollution) Act, 1981.

42. In case the consent fee is revised upward during this period, the industry shall pay the differential fees to the Board (for the remaining years) to keep the consent order in force. If they fail to pay the amount within the period stipulated by the Board the consent order will be revoked without prior notice.

43. The Board reserves the right to revoke/refuse consent to operate at any time during period for which consent is granted in case any violation is observed and to modify/ stipulate additional conditions as deemed appropriate.

GENERAL CONDITIONS FOR UNITS WITH INVESTMENT OF MORE THAN Rs 50 CRORES, AND 17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES (RED A).

1. The applicant shall analyse the emissions every month for the parameters indicated in TABLE .B & C as mentioned in this order and shall furnish the report thereof to the Board by the 10th of the succeeding month.

2. The applicant shall provide and maintain at his own cost three ambient air quality monitoring stations for monitoring Suspended Particulate Matter, Sulphor Dioxide, Oxides of Nitrogen, Hydro-Carbon, Carbon-Monixide and monitor the same once in a day/week/fortnight/month. The data collected shall be maintained in a register and a monthly extract be furnished to the Board.

3. The applicant shall provide and maintain at his own cost a meteorological station to collect the data on wind velocity, direction, temperature, humidity, rainfall, etc. and the daily reading shall be recorded and the extract sent to the Board once in a month.

4. The applicant shall forward the following information to the Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar regularly.
   a. Report of analysis of stack monitoring, ambient air quality monitoring meteorological data as required every month.
   b. Progress on planting of trees quarterly.

5. The applicant shall install mechanical composite sampling equipment and continuous flow measuring / recording devices on the effluent drains of trade as well as domestic effluent. A record of daily discharge shall be maintained.

6. The following information shall be forwarded to the Member Secretary on or before 10th of every month.

   a. Performance / progress of the treatment plant.
   b. Monthly statement of daily discharge of domestic and/or trade effluent.

7. **Non-compliance with effluent limitations**

   a) If for any reason the applicant does not comply with or is unable to comply with any effluent limitations specified in this consent, the applicant shall immediately notify the consent issuing authority by telephone and provide the consent issuing authority with the following information in writing within 5 days of such notification.

      i) Causes of non-compliance

      i) A description of the non-compliance discharge including its impact on the receiving waters.

      ii) Anticipated time of continuance of non-compliance if expected to continue or if such condition has been corrected the duration or period of non-compliance.

      iii) Steps taken by the applicant to reduce and eliminate the non-complying discharge and

      iv) Steps to be taken by the applicant too prevent the condition of non-compliance.

   b) The applicant shall take all reasonable steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

   c) Nothing in this consent shall be construed to relieve the applicant from civil or criminal penalties for non-compliance whether or not such non-compliance is due to factors beyond his control, such as break-down, electric failure, accident or natural disaster.

8. The applicant shall at his own cost get the effluent samples collected both before and after treatment and get them analysed at an approval laboratory every month for the parameters indicated in Part-D and shall submit in duplicate the report thereof to the Board.

9. The addition of various treatment chemicals should be done only with mechanical dosers and proper equipment for regulation of correct dosages determined daily and for proper uniform feeding. Crude practices such as dumping of chemicals in drains or sumps or trickling of acids or alkalies arbitrarily and utilizing poles for stirring etc. should not be resorted to.

10. In the disposal of treated effluent on land for irrigation, the industry shall keep in view of the need for;

    Rotation of crops

    Change of point of application of effluent on land

    A portion of land kept fallow.

11. The adoption of these would avoid soil becoming sick or slate, the industry may ensure this in consultation with the Agriculture Department.

12. It is the sole responsibility of the industry to ensure that there are no complaints at any time from the royats in the surrounding areas as a result of discharge of sewage or trade effluent if any.

13. Proper housekeeping shall be maintained by a dedicated team.

14. The industry must constitute a team of responsible and technically qualified personnel who will ensure continuous operation of all pollution control devices round the clock (including night hours) and should be in a position to explain the status of operation of the pollution control measures to the inspecting officers of the Board at any point of time. The name of these persons with their contact telephone numbers shall be intimated to the concerned. Regional Officer and Head Office of the Board and in case of any change in the team it shall be intimated to the Board immediately.

E. SPECIAL CONDITIONS:

1) This consent order is subject to final outcome in the matter W.P. (C) No. 4157/2016 pending at Honourable High Court of Orissa.

2) Mining operation is subject to availability of all other statutory clearances required under relevant Acts/Rules.

3) Wet drilling shall be practiced or suitably designed dust extractor shall be provided for dry drilling to prevent generation of dust in the work environment.

4) Pre-wetting of blasting site and controlled blasting shall be practiced. Blasting shall be carried out during day time.

5) Water sprinkling shall also be carried out on haul roads at frequent interval so that it should always remain in wet condition. Haulage roads shall be devoid of ruts and potholes and shall be maintained properly to avoid generation of dust during movement of vehicles.

6) Wheel washing facility for the ore transport vehicles shall be provided at the exit point of the mine. The wheel washing facility shall be integrated with complete recirculation system.

7) The vehicles carrying ore for transportation from the mine shall be covered with tarpaulin.

8) Regular water sprinkling on mineral transportation roads passing through the habitation area as well as other strategic point on the National Highway shall be done jointly by the mining lessees in consultation with the Regional Officer.

9) Regular monitoring of ambient air quality shall be carried out at three appropriate places and consolidated monitoring report shall be furnished to the Board once in a year. The permanent monitoring stations shall be fixed in consultation with the Regional Officer of the Board.

10) Ambient air quality of the mine shall meet the prescribed standards for industrial area.

11) Wastewater generated from the ore beneficiation plant shall be completely reused.

12) The slime generated from the ore beneficiation plant shall be disposed of safely as per mining plan and action shall be taken to prevent the contamination of ground water due to its disposal.

13) Retention wall shall be constructed at the toe of OB dump with provision of garland drain. Provision shall be made to divert the runoff from OB, ore stack yard and other areas of the mine to the ETP. Garland drains, channels and sedimentation pits constructed for the purpose shall be desilted as and when required and after monsoon

14) Mine drainage water shall be used for wet beneficiation of sub-grade ore. Excess water if any, shall be discharged into surface water body after adequate treatment in the ETP. The quality of the treated wastewater shall conform to the prescribed standard as stated in Part A(Sl. no.2) of the consent order. The treated wastewater of ETP shall also be utilized for sprinkling activities at various sources of generation of dust.

15) The ETP and online continuous monitoring system at the inlet & outlet of ETP with data transfer facility to SPCB server shall be effectively operated and the quality of treated wastewater shall never exceed the prescribed standards(Part A, Sl. No. 2).

16) Domestic effluents shall be treated in a sewage treatment plant (STP). The quality of the treated wastewater from STP shall conform to the prescribed standard. (Part-A, Sl. No.1).

17) Oil and grease trap with sedimentation pit shall be provided for treatment of workshop effluent. The treated wastewater shall be completely recycled. The quality of the treated wastewater shall conform to the prescribed standard as stated in Part A(Sl. no.2) of the consent order.

18) Overburden / waste rock shall be properly stacked in the earmarked areas approved by IBM and shall be suitably terraced and stabilized through vegetative cover or otherwise.

19) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), post-monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly.

20) Adequate measures shall be taken for control of noise levels below 85 dB (A) in work zone.

21) Ambient Air Quality monitoring data, Noise Monitoring data & Water/Waste Water Quality Monitoring data shall be electronically displayed at the entry point of the mine or at a suitable location of the mine.

22) Plantation of trees shall be undertaken in the colony/ township, over top soil dumps, OB dumps, along the side of haul road and in other areas of the mines not being utilized for mining activities. The mine shall take up avenue plantation and plantation in nearby village areas in consultation with DFO/Horticulture Department. The plantation details shall be submitted to the Board before end of March every year.

23) A copy of the annual return (annual return submitted to IBM, Govt. of India/ Directorate of Mines, Govt. of Odisha) shall be submitted every year.

24) The environmental statement report shall be submitted to the Board in proper format every year.

MEMBER SECRETARY
STATE POLLUTION CONTROL BOARD, ODISHA

TO,

SRI TARINI PRASAD MOHANTY, AGENT,
KALIAPANI CHROMITE MINES OF
M/S. BALASORE ALLOYS LIMITED,
MODULE C1, IST FLOOR, FORTUNE TOWER,
BHUBANESWAR-23,
ODISHA

Memo No._____/Dt._____/

Copy forwarded to :

i) Regional Officer, State Pollution Control Board, **Kalinganagar**
ii) District Collector, **Jajpur**
iii) Director of Mines, Govt. of Odisha, Bhubaneswar,
iv) Director, Environment -cum-Special Secretary, F & E. Deptt. Govt. of Odisha, Bhubaneswar.
v) D.F.O **Cuttack**
vi) Deputy Director of Mines, **Jajpur Road**
vii) Sr. Env. Engineer-L-I (C) (Hazardous waste cell)
viii) Sr. Env. Scientist –L-I (L), Central Lab. SPCB, Bhubaneswar
ix) Consent Register

SR. ENV. ENGINEER (L-I)
STATE POLLUTION CONTROL BOARD, ODISHA

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART –A : EFFLUENTS

Sl.No.	Parameters	Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Costal Areas
		(a)	(b)	(c)	(d)
1.	Colour&odour	Colourless/Odourless as far as practible	------	See 6 of Annex-1	See 6 of Annex-1
2.	Suspended Solids (mg/l)	100	600	200	For process wastewater – 100 b. For cooling water effluent 10% above total suspended matter of influent.
3.	Particular size of SS	Shall pass 850	-----	------	
5.	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	Shall not exceed 5^0C above the receiving water temperature	-------	--------	Shall not exceed 5^0C above the receiving water temperature
7.	Oil & Grease mg/l max.	10	20	10	20
8.	Total residual chlorine	1.0	----	------	1.0
9.	Ammonical nitrogen (as N) mg/l max.	50	50	------	50
10.	Total Kajeldahl nitrogen (as NH_3) mg/1 max.	100	----	------	100
11.	Free ammonia (as NH_3) mg/1 max.	5.0	----	------	5.0
12.	Biochemical Oxygen Demand (5 days at (20^0C) mg/1 max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/1 max.	250	----	------	250
14.	Arsenic (as As) mg/1 max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg) mg/1 max.	0.01	0.01	------	0.001
16.	Lead (as pb) mg/1 max.	01.	1.0	------	2.0

17.	Cardmium (as Cd) mg/1 max.	2.0	1.0	------	2.0
18.	Hexavalent Chromium (as Cr + 6) mg/l max.	0.1	2.0	--------	1.0
19.	Total Chromium (as Cr) mg/l max.	2.0	2.0	---------	2.0
20.	Copper (as Cu) mg/l max.	3.0	3.0	---------	3.0
21.	Zinc (as Zn) mg/l max.	5.0	15	---------	15
22.	Selenium (as Sc) mg/l max.	0.05	0.05	---------	0.05
23.	Nickel (as Nil) mg/l max.	3.0	3.0	---------	5.0
24.	Cyanide (as CN) mg/l max.	0.2	2.0	0.2	0.02
25.	Fluoride (as F) mg/l max.	2.0	15	---------	15
26.	Dissolved Phosphates (as P) mg/l max.	5.0	-------	---------	--------
27.	Sulphide (as S) mg/l max.	2.0	--------	---------	5.0
28.	Phennolic compounds as (C_6H_5OH) mg/l max.	1.0	5.0	---------	5.0
29.	Radioactive materials a. Alpha emitter micro curle/ml. b. Beta emitter micro curle/ml.	 10^7 10^6	 10^7 10^6	 10^8 10^7	 10^7 10^6
30.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
31	Manganese (as Mn)	2 mg/l	2 mg/l	---------	2 mg/l
32.	Iron (Fe)	3 mg/l	3 mg/l	---------	3 mg/l
33.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	---------	0.2 mg/l
34.	Nitrate Nitrogen	10 mg/l	--------	---------	20 mg/l

NATIONAL AMBIENT AIR QUALITY STANDARDS

Sl. No.	Pollutants	Time Weighed Average	Concentrate of Ambient Air		
			Industrial Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1.	Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual *	50	20	-Improved west and Gaeke
		24 Hours **	80	80	- Ultraviolet fluorescence
2.	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual *	40	30	- Modified Jacob &Hochheiser (Na-Arsenite)
		24 Hours **	80	80	- Chemiluminescence
3.	Particulate Matter (size less than 10µm) or $PM_{10}\mu g/m^3$	Annual *	60	60	-Gravimetric - TOEM
		24 Hours **	100	100	- Beta Attenuation
4.	Particulate Matter (size less than 2.5µm) or $PM_{2.5}\mu g/m^3$	Annual *	40	40	-Gravimetric - TOEM
		24 Hours **	60	60	- Beta Attenuation
5.	Ozone (O_3) $\mu g/m^3$	8 Hours **	100	100	- UV Photometric - Chemiluminescence
		1 Hours **	180	180	- Chemical Method
6.	Lead (Pb) $\mu g/m^3$	Annual *	0.50	0.50	-AAS/ICP method after sampling on EMP 2000 or equivalent filter paper.
		24 Hours **	1.0	1.0	- ED-XRF using Teflon filter
7.	Carbon Monoxide (CO) mg/m^3	8 Hours **	02	02	- Non Dispersive Infra Red (NDIR)
		1 Hours **	04	04	Spectroscopy
8.	Ammonia (NH_3) $\mu g/m^3$	Annual*	100	100	-Chemiluminescence - Indophenol Blue Method
		24 Hours**	400	400	
9.	Benzene (C_6H_6) $\mu g/m^3$	Annul *	05	05	-Gas Chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10.	Benzo (a) Pyrene (BaP)-Particulate phase only, ng/m^3	Annual*	01	01	-Solvent extraction followed by HPLC/GC analysis
11.	Arsenic (As), ng/m^3	Annual*	06	06	-AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12.	Nickel (Ni),ng/m^3	Annual*	20	20	-AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

** Annual arithmetic mean of minimum I04 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 0I hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Annexure: VII

Kaliapani Chromite Mines										
Traffic Density Study Report										
Station	**Working Days**				**Non Working Days**			**Market Days**		
Mines main Gate	**Result**	**Light Vehicle**	**Medium Vehicle**	**Heavy Vehicle**	**Light Vehicle**	**Medium Vehicle**	**Heavy Vehicle**	**Light Vehicle**	**Medium Vehicle**	**Heavy Vehicle**
	Total Nos	1507	566	560	1019	341	306	2506	944	541
	Avg Traffic Load/Hr	62.79	23.58	23.33	42.45	14.2	12.75	104.41	39.33	22.54
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	47.09	47.16	86.33	31.84	28.41	47.17	78.31	78.66	83.40
Kalarngiatta	Total Nos	878	379	455	950	418	265	2363	934	345
	Avg Traffic Load/Hr	36.58	15.79	18.95	39.58	17.41	11.04	98.45	38.91	14.37
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	27.43	31.58	70.14	29.68	34.83	40.85	73.84	77.83	53.18
Kansa	Total Nos	878	379	455	745	278	193	1374	328	309
	Avg Traffic Load/Hr	36.58	15.79	18.95	31.04	11.58	8.04	57.25	13.66	12.87
	Passenger Car Unit (PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	27.43	31.58	70.14	23.28	23.16	29.75	42.93	27.33	47.63

Station Code : AAQ – 1 Office Area (21^0 02'04.7"N, 85^0 45' 31.0"E)													
		PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO µg/m^3	O_3 µg/m^3	NH_3 µg/m^3	C_6H_6 µg/m^3	Bap ng/m^3	Pb µg/m^3	Ni ng/m^3	As ng/m^3
October,17	Average	55.25	27.25	6.02	13.31	0.4	5.5	BDL	0.49	BDL	0.000224	BDL	BDL
	Min	47	18	4.8	11.7	0.2	4.6	BDL	0.37	BDL	0.00016	BDL	BDL
	Max	82	35	7.9	16.8	0.6	6.2	BDL	0.6	BDL	0.00028	BDL	BDL
Nove, 17	Average	52.88	28	6	12.7	0.4	4.44	BDL	0.45	BDL	0.000186	BDL	BDL
	Min	40	17	4.6	10.5	0.2	4.1	BDL	0.36	BDL	0.0001	BDL	BDL
	Max	88	35	7.3	15.5	0.6	4.8	BDL	0.59	BDL	0.00025	BDL	BDL
Dec,17	Average	58	27.75	6.22	13.07	0.36	4.525	BDL	0.47	BDL	0.000225	BDL	BDL
	Min	48	22	5.4	10.8	0.2	3.7	BDL	0.32	BDL	0.00018	BDL	BDL
	Max	81	36	7.2	15.8	0.6	5.3	BDL	0.64	BDL	0.00027	BDL	BDL
Jan,18	Average	54.55	28.22	6.57	12.4	0.28	5.36	BDL	0.453	BDL	0.000229	BDL	BDL
	Min	46	20	5.1	10.2	0.2	4.4	BDL	0.3	BDL	0.00016	BDL	BDL

	Max	83	40	8.2	15.3	0.4	6.5	BDL	0.61	BDL	0.00028	BDL	BDL
Feb,18	Average	54	27.87	7.08	12.08	0.3	5.075	BDL	0.44	BDL	0.000218	BDL	BDL
	Min	44	21	6.3	9.7	0.1	4.1	BDL	0.33	BDL	0.00018	BDL	BDL
	Max	79	33	7.9	15.8	0.5	5.9	BDL	0.53	BDL	0.00026	BDL	BDL
March,18	Average	57	24.7					BDL		BDL	BDL	BDL	BDL
	Min	47	22	7.2	13.4	0.1	5	BDL	0.33	BDL	BDL	BDL	BDL
	Max	90	38	10.2	16.8	1	6.2	BDL	0.51	BDL	BDL	BDL	BDL
Station Code : AAQ – 2 Bachelor Barrack (21^0 02'05.7"N, 85^0 45' 34.2"E)													
Oct,17	Average	52.87	26.5	6.21	12.86	0.36	5.47	BDL	0.47	BDL	0.000203	BDL	BDL
	Min	42	20	5.1	10.1	0.2	4.2	BDL	0.27	BDL	0.00015	BDL	BDL
	Max	77	36	8.2	15.9	0.6	7.1	BDL	0.68	BDL	0.00025	BDL	BDL
Nove,17	Average	58.33	29.88	6.46	12.26	0.48	4.38	BDL	BDL	BDL	BDL	BDL	BDL
	Min	49	25	5.1	10.4	0.2	4	BDL	BDL	BDL	BDL	BDL	BDL
	Max	86	36	7.7	14.2	0.8	4.8	BDL	BDL	BDL	BDL	BDL	BDL
Dec,17	Average	51.62	32.12	6.33	13.81	0.55	5.23	BDL	0.52	BDL	0.000216	BDL	BDL
	Min	51	25	5.3	11.8	0.4	3.9	BDL	0.34	BDL	0.00016	BDL	BDL
	Max	87	43	7.4	16.2	0.8	6.5	BDL	0.66	BDL	0.00026	BDL	BDL
	Averag	67.44	29.33	6.65	13.18	0.4	5.025	BDL	0.49	BDL	0.000229	BDL	BDL

Jan,18	e												
	Min	57	21	5.3	10.5	0.2	3.6	BDL	0.36	BDL	0.00019	BDL	BDL
	Max	81	35	7.5	15.8	0.6	6.8	BDL	0.65	BDL	0.00027	BDL	BDL
Feb,18	Average	58.125	29.37	6.78	13.41	0.475	5.27	BDL	0.49	BDL	0.000221	BDL	BDL
	Min	45	25	6.1	11.1	0.2	4.1	BDL	0.33	BDL	0.00019	BDL	BDL
	Max	79	33	7.5	16	0.9	6.2	BDL	0.59	BDL	0.00026	BDL	BDL
March,18	Average	59.1	24					BDL		BDL	BDL	BDL	BDL
	Min	55	22	7.0	12.2	BDL	BDL	BDL	0.44	BDL	BDL	BDL	BDL
	Max	94	41	11.2	18.4	1.0	6.1	BDL	0.66	BDL	BDL	BDL	BDL
Station Code : AAQ – 3 Quarry (21^0 01'57.8"N, 85^0 46' 01.2"E)													
October,17	Average	58.37	28	6.66	13.45	0.467	5.95	BDL	0.53	BDL	0.000241	BDL	BDL
	Min	53	19	5.6	11.4	0.4	5.1	BDL	0.44	BDL	0.00019	BDL	BDL
	Max	80	37	7.8	15.9	0.6	6.6	BDL	0.67	BDL	0.00028	BDL	BDL
Nove, 17	Average	58.89	31.44	6.53	13.53	0.5	4.92	BDL	0.53	BDL	0.000259	BDL	BDL
	Min	42	27	5.2	11.3	0.4	4.4	BDL	0.4	BDL	0.00018	BDL	BDL
	Max	89	37	7.9	14.9	0.6	6.4	BDL	0.62	BDL	0.00032	BDL	BDL

Dec,17	Average	53.37	30.25	6.9	14.15	0.5	4.73	BDL	0.49	BDL	0.000243	BDL	BDL
	Min	48	27	5.9	12.5	0.2	3.6	BDL	0.35	BDL	0.0002	BDL	BDL
	Max	82	35	7.8	16	0.8	6.1	BDL	0.62	BDL	0.00029	BDL	BDL
Jan,18	Average	53.22	33.11	6.66	13.22	0.37	5.1	BDL	0.46	BDL	0.000228	BDL	BDL
	Min	49	24	5.1	10.6	0.2	3.6	BDL	0.32	BDL	0.00017	BDL	BDL
	Max	92	43	7.2	15.2	0.8	6.3	BDL	0.69	BDL	0.00028	BDL	BDL
Feb,18	Average	59	31.875	6.1375	12.9	0.44	5.34	BDL	0.46375	BDL	0.000246	BDL	BDL
	Min	46	24	5.1	11.3	0.3	4.4	BDL	0.36	BDL	0.00021	BDL	BDL
	Max	86	44	6.9	16.2	0.7	6.3	BDL	0.59	BDL	0.00028	BDL	BDL
March,18	Average	50.1	42.8	10.1	17.4	0.9	0.8	BDL		BDL	BDL	BDL	BDL
	Min	50	42	9.2	15.3	BDL	BDL	BDL	0.32	BDL	BDL	BDL	BDL
	Max	93	29	15.2	24.2	1	7.8	BDL	0.62	BDL	BDL	BDL	BDL
Station Code : AAQ – 4 Kaliapani Village (21^0 03’42.0”N, 85^0 46’ 19.3”E)													
October,17	Average	59.37	23.5	5.65	12.67	BDL	BDL	BDL	0.4975	BDL	0.000205	BDL	BDL

	Min	47	17	4.9	10.8	BDL	BDL	BDL	0.32	BDL	0.00014	BDL	BDL
	Max	73	35	7.1	15.6	BDL	BDL	BDL	0.69	BDL	0.00027	BDL	BDL
Nove, 17	Average	55.89	24.22	6.17	11.18	BDL	BDL	BDL	0.45	BDL	0.00018	BDL	BDL
	Min	46	17	5	10	BDL	BDL	BDL	0.34	BDL	0.00008	BDL	BDL
	Max	74	32	7.8	14.3	BDL	BDL	BDL	0.58	BDL	0.00025	BDL	BDL
Dec,17	Average	52.87	25.35	5.68	11.51	BDL	BDL	BDL	0.41	BDL	0.000183	BDL	BDL
	Min	50	19	4.9	9.6	BDL	BDL	BDL	0.26	BDL	0.00008	BDL	BDL
	Max	77	33	6.8	13.9	BDL	BDL	BDL	0.63	BDL	0.00025	BDL	BDL
Jan,18	Average	54.44	27.33	5.65	12	BDL	BDL	BDL	0.43	BDL	0.000222	BDL	BDL
	Min	45	21	4.8	10.5	BDL	BDL	BDL	0.26	BDL	0.00017	BDL	BDL
	Max	78	35	7.5	14.1	BDL	BDL	BDL	0.58	BDL	0.00029	BDL	BDL
Feb,18	Average	54	26.87	5.675	12.7	BDL	BDL	BDL	0.35	BDL	0.000235	BDL	BDL
	Min	48	21	4.7	11.8	BDL	BDL	BDL	0.28	BDL	0.00019	BDL	BDL
	Max	78	33	6.3	13.8	BDL	BDL	BDL	0.54	BDL	0.00029	BDL	BDL
March	Average	52.4	21.4	6.2	12.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

,18	Min	44	18	5.4	10.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Max	66	28	8.8	15.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Station Code : AAQ – 5 Ransol Village (21^0 03'43.1"N, 85^0 44' 32.2"E)													
Octob er,17	Averag e	53.87	22.87	5.2	11.82	0.4	4.65	BDL	0.49	BDL	0.000223	BDL	BDL
	Min	43	18	4.6	10.1	0.4	4.2	BDL	0.3	BDL	0.00016	BDL	BDL
	Max	74	27	5.8	13.1	0.4	5.1	BDL	0.63	BDL	0.00028	BDL	BDL
Nove, 17	Averag e	50.66	22.33	5.8	10.55	0.4	4.3	BDL	0.47	BDL	0.000197	BDL	BDL
	Min	42	18	5.3	9.8	0.4	4.2	BDL	0.36	BDL	0.00014	BDL	BDL
	Max	70	29	6.4	11.5	0.4	4.4	BDL	0.55	BDL	0.00028	BDL	BDL
Dec,1 7	Averag e	56.75	24.12	5.58	11.82	BDL	BDL	BDL	0.39	BDL	0.000213	BDL	BDL
	Min	46	19	4.8	10.5	BDL	BDL	BDL	0.25	BDL	0.00015	BDL	BDL
	Max	72	34	6.7	13.4	BDL	BDL	BDL	0.63	BDL	0.00028	BDL	BDL
Jan,18	Averag e	53.77	26.33	5.425	12.21	BDL	BDL	BDL	0.416	BDL	0.000236	BDL	BDL
	Min	46	17	4.7	10.4	BDL	BDL	BDL	0.21	BDL	0.00017	BDL	BDL
	Max	73	34	5.8	13.4	BDL	BDL	BDL	0.56	BDL	0.00028	BDL	BDL

Feb,18	Average	51.75	26.37	5.325	11.51	BDL	BDL	BDL	0.43	BDL	0.000248	BDL	BDL
	Min	43	19	4.9	10.4	BDL	BDL	BDL	0.29	BDL	0.00016	BDL	BDL
	Max	79	37	5.8	12.8	BDL	BDL	BDL	0.58	BDL	0.00029	BDL	BDL
March,18	Average	46.2	18.9	6.8	13.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Min	43	15	5.6	11.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Max	61	29	7.2	14.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Station Code: AAQ – 6 Sukrangi Village (21^0 02'44.5"N, 85^0 48' 16.3"E)													
October,17	Average	55.5	27.87	6.51	12.68	0.2	4.75	BDL	0.48	BDL	0.000219	BDL	BDL
	Min	48	18	5.6	10.2	0.2	4.1	BDL	0.31	BDL	0.00014	BDL	BDL
	Max	48	18	5.6	10.2	0.2	4.1	BDL	0.31	BDL	0.00027	BDL	BDL
Nove, 17	Average	50.22	27.33	5.73	12.74	0.33	4.16	BDL	0.44	BDL	0.00021	BDL	BDL
	Min	41	19	5.1	10.1	0.2	4	BDL	0.32	BDL	0.00014	BDL	BDL
	Max	76	34	6.2	15.2	0.4	4.3	BDL	0.62	BDL	0.00031	BDL	BDL
Dec,17	Average	59.25	23.62	5.7	11.85	BDL	BDL	BDL	0.38	BDL	0.000228	BDL	BDL

	Min	47	18	4.7	9.5	BDL	BDL	BDL	0.29	BDL	0.00017	BDL	BDL
	Max	66	29	6.3	13.9	BDL	BDL	BDL	0.52	BDL	0.00028	BDL	BDL
Jan,18	Average	50.88	25.66	5.53	11.51	BDL	BDL	BDL	0.41	BDL	0.000224	BDL	BDL
	Min	48	18	4.5	9.9	BDL	BDL	BDL	0.25	BDL	0.00016	BDL	BDL
	Max	81	37	6.9	12.8	BDL	BDL	BDL	0.62	BDL	0.00028	BDL	BDL
Feb,18	Average	53.12	28.75	5.3	12.05	BDL	BDL	BDL	0.415	BDL	0.000234	BDL	BDL
	Min	46	24	4.7	10.8	BDL	BDL	BDL	0.29	BDL	0.00019	BDL	BDL
	Max	72	37	5.8	13.8	BDL	BDL	BDL	0.52	BDL	0.00026	BDL	BDL
March ,18	Average	56.1	27.9	6.3	14.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Min	54	22	5.4	12.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Max	64	34	7.8	16.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CPCB NORM		**100**	**60**	**80**	**80**	**04**	**180**	**400**	**05**	**01**	**1.0**	**20**	**06**
		24 Hrs	**24 Hrs**	**24hrs**	**24 Hrs**	**1 hrs**	**1 hrs**	**24hrs**	**Annual**	**Annual**	**24 hrs**	**Annual**	**Annual**
		60	**40**	**50**	**40**	**02**	**100**	**100**			**0.5**		
		Annual	**Annual**	**Annual**	**Annual**	**8 hr**	**8hrs**	**Annual**			**Annual**		
Parameters		**PM_{10} µg/m^3**	**$PM_{2.5}$ µg/m^3**	**SO_2 µg/m^3**	**NO_2 µg/m^3**	**CO µg/m^3**	**O_3 µg/m^3**	**NH_3 µg/m^3**	**C_6H_6 µg/m^3**	**Bap ng/m^3**	**Pb µg/m^3**	**Ni ng/m^3**	**As ng/m^3**

Dust Suppression Measure Inside Mines

Annexure-IX

Fixed Sprinkler

Water tanker

Annexure-X

Ground Water Level report (Oct 2017- March 2018)						
M/S Balasore Alloys Ltd						
Kaliapani Chromite mines						
Station	**Water Table (MBGL)**	**Water Table (MBGL)**	**Water Table (MBGL)**	**Water Table (MBGL)**	**Water Table (MBGL)**	**Water Table (MBGL)**
	October,17	**November,17**	**December,17**	**January,18**	**Feb,18**	**March,18**
Buffer Zone						
kaliapani-1	**3.6**	**3.7**	**3.7**	**3.9**	**3.9**	**4.0**
kaliapani-2	**4.0**	**4.5**	**4.7**	**5.0**	**5.0**	**5.3**
Tisco Hutting	**6.2**	**6.4**	**6.5**	**6.5**	**6.5**	**6.6**
Sukrangi	**3.3**	**3.5**	**3.6**	**3.7**	**4.0**	**4.2**
Core Zone						
Piezohole-1	**27.6**	**27.8**	**27.8**	**27.9**	**27.9**	**28.1**
Piezohole-2	**27.2**	**27.4**	**27.5**	**27.6**	**27.8**	**27.9**

Annexure: XI

Ground Water Quality Report

Kaliapani Chromite Mines/s Balasore Alloys Ltd

November, 2017

Sl. No.	Parameters	Unit	Standard as per IS–10500	GW1	GW2	GW3	GW4	GW5	GW6
				Open Well	Open Well	Open Well	Bore Well	Open Well	Open Well
1	pH	---	6.5-8.5	7.05	7.22	7.56	7.18	6.72	7.10
2	Odour	---	Agreeable	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless
3	Colour	Hazen	5 (Max)	CL	CL	CL	CL	CL	CL
4	Taste	---	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	1 (Max)	0.2	0.6	0.2	0.4	0.2	0.6
6	Chloride (as Cl)	mg/l	250 (Max)	10.9	12.6	11.4	11.8	12.4	11.8
7	Residual free Chlorine	mg/l	0.2 (Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solid	mg/l	500 (Max)	114	123	108	138	112	127
9	Total Hardness (as $CaCO_3$)	mg/l	200 (Max)	54	72	78	80	79	94
10	Iron (as Fe)	mg/l	0.3 (Max)	0.16	0.22	0.14	0.20	0.10	0.18
11	Calcium (as Ca)	mg/l	75 (Max)	34.2	42.5	30.3	34.9	40.2	32.4
12	Magnesium (as Mg)	mg/l	30 (Max)	20.2	16.8	24.5	23.7	17.3	18.6
13	Sulfate (as SO_4)	mg/l	200 (Max)	12.6	14.2	12.8	13.6	14.0	14.8
14	Manganese (as Mn)	mg/l	0.10 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
15	Nitrate (as NO_3)	mg/l	45 (Max)	0.53	0.41	0.48	0.62	0.51	0.57
16	Alkalinity (as $CaCO_3$)	mg/l	200 (Max)	52	64	66	68	66	69
17	Chromium (as Cr^{+6})	mg/l	$	0.018	0.022	0.010	0.016	0.026	0.014
18	Fluoride (as F)	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.003 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
20	Copper (as Cu)	mg/l	0.05 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc (as Zn)	mg/l	5 (Max)	0.14	0.19	0.22	0.11	0.19	0.27
22	Lead (as Pb)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium (as Se)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	mg/l	0.5 (Max)	ND	ND	BDL	BDL	ND	ND
25	Mercury (as Hg)	mg/l	0.001 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
26	Cyanide (as CN)	mg/l	0.05 (Max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron (as B)	mg/l	0.5 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic (as As)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorus (as P)	mg/l	$	0.54	0.51	0.62	0.48	0.63	0.66

Note- AL- Agreeable, CL-Colourless, ND-Not Detecte,. $-Not Specified.

February, 2018

Sl. No.	Parameters	Unit	Standard as per IS–10500	GW1	GW2	GW3	GW4	GW5	GW6
				Open Well	Open Well	Open Well	Bore Well	Open Well	Open Well
1	pH	---	6.5-8.5	7.30	7.15	7.50	7.10	6.95	7.20
2	Odour	---	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless
3	Colour	Hazen	5 (Max)	CL	CL	CL	CL	CL	CL
4	Taste	---	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	1 (Max)	0.4	0.4	0.6	0.2	0.4	0.2
6	Chloride (as Cl)	mg/l	250 (Max)	11.2	10.5	12.1	10.7	12.6	10.5
7	Residual free Chlorine	mg/l	0.2 (Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solid	mg/l	500 (Max)	126	136	142	124	143	118
9	Total Hardness (as $CaCO_3$)	mg/l	200 (Max)	67	78	81	86	83	97

10	Iron (as Fe)	mg/l	0.3 (Max)	0.28	0.20	0.15	0.18	0.12	0.10
11	Calcium (as Ca)	mg/l	75 (Max)	35.1	44.1	34.3	33.2	35.4	36.7
12	Magnesium (as Mg)	mg/l	30 (Max)	22.1	18.9	27.4	25.4	21.2	20.7
13	Sulfate (as SO_4)	mg/l	200 (Max)	11.4	13.3	16.4	14.4	14.8	13.8
14	Manganese (as Mn)	mg/l	0.10 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
15	Nitrate (as NO_3)	mg/l	45 (Max)	0.62	0.43	0.51	0.72	0.59	0.53
16	Alkalinity (as $CaCO_3$)	mg/l	200 (Max)	52	64	66	68	66	69
17	Chromium (as Cr^{+6})	mg/l	$	0.022	0.028	0.016	0.026	0.024	0.020
18	Fluoride (as F)	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.003 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
20	Copper (as Cu)	mg/l	0.05 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc (as Zn)	mg/l	5 (Max)	0.17	0.21	0.20	0.18	0.22	0.23
22	Lead (as Pb)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium (as Se)	mg/l	0.01 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	mg/l	0.5 (Max)	ND	ND	BDL	BDL	ND	ND
25	Mercury (as Hg)	mg/l	0.001 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
26	Cyanide (as CN)	mg/l	0.05 (Max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron (as B)	mg/l	0.5 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic (as As)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorus (as P)	mg/l	$	0.53	0.60	0.68	0.50	0.65	0.72

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

GW1- Tisco Camp (21^0 01'44.8"N, $85^0$44'44.6"E)
GW2- Kaliapani Village (21^0 02'39.1"N, $85^0$46'21.4"E)
GW3- Sukurangi (21^0 02' 18.1"N, $85^0$47' 41.7"E)
GW4- Inside Mine ($21^0$02'7.7"N, $85^0$45'32.6"E)
GW5- Chingudiapal (21^0 02'56.9"N, 85^0 45' 4.5"E)
GW6- Kalarangi Village (21^0 0' 47.6"N, 85^0 43' 38.1"E)

Annexure: XII

Kaliapani Chromite Mines

Flow Rate Monitoring Report

Sl No	Location	November,2017		January,2018	
		Flow rate m^3/s	Flow rate IN CUSEC	Flow rate m^3/s	Flow rate IN CUSEC
1	Damsala U/S	5.99	211.46	4.72	166.68
2	Damsala D/S	7.25	256.00	5.71	201.65

Annexure: XIII

DETAILS OF COIR MATTING & GRASS TURFING ON DUMP SLOPE

KALIAPANI CHROMITE MINES,M/s BALASORE ALLOYS LIMITED

DETAILS OF COIRMATTING		
YEAR	**LOCATION**	**AREA (SQM)**
2010-11	Dump 2	5000
2011-12	Dump-3(IMFA side)	4500
2012-13	Dump-3(IMFA side)	4500
2013-14	Dump-3(Mahagiri side)	8600
2014-15	Dump-1 (North)	8500
2015-16	Dump 3 (North side)	6000
2017-18	Dump 3(Mhagiri Side)	4000
Total		**41100**

DETAILS OF GRASS TURFING		
YEAR	**LOCATION**	**AREA (SQM)**
2013-14	Dump-1 (Access road) slope	5000
2014-15	Dump-1 (Access road) slope	5200
2015-16	Washing Bay to View Point and common Boundary with IMFA	6350
Total		**16550**

DETAILS OF INSIDE ML AREA PLANTATION

YEAR	LOCATION	AREA (Ha.)	NOS.	SURVIVAL %	SPECIES
2010-11	Dump-1	2	11020	87%	Peltophorum, Acacia, Albizzia, Pongamia, Tamarind, Almond, Neem and Arjun
	Inside mines premises (COB, Canteen & weigh bridge)		95	87%	
2011-12	Dump-3	0.8	1600	87%	
	Dump-1	1.2	8375	87%	
2012-13	Dump-3	0.2	250		
	Dum-1	1.8	8150		
2013-14	Dump-3, slope	0.8	6882	85%	
	Safety zone, Dump-3	0.5	3018	85%	
	Dump-1 (Access road)	0.7	2085	87%	
2014-15	Dump-1 (Access road) slope and safety zone	1	2565	86%	
	Dump-1 (North)	1.25	4000	86%	
	Dump-2 slope and safety zone	4	12000	88%	
2015-16	Admin. Office premises & Access road Jindal side from Old washing platform to View point (Dump-1)	1.25	5000	85%	
	Common boundary with IMFA Area (Mines Pit)	1	4000	89%	
	Access road Jindal side along with Aloe vera Plantn (Dump-1)	0.3	1200	86%	
	Over coirmatting of dump-3, 2nd terrace (mines pit side)	0.1875	750	85%	
	Dump-3(Jindal site Boundary area)	1.2	4800	86%	
	Dump-3 Slope	0.18	750	90%	
2016-17	Dump-3 slope	0.2	2000	90%	
2017-18	Gabion wall	0.35	134000		
TOTAL			**78540**		

भारत सरकार
GOVERNMENT OF INDIA
श्रम एवं रोजगार मंत्रालय
MINISTRY OF LABOUR EMPLOYMENT
खान सुरक्षा महानिदेशालय
DIRECTORATE GENERAL OF MINES SAFETY,
भुवनेश्वर क्षेत्र
BHUBANESWAR REGION
L-1, Nayapalli, PO: RRL Campus, Bhubaneswar-751013
(Phone – (+91) 7735277034 ; FAX – (0674) 2301452; e-mail: dgmsbbsr@gmail.com)

संख्या BBR-JA/CH-2&12/P-111(3)/2017/_____/ भुवनेश्वर, दिनांक ____/02/2017

प्रेषक

खान सुरक्षा निदेशक,
भुवनेश्वर क्षेत्र ।

To

1) The Agent,
Kaliapani Chromite Mine,
M/s Balasore Alloyes Limited,
P.O. Kaliapani, Dist: Jajpur (Odisha).

2) The Agent,
Sukinda Mines(Chromite)
M/s IMFA, Jajpur Road,
Dist: Jajpur (Odisha).

Sub: Extension of validity period of permission granted vide letter no.BJA/CH-2 & 12/P-111(3)/2015/595-96 dated 12.02.2015 under Reg.111(3) of the Metalliferous Mines Regulations, 1961 for dumping of overburden within 7.5 m of common boundary between Kaliapani Chromite Mine of M/s Balasore Alloys Ltd. & Sukinda Mines(Chromite) of M/s IMFA Ltd.

Sir,

Please refer to your letter No.Mines/BAL/160 dated 10.01.2017 and the enclosed plans/sections therewith on the above subject.

The matter has since been examined in the light of what has been stated in the application and the submitted plan/section.

In exercise of the powers conferred on the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under the provisions of Regulations 111(3) of the Metalliferous Mines Regulations, 1961 and by virtue of authorisation granted to me by the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under Section 6(1) of the Mines Act, 1952, I, hereby extend the validity period of the earlier granted permission under Reg.111(3) of the Metalliferous Mines Regulations, 1961 vide this Directorate's letter no. BJA/CH-2&12/P-111(3)/2015/595-96 dated 12.02.2015, for dumping of overburden within 7.5 m of common boundary between Kaliapani Chromite Mine of M/s Balasore Alloys Ltd. & Sukinda Mines(Chromite) of M/s IMFA Ltd, as shown on the enclosed Plan No. BAL/IMFA/02/16 and No.BAL/IMFA/2/16 both dated 10.01.2017, **for a further period of two years i.e. upto 11.02.2019,** subject to the following conditions being complied with:

1.0 The proposed dumping of overburden along the common boundary lines i.e 'AB' & 'BC' of M/s IMFA and 'IH' & 'HG' of M/s BAL, as shown in the enclosed Plan No. BAL/IMFA/02/16 and No.BAL/IMFA/2/16 both dated 10.01.2017, shall be in 3(three) stages of each not exceeding 20 m in height subject to a total common height of not exceeding 60 m from ground level.

2.0 The overall stability aspects of the proposed common overburden dumping of height not exceeding 60 m from the ground level and also the influence of the common overburden dump on stress levels in the surrounding ground surface shall be jointly got studied by a

scientific agency of repute and a report submitted to this Directorate within 6 (six) months of commencement of operations in accordance with this permission.

3.0 All other conditions of the earlier granted permission under Reg.111(3) of the Metalliferous Mines Regulations, 1961 vide this Directorate's letter no. BJA/CH-2&12/P-111(3)/2015/595-96 dated 12.02.2015 shall remain unchanged except validity period.

4.0 In the event of any change in the circumstances connected with this relaxation which is likely to endanger the life of persons employed in the mine or the mine, the mining operations for which this relaxation has been granted shall be stopped forthwith and intimation thereof shall be sent to this Directorate. The said mining operation shall not be resumed without express and fresh permission in writing from this Directorate.

5.0 If at any time any one of the conditions, subject to which this permission has been granted, is violated or not complied with, this relaxation shall be deemed to have been revoked with immediate effect.

6.0 This relaxation may be amended or withdrawn at any time if considered necessary in the interest of safety.

7.0 This relaxation is being granted under Regulation 111(3) of the Metalliferous Mines Regulations, 1961 only without prejudice to any other provisions of law which may be or may become applicable at any time.

8.0 Intimation about completion of the mining operations should also be sent promptly and in any case not later than one month thereof.

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(आर. सुब्रमणियन)
खान सुरक्षा निदेशक,
भुवनेश्वर क्षेत्र ।

संख्या BBR-JA/CH-2&12/P-111(3)/2017/237-38 भुवनेश्वर, दिनांक 15/02/2017

Copy forwarded for information and necessary action to:

1. The Owner, M/s Balasore Alloys Ltd., PO: Balgopalpur, Balasore-756020/Orissa.
2. The Owner, Sukinda Mines (Chromite), M/s IMFA Ltd., Bomikhal, Bhubaneswar.

15/2/17

खान सुरक्षा निदेशक,
भुवनेश्वर क्षेत्र ।

By e-mail

सत्यमेव जयते

भारतसरकार

Government of India

श्रम एवंरोजगारमंत्रालय

Ministry of Labour & Employment

खानसुरक्षामहानिदेशालय

Directorate General of Mines Safety

संख्या BJA/CH-2&12/P-111(3)/2017/ 2037 / भुवनेश्वर, दिनांक 14/08/2017

प्रेषक

खान सुरक्षा निदेशक,
भुवनेश्वर क्षेत्र ।

To

1. The Agnet,
   Jindal Chromite Mine,
   M/s Jindal Stainless Ltd,
   PO-Kaliapani, Dist-Jajpur (Odisha)

2. The Agent,
   Kaliapani Chromite Mine,
   M/s Balasore Alloys Limited,
   P.O. Kaliapani, Dist: Jajpur(Odisha).PIN-755 047.

Sub: Renewal of permission granted vide this Directorate's lr No.BJA/CH-2&12/111(3)/2015/1697-98 dated 08.07.2015, under Reg.111(3) of the Metalliferous Mines Regulations, 1961for dumping of overburden within 7.5 m of the common boundary between Kaliapani Chromite mine of M/s Balasore Alloys Ltd and Jindal Chromite Mine of M/s Jindal Staineless Ltd.

Sir,

Please refer to your application vide letter No.Nil dated 19.06.2017 on the above subject, requesting for the renewal of the above exemption.

The matter has since been examined on the basis of information furnished in your application under reference and shown on the enclosed plans and sections submitted by you.

In exercise of the powers conferred on the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under the provisions of Regulations 111(3) of the Metalliferous Mines Regulations, 1961 and by virtue of authorisation granted to me by the Chief Inspector of Mines (also designated as Director General of Mines Safety) under Section 6(1) of the Mines Act, 1952, I, hereby **renew the permission granted vide letter No.BJA/CH-2&12/111(3)/2015/1697-98 dated 08.07.2015,under Regulation 111(3) of the Metalliferous Mines Regulations, 1961 for dumping of overburden within 7.5 m of the common boundary between Kaliapani Chromite mine of M/s Balasore Alloys Ltd. and M/s Jindal Chromite mine of M/s Jindal Stainless Ltd.,** subject to the following conditions being strictly complied with:

1.0 All conditions stipulated in the said permission letter bearing **No.BJA/CH-2&12/111(3)/2015/1697-98 dated 08.07.2015** shall remain unaltered except **Condition No.11.0.**

2.0 The permission shall remain valid for a period of two (2) years from the date of issue of the letter.

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(आर. सुब्रमणियन)
खान सुरक्षा निदेशक,
भुवनेश्वर क्षेत्र

Annexure-XIV

Plantation inside ML area



Vertiver Plantation and Grass Turffing at Dump slope



Coirmatting at Dump-3



Annexure-XV

Kaliapani Chromite Mines. M/s Balasore Alloys Ltd

Details of Retaining Wall and Gabion wall at Mines

Environmental Measures	**Dump-1**	**Dump-2**	**Dump-3**
Retaining wall		116M×2M×1M	380M×1M×2M, 150M×1M×5M
Gabion wall	450M×30M×15-10M	…..	…….
Garland drain	224 M	116 M	830 M
Coirmatting	8500 Cum	5000 Cum	16500 Cum
Plantation	36190 nos	12000 nos	15750 nos
Grass Turffing	10200 Cum		
Settling Pit	Two nos 90 Cum & 192 Cum		Two nos 972 Cum & 288 Cum

Annexure-XV.A

Photos Showing Gabion wall and Retaining wall

Gabion wall at Dump-1

Retaining wall at dump-2

Retaining wall at dump-3

Annexure XVII

Kaliapani Chromite Mines/s Balasore Alloys Ltd

November,2017

ANALYSIS RESULTS OF SURFACE WATER

Sl. No.	Parameters	Unit	Standard as per IS-2296 Class-C	SW1	SW2	SW3
1	Colour,	Hazen	Colourless	Colourless	Colourless	Colourless
2	pH value	----	5.5-9.0	7.12	7.29	6.38
3	Iron (as Fe)	mg/l	3	0.59	0.76	0.64
4	Chloride (as Cl)	mg/l	$	20.7	19.6	24.2
5	Fluoride (as F)	mg/l	2.0	ND	ND	ND
6	Total Dissolved Solids	mg/l	$	68	74	76
7	Total Suspended Solids	mg/l	100	64	76	88
8	Manganese (as Mn)	mg/l	2	0.034	0.024	0.035
9	Sulfate (as SO_4)	mg/l	$	16.5	18.2	20.6
10	Nitrate (as NO_3)	mg/l	1.0	0.50	0.42	0.53
11	Phenolic Compounds (as C_6H_5OH)	mg/l	1.0	<0.001	<0.001	<0.001
12	Mercury (as Hg)	mg/l	0.01	<0.00001	<0.00001	<0.00001
13	Cadmium (as Cd)	mg/l	2.0	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr^{+6})	mg/l	0.1	0.020	0.016	0.030
15	Total Chromium (ac Cr)	mg/l	2.0	0.064	0.054	0.080
16	Selenium (as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic (as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide (as CN)	mg/l	0.2	<0.002	<0.002	<0.002
19	Lead (as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	5.0	<0.0001	<0.0001	<0.0001
21	Nickel (as Ni)	mg/l	3.0	0.28	0.22	0.34
22	Oil Grease	mg/l	10	ND	ND	ND
23	Free Ammonia (NH_3)	mg/l	5.0	0.36	0.28	0.19
24	Coliform Organism	MPN/100ml	$	136	119	152
25	Bio-assay Test	----	90% of survival of fish after 96 hours in 100% effluent	98%	98%	98%
26	Dissolved Oxygen as O_2	mg/l	$	5.6	6.2	6.4
27	BOD, 3 days at 27^0C	mg/l	30	2.4	2.2	2.0
28	COD	mg/l	250	7.2	6.8	7.0
29	Electrical Conductivity (EC), µmhos/cm	µmhos/cm	$	114	130	122
30	Phosphorus (as P)	mg/l	$	0.16	0.20	0.19

Note- ND-Not Detected, $-Not Specified .

February, 2018

Sl. No.	Parameters	Unit	Standard as per IS-2296 Class-C	SW1	SW2	SW3
1	Colour,	Hazen	Colourless	Colourless	Colourless	Colourless
2	pH value	----	5.5-9.0	7.35	7.64	7.95
3	Iron (as Fe)	mg/l	3	0.57	0.52	0.47
4	Chloride (as Cl)	mg/l	$	15.3	13.5	12.9
5	Fluoride (as F)	mg/l	2.0	0.08	0.14	0.11
6	Total Dissolved Solids	mg/l	$	67	73	78
7	Total Suspended Solids	mg/l	100	50	48	61
8	Manganese (as Mn)	mg/l	2	0.051	0.039	0.032
9	Sulfate (as SO_4)	mg/l	$	18.4	15.5	13.1
10	Nitrate (as NO_3)	mg/l	1.0	0.24	0.37	0.31

11	Phenolic Compounds (as C_6H_5OH)	mg/l	1.0	<0.001	<0.001	<0.001
12	Mercury (as Hg)	mg/l	0.01	<0.00001	<0.00001	<0.00001
13	Cadmium (as Cd)	mg/l	2.0	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr^{+6})	mg/l	0.1	0.018	0.026	0.030
15	Total Chromium (ac Cr)	mg/l	2.0	0.028	0.032	0.044
16	Selenium (as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic (as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide (as CN)	mg/l	0.2	<0.002	<0.002	<0.002
19	Lead (as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	5.0	<0.0001	<0.0001	<0.0001
21	Nickel (as Ni)	mg/l	3.0	0.23	0.36	0.32
22	Oil Grease	mg/l	10	ND	ND	ND
23	Free Ammonia (NH_3)	mg/l	5.0	0.18	0.11	0.13
24	Coliform Organism	MPN/100ml	$	128	119	135
25	Bio-assay Test	----	90% of survival of fish after 96 hours in 100% effluent	98%	98%	98%
26	Dissolved Oxygen as O_2	mg/l	$	7.1	6.3	5.5
27	BOD, 3 days at 27^0C	mg/l	30	2.2	2.5	2.3
28	COD	mg/l	250	5.4	5.9	6.2
29	Electrical Conductivity (EC), µmhos/cm	µmhos/cm	$	120	114	137
30	Phosphorus (as P)	mg/l	$	0.28	0.22	0.27

Note- ND-Not Detected, $-Not Specified .

SW1- Damsala Nala Near Chirigunia U/S ($21^0$02'39.1"N, 85^0 46'21.4"E)
SW2- Damsala Nala Near Chingudiapal D/S ($21^0$02' 8.8"N, $85^0$44'27.8"E)
SW3- Near Mine Boundary ($21^0$02'18.1"N, $85^0$45'33.2"E)

KALIAPANI CHROMITE MINES, M/S BALASORE ALLOYS LTD

VEHICULAR EMISSION REPORT

Sl. No.	Vehicle No.	Vehicle Make	Vehicle Model	CO (%)	HC (ppm)	NOx (%)	Smoke (HSU)
1	OD-04- B- 8779	MAN	HIWA	0.124	59	78.63	36.48
2	OD-04- E- 7537	MAN	HIWA	0.116	62	79.52	26.56
3	OD-04- E- 8594	MAN	HIWA	0.108	73	77.21	42.20
4	OD-04- E- 8592	MAN	HIWA	0.097	58	78.46	50.49
5	OD-04- B- 8781	MAN	HIWA	0.117	70	78.36	29.36
6	OD-04- B- 8780	MAN	HIWA	0.089	82	77.74	46.77
7	OD-04- E- 8589	MAN	HIWA	0.099	67	77.92	37.95
8	OD-04- E- 8590	MAN	HIWA	0.101	77	80.56	49.78
9	OD-04- E- 7536	MAN	HIWA	0.126	68	79.02	38.49
10	OD-04- G- 5855	MAN	HIWA	0.109	81	80.76	39.93
11	OD-04- E- 7535	MAN	HIWA	0.116	79	78.90	59.55
12	OD-04- B- 8776	MAN	HIWA	0.120	84	78.87	39.47
13	OD-04- B- 8778	MAN	HIWA	0.098	69	75.59	56.59
14	OD-04- B- 8782	MAN	HIWA	0.082	74	75.59	45.33
15	OD-04- E- 7537	MAN	HIWA	0.123	65	78.90	52.52
16	OD-04- E- 7535	MAN	HIWA	0.112	76	77.79	34.61
17	OD-04- E- 7534	MAN	HIWA	0.104	80	77.51	17.65
18	OD-04- E- 7533	MAN	HIWA	0.093	55	76.50	54.36
19	Water Tanker	--	--	0.135	87	78.22	36.39
20	Water Tanker	--	--	0.141	90	78.44	33.25
CPCB Standard				**3.0**	**1500**	**--**	**65**

PHOTOS SHOWING TRUCKS COVERED WITH TARPAULINE & WHEEL WASHNING SYTEM AT MINES

Annexure XVIII

Photos Showing ETP, STP & O& G Pit

Annexure-XIX

ETP: capacity 445 KLH

STP: 40KLD

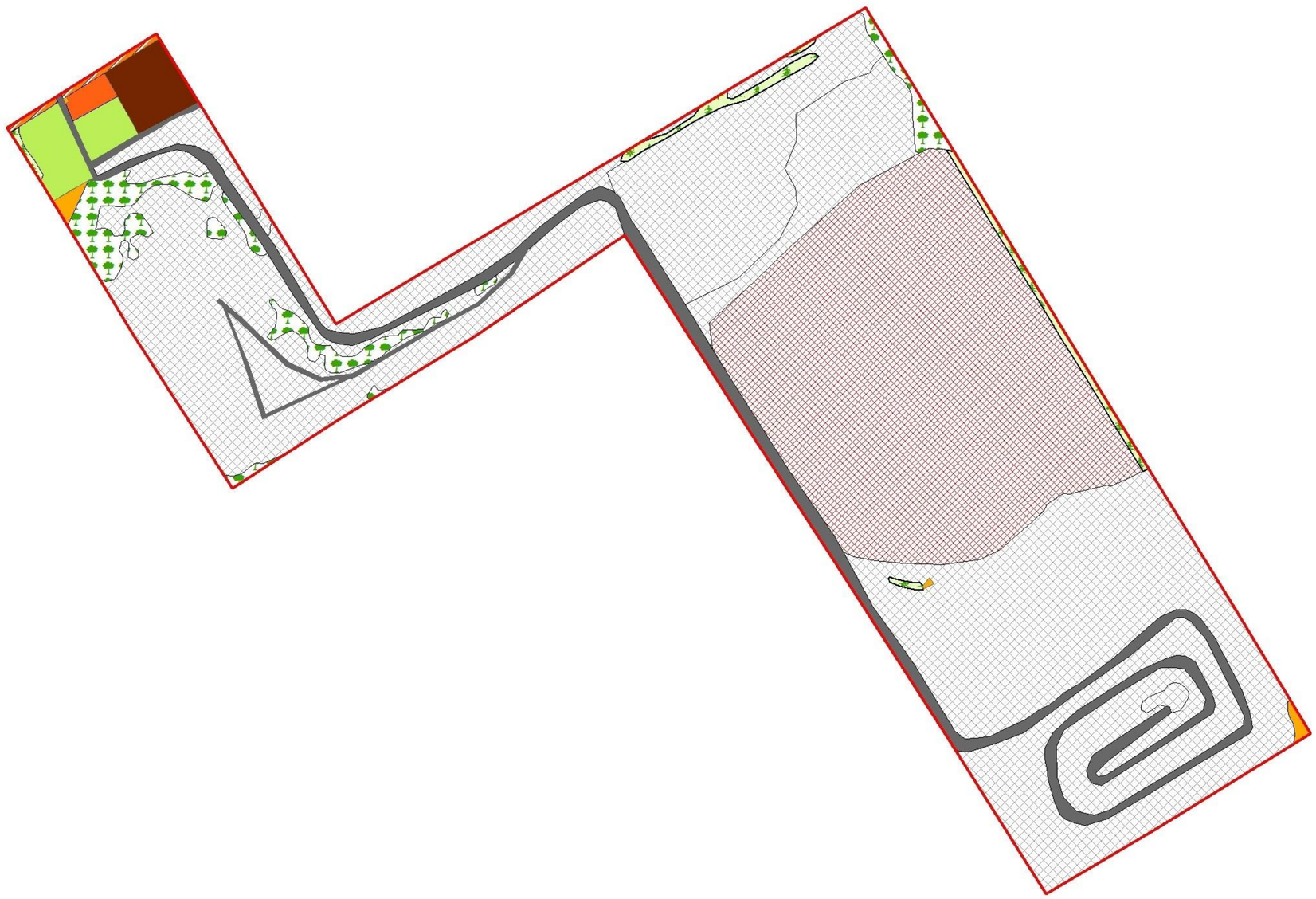
O& G Pit

Kaliapani Chromite Mines/s Balasore Alloys Ltd

Present land Use Breakup

Sl. No.	Component	Forest Land (Ha)	Non Forest land(Ha)
1	Area under mining	22.022	Nil
2	Storage for top soil	0	Nil
3	Waste dump site	35.173	Nil
4	Mineral storage	2.249	Nil
5	Infrastructure (workshop, administrative building, colony etc.	1.071	Nil
6	Hauling Road for Mining	0.342	….
7	Roads	….	0.344
8	Railways	0	Nil
9	Tailing pond	0.020	Nil
10	Effluent Treatment Plant	0.240	Nil
11	Mineral Separation Plant	0.702	Nil
12	Township area	0	Nil
13	Others (to specify) - Area towards south east side of dump – 3 and areas where green belt and garland drain has already been developed.(including Safety Zone)	2.300	Nil
Grand Total		**64.119**	**0.344**

LAND USE / LAND COVER MAP OF KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.



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SCALE - 1:5,000

Meters

100 50 0 100 200 300

LEGEND

- M.L.BOUNDARY
- SAFETY ZONE
- COBP
- ETP
- INFRASTRUCTURE
- MINING ROAD
- DUMP
- QUARRY
- SETTLING PIT
- PLANTATION OVER DUMP
- PLANTATION
- OTHER UTILITY AREA

For BALASORE ALLOYS LTD.

BACHCHAN KUMAR

President (Mines) & Constituted Attorney

BY E-MAIL

OFFICE OF THE DIVISIONAL FOREST OFFICER: CUTTACK FOREST DIVISION
GHATAKULA, NUAPADA, MADHUPATNA, CUTTACK-753010.
E-mail Id-dfo.cuttackforestdivision@yahoo.com, Fax-0671-2347611
No. 443 /
Dated, Cuttack 21 Th January, 2015..

To

The Vice President (Mine),
Kaliapani Chromite Mines,
M/s-Balasore Alloys Ltd., At/P.O.- Kaliapani, Dist-Jajpur.

Sub: - Site specific wildlife conservation plan in respect of Kaliapani Chromite mines of M/s Balasore Alloys Ltd. in Jajpur Dist. Odisha.

X-Sub:- Revision/modification of this office memo no.233 dt.12.01.2015.

Ref: - (i) Memo No.8478 dt.07.11.2014 of PCCF, (Wildlife) & Chief Wildlife Warden, Odisha to your address.
(ii) This office letter no.233 dt.12.01.2015.
(iii)Your letter no.1968 dt.20.01.2015.

Sir,

In inviting a reference to the subject cited above it is to inform you that the letter as issued vide this office no.233 dt.12.01.2015 is hereby revised /modified which should be read as follows and act accordingly.

The Site specific wildlife conservation plan in respect of Kaliapani Chromite mines of M/s Balasore Alloys Ltd. has been approved by the PCCF (Wildlife) & Chief Wildlife Warden, Odisha with the financial forecast of Rs.254.18 Lakh (Two Crore Fifty Fore Lakh Eighteen Thousand) only for the following activities.

(i)	For activities to be implemented in project area by the User Agency in Cuttack Forest Division.	Rs.64.82 Lakh
(ii)	For activities to be Implemented by DFO, Cuttack Division in project impact area	Rs 189.36 Lakh
	Grand Total-	**Rs 254.18 Lakh**

Hence you are requested to deposit an amount of **Rs 189.36 Lakh (Rupees One Crore Eighty Nine Lakh Thirty Six Thousand)** only through RTGS in either of the following Banks in the CAMPA fund.

1. Corporation Bank, Lodhi Complex Branch, New Delhi-110003 (RTGS/IFSC No. CORP0000371, **SB Account No. SB01025222**).
2. Union Bank of India, Sundar Nagar, New Delhi-110003 (RTGS/IFSC No. UBIN0534498, **SB Account No. 344902010105428**)

Further, you are requested to note the following conditions for future compliance.

i. This plan may be revisited after five years and the user agency will give undertaking to contribute towards the revised cost of the conservation plan till the project period, if any.
ii. The project proponent has to prepare and submit the Conservation Plan for the next ten years of their lease period (balance period of which forest land remains diverted) at least one year before the expiry of the present Conservation Plan and deposit the outlay amount upon its approval. In case of delay, the project operation will be automatically stopped.

Contd…2

Further , as regards the guidance sought by you for para (i) it is to inform you that an undertaking require to be furnished as per the memo no.8478 dt.07.11.2014 of the PCCF, (Wildlife) & Chief Wildlife Warden, Odisha communicated to your address.

Yours faithfully,

21/1/2015

Divisional Forest Officer,
Cuttack Forest Division

Memo No. 444 /dt. 21-01-2015.

Copy forwarded to Addl. Pr. Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o-the PCCF, Odisha for information and necessary action in continuation to this office memo no.234 dt.12.01.2015.

21/1/2015

Divisional Forest Officer,
Cuttack Forest Division

Memo No. 445 /dt. 21-01-2015.

Copy forwarded to Regional Chief Conservator of Forests, Angul Circle, Angul for favour of kind in continuation to this office memo no.234 dt.12.01.2015.

21/1/2015

Divisional Forest Officer,
Cuttack Forest Division

Memo No. 446 /dt. 21-01-2015.

Copy forwarded to PCCF (Wildlife) & Chief Wildlife Warden for information and necessary action in continuation to this office memo no.234 dt.12.01.2015.

21/1/2015

Divisional Forest Officer,
Cuttack Forest Division

Online Submission & Monitoring of Environmental, Forest and Wildlife Clearances -A Single Window Clearance System

14 Mar 2017 12:17:52 Logout

User Name: [Swarup]
State: [Orissa]
Role : [Applicant]

My Account | My Proposals Environment Clearance | My Proposals Forest Clearance | My Proposals Wildlife Clearance | Help

Online payment history made by User Agency under CAMPA

Help

Sno.	Proposal Detail	Application_No	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/OR/MIN/11934/2015 Kaliapani Chromite Mines, Village:Kaliapani,Tehsil: Sukinda, Dist. Jajpur , Odisha.	MIN119342015626	18 Nov 2016	**CA:** 23979700/- , **Addl CA :** 0/- **PCA:** 0/- , **CAT :** 0/- **Safety Zone:** 0/- , **Addl PA :** 0/- **NPV:** 0/- , **Site Specific Conservation Plan :** 18936000/- **Other Charges1 :** 0/- **Other Charges2 :** 0/- **Other Charges3 :** 0/- **Total :** 42915700/-	Paid	**Fund Demand Verified by Nodal Officer On** : 30 Dec 2016 **Bank Name** : Union Bank Of India **Mode of Payment** : NEFT/RTGS (Challan) **Challan Generated On** : 30 Dec 2016 **Transaction Date** : 23 Feb 2017	Demand Letter Generated Challan

BALASORE ALLOYS LIMITED

ISPAT

CIN-L27101OR1984PLC001354

Ref. No: BAL/ACCTS/
Date : 23 FEB 2017

The Chief Manager
State Bank of India
SME Branch
Balasore Industrial Estate Branch
Balasore

Dear Sir,

Sub: Payment Through RTGS/NEFT

Kindly arrange to transfer a sum of **Rs. 4,29,15,700/-** (Rupees Four Crore Twenty Nine Lac Fifteen Thousand Seven Hundred) only through RTGS/NEFT as per the details given below by debiting our CC a/c No. **30352334031** with you towards CA Scheme Charge and Site Specific Wildlife Management Plan.

Amount	:	**Rs. 4,29,15,700/-**
Account No	:	**CAMPAORMIN119342015626**
Name of Party	:	**ORRISA CAMPA**
Bank Name	:	**Union Bank Of India** **52, Sunder Nagar** **New Delhi - 110003**
IFSC/RTGS Code No	:	**UBIN0534498**

22 FEB 2017

Necessary bank charges also may please be debited to our above account under intimation to us.

Your kind co-operation in this regard shall be highly appreciated

Thanking you.

Yours faithfully
For BALASORE ALLOYS LTD.

AUTHORISED SIGNATORIES

Mob: 07381095938
UTR NO. SBINR520170223000 51...

4,29,15,700=00
Com. 57=50
4,29,15,757=50

R520170223000510 75 Ref - 724059 (EC)

OFFICE OF THE DIVISIONAL FOREST OFFICER: CUTTACK FOREST DIVISION
GHATAKULA: NUAPARA: CUTTACK

Memo 7581 /5F (Misc.)
Dated, Cuttack, the 2ND Spetemeber'2013

To

The Addl.Chief Conservator of Forests,
Forest Diversion and Nodal Officer, FC Act,
O/O-the Pr. Chief Conservator of Forests,
Odisha Bhubaneswar.

Sub: Implementation of Wildlife Management Plan in the Mining area at Project cost.

X-Sub: Payment of cost of Wildlife Management Plan in respect of lease for Chromite Mines of M/S Ispat Alloys now renamed as M/S Balasore Alloys Ltd.

Ref: Letter No.10F (Cons)-81/2004-6495/F&E Dt.23.03.2008 of Govt. of Orissa Forest & Environment Department & your office memo no.8664 Dt.02.05.2008.

As per the instruction contained in the above memo, the User Agency, M/S Balasore Alloys Ltd. Dist. - Jajpur was asked to submit the cost of Wildlife Management Plan to make payment towards cost of Wildlife Management Plan over 64.463 ha. (64.743 ha. mentioned in the demand notice which is a typographical error) of M.L area in respect of Kaliapani Chromite Mines. Accordingly the User Agency has deposited the cost of Wildlife Management Plan through RTGS in favour of *"Compensatory Afforestation Fund (CAF)-Orissa. Account No. C.A-25222 in Corporation Bank, Lodhi Road, New Delhi* amounting to Rs. 1289260 /- (Rupees twelve lakh eighty nine thousand two hundred sixty) only" and the copy of the receipt is sent herewith for favour of kind information and necessary action.

Encl: As above

Sd/-
DIVISIONAL FOREST OFFICER
CUTTACK FOREST DIVISION

Memo No._____/Dt.

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul for favour of kind information and necessary action.

Sd/-
DIVISIONAL FOREST OFFICER
CUTTACK FOREST DIVISION

Memo No. 7581 ***/Dt.*** 02-9-13

Copy forwarded to the Vice -President (Mines), M/S Balasore Alloys Pvt. Ltd., 199, Forest Park, Bhubaneswar for info5rmation and necessary action with reference to his letter No.BAL/MINES/716/2013 Dt.16.08.2013.

DIVISIONAL FOREST OFFICER
CUTTACK FOREST DIVISION

ANNEXURE-XXIV

CSR DETAIL 2017-18

Sl No	Activities	Amount in Rs
1	Construction of Community Mandap, Puja Mandap	226410
2	Contribution to College Bus	85800
3	Construction of Girls common room with toilet, Sukinda College	522793
5	Celebration of Van Mahotsav & saplings distribution	4940
6	Relief to fire tragedy affected villagers, Kamkhyanagar	34547
7	Operation & Maintenance of 4 water supply projects, Kaliapani,Ghagiashi,Chinghudipal & Bamanagar	74220
8	Water supply by tanker in summer, Sukinda	322787
9	Construction of Community Toilet, Kaliapani	144472
10	Swachhta Pakhwada Celebration	39749
11	Youth Festival – Sourik Yuva Mahotsav Contribution, Sukinda	200000
12	Contribution to Tribal cultural functions	66230
13	Tailoring Center for Women Skill development, Chirgunia	185639
14	Misc. Donations to SHGs, Youth Clubs, Govt. initiatives	182749
15	Construction of Bike/Cycle Stand, Tehsil Office, Sukinda	139153
16	Construction of Community Hall at Birsanagar, Kateni and Sagor	1995018
17	Baseline Survey for need assessment	500000
	Total	**4724507**

ANNEXURE-XXV

PERIOD- October 2017 to March 2018

, Kaliapani Chromite Mines M/s Balasore Alloys Limited

AMBIENT NOISE LEVEL

Sl.No	Location	Station Code	Values are in dB(A)											
			DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
Month			October'17		November'17		December'17		January'18		February'18		March'18	
1	Mines Office	ANL 1	43.9	30.6	44.9	32.8	45.2	31.8	46.0	32.0	46.0	32.0	46.0	31.0
2	Village Kaliapani	ANL 2	47.4	31.75	46.5	32.5	48.4	32.8	47.6	31.2	47.6	31.2	46.6	31.8
3	Village Sukrangi	ANL 3	44.7	31.05	44.4	29.9	43.4	29.85	44.4	30.9	44.4	30.9	46	31.2
4	Village Ransol	ANL 4	46.7	32.05	46.8	32.1	46.7	32.15	46.9	32.4	46.9	32.4	47.9	32
6	Village Tisco Hutting	ANL 5	46.5	33	47.15	33	47.95	33.6	48.2	32.7	48.2	32.7	47.4	31.7
WORK ZONE NOISE LEVEL														
1	O/C Quarry	WNL 1	65.6	60.95	65	61.8	65.7	64.8	65.7	62.2	65.65	62.2	66.1	62.7
2	Dumper Operation	WNL 2	70.2	66.05	68.3	63.7	67	67.7	66.9	66.0	66.9	66.0	67.3	66.2
3	Excavator Operation	WNL 3	70.9	66.8	71.1	67	70.85	67.1	69	67.1	69	67.1	70.4	65.8
4	DG Set	WNL 4	69.5	68.3	69.9	68.0	68.5	66.8	68.5	66.8	68.5	66.8	66.3	63.7
5	Electric Pump	WNL 5	65.1	60.8	65.5	61.0	65	65.7	65.1	60.8	65.05	60.8	67.5	61.7
6	Loading Point	WNL 6	65.8	64.7	67.6	63.7	68.2	60.8	65.8	64.7	65.8	64.7	68.9	65.7
7	COB Plant	WNL 7	67.6	64.3	67.2	62.7	65.3	63.4	67.6	64.3	67.6	64.3	65.0	60.7

Annexure-XXVI

Kaliapani Chromite Mines/s Balasore Alloys Ltd			
Details of Expenditure Made Towards Protection of Environment(Rupees in Lakh)			
Sl No.	**Activity**	**Sub-Activities**	**Expense**
1	Protection Measures for Water Pollution	Fixed type water sprinklers installation/maintenance	10.15
		Dry-fog system installation / maintenance	0.20
		Expenditure towards deployment of water tankers for water sprinkling including recurring expenditure	15
2	Dump Management	Construction /Maintenance of check dams, garlanding drain, Retaining wall and Gabbion wall	310
3	Plantation	Inside ML area Plantation(Dump slope, Safety zone incl maintenance)	2
		Out ML area plantation(Avenue & Block)	-
4	Protective Measures for Water Pollution	ETP Operation and Maintenance(Including chemical cost)	21.85
		ETP up gradation	96
		Surface Run Off Management	4.5
5	Training & Awareness	Training	0.10
		Awareness	0.10
6	Occupational Health & Hygiene	IME/PME	0.20
		Drinking Water facility	1.0
		Medicine/First aid	0.6
8	Environmental Monitoring	Water, Air, Soil & Noise	6.80
		Maintenance of Equipment	0.5
9	Other Expenses	Statutory Payment	0.66
Total			**469.6**

BALASORE ALLOYS LIMITED

CIN-L27101OR1984PLC001354

Ref No: BAL/Mines/4449

Dated: 04.09.2017

The Member Secretary,
State Pollution Control Board
Paribesh Bhawan,A/118
Nilakantha Nagar Unit-VIII
Bhubaneswar -751012

Sub: Submission of Environmental Statement in Form-V with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd for the financial year 2016-17.

Ref: *Consent to Operate Vide No No: 4712/IND_I-CON-2576 dated 17.3.2016 Consent Order No. 1239*

Dear Sir,

Please find enclosed herewith the Environmental Statement in Form - V for the financial year 2016-17 with respect to our Kaliapani Chromite Mines, M/S Balasore Alloys Ltd, Kaliapani, Jajpur,Odisha for your kind perusal.

Thanking you with regards

Yours faithfully
For M/s Balasore Alloys Ltd

Swarup Panda
Vice President (Corporate Affairs)
Encl: As above

Copy to: The Regional Officer,Kalinagnagar, OSPCB.

Received 4/9/17

No. Dt.
04 SEP 2017
S.P.C.B. BOARD
BHUBANESWAR-12

Kaliapani Chromite Mines, At/Po. : Kaliapani - 755047,Dist. : Jajpur, Odisha, Phone : 06726-268297/98, Fax : 06726-268520
E-mail : sukinda_mines@balasorealloys.com. ialmines@yahoo.com, Website : www.balasorealloys.com

Kaliapani Chromite Mines, M/s Balasore Alloys Ltd
Environment Statement For the Year 2016-17

FORM – V

(See rule 14)

Environmental Statement for the financial year ending with 31st March' 17

PART – A

i. Name and address of the owner/occupier of the industry/operation/process :

Mr Amarnath Dhar
Mines Manager
Kaliapani Chromite Mine,
M/s Balasore Alloys Ltd
At/PO:Kaliapani, Jajpur 755047
Odisha.
sukinda_mines@balasorealloys.com

ii. Industry category : Primary - Large
Secondary - Red

iii. Production category : Open Cast Chromite Mine

iv. Year of establishment : 2000

v. Date of the last Environmental Statement submitted: 26.9.2016

PART – B

Water and Raw Material Consumption:

i. Water consumption in m^3/day

Process (COB Plant): 220 M^3/Day

Cooling: Not Applicable

Domestic: 50 M^3/Day

Name of Products	Process water consumption per unit of products	
	During the current financial year(2015-16)	During the current financial year(2016-17)
Chrome Ore	No water is required for mining of chrome ore	
Chrome concentrate	2.07 KL/Ton	2.07 KL/Ton

For BALASORE ALLOYS LTD.

Authorised Signatory

ii. Raw material consumption: Raw material is consumed only in the C.O.B. Plant.

Name of raw materials*	Name of Products	Consumption of raw material per unit of output	
		During the current last financial year(2015-16)	During the current financial year(2016-17)
Low Grade Chrome Ore	Chrome Concentrate	2.918 MT	2.918 MT

* Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

PART – C

Pollution discharged to environment/unit of output:

(Parameter as specified in the consent issued)

Pollutants	Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharged (mass/volume)	Percentage of variation from prescribed standards with reasons
Water			
i. pH	7.6	7.76	-13.71%
ii. TSS	171106.6 mg	43.8 mg/L	-61.20%
iii. Cr^{6+}	88.94 mg	0.015 mg/L	-59.67%

For BALASORE ALLOYS LTD.

Authorised Signatory

Kaliapani Chromite Mines, M/s Balasore Alloys Ltd
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Air			
i. PM 10	-	60.86 µg/m^3 25.51 µg/m^3	-39..13% -57.48%
ii. PM 2.5		6.59 µg/m^3	-91.75%
iii. SO_2	-	12.39 µg/m^3	-84.50%
iv. NO_x	-	0.288 µg/m^3	-92.75 %
v. CO		5.85 µg/m^3	-96.75%
vi. O_3		26.26 µg/m^3	-93.43 %
vii. NH_3		0.32 µg/m^3	-93.59 %
viii. C_6H_6		0.3 µg/m^3	-70%
ix. Bap		0.20 µg/m^3	-79.98%
x. Pb		0.26 µg/m^3	-98.67
xi. NI		<0.1 µg/m^3	
xii. As			.....

PART – D

HARZARDOUS WASTES:

(As specified under Hazardous Wastes (Management & Handling Rules, 1989)

Hazardous Wastes	Total Quantity	
	During the previous financial year(2015-16)	During the current financial year(2016-17)
From Process i. Used oil	4400 Ltrs	6720 Ltrs
From Pollution Control Equipments (ETP sludge)	25.00 Metric Ton	38.97 Metric Ton

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PART – E

SOLID WASTES:

Solid Wastes	Total Quantity	
	During the previous financial year(2015-16)	During the current financial year(2016-17)
From Process i. Overburden ii. Tailing Pond Sludge	426602 M^3 **55200.769 Ton**	438060 M^3 51104.57 Ton
From Pollution Control Facility	Nil	Nil
Quantity recycled or reutilized within the unit	Nil	Nil

PART – F

Please specify the characteristics (in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes:

I. **Solid Waste:**

Overburden: Solid wastes in form of overburden and sludge of the tailing pond are generated during development of open cast mines and operation of Chrome Ore Beneficiation Plant. The overburden is being dumped on non-mineralized zone as per the mining plan approved by Indian Bureau of Mines.

Tailing Pond Sludge: The sludge of the tailing pond, after drying, are taken to the tailing dump, where these are dumped on a impervious platform made up of concrete and HDPE lining by providing retaining wall along the dump with settling pit and leachate collection pit. The collected run-off and leachate are diverted to the ETP for treatment with pumping arrangement.

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II. Hazardous Waste:

ETP Sludge: The sludge from the ETP has been disposed to Common Hazardous Waste treatment Storage Disposal facility (M/s Ramky) present at Jajpur, Odisha.

Used Oil: The used oil generated at mines collected in leak proof barrels and stored at hazardous waste yard and disposed to OSPCB authorized vendors as per the guidelines.

PART – G

In respect of the pollution abatement measures taken up on conservation of natural resources and on the cost of production

- To suppress the fugitive dust generation, regular sprinkling of water is being done on haul roads and transporting roads.
- The dead overburden dump surfaces are covered with intensive plantation. For treatment of mine discharge water, run-off water during rain an Effluent Treatment Plant is in operation.
- Regular maintenance of vehicle deployed at mines is going on for minimizing the noise generation and other emission. For the people in the noise prone areas protection equipments like ear muffs have been provided.
- Oil & Grease pit has been provided at vehicle washing center and after separation oil and grease has been stored at hazardous waste yard

PART – H

Additional measures/investment proposal for environmental protection including abatement of pollution:

- The dump slopes of the dead dumps will be covered with coir matting, grass turfing, grass development through seed dispersion and massive plantation.
- Hexavalent chromium content of the mine water is being/will be reduced by treatment of at ETP.
- All the surface runoff of mines has been channelized to ETP for treatment before disposing outside.
- Plantation at outside ML area and inside ML area.

PART – I

Any other particular for improving the quality of the environment

- Gabion wall is constructed at toe of dump-1 to arrest wash off from dump slope.
- Dump slope has been stabilized by plantation of Vertiver and installation of coirmat.
- Construction of wheel washing bay at mine gate to avoid chromite contamination of by the dust carried by wheels of trucks.

For BALASORE ALLOYS LTD.

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