

KLCM/ENV/ 277/2018

Date: 24.11.2018

To

**Dr. A.K. Gupta**  
**Joint Director(S)**  
Ministry of Environment, Forest & Climate change  
Govt. of India  
Eastern Regional Office  
Bhubaneswar

Sub: Six Monthly Compliance of conditions stipulated vide Environmental Clearance Letter No. J-11015/183/2007-IA-II(M) dt.13-05-09 of Kalarangiatta Chromite Mines of M/s. FACOR Ltd.

Dear Sir,

With reference to above stated Environmental Clearance letters, we are herewith submitting hard copies of six monthly compliance report of our Kalarangiatta Chromite Mines of M/s. FACOR Ltd. for the period from April, 2018 to September, 2018 for your kind perusal. The soft copy of the same has already been sent to your good Office through mail.

Thanking you,

Yours faithfully,  
for FERRO ALLOYS CORPORATION LTD.



**MINES MANAGER**

Encl: As above

Copy to: The Director, MOEF, New Delhi – for favor of kind information.

**Name of the Project: KALARANGIATTA CHROMITE MINES, M/S. FACOR LTD.**Project Code : **Mining (Non-Coal)**

Clearance Letter No. with date : J-11015/183/2007-IA-II (M) dated.13-05-2009

Period of Compliance Report : April, 2018 to September, 2018

**Specific Condition**

<b>Sl. No.</b>	<b>Condition</b>	<b>Compliance Status</b>
1.	All the conditions stipulated by the State Pollution control Board, Odisha in their consent to establish shall be effectively implemented.	All stipulated conditions are being effectively implemented.
2.	The environmental clearance is granted for opencast mining only. For the underground mining, the project proponent shall obtain separate clearance after getting the mine plan approval from the Indian Bureau of Mines.	Now opencast mining operation is going on. Before starting underground mining the project proponent will obtain separate clearance after getting mining plan approval from the Indian Bureau of Mines.
3.	The environmental clearance is subject to approval of the State Land purposes Dept. Govt. of Odisha for diversion of agricultural land for non-agricultural use.	Till date Agricultural land has not been used for non-agricultural use. Diversion of Agricultural land for non-agricultural use will be done after getting approval from the State Land use Dept., Govt. of Odisha.
4.	The Project proponent shall ensure that no natural watercourse and/or water resources are obstructed due to any mining operations. Adequate measures shall be taken for protection of Damsala Nallah and other seasonal channels, if any emanating from the mine lease, during the course of mining operation.	There is no natural water course or water resource obstructed due to the mining operation. Adequate measures have been taken before discharging the mines pumped out water to Damsala Nallah. Water is being treated in upgraded ETP with Ferrous sulfate depending upon the concentration of Cr <sup>+6</sup> to neutralize its effect before discharging out of the mine lease area.
5.	The top soil shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The top soil shall be used for land reclamation and plantation.	Total 1250 M <sup>3</sup> (1225 M <sup>3</sup> generated in 2018-19 & 25 M <sup>3</sup> previous Stock) of top soil has been used for land reclamation and plantation purposes.
6.	The overburden (OB) generated during the mining operation shall be stacked at earmarked dump site (s) only and it should not be kept active for a long period of time and their phase-wise stabilization shall be carried out. There shall be one external over burden dump having maximum projected height of 30m. Proper terracing of the OB dump maintained to 27°.	The OB generated during the mining operation is being stacked at earmarked dump site. The OB dump is not kept active for long period. Overall slope of the OB dump is being maintained below 30° in MCDR data base. Bottom inactive slope of the dump have been vegetated with native species to prevent erosion & surface run-off. Monitoring and management of rehabilitated areas of the dump have been continuing until the vegetation becomes self-sustaining.

	<p>The OB dump shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment &amp; Forests and its Regional Office located at Bhubaneswar on six monthly basis</p>	<p>Several precautions have been taken in the dump for its slope stabilization which are given below</p> <ol style="list-style-type: none"> <li>1. Dumping is being carried out in peripheral dumping method by using dozers. In this method the materials are compacted by running of vehicles as well as the dozer.</li> <li>2. The top surface is also maintained to avoid ponding of water which affect the stability of the dump.</li> <li>3. The overburden is stacked in bench form to ensure stability.</li> <li>4. The bench height is maintained at 10 – 15 mtrs.</li> <li>5. Various types of plants such as Acacia, Chakunda, Teak, Chhatian etc. have been planted in the inactive portions of the overburden dump.</li> <li>6. The overburden dump has been stabilized by tree plantation in the dead benches after carrying out suitable terracing of size 2 M × 1 M each.</li> <li>7. Grass patching has been developed on the dump slopes to ensure prevention of erosion of soil from the dump slopes due to rain water.</li> <li>8. Proper drainage system has already been maintained to prevent raincuts on the dump.</li> <li>9. Proper garland drain is being maintained all around the dump to collect the surface runoff during rain.</li> <li>10. Over the bench surface of the overburden dump yard longitudinal and transverse drains have been made to enable the water to flow to the settling pit through proper drainage system. This not only prevents erosion of overburden dump material but also ensure stability of overburden dump by preventing development of hydro static pressure inside the overburden dump and proper channelization of rain water for plantation purposes. As a result the generation of rain cut is very negligible.</li> <li>11. We have already planted 10919 Nos. of Saplings to stabilize this overburden dump.</li> <li>12. Garland drain &amp; retaining wall has been constructed all around the dump.</li> </ol>
7.	<p>Catch drains and siltation ponds of appropriate size shall be constructed for the working pit, soil, OB and mineral dumps to arrest flow of silt and sediment directly into the Damsala Nallah and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc.</p>	<p>Catch drains/garland drains of appropriate size has been constructed around the working pit, OB &amp; mineral dumps with siltation ponds at different intervals to arrest flow of silt &amp; sediments. Whenever required, the silts &amp; sediments have been cleaned. Mines pumped-out water is being used for dust suppression and plantation purposes.</p>

	<p>The drains should be regularly de-silted particularly after the monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and overburden dump to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years of data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.</p> <p>Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall/super cyclone period. A separate storm water sump for this purpose should be created.</p>	
8.	<p>Dimension of retaining wall at the toe of the overburden dump and the OB benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>About 1573 mtrs of retaining wall of width 1.5m and height 1.2m has been constructed at toe of the overburden dump to check run-off and siltation.</p>
9.	<p>Effluents containing Cr<sup>+6</sup> shall be treated to meet the prescribed standards before reuse/discharge. Effluent treatment plant should be provided for treatment of mine water discharge and wastewater generated from the workshop and mineral separation plant.</p> <p>Run off from the OB dump and other surface run off should be analysed for Cr<sup>+6</sup> and in case its concentration is found higher than the permissible limit the water should be treated before reuse/discharge.</p>	<p>An Effluent Treatment Plant has been in operation for treatment of mines discharge water. The concentration of Cr<sup>+6</sup> in treated discharged water is &lt;0.005 mg/l. The analysis report of mines final discharge water after treatment in ETP for the period from April, 2018 to September, 2018 is enclosed in <b>Annexure-1</b>.</p> <p>Small scale mining operation is being carried out with an Excavator &amp; 4 nos. of dumpers. Also the machineries &amp; vehicles belong to the Contractor. The repairing of these vehicles is being done at outside workshop only. There is no workshop and mineral separation plant.</p> <p>Surface runoff water samples were collected in a settling pit during rainy season and then pumped to the ETP for treatment before final discharge.</p> <p>Mine discharge water through pumping station is pumped to Flash Mixing Tank with ferrous sulfate (FeSO<sub>4</sub>) for reduction of Cr<sup>6+</sup> to Cr<sup>3+</sup>.</p> <p>The effluent is then distributed to Clari-flocculators &amp; the supernatant are passed into the Sand Filters.</p>

		Now, the filtered water shall be collected in Treated Water Tank and could be disposed off meeting standards stipulated by OSPCB or reused in plantation or haul roads dust suppression.
10.	Separate impervious concrete pits for disposal of sludge shall be provided for the safe disposal of sludge generated from the mining operations.	Sludge generated from mines contains Low Grade Chrome ore hence it has been stacked along with Low Grade Chrome ore for utilization.
11.	The project proponent shall ensure that the treated effluents conforming to the prescribed standards shall only be discharged.	The mines pumped out water directly collected in the intake tank of ETP through pipeline and then treated by adding FeSO <sub>4</sub> & NaOH dosing. The final treated water is being discharged to outside ML area, conforming to the prescribed standards. For analysis reports refer <b>Annexure-1</b> .
12.	Plantation shall be raised in an area of 12.715 ha. Including 7.5m wide green belt in the safety zone around the mining lease, overburden dump, roads etc. by planting the native species in consultation with the local DFO/Agriculture Dept. The density of the trees should be around 2500 plants per hect.	Till date 1624 Nos. and cumulative 10919 Nos. of saplings have been planted in the Safety Zone area around the Mining lease and inactive bottom slope of the dump. Native species has been planted in consultation with local Forest Dept.
13.	The void left unfilled in an area of 5.21 ha. shall be converted into the water body. The higher benches of the excavated void/mine pit shall be terraced and plantation done to stabilize the slopes. The slopes of higher benches shall be made gentler for easy accessibility by the local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.	The same will be implemented at the end of mining operation.
14.	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 & RSPM such as around crushing and screening plant, loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	All the parameters of ambient air quality are well within the prescribed limit. Although, regular water sprinkling is being carried out on haul roads, loading & unloading points to control the dust generation at source. There is no crushing and screening plant.
15.	Regular monitoring of water quality upstream and downstream of the Damsala nallah shall be carried out and record of monitored data should be maintained and	Monitoring of water quality upstream & downstream of the Damsala nallah is being carried out and record of monitoring data are being maintained.

	submitted to the Ministry of Environment & Forests, its Regional Office, Bhubaneswar, the Central Ground water Authority, the Regional Director, Central Ground water Board, the State Pollution control Board and the Central Pollution Control Board.	The test reports for the period April, 2018 to September, 2018 are enclosed as <b>Annexure-2</b> .
16.	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.	Garland drain water has been collected in pits and pond for recharge to ground water resources.
17.	Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers in and around the mining lease during the mining operation. The periodical 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 MoEF and its Regional Office, Bhubaneswar, the Central Ground Water Authority and the Regional Director, CGWB. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Monitoring of ground water level & quality is being carried out in and around the mining lease and the analysis report is enclosed as <b>Annexure-3 &amp; 3A</b> .
18.	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) for the project and effectively implement all the conditions stipulated therein.	NOC has been obtained from Central Ground Water Authority, Ministry of Water Resources, New Delhi vide letter no. 21-4/1457/OR/MIN/2017-1766 dated 12.09.2018 for ground water withdrawal. The stipulated conditions are being effectively implemented.
19.	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, CGWB.	Rain water has been collected in pits and pond for suitable rain water harvesting measures.
20.	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.	Vehicular emission of all machinery used in mining operations are being monitored regularly and kept under control by rigorous maintenance of all engines & changing of lubricants as per the recommendation of the manufacturer.

	The mineral transportation shall be carried out through the covered trucks only and vehicles carrying the mineral shall not be overloaded.	The HEMMs, with valid PUC certificate are allowed for operation inside the mines. Transportation of mineral has been done through covered trucks and also avoids overloading.
21.	Blasting operation shall be carried out only during the day time. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	At present, blasting operation has not been carried out. Excavation has been carried out by machines only.
22.	Drills shall either be operated with dust extractors or equipped with water injection system.	Drilling has not been done so far. In future, if drilling is required, then wet drilling practice will be adopted.
23.	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	Water spraying arrangement is being carried out on mineral handling area, loading & unloading areas to suppress dust generation.
24.	Sewage treatment plant shall be installed for the colony, ETP shall also be provided for the workshop and waste water generated during the mining operation.	As there is no colony inside lease area, so sewage treatment plant is not necessary. All the mining machineries have been engaged by contractor for mining operation and the maintenance work of their machines have been carried out at outside workshop. Therefore, question of workshop effluent does not arise. An ETP has been established for treatment of mines pumped out water and surface runoff water before discharge to outside leasehold area.
25.	Consent to operate shall be obtained from the State Pollution Control Board, Odisha before starting production from the mine.	Consent to Operate has been obtained from SPCB, Odisha before starting production from the mine. Mining operation has been going on with valid consent to operate obtained from SPCB vide their letter No. 2485/IND-I-CON-6318, Dtd.06-02-2016 for the period upto 31.03.2020.
26.	The project authorities should undertake sample survey to generate data on pre-project community health status within a radius of 1 km from proposed mine.	Sample survey for community health status within 1 Km radius from Project area has already been done.
27.	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 has already been carried out of the workers engaged in the project and the records are being maintained and periodical medical examination is carried out once in five years.
28.	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities	Housing for construction labor is not required, since the laborers are coming from nearby villages.

	<p>such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc.</p> <p>The housing may be in the form of temporary structures to be removed after the completion of the project.</p>	
29.	<p>The critical parameters such as SPM, RSPM, NOx, In the ambient air within the impact zone, peak particle velocity at 300 m distance or within the nearest habitation, whichever is closure shall be monitored periodically (atleast once a month). Further, quality of discharged water shall also be monitored (TDS, DO, pH, suspended particulate matter and Cr<sup>+6</sup>). The monitored data shall be uploaded on the website as well as displayed on a display board at a suitable location in public domain.</p>	<p>Parameters such as PM<sub>10</sub>, PM<sub>2.5</sub>, NOx &amp;SO<sub>2</sub> in the Ambient Air and Quality of discharge water are being monitored. The monitored data is being uploaded in the Company Website and display on a display board installed at the Mines main gate. Blasting operation has not been carried out. Hence peak particle velocity has not been monitored.</p>
30.	<p>The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely elephant etc. 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 Dept. All the safeguard measures brought out in the Wildlife Conservation Plan so prepared specific to this project site shall be effectively implemented. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the MoEF and its Regional Office, Bhubaneswar.</p>	<p>The endangered flora and fauna are not spotted in the study area. Hence, action plan for conservation for the same is not required.</p>
31.	<p>A final Mine Closure Plan along with details of Corpus Fund shall be submitted to the MoEF 5 years in advance of final mine closure for approval.</p>	<p>The same will be submitted in due time to MOEF for approval.</p>

## GENERAL CONDITIONS

<b>Sl. No.</b>	<b>Condition</b>	<b>Compliance Status</b>
1	No change in mining technology and scope of working should be made without prior approval of the MoEF.	The Mining technology & scope of working will not change without approval of Ministry of Environment & Forest.
2	No change in the calendar plan including excavation, quantum of mineral chromite ore and the waste shall be made.	The calendar plans including excavation, quantum of mineral chromite ore and waste overburden have not been changed. The calendar plan including excavation, quantum of mineral chromite ore and overburden generated during the period April, 2017 to March, 2018 is given in <b>Annexure-6</b> .
3	At least four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for RSPM, SPM, SO <sub>2</sub> , & NO <sub>x</sub> monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Ambient Air quality monitoring stations has already been established in consultation with SPCB.
4	Data on ambient air quality (RSPM, SPM, SO <sub>2</sub> & NO <sub>x</sub> ) should be regularly submitted to the MoEF including its Regional. Office located at Bhubaneswar and the state Pollution Control Board / Central Pollution Control Board once in six months.	Data on Ambient Air Quality Monitoring with respect to PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> & NO <sub>x</sub> are being carried out. The monitoring report for the period from April, 2018 to September, 2018 is enclosed as <b>Annexure-4</b> .
5	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Control of fugitive dust emission is being carried out by water spraying on haul roads, loading & unloading points and ore handling yard regularly.
6	Measures should be taken for control of noise levels below 85 dB (A) in the work environment. Workers engaged in operations of HEMM etc. should be provided with ear plugs/muffs.	Control measures such as maintenance of all machines including checking of silencers regularly, and changing of engine oil as per recommendation of the manufacturer has been carried out regularly. The workers engaged at noise generating areas are provided with ear plugs/muffs. The present noise level at work environment is below 85 dB (A). Sound pressure level at work environment is enclosed as <b>Annexure -5</b> .
7	Industrial waste water (Workshop & Waste water from the mine) should be properly collected, treated so as to conform to the	The Mines waste water is being collected directly in intake tank of the ETP for treatment of Cr <sup>+6</sup> and finally discharged to outside ML area.

	standards prescribed under GSR 422(E) Dtd. 19 <sup>th</sup> May, 1993 and 31 <sup>st</sup> December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	The analysis of this water shows that all parameters are well within the prescribed limit. The analysis report of mines final discharge water after treatment in ETP is given in <b>Annexure -1</b> . Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The repairing of these vehicles is being done at outside workshop by the contractor. Therefore, question of workshop effluent does not arise.
8	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	In addition to water spraying to suppress dust generation, workers engaged in dusty areas such as dumper drivers, HEMM Operators, are being provided with nose masks as a precautionary measure. Training & information on safety, health hazards are being given to all categories of deserved workers. Occupational health surveillance programme of all categories of workers and employees have been conducted periodically.
9	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 with qualified personnel and well equipped Environment Engineering Laboratory are functioning under the control of Senior Executive. Besides we are carrying out all Environmental monitoring & analysis through a MoEF & NABL accredited laboratory M/S Environmental Research and Services (India) Pvt. Ltd., Bhubaneswar & the monitoring reports are enclosed in Annexures.
10	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 MoEF and its Regional Office located at Bhubaneswar.	Separate funds provision is made to carryout environmental protection measures. Details of expenses for Environmental protection measures during the year 2017-18 and proposed budgeted amount for the year 2018-19 are given in <b>Annexure-7</b> .
11	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.	The date of final approval of the Project is 04.10.2010 by DMS and 23-01-2012 by SPCB.
12	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.	The project authorities will extend full co-operation to the officers of the Regional office by furnishing the requisite data/ information/ monitoring reports.

13	<p>The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the MoEF, its Regional Office, Bhubaneswar, CPCB, and SPCB, The project proponent shall upload the status of compliance of the environment clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, MoEF, Bhubaneswar.</p>	<p>Implementing the conditions stipulated in the Environmental Clearance letter. The report on Status of compliance of the Environmental Clearance conditions have been submitted to the concerned authorities and the same is being uploaded in our website.</p>

**ANALYSIS REPORT OF EFFLUENT WATER SAMPLE  
(For May-2018)****Date: 12 June 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Sampling : 18.05.2018  
Sample Collected by : Representative of ERS (I) Pvt.  
Ltd. Sample Collected in presence of : Representative of the client  
Sample Received on : 22.05.2018  
Analysis Started On : 24.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature:  
Sampling Location Specification : EWQ1- Mines Final Discharge Water after Treatment in ETP

Sl.	Parameters Analysed	Unit	Permissible Limit As per G.S.R. 422(E) dated 19.05.1993	Result
				EWQ-1
01	Colour	Hazen	5.0	<5.0
02	Odour	--	Agreeable (A)	A
03	Suspended Solids	mg/L	100.0	24.0
04	pH value	No.	5.5 – 9.0	7.39
05	Temperature	°C	Shall not exceed 5°C above the receiving water temperature	NOT APPLICABLE
06	Oil & Grease	mg/L	10.0	<1.0
07	Total Residual Chlorine	mg/L	1.0	Nil
08	Ammonical Nitrogen (as N)	mg/L	50.0	0.05
09	Total Kjeldahl Nitrogen (as NH <sub>3</sub> )	mg/L	100.0	0.42
10	Free Ammonia (as NH <sub>3</sub> )	mg/L	5.0	Nil
11	BOD @ 27°C 3Days	mg/L	30.0	1.80



12	COD	mg/L	250.0	19.60
13	Arsenic (as As)	mg/L	0.2	ND
14	Mercury (as Hg)	mg/L	0.01	ND
15	Lead (as Pb)	mg/L	0.1	ND
16	Cadmium (as Cd)	mg/L	2.0	ND
17	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.1	<0.03
18	Total Chromium (as Cr)	mg/L	2.0	0.05
19	Copper (as Cu)	mg/L	3.0	ND
20	Zinc (as Zn)	mg/L	5.0	ND
21	Selenium (as Se)	mg/L	0.05	ND
22	Nickel (as Ni)	mg/L	3.0	ND
23	Cyanide (as CN)	mg/L	0.2	ND
24	Fluoride (as F)	mg/L	2.0	0.68
25	Dissolved Phosphates (as P)	mg/L	5.0	2.14
26	Sulphide (as S)	mg/L	2.0	<0.1
27	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	1.0	ND
28	Manganese (as Mn)	mg/L	2.0	ND
29	Iron (as Fe)	mg/L	3.0	2.43
30	Vanadium (as V)	mg/L	0.2	ND
31	Nitrate Nitrogen	mg/L	10.0	0.8
32	Particle Size of Suspended Solids	--	shall pass 850 micron IS Sieve	Passed 850 micron IS Sieve
33	Bio-assay Test	--	90% survival of fish after 96 hrs in 100% effluent	93% Survival of fish after 96 hrs in 100% effluent
34	Dissolved Oxygen	mg/L	--	4.4
35	Total Coliform	MPN/100 ml	--	16.0

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
**Tech. Manager**



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF EFFLUENT WATER SAMPLE (For Aug-2018)

Page 1 of 2

ULR-TC7440180-00000012P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/50

Name and Address of the Customer	:	Kalarangiatta Chromite Mines of M/S FACOR LTD
Date of Sampling	:	24-25.08.2018
Sample Collected by	:	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	:	Representative of the client
Sample Received on	:	27.08.2018
Analysis Started on	:	28.08.2018
Analysis Completed on	:	04.09.2018
Method of Sampling	:	IS 3025: Part 1: 1987, Reaffirmed 2014
Quantity of Sample	:	2ltrs
Type of Container	:	Glass Bottle & HDPE Bottle
Environment Condition	:	All Tests carried out in Room Temperature:
Sampling Location Specification	:	ERSIPL/WA/662
		EWQ1- Mines Final Discharge Water after Treatment in ETP

Sl.	Parameters Analysed	Unit	Permissible Limit As per G.S.R. 422(E) dated 19.05.1993	Result
				ERSIPL/ WA/662
01	Colour	Hazen	5.0	<5.0
02	Odour	--	Agreeable (A)	A
03	Suspended Solids	mg/L	100.0	<10.0
04	pH value	No.	5.5 – 9.0	7.62
05	Temperature	°C	Shall not exceed 5°C above the receiving water temperature	NOT APPLICABLE
06	Oil & Grease	mg/L	10.0	<10.0
07	Total Residual Chlorine	mg/L	1.0	Nil
08	Ammonical Nitrogen (as N)	mg/L	50.0	0.86



GSTIN : 21AAACE6224D1ZE



# Environmental Research and Services (India) Pvt. Ltd.



(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Page 2 of 2

09	Total Kjeldahl Nitrogen (as NH <sub>3</sub> )	mg/L	100.0	1.8
10	Free Ammonia (as NH <sub>3</sub> )	mg/L	5.0	0.2
11	BOD @ 27°C 3Days	mg/L	30.0	3.4
12	COD	mg/L	250.0	20.80
13	Arsenic (as As)	mg/L	0.2	ND
14	Mercury (as Hg)	mg/L	0.01	ND
15	Lead (as Pb)	mg/L	0.1	ND
16	Cadmium (as Cd)	mg/L	2.0	ND
17	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.1	<0.1
18	Total Chromium (as Cr)	mg/L	2.0	1.24
19	Copper (as Cu)	mg/L	3.0	ND
20	Zinc (as Zn)	mg/L	5.0	ND
21	Selenium (as Se)	mg/L	0.05	ND
22	Nickel (as Ni)	mg/L	3.0	ND
23	Cyanide (as CN)	mg/L	0.2	ND
24	Fluoride (as F)	mg/L	2.0	0.54
25	Dissolved Phosphates (as P)	mg/L	5.0	0.42
26	Sulphide (as S)	mg/L	2.0	<0.1
27	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	1.0	ND
28	Manganese (as Mn)	mg/L	2.0	ND
29	Iron (as Fe)	mg/L	3.0	0.26
30	Vanadium (as V)	mg/L	0.2	ND
31	Nitrate Nitrogen	mg/L	10.0	0.1
32	Particle Size of Suspended Solids	--	shall pass 850 micron IS Sieve	Passed 850 micron IS Sieve
33	Bio-assay Test	--	90% survival of fish after 96 hrs in 100% effluent	97% Survival of fish after 96 hrs in 100% effluent
34	Dissolved Oxygen	mg/L	--	5.4
35	Total Coliform	MPN/100 ml	--	8.0

ND - Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanavak**  
Tech.Manager



## ANALYSIS REPORT OF SURFACE WATER SAMPLE (For May-2018)

**Date: 12 June 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Sampling : 18.05.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client.  
Sample Received on : 22.05.2018  
Analysis Started On : 24.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature  
Sampling Location Specification : SWQ1- Damsala nallah up-stream water (100 mtr up)  
SWQ2- Damsala nallah down-stream water (100 mtr down)  
(with impact of other mines discharge)

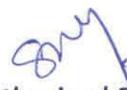
Sl.	Parameters Analysed	Unit	Permissible Limit As per IS-2296 class "C"	Result	
				SWQ-1	SWQ-2
01	pH value	No.	6.5 – 8.5	7.60	7.27
02	Dissolved Oxygen	mg/L	4.0 (min)	4.4	4.0
03	BOD @ 27°C 3Days	mg/L	3.0	4.0	9.0
04	Total Coliform	MPN/100 ml	5000.0	450.0	580.0
05	Colour	Hazen	300.0	5-10	10-15
06	Fluoride (as F)	mg/L	1.5	0.58	1.14
07	Cadmium (as Cd)	mg/L	0.01	ND	ND
08	Chlorides (as Cl)	mg/L	600.0	7.71	7.71
09	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.05	0.08	0.14
10	Cyanide (as CN)	mg/L	0.05	ND	ND



11	Total Dissolved Solids	mg/L	1500.0	252.0	268.0
12	Selenium (as Se)	mg/L	0.05	ND	ND
13	Sulphates (as SO <sub>4</sub> )	mg/L	400.0	92.9	100.0
14	Lead (as Pb)	mg/L	0.1	ND	ND
15	Copper (as Cu)	mg/L	1.5	ND	ND
16	Arsenic (as As)	mg/L	0.2	ND	ND
17	Iron (as Fe)	mg/L	50.0	3.37	3.17
18	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	0.005	ND	ND
19	Zinc (as Zn)	mg/L	15.0	ND	ND
20	Insecticides	mg/L	Absent	Absent	Absent
21	Anionic detergents (as MBAS)	mg/L	1.0	ND	ND
22	Oil & Grease	mg/L	0.1	<0.10	<0.10
23	Nitrate (as NO <sub>3</sub> )	mg/L	50	ND	ND

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P.Pattanayak**  
**Tech.Manager**



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF SURFACE WATER SAMPLE (For Aug-2018)

Page 1 of 2

ULR-TC7440180-00000013P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/51

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Sampling : 24-25.08.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client  
Sample Received on : 27.08.2018  
Analysis Started on : 28.08.2018  
Analysis Completed on : 04.09.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature Sampling  
Location Specification :

ERSIPL/WA/663

SWQ1- Damsala nallah up-stream water (100 mtr up)

ERSIPL/WA/664

SWQ2- Damsala nallah down-stream water (100 mtr down)  
(with impact of other mines discharge)

Sl.	Parameters Analysed	Unit	Permissible Limit As per IS-2296 class "C"	Result	
				ERSIPL/ WA/663	ERSIPL/ WA/664
01	pH value	No.	6.5 – 8.5	7.13	7.46
02	Dissolved Oxygen	mg/L	4.0 (min)	6.1	7.3
03	BOD @ 27°C 3Days	mg/L	3.0	5.4	6.8
04	Total Coliform	MPN/100 ml	5000.0	380.0	460.0
05	Colour	Hazen	300.0	5-10	10-15
06	Fluoride (as F)	mg/L	1.5	0.54	0.68
07	Cadmium (as Cd)	mg/L	0.01	ND	ND
08	Chlorides (as Cl)	mg/L	600.0	11.57	9.64



GSTIN : 21AAACE6224D1ZE



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09	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.05	0.06	0.08
10	Cyanide (as CN)	mg/L	0.05	ND	ND
11	Total Dissolved Solids	mg/L	1500.0	98.4	185.1
12	Selenium (as Se)	mg/L	0.05	ND	ND
13	Sulphates (as SO <sub>4</sub> )	mg/L	400.0	19.1	46.7
14	Lead (as Pb)	mg/L	0.1	ND	ND
15	Copper (as Cu)	mg/L	1.5	ND	ND
16	Arsenic (as As)	mg/L	0.2	ND	ND
17	Iron (as Fe)	mg/L	50.0	1.98	2.26
18	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	0.005	ND	ND
19	Zinc (as Zn)	mg/L	15.0	ND	ND
20	Insecticides	mg/L	Absent	Absent	Absent
21	Anionic detergents (as MBAS)	mg/L	1.0	ND	ND
22	Oil & Grease	mg/L	0.1	<0.10	<0.10
23	Nitrate (as NO <sub>3</sub> )	mg/L	50	2.4	2.8

ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager

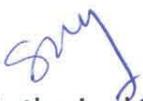


**GROUND WATER LEVEL, DEPTH FROM SURFACE**

**(For May-2018)**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 18-19.05.2018  
Monitoring carried by : ERSIPL's representative  
Monitoring carried in presence of : Client's representative

Sl. No.	Location	Depth (bgL in meter)
01	Tube well water near TISCO main gate	10.74
02	Tube well inside the lease hold area	7.62
03	Tube well water of Ransol	8.53
04	Tube well water of Kalarangiatta	12.65
05	Tube well water of Bhimtangar	19.86
06	Open well village Goramian	6.91
07	Tube well near OMC labour colony	13.34
08	Open well village Chingudipal	5.33
09	Open well village Kusumundia	5.94

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
**Tech.Manager**



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## GROUND WATER LEVEL, DEPTH FROM SURFACE

(For Aug-2018)

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 24-25.08.2018  
Monitoring carried by : ERSIPL's representative  
Monitoring carried in presence of : Client's representative

Sl. No.	Location	Depth (bgL in meter)
01	Tube well water near TISCO main gate	7.67
02	Tube well inside the lease hold area	1.58
03	Open well water of Ransol	1.04
04	Tube well water of Kalarangiatta	7.82
05	Tube well water of Bhimtangar	11.68
06	Open well village Goramian	2.85
07	Tube well near OMC labour colony	11.33
08	Open well village Chingudipal	1.37
09	Open well village Kusumundia	3.12

  
(Authorized Signatory)

.....END OF TEST REPORT.....

S.P.Pattanayak  
Tech.Manager



Test Report Format No.: ERSIPL/FM/40

**ANALYSIS REPORT OF GROUND WATER SAMPLE  
(For May-2018)**

Page 1 of 2

**Date: 12 June 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Sampling : 18-19.05.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client  
Sample Received on : 22.05.2018  
Analysis Started On : 24.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature:  
Sampling Location Specification : GWQ1- Tube well water near TISCO main gate  
GWQ2- Tube well inside the lease hold area  
GWQ3- Tube well water of Ransol  
GWQ4- Tube well water of Kalarangiatta  
GWQ5- Tube well water of Bhimtangar

Sl	Parameters Analysed	Unit	Permissible Limit as per IS:10500, 2012	Result				
				GWQ1	GWQ2	GWQ3	GWQ4	GWQ5
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A	A
04	Turbidity	NTU	1.0	0.1	0.1	0.1	0.1	0.1
05	pH	No	6.5 to 8.5	6.83	7.42	6.55	6.52	7.06
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	149.48	188.36	80.8	161.60	141.40
07	Total Iron	mg/L	0.3	0.23	0.16	0.11	0.71	0.15
08	Chloride	mg/L	250.0	17.35	11.57	11.57	13.49	7.71
09	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil	Nil
10	Total Dissolved Solids	mg/L	500.0	179.3	259.0	102.5	198.0	155.3
11	Calcium as Ca	mg/L	75.0	12.95	27.52	6.47	16.19	16.19
12	Magnesium as Mg	mg/L	30.0	28.46	29.04	15.70	29.43	24.52
13	Copper	mg/L	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese	mg/L	0.1	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO <sub>4</sub>	mg/L	200.0	<1.0	<1.0	5.2	1.5	2.0
16	Nitrate as NO <sub>3</sub>	mg/L	45.0	1.2	2.5	1.6	2.6	1.8
17	Fluoride	mg/L	1.0	0.34	0.72	0.44	<0.02	<0.02



18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1	<0.1
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.88	0.04	0.50	0.34	0.21
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	116.0	184.0	84.0	140.0	124.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND	ND

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P.Pattanayak**  
**Tech.Manager**



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For Aug-2018)

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ULR-TC7440180-00000011P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/49

Name and Address of the Customer	:	Kalarangiatta Chromite Mines of M/S FACOR LTD
Date of Sampling	:	24-25.08.2018
Sample Collected by	:	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	:	Representative of the client
Sample Received on	:	27.08.2018
Analysis Started on	:	28.08.2018
Analysis Completed on	:	04.09.2018
Method of Sampling	:	IS 3025: Part 1: 1987, Reaffirmed 2014
Quantity of Sample	:	2ltrs
Type of Container	:	Glass Bottle & HDPE Bottle
Environment Condition	:	All Tests carried out in Room Temperature
Sampling Location Specification	:	
ERSIPL/WA/657		GWQ1- Tube well water near TISCO main gate
ERSIPL/WA/658		GWQ2- Tube well inside the lease hold area
ERSIPL/WA/659		GWQ3- Open well water of Ransol
ERSIPL/WA/660		GWQ4- Tube well water of Kalarangiatta
ERSIPL/WA/661		GWQ5- Tube well water of Bhimtangar

Sl	Parameters Analysed	Unit	Permissible Limit as per IS:10500, 2012	Result				
				ERSIPL/WA/657	ERSIPL/WA/658	ERSIPL/WA/659	ERSIPL/WA/660	ERSIPL/WA/661
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A	A
04	Turbidity	NTU	1.0	0.8	0.9	0.6	0.7	0.9
05	pH	No	6.5 to 8.5	6.67	7.47	6.12	6.37	6.84
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	156.8	198.0	86.24	192.08	160.72
07	Total Iron	mg/L	0.3	0.42	0.16	0.07	0.08	0.07
08	Chloride	mg/L	250.0	28.92	17.35	26.99	21.21	32.78
09	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil	Nil
10	Total Dissolved Solids	mg/L	500.0	227.0	289.0	150.6	242.0	243.0
11	Calcium as Ca	mg/L	75.0	21.99	32.14	7.85	23.56	21.99



GSTIN : 21AAACE6224D1ZE



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Ref. No. ....

Date.....

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12	Magnesium as Mg	mg/L	30.0	24.81	28.65	16.22	32.45	25.77
13	Copper	mg/L	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese	mg/L	0.1	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO <sup>2-</sup> 4	mg/L	200.0	6.1	5.7	5.6	6.8	10.4
16	Nitrate as NO <sub>3</sub>	mg/L	45.0	2.40	1.46	2.02	2.80	2.46
17	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1	<0.1
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1	<0.1
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.19	0.04	0.48	0.36	0.52
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	120.0	200.0	32.0	140.0	124.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND	ND

ND - Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 19 May 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 26-27.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-37<sup>o</sup>C/27<sup>o</sup>C

### Sample ID. No.

1. ERSIPL/AA/396
2. ERSIPL/AA/397
3. ERSIPL/AA/394
4. ERSIPL/AA/395

### Locations (Core Zone)

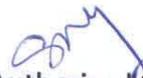
1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. *Near One Plot Area*

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/396	ERSIPL/AA/397	ERSIPL/AA/394	ERSIPL/AA/395
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	93.09	85.33	76.90	87.70
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	40.84	47.10	46.33	43.26
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.63	<6.0	<6.0	6.42
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	20.84	12.41	20.46	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 19 May 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 26-27.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-37<sup>o</sup>C/27<sup>o</sup>C

### Sample ID. No.

1. ERSIPL/AA/396
2. ERSIPL/AA/397
3. ERSIPL/AA/394
4. ERSIPL/AA/395

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. *Near one pit Area*

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009t	Results*			
					ERSIPL/AA/396	ERSIPL/AA/397	ERSIPL/AA/394	ERSIPL/AA/395
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



**TEST REPORT (AMBIENT AIR)**

**Date: 19 May 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the Client.  
 Date of Sampling/Monitoring : 27/28/29.04.2018  
 Sample Received on : 02.05.2018  
 Analysis Started On : 03.05.2018  
 Analysis Completed on : 14.05.2018  
 Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
 Quantity of Sample : 01 sample for each parameter  
 Environment Condition : Sunny, Temp-37<sup>o</sup>C/25<sup>o</sup>C

**Sample ID. No.**

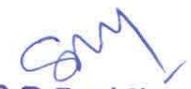
**Locations (Buffer Zone)**

- |                   |                            |
|-------------------|----------------------------|
| 1. ERSIPL/AA/398  | 1. Near Village Bhimtangar |
| 2. ERSIPL/AA/401  | 2. Near Village Ransol     |
| 3. ERSIPL/AA/403B | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/399  | 4. Near Village Godisahi   |
| 5. ERSIPL/AA/400  | 5. Near Village Baragaji   |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*				
					ERSIPL/AA/398	ERSIPL/AA/401	ERSIPL/AA/403B	ERSIPL/AA/399	ERSIPL/AA/400
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sub>3</sub>	100.0	66.72	86.97	85.42	76.68	83.44
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sub>3</sub>	60.0	35.00	44.84	41.65	49.44	53.57
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sub>3</sub>	80.0	7.73	7.84	6.48	13.76	8.04
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sub>3</sub>	80.0	10.79	12.66	15.24	15.00	18.82
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sub>3</sub>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

  
 (As Per Prad Signature)  
**Tech. Manager**

END OF TEST REPORT



## TEST REPORT (AMBIENT AIR)

Date: 19 May 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 27/28/29.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-37<sup>0</sup>C/25<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/398
2. ERSIPL/AA/401
3. ERSIPL/AA/403B
4. ERSIPL/AA/399
5. ERSIPL/AA/400

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*				
					ERSIPL/AA/398	ERSIPL/AA/401	ERSIPL/AA/403B	ERSIPL/AA/399	ERSIPL/AA/400
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

S.P. Pattanayak  
Tech. Manager

  
(Authorized Signatory)



## TEST REPORT (AMBIENT AIR) (For May-2018)

**Date: 12 June 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the Client.  
 Date of Sampling/Monitoring : 18-19.05.2018  
 Sample Received on : 22.05.2018  
 Analysis Started On : 28.05.2018  
 Analysis Completed on : 04.06.2018  
 Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
 Quantity of Sample : 01 sample for each parameter  
 Environment Condition : Sunny, Temp-35<sup>0</sup>C/26<sup>0</sup>C

**Sample ID. No.**

**Locations (Core Zone)**

- |                 |                                     |
|-----------------|-------------------------------------|
| 1. ERSIPL/AA/C1 | 1. Near Office Building             |
| 2. ERSIPL/AA/C2 | 2. Near ETP                         |
| 3. ERSIPL/AA/C3 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/C4 | 4. Near Ore Plot Area               |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/C1	ERSIPL/AA/C2	ERSIPL/AA/C3	ERSIPL/AA/C4
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	79.33	83.74	97.56	64.18
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	39.24	44.25	51.77	30.62
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.0	10.49	9.67	<6.0
4	Nitrogen Oxide (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	<9.0	21.30	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

  
 (Authorized Signatory)  
**S.P. Pattanayak**  
 Tech. Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 18-19.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35°C/26°C

### Sample ID. No.

1. ERSIPL/AA/C1
2. ERSIPL/AA/C2
3. ERSIPL/AA/C3
4. ERSIPL/AA/C4

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

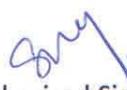
### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/C1	ERSIPL/AA/C2	ERSIPL/AA/C3	ERSIPL/AA/C4
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 17-18.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny/Rainy, Temp-36<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/B1
2. ERSIPL/AA/B2
3. ERSIPL/AA/B3
4. ERSIPL/AA/B4
5. ERSIPL/AA/B5

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/AA/B1	ERSIPL/AA/B2	ERSIPL/AA/B3	ERSIPL/AA/B4	ERSIPL/AA/B5
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	79.68	58.57	63.19	50.69	52.50
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	38.88	23.27	28.08	23.16	28.71
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	8.74	6.17	10.82	<6.0	7.96
4	Nitrogen Oxide (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	<9.0	20.32	<9.0	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 17-18.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny/Rainy, Temp-36<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/B1
2. ERSIPL/AA/B2
3. ERSIPL/AA/B3
4. ERSIPL/AA/B4
5. ERSIPL/AA/B5

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/AA/B1	ERSIPL/AA/B2	ERSIPL/AA/B3	ERSIPL/AA/B4	ERSIPL/AA/B5
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 20-21.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-40<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

### Locations (Core Zone)

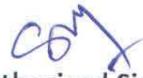
- |                  |                                     |
|------------------|-------------------------------------|
| 1. ERSIPL/AA/535 | 1. Near Office Building             |
| 2. ERSIPL/AA/536 | 2. Near ETP                         |
| 3. ERSIPL/AA/537 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/538 | 4. Near Ore Plot Area               |

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/535	ERSIPL/AA/536	ERSIPL/AA/537	ERSIPL/AA/538
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	95.37	94.83	78.92	82.36
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	39.67	25.19	30.78	23.43
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.06	<6.0	7.54	<6.0
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	<9.0	10.65	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattansyak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 20-21.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-40<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/535
2. ERSIPL/AA/536
3. ERSIPL/AA/537
4. ERSIPL/AA/538

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A A/535	ERSIPL/ AA/536	ERSIPL/ AA/537	ERSIPL/ AA/538
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol – I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 21-24.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-36<sup>0</sup>C/23<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/539
2. ERSIPL/AA/540
3. ERSIPL/AA/541
4. ERSIPL/AA/542
5. ERSIPL/AA/543

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

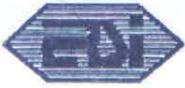
Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/AA/539	ERSIPL/AA/540	ERSIPL/AA/541	ERSIPL/AA/542	ERSIPL/AA/543
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	92.98	87.52	97.58	85.23	89.51
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	41.09	34.61	44.90	43.09	48.05
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.90	6.92	9.35	7.05	8.92
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	9.17	18.28	15.08	9.40	11.22
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



# Environmental Research and Services (India) Pvt. Ltd.

## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 21-24.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-36<sup>0</sup>C/23<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/539
2. ERSIPL/AA/540
3. ERSIPL/AA/541
4. ERSIPL/AA/542
5. ERSIPL/AA/543

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

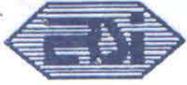
Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/AA/539	ERSIPL/AA/540	ERSIPL/AA/541	ERSIPL/AA/542	ERSIPL/AA/543
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

**Date: 11 Aug 2018****Test Report No: ERSIPL/TR/AA/13**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 26-27.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-34<sup>0</sup>C/25<sup>0</sup>C

**Sample ID. No.****Locations (Core Zone)**

- |                  |                                     |
|------------------|-------------------------------------|
| 1. ERSIPL/AA/605 | 1. Near Office Building             |
| 2. ERSIPL/AA/606 | 2. Near ETP                         |
| 3. ERSIPL/AA/607 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/608 | 4. Near Ore Plot Area               |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/605	ERSIPL/AA/606	ERSIPL/AA/607	ERSIPL/AA/608
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	81.70	79.88	82.57	81.55
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	34.33	32.11	34.98	36.12
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	8.20	6.86	8.09	7.23
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	10.88	10.70	9.93	10.93
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/13N

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 26-27.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-34<sup>o</sup>C/25<sup>o</sup>C

### Sample ID. No.

1. ERSIPL/AA/605
2. ERSIPL/AA/606
3. ERSIPL/AA/607
4. ERSIPL/AA/608

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A A/605	ERSIPL/ AA/606	ERSIPL/ AA/607	ERSIPL/ AA/608
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/14

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 27-28.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-33°C/24°C

### Sample ID. No.

1. ERSIPL/AA/609
2. ERSIPL/AA/610
3. ERSIPL/AA/611
4. ERSIPL/AA/612
5. ERSIPL/AA/613

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/AA/609	ERSIPL/AA/610	ERSIPL/AA/611	ERSIPL/AA/612	ERSIPL/AA/613
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	75.63	74.55	69.82	78.24	72.54
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	29.96	27.31	26.74	35.36	27.27
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.84	7.91	7.87	6.61	6.31
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	9.12	<9.0	10.25	9.55	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/14N

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 27-28.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-33<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/609
2. ERSIPL/AA/610
3. ERSIPL/AA/611
4. ERSIPL/AA/612
5. ERSIPL/AA/613

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*				
					ERSIPL/A A/609	ERSIPL/ AA/610	ERSIPL/ AA/611	ERSIPL/ AA/612	ERSIPL/ AA/613
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol – I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

(Authorized Signatory)

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.



(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

ULR-TC7440180-00000014P

Pg No: 1 of 1

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/AA/35

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 23-24.08.2018  
Sample Received on : 27.08.2018  
Analysis Started on : 28.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny/Rainy, Temp-34°C/25°C

### Sample ID. No.

1. ERSIPL/AA/669
2. ERSIPL/AA/670
3. ERSIPL/AA/671
4. ERSIPL/AA/672

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/669	ERSIPL/AA/670	ERSIPL/AA/671	ERSIPL/AA/672
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	71.49	78.48	70.31	72.05
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	26.09	25.82	26.79	32.04
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.87	8.26	8.16	7.60
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	10.69	12.64	12.43	13.12
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

(Authorized Signatory)

.....END OF TEST REPORT.....

S.P.Pattanayak  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

Pg No: 1 of 1

**Date: 10 Sep 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 23-24.08.2018  
Sample Received on : 27.08.2018  
Analysis Started on : 28.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny/Rainy, Temp-34<sup>o</sup>C/25<sup>o</sup>C

**Sample ID. No.**

1. ERSIPL/AA/669
2. ERSIPL/AA/670
3. ERSIPL/AA/671
4. ERSIPL/AA/672

**Locations (Core Zone)**

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/669	ERSIPL/AA/670	ERSIPL/AA/671	ERSIPL/AA/672
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	μg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		μg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		μg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		μg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures Note:  
ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

S.P. Pattana  
Tech. Manager



Certificate No. : TC-7440



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

ULR-TC7440180-00000015P

Pg No: 1 of 1

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/AA/36

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 22-25.08.2018  
Sample Received on : 27.08.2018  
Analysis Started on : 28.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy/Sunny, Temp-33°C/26°C

**Sample ID. No.**

1. ERSIPL/AA/673
2. ERSIPL/AA/674
3. ERSIPL/AA/675
4. ERSIPL/AA/676
5. ERSIPL/AA/677

**Locations (Buffer Zone)**

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*				
					ERSIPL/AA/673	ERSIPL/AA/674	ERSIPL/AA/675	ERSIPL/AA/676	ERSIPL/AA/677
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed-2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	70.08	69.82	74.68	81.69	69.53
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01, Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	36.09	29.90	30.19	33.65	32.20
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	8.79	8.09	7.15	7.93	6.31
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	10.82	15.58	13.29	14.60	9.44
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

  
(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

Pg No: 1 of 1

**Date: 10 Sep 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 22-25.08.2018  
Sample Received on : 27.08.2018  
Analysis Started on : 28.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy/Sunny, Temp-33<sup>0</sup>C/26<sup>0</sup>C

**Sample ID. No.**

1. ERSIPL/AA/673
2. ERSIPL/AA/674
3. ERSIPL/AA/675
4. ERSIPL/AA/676
5. ERSIPL/AA/677

**Locations (Buffer Zone)**

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*				
					ERSIPL/AA/673	ERSIPL/AA/674	ERSIPL/AA/675	ERSIPL/AA/676	ERSIPL/AA/677
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene(BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT

S.P. Pattanayak  
Tech ..



GSTIN : 21AAACE6224D1ZE



# Environmental Research and Services (India) Pvt. Ltd.



(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

ULR-TC7440180-00000045P

Pg No: 1 of 1

Date: 03 Oct 2018

Test Report No: ERSIPL/TR/AA/48

Name and Address of the Customer	:	Kalarangiatta Chromite Mines of M/S FACOR LTD.
Sample Collected by	:	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	:	Representative of the Client.
Date of Sampling/Monitoring	:	12-13.09.2018
Sample Received on	:	17.09.2018
Analysis Started on	:	18.09.2018
Analysis Completed on	:	25.09.2018
Method of Sampling	:	IS 5182 : Part 5 : 1975, Reaffirmed 2014
Quantity of Sample	:	01 sample for each parameter
Environment Condition	:	Sunny, Temp-35°C/26°C

### Sample ID. No.

1. ERSIPL/AA/720
2. ERSIPL/AA/721
3. ERSIPL/AA/722
4. ERSIPL/AA/723

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/720	ERSIPL/AA/721	ERSIPL/AA/722	ERSIPL/AA/723
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	72.50	73.00	74.72	63.86
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	36.46	32.39	31.77	30.07
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	<6.0	<6.0	7.74	6.78
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	12.03	10.43	12.25	12.36
5	Carbon Monoxide (CO)*	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

Pg No: 1 of 1

**Date: 03 Oct 2018**      **Test Report No: ERSIPL/TR/AA/48T**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 12-13.09.2018  
Sample Received on : 17.09.2018  
Analysis Started on : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35°C/26°C

### Sample ID. No.

1. ERSIPL/AA/720
2. ERSIPL/AA/721
3. ERSIPL/AA/722
4. ERSIPL/AA/723

### Locations (Core Zone)

1. Near Office Building
2. Near ETP
3. At Middle of the Opencast Quarry
4. Near Ore Plot Area

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/720	ERSIPL/AA/721	ERSIPL/AA/722	ERSIPL/AA/723
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures Note:  
ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

ULR-TC7440180-00000046P

Pg No: 1 of 1

Date: 03 Oct 2018

Test Report No: ERSIPL/TR/AA/49

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 13-14.09.2018  
Sample Received on : 17.09.2018  
Analysis Started on : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35<sup>0</sup>C/26<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/724
2. ERSIPL/AA/725
3. ERSIPL/AA/726
4. ERSIPL/AA/727
5. ERSIPL/AA/728

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results				
					ERSIPL/AA/724	ERSIPL/AA/725	ERSIPL/AA/726	ERSIPL/AA/727	ERSIPL/AA/728
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed-2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	78.94	72.04	74.79	62.68	69.15
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01, Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	26.59	26.46	31.95	34.87	28.55
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.65	7.26	<6.0	6.28	<6.0
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	13.65	10.37	12.36	13.65	13.68
5	Carbon Monoxide (CO)*	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

(Authorized Signatory)

**S.P. Pattanayak**  
Tech. Manager

.....END OF TEST REPORT.....



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

Pg No: 1 of 1

Date: 03 Oct 2018

Test Report No: ERSIPL/TR/AA/49T

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 13-14.09.2018  
Sample Received on : 17.09.2018  
Analysis Started on : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35°C/26°C

### Sample ID. No.

1. ERSIPL/AA/724
2. ERSIPL/AA/725
3. ERSIPL/AA/726
4. ERSIPL/AA/727
5. ERSIPL/AA/728

### Locations (Buffer Zone)

1. Near Village Bhimtangar
2. Near Village Ransol
3. Near Kaliapani Township
4. Near Village Godisahi
5. Near Village Baragaji

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*				
					ERSIPL/AA/724	ERSIPL/AA/725	ERSIPL/AA/726	ERSIPL/AA/727	ERSIPL/AA/728
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND	ND
7	Benzo(a)Pyrene(BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

(Authorized Signatory)

**S.P. Pattanayak**  
Tech. Manager

.....END OF TEST REPORT



**NOISE LEVEL MEASUREMENT REPORT**  
**(For May-2018)**

**Date: 12 June 2018**

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD

Date of Monitoring : 18.05.2018

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of the client.

Sl. No	Location	Result in dB (A)	
		Day Time (6.00 A. M. – 10.00 P.M.)	Night Time (10.00 P.M. – 6.00 A.M.)
1	Near Middle of the quarry	74.3	60.2
2	Ambient Near Office	52.6	45.8

**Ambient Noise Level Standards**

Area Code	Category of Area / Zone	Limits in dB(A)	
		Day Time (6.00 a.m. to 10.00 p.m.)	Night Time (10.00 p.m. to 6.00 a.m.)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P.Pattanayak**  
**Tech.Manager**



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Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

## NOISE LEVEL MEASUREMENT REPORT (For Aug-2018)

Date: 10 Sept 2018

Name and Address of the Customer : Kalarangiatta Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 24.08.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client

Sl. No	Location	Result in dB (A)		
		Day Time (6.00 A. M. – 10.00 P.M.)	Night Time (10.00 P.M. – 6.00 A.M.)	
1	Ambient	Near Middle of the quarry	36.8	30.1
2		Near Office	42.5	31.9

### Ambient Noise Level Standards

Area Code	Category of Area / Zone	Limits in dB(A)	
		Day Time (6.00 a.m. to 10.00 p.m.)	Night Time (10.00 p.m. to 6.00 a.m.)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

.....END OF TEST REPORT.....

  
(Authorized Signatory)

S.P.Pattanayak  
Tech.Manager

**CALENDAR PLAN INCLUDING EXCAVATION, QUANTUM OF MINERAL  
CHROMITE AND WASTE GENERATED DURING THE PERIOD 2017-2018 IN  
OUR KALARANGIATTA CHROMITE MINES**

SL. NO.	MATERIALS	CALENDER PLAN PER ANNUM	QUANTITY GENERATED DURING THE PERIOD FROM APRIL, 2017 TO MARCH, 2018
01.	CHROME ORE	50,000 TONNES	49,893.463 TONNES
02.	WASTE OVER BURDEN	1,45,000 M <sup>3</sup>	93,354 M <sup>3</sup>

**DETAILS OF EXPENDITURE INCURRED ON ENVIRONMENTAL PROTECTION MEASURES DURING THE YEAR 2017-18 AND PROPOSED BUDGETED AMOUNT FOR THE YEAR 2018-19 BY KALARANGIATTA CHROMITE MINES**

<b>Sl. No.</b>	<b>I T E M</b>	<b>Expenses during the Year 2017-18 (in Rs.)</b>	<b>Proposed budgeted amount for the year 2018-19 (in Rs.)</b>
1.	<b>AFFORESTATION</b>		
	a. Seedlings @ Rs.56/- each	1,21,240	1,30,000
	b. Fertilizer/Insecticide/Cow-dung @ Rs.11/- each	23,815	25,200
	c. Digging of Pits/Planting @ Rs.24/- each	51,960	60,000
	d. Post Plantation care @ Rs. 114/- (Watering, Weeding, basin making etc.)	2,46,810	2,60,00
	e. Supervising & watchman	3,22,585	3,27,000
	<b>Sub-Total</b>	<b>7,66,410</b>	<b>8,02,200</b>
2.	<b>WATER MANAGEMENT &amp; TREATMENT</b>		
	a. ETP Operation & Maintenance (including costs of chemical & Manpower)	11,00,000	12,00,000
	b. Power Consumption	1,77,918	2,00,000
	c. Sludge disposal	29,000	30,000
	d. Water sample analysis	72,216	40,000
	<b>Sub-Total</b>	<b>13,79,134</b>	<b>14,70,000</b>
3.	<b>DUST SUPPRESSION &amp; AIR MONITORING</b>		
	a. Water spraying at dust generating points by water tanker around 205 days in a year @ Rs.817/- per trip costing 5 trips per day (5 × 817 × 205)	8,37,425	9,00,000
	b. Environmental monitoring (Air monitoring charges) & analysis by M/S Environmental Research and Services (India) Pvt. Ltd., Bhubaneswar.	2,71,872	2,10,000
	<b>Sub-Total</b>	<b>11,09,297</b>	<b>11,10,000</b>
	<b>Grand Total</b>	<b>Rs.32,54,841/-</b>	<b>Rs.33,82,200/-</b>
		<b>≈Rs. 32.5 Lacs</b>	<b>≈Rs. 33.8 Lacs</b>