

Ferro Alloys Corporation Ltd.

(A subsidiary of Vedanta Ltd.)



Dated: 30.05.2022

OCM/ENV/ 960 /2022

To,

The Joint Director(s)
Ministry of Environment, Forest & Climate Change,
Eastern Regional Office,
Bhubaneswar

Sub.: Submission of Six-monthly compliance report to the conditions stipulated in the grant order of Environmental Clearance (EC) pertaining to Ostapal Chromite Mines of M/s FACOR LTD.

Ref.: MoEF EC Letter No.: J-11015/38/2006-IA II(M) dtd.06-12-2006

Dear Sir,

With reference to the captioned subject & cited reference, we are herewith submitting six monthly compliance reports pertaining to Ostapal Chromite Mines of M/s FACOR Ltd for the period from October'2021 to March'2022 for your kind perusal.

The Monthly & quarterly Environmental monitoring data for the period October'2021 to Mar'2022 comprising AAQ, Water, Noise & Soil are enclosed herewith as Annexures.

This is for your Kind information & necessary action.

Thanking You

Yours faithfully, for Ferro Alloys Corporation LTD

MINES MANAGER

Encl.: A/a

Name of the Proæct **②OSTAPALCHROMITEMINES, M/S.FACORLTD.**

Proæct Code ②Mining ②Non-Coal
②

Clearance Letter No. With date ®No.№11015/38/2006-IA-II ®M®dt.06-12- 2006

Period of Compliance Report

	Specific Condition						
SI.	Condition	Compliance Status					
No. 1.	All the conditions stipulated by the State Pollution control Board, in their	All the stipulated conditions are being effectively implemented.					
	Consent to establish should be effectively implemented.	implemented.					
2.	Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 4.07 hectares forest land shall be obtained before starting mining operation in that area. Till such time mining activities shall be restricted to an area of 64.354 ha for which in principle forestry clearance has been obtained from the Ministry on 03.10.2005	This area is left as Safety Zone area for greenbelt around periphery of forest land of M.L. area and mining operations in this area will not be done.					
_		Plantation In Safety Zone					
3.	Topsoil should be stacked properly with proper slope at earmarked site(s)	No topsoil has been generated during the period Oct'2021 to March '2022.					
	with adequate measures and should	Watch 2022.					
	be used for reclamation and						
	rehabilitation of mined out area.						
4.	Over burden shall be stacked at earmarked dump site(s) only and should not be kept active for long period. The total height of the dump(s) should not exceed 45m in three stages of 15 m each, keeping overall slope of the dumps below 28°. The proponent shall carry out slope	The inactive benches are being vegetated by suitable native specie and massive grass plantation to prevent erosion & surface runoff. The management of the rehabilitated areas of the dumps has been continuing until the vegetation becomes self-sustaining. Further, in the weaker zone/part of the dump is being covered with Geo-textile to prevent erosion & to make it stable by planting the native species scientifically as follows:					
	stability study and submit report to the Ministry. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be taken for stabilization of the dump						
	Monitoring and management of	f					

rehabilitated areas should continue until the vegetation becomes self - sustaining.

Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.



Plantation in Dump

5. Trace Metals such as Ni,Co,As, and Hg should be analyzed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards, then with prior approval of MOEF this specific monitoring could be discontinued.

Collection and analysis of dust & soil samples is done, and the test reports are enclosed in **Annexure No.1**.

6. Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, plantation etc. The drains should be regularly de -silted and maintained properly.

Garland drain (size, gradient and length) shall be constructed for both mine pit & waste dump and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.

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.

Catch drains around OB dumps and mineral stockyard have already been constructed with siltation ponds at regular intervals to arrest silt and sediments. Whenever required the silts and sediments are being cleaned from catch drains and siltation ponds and maintained regularly. Mine pumped out water is sufficient for dust suppression and plantation purposes. Hence catch drain water is dis-charging outside M.L. area through ETP process. Hence there is no need for collection of water from catch drains from mine area, roads, plantation etc.

Garland drains of width 2m, depth 1.5m and length 3424 m with gradient have been constructed for maximum discharge of rainfall in the adjoining areas.

There is no chance of flow of storm water into the effluent treatment plant during high rain fall/super cyclone period became the plant is at high reduced level (RL). Hence storm water return system is not required.



Garland Drain with Chec Dam

7. Dimensions of retaining wall at the toe of OB dumps & benches within the mine to check run -off and siltation should be based on the rain fall data.

Retaining wall of width 1.5m and height 1.2m has already been constructed all around the toe of dumps up to a length of 3424 m to check the run -off and siltation.



Retaining Wall

8. Effluents containing of Cr +6 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.

Run off from OB dumps and other surface run off should be analyzed for Cr +6 and in case its concentration is found higher than the permissible limit the water should be treated before reuse/discharge.

An Effluent Treatment Plant is operating for treatment of Mines discharge water. The conc. of Cr^{+6} in treated discharge water is <0.05mg/l.



ETP Outlet Cr²⁶ conc. data

The tailing water (waste water of mineral separation plant) also is being treated by adding FeSO₄ before discharge into tailing pond. The treated tailing pond water is being collected in an intake pond and being re -used in beneficiation plant. Thus, zero discharge from Beneficiation Plant is being maintained.

Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few nos. of vehicles. The major repairing of these vehicles is being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil.

The total surface runoff water is being collected in settling pond which are pumped to the ETP for treatment before final discharge.

 Separate impervious concrete pits for disposal of sludge shall be provided for the safe disposal of sludge generated from the mining operations. Separate impervious pit has been provided for sludge generated from the treatment of effluent water through ETP.

- 10. the quality of decanted effluents from the tailing pond confirm to the prescribed standards before discharge.
- The Project proponent shall ensure that The effluents from tailing pond are not discharged outside. The supernatant water of the tailing pond is being collected in a sump adjacent to the tailing pond and re-circulated in Beneficiation Plant.
- The Project proponent shall explore 11. possibility to concentration of Cr +6 in the tailing pond in consultation with an Expert Scientific Institution like NEERI.

The Conc. of Cr +6 in tailings is being reduced by adding FeSO₄ solution and disposed in the tailing pond.

Further, NIT, Rourkela has been engaged for carrying out the study & to provide suitable technology to reduce the Cr+6. This study is under process.

Plantation shall be raised in an area of 12. 33.02 Ha including green belt in an area of 6.56 Ha by planting native species around ML area, OB dumps, and roads around worked out area etc. in consultation with DFO/Agriculture Department . The density of the trees should be around 2000 plant species per hectare.

Plantation has been done over inactive/dead benches of OB dumps. Roadside, around C.O.B. Plant and other places in an area of 34.92 Ha. Plantation is being carried out in consultation with local Forest Department.



Plantation in Benches of the Inactive/dead dump



Plantation along the haul road

13. Regular monitoring of ground water level & quality should be carried out by establishing a network of existing wells and constructing piezometers during the mining operation. The monitoring should be carried out four times in a year- premonsoon (April -May), monsoon (August), post - monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground Water Board.

Monitoring of ground water level & quality is being carried out by third party accredited agency.

Further, DWLR with telemetry system fitted in Piezometer holes to carried out the real time monitoring of Ground water level.



The Monitoring reports has been sent & the monitoring report for the period from Oct'2021 to Mar'2022 is enclosed as:

Ground water level & Quality : Annexure No.-2 & 3

14. The project proponent shall carry out regular monitoring of ground water quality in all the 14 wells. The frequency of monitoring in 8 wells where concentration of Cr⁺⁶ is within permissible limits, will be quarterly while in the remaining 6 wells it will be on monthly basis.

The monitoring test reports of ground water quality in 14 wells have been analyzed & concentration of Cr +6 are within the limit. Copy enclosed as **Annexure No.** - **2.**

15. Project Authorities should meet water requirement of the peripheral village(s), especially, if the village wells go dry due to mine de watering.

As a part of peripheral development nos. of borewell have been constructed in nearby villages and also potable water is being provided to nearby villages by water tankers.

Reading of the abstraction structures, used for water supply to local community are enclosed for reference as **Annexure No. 5**





Water provided to near y village y tangers

16. Permission from the competent authority should be obtained for drawl of ground water for domestic use.

NOC has been obtained from Central Ground Water Authority, Ministry of Water Resources, New Delhi vide NOC No.: CGWA/NOC/MIN/REN/1/2021/6481.

17.	Suitable rain water harvesting measures on long-term basis shall be planned and implemented in consultation with Regional Director, CGWB.	Rainwater has been collected in different structures for suitable rain water harvesting measures. Rooftop Rain-Water Harvesting Garland drain
18.	Drills should be wet operated or operated with dust extractors.	Wet Drilling is being practiced.
19.	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. To mitigate measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting operation is being carried out in day time only. Controlled blasting is being practiced by following Nonel & muffle blasting. Delay detonators are used for providing delay timings between rows and within rows of holes. Numbers of rows in a blast are restricted to less than three to get good fragmentation and to reduce fly rocks and ground vibration.
20.	The voids created at the end of mining shall be converted into water Body with shallow depths not exceeding 30m. The higher benches of the excavated void/mine pit shall be terraced and plantation done to stabilize the slopes. Peripheral fencing shall be done along the excavated area.	The same will be implemented at the end of mining operation. It has already been prepared in Mining Plan & submitted to IBM, Bhubaneswar
21.	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.	Vehicular emission of all machinery used in mining operations are being monitored regularly and kept under control of rigorous maintenance of all engines and changing of lubricants as per the recommendation of the manufacturer. HEMMs have valid PUC Certificate which is only allowed for operation inside the Mines. All the transporting vehicles are being covered with tarpaulin and over loading are strictly avoided.
22.	Consent to operate should be obtained from SPCB before enhancing Production capacity of the mine.	Consent to operate has been obtained from SPCB, Bhubaneswar CTO has been enclosed for as Annexure No6

23. Sewage treatment Plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from Mining operations.

Two nos. of STP have been installed. One is 20 KLD & another capacity is 10 KLD. All domestic wastewater generated point connected with STP and being treated there.





10 KLD STP Near Office

20 KLD STP Near Dispensary

Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. Of vehicles. However, major repairing of the vehicles are being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil. An ETP has already been established for treatment of mines water.





Effluent Treatment Plant

24. A final mines closure plan along with details of corpus fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

The same will be submitted in due time to MOEF for approval.

GENERAL CONDITIONS2

SI. No.	Condition	Compliance Status
1	No change in mining technology & sco working should be made without approval of the MoEF.	The Mining technology & scope of working has not been changed.
2	No change in the calendar plan includi excavation, quantum of mineral Chromi and waste should be made.	The calendar plan including excavation, quantum of mineral Chromite and waste over burden has not been changed. The calendar plan including excavation, quantum of mineral chromite and waste over burden has been generated during the period (April 2021 to March, 2022) is given in Annexure No7 .
3	Conservation measures for protection of flora & fauna in the Core & Buffer Zone should be drawn up in consultation with local forest & wildlife department.	As per the advice of Forest Department, we are maintaining vehicles, watchman and infrastructural facility as measures to protect Flora & Fauna in core & buffer zone. Further, Biodiversity study & Wildlife Management study has been conducted by accredited agency.
4	Four ambient air quality -monitoring stations should be established in the Core zone as well as in the Buffer zone for RPM, SPM, SO ₂ & NO x monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.	Ambient Air quality monitoring stations has already been established in consultation with SPCB. Ambient Air Quality Monitoring System
5	Data on ambient Air Quality (RPM, SPM, SO ₂ & NO _x) should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.	Monitoring report for the period Oct'2021 to March'2022 is enclosed as follows:

Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading & unloading and at transfer points should be provided and properly maintained.

Control of fugitive dust emissions is being carried out by water spraying on haul roads, Ore handling yard, loading and unloading points regularly. The test report of the same is enclosed as Annexure No.-10.



Water springling in haul road

7 Measures should be taken for control of Control measures such as maintenance of all machines including environment.

muffs.

noise levels below 85 dB (A) in work checking of silencers regularly, controlled blasting using delay detonators, installing immovable machinery on foundations with Workers engaged in operations of HEMM, suitable rubber pad and closed rooms is being followed -up. The etc. should be provided with ear plugs workers engaged at noise generating areas are allowed to work on rotation basis with providing earplugs/muffs.

Location wise noise level at work environment is enclosed as Annexure No. -11.

Industrial wastewater (workshop should be installed before discharge of Mar'2022 is enclosed as Annexure No.-12. workshop effluents.

8

& The Mines wastewater is being pumped out directly in to the wastewater from the Mine) should be intake tank of the ETP for treatment of Cr+6 and part of the properly collected, treated so as to treated water is used for plantation, dust suppression and surplus conform to the standards prescribed treated water is finally discharged to outside ML area. The under GSR 422 (E) dated 19th May 1993 analysis of this water shows that all parameters are well within and 31st December 1993 or as amended the prescribed limit. The analysis report of Mines final discharge from time to time. Oil & grease trap water after treatment in E.T.P., for the period Oct'2021 to

> Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few nos, of vehicles. The major repairing of these vehicles is being done outside mines and minor repairing is being done in our garage. Hence, discharge of workshop effluent is not envisaged.

10	wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed. A separate Environment Management Cell with suitable qualified personnel should	A separate Environment Management Cell with qualified personnel and well-equipped Environment Engineering
	be set -up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Laboratory is functioning under the control of a Senior Executive. Besides we are carrying out all Environmental monitoring & analysis through a MoEF & NABL accredited laboratory M/S VisionTek Consultancy Services Pvt. Ltd., Bhubaneswar & the monitoring reports are enclosed as Annexures.
11	•	
12		

Analysis Of Dust Fall

Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for: 1SO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Infrastructure Enginering

• Water Resource Management

· Environmental & Social Study

Surface & Sub-Surface Investigation

• Quality Control & Project Management

· Reservable Energy

Agricultural Development

• Information Technology

· Public Health Engineering

Mine Planning & Design
 Mineral Sub-Suil Exploration

Waste Management Services

Date: 12.01.2022

Laboratory Services Environment Lab Food Lab Material Lab Sell Lab Mineral Lab

Ref: Envlab/21/R-0063

DUSTFALL ANALYSIS REPORT- DECEMBER- 2021

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK Name of the Project : KALARANGIATTA CHROMITE MINES, KALIAPANI, JAJPUR 2.

3. Sampling Location : DF1- Near Roof Top of Office Building

4. Date of Sampling : 14.12.2021

Sample Collected by : VCSPL Representative in presence of Client's Representative

	1971. 372.1	Unit	Analysis Result	
SL.No.	Parameters	(mg of deposit per square meter per day)	DFI	
1	Mercury as Hg	mg/m²d	ND	
2	Nickel as Ni	mg/m²d	ND	
3	Cobalt as CO	mg/m²d	ND	
4	Arsenic as As	mg/m²d	ND	









isiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by: NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- Infrastructure Enginering Surface & Sub-Surface Investigation
- Water Resource Management
- · Environmental & Social Study
- Quality Control & Project Management
- Renewable Energy

Ref: Envlab/21/R-5014

- Agricultural Development
- Information Technology
- · Public Health Engineering
- Mine Planning & Design
- Mineral/Sub-Soil Exploration

Waste Management Services

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab & Microbiology Lab

Date: 31.03.2022

DUST FALL ANALYSIS REPORT- MARCH 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK 1.

2. Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

3. Sampling Location : DF1- Near Roof Top of Office Building

4. **Date of Sampling** :15.03.2022

5. Sample Collected by : VCSPL Representative in presence of Client's Representative

	L. L	Unit	Analysis Result	
SL.No.	Parameters	(mg of deposit per square meter per day)	DF1	
1	Mercury as Hg	mg/m²d	ND	
2	Nickel as Ni	mg/m²d	ND	
3	Cobalt as CO	mg/m²d	ND	
4	Arsenic as As	mg/m ² d	ND	









Analysis of Soil Sample

Visiontek Consultancy Services Pvt. Ltd.

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· Infrustructure Engineering Surface & Sub-Surface Investigation

Ref : Envlah/21/R-0022

- · Quality Control & Project Management
- Agricultural Development Information Technology Public Health Engineering
- Mine Planning & Design
- Mineral/Sub-Sull Exploration
- Waste Management Services

Laboratory Services Firemocat Lab Fired Lab Material Lab Sati Lab Mineral Late Minubiology Lab

- · Water Resource Management
- · Environmental & Social Study
 - · Renewable Energy.

Date: 10.01.2022

SOIL QUALITY ANALYSIS REPORT- DECEMBER- 2021

Name of Chent M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1. OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR 2. Name of the Project

Sampling Location : S1 : East Side Quarry

S2: West Side Quarry S3: North Side Quarry S4: South Side Quarry

: 14.12.2021 Date of Sampling

5. Date of Analysis : 15.12.2021 TO 16.12.2021

Sample Collected by : VCSPL Representative in presence of Client's Representative

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SL No.	Name of the Parameters	Unit	Testing Method	SI	52	SS ND ND ND	54
4	Mcreury as Hg	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
2	Nickel as Ni	mg/kg mg/kg	kg EPA 3050B, 7000B ND Rev 02, 1996 ND	ND	ND	ND	
3	Cohalt as CO m		EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
4	Arsenie na As	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND

BDL Value: No <50 mg/kg. Co< 10 mg/kg. As < 10 mg/kg. Hg =10 mg/kg.







• Infrastructure Enginering

· Water Resource Management

Environmental & Social Study

Visiontek Consultancy Services Pvt. Ltd.

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Certified for: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by: NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

• Surface & Sub-Surface Investigation

· Quality Control & Project Management

· Renewable Energy Public Health Engineering

 Mine Planning & Design Agricultural Development Information Technology

Mineral/Sub-Soil Exploration

Waste Management Services

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab & Microbiology Lab

Ref: Envlab/21/R-5010

Date: 31.03.2022

SOIL QUALITY ANALYSIS REPORT- FEBRUARY 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK

2. Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

3. Sampling Location : S1 : East Side Quarry

> S2: West Side Quarry S3: North Side Quarry S4: South Side Quarry

: 15.03.2022 4. Date of Sampling

5. Date of Analysis : 16.03.2022 TO 18.03.2022

6. Sample Collected by : VCSPL Representative in presence of Client's Representative

				sult	-		
SI. No.	Name of the Parameters	Unit	Testing Method	SI	82	S3	54
1	Mercury as Hg	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
2	Nickel as Ni	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
3	Cobalt as CO	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
4	Arsenic as As	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND

BDL Value: Ni <50 mg/kg, Co< 10 mg/kg, As < 10 mg/kg, Hg <10 mg/kg

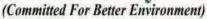




GROUND WATER LEVEL MEASUREMENT

Visiontek Consultancy Services Pvt. Ltd.

Agricultural Development



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- Infrastructure Enginering
 Surface & Sub-Surface Investigation
 - Quality Control & Project Management
 - e Public Health Engineering
- Mine Planning & Design
 Wines West Sell Contents
- Mineral/Sub-Soil Exploration
 Waste Management Services

Date: 12.01.2022

Material Lab Soil Lab Mineral Lab & Microbiology Lab

Laboratory Services
Environment Lab
Food Lab

Environmental & Social Study
 Renewable Energy

• Water Resource Management

Ref : Envlab/21/R-0067

GROUND WATER LEVEL REPORT- DECEMBER 2021

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK
 Name of the Project : OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR

3. Date of Sampling : 14.12.2021

4. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL. No.	Locations	Unit	DOS	Analysis Result
1	Bore well Near Workshop of Mines	mt/bgl	14.12.2021	11.4
2	Bore well Near Main Gate of OCM	mt/bgl	14.12.2021	10.8
3	Open Well Near Ostia Village	mt/bgl	14.12.2021	4.1
4	Open Well Near Ostapal Village	mt/bgl	14.12.2021	5.6
5	Tube well inside Shiva Temple of the Village Gurujanga	mt/bgl	14.12.2021	10.8
6	Tube well outside Shiva Temple of the Village Gurujanga	mt/bgl	14.12.2021	11.4
7	Eastern side of the Quarry (PZ-1)	mt/bgl	14.12.2021	4.6
8	Southern side of the Quarry (PZ-2)	mt/bgl	14.12.2021	4.2
9	Watstern side of the Quarry (PZ-3)	mt/bgl	14.12.2021	4.1











Visiontek Consultancy Services Pvt. Ltd.

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Accredited by: NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- Infrastructure Enginering
- Water Resource Management
- Environmental & Social Study
- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- · Renewable Energy

Ref: Envlab/21/R-5012

- · Agricultural Development
- Information Technology
- Public Health Engineering
- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Date: 31.03.2022

GROUND WATER LEVEL REPORT- MARCH 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
 Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

4. Date of Sampling : 15.03.2022

5. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL. No.	Locations	Unit	DOS	Analysis Result
1	Bore well Near Workshop of Mines	mt/bgl	15.03.2022	11.6
2	Bore well Near Main Gate of OCM	mt/bgl	15.03.2022	10.8
3	Open Well Near Ostia Village	mt/bgl	15.03.2022	4.8
4	Open Well Near Ostapal Village	mt/bgl	15.03.2022	5.6
5	Tube well inside Shiva Temple of the Village Gurujanga	mt/bgl	15.03.2022	11.2
6	Tube well outside Shiva Temple of the Village Gurujanga	mt/bgl	15.03.2022	11.8
7	Eastern side of the Quarry (PZ-1)	mt/bgl	15.03.2022	4.8
8	Southern side of the Quarry (PZ-2)	mt/bgl	15.03.2022	4.2
9	Watstern side of the Ouarry (PZ-3)	mt/bgl	15.03.2022	5.2



Manda



Paja Makanly



isiontek Consultancy Services Pvt. Ltd

(Committed For Better Environment)

Certified for: 18O 9001:2015, ISO 14001:2015, 18O 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Infinativator Engineeing
 Wister Resource Minigement
 Environmental & Social Study

Sarfaer & Sub-Norther Investigation
 Quality Central & Project Management
 Benevialité Energy

Agricultural Development
 Information Technology
 Politic Health Engineering

Mine Planning & Design
 Mineral Sub-Sull Exploration
 Wavie Management Services

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Ref : Envlah/21/R-0064

Date : 12.01,2022

GROUND WATER QUALITY ANALYSIS REPORT- DECEMBER 2021

1. Name of Client M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK

2. Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

: GWI: Bore well Near Work Shop of the Mines 3. Sampling Location

GW2 : Bare Well Near Main Gine of OCM GW3 : Open Well Near Ostin Village : APHA 1000 B

4. Method of Sampling 5. Date of Sampling : 16.12.2021

Date of Analyses 6. : 17.12.2021 TO 24.12.2021

	Business			Mandard or jee		Analysis Result			
SL No.	Parameter	Testing Method	Cuit	19 - 10 mm 2617 Amount of 2617 A 2618		GWI	GW2	GWJ	
			1	Acceptable Class	Fernandis Lastr	30.11.5	Sellie.	44.74	
Eur	plai Characteristics								
1:	Colina	Aftinal Comportion Method Aftina 23th (4.200) 2320(0.4)	Hame	- 6	16	-3	13	43	
1	Olicar	Through Odear Test APRA 337 St 2017 CS Mills	-	Agroste	Agravable	Appeable	Agreeable	Agreeable	
1	Taxe	Flavor Threshold Test APRA 23 to Labor 1 (2004)	5-3	Agricano	Agrevatile	Agreeable	Agrecable	Agreeable	
4	Teskulay	Apple State Apple	NTU	1.		6.1	7,0	14	
3	pH Volum 25°C	APRIA 23 ^{PE} ILEZHI P. MISSH II.	-	1.585	No. Religiotion	6,74	b/82	6.89	
X.	Total Hurdren (as Cat O J)	APILS 23" DE 2017 2166C	agl	344	-46	-100L-	188	172	
7	hom car Eq.	Ry AAS Method APA 4 21 to 64 200 - 10 U.B.	mgl	1.00	Releases	0.21	0.24	0.21	
90	(Chloride (ne Cl.)	Argentinestric Method APRA 23 th Falcier Lisson III.		254	promot	-41	18	36	
	Republish New Children	APPA 22 FACED SHALLE	-	A.S	1	ND	ND	ND:	
Desir	while Characteristics								
10.	Diswilland Solids	Gravinetric Method APIGA 23 ⁴⁰ Fd 3627 15465	ingit	506	2001	278	326	260	
H	Consum (as Ca.)	APRA Diversors Medical APRA 20 ¹⁰ (at 201) (2000 p.m.)	mg1	38	200	48.8	50.6	-314	
11	Magnesonn (or Mg)	Criestenia Method APRA 23 FA ST 1800043 B	-	39.	3100.	20.6	21.6	24.1	
11	Copper (as Co)	APIA 23 LAZIOTI HILLE	- mgT	p.45	- 13	=0.05	-0.07	-0.05	
14	Manganese (as Mn)	Arriva 22 14.307 (1005m ft	-91	8.1	,U	+0.03	10005	-0.05	
LS	Sulphale (in 50)	Articlescore Method Article 22th (4.2017) 4500 804 5	>g1	- 100	100	28.9	30.2	36.4	
16.	Semate (as NO ₃)	Sig S.V. Surrey Method APEA 23 th Value 7, 4500 Sel. E.	ngi.	-43	No.	7.1	7.8	7.0	
11	Floresde (as F)	Destillation followed by Special Street Laboration of APIA 25th Laboration of	mm 1	100	10	0.16	0.42	IL 18	
w	Phaselic Cherphond) (in C ₂ H ₂ OH)	Chierotorus Entraction by Chierometric Method APMA 23 th Est.2017 1430 (MD)	agi	1,000	6.863	=0.001	<0,001	<0.001	
19	Mercury (as flg)	AAS Method APISA 23 ⁴⁰ (44.34(2.711)2.8).	agl	1.000	No. Bulgarden	0.001	=0.001	⇒00001	
×	Customer (a)	ARMA 23P EALSET 31(1.0)	$-i = (1 - 1)^{-1}$	9.90	No Relegation	=0.001	-0.001	~0.001	
21	Schenium (an Sc)	Re AAX Method AFRIA 23 11 14 July 7 (160 Sc C	ingl	1.01	No.	10.01	-0001	10.0	
22	America (14 Ah)	By AAS Method ARRA 23 ²⁰ (ALSE) 2114-91	ngT	940	No. Reference	10.01	=0,01	-:0,01	
21	Cyande (ai CN)	Distribution followed by Spercopholometric Method APRA 21 th TA 2017: 4500 CN (2.5)	mpl	0.00	No Heletation	-0.01	1000	+0.04	
34	Lead (as Ph)	By AAA Meland ARIA 20 ¹⁰ EZ-200 TO D.E.	190	9.43	Heleusten	=0.01	<0.01	< 0.01	



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 Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab & Microbiology Lab

25	Zinc (as Zn)	By AAS Method APHA 23 ⁸²⁵ Ed,2017: 3111 B	mg/l	5	15	1.9	2.4	1.8
26	Anionic Detergents (as MBAS)	Anionic Surfactants as MBAS APHA 23RD Ed.2017: 5540 C	mg/t	0.2	-	ND	ND	ND
27	Chromium (as Cr ⁺⁶⁾	Diphenyl Carbazide Method APHA 23 ¹⁰ Ed.2017: 3500Cr B	mg/l	44	-	0.012	0.014	0.012
28	Mineral Oil	Partition-Gravimetric Method APHA 23 ⁸⁰ Ed,2017: 5520 fl	mg/l	0.5	No Relaxation	ND	ND	ND
29	Alkalinity	Titration Method APHA 23 ^{BD} Ed,2017:2320 B	mg/l	200	600	190	208	168
30.	Aluminium as(Al)	AAS Method APHA 23 ^{8D} Ed,2017: 3111 D	mg/l	0.03	0.2	< 0.01	< 0.01	< 0.01
31	Boron (as B)	Curcumin Method APHA 23 RD Ed,2017: 4500B, B	mg/l	0.5	2.4	0.54	<0.1	<0.1
32	Total Coliform as TC	MPN Method APHA 23 ⁸¹² Ed.2017 : 9223 b	MPN/ 100ml	Shall not be detectable in any 100ml sample	44	<1.8	<1.8	<1.8

CL = Colourless, U/O = Unobjectionable, ND = Not descend

RDL (Below detection limit) Values : (Cu=0.05 mg/1, Ma=0.005 mg/1, C_sB_sOH=0.001 mg/1, Hg=bill5 mg/1, Cd=0.001 mg/1 Se=0.001 mg/1, As=0.001 mg/1, Pb=0.01 mg/1, Zo=0.05 mg/1, Al=0.001 mg/1, B=0.01 mg/1, No=0.01 mg/1, No=0.01 mg/1, No=0.001 mg/1,











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★ Number & Sub-Serface Investigation · latractractury lygivering.

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Wurte Management Services

Latterstery Services First Fab. Hant Fab. Mannyal Late Soft Lab. Ulimid Lab

· Water Measures Management

· Kinstrommental & Social Study

· Horman Tarry

Ref : Envlub/21/R-0065 Date: 12.01.2022

GROUND WATER QUALITY ANALYSIS REPORT- DECEMBER- 2021

Name of Client M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK I)

2 Name of the Project OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR

GW4; Open Well Near Ostapul Village Sampling Location

GW5. Tale Will made the Slova Temple of Village Countrings GWie Tube Well outside Shiva Temple of Village Gurmanga

Method of Sampling APHA 1969 B 4. 5. Date of Sampling 16.12.2021

Date of Analysis 17.12.2021 10 24.12.2021 6.

Sample Collected by : VESPL Representative in presence of Chiefe a Representative

			1		dure:	- 9	analysis Res	dt
SI.	Parameter	Testing Medical	Lve		(8054 306 (8054 306	GW4	GW5	GW6
				Gregoriti Lane	Frimpolis.	Line	1.112	600
619	ptiel Etaracteristics				-			
1	Chino	APTIA TENTO TRADE TOTAL	House			145	95	163
7	Odea	Titreshold Odior Teld APIA 21 to Li 2017 2 DH U		Agreation	Approaché	Agreeable	Ajministra	Agrocable
1	Testr.	Figure Taxonials Test: Admin 23 ²⁴ Int 2011 (2016)	2	haneddo	Agrees244	Agrecolds	Agreeable 1	Agovald
	Tarredity	Septements Method APRA 20 Pt Tal September 1989	MID	1	3	10.0	6.8	7.2
ŧ	yit Vales	AMIA 21 (AZW) - PROFILE	-	65.65	No.	7.56	754	7.42
è	Total Harbinson (IN CaCO _A)	KINTA Trementes Method	ing?	396	/60	1.12	42	70
Ť	See (arFe)	By AAS Method ABIA 20 th 163218 1 JULIB	tyn.	1.0	Retriates	0:21	0.18	0,16
4	Chloricus (1)	Acgordonalitic State of	mp1	- 116	1999	42	46	48
9	Resident that Charles	ANNA OF TAXABLE ANNA A D	ing/I	- 90	-1-	Alla	NO	-100
lien	relie Chemicieratics		-			_		
10	Dresstral Solids	Conductor Method ABHA 22 ^{est} bd 2n(7 - 2s40 ti	trig 7	150	386	180	112	90
11	Champers	EDTA Tipmeire Method APRA 23" 1723011 20002-0	gug9	79.	26	44	32	38
12	Napone (a Ma	Catestatus Memosi 1991A 21 th Tal2017 1999My D	ng)	-19	- 100	200	17.9	10%
15	Copper careful	By AAS Michael APRIA 27 th 162,3917 (100.0)	997.	1.66	0	-0.05	-0.05	+0.05
14	Micenson in Min	APITA 21th Fd 2511, USBBA III	nig/T	4.1	13	<0005	0,05	+0.05
15	Solphur ne SO,	APILA 21" Da 281 Y-4900 SAM E	reg T	266	400	4.6	44	4.0
in	(Viznie (m NO))	By UV Server Method APRA 23 to https://doi.org/10.	(api)	45	No.	1.6	TOTAL	9.62
17	Emonde (a. f)	Disellation believed by Specialization of Marked April A 27 ¹⁰ Induly 1 (1996) 1	(qp)	M	1.5	0.012	0.015	0.011
16	Plendis Composité (40 CSB(DB)	Coherchine Extraorbic by Coherchine Method (ARIA 2) 10 (420) 11 (530) (44)	sug!	(m)	W/902	-91061	-3130Fi	>0.001
W	Allgrenry (as 11g)	AM Styling	:040	9,081	No.	<00.000)	-(0)000	≥0,000
20	Callinium (na Cil)	AAS Method ARIA 2 DESCRIPTION	Type	9303	Holesartina Holesartina	-0.001	<0.001	-=0.001
21	heammin(5c)	94 AXS Method 3,003, 20 ¹² Ed 2017, 3300 feet	0.61	7.81	No Relations	40.01	-000	<0.01
22	Ansauc (19 As)	ANIA DEL LACIO DE LE	uig1	3.61	No Relausion	10,01	<0,01	9.01
23	Cyamile (or CN)	Spiritates fellowed by Spiritages service Modes	Tyn	Age	The Releasions	40.05	<0.05	=0.05



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Laboratory Services Environment Lah Food Lah Material Lah Soil Lah Mineral Lab & Microbiology Lab

		C,D					ė E	
24	Lead (as Pb)	By AAS Method APHA 23 ⁸⁰ Ed,2017 3111 B	mg/l	10.0	No Relaxation	<0.01	< 0.01	< 0.01
25	Zinc (as Zn)	By AAS Method APHA 23 RD Ed, 2017: 3111 B	mg/l	5	15	2.1	2.8	3.2
26	Anionic Detergents (as MBAS)	Anionic Surfactants as MBAS APHA 23RD Ed;2017: 5540 C	mg/l	0.2		ND	ND	ND
27	Chromium (as Cr ⁺⁶)	Diphenyl Carbazide Method APHA 23 RD Ed,2017: 3500Cr B	mg/l	-		0.012	0.011	0.010
28	Mineral Oil	Partition-Gravimetric Method APHA 23 ^{kn} Ed,2017: 5520 B	mg/l	0.5	No Relexation	ND	ND	ND
29	Alkalinity	Titration Method APHA 23 RD Ed,2017:2320 B	mg/l	200	600	82	28	20
30	Aluminium as(Al)	AAS Method APHA 23 an Ed,2017: 3111 D	mg/I	0.03	0.2	< 0.01	< 0.01	< 0.01
31	Boron (as B)	Curcumin Method APHA 23 ⁸⁶³ Ed,2017: 4500B, B	mg/l	0.5	2.4	<0.1	<0.1	< 0.1
32	Total Coliform as TC	MPN Method APHA 23 ^{8D} Ed;2017: 9221 b	MPN/ 100ml	Shall not be detectable in any 100ml sample	4	<1.8	<1.8	<1.8

CL = Colourless, U/O = Unobjectionable, ND = Not detected:

BDL (Below detection limit) Values (Cu=0.05 mg/L, Mis=0.005 mg/L, Cu=0.001 mg/L, Eq=0.005 mg/L, Cu=0.001 mg/L, Se=0.001 mg/L, As=0.001 mg/L, Pb=0.01 mg/L, Ze=0.05 mg/L, Cu=0.05 mg/L, As=0.001 mg/L, Se=0.001 mg/L, Se=







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Waste Management Services

Laboratory Services Environment Lab Food Lab Manerial Lab Soil Lab Mineral Lab Microbiology Lab

Ref : Envlab/21/R-0066

Surface & Sub-Surface Investigation

Date : 12.01.2022

GROUND WATER QUALITY ANALYSIS REPORT- DECEMBER- 2021

: M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK E Name of Client Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR 2.

3. Sampling Location : GW7: Eastern Side of the Quarry (PZ-1)

GW8: Southern Side of the Quarry (PZ-2) GW9: Western Side of the Quarry (PZ-3)

4. Method of Sampling : APHA 1060 B : 16.12.2021 5. **Date of Sampling**

Date of Analysis : 17.12.2021 TO 24.12.2021 6.

Sample Collected by : VCSPL Representative in presence of Client's Representative

					rd us per	- V	Analysis Resu	lt
SL No.	Parameter	Testing Method	Unit		00:2012 2015 & 2018	GW7	GW8	GW9
				Permasihte Limit	Permissible Limit	Com/	GWa	Gny
Esset	itial Characteristics							
1	Colour	Visual Comparison Method APIIA 23 ⁴² Ed,2017 : 2120 B. C	Hazen	.5	15	<5	5	<5
2	Odour	APIIA 23 ^{III} Ed,2017 :2150 B	0	Agreeable	Agreeable	Agrecable	Agreeable	Agrecable
3	Taste	Flavor Threshold Test APHA 23 ^{ED} Ed,2017: 2160 C	9.1	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	Nephelometric Method APIIA 23 D Ed. 2017 2130 B	NTU		5	6.2	7.1	7.6
5	pH Value	pH Meter APHA 23 ^{NO} Ed,2017 : 4500H B	96.	6.5-8.5	No Relaxation	7.41	7.54	7.48
6	Total Hardness (as CaCO ₁)	EDTA Titrimetric Method APIIA 23 ²²⁵ Ed,2017 - 2340 C	mg/L	200	600	124	116	84
7.	Iron (as Fe)	By AAS Method APHA 23 ^{2D} Ed,2017 : 3111, B	mg/l	6.0	Relaxation	0.34	0.24	0.18
8	Chloride (as Cl.)	Argentometric Method APHA 23 ^{3D} Ed,2017 : 4500CT B	mg/l	250	1000	44	40	38
9	Residual, free Chlorine	Indometric Method APITA 23 ^{xts} Ed,2017 : 4500CL, H	mg/t	0.2	1	ND	ND	ND
Desir	able Characteristics							
10	Dissolved Solids	Gravimetric Method APIIA 23 th Ed,2017 - 2540 C	mg/L	500	2000	218	194	144
11	Calcium (as Ca)	APHA 23 RD Ed,2017 : 3500Ca B	mg/l	75	200	48	40	36
12	Magnesium (as Mg)	Calculation Method APITA 23 ⁸²⁵ Ed,2017 : 3500Mg B	mg/l	241	100	20,8	11.4	10.2
13	Copper (as Cu)	By AAS Method APRA 23 ⁴²⁾ Ed,2017: 3111 B	mg/1	0.05	1.5	< 0.05	< 0.05	< 0.05
14	Manganese (as Mn)	Persulfate Method APHA 23 ^{8D} Ed,2017: 3500Mn B	mg/l	0.1	0.3	< 0.05	< 0.05	< 0.05
15	Sulphate (as SO _A)	Turbidimetric Method APHA 23 ^{E5} Ed,2017: 4500 SO4 ² E By UV-Screen Method	mg/l	200	400	4.2	4.6	3.8
16	Nitrate (as NO ₃)	APRIA 23 ⁸⁰ Ed,2017: 4500 NO; E	mg/l	45	No Relaxation	1.68	0.87	0.78
17	Fluoride (as F)	Distillation followed by Spectruphotometric Method APHA 23 ⁸² Ed,2017: 4500F C	mg/l	1,0	1.5	0.014	0.016	0.014
18	Phenotic Compounds (as C ₆ H ₃ OH)	Chloroform Extraction by Colorimric Method APIIA 23 Ed. 2017: 5530 B.D	mg/l	0.001	0.002	<0.001	<0.001	<0.001
19	Mercury (as Hg)	AAS Method APBA 23 ⁸² Ed,2017: 3112 B	mg/l	0.001	No Relaxation	<0.001	< 0.001	< 0.001
20	Cadmium (as Cd)	AAS Method APIIA 23 ³²¹ Ed,2017: 3111 B	mg/l	0.003	No Relaxation	<0.001	< 0.001	< 0.001
21	Sclenium (as Se)	By AAS Method APIIA 23 RD Ed.2017: 3500 Se C	mg/l	0.01	No Relayation	< 0.01	< 0.01	< 0.01



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- Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab A Microbiology Lab

22	Arsenic (as As)	By AAS Method APHA 23 ⁸²⁰ Ed;2017; 3114 B	mg/l	0.01	No Relaxation	< 0.01	< 0.01	< 0.01
23	Cyanide (as CN)	Distillation followed by Spectophotometric Method APHA 23 ^{8D} Ed,2017: 4500 CN C.D	mg/l	0.05	No Relaxation	< 0.05	<0.05	< 0.05
24	Lead (as Pb)	By AAS Method APHA 23 RD Ed;2017 3111 H	mg/l	10.0	No Relaxation	< 0.01	< 0.01	< 0.01
25	Zinc (as Zn)	By AAS Method APHA 23 ⁸²¹ Ed,2017; 3111 B	mg/l	.5	15	4.2	4.6	4.4
26	Anionic Detergents (as MBAS)	Anionic Surfactures as MBAS APHA 23RD Ed,2017: 5540 C	mg/l	6.2	-	ND	ND	ND
27	Chromium (as Cr ⁺⁶ⁱ	Diphenyl Carbazide Method APHA 23 ⁸²⁷ Ed,2017: 3500Cr B	mg/l	-	- 5 - 1	0.024	0.028	0.022
28	Mineral Oil	Partition-Gravimetric Method APHA 23 ⁸⁰ Ed,2017: 5520 B	mg/l	0.5	No Refuxation	ND	ND	ND
29	Alkalinity	Titration Method APHA 23 ⁸⁰ Ed,2017:2320 B	mg/l	200	600	52	44	30
30	Aluminium as(Al)	AAS Method APHA 23 ²⁰ Ed.2017; 3111 D	mg/l	0.03	0.2	10.0>	<0.01	< 0.01
31	Boron (as B)	Curcumin Method APHA 23 ²⁶³ Ed,2017: 4500B, B	mg/l	0.5	2.4	<0.1	< 0.1	<0.1
32	Total Coliform as TC	MPN Method APHA 23 ^{ED} Ed,2017: 9224 b	MPN/ 100ml	Shall not be descetable an any 100ml sample	-	<1.8	<1.8	<1.8

CL = Colouriess, U/O = Unobjectionable, ND = Not detected.

BDL (Below detection limit) Values 3Ca<0.05 mg/1, Mn=0.005 mg/1, Cl-0.001 mg/1, Hg=0.005 mg/1, Cd=0.001 mg/1, Sc=0.001 mg/1, Ac=0.001 mg/1, Pb=0.01 mg/1, Cd=0.001 mg/1, Cd=0.001 mg/1, Ac=0.001 mg/1, Dc=0.01 mg/1, NO=0.01 mg/1)





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Quality Control & Project Management

Ref: Envlab/21/R-5005 Date: 31,03,2022

GROUND WATER QUALITY ANALYSIS REPORT- MARCH 2022

: M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1. Name of Client.

2. Name of the Project OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR

3. Sampling Location : GW1: Bore well Near Work Shop of the Mines

> GW2: Bore Well Near Main Gate of OCM GW3: Open Well Near Ostia Village

4. Method of Sampling : APHA 1060 B 5. Date of Sampling : 15.03.2022

6. Date of Analysis : 16.03.2022 TO 23.03.2022

7. Sample Collected by VCSPL Representative in presence of Client's Representative

					rd m per	A	nalysis Rest	ılt
SL No.	Parameter	Testing Method	Unit		900:201.2 1 2015 & 2018	GWI	GW2	GW3
				Acceptable Limit	Permissible Limit	- July	GW2	GW3
Essen	tial Characteristics		1					
1	Colour	Visual Comparison Method APHA 23 ^{6D} Ed,2017: 2120 B, C	Hazen	5	15	<5	<5	<5
2	Odour	Threshold Odour Test APHA 23 RD Ed,2017 -2150 H	Θ.	Agrecable	Agreeable	Agreeable	Agreeable	Agreeable
3	Tasse	Flavor Threshold Test APHA 23 TE Ed. 2017 : 2160 C	-	Agreeable	Agreeable	Agreeable	Agreeable	Agrecable
4	Turbidity	Nephelometric Method APHA 23 ^{2D} Ed,2017 2130 H	NTU	1	5	<1	≺1	ব
5	pH Value at 25°C	pH Meter APHA 23 ^{lis)} Ed;2017: 4500H B	-	6.5-8.5	No Relaxation	6.82	6.84	6.93
6	Total Hardness (as CaCO ₁)	EDTA Titrimetric Method APHA 23 RD Ea,2017 2340 C	mg/I	200	600	191	190	182
7	Iron (as Fe)	By AAS Method APHA 23 ⁸⁰ Ed,2017: 3111, B	mg/T	1.0	No Relaxation	0.24	0.28	0.24
8	Chloride (as C1)	Argentametric Method APHA 23 ²⁰ Ed,2017 : 4500CT B	mg/L	250	1000	44	40	40
9	Residual, free Chlorine	Indometric Method APHA 23 ^{BD} Ed.2017 : 4500CL B	mg/I	9.2	1	0.18	0.12	0.21
Desir	able Characteristics							
10	Dissolved Solids	Gravemetric Method APHA 23 ⁸⁰ Ed,2017: 2540 C	mg/t	500	2000	284	332	272
11	Calcium (as Ca)	EDTA Titrimetric Method APHA 23 th Ed,2017: 3500Ca B	mg/t	75	200	50.6	52.8	52.6
121	Magnesium (as Mg)	Calculation Method APHA 23 ^{MD} Ed,2017 : 3500Mg B	mg/t	.30	100	21.8	23.6	24.8
13	Copper (as Cu)	By AAS Method APHA 23 ⁸⁰ Ed,2017: 31.11 B	mg/I	0.05	15	< 0.02	<0.02	< 0.02
14	Manganese (as Mn)	Persulfate Method APHA 23 th Ed,2017: 3500Mn B	mg/i	63	0.3	<0.025	< 0.025	<0.025
15	Sulphate (as SO ₄)	Turbidimetric Method APHA 23 RD Ed,2017: 4500 SQ4* E	mg/I	200	400	29.6	31.8	38.2
16	Nitrate (as NO ₃)	By UV-Screen Method APHA 23 RD Ed,2017: 4500 NO; L	mg/l	45	No Relexation	7.6	7.4	7.2
17	Fluoride (as F)	Distillation followed by Spectophotometric Method APHA 23 ⁰⁰⁵ Ed,2017: 4500F C	ing/I	La	1.5	0.19	0.14	0.21
18	Phenolic Compounds (as C ₆ H ₅ OH)	Chloroform Extraction by Cohorimetric Method APHA 23 ⁸⁰ Ed.2017 5530 H.D	mg/l	0.001	8.002	< 0.05	<0.05	< 0.05
19	Mercury (as Hg)	AAS Method APHA 23 ²⁰² Ed,2017: 3112 B	mg/f	0.001	No Relaxation	< 0.004	<0.004	< 0.004
20	Cadmium (as Cd)	AAS Method APHA 23 ⁰⁰ Ed,2017: 3141 II	mg/f	0.003	No Referation	< 0.01	<0.01	<0:01
21	Selenium (as Se)	By AAS Method APHA 23 to Ed, 2017: 3500 Se C	mg/l	0.01	No Relaxation	< 0.001	<0.001	< 0.001
22	Arsenic (as As)	By AA5 Method APHA 23 ^{2D} Ed,2017; 3114 II	mg/t	0,01	No Relaxation	< 0.004	<0.004	<0.004
23	Cyanide (as CN)	Distillation followed by Spectophotometric Method APIA 72 ^{3D} Ed 2027-4500 CN (CD)	mg/f	0.05	No Relaxation	< 0.01	<0.01	<0.01



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24	Lead (as Pb)	By AAS Method APHA 23 RD Ed,2017 3111 B	mg/l	0.01	No Relaxation	< 0.02	<0.02	< 0.02
25	Zinc (as Zn)	By AAS Method APHA 23 RD Ed,2017: 3111 B	mg/l	5	15	1.8	2,2	2.3
26	Anionic Detergents (as MBAS)	Anionic Surfactants as MBAS APHA 23RD Ed.2017: 5540 C	mg/l	0.2	-6	<0.2	<0.2	< 0.2
27	Total Chromium as Cr	AAS Method APHA 23 ⁸⁰⁰ Ed ₂ 2017: 3111B	mg/l	0.05	No Relaxation	0.014	0.016	0.015
28	Mineral Oil	Partition-Gravimetric Method APHA 23 RD Ed;2017: 5520 B	mg/l	0.5	No Relaxation	< 0.5	< 0.5	< 0.5
29	Alkalinity	Titration Method APHA 23 ⁸¹³ Ed,2017:2320 B	mg/I	200	600	196	198	172
30	Aluminium as(Al)	AAS Method APHA 23 RD Ed;2017; 3111 D	mg/l	0.03	0.2	<0.1	< 0.01	< 0.01
31	Boron (as B)	Curcumin Method APHA 23 ⁸⁰ Ed,2017; 4500B, B	mg/l	0.5	2.4	0.41	<0.1	< 0.1
32	Total Coliform as TC	MPN Method APHA 23 RD Ed,2017 : 9221 h	MPN/ 100ml	Shall not be detectable in any 100ml sample	-	<1.8	<1.8	<1.8

CL - Colourless, ND - Nat detected.

BDL (Believe detection Burty Februs; Cu-0.02 mg/t, Mn<0.025 mg/t, Cd-0.05 mg/t, Hg<0.004mg/t, Cd-0.01 mg/t, Sc<0.001 mg/t, Ac<0.004 mg/U/6~0.02 mg/t, Zn<0.03 mg/t, Cr²~0.01 mg/t, Ad<0.1 mg/t, Bdl 1 mg/t, NO₂1 mg/t)







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■ Infrastructure Enginering Water Resource Management · Environmental & Social Study

Ref: Envlab/21/R-5006

Date: 31.03.2022 **GROUND WATER QUALITY ANALYSIS REPORT- MARCH 2022**

: M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK Name of Client 1.

OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR Name of the Project Sampling Location : Gw4: Open Well Near Ostapal Village

GW5: Tube Well inside the Shiva Temple of Village Gurujanga GW6: Tube Well outside Shiva Temple of Village Gurujanga

Method of Sampling : APHA 1060 B : 15.03.2022 **Date of Sampling** 5.

· Renewable Energy

Date of Analysis : 16.03.2022 TO 23.03.2022

					rd as per	A	nalysis Resu	li
SL No.	Parameter	Testing Method	Unit		00: 2012 2015 & 2018	GW4	GW5	GW6
				Acceptable Limit	Permissible Limit	GW4	GWS	GWO
Essen	tial Characteristics							
1	Colour	Visual Comparison Method APIGA 23 ⁽¹³⁾ Ed.2017 2120 B. C	Hazen	3	15	<5	<5	<5
2	Odour	Threshold Odour Test APRA 23 RD Ed.2017 2150 B	- 5-0-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Physic Threshold Test APHA 23 ^{aD} Ed.2017 : 2160 C	390	Agreeable	Agreeable	Agrecable	Agrecable	Agreeable
4.	Turbidity	APHA 23 ^{8,0} Ed,2017-2130 B	NTU	1	5	51)	<1	<1
(5)	pH Value	pH Meter APHA 23 RD Ed,2017: 4500H B	-	6.5-8.5	No Relaxation	7,39	7.42	7.32
6	Total Hardness (as CaCO ₃)	EDTA Titrimetric Method APIIA 23 ^{III} Ed 2017 : 2340 C	mg/l	200	600	116	88	66
7	Iron (as Fe)	By AAS Method APHA 23 ^{8D} Ed.2017 - 3111, B	mg/I	1.0	No Relayation	0.21	0.23	0.14
8	Chloride (as CL)	Argentometric Method APHA 23 ^{aD} Ed,2017 14500CF B	mg/l	250	1000	40	44	46
9	Residual, free Chlorine	Iodometric Method APHA 23 ³²⁷ Ed 2017 : 4500C1, H	mg/I	0.2	10	0,21	0.18	0.24
Desin	able Characteristics			V-				
10	Dissolved Solids	Genvimetric Method APHA 23 ^{8D} Ed.2017: 2540 C	mg/l	300	2006	188	121	98
11	Calcium (as Ca.)	EDTA Titrimetric Method APHA 23 ^{ED} Ed,2017 3500Ca B	mg/l	75	200	48	36	32
12	Magnesium (as Mg)	Calculation Method APHA 23 ^{4D} Ed.2017: 3500Mg B	mg/l	36	t00	21.2	14.8	11.6
13	Copper (as Cu)	By AAS Method APHA 25 ^{8D} Ed.2017:3111 H	mg/l	0.05	1.5	<0.02	< 0.02	< 0.02
14	Manganese (as Mn)	Persulfate Method APHA 23 ^{8D} Ed,2017: 3500Mn B	mg/I	0.1	0.3	< 0.025	< 0.025	<0.025
15	Sulphate (as SO ₂)	Turbidimetric Method APHA 23 ^{SD} Ed.2017: 4500 SD4 ^L E	mg/I	200	400	5.1	4.8	4.6
16	Nitrate (as NO ₃)	By UV-Screen Method APHA 23 ²⁵ Ed,2017: 4500 NO. E	mg/I	45	No Relayation	1.8	0.89	0.69
17	Fluoride (as F)	Distillation followed by Specimphutometric Method APIIA 23 ^{ID} Ed 2017: 4500F C	mg/l	1.0	13	0.011	0.014	0.013
18	Phenolic Compounds (as C ₆ H ₅ OH)	Chloroform Extraction by Colorimete Method APSIA 23 ^{4D} Ed.2017: 5530 B.D.	mg/l	1001	0.002	<0.05	<0.05	<0.05
19	Mercury (as Hg)	AAS Method APHA 23 ^{3D} Ed.2017: 1112 B	mg/l	10.001	No Relaxation	< 0.004	≤0.004	≤0.004
20	Cadmium (as Cd)	AAS Method APHA 23 ^{aD} Ed,2017: 3111 B	mg/l	6.003	No Relaxation	<0.01	<0.01	<0.01
21	Selenium (as Se)	By AAS Method APHA 23 ⁽²⁷⁾ Ed,2017: 3500 Se C	mg/l	9.01	No Relaxation	<0,001	≤0.001	<0.001
22	Arsenic (as As)	By AAS Method	mg/l	0.01	No Relaxation	<0.004	<0.004	<0.004
23	Cyanide (as CN)	APHA 23 RD Ed.2017: 3114 B Distillation followed by Spectophotometric Method APRA 23 RD Ed.2017: 4500 CN C,D	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01
24	Lead (as Pb)	By AAS Method	mg/l	0.01	No	<0.02	< 0.02	< 0.02



• Environmental & Social Study

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		APHA 23 ^{ab} Ed,2017 3111 B			Relaxation	0	0	
25	Zinc (as Zn)	By AAS Method APHA 23 ^{AD} Ed.2017: 3111 B	mg/l	5	15	2.6	3.2	2.8
26	Anionic Detergents (as MBAS)	Anionic Surfactants as MBAS APHA 23RD Ed.2017: 5540 C.	mg/l	9.2	-	<0.2	<0.2	< 0.2
27	Total Chromium as Cr	By AAS Method APHA 23 RD Ed,2017: 3111B	mg/l	0.05	No Relaxation	0.011	0.011	0.012
28	Mineral Oil	Partition-Gravimetric Method APHA 23 RD Ed,2017: 5520 B	mg/l	0.5	No Relaxation	< 0.5	<0.5	< 0.5
29	Alkalinity	Titration Method APHA 23 RD Ed.2017:2320 B	mg/l	200	600	80	30	26
30	Aluminium as(Al)	AAS Method APHA 23 RD Ed.2017: 3111 D	mg/l	0.03	0.2	< 0.1	<0.1	< 0.1
31	Boron (as B)	Curcumin Method APHA 23 RD Ed,2017: 4500B, B	mg/l	0.5	2.4	<0.1	< 0.1	<0.1
32	Total Coliform as TC	MPN Method APHA 23 ^{8D} Ed.2017: 9221 b	MPN/ 100ml	Shall not be detectable in any 100ml sample	-	<1.8	<1.8	<1.8

CL - Colorless, ND - Not detected.

BDL (Below devectors Burney) Fathers (Co+0.02 mg/1, Mm=0.025 mg/1, C_3k_OH+0.05 mg/1, Hg=0.004 mg/1, Cd=0.01 mg/1, Se=0.001 mg/1, As=0.004 mg/1, Pb=0.02 mg/1, Zn=0.03 mg/1, Cr*<0.01 mg/1, B=0.1 mg/1, B=0.1 mg/1, NO₁1 mg/1)







• Infrastructure Enginering

· Water Resource Management

● Environmental & Social Study

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Date: 31.03.2022

· Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab Microbiology Lab

Ref: Envlab/21/R-5007

GROUND WATER QUALITY ANALYSIS REPORT- MARCH 2022

I. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR Name of the Project 2.

3. : GW7; Eastern Side of the Quarry (PZ-1) Sampling Location GW8: Southern Side of the Quarry (PZ-2) GW9: Western Side of the Quarry (PZ-3)

Method of Sampling 4. : APHA 1060 B 5. **Date of Sampling** : 15.03.2022

: 16.03.2022 TO 23.03.2022 6. Date of Analysis 7. Sample Collected by : VCSPL Representative in presence of Client's Representative

			Standard as per 15-10500:2012 and Unit Amended as 2015 & 2018			19	Analysis Rest	ılt
SL No.	Parameter	Testing Method	Unit			GW7	GW8	GW9
				Permissible Limit	Permissible Limit	1411)	GN0	Miles
Essenti	ial Characteristics							
1	Colour	Visual Comparison Method APHA 23 ^{3D} Ed,2017: 2120 B. C	Hazen	3	15	<5	<5	<3
2	Odour	APHA 21 th Ed.2017 (2150 H	11-01	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Flavor Threshold Test APHA 23 ⁸²⁷ Ed,2017 - 2160 C	~	Agrecable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	Nephelometric Method APFIA 23 RD Ed,2017-2130 B	NTU	3-	5	<1.	81	্ব
5	pH Value	pH Meter APHA 23 ³²³ Ed,2017 : 4500H H	(0)	6.5-8.5	No Reluxation	7.38	7.41	7.39
6	Total Hardness (as CaCO ₃)	EDTA Titrimetric Method APHA 25 ⁸⁰ Ed.2017 - 2340 C	mg/l	200	600	121	116	88
7	Iron (as Fe)	By AAS Method APHA 23 ⁸¹⁵ Ed,2017 : 3111, B	mg/l	1,0	No Relaxation	0.34	0.28	0.19
8	Chloride (as Cl.)	Argentometric Method APHA 23 RD Ed,2017 4500CT H	mg/l	250	1000	46	40	32
9	Residual, free Chlorine	Indumetric Method APHA 23 ^{6D} Ed.2017 -4500Cl, B	mg/f	0.2	1	ND	ND	ND
Destrui	ble Characteristics							
10	Dissolved Solids	Gravimetric Method APHA 23 ¹⁰ Ed,2017: 2540 C	mg/l	500	2000	218	192	148
11	Calcium (as Ca.)	EDTA Titrimetric Method APHA 23 ^{4D} Ed;2017 = 3500Ca B	mg/l	75	200	46	40	36
12	Magnesium (as Mg)	Calculation Method APSIA 23 ⁸²⁵ Ed,2017 5500Mg II	mg/l	30	100	24.8	18.6	11.8
13	Copper (as Cu)	APHA 23 Ed, 2017: 3111 B	mg/I	0.05	15	< 0.02	< 0.02	<0.02
14	Manganese (as Mn)	Persulfate Method APHA 23 ^{4D} Ed.2017: 3500Mn B	mg/l	0.1	0.3	<0.025	< 0.025	< 0.025
15	Sulphate (as SO ₄)	Turbidimetric Method APHA 23 Rd Ed. 2017: 4500 SO4* E	mg/L	200	400	4.2	4.8	3.9
16	Nitrate (as NO ₃)	By UV-Screen Method APHA 23 ⁸⁰ Ed,2017: 4500 NO ₁ E	mg/l	45	No Relaxation	1.71	0.88	0.78
17	Fluoride (as F)	Distillation followed by Spectrophotometric Method APHA 23 Ed.2017: 4500F. C	mg/t	1.0	1.5	0.014	0.016	0.011
18	Phenolic Compounds (as C _a H ₃ OH)	Chloroform Extraction by Colorimetric Method APHA 23 ^{8D} Ed,2017: 5530 B.D	mg/l	0.001	0.002	<0.05	<0.05	<0.05
19	Mercury (as Hg)	AAS Method APEIA 23 ^{3D} Ed,2017; 3112/B	mg/L	0.001	No Relaxation	<0.004	< 0.004	<0.004
20	Cadmium (as Cd)	AAS Method APHA 23 ⁸⁰ Ed,2017: 3111 B	mg/l	0.003	No- Relaxation	<0.01	≤0.01	< 0.01
21	Sclenium (as Se)	By AAS Method APHA 23 ^{4D} Ed.2017; 3500 Se C	mg/L	0.01	No Rehisation	< 0.001	< 0.001	< 0.001



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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

22	Arsenic (as As)	By AAS Method APHA 23 ⁸⁰ Ed,2017: 3114 B	mg/I	0.01	No Relaxation	< 0.004	< 0.004	< 0.004
23	Cyanide (as CN)	Distillation followed by Spectophotometric Method	mg/l	0.05	No Relaxation	< 0.01	< 0.01	< 0.01
		APHA 23 RD Ed.2017: 4500 CN C ₂ D						
24	Lead (as Pb)	By AAS Method APHA 23RB Ed 2017 3111 B	mg/l	0.01	No Relaxation	< 0.02	< 0.02	<0.02
25	Zinc (as Zn)	By AAS Method APHA 23 ^{RB} Ed.2017; 3111 B	mg/l	5	15	3.8	4.6	4.9
26	Anionic Detergents (as MBAS)	Anionic Surfactants as MBAS APHA 23RD Ed.2017: 5540 C	mg/l	0.2	-	ND	ND	ND
27	Total Chromium as Cr	AAS Method APHA 23 ^{2D} Ed,2017: 31118	mg/l	0.05	No Relevation	0.012	0.024	0.018
28	Mineral Oil	Partition-Gravimetric Method APHA 23 RD Ed.2017: 5520 B	mg/l	0.5	No Relaxation	ND	ND	ND
29	Alkalinity	Titration Method APHA 23 ^{BD} Ed,2017:2320 B	mg/I	200	600	54	48	32
30	Aluminium as(Al)	AAS Method APHA 23 ⁸¹¹ Ed;2017: 3111 D	mg/l	0.03	0.2	<0.1	<0.1	<0.1
31	Boron (as B)	Curcumia Method APHA 23 RD Ed,2017: 4500B, B	mg/l	0.5	2.4	<0.1	< 0.1	< 0.1
32	Total Coliform as TC	MPN Method APHA 23 RD Ed:2017 : 9221 b	MPN/ 100ml	Shall not be detectable in any 100ml sample	-	<1.8	<1.8	<1.8

CL - Colorless, ND - Not detected.

RDL (Below detection limit) Values (Cu=0.02 mg1, Mn=0.025 mg1, C_H,OH=0.05 mg1, Hg=0.004mg1, Cd=0.01 mg1, Se=0.001 mg1, As=0.004 mg1,Pb=0.02 mg1, Zn=0.03 mg1, Cr=0.01 mg1, As=0.01 mg1, B=0.1 mg1, No;1 mg1)













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Date: 05.01.2022

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 Waste Management Services

Laborators Services
Conferenceal Lab
Food Lab
Manufal Lab
Soil Cab
Minyal Lab
A

Ref: Envlab/21/R-0550

Water Resource Management
 Environmental & Social Study

BORE WELL MONITORING FOR HEXAVALENT ANALYSIS OSTAPAL CHROMITE MINE

Date of Sample Collection: 27.12.2021

Monitoring Well No	Location	Local Co	Hexavalent Analysis	
		Easting	Northing	Result
1.4	Bore well Near Main gate of Mine	3106	2494	<0.01
2	Bore well Near Mechanical Office	2840	2425	<0.01
3.	Eastern side of the quarry	3156	2833	<0.01
4	Eastern side of the quarry	3154	2828	< 0.01
5	Near North dump Toe	2984	3182	0.013
6	Near North dump Toe	2924	3182	0.011
7.	Near North dump Toe	2880	3178	0.012
- 8	Near North dump Toe	2826	3178	<0.01
9	Eastern side of the quarry	3234	2949	<0.01
10	Eastern side of the quarry	3230	2810	<0.01
- 11	Eastern side of the quarry	3210	2760	<0.01
12	Eastern side of the quarry	3195	2835	<0.01
13	Eastern side of the quarry	3203	2833	0.011
14	Eastern side of the quarry	3190	2840	0.011

Reviewed By



Approved By





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Sell Lab
Mineral Lab
A
Mineral Lab

Ref : Envlab/22/R-2326

Date: 05.04.2022

BORE WELL MONITORING FOR HEXAVALENT ANALYSIS OSTAPAL CHROMITE MINE

Sample Collection Date: 7.03.2022

Monitoring Well No	Location	Local Co	-ordinates	Hexavalent Analysis Result	Remarks
		Easting	Northing		
1	Bore well Near Main gate of Mine	3106	2494	<0.01	Bore well used for Drinking water
2	Bore well Near Mechanical Office	2840	2425	<0.01	purpose & Monitoring purpose
3	Eastern side of the quarry	3156	2833	=0.01	
4	Eastern side of the quarry	3154	2828	≤0.01	
5	Near North dump Toe	2984	3182	<0.01	1
6	Near North dump Toe	2924	3182	0.012	1
7	Near North dump Toe	2880	3178	0.012	Barrier State of St
8	Near North dump Toe	2826	3178	<0.01	Dedicated Bore well
9	Eastern side of the quarry	3234	2949	< 0.01	used for Monitoring Purpose
10	Eastern side of the quarry	3230	2810	< 0.01	i sajanse
110	Eastern side of the quarry	3210	2760	<0.01	
12	Eastern side of the quarry	3195	2835	≠0.01	
13	Eastern side of the quarry	3203	2833	0.013	
14	Eastern side of the quarry	3190	2840	0.012	







WATER WITHDRAWAL FROM GROUND WATER FOR SUPPLY TO NEARBY VILLAGES

AND DOMESTIC USE

	GROUND WATER ABSTRACTION DATA FROM ABSTRACTION STRUCTURE												
	FOR THE YEAR 2021-22												
	Е	Bore Well -:	1	E	3ore well -2	2	TOTAL	Avg.					
			A.Total			B.Total	Withdra						
Month	Initial	Final	withdraw	Initial	Final	withdraw	wal	Withdra	Remarks				
	Reading	Reading	al	Reading	Reading	al	(A+B) in	wal					
			(In KL)			(In KL)	KL	Per day					
April'21	78488	80269	1781	85868	86990	1122	2903	97					
May'21	80269	82301	2032	86990	87949	959	2991	96					
June'21	82301	84302	2001	87949	88891	942	2943	98					
July'21	84302	86389	2087	88891	89861	970	3057	99					
Aug'21	86389	808.455	1156.455	89861	459.55	739.55	1896	61	Conventional flow meter withdrawn , Digital water flow meter fitted on 10.08.2021				
Sept'21	808.455	1959.236	1150.781	459.55	1192.154	732.604	1883	63					
Oct'21	1959.236	3498.548	1539.312	1192.154	2026.129	833.975	2373	77					
Nov'20	3498.548	5128.23	1629.682	2026.129	2861.88	835.751	2465	82					
Dec'21	5128.23	6461.96	1333.73	2861.88	3022.03	160.15	1629	53					
Jan'22	6461.96	7390.96	929	3022.03	3545.75	523.72	1629	53					
Feb'22	7390.96	8159.53	768.57	3545.75	4344.5	798.75	1629						
Mar'22	8159.53	8386.5	226.97	4344.5	4839.5	495	1629						
		TOTAL	16635.5	TO.	TAL	9112.5	27028	778					
		A	vg. withdra	awal per da	ay is 77.0 I	KL	,						





CONSENT ORDER

Page: 1 of 12

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012 Phone-2561909, Fax: 2562822, 2560955

CONSENT ORDER

5320

/IND-I-CON- 1163

Dt 27-03-2021

CONSENT ORDER NO. 366

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

Ref: Your online application No. 3216555 dated 28-11-2020 and Online reply dated 30.12.2020

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

Name of the Industry: OSTAPAL CHROMITE MINES OF M/S. FACOR LTD.

Name of the Occupier & Designation: SRI SAUVICK MAZUMDAR, DIRECTOR

Address: AT: GURUJANG, PO: KALIAPANI, DIST: JAJPUR

This consent order is valid for the period up to 31.03.2022 from the date of issue of this order.

This consent order supersedes the earlier consent order issued vide letter No. 2430 dated 5.02.2016.

Details of Products Manufactured

SI. No	Product	Quantity
01.	Chrome ore(ROM)	0.2 MTPA

Details of Mineral Handing Plants/Units

01.	Operation of COB Plant of capacity	0.1 MTPA (chrome ore concentrate)

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

Annexure No.-7

Calender Plan Including Production & Excavation

For the year 2021-22

Item	Target FY 2021-22	Achievement FY 2021-22				
Ore	2.0 Lac MT	1.99 MT				
Overburden	4.78 Lac Cub Mt	4.75 Lac Cub Mt				

AMBIENT AIR QUALITY MONITORING REPORT OF CORE ZONE



(Committed For Better Environment)

Certified for: 1SO 9001;2015, ISO 14001;2015, ISO 45001;2018 (OH&S), ISO/IEC 17025;2017 Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- · Infrastructure Enginering
- Water Resource Management
- · Environmental & Social Study
- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- · Renewable Energy
- Agricultural Development
 Information Technology
 Public Bealth Engineering

- Mine Planning & Design Mineral/Sub-Soil Exploration
 Waste Management Services

Date: 10.01.2022

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Milarral Lab Migrahiology Lab

Ref: Envlab/21/R-0019

AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- DECEMBER-2021

M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1. Name of Client

2. Name of the Project OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor. VQC Sampler

Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring	PM _{II} (µg/m²)	PM_i (He/m*)	5Ο _λ (με/m*)	NO, (μg/m²)	(mg/m ⁴)	Ο ₁ (μg/m ²)	NH,	C _i H _i (µg/m ²)	Sap (ng/m²)	Pb (µg/m²)	/m/ (ng/m²)	As (ng/m²)	
Date	AAQM5-1: Near Dispensary												
01.12.2021	68.8	41.3	11.6	13.8	1,24	20.8	5.4	BDL	BOL	BDL	BOL	BDL	
04.12.2021	66.6	40.0	11.8	13.6	1,22	20.6	5.6	BDL	BDL	BDL	BOL	BDL	
08.12.2021	62.6	37.6	12.4	12.8	1.18	21.4	5.2	BDL	BDL	BDL	BDL	BDL	
11.12.2021	58.8	35.3	12.6	12.2	1.16	21.6	5.1	BDL	BDL	BOL	BDL	BDL	
15,12,2021	52.6	31.6	10.8	14.5	1.12	22.8	4:4	BDL	BDL	BDL	BDL	BDL	
18.12.2021	60.8	36.5	10.6	14.8	1.08	22.6	4.2	BDL	BDL	BDL	BDL	BDL	
22.12.2021	54.2	38.5	11.2	13.4	1.02	20.4	4.1	BDL	BDL	BDL	BDL	BDL	
25.12.2021	63.2	37.9	11.1	13.1	1.11	20.2	4	BDL	BDL	BDL	BDL	BDL	
Monthly Average	62.2	37.3	11.5	13.5	1.14	21.3	4.8	BDL	BOL	BDL	BDL	BDL	
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06	
Manitoring	PM ₁₃ (ug/m ³)	PM _{cA} (µg/m³)	50 ₃ [µg/m²]	ΝΟ, (μg/m²)	(mg/m²)	Ο, (μg/m*)	МН ₁ (µg/m²)	C _c H _c (µg/m ^a)	Бэр (ng/m*)	Pb (ug/m*)	(ng/m²)	(ing/m²)	
Date						AAQMS	-2: Near	Weighbrid	ige				
01.12.2021	44.6	26.8	9.4	5.5	1.14	16.6	4.6	BDL	BDL	BDL	BDL	BDL	
04.12.2021	42.8	25.7	9.6	6.2	1.12	17.4	4.4	BDL	BDL	BDL	BDL	BDL	
08.12.2021	40.6	24.4	9.1	7.4	0.98	17.2	4,3	BDL	BDL	BDL	BOL	BDL	
11.12.2021	38.8	23.3	9.4	7.7	0.94	17.1	4.1	BDL	BDL	BDL	BDL	BDL	
15.12.2021	36.6	22.0	9.2	7,8	0.96	16.6	4.4	BDL	BD1	BDL	BDL	BDL	
18.12.2021	32.2	19.3	8.6	5.4	1.12	16.4	4.8	BDL	BDL	BDL	BDL	BDL	
22.12.2021	31.6	19.0	8.2	6.2	1.08	18.1	4.6	BDL	BDL	BDL	BDL	BDL	
25.12.2021	30.8	18.5	9.1	7.1	1.06	17.2	4.4	BDL	BDL	BDL	BDL	BDL	
Monthly Average	37.3	22.4	9.1	6.9	1.05	17.1	4.5	BDL	BDL	BDL	BDL	BOL	
NAAQ Standard	100	60	80	80	-4	100	400	5	nt	DI	20	06	
Testing Method	Gravimatric	Gravimutris	Improved West and Goder method	Modified Sects & Hackbarrer (No- Assessing)	NOM Spectroscopy	Chemical Method	Indo Phensi Siss Mathed	Absorption A Description followed by	Salverd Education followed by GE	AAS Method	ARS Method	AA3 Method	





Page No 1 of 2



Visiontek Consultancy Services Pvt. Ltd.
(Committed For Better Environment)
(Laborasury Services)

Certified for : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- · Surface & Sub-Surface Investigation · Infrastructure Enginering
- Quality Control & Project Management
 Renewable Energy Water Resource Management
- · Environmental & Social Study
- Agricultural Development • Information Technology Public Health Engineering
- Mine Planning & Design
 Mineral/Sub-Suit Exploration

Date: 10.01.2022

• Waste Management Services

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab Microbiology Lub

Ref : Envlab/21/R-0020

AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- DECEMBER-2021

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK I.

2. Name of the Project OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR

3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring	PM _{sd} (µg/m³)	PM (ug/m²)	SO ₁ (µg/m ⁴)	NO ₂ (µg/m²)	(mg/m³)	Ο ₁ (με/m ¹)	NH ₃ (sig/m ⁴)	C _ε H _ε (μg/m ¹)	Bap (ng/m²)	eb (wg/m")	(ng/m²)	As (mg/m²)	
Date	AAQMS-3: At the Middle of the Open Cast Quarry												
01.12.2021	56.6	34.0	11.6	13.4	1.12	20.8	5.4	BDL	BDL	BDL	BDL	BDL	
04.12.2021	52.2	31.3	11.8	13.8	1.14	20.6	5.6	BDL	BDL	BDL	BDL	BDL	
08.12.2021	54.8	32.9	12.2	14.6	1.08	19.4	5.8	BDL	BDL	BDL	BDL	BDL	
11.12.2021	66.6	40,0	12.4	14.8	1.06	19.2	4,6	BDL	BDL	BDL	BDL	BDL	
15.12.2021	62.8	37.7	9.8	15.2	1.02	18.6	4.4	BDL	BDL	BDL	BDL	BDL	
18.12.2021	60.6	35.4	9.6	15.6	1.12	18.8	4.3	BDL	BDL	BDL	BDL	BDL	
22.12.2021	58.8	35.3	10.6	14.4	1.14	19.1	5.6	BDL	BDL	BDL	BDL	BDL	
25.12.2021	58.2	34.9	10,2	14.2	1.11	20,2	5.2	BDL	BDL	BDL	BDL	BOL	
Monthly Average	58.8	35.3	11.0	14.5	1.10	19.6	5.1	BOL	BDL	BDL	BOL	BDL	
NAAQ Standard	100	60	80	80	4	100	400	5	01	.01	20	06	
Monitoring	PM _{sa} (µg/m²)	(µg/m²)	50; (#R/m²)	(wg/m²)	(mg/m²)	Ο ₃ (μg/m²)	NH ₄ (ug/m ⁴)	ξ,Η, (μg/m²)	(ng/m*)	Pb (µg/m²)	Ni (ng/m²)	As (ng/m²)	
Date					AAQMS-4	: At the	Middle o	f the COB	Plant				
01.12.2021	65.8	39.5	10.8	14.8	1.09	21.6	5.8	BDL	BDL	BDL	BDL	BDL	
04.12.2021	66.4	39.8	10.2	14.6	1.12	22,4	6.4	BDL	BDL	BDL	BDL	BDL	
08.12.2021	67.2	40.3	11.6	15.4	1.11	23.8	5.6	BDL	BDL	BDL	BDL	BDL	
11.12.2021	66.8	40.1	11.8	15.6	1.14	23.4	6.2	BDL	BDL	BDL	BDL	BDL	
15.12.2021	64.6	38.8	12.2	16.1	0.88	22.8	6.1	BDL	BDL	BDL	BDL	BDL	
18.12.2021	63.8	38.3	12.4	15.1	0.89	25.6	5.4	BDL	BDL	BDL	BDL	BDL	
22.12.2021	62.6	37.6	10.6	14.6	0.82	25.8	5.2	BDL	BDL	BDL	BDL	BDL	
25.12.2021	65.2	39.1	10.2	14.2	0.78	24.5	6.1	BDL	BDL	BDL	BDL	BDL	
Monthly Average	65.3	39.2	11.2	15.1	0.98	23.8	6.0	BDL	BDL	BDL	BDL	BDL	
NAAQ Standard	100	60	80	-80		200	400	5	10	01	29	06	
Testing Method	Craytmetris	Snevemetric	Improved West and Grake method	Modified Justob & Hophiteises (No- Artentia)	NOW Spectroscopy	Chamical Method	Indo Phinst Blue Method	Absorption E Description followed by	Selvent Estraction Followed by GC	AAS Method	AAS Shithad	AAS Member	







• Infrastructure Enginering

• Water Resource Management

· Environmental & Social Study

(Committed For Better Environment)

Certified for: 1SO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCR-A Grade

- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- Renewable Energy
- Agricultural Development **◆ Information Technology**
- Public Health Engineering
- Mine Planning & Design
 Mineral/Sub-Sull Exploration
- Waste Management Services

Environment Lab Fund Lab Manerial Eath Soil Lab Mineral Lab

Laboratory Services

Microlinbry Lab

Ref: Envlab/21/R-5002

Date : 31.03,2022

AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- MARCH 2022

: M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1. Name of Client

2. Name of the Project : OSTAPAL CHROMITE MINES , KALJAPANI, JAJPUR

3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

: VCSPL Representative in presence of Client's Representative 4. Sample Collected by

Monitoring	PM _{th} (µg/m²)	PM _{1,4} (µg/m ²)	50; (µg/m²)	NO, (µg/m²)	(mg/m²)	OL (m/m')	(ug/m²)	C,H, (Hg/m²)	Bap (ng/m²)	Pb (μμ/m²)	(mg/m²)	As (ng/m²)
Date					AAQMS-1	: Near Dis	pensary			-		
01.03.2022	71.5	43.0	11.6	14.6	1.19	21.6	5.8	BDL	BDL	BDL	BDL	BDL
04.03.2022	54.6	32.8	11.2	14.2	1.12	21.8	5.6	BDL	BDL	BDL	BDL	BDL
08.03,2022	72.2	43.3	10.8	13.8	1.14	20.6	5.2	BDL	BDL	BDL	BDL	BOL
11.03.2022	48.6	29.2	10.6	13.2	1.15	20.8	5.1	BDL	BDL	BDL	BDL	BOL
15.03.2022	59.2	41.5	11.2	13.1	1.12	20.6	5.1	BDL	BDL	BDL	8DL	BDL
18.03.2022	68.8	41,3	11.4	12.6	1.24	20.8	5.6	BDL	BDL	BDL	BDL	BDL
22.03.2022	59.5	35.8	12.2	12.9	1.28	21.2	5.2	BDL	BDL	BDL	BDL	BDL
25.03.2022	52.8	31.7	12.1	13.2	1.22	20.2	5.1	BDL	BDL	BDL	BDL	BDL
Monthly Average	62.2	37.3	11.4	13.5	1.2	21.0	5.3	BDL	BDL	BOL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	-5	01	01	20	06
Monitoring	PM _{cs} (µg/m ¹)	PM ₄₁ (µg/m [*])	\$0; (µg/m*)	NO. (ug/m²)	(mg/m²)	(µg/m ⁴)	MH, (µg/m²)	Ε _ε Η _ε (μg/m ³)	Bap (ng/m²)	Pb (µg/m²)	(ng/m²)	(ng/m ⁴)
Date					AAQN	5-2; Near	Weighbr	idge				
01.03,2022	48.6	29.2	9.6	7.2	1.18	17.4	4.8	BDL	BDL	BDL	BDL	BDL
04.03.2022	49.2	29.5	9.8	7.7	1,12	17.2	4.6	BDL	BDL	BDL	BDL	BDL
08.03.2022	51.6	31.0	9.2	7.6	0.99	15.6	5.2	BDL	BDL	BDL	BDL	BDL
11.03.2022	51.2	30.7	9.4	7.1	0.98	15,4	5.6	BDL	BDL	BDL	BDL	BDL
15.03.2022	50.6	30.4	9.2	7.3	1.22	16.6	5.4	BDL	BDL	BDL	BDL	BDL
18.03.2022	50.8	30.5	9.1	7.2	1,24	16.8	4.9	BDL	BDL	BDL	BDL	BDL
22.03.2022	43.8	26,3	10.63	7.4	1.28	17.2	4.6	BDL	BDL	BOL	BDL	BDL
25.03,2022	44.5	26.8	10.4	7.1	0.92	17.8	5.2	BDL	BDL	BDL	BDL	BOL
Monthly Average	48.8	29.3	9.7	7.3	1,1	16.8	5.0	BDL	BOL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	- 4	106	400	5	01	01	20	06
Testing Method	Gravimetris:	Gravitmetric	Improved Wasturel Gester method	Modified Secob & Hoofitesser (No-Arsentia)	Note: Spectroscopy	Charrical Method	Inde Phensi Siuv Method	Absorption 8. Description followed by 6C	Solvent Extraction of Followed by OC	AAS- Method	AAS Method	AAS Method







Page No 1 of 2



Consultancy Services Pvt.

Certified for: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by: NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- Infrastructure Enginering
- · Water Resource Management
- · Environmental & Social Study
- Surface & Sub-Surface Investigation
- · Quality Control & Project Management
- · Renewable Energy

Ref : Envlab/21/R-5003

- Agricultural Development
- Information Technology
- · Public Health Engineering
- Mine Planning & Design
 Mineral/Sub-Sull Exploration
- Waste Management Services

Laboratory Services Environment Lab Fessil Lab Material Lab Sail Lab Mineral Lab Microbiology Lab

Date: 31.03.2022

AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- MARCH 2022

: M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK Name of Client

: OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR 2. Name of the Project

Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler 3.

Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring	PM _{cs} (µg/m²)	PM _{EA} (µg/m ⁵)	50 ₂ (µg/m ³)	NO, (µg/m²)	(mg/m²)	D _k (µg/m²)	NH, (µg/m ⁵)	CoHe (pg/m²)	Bap (ng/m ⁴)	Pb (ug/m²)	(ng/m²)	As (ng/m²)	
Date				AAC	MS-3: At th	e Middle	of the Oper	Cast Qua	rry				
01.03.2022	59.6	35.8	10.8	13.8	1.12	21.6	5.4	BDL	BOL	BDL	BDL	BDL	
04.03.2022	48.6	29.2	10.6	12.8	1,12	22.8	5.8	BDL	BDL	BDL	BDL	BDL	
08.03.2022	60.8	36.5	11.6	12,6	1.24	23.6	5.6	BDL	BDL	BDL	BDL	BDL	
11.03.2022	46.6	28.0	11.2	12.8	1.38	23.8	5.2	BDL	BDL	BDL	BDL	BDL	
15.03.2022	52.8	31.7	9.8	11.6	1.41	24.6	4.5	BDL	BDL	BDL	BDL	BDL	
18.03.2022	60.6	36,4	9.6	11.8	1.32	22.8	4.8	BDL	BDL	BDL	BDL	BDL	
22.03.2022	60.8	36.5	9.9	11.2	1,31	21.6	5.1	BDL	BDL	BDL	BDL	BDL	
25.03.2022	61.6	37.0	10.6	12.4	1.26	20.8	5.3	BDL	BDL	BDL	BOL	BDL	
Monthly Average	56.4	33.9	10.5	12.4	1.3	22.7	5.2	BDL	BDL	BDL	BDL	BDL	
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06	
Monitoring	PM _{be} (µg/m²)	PM _{2A} (μg/m ²)	50 ₁ (µg/m²)	NO, (µg/m²)	CO (mg/m ²)	O _L	NH ₁ (µg/m ²)	(Little (pg/m²)	Raip (rg/m²)	P6 [HR/m*)	(ng/m²)	As (ng/m²)	
Date		AAQMS-4: At the Middle of the CQB Plant											
01.03.2022	58.8	41.3	11.6	14.9	1.12	21,6	5,8	BDL	BDL	BDL	BDL	BDL	
04.03.2022	69.6	41.8	11.8	14.6	1.18	22.8	5.4	BDL	BDL	BDL	BDL	BDL	
08.03.2022	70.2	42.1	12.4	14.2	1.08	22.4	5.2	BDL	BDL	BDL	BDL	BDL	
11.03.2022	71.4	42.8	12.6	13.8	0.88	23.6	4.8	BDL	BDL	BDL	BDL	BDL	
15.03.2022	72.8	43.7	11.6	13.6	0.89	23.8	4.2	BDL	BDL	BDL	BDL	BDL	
18.03.2022	72.6	43.6	11.8	13.2	0.92	24.6	5.6	BDL	BDL	BDL	BDL	BDL	
22.03.2022	70.6	42.4	10.6	14.1	1,08	25.2	5.8	BDL	BDL	BDL	BDL	BDL	
25.03.2022	66.8	40.1	11.2	14.2	1.12	24.8	5.2	BDL	BDL	BDL	BDL	BDL	
Monthly Average	70.4	42.2	11.7	14.1	1.0	23.6	5.3	BDL	BDL	BDL	BDL	BDL	
NAAQ Standard	100	60	80	HD	4	100	400	5	93	01	20	06	
Testing Method	Gravemetric	Gestimetric	improved West and Guake method	Modified Motheriner (No- Assents)	nom Spectroscopy	Operacial Method	Indo Phenol Blue Method	Absorption & Description tolerand by GC	Salvers Extraction followed by GC	AAS Metting	AAS Method	AAS Mathod	









AMBIENT AIR QUALITY MONITORING REPORT OF BUFFER ZONE



(Committed For Better Environment)

Certified for: 1SO 9001:2015, 1SO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Accredited by: NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

- Infrastructure Engineeing
- Water Resource Management
- · Environmental & Social Study
- Surface & Sub-Surface Investigation
- Quality Control & Project Management
 Renewable Energy
- Agricultural Development
- Information Technology Public Health Engineering
- Mine Planning & Design Mineral/Sub-Soil Exploration
- Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Miseral Lab
Miseral Lab
Miseral Lab

Ref: Envlab/21/R-0021 Date: 10.01.2022

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- DECEMBER-2021

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK

Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR 2.

3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

: VCSPL Representative in presence of Client's Representative Sample Collected by

Monitoring	PM ₁₀ (μg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m³)	(mg/m³)	Ο ₃ (μg/m ³)	NH ₃ (μg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m³)	Pb (µg/m³)	Ni (ng/m³)	As (ng/m³)	
Date		AAQMS-1; Near Village Ostia											
03.12.2021	62.2	39.4	8.4	14.2	0.54	BDL	6.4	BDL	BOL	BDL	BOL	BDL	
		3		- 1	AQM5-2: N	ear Village	Kaposi						
10.12.2021	53.6	33.2	8.6	14.1	0.58	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
			VII.	AAQMS	-3: Near Vil	lage Kallap	ani Townsh	ip	1				
17.12.2021	62.2	41.6	8.9	13.8	1,24	6.8	21.4	BDL	BOL	BDL	BDL	BDL	
				A	AQMS-4: No	ar Village (Ostapal						
24.12.2021	56.2	38.8	7.4	10.8	0.42	4.8	BDL	BDL	BDL	BDL	BDE	BDL	











Visiontek Consultancy Services Pvt. Ltd. (Committed For Better Environment) (Laboratory Services)

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- Infrastructure Enginesing
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- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- · Renewable Energy
- Agricultural Development
 - Mine Planning & Design
- Information Technology
- Mineral/Sub-Soil Exploration Public Health Engineering Waste Management Services

Laboratory Services
Environment Lab
Frod Lab
Manerial Lab
Soil Lab
Mineral Lab

& Microbiology Lab

Ref: Envlab/21/R-5004 Date: 31.03.2022

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- MARCH 2022

: M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK 1. Name of Client

: OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR Name of the Project 2.

Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler 3.

4. Sample Collected by = VCSPL Representative in presence of Client's Representative

Monitoring	PM ₁₀ (µg/m ¹)	PM ₂₅ (µg/m ³)	50 ₂ (µg/m ³)	NO ₃ (μg/m ³)	(mg/m³)	Ο ₃ (μg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m³)	Pb (µg/m³)	Ni (ng/m ³)	As (ng/m ³
Date	- 0			AAC	MS-1: Near	Village Ost	ia					
07.03.2022	52.8	39.6	8.4	14.6	0.53	BDL	6.6	BDL	BDL	BDL	BDL	BDL
				AA	QMS-2: Near	Village Ka	posi					
07.03.2022	53.08	34.6	8.8	13.9	0.62	BDL	8DL	BDL	BDL	BDL	BDL	BDL
1				AAQMS-3	: Near Villag	e Kaliapani	Township					
14.03.2022	62.2	41.6	9.4	14.8	1.19	6.9	21.6	BDL	BDL	BDL	BDL	BDL
				AAC	QMS-4: Near	Village Ost	apal					
21 03 2022	55.8	40.6	8.1	11.8	0.52	5.6	RIVI	ROL	BOL	RDI	RDi	RDI









FUGITIVE EMISSION ANALYSIS REPORT

isiontek Cons

(Committed For Better Environment)

Certified for: 1SO 9001:2015, 1SO 14001:2015, 1SO 45001:2018 (OH&S), 1SO/IEC 17025:2017 Accredited by ; NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

• Surface & Sub-Surface Investigation • Infrastructure Enginering

Water Resource Management
 Environmental & Social Study

 Quality Control & Project Management • Renewable Energy

 Agricultural Development • Information Technology • Public Health Engineering • Mine Planning & Design

 Mineral/Sub-Soil Exploration Waste Management Services

Soil Lab Mineral Lab & Microbiology Lab

Laboratory Services Environment Lab Food Lab Material Lab

Ref : Envlab/21/R-0068

Date: 12.01.2022

FUGITIVE EMISSION ANALYSIS REPORT- DECEMBER- 2021

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK

2. Name of the Project : OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR

3. Sampling Location : F1- Near Mines Ore Plot Area

F2- Near COB Plant Area

F3- Near Mines Loading & Unloading Point

4. Method of Sampling : IS 5182(P-5) 1975 RA 2014

5. Date of Sampling : 16.12.2021

6. Date of Analysis : 17.12.2021 TO 18.12.2021

7. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL.	Tot Down ton	Tot Mathed	#1	Analysis Result			
No.	Test Parameters	Test Method	Unit	F1	F2	F3	
1	Suspended Particulate Matter as SPM	IS 5182 (P-4)1999 RA 2014 Gravimetric Method	μg/m³	128	232	188	







■ Infrastructure Enginering

· Environmental & Social Study

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- Surface & Sub-Surface Investigation • Water Resource Management
 - Quality Control & Project Management · Renewable Energy
- Agricultural Development • Information Technology Public Health Engineering
- Mine Planning & Design
- Mineral/Sub-Soil Exploration Waste Management Services

Date: 31.03.2022

Laboratory Services
Environment Lab
Food Lab
Material Lah
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref : Envlab/21/R-5013

FUGITIVE EMISSION ANALYSIS REPORT- MARCH 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK

2. Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

3. Sampling Location : F1- Near Mines Ore Plot Area

F2- Near COB Plant Area

F3- Near Mines Loading & Unloading Point

4. Method of Sampling : IS 5182(P-5) 1975 RA 2014

5. Date of Sampling : 15.03.2022

6. Date of Analysis : 16.03.2022 TO 19.03.2022

7. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL.	Task Danasastasa	Tot Mathed	III.de	Analysis Result			
No.	Test Parameters	Test Method	Unit	F1	F2	F3	
1	Suspended Particulate Matter as SPM	IS 5182 (P-4)1999 RA 2014 Gravimetric Method	μg/m³	131	218	168	









NOISE LEVEL SURVEY REPORT

Visiontek Consultancy Services Pvt. Ltd.
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- Water Resource Management
 Environmental & Social Study
- Surface & Sub-Surface Investigation
- Quality Control & Project Management
 Renewable Energy
- Agricultural Development
- Information Technology Public Health Engineering

 Mine Planning & Design
 Mineral/Sub-Soil Exploration
 Waste Management Services Microbiology Lab

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab

Ref: Envlab/21/R-0023 Date: 10.01.2022

NOISE QUALITY ANALYSIS REPORT- DECEMBER 2021

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 2. Name of the Project : OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR

3. Date of Sampling : 14.12.2021

Sample Collected by : VCSPL Representative in presence of Client's Representative

			Result in dB (A)			
Location ID	Location	Ambient	Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)		
NI	Open Cast Quarry	7	70.8	63.2		
N2	COB Plant		66.6	60.8		
N3	Mines Loading & Unloading	7	68.2	61.2		

AMBIENT NOISE LEVEL STANDARD

	Li	imit in dB (A)
Category Area/Zone	Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)
Industrial Area	75	70
Residential Area	55	45
Commercial Area	65	55
Silence Zone	50	40











Visiontek Consultancy Services Pvt. Ltd.
(Committed For Better Environment)

(Laboratory Services)

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• Infrastructure Enginering

• Water Resource Management

· Environmental & Social Study

Surface & Sub-Surface Investigation

· Quality Control & Project Management

· Renewable Energy

· Agricultural Development

• Information Technology

Public Health Engineering

• Mine Planning & Design

Mineral/Sub-Soil Exploration

• Waste Management Services

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab & Microbiology Lab

Date: 31.03.2022

Ref: Envlab/21/R-5011

NOISE QUALITY ANALYSIS REPORT- MARCH 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK

: OSTAPAL CHROMITE MINES , KALIAPANI, JAJPUR Name of the Project 2.

3. Date of Sampling : 15.03.2022

Sample Collected by : VCSPL Representative in presence of Client's Representative

+ + 6	2.734		Result in dB (A)			
Location ID	Location	0.000	Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)		
N1	Open Cast Quarry	Ambient	66	61		
N2	COB Plant		63	56		
N3	Mines Loading & Unloading		68.2	60.2		

AMBIENT NOISE LEVEL STANDARD

2 2 - x - 1 K	Lin	mit in dB (A)
Category Area/Zone	Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)
Industrial Area	75	70
Residential Area	55	45
Commercial Area	65	55
Silence Zone	50	40









Effluent Water Discharge

Visiontek Consultancy Services Pvt. Ltd.
(Committed For Better Environment)

(Laboratory Services)

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Surface & Sub-Surface Investigation • Infrastructure Enginering

· Agricultural Development Quality Control & Project Management
 Renewable Energy • Information Technology • Public Health Engineering Mine Planning & Design

Date: 13.12.2021

Mineral/Sub-Suit Exploration
 Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
A
Microbiology Lab

• Water Resource Management

· Environmental & Social Study

Ref : Envlab/21/R-9177

EFFLUENT WATER DISCHARGE ANALYSIS REPORT- DECEMBER-2021

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1. Name of the Project : OSTAPALCHROMITE MINES , KALIAPANI, JAJPUR 2.

Sampling Location : EW1: ETP Mines Final Discharge Water 3.

Method of Sampling : APHA 1060 B 4. Date of Sampling : 03.12.2021 5.

6. Date of Analysis : 04.12.2021 TO 10.12.2021

Sample Collected by VCSPL Representative in presence of Client's Representative

St. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results EW-I
1.	Colour	Visual Comparison Method APHA 2120 B; 23th Edition, 2017	Hoten	Colourtess	10
2	Odour	Threshold Odour Method APHA 2150 B; 22 rd Edition, 2017	1	Odourless	pungent smell
3	pH at 25°C	pH Meter APHA 4500 H B; 23th Edition, 2017	1	55.9.0	7,98
4	Total Suspended Solids	Gravimetric Method APHA 2540 D: 23 rd Edition, 2017	Ing/L	100	32
5	Copper as Cu	By AAS Method APHA 3111 B; 23 st Edition, 2017	Toget	4:	< 0.05
6	Flooride as F	Distillation followed by Spectophotometric Method APHA 4500 F C.D; 23 rd Edition, 2017	mg (2	0.38
7	Total Residual Chlorine	ludometric Method APHA 23RD Ed,2017 : 4500CL B	mgl		ND
8	Iron as Fe	By AAS Method APHA 3111 B: 23° Edition, 2017	lvg/l	3	0.42
9	Manganese as Mn	By AAS Method APHA 3111 B; 23th Edition, 2017	ing/	2	< 0.05
10	Nitrate as NO;	By UV-Screen Method APHA 4500 NO. B; 23 rd Edition, 2017	Ing/E	10	7.46
11	Phenolic Compounds as C ₂ H ₂ OH	Distillation Followed by Spectophotometric Method APHA 5530-B, D: 23 rd Edition, 2017	tafi I	Y	<0.001
12	Selenium as Se	By AAS Method APHA 3500 Se C: 23th Edition, 2017	ing t	0.05	<0.0)
13	Cadmium as Cd	By AAS Method APHA 3113 B; 23 rd Edition, 2017	/mg/l	2,0	< 0.001
14	Cyanide as CN	Distillation Followed by Spectophotometric Method APHA 4500 -CN-C.E.; 23 th Edition, 2017	img (6.2	< 0.05
15	Lead as Ph	By AAS Method APHA 3111 B: 23 rd Edition: 2017	Figur	0.1	<0.0>
16	Mercury as Hg	By AAS Method APHA 3112 B; 23th Edition, 2017	Inju!	0.01	<0.001
17	Nickel as Ni	By AAS Method APHA 3111 B; 23th Edition, 2017	mg/l	3	< 0.05
13	Arsenic 2s As	By AAS Method APHA 3114 B; 23th Edition, 2017	ing t	0.2	<0.05
19	Total Chrommun as Cr	By AAS Method APHA 3111 B; 23th Edition, 2017	mg/l	1	0.28
20	Zinc as Zin	By AAS Method APHA 3111 B; 23th Edinson, 2017	T.gon	5	0.024
21	Hexavalent Chromaum as Cr*	By AAS Method APHA 3500 Cr B; 23 st Edition, 2017	ingV	9.1	< 0.001
22	Vasadium as V	By AAS Method APHA 3500 V: 23 rd Edition, 2017	mg/t	0.2	< 0.001



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· Environmental & Social Study

Surface & Sub-Surface Investigation

· Quality Control & Project Management

· Renewable Energy

· Agricultural Development

• Information Technology

· Public Health Engineering

Mine Planning & Design
 Mineral/Sub-Soil Exploration

Waste Management Services

Laboratory Services Environment Lab Food Lab Material Lab Soil Lab Mineral Lab & Microbiology Lab

Ref: Envlab/21/R-9177 Date: 13.12.2021

23	Temperature	By Thermometer APHA 2550 B: 23 ¹⁴ Edition, 2017	ªC	Shall not exceed 5°C allove the receiving water temperature	33
24	Dissolved Oxygen	Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017	mg/l	9	6.1
25	Biochemical Oxygen Demand as BOD	Oxygen Depletion Method IS 3025 (Part 44):2003	ngT	30	2,2
26	Chemical Oxygen Demand as COD	Open Reflux Method APHA 5220 B; 23 ¹⁰ Edition, 2017	mgf	250	16
27	Oil & Grease	Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017	mg/l	10	3.8
28	Ammonical Nitrogen as N	By TKN Method APHA 4500-NH ₁ C; 23rd Edition, 2017	mgl	50	24
29	Total Kjeldahl Nitrogen as N	By TKN Method APHA 4500-N _m C; 23rd Edition, 2017	mg/L	100	3,9
30	Sulphide as S	By Methylene Blue Method APHA 4500-S D; 23rd Edition, 2017	mg/l	2	<0.00]
31	Free Ammonia as NH	By Calculation	Tue	10	4.4
32	Partsculate Size of Suspended Solida	Gravimetric Method APHA 2540 D. 23 rd Edition, 2017	μ	Shall pass 850 micron IS Sieve	<850
33	Bio-assay Test	Evaluating Acute Toxicity IS 6582 (P-2) 2008	6.A	90% survival of fish after 96 hours in 100% effluent	98% Survival of Fish after 96 Hrs in 100% Edfuent









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 Agricultural Development · Quality Control & Project Management · Information Technology

Mine Planning & Design

Mineral/Sub-Soil Exploration

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab Microbiology Lab

Infrastructure Enginering

• Water Resource Management · Environmental & Social Study

• Renewable Energy

· Public Health Engineering

Waste Management Services

Ref: Envlab/21/R-5008

Date: 31.03.2022 EFFLUENT WATER DISCHARGE ANALYSIS REPORT- MARCH 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED, BHADRAK 1.

OSTAPAL CHROMITE MINES, KALIAPANI, JAJPUR 2. Name of the Project

: EW1: ETP Outside Discharge Point 3. Sampling Location

: APHA 1060 B 4. Method of Sampling Date of Sampling : 15.03.2022 5.

Date of Analysis : 16.03.2022 TO 23.03.2022

Sample Collected by : VCSPL Representative in presence of Client's Representative

SL No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results EW-1
1	Colour	Visual Comparison Method APHA 2120 B: 23 rd Edition, 2017	Hazen	Columbes	3
2	Odour	Threshold Odour Method APRA 2150 B; 23 rd Edition, 2017	100	Odourless	Pungent Smell
3	pH at 25°C	pH Meter APHA 4500 H B; 23 rd Edition; 2017	0	5.5-9.0	7.88
4	Total Suspended Solids	Convinceric Method APHA 2540 D; 23th Edition, 2017	Tum.	100	20
5	Copper as Cu	By AAS Method APHA 3311 B; 23 rd Edition, 2017	mg/l	3	< 0.02
6	Fluoride as F	Distillation followed by Spectrophotometric Method APHA 4500 F. C.D. 23 rd Editions, 2017	mg/l	2	0.24
9	Total Residual Chlorine	Iodometric Method APHA 23RD Ed.2017 : 4500Cl, B	figit)	-1	0.24
8	Iron as Fe	By AAS Method APHA 3111 B; 21th Edition, 2017	mg/l	3	0.58
N	Manganese as Mn	By AAS Method APHA 3111 B; 23 rd Edmon. 2017	mg/I	2	< 0.025
10	Natrate as NO ₁	By UV-Screen Method APHA 4500 NO: B; 23 rd Edition, 2017	mg/I	10	4.6
1)	Phenolic Compounds as CollsOH	Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017	mg/l	- 4	< 0.05
12	Selenium as Se	By AAS Method APHA 3500 Se C; 23 rd Edition, 2017	mg/l	0,05	<0.001
13	Cadmaun as Cd	By AA5 Method APHA 3111 B; 23th Edition, 2017	mg/l	2.0	<0.01
14	Cymide as CN	Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C.E; 23 st Edition, 2017	mg/I	0.2	(0.0)
15	Lead as Pb	By AAS Method APHA 3311 B; 23 rd Edition, 2017	mg/l	0.1	< 0.02
1.6	Mercury as Hg	By AAS Method APHA 3112 B; 23 rd Edition, 2017	mg/l	0:01	<0.004
17	Nickel as Ni	By AAS Method APHA 3111 B; 23td Edmon. 2017	mg/l	3	≥0.1
18	Arsenic as As	By AAS Method APHA 3114 B: 23 ¹⁶ Edition, 2017	mg/l	11.2	<0.004
19	Total Chromium as Cr	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	1	0.36
20	Zinc as Zn	By AAS Method APHA 3111 B; 23th Edition, 2017	mg/l	5	0.021
21	Hexavalent Chromium as Cr ⁻¹	By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017	mg/T	0.1	<0.01
22	Vassdium as V	By AAS Method APHA 3500 V; 23 rd Edition, 2017	mg/I	0.2	<0.001
23	Temperature	By Thermometer APHA 2550 B; 23 rd Edition, 2017	#C	Shall not exceed S ¹ C above the receiving water temperature	35
24	Dissolved Oxygen	Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017	mg/l		6.1
25	Biochemical Oxygen Demand as BOD	Oxygen Depletion Method 1S 3025 (Pan 44):2003	mg/t	30	3.1
26	Chemical Oxygen Demand as	Open Reillux Method	mu/l	250	10



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- Agricultural Development
- . Information Technology
- · Public Health Engineering
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- Mineral/Sub-Soil Exploration
- Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab Soil Lab Mineral Lab & Microbiology Lab

1	COD	APHA 5220 B; 23 rd Edition, 2017			/ -
27	Oil & Grease	Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017	mg/I	10	4.2
29	Ammonical Nstrogen as N	By TKN Method APHA 4500-NH; C; 23rd Edition, 2017	mg/l	50	1.8
30	Total Kjeldahl Nitrogen as N	By TKN Method APHA 4500-N _{ee} C; 23rd Edition, 2017	mg/t	100	5.1
31	Sulphide as S	By Methylene Blue Method APHA 4500-S D; 23rd Edition, 2017	mg/l	2	< 0.001
32	Free Ammonia as NH;	By Calculation	mg/l	10	3.8
33	Particulate Size of Suspended Solids	Gravimetric Method APHA 2540 D; 23 rd Edition, 2017	μ	Shall pass 850 micron IS Sieve	<850
34	Bio-assay Test	Evaluating Acute Toxicity IS 6582 (P-2) 2008	%	90% survival of fish after 96 hours in 100% effluent	98% Survival of Fish after 96 Hrs in 100% Effluen





Annexure No.-13

SI. No.	ITEM	Expenses for the year 2021-22 (in Rupees ₹)			
1	AFFORESTATION 2897 FY 21				
a)	Seedlings	173,820			
b)	Fertilizer/Insecticide/Cow -dung	57,940			
c)	Digging of Pits/Planting (Laborcost)	101,395			
d)	Post Plantation care(Watering, Weeding, basin making etc.)	362,125			
e)	Supervising	490,000			
	Sub-Total	1,185,280			
2	WATER MANAGEMENT & TREATMENT				
-)	ETP Operation & Maintenance	2.570.007			
a)	(including costs of chemical & Manpower)	2,570,897			
b)	Power Consumption	512,100			
c)	Sludge disposal	80,000			
d)	Water sample analysis	71,160			
e)	Water Tax Payment	369,360			
	Sub-Total	3,234,157			
3 DUST SUPRESSION & AIR MONITORING					
a)	Water spraying at dust generating points by water tanker 2111 No. trip	1,023,835			
b)	Air monitoring charges	1,126,400			
c)	Fusitive dust emission	18,804			
c)	Noise level measurement	1,800			
	Sub-Total	2,170,839			
	Grand Total	6,590,276			