



Ref: No: GD/998/39

Date: September 25, 2018

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

**REGD. PARCEL WITH A/D**

Dear Sir,

*Reg.: Annual Environmental Statement in Form-V for the year 2017-18.*

We are enclosing herewith Annual Environmental Statement in Form-V for the financial year 2017-18 in respect of our Gomardih Dolomite Quarry of M/s Tata Steel Limited for your kind perusal.

Thanking you.

Yours faithfully,  
F: Tata Steel Limited

**Agent-Cum-Manager,**  
**Gomardih Dolomite Quarry**

Encl: As above

Copy to: The Regional Officer, Odisha State Pollution Control Board, Town  
Engineering Office Premises, Sector-5, Rourkela, Sundergarh, Odisha,  
PIN:769005.

**TATA STEEL LIMITED**

Gomardih Dolomite Quarry, Tunmura-770070, Sundargarh, Odisha, India  
Tel: 7894449615 e-Mail: admingdq@tatasteel.com  
Regd. Office: Bombay House, 24 Homi Mody Street Fort, Mumbai – 400 001  
Tel 91 66658282 Fax 91 22 66657724

**FORM - V**  
(See Rule -14)

**ENVIRONMENT STATEMENT**  
**FOR THE FINANCIAL YEAR ENDING THE 31<sup>st</sup> MARCH, 2018**

**GOMARDIH DOLOMITE QUARRY, TATA STEEL LTD.**

**PART-A**

1. Name and address of the owner/  
Occupier of the industry, operation : Gomardih Dolomite Quarry  
: Tata Steel Ltd., P.O-Tunmura  
Dist - Sundargarh, Odisha -770070
- Agent : Mr. Rajesh Kumar  
Nominated Owner : Mr. T.V Narendran,  
Managing Director  
Tata Steel India & SEA, Jamshedpur
2. Industry Category : Opencast Mining
3. Production Capacity : Dolomite Ore -8,16,000 TPA
4. Year of establishment : 1962
5. Date of submission of previous  
Environment Audit Report. 26<sup>th</sup> September' 2017

**PART-B**

- A) Water consumption in m<sup>3</sup> / day under all the three heads for the assessment Year is as follows:

**(i) Water Consumption:**

Quarry water is used for processing, spraying and cooling.

Consumption Head	2016-17 (Cum/day) (Annual average)	2017-18(Cum/day) (Annual average)
Process (for washing equipment and crusher plant)	14.75	20.09
Cooling(Sprinkling on haul road)	0	51.5
Domestic	37.8	42.22

Name of products	Water Consumption for unit of products	
	During the previous financial year (2016-17)	During the current financial year (2017-18)
Dolomite	517684.31	637111.3

Dolomite Ore is produced by mechanized method of mining, which does not involve beneficiation and thus precludes the consumption of water. Presently about Av. 270 m<sup>3</sup> of water is being pumped out from the pit per day. Part of this water is utilized every day for dust suppression on haul roads, crushing & screening plant and in equipment maintenance. The balance water is discharged to the nearby agricultural fields, where it is utilised by the villagers for irrigation.

Domestic water requirement is being met by pumping water from Nakti Jor, a perennial stream nearby. Gomardih Dolomite Quarry. It has obtained NOC vide No. 21-4(302)/CGWA/SER/2011-169 dated 05/02/2011 from CGWA, Bhubaneswar. The application for drawl of surface water from the Nakti Jor is under consideration by the "Water Resources Department, Govt. of Odisha. Interim agreement for drawing water from Nakti Jor has been executed with Executive Engineer, Sundargarh Irrigation Sub-division on 7<sup>th</sup> April, 2018. The copy of the NOC issued by CGWA and application submitted for drawl of surface water & the interim agreement for drawl of surface water are annexed as **Annexure-I,II & III** respectively.

## (ii) Raw Material Consumption

The other material consumed during the process of mining like lubricants, oil & grease, brake fluid, explosives and accessories, electric power, industrial gas etc. Are given as follows:

Other Raw Materials used	During the current financial year (2016-17)	During the current financial year (2017-18)
High Speed Diesel (ltrs)	13388	9663.45
Gas (cum)	1490.97	1297.313
Lubricant (ltrs)	11540	13390
Grease (kg)	360	270
Electricity consumed (kwh)	1758000	1802000
Explosives of all types (Explosive, cordex, detonator)	216275 KG, 0.00mtr, 12760 nos.	221575 KG, 0.00mtr, 11718 nos.

## PART-C

### POLLUTION DISCHARGED TO ENVIROMENT/ UNIT OF OUTPUT (Parameters as specified in the consent issued)

#### **Water Pollution:**

The water, which gets accumulated in the pit, is regularly pumped out to continue the mining operations. The mine discharge is allowed to settle at the series of settling ponds made at the top of the quarry. Then it is allowed to go outside. The same water is used at the nearby paddy fields for irrigation purpose. Similarly the canteen effluent is discharged to a soak pit. The domestic sewage is discharged to septic tanks and soak pits. The mine discharge and canteen effluent quality are regularly monitored. The sample of few parameters are given as Table-I and the annual average for the year 2017-18 of the effluent quality (Mine discharge water quality and canteen discharge water quality) are annexed as **Annexure-IV and IV** respectively. The results show that the parameters are within the prescribed limits.

#### Details of Water Quality Monitoring: (Table -1)

Pollutants	Units	Concentration of pollutants (milligrams/litre)	Standards (milligrams/litre)	Percentage of variation from standards with reasons
Mines Discharge	Unit			
pH	-	6.23	5.5-9.0	-
BOD 3 days	mg/l	2.1	30	(-) 95.00
Fe	mg/l	0.20	3	(-) 93.33

Note: (-) deviation implies better than standard

#### **Air:**

Since this is an open cast Mine, the dust generation is mainly due to the movement of vehicles in the haul roads, drilling activities, crusher plant etc, which is fugitive in nature and cannot be quantified. The fugitive dust is controlled at source by provision of wet drilling in the drill machines and installation of dry fog system at the crusher plant. Besides, dust is suppressed by sprinkling of water using mobile water tankers. Green belt has been developed by plantation of trees at lease boundary as well as around the residential colony to prevent propagation of dust.

The annual average of some important parameters are given below. The details of the annual average of ambient air quality data is enclosed as **Annexure-VI**. It shows that the concentrations of the pollutants are well within the permissible standards.

Details of Ambient Air Quality Monitoring :

**1. Near First Gate**

Parameter	Average Concentration (Apr'17 to Mar'18)	CPCB Standard Annual Average $\mu\text{g}/\text{m}^3$	% of Variation from the Standards	Remarks
PM-10 ( $\mu\text{g}/\text{m}^3$ )	63.6	100	(-)36	
PM2.5 ( $\mu\text{g}/\text{m}^3$ )	34	60	(-)55	
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	5.5	80	(-)93	
No <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	21.9	80	(-)72	
CO (mg/m <sup>3</sup> )	0.4	4 mg/m <sup>3</sup>	(-)90	

**2. Near Crusher Plant**

Parameter	Average Concentration (Apr'15 to Mar'16)	CPCB Standard Annual Average $\mu\text{g}/\text{m}^3$	% of Variation from the Standards	Remarks
PM-10 ( $\mu\text{g}/\text{m}^3$ )	69.5	100	(-)30.5	
PM2.5 ( $\mu\text{g}/\text{m}^3$ )	37.2	60	(-)38	
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	5.9	80	(-)92.6	
No <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	22.5	80	(-)71.8	
CO (mg/m <sup>3</sup> )	0.4	4 mg/m <sup>3</sup>	(-)90	

**3. Near VT Centre**

Parameter	Average Concentration (Apr'15 to Mar'16)	CPCB Standard Annual Average $\mu\text{g}/\text{m}^3$	% of Variation from the Standards	Remarks
PM-10 ( $\mu\text{g}/\text{m}^3$ )	54.6	100	(-)43	
PM2.5 ( $\mu\text{g}/\text{m}^3$ )	28.717	60	(-)55	
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	4.95	80	(-)91	
No <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	19.55	80	(-)72	
CO (mg/m <sup>3</sup> )	0.274	4 mg/m <sup>3</sup>	(-)95	

**4. Near Hospital**

Parameter	Average Concentration (Apr'15 to Mar'16)	CPCB Standard Annual Average $\mu\text{g}/\text{m}^3$	% of Variation from the Standards	Remarks
PM-10 ( $\mu\text{g}/\text{m}^3$ )	51	100	(-)57	
PM2.5 ( $\mu\text{g}/\text{m}^3$ )	26.3	60	(-)42	
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	4.8	80	(-)81	
No <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	17.8	80	(-)74	
CO (mg/m <sup>3</sup> )	0.22	4 mg/m <sup>3</sup>	(-)94	

**5. Near Substation**

Parameter	Average Concentration (Apr'15 to Mar'16)	CPCB Standard Annual Average $\mu\text{g}/\text{m}^3$	% of Variation from the Standards	Remarks
PM-10 ( $\mu\text{g}/\text{m}^3$ )	61.8	100	(-)42	
PM2.5 ( $\mu\text{g}/\text{m}^3$ )	32.9	60	(-)54.56	
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	5.3	80	(-)81.0	
No <sub>x</sub> ( $\mu\text{g}/\text{m}^3$ )	21.1	80	(-)73	
CO (mg/m <sup>3</sup> )	0.4	4 mg/m <sup>3</sup>	(-)94	

**Note: (-) deviation implies better than standard.**

This is an opencast mine and does not have any single point source of air pollution. Hence, quantitative estimation of air pollutants discharged in Kg/day cannot be ascertained. The above ambient air quality data shows that the concentrations of the pollutants are well within the permissible standards.

## PART-D

### HAZARDOUS WASTES

As specified under the Hazardous Waste (Management, Handling and Trans-boundary) Rules, 2008 and amendment thereof

Hazardous Waste generation		Total Quantity in Kilograms	
		During the previous financial year (2016-17)	During the current financial year (2017-18)
a)	From process		
	-Used oil in liquid form	0.57KL	0.079 KL
	-Oily wastes in solid form	NIL	0.010 mt
	-Used battery in solid form	10	Nil
b)	From pollution control facilities	Nil	Nil

## PART-E

### SOLID WASTES

Solid Waste		Total Quantity	
		During the previous financial year (2016-17)	During the current financial year (2017-18)
a)	From process		
	- Mining Overburden	14665 m <sup>3</sup>	29641 m <sup>3</sup>
	- Rejects	Nil	Nil
	- Spoils	Nil	Nil
	- Ore washing slimes	Nil	Nil
b)	from pollution control facilities	Nil	Nil
c)	1. Quantity recycled or re-utilized	Nil	Nil
	2. Sold	Nil	Nil
	3. Disposed	Nil	Nil

## PART-F

### THE CHARACTERISTICS (in terms of composition and quantum) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

The oil containing sludge and materials having oil, used oil from vehicle maintenance, used automobile batteries and used up torch cells has been identified as hazardous materials generated. We have been granted authorization for disposal of hazardous materials under Hazardous Waste (Management and Handling) Rules, 2008. Kindly refer to your letter no: -Ind-IV-HW-308-1045 dated 1st June 2015 which is valid up to 31st March'2020.

## **DISPOSAL PRACTICE:-**

### **a) SOLID WASTES:**

Solid Waste generated as overburden mainly consists of morrum. Overburden is systematically and scientifically dumped on a non-mineralised area and the same will be reclaimed by afforestation once it becomes inactive.

### **b) HAZARDOUS WASTE:**

The oil containing sludge and materials having oil, used oil from vehicle maintenance, used automobile batteries and used up torch cells has been identified as hazardous materials generated. We have been granted authorization for disposal of hazardous materials under Hazardous Waste (Management and Handling) Rules, 2008 vide letter no: --Ind-IV-HW-308-1045 dated 1st June 2015 issued by Odisha State Pollution Control Board which is valid up to 31st March'2020.

### **WASTE OIL:**

The waste oil generated at various sources is collected in leak proof barrels and then is kept on an impervious floor with oil catch pit. It is also ensured that the caps of the barrels remain intact and horizontal. The storage area is properly fenced and caution board displayed. During transfer of waste oil to barrels, a trough is placed underneath in order to prevent land contamination due to oil spillage. Then at a fixed interval, these barrels are supposed to be sold to the authorized vendor of OSPCB. Provision of impervious pit with oil for collection of oily waste is there at the workshop premises in addition to the existing practice of collection at specified barrels. Oil and water separation arrangements are also made at the workshop premises.

### **WASTE BATTERIES:**

The used lead acid batteries with diluted acid and caps intact are kept under a shed having impervious floor. Then at a fixed interval, these batteries are supposed to be disposed through auction to the authorized recycler after due intimation to State Pollution Control Board.

### **Note:**

Now we have made an agreement on 09.04.2013 with M/s West Bengal Waste Management Limited, a division of Ramky Enviro Engineers Limited located at Haldia, West Bengal to dispose the waste containing oil falling in line with the recent directive from Member Secretary, State Pollution Control Board, Orissa vide his letter no. 14315/IND-IV-Misc,-256, dated 04.09.09. This agreement is valid till 12<sup>th</sup> April,2018.

According to the agreement between M/S Tata Steel, Ferro Alloys and Minerals Division (FAMD) and M/S Ramky Enviro Engineers Pvt. Ltd; the hazardous waste generated at the premises of the Generator located at FAMD (Sukinda Chromite Mines, Ferro Alloys Plant, Bamnipal, Manganese Group of Mines, Joda, Gomardih Dolomite Quarry) shall be disposed to the authorized party. The hazardous waste generated so far at Gomardih is very negligible in quantity. The service of the authorized vendor shall be rendered as per requirement.

## **PART-G**

### **IMPACT OF POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION**

#### **DUST SUPPRESSION:**

- Water spraying on mine haul roads by water tankers has reduced the dust levels in the ambient air.
- The dry fog system has been installed in the crusher plant. Besides, spraying of water in crusher hopper, screens and transfer points has improved the work zone environment in the plant.
- Tarpaulin sheets are now being used to cover the Dolomite fines stacks to avoid dust nuisance during dry seasons.
- Wet drilling is in practice to control the generation of fugitive dust at source.
- Water spraying is done on the blasted mock pile to reduce generation of dust during loading.
- The people working in the areas of potential dust generation points have been provided with

- Photographs of different activities of dust suppression are attached as **Annexure-VIII**.

#### **MANAGEMENT OF SURFACE RUN-OFF & MINE DISCHARGE WATER:**

- About 180 meters of garland drain and 5 nos. of settling pits were made during the year 2013-14 along the northern lease boundary of the mine. All the garland drain and settling pits are being maintained to check run-off during monsoon season.
- Garland drain around the mine is maintained regularly at the toe of dumps, periphery of the quarries and mineral storage area.
- The garland drains are made of avg. width 1.5 m and depth min. 1m and cleaned before monsoon every year.
- The garland drains are provided with intermittent settling ponds where the rain water along with surface run-off gets settled and clean water is allowed to go outside the mining lease area. This water is utilized for irrigation purpose by the neighbor villages.

#### **TOP SOIL & SOLID WASTE MANAGEMENT:**

- The top soil generated during the course of OB excavation is stacked separately at a designated place. It is used as sweet earth while doing plantation at OB dumps and other places.
- The overburden is dumped at a place earmarked for the purpose and the approved design of the Mining Plan is being followed while developing the dump.
- The reclamation of the OB dump is done by phase-wise plantation at the dump slopes.
- Toe wall has been provided at the bottom of the OB dump to arrest the slided material at the toe of the dump.
- Company had spent an amount of Rs. 11 Lakhs on a study on Dump Stability engaging CIMFR, Dhanbad.
- Photographs of dumps management activities are attaches as **Annexure-IX**.

#### **WATER TREATMENT & RECYCLING:**

- The mine has two filter plant units one at the mine premises and another at its colony area. The mine discharge water as well as the water drawn from the Nakti Jor is treated at these filter plants before it is supplied for domestic use. The water quality meets all the parameters as prescribe by the statutory authorities.
- The canteen effluent is discharged to a soak pit made for the purpose.
- The oil and grease separation system is there for treating workshop effluent.
- A roof top Rainwater Harvesting Structure has been installed at the Guest House on a trial basis.
- Photographs of water treatment are attached as **Annexure-X**.

#### **ENVIRONMETNAL MONITORING:**

- Regular monitoring of the Ambient Air Quality of both core and buffer zone is being done by engaging a vendor i.e. M/S Visiontek Consultancy Pvt. Ltd. Bhubaneswar, authorized by OSPCB and having its environmental laboratory accredited by NABL. The monitoring consists of ambient air quality monitoring at a frequency of twice in a week with 24 hourly sampling, water quality monitoring once in a month for all the parameters and ambient noise quality.
- Meteorological station installed at project site at a height of 10m above ground level for measurement of parameters like Temperature, Humidity, Wind speed, Wind Direction, rainfall, on hourly basis continuously for the study period by using automated "Davis" make weather monitoring station.

#### **AFFORESTATION:**

- About 3790 numbers of saplings covering an area of 1.216 ha inside mining lease hold have been planted in different places like OB dump, along the road side area leading from Mine to Sonakhan during the year FY'17-18.
- In addition to this, the 200 saplings planted outside mine lease boundary especially along the side of road connecting SH-10 and mine, and area around colony are being maintained.
- Apart from the above, TSRDS (Tata Steel Rural Development Society) has distributed 8000 saplings to different schools near Gomardih.
- Photographs of afforestation are attached as **Annexure-XI**.

#### **NOISE REDUCTION:**

- Periodic maintenance of the HEMM is in practice which has helped in reduction of noise generation at source.
- People working at HEMM and crusher plant area have been provided with earmuffs to use as a contingency measure.
- Constant monitoring of the noise level is in practice. The six monthly monitoring results as attached in **Annexure-VII** shows that it is within prescribed limits.

#### **SANITATION & WATER SUPPLY:**

- Potable water is supplied to all the camp residents after treatment in the pressure filter plant.
- Sufficient nos. of toilets with washing facility has been provided at the work place for sanitation jobs. Besides, all the residential houses inside the colony are having individual toilets and bathrooms. All these toilets are connected with a sewage network, septic tanks and soak pits.
- Construction of a new sewage treatment plant (STP) at the residential colony of Gomardih is under progress and will be commissioned shortly.

#### **MEDICAL FACILITIES & HEALTH MONITORING:**

- All the employees do undergo periodical medical examination (PME) in hospital every five years. However as per the recent notification, PME of all the employees shall be carried out once in three years for those employees who have reached 45 years of age or more.
- M/S Utkal Polyclinic has been assigned for doing the PME of all the departmental and contractual employees of Gomardih.
- As of now, no occupational diseases have been reported till date. Approx. 111 nos. of contract workers and 53 departmental workers were covered under PME and The medical facilities are also extended to the local community by organizing regular health camps. Health initiatives in the nearby villages were taken care by our TSRDS unit.

#### **ENVIRONMENT AWARENESS:**

- Mines Environment and Mineral Conservation week was observed by participation of most of the mines of Bhubaneswar region, under the aegis of Indian Bureau of Mines, Govt. of India. Our mine bagged total one numbers of prizes i.e. Top soil management.
- Biodiversity conservation program has been started with the help of IUCN. The aim of this initiative was to adopt a Comprehensive Biodiversity Conservation and Management Policy for the company. An Agreement has signed between the IUCN & TS for the study and conservation of biodiversity. It also aims to promote good practice by sharing the learning with the wider industry and conservation communities through dialogue, which will provide input into the development of Indian minerals policies and laws.

#### **PERIPHERAL DEVELOPMENT UNDER CSR ACTIVITIES:**

The TATA STEEL RURAL DEVELOPMENT SOCIETY (TSRDS) was formed way back in the early eighties of the last century to provide services in the domains of health, education, agriculture & empowerment to the people of surrounding villages for improving their standard of life. TSRDS organizes free medical treatment camps at the surrounding villages with the help of specialist doctors and paramedical staff from the Tata Main Hospital, Jamshedpur with company's expenditure. They conduct Free Medical treatment. Immunization programs, School health programs, Health education and other national health programs like Malaria, TB and HIV/AIDS and also provides primary medical facilities to the surrounding villages with the help of well-equipped mobile medical units throughout the year.

Besides, The Tata Steel Rural Development Society, also organizes different income generation programs for the villagers. It encourages youth sponsoring different sports events in the periphery villages. The list of various CSR activities along with the cost incurred for the same are enumerated in Part-H.



**PART-H**

**ADDITIONAL MEASURES/ INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION  
INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION**

EXPENDITURE INCURRED FOR DIFFERENT ENVIRONMENTAL ACTIVITIES DURING 2017-18

Items	2017-18(Actual) in Rupees
Afforestation	7,18,250.00
Dust suppression	1,060,800.00
Environment & weather , exhaust monitoring	22,02,885.00
Drinking water supply	410,081.00
Sanitation	19,44,735.00
Malaria eradication	2,27,600.00
Garland drain& storm water drain	25,000.00
Environment awareness ( EMS)	40,000.00
Community Development through TSRDS	24280000
Hazardous waste management	25,000.00
Total (Rs.)	30934351

The photographs of peripheral activities done under CSR in and around Gomardih are given in **Annexure-X**.

**LIST OF PERIPHERL ACTIVITIES DONE BY TATA STEEL IN THE YEAR 2017-18**

Sl.No	Activity	Expenditure
Health	Mega Health Camp	2.70
Drinking water	Installation & repair of Hand Tube Well	5.79
Education	Jyoti fellowship Scholarship for SC/ST School level students & 1000 project school	216.81
Livelihood	Enterpreneurship & Agriculture development	5.00
Sports	Inter village football & hocky carnival	9.50
Spl Project	Model school project	865.58
Skill development	computer training programme	3.00
<b>Total</b>		<b>1,108.38</b>

## PART-I

### ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- Company is committed for prevention of pollution, continual improvement of environmental performance, committed to comply with relevant environmental and other legislation, regulation & other requirements and continual effort are made to minimize the adverse environmental impacts of our activities, products or services.
- One roof top rain water harvesting structure has already been completed at Guest House building.
- Company is now installing a STP at the residential colony of Gomardih.
- The Management conducts the awareness development programme on environmental protection for school children and camp residents.
- Company has started initiative to combat Climate Change. Energy Audit has already been conducted and time bound action plan has been made to reduce energy consumption.
- The Mine management celebrates and participates in 'Mine Environment & Mineral Conservation Week" every year under the aegis of Indian Bureau of Mines, Bhubaneswar Region.
- Company has installed electronic display board to display the important environmental parameters and messages for the knowledge of the public.
- Meteorological Data for the year 2017-18:

Maximum temperature: -	40.2 C
Minimum temperature: -	9.2° C
Maximum rainfall :-	822.0 mm

**Manager cum Agent  
Gomardih Dolomite Quarry  
Tata Steel Limited**

Copy to: Regional Officer, OPCB, Rourkela.



## TATA STEEL

### LIST OF ANNEXURES

Annexure-I	NOC issued be CGWA, Bhubaneswar for ground water
Annexure-II	Application made for drawl of Surface water from Nakti Jor
Annexure-III	Interim Agreement made with Executive Engineer, Sundargarh Irrigation Division, Sundargarh on 7 <sup>th</sup> October'2017 valid till 6 <sup>th</sup> April'2018 for drawl of Surface water from Nakti Jor.
Annexure-IV	Annual average monitoring data for Mine Discharge of Gomardih
Annexure-V	Annual average monitoring data for Canteen Effluent of Gomardih
Annexure-VI	Annual average monitoring data of Ambient Air Quality (CZ) of Gomardih
Annexure-VII	Annual average monitoring data of Ambient Noise Quality of Gomardih
Annexure-VIII	Photographs showing different activities done for dust suppression at Gomardih
Annexure-IX	Photographs showing garland drain and toe wall of Gomardih
Annexure-X	Photographs of Water Treatment Plant and roof top RWH structure of Guest House at Gomardih
Annexure-XI	Photographs of plantation at different locations of Gomardih
Annexure-XII	Photographs showing the peripheral activities done around Gomardih under CSR of Tata Steel

**Central Ground Water Authority**  
 Ministry of Water Resources  
 Government of India

No. 21-4(302)/CGWA/SER/2011-

Dated-

To,

169

Mr. Rimfal Joshi  
 Mines side: Gomardih  
 Gomardih Dolomite Quarry, M/s Tata Steel Ltd.  
 Sundargarh, Orissa- 755028

**Sub: Request for Ground Water clearance in respect of Gomardih Dolomite Quarry, of M/s Tata Steel Ltd., for proposed expansion programme of Gomardih Dolomite Mines at village Gomardih, Block Kutra, Tehsil Rajgangpur, District Sundargarh, Orissa-reg.**

Sir,

The area where the project falls comes under safe category as per the ground water assessment carried out by Central Ground Water Board. Since the total requirement of ground water is 400 m<sup>3</sup>/day, NOC is not required for ground water withdrawal from Central Ground Water Authority. However, to neutralize the adverse impact of ground water withdrawal that may arise on a long term basis, the industry/project is advised to undertake the following measures:

1. Ground Water withdrawal shall not exceed the proposed quantity of 400 m<sup>3</sup>/day.
2. The abstraction structures should be fitted with water meter by the industry and monitoring of ground water abstraction to be undertaken accordingly on regular basis, at least once in a month. The data may be submitted on a yearly basis to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for perusal and records.
3. The industry should adopt and implement artificial recharge measures/rain water harvesting measures for augmenting the ground water resources of the area as per the hydrogeological investigation.
4. The industry shall ensure proper conservation measures, recycling and reuse of waste water after adequate treatment.
5. The industry shall monitor the ambient ground water regime of the area through piezometers and submit the data on a yearly basis to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for perusal and records.

Yours faithfully,

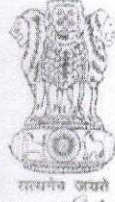
*S. Bhattacharya*  
 (S. Bhattacharya)  
 Scientist 'D'  
 for Member Secretary

Copy to:

1. The Member Secretary, State Pollution Control Board, Orissa, Department of Forest & Environment, Government of Orissa, Parivesh Bhawan, A-118, Nilakantha Nagar, Unit VIII, Bhubaneswar, Orissa-751012, with a request to ensure that Rain Water Harvesting and Artificial Recharge methods are being implemented by the firm and quantity of ground water withdrawal is not exceeding 400 m<sup>3</sup>/day.
2. The Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar, Khandagiri, Bhubaneswar-751030, Orissa. This has reference to your letter No. 5-22/SER/CGWA/2010-53 dated 12.01.2011.
3. The TS to Chairman, Central Ground Water Board, NH-IV, Faridabad.

(S. Bhattacharya)  
 Scientist 'D'  
 for Member Secretary

K. C. Naik  
Member Secretary



भारत सरकार  
केन्द्रीय भूमि जल प्राधिकरण  
जल संसाधन, नदी विकास  
और गंगा संरक्षण मंत्रालय

File No: - 21-4/1294/OR/MIN/2017 - 484

NOC No: - CGWA/NOC/MIN/ORIG/2018/3162

Government of India  
Central Ground Water Authority  
Ministry of Water Resources,  
River Development & Ganga Rejuvenation

Date:- 22 MAR 2018

To

✓ M/s Tata Steel Ltd.  
Gomardih Dolomite Quarry,  
AT/PO Tunmura, VIA/PS Kutra,  
Block Rajgangpur, District Sundargarh,  
Odisha - 770070

Sub: - NOG for ground water withdrawal to M/s Tata Steel Ltd. in respect of their Limestone Mine project "Gomardih Dolomite Quarry" located at Village Sonakhanbeat, Block Rajgangpur, District Sundargarh, Odisha - reg.

Refer to your application for grant of NOC for ground water withdrawal dated 12/07/2017. Based on recommendations of Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar vide his letter dated 02/09/2017 and further deliberations on the subject, the NOC of Central Ground Water Authority for ground water withdrawal is hereby accorded to M/s Tata Steel Ltd. in respect of their Limestone Mine project "Gomardih Dolomite Quarry" located at Village Sonakhanbeat, Block Rajgangpur, District Sundargarh, Odisha. The NOC is valid from 28/02/2018 to 27/02/2020 and is subject to the following conditions:-

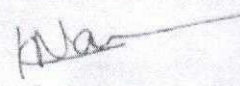
1. The firm may abstract 60 cu.m/day (not exceeding 21,900 cu.m/year) ground water through proposed one (1) bore well and 948 cu.m/day (not exceeding 1,29,750 cu.m/year) through dewatering the mine seepage through existing two (2) structures on account of mining intersecting the water table. The total withdrawal should not exceed 1,008 cu.m/day (not exceeding 1,51,650 cu.m/year). No additional dewatering and no additional ground water abstraction structures shall be constructed for this purpose without prior approval of the CGWA. Any unexpected variation in inflow of ground water into the mine pit should be reported to the concerned Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar.
2. The dewatering structures as well as borewells shall be fitted with digital water meters by the firm at its own cost and monitoring of monthly ground water abstraction data shall be recorded in a log book. Compliance to this condition shall be reported within one month from the date of issue of this letter.
3. M/s Tata Steel Ltd., Gomardih Dolomite Quarry, in consultation with the Regional Director Central Ground Water Board, South Eastern Region, Bhubaneswar shall implement ground water recharge measures atleast to the tune of 46,679 cu.m/year as proposed, for augmenting the ground water resources of the area within six months from the date of issue of this letter. Firm shall also undertake periodic maintenance of recharge structures at its own cost.
4. The photographs of the recharge structures after completion of construction of the same shall be furnished immediately to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for verification under intimation to this office.

18/11, Jamnagar House, Mansingh Road, New Delhi-110011

Phone : (011) 23383561 Fax : 23382051, 23386743


Website: www.cgwa.noc.gov.in

5. The firm, at its own cost, shall construct two (2) observation wells (piezometers) at suitable locations and install digital water level recorders having telemetry systems along the periphery of the mine pit and execute monthly ground water level monitoring in core and buffer zone by establishing sufficient number of key wells in consultation with Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar. The firm shall share the user ID and password of the telemetry system with the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar.
6. The ground water quality shall be monitored twice in a year (during pre and post-monsoon periods).
7. The monitoring data in respect of S. No. 2, 5 & 6 shall be submitted to Central Ground Water Board, South Eastern Region, Bhubaneswar on regular basis at least once in a year.
8. The firm shall ensure proper recycling and reuse of waste water after adequate treatment.
9. Action taken report in respect of S. No. 1 to 8 shall be submitted to CGWA within one year period.
10. The NOC is liable to be cancelled in case of non-compliance of any of the conditions as mentioned in S. No. 1 to 9.
11. This NOC is subject to prevailing Central/State Government rules/laws or Court orders related to construction of tubewell/ground water withdrawal/construction of recharge or conservation structure/discharge of effluents or any such matter as applicable.
12. The firm shall report self compliance online in the website ([www.cgwa-noc.gov.in](http://www.cgwa-noc.gov.in)) within one year from the date of issue of this NOC.
13. This NOC does not absolve the applicant / proponent of this obligation / requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
14. The NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and be taking decisions independently of the NOC.

  
Member Secretary

Copy to:

1. The Member Secretary, Odisha Pollution Control Board Paribesh Bhawan, A/118, Nilakantha Nagar, Unit - VIII, Bhubaneswar - 751012, Odisha with a request to ensure that the conditions mentioned in the NOC are complied by the firm in consultation with the District Collector & Magistrate, District Sundargarh, Odisha.
2. The District Collector & Magistrate, District Sundargarh, Odisha for necessary action.
3. The Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar. This has reference to your recommendation dated 02/09/2017.
4. TS to the Chairman, Central Ground Water Board, Bhujal Bhawan, Faridabad, Haryana.
5. Guard File 2017-18.

  
Member Secretary



o/c

Ref: Letter No. GD/943/39  
Dated: 18.9.2012

To

The Principal Secretary,  
Department of Water Resources,  
Govt. of Odisha,  
Bhubaneswar.

Sub: Application for obtaining permission to draw water @ 800m<sup>3</sup>/day or 0.327 cusec. from Naktijor, tributary of Sankh River of Brahmani Basin for our Gomardih Dolomite Quarry, Tata Steel Limited, Villages : Tunmura & Jharbera, P.O: Tunmura, Tahsil-Rajgangpur, Dist. Sundergarh, Odisha.

Dear Sir,

We would like to inform you that, currently we are drawing @250m<sup>3</sup>/day water from Naktijor, tributary of Sankh River of Brahmani Basin near villages Girjatoli, just adjacent to our Gomardih Colony and paying water tax regularly to the Govt. The additional water @550m<sup>3</sup>/day is required from the same source i.e. Nakti Jor for our Gomardih Quarry, Colony, nearby villages and others. So that the total water requirement is estimated @ 800m<sup>3</sup>/day or 0.327 cusec.

We are enclosing here with the filled-in application in Form-J duly signed by the applicant along with the requisite fees in shape of Demand Draft ie. (1) DD No.656661, Dated. 17/09/2012 for Rs.1,000/- (Rupees one thousand) only towards processing fees and (2) DD No.656660, dated.17/09/2012 for Rs. 49,100/- (Rupees forty nine thousand one hundred) only towards security deposit, drawn on State Bank of India, in favor of AFA Cum Under Secretary, DOWR, payable at Bhubaneswar, for your kind perusal and necessary approval for drawl of water @800m<sup>3</sup>/day from Naktijor for mines & residential purpose.

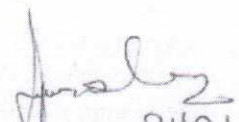
The Water Management Plan along with necessary annexure will be submitted shortly.

Thanking you.

Yours faithfully,  
F: Tata Steel Limited

  
Agent-cum-Manager  
Gomardih Dolomite Quarry

Received  
DD no. 656660 for ₹ 49,100/-  
& DD no. 656661 for ₹ 1000/-

  
21/9/12  
AFA-cum-Under Secy. to Govt.  
Department of Water Resources

TATA STEEL LTD.

Ferro Alloys & Minerals Division, Gomardih Dolomite Quarry P.O. Tunmura  
Dist. Sundergarh, Orissa - 770070  
Tel. (06624) 249032

Regd. Office, Bombay House, 24 Homi Mohi Street, Mumbai - 400 031



उड़ीसा ORISSA

E 957081

CERTIFIED COPY

*[Signature]*  
 Executive Engineer  
 Sundargarh Irrigation Division  
 SUNDARGARH

**"FORM 'K'**  
**[See rule 23-A (2) (e) & rule 26]**  
**RENEWAL AGREEMENT FOR SUPPLY OF WATER FOR THE PURPOSE OF**  
**INDUSTRIAL/COMMERCIAL USE**

THIS INTERIM AGREEMENT is made on the 7<sup>th</sup> day of April Two Thousand Seventeen BETWEEN Sri G.P Sahu alais Ganesh Prasad Sahu S/o- Late Sri Shiv Nrayan Sahu, Village :- Khunti, P.S -Chandil, District - Sareikala-kharswan, State:-Jharkhand, Head Ferro Alloys Plant of M/s Tata Steel Ltd.( Gomardihi Dolomite Quarry, At/P.o-Tunmura, P.S-Kutra, Dist- Sundargarh) ( Hereinafter called The "Applicant") of the first part.

AND  
 Sri Subhranshu Sekhar Mishra S/o-Sarat Chandra Mishra, At:-Kashipur P.O- Keonjargarh Dist -Keonjhar (Odisha), Pin-758001, Agent-Cum-Manager employee of the applicant by profession (hereinafter referred to as The "Surety") of the second part.

AND  
 The Governer of Odisha which expression unless repugnant to the context, shall include his successors and assigns (hereinafter called "The Government") of the third part.

WHEREAS, the applicant has made an application for supply of water from Government water source for the period as mentioned in the Schedule here to annexed;

AND, WHEREAS, the sureties have agreed to stand surety for payment of rates charged for such supply in the manner hereinafter appearing and the Government has agreed to supply water provisionally for the purpose specified in the schedule annexed hereto-

OR TATA STEEL LTD.  
 By their Constituted Attorney  
*[Signature]*  
 (GANESH PRASAD SAHU)  
 Head (Ferro Alloys Production)

*[Signature]* Page-1/13  
 Executive Engineer  
 Sundargarh Irrigation Division  
 SUNDARGARH  
 7/12/17



## ANNEXURE-IV

## WATER QUALITY OF MINE DISCHARGE OF GOMARDIH DOLOMITE QUARRY

TATA STEEL LIMITED Location: Mines Discharge Water Site: Gomardih Dolomite Quarry, Sundargarh, Odisha				Yearly Average (2017-2018)
Sl.	Parameters	Unit	Standard	Result
1	Colour	Hazen	-	1.0
2	Odour	-	-	Unobjectionable
3	Suspended Solid	mg/l	100	19.8
4	Particulate Size of Suspended solids	mg/l	850 $\mu$ m IS Sieve	Passes through 850 $\mu$ m IS Sieve
5	pH	-	5.5-9.0	7.2
6	Temperature	$^{\circ}$ C	-	25.2
7	Oil & Grease	mg/l	10	1.4
8	Total Residual Chlorine	mg/l	1.0	0.1
9	Amm. Nitrogen as N	mg/l	-	0.1
10	Total Kjeldal Nitrogen as N	mg/l	-	0.3
11	Free Ammonia as NH <sub>3</sub>	mg/l	-	0.9
12	BOD (3) days at 27 $^{\circ}$ C	mg/l	30	2.03
13	COD	mg/l	250	6.83
14	Arsenic as As	mg/l	0.2	0.001
15	Mercury as Hg	mg/l	0.01	0.001
16	Lead as Pb	mg/l	0.1	0.05
17	Cadmium as Cd	mg/l	2.0	0.001
18	Total Chromium as Cr	mg/l	2.0	0.05
19	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	0.1	0.05
20	Copper as Cu	mg/l	3.0	0.05
21	Zinc as Zn	mg/l	5.0	0.05
22	Selenium as Se	mg/l	0.05	0.005
23	Nickel as Ni	mg/l	3.0	0.02
24	Cyanide as CN	mg/l	0.2	0.01
25	Fluoride as F	mg/l	2.0	0.4
26	Dissolved Oxygen	mg/l	-	6.3
27	Diss. Phosphate as P	mg/l	5.0	0.5
28	Sulphide as S	mg/l	2.0	0.1
29	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	1.0	0.001
30	Manganese as Mn	mg/l	2.0	0.02
31	Iron as Fe	mg/l	3.0	0.25
32	Vanadium as V	mg/l	0.2	0.2
33	Nitrate as NO <sub>3</sub>	mg/l	10.0	#REF!
34	Bio-assay Test	--	100% survival of fish after 96 hours in 100% effluent	100% survival of fish after 96 hours in 100% effluent

Note: CL: Colourless, U/O: Unobjectionable.

**ANNEXURE-V**

**QUALITY OF DOMESTIC WASTE WATER (Canteen effluent) OF GOMARDIH DOLOMITE QUARRY**

TATA STEEL LIMITED Location: Mines Discharge Water Site: Gomardih Dolomite Quarry, Sundargarh, Odisha				Yearly Average (2017-2018)
Sl.	Parameters	Unit	Standard	Result
1	Colour	Hazen	-	1
2	Odour	-	-	Unobjectionable
3	Suspended Solid	mg/l	100	29.2
4	Particulate Size of Suspended solids	mg/l	850 µm IS Sieve	Passes through 850 µm IS Sieve
5	pH <sup>+</sup>	-	5.5-9.0	7
6	Temperature	°C	-	25.3
7	Oil & Grease	mg/l	10	1.4
8	Total Residual Chlorine	mg/l	1.0	0.1
9	Amm. Nitrogen as N	mg/l	-	0.8
10	Total Kjeldal Nitrogen as N	mg/l	-	1.9
11	Free Ammonia as NH <sub>3</sub>	mg/l	-	0.7
12	BOD (3) days at 27°C	mg/l	30	6.0
13	COD	mg/l	250	6.04
14	Arsenic as As	mg/l	0.2	36.3
15	Mercury as Hg	mg/l	0.01	0.01
16	Lead as Pb	mg/l	0.1	0.001
17	Cadmium as Cd	mg/l	2.0	0.01
18	Total Chromium as Cr	mg/l	2.0	0.001
19	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	0.1	0.05
20	Copper as Cu	mg/l	3.0	0.05
21	Zinc as Zn	mg/l	5.0	0.05
22	Selenium as Se	mg/l	0.05	0.05
23	Nickel as Ni	mg/l	3.0	0.005
24	Cyanide as CN	mg/l	0.2	0.02
25	Fluoride as F	mg/l	2.0	0.01
26	Dissolved Oxygen	mg/l	-	0.4
27	Diss. Phosphate as P	mg/l	5.0	0.7
28	Sulphide as S	mg/l	2.0	0.1
29	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	1.0	0.001
30	Manganese as Mn	mg/l	2.0	0.05
31	Iron as Fe	mg/l	3.0	0.30
32	Vanadium as V	mg/l	0.2	0.2
33	Nitrate as NO <sub>3</sub>	mg/l	10.0	2.6
34	Bio-assay Test	--	100% survival of fish after 96 hours in 100% effluent	100% survival of fish after 96 hours in 100% effluent

**AMBIENT AIR QUALITY RESULTS, (April-17 to Mar-18)**

**ANNEXURE-VI**

**Monitoring Location: Near Sub station**

Month	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo (a) pyrene (ng/m <sup>3</sup> )
APR'17	Near Sub Station	69.3	34.5	4.8	14.7	22.6	6.8	0.30	0.001	0.1	0.001	0.001	0.002
MAY'17	Near Sub Station	68.8	34.1	4.9	15.8	24.4	8.5	0.36	0.001	0.1	0.001	0.001	0.002
JUN'17	Near Sub Station	51.2	24.6	4.1	10.9	20.0	4.0	0.23	0.001	0.1	0.001	0.001	0.002
	Near Sub Station	50.5	27.7	4.8	23.5	10.3	10.0	0.23	0.02	4.0	1.0	2.08	0.4
AUG'17	Near Sub Station	49.1	25.8	4.9	23.9	10.3	10.0	0.24	0.02	4.0	1.0	2.08	0.4
SEP'17	Near Sub Station	50.8	28.3	5.0	24.0	10.0	10.0	0.23	0.02	4.0	1.0	2.08	0.4
OCT'17	Near Sub Station	56.6	30.4	5.4	24.3	10.1	10.2	0.25	0.02	4.0	1.0	2.08	0.4
NOV'17	Near Sub Station	58.8	31.8	5.6	26.0	11.1	12.6	0.51	0.02	4.0	1.0	2.08	0.4
DEC'17	Near Sub Station	75.5	38.5	6.0	25.0	15.8	14.2	0.50	0.02	4.2	1.0	2.08	0.4
JAN'18	Near Sub Station	75.8	43.7	6.1	25.3	11.9	11.3	0.54	0.02	4.2	1.0	2.08	0.4
FEB'18	Near Sub Station	65.8	35.0	6.1	20.1	10.4	12.8	0.49	0.02	4.0	1.0	2.08	0.4
Mar'18	Near Sub Station	69.8	39.9	5.7	20.2	10.0	10.0	0.33	0.02	4.0	1.0	2.08	0.4
Limit	CPCB	100 (µg/m <sup>3</sup> )	60 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	400(µg/m <sup>3</sup> )	100(µg/m <sup>3</sup> )	2(mg/m <sup>3</sup> )	01(µg/m <sup>3</sup> )	20(ng/m <sup>3</sup> )	6(ng/m <sup>3</sup> )	5	1

**Monitoring Location: Near Gate No-1  
(April'17-March'18)**

Month	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzen e (µg/m <sup>3</sup> )	Benz o (a) pyre ne (ng/ m <sup>3</sup> )
APR'17	Near First Gate	65.9	32.8	4.5	13.5	21.5	6.2	0.30	0.001	0.1	0.001	0.001	0.002
MAY'17	Near First Gate	66.5	33.2	4.7	15.1	22.4	7.9	0.35	0.001	0.1	0.001	0.001	0.002
JUN'17	Near First Gate	49.9	24.7	4.1	10.8	20.0	4.0	0.23	0.001	0.1	0.001	0.001	0.002
JUL'17	Near First Gate	51.2	25.8	4.9	22.6	10.1	10.0	0.23	0.02	4.0	1.0	2.08	0.4
AUG'17	Near First Gate	50.8	27.0	5.3	24.4	10.6	10.0	0.24	0.02	4.0	1.0	2.08	0.4
SEP'17	Near First Gate	51.7	27.3	5.6	23.9	10.4	10.0	0.25	0.02	4.0	1.0	2.08	0.4
OCT'17	Near First Gate	58.3	32.2	6.0	25.1	11.2	10.9	0.26	0.02	4.0	1.0	2.08	0.4
NOV'17	Near First Gate	64.3	35.4	6.4	27.1	17.9	16.8	0.55	0.02	7.0	1.0	2.08	0.4
DEC'17	Near First Gate	76.0	40.8	5.9	25.6	14.9	14.1	0.57	0.02	4.2	1.0	2.08	0.4
JAN'18	Near First Gate	79.4	46.1	6.3	27.7	11.9	11.6	0.51	0.02	4.2	1.0	2.08	0.4
FEB'18	Near First Gate	75.3	40.0	5.6	23.1	11.7	14.1	0.42	0.02	4.0	1.0	2.08	0.4
Mar'18	Near First Gate	74.4	42.1	6.2	23.7	10	10.0	0.33	0.02	4.0	1.0	2.08	0.4
Limit	CPCB	100 (µg/m <sup>3</sup> )	60 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	400(µg/m <sup>3</sup> )	100(µg/m <sup>3</sup> )	2(mg/m <sup>3</sup> )	01(µg/m <sup>3</sup> )	20(ng/m <sup>3</sup> )	6(ng/m <sup>3</sup> )	5	1

**Monitoring Location: Near Crusher Plant  
(April'17-March'18)**

Month	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo (a) pyrene (ng/m <sup>3</sup> )
APR'17	Near Crusher Plant	71.1	36	5.1	15.3	25.8	7.4	0.4	0.001	0.1	0.001	0.001	0.002
MAY'17	Near Crusher Plant	71.1	35.7	4.8	15.9	25.2	8.9	0.37	0.001	0.1	0.001	0.001	0.002
JUN'17	Near Crusher Plant	53.5	25.8	4.2	11.5	20.1	4.0	0.26	0.001	0.1	0.001	0.001	0.002
	Near Crusher Plant	57.6	31.5	6.0	26.0	11.2	10.0	0.28	0.02	4.0	1.0	2.08	0.4
AUG'17	Near Crusher Plant	55.7	30.7	6.2	25.4	10.5	10.0	0.27	0.02	4.0	1.0	2.08	0.4
	Near Crusher Plant	57.3	31.6	6.5	25.3	10.4	10.0	0.28	0.02	4.0	1.0	2.08	0.4
SEP'17	Near Crusher Plant	64.4	35.3	6.5	26.3	10.5	10.5	0.28	0.02	4.0	1.0	2.08	0.4
OCT'17	Near Crusher Plant	68.2	38.7	5.8	26.2	11.1	16.6	0.46	0.02	5.8	1.0	2.08	0.4
NOV'17	Near Crusher Plant	86.2	43.8	6.2	26.7	11.1	12.2	0.6	0.02	4.1	1.0	2.08	0.4
DEC'17	Near Crusher Plant	85.6	47.5	6.6	27.3	11.6	10.5	0.53	0.02	4.1	1.0	2.08	0.4
JAN'18	Near Crusher Plant	80.1	42.7	6.1	21.6	11.0	11.5	0.5	0.02	4.0	1.0	2.08	0.4
FEB'18	Near Crusher Plant	82.6	47.6	6.3	21.9	10.0	10.0	0.48	0.02	4.0	1.0	2.08	0.4
Mar'18	Near Crusher Plant												
Limit	CPCB	100 (µg/m <sup>3</sup> )	60 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	400(µg/m <sup>3</sup> )	100(µg/m <sup>3</sup> )	2(mg/m <sup>3</sup> )	01(µg/m <sup>3</sup> )	20(ng/m <sup>3</sup> )	6(ng/m <sup>3</sup> )	5	1

**Monitoring Location: Near VT Centre  
(April'17-March'18)**

Month	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo (a) pyrene (ng/m <sup>3</sup> )
APR'17	Near V.T.Center	50.6	24.6	4.1	9.9	20	4	0.15	0.001	0.1	0.001	0.001	0.002
MAY'17	Near V.T.Center	51.0	25.0	4.1	9.8	20	4	0.14	0.001	0.1	0.001	0.001	0.002
JUN'17	Near V.T.Center	39.9	18.5	4	9.3	20	4	0.12	0.001	0.1	0.001	0.001	0.002
JUL'17	Near V.T.Center	49.5	25.5	5.0	23.7	10.3	10.0	0.23	0.02	4.0	1.0	2.08	0.4
AUG'17	Near V.T.Center	46.6	23.3	5.1	24.0	11.2	10.0	0.22	0.02	4.0	1.0	2.08	0.4
	Near V.T.Center	47.3	24.3	5.2	23.2	11.2	10.6	0.23	0.02	4.0	1.0	2.08	0.4
OCT'17	Near V.T.Center	52.3	27.4	5.4	23.1	11	10	0.22	0.02	4.0	1.0	2.08	0.4
NOV'17	Near V.T.Center	57.2	30.5	5.5	24.8	10.0	12.30	0.43	0.02	4.6	1.0	2.08	0.4
DEC'17	Near V.T.Center	69.7	36.0	5.5	23.6	10.0	10.00	0.49	0.02	4.6	1.0	2.08	0.4
JAN'18	Near V.T.Center	70.5	42.9	5.5	24.4	10.0	10.0	0.42	0.02	4.0	1.0	2.08	0.4
FEB'18	Near V.T.Center	60.7	31.5	5.1	18.7	10.9	10.7	0.34	0.02	4.0	1.0	2.08	0.4
Mar'18	Near V.T.Center	59.9	35.1	5.0	20.2	10	10.0	0.30	0.02	4.0	1.0	2.08	0.4
		54.6	28.717	4.9583	19.558	12.883	8.8	0.2742	0.0153	3.125	0.7503	1.56025	0.3005
Limit	CPCB	100 (µg/m <sup>3</sup> )	60 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	400(µg/m <sup>3</sup> )	100(µg/m <sup>3</sup> )	2(mg/m <sup>3</sup> )	01(µg/m <sup>3</sup> )	20(ng/m <sup>3</sup> )	6(ng/m <sup>3</sup> )	5	1

**Monitoring Location: Near Hospital  
(April'17-March'18)**

Month	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzene (a) pyren (ng/m <sup>3</sup> )
APR'17	Near Hospital	47.2	23.2	4.0	9.7	20	4	0.14	0.001	0.1	0.001	0.001	0.002
MAY'17	Near Hospital	47.2	23.1	4.0	9.5	20	4	0.13	0.001	0.1	0.001	0.001	0.002
JUN'17	Near Hospital	37.5	17.1	4	9.1	20	4	0.12	0.001	0.1	0.001	0.001	0.002
JUL'17	Near Hospital	47.0	23.3	4.8	19.1	10.7	10.0	0.18	0.02	4.0	1.0	2.08	0.4
AUG'17	Near Hospital	45.0	22.3	4.7	19.6	10.6	10.0	0.19	0.02	4.0	1.0	2.08	0.4
SEP	Near Hospital	45.6	22.7	4.6	19.2	10.6	10.0	0.16	0.02	4.0	1.0	2.08	0.4
OCT'17	Near Hospital	50.2	26.1	4.9	21.7	10.8	10.0	0.19	0.02	4.0	1.0	2.08	0.4
NOV'17	Near Hospital	53.0	28.1	5.3	22.9	10.0	15.5	0.38	0.02	4.0	1.0	2.08	0.4
DEC'17	Near Hospital	64.5	32.3	5.3	22.6	10.8	14.1	0.49	0.02	4.0	1.0	2.08	0.4
JAN'18	Near Hospital	63.5	35.8	5.2	21.9	10.0	12.00	0.4	0.02	4.0	1.0	2.08	0.4
FEB'18	Near Hospital	55.8	28.9	5.3	19.4	10.7	10.0	0.34	0.02	4.0	1.0	2.08	0.4
Mar'18	Near Hospital	55.8	32.3	5.0	19.4	10.0	10.0	0.23	0.02	4.0	1.0	2.08	0.4
Limit	CPCB	100 (µg/m <sup>3</sup> )	60 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	80 (µg/m <sup>3</sup> )	400(µg/m <sup>3</sup> )	100(µg/m <sup>3</sup> )	2(mg/m <sup>3</sup> )	01(µg/m <sup>3</sup> )	20(ng/m <sup>3</sup> )	6(ng/m <sup>3</sup> )	5	1

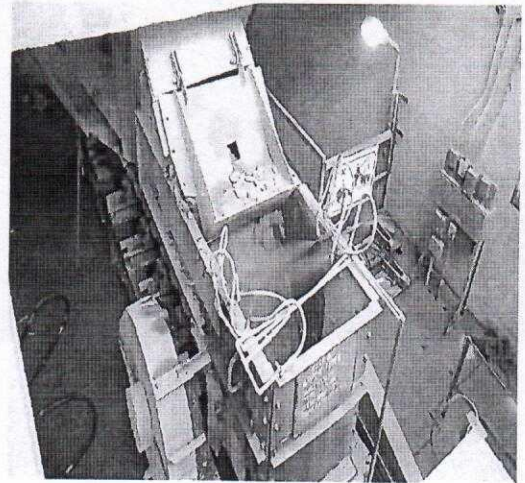
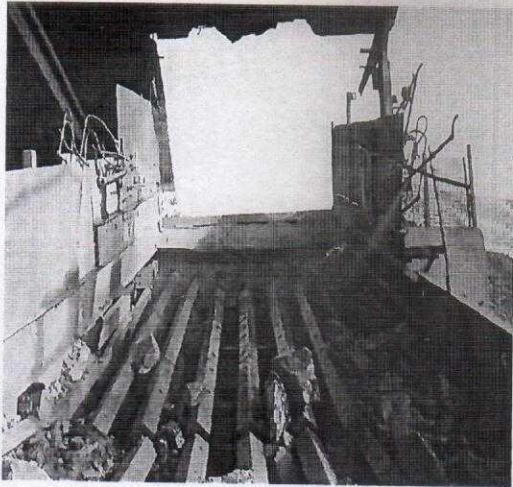
**ANNEXURE-VII**

**Noise Monitoring Report (April'17 to March'18)**

Sl. No	Category of Area/Zone	Sampling Location	(APR-17 TO March-18) Noise Level in db			
			Day time Equivalent		Night time Equivalent	
			Standard as per CPCB	Actual	Standard as per CPCB	Actual
1	<b>Industrial Area</b>	Mines Area	75	58.6	70	43.8
2		Crusher Plant		72.8		67.1
3	<b>Residential Area</b>	Colony	55	50.5	45	38.4
4		Gomardih Village		47.7		37.0
5	<b>Silence Zone</b>	Hospital	50	48.6	40	37.5



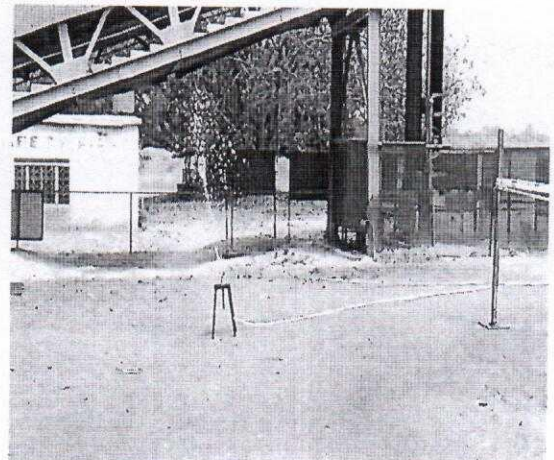
PHOTOGRAPHS



DRY FOG SYSTEM



FIXED TYPE WATER SPRINKLING SYSTEM  
ARRANGEMENTS



PORTABLE

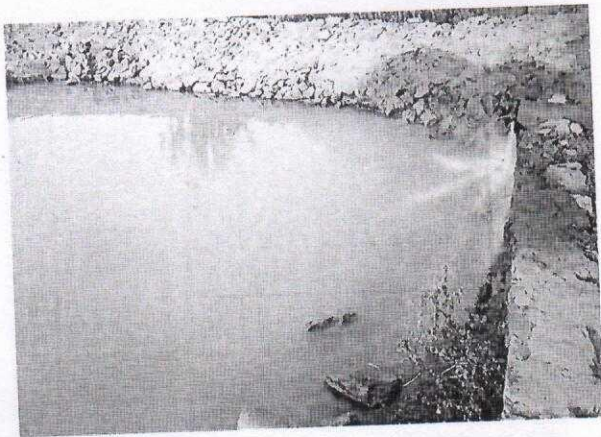
SPRINKLING



**MINERAL STACKYARD TOE WALL**



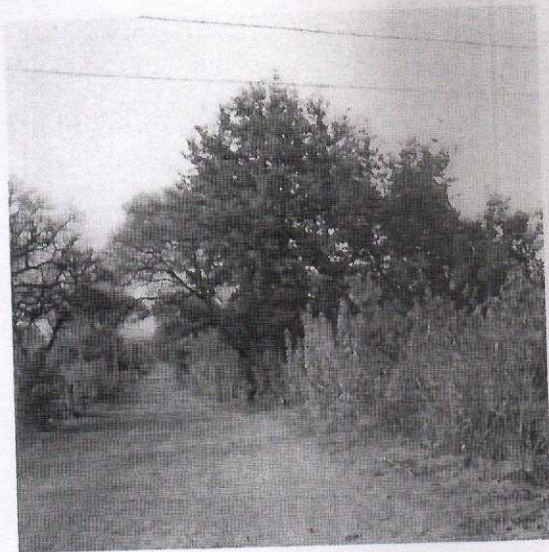
**OB DUMP TOE WALL**



**SETTLING POND**



**GARLAND DRAIN**



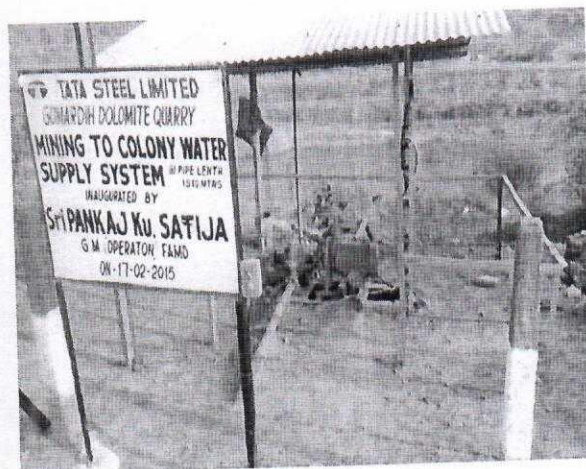
**ROAD SIDE PLANTATION  
(SH-10 TO COLONY)**



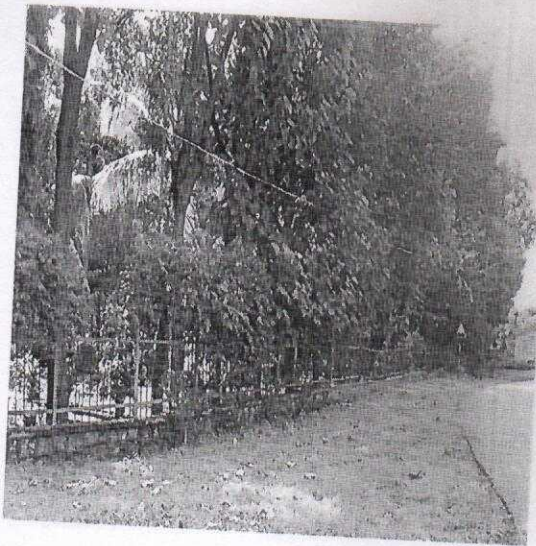
**OB DUMP PLANTATION**



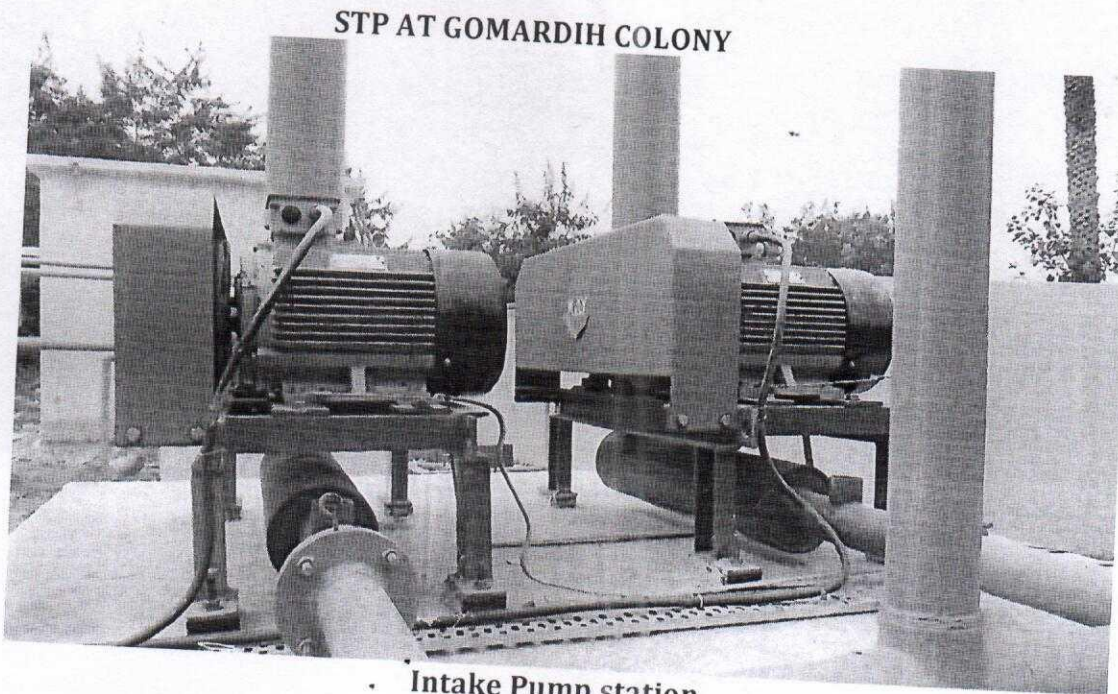
**RECHARGE PIT OF ROOF TOP RAIN  
WATER HARVESTING STRUCTURE OF  
GUEST HOUSE OF GOMARDIH**



**ARRANGEMENTS FOR PUMPING AND  
TREATMENT OF ACCUMULATED RAIN  
WATER OF THE QUARRY**



**COLONY PLANTATION**

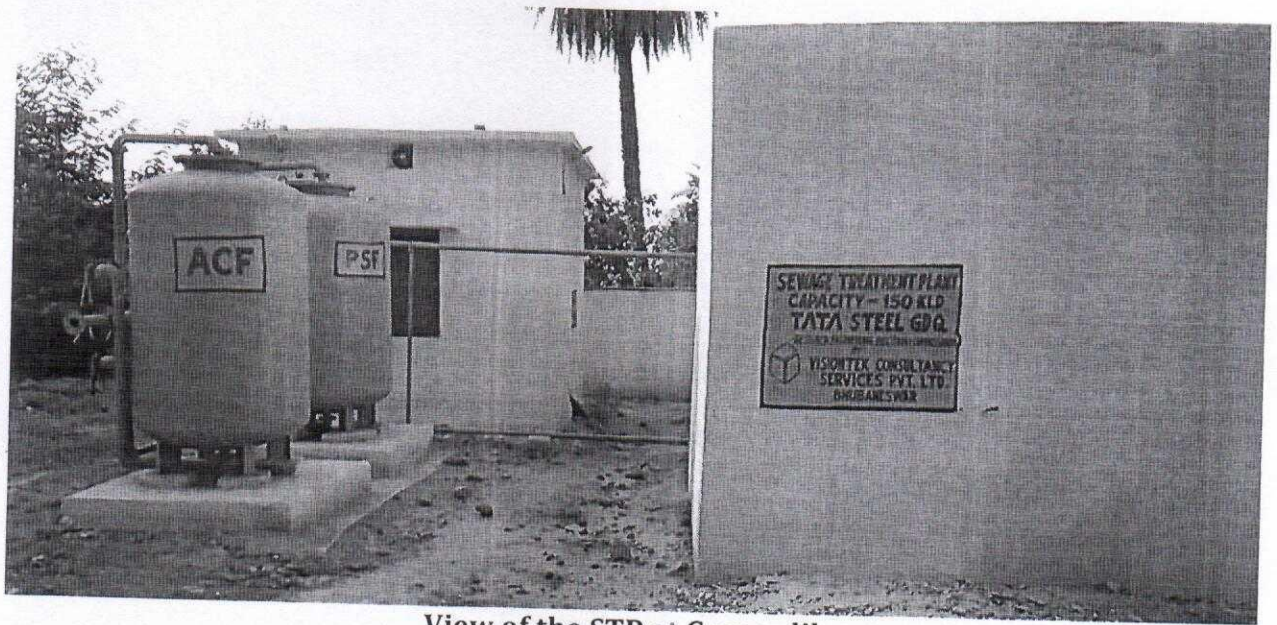


**STP AT GOMARDIH COLONY**

**Intake Pump station**

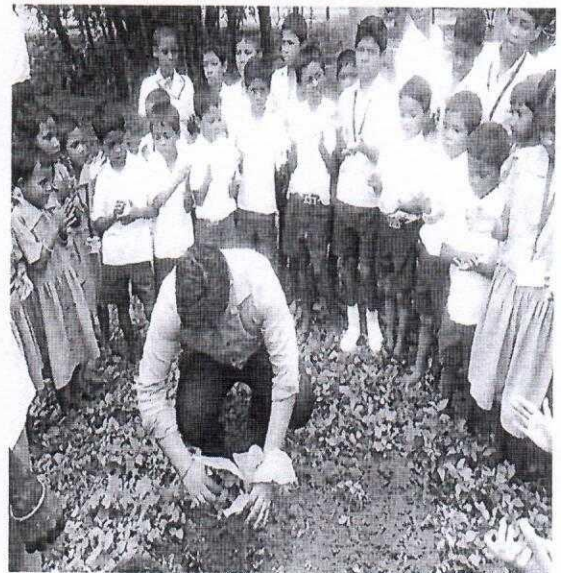


Screen Chamber & Collection Tank



View of the STP at Gomardih

PLANTATION IN NEARBY VILLAGES & SCHOOLS



Electronics Display Board for at Gomardih

