



Regd Post with A/D

Ref.No.: MGM/P&E/1240/18

Date : 28/09/2018

**The Member Secretary,  
State Pollution Control Board, Orissa,  
A/118, Nilakantha Nagar,  
Bhubaneswar**

Sub : Submission of Annual Environment Statement (FORM-V) for Joda West Manganese Mine, M/s TATA Steel Ltd. for the year 2017-18.

Dear Sir,

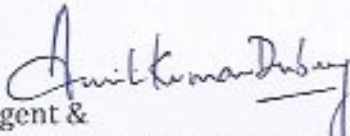
We are enclosing herewith Annual Environment Statement in Form-V for Joda West Manganese Mine, M/s TATA Steel Ltd. for the year ending 31<sup>st</sup> March'2018.

This is for your kind perusal.

Thanking you,

Yours faithfully,

F: TATA STEEL LTD.

  
Agent &  
Head, Manganese Gr. of Mines  
Ferro Alloys & Minerals Division,  
Joda.

Encl: as above.

Copy to : (1) The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Orissa with enclosure.  
(2) Central Pollution Control Board Southernd Conclave, Block 502, 5th & 6th Floors  
1582 Rajdanga Main Road Kolkata - 700 107 (W. B.)

**TATA STEEL LTD.**

Ferro Alloys & Minerals Division, Manganese Group of Mines, A/P.O. : Bichhakundi, Via: Joda,  
Dist: Keonjhar Odisha - 758 034 Tel.: 9238101370, e-mail : mnminesadmin@tatasteel.com  
Regd.Office : Bombay House, 24 Homi Modi Street, Mumbai - 400 001 Tel 912266658282, Fax 912266657724  
Corporate Identity Number L27100MH1907PLC000260 website : www.tatasteel.com



**ENVIRONMENTAL STATEMENT**

**2017-18**

**UNDER RULE 14 OF ENVIRONMENT (PROTECTION) RULES, 1986**

**In**

**FORM - V**

**JODA WEST MANGANESE MINES**

**TATA STEEL LIMITED**

**SEPTEMBER 2018**

Environmental Statement : Joda West Manganese Mines – 2017-18

**FORM V**  
**[See Rule 14 of Environment (Protection) Rules, 1986]**

**ENVIRONMENTAL STATEMENT**  
**FOR THE FINANCIAL YEAR ENDING THE 31<sup>ST</sup> MARCH 2018**

**PART - A**

- (i) Name and Address of the Owner / occupier of the industry operation or process : **JODA WEST MANGANESE MINE**  
**Nominated Owner :-**  
Mr. T.V. Narendran.  
Managing Director, M/s TATA Steel Ltd.  
Jamshedpur, Dist- East Singhbhum  
Jharkhand - 831001  
**Agent:**  
Mr. Amit Kumar Dubey  
Head (Manganese Group of Mines), Joda,  
FA & MD, TATA Steel  
P.O.: Bichhakundi, Via : Joda  
Dist : Keonjhar, Orissa - 758034
- (ii) Industry Category : Opencast Mining
- (iii) Production Capacity - Units : 1,80,000 TPA (Manganese Ore)
- (iv) Year of Establishment : 1933
- (v) Date of the last environmental statement submitted : 27<sup>th</sup> Sept'2017  
(Vide Letter No. MGM/P&E/665/17,  
Dt.27.09.2017)

**PART - B**

**Water and Raw Material Consumption**

**(1) Water Consumption m<sup>3</sup>/day**

- Process : 50.58 m<sup>3</sup>/day (Water sprinkling - Avg. during 2017-18)  
Cooling : Nil  
Domestic : 414.93 m<sup>3</sup>/day (Avg. during 2017-18)

Name of the Products	Process water consumption per unit of product output	
	During the previous Financial year	During the current Financial year
	(1)	(2)
(1) Manganese Ore	Nil	Nil

Remarks : Manganese Ore is produced by semi mechanized Mining method, which does not involve beneficiation and thus precludes the consumption of water.

(2) Raw material consumption

Name of the raw materials	Name of the product	Consumption of raw materials per unit	
		During the previous Financial year	During the current Financial year
Manganese Ore	Manganese Ore	<u>Year - 2016-17</u>	<u>Year - 2017-18</u>
		Production :-	Production :-
		79727.307 MT	69595.740 MT
		Dispatch :-	Dispatch :-
		84120.910 MT	57927.890 MT

Remarks : Produced Manganese Ore dispatched to Ferro Alloys Plants within India.

**PART - C**

Pollution discharged to environment / unit of output

(Parameter as specified in the Consents issued)

Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of Pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	<p>The process of Manganese Ore production includes blasting, removal of overburden, breaking and sizing of ore to required size and then transportation to the customer does not require consumption of water. Thus, there is no process discharge from the mine.</p> <p>The monthly average of surface water quality data for the year 2017-18 is enclosed as <b>Annexure - I</b>. It shows that the concentrations of the pollutants are well within the permissible standards.</p>		
(b) Air	<p>Since this is an open cast Mine, the dust generation is mainly due to the movement of vehicles in the haul roads, drilling activities etc, which is fugitive in nature and cannot be quantified. The fugitive dust is allayed by sprinkling of water by mobile tanker and development of green barrier by plantation around the residential area.</p> <p>The monthly average ambient air quality data is enclosed as <b>Annexure - II</b>. It shows that the concentrations of the pollutants are well within the permissible standards.</p>		

## PART - D

### **Hazardous Wastes**

[As specified under the Hazardous wastes (Management & Handling) Rules, 1989]

Hazardous Wastes	Total Quantity	
	During the previous Financial year	During the current Financial year
	<u>Year - 2016-17</u>	<u>Year - 2017-18</u>
(i) From Process		
Waste Oil (in Ltrs.)	23 kg	09 kg
Used Oil (in Ltrs.)	190 litrs.	410 litrs.
Cotton Waste (in Kgs)	Nil	Nil
Duster (in Nos.)	Nil	Nil
Filters (in Nos.)	Nil	Nil
(ii) From pollution control facilities	Nil	Nil

## PART - E

### **Solid Wastes**

	Total Quantity	
	During the previous Financial year	During the current Financial year
	<u>Year - 2016-17</u>	<u>Year - 2017-18</u>
(a) From Process (Overburden rejects)	08,88,364 MT	12,12,144 MT
(b) From pollution control facilities	Nil	Nil
(c)		
(1) Quantity recycled or re-utilized within the unit	Nil	Nil
(2) Sold	Nil	Nil
(3) Disposal	08,88,364 MT	12,12,144 MT

## PART - F

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

- **Characterization of Hazardous Waste:** - The composition of hazardous wastes like Waste Oil & used oil are Hydrocarbons, lead and used acids. The composition of the solid wastes (Overburden and rejects) contains lateritic morrum, shale and quartzite.

- **Disposal Practice:-**

- **SOLID WASTES** -The overburden is systematically and scientifically dumped on a geologically barren area and the same will be reclaimed by plantation after being declared inactive.
- **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 returned to Ferro Manganese Plant Stores for final disposal through auction to the authorized party.
- **USED COTTON WASTES** - The used cotton wastes generated at various locations are kept in designated barrels and at a fixed interval, these wastes are handed over to the Shift in-charge of the Furnace Section of FAP, Joda for incinerating in the Electric Arc Furnace at a temperature of more than 1100 degree C.
- Provision of impervious pit for collection of oily waste in the workshop premises in addition to the existing practice of collection at specified barrels.

**PART - G**

Impact of pollution abatement measures taken on conservation of natural resources and on the cost of production.

1. Water spraying on haul Roads and Mine Pits is done regularly to suppress the dust.
2. All the haul roads in the mining area are made up of morrum & compacted. Regular repair is being done by dozer & grader after spreading the layer of sweet morrum over it.
3. Wet drilling has been implemented in all drills. Controlled blasting pattern is being followed.
4. One double stage sedimentation basin with check dam had been provided at H'Quarry to prevent direct flow of surface run off to Kundra Nallah, a perennial source of water flowing along the western lease boundary. A multi-stage sedimentation basin with check dam had been provided at H'Quarry to prevent direct flow of surface run off to Kundra Nallah, a perennial source of water flowing along the western lease boundary. We have provided 5 nos. multi stage check dams with settling pits to further arrest the run-off and provide effective run-off management considering peak rainfall data.
5. 24839 nos. of saplings of various forestry species were planted within the leasehold areas covering an area of 3.6 hectare at Joda West Mn.Mine.
6. The utilization of environment management for the period 2017-18 was Rs. 31,82,206/- including Environmental Monitoring, Plantation activities and construction of toe-wall, check dams and garland drains.

7. In addition, Tata Steel Rural Development Society also undertakes the peripheral development activities with a large magnitude.

#### **PART - H**

Additional measures / investment proposal for environmental protection, abatement of pollution, prevention of pollution.

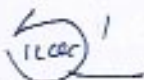
- a) Garland drains and toe wall around the OB dumping shall be provided to check and channelize surface run-off.
8. Maintenance of sedimentation basin with check dam at H' Quarry to prevent the direct flow of surface run-off to the nallah. One double stage sedimentation basin with check dam had been provided at H' Quarry to prevent direct flow of surface run off to Kundra Nallah, a perennial source of water flowing along the western lease boundary. A multi-stage sedimentation basin with check dam had been provided at H' Quarry to prevent direct flow of surface run off to Kundra Nallah, a perennial source of water flowing along the western lease boundary. We have provided 5 nos. multi stage check dams with settling pits to further arrest the run-off and provide effective run-off management considering peak rainfall data.
- b) Plantation of forestry species shall be done over the inactive waste dump slopes to arrest the airborne dust.

#### **PART - I**

Any other particulars for improving the quality of environment.

1. With compliance to conditions of Environment Clearance obtained from MoEF, the following monitoring is being done at regular interval.
  - Ground Water Level at nearby bore wells
  - Trace metal in dust fall
  - Ground water quality at lower level
  - Meteorological monitoring
  - Trace metals such as Fe, Cr+6, Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water (downstream & upstream) and ground water at lower elevation is being periodically monitored by referring to the standards as per BIS : 10500.
2. Top soils generated during excavation are utilized immediately for nursery development and dump slope plantation.
3. Measures taken to control Air Pollution :-
  - Water sprinkling on the haul road,
  - Provision of dust masks to the workmen,
  - Adoption of wet drilling arrangement in the drill machines and
  - Black topped road in the residential colony.
4. Measures taken to control Water Pollution :-
  - Construction of toe wall and garland drain along the dump slope to prevent surface run-off during monsoon.
  - Construction of soak pits for discharge of sanitary sewage.

- Provision of oil separation pit for effluents coming out of work shop.
5. Measures taken to control Noise & Ground Vibration :-
- Thick plantation has been developed around the mines and office building to provide a canopy cover
  - Implementation of advance blasting technique(NONEL) to reduce the blast induced ground vibration and
  - Workmen are provided with ear-muff while working near heavy earth moving machineries.
6. Measures taken to control Land Degradation :-
- Afforestation around the non-active dump for stabilization and
  - Reclamation and rehabilitation of mined out area as per approved Scheme of Mining.
7. Nursery Development: - Local self-help groups are engaged for development of centralized nursery to grow the forestry saplings to facilitate the plantation programme at all the Manganese Mines under same management control.
8. Surveillance of Occupational Health: - Periodical Medical Examination of employees (departmental & contractual) is conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood hematology, blood pressure, detailed cardiovascular assessment, neurological examination etc. All chest radiographs are being classified for detection of pneumoconiosis, diagnosis and documentation made in accordance to ILO classifications. During the year 2017-18, 238 nos. of employees (Departmental - 9, Contractual - 229) have undergone periodical medical examination (PME) and 238 Nos of employees (Departmental-0, Contractual- 238) have undergone initial medical examination (IME). There are no findings of pneumoconiosis and manganese poisoning which is classified as occupational disease.
9. The mine is certified with ISO-14001 (Environment Management System).



Manager  
Joda West Manganese Mine.  
M/s.TATA STEEL LTD.



Joda West (Kundra Nala Entering H Quarry)		April'17	May'17	June'17	July'17	Aug'17	Sept'17
Parameters		1st Report	1st Report	1st Report	1st Report	1st Report	1st Report
Dissolved Oxygen (minimum)	mg/l	5.1	5.3	5.3	6.3	6.4	6.2
BOD (3) days at 27°C (max)	mg/l	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Total Coli form	MPN/100 ml	98	120	270	470	900	510
pH Value	--	7.24	7.28	7.22	7.25	7.24	7.30
Colour (max)	Hazen	CL	CL	6	24	18	15
Total Dissolved Solids	mg/l	132.0	138.0	127.0	116.0	124.0	124.0
Copper as Cu (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron as Fe (max)	mg/l	0.45	0.42	0.48	0.54	0.44	0.42
Chloride (max)	mg/l	29.0	32.0	24.0	21.0	25.0	22.0
Sulphates (SO <sub>4</sub> ) (max)	mg/l	4.8	4.6	5.2	4.1	3.9	4.0
Nitrate as NO <sub>3</sub> (max)	mg/l	1.9	1.7	1.8	1.8	1.7	1.7
Fluoride as F (max)	mg/l	1.5	0.022	0.014	0.021	0.02	0.016
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium as Cd (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic as As	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide as CN (max)	mg/l	ND	ND	ND	ND	ND	ND
Lead as Pb (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc as Zn (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexa Chromium as Cr <sup>+6</sup>	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<b>Joda West (Kundra Nala Entering H Quarry)</b>							
Dissolved Oxygen (minimum)	mg/l	5.9	6.1	5.7	5.5	5.2	5.3
BOD (3) days at 27°C (max)	mg/l	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Total Coli form	MPN/100 ml	900	410	370	220	370	170
pH Value	--	7.28	7.34	7.38	7.36	7.32	7.2
Colour (max)	Hazen	5	1	CL	CL	CL	CL
Total Dissolved Solids	mg/l	122.0	125.0	127.0	132.0	137.0	140
Copper as Cu (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron as Fe (max)	mg/l	0.44	0.46	0.48	0.45	0.48	0.45
Chloride (max)	mg/l	21.0	22.0	21.0	25.0	28.0	30.0
Sulphates (SO <sub>4</sub> ) (max)	mg/l	4.1	4.4	4.5	4.7	4.9	5.0
Nitrate as NO <sub>3</sub> (max)	mg/l	1.6	1.7	1.8	1.9	1.8	1.94
Fluoride as F (max)	mg/l	1.5	0.021	0.018	0.022	0.02	0.019
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium as Cd (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic as As	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide as CN (max)	mg/l	ND	ND	ND	ND	ND	ND
Lead as Pb (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc as Zn (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexa Chromium as Cr <sup>+6</sup>	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

**Annexure - I : Surface Water Quality Monitoring at Joda West Mn Mine (WZ Kundra Nala Leaving H Quarry)**

<b>Joda West (Kundra Nala Entering H Quarry)</b>		<b>April'17</b>	<b>May'17</b>	<b>June'17</b>	<b>July'17</b>	<b>Aug'17</b>	<b>Sept'17</b>
<b>Parameters</b>		<b>1st Report</b>	<b>1st Report</b>	<b>1st Report</b>	<b>1st Report</b>	<b>1st Report</b>	<b>1st Report</b>
Dissolved Oxygen (minimum)	Unit	5.3	5.5	5.8	6.4	6.3	6.1
BOD (3) days at 27°C (max)	mg/l	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Total Coli form	MPN/100 ml	110	150	320	540	1600	900
pH Value	--	7.32	7.3	7.26	7.28	7.32	7.33
Colour (max)	Hazen	CL	CL	8	27	20	16
Total Dissolved Solids	mg/l	136.0	140.0	130.0	118.0	120.0	122.0
Copper as Cu (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron as Fe (max)	mg/l	0.48	0.44	0.56	0.56	0.46	0.45
Chloride (max)	mg/l	32.0	34.0	27.0	22.0	26.0	24.0
Sulphates (SO <sub>4</sub> ) (max)	mg/l	5.2	5.3	5.3	4.3	4.1	3.9
Nitrate as NO <sub>3</sub> (max)	mg/l	2.1	2.2	1.9	1.9	1.8	1.5
Fluoride as F (max)	mg/l	0.023	0.024	0.016	0.02	0.018	0.018
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium as Cd (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic as As	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide as CN (max)	mg/l	ND	ND	ND	ND	ND	ND
Lead as Pb (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc as Zn (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexa Chromium as Cr +6	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<b>Joda West (Kundra Nala Entering H Quarry)</b>							
Dissolved Oxygen (minimum)	mg/l	6.1	5.8	5.9	5.4	5.7	5.4
BOD (3) days at 27°C (max)	mg/l	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Total Coli form	MPN/100 ml	1600	510	410	350	310	370
pH Value	--	7.3	7.29	7.34	7.39	7.36	7.24
Colour (max)	Hazen	6	1	CL	CL	CL	CL
Total Dissolved Solids	mg/l	120.0	128.0	134.0	139.0	136.0	144.0
Copper as Cu (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron as Fe (max)	mg/l	0.46	0.48	0.45	0.47	0.45	0.47
Chloride (max)	mg/l	20.0	24.0	22.0	26.0	28.0	31.0
Sulphates (SO <sub>4</sub> ) (max)	mg/l	4.3	4.8	4.9	4.8	4.7	5.2
Nitrate as NO <sub>3</sub> (max)	mg/l	1.5	1.8	1.9	2.1	1.7	2.06
Fluoride as F (max)	mg/l	0.029	0.022	0.021	0.024	0.022	0.025
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium as Cd (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic as As	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide as CN (max)	mg/l	ND	ND	ND	ND	ND	ND
Lead as Pb (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc as Zn (max)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexa Chromium as Cr +6	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

**Annexure-II : Ambient Air Quality Monitoring Report, JWMM, Sampling Location-1**

**PARAMETERS**

	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	NOx ( $\mu\text{g}/\text{m}^3$ )	O <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )	NH <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	Pb ( $\mu\text{g}/\text{m}^3$ )	Ni ( $\text{ng}/\text{m}^3$ )	As ( $\text{ng}/\text{m}^3$ )	Cd/Hg ( $\mu\text{g}/\text{m}^3$ )	BaP ( $\text{ng}/\text{m}^3$ )	Mn ( $\mu\text{g}/\text{m}^3$ )
Limit as per CPCB notification, New Delhi, 18th Nov, 2009 for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182/Part -23)-1999	USEPA CFR-40, Part-50, Appendix-1.	IS 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part.10-1999	Air Sampling, 3rd Edn By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114-C	IS 5182 Part. 11	IS 5182 Part. 12	EPA IO-3.2
April'17	71.2	36.4	5.7	15.8	6.3	0.4	27.6	<0.001	<0.01	<0.001	<0.001	<0.002	0.02
May'17	73.3	36.7	6	17.1	8.7	0.41	26.7	<0.001	<0.01	<0.001	<0.001	<0.002	0.01
Jun'17	48.8	23.5	<4.2	<11.2	<4.3	0.26	<20.2	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
July'17	33.1	14.9	<4.1	<9.3	<4.0	0.12	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Aug'17	30.7	13.4	<4.1	<9.3	<4.0	<0.12	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Sept'17	41	20	<4.2	10.6	<4.0	0.19	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Oct'17	50	24.2	<4.41	11.1	<4.0	0.23	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Nov'17	62.3	31.3	4.8	13.3	<4.7	0.33	<21.4	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Dec'17	74.3	38.3	5.5	15.7	8.1	0.43	29.4	<0.001	<0.01	<0.001	<0.001	<0.002	0.008
Jan'18	79.4	37.2	5.4	15.3	10.3	0.4	27.1	<0.001	<0.01	<0.001	<0.001	<0.002	0.011
Feb'18	70.1	35.5	5	15.2	10.5	0.44	25.9	<0.001	<0.01	<0.001	<0.001	<0.002	0.008
Mar'18	73.72	37.28	4.44	14.39	8.72	0.43	23.21	<0.001	<0.01	<0.001	<0.001	<0.002	0.007

Ambient Air Quality Monitoring Report, JWIMM, Sampling Location-2

PARAMETERS

	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NOx	O <sub>3</sub>	CO	NH <sub>3</sub>	Pb	Ni	As	CaHs	BaP	Mn
	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\text{mg}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\text{ng}/\text{m}^3$ )	( $\text{ng}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\text{ng}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	50	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -2)-1999	USEPA CFR-40, Part-50, Appendix-1	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 Part-10-1999	Air Sampling, 3rd Edn By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182 Part-11	IS 5182 Part-12	EPA IO-3.2
April'17	75	38.6	6.3	16.6	8.7	0.42	30.2	<0.001	<0.01	<0.001	<0.001	<0.002	0.011
May'17	77.7	39.5	6.5	17.7	10.6	0.44	29.6	<0.001	<0.01	<0.001	<0.001	<0.002	0.014
Jun'17	54.6	26.2	<4.7	<11.7	<4.4	0.29	<20.4	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
July'17	34.2	14.9	<4.1	<9.2	<4.0	0.12	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Aug'17	32.8	14.5	<4.1	<9.5	<4.0	<0.13	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Sept'17	43.9	21.4	4.4	11.1	<4.0	0.22	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Oct'17	58.4	29.5	<4.7	12.1	<4.0	0.28	<20.0	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Nov'17	68.5	34.6	5.2	14	<5.3	0.37	23.1	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Dec'17	78.3	41	5.9	16.2	8.8	0.45	32.1	<0.001	<0.01	<0.001	<0.001	<0.002	0.012
Jan'18	78.6	40.1	5.8	16.2	11.2	0.45	29.4	<0.001	<0.01	<0.001	<0.001	<0.002	0.014
Feb'18	76.8	39.1	5.5	16.2	11.6	0.48	28.3	<0.001	<0.01	<0.001	<0.001	<0.002	<0.011
Mar'18	79.53	41.47	5.17	15.8	10.09	0.48	25.77	<0.001	<0.01	<0.001	<0.001	<0.002	0.013