

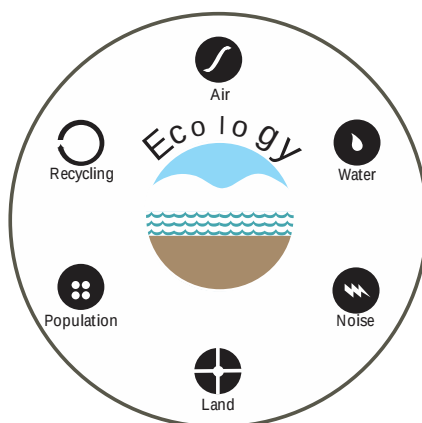


Annual Compiled Monitoring Report Of Jagannath Area For 2012-2013

(Ananta OCP, Bhubaneswari OCP & Jagannath OCP)

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



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CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine(s)/Projects(s)

Jagannath area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has four OCPs under its administrative control. The OCPs are Jagannath, Ananta, Bhubaneswari and Balanda.

Jagannath OCP

Jagannath OCP lies between latitude 20° 56' 00" and 20° 57' 31" N and longitudes 85° 08' 39" and 85° 10' 43" E. The mine is well connected by rail & road. The capacity of Jagannath OCP Expn. is 6.00 Mty. The project area is predominantly soil covered and gently undulating. The elevation of the area varies from 105 to 135 m above MSL.

The mean temperature ranges from 6.7° C (winter season) to 44.1° C (pre-monsoon cyclone season). The monthly mean wind speed at 8:30 hr varies from 2.0 to 3.0 kmph during the year against 2.0 to 8.0 kmph at 17:30 hr.

Talcher Thermal Power Station (TTPS) besides power houses of southern India are main consumers. Coal from this project also will meet the demand of basket linkage of Talcher coalfield.

Considering geo-mining conditions, shovel-dumper combination system of mining has been envisaged.

The boundary of the mine is as follows :

East	=	Floor boundary is arrived after leaving a surface barrier of 20m against Ananta OCP.
South	=	Fault F ₅ - F ₅ is taken as the floor.
West	=	The floor boundary is arrived after leaving a surface barrier of 150 m against Padmabatipur village.
North	=	Acquired land boundary is taken as the surface to arrive at the floor boundary.

Ananta OCP

The project lies between latitude 20° 57' 12" and 20° 59' 13" N and longitudes 85° 13' 18" and 85° 15' 06" E. The project was initially planned to produce 4.0 Mty. Now the production has been enhanced to 12.0 Mty through expansion. The project well connected by rail & road. The project area is predominantly soil covered and gently undulating. The ground has a gentle slope towards north. The elevation varies from 90 to 120 m above MSL.

Coal from this project meets the demand of CPPS of Visakhapatnam Steel Plant & ICCL, Choudwar besides power houses of southern India.

The project has its boundary as follows :

- North and East : 60m surface barrier against conveyor line, infrastructure proposed for Bhubaneswari OCP and nationalisation of boundary.
- South : Boundary fault F1 - F1 between main block and extension block.
- West : Geological block boundary.

For coal winning & transporation, contractual shovel dumper system has been deployed.

Balanda OCP

The capacity of the mine was 1.0 Mty. This mine is closed now.

Bhubaneswari OCP

The capacity of the mine is 20 Mty. Production has commenced.

1.2 Frequency of Environmental Monitoring

(i) Ambient air quality monitoring

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out.

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

- (ii) Drinking water monitoring : Once in every month.

(iii) Effluent quality monitoring

5 parameters and 4 parameters	:	Once in a fortnight
1 parameter	:	once in every Month.

21 parameters	:	Once in a year

- (iv) Well water level monitoring : Quarterly

- (v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The details of various environmental quality monitoring stations are given in are given below:

- **Air quality monitoring stations**

Sl.No. Name of Stations

Jagannath OCP

1. Jagannath OCP - Time Office
2. Balanda Colony, Near Railway siding I & II
3. Central Colony Near Sdg. 3 & 4
4. Jagannath Colony
5. Rakas Village*
6. Ananta Project Office.*

Ananta OCP

1. Dera Village
2. Rakas Village
3. Ananta Project Office
4. Ananta Vihar Colony
5. Hensamul Village- Talasahi*

Balanda OCP

1. Jagannath Colony*
2. Balanda Colony*
3. Rakas Village*

Bhubaneswari OCP

1. Project Site Office
2. Naraharipur Basti
3. Hensamul School Sahi*
4. Ekdal Village
5. Raghunathpur Village

*-- To be reported only.

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

Jagannath OCP

1. Tap Water, Jagannath Colony / Project Office Tap water
2. Rakas Village Well Water
3. Balanda Colony Tap Water
4. Project Office Tube Water

Ananta OCP

1. Ananta Colony Tap Water
2. Hensamul Village Well Water
3. Dera Village Tube Well Water

Bhubaneswari OCP

1. Project site office water
2. Naharipur Tube Well Water
3. Jilinda vill. well water

- Effluent quality monitoring station

1. MDTP outlet – Jagannath OCP
2. O & G trap outlet– Jagannath OCP
3. Mine discharge water – Ananta OCP
4. Out let of DETP – Ananta OCP
5. Mine sump water– Jagannath OCP
6. Mine sump water– Ananta OCP
7. Mine Discharge Water in Bangaru Jhor--Bhubaneswari OCP
8. O & G trap outlet--Bhubaneswari OCP

- Well water level monitoring station

1. Rakas village well– Jagannath OCP
2. Dera village well – Ananta OCP
3. Hensamul village well– Ananta OCP
4. Jilinda village well water--Bhubaneswari OCP
5. Naharipur village well--Bhubaneswari OCP

- Noise level monitoring stations**Sl.No. Name of Stations****Jagannath OCP**

1. Time Office
2. Balanda Colony, Near Railway siding I & II
3. Central Colony Near Sdg. 3 & 4
4. Jagannath Colony
5. Rakas Village*
6. Ananta Project Office*

Ananta OCP

1. Dera Village
2. Rakas Village
3. Ananta Project Office
4. Anantavihar Colony
5. Hensamul Village-Talasahi*

Balanda OCP

1. Jagannath Colony*
2. Balanda Colony*
3. Rakas Village*

Bhubaneswari OCP

1. Project Site Office
2. Narharipur Basti
3. Hensamul village- Talasahi
4. Ekdal Village
5. Raghunathpur Village

- **Siltation study by monitoring parameter TSS (fortnightly once each in July, Aug., Sept.) of Ananta OCP**

1. 100m u/s of the point of confluence of mine discharge water with Bangaru nullah.
2. 100m d/s of the point of confluence of mine discharge water with Bangaru nullah.

- **Siltation study by monitoring parameter TSS (fortnightly once each in July, Aug., Sept.) of Bhubaneswari OCP**

1. 100m u/s of the point of confluence of mine discharge water in Bangaru nullah.
2. 100m d/s of the point of confluence of mine discharge water in Bangaru nullah.

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1

**Details of Air Quality Monitoring Stations
along with Sources of Pollution**

Sl.No.	Location	Sources of Pollution
Jagannath OCP		
1	Jagannath OCP Time Office	Mine activities, transportation
2	Balanda Colony, Near Railway siding I & II	Mining activities, siding, transportation.
3	Central Colony Siding 3 & 4	Railway siding
4	Jagannath Colony	Transportation
Ananta OCP		
1.	Rakas village	Mining activities.
2.	Ananta Project Office/Dera village	CHP, transportation
3.	Hensamul village	Mining activities.
4.	Ananta vihar colony	Transportation and railway siding
Balanda OCP		
1.	Jagannath colony	Siding, CHP
2.	Balanda Colony	Near by mining activities
3.	Rakas Village	Transportation
Bhubaneswari OCP		
1.	Project Site Office	Mining activities
2.	Narharipur Basti	Mining activities
3.	Hensamul School Sahi	Nearby mining activities
4.	Ekdal village	Nearby mining activities
5.	Ragunathpur village	Nearby mining activities

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2
Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached.

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Jagannath Area reveals the following:

- In coal mining area like Project Office, Central Nursery, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines barring a few aberated value.
- In residential area the values of SPM and RPM are found to be within the limits of the prescribed limits of NAAQS barring a few aberated values.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Water sprinkling on haul roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers at haul roads and siding.
- Cleaning spillage from roads.
- Practice for covered transportation.
- Regular maintenance of all HEMMs and other machinery.
- Provision of gas filters for exhaust fumes.
- No overloading of trucks/dumpers.
- Application of innocuous chemical binders on haul roads.
- Development of thick greenbelts around the mines, infrastructure sites and residential area besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.

- Drills with well-designed dust extractors/arrestors.
- Provision of dust extraction system for crusher house.
- Suppression of coal dust at CHP by provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers.

CHAPTER-III

WATER ENVIRONMENT

3.1 Methodology and Instruments used for water & effluent analysis

Details are given in Table-3.

Table-3

Methodology & Instruments used for Water and Effluent Analysis

Sl.No.	Parameters	Method/Instruments
1	PH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The results of analyses of drinking water samples and effluent are given in Tables attached.

Ground water level monitoring of various dug-wells are given in Tables attached.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.2 Results

The fortnightly noise level measurements for different stations are given in Tables attached.

4.3 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards barring a few aberrated values.

4.4 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Proper designing of plant and machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- HEMMs with sound proof cabin.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Jagannath OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Balanda Colony, Near Rly. Sdg.I&II	217	106	26	32	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
20-Apr-12	Balanda Colony, Near Rly. Sdg.I&II	253	105	28	37	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
04-May-12	Balanda Colony, Near Rly. Sdg.I&II	217	68	24	30	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
21-May-12	Balanda Colony, Near Rly. Sdg.I&II	252	87	30	38	Near by mining activities, transportation	About 200m to 500m	South to north & sunny
06-Jun-12	Balanda Colony, Near Rly. Sdg.I&II	244	92	32	39	Near by mining activities, transportation	About 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

22-Jun-12	Balanda Colony, Near Rly. Sdg.I&II	158	73	24	30	Near by mining activities, transportation	About 200m to 500m	South to north & cloudy rain fall
05-Jul-12	Balanda Colony, Near Rly. Sdg.I&II	226	83	28	35	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
20-Jul-12	Balanda Colony, Near Rly. Sdg.I&II	169	66	24	30	Near by mining activities, transportation	About 200m to 500m	South to North cloudy, and rainfall
06-Aug-12	Balanda Colony, Near Rly. Sdg.I&II	145	72	21	39	Near by mining activities, transportation	About 200m to 500m	South to North cloudy, and rainfall
21-Aug-12	Balanda Colony, Near Rly. Sdg.I&II	187	95	27	37	Near by mining activities, transportation	About 200m to 500m	South to North cloudy, and rainfall
05-Sep-12	Balanda Colony, Near Rly. Sdg.I&II	164	101	23	39	Near by mining activities, transportation	About 200m to 500m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

21-Sep-12	Balanda Colony, Near Rly. Sdg.I&II	171	73	20	25	Near by mining activities, transportation	About 200m to 500m	South to North & sunny
05-Oct-12	Balanda Colony, Near Rly. Sdg.I&II	136	61	26	34	Near by mining activities, transportation	About 200m to 500m	East to west cloudy and rainfall
20-Oct-12	Balanda Colony, Near Rly. Sdg.I&II	245	83	28	36	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
05-Nov-12	Balanda Colony, Near Rly. Sdg.I&II	252	94	26	34	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
20-Nov-12	Balanda Colony, Near Rly. Sdg.I&II	214	101	20	26	Near by mining activities, transportation	About 200m to 500m	East to west hot & sunny
11-Dec-12	Balanda Colony, Near Rly. Sdg.I&II	254	116	23	28	Near by mining activities, transportation	About 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Dec-12	Balanda Colony, Near Rly. Sdg.I&II	291	129	25	27	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
09-Jan-13	Balanda Colony, Near Rly. Sdg.I&II	272	113	21	24	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
24-Jan-13	Balanda Colony, Near Rly. Sdg.I&II	285	127	23	26	Near by mining activities, transportation	About 200m to 500m	South to north & sunny
11-Feb-13	Balanda Colony, Near Rly. Sdg.I&II	297	136	25	28	Near by mining activities, transportation	About 200m to 500m	South to north & sunny
26-Feb-13	Balanda Colony, Near Rly. Sdg.I&II	310	147	27	29	Near by mining activities, transportation	About 200m to 500m	East to west & sunny
11-Mar-13	Balanda Colony, Near Rly. Sdg.I&II	281	131	26	28	Near by mining activities, transportation	About 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

26-Mar-13	Balanda Colony, Near Rly. Sdg.I&II	294	126	24	27	Near by mining activities, transportation	About 200m to 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Jagannath OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
04-Apr-12	Jagannath Colony	189	102	22	28	Siding, Mining activities, transportation	About 500m	South to north & sunny
19-Apr-12	Jagannath Colony	184	67	22	30	Siding, Mining activities, transportation	About 500m	East to west & sunny
03-May-12	Jagannath Colony	233	71	24	30	Siding, Mining activities, transportation	About 500m	East to west & sunny
18-May-12	Jagannath Colony	241	89	28	36	Siding, Mining activities, transportation	About 500m	East to west & sunny
05-Jun-12	Jagannath Colony	205	76	26	33	Siding, Mining activities, transportation	About 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

22-Jun-12	Jagannath Colony	184	68	22	27	Siding,Mining activities,transportation	About 500m	South to north cloudy rain fall
04-Jul-12	Jagannath Colony	166	74	24	30	Siding,Mining activities,transportation	About 500m	West to east & sunny
19-Jul-12	Jagannath Colony	144	62	22	27	Siding,Mining activities,transportation	About 500m	South to North cloudy, and rainfall
03-Aug-12	Jagannath Colony	161	83	24	35	Siding,Mining activities,transportation	About 500m	South to North cloudy, and rainfall
20-Aug-12	Jagannath Colony	132	98	26	30	Siding,Mining activities,transportation	About 500m	East to west, cloudy and rainfall
04-Sep-12	Jagannath Colony	112	91	21	37	Siding,Mining activities,transportation	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

19-Sep-12	Jagannath Colony	167	72	21	26	Siding,Mining activities,transportation	About 500m	East to west & sunny
04-Oct-12	Jagannath Colony	122	60	24	28	Siding,Mining activities,transportation	About 500m	East to west cloudy and rainfall
19-Oct-12	Jagannath Colony	254	85	28	33	Siding,Mining activities,transportation	About 500m	East to west & sunny
02-Nov-12	Jagannath Colony	263	96	25	31	Siding,Mining activities,transportation	About 500m	East to west & sunny
19-Nov-12	Jagannath Colony	237	109	22	27	Siding,Mining activities,transportation	About 500m	East to west & sunny
11-Dec-12	Jagannath Colony	221	102	24	26	Siding,Mining activities,transportation	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Dec-12	Jagannath Colony	243	114	21	24	Siding,Mining activities,transportation	About 500m	East to west & sunny
09-Jan-13	Jagannath Colony	217	109	23	26	Siding,Mining activities,transportation	About 500m	East to west & sunny
24-Jan-13	Jagannath Colony	231	110	22	25	Siding,Mining activities,transportation	About 500m	South to north & sunny
11-Feb-13	Jagannath Colony	259	121	24	26	Siding,Mining activities,transportation	About 500m	South to north & sunny
26-Feb-13	Jagannath Colony	271	130	25	26	Siding,Mining activities,transportation	About 500m	East to west & sunny
11-Mar-13	Jagannath Colony	265	124	23	25	Siding,Mining activities,transportation	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Mar-13	Jagannath Colony	279	148	26	29	Siding,Mining activities,transportation	About 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Jagannath OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Central Colony Near Siding 3 & 4	243	98	22	30	Siding, Mining activities, transportation	About 500m	South to north & sunny
20-Apr-12	Central Colony Near Siding 3 & 4	220	83	28	38	Siding, Mining activities, transportation	About 500m	East to west & sunny
03-May-12	Central Colony Near Siding 3 & 4	236	81	26	35	Siding, Mining activities, transportation	About 500m	East to west & sunny
18-May-12	Central Colony Near Siding 3 & 4	263	109	30	40	Siding, Mining activities, transportation	About 500m	East to west & sunny
05-Jun-12	Central Colony Near Siding 3 & 4	274	106	32	40	Siding, Mining activities, transportation	About 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

22-Jun-12	Central Colony Near Siding 3 & 4	236	79	26	32	Siding,Mining activities,transportation	About 500m	South to north cloudy rain fall
04-Jul-12	Central Colony Near Siding 3 & 4	272	95	32	38	Siding,Mining activities,transportation	About 500m	West to east & sunny
19-Jul-12	Central Colony Near Siding 3 & 4	194	82	26	32	Siding,Mining activities,transportation	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Jagannath OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
03-Aug-12	Central Colony Near Rly Siding 3 & 4	175	94	27	42	Siding, Mining activities, transportation	About 500m	South to North cloudy, and rainfall
20-Aug-12	Central Colony Near Rly Siding 3 & 4	162	103	21	40	Siding, Mining activities, transportation	About 500m	East to west, cloudy and rainfall
04-Sep-12	Central Colony Near Rly Siding 3 & 4	145	98	26	34	Siding, Mining activities, transportation	About 500m	South to North cloudy, and rainfall
19-Sep-12	Central Colony Near Rly Siding 3 & 4	183	97	23	28	Siding, Mining activities, transportation	About 500m	East to west & sunny
04-Oct-12	Central Colony Near Rly Siding 3 & 4	165	64	28	35	Siding, Mining activities, transportation	About 500m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

19-Oct-12	Central Colony Near Rly Siding 3 & 4	283	92	30	37	Siding,Mining activities,transportation	About 500m	East to west & sunny
02-Nov-12	Central Colony Near Rly Siding 3 & 4	278	99	29	35	Siding,Mining activities,transportation	About 500m	East to west & sunny
19-Nov-12	Central Colony Near Rly Siding 3 & 4	253	112	25	29	Siding,Mining activities,transportation	About 500m	East to west & sunny
11-Dec-12	Central Colony Near Rly Siding 3 & 4	273	124	26	30	Siding,Mining activities,transportation	About 500m	East to west & sunny
26-Dec-12	Central Colony Near Rly Siding 3 & 4	286	101	23	26	Siding,Mining activities,transportation	About 500m	East to west & sunny
07-Jan-13	Central Colony Near Rly Siding 3 & 4	254	117	25	27	Siding,Mining activities,transportation	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

22-Jan-13	Central Colony Near Rly Siding 3 & 4	268	109	21	23	Siding,Mining activities,transportation	About 500m	East to west & sunny
07-Feb-13	Central Colony Near Rly Siding 3 & 4	282	116	23	25	Siding,Mining activities,transportation	About 500m	East to west & sunny
22-Feb-13	Central Colony Near Rly Siding 3 & 4	292	141	26	28	Siding,Mining activities,transportation	About 500m	East to west & sunny
07-Mar-13	Central Colony Near Rly Siding 3 & 4	272	129	25	27	Siding,Mining activities,transportation	About 500m	East to west & sunny
22-Mar-13	Central Colony Near Rly Siding 3 & 4	285	136	27	30	Siding,Mining activities,transportation	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Jagannath OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Jagannath OCP - Time Office	333	146	36	46	Mining activities, transportation	200m to 500m	East to west & sunny
20-Apr-12	Jagannath OCP - Time Office	366	136	38	52	Mining activities, transportation	200m to 500m	East to west & sunny
04-May-12	Jagannath OCP - Time Office	305	124	37	44	Mining activities, transportation	200m to 500m	East to west & sunny
21-May-12	Jagannath OCP - Time Office	399	156	40	48	Mining activities, transportation	200m to 500m	East to west & sunny
06-Jun-12	Jagannath OCP - Time Office	326	131	38	45	Mining activities, transportation	200m to 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

22-Jun-12	Jagannath OCP - Time Office	247	105	32	40	Mining activities, transportation	200m to 500m	South to north & cloudy rain fall
05-Jul-12	Jagannath OCP - Time Office	288	119	35	42	Mining activities, transportation	200m to 500m	East to west & sunny
21-Jul-12	Jagannath OCP - Time Office	206	100	28	36	Mining activities, transportation	200m to 500m	East to west, cloudy and rainfall
06-Aug-12	Jagannath OCP - Time Office	221	115	29	41	Mining activities, transportation	200m to 500m	East to west, cloudy and rainfall
21-Aug-12	Jagannath OCP - Time Office	210	112	24	39	Mining activities, transportation	200m to 500m	South to North cloudy, and rainfall
05-Sep-12	Jagannath OCP - Time Office	193	105	20	41	Mining activities, transportation	200m to 500m	South to north cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

21-Sep-12	Jagannath OCP - Time Office	230	108	25	33	Mining activities, transportation	200m to 500m	South to North & sunny
05-Oct-12	Jagannath OCP - Time Office	212	85	33	41	Mining activities, transportation	200m to 500m	East to west cloudy and rainfall
20-Oct-12	Jagannath OCP - Time Office	329	131	36	44	Mining activities, transportation	200m to 500m	East to west & sunny
05-Nov-12	Jagannath OCP - Time Office	294	125	30	37	Mining activities, transportation	200m to 500m	East to west & sunny
20-Nov-12	Jagannath OCP - Time Office	278	119	27	30	Mining activities, transportation	200m to 500m	East to west & cloudy
11-Dec-12	Jagannath OCP - Time Office	285	129	29	32	Mining activities, transportation	200m to 500m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Dec-12	Jagannath OCP - Time Office	257	118	27	30	Mining activities, transportation	200m to 500m	East to west & sunny
07-Jan-13	Jagannath OCP - Time Office	276	125	26	29	Mining activities, transportation	200m to 500m	East to west & sunny
22-Jan-13	Jagannath OCP - Time Office	259	113	24	27	Mining activities, transportation	200m to 500m	East to west & sunny
07-Feb-13	Jagannath OCP - Time Office	276	129	25	27	Mining activities, transportation	200m to 500m	East to west & sunny
22-Feb-13	Jagannath OCP - Time Office	281	137	25	27	Mining activities, transportation	200m to 500m	East to west & sunny
07-Mar-13	Jagannath OCP - Time Office	293	149	27	29	Mining activities, transportation	200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

22-Mar-13	Jagannath OCP - Time Office	305	153	28	31	Mining activities, transportation	200m to 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Ananta OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Apr-12	Dera Village	160	62	20	27	CHP, Transportation	About 300m to 600m	South to north & sunny
26-Apr-12	Dera Village	161	86	24	33	CHP, Transportation	About 300m to 600m	East to west & sunny
09-May-12	Dera Village	210	72	26	33	CHP, Transportation	About 300m to 600m	East to west & sunny
24-May-12	Dera Village	187	84	30	34	CHP, Transportation	About 300m to 600m	East to west & sunny
11-Jun-12	Dera Village	216	88	30	36	CHP, Transportation	About 300m to 600m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Jun-12	Dera Village	174	71	24	31	CHP, Transportation	About 300m to 600m	East to west & cloudy rain fall
11-Jul-12	Dera Village	266	86	30	36	CHP, Transportation	About 300m to 600m	West to east & sunny
26-Jul-12	Dera Village	129	61	24	28	CHP, Transportation	About 300m to 600m	East to west, cloudy and rainfall
08-Aug-12	Dera Village	137	85	27	38	CHP, Transportation	About 300m to 600m	East to west, cloudy and rainfall
24-Aug-12	Dera Village	103	81	21	30	CHP, Transportation	About 300m to 600m	East to west, cloudy and rainfall
10-Sep-12	Dera Village	120	105	25	38	CHP, Transportation	About 300m to 600m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

24-Sep-12	Dera Village	130	68	22	31	CHP, Transportation	About 300m to 600m	South to North & sunny
10-Oct-12	Dera Village	125	58	23	28	CHP, Transportation	About 300m to 600m	East to west cloudy and rainfall
25-Oct-12	Dera Village	186	74	26	31	CHP, Transportation	About 300m to 600m	East to west & sunny
08-Nov-12	Dera Village	195	87	24	30	CHP, Transportation	About 300m to 600m	East to west & sunny
23-Nov-12	Dera Village	174	95	21	27	CHP, Transportation	About 300m to 600m	East to west & cloudy
05-Dec-12	Dera Village	162	91	23	25	CHP, Transportation	About 300m to 600m	West to east & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

20-Dec-12	Dera Village	146	119	24	26	CHP, Transportation	About 300m to 600m	West to east & cloudy
04-Jan-13	Dera Village	135	117	23	25	CHP, Transportation	About 300m to 600m	South to north & sunny
19-Jan-13	Dera Village	167	95	20	23	CHP, Transportation	About 300m to 600m	East to west & sunny
06-Feb-13	Dera Village	179	106	23	25	CHP, Transportation	About 300m to 600m	East to west & sunny
20-Feb-13	Dera Village	186	115	22	24	CHP, Transportation	About 300m to 600m	East to west & sunny
06-Mar-13	Dera Village	197	121	24	26	CHP, Transportation	About 300m to 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

21-Mar-13	Dera Village	216	135	25	28	CHP, Transportation	About 300m to 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Ananta OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
12-Apr-12	Ananta PO Office	287	134	30	38	CHP, Transportation	About 200m to 500m	East to west & sunny
28-Apr-12	Ananta PO Office	352	134	38	47	CHP, Transportation	About 200m to 500m	East to west & sunny
10-May-12	Ananta PO Office	310	104	38	47	CHP, Transportation	About 200m to 500m	South to north & sunny
25-May-12	Ananta PO Office	355	132	38	44	CHP, Transportation	About 200m to 500m	East to west & sunny
12-Jun-12	Ananta PO Office	344	128	36	46	CHP, Transportation	About 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Jun-12	Ananta PO Office	305	95	28	35	CHP, Transportation	About 200m to 500m	East to west & cloudy rain fall
12-Jul-12	Ananta PO Office	270	130	35	43	CHP, Transportation	About 200m to 500m	East to west & sunny
27-Jul-12	Ananta PO Office	204	91	32	40	CHP, Transportation	About 200m to 500m	Calm,cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Ananta OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
10-Aug-12	Ananta Project Office	183	91	29	45	CHP, Transportation	About 200m to 500m	East to west, cloudy and rainfall
27-Aug-12	Ananta Project Office	174	102	20	39	CHP, Transportation	About 200m to 500m	South to North cloudy, and rainfall
11-Sep-12	Ananta Project Office	154	91	23	32	CHP, Transportation	About 200m to 500m	South to North cloudy, and rainfall
26-Sep-12	Ananta Project Office	135	81	24	27	CHP, Transportation	About 200m to 500m	South to North & sunny
11-Oct-12	Ananta Project Office	285	117	32	38	CHP, Transportation	About 200m to 500m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

26-Oct-12	Ananta Project Office	316	132	36	45	CHP, Transportation	About 200m to 500m	East to west & sunny
09-Nov-12	Ananta Project Office	321	145	37	44	CHP, Transportation	About 200m to 500m	East to west & sunny
26-Nov-12	Ananta Project Office	296	134	28	31	CHP, Transportation	About 200m to 500m	East to west & cloudy
05-Dec-12	Ananta Project Office	267	124	24	26	CHP, Transportation	About 200m to 500m	East to west & cloudy
20-Dec-12	Ananta Project Office	238	117	25	27	CHP, Transportation	About 200m to 500m	East to west & cloudy
04-Jan-13	Ananta Project Office	286	128	26	29	CHP, Transportation	About 200m to 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

19-Jan-13	Ananta Project Office	264	113	22	25	CHP, Transportation	About 200m to 500m	East to west & sunny
06-Feb-13	Ananta Project Office	253	137	24	27	CHP, Transportation	About 200m to 500m	East to west & sunny
20-Feb-13	Ananta Project Office	267	131	26	29	CHP, Transportation	About 200m to 500m	East to west & sunny
06-Mar-13	Ananta Project Office	276	143	27	29	CHP, Transportation	About 200m to 500m	East to west & sunny
21-Mar-13	Ananta Project Office	283	138	26	28	CHP, Transportation	About 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Ananta OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Rakas Village	196	94	24	30	Mining activities	About 500m	East to west & sunny
20-Apr-12	Rakas Village	234	112	26	34	Mining activities	About 500m	East to west & sunny
04-May-12	Rakas Village	239	86	28	36	Mining activities	About 500m	East to west & sunny
21-May-12	Rakas Village	216	91	32	38	Mining activities	About 500m	East to west & sunny
06-Jun-12	Rakas Village	210	87	30	35	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

21-Jun-12	Rakas Village	156	64	22	27	Mining activities	About 500m	South to noth & cloudy rain fall
06-Jul-12	Rakas Village	158	72	24	30	Mining activities	About 500m	East to west & sunny
21-Jul-12	Rakas Village	142	58	24	30	Mining activities	About 500m	South to North cloudy, and rainfall
06-Aug-12	Rakas Village	151	64	23	41	Mining activities	About 500m	East to west, cloudy and rainfall
21-Aug-12	Rakas Village	121	86	25	34	Mining activities	About 500m	South to North cloudy, and rainfall
05-Sep-12	Rakas Village	112	98	21	36	Mining activities	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

21-Sep-12	Rakas Village	125	76	20	29	Mining activities	About 500m	South to North & sunny
05-Oct-12	Rakas Village	102	56	22	25	Mining activities	About 500m	East to west cloudy and rainfall
20-Oct-12	Rakas Village	203	87	29	34	Mining activities	About 500m	East to west & sunny
05-Nov-12	Rakas Village	212	96	27	29	Mining activities	About 500m	East to west & sunny
20-Nov-12	Rakas Village	183	101	24	26	Mining activities	About 500m	East to west & sunny
05-Dec-12	Rakas Village	176	105	22	24	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

20-Dec-12	Rakas Village	189	129	23	25	Mining activities	About 500m	East to west & sunny
04-Jan-13	Rakas Village	176	116	22	24	Mining activities	About 500m	South to north & sunny
19-Jan-13	Rakas Village	192	105	23	26	Mining activities	About 500m	East to west & sunny
06-Feb-13	Rakas Village	226	129	26	28	Mining activities	About 500m	East to west & sunny
20-Feb-13	Rakas Village	217	120	25	27	Mining activities	About 500m	East to west & sunny
06-Mar-13	Rakas Village	235	134	26	28	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

21-Mar-13	Rakas Village	253	148	27	29	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
13-Apr-12	Project Site Office	321	128	32	38	Mining activities	About 500m	West to east & sunny
28-Apr-12	Project Site Office	388	162	38	45	Mining activities	About 500m	West to east & sunny
11-May-12	Project Site Office	331	148	36	45	Mining activities	About 500m	West to east & sunny
28-May-12	Project Site Office	356	134	40	48	Mining activities	About 500m	East to west & sunny
13-Jun-12	Project Site Office	327	121	38	46	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Jun-12	Project Site Office	288	102	31	36	Mining activities	About 500m	South to north & cloudy rain fall
13-Jul-12	Project Site Office	283	122	36	44	Mining activities	About 500m	East to west & sunny
28-Jul-12	Project Site Office	217	104	33	40	Mining activities	About 500m	East to west, cloudy and rainfall
13-Aug-12	Project Site Office	230	95	37	43	Mining activities	About 500m	East to west, cloudy and rainfall
28-Aug-12	Project Site Office	197	102	31	39	Mining activities	About 500m	East to west, cloudy and rainfall
12-Sep-12	Project Site Office	174	100	24	40	Mining activities	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Sep-12	Project Site Office	158	92	20	29	Mining activities	About 500m	East to west & sunny
12-Oct-12	Project Site Office	264	122	33	45	Mining activities	About 500m	West to East & sunny
27-Oct-12	Project Site Office	311	125	35	41	Mining activities	About 500m	East to west & sunny
14-Nov-12	Project Site Office	299	135	30	36	Mining activities	About 500m	West to east & sunny
29-Nov-12	Project Site Office	273	124	27	32	Mining activities	About 500m	West to east & cloudy
13-Dec-12	Project Site Office	264	117	26	28	Mining activities	About 500m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Dec-12	Project Site Office	286	124	25	29	Mining activities	About 500m	South to North & cloudy
11-Jan-13	Project Site Office	261	118	23	26	Mining activities	About 500m	South to north & sunny
26-Jan-13	Project Site Office	246	120	25	27	Mining activities	About 500m	South to north & sunny
13-Feb-13	Project Site Office	268	138	26	29	Mining activities	About 500m	East to west & sunny
27-Feb-13	Project Site Office	272	143	26	28	Mining activities	About 500m	South to north & sunny
13-Mar-13	Project Site Office	285	151	28	30	Mining activities	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

29-Mar-13	Project Site Office	292	162	29	31	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
13-Apr-12	Ekdal Village	151	74	20	25	Mining activities	About 500m	West to east & sunny
28-Apr-12	Ekdal Village	231	89	26	33	Mining activities	About 500m	East to west & sunny
11-May-12	Ekdal Village	158	63	22	27	Mining activities	About 500m	East to west & sunny
28-May-12	Ekdal Village	188	76	28	34	Mining activities	About 500m	East to west & sunny
13-Jun-12	Ekdal Village	164	72	26	30	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Jun-12	Ekdal Village	183	75	23	28	Mining activities	About 500m	East to west & cloudy rain fall
13-Jul-12	Ekdal Village	164	84	30	35	Mining activities	About 500m	East to west & sunny
28-Jul-12	Ekdal Village	144	64	22	26	Mining activities	About 500m	East to west, cloudy and rainfall
13-Aug-12	Ekdal Village	125	79	25	34	Mining activities	About 500m	East to west, cloudy and rainfall
28-Aug-12	Ekdal Village	135	92	26	36	Mining activities	About 500m	East to west, cloudy and rainfall
12-Sep-12	Ekdal Village	127	95	25	33	Mining activities	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Sep-12	Ekdal Village	142	89	21	28	Mining activities	About 500m	East to west & sunny
12-Oct-12	Ekdal Village	164	69	24	30	Mining activities	About 500m	East to west & sunny
27-Oct-12	Ekdal Village	166	68	24	29	Mining activities	About 500m	East to west & sunny
14-Nov-12	Ekdal Village	153	86	23	27	Mining activities	About 500m	West to east & sunny
29-Nov-12	Ekdal Village	141	89	21	25	Mining activities	About 500m	West to east & cloudy
13-Dec-12	Ekdal Village	148	97	23	26	Mining activities	About 500m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Dec-12	Ekdal Village	157	105	.20	23	Mining activities	About 500m	South to North & cloudy
11-Jan-13	Ekdal Village	167	103	24	27	Mining activities	About 500m	South to north & sunny
26-Jan-13	Ekdal Village	183	108	22	25	Mining activities	About 500m	South to north & sunny
13-Feb-13	Ekdal Village	196	118	23	25	Mining activities	About 500m	East to west & sunny
27-Feb-13	Ekdal Village	214	128	24	27	Mining activities	About 500m	South to north & sunny
13-Mar-13	Ekdal Village	227	131	25	27	Mining activities	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

29-Mar-13	Ekdal Village	235	139	26	28	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
12-Apr-12	Hensamul Village-Talasahi	237	102	22	28	Mining activities	500 m E	East to west & sunny
28-Apr-12	Hensamul Village-Talasahi	237	119	27	35	Mining activities	500 m E	East to west & sunny
10-May-12	Hensamul Village-Talasahi	268	127	32	38	Mining activities	500 m E	South to north & sunny
25-May-12	Hensamul Village-Talasahi	252	119	36	42	Mining activities	500 m E	East to west & sunny
12-Jun-12	Hensamul Village-Talasahi	266	109	35	42	Mining activities	500 m E	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Jun-12	Hensamul Village-Talasahi	247	94	30	36	Mining activities	500 m E	East to west & cloudy rain fall
12-Jul-12	Hensamul Village-Talasahi	214	96	32	39	Mining activities	500 m E	West to east & sunny
28-Jul-12	Hensamul Village-Talasahi	170	76	27	32	Mining activities	500 m E	Calm,cloudy and rainfall
10-Aug-12	Hensamul Village-Talasahi	162	81	29	37	Mining activities	500 m E	East to west, cloudy and rainfall
27-Aug-12	Hensamul Village-Talasahi	154	97	23	35	Mining activities	500 m E	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Sep-12	Hensmul Village-Talasahi	132	92	21	39	Mining activities	500 m E	East to west cloudy and rainfall
26-Sep-12	Hensmul Village-Talasahi	141	87	23	30	Mining activities	500 m E	South to North & sunny
11-Oct-12	Hensmul Village-Talasahi	252	104	30	37	Mining activities	500 m E	South to North & sunny
26-Oct-12	Hensmul Village-Talasahi	244	116	34	39	Mining activities	500 m E	East to west & sunny
14-Nov-12	Hensmul Village-Talasahi	256	123	29	34	Mining activities	500 m E	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

29-Nov-12	Hensmul Village-Talasahi	215	107	27	31	Mining activities	500 m E	West to east & cloudy
13-Dec-12	Hensmul Village-Talasahi	253	115	25	29	Mining activities	500 m E	South to North & sunny
28-Dec-12	Hensmul Village-Talasahi	268	107	24	27	Mining activities	500 m E	South to North & cloudy
11-Jan-13	Hensmul Village-Talasahi	283	114	22	25	Mining activities	500 m E	South to north & sunny
26-Jan-13	Hensmul Village-Talasahi	268	152	24	26	Mining activities	500 m E	South to north & sunny
13-Feb-13	Hensmul Village-Talasahi	283	146	25	27	Mining activities	500 m E	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Feb-13	Hensmul Village-Talasahi	295	152	26	28	Mining activities	500 m E	South to north & sunny
13-Mar-13	Hensmul Village-Talasahi	305	149	27	29	Mining activities	500 m E	South to north & sunny
29-Mar-13	Hensmul Village-Talasahi	312	156	28	30	Mining activities	500 m E	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
13-Apr-12	Raghunathpur Village	173	98	22	26	Mining activities	About 600m	West to east & sunny
28-Apr-12	Raghunathpur Village	159	67	22	26	Mining activities	About 600m	East to west & sunny
11-May-12	Raghunathpur Village	268	101	28	34	Mining activities	About 600m	East to west & sunny
28-May-12	Raghunathpur Village	241	97	30	34	Mining activities	About 600m	East to west & sunny
13-Jun-12	Raghunathpur Village	215	76	24	29	Mining activities	About 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Jun-12	Raghunathpur Village	157	68	21	26	Mining activities	About 600m	East to west & cloudy rain fall
13-Jul-12	Raghunathpur Village	184	68	22	27	Mining activities	About 600m	East to west & sunny
28-Jul-12	Raghunathpur Village	165	72	23	27	Mining activities	About 600m	East to west, cloudy and rainfall
13-Aug-12	Raghunathpur Village	183	86	28	35	Mining activities	About 600m	East to west, cloudy and rainfall
28-Aug-12	Raghunathpur Village	167	99	20	31	Mining activities	About 600m	East to west, cloudy and rainfall
12-Sep-12	Raghunathpur Village	143	105	22	38	Mining activities	About 600m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Sep-12	Raghunathpur Village	135	83	24	32	Mining activities	About 600m	East to west & sunny
12-Oct-12	Raghunathpur Village	191	84	28	33	Mining activities	About 600m	East to west & sunny
27-Oct-12	Raghunathpur Village	198	86	24	30	Mining activities	About 600m	East to west & sunny
14-Nov-12	Raghunathpur Village	201	112	26	30	Mining activities	About 600m	West to east & sunny
29-Nov-12	Raghunathpur Village	215	104	23	26	Mining activities	About 600m	West to east & cloudy
13-Dec-12	Raghunathpur Village	219	101	22	25	Mining activities	About 600m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Dec-12	Raghunathpur Village	235	109	24	26	Mining activities	About 600m	South to North & cloudy
11-Jan-13	Raghunathpur Village	254	126	25	28	Mining activities	About 600m	South to north & sunny
26-Jan-13	Raghunathpur Village	218	107	26	28	Mining activities	About 600m	South to north & sunny
13-Feb-13	Raghunathpur Village	234	113	25	28	Mining activities	About 600m	East to west & sunny
27-Feb-13	Raghunathpur Village	217	110	24	26	Mining activities	About 600m	South to north & sunny
13-Mar-13	Raghunathpur Village	238	127	23	25	Mining activities	About 600m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

29-Mar-13	Raghunathpur Village	245	132	24	26	Mining activities	About 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

Project : **Bhubaneswari OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
13-Apr-12	Naraharipur Basti	191	86	22	27	Mining activities	About 500m	West to east & sunny
28-Apr-12	Naraharipur Basti	204	76	24	30	Mining activities	About 500m	East to west & sunny
10-May-12	Naraharipur Basti	211	91	30	36	Mining activities	About 500m	East to west & sunny
28-May-12	Naraharipur Basti	227	96	32	40	Mining activities	About 500m	East to west & sunny
13-Jun-12	Naraharipur Basti	199	84	30	35	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Jun-12	Naraharipur Basti	171	66	21	25	Mining activities	About 500m	South to north & cloudy rain fall
13-Jul-12	Naraharipur Basti	173	78	26	30	Mining activities	About 500m	East to west & sunny
28-Jul-12	Naraharipur Basti	125	57	20	24	Mining activities	About 500m	East to west, cloudy and rainfall
13-Aug-12	Naraharipur Basti	112	63	23	31	Mining activities	About 500m	East to west, cloudy and rainfall
28-Aug-12	Naraharipur Basti	101	83	21	34	Mining activities	About 500m	East to west, cloudy and rainfall
12-Sep-12	Naraharipur Basti	120	108	23	37	Mining activities	About 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

27-Sep-12	Naraharipur Basti	138	84	25	31	Mining activities	About 500m	East to west & sunny
12-Oct-12	Naraharipur Basti	176	82	28	34	Mining activities	About 500m	East to west & sunny
27-Oct-12	Naraharipur Basti	172	88	29	36	Mining activities	About 500m	East to west & sunny
14-Nov-12	Naraharipur Basti	184	97	27	35	Mining activities	About 500m	West to east & sunny
29-Nov-12	Naraharipur Basti	171	101	24	27	Mining activities	About 500m	West to east & cloudy
13-Dec-12	Naraharipur Basti	184	109	24	27	Mining activities	About 500m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Jagannath**

28-Dec-12	Naraharipur Basti	193	102	23	26	Mining activities	About 500m	South to North & cloudy
11-Jan-13	Naraharipur Basti	217	121	20	23	Mining activities	About 500m	South to north & sunny
26-Jan-13	Naraharipur Basti	227	116	23	26	Mining activities	About 500m	South to north & sunny
13-Feb-13	Naraharipur Basti	237	128	24	26	Mining activities	About 500m	East to west & sunny
27-Feb-13	Naraharipur Basti	246	137	25	29	Mining activities	About 500m	South to north & sunny
13-Mar-13	Naraharipur Basti	264	142	26	28	Mining activities	About 500m	South to north & sunny

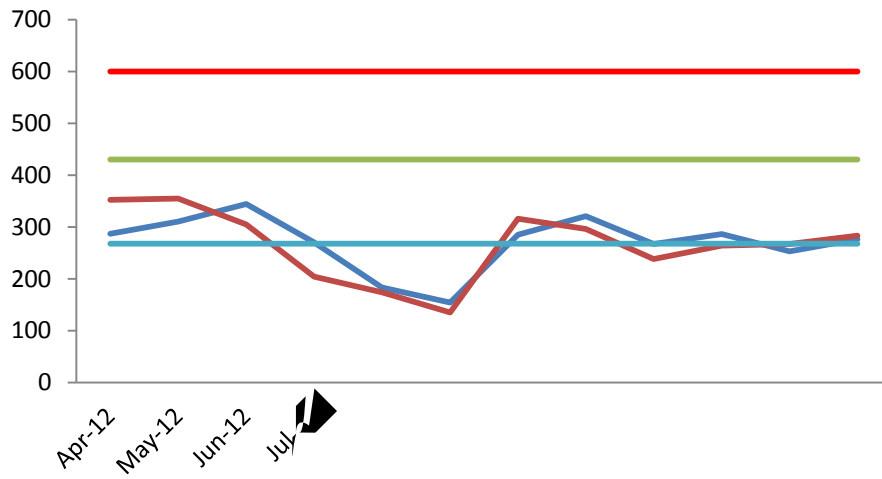
TABLE--
AMBIENT AIR QUALITY DATA

Area : Jagannath

29-Mar-13	Naraharipur Basti	273	140	25	27	Mining activities	About 500m	East to west & sunny



Air Quality Graph of Ananta OCP



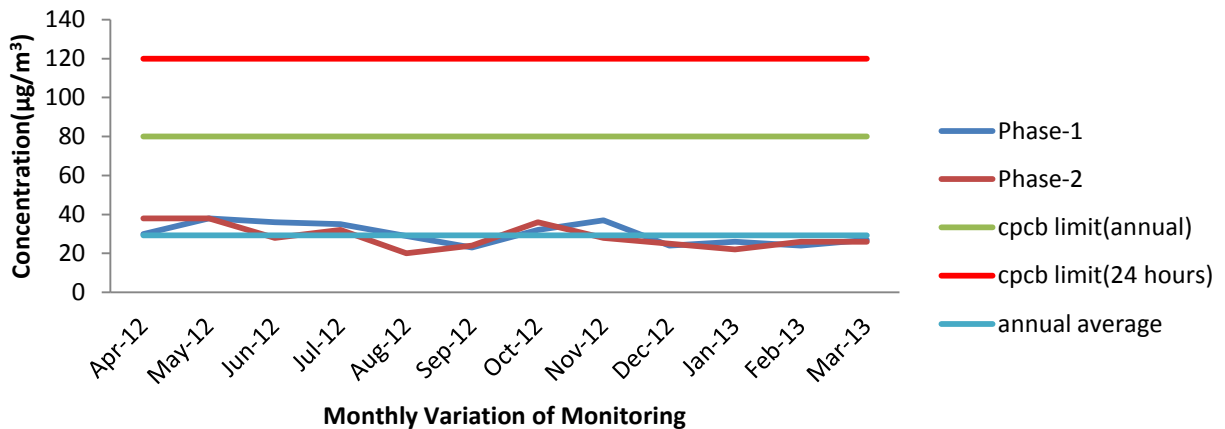
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

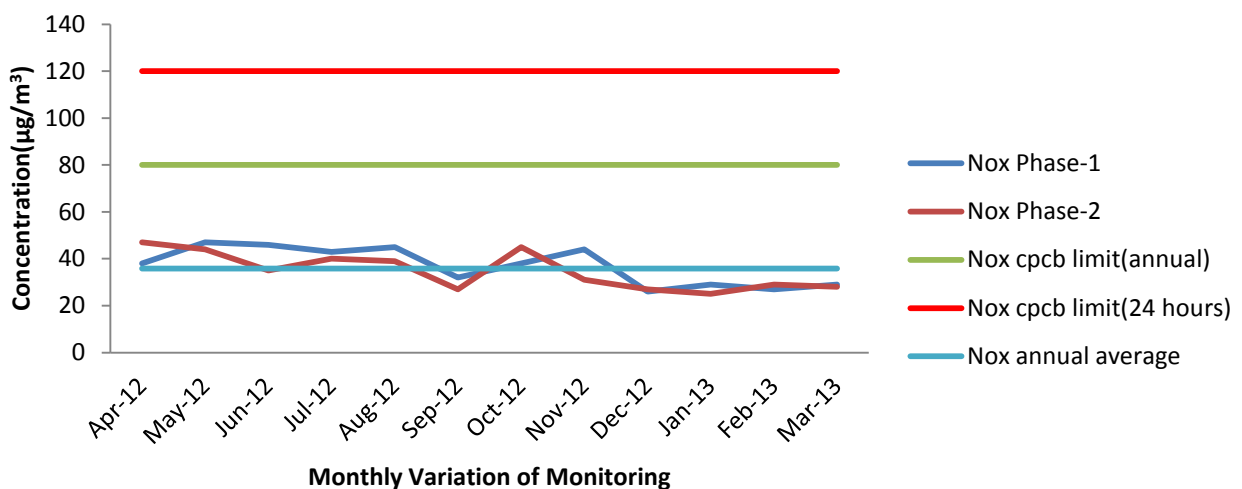


Air Quality Graph of Ananta OCP

Graph-3: So_x monitoring of Ananta Project Office of Ananta OCP



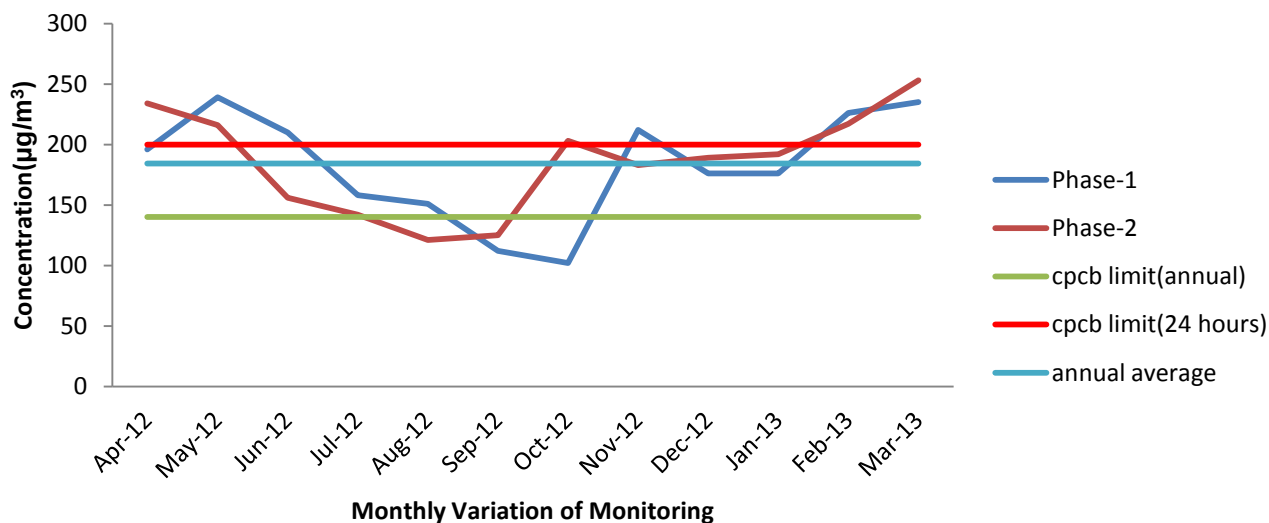
Graph-4: No_x monitoring of Ananta Project Office of Ananta OCP



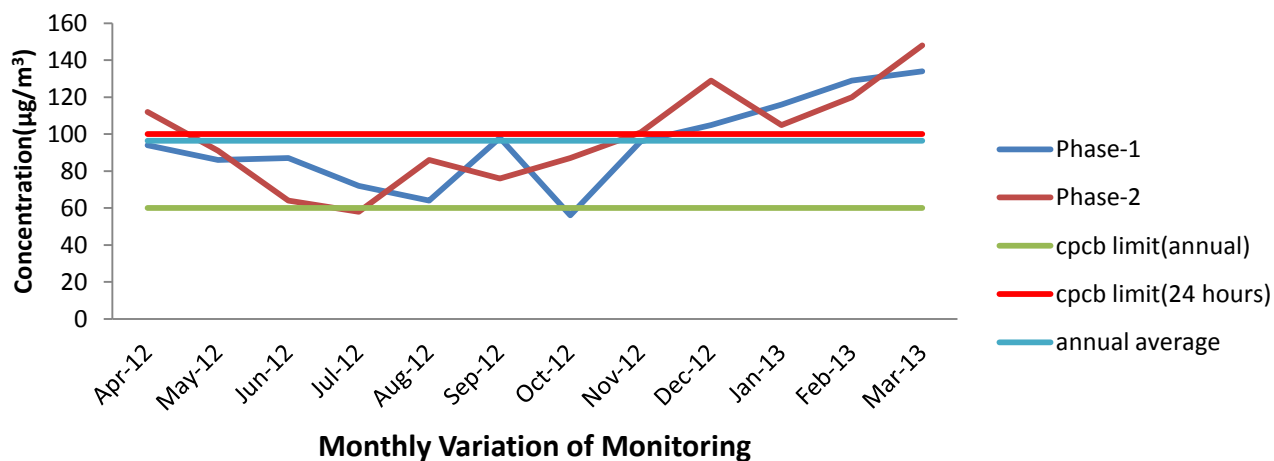


Air Quality Graph of Ananta OCP

**Graph-5: SPM monitoring of Hensmul Village-
Talasahi of Ananta OCP**



**Graph-6: RPM monitoring of Hensmul Village-
Talasahi of Ananta OCP**



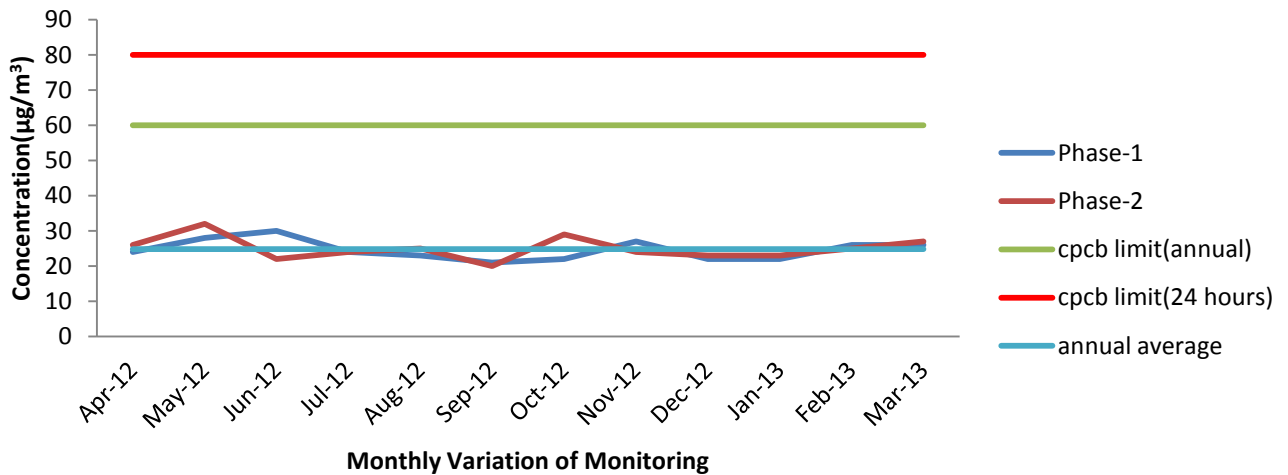
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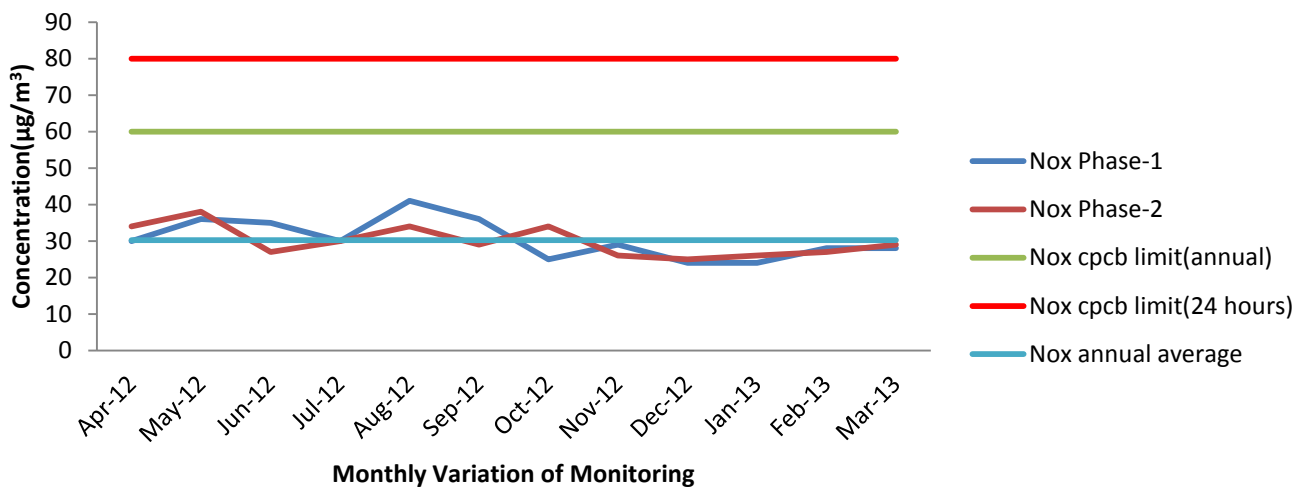


Air Quality Graph of Ananta OCP

Graph-7: So_x monitoring of Hensmul Village-Talasahi of Ananta OCP



Graph-8: No_x monitoring of Hensmul Village-Talasahi of Ananta OCP



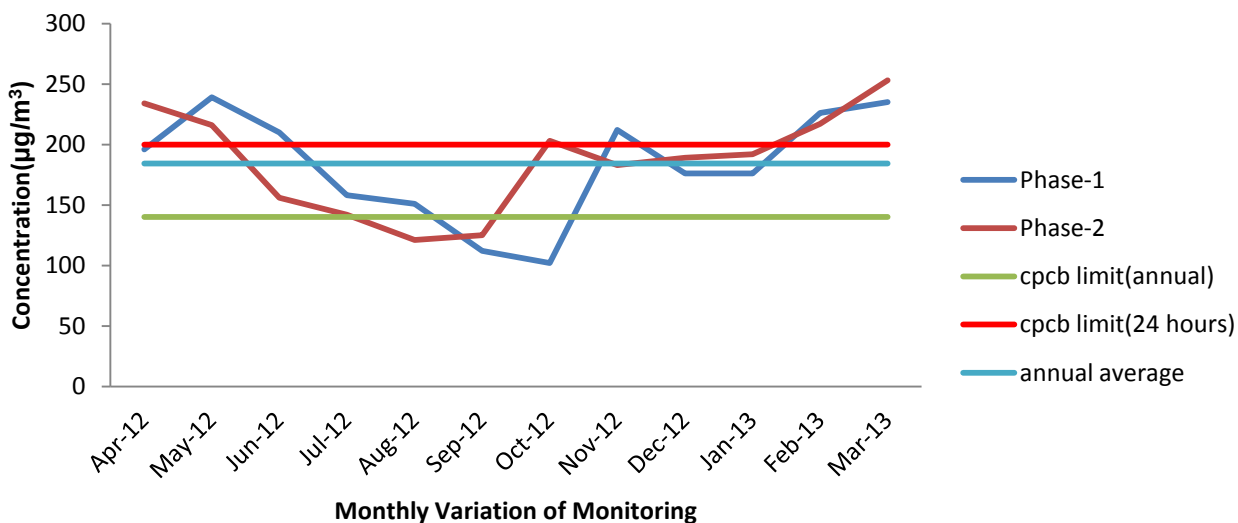
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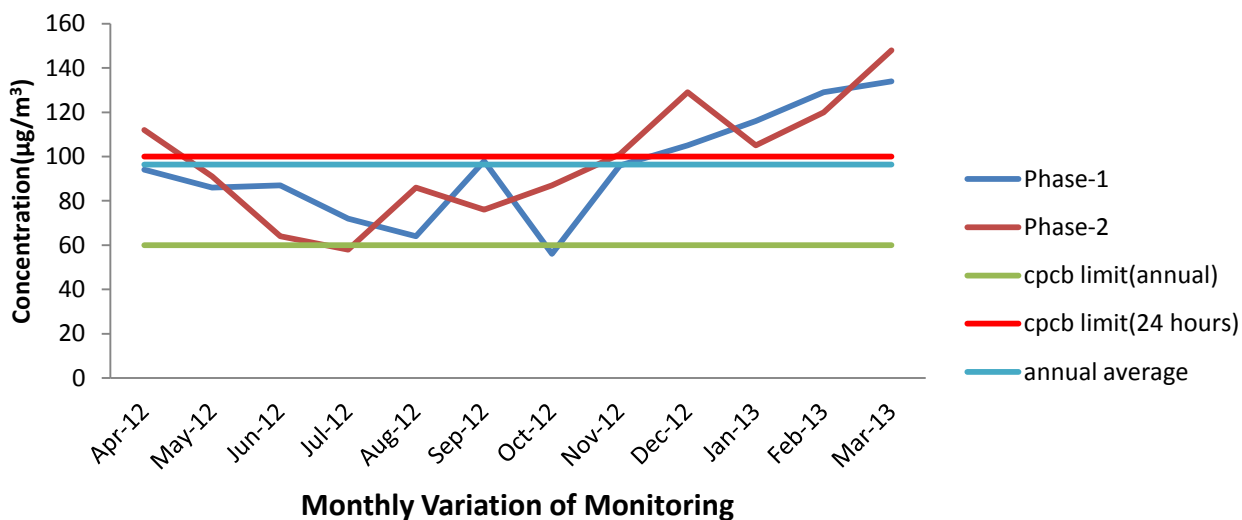


Air Quality Graph of Ananta OCP

Graph-9: SPM monitoring of Ananta Vihar Colony of Ananta OCP



Graph-10: RPM monitoring of Ananta Vihar Colony of Ananta OCP



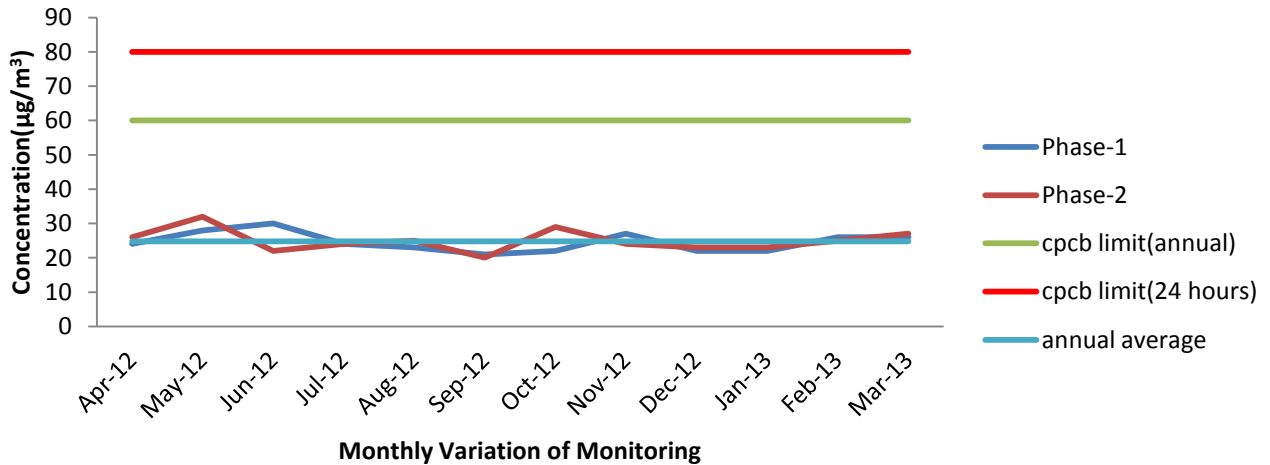
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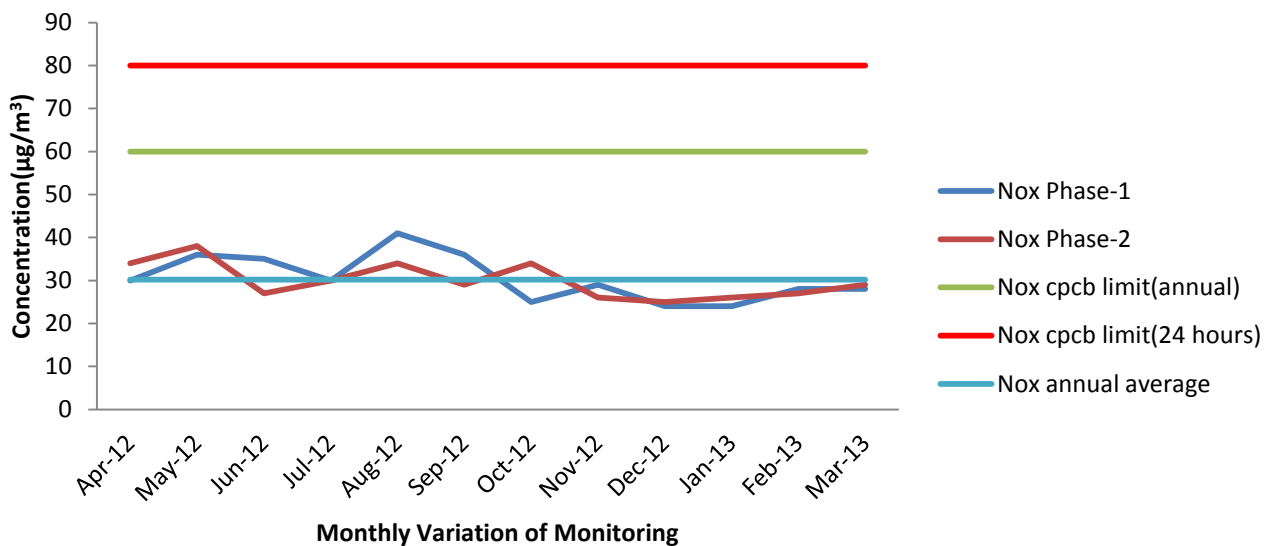


Air Quality Graph of Ananta OCP

Graph-11: SO_x monitoring of Ananta Vihar Colony of Ananta OCP



Graph-12: NO_x monitoring of Ananta Vihar Colony of Ananta OCP



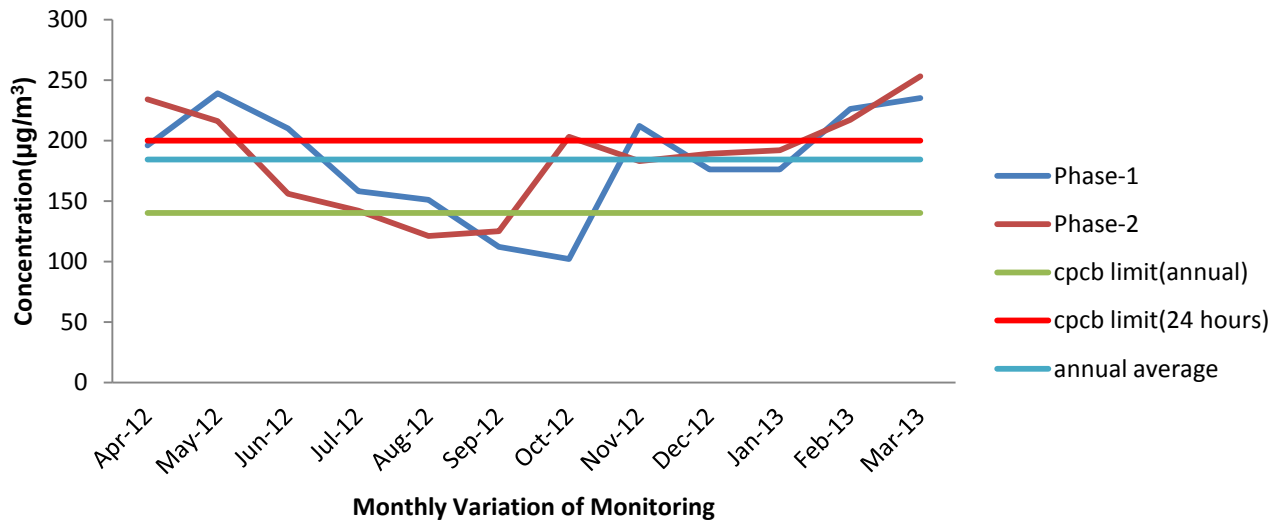
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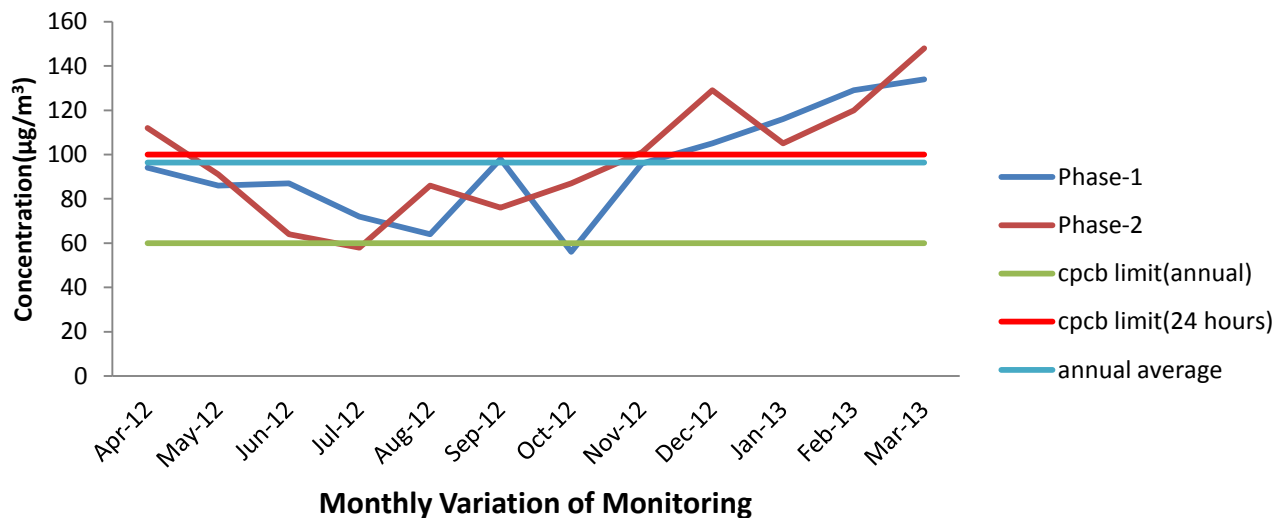


Air Quality Graph of Ananta OCP

Graph-13: SPM monitoring of Dera Village of Ananta OCP



Graph-14: RPM monitoring of Dera Village of Ananta OCP



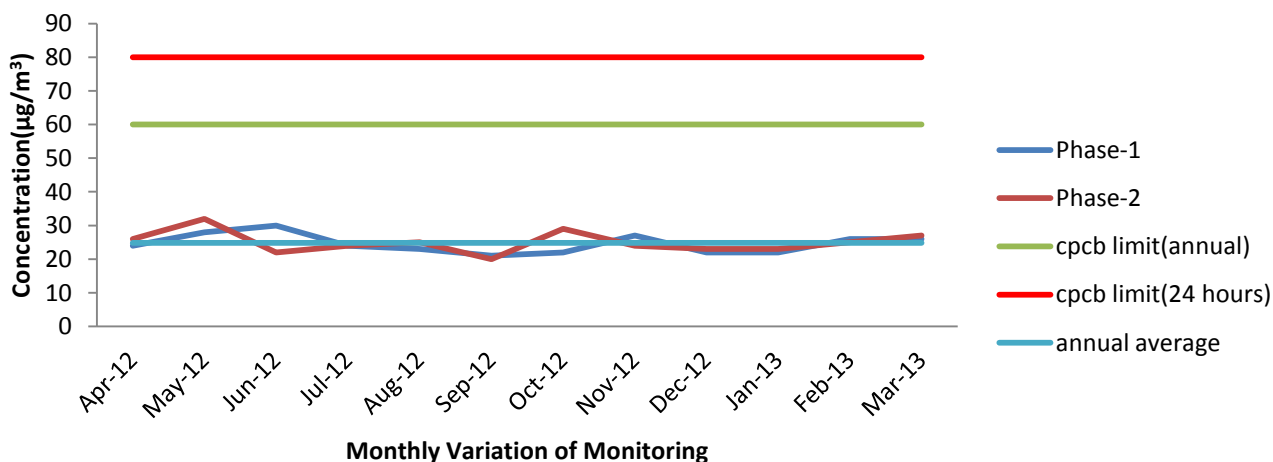
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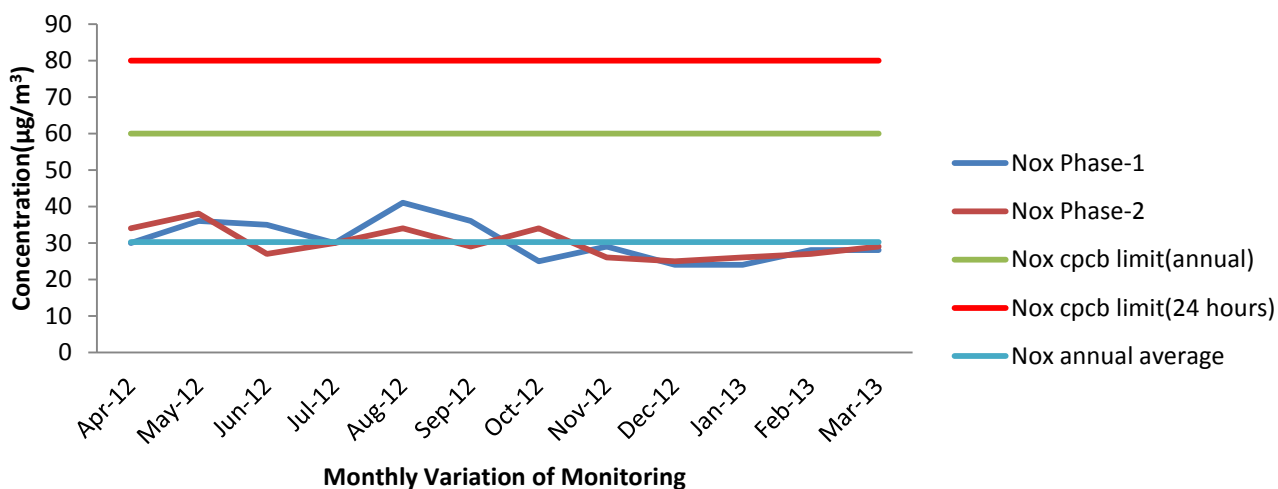


Air Quality Graph of Ananta OCP

Graph-15: So_x monitoring of Dera Village of Ananta OCP



Graph-16: No_x monitoring of Dera Village of Ananta OCP



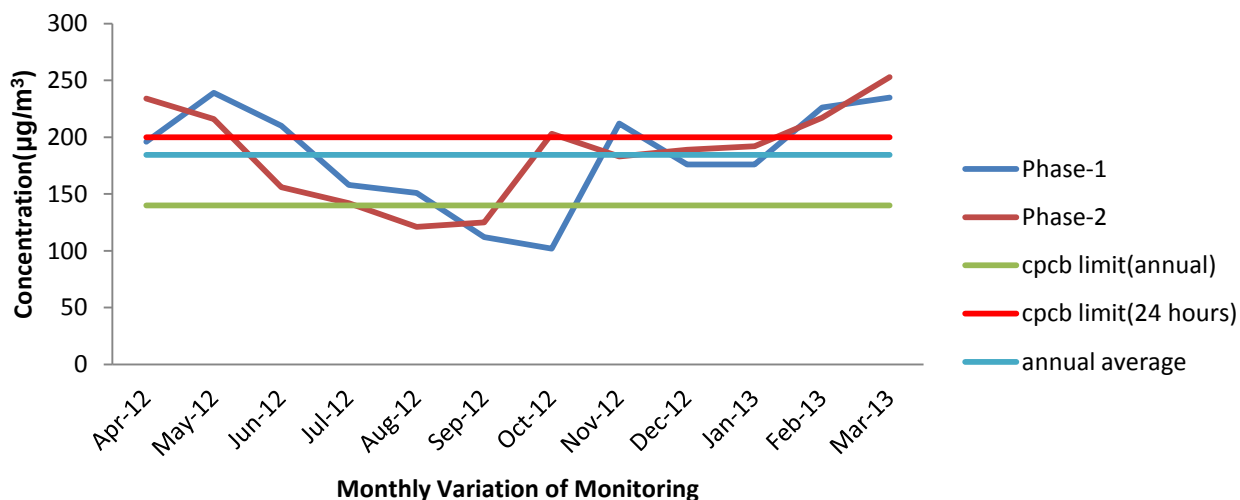
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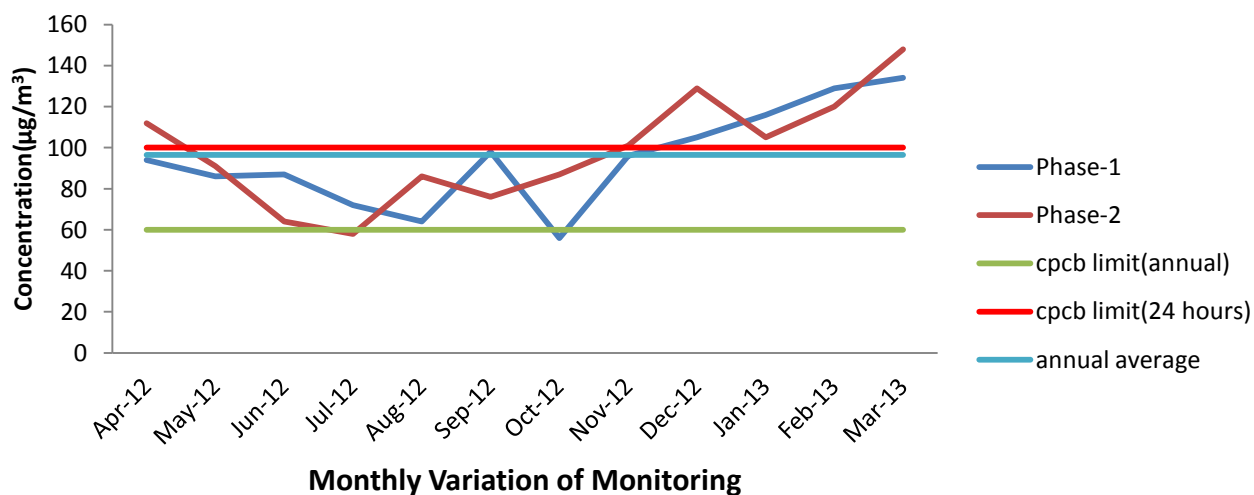


Air Quality Graph of Ananta OCP

Graph-17: SPM monitoring of Rakas Village of Ananta OCP



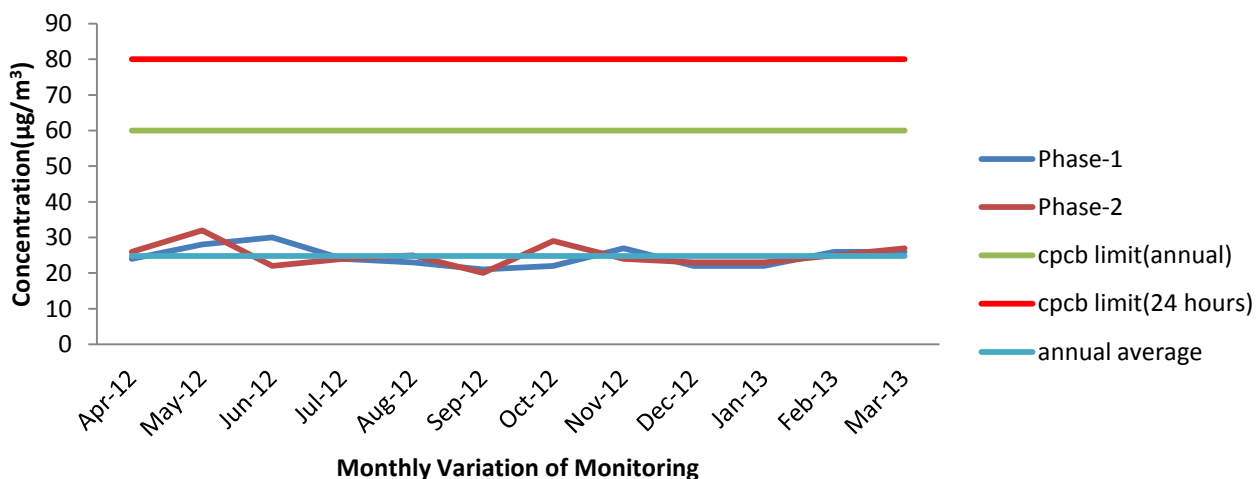
Graph-18: RPM monitoring of Rakas Village of Ananta OCP



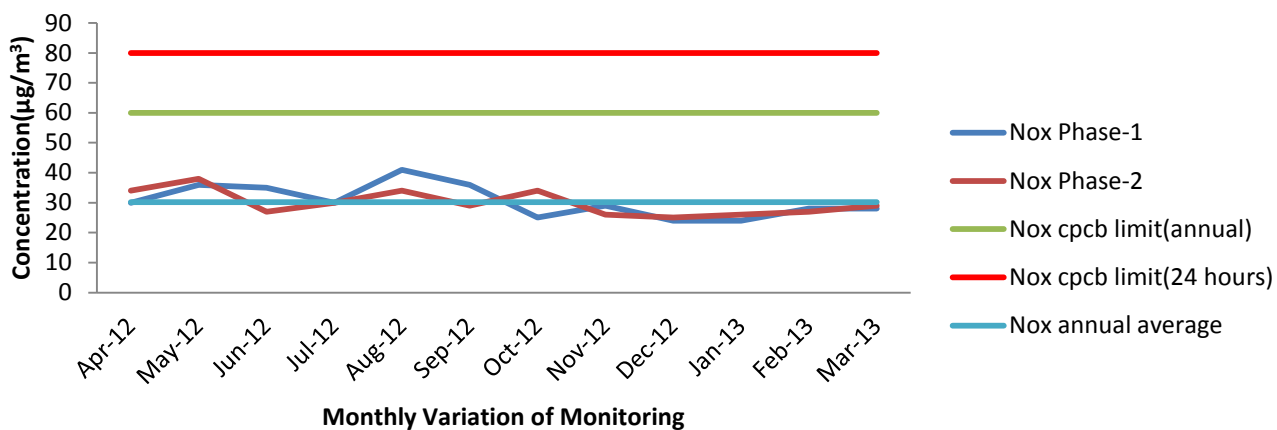


Air Quality Graph of Ananta OCP

Graph-19: So_x monitoring of Rakas Village of Ananta OCP



Graph-20: No_x monitoring of Rakas Village of Ananta OCP



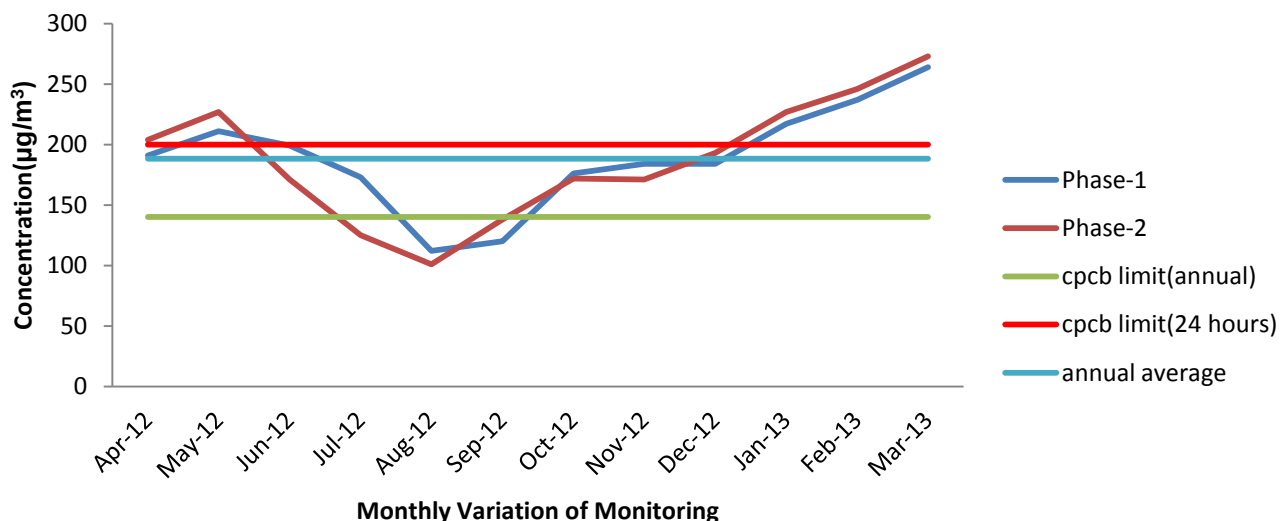
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

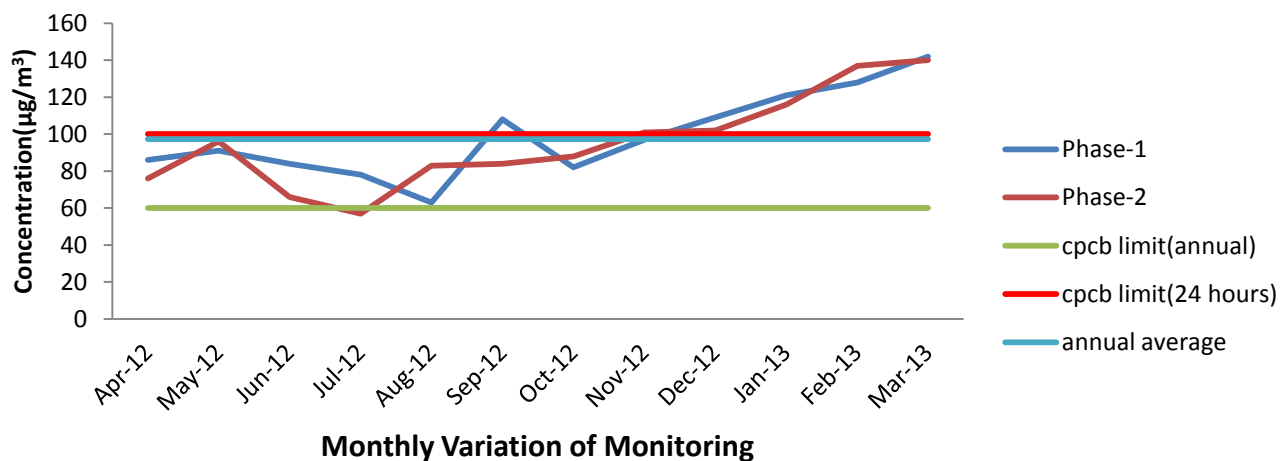


Air Quality Graph of Bhubaneswari OCP

Graph-13: SPM monitoring of Ekdal Village of Bhubaneswari OCP



Graph-14: RPM monitoring of Ekdal Village of Bhubaneswari OCP



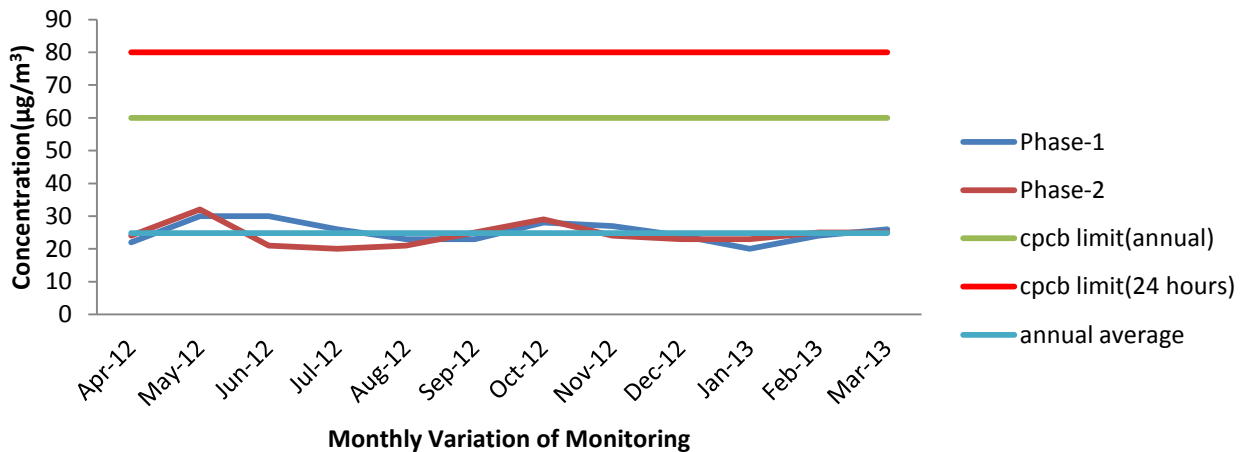
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

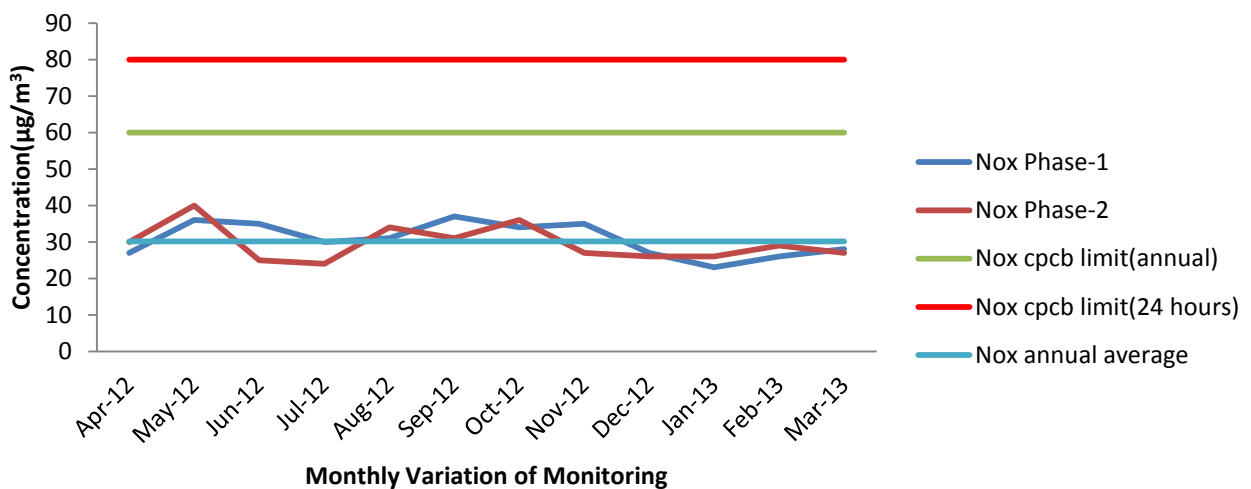


Air Quality Graph of Bhubaneswari OCP

Graph-15: So_x monitoring of Ekdal Village of Bhubaneswari OCP



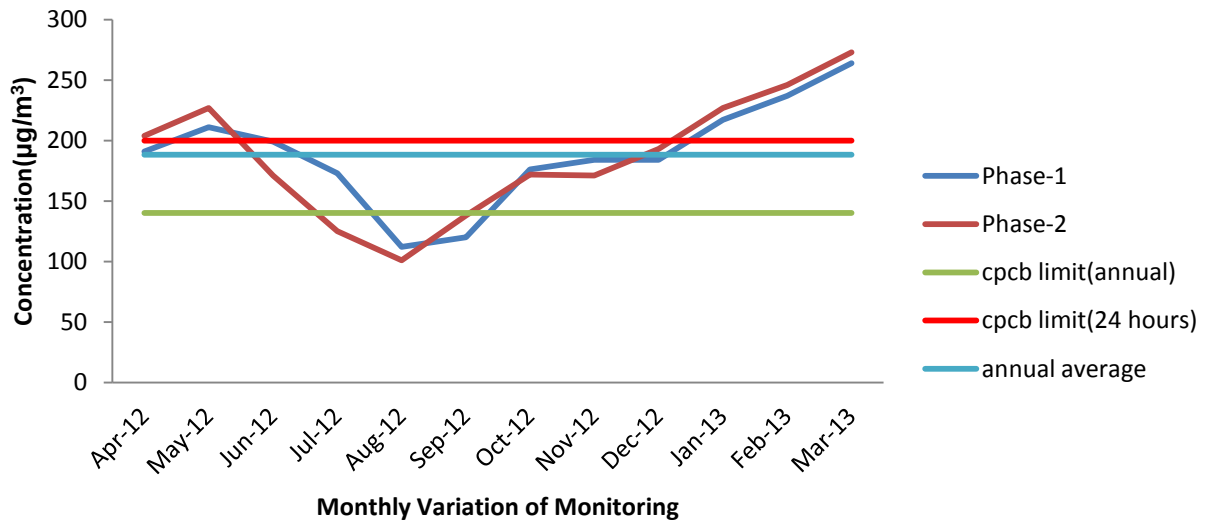
Graph-16: No_x monitoring of Ekdal Village of Bhubaneswari OCP



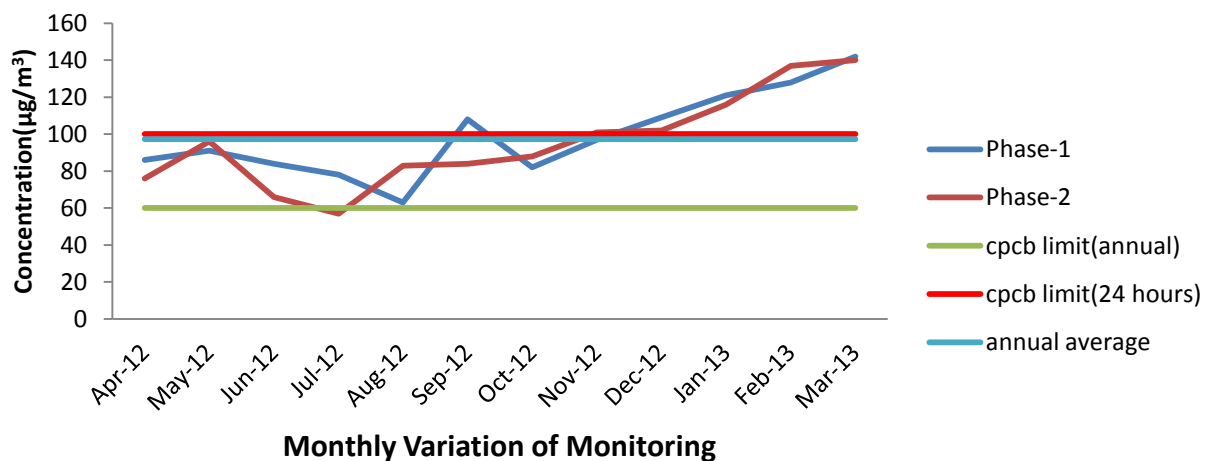


Air Quality Graph of Bhubaneswari OCP

Graph-9: SPM monitoring of Raghunathpur Village of Bhubaneswari OCP



Graph-10: RPM monitoring of Raghunathpur Village of Bhubaneswari OCP



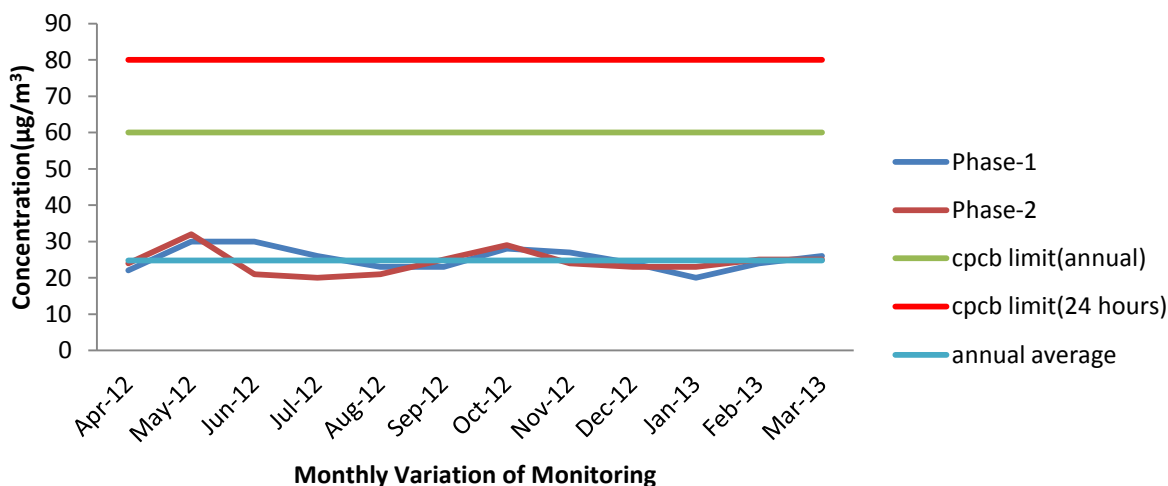
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

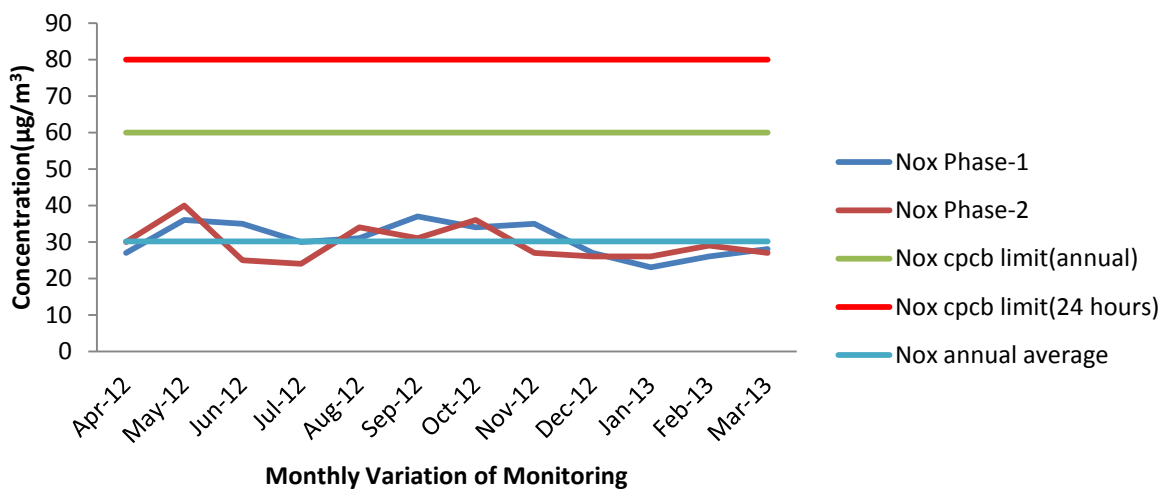


Air Quality Graph of Bhubaneswari OCP

Graph-11: SO_x monitoring of Raghunathpur Village of Bhubaneswari OCP



Graph-12: NO_x monitoring of Raghunathpur Village of Bhubaneswari OCP



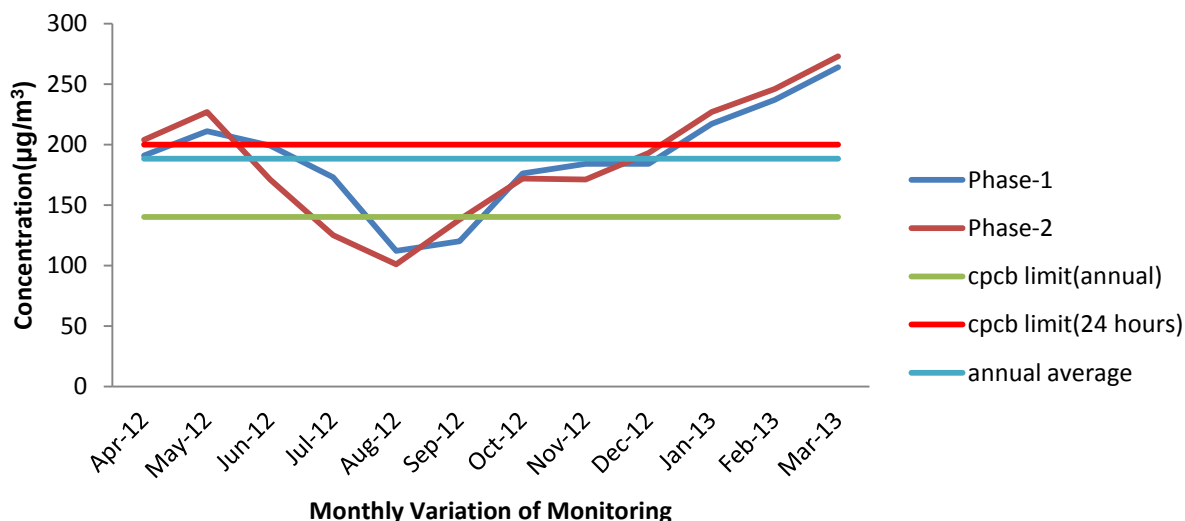
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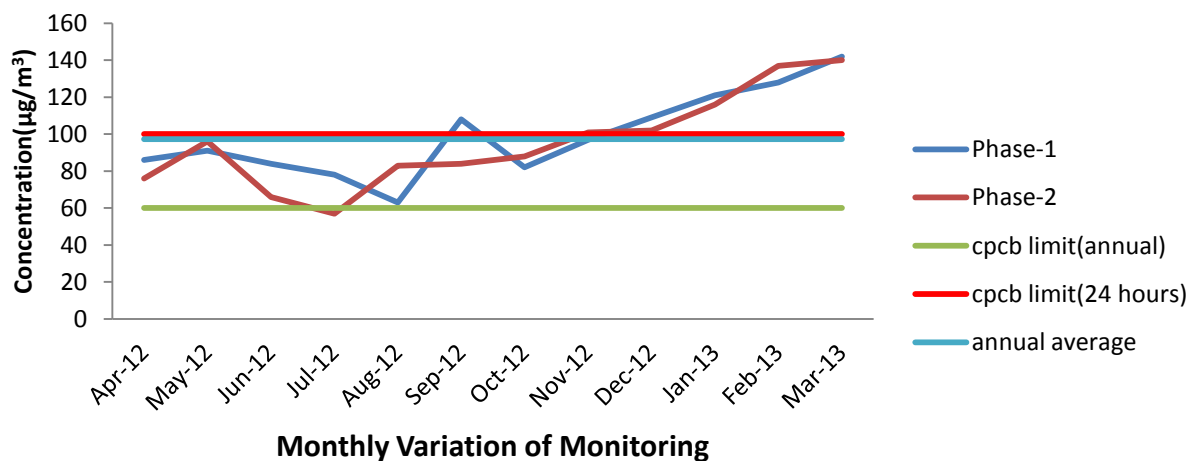


Air Quality Graph of Bhubaneswari OCP

Graph-1: SPM monitoring of Hensmul Village-Talasahi of Bhubaneswari OCP



Graph-2: RPM monitoring of Hensmul Village-Talasahi of Bhubaneswari OCP



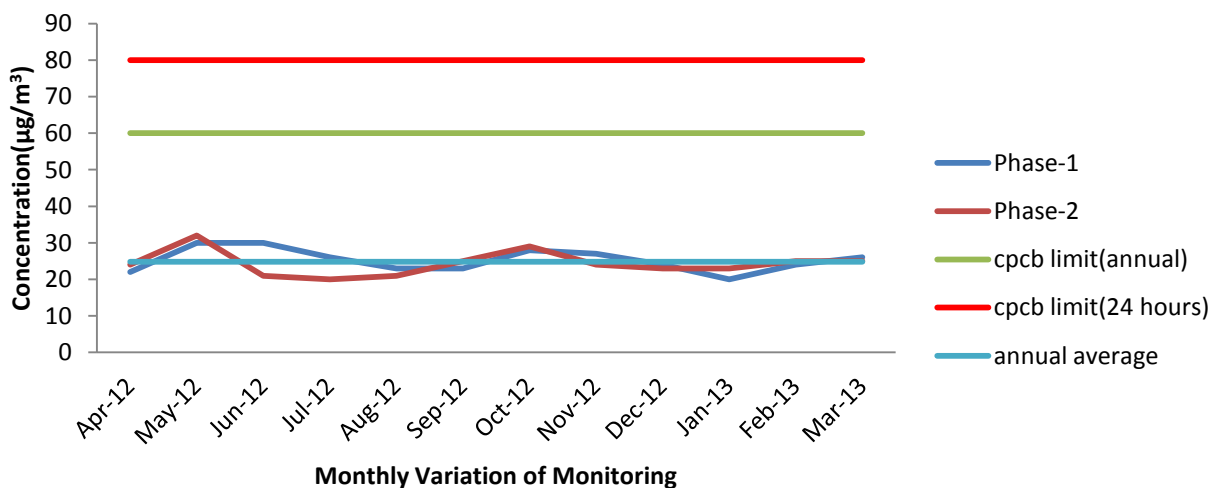
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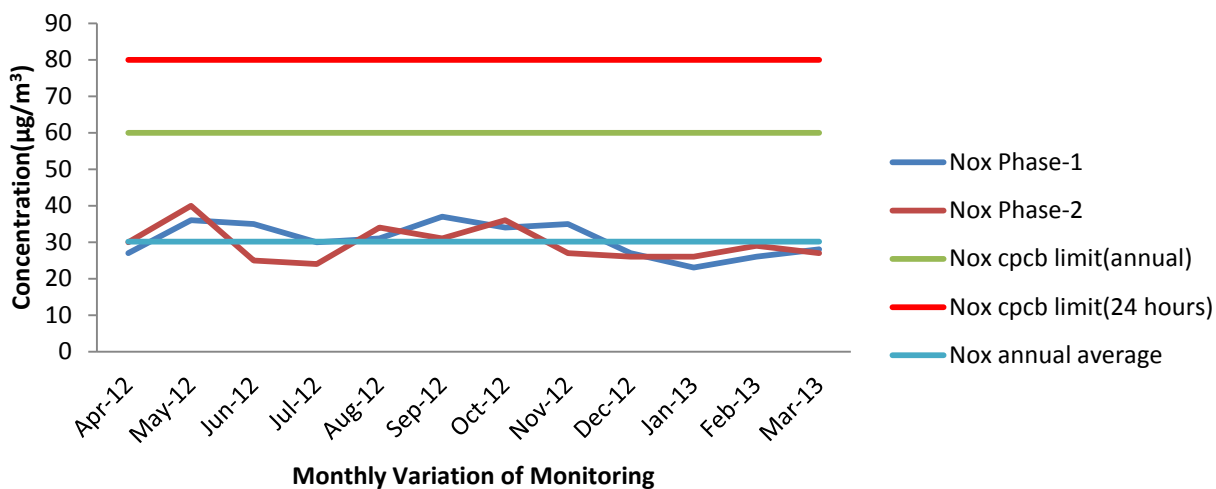


Air Quality Graph of Bhubaneswari OCP

Graph-3: SO_x monitoring of Hensmul Village-Talasahi of Bhubaneswari OCP



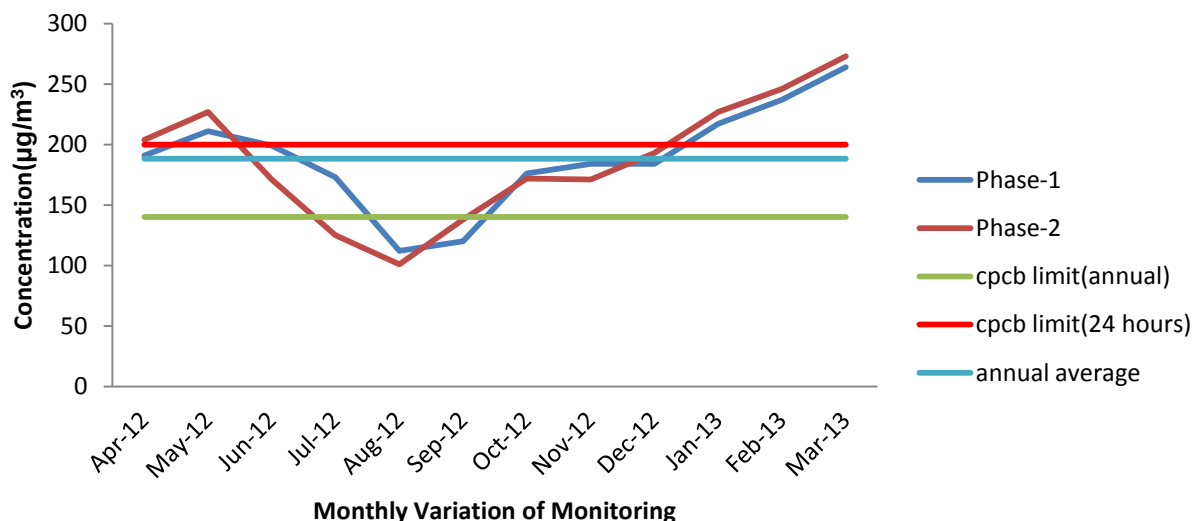
Graph-4: NO_x monitoring of Hensmul Village-Talasahi of Bhubaneswari OCP



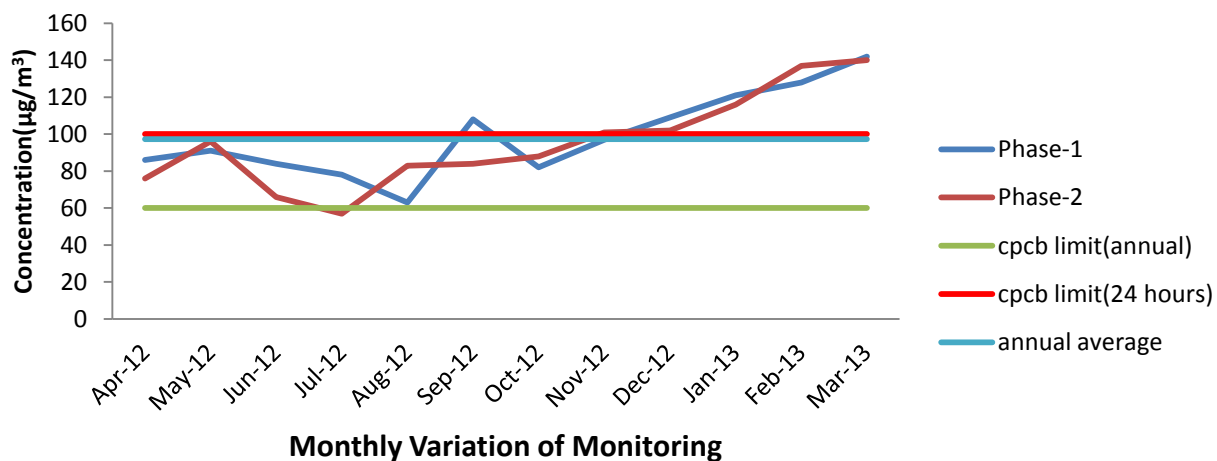


Air Quality Graph of Bhubaneswari OCP

Graph-5: SPM monitoring of Naraharipur Bastiof Bhubaneswari OCP



Graph-6: RPM monitoring of Naraharipur Bastiof Bhubaneswari OCP



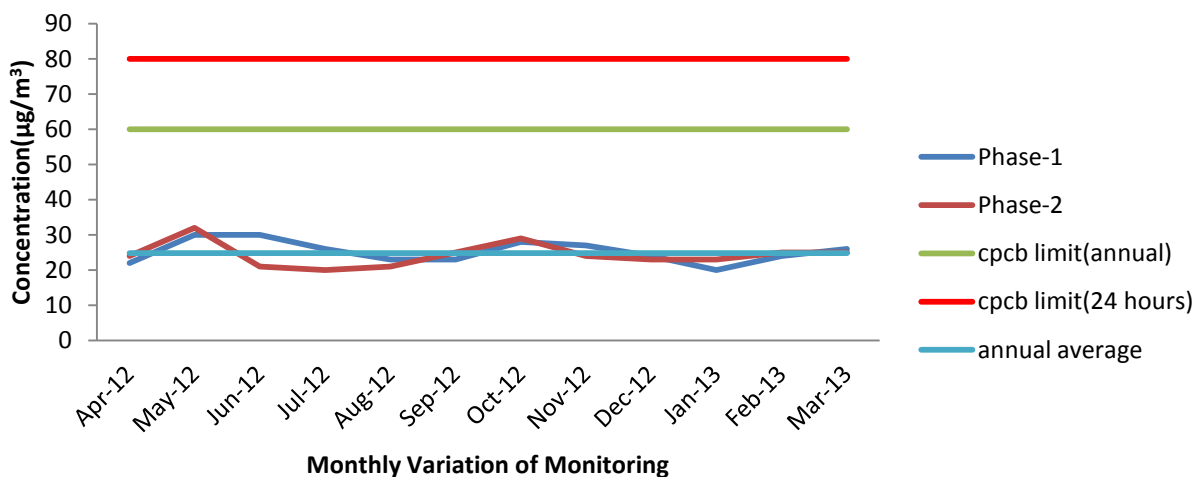
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

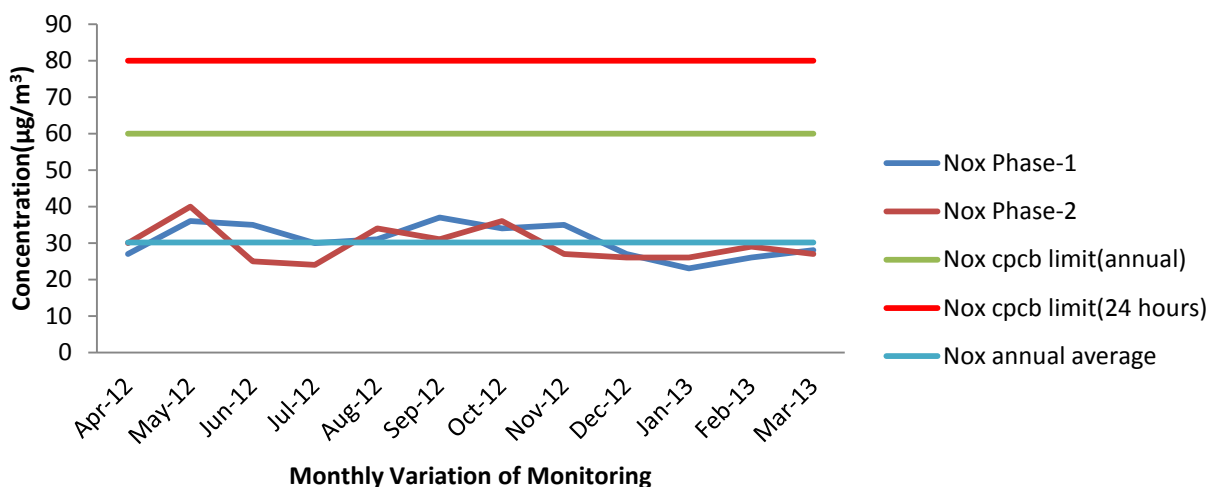


Air Quality Graph of Bhubaneswari OCP

Graph-7: SO_x monitoring of Naraharipur Bastiof Bhubaneswari OCP



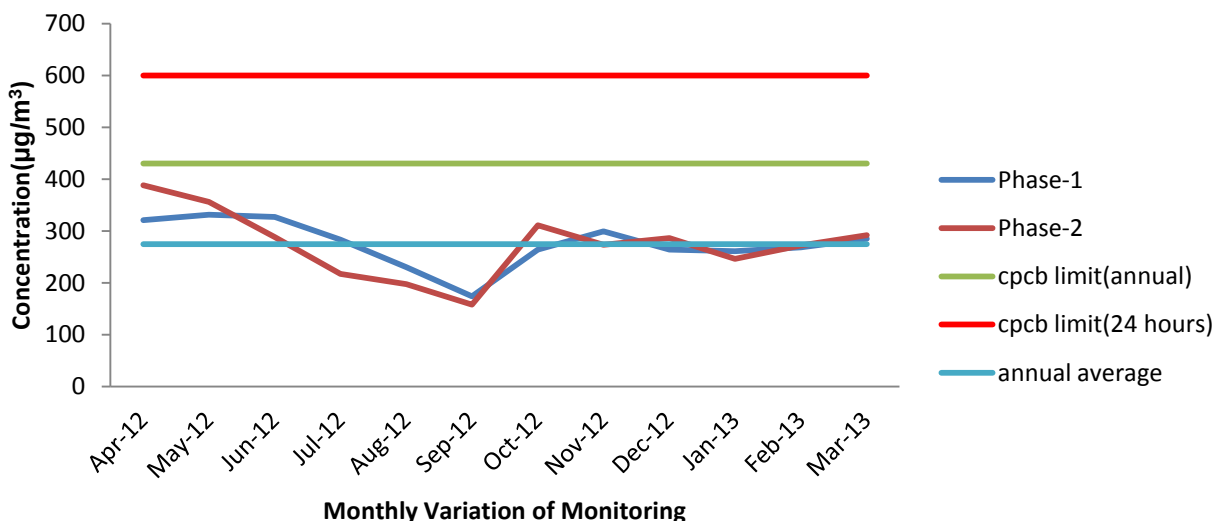
Graph-8: NO_x monitoring of Naraharipur Bastiof Bhubaneswari OCP



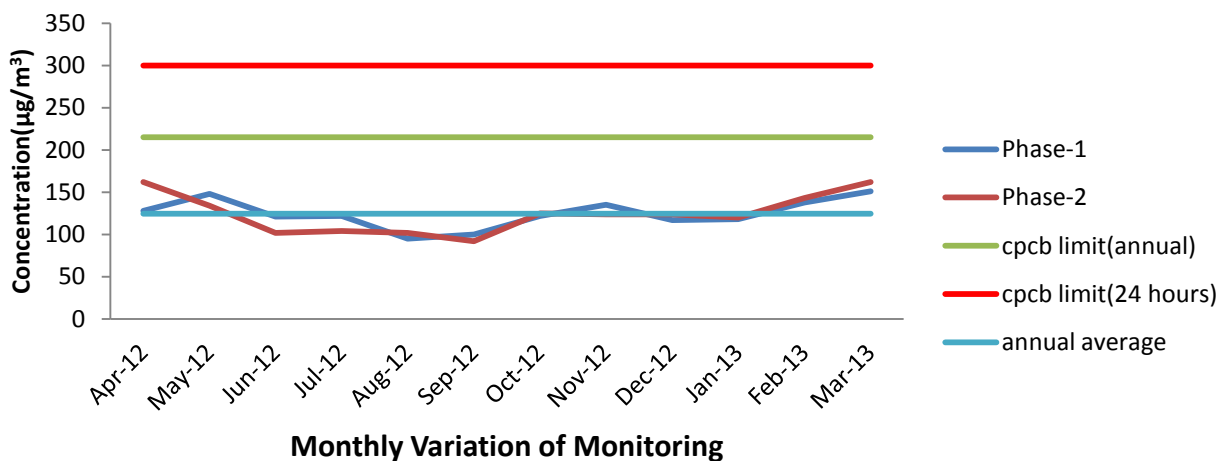


Air Quality Graph of Bhubaneswari OCP

Graph-17: SPM monitoring of Project Site Office of Bhubaneswari OCP



Graph-18: RPM monitoring of Project Site Office of Bhubaneswari OCP



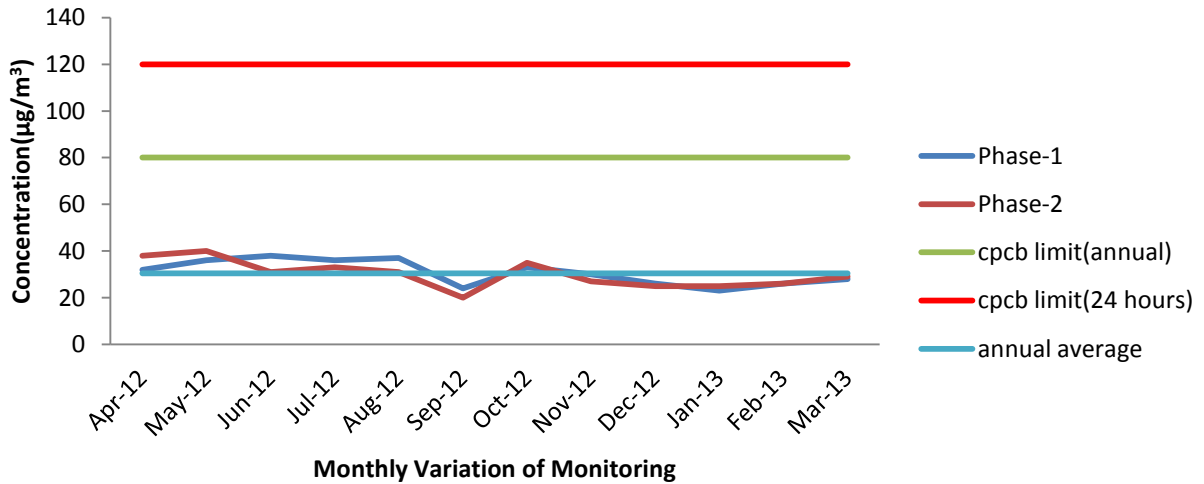
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

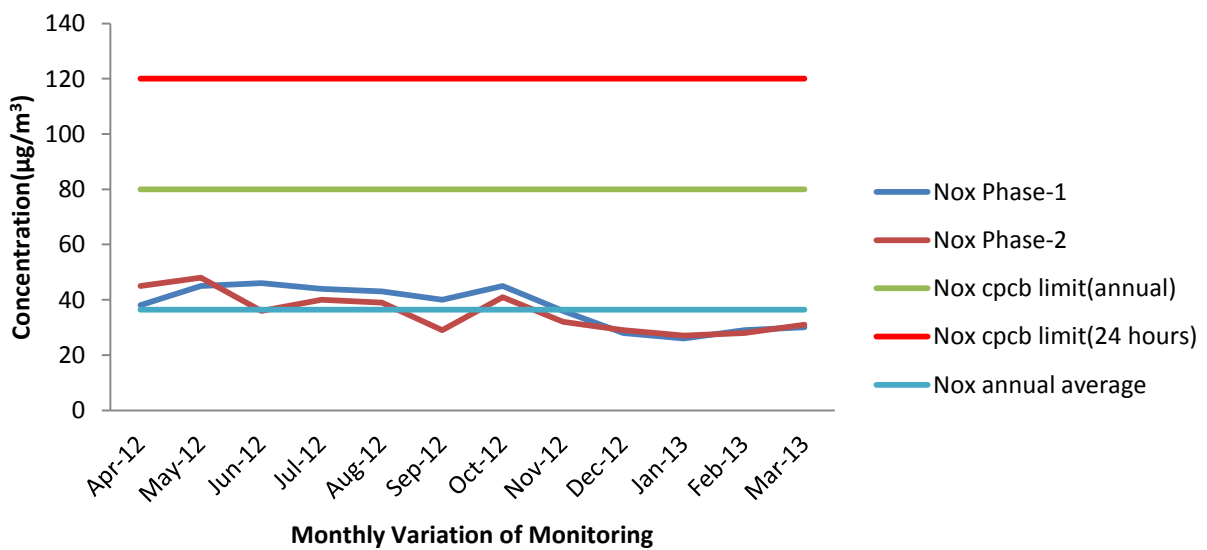


Air Quality Graph of Bhubaneswari OCP

Graph-19: SO_x monitoring of Project Site Office of Bhubaneswari OCP



Graph-20: NO_x monitoring of Project Site Office of Bhubaneswari OCP



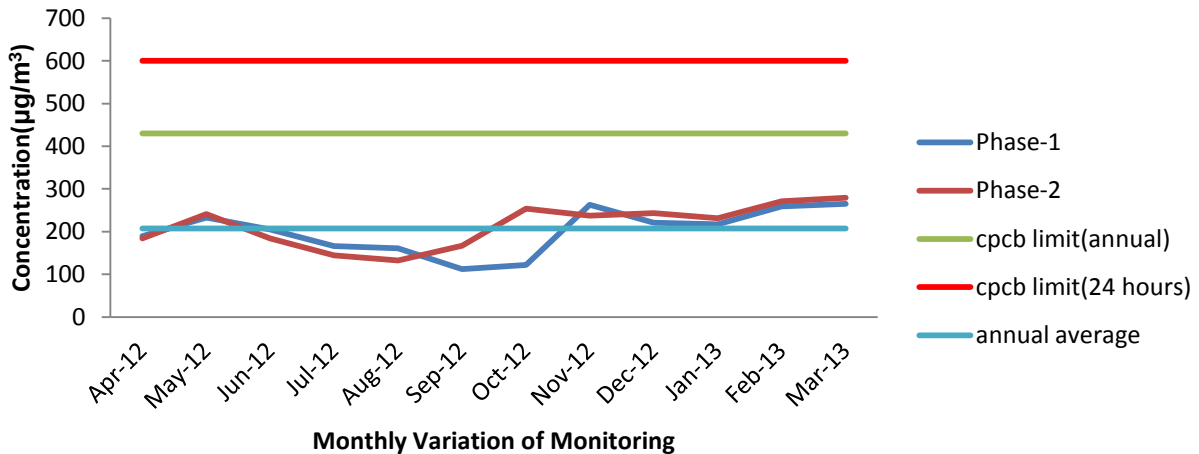
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

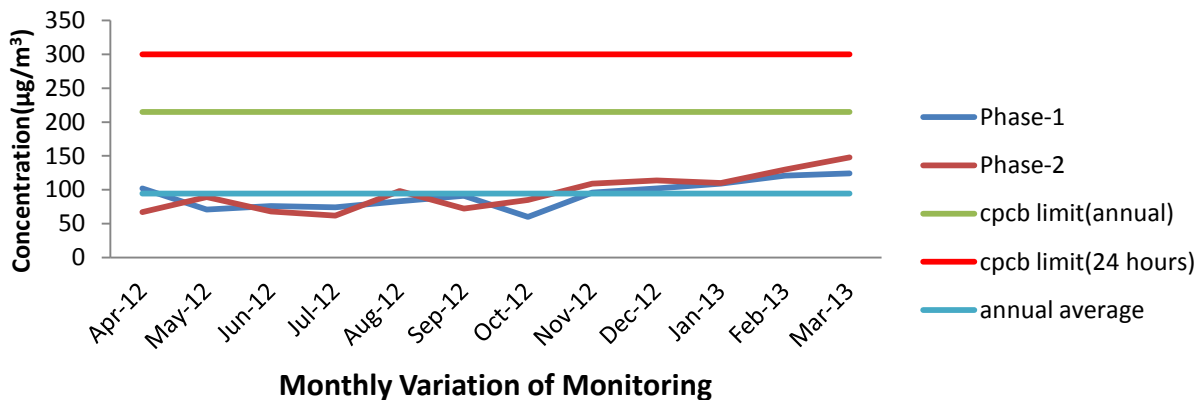


Air Quality Graph of Jagannath OCP

Graph-1: SPM monitoring of Jagannath OCP-Time office of Jagannath OCP.



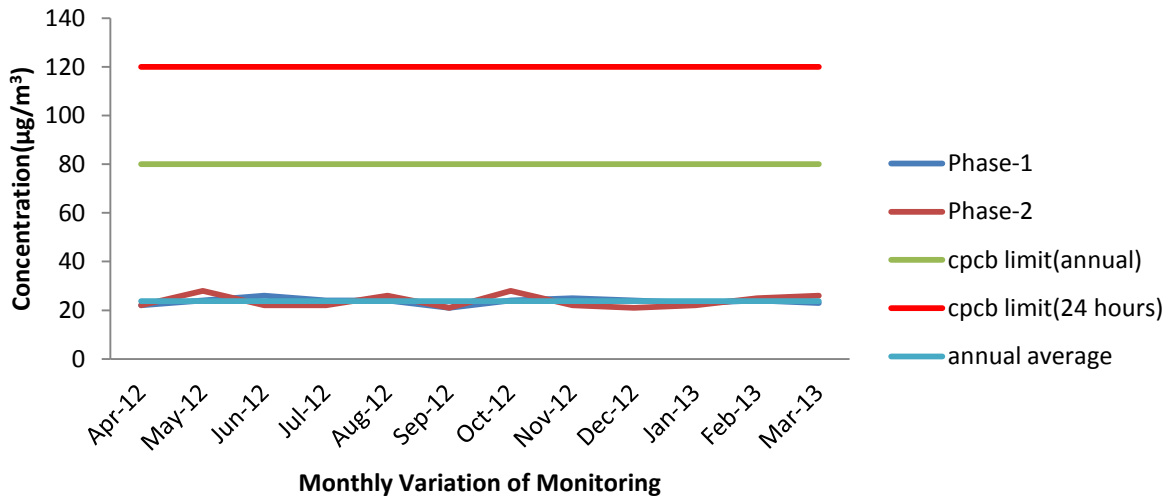
Graph-2: RPM monitoring of Jagannath OCP-Time office of Jagannath OCP.



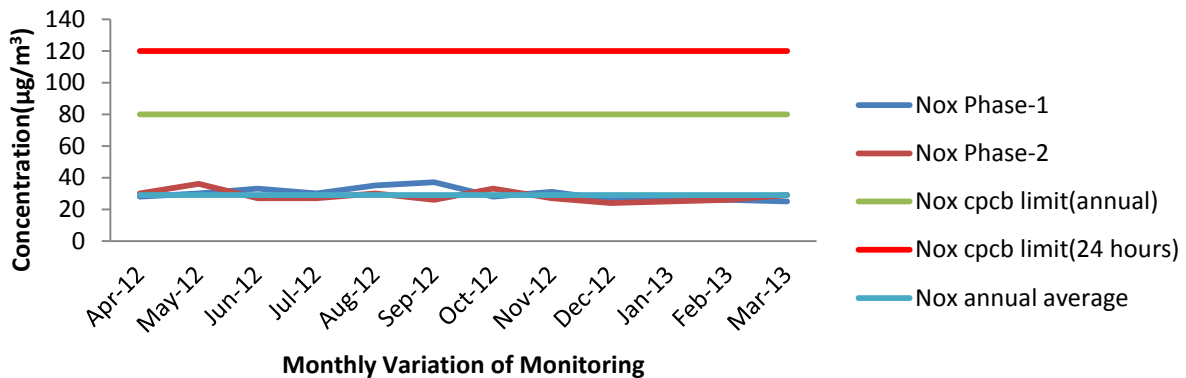


Air Quality Graph of Jagannath OCP

Graph-3 SO_x monitoring of Jagannath OCP-Time office of Jagannath OCP.



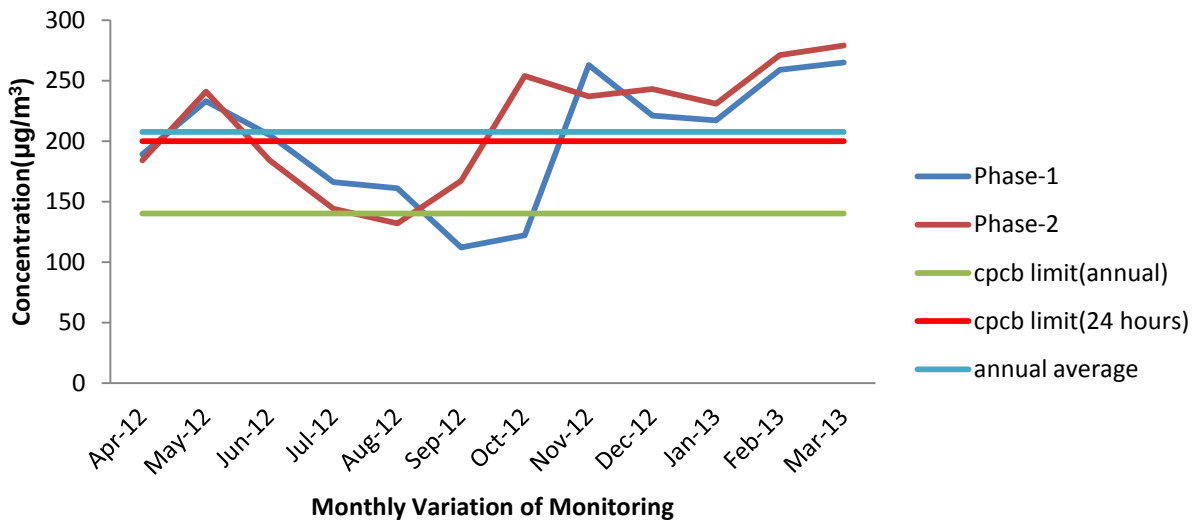
Graph-4: NO_x monitoring of Jagannath OCP-Time office of Jagannath OCP.



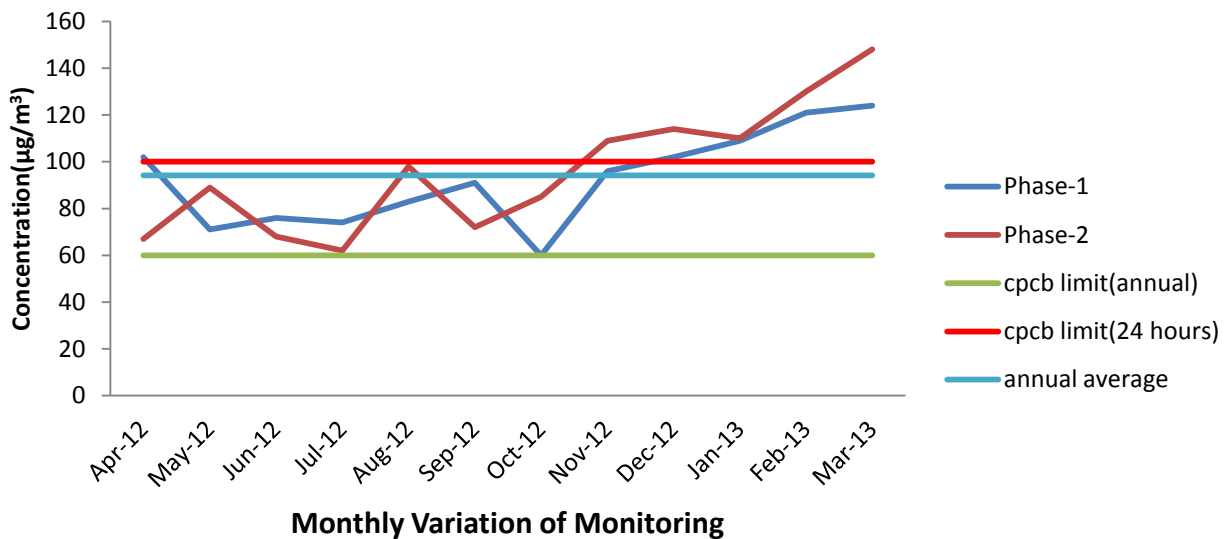


Air Quality Graph of Jagannath OCP

Graph-5: SPM monitoring of Jagannath Colony of Jagannath OCP



Graph-6: RPM monitoring of Jagannath Colony of Jagannath OCP



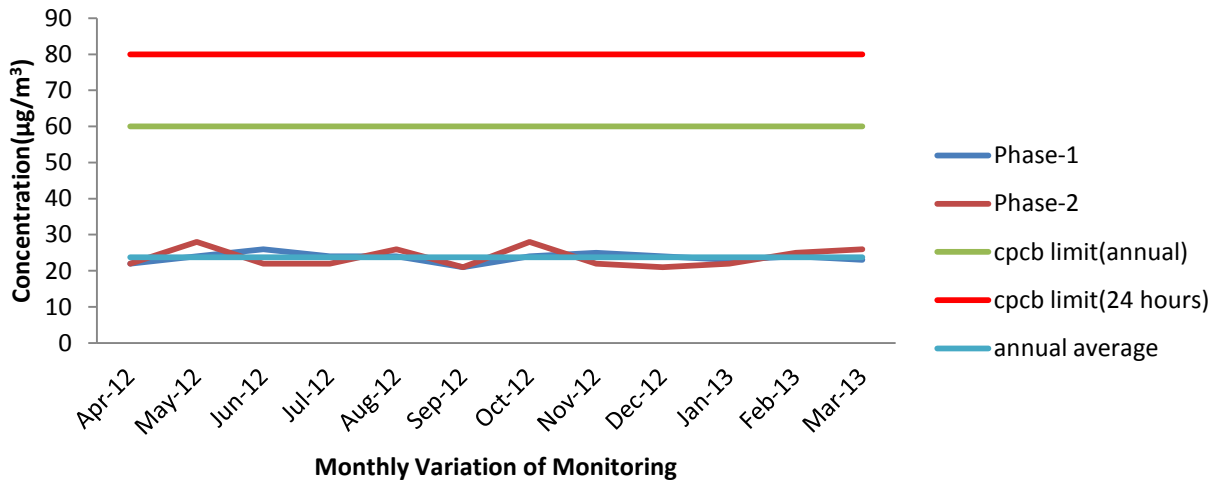
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

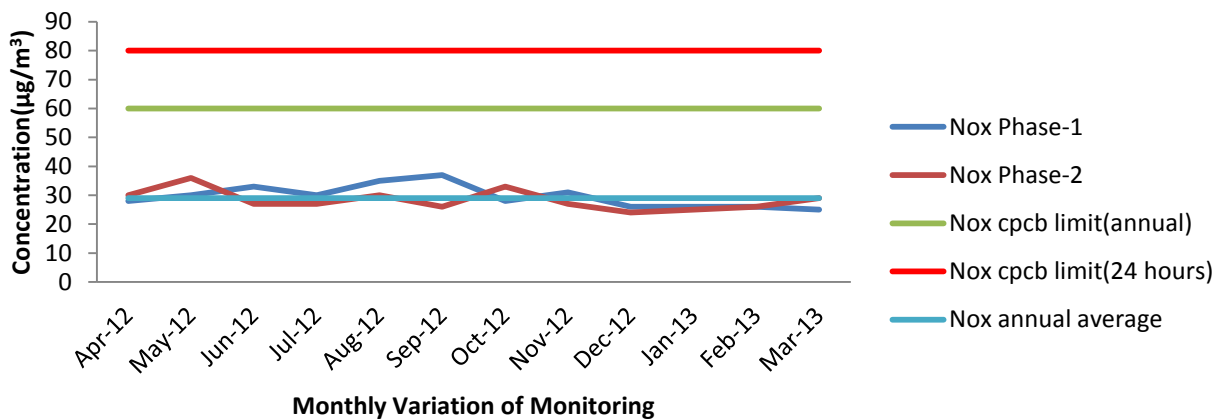


Air Quality Graph of Jagannath OCP

Graph-7: SO_x monitoring of Jagannath Colony of Jagannath OCP



Graph-8: NO_x monitoring of Jagannath Colony of Jagannath OCP



Drinking Water Data Area: Jagannath Project: Ananta OCP

Areas	Jagannath	Jagannath	Jagannath	Jagannath	IS 10500
Project	Ananta OCP	Ananta OCP	Ananta OCP	Ananta OCP	
Date of Sampling	05-May-12	10-Aug-12	09-Nov-12	07-Feb-13	
Monitoring Station	Tap water Ananta Colony	Ananta Colony Tap Water	Ananta Colony Tap Water	Ananta Colony Tap Water	
Colour, Hazen unit, Max	1	3	2	3	5
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	UO
Taste	Agreeable	Agreeable	Agreeable	Agreeable	A
Turbidity,NTU,Max	3	4	2	4	5
pH value	7.46	7.42	7.45	7.42	6.5-8.5
Total hardness	108	96	88	76	300
Iron	<0.05	0.02	<0.05	<0.05	0.3
Chlorides	22	22	18	16	250
Dissolved solids	188	172	154	138	500
Calcium	25.6	22.4	20.8	17.6	75
Copper	<0.02	<0.02	<0.02	<0.02	0.05
Manganese	<0.05	<0.05	<0.05	<0.05	0.1
Sulphate	37	29	31	28	200
Nitrate	4.43	5.37	4.62	4.43	45
Flouride	0.24	0.32	0.21	0.17	1.5
Selenium	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	<0.01	<0.01	<0.01	<0.01	0.05
Lead	<0.05	<0.05	<0.05	<0.05	0.05
Zinc	0.05	0.12	0.04	<0.02	5
Hexavalent chromium	<0.01	<0.01	<0.01	<0.01	0.05
Boron	<0.01	<0.20	<0.20	<0.20	1
Phenolics	<0.001	<0.001	<0.001	<0.001	0.001
Alkalinity	60	56	52	40	200
Residual Chlorine	Nil	Nil	Nil	Nil	0.2
MPN	Nil	Nil	Nil	Nil	nil

Drinking Water Data Area: Jagannath Project: Ananta OCP

[illegible]

Drinking Water Data Area: Jagannath Project: Ananta OCP

[illegible]

Drinking Water Data Area: Jagannath Project: Bhubaneswari OCP

[illegible]

Drinking Water Data Area: Jagannath Project: Bhubaneswari OCP

[illegible]

[illegible]

[illegible]

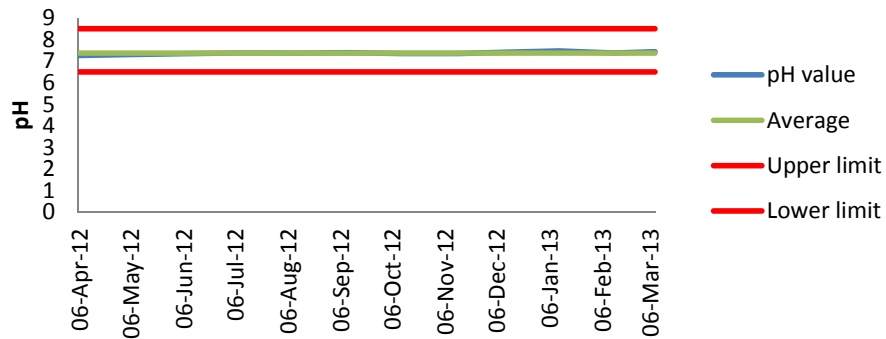


Drinking Water Data Area: Jagannath Project: Jagannath OCP

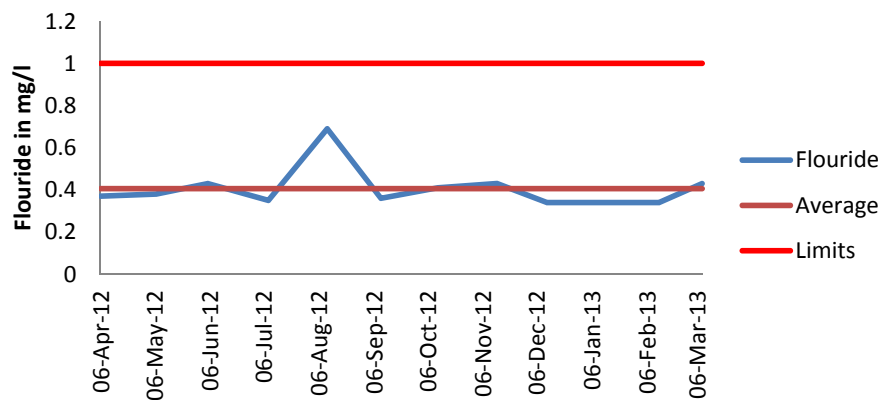


Drinking Water Data Area: Jagannath Project: Jagannath OCP

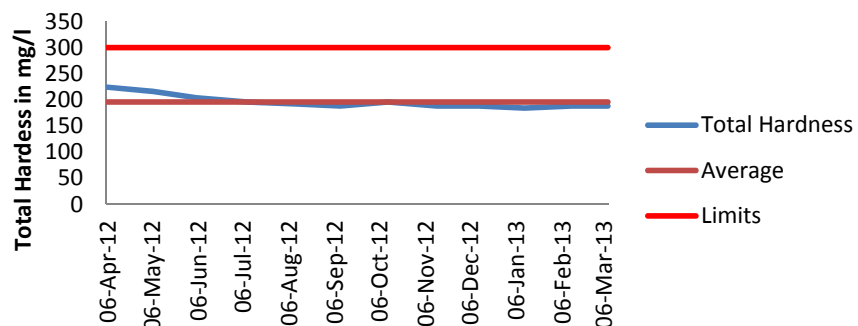
variation in pH at Jilinda Village well water at Bhubaneswari OCP



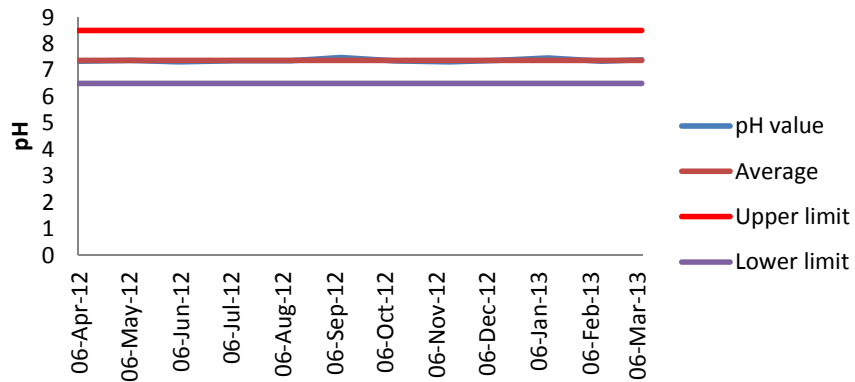
variation in Flouride at Jilinda Village well water at Bhubaneswari OCP



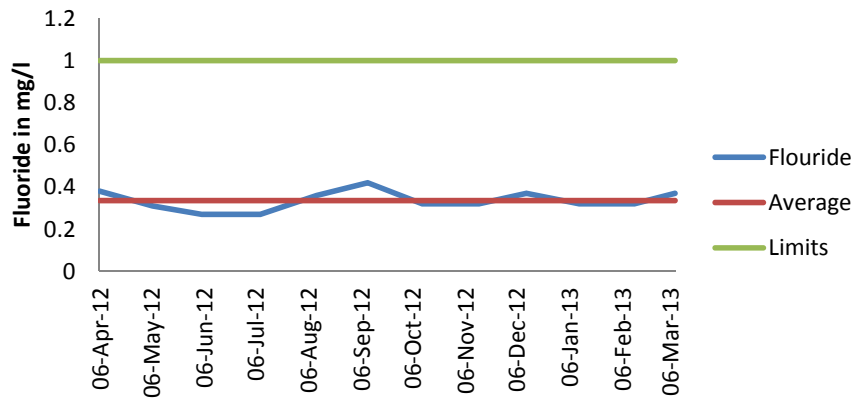
variation in Total Hardness at Jilinda Village well water at Bhubaneswari OCP



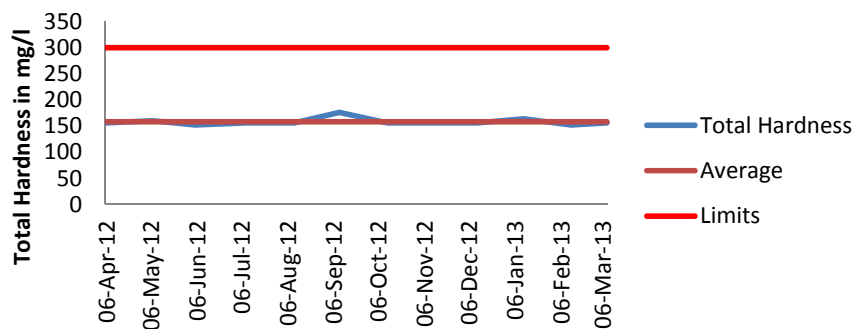
variation in pH at Project site office water at Bhubaneswari OCP



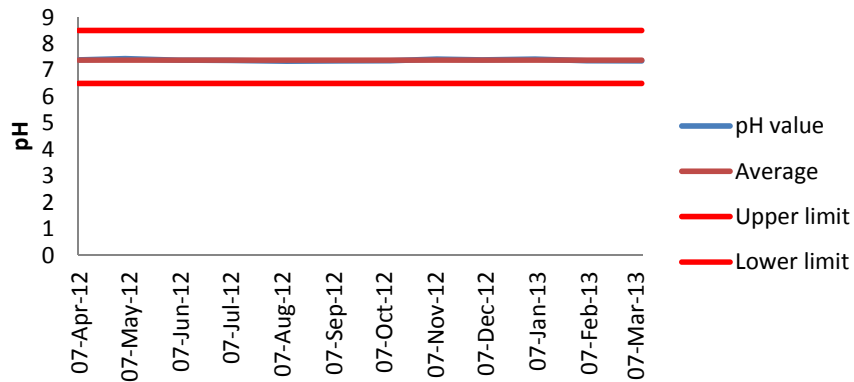
variation in Flouride at Project site office water at Bhubaneswari OCP



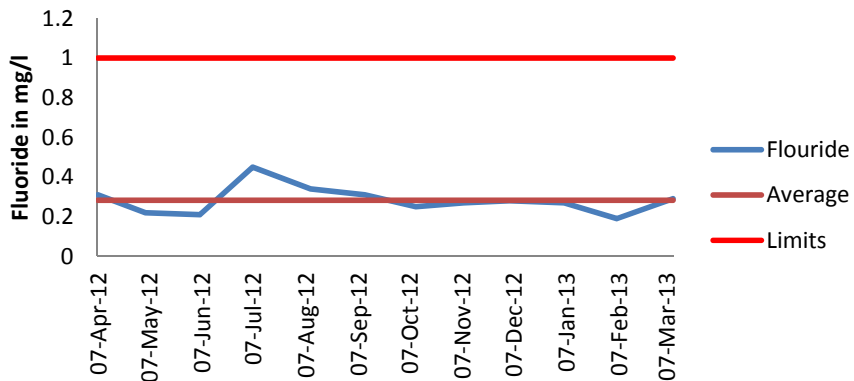
variation in Total Hardness at Project site office water at Bhubaneswari OCP



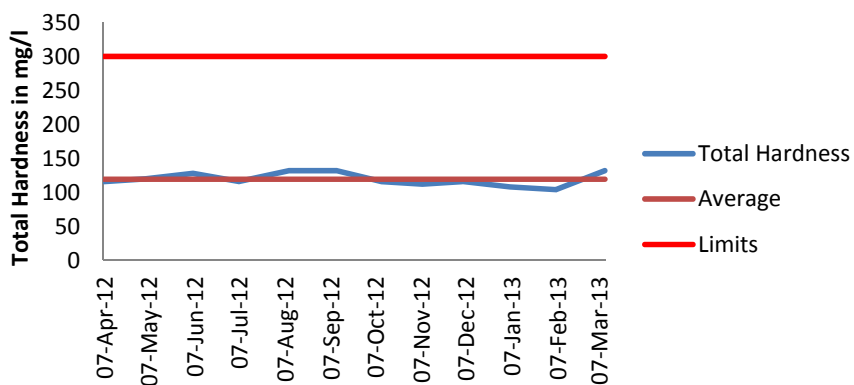
variation in pH at Dera Village tubewell water at Ananta OCP



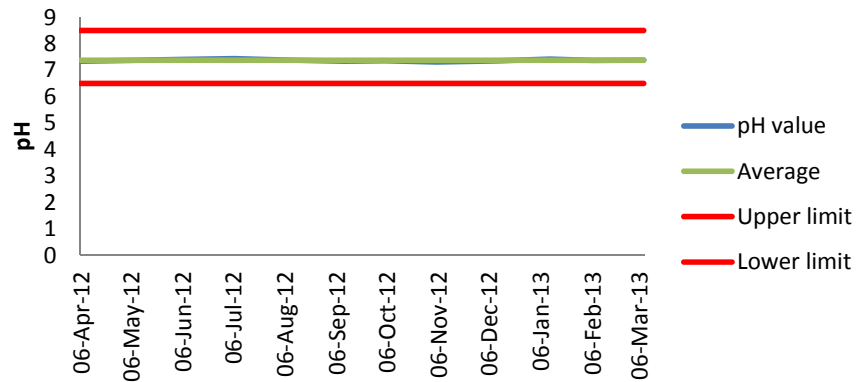
variation in Fluoride at Dera Village tubewell water at Ananta OCP



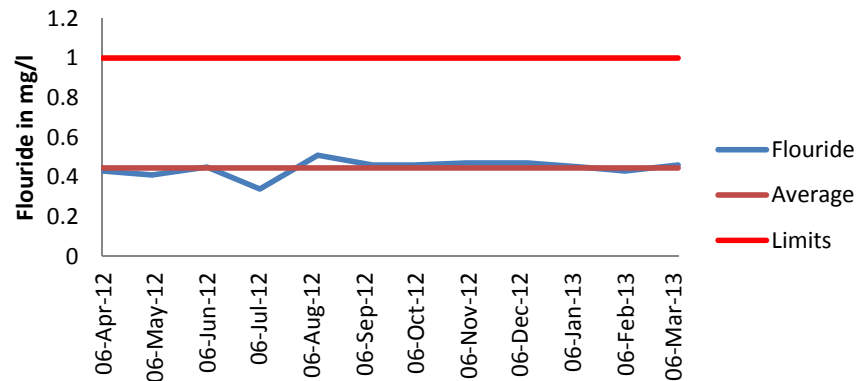
variation in Total Hardness at Dera Village tubewell water at Ananta OCP



variation in pH at Rakas Village well water at Jagannath OCP



variation in Flouride at Rakas Village well water at Jagannath OCP



variation in Total Hardness at Rakas Village well water at Jagannath OCP

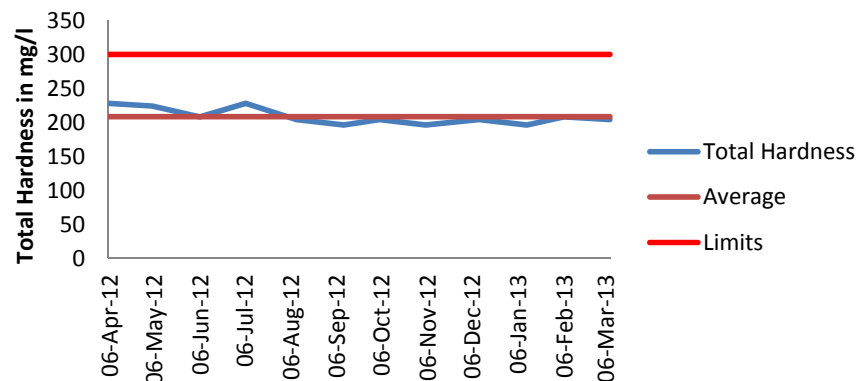


TABLE--
EFFLUENT QUALITY DATA

Area : **Jagannath**

Project : **Ananta OCP**

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	DETP Outlet	8.55	-	16	-	10	-
21-Apr-12	DETP Outlet	8.62	-	12	-	8	-
07-May-12	DETP Outlet	8.60	-	10	-	7	-
22-May-12	DETP Outlet	8.64	-	12	-	8	-
07-Jun-12	DETP Outlet	8.60	-	14	-	10	-
23-Jun-12	DETP Outlet	8.55	-	16	-	8	-
09-Jul-12	DETP Outlet	8.55	-	12	-	6	-
24-Jul-12	DETP Outlet	8.48	-	14	-	8	-
10-Aug-12	DETP Outlet	8.35	-	16	-	9	-
24-Aug-12	DETP Outlet	8.22	-	14	-	8	-
10-Sep-12	DETP Outlet	8.40	-	12	-	6	-

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

26-Sep-12	DETP Outlet	8.25	-	14	-	7	-
11-Oct-12	DETP Outlet	8.15	-	10	-	6	-
29-Oct-12	DETP Outlet	8.40	-	12	-	6	-
09-Nov-12	DETP Outlet	8.25	-	14	-	7	-
24-Nov-12	DETP Outlet	8.20	-	14	-	8	-
05-Dec-12	DETP Outlet	8.10	-	16	-	9	-
20-Dec-12	DETP Outlet	8.00	-	14	-	8	-
06-Jan-13	DETP Outlet	7.88	-	12	-	7	-
21-Jan-13	DETP Outlet	7.80	-	10	-	6	-
06-Feb-13	DETP Outlet	7.95	-	12	-	7	-
22-Feb-13	DETP Outlet	7.75	-	12	-	6	-
11-Mar-13	DETP Outlet	7.85	-	10	-	6	-

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

26-Mar-13	DETP Outlet	7.75	-	12	-	8	-
25-Mar-13	ETP Workshop Outlet	8.10	<1.0	34	50	-	-
07-Jul-12	Mine discharge water	8.65	<1.0	38	55	-	2.2
25-Jul-12	Mine discharge water	8.74	<1.0	34	30	-	2.1
11-Aug-12	Mine discharge water	8.65	<1.0	38	55	-	2.1
24-Aug-12	Mine discharge water	8.45	<1.0	34	50	-	2.2
11-Sep-12	Mine discharge water	8.60	<1.0	34	50	-	2.0
27-Sep-12	Mine discharge water	8.65	<1.0	38	55	-	2.2
11-Oct-12	Mine discharge water	8.52	<1.0	34	50	-	2.0
29-Oct-12	Mine discharge water	8.70	<1.0	34	50	-	2.1
09-Nov-12	Mine discharge water	8.64	<1.0	38	55	-	2.2
24-Nov-12	Mine discharge water	8.55	<1.0	40	60	-	2.3

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

05-Dec-12	Mine discharge water	8.45	<1.0	36	55	-	2.2
20-Dec-12	Mine discharge water	8.52	<1.0	40	60	-	2.3
06-Jan-13	Mine discharge water	8.45	<1.0	36	55	-	2.2
21-Jan-13	Mine discharge water	8.35	<1.0	34	55	-	2.1
06-Feb-13	Mine discharge water	8.50	<1.0	40	60	-	2.3
22-Feb-13	Mine discharge water	8.50	<1.0	40	60	-	2.3
11-Mar-13	Mine discharge water	8.35	<1.0	38	55	-	2.1
26-Mar-13	Mine discharge water	8.25	<1.0	40	60	-	2.3
05-Apr-12	Oil & Grease Trap Outlet	8.65	<1.0	26	40	-	-
20-Apr-12	Oil & Grease Trap Outlet	8.72	<1.0	24	35	-	-
05-May-12	Oil & Grease Trap Outlet	8.72	<1.0	22	35	-	-
21-May-12	Oil & Grease Trap Outlet	8.75	<1.0	24	40	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : **Jagannath**

06-Jun-12	Oil & Grease Trap Outlet	8.72	<1.0	20	30	-	-
22-Jun-12	Oil & Grease Trap Outlet	8.62	<1.0	24	35	-	-
07-Jul-12	Oil & Grease Trap Outlet	7.71	<1.0	18	25	-	-
25-Jul-12	Oil & Grease Trap Outlet	7.62	<1.0	22	35	-	-
11-Aug-12	Oil & Grease Trap Outlet	7.55	<1.0	20	30	-	-
24-Aug-12	Oil & Grease Trap Outlet	7.42	<1.0	24	35	-	-
11-Sep-12	Oil & Grease Trap Outlet	7.62	<1.0	22	35	-	-
27-Sep-12	Oil & Grease Trap Outlet	7.58	<1.0	26	55	-	-
11-Oct-12	Oil & Grease Trap Outlet	7.45	<1.0	24	35	-	-
29-Oct-12	Oil & Grease Trap Outlet	8.64	<1.0	22	35	-	-
09-Nov-12	Oil & Grease Trap Outlet	8.52	<1.0	26	40	-	-
24-Nov-12	Oil & Grease Trap Outlet	8.45	<1.0	24	35	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

05-Dec-12	Oil & Grease Trap Outlet	8.30	<1.0	26	40	-	-
20-Dec-12	Oil & Grease Trap Outlet	8.35	<1.0	24	35	-	-
06-Jan-13	Oil & Grease Trap Outlet	8.22	<1.0	20	30	-	-
21-Jan-13	Oil & Grease Trap Outlet	8.12	<1.0	22	35	-	-
06-Feb-13	Oil & Grease Trap Outlet	8.25	<1.0	24	35	-	-
22-Feb-13	Oil & Grease Trap Outlet	8.15	<1.0	22	35	-	-
11-Mar-13	Oil & Grease Trap Outlet	8.15	<1.0	26	40	-	-
26-Mar-13	Oil & Grease Trap Outlet	8.00	<1.0	24	35	-	-

Project : Bhubaneswari OCP

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
06-Apr-12	Mine discharge water in Bangaru Jhor	8.90	<1.0	34	50		2.0
20-Apr-12	Mine discharge water in Bangaru Jhor	8.95	<1.0	38	60		2.2
07-May-12	Mine discharge water in Bangaru Jhor	8.83	<1.0	38	55		2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

22-May-12	Mine discharge water in Bangaru Jhor	8.78	<1.0	34	50		2.2
09-Jul-12	Mine discharge water in Bangaru Jhor	7.75	<1.0	32	45		1.9
24-Jul-12	Mine discharge water in Bangaru Jhor	7.80	<1.0	34	50		2.0
10-Aug-12	Mine discharge water in Bangaru Jhor	7.72	<1.0	38	55		2.2
24-Aug-12	Mine discharge water in Bangaru Jhor	7.60	<1.0	34	50		2.2
11-Sep-12	Mine discharge water in Bangaru Jhor	7.80	<1.0	40	60		2.3
27-Sep-12	Mine discharge water in Bangaru Jhor	7.90	<1.0	36	55		2.2
12-Oct-12	Mine discharge water in Bangaru Jhor	7.75	<1.0	34	50		2.1
30-Oct-12	Mine discharge water in Bangaru Jhor	7.80	<1.0	32	50		2.1
14-Nov-12	Mine discharge water in Bangaru Jhor	7.68	<1.0	30	45		2.0
29-Nov-12	Mine discharge water in Bangaru Jhor	7.75	<1.0	34	50		2.1
12-Dec-12	Mine discharge water in Bangaru Jhor	7.82	<1.0	32	45		2.0

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

28-Dec-12	Mine discharge water in Bangaru Jhor	7.75	<1.0	36	55		2.1
12-Jan-13	Mine discharge water in Bangaru Jhor	7.67	<1.0	32	50		2.0
28-Jan-13	Mine discharge water in Bangaru Jhor	7.58	<1.0	36	55		2.1
13-Feb-13	Mine discharge water in Bangaru Jhor	7.76	<1.0	36	55		2.1
28-Feb-13	Mine discharge water in Bangaru Jhor	7.70	<1.0	36	55		-
09-Mar-13	Mine discharge water in Bangaru Jhor	7.64	<1.0	32	50		2.2
25-Mar-13	Mine discharge water in Bangaru Jhor	7.55	<1.0	36	55		2.1

Project : Jagannath OCP

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	DETP Outlet	8.64	-	14		10	-
20-Apr-12	DETP Outlet	8.70	-	12		8	-
07-May-12	DETP Outlet	8.70	-	12		8	-
22-May-12	DETP Outlet	8.68	-	14		10	-

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

06-Jun-12	DETP Outlet	8.70	-	10		6	-
22-Jun-12	DETP Outlet	8.62	-	14		8	-
09-Jul-12	DETP Outlet	8.75	-	12		8	-
24-Jul-12	DETP Outlet	8.68	-	16		10	-
10-Aug-12	DETP Outlet	8.62	-	14		8	-
24-Aug-12	DETP Outlet	8.45	-	10		6	-
10-Sep-12	DETP Outlet	8.55	-	16		9	-
26-Sep-12	DETP Outlet	8.60	-	16		9	-
05-Oct-12	DETP Outlet	8.55	-	14		7	-
19-Oct-12	DETP Outlet	8.55	-	14		7	-
05-Nov-12	DETP Outlet	8.40	-	10		6	-
20-Nov-12	DETP Outlet	8.25	-	12		7	-

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

11-Dec-12	DETP Outlet	8.20	-	10		6	-
26-Dec-12	DETP Outlet	8.25	-	14		8	-
12-Jan-13	DETP Outlet	8.10	-	16		10	-
28-Jan-13	DETP Outlet	7.95	-	14		9	-
06-Feb-13	DETP Outlet	8.10	-	16		9	-
22-Feb-13	DETP Outlet	8.00	-	12		8	-
11-Mar-13	DETP Outlet	7.95	-	14		8	-
26-Mar-13	DETP Outlet	7.84	-	16		10	-
06-Apr-12	MDTP Outlet	8.10	<1.0	32	50	-	1.9
21-Apr-12	MDTP Outlet	8.18	<1.0	30	45	-	2.0
07-May-12	MDTP Outlet	8.20	<1.0	30	45	-	2.1
23-Jun-12	MDTP Outlet	8.52	<1.0	30	45	-	2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

07-Jul-12	MDTP Outlet	7.60	<1.0	30	45	-	2.1
25-Jul-12	MDTP Outlet	7.52	<1.0	28	40	-	1.9
10-Aug-12	MDTP Outlet	7.55	<1.0	30	45	-	2.0
24-Aug-12	MDTP Outlet	7.62	<1.0	32	50	-	2.1
11-Sep-12	MDTP Outlet	7.60	<1.0	28	40	-	1.9
27-Sep-12	MDTP Outlet	7.75	<1.0	30	45	-	2.0
05-Oct-12	MDTP Outlet	7.82	<1.0	28	40	-	1.9
19-Oct-12	MDTP Outlet	7.82	<1.0	32	50	-	2.2
05-Nov-12	MDTP Outlet	7.70	<1.0	30	45	-	2.0
20-Nov-12	MDTP Outlet	7.77	<1.0	28	40	-	1.9
11-Dec-12	MDTP Outlet	7.80	<1.0	30	45	-	2.0
26-Dec-12	MDTP Outlet	7.72	<1.0	34	50	-	2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Jagannath

12-Jan-13	MDTP Outlet	7.62	<1.0	30	45	-	2.0
28-Jan-13	MDTP Outlet	7.70	<1.0	32	50	-	2.1
06-Feb-13	MDTP Outlet	7.72	<1.0	32	50	-	2.1
22-Feb-13	MDTP Outlet	7.55	<1.0	32	50	-	2.0
11-Mar-13	MDTP Outlet	7.65	<1.0	30	45	-	1.9
26-Mar-13	MDTP Outlet	7.55	<1.0	34	50	-	2.1
06-Apr-12	Oil & Grease Trap Outlet	8.45	<1.0	20	30	-	-
21-Apr-12	Oil & Grease Trap Outlet	8.50	<1.0	20	30	-	-
07-May-12	Oil & Grease Trap Outlet	8.50	<1.0	24	35	-	-
22-May-12	Oil & Grease Trap Outlet	8.45	<1.0	20	30	-	-
06-Jun-12	Oil & Grease Trap Outlet	8.50	<1.0	20	30	-	-
23-Jun-12	Oil & Grease Trap Outlet	8.35	<1.0	26	40	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : **Jagannath**

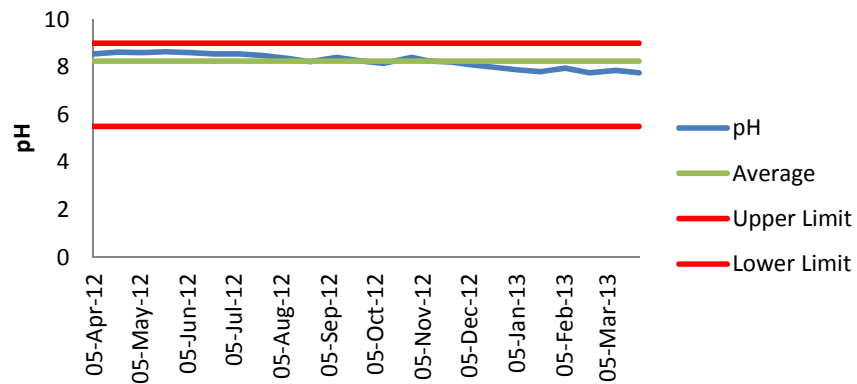
07-Jul-12	Oil & Grease Trap Outlet	8.60	<1.0	24	35	-	-
25-Jul-12	Oil & Grease Trap Outlet	8.50	<1.0	20	30	-	-
10-Aug-12	Oil & Grease Trap Outlet	8.45	<1.0	22	35	-	-
24-Aug-12	Oil & Grease Trap Outlet	8.52	<1.0	26	40	-	-
11-Sep-12	Oil & Grease Trap Outlet	8.34	<1.0	20	30	-	-
27-Sep-12	Oil & Grease Trap Outlet	8.20	<1.0	24	35	-	-
05-Oct-12	Oil & Grease Trap Outlet	8.10	<1.0	20	30	-	-
19-Oct-12	Oil & Grease Trap Outlet	8.00	<1.0	20	30	-	-
05-Nov-12	Oil & Grease Trap Outlet	7.90	<1.0	24	35	-	-
20-Nov-12	Oil & Grease Trap Outlet	7.82	<1.0	20	30	-	-
11-Dec-12	Oil & Grease Trap Outlet	7.90	<1.0	24	35	-	-
26-Dec-12	Oil & Grease Trap Outlet	7.80	<1.0	20	30	-	-

TABLE--
EFFLUENT QUALITY DATA

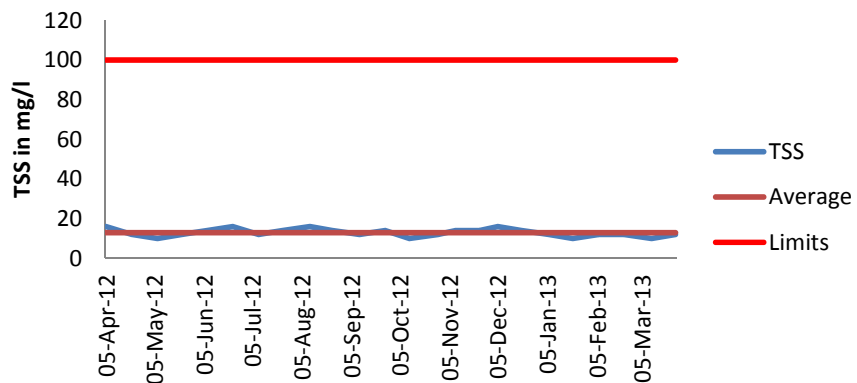
Area : Jagannath

12-Jan-13	Oil & Grease Trap Outlet	7.74	<1.0	24	35	-	-
28-Jan-13	Oil & Grease Trap Outlet	7.62	<1.0	26	40	-	-
06-Feb-13	Oil & Grease Trap Outlet	7.82	<1.0	20	30	-	-
22-Feb-13	Oil & Grease Trap Outlet	7.64	<1.0	20	30	-	-
11-Mar-13	Oil & Grease Trap Outlet	7.70	<1.0	22	35	-	-
26-Mar-13	Oil & Grease Trap Outlet	7.65	<1.0	26	40	-	-

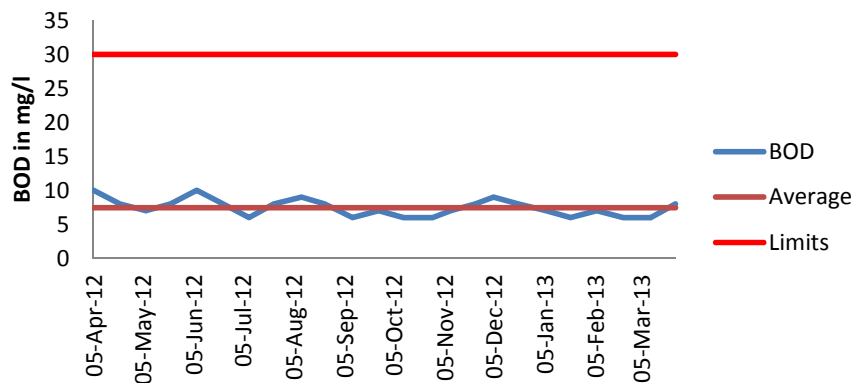
Variration in pH at DETP Outlet in Ananta OCP



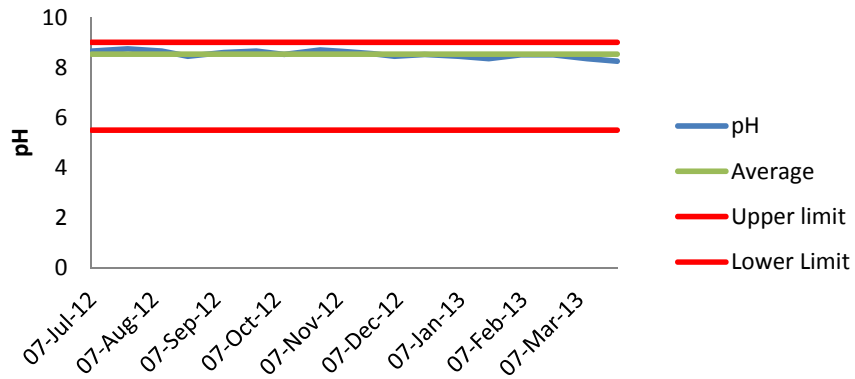
Variration inTSS at DETP Outlet in Ananta OCP



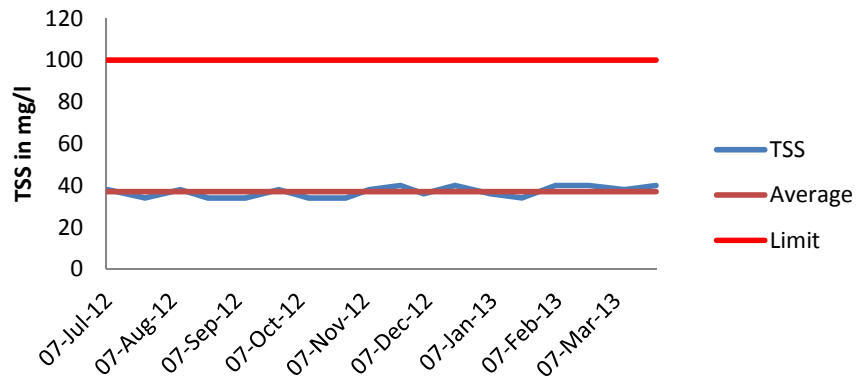
Variration in BOD at DETP Outlet in Ananta OCP



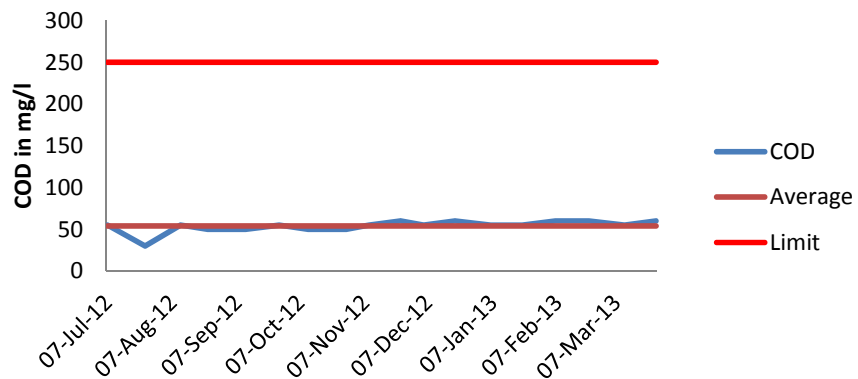
Variation in pH at Mine Discharge water in Ananta OCP



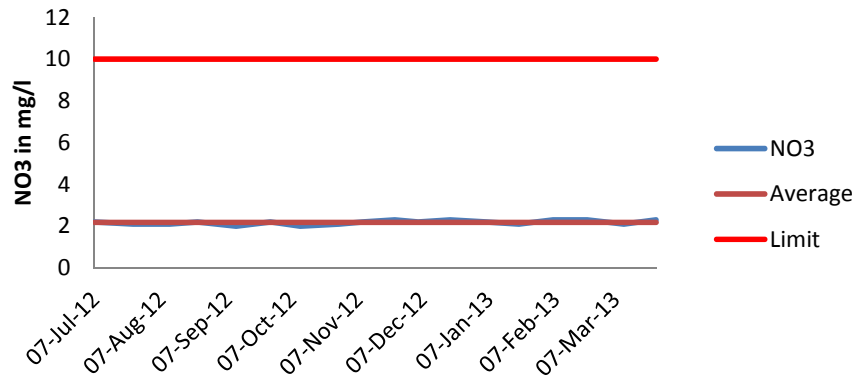
Variation in TSS at Mine Discharge water in Ananta OCP



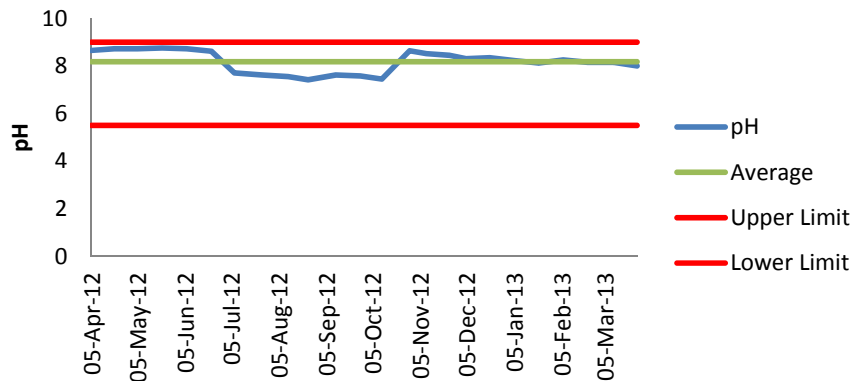
Variation in COD at Mine Discharge water in Ananta OCP



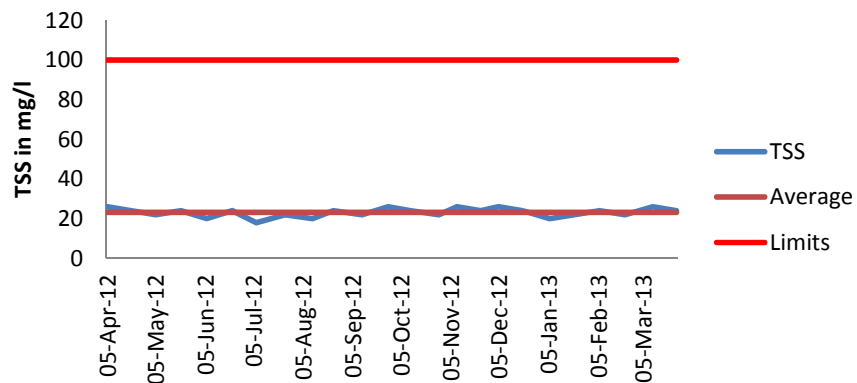
Variation in NO3 at Mine Discharge water in Ananta OCP



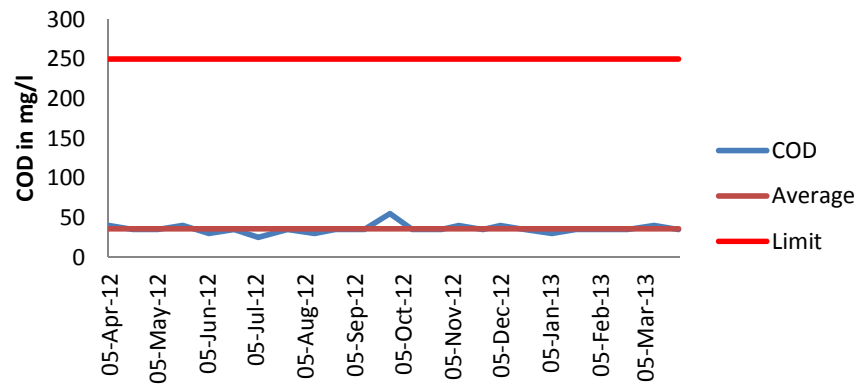
Variation in pH at O&G trap outlet in Ananta OCP



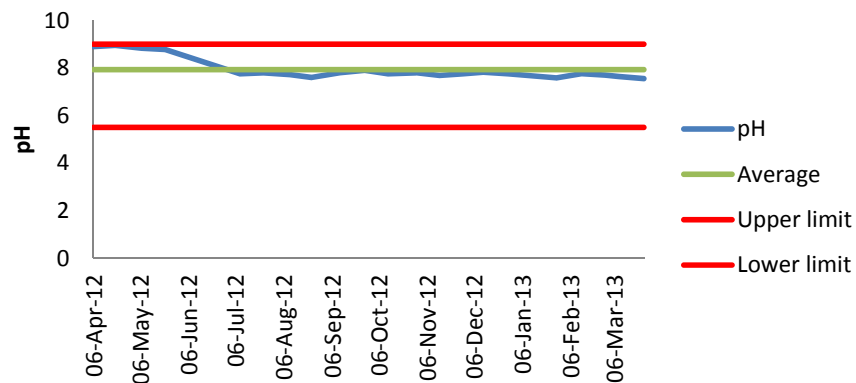
Variation in TSS at O&G trap outlet in Ananta OCP



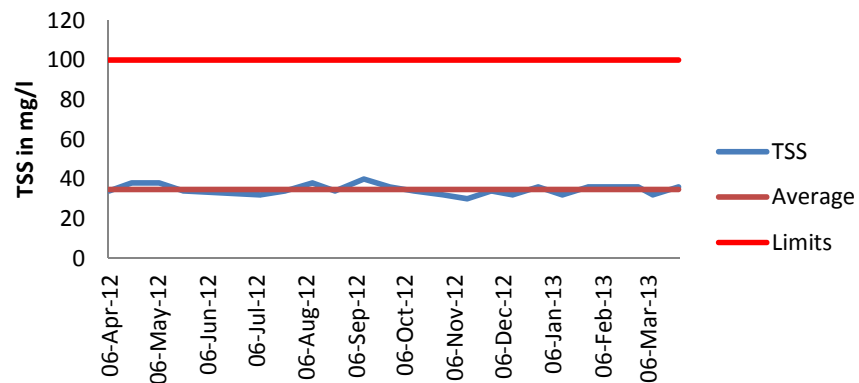
Variation in COD at O&G trap outlet in Ananta OCP



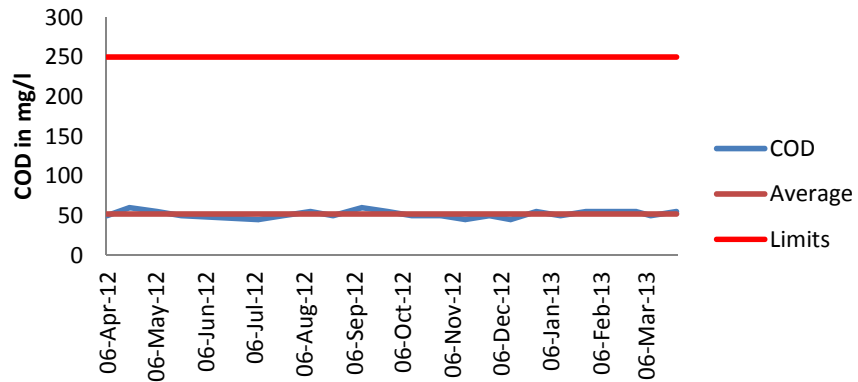
Variation in pH at Mine Discharge in Bangaru Jhor in Bhubaneswari OCP



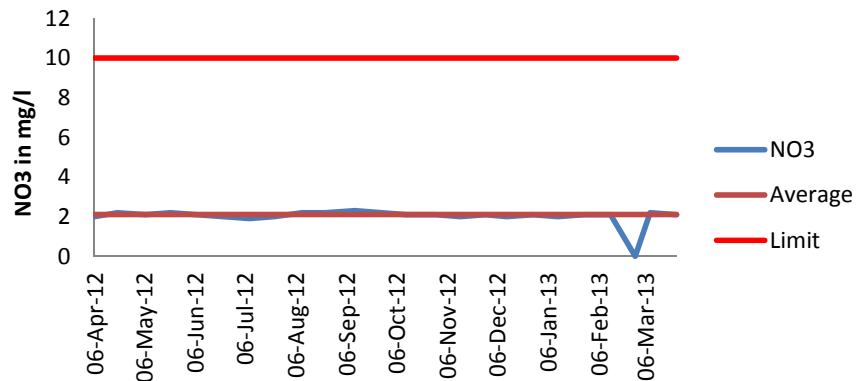
Variation in TSS at Mine Discharge in Bangaru Jhor in Bhubaneswari OCP



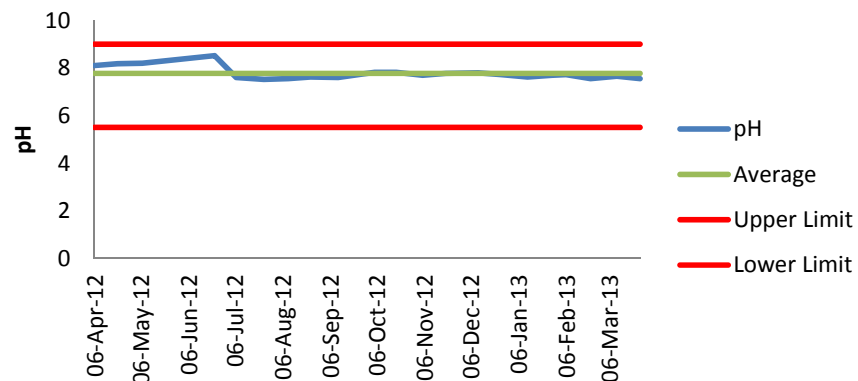
Variation in COD at Mine Discharge in Bangaru Jhor in Bhubaneswari OCP



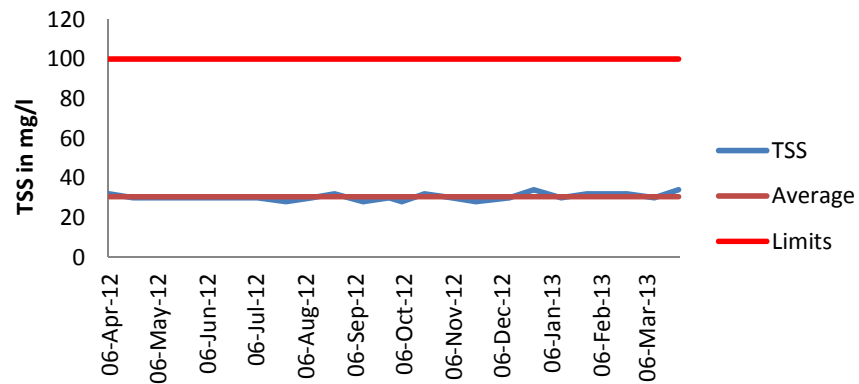
Variation in pH at Mine Discharge in Bangaru Jhor in Bhubaneswari OCP



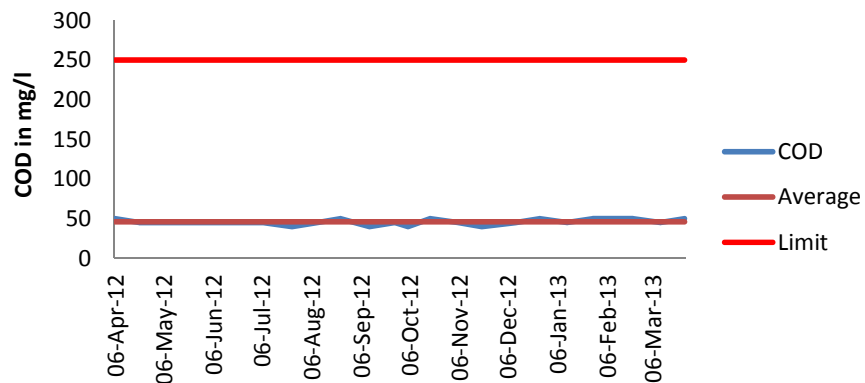
Variation in pH at MDTP outlet in Jagannath OCP



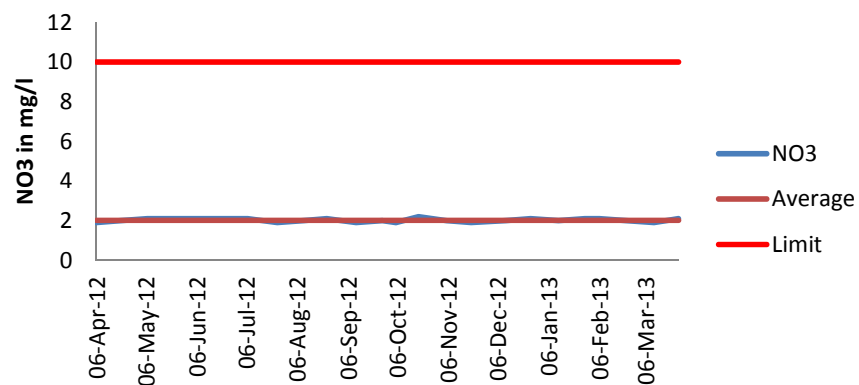
Variation in TSS at MDTP outlet in Jagannath OCP



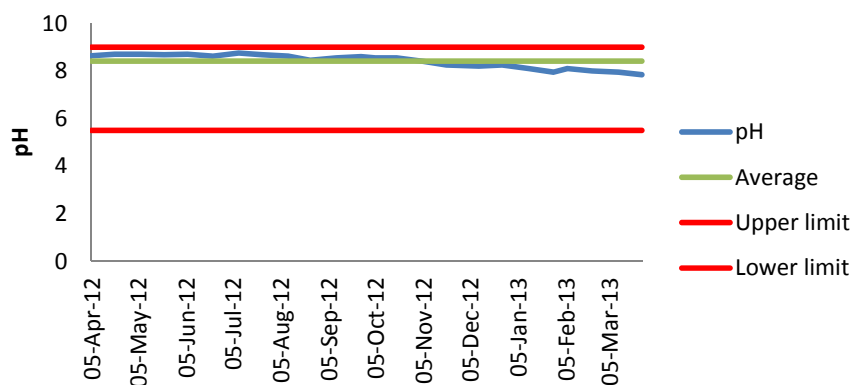
Variation in COD at MDTP outlet in Jagannath OCP



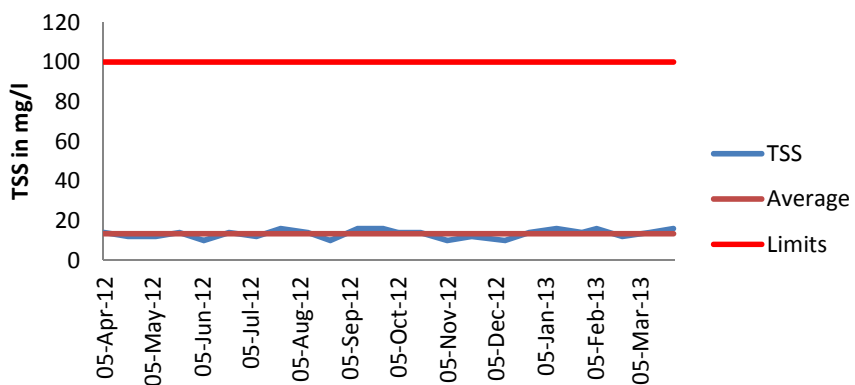
Variation in NO3 at MDTP outlet in Jagannath OCP



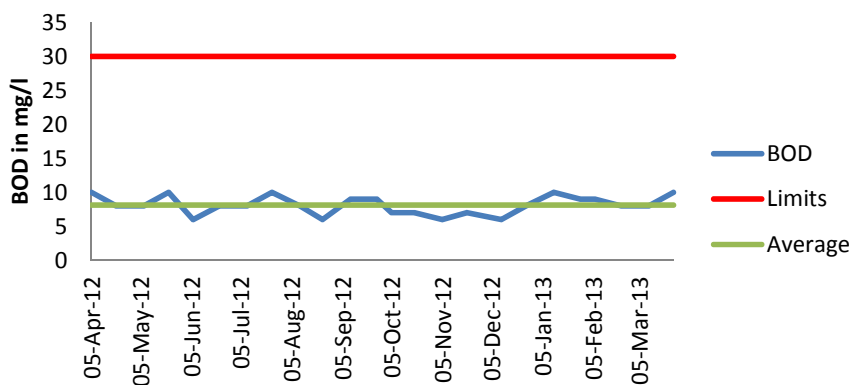
Variation in pH at DETP outlet in Jagannath OCP



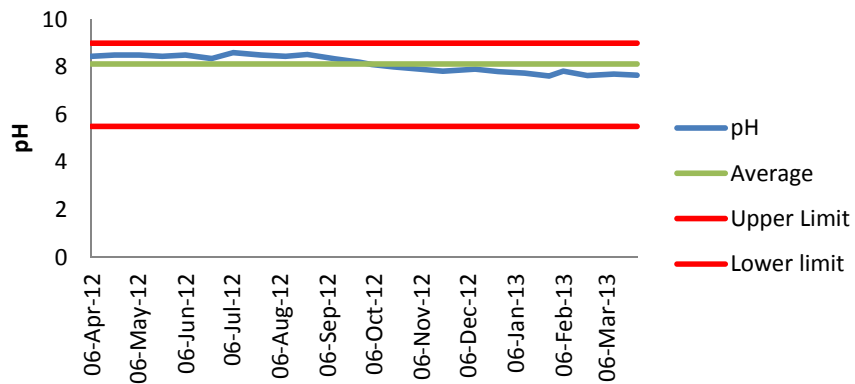
Variation in TSS at DETP outlet in Jagannath OCP



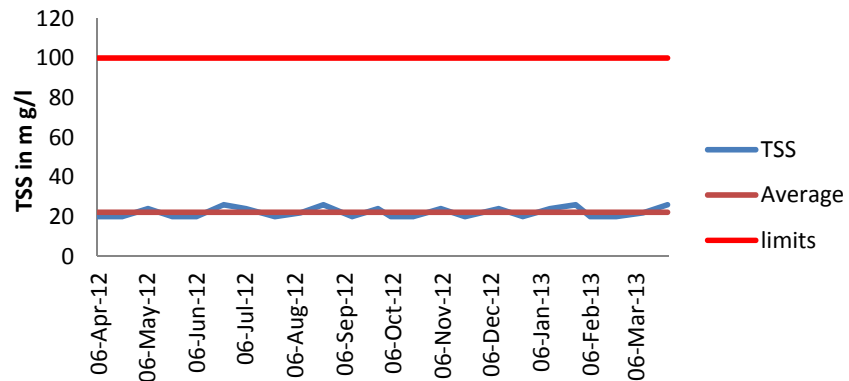
Variation in BOD at DETP outlet in Jagannath OCP



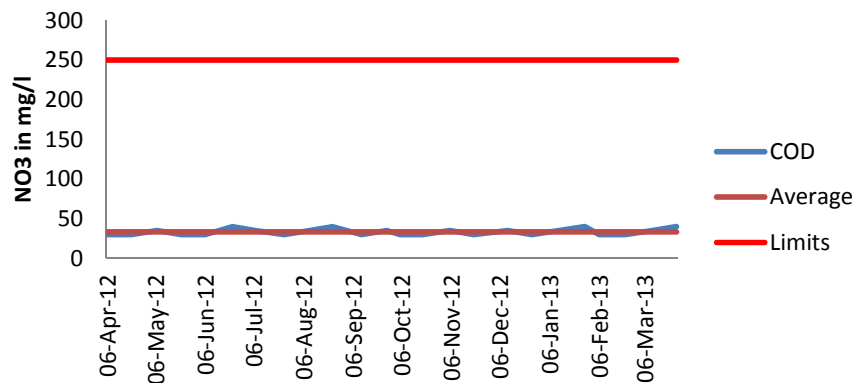
Variation in pH at O&G outlet in Jagannath OCP



Variation in TSS at O&G outlet in Jagannath OCP



Variation in NO3 at O&G outlet in Jagannath OCP



Yearly Effluent Data

Area: Jagannath

Area	<i>Jagannath</i>	<i>Jagannath</i>	<i>Jagannath</i>
Project	<i>Ananta OCP</i>	<i>Bhubaneswari OCP</i>	<i>Jagannath OCP</i>
Date of sampling	29-Oct-12	30-Oct-12	19-Oct-12
Name of the station	Mine discharge water	Mine discharge in Bangaru Jhor	Mine discharge water
Colour	Acceptable	Acceptable	Acceptable
Odour	Aggreable	Aggreable	Aggreable
Temperature, °C	13.6	13.4	13.6
Amonical Nitrogen	0.34	0.36	0.36
TKN	1.20	1.50	0.94
BOD	10	12	16
Arsenic	<0.01	<0.01	<0.01
Lead	<0.05	<0.05	<0.05
Hexavalent chromium	<0.01	<0.01	<0.01
Total chromium	<0.1	<0.1	<0.1
Copper	<0.02	<0.02	<0.02
Zinc	0.36	0.34	0.38
Selenium	<0.01	<0.01	<0.01
Nickel	<0.1	<0.1	<0.1
Fluoride	0.70	0.66	0.68
Dissolved phosphate	0.28	0.32	0.07
Sulphide	0.005	0.005	0.004
Phenolics	<0.001	<0.001	<0.001
Manganese	<0.05	<0.05	<0.05
Iron	0.14	0.12	0.13
Nitrate Nitrogen	2.1	2.1	2.2

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Balanda Colony, Near Rly. Sdg.I&II	56.5	50.2
27-Apr-12	Balanda Colony, Near Rly. Sdg.I&II	50.3	40.6
12-May-12	Balanda Colony, Near Rly. Sdg.I&II	59.6	56.7
29-May-12	Balanda Colony, Near Rly. Sdg.I&II	57.5	48.2
13-Jun-12	Balanda Colony, Near Rly. Sdg.I&II	60.2	54.8
28-Jun-12	Balanda Colony, Near Rly. Sdg.I&II	52.1	46.9
12-Jul-12	Balanda Colony, Near Rly. Sdg.I&II	58.6	54.6
28-Jul-12	Balanda Colony, Near Rly. Sdg.I&II	53.3	50.6
11-Aug-12	Balanda Colony, Near Rly. Sdg.I&II	55.8	50.2
27-Aug-12	Balanda Colony, Near Rly. Sdg.I&II	52.6	47.2
13-Sep-12	Balanda Colony, Near Rly. Sdg.I&II	53.1	50.1
27-Sep-12	Balanda Colony, Near Rly. Sdg.I&II	60.8	53.4
12-Oct-12	Balanda Colony, Near Rly. Sdg.I&II	60.7	57.6
29-Oct-12	Balanda Colony, Near Rly. Sdg.I&II	55.1	43.7
12-Nov-12	Balanda Colony, Near Rly. Sdg.I&II	59.6	55.6
28-Nov-12	Balanda Colony, Near Rly. Sdg.I&II	59.4	54.5
13-Dec-12	Balanda Colony, Near Rly. Sdg.I&II	60.1	55.6
28-Dec-12	Balanda Colony, Near Rly. Sdg.I&II	61.2	57.8
12-Jan-13	Balanda Colony, Near Rly. Sdg.I&II	60.3	56.9
29-Jan-13	Balanda Colony, Near Rly. Sdg.I&II	54.9	49.6
13-Feb-13	Balanda Colony, Near Rly. Sdg.I&II	53.2	45.5

26-Feb-13	Balanda Colony, Near Rly. Sdg.I&II	59.6	56.6
13-Mar-13	Balanda Colony, Near Rly. Sdg.I&II	56.8	52.7
27-Mar-13	Balanda Colony, Near Rly. Sdg.I&II	57.4	47.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Central Colony Near Siding 3 & 4	59.3	56.2
27-Apr-12	Central Colony Near Siding 3 & 4	52.5	41.3
12-May-12	Central Colony Near Siding 3 & 4	53.2	47.9
29-May-12	Central Colony Near Siding 3 & 4	55.1	48.1
13-Jun-12	Central Colony Near Siding 3 & 4	59.4	55.7
28-Jun-12	Central Colony Near Siding 3 & 4	50.5	46.3
28-Jul-12	Central Colony Near Siding 3 & 4	57.6	55.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

<i>DATE OF SAMPLING</i>	<i>STATION</i>	<i>Noise Level Measurement in dB(A)</i>	
		<i>DAY</i>	<i>NIGHT</i>
12-Jul-12	Central Colony Near Rly. Siding 3 & 4	60.5	55.9

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
11-Aug-12	Central Colony Near Rly.Siding 3 & 4	56.1	53.2
27-Aug-12	Central Colony Near Rly.Siding 3 & 4	52.8	46.9
13-Sep-12	Central Colony Near Rly.Siding 3 & 4	58.6	54.9
27-Sep-12	Central Colony Near Rly.Siding 3 & 4	57.6	52.8
12-Oct-12	Central Colony Near Rly.Siding 3 & 4	61.6	56.5
29-Oct-12	Central Colony Near Rly.Siding 3 & 4	51.4	42.6
12-Nov-12	Central Colony Near Rly.Siding 3 & 4	60.5	56.7
28-Nov-12	Central Colony Near Rly.Siding 3 & 4	60.4	57.5
13-Dec-12	Central Colony Near Rly.Siding 3 & 4	59.2	56.5
28-Dec-12	Central Colony Near Rly.Siding 3 & 4	59.3	54.5
12-Jan-13	Central Colony Near Rly.Siding 3 & 4	56.3	51.1
29-Jan-13	Central Colony Near Rly.Siding 3 & 4	57.8	48.5
13-Feb-13	Central Colony Near Rly.Siding 3 & 4	55.4	49.5
26-Feb-13	Central Colony Near Rly.Siding 3 & 4	60.3	55.5
13-Mar-13	Central Colony Near Rly.Siding 3 & 4	53.7	50.4
27-Mar-13	Central Colony Near Rly.Siding 3 & 4	61.5	53.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Jaganath Colony	50.1	45.4
27-Apr-12	Jaganath Colony	52.2	40.6
12-May-12	Jaganath Colony	52.1	44.6
29-May-12	Jaganath Colony	52.9	48.6
13-Jun-12	Jaganath Colony	52.6	48.5
28-Jun-12	Jaganath Colony	55.8	45.5
28-Jul-12	Jaganath Colony	52.6	45.2
11-Aug-12	Jaganath Colony	56.2	46.2
27-Aug-12	Jaganath Colony	52.1	43.6
13-Sep-12	Jaganath Colony	56.5	46.5
27-Sep-12	Jaganath Colony	53.4	46.8
12-Oct-12	Jaganath Colony	52.4	47.4
29-Oct-12	Jaganath Colony	53.5	43.2
12-Nov-12	Jaganath Colony	52.6	47.5
28-Nov-12	Jaganath Colony	52.4	46.2
13-Dec-12	Jaganath Colony	52.6	47.8
28-Dec-12	Jaganath Colony	53.6	44.6
12-Jan-13	Jaganath Colony	51.9	46.8
29-Jan-13	Jaganath Colony	50.5	41.1
13-Feb-13	Jaganath Colony	52.6	46.5
26-Feb-13	Jaganath Colony	51.4	45.9

13-Mar-13	Jaganath Colony	54.7	46.9
27-Mar-13	Jaganath Colony	58.1	47.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Jagannath OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Jagannath OCP-Time Office	61.7	56.2
27-Apr-12	Jagannath OCP-Time Office	60.8	48.3
12-May-12	Jagannath OCP-Time Office	58.7	54.6
29-May-12	Jagannath OCP-Time Office	61.2	53.8
13-Jun-12	Jagannath OCP-Time Office	60.2	58.5
28-Jun-12	Jagannath OCP-Time Office	58.1	50.5
12-Jul-12	Jagannath OCP-Time Office	60.2	56.2
28-Jul-12	Jagannath OCP-Time Office	62.3	57.8
11-Aug-12	Jagannath OCP-Time Office	60.9	56.8
27-Aug-12	Jagannath OCP-Time Office	60.4	57.8
13-Sep-12	Jagannath OCP-Time Office	55.4	50.3
27-Sep-12	Jagannath OCP-Time Office	58.3	55.0
12-Oct-12	Jagannath OCP-Time Office	60.4	55.2
29-Oct-12	Jagannath OCP-Time Office	54.9	42.0
12-Nov-12	Jagannath OCP-Time Office	60.5	57.2
28-Nov-12	Jagannath OCP-Time Office	62.3	58.4
13-Dec-12	Jagannath OCP-Time Office	60.3	55.8
28-Dec-12	Jagannath OCP-Time Office	61.5	58.5
12-Jan-13	Jagannath OCP-Time Office	61.3	56.5
29-Jan-13	Jagannath OCP-Time Office	60.8	54.2
13-Feb-13	Jagannath OCP-Time Office	61.1	58.9

26-Feb-13	Jagannath OCP-Time Office	59.6	53.4
13-Mar-13	Jagannath OCP-Time Office	58.4	49.8
27-Mar-13	Jagannath OCP-Time Office	60.5	54.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Ananta OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Dera Village	50.9	45.5
27-Apr-12	Dera Village	50.6	41.2
12-May-12	Dera Village	52.1	44.5
29-May-12	Dera Village	51.7	45.1
13-Jun-12	Dera Village	52.5	47.6
28-Jun-12	Dera Village	50.4	45.2
12-Jul-12	Dera Village	52.1	47.8
28-Jul-12	Dera Village	52.1	45.6
11-Aug-12	Dera Village	50.1	43.1
27-Aug-12	Dera Village	52.2	47.0
13-Sep-12	Dera Village	50.6	41.6
27-Sep-12	Dera Village	53.1	43.6
12-Oct-12	Dera Village	52.2	47.4
29-Oct-12	Dera Village	52.1	42.3
12-Nov-12	Dera Village	52.1	47.8
28-Nov-12	Dera Village	52.1	46.9
13-Dec-12	Dera Village	52.1	44.5
28-Dec-12	Dera Village	52.5	46.5
12-Jan-13	Dera Village	50.2	41.3
29-Jan-13	Dera Village	50.5	46.3
13-Feb-13	Dera Village	52.6	44.6

26-Feb-13	Dera Village	50.1	46.3
13-Mar-13	Dera Village	53.8	42.7
27-Mar-13	Dera Village	52.7	44.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Ananta OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Ananta Project Office	61.6	54.2
27-Apr-12	Ananta Project Office	54.3	44.9
12-May-12	Ananta Project Office	59.5	48.5
29-May-12	Ananta Project Office	61.8	51.7
13-Jun-12	Ananta Project Office	60.6	57.6
28-Jun-12	Ananta Project Office	56.5	50.3
12-Jul-12	Ananta Project Office	60.2	55.6
28-Jul-12	Ananta Project Office	60.6	56.7
11-Aug-12	Ananta Project Office	59.5	50.1
27-Aug-12	Ananta Project Office	60.2	55.8
13-Sep-12	Ananta Project Office	55.3	50.6
27-Sep-12	Ananta Project Office	62.4	54.8
12-Oct-12	Ananta Project Office	59.5	55.4
29-Oct-12	Ananta Project Office	55.6	41.9
12-Nov-12	Ananta Project Office	60.2	57.2
28-Nov-12	Ananta Project Office	62.3	58.6
13-Dec-12	Ananta Project Office	60.8	56.7
28-Dec-12	Ananta Project Office	60.7	55.4
12-Jan-13	Ananta Project Office	60.9	55.8
29-Jan-13	Ananta Project Office	59.3	50.9
13-Feb-13	Ananta Project Office	60.7	55.5

26-Feb-13	Ananta Project Office	56.8	50.4
13-Mar-13	Ananta Project Office	54.6	47.6
27-Mar-13	Ananta Project Office	52.4	46.6

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Ananta OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Rakas Village	49.2	41.6
27-Apr-12	Rakas Village	51.2	42.5
12-May-12	Rakas Village	52.2	42.5
29-May-12	Rakas Village	50.6	42.3
13-Jun-12	Rakas Village	52.5	44.5
28-Jun-12	Rakas Village	52.1	43.1
12-Jul-12	Rakas Village	52.2	44.6
28-Jul-12	Rakas Village	52.7	44.7
11-Aug-12	Rakas Village	55.4	43.2
27-Aug-12	Rakas Village	52.1	42.8
13-Sep-12	Rakas Village	51.9	40.1
27-Sep-12	Rakas Village	52.0	46.8
12-Oct-12	Rakas Village	51.6	44.6
29-Oct-12	Rakas Village	54.7	42.2
12-Nov-12	Rakas Village	52.2	45.6
28-Nov-12	Rakas Village	52.6	43.4
13-Dec-12	Rakas Village	51.2	46.7
28-Dec-12	Rakas Village	52.5	44.6
12-Jan-13	Rakas Village	56.1	47.2
29-Jan-13	Rakas Village	50.1	40.1
13-Feb-13	Rakas Village	52.7	44.1

26-Feb-13	Rakas Village	52.3	41.6
13-Mar-13	Rakas Village	54.7	41.4
27-Mar-13	Rakas Village	60.1	42.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Ananta OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Ananta Vihar Colony	50.2	43.1
27-Apr-12	Ananta Vihar Colony	50.3	44.2
12-May-12	Ananta Vihar Colony	52.6	46.4
29-May-12	Ananta Vihar Colony	50.9	44.5
13-Jun-12	Ananta Vihar Colony	52.1	47.6
28-Jun-12	Ananta Vihar Colony	51.4	44.8
12-Jul-12	Ananta Vihar Colony	52.6	47.8
28-Jul-12	Ananta Vihar Colony	52.7	43.6
11-Aug-12	Ananta Vihar Colony	52.3	46.1
27-Aug-12	Ananta Vihar Colony	52.1	47.8
13-Sep-12	Ananta Vihar Colony	50.6	40.5
27-Sep-12	Ananta Vihar Colony	53.8	45.6
12-Oct-12	Ananta Vihar Colony	52.7	46.2
29-Oct-12	Ananta Vihar Colony	53.2	43.6
12-Nov-12	Ananta Vihar Colony	52.5	45.8
28-Nov-12	Ananta Vihar Colony	52.4	45.2
13-Dec-12	Ananta Vihar Colony	52.5	47.3
28-Dec-12	Ananta Vihar Colony	53.6	47.5
12-Jan-13	Ananta Vihar Colony	51.6	47.9
29-Jan-13	Ananta Vihar Colony	50.6	41.1
13-Feb-13	Ananta Vihar Colony	52.6	46.7

26-Feb-13	Ananta Vihar Colony	51.6	41.1
13-Mar-13	Ananta Vihar Colony	54.8	43.3
27-Mar-13	Ananta Vihar Colony	51.4	42.3

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Ekdal Village	51.6	40.3
28-Apr-12	Ekdal Village	52.1	40.6
14-May-12	Ekdal Village	52.4	42.6
30-May-12	Ekdal Village	50.2	44.8
14-Jun-12	Ekdal Village	52.1	42.6
29-Jun-12	Ekdal Village	48.6	42.7
13-Jul-12	Ekdal Village	51.5	43.5
30-Jul-12	Ekdal Village	51.5	42.6
13-Aug-12	Ekdal Village	52.3	42.8
28-Aug-12	Ekdal Village	52.1	43.8
14-Sep-12	Ekdal Village	50.9	41.6
28-Sep-12	Ekdal Village	52.6	43.8
13-Oct-12	Ekdal Village	51.7	44.6
30-Oct-12	Ekdal Village	52.7	42.8
14-Nov-12	Ekdal Village	51.2	43.6
29-Nov-12	Ekdal Village	52.1	42.5
14-Dec-12	Ekdal Village	52.7	43.8
29-Dec-12	Ekdal Village	53.4	45.8
14-Jan-13	Ekdal Village	50.2	41.3
30-Jan-13	Ekdal Village	50.1	42.3
14-Feb-13	Ekdal Village	52.1	44.8

27-Feb-13	Ekdal Village	50.7	42.1
14-Mar-13	Ekdal Village	54.9	45.5
29-Mar-13	Ekdal Village	51.7	41.7

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Hensamul village-Tala Sahi	50.1	45.6
28-Apr-12	Hensamul village-Tala Sahi	50.3	42.9
14-May-12	Hensamul village-Tala Sahi	52.6	45.9
30-May-12	Hensamul village-Tala Sahi	48.2	45.9
14-Jun-12	Hensamul village-Tala Sahi	52.4	47.9
29-Jun-12	Hensamul village-Tala Sahi	50.6	44.8
13-Jul-12	Hensamul village-Tala Sahi	52.2	48.5
30-Jul-12	Hensamul village-Tala Sahi	52.3	44.2
13-Aug-12	Hensamul village-Tala Sahi	53.1	42.1
28-Aug-12	Hensamul village-Tala Sahi	52.1	46.3

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Sep-12	Hensmul village-Tala Sahi	52.6	42.1
28-Sep-12	Hensmul village-Tala Sahi	52.1	46.7
13-Oct-12	Hensmul village-Tala Sahi	52.1	46.5
30-Oct-12	Hensmul village-Tala Sahi	55.6	41.2
14-Nov-12	Hensmul village-Tala Sahi	52.3	47.7
29-Nov-12	Hensmul village-Tala Sahi	52.5	48.9
14-Dec-12	Hensmul village-Tala Sahi	53.2	46.2
29-Dec-12	Hensmul village-Tala Sahi	52.6	46.5
14-Jan-13	Hensmul village-Tala Sahi	51.1	46.9
30-Jan-13	Hensmul village-Tala Sahi	50.1	45.6
14-Feb-13	Hensmul village-Tala Sahi	52.1	46.5
27-Feb-13	Hensmul village-Tala Sahi	50.1	45.6
14-Mar-13	Hensmul village-Tala Sahi	53.4	43.7
29-Mar-13	Hensmul village-Tala Sahi	52.4	44.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Naraharipur Basti	50.3	42.8
28-Apr-12	Naraharipur Basti	50.6	41.6
14-May-12	Naraharipur Basti	52.5	45.6
30-May-12	Naraharipur Basti	51.5	41.7
14-Jun-12	Naraharipur Basti	52.2	44.8
29-Jun-12	Naraharipur Basti	59.4	44.6
13-Jul-12	Naraharipur Basti	52.4	43.6
30-Jul-12	Naraharipur Basti	52.4	47.1
13-Aug-12	Naraharipur Basti	50.1	41.6
28-Aug-12	Naraharipur Basti	52.2	45.1
14-Sep-12	Naraharipur Basti	50.6	44.9
28-Sep-12	Naraharipur Basti	53.7	44.3
13-Oct-12	Naraharipur Basti	52.6	45.2
30-Oct-12	Naraharipur Basti	54.3	45.4
14-Nov-12	Naraharipur Basti	52.6	44.7
29-Nov-12	Naraharipur Basti	52.2	44.5
14-Dec-12	Naraharipur Basti	53.2	45.1
29-Dec-12	Naraharipur Basti	52.6	47.8
14-Jan-13	Naraharipur Basti	56.6	43.5
30-Jan-13	Naraharipur Basti	50.5	46.1
14-Feb-13	Naraharipur Basti	52.4	45.8

27-Feb-13	Naraharipur Basti	51.3	44.3
14-Mar-13	Naraharipur Basti	52.8	47.4
29-Mar-13	Naraharipur Basti	55.8	42.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Raghunathpur Village	50.2	42.6
28-Apr-12	Raghunathpur Village	56.3	43.9
14-May-12	Raghunathpur Village	52.1	42.2
30-May-12	Raghunathpur Village	54.9	45.2
14-Jun-12	Raghunathpur Village	52.8	42.5
29-Jun-12	Raghunathpur Village	51.6	44.5
13-Jul-12	Raghunathpur Village	52.6	42.6
30-Jul-12	Raghunathpur Village	52.6	43.8
13-Aug-12	Raghunathpur Village	50.9	43.5
28-Aug-12	Raghunathpur Village	51.6	42.6
14-Sep-12	Raghunathpur Village	51.8	44.3
28-Sep-12	Raghunathpur Village	53.4	44.0
13-Oct-12	Raghunathpur Village	52.7	44.8
30-Oct-12	Raghunathpur Village	51.9	43.0
14-Nov-12	Raghunathpur Village	52.5	45.5
29-Nov-12	Raghunathpur Village	52.2	42.2
14-Dec-12	Raghunathpur Village	52.7	45.5
29-Dec-12	Raghunathpur Village	52.1	44.6
14-Jan-13	Raghunathpur Village	50.9	40.8
30-Jan-13	Raghunathpur Village	50.1	40.4
14-Feb-13	Raghunathpur Village	52.4	43.5

27-Feb-13	Raghunathpur Village	51.6	43.2
14-Mar-13	Raghunathpur Village	53.6	46.8
29-Mar-13	Raghunathpur Village	52.4	42.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Jagannath*

PROJECT : *Bhubaneswari OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Project Site Office	60.2	55.2
28-Apr-12	Project Site Office	56.4	52.1
14-May-12	Project Site Office	58.6	55.5
30-May-12	Project Site Office	58.7	52.4
14-Jun-12	Project Site Office	60.1	56.7
29-Jun-12	Project Site Office	57.9	49.9
13-Jul-12	Project Site Office	60.4	55.2
30-Jul-12	Project Site Office	60.6	54.3
13-Aug-12	Project Site Office	50.1	43.2
28-Aug-12	Project Site Office	60.7	55.6
14-Sep-12	Project Site Office	51.7	49.9
28-Sep-12	Project Site Office	58.6	53.4
13-Oct-12	Project Site Office	60.2	55.8
30-Oct-12	Project Site Office	58.2	45.8
14-Nov-12	Project Site Office	60.5	57.8
29-Nov-12	Project Site Office	62.6	58.4
14-Dec-12	Project Site Office	60.5	56.7
29-Dec-12	Project Site Office	51.5	58.5
14-Jan-13	Project Site Office	58.1	52.2
30-Jan-13	Project Site Office	55.9	50.6
14-Feb-13	Project Site Office	60.4	54.6

27-Feb-13	Project Site Office	60.9	54.1
14-Mar-13	Project Site Office	56.4	47.8
29-Mar-13	Project Site Office	55.4	48.4

pH

Area : Jagannath

<i>Project</i>	<i>Station</i>	<i>Date of Sampling</i>	<i>pH</i>
Ananta OCP	Mine Sump Water	12-Apr-12	6.5
Ananta OCP	Mine Sump Water	11-May-12	7.2
Ananta OCP	Mine Sump Water	13-Jun-12	7.5
Ananta OCP	Mine Sump Water	12-Jul-12	7.3
Ananta OCP	Mine Sump Water	14-Aug-12	6.2
Ananta OCP	Mine Sump Water	13-Sep-12	7.3
Ananta OCP	Mine Sump Water	13-Oct-12	6.9
Ananta OCP	Mine Sump Water	12-Nov-12	6.3
Ananta OCP	Mine Sump Water	14-Dec-12	6.9
Ananta OCP	Mine Sump Water	14-Jan-13	7.0
Ananta OCP	Mine Sump Water	13-Feb-13	7.1
Ananta OCP	Mine Sump Water	12-Mar-13	6.8
Jagannath OCP	Mine Sump Water	12-Apr-12	7.2
Jagannath OCP	Mine Sump Water	11-May-12	7.5
Jagannath OCP	Mine Sump Water	13-Jun-12	6.9
Jagannath OCP	Mine Sump Water	12-Jul-12	7.1
Jagannath OCP	Mine Sump Water	14-Aug-12	6.5
Jagannath OCP	Mine Sump Water	13-Sep-12	7.2
Jagannath OCP	Mine Sump Water	13-Oct-12	6.4
Jagannath OCP	Mine Sump Water	12-Nov-12	6.1

<i>Project</i>	<i>Station</i>	<i>Date of Sampling</i>	<i>pH</i>
Jagannath OCP	Mine Sump Water	14-Dec-12	7.1
Jagannath OCP	Mine Sump Water	14-Jan-13	6.8
Jagannath OCP	Mine Sump Water	13-Feb-13	6.4
Jagannath OCP	Mine Sump Water	12-Mar-13	7.1

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : Jagannath

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Ananta OCP	Hensamul village well	7.70
12-Apr-12	Bhubaneswari OCP	Naraharipur village well	5.69
12-Apr-12	Bhubaneswari OCP	Jilinda village well	5.61
12-Apr-12	Jagannath OCP	Rakas village well	7.92
12-Apr-12	Jagannath OCP	Naraharipur village well	5.69
12-Apr-12	Ananta OCP	Dera village well	4.01
13-Aug-12	Bhubaneswari OCP	Naraharipur village well	3.23
13-Aug-12	Ananta OCP	Dera village well	2.18
13-Aug-12	Ananta OCP	Hensamul village well	3.43
13-Aug-12	Bhubaneswari OCP	Jilinda village well	3.25
13-Aug-12	Jagannath OCP	Rakas village well	3.10
14-Nov-12	Ananta OCP	Hensamul village well	3.27
14-Nov-12	Bhubaneswari OCP	Jilinda village well	4.26
14-Nov-12	Jagannath OCP	Rakas village well	4.17
14-Nov-12	Bhubaneswari OCP	Naraharipur village well	5.85
14-Nov-12	Ananta OCP	Dera village well	2.81
12-Jan-13	Bhubaneswari OCP	Naraharipur village well	5.03
12-Jan-13	Ananta OCP	Dera village well	2.92
12-Jan-13	Ananta OCP	Hensamul village well	3.48
12-Jan-13	Bhubaneswari OCP	Jilinda village well	4.65
12-Jan-13	Jagannath OCP	Rakas village well	8.10

SILTATION STUDY AT TALCHER COALFIELD

JAGANNATH AREA (Ananta OCP)

MONTH : JULY 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	09.07.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	09.07.12	38

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.07.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.07.12	34

SILTATION STUDY AT TALCHER COALFIELD

JAGANNATH AREA (Bhubaneswari OCP)

MONTH : JULY 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	09.07.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	09.07.12	40

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.07.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.07.12	36

SILTATION STUDY AT TALCHER COALFIELD

JAGANNATH AREA

MONTH : August 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.08.12	36
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.08.12	40
	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.08.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.08.12	38

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.08.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	25.08.12	34
	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.08.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.08.12	36

SILTATION STUDY AT TALCHER COALFIELD

JAGANNATH AREA

MONTH : September 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	36
	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	34

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Jagannath	Ananta OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	38
	Bhubaneswari OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	38

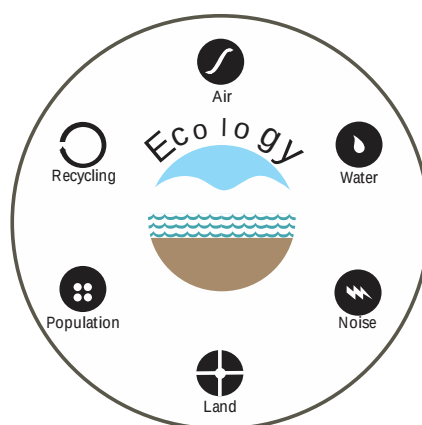


Annual Compiled Monitoring Report Of Bharatpur Area For 2012-2013

(Bharatpur OCP & Chendipada OCP)

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



Central Mine Planning & Design Institute Ltd.

(A Subsidiary of Coal India Ltd.)

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CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine(s) / Project(s)

Bharatpur area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has two OCPs under its administrative control. The OCPs are Bharatpur OCP and Chhendipada OCP.

Bharatpur OCP

Bharatpur opencast project lies between latitudes 20° 56' 01" and 20° 57' 30" N and longitudes 85° 06' 00" and 85° 08' 30" E. The project is well connected by rail & road. The area is predominantly soil covered and gently undulating. The general slope of the ground is towards north. The elevation of the area varies from 105 m to 145 m above MSL. The drainage of the area is controlled mainly by the Brahmani river.

Coal from this project is supplied to the captive power plant of NALCO and the basket linkage of Talcher coalfield.

Considering geo-mining conditions shovel-dumper system has been envisaged.

Chhendipada OCP

After formation of Bharatpur area Chhendipada OCP attached to Bharatpur area. Chhendipada is a part of Baitarani geological block and covers an area of 0.20 sq.km. This project is near Chhendipada Tahasil.

The area is well connected with Angul town. The area is represented by rolling topography with an average ground level elevation of about 152.5 m above MSL. The elevation varies from 147.5 m to 157.5 m above MSL. The drainage of the area is controlled mainly by the Tikra nadi, a tributary of the Brahmani river.

Shovel-dumper combination system has been deployed for this mine.

The production from this project goes directly by road to the linked consumers.

1.2 Frequency of Environmental Monitoring

(i) Ambient air quality monitoring

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out:

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

(ii) Drinking water monitoring : Every month.

(iii) Effluent quality monitoring

4 parameters : Only during monsoon month i.e. July, Aug. & Sept.

21 parameters : Once in a year

(iv) Well water level monitoring : Quarterly

(v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The details of various environmental quality monitoring stations are given in are given below:

- Air quality monitoring stations

Sl.No. Name of Stations

Chhendipada OCP

1. Near site office
2. Near fire station
3. Mamuria sahi
4. Dolomandap Chhak

Bharatpur OCP

1. On backfill near rejects dump yard
2. Padmabatipur village
3. Near Civil Maintenance office of Kalinga colony / pressure filter.
4. Regional store

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

Chhendipada OCP

1. Bore Well Water at Site Office

Bhararpur OCP

1. Tap Water of N.S. Nagar
2. Old quarry water to be monitored during April to June.

- **Effluent quality monitoring station**

1. Mine discharge water at the point of confluence with Bangaru nullah, Bharatpur OCP.
2. Oil & Grease trap Outlet
3. Outlet of DETP (3 parameters).
4. Mine discharge water at the point of confluence with Bangaru nullah, Bharatpur OCP.
5. Mine discharge water (Chhendipada)
6. Outlet of DETP

- **Well water level monitoring station**

1. Open well nearest to the mine

- **Noise level monitoring stations**

Sl.No. Name of Stations

Chhendipada OCP

1. Near Site Office
2. Near Mine Working
3. Near Weigh Bridge

Bharatpur OCP

1. On backfill near rejects dump yard
2. Padmabatipur village
3. Near Civil Maintenance office of Kalinga colony / pressure filter.

- **Siltation study by monitoring parameter TSS (fortnightly once each in July, Aug., Sept.)**

Bharatpur OCP

1. 100m u/s of the point of confluence of mine discharge water with Bangaru nullah.
2. 100m d/s of the point of confluence of mine discharge water with Bangaru nullah.

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1

**Details of Air Quality Monitoring Stations
along with Sources of Pollution**

Sl.No.	Location	Sources of Pollution
Bharatpur OCP		
1	On backfill near rejects dump yard	Mine activities, coal stock
2	Padmabatipur village	Mine activities, transportation.
3.	Near Civil Maintenance Office of Kalinga Colony / Pressure filter	CHP, RLS and transportation
4.	Regional Store	Transportation, Road & Rly. line
Chhendipada OCP		
1.	Near site Office	Mine activities
2.	Near Fire Station	Mine activities
3.	Mamuria Sahi	Mine activities
4.	Dolamandap Chhak	Mine activities

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2

Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached.

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Bharatpur Area reveals the following:

- In coal mining area like land farming site, on backfill near reject dump, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines, barring a few aberrated value.
- In Mamuria sahi the values are found to be within the limits of the National Ambient Air Quality Standards (NAAQS) notified under Schedule-VII.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Water sprinkling on haul roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers at haul roads and siding.
- Cleaning spillage from roads.
- Practice for covered transportation.
- Regular maintenance of all HEMMs and other machinery.
- Provision of gas filters for exhaust fumes.
- No overloading of trucks/dumpers.
- Application of innocuous chemical binders on haul roads.
- Development of thick greenbelts around the mines, infrastructure sites and residential area besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.
- Drills with well-designed dust extractors/arrestors.
- Provision of dust extraction system for crusher house.
- Suppression of coal dust at CHP by provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers.

CHAPTER-III

WATER ENVIRONMENT

3.1 Methodology and Instruments used for water & effluent analysis

Details are given in Table-4.

Table-4

Methodology & Instruments used for Water and Effluent Analysis

Sl.No.	Parameters	Method/Instruments
1	pH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The result of analyses of drinking water sample is given in Table. Result of effluent analyses is given in Tables attached. Ground water level monitoring of various dug-wells are given in Tables attached.

3.3 Discussions

(a) Drinking water sample

The examination of analytical results of drinking water sample reveals the following :

- All physico-chemical parameters are well within the limits of the Indian Drinking Water Standard in the drinking water sample.

(b) Effluent sample

All parameters of DETP are found to be within the limits.

Control Measures

The following control measures are recommend to maintain water quality within the permissible limits of prescribed standard.

- Regular disinfection of water for making fit for portability.
- Regular/periodical maintenance of Treatment Plants.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.2 Results

The fortnightly noise level measurements for different stations are given in Tables attached.

4.3 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards.

4.4 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Proper designing of plant and machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- HEMMs with sound proof cabin.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Apr-12	On backfill near reject dump yard	385	131	36	44	Mining activities & coal stock	Within 500m	South to north & sunny
26-Apr-12	On backfill near reject dump yard	449	141	44	56	Mining activities & coal stock	Within 500m	East to west & sunny
09-May-12	On backfill near reject dump yard	309	128	36	45	Mining activities & coal stock	Within 500m	East to west & sunny
24-May-12	On backfill near reject dump yard	387	174	44	52	Mining activities & coal stock	Within 500m	South to north & sunny
11-Jun-12	On backfill near reject dump yard	322	146	40	44	Mining activities & coal stock	Within 500m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Jun-12	On backfill near reject dump yard	266	117	32	39	Mining activities & coal stock	Within 500m	East to west & cloudy rain fall
11-Jul-12	On backfill near reject dump yard	295	128	36	44	Mining activities & coal stock	Within 500m	West to east & sunny
26-Jul-12	On backfill near reject dump yard	239	96	33	39	Mining activities & coal stock	Within 500m	East to west, cloudy and rainfall
09-Aug-12	On backfill near reject dump yard	210	83	30	37	Mining activities & coal stock	Within 500m	East to west, cloudy and rainfall
24-Aug-12	On backfill near reject dump yard	202	98	27	39	Mining activities & coal stock	Within 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Sep-12	On backfill near rejects dump yard	186	107	25	41	Mining activities & coal stock	Within 500m	East to west cloudy and rainfall
25-Sep-12	On backfill near rejects dump yard	243	118	33	42	Mining activities & coal stock	Within 500m	South to North & sunny
10-Oct-12	On backfill near rejects dump yard	217	76	26	35	Mining activities & coal stock	Within 500m	East to west cloudy and rainfall
26-Oct-12	On backfill near rejects dump yard	349	131	39	48	Mining activities & coal stock	Within 500m	East to west hot & sunny
08-Nov-12	On backfill near rejects dump yard	307	136	31	36	Mining activities & coal stock	Within 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Bharatpur

23-Nov-12	On backfill near rejects dump yard	279	124	27	32	Mining activities & coal stock	Within 500m	East to west & cloudy
10-Dec-12	On backfill near rejects dump yard	264	116	29	33	Mining activities & coal stock	Within 500m	East to west & cloudy
25-Dec-12	On backfill near rejects dump yard	253	112	26	28	Mining activities & coal stock	Within 500m	East to west & sunny
09-Jan-13	On backfill near rejects dump yard	246	108	23	26	Mining activities & coal stock	Within 500m	East to west & sunny
24-Jan-13	On backfill near rejects dump yard	254	103	22	25	Mining activities & coal stock	Within 500m	South to north & sunny
11-Feb-13	On backfill near rejects dump yard	262	109	23	26	Mining activities & coal stock	Within 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

25-Feb-13	On backfill near rejects dump yard	276	113	24	27	Mining activities & coal stock	Within 500m	East to west & sunny
11-Mar-13	On backfill near rejects dump yard	262	124	25	28	Mining activities & coal stock	Within 500m	East to west & sunny
26-Mar-13	On backfill near rejects dump yard	275	134	26	28	Mining activities & coal stock	Within 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Apr-12	Near civil maintenance office of Kalinga Colony/PR	184	67	19	24	CHP, RLS, Transportation	Varying from 300m to 700m	South to north & sunny
26-Apr-12	Near civil maintenance office of Kalinga Colony/PR	151	56	20	23	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
09-May-12	Near civil maintenance office of Kalinga Colony/PR	173	62	22	26	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
24-May-12	Near civil maintenance office of Kalinga Colony/PR	233	104	30	36	CHP, RLS, Transportation	Varying from 300m to 700m	South to north & sunny
11-Jun-12	Near civil maintenance office of Kalinga Colony/PR	142	65	19	22	CHP, RLS, Transportation	Varying from 300m to 700m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Jun-12	Near civil maintenance office of Kalinga Colony/PR	148	59	19	24	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & cloudy rain fall
11-Jul-12	Near civil maintenance office of Kalinga Colony/PR	154	65	20	24	CHP, RLS, Transportation	Varying from 300m to 700m	West to east & sunny
26-Jul-12	Near civil maintenance office of Kalinga Colony/PR	94	48	17	21	CHP, RLS, Transportation	Varying from 300m to 700m	East to west, cloudy and rainfall
09-Aug-12	Near civil maintenance office of Kalinga Colony/PR	113	64	21	38	CHP, RLS, Transportation	Varying from 300m to 700m	East to west, cloudy and rainfall
24-Aug-12	Near civil maintenance office of Kalinga Colony/PR	101	87	24	41	CHP, RLS, Transportation	Varying from 300m to 700m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Sep-12	Near civil maintenance office of Kalinga Colony/PF	164	94	21	37	CHP, RLS, Transportation	Varying from 300m to 700m	East to west cloudy and rainfall
25-Sep-12	Near civil maintenance office of Kalinga Colony/PF	115	61	19	23	CHP, RLS, Transportation	Varying from 300m to 700m	South to North & sunny
10-Oct-12	Near civil maintenance office of Kalinga Colony/PF	94	56	20	24	CHP, RLS, Transportation	Varying from 300m to 700m	East to west cloudy and rainfall
26-Oct-12	Near civil maintenance office of Kalinga Colony/PF	164	69	22	26	CHP, RLS, Transportation	Varying from 300m to 700m	East to west hot & sunny
08-Nov-12	Near civil maintenance office of Kalinga Colony/PF	172	98	23	27	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Bharatpur

23-Nov-12	Near civil maintenance office of Kalinga Colony/PF	167	104	25	29	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & cloudy
10-Dec-12	Near civil maintenance office of Kalinga Colony/PF	157	101	26	29	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & cloudy
25-Dec-12	Near civil maintenance office of Kalinga Colony/PF	149	93	20	23	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
09-Jan-13	Near civil maintenance office of Kalinga Colony/PF	157	101	22	25	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
24-Jan-13	Near civil maintenance office of Kalinga Colony/PF	194	110	23	26	CHP, RLS, Transportation	Varying from 300m to 700m	South to north & sunny
11-Feb-13	Near civil maintenance office of Kalinga Colony/PF	213	118	24	27	CHP, RLS, Transportation	Varying from 300m to 700m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Feb-13	Near civil maintenance office of Kalinga Colony/PF	227	127	25	28	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
11-Mar-13	Near civil maintenance office of Kalinga Colony/PF	238	135	26	29	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny
26-Mar-13	Near civil maintenance office of Kalinga Colony/PF	249	151	29	31	CHP, RLS, Transportation	Varying from 300m to 700m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Apr-12	Padmabatipur Village	237	96	23	28	Mining activities & transportation	300m to 600m	South to north & sunny
26-Apr-12	Padmabatipur Village	205	103	26	30	Mining activities & transportation	300m to 600m	East to west & sunny
09-May-12	Padmabatipur Village	213	84	24	30	Mining activities & transportation	300m to 600m	East to west & sunny
24-May-12	Padmabatipur Village	264	117	30	38	Mining activities & transportation	300m to 600m	South to north & sunny
11-Jun-12	Padmabatipur Village	218	86	25	30	Mining activities & transportation	300m to 600m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Jun-12	Padmabatipur Village	146	62	21	26	Mining activities & transportation	300m to 600m	East to west & cloudy rain fall
11-Jul-12	Padmabatipur Village	150	65	22	27	Mining activities & transportation	300m to 600m	West to east & sunny
26-Jul-12	Padmabatipur Village	129	62	20	26	Mining activities & transportation	300m to 600m	East to west, cloudy and rainfall
09-Aug-12	Padmabatipur Village	142	92	24	34	Mining activities & transportation	300m to 600m	East to west, cloudy and rainfall
24-Aug-12	Padmabatipur Village	138	96	21	30	Mining activities & transportation	300m to 600m	South to North cloudy, and rainfall
10-Sep-12	Padmabatipur Village	124	102	26	39	Mining activities & transportation	300m to 600m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

25-Sep-12	Padmabatipur Village	136	85	22	27	Mining activities & transportation	300m to 600m	South to North & sunny
10-Oct-12	Padmabatipur Village	114	52	19	22	Mining activities & transportation	300m to 600m	East to west cloudy and rainfall
26-Oct-12	Padmabatipur Village	192	86	26	33	Mining activities & transportation	300m to 600m	East to west hot & sunny
08-Nov-12	Padmabatipur Village	180	109	21	30	Mining activities & transportation	300m to 600m	East to west & sunny
23-Nov-12	Padmabatipur Village	196	118	23	29	Mining activities & transportation	300m to 600m	East to west & cloudy
10-Dec-12	Padmabatipur Village	186	108	24	27	Mining activities & transportation	300m to 600m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

25-Dec-12	Padmabatipur Village	176	104	23	26	Mining activities & transportation	300m to 600m	East to west & sunny
09-Jan-13	Padmabatipur Village	172	110	25	29	Mining activities & transportation	300m to 600m	East to west & sunny
24-Jan-13	Padmabatipur Village	182	106	24	27	Mining activities & transportation	300m to 600m	South to north & sunny
11-Feb-13	Padmabatipur Village	195	121	25	28	Mining activities & transportation	300m to 600m	South to north & sunny
26-Feb-13	Padmabatipur Village	218	139	26	29	Mining activities & transportation	300m to 600m	East to west & sunny
11-Mar-13	Padmabatipur Village	227	131	26	28	Mining activities & transportation	300m to 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Mar-13	Padmabatipur Village	215	138	25	27	Mining activities & transportation	300m to 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Bharatpur OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Apr-12	Regional Store	364	138	34	39	Miniiing activities	About 400m	South to north & sunny
26-Apr-12	Regional Store	395	152	36	48	Miniiing activities	About 400m	East to west & sunny
09-May-12	Regional Store	344	132	38	48	Miniiing activities	About 400m	East to west & sunny
24-May-12	Regional Store	367	154	42	50	Miniiing activities	About 400m	South to north & sunny
11-Jun-12	Regional Store	317	122	34	42	Miniiing activities	About 400m	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

26-Jun-12	Regional Store	242	99	30	36	Miniiing activities	About 400m	East to west & cloudy rain fall
11-Jul-12	Regional Store	203	87	26	34	Miniiing activities	About 400m	West to east & sunny
26-Jul-12	Regional Store	177	76	25	29	Miniiing activities	About 400m	East to west, cloudy and rainfall
09-Aug-12	Regional Store	164	79	26	33	Miniiing activities	About 400m	East to west, cloudy and rainfall
24-Aug-12	Regional Store	145	83	22	35	Miniiing activities	About 400m	South to North cloudy, and rainfall
10-Sep-12	Regional Store	130	97	20	35	Miniiing activities	About 400m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

25-Sep-12	Regional Store	204	106	26	33	Miniiing activities	About 400m	South to North & sunny
10-Oct-12	Regional Store	187	74	24	29	Miniiing activities	About 400m	East to west cloudy and rainfall
26-Oct-12	Regional Store	287	114	33	42	Miniiing activities	About 400m	East to west hot & sunny
08-Nov-12	Regional Store	285	124	28	35	Miniiing activities	About 400m	East to west & sunny
23-Nov-12	Regional Store	298	137	29	37	Miniiing activities	About 400m	East to west & cloudy
10-Dec-12	Regional Store	272	131	28	32	Miniiing activities	About 400m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

25-Dec-12	Regional Store	262	103	25	27	Miniiing activities	About 400m	East to west & sunny
09-Jan-13	Regional Store	278	115	24	28	Miniiing activities	About 400m	East to west & sunny
24-Jan-13	Regional Store	292	116	25	28	Miniiing activities	About 400m	South to north & sunny
11-Feb-13	Regional Store	286	124	27	30	Miniiing activities	About 400m	South to north & sunny
25-Feb-13	Regional Store	295	134	28	30	Miniiing activities	About 400m	East to west & sunny
11-Mar-13	Regional Store	310	157	29	30	Miniiing activities	About 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : ***Bharatpur***

26-Mar-13	Regional Store	295	143	27	29	Miniing activities	About 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Chhendipada OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
03-Apr-12	Dolamandap Chhak	183	70	20	25	Mining activities	About 300m to 400m	East to west & sunny
18-Apr-12	Dolamandap Chhak	240	85	24	29	Mining activities	About 300m to 400m	South to north & sunny
02-May-12	Dolamandap Chhak	142	59	22	26	Mining activities	About 300m to 400m	South to north & sunny
17-May-12	Dolamandap Chhak	155	66	24	27	Mining activities	About 300m to 400m	East to west & sunny
04-Jun-12	Dolamandap Chhak	169	68	24	27	Mining activities	About 300m to 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Jun-12	Dolamandap Chhak	169	66	20	25	Mining activities	About 300m to 400m	Calm & cloudy rain fall
04-Jul-12	Dolamandap Chhak	150	60	22	25	Mining activities	About 300m to 400m	East to west & sunny
19-Jul-12	Dolamandap Chhak	102	51	18	22	Mining activities	About 300m to 400m	East to west, cloudy and rainfall
02-Aug-12	Dolamandap Chhak	104	82	20	31	Mining activities	About 300m to 400m	East to west, cloudy and rainfall
17-Aug-12	Dolamandap Chhak	116	91	21	35	Mining activities	About 300m to 400m	East to west, cloudy and rainfall
03-Sep-12	Dolamandap Chhak	104	95	24	38	Mining activities	About 300m to 400m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Sep-12	Dolamandap Chhak	110	71	20	24	Mining activities	About 300m to 400m	East to west & sunny
03-Oct-12	Dolamandap Chhak	92	52	15	17	Mining activities	About 300m to 400m	East to west cloudy and rainfall
18-Oct-12	Dolamandap Chhak	118	66	20	24	Mining activities	About 300m to 400m	East to west hot & sunny
01-Nov-12	Dolamandap Chhak	111	82	20	24	Mining activities	About 300m to 400m	South to North & cloudy
15-Nov-12	Dolamandap Chhak	157	95	21	24	Mining activities	About 300m to 400m	East to west & cloudy
03-Dec-12	Dolamandap Chhak	146	92	21	23	Mining activities	About 300m to 400m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Dec-12	Dolamandap Chhak	132	95	22	26	Mining activities	About 300m to 400m	East to west & sunny
02-Jan-13	Dolamandap Chhak	149	99	20	23	Mining activities	About 300m to 400m	East to west & sunny
17-Jan-13	Dolamandap Chhak	176	103	21	24	Mining activities	About 300m to 400m	South to north & sunny
04-Feb-13	Dolamandap Chhak	186	114	23	25	Mining activities	About 300m to 400m	South to north & sunny
18-Feb-13	Dolamandap Chhak	198	106	24	25	Mining activities	About 300m to 400m	East to west & sunny
04-Mar-13	Dolamandap Chhak	210	124	25	27	Mining activities	About 300m to 400m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Mar-13	Dolamandap Chhak	225	138	26	28	Mining activities	About 300m to 400m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Chhendipada OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
03-Apr-12	Near Fire Station	183	94	22	27	Mining activities	About 500m	East to west & sunny
18-Apr-12	Near Fire Station	222	83	26	32	Mining activities	About 500m	South to north & sunny
02-May-12	Near Fire Station	155	64	28	33	Mining activities	About 500m	South to north & sunny
17-May-12	Near Fire Station	163	72	28	32	Mining activities	About 500m	East to west & sunny
04-Jun-12	Near Fire Station	144	72	26	32	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Jun-12	Near Fire Station	157	68	22	27	Mining activities	About 500m	Calm & cloudy rain fall
05-Jul-12	Near Fire Station	175	66	24	29	Mining activities	About 500m	East to west & sunny
19-Jul-12	Near Fire Station	122	56	20	23	Mining activities	About 500m	East to west, cloudy and rainfall
02-Aug-12	Near Fire Station	134	79	25	39	Mining activities	About 500m	East to west, cloudy and rainfall
17-Aug-12	Near Fire Station	127	81	23	37	Mining activities	About 500m	East to west, cloudy and rainfall
03-Sep-12	Near Fire Station	118	91	20	35	Mining activities	About 500m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Sep-12	Near Fire Station	122	72	21	25	Mining activities	About 500m	East to west & sunny
03-Oct-12	Near Fire Station	102	55	17	20	Mining activities	About 500m	East to west cloudy and rainfall
18-Oct-12	Near Fire Station	132	71	20	24	Mining activities	About 500m	East to west hot & sunny
01-Nov-12	Near Fire Station	137	94	23	27	Mining activities	About 500m	South to North & cloudy
15-Nov-12	Near Fire Station	143	98	25	29	Mining activities	About 500m	East to west & cloudy
03-Dec-12	Near Fire Station	138	101	24	27	Mining activities	About 500m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Dec-12	Near Fire Station	267	115	25	27	Mining activities	About 500m	East to west & sunny
02-Jan-13	Near Fire Station	284	124	22	25	Mining activities	About 500m	East to west & sunny
17-Jan-13	Near Fire Station	295	118	24	27	Mining activities	About 500m	South to north & sunny
04-Feb-13	Near Fire Station	279	125	25	28	Mining activities	About 500m	South to north & sunny
18-Feb-13	Near Fire Station	264	117	23	26	Mining activities	About 500m	East to west & sunny
04-Mar-13	Near Fire Station	272	136	24	26	Mining activities	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Mar-13	Near Fire Station	261	129	25	27	Mining activities	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Chhendipada OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
03-Apr-12	Near Site Office	273	112	24	30	Mining activities	About 400m	East to west & sunny
18-Apr-12	Near Site Office	384	131	34	42	Mining activities	About 400m	South to north & sunny
02-May-12	Near Site Office	278	108	36	42	Mining activities	About 400m	South to north & sunny
17-May-12	Near Site Office	255	116	36	42	Mining activities	About 400m	East to west & sunny
04-Jun-12	Near Site Office	234	106	33	38	Mining activities	About 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Jun-12	Near Site Office	182	89	28	34	Mining activities	About 400m	Calm & cloudy rain fall
04-Jul-12	Near Site Office	205	71	28	34	Mining activities	About 400m	East to west & sunny
19-Jul-12	Near Site Office	158	70	24	29	Mining activities	About 400m	East to west, cloudy and rainfall
02-Aug-12	Near Site Office	169	95	23	34	Mining activities	About 400m	East to west, cloudy and rainfall
17-Aug-12	Near Site Office	151	93	20	39	Mining activities	About 400m	East to west, cloudy and rainfall
03-Sep-12	Near Site Office	137	97	23	34	Mining activities	About 400m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Sep-12	Near Site Office	160	95	26	31	Mining activities	About 400m	East to west & sunny
03-Oct-12	Near Site Office	144	62	22	26	Mining activities	About 400m	East to west cloudy and rainfall
18-Oct-12	Near Site Office	189	83	24	31	Mining activities	About 400m	East to west hot & sunny
01-Nov-12	Near Site Office	176	99	25	30	Mining activities	About 400m	South to North & cloudy
15-Nov-12	Near Site Office	154	91	23	26	Mining activities	About 400m	East to west & cloudy
03-Dec-12	Near Site Office	162	94	25	29	Mining activities	About 400m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Dec-12	Near Site Office	176	104	26	28	Mining activities	About 400m	East to west & sunny
02-Jan-13	Near Site Office	164	101	24	26	Mining activities	About 400m	East to west & sunny
17-Jan-13	Near Site Office	152	97	26	28	Mining activities	About 400m	South to north & sunny
04-Feb-13	Near Site Office	179	99	26	29	Mining activities	About 400m	South to north & sunny
18-Feb-13	Near Site Office	185	112	25	27	Mining activities	About 400m	East to west & sunny
04-Mar-13	Near Site Office	197	119	26	29	Mining activities	About 400m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Mar-13	Near Site Office	210	120	24	26	Mining activities	About 400m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

Project : **Chhendipada OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
03-Apr-12	Mamuria sahi	159	65	20	24	Mining activities	About 500m	East to west & sunny
18-Apr-12	Mamuria sahi	179	74	22	26	Mining activities	About 500m	South to north & sunny
02-May-12	Mamuria sahi	136	65	24	27	Mining activities	About 500m	South to north & sunny
17-May-12	Mamuria sahi	147	68	24	27	Mining activities	About 500m	East to west & sunny
04-Jun-12	Mamuria sahi	135	61	24	27	Mining activities	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

19-Jun-12	Mamuria sahi	119	55	18	22	Mining activities	About 500m	Calm & cloudy rain fall
04-Jul-12	Mamuria sahi	148	56	19	21	Mining activities	About 500m	East to west & sunny
19-Jul-12	Mamuria sahi	94	47	17	20	Mining activities	About 500m	East to west, cloudy and rainfall
02-Aug-12	Mamuria sahi	110	64	28	36	Mining activities	About 500m	East to west, cloudy and rainfall
17-Aug-12	Mamuria sahi	103	86	25	32	Mining activities	About 500m	East to west, cloudy and rainfall
03-Sep-12	Mamuria sahi	129	101	25	39	Mining activities	About 500m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Sep-12	Mamuria sahi	101	64	18	21	Mining activities	About 500m	East to west & sunny
03-Oct-12	Mamuria sahi	95	48	14	16	Mining activities	About 500m	East to west cloudy and rainfall
18-Oct-12	Mamuria sahi	133	68	19	22	Mining activities	About 500m	East to west hot & sunny
01-Nov-12	Mamuria sahi	129	85	21	25	Mining activities	About 500m	South to North & cloudy
15-Nov-12	Mamuria sahi	137	95	23	27	Mining activities	About 500m	East to west & cloudy
03-Dec-12	Mamuria sahi	125	99	22	26	Mining activities	About 500m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Bharatpur**

18-Dec-12	Mamuria sahi	147	93	23	25	Mining activities	About 500m	East to west & sunny
02-Jan-13	Mamuria sahi	158	102	24	27	Mining activities	About 500m	East to west & sunny
17-Jan-13	Mamuria sahi	189	101	25	28	Mining activities	About 500m	South to north & sunny
04-Feb-13	Mamuria sahi	195	109	26	29	Mining activities	About 500m	South to north & sunny
18-Feb-13	Mamuria sahi	217	128	27	30	Mining activities	About 500m	East to west & sunny
04-Mar-13	Mamuria sahi	237	142	28	30	Mining activities	About 500m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

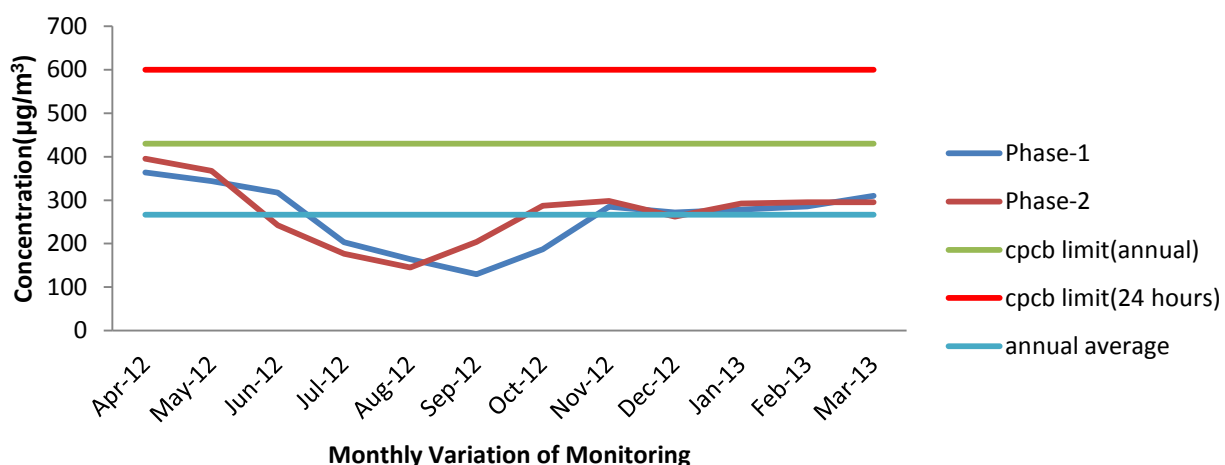
Area : **Bharatpur**

19-Mar-13	Mamuria sahi	249	157	29	31	Mining activities	About 500m	South to north & sunny

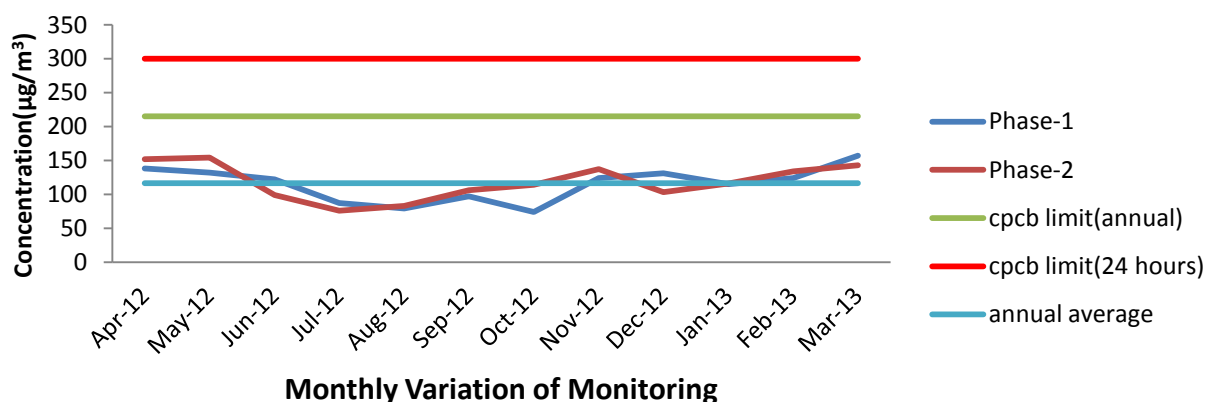


Air Quality Graph of Bharatpur OCP

Graph-1: SPM monitoring of Near civil maintenance office of Kalinga Colony/PR of Bharatpur OCP



Graph-2: RPM monitoring of Near civil maintenance office of Kalinga Colony/PR of Bharatpur OCP



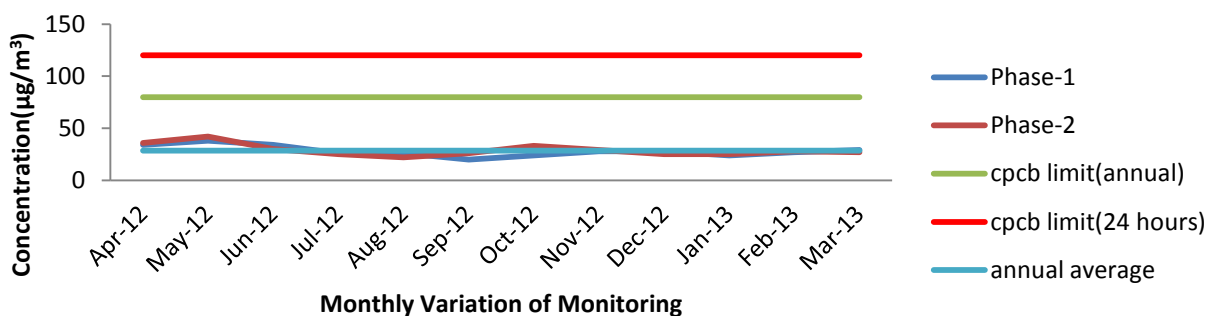
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

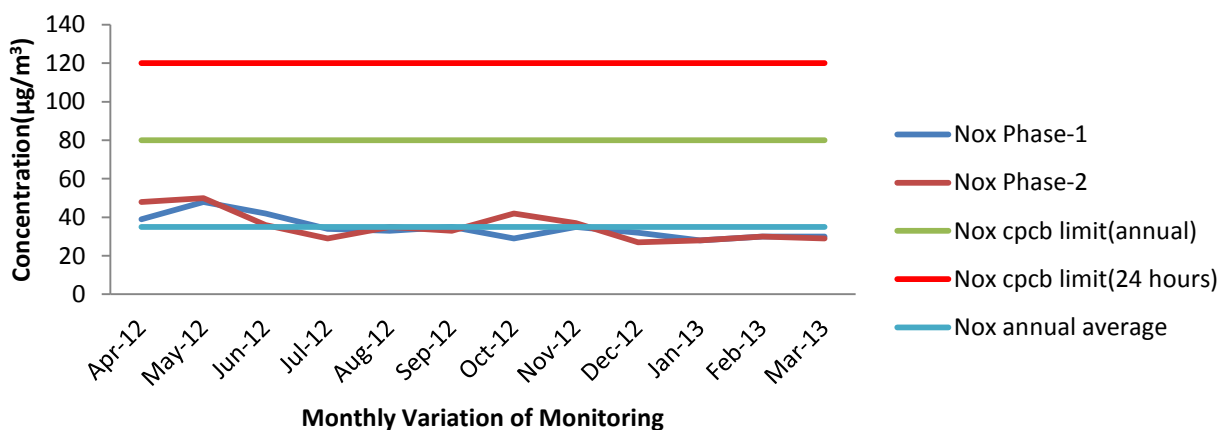


Air Quality Graph of Bharatpur OCP

Graph-3: So_x monitoring of Near civil maintenance office of Kalinga Colony/PR of Bharatpur OCP



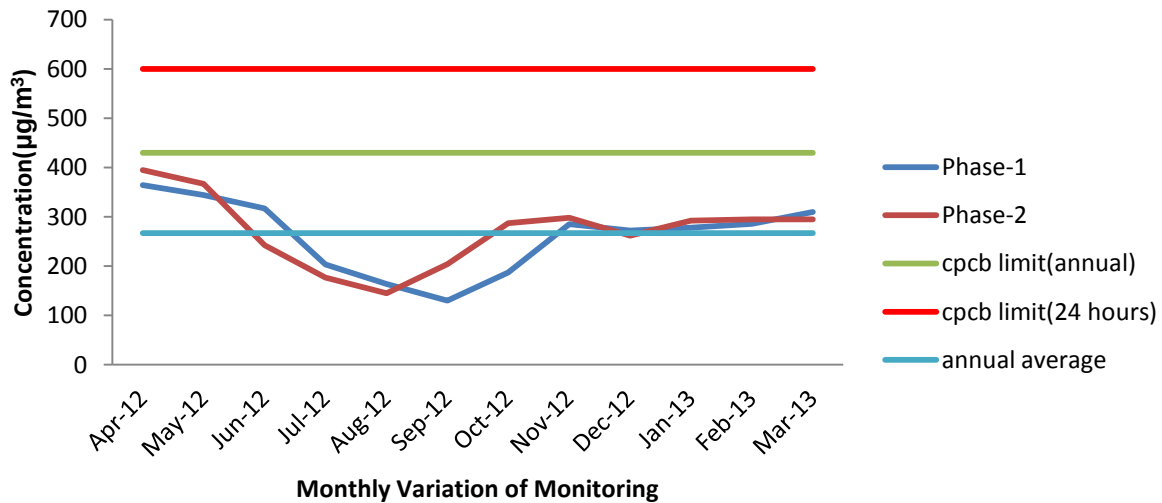
Graph-4: No_x monitoring of Near civil maintenance office of Kalinga Colony/PR of Bharatpur OCP



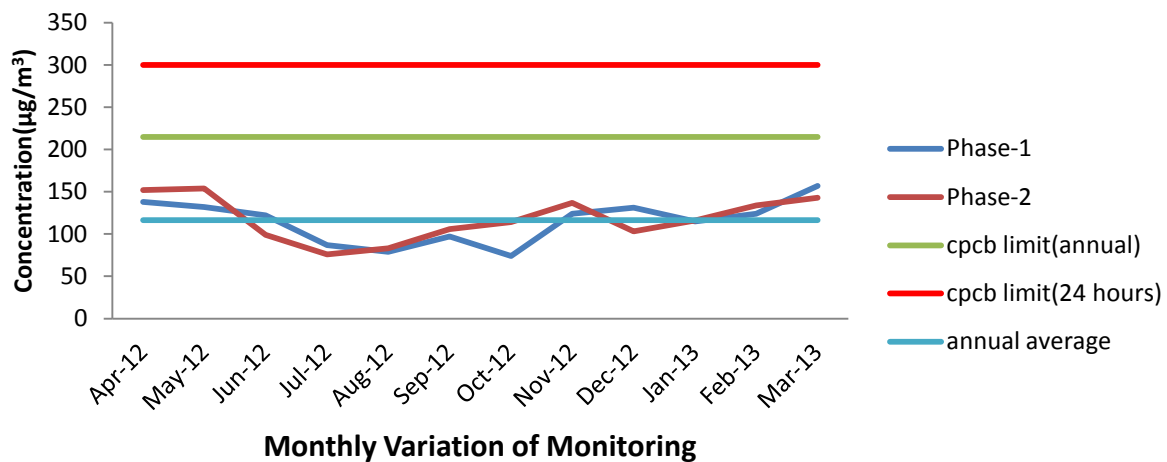


Air Quality Graph of Bharatpur OCP

Graph-5: SPM monitoring of On Backfill near reject dumpyard of Bharatpur OCP



Graph-6: RPM monitoring of On Backfill near reject dumpyard of Bharatpur OCP



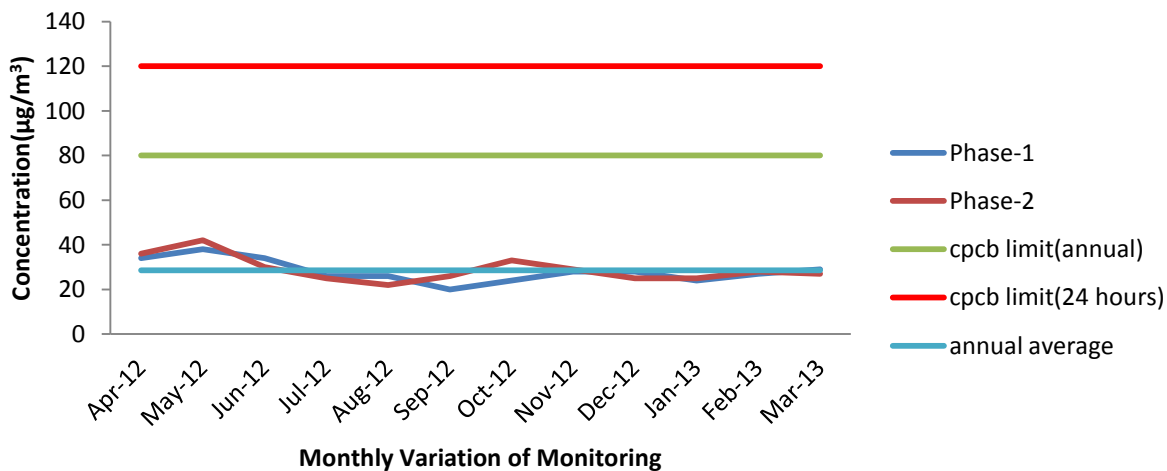
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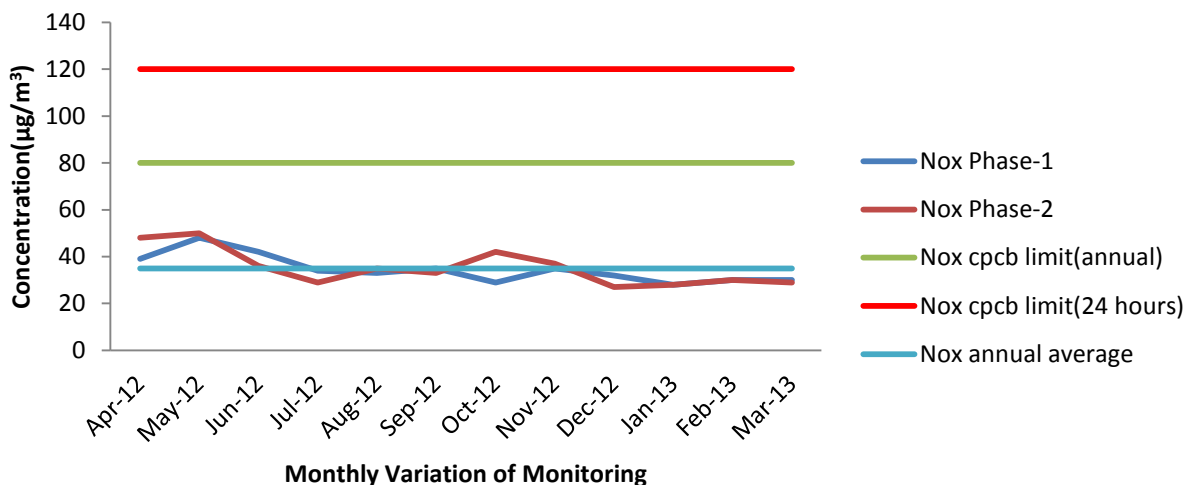


Air Quality Graph of Bharatpur OCP

Graph-7: SO_x monitoring of On Backfill near reject dumpyard of Bharatpur OCP



Graph-8: NO_x monitoring of On Backfill near reject dumpyard of Bharatpur OCP



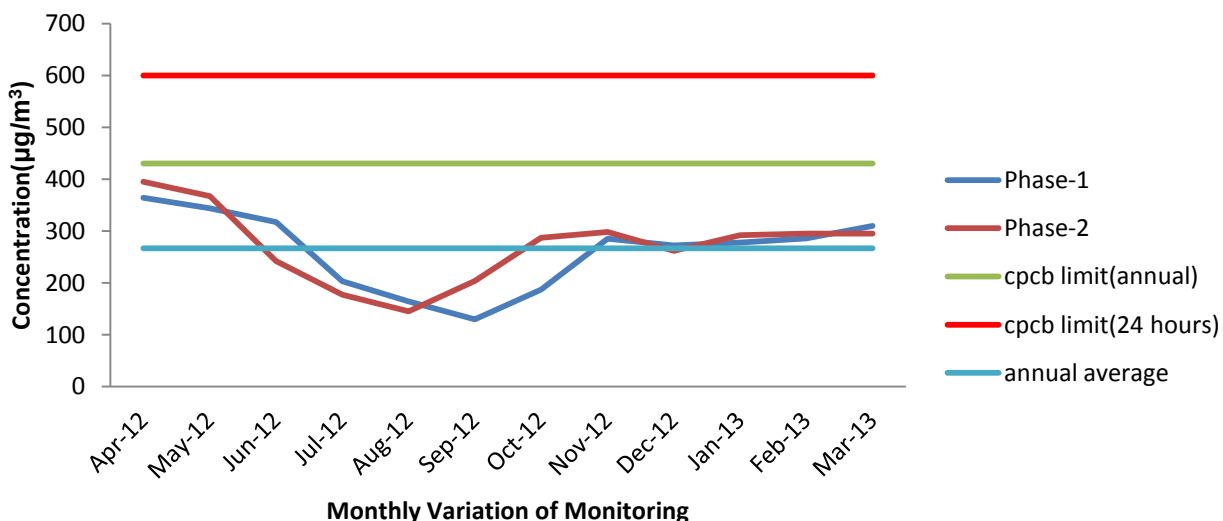
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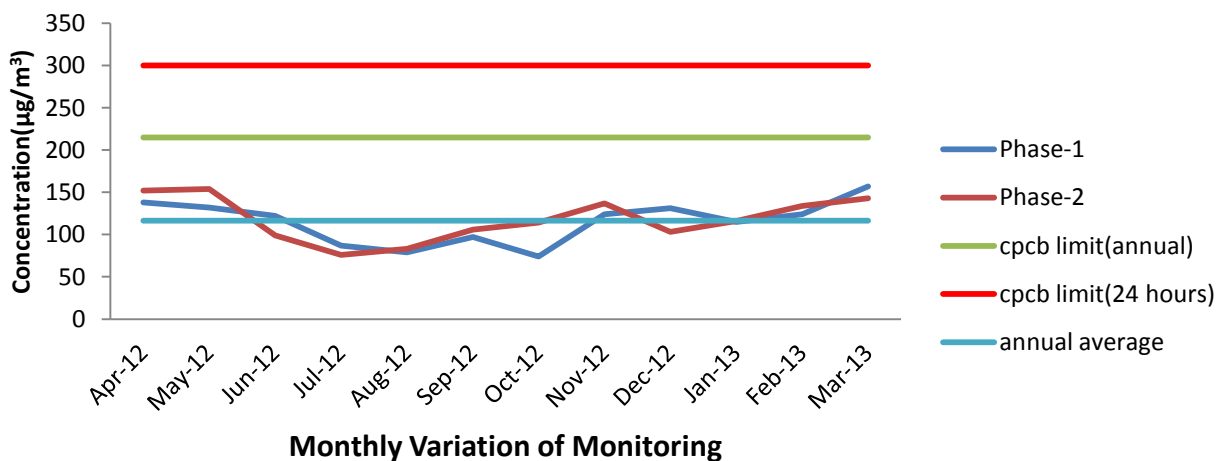


Air Quality Graph of Bharatpur OCP

Graph-9: SPM monitoring of Regional store of Bharatpur OCP



Graph-10: RPM monitoring of Regional store of Bharatpur OCP



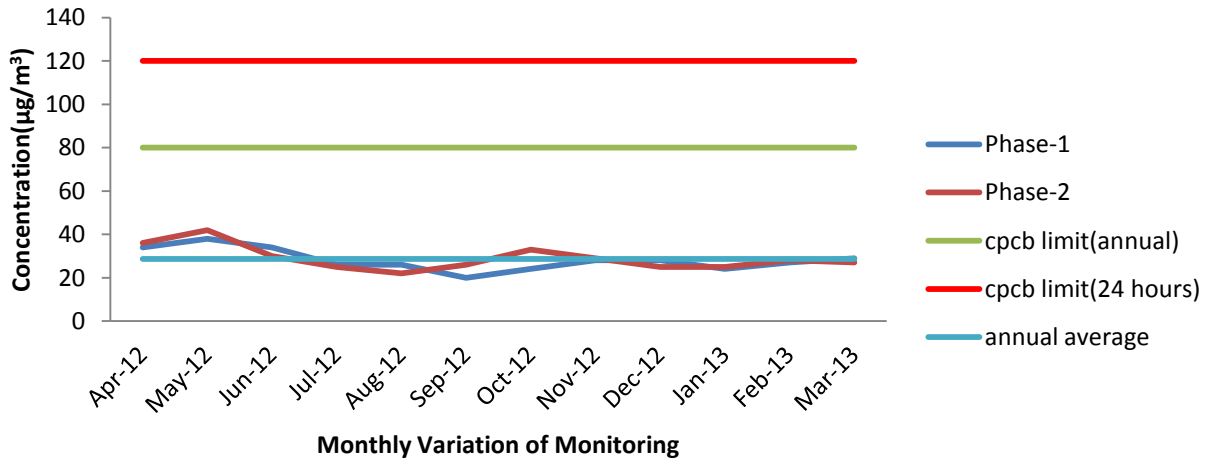
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

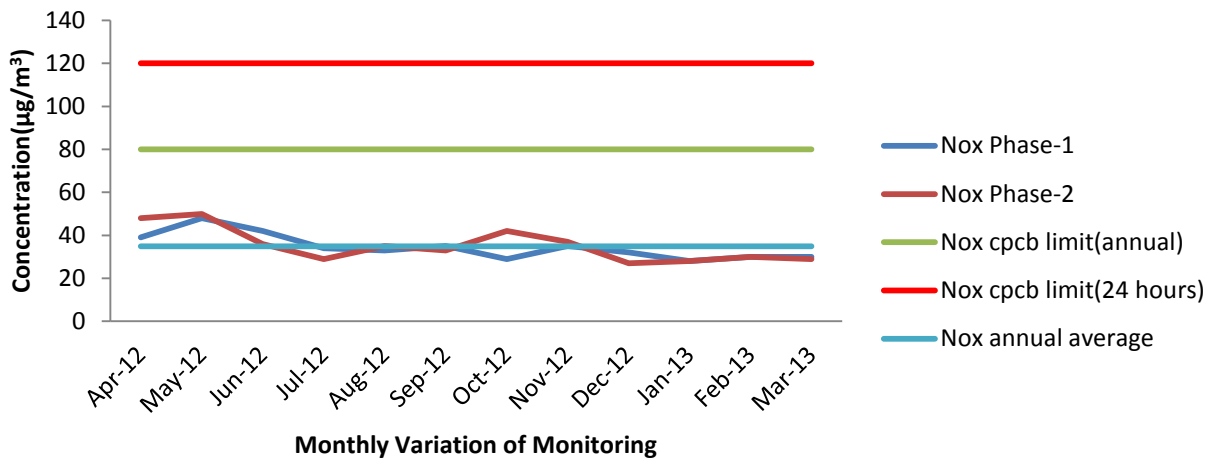


Air Quality Graph of Bharatpur OCP

Graph-11: SO_x monitoring of Regional store of Bharatpur OCP



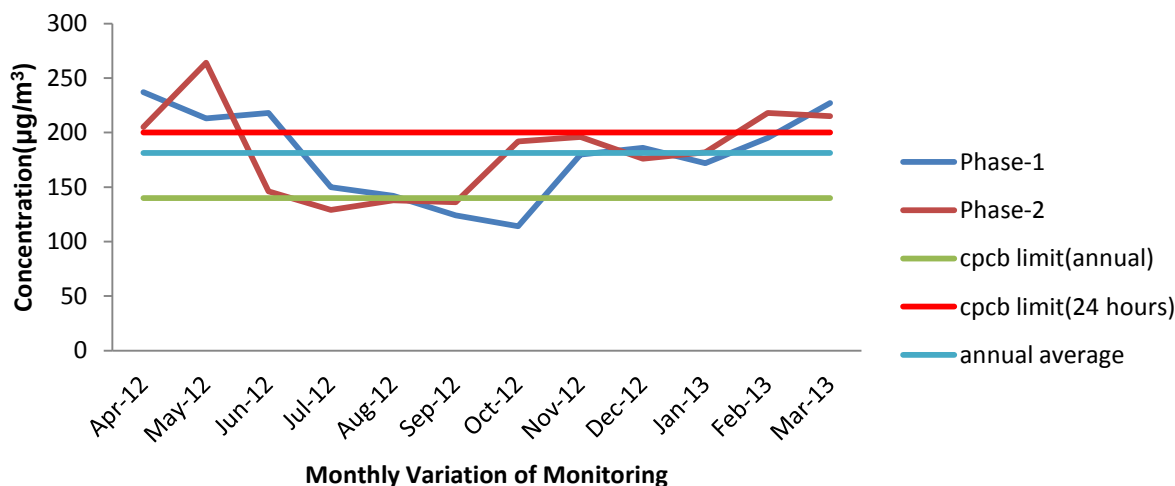
Graph-12: NO_x monitoring of Regional store of Bharatpur OCP



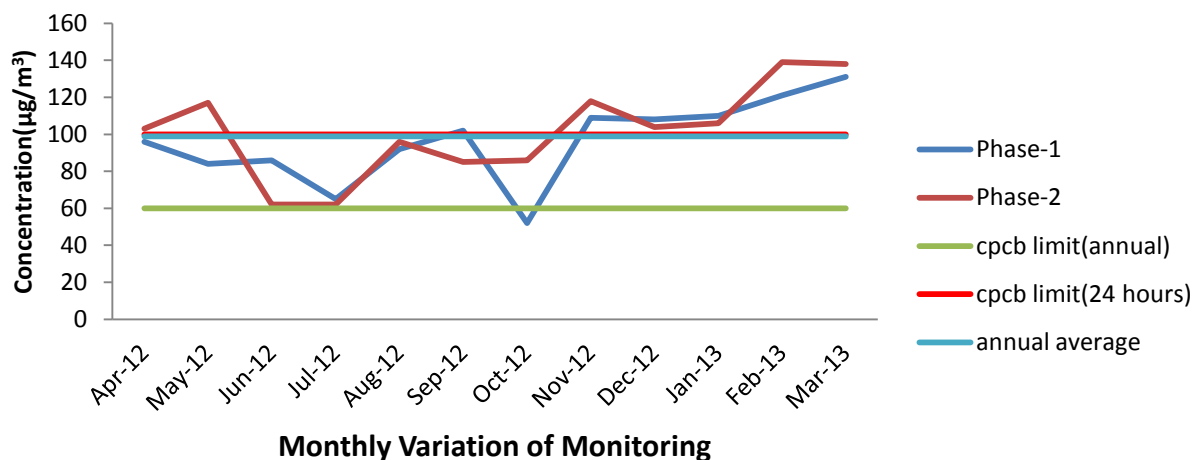


Air Quality Graph of Bharatpur OCP

Graph-13: SPM monitoring of Padmabatipur Village of Bharatpur OCP.



Graph-14: RPM monitoring of Padmabatipur Village of Bharatpur OCP.



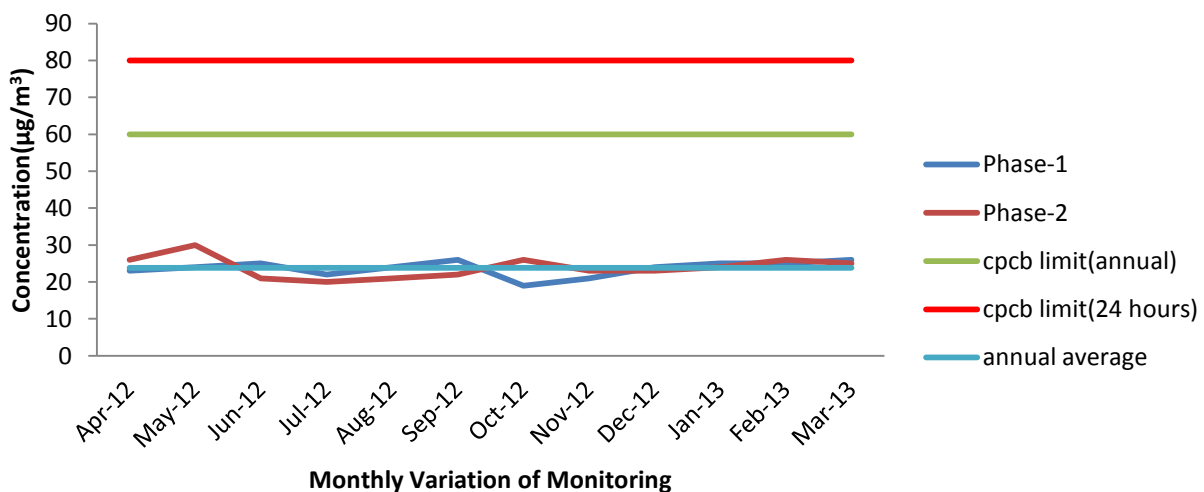
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

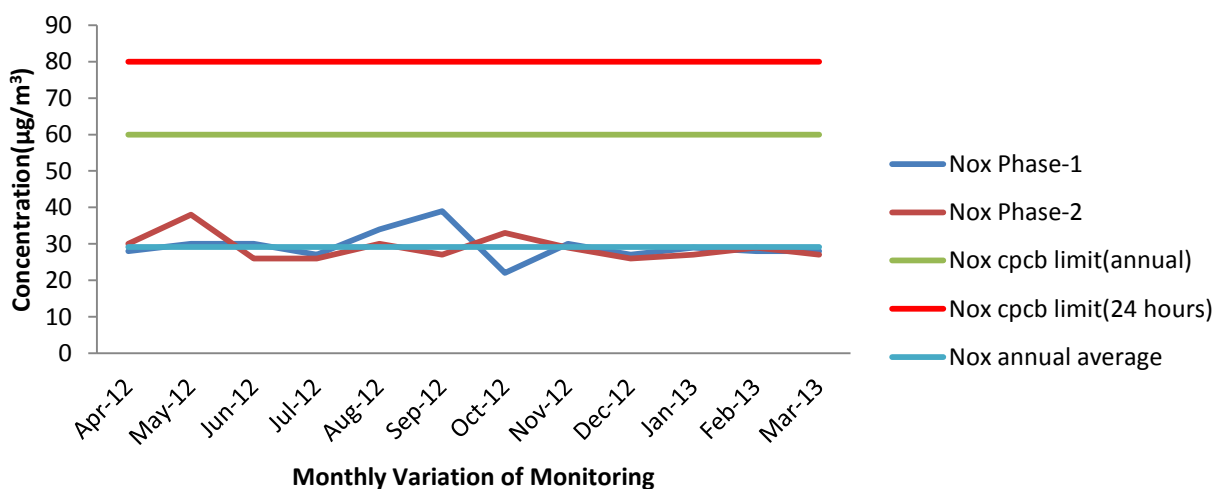


Air Quality Graph of Bharatpur OCP

Graph-15: SO_x monitoring of Padmabatipur Village of Bharatpur OCP.



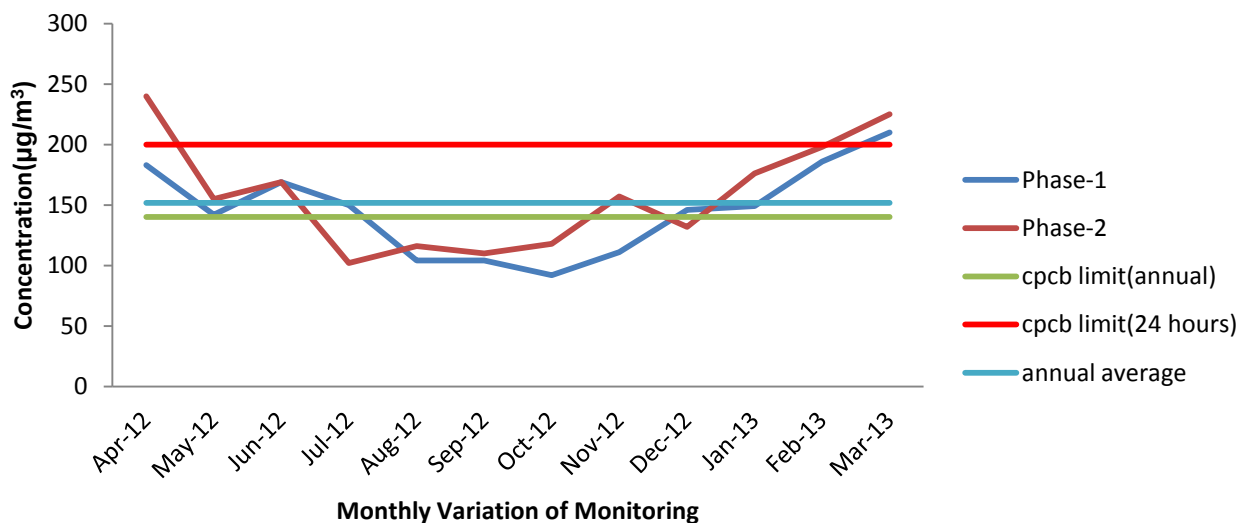
Graph-16: NO_x monitoring of Padmabatipur Village of Bharatpur OCP.



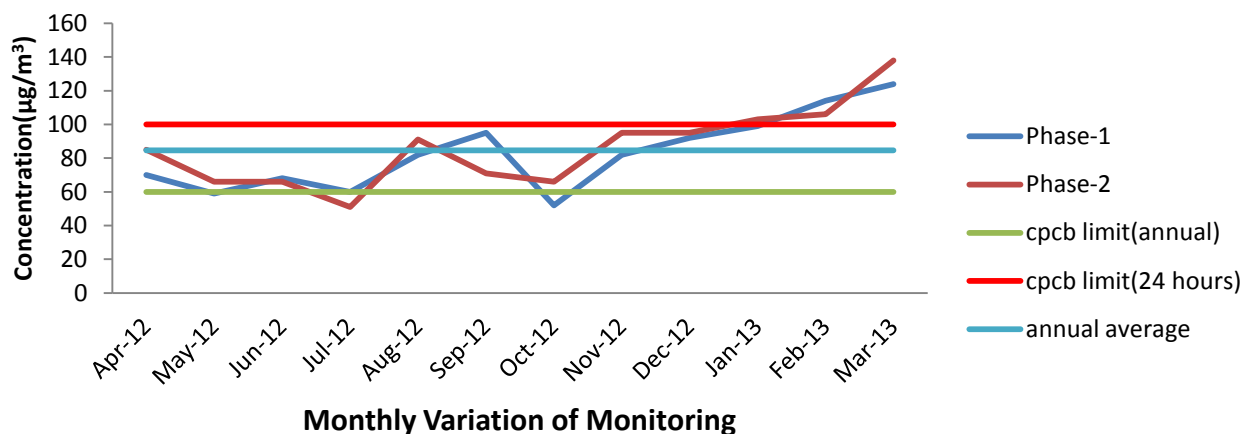


Air Quality Graph of Chhendipada OCP

Graph-9: SPM monitoring of Dolamandap Chhak of Chhendipada OCP



Graph-10: RPM monitoring of Dolamandap Chhak of Chhendipada OCP



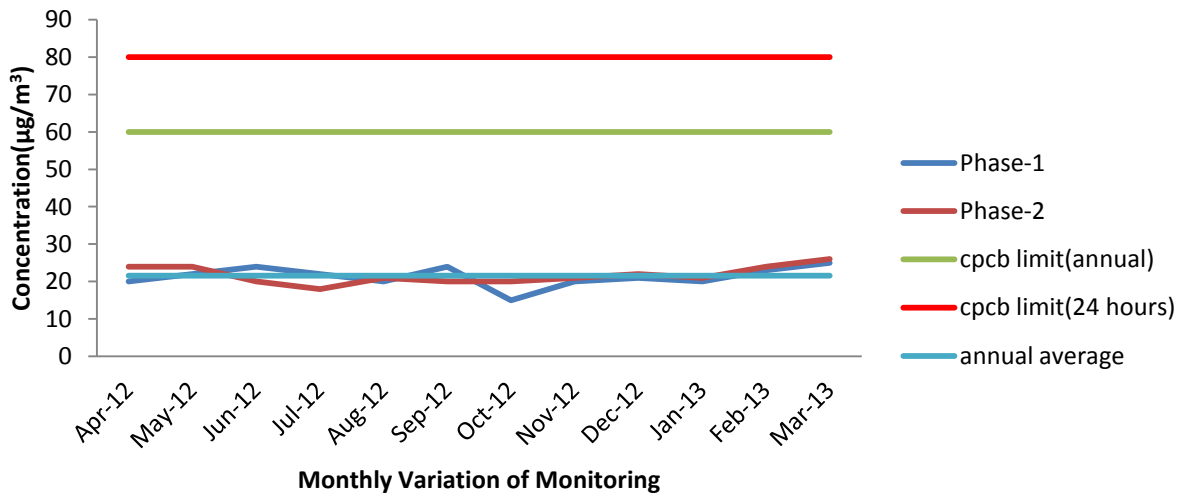
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

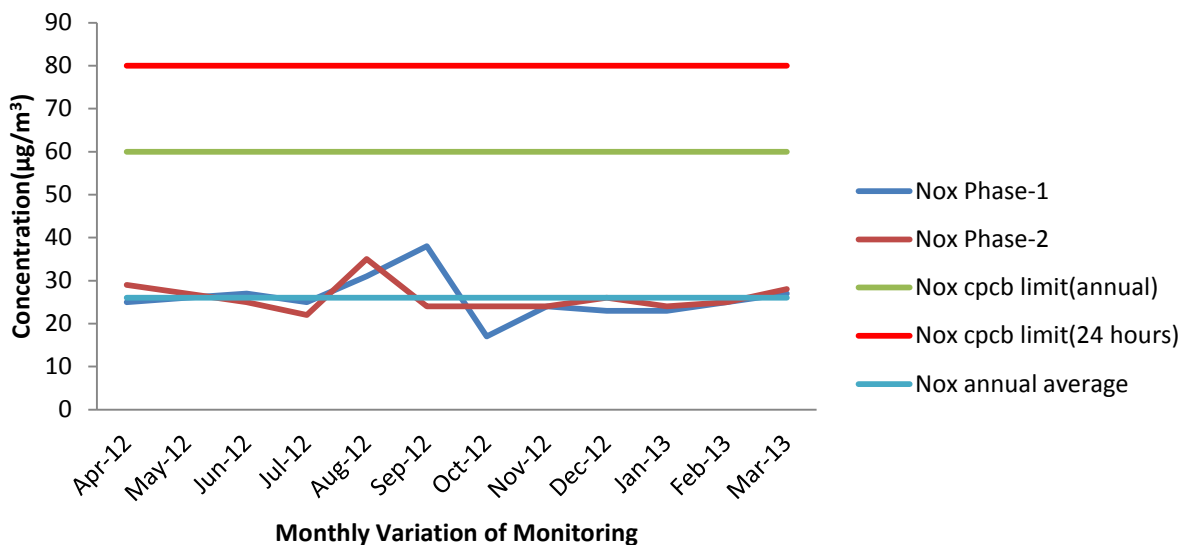


Air Quality Graph of Chhendipada OCP

Graph-11: SO_x monitoring of Dolamandap Chhak of Chhendipada OCP



Graph-12: NO_x monitoring of Dolamandap Chhak of Chhendipada OCP



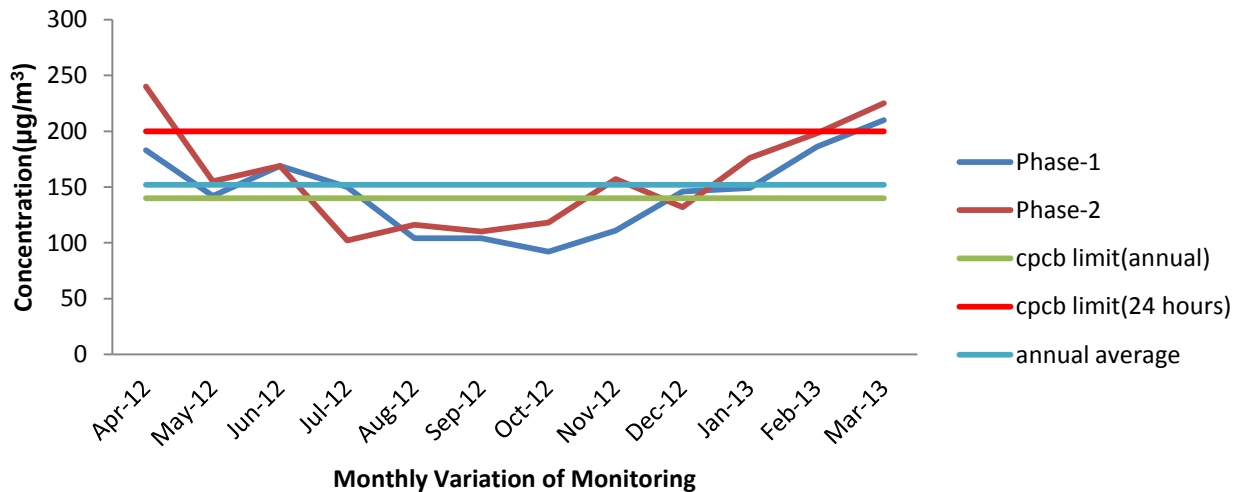
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

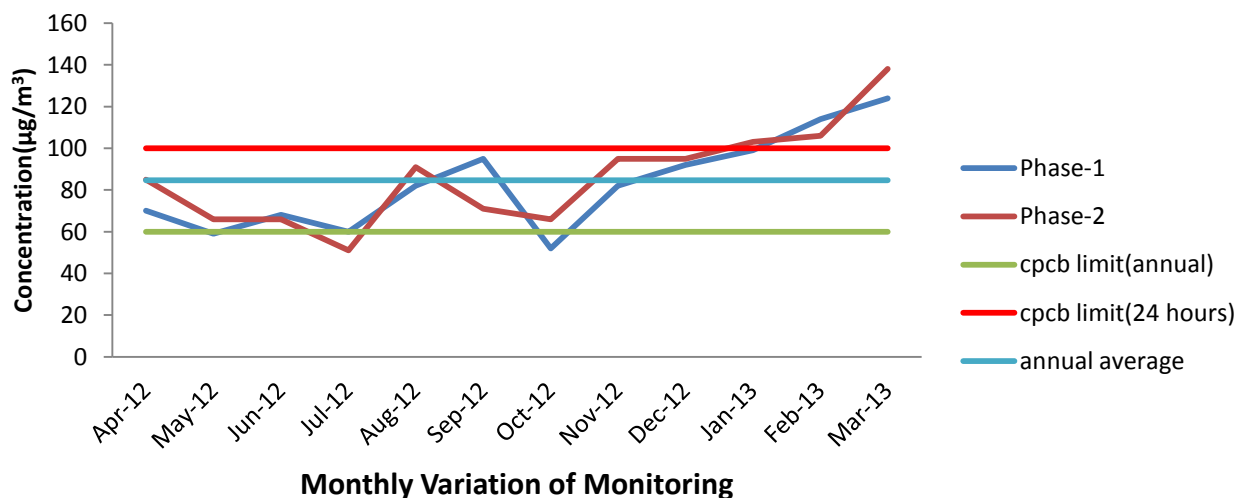


Air Quality Graph of Chhendipada OCP

Graph-1: SPM monitoring of Mamuria Sahiof Chhendipada OCP.



Graph-2: RPM monitoring of Mamuria Sahiof Chhendipada OCP.



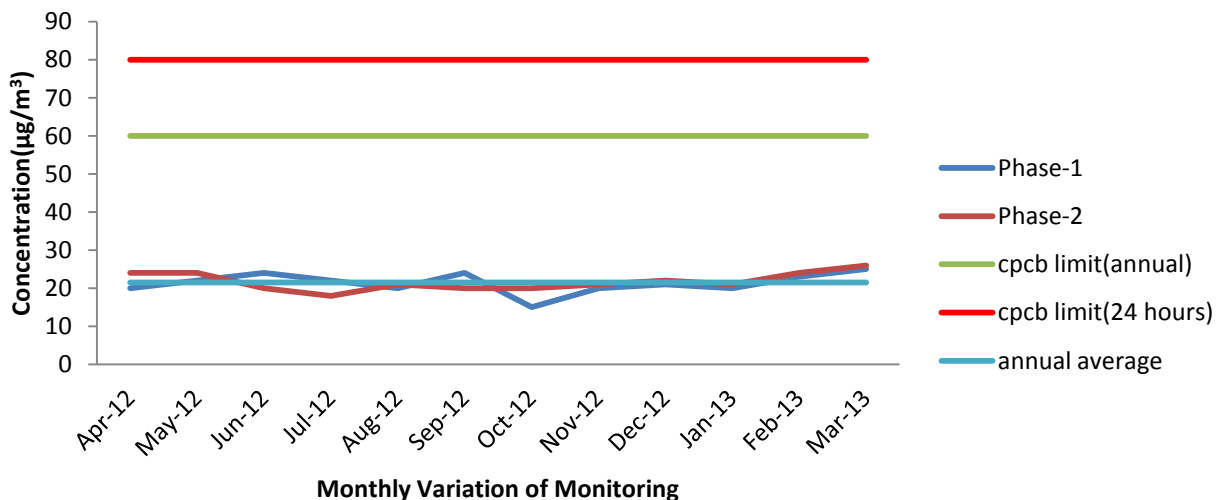
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

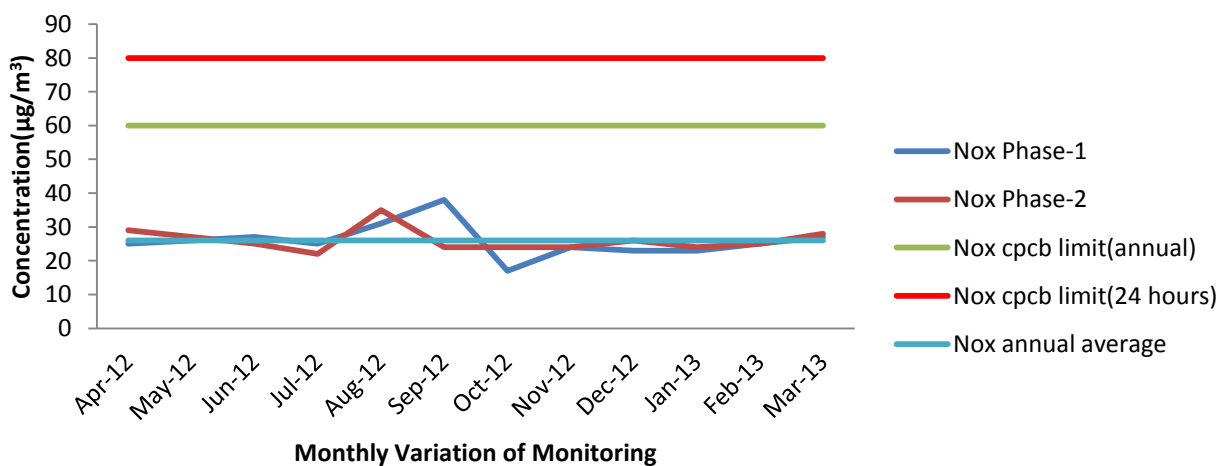


Air Quality Graph of Chhendipada OCP

Graph-3: SO_x monitoring of Mamuria Sahiof Chhendipada OCP.



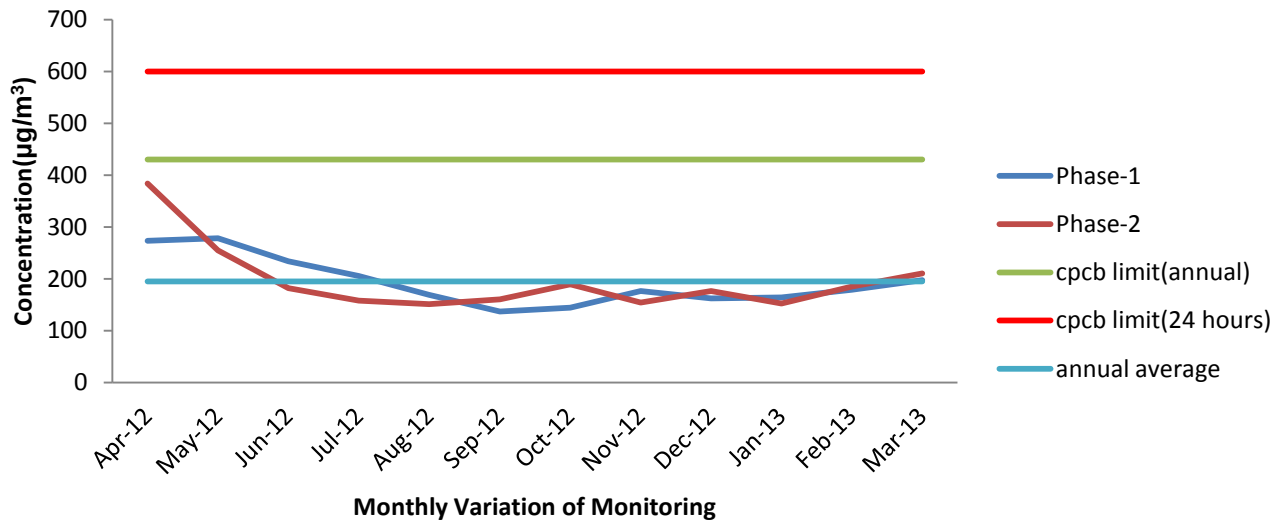
Graph-4: NO_x monitoring of Mamuria Sahiof Chhendipada OCP.



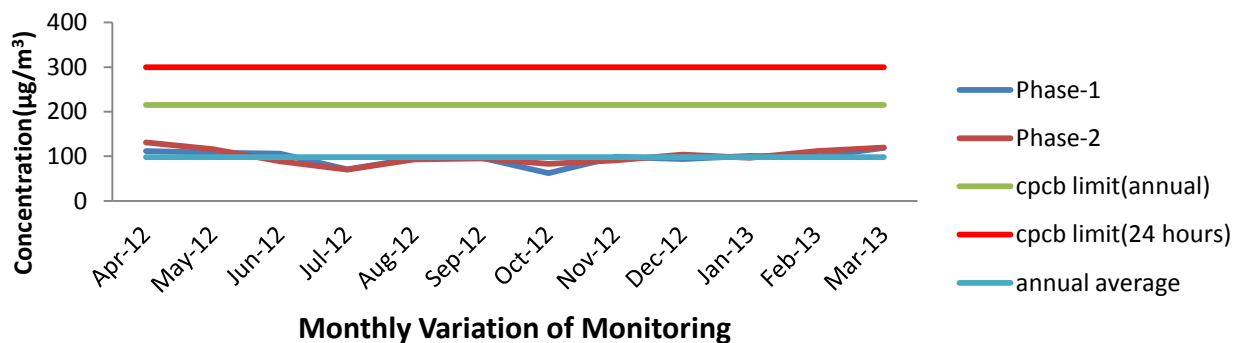


Air Quality Graph of Chhendipada OCP

Graph-5: SPM monitoring of Near Fire Station of Chhendipada OCP



Graph-6: RPM monitoring of Near Fire Station of Chhendipada OCP



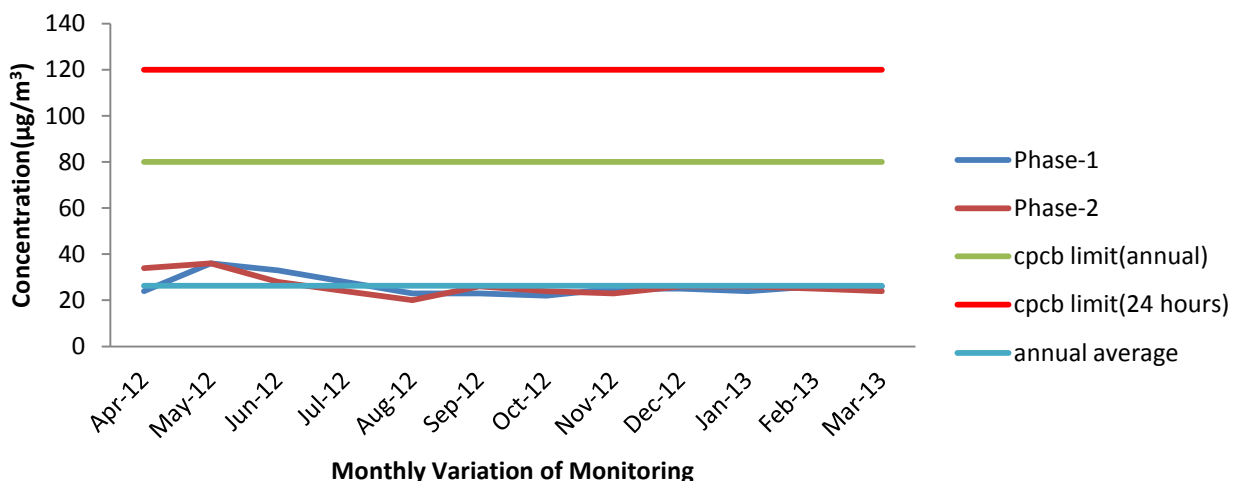
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

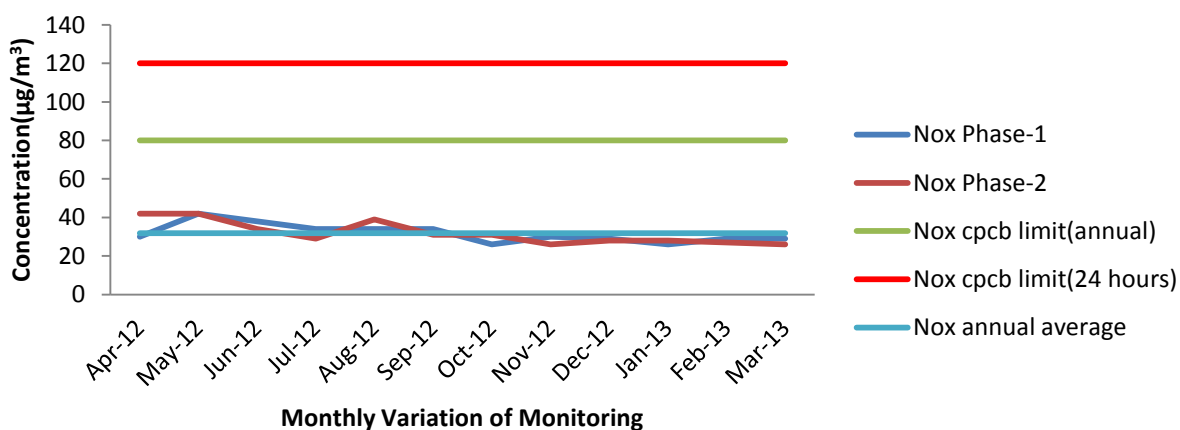


Air Quality Graph of Chhendipada OCP

Graph-7: SO_x monitoring of Near Fire Station of Chhendipada OCP



Graph-8: NO_x monitoring of Near Fire Station of Chhendipada OCP



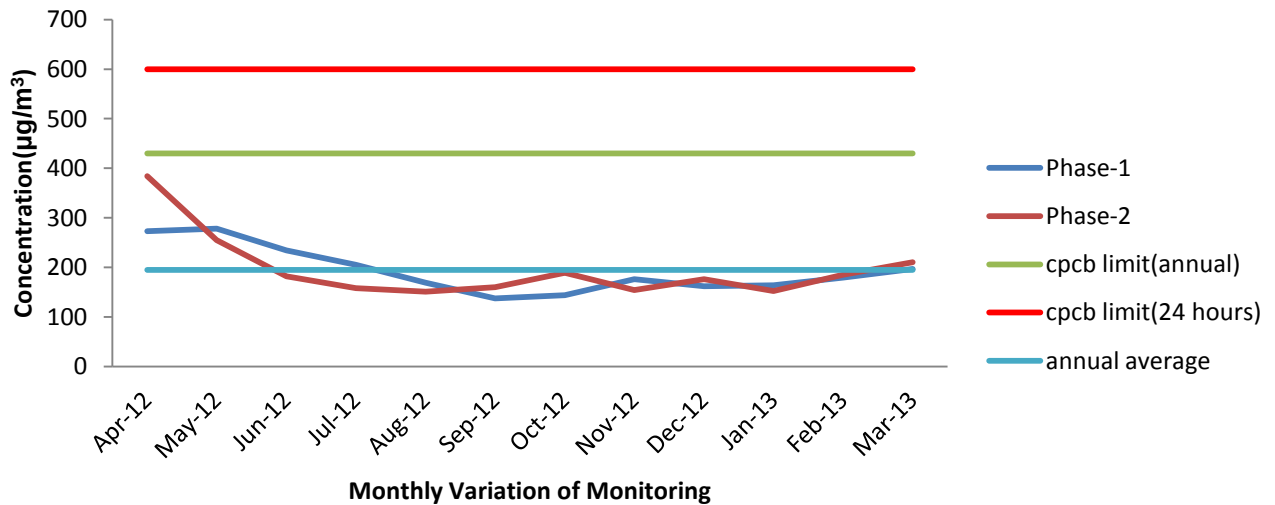
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

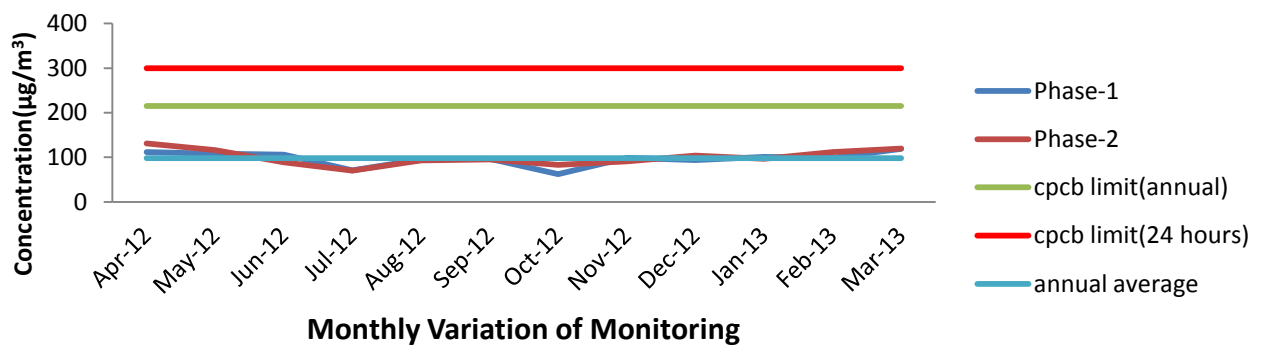


Air Quality Graph of Chhendipada OCP

Graph-13: SPM monitoring of Near Site Office of Chhendipada OCP



Graph-14: RPM monitoring of Near Site Office of Chhendipada OCP



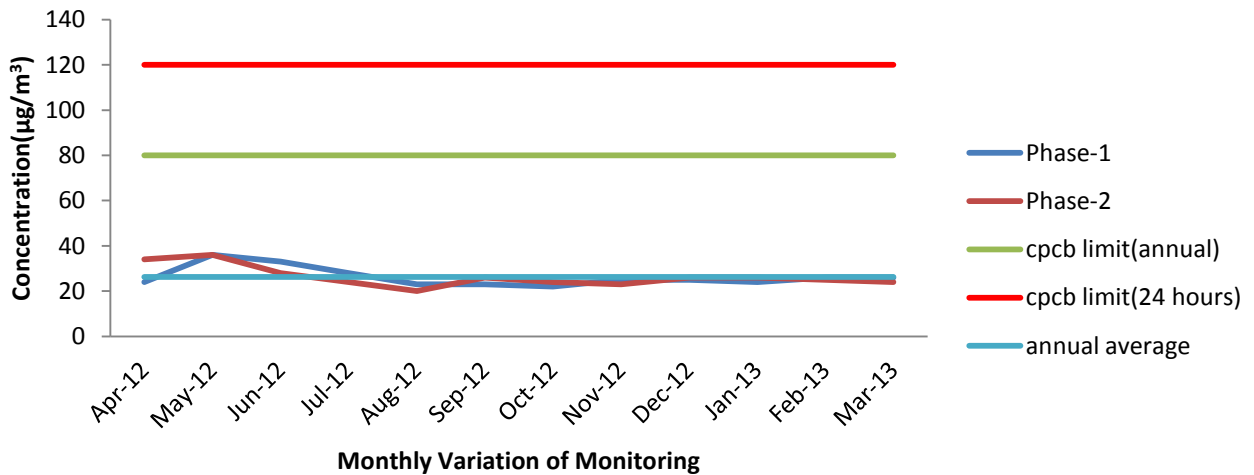
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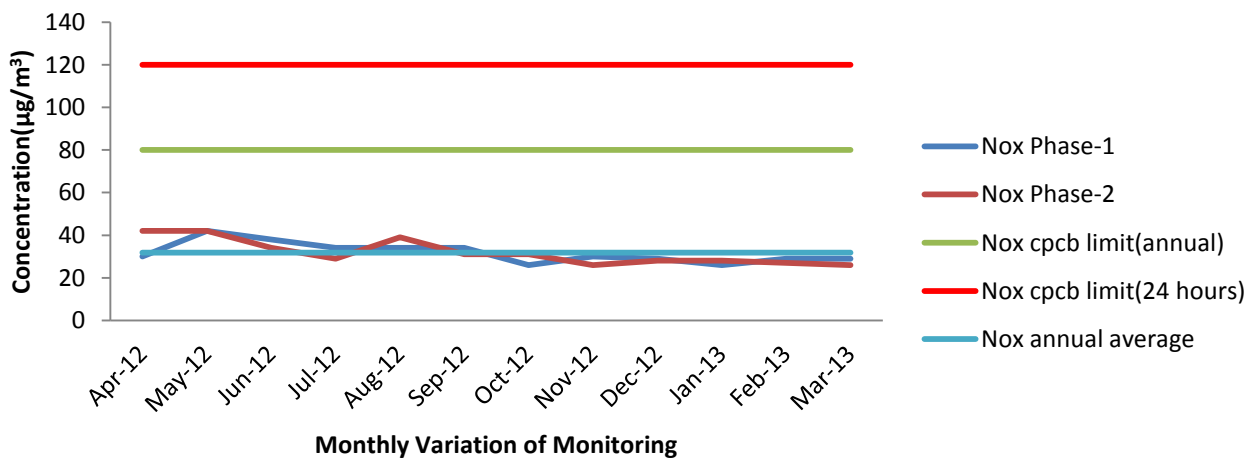


Air Quality Graph of Chhendipada OCP

Graph-15: SO_x monitoring of Near Site Office of Chhendipada OCP



Graph-16: NO_x monitoring of Near Site Office of Chhendipada OCP



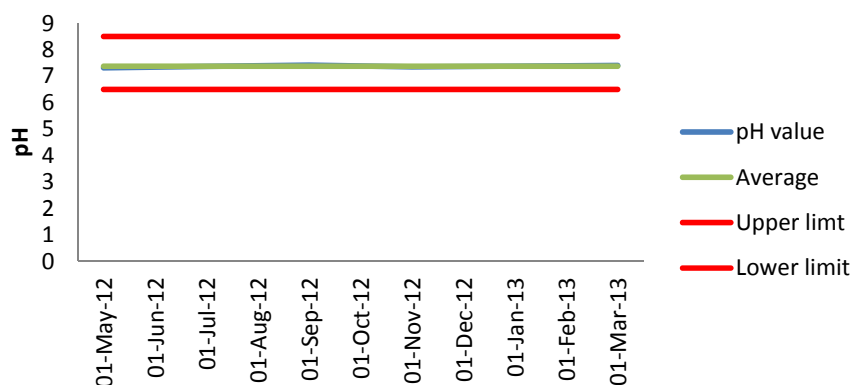
Area: Bharatpur Project: Chendipada OCP

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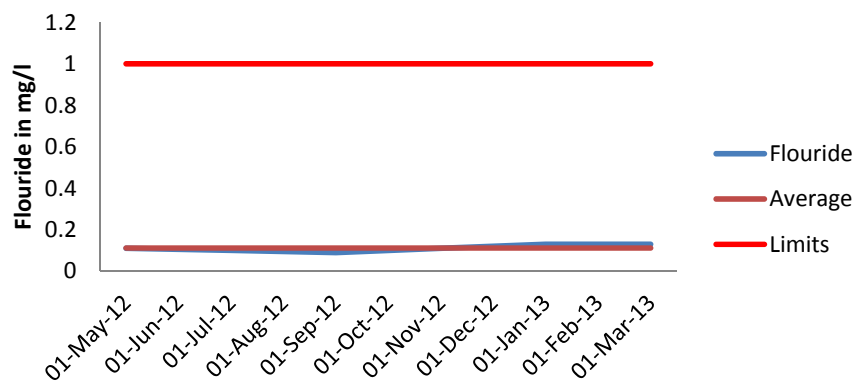
Area: Bharatpur OCP Project: Bharatpur OCP

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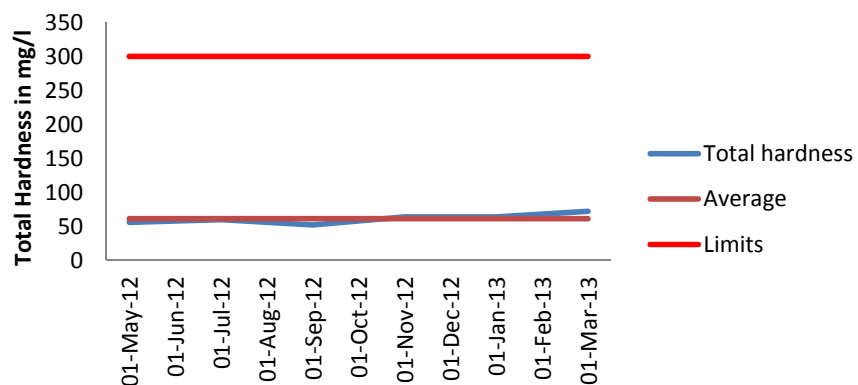
variation in pH at Tap Water in N S Nagar at Bharatpur OCP



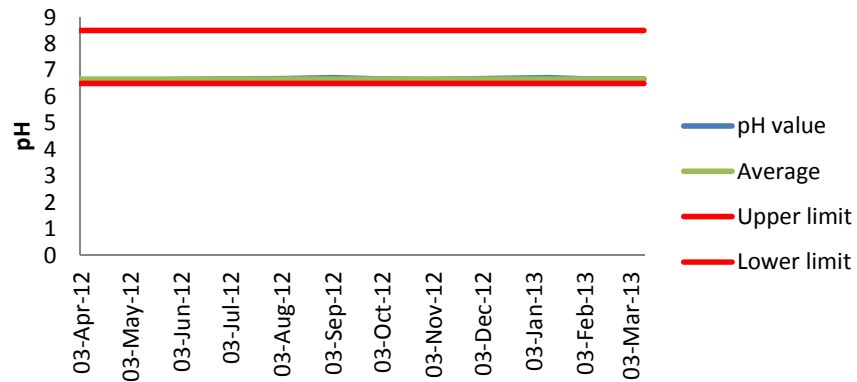
variation in Flouride at Tap Water in N S Nagar at Bharatpur OCP



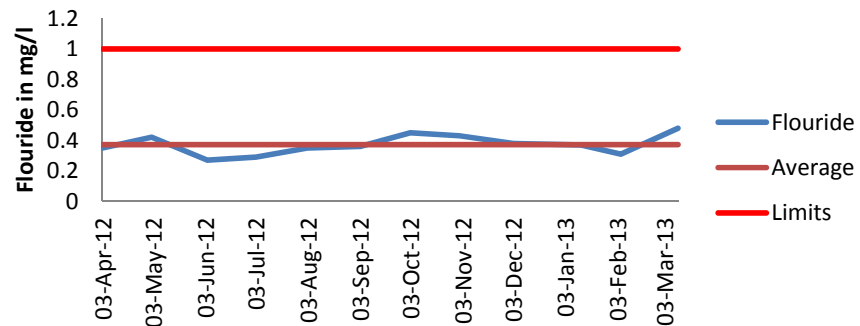
variation in Total Hardness at Tap Water in N S Nagar at Bharatpur OCP



variation in pH at Bore well water at site office in Chendipada OCP



variation in Flouride at Bore well water at site office in Chendipada OCP



variation in Total Hardness at Bore well water at site office in Chendipada OCP

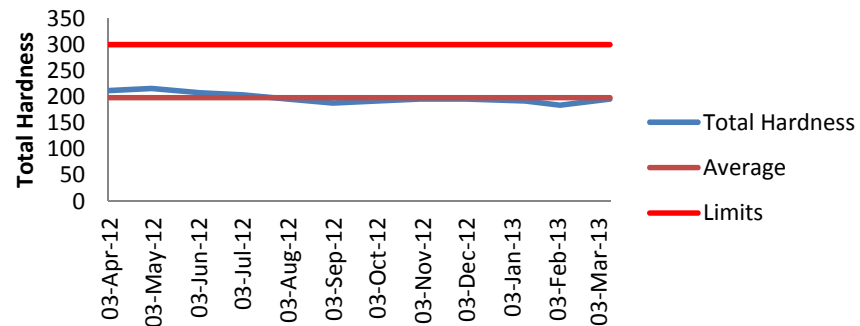


TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

27-Sep-12	DETP : Bharatpur clarifier Outlet	8.35	-	14	-	8	-
10-Oct-12	DETP : Bharatpur clarifier Outlet	8.40	-	16	-	9	-
26-Oct-12	DETP : Bharatpur clarifier Outlet	8.22	-	16	-	10	-
08-Nov-12	DETP : Bharatpur clarifier Outlet	8.15	-	12	-	8	-
23-Nov-12	DETP : Bharatpur clarifier Outlet	8.15	-	10	-	6	-
10-Dec-12	DETP : Bharatpur clarifier Outlet	8.10	-	14	-	8	-
25-Dec-12	DETP : Bharatpur clarifier Outlet	8.15	-	16	-	10	-
10-Jan-13	DETP : Bharatpur clarifier Outlet	8.00	-	16	-	9	-
25-Jan-13	DETP : Bharatpur clarifier Outlet	7.90	-	12	-	7	-
11-Feb-13	DETP : Bharatpur clarifier Outlet	7.80	-	14	-	8	-
26-Feb-13	DETP : Bharatpur clarifier Outlet	7.95	-	14	-	10	-
09-Mar-13	DETP : Bharatpur clarifier Outlet	7.70	-	10	-	6	-

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

22-Jun-12	Inlet of STP	7.30	<1.0	22	30		
11-Sep-12	Inlet of STP	7.35		24		10	
10-Dec-12	Inlet of STP	7.42	-	26	40	-	-
25-Mar-13	Inlet of STP	7.42	-	26	-	10	-
06-Apr-12	Mine discharge at the point of confluence with Bangaru nulla	8.82	<1.0	40	60		2.1
20-Apr-12	Mine discharge at the point of confluence with Bangaru nulla	8.90	<1.0	36	55		2.2
05-May-12	Mine discharge at the point of confluence with Bangaru nulla	8.80	<1.0	36	55		2.0
22-May-12	Mine discharge at the point of confluence with Bangaru nulla	8.70	<1.0	32	50		1.9
07-Jul-12	Mine discharge at the point of confluence with Bangaru nulla	7.27	<1.0	32	50		2.2
24-Jul-12	Mine discharge at the point of confluence with Bangaru nulla	7.40	<1.0	36	50		2.1
11-Aug-12	Mine discharge at the point of confluence with Bangaru nulla	7.47	<1.0	38	55		2.2
24-Aug-12	Mine discharge at the point of confluence with Bangaru nulla	7.55	<1.0	36	50		2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

11-Sep-12	Mine discharge at the point of confluence with Bangaru nulla	7.55	<1.0	34	50		2.1
27-Sep-12	Mine discharge at the point of confluence with Bangaru nulla	7.72	<1.0	36	55		2.2
10-Oct-12	Mine discharge at the point of confluence with Bangaru nulla	7.65	<1.0	40	60		2.3
26-Oct-12	Mine discharge at the point of confluence with Bangaru nulla	7.85	<1.0	40	60		2.3
08-Nov-12	Mine discharge at the point of confluence with Bangaru nulla	7.75	<1.0	38	55		2.2
23-Nov-12	Mine discharge at the point of confluence with Bangaru nulla	7.72	<1.0	36	55		2.2
10-Dec-12	Mine discharge at the point of confluence with Bangaru nulla	7.62	<1.0	32	50		2.1
25-Dec-12	Mine discharge at the point of confluence with Bangaru nulla	7.70	<1.0	26	55		2.2
10-Jan-13	Mine discharge at the point of confluence with Bangaru nulla	7.55	<1.0	34	55		2.2
25-Jan-13	Mine discharge at the point of confluence with Bangaru nulla	7.44	<1.0	32	50		2.1
11-Feb-13	Mine discharge at the point of confluence with Bangaru nulla	7.36	<1.0	34	50		2.2
26-Feb-13	Mine discharge at the point of confluence with Bangaru nulla	7.45	<1.0	32	50		2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

09-Mar-13	Mine discharge at the point of confluence with Bangaru nulla	7.30	<1.0	38	55		2.3
25-Mar-13	Mine discharge at the point of confluence with Bangaru nulla	7.25	<1.0	40	60		2.2
03-Apr-12	Oil & Grease trap Outlet	8.69	<1.0	22	35	-	-
20-Apr-12	Oil & Grease trap Outlet	8.55	<1.0	24	40	-	-
07-May-12	Oil & Grease trap Outlet	8.60	<1.0	18	30	-	-
22-May-12	Oil & Grease trap Outlet	8.55	<1.0	22	35	-	-
06-Jun-12	Oil & Grease trap Outlet	8.48	<1.0	20	30	-	-
23-Jun-12	Oil & Grease trap Outlet	8.54	<1.0	24	35	-	-
07-Jul-12	Oil & Grease trap Outlet	8.38	<1.0	18	25	-	-
24-Jul-12	Oil & Grease trap Outlet	8.20	<1.0	20	30	-	-
11-Aug-12	Oil & Grease trap Outlet	8.15	<1.0	26	40	-	-
24-Aug-12	Oil & Grease trap Outlet	8.10	<1.0	30	45	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

11-Sep-12	Oil & Grease trap Outlet	8.00	<1.0	24	35	-	-
27-Sep-12	Oil & Grease trap Outlet	7.90	<1.0	28	40	-	-
10-Oct-12	Oil & Grease trap Outlet	7.80	<1.0	24	35	-	-
26-Oct-12	Oil & Grease trap Outlet	7.76	<1.0	30	45	-	-
08-Nov-12	Oil & Grease trap Outlet	7.70	<1.0	28	40	-	-
23-Nov-12	Oil & Grease trap Outlet	7.68	<1.0	26	40	-	-
10-Dec-12	Oil & Grease trap Outlet	7.58	<1.0	22	35	-	-
25-Dec-12	Oil & Grease trap Outlet	7.45	<1.0	24	40	-	-
10-Jan-13	Oil & Grease trap Outlet	7.45	<1.0	26	40	-	-
25-Jan-13	Oil & Grease trap Outlet	7.35	<1.0	22	35	-	-
11-Feb-13	Oil & Grease trap Outlet	7.28	<1.0	24	40	-	-
26-Feb-13	Oil & Grease trap Outlet	7.35	<1.0	22	35	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

09-Mar-13	Oil & Grease trap Outlet	7.22	<1.0	26	40	-	-
25-Mar-13	Oil & Grease trap Outlet	7.15	<1.0	24	35	-	-

Project : Chhendipada OCP

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
03-Apr-12	Outlet of mine discharge water	8.78	<1.0	38	60	-	2.2
18-Apr-12	Outlet of mine discharge water	8.85	<1.0	34	50	-	2.1
02-May-12	Outlet of mine discharge water	8.85	<1.0	34	50	-	2.1
21-May-12	Outlet of mine discharge water	8.90	<1.0	32	50	-	2.0
05-Jun-12	Outlet of mine discharge water	8.95	<1.0	30	45	-	1.9
19-Jun-12	Outlet of mine discharge water	8.86	<1.0	34	50	-	2.0
03-Jul-12	Outlet of mine discharge water	8.80	<1.0	32	50	-	2.1
19-Jul-12	Outlet of mine discharge water	8.65	<1.0	36	55	-	2.2
03-Aug-12	Outlet of mine discharge water	8.60	<1.0	40	60	-	2.3

TABLE--
EFFLUENT QUALITY DATA

Area : Bharatpur

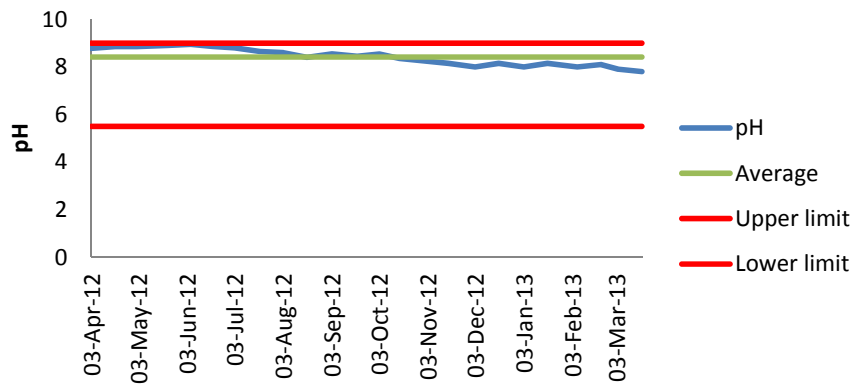
18-Aug-12	Outlet of mine discharge water	8.40	<1.0	36	55	-	2.2
03-Sep-12	Outlet of mine discharge water	8.55	<1.0	36	55	-	2.2
19-Sep-12	Outlet of mine discharge water	8.45	<1.0	32	50	-	2.1
03-Oct-12	Outlet of mine discharge water	8.54	<1.0	34	55	-	2.0
16-Oct-12	Outlet of mine discharge water	8.35	<1.0	34	55	-	2.3
01-Nov-12	Outlet of mine discharge water	8.25	<1.0	36	55	-	2.1
16-Nov-12	Outlet of mine discharge water	8.15	<1.0	34	50	-	2.0
03-Dec-12	Outlet of mine discharge water	8.00	<1.0	32	45	-	1.9
18-Dec-12	Outlet of mine discharge water	8.15	<1.0	36	50	-	2.0
03-Jan-13	Outlet of mine discharge water	8.00	<1.0	38	55	-	2.2
18-Jan-13	Outlet of mine discharge water	8.15	<1.0	40	60	-	2.3
06-Feb-13	Outlet of mine discharge water	8.00	<1.0	38	55	-	2.2

TABLE--
EFFLUENT QUALITY DATA

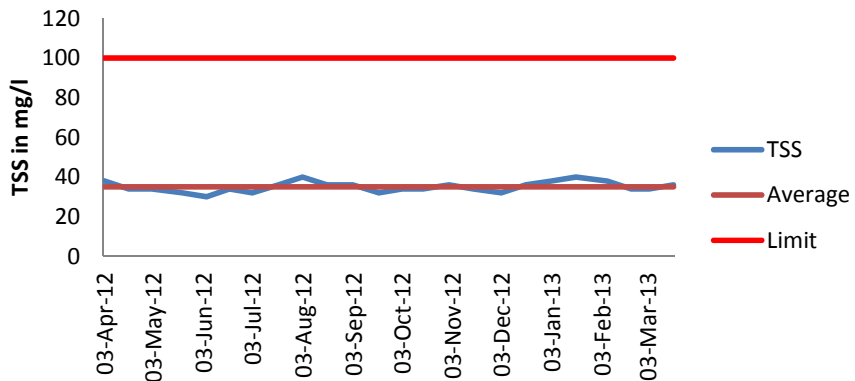
Area : Bharatpur

21-Feb-13	Outlet of mine discharge water	8.10	<1.0	34	50	-	2.1
04-Mar-13	Outlet of mine discharge water	7.90	<1.0	34	50	-	2.1
19-Mar-13	Outlet of mine discharge water	7.80	<1.0	36	55	-	2.2

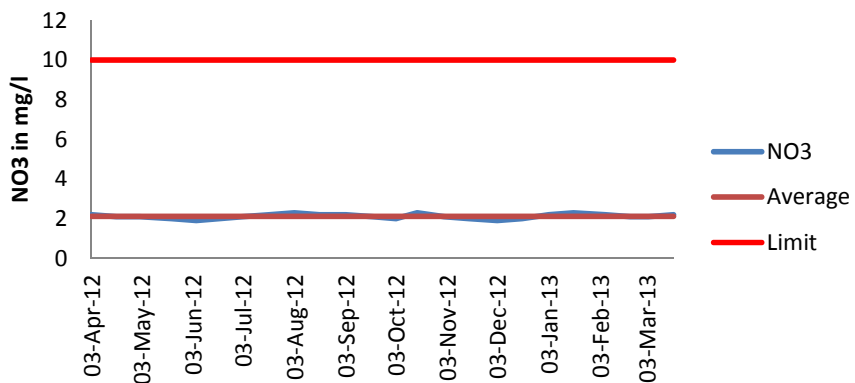
Variation in pH at Mine discharge outlet in Chendipada OCP



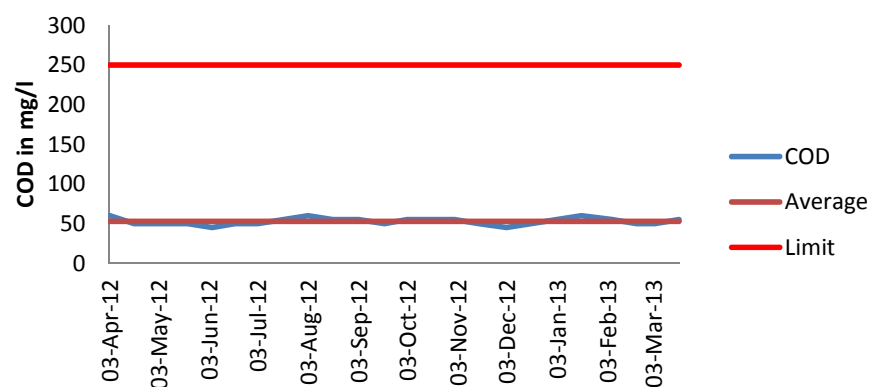
Variation in TSS at Mine discharge outlet in Chendipada OCP



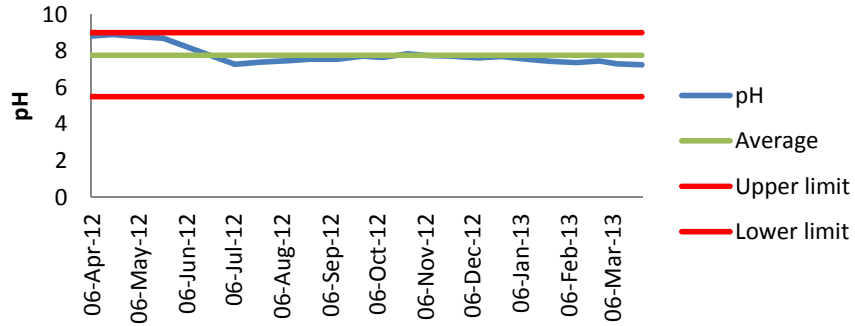
Variation in NO3 at Mine discharge outlet in Chendipada OCP



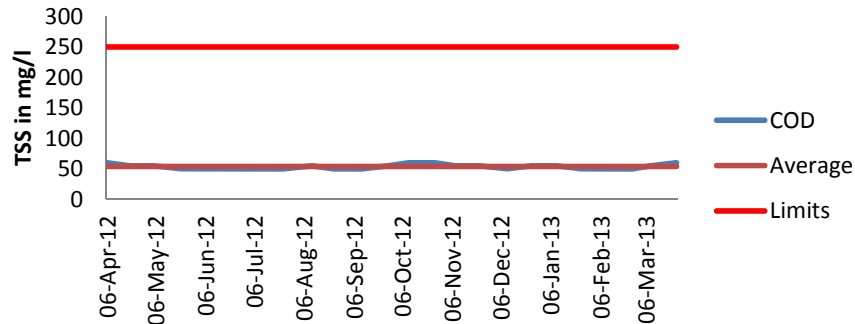
Variation in COD at Mine discharge outlet in Chendipada OCP



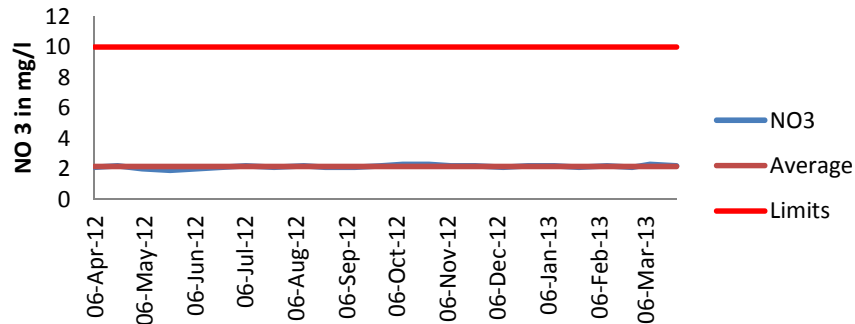
Variation in pH at Mine Discharge at the point of confluence with Bangaru Nalla in Bharatpur OCP



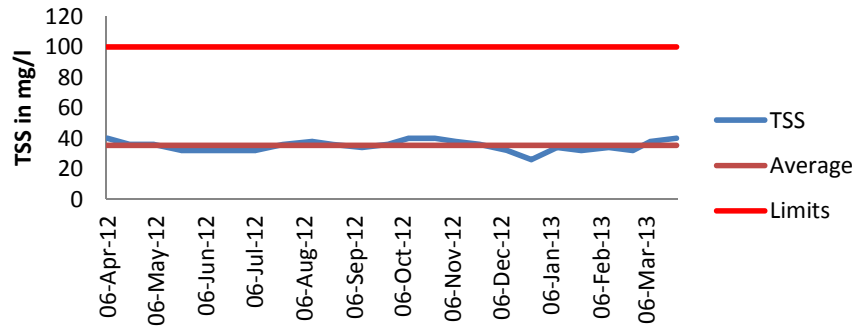
Variation in COD at Mine Discharge at the point of confluence with Bangaru Nalla in Bharatpur OCP



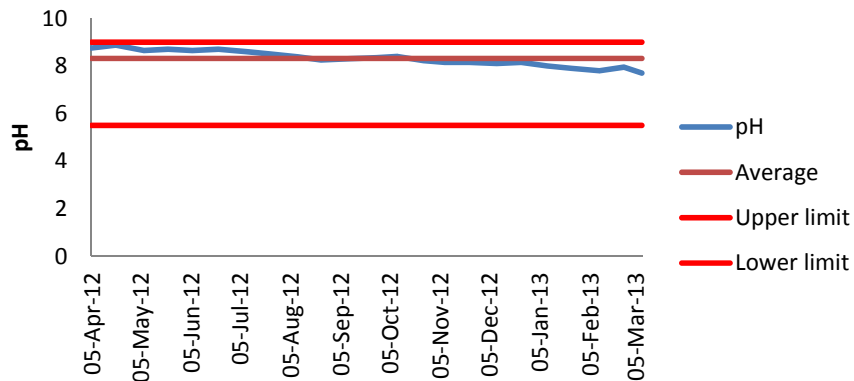
Variation in NO₃ at Mine Discharge at the point of confluence with Bangaru Nalla in Bharatpur OCP



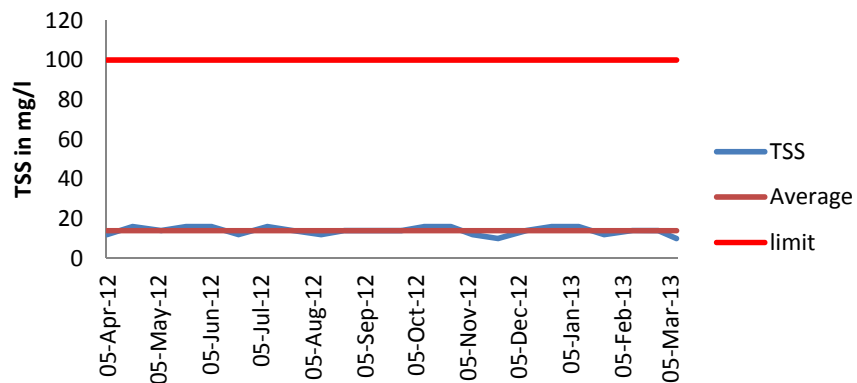
Variation in TSS at Mine Discharge at the point of confluence with Bangaru Nalla in Bharatpur OCP



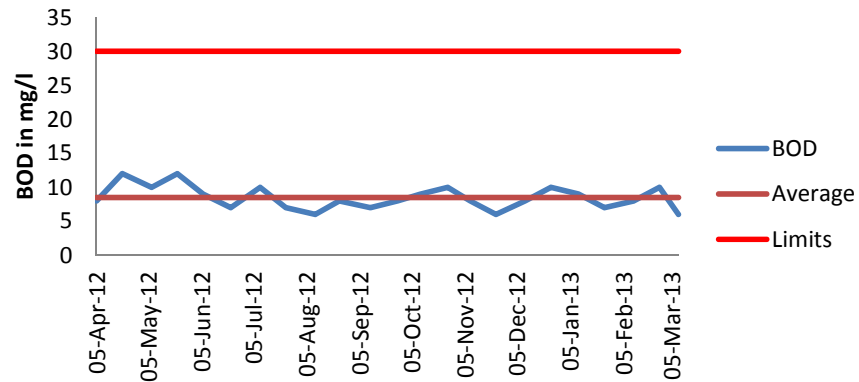
Variation in pH at DETP Outlet in Bharatpur OCP



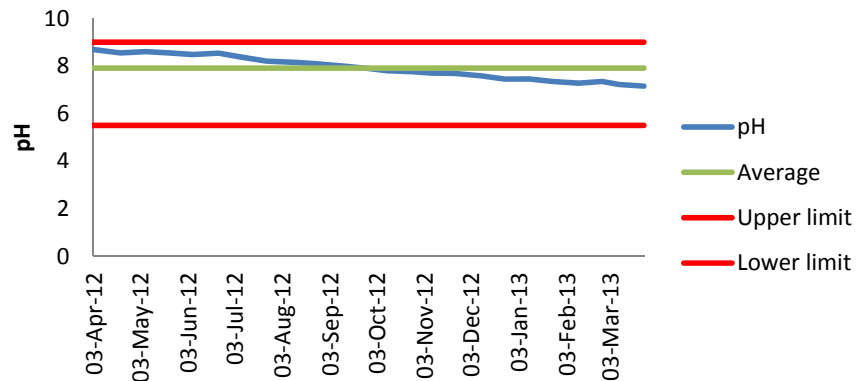
Variation in TSS at DETP Outlet in Bharatpur OCP



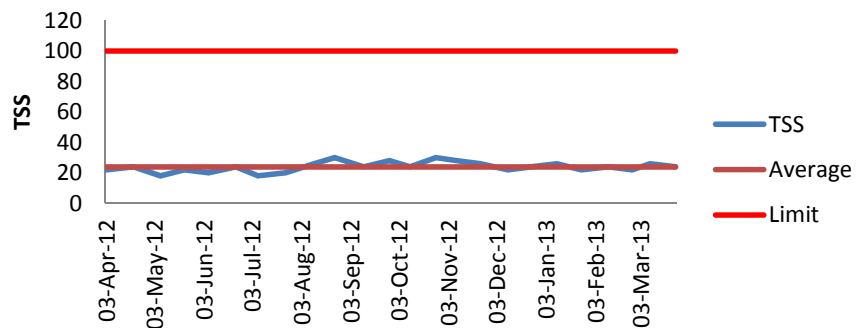
Variation in BOD at DETP Outlet in Bharatpur OCP

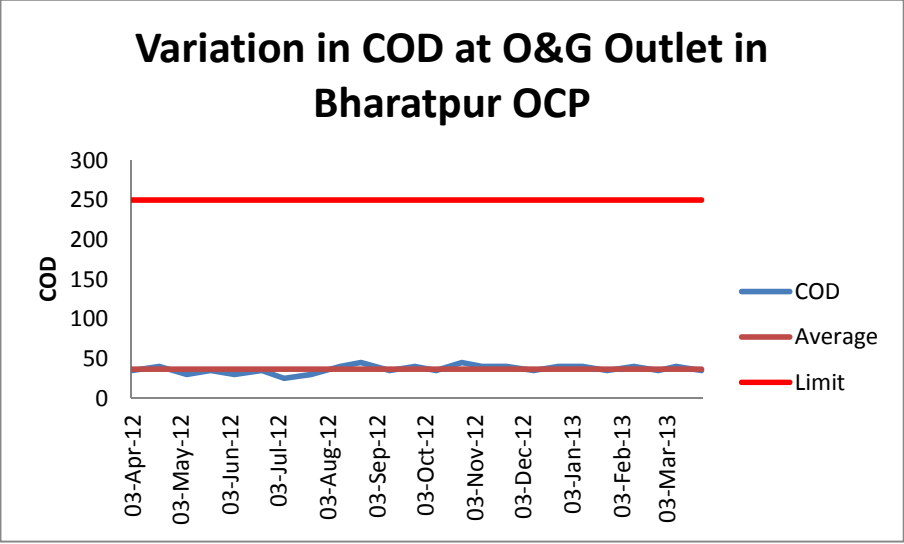


Variation in pH at O&G Outlet in Bharatpur OCP



Variation in TSS at O&G Outlet in Bharatpur OCP





Yearly Effluent Data

Area: Bharatpur

Area	<i>Bharatpur</i>	<i>Bharatpur</i>
Project	<i>Bharatpur OCP</i>	<i>Chhendipada OCP</i>
Date of sampling	26-Oct-12	16-Oct-12
Name of the station	Mine discharge at pt.of confl. With Bangaru nallh	Mine discharge water
Colour	Acceptable	Acceptable
Odour	Aggreable	Agreeable
Temperature, °C	13.5	13.5
Amonical Nitrogen	0.24	0.38
TKN	2.25	2.14
BOD	14	10
Arsenic	<0.01	<0.01
Lead	<0.05	<0.05
Hexavalent chromium	<0.01	<0.01
Total chromium	<0.1	<0.1
Copper	<0.02	<0.02
Zinc	0.33	0.34
Selenium	<0.01	<0.01
Nickel	<0.1	<0.1
Fluoride	0.40	0.34
Dissolved phosphate	0.18	0.18
Sulphide	0.004	0.005
Phenolics	<0.001	<0.001
Manganese	<0.05	<0.05
Iron	0.16	0.12
Nitrate Nitrogen	2.3	2.3

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Bharatpur

PROJECT : Bharatpur OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Near civil maintenance office of Kalinga Colony/PR	50.3	47.6
27-Apr-12	Near civil maintenance office of Kalinga Colony/PR	55.2	43.7
12-May-12	Near civil maintenance office of Kalinga Colony/PR	52.1	45.9
29-May-12	Near civil maintenance office of Kalinga Colony/PR	50.4	46.4
13-Jun-12	Near civil maintenance office of Kalinga Colony/PR	53.4	44.5
28-Jun-12	Near civil maintenance office of Kalinga Colony/PR	53.4	42.1
12-Jul-12	Near civil maintenance office of Kalinga Colony/PR	52.6	45.9
28-Jul-12	Near civil maintenance office of Kalinga Colony/PR	52.5	44.7
11-Aug-12	Near civil maintenance office of Kalinga Colony/PR	50.1	44.3
27-Aug-12	Near civil maintenance office of Kalinga Colony/PR	52.8	45.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Bharatpur

PROJECT : Bharatpur OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Sep-12	Near civil maintenance office of Kalinga Colony/PF	54.1	50.7
27-Sep-12	Near civil maintenance office of Kalinga Colony/PF	53.4	49.3
12-Oct-12	Near civil maintenance office of Kalinga Colony/PF	52.6	47.3
29-Oct-12	Near civil maintenance office of Kalinga Colony/PF	52.7	42.7
12-Nov-12	Near civil maintenance office of Kalinga Colony/PF	52.8	45.9
28-Nov-12	Near civil maintenance office of Kalinga Colony/PF	52.4	44.6
13-Dec-12	Near civil maintenance office of Kalinga Colony/PF	52.4	47.6
28-Dec-12	Near civil maintenance office of Kalinga Colony/PF	53.6	48.2
12-Jan-13	Near civil maintenance office of Kalinga Colony/PF	52.8	46.9
29-Jan-13	Near civil maintenance office of Kalinga Colony/PF	50.8	42.1
13-Feb-13	Near civil maintenance office of Kalinga Colony/PF	53.4	45.6
26-Feb-13	Near civil maintenance office of Kalinga Colony/PF	50.6	46.3
13-Mar-13	Near civil maintenance office of Kalinga Colony/PF	54.7	42.3
27-Mar-13	Near civil maintenance office of Kalinga Colony/PF	53.4	47.2

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Bharatpur

PROJECT : Bharatpur OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Padmabatipur Village	50.1	42.1
27-Apr-12	Padmabatipur Village	49.6	40.5
12-May-12	Padmabatipur Village	51.6	42.6
29-May-12	Padmabatipur Village	56.9	44.3
13-Jun-12	Padmabatipur Village	52.1	48.6
28-Jun-12	Padmabatipur Village	50.9	44.2
12-Jul-12	Padmabatipur Village	52.2	44.6
28-Jul-12	Padmabatipur Village	52.4	45.6
11-Aug-12	Padmabatipur Village	50.2	41.4
27-Aug-12	Padmabatipur Village	52.1	46.7
13-Sep-12	Padmabatipur Village	50.6	40.1
27-Sep-12	Padmabatipur Village	52.7	43.7
12-Oct-12	Padmabatipur Village	52.1	45.6
29-Oct-12	Padmabatipur Village	48.2	40.8
12-Nov-12	Padmabatipur Village	52.2	45.6
28-Nov-12	Padmabatipur Village	52.5	46.5
13-Dec-12	Padmabatipur Village	53.2	45.6
28-Dec-12	Padmabatipur Village	52.3	47.8
12-Jan-13	Padmabatipur Village	50.5	41.3
29-Jan-13	Padmabatipur Village	50.2	40.8
13-Feb-13	Padmabatipur Village	52.4	46.5

26-Feb-13	Padmabatipur Village	51.1	44.4
13-Mar-13	Padmabatipur Village	51.4	41.6
27-Mar-13	Padmabatipur Village	51.6	42.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Bharatpur

PROJECT : Bharatpur OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	On backfill near reject dump yard	60.6	54.1
27-Apr-12	On backfill near reject dump yard	60.4	54.3
12-May-12	On backfill near reject dump yard	59.2	54.7
29-May-12	On backfill near reject dump yard	63.2	53.6
13-Jun-12	On backfill near reject dump yard	62.6	58.6
28-Jun-12	On backfill near reject dump yard	62.4	57.6
12-Jul-12	On backfill near reject dump yard	62.2	57.8
28-Jul-12	On backfill near reject dump yard	62.8	58.6
11-Aug-12	On backfill near reject dump yard	61.6	56.4
27-Aug-12	On backfill near reject dump yard	62.5	56.7
13-Sep-12	On backfill near reject dump yard	59.8	53.2
27-Sep-12	On backfill near reject dump yard	58.4	52.0
12-Oct-12	On backfill near reject dump yard	61.6	58.7
29-Oct-12	On backfill near reject dump yard	60.8	51.5
12-Nov-12	On backfill near reject dump yard	62.2	57.8
28-Nov-12	On backfill near reject dump yard	62.5	58.6
13-Dec-12	On backfill near reject dump yard	62.4	58.5
28-Dec-12	On backfill near reject dump yard	61.5	57.6
12-Jan-13	On backfill near reject dump yard	61.1	55.2
29-Jan-13	On backfill near reject dump yard	61.8	55.5
13-Feb-13	On backfill near reject dump yard	61.5	56.9

26-Feb-13	On backfill near reject dump yard	60.4	57.6
13-Mar-13	On backfill near reject dump yard	60.6	49.8
27-Mar-13	On backfill near reject dump yard	62.1	56.3

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Bharatpur*

PROJECT : *Chhendipada OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Near Weigh Bridge	59.8	50.7
30-Apr-12	Near Weigh Bridge	56.2	53.4
15-May-12	Near Weigh Bridge	62.6	57.6
31-May-12	Near Weigh Bridge	61.5	54.2
15-Jun-12	Near Weigh Bridge	62.5	56.1
30-Jun-12	Near Weigh Bridge	50.1	46.8
14-Jul-12	Near Weigh Bridge	62.4	56.7
31-Jul-12	Near Weigh Bridge	62.3	56.7
14-Aug-12	Near Weigh Bridge	60.8	51.3
31-Aug-12	Near Weigh Bridge	59.7	53.6
15-Sep-12	Near Weigh Bridge	53.2	40.6
29-Sep-12	Near Weigh Bridge	61.3	55.8
15-Oct-12	Near Weigh Bridge	60.5	56.2
31-Oct-12	Near Weigh Bridge	60.4	49.5
15-Nov-12	Near Weigh Bridge	62.5	56.9
30-Nov-12	Near Weigh Bridge	62.6	57.5
15-Dec-12	Near Weigh Bridge	61.2	58.4
31-Dec-12	Near Weigh Bridge	61.8	58.9
15-Jan-13	Near Weigh Bridge	58.3	45.5
31-Jan-13	Near Weigh Bridge	60.3	50.7
15-Feb-13	Near Weigh Bridge	61.2	57.1

28-Feb-13	Near Weigh Bridge	59.5	55.2
15-Mar-13	Near Weigh Bridge	54.7	42.3
30-Mar-13	Near Weigh Bridge	59.8	54.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Bharatpur*

PROJECT : *Chhendipada OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Near Mine Working	60.1	50.3
30-Apr-12	Near Mine Working	58.6	51.1
15-May-12	Near Mine Working	60.1	54.8
31-May-12	Near Mine Working	57.1	53.9
15-Jun-12	Near Mine Working	60.9	58.5
30-Jun-12	Near Mine Working	54.3	47.6
14-Jul-12	Near Mine Working	62.6	58.7
31-Jul-12	Near Mine Working	59.4	54.7
14-Aug-12	Near Mine Working	60.5	53.1
31-Aug-12	Near Mine Working	60.8	54.6
15-Sep-12	Near Mine Working	52.9	42.1
29-Sep-12	Near Mine Working	59.6	54.3
15-Oct-12	Near Mine Working	62.4	56.7
31-Oct-12	Near Mine Working	62.3	51.4
15-Nov-12	Near Mine Working	62.6	58.6
30-Nov-12	Near Mine Working	60.1	58.1
15-Dec-12	Near Mine Working	60.4	56.7
31-Dec-12	Near Mine Working	61.3	55.4
15-Jan-13	Near Mine Working	60.5	53.2
31-Jan-13	Near Mine Working	59.5	50.1
15-Feb-13	Near Mine Working	61.6	58.5

28-Feb-13	Near Mine Working	61.4	55.6
15-Mar-13	Near Mine Working	55.6	50.9
30-Mar-13	Near Mine Working	60.4	56.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Bharatpur*

PROJECT : *Chhendipada OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Near Site Office	59.7	55.2
30-Apr-12	Near Site Office	60.9	51.6
15-May-12	Near Site Office	59.5	54.5
31-May-12	Near Site Office	56.3	53.8
15-Jun-12	Near Site Office	60.4	57.8
30-Jun-12	Near Site Office	50.9	45.6
14-Jul-12	Near Site Office	60.4	55.8
31-Jul-12	Near Site Office	60.6	57.6
14-Aug-12	Near Site Office	59.1	50.6
31-Aug-12	Near Site Office	59.7	54.2
15-Sep-12	Near Site Office	52.5	45.9
29-Sep-12	Near Site Office	57.6	53.0
15-Oct-12	Near Site Office	60.1	55.6
31-Oct-12	Near Site Office	61.5	53.2
15-Nov-12	Near Site Office	60.4	57.9
30-Nov-12	Near Site Office	60.2	57.2
15-Dec-12	Near Site Office	60.5	56.3
31-Dec-12	Near Site Office	60.1	56.7
15-Jan-13	Near Site Office	56.8	51.3
31-Jan-13	Near Site Office	60.3	50.4
15-Feb-13	Near Site Office	60.2	57.6

28-Feb-13	Near Site Office	59.6	54.8
15-Mar-13	Near Site Office	54.6	45.8
30-Mar-13	Near Site Office	57.5	52.4

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : **Bharatpur**

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Chhendipada OCP	Open well nearest to the mine	4.95
13-Aug-12	Chhendipada OCP	Open well nearest to the mine	2.87
14-Nov-12	Chhendipada OCP	Open well nearest to the mine	4.29
12-Jan-13	Chhendipada OCP	Open well nearest to the mine	1.42

SILTATION STUDY AT TALCHER COALFIELD

BHARATPUR AREA

MONTH : JULY 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	07.07.12	26
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	07.07.12	32

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.07.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.07.12	34

SILTATION STUDY AT TALCHER COALFIELD

BHARATPUR AREA

MONTH : August 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	10.08.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	10.08.12	36

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.08.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	24.08.12	38

SILTATION STUDY AT TALCHER COALFIELD

BHARATPUR AREA

MONTH : September 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	36
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	11.09.12	40

2nd PHASE

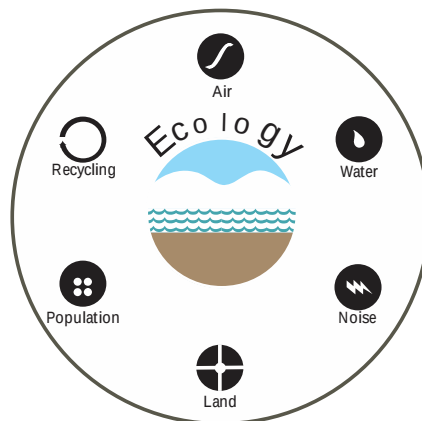
Area	Project	Monitoring Station	Date of Sampling	TSS
Bharatpur	Bharatpur OCP	100m U/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Bangaru nallah	27.09.12	38



Annual Compiled Monitoring Report Of Lingaraj Area For 2012-2013

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)

Regional Institute-VII, OSHB Building, Bhubaneswar – 751 001 (Orissa)
[Assistance from Environment Division, CMPDI(HQs), Ranchi]

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Sl.No.	Particulars	Chapter No.	Page
1	Introduction	I	
2	Air Environment	II	
3	Water Environment	III	
4	Noise Environment	IV	

CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine

Lingaraj area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has one OCP under its administrative control. The OCP is Lingaraj.

Lingaraj OCP

Lingaraj OCP is situated between latitudes 20° 57' 39" & 20° 58' 19" N and longitudes 85° 09' 33" and 85° 12' 12" E. The project is well connected by rail and road. Talcher railway station on the brach line of East-Coast Railway is at a distance of about 3 km.

The area has a gentle slope towards north. The elevation of the area varies from 90 to 110 m.

The mean temperature ranges from 6.7° C (winter season) to 44.1°C (pre-monsoon cyclone season). The monthly mean wind speed at 8:30 hr. varies from 2.0 to 3.0 kmph during the year against 2.0 to 8.0 kmph at 17:30 hr.

For coal wining and transportation contractual shovel-dumper combination system is used. For OB removal and transportation, shovel-dumper combination system is also used. The main consumer of Lingaraj OCP is Rajiv Gandhi Super Thermal Power Station (NTPC), Kaniah.

1.2 Frequency of Environmental Monitoring

(i) Ambient air quality monitoring

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out.

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

(ii) Drinking water monitoring : Every month.

(iii) Effluent quality monitoring

1/4/5 parameters : once in a fortnight/monthly/
July, Aug. & Sept.

21 parameters : Once in a year

(iv) Well water level monitoring : Quarterly

(v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The details of various environmental quality monitoring stations are given in are given below:

- **Air quality monitoring stations**

Sl.No. Name of Stations

Lingaraj OCP

1. Lingaraj C.G.M. Office
2. Near Deulbera Colliery
3. Near CT Road (Lingaraj to Dera)
4. kandhal Village
5. Lingaraj Township (Hly. Pre & Post-monsoon)

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

1. Lingaraj township water / tap water GM Office/MTK office
2. Well from Balunga khamar vill./Deulbera/ Talabera

- **Effluent quality monitoring station**

1. Outlet of MDTP, if discharge outside
2. Lingaraj mine discharge./ Outlet of O&g trap at confluence point of brahamani river

- **Well water level monitoring station**

1. Balugaon Khamar village well
2. Balunga khamar village well
3. Talabera village well

- **Noise level monitoring stations**

Sl.No. Name of Stations

1. Lingaraj C.G.M. Office
2. Near Deulbera Colliery
3. Near CT Road (Lingaraj to Dera).
4. Kandhal village

- **Siltation study by monitoring parameter TSS (fortnightly once each in July, Aug., Sept.)**

1. 100m u/s of the point of confluence of mine discharge water with Brahmani river.
2. 100m d/s of the point of confluence of mine discharge water with Brahmani river.

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1
Details of Air Quality Monitoring Stations
along with Sources of Pollution

Sl.No.	Location	Sources of Pollution
Lingaraj OCP		
1	Lingaraj C.G.M. Office	Traffic and mining activities, siding 1 & 2.
2	Near Deulbera Colliery	Domestic and mining activities, CHP.
3	Near Transportation Road	Traffic and mining activities.
4	Kandhal Village	Domestic and mining activities.

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2
Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached.

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Lingaraj Area reveals the following:

- In coal mining area like G.M Office, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines, barring a few aberated value.
- In residential areas, all the values are found to be within the limits of the National Ambient Air Quality Standards (NAAQS) notified under Schedule-VII.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Water sprinkling on haul roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers at haul roads and siding.
- Cleaning spillage from roads.
- Practice for covered transportation.
- Regular maintenance of all HEMMs and other machinery.
- Provision of gas filters for exhaust fumes.
- No overloading of trucks/dumpers.
- Application of innocuous chemical binders on haul roads.
- Development of thick greenbelts around the mines, infrastructure sites and residential area besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.
- Drills with well-designed dust extractors/arrestors.
- Provision of dust extraction system for crusher house.
- Suppression of coal dust at CHP by provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers.

CHAPTER-III

WATER ENVIRONMENT

3.1 Methodology and Instruments used for water & effluent analysis

Details are given in Table-4.

Table-4

Methodology & Instruments used for Water and Effluent Analysis

Sl.No.	Parameters	Method/Instruments
1	PH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The results of analysis of water samples (Drinking) is given in Tables attached.. Ground water level monitoring of various dug-wells are given in Tables attached..

3.3 Discussions

(a) Drinking water sample

The examination of analytical results of drinking water sample reveals the following :

- All physico-chemical parameters are well within the limits of the Indian Drinking Water Standard in the drinking water sample.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.2 Results

The fortnightly noise level measurements for different stations are given in Table-6.

4.3 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards.

4.4 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Proper designing of plant and machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- HEMMs with sound proof cabin.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

Project : **Lingaraj OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
06-Apr-12	Lingaraj CGM Office	259	122	26	34	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
23-Apr-12	Lingaraj CGM Office	262	106	28	37	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
07-May-12	Lingaraj CGM Office	305	132	36	44	Traffic and mining activities siding 1 & 2	300m to 400m S	South to north & sunny
22-May-12	Lingaraj CGM Office	352	144	42	46	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
07-Jun-12	Lingaraj CGM Office	301	124	36	44	Traffic and mining activities siding 1 & 2	300m to 400m S	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Jun-12	Lingaraj CGM Office	263	85	24	32	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & cloudy rain fall
07-Jul-12	Lingaraj CGM Office	278	104	36	44	Traffic and mining activities siding 1 & 2	300m to 400m S	West to east & sunny
23-Jul-12	Lingaraj CGM Office	232	98	33	39	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west, cloudy and rainfall
07-Aug-12	Lingaraj CGM Office	210	115	29	42	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west, cloudy and rainfall
22-Aug-12	Lingaraj CGM Office	197	102	23	39	Traffic and mining activities siding 1 & 2	300m to 400m S	South to North cloudy, and rainfall
06-Sep-12	Lingaraj CGM Office	175	94	20	32	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Sep-12	Lingaraj CGM Office	157	97	22	29	Traffic and mining activities siding 1 & 2	300m to 400m S	South to North & sunny
11-Oct-12	Lingaraj CGM Office	204	72	26	31	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west cloudy and rainfall
19-Oct-12	Lingaraj CGM Office	274	116	30	38	Traffic and mining activities siding 1 & 2	300m to 400m S	West to east & sunny
06-Nov-12	Lingaraj CGM Office	256	108	27	33	Traffic and mining activities siding 1 & 2	300m to 400m S	South to North & sunny
21-Nov-12	Lingaraj CGM Office	267	112	28	31	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & cloudy
06-Dec-12	Lingaraj CGM Office	252	107	26	29	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

21-Dec-12	Lingaraj CGM Office	283	116	25	28	Traffic and mining activities siding 1 & 2	300m to 400m S	South to north & cloudy
07-Jan-13	Lingaraj CGM Office	297	124	26	29	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
22-Jan-13	Lingaraj CGM Office	286	120	27	30	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
07-Feb-13	Lingaraj CGM Office	294	143	25	27	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
22-Feb-13	Lingaraj CGM Office	287	136	24	26	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny
07-Mar-13	Lingaraj CGM Office	276	131	25	27	Traffic and mining activities siding 1 & 2	300m to 400m S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Mar-13	Lingaraj CGM Office	285	145	26	28	Traffic and mining activities siding 1 & 2	300m to 400m S	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

Project : **Lingaraj OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
06-Apr-12	Near CT Road (Lingaraj to Dera)	220	82	22	30	Traffic and mining activities	500m towards SE	East to West & sunny
23-Apr-12	Near CT Road (Lingaraj to Dera)	301	125	28	38	Traffic and mining activities	500m towards SE	East to West & sunny
07-May-12	Near CT Road (Lingaraj to Dera)	328	107	30	42	Traffic and mining activities	500m towards SE	East to West & sunny
22-May-12	Near CT Road (Lingaraj to Dera)	305	128	34	42	Traffic and mining activities	500m towards SE	East to West & sunny
07-Jun-12	Near CT Road (Lingaraj to Dera)	305	101	30	38	Traffic and mining activities	500m towards SE	East to West & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Jun-12	Near CT Road (Lingaraj to Dera)	177	65	22	30	Traffic and mining activities	500m towards SE	East to west & cloudy rain fall
07-Jul-12	Near CT Road (Lingaraj to Dera)	237	81	28	36	Traffic and mining activities	500m towards SE	East to west & sunny
23-Jul-12	Near CT Road (Lingaraj to Dera)	158	62	22	29	Traffic and mining activities	500m towards SE	East to west, cloudy and rainfall
07-Aug-12	Near CT Road (Lingaraj to Dera)	142	79	23	34	Traffic and mining activities	500m towards SE	East to west, cloudy and rainfall
22-Aug-12	Near CT Road (Lingaraj to Dera)	134	89	20	31	Traffic and mining activities	500m towards SE	East to west, cloudy and rainfall
06-Sep-12	Near CT Road (Lingaraj to Dera)	124	98	20	37	Traffic and mining activities	500m towards SE	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Sep-12	Near CT Road (Lingaraj to Dera)	115	91	23	30	Traffic and mining activities	500m towards SE	East to west & sunny
08-Oct-12	Near CT Road (Lingaraj to Dera)	143	62	25	31	Traffic and mining activities	500m towards SE	East to west cloudy and rainfall
25-Oct-12	Near CT Road (Lingaraj to Dera)	284	122	29	37	Traffic and mining activities	500m towards SE	East to west & sunny
06-Nov-12	Near CT Road (Lingaraj to Dera)	279	128	30	36	Traffic and mining activities	500m towards SE	South to North & sunny
21-Nov-12	Near CT Road (Lingaraj to Dera)	286	132	27	32	Traffic and mining activities	500m towards SE	East to west & cloudy
06-Dec-12	Near CT Road (Lingaraj to Dera)	273	124	28	31	Traffic and mining activities	500m towards SE	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

21-Dec-12	Near CT Road (Lingaraj to Dera)	284	115	23	27	Traffic and mining activities	500m towards SE	East to west & cloudy
07-Jan-13	Near CT Road (Lingaraj to Dera)	272	108	21	23	Traffic and mining activities	500m towards SE	East to west & sunny
22-Jan-13	Near CT Road (Lingaraj to Dera)	261	101	21	24	Traffic and mining activities	500m towards SE	East to west & sunny
07-Feb-13	Near CT Road (Lingaraj to Dera)	283	128	27	29	Traffic and mining activities	500m towards SE	East to west & sunny
22-Feb-13	Near CT Road (Lingaraj to Dera)	298	145	28	30	Traffic and mining activities	500m towards SE	East to west & sunny
07-Mar-13	Near CT Road (Lingaraj to Dera)	305	157	29	31	Traffic and mining activities	500m towards SE	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

22-Mar-13	Near CT Road (Lingaraj to Dera)	293	162	28	30	Traffic and mining activities	500m towards SE	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

Project : **Lingaraj OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
12-Apr-12	Near Deulbera colliery	181	85	22	27	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
27-Apr-12	Near Deulbera colliery	282	97	30	37	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
10-May-12	Near Deulbera colliery	214	86	26	35	Domestic, mining activities, CHP	About 500m towards S	South to north & sunny
25-May-12	Near Deulbera colliery	243	109	32	38	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
12-Jun-12	Near Deulbera colliery	213	102	28	36	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

27-Jun-12	Near Deulbera colliery	252	86	24	32	Domestic, mining activities, CHP	About 500m towards S	East to west & cloudy rain fall
12-Jul-12	Near Deulbera colliery	205	92	30	36	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
27-Jul-12	Near Deulbera colliery	154	60	23	27	Domestic, mining activities, CHP	About 500m towards S	Calm,cloudy and rainfall
10-Aug-12	Near Deulbera colliery	145	82	27	38	Domestic, mining activities, CHP	About 500m towards S	East to west, cloudy and rainfall
27-Aug-12	Near Deulbera colliery	118	92	21	36	Domestic, mining activities, CHP	About 500m towards S	South to North cloudy, and rainfall
11-Sep-12	Near Deulbera colliery	110	90	23	39	Domestic, mining activities, CHP	About 500m towards S	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

26-Sep-12	Near Deulbera colliery	104	85	20	27	Domestic, mining activities, CHP	About 500m towards S	South to North & sunny
11-Oct-12	Near Deulbera colliery	154	65	24	28	Domestic, mining activities, CHP	About 500m towards S	South to North cloudy, and rainfall
26-Oct-12	Near Deulbera colliery	253	101	29	36	Domestic, mining activities, CHP	About 500m towards S	West to east & sunny
09-Nov-12	Near Deulbera colliery	264	105	26	34	Domestic, mining activities, CHP	About 500m towards S	West to east & sunny
24-Nov-12	Near Deulbera colliery	291	129	29	33	Domestic, mining activities, CHP	About 500m towards S	East to west & cloudy
05-Dec-12	Near Deulbera colliery	243	105	27	30	Domestic, mining activities, CHP	About 500m towards S	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

20-Dec-12	Near Deulbera colliery	256	127	28	31	Domestic, mining activities, CHP	About 500m towards S	East to west & cloudy
04-Jan-13	Near Deulbera colliery	243	115	25	28	Domestic, mining activities, CHP	About 500m towards S	South to north & sunny
19-Jan-13	Near Deulbera colliery	257	116	26	29	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
06-Feb-13	Near Deulbera colliery	235	109	24	26	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
20-Feb-13	Near Deulbera colliery	241	140	25	27	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny
06-Mar-13	Near Deulbera colliery	237	139	24	27	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

21-Mar-13	Near Deulbera colliery	242	141	24	26	Domestic, mining activities, CHP	About 500m towards S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Lingaraj**

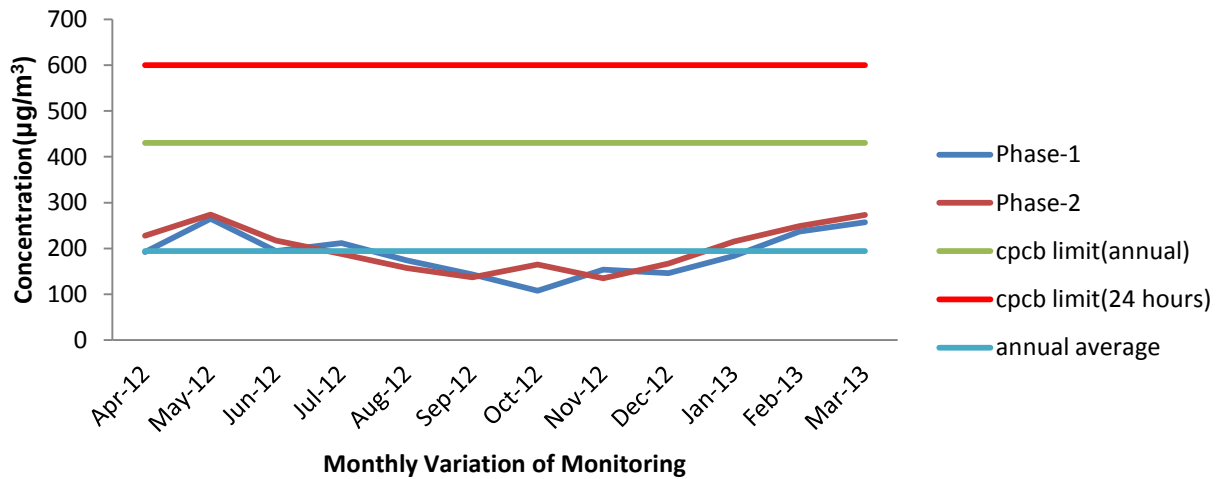
Project : **Lingaraj OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
20-Mar-13	Lingaraj Township	253	138	23	25	Domestic,	About 500 m	East to west & sunny

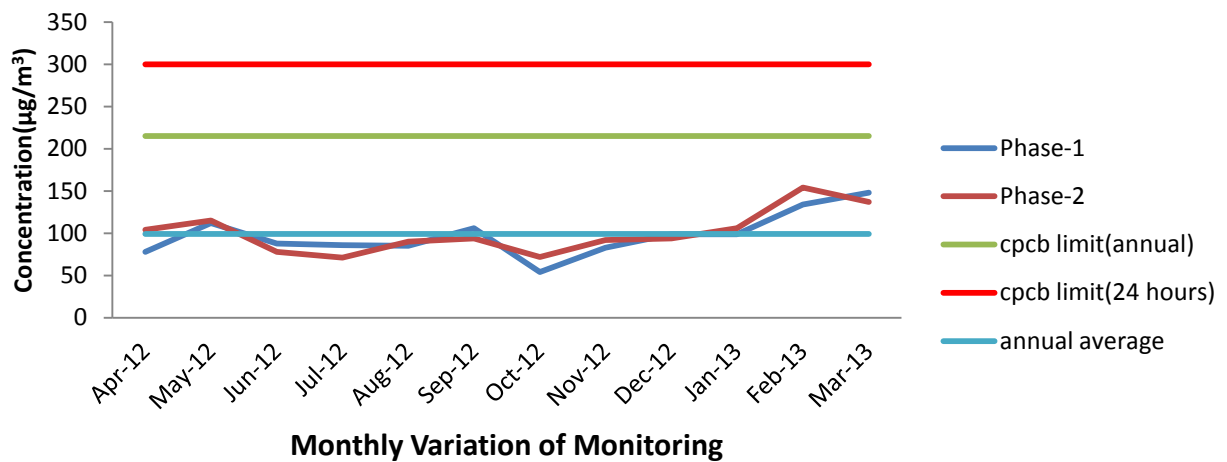


Air Quality Graph of Lingaraj OCP

Graph-13: SPM monitoring of Near Deulbera colliery of Lingaraj OCP.



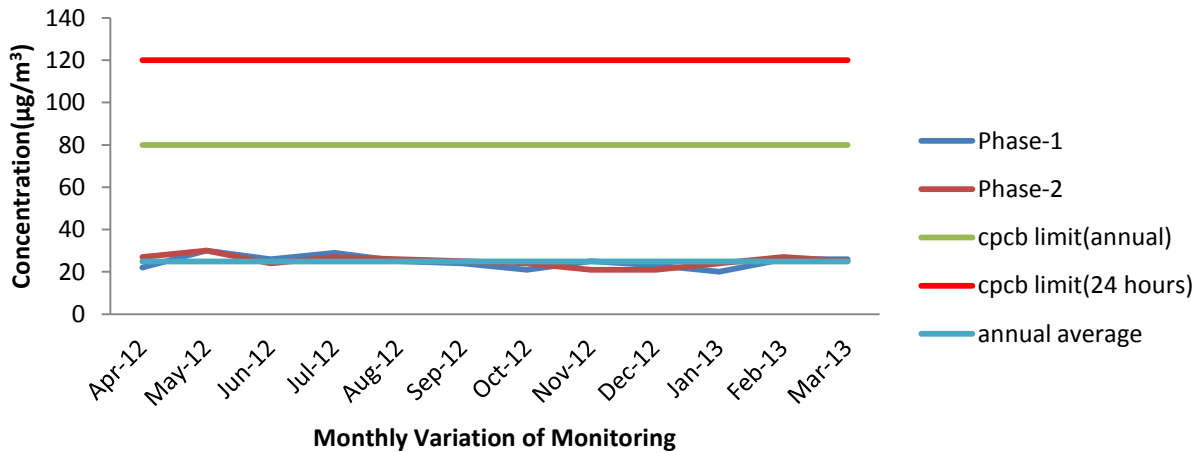
Graph-14: RPM monitoring of Near Deulbera colliery of Lingaraj OCP.



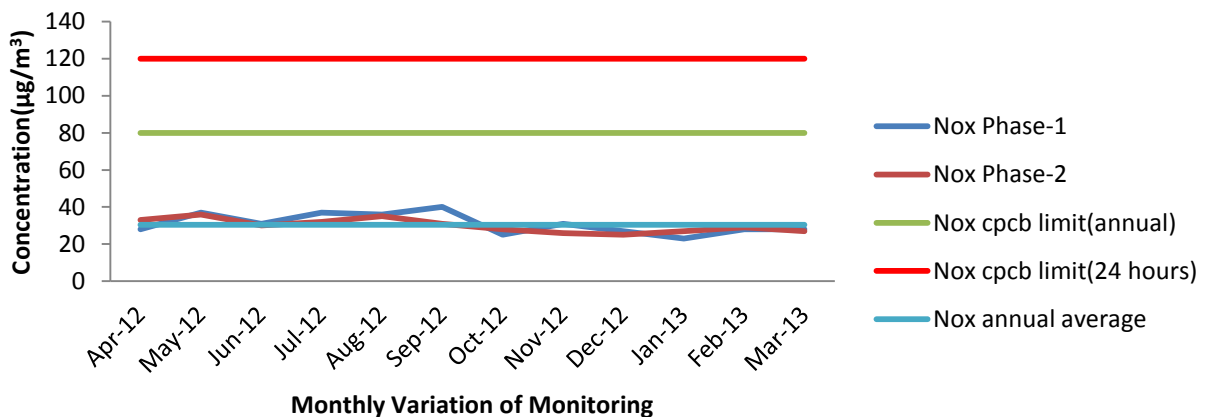


Air Quality Graph of Lingaraj OCP

Graph-15: SO_x monitoring of Near Deulbera colliery of Lingaraj OCP.



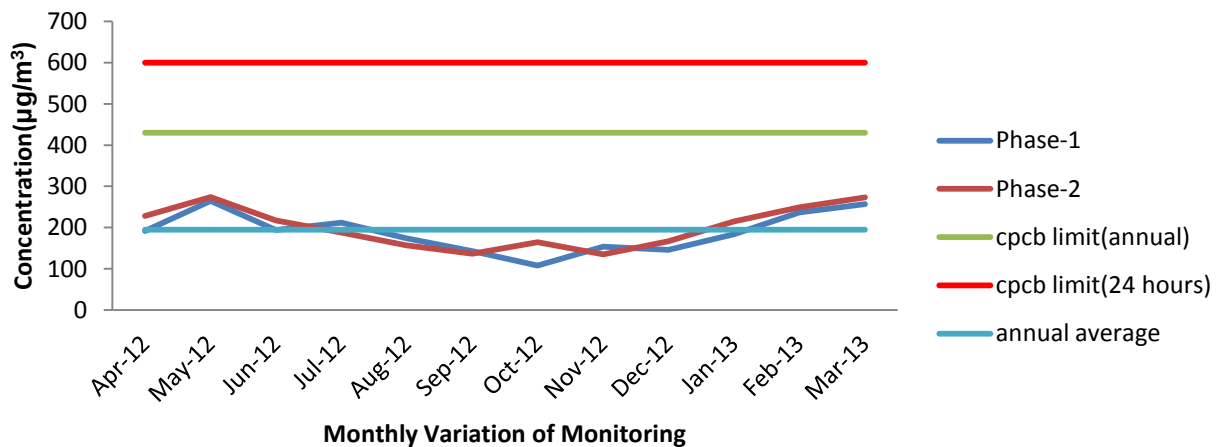
Graph-16: NO_x monitoring of Near Deulbera colliery of Lingaraj OCP.



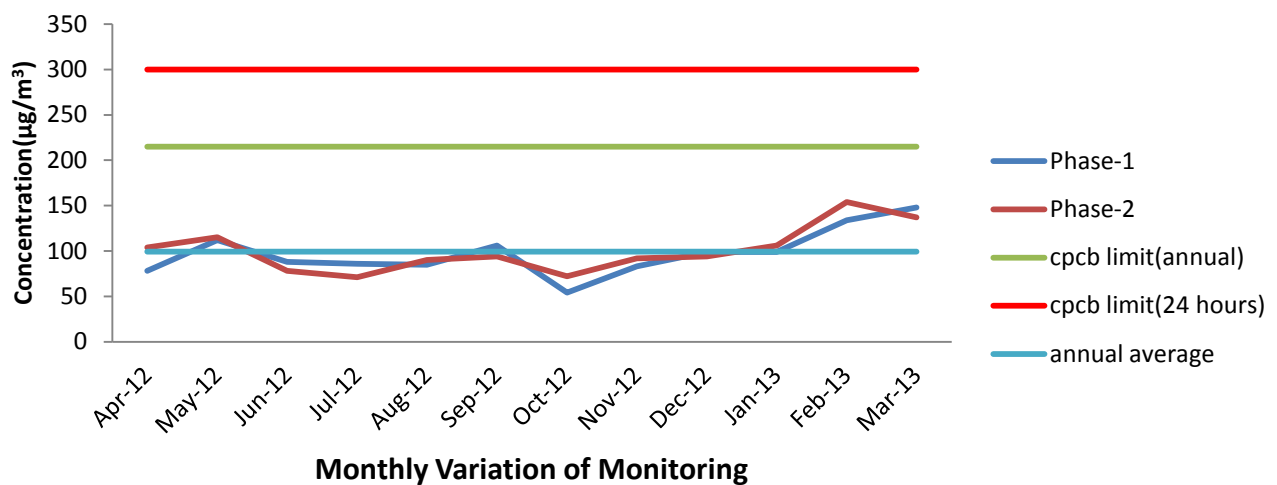


Air Quality Graph of Lingaraj OCP

Graph-9: SPM monitoring of Near CT Road (Lingaraj to Dera) of Lingaraj OCP.



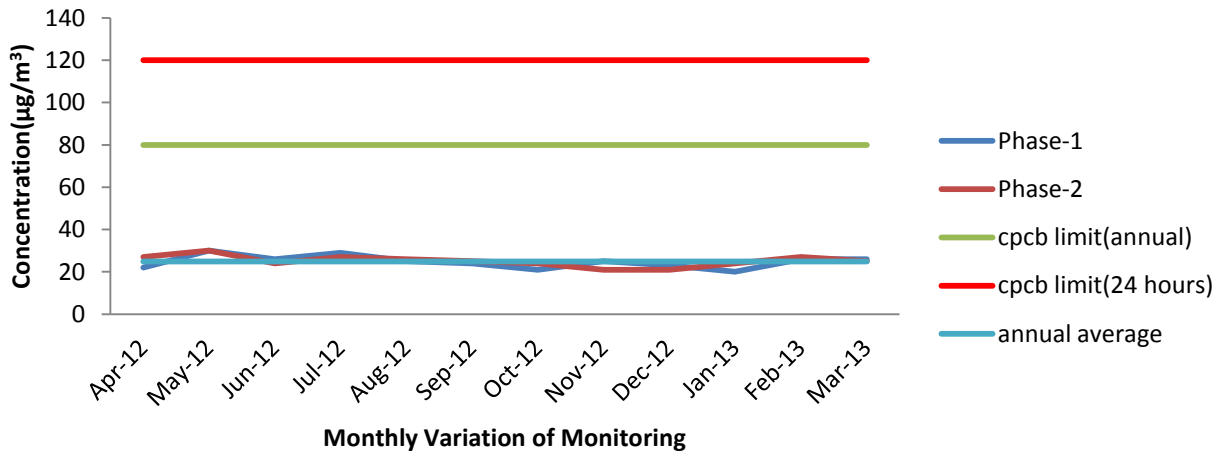
Graph-10: RPM monitoring of Near CT Road (Lingaraj to Dera) of Lingaraj OCP.



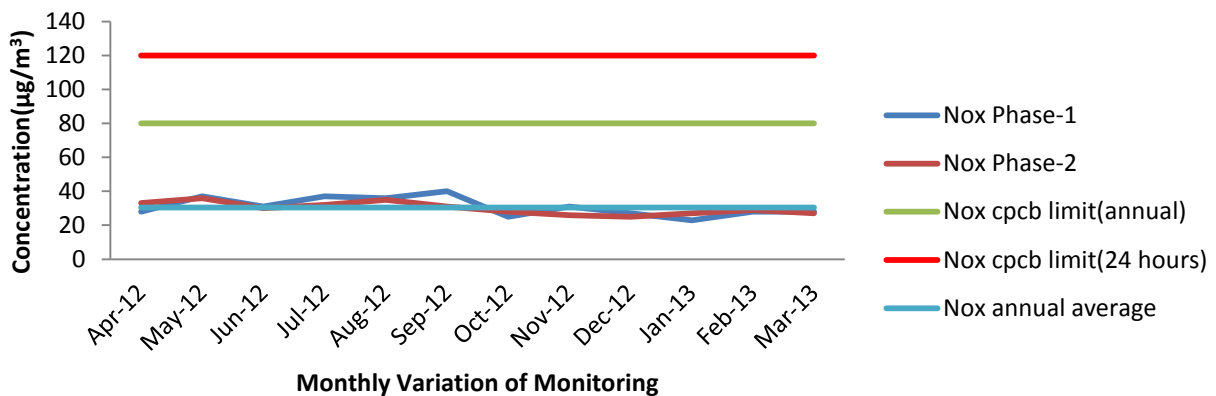


Air Quality Graph of Lingaraj OCP

Graph-11 SO_x monitoring of Near CT Road (Lingaraj to Dera) of Lingaraj OCP.



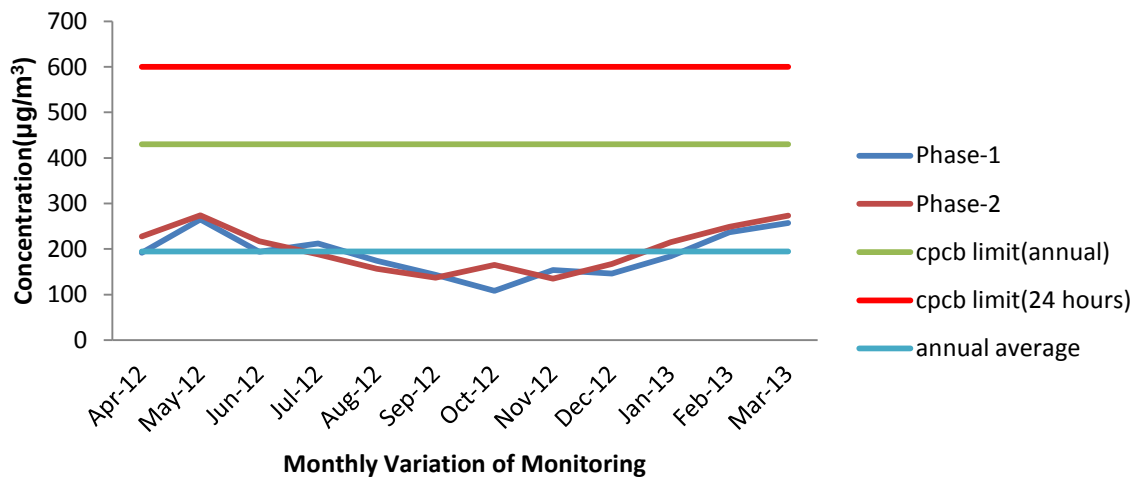
Graph-12: NO_x monitoring of Near CT Road (Lingaraj to Dera) of Lingaraj OCP.



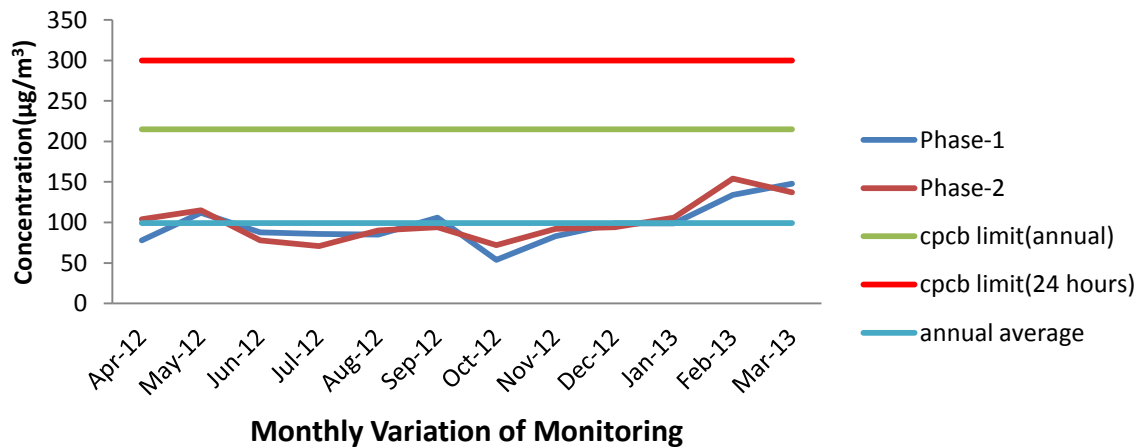


Air Quality Graph of Lingaraj OCP

Graph-5: SPM monitoring of Lingaraj CGM office of Lingaraj OCP.



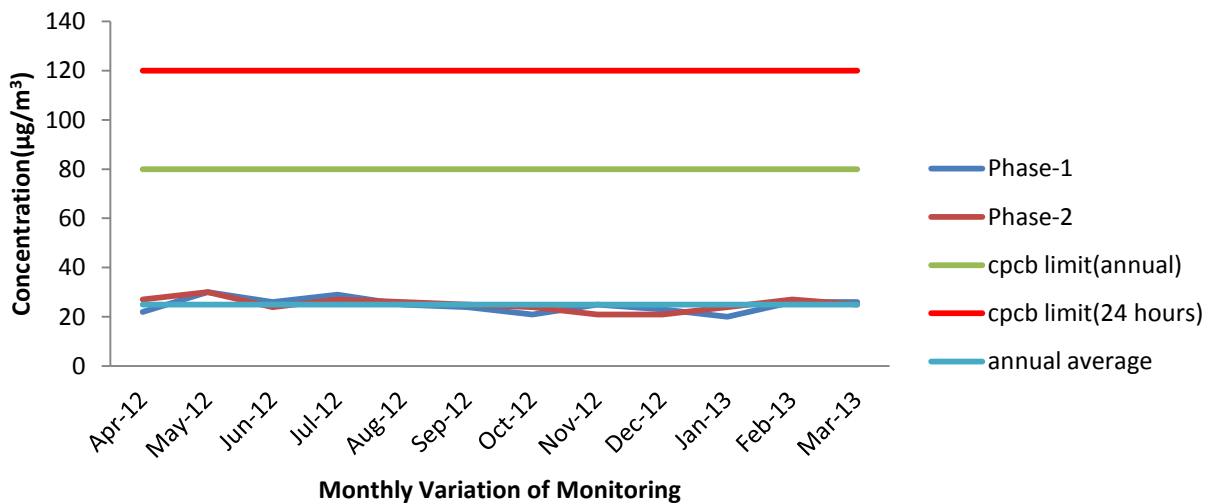
Graph-6: RPM monitoring of Lingaraj CGM office of Lingaraj OCP.



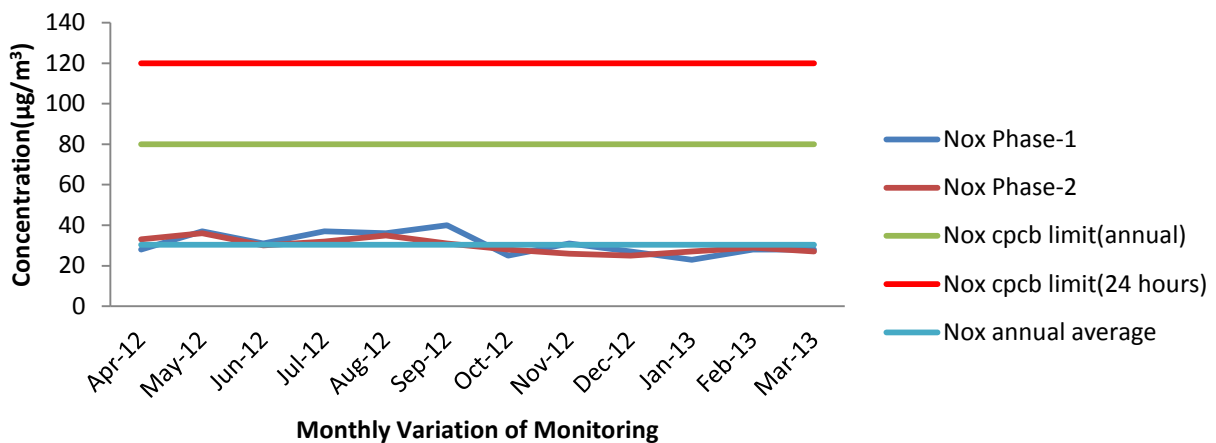


Air Quality Graph of Lingaraj OCP

Graph-7 SO_x monitoring of Lingaraj CGM office of Lingaraj OCP.



Graph-8: NO_x monitoring of Lingaraj CGM office of Lingaraj OCP.



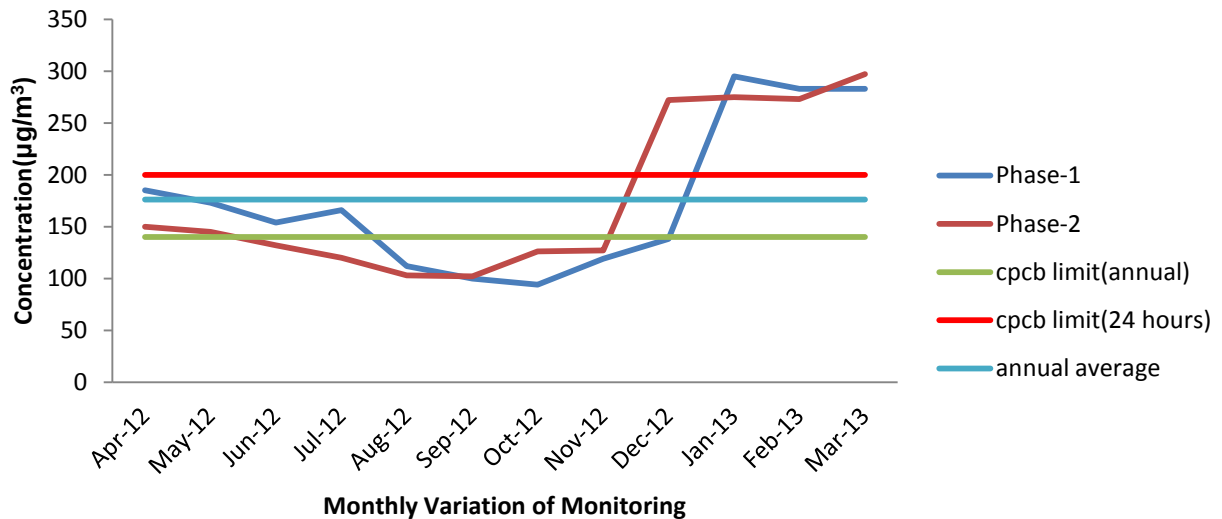
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

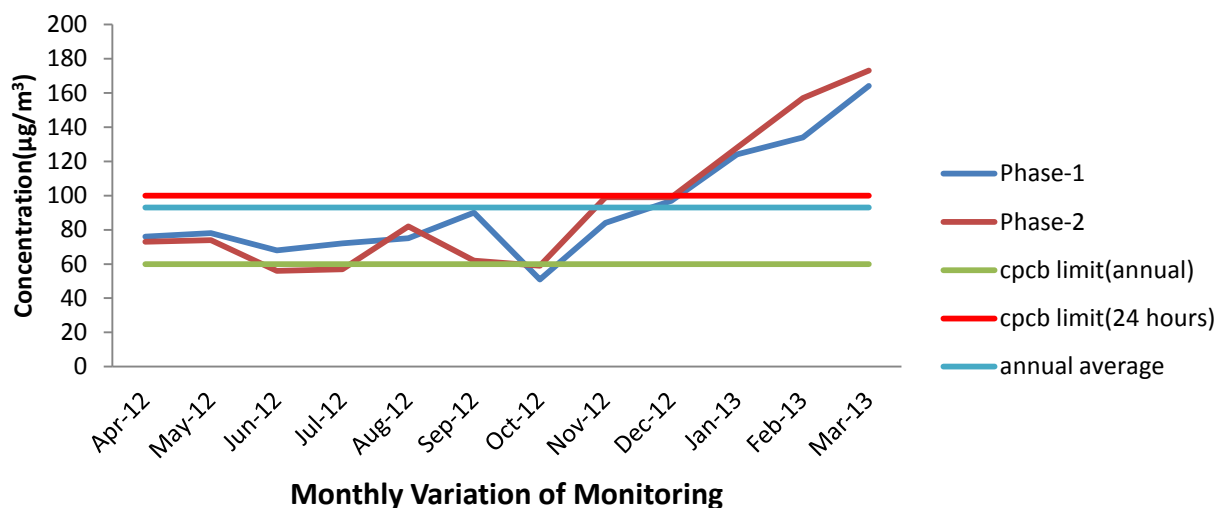


Air Quality Graph of Lingaraj OCP

Graph-1: SPM monitoring of Khandal Village of Lingaraj OCP.



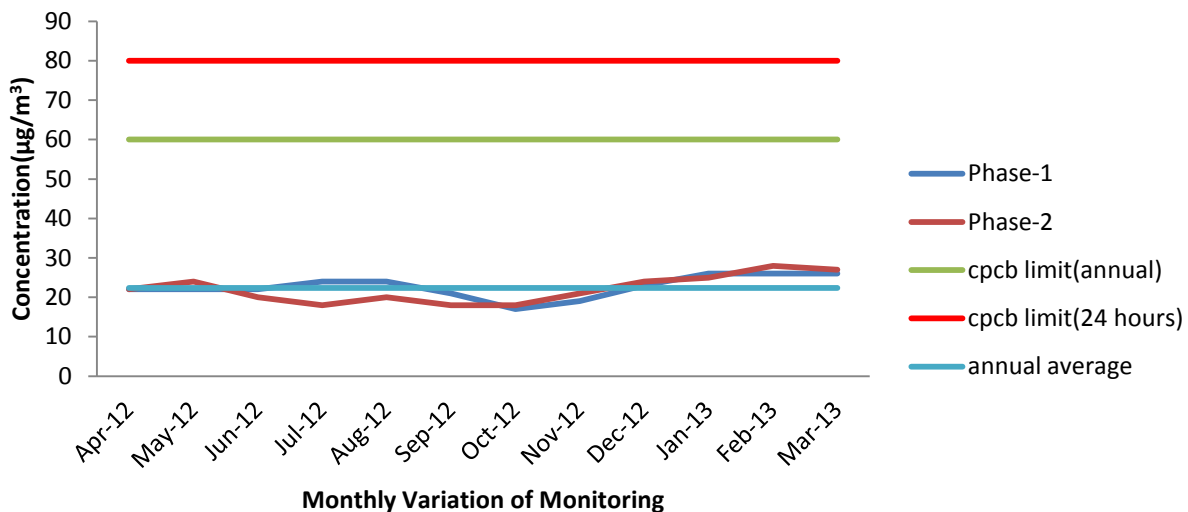
Graph-2: RPM monitoring of Khandal Village of Lingaraj OCP.



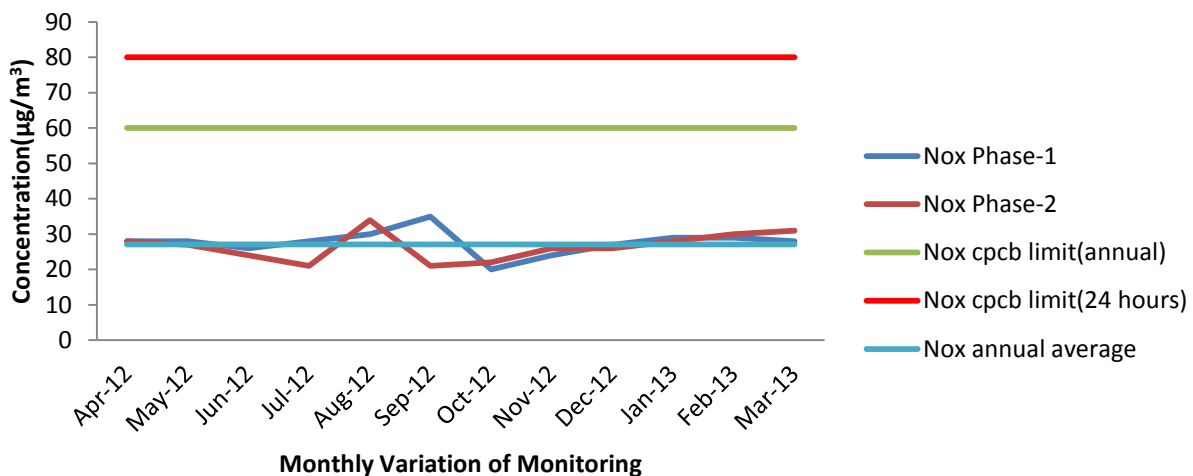


Air Quality Graph of Lingaraj OCP

Graph-3: SO_x monitoring of Khandal Village of Lingaraj OCP.



Graph-4: NO_x monitoring of Khandal Village of Lingaraj OCP.



[illegible]

TABLE--
EFFLUENT QUALITY DATA

Area : **Lingaraj**

Project : **Lingaraj OCP**

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
24-Jul-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	8.00		14	-	8	-
10-Aug-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.85		16	-	10	-
24-Aug-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.90		14	-	8	-
10-Sep-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.90		14	-	8	-
26-Sep-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.75		12	-	7	-
08-Oct-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.62		14	-	8	-
19-Oct-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.63		10	-	6	-
06-Nov-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.60		12	-	7	-
21-Nov-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.70		12	-	7	-
06-Dec-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.65		14	-	8	-
21-Dec-12	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.55		12	-	7	-

TABLE--
EFFLUENT QUALITY DATA

Area : Lingaraj

12-Jan-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.55		12	-	7	-
28-Jan-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.45		10	-	6	-
07-Feb-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.38	-	10	-	6	-
22-Feb-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	8.10	-	10	-	6	-
09-Mar-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.25	-	12	-	8	-
25-Mar-13	Domestic Effluent Discharge From Sedimentation pond (earthen pit)	7.15	-	10	-	6	-
23-Jun-12	Inlet to Oil & Grease Trap	6.80	<1.0	26	40	-	-
24-Jul-12	Inlet to Oil & Grease Trap	8.35	<1.0	20	30	-	-
06-Dec-12	Inlet to Oil & Grease Trap	7.10	<1.0	26	40	-	-
25-Mar-13	Inlet to Oil & Grease Trap	6.85	<1.0	20	30	-	-
05-Apr-12	Oil & Grease trap Outlet	8.30	<1.0	24	35	-	-
21-Apr-12	Oil & Grease trap Outlet	8.40	<1.0	20	30	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Lingaraj

05-May-12	Oil & Grease trap Outlet	8.35	<1.0	20	30	-	-
22-May-12	Oil & Grease trap Outlet	8.40	<1.0	24	35	-	-
04-Jun-12	Oil & Grease trap Outlet	8.35	<1.0	20	30	-	-
22-Jun-12	Oil & Grease trap Outlet	8.42	<1.0	22	35	-	-
06-Jul-12	Oil & Grease trap Outlet	8.43	<1.0	24	35	-	-
10-Aug-12	Oil & Grease trap Outlet	8.25	<1.0	22	35	-	-
25-Aug-12	Oil & Grease trap Outlet	8.32	<1.0	22	35	-	-
10-Sep-12	Oil & Grease trap Outlet	8.30	<1.0	26	40	-	-
26-Sep-12	Oil & Grease trap Outlet	8.20	<1.0	24	35	-	-
08-Oct-12	Oil & Grease trap Outlet	8.25	<1.0	30	45	-	-
19-Oct-12	Oil & Grease trap Outlet	8.15	<1.0	22	30	-	-
06-Nov-12	Oil & Grease trap Outlet	8.00	<1.0	20	30	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Lingaraj

21-Nov-12	Oil & Grease trap Outlet	8.10	<1.0	24	35	-	-
06-Dec-12	Oil & Grease trap Outlet	8.00	<1.0	20	30	-	-
21-Dec-12	Oil & Grease trap Outlet	8.10	<1.0	24	35	-	-
10-Jan-13	Oil & Grease trap Outlet	7.90	<1.0	24	35	-	-
25-Jan-13	Oil & Grease trap Outlet	7.20	<1.0	22	35	-	-
07-Feb-13	Oil & Grease trap Outlet	7.72	<1.0	26	40	-	-
22-Feb-13	Oil & Grease trap Outlet	7.82	<1.0	20	30	-	-
09-Mar-13	Oil & Grease trap Outlet	7.65	<1.0	28	40	-	-
25-Mar-13	Oil & Grease trap Outlet	7.53	<1.0	24	35	-	-
05-Apr-12	Outlet of DETP	8.22		14	-	8	-
21-Apr-12	Outlet of DETP	8.15		16	-	10	-
07-May-12	Outlet of DETP	8.15		16	-	10	-

TABLE--
EFFLUENT QUALITY DATA

Area : **Lingaraj**

22-May-12	Outlet of DETP	8.20		12	-	8	-
06-Jun-12	Outlet of DETP	8.12		14	-	8	-
23-Jun-12	Outlet of DETP	8.16		12	-	7	-
09-Jul-12	Outlet of DETP	8.05		12	-	6	-
05-Apr-12	Outlet of MDTP	8.75	<1.0	36	55	-	2.0
21-Apr-12	Outlet of MDTP	8.62	<1.0	32	50	-	2.1
05-May-12	Outlet of MDTP	8.80	<1.0	32	45	-	1.9
22-May-12	Outlet of MDTP	8.75	<1.0	28	40	-	2.0
04-Jun-12	Outlet of MDTP	8.72	<1.0	26	35	-	1.9
22-Jun-12	Outlet of MDTP	8.80	<1.0	28	40	-	2.0
06-Jul-12	Outlet of MDTP	8.80	<1.0	30	45	-	2.0
24-Jul-12	Outlet of MDTP	8.70	<1.0	28	40	-	1.8

TABLE--
EFFLUENT QUALITY DATA

Area : Lingaraj

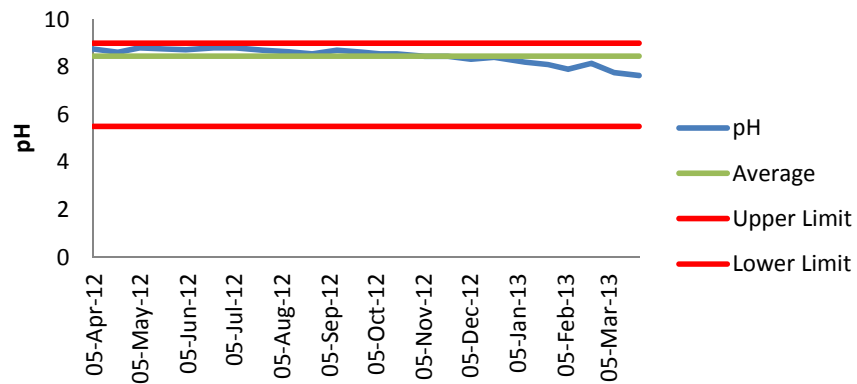
10-Aug-12	Outlet of MDTP	8.64	<1.0	30	45	-	1.9
25-Aug-12	Outlet of MDTP	8.55	<1.0	28	40	-	1.8
10-Sep-12	Outlet of MDTP	8.70	<1.0	32	50	-	1.9
26-Sep-12	Outlet of MDTP	8.62	<1.0	30	45	-	1.8
08-Oct-12	Outlet of MDTP	8.55	<1.0	28	40	-	1.9
19-Oct-12	Outlet of MDTP	8.55	<1.0	28	40	-	2.0
06-Nov-12	Outlet of MDTP	8.45	<1.0	26	35	-	1.9
21-Nov-12	Outlet of MDTP	8.45	<1.0	30	45	-	1.9
06-Dec-12	Outlet of MDTP	8.32	<1.0	28	40	-	2.0
21-Dec-12	Outlet of MDTP	8.40	<1.0	32	45	-	2.1
10-Jan-13	Outlet of MDTP	8.20	<1.0	30	45	-	1.9
25-Jan-13	Outlet of MDTP	8.10	<1.0	28	40	-	2.0

TABLE--
EFFLUENT QUALITY DATA

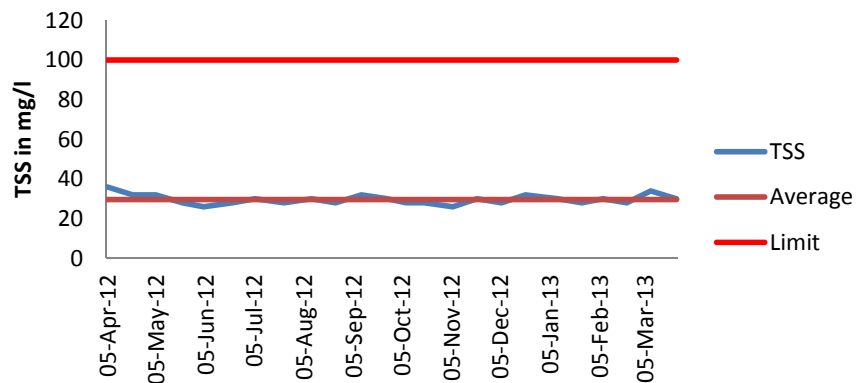
Area : Lingaraj

07-Feb-13	Outlet of MDTP	7.90	<1.0	30	45	-	1.9
22-Feb-13	Outlet of MDTP	8.15	<1.0	28	40	-	2.0
09-Mar-13	Outlet of MDTP	7.76	<1.0	34	50	-	2.1
25-Mar-13	Outlet of MDTP	7.64	<1.0	30	45	-	2.0

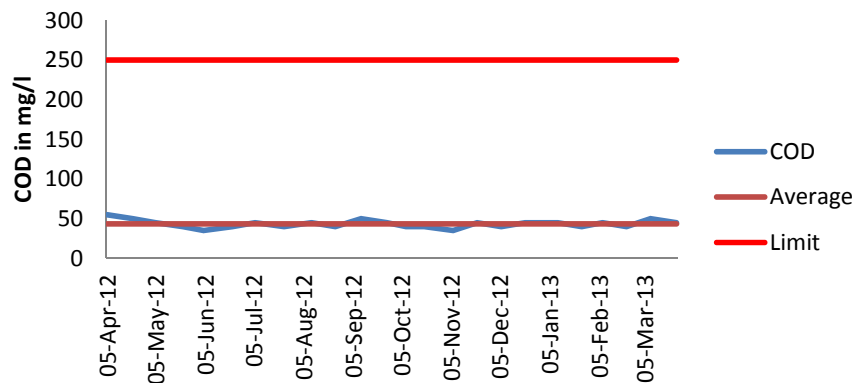
Variation in pH at MDTP Outlet in Lingaraj OCP



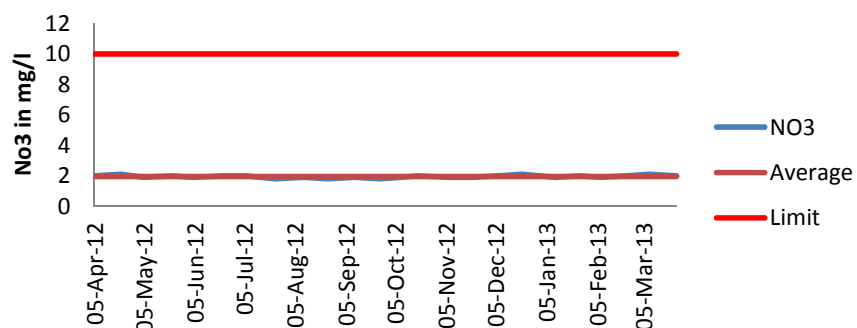
Variation in TSS at MDTP Outlet in Lingaraj OCP



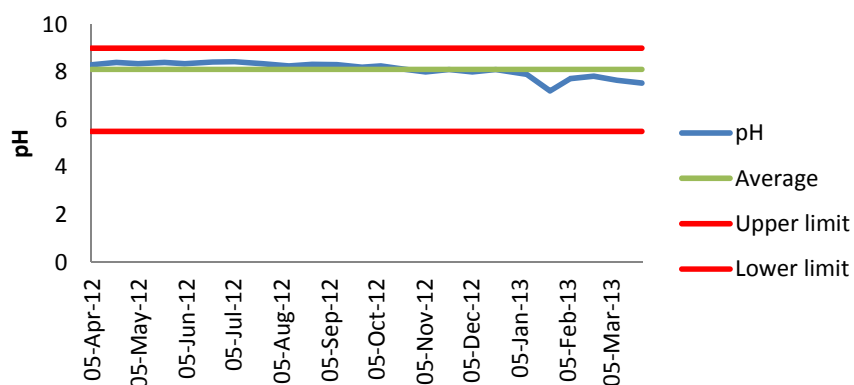
Variation in COD at MDTP Outlet in Lingaraj OCP



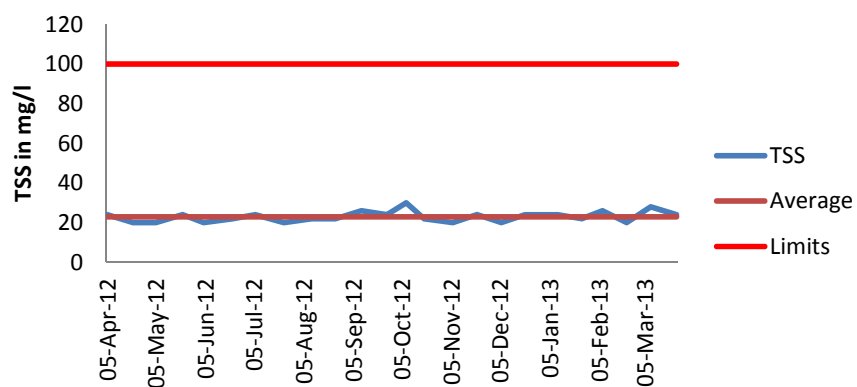
Variation in NO3 at MDTP Outlet in Lingaraj OCP

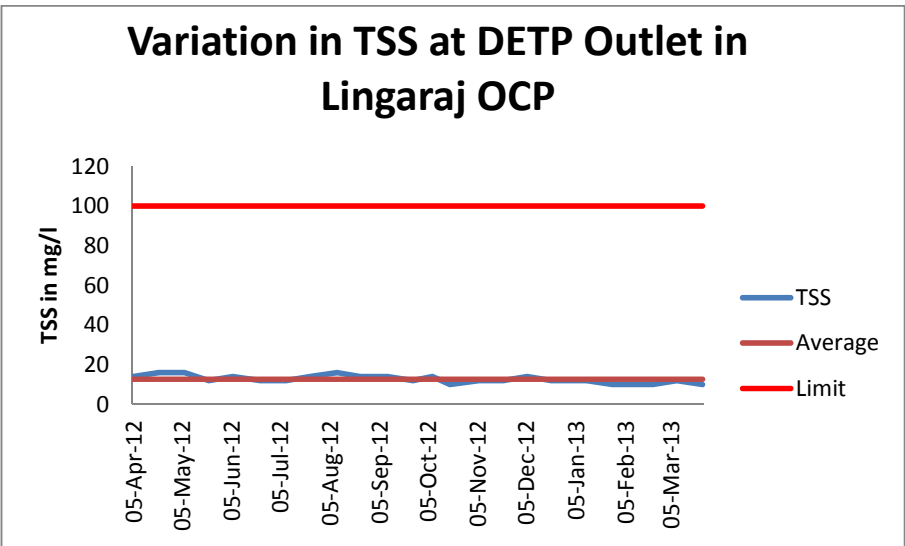
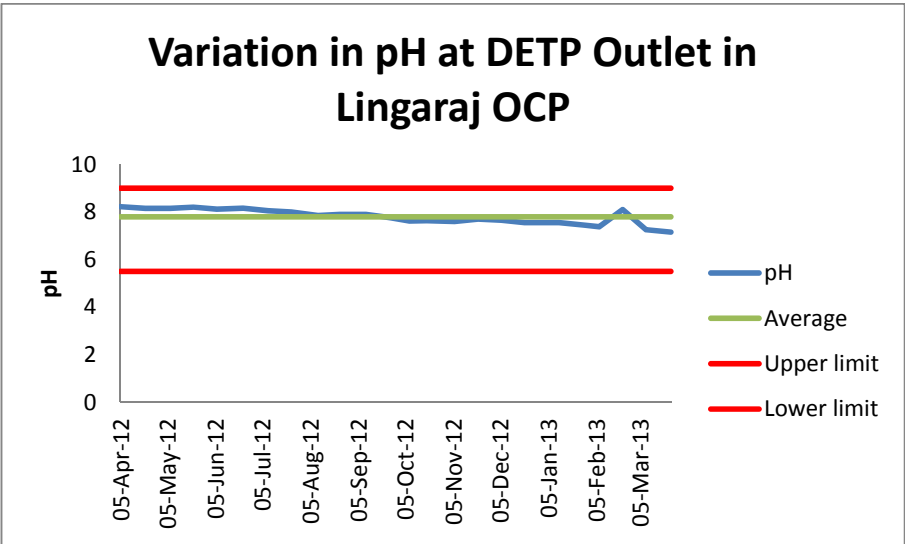
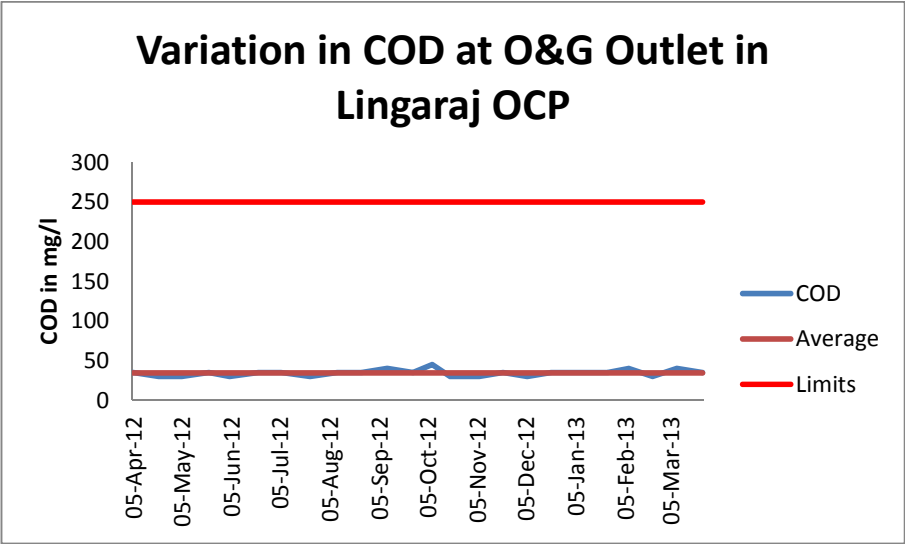


Variation in pH at O&G Outlet in Lingaraj OCP

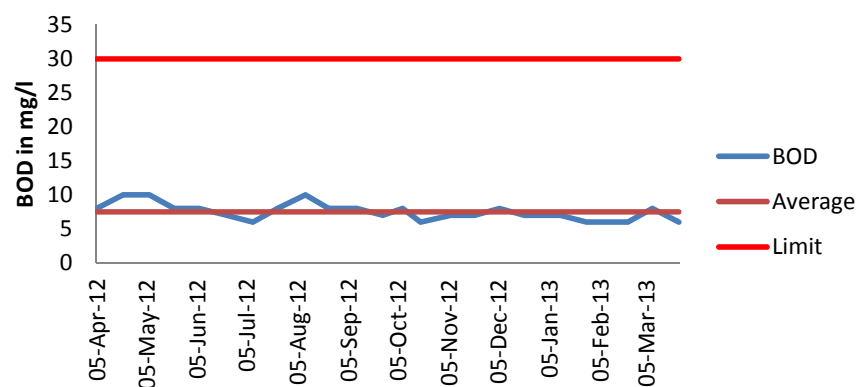


Variation in TSS at O&G Outlet in Lingaraj OCP





Variation in BOD at DETP Outlet in Lingaraj OCP



Yearly Effluent Data

Area: Lingaraj

Area	<i>Lingaraj</i>
Project	<i>Lingaraj OCP</i>
Date of sampling	19-Oct-12
Name of the station	Outlet of O&G trap at confl. Pt. of Brahmani river
Colour	Acceptable
Odour	Agreeable
Temperature, °C	13.5
Amonical Nitrogen	0.11
TKN	2.10
BOD	16
Arsenic	<0.01
Lead	<0.05
Hexavalent chromium	<0.01
Total chromium	<0.1
Copper	<0.02
Zinc	0.24
Selenium	<0.01
Nickel	<0.1
Fluoride	0.32
Dissolved phosphate	0.15
Sulphide	0.005
Phenolics	<0.001
Manganese	<0.05
Iron	0.18
Nitrate Nitrogen	-

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Lingaraj

PROJECT : Lingaraj OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Lingaraj CGM Office	56.1	46.3
27-Apr-12	Lingaraj CGM Office	59.9	55.1
12-May-12	Lingaraj CGM Office	52.4	45.9
29-May-12	Lingaraj CGM Office	59.2	56.8
13-Jun-12	Lingaraj CGM Office	55.6	49.6
28-Jun-12	Lingaraj CGM Office	60.9	56.2
12-Jul-12	Lingaraj CGM Office	60.4	54.6
28-Jul-12	Lingaraj CGM Office	55.1	50.1
11-Aug-12	Lingaraj CGM Office	56.8	47.5
27-Aug-12	Lingaraj CGM Office	54.9	47.7
13-Sep-12	Lingaraj CGM Office	57.6	50.1
27-Sep-12	Lingaraj CGM Office	56.4	52.4
12-Oct-12	Lingaraj CGM Office	55.8	49.6
29-Oct-12	Lingaraj CGM Office	56.2	47.6
12-Nov-12	Lingaraj CGM Office	60.5	55.5
28-Nov-12	Lingaraj CGM Office	58.5	49.5
13-Dec-12	Lingaraj CGM Office	56.6	50.4
28-Dec-12	Lingaraj CGM Office	58.1	56.7
12-Jan-13	Lingaraj CGM Office	60.9	56.8
29-Jan-13	Lingaraj CGM Office	61.3	44.3
13-Feb-13	Lingaraj CGM Office	54.5	47.6

26-Feb-13	Lingaraj CGM Office	54.5	48.6
13-Mar-13	Lingaraj CGM Office	55.7	49.8
27-Mar-13	Lingaraj CGM Office	54.5	49.6

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Lingaraj*

PROJECT : *Lingaraj OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Kandhal Village	49.4	42.1
27-Apr-12	Kandhal Village	51.6	43.6
12-May-12	Kandhal Village	51.6	48.5
30-May-12	Kandhal Village	51.7	45.7
14-Jun-12	Kandhal Village	52.6	42.5
29-Jun-12	Kandhal Village	52.3	44.6
13-Jul-12	Kandhal Village	52.1	42.6
30-Jul-12	Kandhal Village	52.1	47.0
13-Aug-12	Kandhal Village	50.1	40.2
28-Aug-12	Kandhal Village	52.6	45.7
14-Sep-12	Kandhal Village	56.1	42.4
27-Sep-12	Kandhal Village	53.0	44.3
13-Oct-12	Kandhal Village	52.1	42.5
29-Oct-12	Kandhal Village	49.8	40.5
14-Nov-12	Kandhal Village	52.1	42.6
28-Nov-12	Kandhal Village	52.1	43.5
14-Dec-12	Kandhal Village	52.4	44.5
29-Dec-12	Kandhal Village	52.7	42.5
14-Jan-13	Kandhal Village	50.3	41.5
30-Jan-13	Kandhal Village	50.2	42.5
14-Feb-13	Kandhal Village	52.4	43.5

27-Feb-13	Kandhal Village	50.1	41.4
13-Mar-13	Kandhal Village	51.4	46.4
27-Mar-13	Kandhal Village	51.6	42.6

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Lingaraj

PROJECT : Lingaraj OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Near CT Road (Lingaraj to Dera)	55.6	46.5
27-Apr-12	Near CT Road (Lingaraj to Dera)	60.5	50.4
12-May-12	Near CT Road (Lingaraj to Dera)	60.4	53.5
29-May-12	Near CT Road (Lingaraj to Dera)	58.9	54.5
13-Jun-12	Near CT Road (Lingaraj to Dera)	60.4	57.9
28-Jun-12	Near CT Road (Lingaraj to Dera)	60.2	50.6
12-Jul-12	Near CT Road (Lingaraj to Dera)	62.1	54.9
28-Jul-12	Near CT Road (Lingaraj to Dera)	62.8	58.1
11-Aug-12	Near CT Road (Lingaraj to Dera)	61.9	58.2
27-Aug-12	Near CT Road (Lingaraj to Dera)	62.2	58.6
13-Sep-12	Near CT Road (Lingaraj to Dera)	55.5	50.2
27-Sep-12	Near CT Road (Lingaraj to Dera)	54.2	43.4
12-Oct-12	Near CT Road (Lingaraj to Dera)	59.4	49.6
29-Oct-12	Near CT Road (Lingaraj to Dera)	59.3	52.9
12-Nov-12	Near CT Road (Lingaraj to Dera)	62.2	58.6
28-Nov-12	Near CT Road (Lingaraj to Dera)	62.8	58.5
13-Dec-12	Near CT Road (Lingaraj to Dera)	62.3	58.5
28-Dec-12	Near CT Road (Lingaraj to Dera)	61.5	57.6
12-Jan-13	Near CT Road (Lingaraj to Dera)	61.5	59.3
29-Jan-13	Near CT Road (Lingaraj to Dera)	61.9	50.3
13-Feb-13	Near CT Road (Lingaraj to Dera)	60.4	54.6

26-Feb-13	Near CT Road (Lingaraj to Dera)	58.6	45.2
13-Mar-13	Near CT Road (Lingaraj to Dera)	59.9	51.0
27-Mar-13	Near CT Road (Lingaraj to Dera)	60.2	52.5

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Lingaraj*

PROJECT : *Lingaraj OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Near Deulbera colliery	58.4	52.1
27-Apr-12	Near Deulbera colliery	50.2	43.6
12-May-12	Near Deulbera colliery	60.1	55.6
29-May-12	Near Deulbera colliery	61.5	58.4
13-Jun-12	Near Deulbera colliery	60.5	57.5
28-Jun-12	Near Deulbera colliery	51.6	44.6
12-Jul-12	Near Deulbera colliery	61.7	57.6
28-Jul-12	Near Deulbera colliery	60.9	58.6
11-Aug-12	Near Deulbera colliery	56.6	50.3
27-Aug-12	Near Deulbera colliery	60.7	55.3
13-Sep-12	Near Deulbera colliery	60.2	52.3
27-Sep-12	Near Deulbera colliery	53.8	42.8
12-Oct-12	Near Deulbera colliery	60.7	55.6
29-Oct-12	Near Deulbera colliery	58.4	52.4
12-Nov-12	Near Deulbera colliery	62.7	57.2
28-Nov-12	Near Deulbera colliery	59.9	56.4
13-Dec-12	Near Deulbera colliery	61.7	57.6
28-Dec-12	Near Deulbera colliery	62.5	58.6
12-Jan-13	Near Deulbera colliery	62.2	56.9
29-Jan-13	Near Deulbera colliery	56.9	40.8
13-Feb-13	Near Deulbera colliery	62.5	56.5

26-Feb-13	Near Deulbera colliery	59.7	53.6
13-Mar-13	Near Deulbera colliery	56.7	48.9
27-Mar-13	Near Deulbera colliery	60.1	52.1

pH

Area : Lingaraj

<i>Project</i>	<i>Station</i>	<i>Date of Sampling</i>	<i>pH</i>
Lingaraj OCP	Mine Sump Water	12-Apr-12	7.1
Lingaraj OCP	Mine Sump Water	11-May-12	6.6
Lingaraj OCP	Mine Sump Water	13-Jun-12	7.1
Lingaraj OCP	Mine Sump Water	12-Jul-12	6.4
Lingaraj OCP	Mine Sump Water	14-Aug-12	7.1
Lingaraj OCP	Mine Sump Water	13-Sep-12	7.6
Lingaraj OCP	Mine Sump Water	13-Oct-12	6.8
Lingaraj OCP	Mine Sump Water	12-Nov-12	6.6
Lingaraj OCP	Mine Sump Water	14-Dec-12	6.2
Lingaraj OCP	Mine Sump Water	14-Jan-13	6.5
Lingaraj OCP	Mine Sump Water	13-Feb-13	6.9
Lingaraj OCP	Mine Sump Water	12-Mar-13	6.7

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : *Lingaraj*

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Lingaraj OCP	Talabeda Village Well	4.65
12-Apr-12	Lingaraj OCP	Balugaon Khamar village well	6.12
13-Aug-12	Lingaraj OCP	Talabeda Village Well	2.34
13-Aug-12	Lingaraj OCP	Balugaon Khamar village well	2.26
14-Nov-12	Lingaraj OCP	Talabeda Village Well	3.58
14-Nov-12	Lingaraj OCP	Balugaon Khamar village well	4.23
12-Jan-13	Lingaraj OCP	Talabeda Village Well	5.28
12-Jan-13	Lingaraj OCP	Balugaon Khamar village well	4.95

SILTATION STUDY AT TALCHER COALFIELD

LINGARAJ AREA

MONTH : JULY 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	07.07.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	07.07.12	38

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	25.07.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	25.07.12	36

SILTATION STUDY AT TALCHER COALFIELD

LINGARAJ AREA

MONTH : August 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	11.08.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	11.08.12	38

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	25.08.12	32
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	25.08.12	36

SILTATION STUDY AT TALCHER COALFIELD

LINGARAJ AREA

MONTH : September 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	11.09.12	34
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	11.09.12	38

2nd PHASE

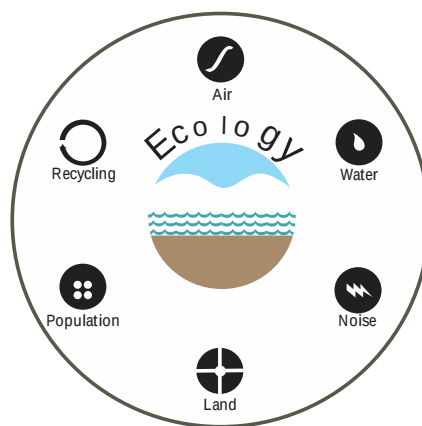
Area	Project	Monitoring Station	Date of Sampling	TSS
Lingaraj	Lingaraj OCP	100m U/S of the pt. of confluence of mine disc. Water with Brahmani river	27.09.12	36
		100m D/S of the pt. of confluence of mine disc. Water with Brahmani river	27.09.12	40



Annual Compiled Monitoring Report Of Kaniha Area For 2012-2013

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



Central Mine Planning & Design Institute Ltd.

(A Subsidiary of Coal India Ltd.)

Regional Institute-VII, OSHB Building, Bhubaneswar – 751 001 (Orissa)
[Assistance from Environment Division, CMPDI(HQs), Ranchi]

CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine

Kaniha area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has one OCP under its administrative control. The OCP is Kaniha.

Kaniha OCP

Kaniha OCP is situated between latitudes 20° 57' 39" & 20° 58' 19" N and longitudes 85° 09' 33" and 85° 12' 12" E. The project is well connected by rail and road. Talcher railway station on the branch line of East-Coast Railway is at a distance of about 3 km.

The area has a gentle slope towards north. The elevation of the area varies from 90 to 110 m.

The mean temperature ranges from 6.7° C (winter season) to 44.1°C (pre-monsoon cyclone season). The monthly mean wind speed at 8:30 hr. varies from 2.0 to 3.0 kmph during the year against 2.0 to 8.0 kmph at 17:30 hr.

For coal wining and transportation contractual shovel-dumper combination system is used. For OB removal and transportation, shovel-dumper combination system is also used. The main consumer of Lingaraj OCP is Rajiv Gandhi Super Thermal Power Station (NTPC), Kaniha.

1.2 Frequency of Environmental Monitoring

(i) **Ambient air quality monitoring**

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out.

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

(ii) Drinking water monitoring : Every month.

(iii) **Effluent quality monitoring**

1/4/5 parameters : once in a fortnight/monthly/
July, Aug. & Sept.

21 parameters : Once in a year

(iv) Well water level monitoring : Quarterly

(v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The details of various environmental quality monitoring stations are given in are given below:

- **Air quality monitoring stations**

Sl.No. Name of Stations

Kaniha OCP

1. Site office
2. Jamunia village
3. Patharmunda village
4. Near jarda village

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

1. Project Office Tube well water
2. Jarda/Kasanubda/Jamunia village well water

- **Well water level monitoring stations**

Sl.No. Name of Stations

1. Jarada village well water
2. Jamunia village
3. Kansamunda village well

- **Noise level monitoring stations**

Sl.No. Name of Stations

1. Site office
2. Jamunia village
3. Patharmunda village
4. Near jarda village

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1

**Details of Air Quality Monitoring Stations
along with Sources of Pollution**

Sl.No.	Location	Sources of Pollution
Kaniha OCP		
1.	Site office	Nearby mining activities.
2.	Patharmunda village	Nearby mining activities.
3.	Near Jarada Village	Nearby mining activities.
4.	Jamunia village	Nearby mining activities

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2

Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached.

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Lingaraj Area reveals the following:

- In coal mining area like G.M Office, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines, barring a few aberated value.
- In residential areas, all the values are found to be within the limits of the National Ambient Air Quality Standards (NAAQS) notified under Schedule-VII.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Water sprinkling on haul roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers at haul roads and siding.
- Cleaning spillage from roads.
- Practice for covered transportation.
- Regular maintenance of all HEMMs and other machinery.
- Provision of gas filters for exhaust fumes.
- No overloading of trucks/dumpers.
- Application of innocuous chemical binders on haul roads.
- Development of thick greenbelts around the mines, infrastructure sites and residential area besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.
- Drills with well-designed dust extractors/arrestors.
- Provision of dust extraction system for crusher house.
- Suppression of coal dust at CHP by provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers.

CHAPTER-III**WATER ENVIRONMENT****3.1 Methodology and Instruments used for water & effluent analysis**

Details are given in Table-4.

Table-4**Methodology & Instruments used for Water and Effluent Analysis**

Sl.No.	Parameters	Method/Instruments
1	PH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The results of analysis of water samples (Drinking) is given in Tables attached. Ground water level monitoring of various dug-wells are given in Tables attached

3.3 Discussions**(a) Drinking water sample**

The examination of analytical results of drinking water sample reveals the following :

- All physico-chemical parameters are well within the limits of the Indian Drinking Water Standard in the drinking water sample.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.2 Results

The fortnightly noise level measurements for different stations are given in Tables attached

4.3 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards.

4.4 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Proper designing of plant and machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- HEMMs with sound proof cabin.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Apr-12	Jamunia Village	185	76	22	28	Mining yet to be started	About 500 m W	East to west & sunny
26-Apr-12	Jamunia Village	150	73	22	28	Mining yet to be started	About 500 m W	East to west & sunny
08-May-12	Jamunia Village	173	78	22	28	Mining yet to be started	About 500 m W	East to west & sunny
23-May-12	Jamunia Village	145	74	24	27	Mining yet to be started	About 500 m W	East to west & sunny
08-Jun-12	Jamunia Village	154	68	22	26	Mining yet to be started	About 500 m W	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Jun-12	Jamunia Village	132	56	20	24	Mining yet to be started	About 500 m W	East to west & cloudy rain fall
08-Jul-12	Jamunia Village	166	72	24	28	Mining yet to be started	About 500 m W	East to west & sunny
24-Jul-12	Jamunia Village	120	57	18	21	Mining yet to be started	About 500 m W	East to west, cloudy and rainfall
08-Aug-12	Jamunia Village	112	75	24	30	Mining yet to be started	About 500 m W	East to west, cloudy and rainfall
23-Aug-12	Jamunia Village	103	82	20	34	Mining yet to be started	About 500 m W	East to west, cloudy and rainfall
07-Sep-12	Jamunia Village	100	90	21	35	Mining started	About 500 m W	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Sep-12	Jamunia Village	102	62	18	21	Mining started	About 500 m W	East to west & sunny
09-Oct-12	Jamunia Village	94	51	17	20	Mining started	About 500 m W	South to North cloudy, and rainfall
25-Oct-12	Jamunia Village	126	59	18	22	Mining started	About 500 m W	West to east & sunny
07-Nov-12	Jamunia Village	119	84	19	24	Mining started	About 500 m W	East to west & sunny
22-Nov-12	Jamunia Village	127	99	21	26	Mining started	About 500 m W	East to west & cloudy
07-Dec-12	Jamunia Village	138	97	23	27	Mining started	About 500 m W	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Dec-12	Jamunia Village	272	99	24	26	Mining started	About 500 m W	South to north & cloudy
08-Jan-13	Jamunia Village	295	124	26	29	Mining started	About 500 m W	East to west & sunny
23-Jan-13	Jamunia Village	275	128	25	28	Mining started	About 500 m W	East to west & sunny
08-Feb-13	Jamunia Village	283	134	26	29	Mining started	About 500 m W	East to west & sunny
25-Feb-13	Jamunia Village	273	157	28	30	Mining started	About 500 m W	South to north & sunny
08-Mar-13	Jamunia Village	283	164	26	28	Mining started	About 500 m W	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Mar-13	Jamunia Village	297	173	27	31	Mining started	About 500 m W	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Apr-12	Near Jarada village	162	86	22	28	Mining yet to be started	About 500m S	East to west & sunny
26-Apr-12	Near Jarada village	142	77	22	28	Mining yet to be started	About 500m S	East to west & sunny
08-May-12	Near Jarada village	165	74	22	28	Mining yet to be started	About 500m S	East to west & sunny
23-May-12	Near Jarada village	174	68	22	28	Mining yet to be started	About 500m S	East to west & sunny
08-Jun-12	Near Jarada village	162	61	22	28	Mining yet to be started	About 500m S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Jun-12	Near Jarada village	145	67	22	26	Mining yet to be started	About 500m S	East to west & cloudy rain fall
08-Jul-12	Near Jarada village	177	74	24	30	Mining yet to be started	About 500m S	East to west & sunny
24-Jul-12	Near Jarada village	103	49	16	18	Mining yet to be started	About 500m S	East to west, cloudy and rainfall
08-Aug-12	Near Jarada village	108	69	18	24	Mining yet to be started	About 500m S	East to west, cloudy and rainfall
23-Aug-12	Near Jarada village	110	87	24	37	Mining yet to be started	About 500m S	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
07-Sep-12	Near Jarda village	104	97	22	39	Mining started	About 500m S	East to west, cloudy and rainfall
24-Sep-12	Near Jarda village	108	65	18	22	Mining started	About 500m S	East to west & sunny
09-Oct-12	Near Jarda village	105	57	19	22	Mining started	About 500m S	South to North cloudy, and rainfall
25-Oct-12	Near Jarda village	139	66	21	26	Mining started	About 500m S	West to east & sunny
07-Nov-12	Near Jarda village	127	86	23	27	Mining started	About 500m S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

22-Nov-12	Near Jarda village	137	95	24	29	Mining started	About 500m S	East to west & cloudy
07-Dec-12	Near Jarda village	129	91	21	25	Mining started	About 500m S	East to west & sunny
24-Dec-12	Near Jarda village	138	95	23	27	Mining started	About 500m S	South to north & cloudy
08-Jan-13	Near Jarda village	149	97	21	25	Mining started	About 500m S	East to west & sunny
23-Jan-13	Near Jarda village	164	105	23	26	Mining started	About 500m S	East to west & sunny
08-Feb-13	Near Jarda village	187	116	24	27	Mining started	About 500m S	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

25-Feb-13	Near Jarda village	196	143	25	28	Mining started	About 500m S	South to north & sunny
08-Mar-13	Near Jarda village	217	134	24	27	Mining started	About 500m S	South to north & sunny
23-Mar-13	Near Jarda village	237	141	25	28	Mining started	About 500m S	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Apr-12	Patharmunda Village	159	67	20	24	Mining yet to be started	About 600m	East to west & sunny
26-Apr-12	Patharmunda Village	184	87	24	30	Mining yet to be started	About 600m	East to west & sunny
08-May-12	Patharmunda Village	221	97	26	32	Mining yet to be started	About 600m	East to west & sunny
23-May-12	Patharmunda Village	159	87	26	30	Mining yet to be started	About 600m	East to west & sunny
08-Jun-12	Patharmunda Village	172	74	24	27	Mining yet to be started	About 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Jun-12	Patharmunda Village	125	59	20	25	Mining yet to be started	About 600m	East to west & cloudy rain fall
08-Jul-12	Patharmunda Village	203	85	26	31	Mining yet to be started	About 600m	East to west & sunny
24-Jul-12	Patharmunda Village	112	59	17	19	Mining yet to be started	About 600m	East to west, cloudy and rainfall
08-Aug-12	Patharmunda Village	119	79	19	32	Mining yet to be started	About 600m	East to west, cloudy and rainfall
23-Aug-12	Patharmunda Village	101	93	23	36	Mining yet to be started	About 600m	East to west, cloudy and rainfall
07-Sep-12	Patharmunda Village	107	99	23	38	Mining started	About 600m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Sep-12	Patharmunda Village	105	59	17	20	Mining started	About 600m	East to west & sunny
09-Oct-12	Patharmunda Village	81	54	19	22	Mining started	About 600m	South to North cloudy, and rainfall
25-Oct-12	Patharmunda Village	122	65	20	23	Mining started	About 600m	West to east & sunny
07-Nov-12	Patharmunda Village	138	95	25	29	Mining started	About 600m	East to west & sunny
22-Nov-12	Patharmunda Village	142	106	26	30	Mining started	About 600m	East to west & cloudy
07-Dec-12	Patharmunda Village	137	102	27	30	Mining started	About 600m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Dec-12	Patharmunda Village	295	113	28	31	Mining started	About 600m	South to north & cloudy
08-Jan-13	Patharmunda Village	257	104	25	28	Mining started	About 600m	East to west & sunny
23-Jan-13	Patharmunda Village	268	117	26	29	Mining started	About 600m	East to west & sunny
08-Feb-13	Patharmunda Village	279	127	27	29	Mining started	About 600m	East to west & sunny
25-Feb-13	Patharmunda Village	264	137	26	29	Mining started	About 600m	South to north & sunny
08-Mar-13	Patharmunda Village	276	143	27	29	Mining started	About 600m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Mar-13	Patharmunda Village	283	154	28	30	Mining started	About 600m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
10-Apr-12	Site Office	252	116	28	35	Mining yet to be started	About 400m	East to west & sunny
26-Apr-12	Site Office	287	122	32	40	Mining yet to be started	About 400m	East to west & sunny
08-May-12	Site Office	296	115	36	40	Mining yet to be started	About 400m	East to west & sunny
23-May-12	Site Office	268	107	30	36	Mining yet to be started	About 400m	East to west & sunny
08-Jun-12	Site Office	244	116	30	36	Mining yet to be started	About 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

23-Jun-12	Site Office	199	78	26	32	Mining yet to be started	About 400m	East to west & cloudy rain fall
08-Jul-12	Site Office	265	119	32	39	Mining yet to be started	About 400m	East to west & sunny
24-Jul-12	Site Office	197	84	28	35	Mining yet to be started	About 400m	East to west, cloudy and rainfall
08-Aug-12	Site Office	174	93	20	31	Mining yet to be started	About 400m	East to west, cloudy and rainfall
23-Aug-12	Site Office	151	90	22	35	Mining yet to be started	About 400m	East to west, cloudy and rainfall
07-Sep-12	Site Office	134	95	20	36	Mining started	About 400m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Sep-12	Site Office	146	92	25	31	Mining started	About 400m	East to west & sunny
09-Oct-12	Site Office	160	69	26	31	Mining started	About 400m	South to North cloudy, and rainfall
25-Oct-12	Site Office	204	96	28	35	Mining started	About 400m	West to east & sunny
07-Nov-12	Site Office	215	104	29	37	Mining started	About 400m	East to west & sunny
22-Nov-12	Site Office	239	113	28	32	Mining started	About 400m	East to west & cloudy
07-Dec-12	Site Office	225	110	29	32	Mining started	About 400m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Kaniha**

24-Dec-12	Site Office	215	119	26	28	Mining started	About 400m	South to north & cloudy
08-Jan-13	Site Office	237	107	24	26	Mining started	About 400m	East to west & sunny
23-Jan-13	Site Office	206	101	22	25	Mining started	About 400m	East to west & sunny
08-Feb-13	Site Office	216	111	22	24	Mining started	About 400m	East to west & sunny
25-Feb-13	Site Office	235	126	23	25	Mining started	About 400m	South to north & sunny
08-Mar-13	Site Office	248	120	23	26	Mining started	About 400m	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

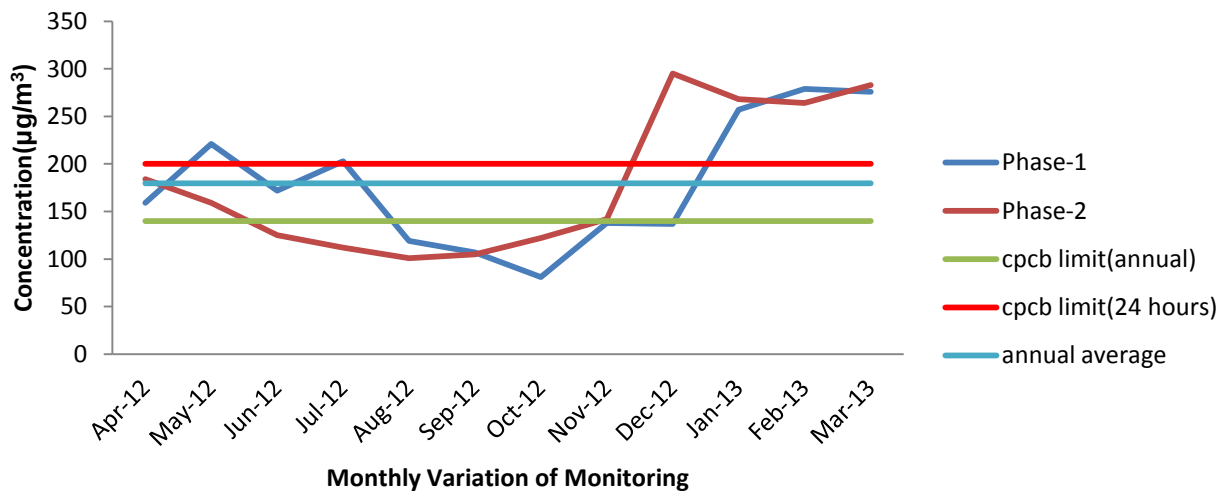
Area : Kaniha

23-Mar-13	Site Office	252	135	26	29	Mining started	About 400m	South to north & sunny

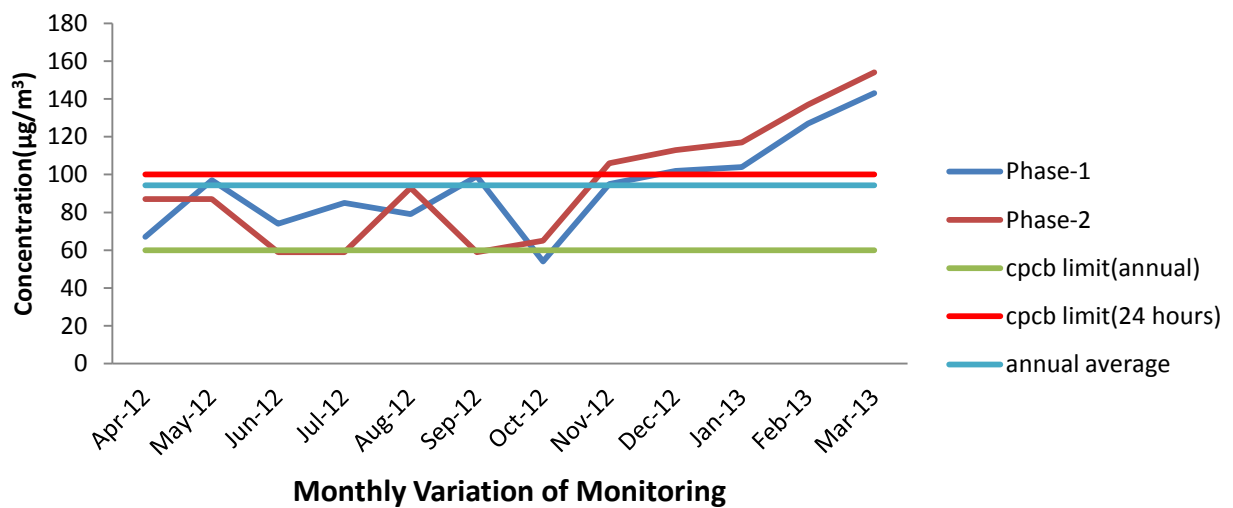


Air Quality Graph of Kaniha OCP

Graph-1: SPM monitoring of Jamunia Village of Kaniha OCP.



Graph-2: RPM monitoring of Jamunia Village of Kaniha OCP.



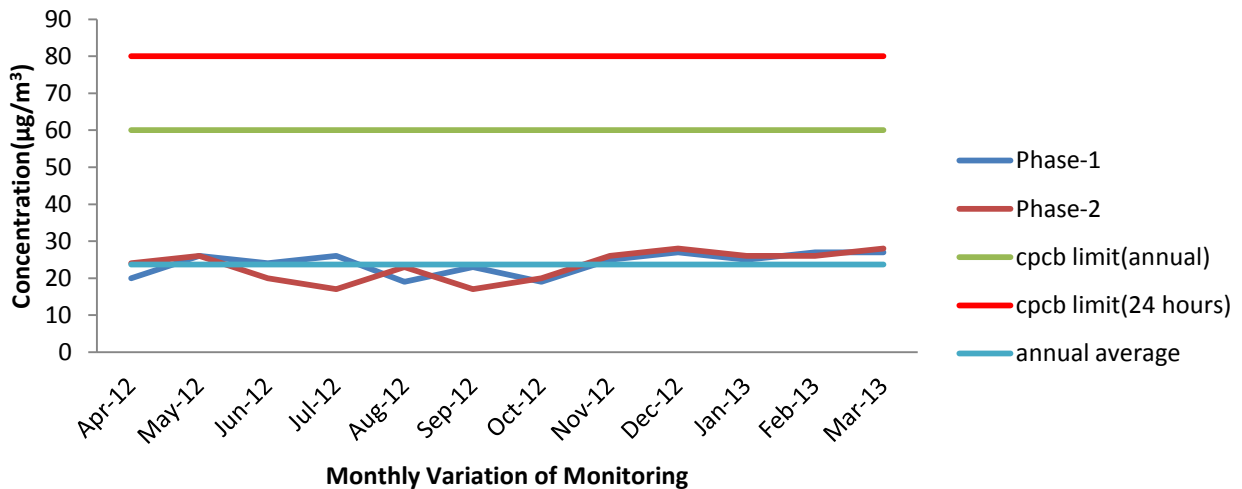
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

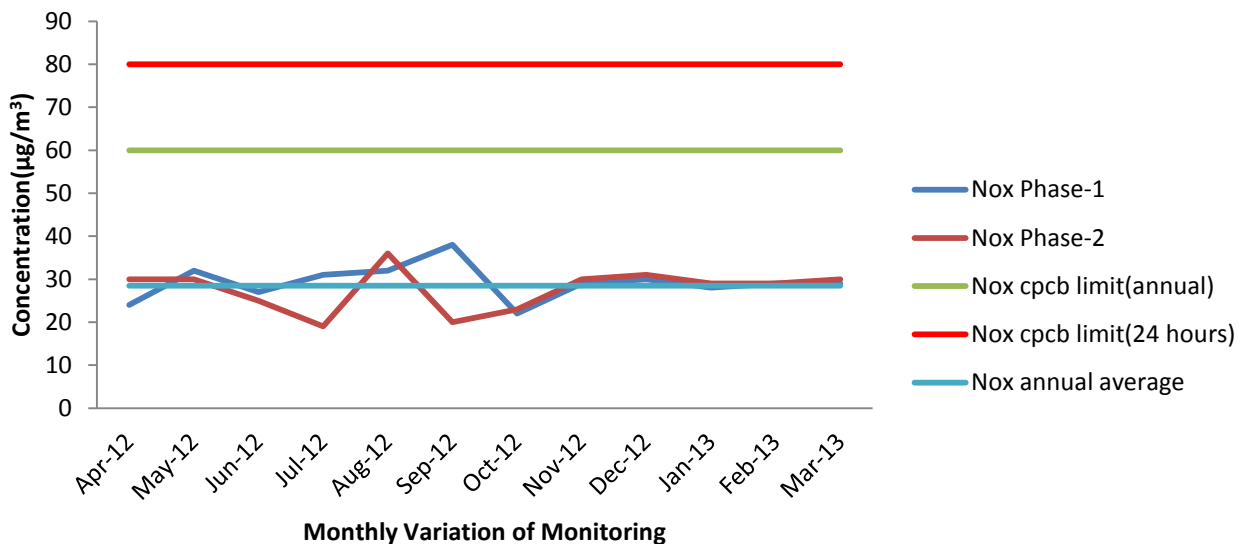


Air Quality Graph of Kaniha OCP

Graph-3: SO_x monitoring of Jamunia Village of Kaniha OCP.



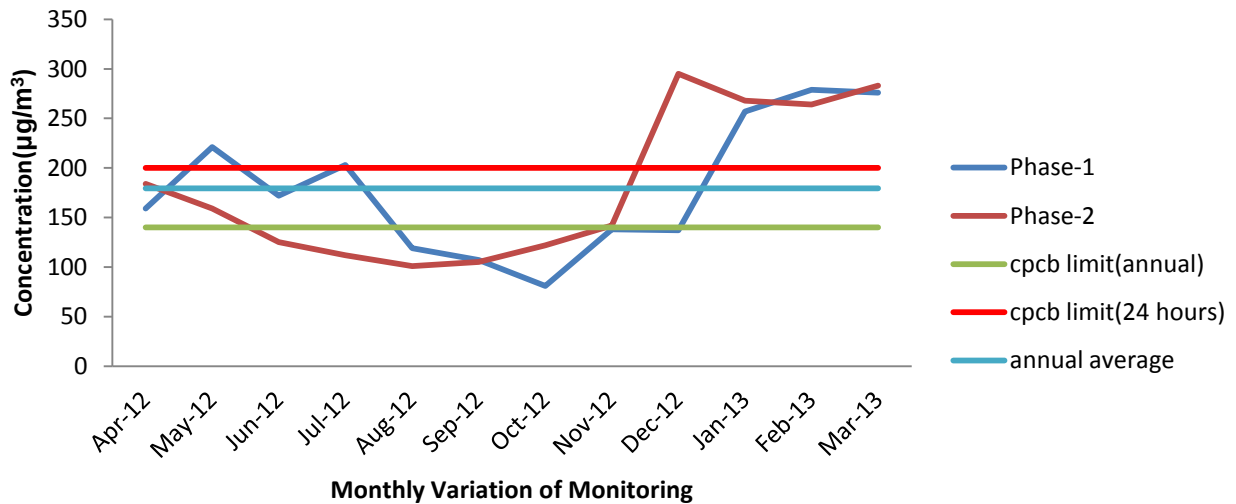
Graph-4: NO_x monitoring of Jamunia Village of Kaniha OCP.



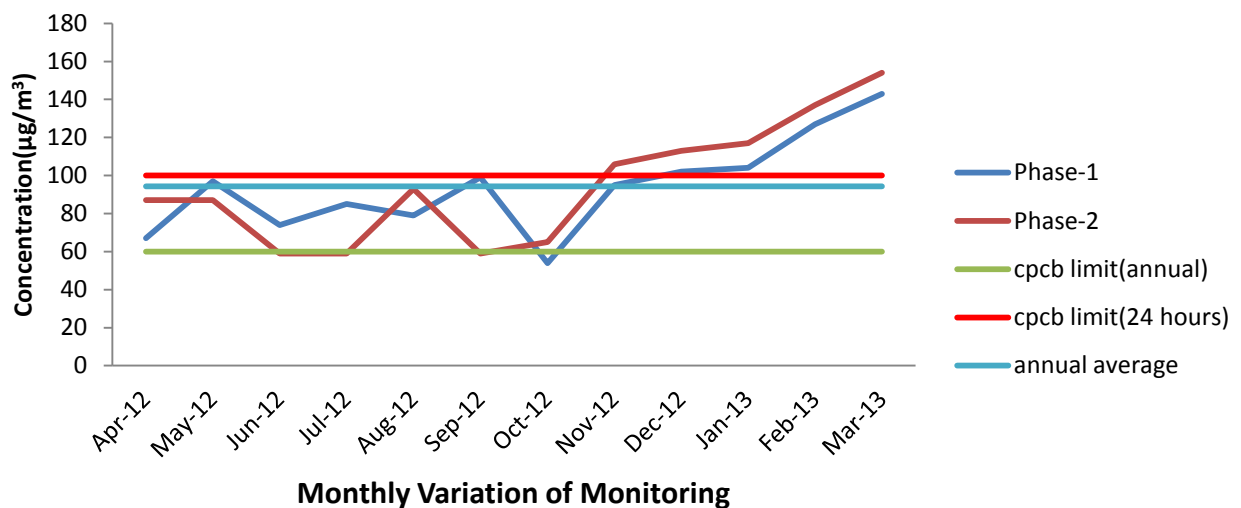


Air Quality Graph of Kaniha OCP

Graph-5: SPM monitoring of Near Jarada Village of Kaniha OCP.



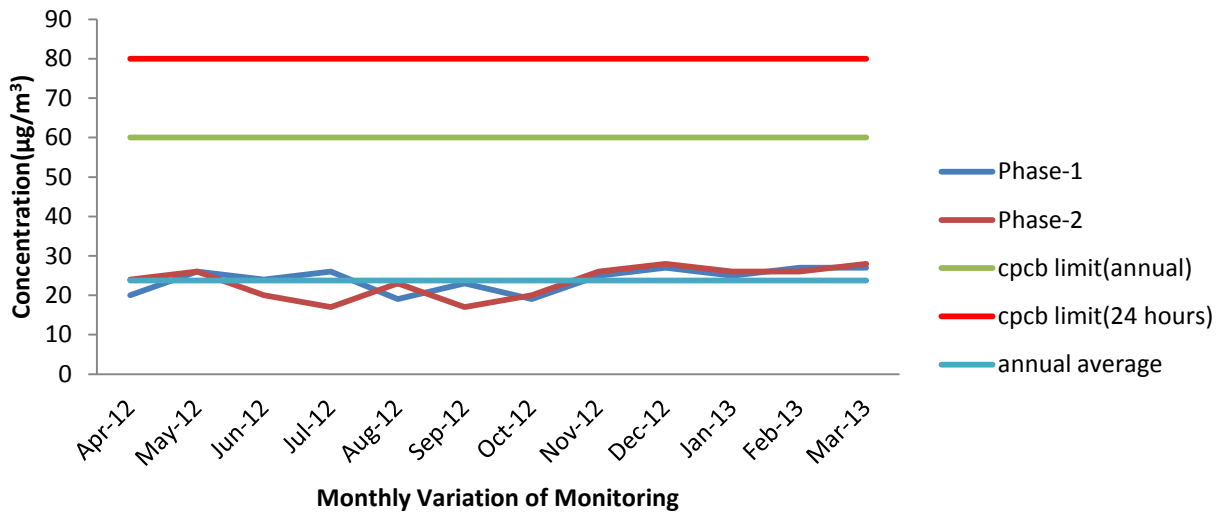
Graph-6: RPM monitoring of Near Jarada Village of Kaniha OCP.



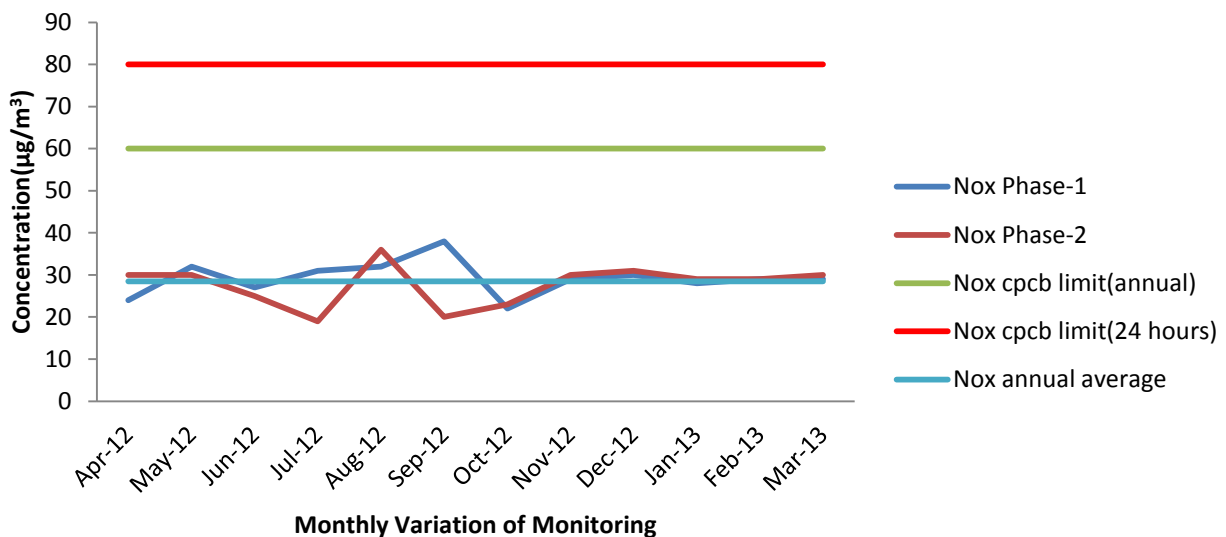


Air Quality Graph of Kaniha OCP

Graph-7: SO_x monitoring of Near Jarada Village of Kaniha OCP.



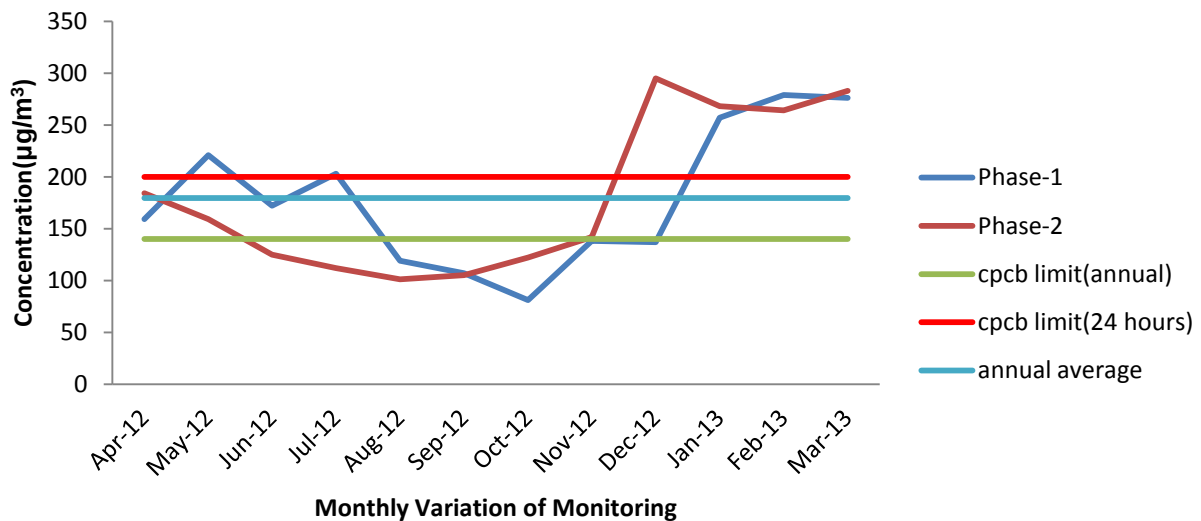
Graph-8: NO_x monitoring of Near Jarada Village of Kaniha OCP.



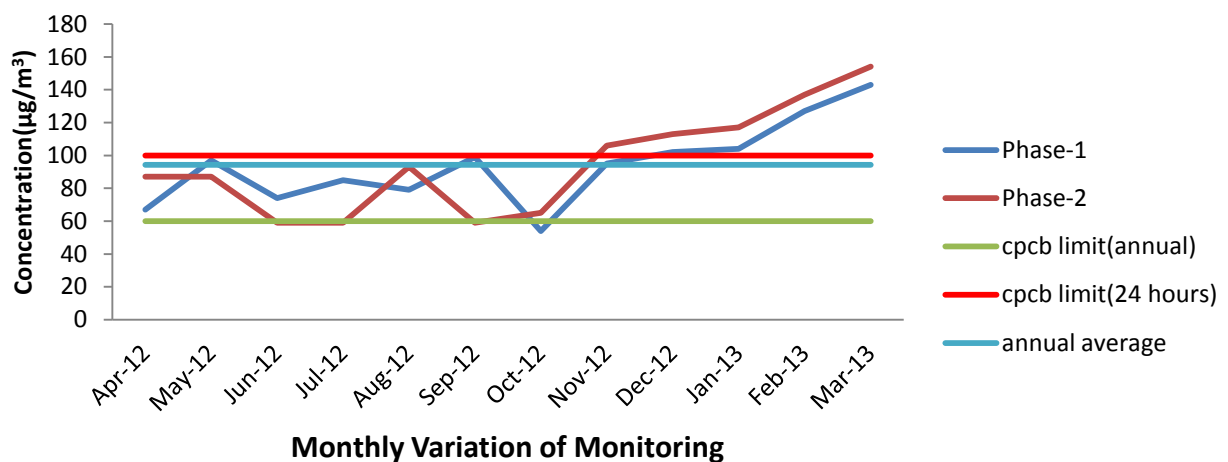


Air Quality Graph of Kaniha OCP

Graph-9: SPM monitoring of Patharmunda Village of Kaniha OCP.



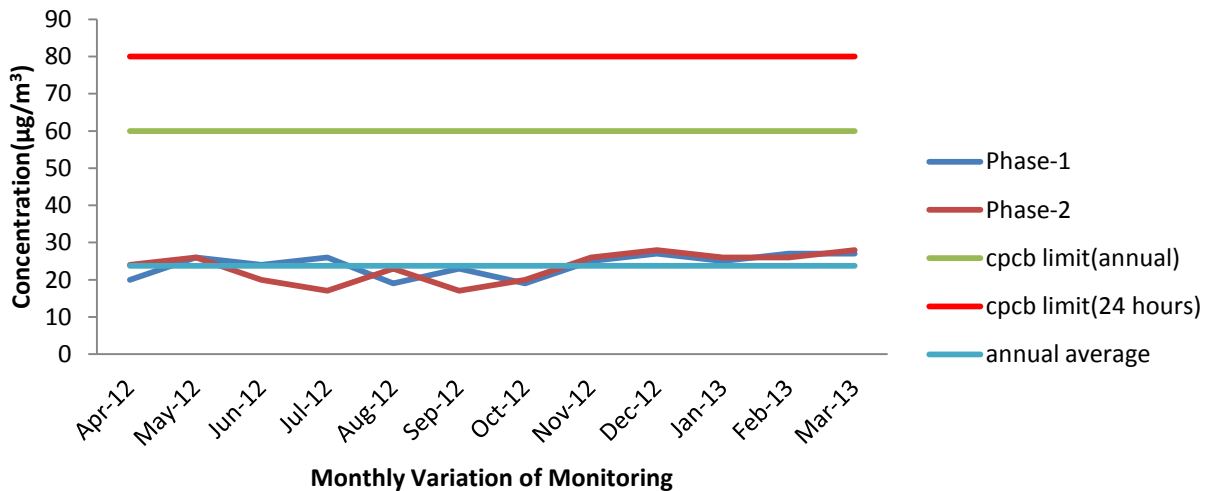
Graph-10: RPM monitoring of Patharmunda Village of Kaniha OCP.



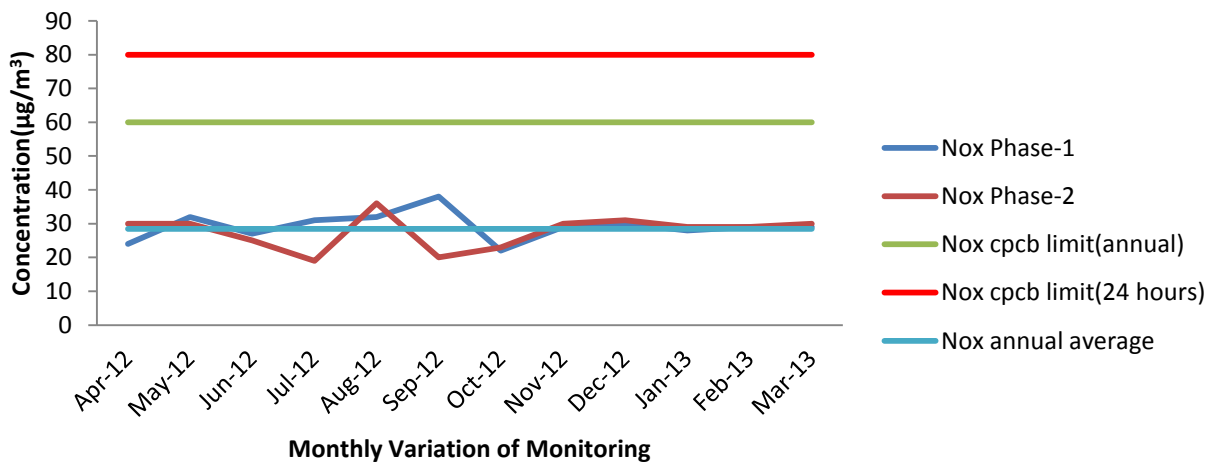


Air Quality Graph of Kaniha OCP

Graph-11: SO_x monitoring of Patharmunda Village of Kaniha OCP.



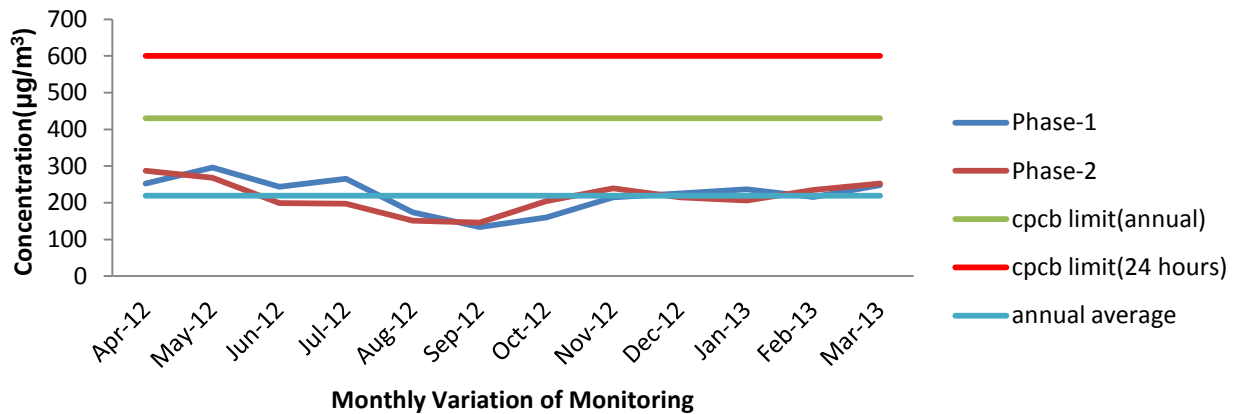
Graph-12: NO_x monitoring of Patharmunda Village of Kaniha OCP.



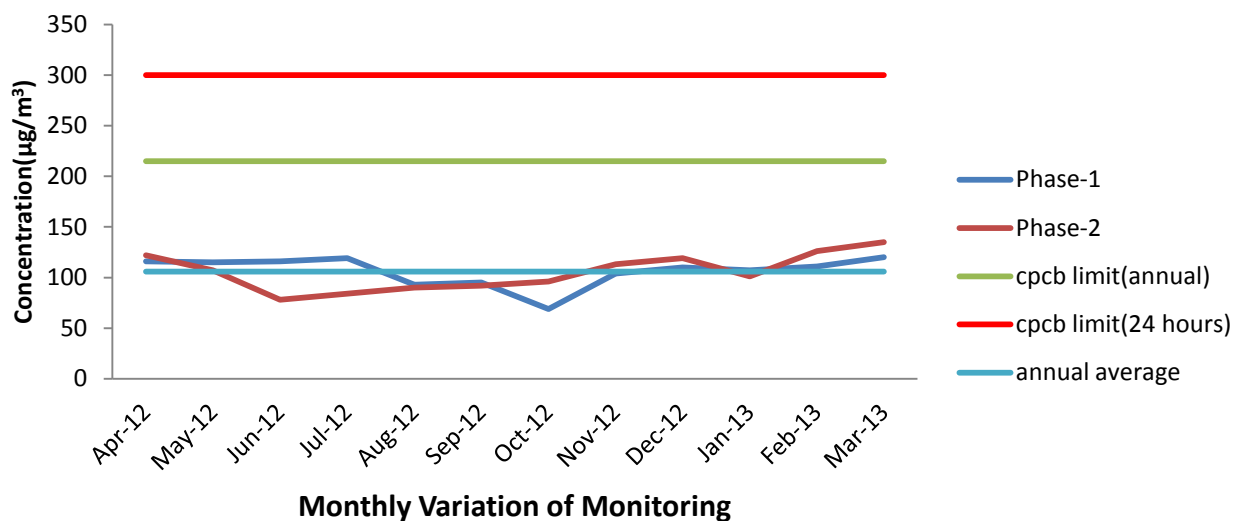


Air Quality Graph of Kaniha OCP

Graph-13: SPM monitoring of Site office of Kaniha OCP.



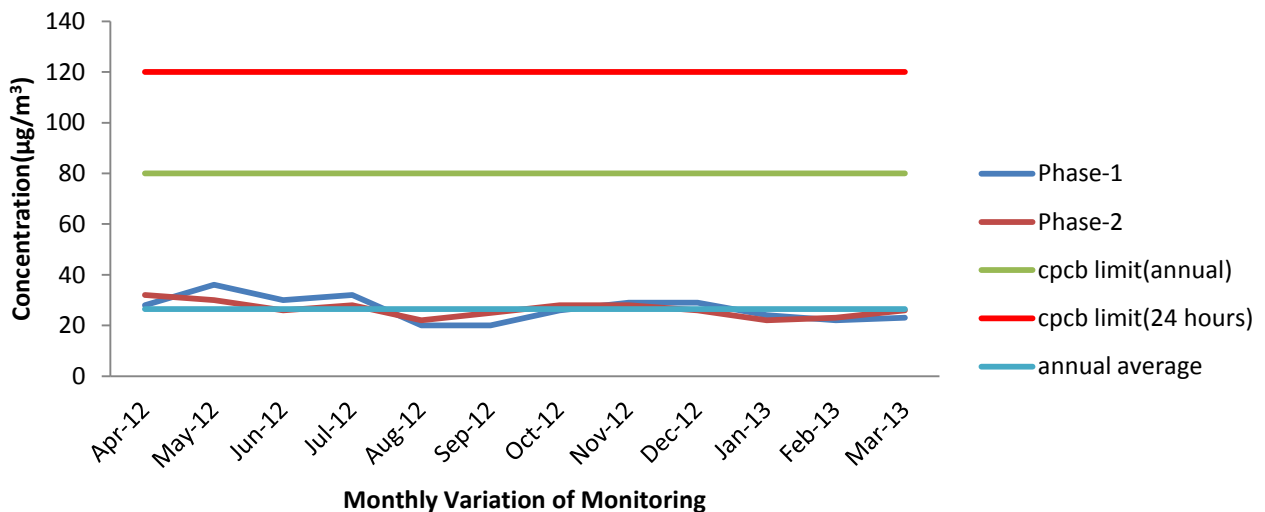
Graph-14: RPM monitoring of Site office of Kaniha OCP.



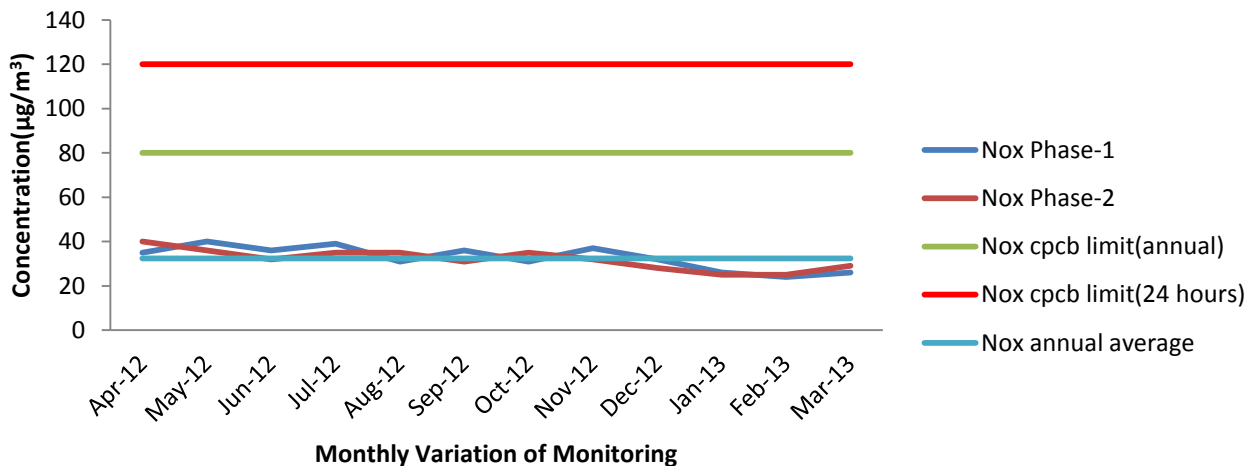


Air Quality Graph of Kaniha OCP

Graph-15: So_x monitoring of Site office of Kaniha OCP.



Graph-16: No_x monitoring of Site office of Kaniha OCP.



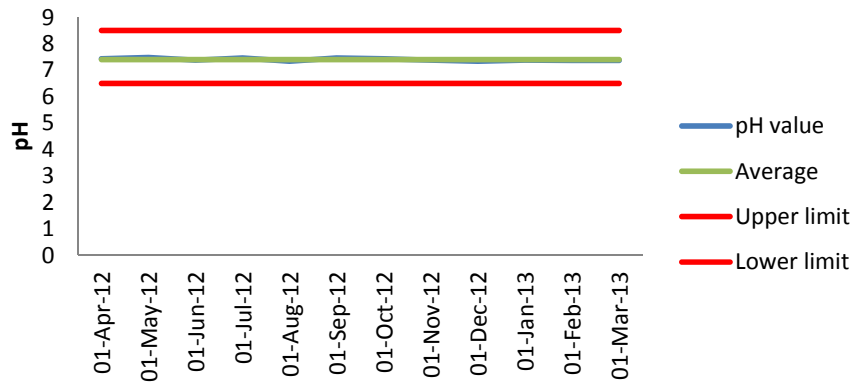
Drinking Water Data Area: Kaniha Project: Kaniha OCP

[illegible]

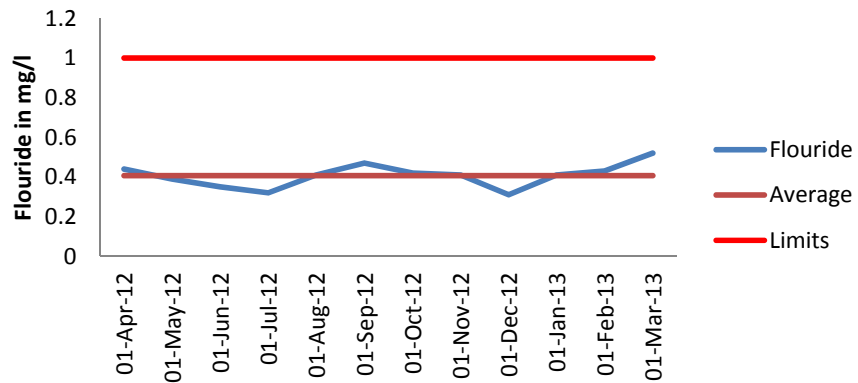
Drinking Water Data **Area: Kaniha** **Project: Kaniha OCP**

[illegible]

variation in pH at Project office tube well water at Kaniha OCP



variation in Flouride at Project office tube well water at Kaniha OCP



variation in Total Hardness at Project office tube well water at Kaniha OCP

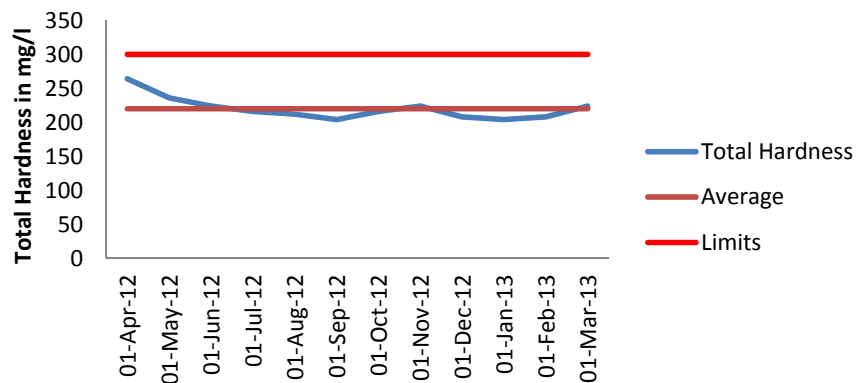


TABLE--
EFFLUENT QUALITY DATA

Area : **Kaniha**

Project : **Kaniha OCP**

(All dimensions are in mg/l unless otherwise stated except pH)

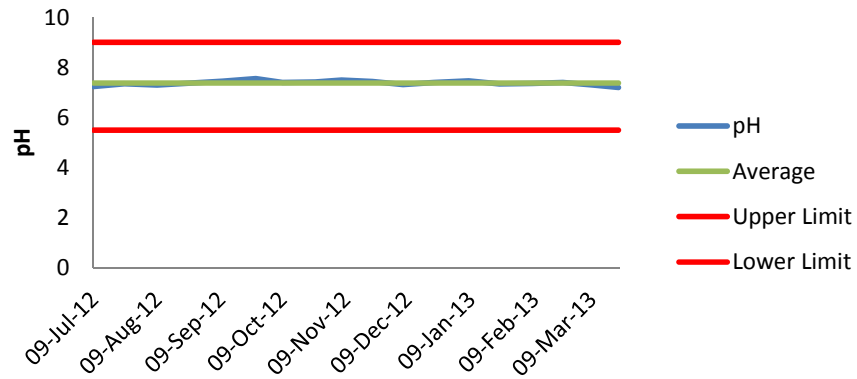
Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
09-Jul-12	Outlet of MDTP	7.24	<1.0	34	50	-	2.1
24-Jul-12	Outlet of MDTP	7.35	<1.0	30	45	-	1.9
09-Aug-12	Outlet of MDTP	7.30	<1.0	34	50	-	2.0
10-Sep-12	Outlet of MDTP	7.45	<1.0	32	45	-	1.9
26-Sep-12	Outlet of MDTP	7.55	<1.0	34	50	-	2.1
09-Oct-12	Outlet of MDTP	7.40	<1.0	30	45	-	1.8
25-Oct-12	Outlet of MDTP	7.42	<1.0	30	45	-	2.0
07-Nov-12	Outlet of MDTP	7.50	<1.0	34	50	-	2.1
22-Nov-12	Outlet of MDTP	7.44	<1.0	32	45	-	2.2
07-Dec-12	Outlet of MDTP	7.32	<1.0	28	40	-	2.1
22-Dec-12	Outlet of MDTP	7.40	<1.0	30	45	-	2.0

TABLE--
EFFLUENT QUALITY DATA

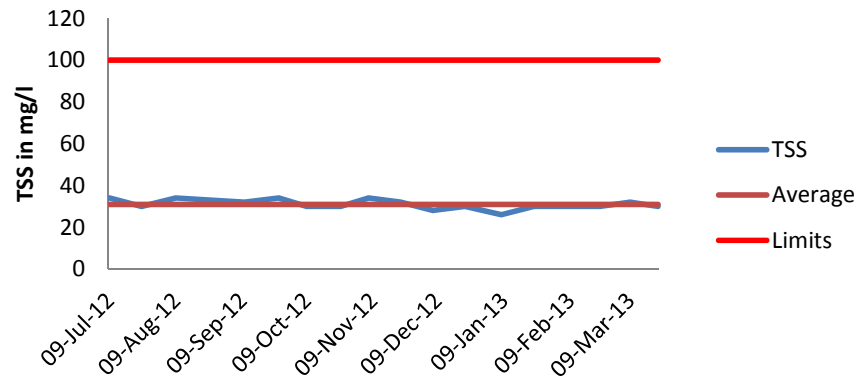
Area : **Kaniha**

08-Jan-13	Outlet of MDTP	7.46	<1.0	26	40	-	2.2
23-Jan-13	Outlet of MDTP	7.34	<1.0	30	45	-	2.0
08-Feb-13	Outlet of MDTP	7.36	<1.0	30	45	-	2.1
23-Feb-13	Outlet of MDTP	7.40	<1.0	30	40	-	2.2
09-Mar-13	Outlet of MDTP	7.30	<1.0	32	50	-	2.1
22-Mar-13	Outlet of MDTP	7.20	<1.0	30	45	-	2.0

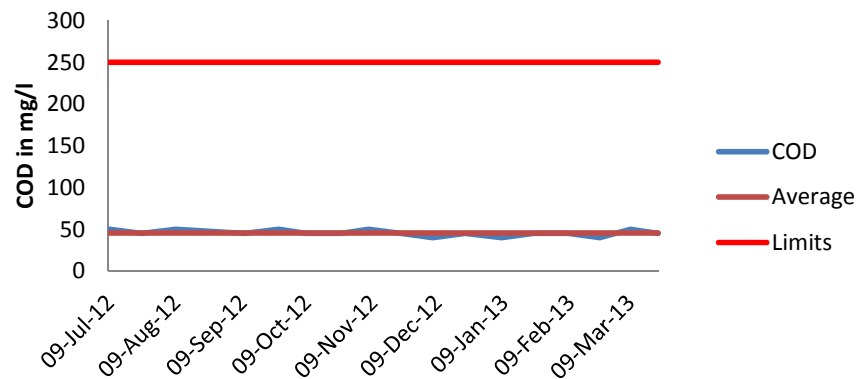
Variation in pH at MDTP Outlet in Kaniha OCP



Variation in TSS at MDTP Outlet in Kaniha OCP



Variation in COD at MDTP Outlet in Kaniha OCP



Variation in NO3 at MDTP Outlet in Kaniha OCP

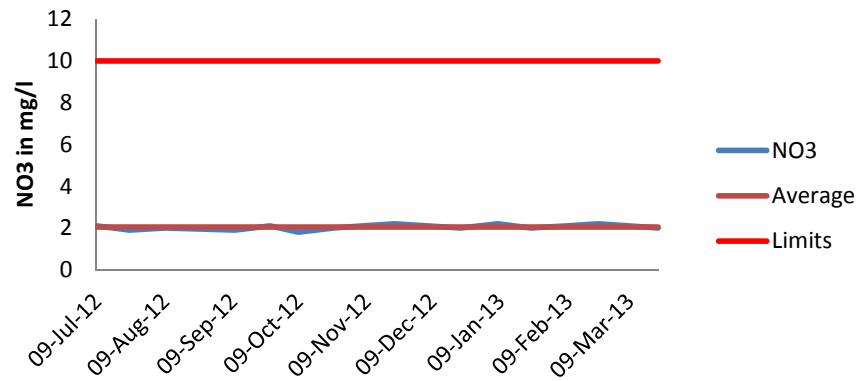


TABLE--
NOISE LEVEL MONITORING DATA

AREA : **Kaniha**

PROJECT : **Kaniha OCP**

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Jamunia Village	51.6	41.3
28-Apr-12	Jamunia Village	51.5	42.6
14-May-12	Jamunia Village	51.6	43.5
30-May-12	Jamunia Village	50.8	44.6
14-Jun-12	Jamunia Village	52.1	48.6
29-Jun-12	Jamunia Village	51.9	42.5
13-Jul-12	Jamunia Village	52.1	42.6
30-Jul-12	Jamunia Village	51.4	45.6
13-Aug-12	Jamunia Village	50.2	41.4
28-Aug-12	Jamunia Village	50.1	42.6
14-Sep-12	Jamunia Village	50.9	41.6
28-Sep-12	Jamunia Village	52.4	46.3
13-Oct-12	Jamunia Village	52.3	43.5
30-Oct-12	Jamunia Village	48.9	41.7
14-Nov-12	Jamunia Village	52.2	42.7
29-Nov-12	Jamunia Village	52.1	43.8
14-Dec-12	Jamunia Village	52.6	44.3
29-Dec-12	Jamunia Village	52.7	46.5
14-Jan-13	Jamunia Village	56.9	50.2
30-Jan-13	Jamunia Village	51.8	42.2
14-Feb-13	Jamunia Village	51.1	47.6

27-Feb-13	Jamunia Village	51.2	42.1
14-Mar-13	Jamunia Village	51.8	41.4
29-Mar-13	Jamunia Village	51.0	43.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Kaniha*

PROJECT : *Kaniha OCP*

<i>DATE OF SAMPLING</i>	<i>STATION</i>	<i>Noise Level Measurement in dB(A)</i>	
		<i>DAY</i>	<i>NIGHT</i>
13-Apr-12	Near Jarada village	52.1	40.1
28-Apr-12	Near Jarada village	51.1	40.6
14-May-12	Near Jarada village	50.8	43.6
30-May-12	Near Jarada village	52.4	43.3
14-Jun-12	Near Jarada village	51.9	43.6
29-Jun-12	Near Jarada village	52.6	41.6
13-Jul-12	Near Jarada village	52.5	44.6
30-Jul-12	Near Jarada village	52.5	42.6
13-Aug-12	Near Jarada village	50.1	44.3
28-Aug-12	Near Jarada village	52.2	44.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Kaniha

PROJECT : Kaniha OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Sep-12	Near Jarda village	50.6	40.1
28-Sep-12	Near Jarda village	53.4	43.4
13-Oct-12	Near Jarda village	53.2	42.2
30-Oct-12	Near Jarda village	51.2	40.3
14-Nov-12	Near Jarda village	52.4	45.6
29-Nov-12	Near Jarda village	52.5	43.2
14-Dec-12	Near Jarda village	52.3	43.4
29-Dec-12	Near Jarda village	51.8	44.6
14-Jan-13	Near Jarda village	51.0	40.8
30-Jan-13	Near Jarda village	49.6	41.3
14-Feb-13	Near Jarda village	52.5	44.5
27-Feb-13	Near Jarda village	56.6	44.1
14-Mar-13	Near Jarda village	52.4	42.8
29-Mar-13	Near Jarda village	51.4	43.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Kaniha*

PROJECT : *Kaniha OCP*

<i>DATE OF SAMPLING</i>	<i>STATION</i>	<i>Noise Level Measurement in dB(A)</i>	
		<i>DAY</i>	<i>NIGHT</i>
13-Apr-12	Patharmunda Village	51.3	40.9
28-Apr-12	Patharmunda Village	52.4	42.1
14-May-12	Patharmunda Village	51.7	44.7
30-May-12	Patharmunda Village	51.6	42.2
14-Jun-12	Patharmunda Village	52.3	44.9
29-Jun-12	Patharmunda Village	50.8	45.2
13-Jul-12	Patharmunda Village	52.1	42.8
30-Jul-12	Patharmunda Village	52.1	43.8
13-Aug-12	Patharmunda Village	49.6	40.1
28-Aug-12	Patharmunda Village	52.1	45.9
14-Sep-12	Patharmunda Village	46.9	40.6
28-Sep-12	Patharmunda Village	54.3	44.7
13-Oct-12	Patharmunda Village	52.5	44.6
30-Oct-12	Patharmunda Village	49.7	42.5
14-Nov-12	Patharmunda Village	52.8	44.3
29-Nov-12	Patharmunda Village	52.3	46.5
14-Dec-12	Patharmunda Village	52.5	45.5
29-Dec-12	Patharmunda Village	52.8	44.8
14-Jan-13	Patharmunda Village	51.6	41.3
30-Jan-13	Patharmunda Village	50.3	42.1
14-Feb-13	Patharmunda Village	52.1	43.9

27-Feb-13	Patharmunda Village	50.1	45.3
14-Mar-13	Patharmunda Village	50.1	44.8
29-Mar-13	Patharmunda Village	52.6	44.6

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Kaniha*

PROJECT : *Kaniha OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Apr-12	Site Office	50.1	42.1
28-Apr-12	Site Office	54.2	42.1
14-May-12	Site Office	59.6	56.5
30-May-12	Site Office	54.9	48.8
14-Jun-12	Site Office	55.7	48.5
29-Jun-12	Site Office	53.4	42.3
13-Jul-12	Site Office	59.6	52.2
30-Jul-12	Site Office	60.3	57.6
13-Aug-12	Site Office	57.3	50.6
28-Aug-12	Site Office	59.2	52.6
14-Sep-12	Site Office	53.9	42.2
28-Sep-12	Site Office	59.8	54.6
13-Oct-12	Site Office	54.2	45.8
30-Oct-12	Site Office	55.2	49.1
14-Nov-12	Site Office	59.6	54.5
29-Nov-12	Site Office	58.5	50.4
14-Dec-12	Site Office	59.5	55.3
29-Dec-12	Site Office	58.6	55.9
14-Jan-13	Site Office	55.3	40.9
30-Jan-13	Site Office	50.9	43.5
14-Feb-13	Site Office	59.5	55.4

27-Feb-13	Site Office	53.1	44.8
14-Mar-13	Site Office	53.4	46.0
29-Mar-13	Site Office	57.6	50.5

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : Kaniha

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Kaniha OCP	Kansamunda village well	4.65
12-Apr-12	Kaniha OCP	Jamunia village well	5.18
12-Apr-12	Kaniha OCP	Jarada village well	3.84
13-Aug-12	Kaniha OCP	Kansamunda village well	2.51
13-Aug-12	Kaniha OCP	Jamunia village well	3.28
13-Aug-12	Kaniha OCP	Jarada village well	2.01
14-Nov-12	Kaniha OCP	Kansamunda village well	3.49
14-Nov-12	Kaniha OCP	Jamunia village well	3.92
14-Nov-12	Kaniha OCP	Jarada village well	4.66
12-Jan-13	Kaniha OCP	Kansamunda village well	4.34
12-Jan-13	Kaniha OCP	Jamunia village well	5.21
12-Jan-13	Kaniha OCP	Jarada village well	3.10

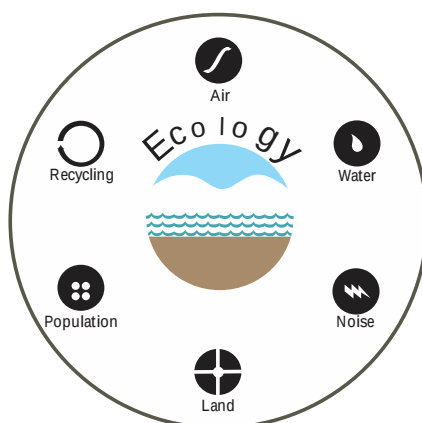


Annual Compiled Monitoring Report Of Hingula Area For 2012-2013

(Balram OCP & Hingula OCP)

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)

Regional Institute-VII, OSHB Building, Bhubaneswar – 751 001 (Orissa)
[Assistance from Environment Division, CMPDI(HQs), Ranchi]

CONTENTS

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2	Air Environment	II	
3	Water Environment	III	
4	Noise Environment	IV	

CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine(s)

Hingula area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has two OCPs under its administrative control. The OCPs are Hingula-II Expn. and Chhendipada OCP.

Hingula-II OCP Expn.

This OCP comprises a part of Gopalprasad (East) geological block of the area. This block is bounded by latitudes 20° 53' 04" and 20° 58' 27" N and longitudes 85° 00' 55" & 85° 02' 01" E. The area of Hingula-II OCP Expansion is mostly soil covered and gently undulating. The general ground slope is towards north. The maximum and minimum elevations are 130 m and 100m respectively. The drainage of the area is controlled mainly by the Brahmani river which flows from north to south. The area experiences a warm tropical climate with short spell of winter. Summer is hot and humid.

The mean temperature ranges from 6.7° (winter) to 44.1° (pre-monsoon cyclone season).

The production from this project meets the gap between demand and availability over this coalfield.

Shovel-dumper combination system and surface miner have been deployed for this mine.

The boundary of the mine is as follows :

East	=	Boundary of Kalinga West
West	=	Gopalprasad West Block
North	=	Singadajhara.
South	=	Incrop of VIII & IX

Balaram OCP

Balaram OCP is located in the south central part of Talcher coalfield. the block area lies between latitudes 20° 56' 02" and 20° 58' 28" N and longitudes 85° 02' 52" and 85° 06' 52" E. The mine is well connected by rail & road. The area is gently undulating. General slope of the ground is towards north-east. The elevation of the area varies from 97.0 to 140 m above MSL. The drainage of the area is controlled mainly by the Brahmani river (flowing north-south). A seasonal nallah "Bangaru jhara" originates from Kalinga block and drains to the Brahmani river ultimately. The mean temperature ranges from 6.7°C (winter) to 44.1°C (pre-monsoon cyclone

season). Coal from this mine is linked to the coastal thermal power stations of southern India including North Madras and Tuticorin Thermal Power Stations.

1.2 Frequency of Environmental Monitoring

(i) Ambient air quality monitoring

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out:

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

(ii) Drinking water monitoring : Every month.

(iii) Effluent quality monitoring

4 parameters : Only during monsoon month i.e. July, Aug. & Sept.

21 parameters : Once in a year

(iv) Well water level monitoring : Quarterly

(v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The details of various environmental quality monitoring stations are given in are given below:

- Air quality monitoring stations

Sl.No. Name of Stations

Hingula-II OCP

1. Near Workshop
2. Near Kumunda basti
3. Bhalugadia village
4. Gopalprasad Village

Balaram OCP

1. Near Land Farming Site on OB Dump
2. On backfilled / internal dump
3. Kalamchhuin Village

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

1. Time Office Water
2. Danara Village Borewell Water
3. Kalinga Township Tap Water
4. Mitty Quarry Water (to be monitored April to June)

- **Effluent quality monitoring station (4 / 5 parameters)-Hingula OCP**

1. Mine discharge water
2. O&G Trap outlet
3. Discharge point at north of mine into Singhda jhor (if discharge is there)
4. Outflow from Satyabadi Sagar, if discharge outside (21 paramters)
5. Final discharge point (Hingula OCP) 21 parameters – once in a year

- **Effluent quality monitoring station (4 / 5 parameters)-Hingula OCP**

1. O&G Trap outlet

- **Well water level monitoring station**

1. Kusumpal village well near OB dump
2. Danara village well
3. Nakaipasi village well

- **Noise level monitoring stations**

Sl.No. Name of Stations

Hingula OCP

1. Near Workshop
2. Near Kumunda basti
3. Bhalugadia village
4. Gopalprasad Village

Balaram OCP

1. Near Land Farming site on OB dump
2. On backfilled / Internal dump
3. Kalamchhuin village

- **Siltation study by monitoring parameter TSS (fortnightly once each in July, Aug., Sept.)**
 - 1. 100m u/s of the point of confluence of mine discharge water with Singhda jhor.
 - 2. 100m d/s of the point of confluence of mine discharge water with Singhda jhor.
 - 3. 100m u/s of the point of confluence of mitty quarry water with Bangaru nallah.
 - 4. 100m d/s of the point of confluence of mitty quarry water with Bangaru nallah.

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1

**Details of Air Quality Monitoring Stations
along with Sources of Pollution**

Sl.No.	Location	Sources of Pollution
Hingula OCP		
1	Near Workshop	Mine working, CHP
2	Near Kumunda Basti	Mine working
3	Bhalugadia village	Mine working
4	Gopalprasad village	Coal transportation road, mining activities.
Balaram OCP		
1.	Near Land Farming site on OB dump	Mine activities, transportation, CHP
2.	On Backfilled / internal dump	Mine activities, CHP, transportation
3.	Kalamchhuin village	Mine activities, transportation

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2

Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached.

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Hingula Area reveals the following:

- In coal mining area like near workshop, south of proposed office, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines barring a few aberated values.
- In residential areas, the values of RPM SPM are found to be within the limits of the National Ambient Air Quality Standards (NAAQS) notified under Schedule-VII barring a few aberated values due to climatic factors and also due to activities of coal transport and mining activities.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Water sprinkling on haul roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers at haul roads and siding.
- Cleaning spillage from roads.
- Practice for covered transportation.
- Regular maintenance of all HEMMs and other machinery.
- Provision of gas filters for exhaust fumes.
- No overloading of trucks/dumpers.
- Application of innocuous chemical binders on haul roads.
- Development of thick greenbelts around the mines, infrastructure sites and residential area besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.
- Drills with well-designed dust extractors/arrestors.
- Provision of dust extraction system for crusher house.
- Suppression of coal dust at CHP by provision of auto-start, time cycle controlled, fine nozzle mounted fixed sprinklers.

CHAPTER-III

WATER ENVIRONMENT

3.1 Methodology and Instruments used for water & effluent analysis

Details are given in Table.

Table

Methodology & Instruments used for Water and Effluent Analysis

Sl.No.	Parameters	Method/Instruments
1	PH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The results of analysis of Drinking water sample and effluent measurement are given in Table attached. Ground water level monitoring of various dug-wells are given in Table attached.

3.3 Discussions

(a) Drinking water sample

The examination of analytical results of drinking water sample reveals the following :

- Turbidity is found to be slightly higher in two cases only and all other physico-chemical parameters are well within the limits of the Indian Drinking Water Standard in the drinking water sample.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.2 Results

The fortnightly noise level measurements for different stations are given in Tables attached.

4.3 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards barring a few aberrated values.

4.4 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Proper designing of plant and machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- HEMMs with sound proof cabin.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Hingula OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
04-Apr-12	Bhalugadia Village	267	106	24	30	Mining activities	About 500m towards W	South to north & sunny
19-Apr-12	Bhalugadia Village	219	81	24	30	Mining activities	About 500m towards W	East to west & sunny
03-May-12	Bhalugadia Village	239	105	28	34	Mining activities	About 500m towards W	East to west & sunny
18-May-12	Bhalugadia Village	299	106	32	38	Mining activities	About 500m towards W	East to west & sunny
05-Jun-12	Bhalugadia Village	211	82	26	31	Mining activities	About 500m towards W	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

20-Jun-12	Bhalugadia Village	177	67	22	28	Mining activities	About 500m towards W	South to north & sunny
05-Jul-12	Bhalugadia Village	168	67	21	26	Mining activities	About 500m towards W	West to east & sunny
20-Jul-12	Bhalugadia Village	153	63	22	26	Mining activities	About 500m towards W	East to west, cloudy and rainfall
03-Aug-12	Bhalugadia Village	168	78	27	32	Mining activities	About 500m towards W	South to North cloudy, and rainfall
20-Aug-12	Bhalugadia Village	149	91	23	38	Mining activities	About 500m towards W	East to west, cloudy and rainfall
04-Sep-12	Bhalugadia Village	143	107	20	36	Mining activities	About 500m towards W	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Sep-12	Bhalugadia Village	159	81	24	27	Mining activities	About 500m towards W	East to west & sunny
04-Oct-12	Bhalugadia Village	127	62	22	26	Mining activities	About 500m towards W	East to west cloudy and rainfall
19-Oct-12	Bhalugadia Village	244	108	30	37	Mining activities	About 500m towards W	East to west hot & sunny
02-Nov-12	Bhalugadia Village	244	108	32	38	Mining activities	About 500m towards W	East to west & sunny
19-Nov-12	Bhalugadia Village	258	118	30	36	Mining activities	About 500m towards W	West to east & sunny
04-Dec-12	Bhalugadia Village	243	113	25	28	Mining activities	About 500m towards W	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Dec-12	Bhalugadia Village	231	108	23	26	Mining activities	About 500m towards W	East to west & sunny
03-Jan-13	Bhalugadia Village	246	114	24	27	Mining activities	About 500m towards W	South to north & sunny
18-Jan-13	Bhalugadia Village	232	109	25	28	Mining activities	About 500m towards W	East to west & sunny
05-Feb-13	Bhalugadia Village	209	110	25	27	Mining activities	About 500m towards W	South to north & sunny
19-Feb-13	Bhalugadia Village	214	127	26	29	Mining activities	About 500m towards W	South to north & sunny
05-Mar-13	Bhalugadia Village	228	131	27	30	Mining activities	About 500m towards W	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : ***Hingula***

20-Mar-13	Bhalugadia Village	239	128	29	31	Mining activities	About 500m towards W	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Hingula OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
04-Apr-12	Gopalprasad Village	242	110	26	32	Coal Transport, Mining activities	about 600m NE	South to north & sunny
19-Apr-12	Gopalprasad Village	245	122	28	36	Coal Transport, Mining activities	about 600m NE	East to west & sunny
03-May-12	Gopalprasad Village	262	116	30	36	Coal Transport, Mining activities	about 600m NE	East to west & sunny
18-May-12	Gopalprasad Village	255	101	32	36	Coal Transport, Mining activities	about 600m NE	East to west & sunny
05-Jun-12	Gopalprasad Village	202	88	24	30	Coal Transport, Mining activities	about 600m NE	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

20-Jun-12	Gopalprasad Village	240	94	32	37	Coal Transport, Mining activities	about 600m NE	South to north & sunny
05-Jul-12	Gopalprasad Village	197	75	22	27	Coal Transport, Mining activities	about 600m NE	West to east & sunny
20-Jul-12	Gopalprasad Village	174	66	22	25	Coal Transport, Mining activities	about 600m NE	East to west, cloudy and rainfall
03-Aug-12	Gopalprasad Village	156	83	29	30	Coal Transport, Mining activities	about 600m NE	South to North cloudy, and rainfall
20-Aug-12	Gopalprasad Village	134	86	26	35	Coal Transport, Mining activities	about 600m NE	East to west, cloudy and rainfall
04-Sep-12	Gopalprasad Village	124	93	21	37	Coal Transport, Mining activities	about 600m NE	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Sep-12	Gopalprasad Village	145	86	24	29	Coal Transport, Mining activities	about 600m NE	East to west & sunny
04-Oct-12	Gopalprasad Village	109	61	22	26	Coal Transport, Mining activities	about 600m NE	East to west cloudy and rainfall
19-Oct-12	Gopalprasad Village	192	88	28	34	Coal Transport, Mining activities	about 600m NE	East to west hot & sunny
02-Nov-12	Gopalprasad Village	186	92	29	35	Coal Transport, Mining activities	about 600m NE	East to west & sunny
19-Nov-12	Gopalprasad Village	194	105	30	34	Coal Transport, Mining activities	about 600m NE	West to east & sunny
04-Dec-12	Gopalprasad Village	187	102	26	30	Coal Transport, Mining activities	about 600m NE	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : Hingula

19-Dec-12	Gopalprasad Village	172	99	21	28	Coal Transport, Mining activities	about 600m NE	East to west & sunny
03-Jan-13	Gopalprasad Village	181	93	22	25	Coal Transport, Mining activities	about 600m NE	South to north & sunny
18-Jan-13	Gopalprasad Village	168	91	24	27	Coal Transport, Mining activities	about 600m NE	East to west & sunny
05-Feb-13	Gopalprasad Village	179	102	24	26	Coal Transport, Mining activities	about 600m NE	South to north & sunny
19-Feb-13	Gopalprasad Village	187	109	23	26	Mining activities, coal transportation	600m NE	South to north & sunny
05-Mar-13	Gopalprasad Village	167	116	24	26	Mining activities, coal transportation	600m NE	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

20-Mar-13	Gopalprasad Village	171	123	25	27	Mining activities, coal transportation	600m NE	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Hingula OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
04-Apr-12	Near Kumunda Basti	231	112	24	30	Mining activities	About 500m N	South to north & sunny
19-Apr-12	Near Kumunda Basti	228	84	24	30	Mining activities	About 500m N	East to west & sunny
03-May-12	Near Kumunda Basti	209	89	26	32	Mining activities	About 500m N	East to west & sunny
18-May-12	Near Kumunda Basti	215	87	30	34	Mining activities	About 500m N	East to west & sunny
05-Jun-12	Near Kumunda Basti	196	74	20	24	Mining activities	About 500m N	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

20-Jun-12	Near Kumunda Basti	175	71	24	29	Mining activities	About 500m N	South to north & sunny
05-Jul-12	Near Kumunda Basti	202	64	19	23	Mining activities	About 500m N	West to east & sunny
20-Jul-12	Near Kumunda Basti	141	56	20	23	Mining activities	About 500m N	East to west, cloudy and rainfall
03-Aug-12	Near Kumunda Basti	150	76	24	35	Mining activities	About 500m N	South to North cloudy, and rainfall
20-Aug-12	Near Kumunda Basti	135	82	29	41	Mining activities	About 500m N	East to west, cloudy and rainfall
04-Sep-12	Near Kumunda Basti	131	97	24	40	Mining activities	About 500m N	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Sep-12	Near Kumunda Basti	136	74	23	28	Mining activities	About 500m N	East to west & sunny
04-Oct-12	Near Kumunda Basti	112	58	20	23	Mining activities	About 500m N	East to west cloudy and rainfall
19-Oct-12	Near Kumunda Basti	173	76	25	30	Mining activities	About 500m N	East to west hot & sunny
02-Nov-12	Near Kumunda Basti	163	84	24	29	Mining activities	About 500m N	East to west & sunny
19-Nov-12	Near Kumunda Basti	176	97	26	31	Mining activities	About 500m N	West to east & sunny
04-Dec-12	Near Kumunda Basti	164	99	24	29	Mining activities	About 500m N	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Dec-12	Near Kumunda Basti	173	105	23	25	Mining activities	About 500m N	East to west & sunny
03-Jan-13	Near Kumunda Basti	164	101	21	24	Mining activities	About 500m N	South to north & sunny
18-Jan-13	Near Kumunda Basti	197	103	22	25	Mining activities	About 500m N	East to west & sunny
05-Feb-13	Near Kumunda Basti	216	107	23	25	Mining activities	About 500m N	South to north & sunny
19-Feb-13	Near Kumunda Basti	225	114	24	26	Mining activities	About 500m N	South to north & sunny
05-Mar-13	Near Kumunda Basti	237	124	25	27	Mining activities	About 500m N	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : *Hingula*

20-Mar-13	Near Kumunda Basti	243	138	26	28	Mining activities	About 500m N	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Hingula OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
04-Apr-12	Near Workshop	370	142	34	40	Mining activities, CHP	About 500m S, SW	South to north & sunny
19-Apr-12	Near Workshop	376	156	40	54	Mining activities, CHP	About 500m S, SW	East to west & sunny
03-May-12	Near Workshop	366	138	38	44	Mining activities, CHP	About 500m S, SW	East to west & sunny
18-May-12	Near Workshop	322	127	38	44	Mining activities, CHP	About 500m S, SW	East to west & sunny
05-Jun-12	Near Workshop	344	132	36	42	Mining activities, CHP	About 500m S, SW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Hingula

20-Jun-12	Near Workshop	254	102	33	41	Mining activities, CHP	About 500m S, SW	South to north & sunny
05-Jul-12	Near Workshop	255	107	32	38	Mining activities, CHP	About 500m S, SW	West to east & sunny
20-Jul-12	Near Workshop	200	94	30	36	Mining activities, CHP	About 500m S, SW	East to west, cloudy and rainfall
03-Aug-12	Near Workshop	189	100	28	39	Mining activities, CHP	About 500m S, SW	South to North cloudy, and rainfall
20-Aug-12	Near Workshop	174	95	22	37	Mining activities, CHP	About 500m S, SW	East to west, cloudy and rainfall
04-Sep-12	Near Workshop	151	91	25	39	Mining activities, CHP	About 500m S, SW	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Sep-12	Near Workshop	183	92	26	33	Mining activities, CHP	About 500m S, SW	East to west & sunny
04-Oct-12	Near Workshop	226	68	26	32	Mining activities, CHP	About 500m S, SW	East to west cloudy and rainfall
19-Oct-12	Near Workshop	293	128	34	43	Mining activities, CHP	About 500m S, SW	East to west hot & sunny
02-Nov-12	Near Workshop	282	117	27	43	Mining activities, CHP	About 500m S, SW	East to west & sunny
19-Nov-12	Near Workshop	293	124	29	35	Mining activities, CHP	About 500m S, SW	West to east & sunny
04-Dec-12	Near Workshop	272	116	27	31	Mining activities, CHP	About 500m S, SW	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

19-Dec-12	Near Workshop	295	124	28	30	Mining activities, CHP	About 500m S, SW	East to west & sunny
03-Jan-13	Near Workshop	272	115	26	29	Mining activities, CHP	About 500m S, SW	South to north & sunny
18-Jan-13	Near Workshop	295	124	27	30	Mining activities, CHP	About 500m S, SW	East to west & sunny
05-Feb-13	Near Workshop	286	134	26	29	Mining activities, CHP	About 500m S, SW	South to north & sunny
19-Feb-13	Near Workshop	297	145	27	30	Mining activities, CHP	About 500m S, SW	South to north & sunny
05-Mar-13	Near Workshop	276	138	26	28	Mining activities, CHP	About 500m S, SW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : ***Hingula***

20-Mar-13	Near Workshop	285	147	27	29	Mining activities, CHP	About 500m S, SW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Balaram OCP** (conc. in µg/cu.m.)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
12-Apr-12	On backfill/internal dump	379	165	38	44	Mining activities, transportation, CHP	Within 500m	East to west & sunny
27-Apr-12	On backfill/internal dump	345	141	40	48	Mining activities, transportation, CHP	Within 500m	South to north & sunny
10-May-12	On backfill/internal dump	291	114	34	44	Mining activities, transportation, CHP	Within 500m	South to north & sunny
25-May-12	On backfill/internal dump	364	154	42	48	Mining activities, transportation, CHP	Within 500m	East to West & sunny
12-Jun-12	On backfill/internal dump	378	142	40	48	Mining activities, transportation, CHP	Within 500m	East to West & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

27-Jun-12	On backfill/internal dump	358	116	32	37	Mining activities, transportation, CHP	Within 500m	East to west & cloudy rain fall
11-Jul-12	On backfill/internal dump	301	122	38	42	Mining activities, transportation, CHP	Within 500m	East to west & sunny
26-Jul-12	On backfill/internal dump	257	104	32	38	Mining activities, transportation, CHP	Within 500m	Calm,cloudy and rainfall
10-Aug-12	On backfill/internal dump	237	115	30	41	Mining activities, transportation, CHP	Within 500m	South to North cloudy, and rainfall
27-Aug-12	On backfill/internal dump	171	117	24	35	Mining activities, transportation, CHP	Within 500m	South to North cloudy, and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Balaram OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
11-Sep-12	On backfilled/internal dump	162	108	22	39	Mining activities, transportation, CHP	Within 500m	East to west cloudy and rainfall
26-Sep-12	On backfilled/internal dump	248	122	32	39	Mining activities, transportation, CHP	Within 500m	South to North & sunny
03-Oct-12	On backfilled/internal dump	276	123	35	44	Mining activities, transportation, CHP	Within 500m	South to North & sunny
18-Oct-12	On backfilled/internal dump	332	133	38	47	Mining activities, transportation, CHP	Within 500m	West to east & sunny
09-Nov-12	On backfilled/internal dump	278	124	34	41	Mining activities, transportation, CHP	Within 500m	South to North & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

24-Nov-12	On backfilled/internal dump	285	132	29	35	Mining activities, transportation, CHP	Within 500m	East to west & cloudy
12-Dec-12	On backfilled/internal dump	294	129	28	31	Mining activities, transportation, CHP	Within 500m	South to North & cloudy
27-Dec-12	On backfilled/internal dump	276	114	26	30	Mining activities, transportation, CHP	Within 500m	South to North & cloudy
10-Jan-13	On backfilled/internal dump	254	109	23	27	Mining activities, transportation, CHP	Within 500m	East to west & sunny
25-Jan-13	On backfilled/internal dump	267	116	25	27	Mining activities, transportation, CHP	Within 500m	East to west & sunny
12-Feb-13	On backfilled/internal dump	283	123	24	27	Mining activities, transportation, CHP	Within 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

26-Feb-13	On backfilled/inte rnal dump	295	134	25	28	Mining activities, transportation, CHP	Within 500m	East to west & sunny
12-Mar-13	On backfilled/inte rnal dump	286	130	25	27	Mining activities, transportation, CHP	Within 500m	East to west & sunny
27-Mar-13	On backfilled/inte rnal dump	296	138	26	29	Mining activities, transportation, CHP	Within 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Balaram OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Kalamchhuin Village	266	107	24	30	Mining activities, transportation	600m WSW	East to west & sunny
20-Apr-12	Kalamchhuin Village	254	112	24	30	Mining activities, transportation	600m WSW	East to west & sunny
04-May-12	Kalamchhuin Village	255	95	28	34	Mining activities, transportation	600m WSW	East to west & sunny
21-May-12	Kalamchhuin Village	305	114	32	38	Mining activities, transportation	600m WSW	South to north & sunny
06-Jun-12	Kalamchhuin Village	241	105	28	38	Mining activities, transportation	600m WSW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

21-Jun-12	Kalamchhuin Village	186	91	27	32	Mining activities, transportation	600m WSW	South to north & cloudy rain fall
05-Jul-12	Kalamchhuin Village	204	66	22	27	Mining activities, transportation	600m WSW	East to west & sunny
20-Jul-12	Kalamchhuin Village	159	68	22	27	Mining activities, transportation	600m WSW	South to North cloudy, and rainfall
06-Aug-12	Kalamchhuin Village	162	79	26	34	Mining activities, transportation	600m WSW	East to west, cloudy and rainfall
21-Aug-12	Kalamchhuin Village	158	87	22	33	Mining activities, transportation	600m WSW	South to North cloudy, and rainfall
05-Sep-12	Kalamchhuin Village	146	95	25	37	Mining activities, transportation	600m WSW	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : Hingula

21-Sep-12	Kalamchhuin Village	186	91	23	34	Mining activities, transportation	600m WSW	South to North & sunny
03-Oct-12	Kalamchhuin Village	136	61	24	28	Mining activities, transportation	600m WSW	East to west cloudy and rainfall
18-Oct-12	Kalamchhuin Village	246	117	28	36	Mining activities, transportation	600m WSW	East to west & sunny
05-Nov-12	Kalamchhuin Village	237	106	26	33	Mining activities, transportation	600m WSW	East to west & sunny
20-Nov-12	Kalamchhuin Village	243	102	25	29	Mining activities, transportation	600m WSW	East to west & cloudy
12-Dec-12	Kalamchhuin Village	237	101	24	29	Mining activities, transportation	600m WSW	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

27-Dec-12	Kalamchhuin Village	221	106	23	26	Mining activities, transportation	600m WSW	South to North & cloudy
10-Jan-13	Kalamchhuin Village	257	124	26	28	Mining activities, transportation	600m WSW	East to west & sunny
25-Jan-13	Kalamchhuin Village	216	110	27	29	Mining activities, transportation	600m WSW	East to west & sunny
12-Feb-13	Kalamchhuin Village	227	109	26	29	Mining activities, transportation	600m WSW	East to west & sunny
27-Feb-13	Kalamchhuin Village	237	115	24	27	Mining activities, transportation	600m WSW	East to west & sunny
12-Mar-13	Kalamchhuin Village	224	111	23	25	Mining activities, transportation	600m WSW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

27-Mar-13	Kalamchhuin Village	237	130	24	26	Mining activities, transportation	600m WSW	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

Project : **Balaram OCP** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
12-Apr-12	Near land farming site on OB dump	329	148	34	42	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
27-Apr-12	Near land farming site on OB dump	377	154	40	44	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
10-May-12	Near land farming site on OB dump	278	112	36	44	Mining activities, transportation, CHP	Varying from 300m to 500m	South to north & sunny
25-May-12	Near land farming site on OB dump	302	132	36	48	Mining activities, transportation, CHP	Varying from 300m to 500m	East to West & sunny
12-Jun-12	Near land farming site on OB dump	326	132	36	44	Mining activities, transportation, CHP	Varying from 300m to 500m	East to West & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

27-Jun-12	Near land farming site on OB dump	307	114	30	36	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & cloudy rain fall
11-Jul-12	Near land farming site on OB dump	268	116	34	42	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
26-Jul-12	Near land farming site on OB dump	203	88	30	36	Mining activities, transportation, CHP	Varying from 300m to 500m	Calm,cloudy and rainfall
10-Aug-12	Near land farming site on OB dump	195	90	27	39	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North cloudy, and rainfall
27-Aug-12	Near land farming site on OB dump	181	98	25	37	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North cloudy, and rainfall
11-Sep-12	Near land farming site on OB dump	154	90	20	36	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

26-Sep-12	Near land farming site on OB dump	235	113	28	36	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North & sunny
03-Oct-12	Near land farming site on OB dump	305	134	36	44	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North & sunny
18-Oct-12	Near land farming site on OB dump	291	123	36	47	Mining activities, transportation, CHP	Varying from 300m to 500m	West to east & sunny
09-Nov-12	Near land farming site on OB dump	282	119	32	38	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North & sunny
24-Nov-12	Near land farming site on OB dump	298	127	27	32	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & cloudy
12-Dec-12	Near land farming site on OB dump	273	114	26	30	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Hingula**

27-Dec-12	Near land farming site on OB dump	289	124	28	32	Mining activities, transportation, CHP	Varying from 300m to 500m	South to North & cloudy
10-Jan-13	Near land farming site on OB dump	273	118	25	29	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
25-Jan-13	Near land farming site on OB dump	234	108	24	26	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
12-Feb-13	Near land farming site on OB dump	249	116	25	28	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
26-Feb-13	Near land farming site on OB dump	256	127	26	29	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny
12-Mar-13	Near land farming site on OB dump	267	120	24	26	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

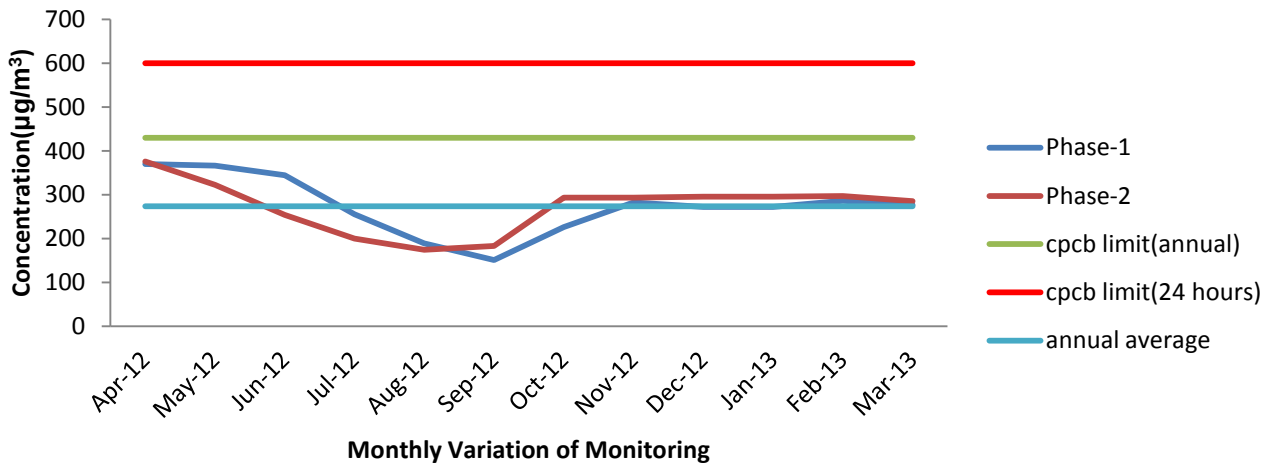
Area : **Hingula**

27-Mar-13	Near land farming site on OB dump	252	121	25	27	Mining activities, transportation, CHP	Varying from 300m to 500m	East to west & sunny

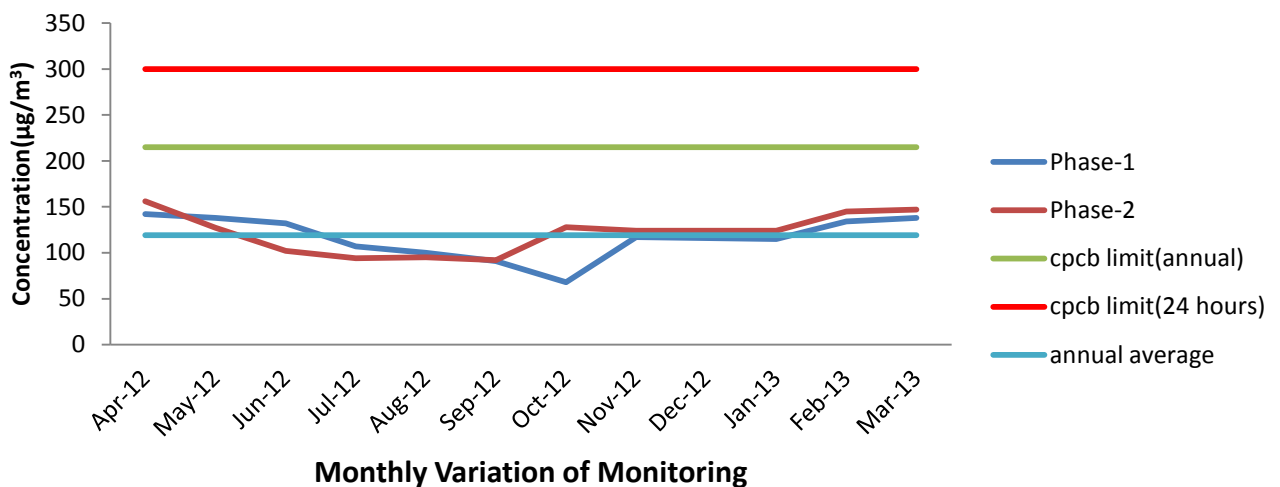


Air Quality Graph of Hingula OCP

Graph-1: SPM monitoring of Gopal Prasad Village of Hingula OCP.



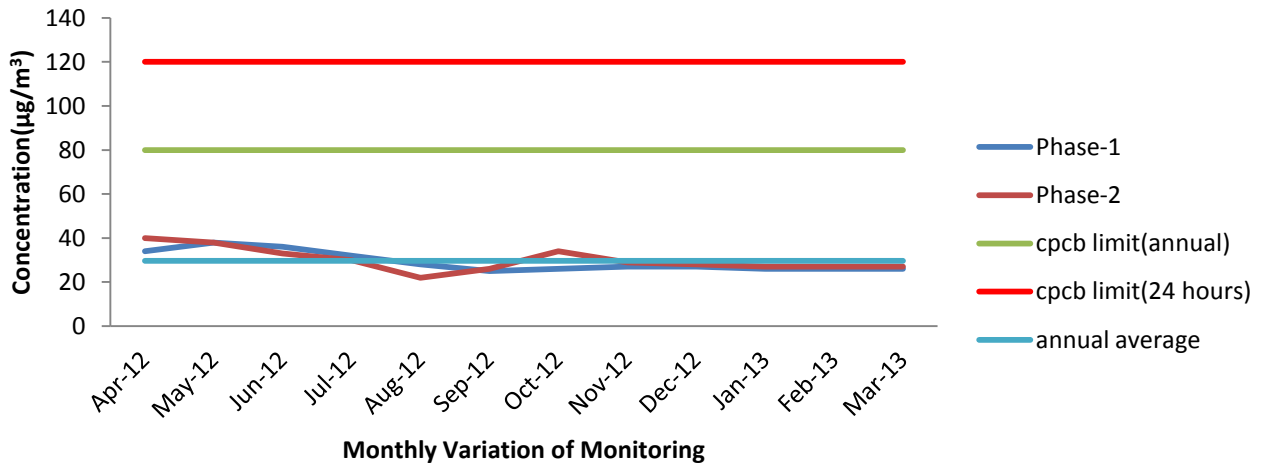
Graph-2: RPM monitoring of Gopal Prasad Village of Hingula OCP.



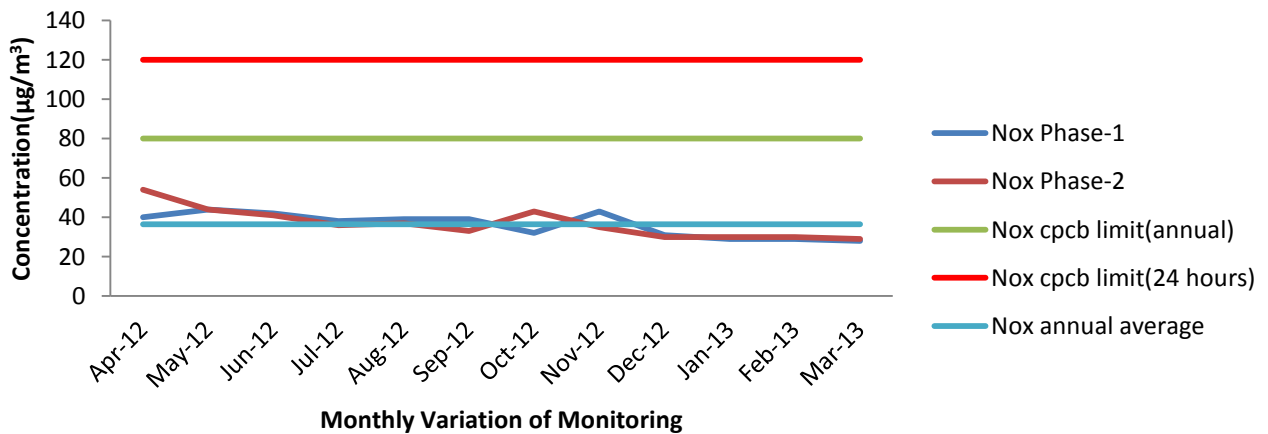


Air Quality Graph of Hingula OCP

Graph-3 So_x monitoring of Gopal Prasad Village of Hingula OCP.



Graph-4: No_x monitoring of Gopal Prasad Village of Hingula OCP.



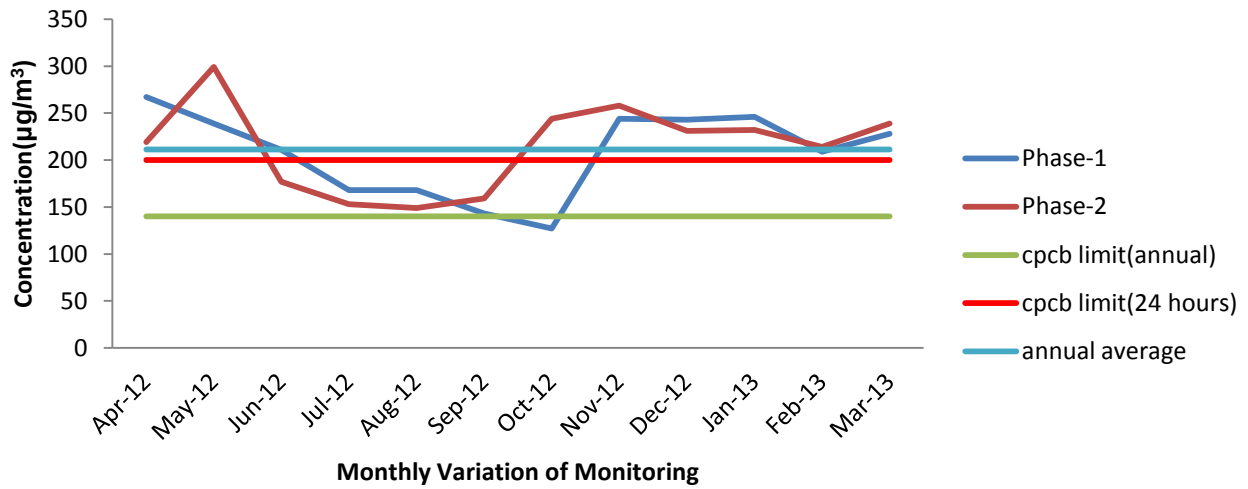
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

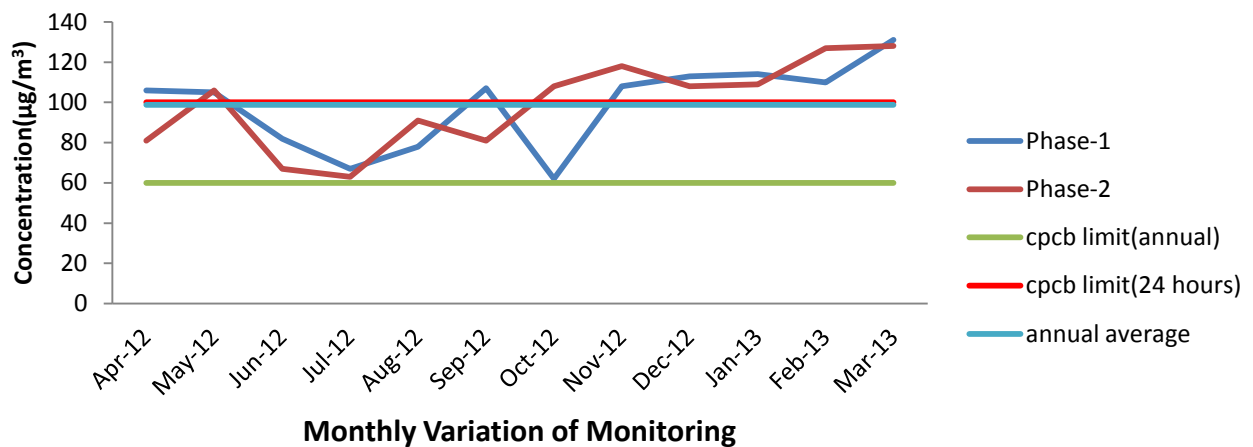


Air Quality Graph of Hingula OCP

Graph-5: SPM monitoring of Bhalugadia village of Hingula OCP.



Graph-6: RPM monitoring of Bhalugadia village of Hingula OCP.



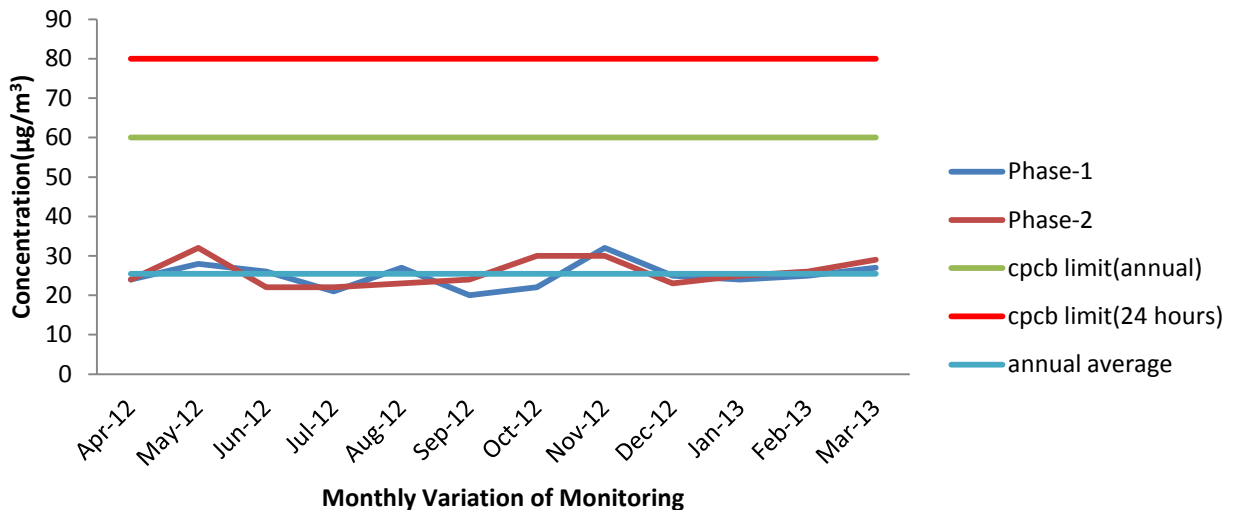
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

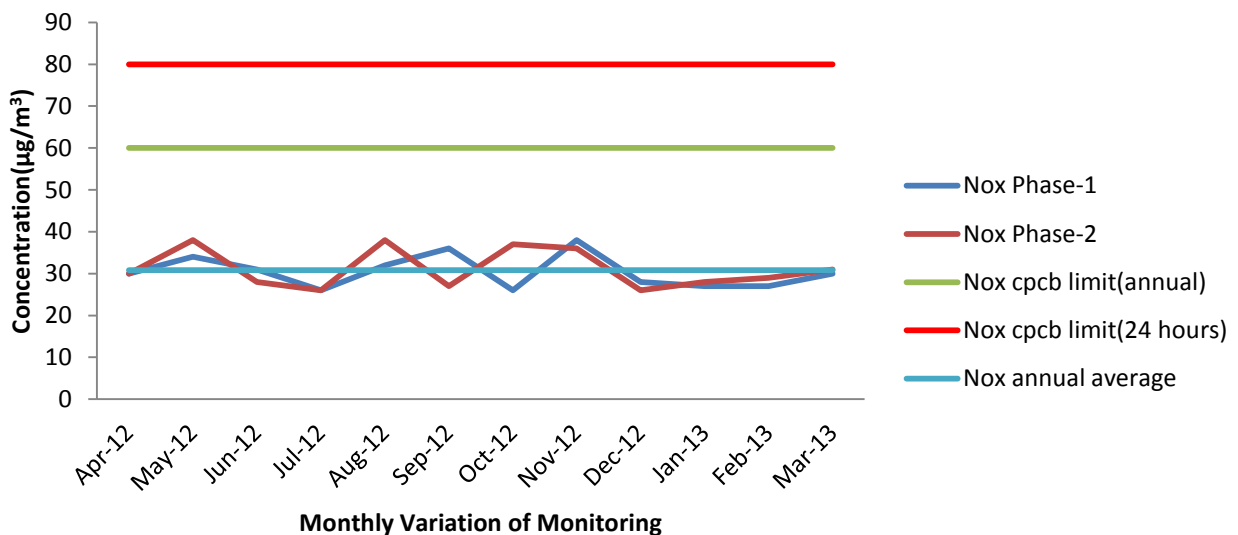


Air Quality Graph of Hingula OCP

Graph-7: SO_x monitoring of Bhalugadia village of Hingula OCP.



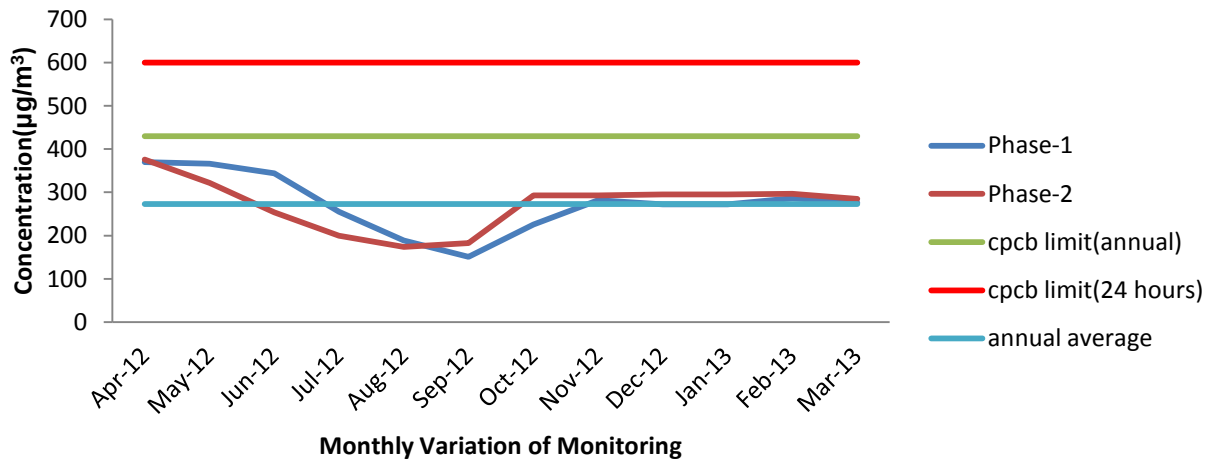
Graph-8: NO_x monitoring of Bhalugadia village of Hingula OCP.



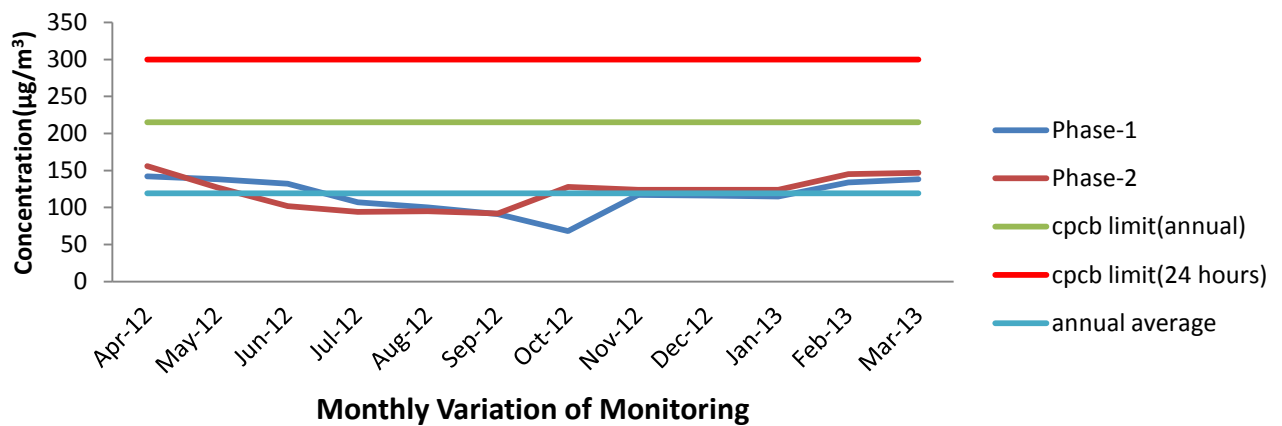


Air Quality Graph of Hingula OCP

Graph-9: SPM monitoring of Near Kamunda Basti of Hingula OCP.



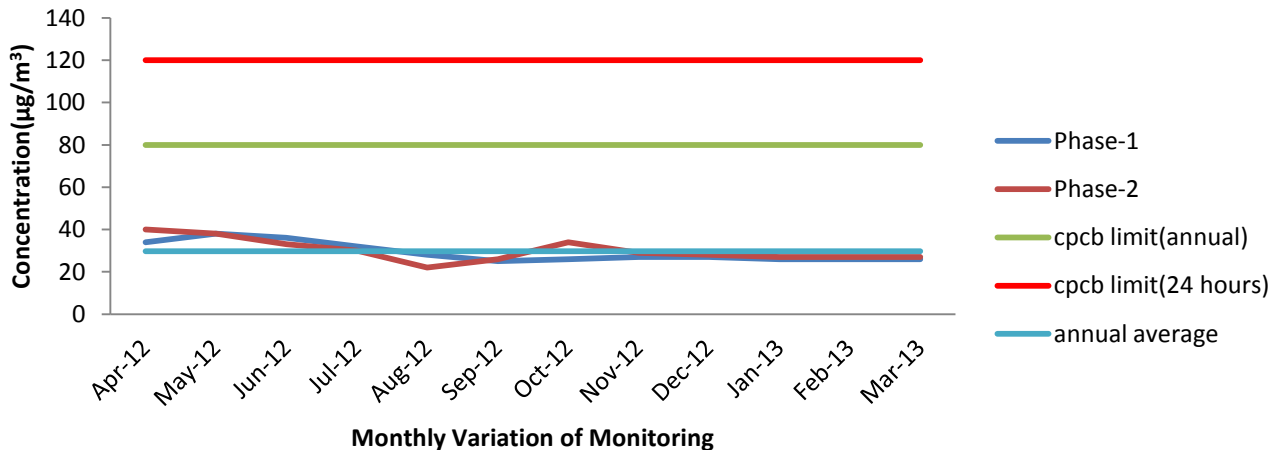
Graph-10: RPM monitoring of Near Kamunda Basti of Hingula OCP.



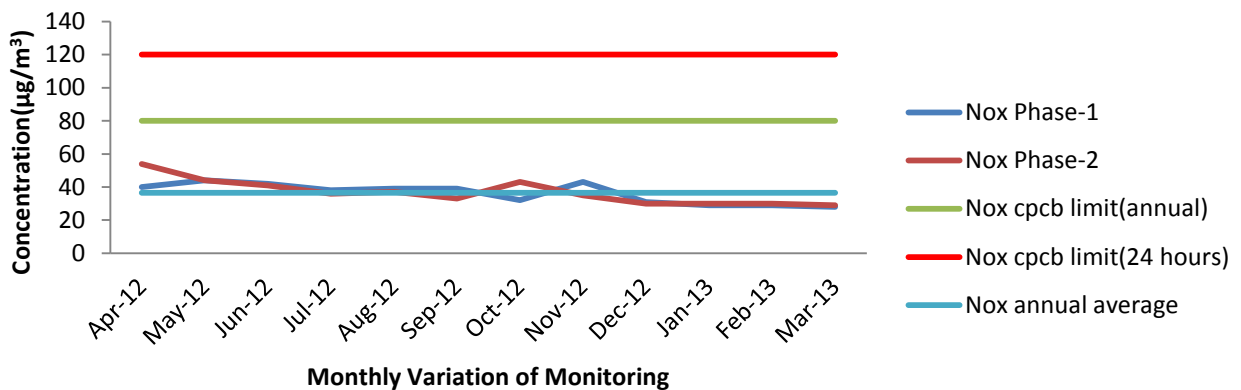


Air Quality Graph of Hingula OCP

Graph-11 So_x monitoring of Near Kamunda Basti of Hingula OCP.



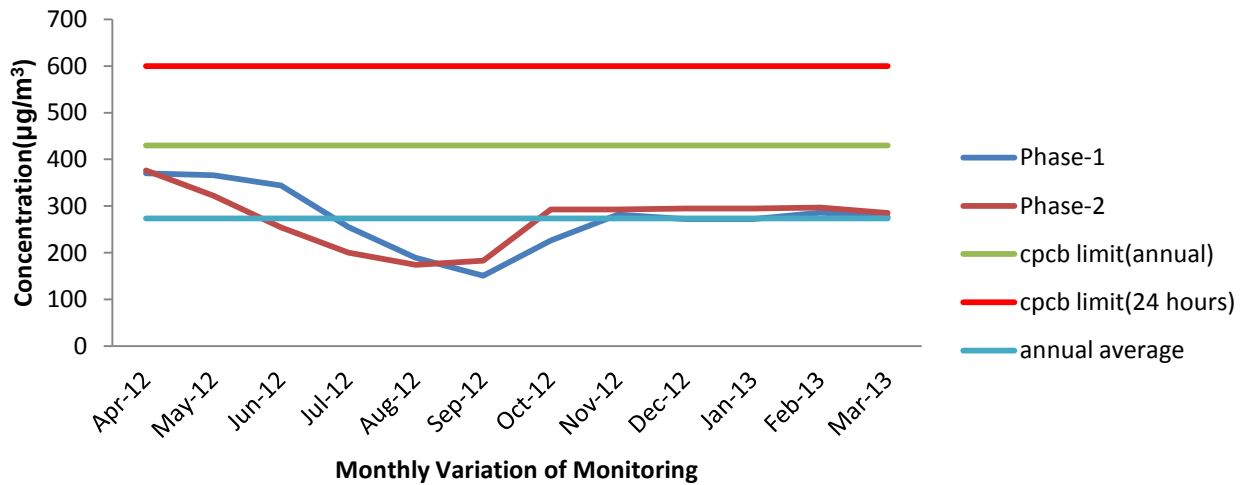
Graph-12: No_x monitoring of Near Kamunda Basti of Hingula OCP.



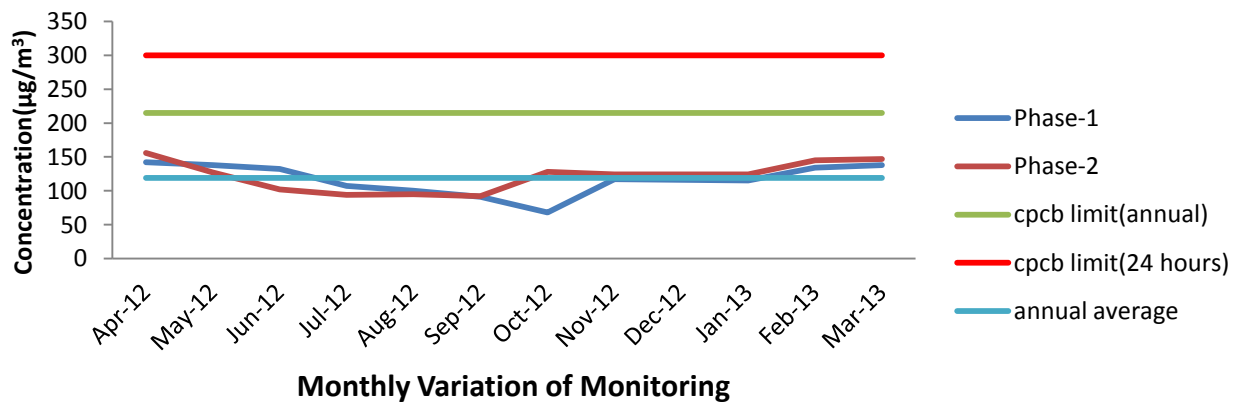


Air Quality Graph of Hingula OCP

Graph-13: SPM monitoring of Near Workshop of Hingula OCP.



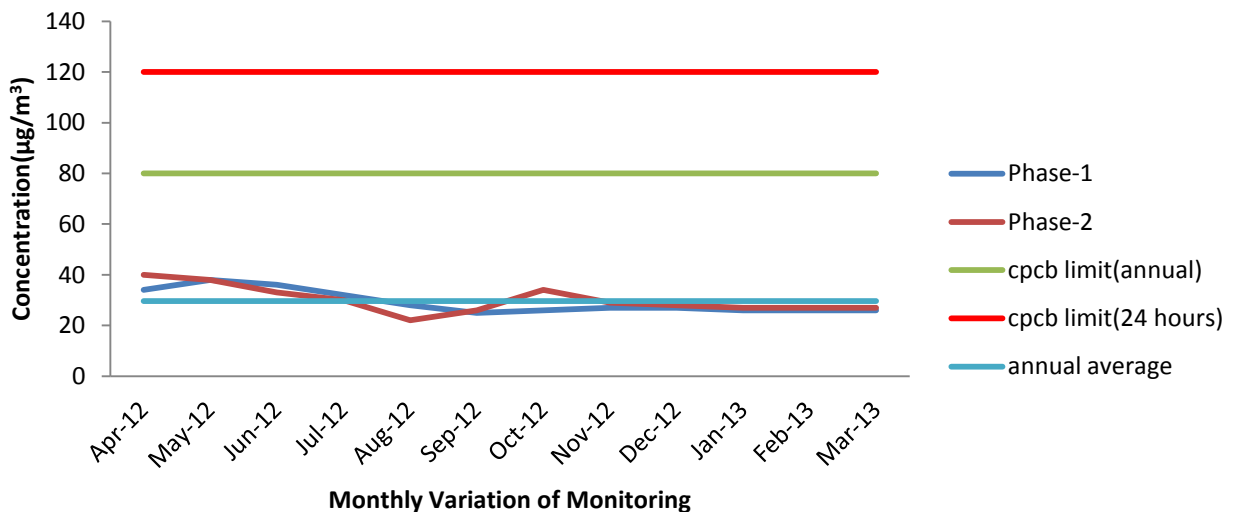
Graph-14: RPM monitoring of Near Workshop of Hingula OCP.



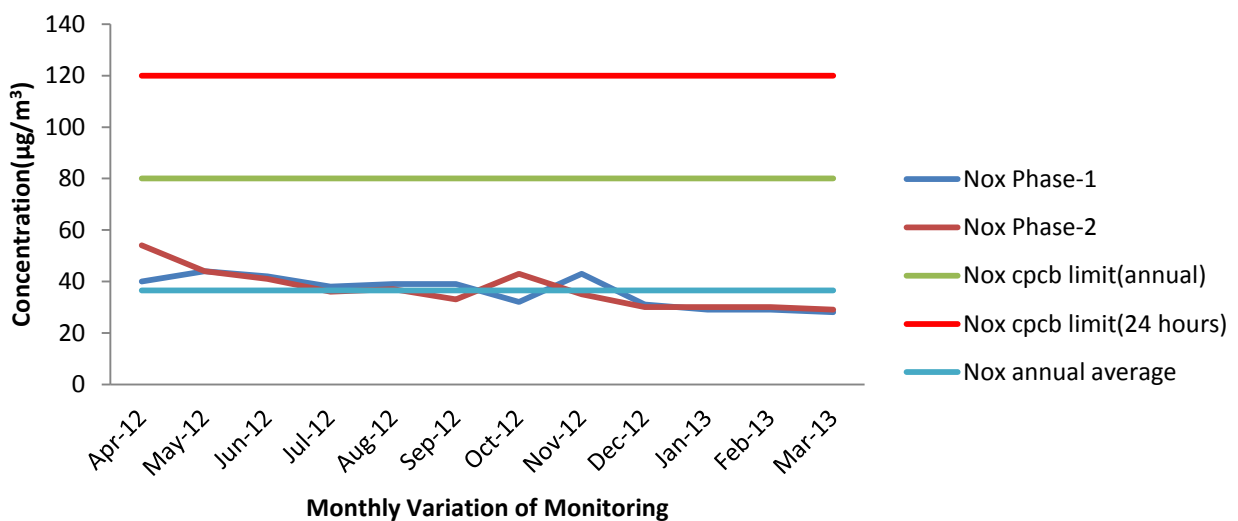


Air Quality Graph of Hingula OCP

Graph-15: SO_x monitoring of Near Workshop of Hingula OCP.



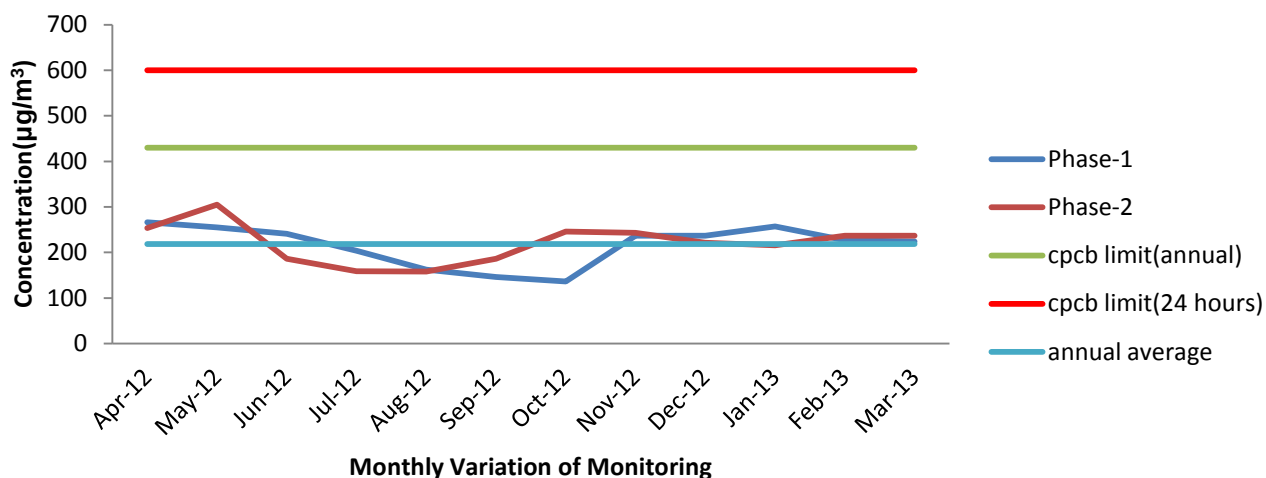
Graph-16: NO_x monitoring of Near Workshop of Hingula OCP.



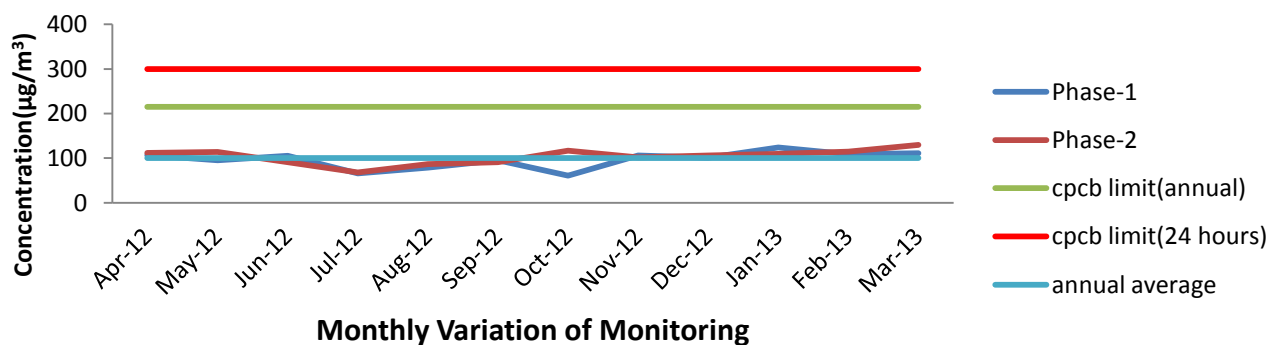


Air Quality Graph of Balaram OCP

Graph-5: SPM monitoring of On backfill/internal dump of Balaram OCP



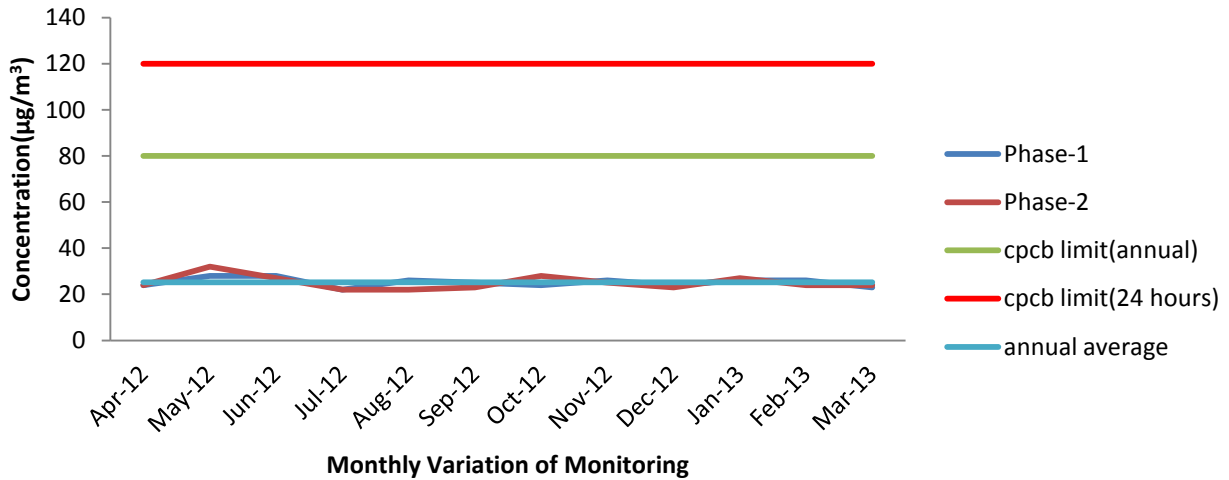
Graph-6: RPM monitoring of On backfill/internal dump of Balaram OCP



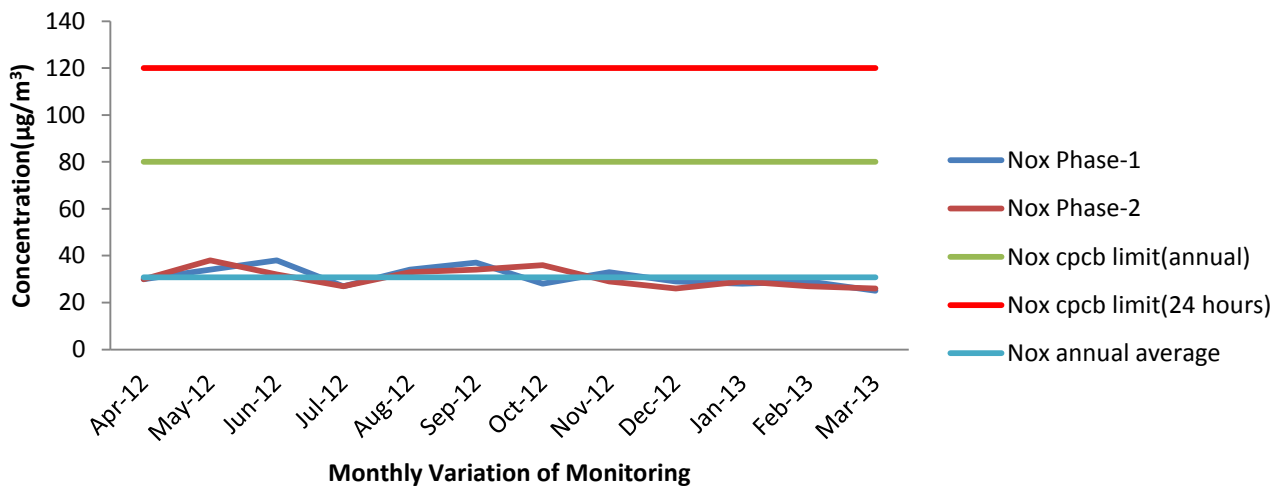


Air Quality Graph of Balaram OCP

Graph-7: SO_x monitoring of On backfill/internal dump of Balaram OCP



Graph-8: NO_x monitoring of On backfill/internal dump of Balaram OCP



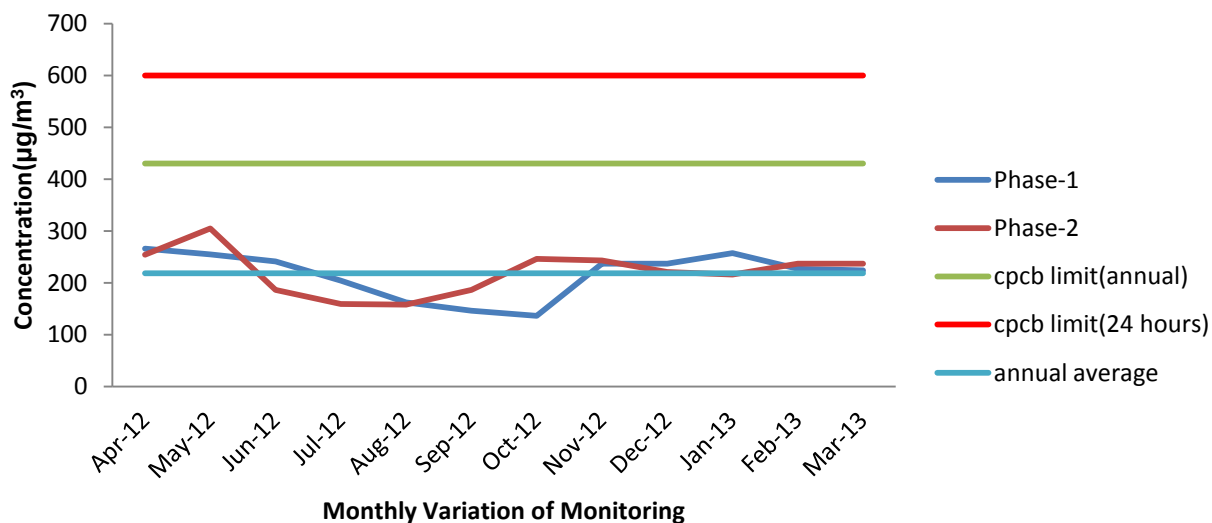
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

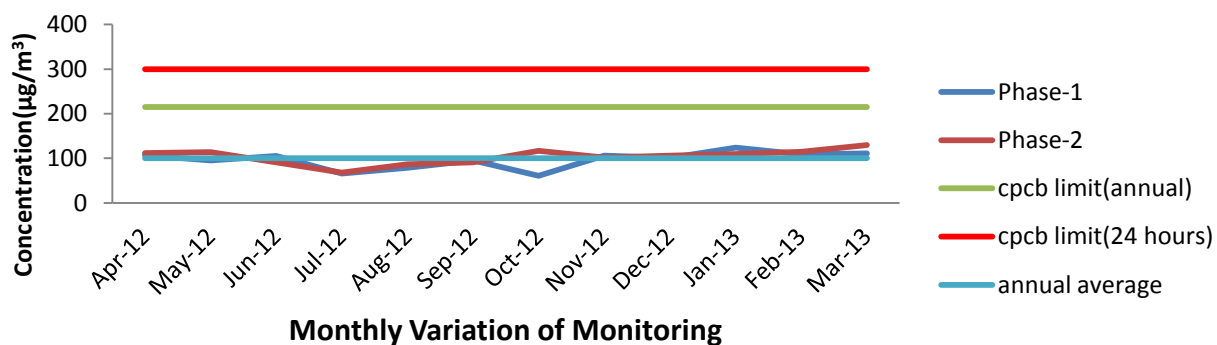


Air Quality Graph of Balaram OCP

Graph-1: SPM monitoring of Near land farming site on OB dump of Balaram OCP



Graph-2: RPM monitoring of Near land farming site on OB dump of Balaram OCP



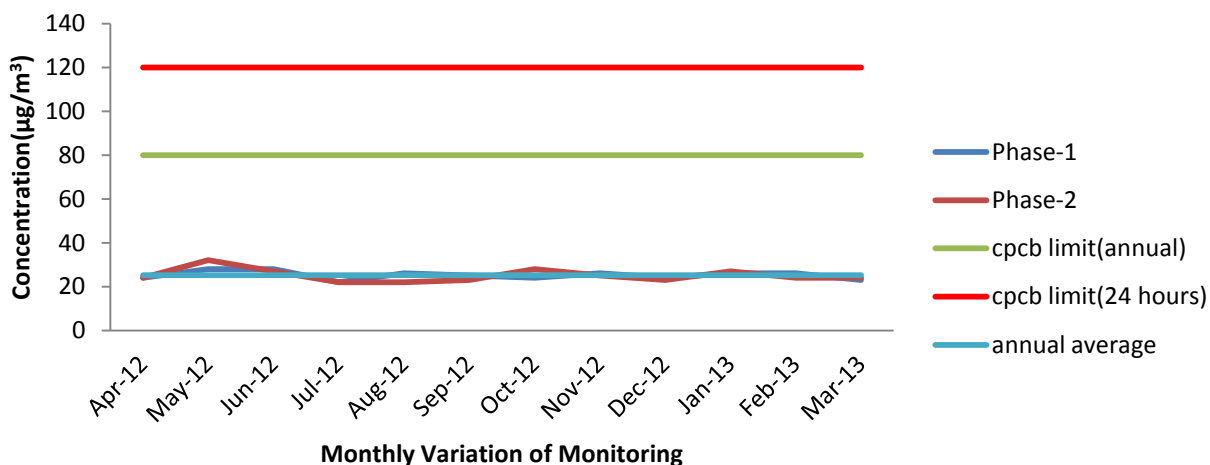
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

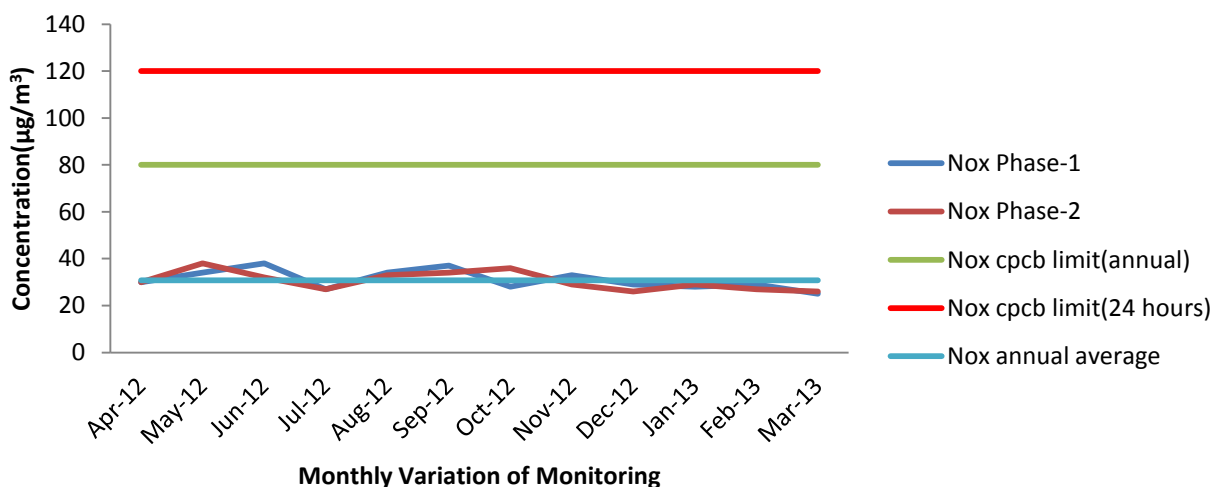


Air Quality Graph of Balaram OCP

Graph-3: SO_x monitoring of Near land farming site on OB dump of Balaram OCP



Graph-4: NO_x monitoring of Near land farming site on OB dump of Balaram OCP



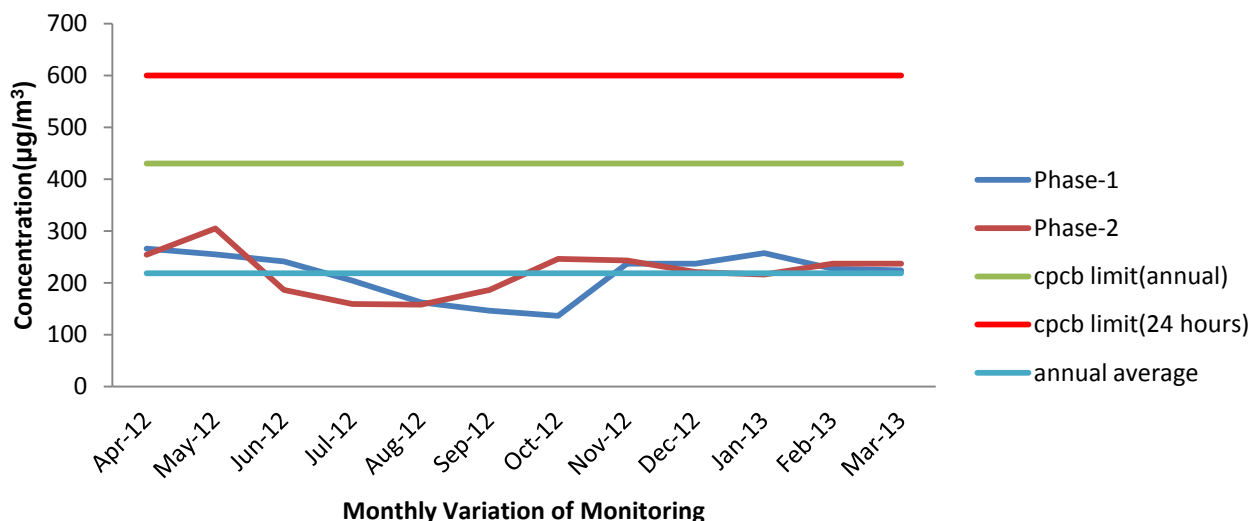
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

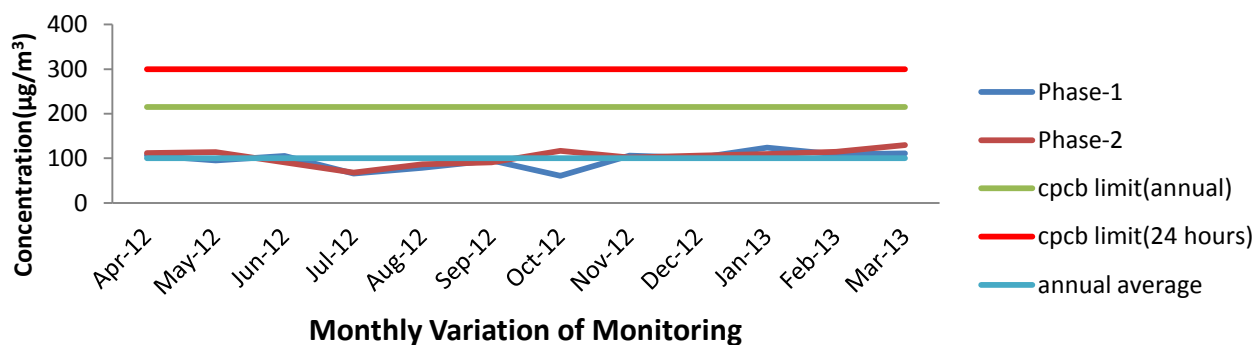


Air Quality Graph of Balaram OCP

Graph-9: SPM monitoring of Kalamchhuin Village on OB dump of Balaram OCP



Graph-10: RPM monitoring of Kalamchhuin Village of Balaram OCP



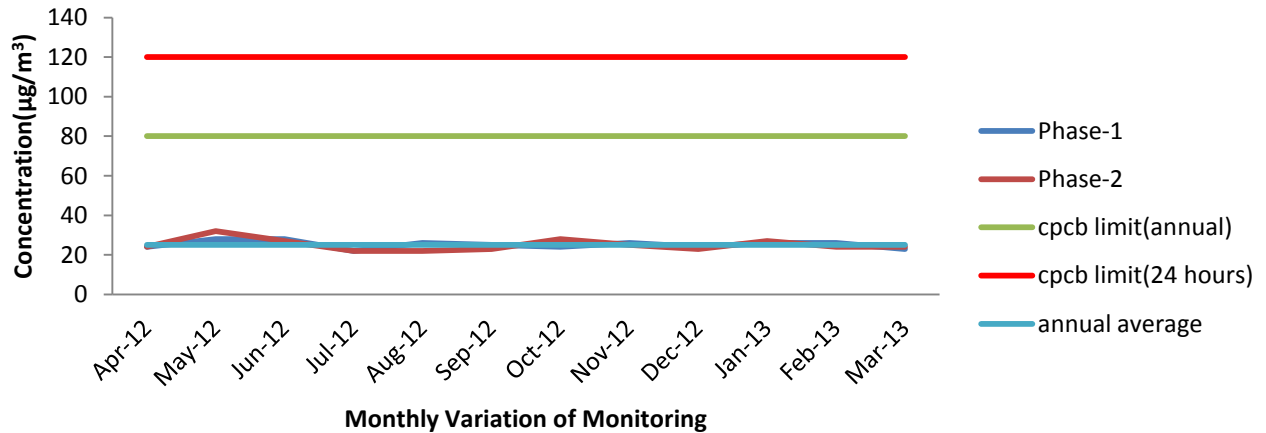
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

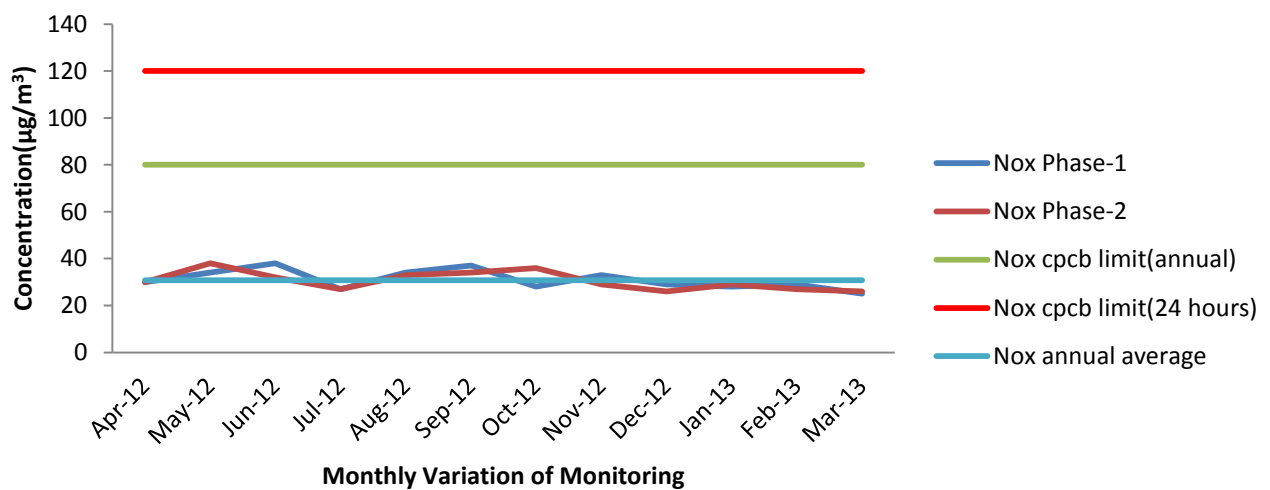


Air Quality Graph of Balaram OCP

Graph-11: SO_x monitoring of Kalamchhuin Village on OB dump of Balaram OCP



Graph-12: NO_x monitoring of Kalamchhuin Village on OB dump of Balaram OCP



[illegible]

Drinking Water Data Area: Hingula Project: Balram OCP

Date of Sampling	05-Apr-12	05-Jun-12	10-Aug-12	05-Oct-12	12-Dec-12	07-Feb-13	IS 10500
Monitoring Station	Kalinga Township Tap water	Kalinga Township Tap water	Kalinga Township Tap Water	Kalinga Township Tap Water	Kalinga Township Tap Water	Kalinga Township Tap Water	
Colour, Hazen unit, Max	3	2	2	3	2	2	5
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	UO
Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	A
Turbidity, NTU, Max	4	3	3	4	3	4	5
pH value	7.41	7.42	7.45	7.43	7.48	7.47	6.5-8.5
Total hardness	212	212	204	204	196	208	300
Iron	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.3
Chlorides	44	52	42	12	40	42	250
Dissolved solids	366	372	364	356	358	362	500
Calcium	51.2	51.2	48	48	46.4	49.6	75
Copper	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05
Manganese	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1
Sulphate	76	72	82	76	63	73	200
Nitrate	6.54	7.53	6.54	7.53	7.79	7.09	45
Flouride	0.39	0.47	0.35	0.41	0.45	0.46	1.5
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Zinc	0.04	<0.02	<0.10	<0.02	0.02	0.06	5
Hexavalent chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Boron	<0.01	<0.01	<0.20	<0.20	<0.20	<0.20	1
Phenolics	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Alkalinity	118	120	120	116	112	16	200
Residual Chlorine	Nil	Nil	Nil	Nil	Nil	Nil	0.2
MPN	Nil	Nil	Nil	Nil	Nil	Nil	nil

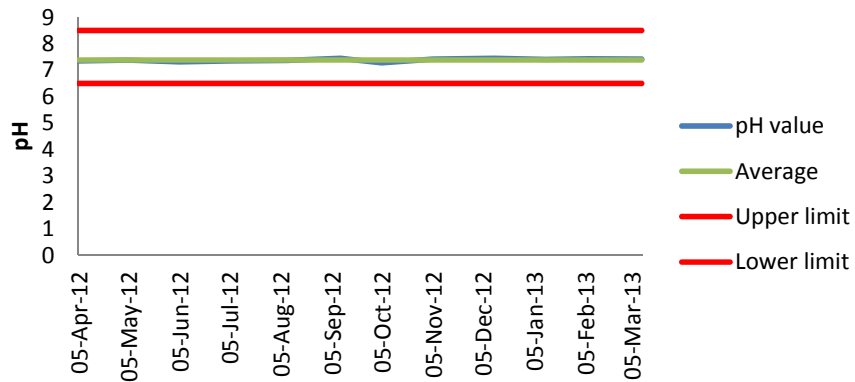
Drinking Water Data Area: Hingula Project: Balram OCP

Date of Sampling	05-Apr-12	05-May-12	05-Jun-12	IS 10500
Monitoring Station	Mitty Quarry Water	Mitty Quarry Water	Mitty Quarry Water	
Colour, Hazen unit, Max	4	3	5	5
Odour	Unobjectionable	Unobjectionable	Unobjectionable	UO
Taste	Agreeable	Agreeable	Agreeable	A
Turbidity, NTU, Max	5	5	5	5
pH value	7.28	7.36	7.39	6.5-8.5
Total hardness	280	276	264	300
Iron	<0.05	<0.05	<0.05	0.3
Chlorides	56	52	64	250
Dissolved solids	486	478	466	500
Calcium	67.2	65.6	62.4	75
Copper	<0.02	<0.02	<0.02	0.05
Manganese	<0.05	<0.05	<0.05	0.1
Sulphate	104	76	84	200
Nitrate	8.96	7.08	8.42	45
Flouride	0.48	0.33	0.52	1.5
Selenium	<0.01	<0.01	<0.01	0.01
Arsenic	<0.01	<0.01	<0.01	0.05
Lead	<0.05	<0.05	<0.05	0.05
Zinc	<0.02	<0.02	0.04	5
Hexavalent chromium	<0.01	<0.01	<0.01	0.05
Boron	<0.01	<0.01	<0.01	1
Phenolics	<0.001	<0.001	<0.001	0.001
Alkalinity	152	152	148	200
Residual Chlorine	Nil	Nil	Nil	0.2
MPN	Nil	Nil	Nil	nil

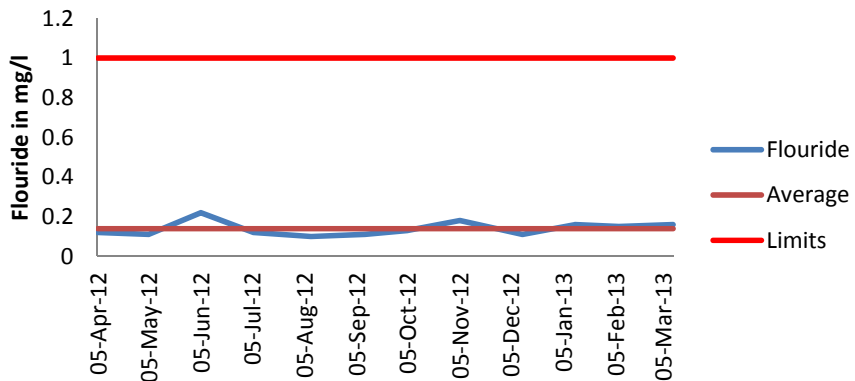
Drinking Water Data **Area: Hingula** **Project: Hingula OCP**

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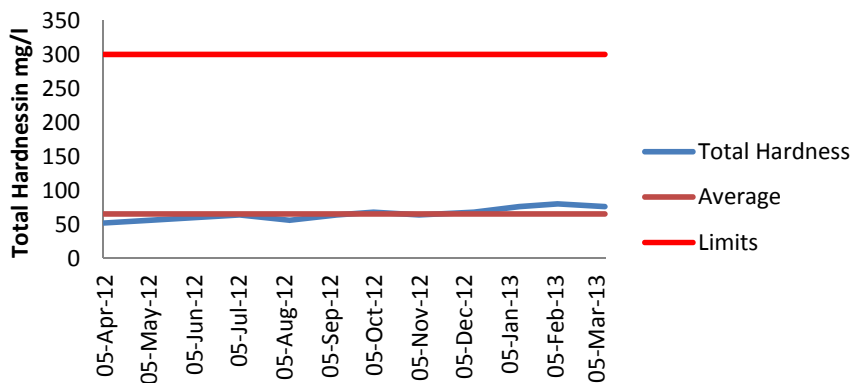
variation in pH at Danara Village borewell water at BalramOCP



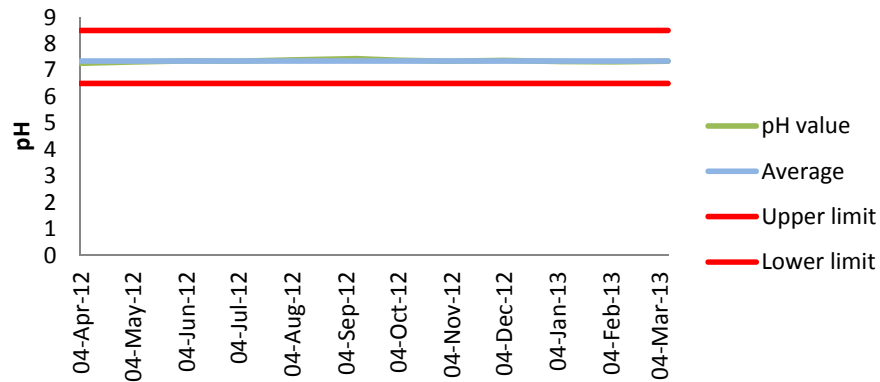
variation in Flouride at Danara Village borewell water at BalramOCP



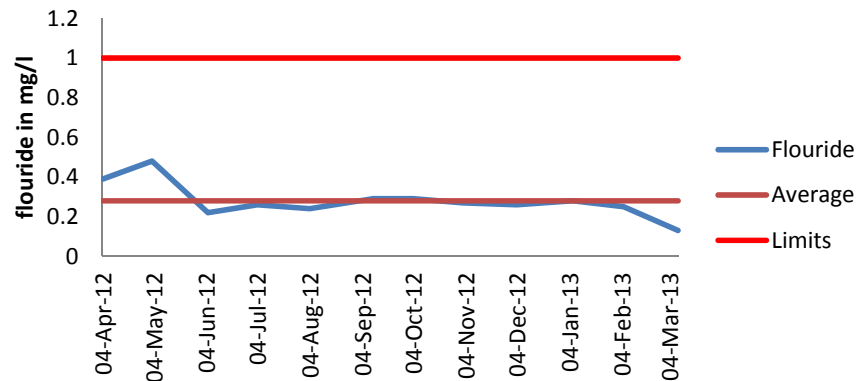
variation in Total Hardness at Danara Village borewell water at BalramOCP



variation in pH at time office water at Hingula OCP



variation in Flouride at time office water at Hingula OCP



variation in Total Hardness at time office water at Hingula OCP

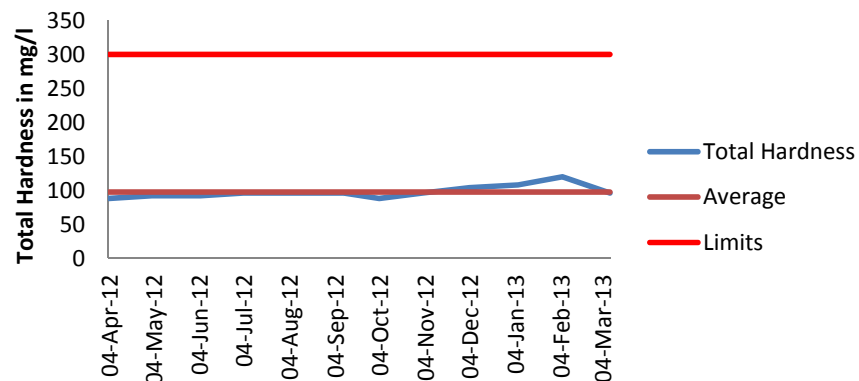


TABLE--
EFFLUENT QUALITY DATA

Area : **Hingula**

Project : **Balaram OCP**

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
06-Apr-12	Oil & Grease Trap Outlet	8.67	<1.0	18	25	-	-
20-Apr-12	Oil & Grease Trap Outlet	8.70	<1.0	22	35	-	-
07-May-12	Oil & Grease Trap Outlet	8.70	<1.0	20	30	-	-
22-May-12	Oil & Grease Trap Outlet	8.72	<1.0	22	35	-	-
06-Jun-12	Oil & Grease Trap Outlet	8.68	<1.0	20	30	-	-
23-Jun-12	Oil & Grease Trap Outlet	8.68	<1.0	16	25	-	-
07-Jul-12	Oil & Grease Trap Outlet	8.55	<1.0	22	35	-	-
24-Jul-12	Oil & Grease Trap Outlet	8.46	<1.0	26	40	-	-
11-Aug-12	Oil & Grease Trap Outlet	8.32	<1.0	28	45	-	-
24-Aug-12	Oil & Grease Trap Outlet	8.25	<1.0	32	50	-	-
11-Sep-12	Oil & Grease Trap Outlet	8.30	<1.0	24	35	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

27-Sep-12	Oil & Grease Trap Outlet	8.22	<1.0	20	30	-	-
05-Oct-12	Oil & Grease Trap Outlet	8.12	<1.0	24	35	-	-
18-Oct-12	Oil & Grease Trap Outlet	8.10	<1.0	24	35	-	-
09-Nov-12	Oil & Grease Trap Outlet	8.15	<1.0	22	35	-	-
24-Nov-12	Oil & Grease Trap Outlet	8.16	<1.0	26	40	-	-
12-Dec-12	Oil & Grease Trap Outlet	7.95	<1.0	24	35	-	-
27-Dec-12	Oil & Grease Trap Outlet	7.85	<1.0	26	40	-	-
12-Jan-13	Oil & Grease Trap Outlet	7.90	<1.0	26	40	-	-
28-Jan-13	Oil & Grease Trap Outlet	7.80	<1.0	22	35	-	-
11-Feb-13	Oil & Grease Trap Outlet	7.85	<1.0	22	35	-	-
26-Feb-13	Oil & Grease Trap Outlet	7.80	<1.0	24	40	-	-
09-Mar-13	Oil & Grease Trap Outlet	7.72	<1.0	20	30	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

25-Mar-13	Oil & Grease Trap Outlet	7.65	<1.0	22	35	-	-
06-Apr-12	DETP Outlet of Baram Colony	8.32	-	16	-	10	-
20-Apr-12	DETP Outlet of Baram Colony	8.28	-	12	-	8	-
07-May-12	DETP Outlet of Baram Colony	8.40	-	12	-	8	-
22-May-12	DETP Outlet of Baram Colony	8.35	-	14	-	10	-
06-Jun-12	DETP Outlet of Baram Colony	8.30	-	16	-	8	-
22-Jun-12	DETP Outlet of Baram Colony	8.34	-	10	-	6	-
09-Jul-12	DETP Outlet of Baram Colony	8.25	-	14	-	7	-
24-Jul-12	DETP Outlet of Baram Colony	8.15	-	12	-	6	-
10-Aug-12	DETP Outlet of Baram Colony	8.10	-	14	-	7	-
24-Aug-12	DETP Outlet of Baram Colony	8.02	-	12	-	6	-
10-Sep-12	DETP Outlet of Baram Colony	8.15	-	12	-	6	-

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

26-Sep-12	DETP Outlet of Baram Colony	8.10	-	10	-	6	-
05-Oct-12	DETP Outlet of Baram Colony	8.22	-	12	-	7	-
18-Oct-12	DETP Outlet of Baram Colony	8.16	-	14	-	8	-
09-Nov-12	DETP Outlet of Baram Colony	8.10	-	16	-	9	-
24-Nov-12	DETP Outlet of Baram Colony	8.10	-	16	-	9	-
12-Dec-12	DETP Outlet of Baram Colony	8.15	-	12	-	7	-
27-Dec-12	DETP Outlet of Baram Colony	8.10	-	10	-	6	-
12-Jan-13	DETP Outlet of Baram Colony	8.00	-	10	-	6	-
28-Jan-13	DETP Outlet of Baram Colony	7.90	-	14	-	8	-
11-Feb-13	DETP Outlet of Baram Colony	8.00	-	14	-	8	-
26-Feb-13	DETP Outlet of Baram Colony	7.90	-	12	-	8	-
09-Mar-13	DETP Outlet of Baram Colony	7.90	-	16	-	10	-

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

25-Mar-13	DETP Outlet of Balaram Colony	7.82	-	14	-	8	-

Project : Hingula OCP

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	Discharge point at north of mine into Singada Jhor	8.55	<1.0	30	45	-	1.9
19-Apr-12	Discharge point at north of mine into Singada Jhor	8.60	<1.0	32	50	-	2.0
07-May-12	Discharge point at north of mine into Singada Jhor	8.60	<1.0	34	50	-	2.0
22-May-12	Discharge point at north of mine into Singada Jhor	8.62	<1.0	30	45	-	2.1
05-Jun-12	Discharge point at north of mine into Singada Jhor	8.54	<1.0	32	50	-	2.0
23-Jun-12	Discharge point at north of mine into Singada Jhor	8.45	<1.0	36	55	-	2.1
04-Jul-12	Discharge point at north of mine into Singada Jhor	8.64	<1.0	36	55	-	2.1
20-Jul-12	Discharge point at north of mine into Singada Jhor	8.54	<1.0	32	50	-	1.9
11-Aug-12	Discharge point at north of mine into Singada Jhor	8.48	<1.0	34	50	-	2.0
20-Aug-12	Discharge point at north of mine into Singada Jhor	8.40	<1.0	36	55	-	2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

10-Sep-12	Discharge point at north of mine into Singhda Jhor	8.50	<1.0	38	60	-	2.2
26-Sep-12	Discharge point at north of mine into Singhda Jhor	8.32	<1.0	34	50	-	2.0
04-Oct-12	Discharge point at north of mine into Singhda Jhor	8.40	<1.0	38	55	-	2.2
17-Oct-12	Discharge point at north of mine into Singhda Jhor	8.40	<1.0	32	45	-	1.9
02-Nov-12	Discharge point at north of mine into Singhda Jhor	8.30	<1.0	30	45	-	1.8
19-Nov-12	Discharge point at north of mine into Singhda Jhor	8.23	<1.0	34	50	-	2.0
04-Dec-12	Discharge point at north of mine into Singhda Jhor	8.15	<1.0	36	55	-	2.2
19-Dec-12	Discharge point at north of mine into Singhda Jhor	8.20	<1.0	32	50	-	2.1
06-Jan-13	Discharge point at north of mine into Singhda Jhor	7.62	<1.0	20	30	-	2.1
21-Jan-13	Discharge point at north of mine into Singhda Jhor	7.82	<1.0	36	55	-	2.2
05-Feb-13	Discharge point at north of mine into Singhda Jhor	7.75	<1.0	34	50	-	2.1
23-Feb-13	Discharge point at north of mine into Singhda Jhor	7.90	<1.0	34	55	-	2.2

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

11-Mar-13	Discharge point at north of mine into Singhda Jhor	7.62	<1.0	32	45	-	2.0
26-Mar-13	Discharge point at north of mine into Singhda Jhor	7.55	<1.0	34	50	-	2.1
05-Apr-12	Mine discharge water	8.55	<1.0	34	50	-	2.0
19-Apr-12	Mine discharge water	8.78	<1.0	36	55	-	2.1
03-May-12	Mine discharge water	8.65	<1.0	38	55	-	2.1
22-May-12	Mine discharge water	8.70	<1.0	34	50	-	2.0
05-Jun-12	Mine discharge water	8.66	<1.0	36	55	-	2.1
23-Jun-12	Mine discharge water	8.60	<1.0	30	45	-	2.0
04-Jul-12	Mine discharge water	8.70	<1.0	34	15	-	1.9
20-Jul-12	Mine discharge water	8.62	<1.0	38	55	-	2.0
11-Aug-12	Mine discharge water	8.52	<1.0	40	60	-	2.1
20-Aug-12	Mine discharge water	8.45	<1.0	38	55	-	2.0

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

10-Sep-12	Mine discharge water	8.45	<1.0	36	55	-	2.0
26-Sep-12	Mine discharge water	8.52	<1.0	32	45	-	1.9
04-Oct-12	Mine discharge water	8.45	<1.0	34	50	-	2.1
17-Oct-12	Mine discharge water	8.66	<1.0	36	50	-	2.1
02-Nov-12	Mine discharge water	8.58	<1.0	32	50	-	2.0
19-Nov-12	Mine discharge water	8.55	<1.0	38	55	-	2.2
04-Dec-12	Mine discharge water	8.64	<1.0	40	60	-	2.3
19-Dec-12	Mine discharge water	8.66	<1.0	36	55	-	2.2
06-Jan-13	Mine discharge water	8.55	<1.0	36	55	-	2.2
21-Jan-13	Mine discharge water	8.42	<1.0	34	50	-	2.1
05-Feb-13	Mine discharge water	8.35	<1.0	38	60	-	2.3
23-Feb-13	Mine discharge water	8.50	<1.0	38	60	-	2.3

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

11-Mar-13	Mine discharge water	8.40	<1.0	40	60	-	2.2
26-Mar-13	Mine discharge water	8.30	<1.0	38	55	-	2.3
05-Apr-12	Outlet from Oil & Grease Trap	8.10	<1.0	20	30	-	-
19-Apr-12	Outlet from Oil & Grease Trap	8.18	<1.0	22	35	-	-
03-May-12	Outlet from Oil & Grease Trap	8.00	<1.0	24	35	-	-
22-May-12	Outlet from Oil & Grease Trap	8.10	<1.0	20	30	-	-
05-Jun-12	Outlet from Oil & Grease Trap	8.15	<1.0	18	25	-	-
23-Jun-12	Outlet from Oil & Grease Trap	8.17	<1.0	22	35	-	-
04-Jul-12	Outlet from Oil & Grease Trap	8.20	<1.0	20	30	-	-
20-Jul-12	Outlet from Oil & Grease Trap	8.15	<1.0	24	35	-	-
11-Aug-12	Outlet from Oil & Grease Trap	8.00	<1.0	26	40	-	-
20-Aug-12	Outlet from Oil & Grease Trap	7.95	<1.0	22	35	-	-

TABLE--
EFFLUENT QUALITY DATA

Area : Hingula

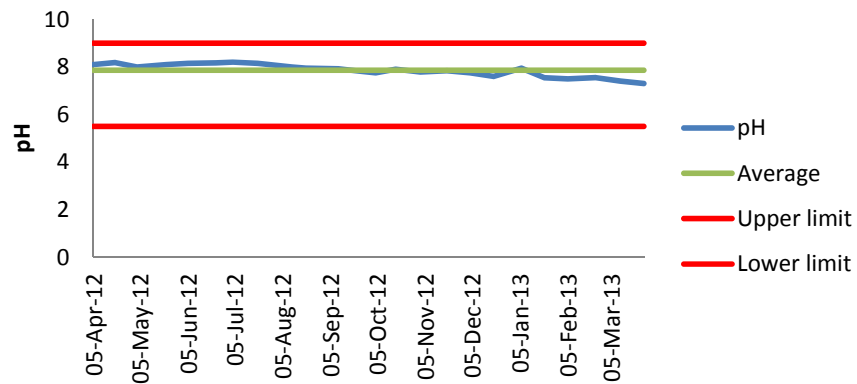
10-Sep-12	Outlet from Oil & Grease Trap	7.92	<1.0	22	35	-	-
26-Sep-12	Outlet from Oil & Grease Trap	7.80	<1.0	20	30	-	-
04-Oct-12	Outlet from Oil & Grease Trap	7.75	<1.0	24	35	-	-
17-Oct-12	Outlet from Oil & Grease Trap	7.90	<1.0	24	35	-	-
02-Nov-12	Outlet from Oil & Grease Trap	7.78	<1.0	20	30	-	-
19-Nov-12	Outlet from Oil & Grease Trap	7.84	<1.0	22	30	-	-
04-Dec-12	Outlet from Oil & Grease Trap	7.75	<1.0	24	35	-	-
19-Dec-12	Outlet from Oil & Grease Trap	7.60	<1.0	20	30	-	-
06-Jan-13	Outlet from Oil & Grease Trap	7.95	<1.0	40	60	-	-
21-Jan-13	Outlet from Oil & Grease Trap	7.54	<1.0	24	35	-	-
05-Feb-13	Outlet from Oil & Grease Trap	7.50	<1.0	20	30	-	-
23-Feb-13	Outlet from Oil & Grease Trap	7.55	<1.0	22	35	-	-

TABLE--
EFFLUENT QUALITY DATA

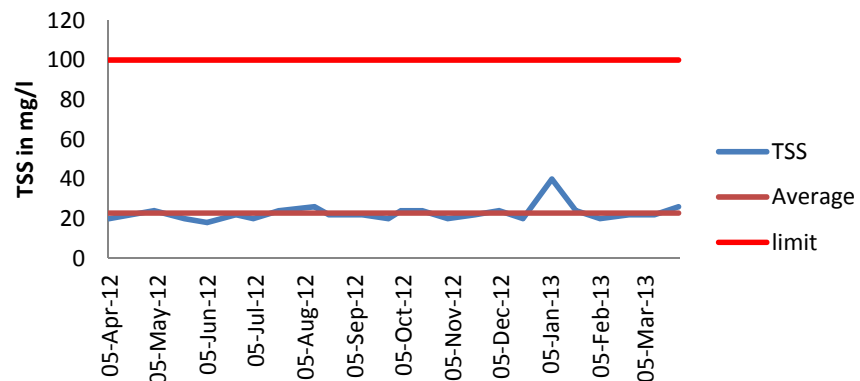
Area : Hingula

11-Mar-13	Outlet from Oil & Grease Trap	7.40	<1.0	22	35	-	-
26-Mar-13	Outlet from Oil & Grease Trap	7.30	<1.0	26	40	-	-

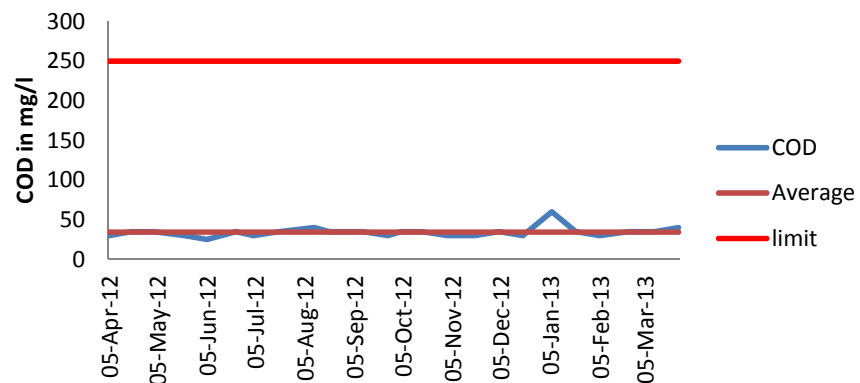
Variation in pH at O&G outlet in Hingula OCP



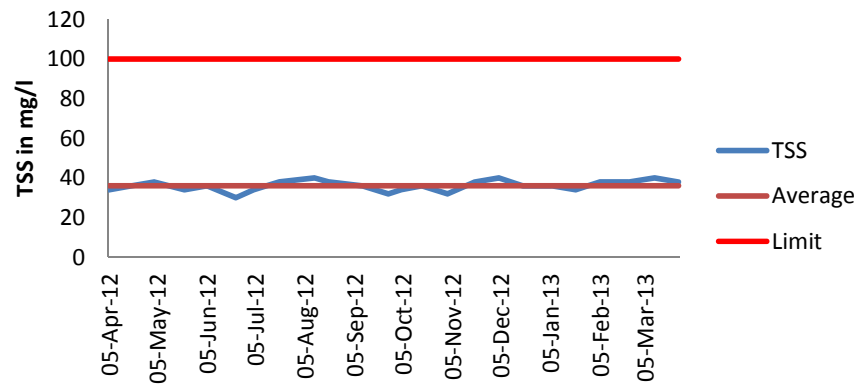
Variation in TSS at O&G outlet in Hingula OCP



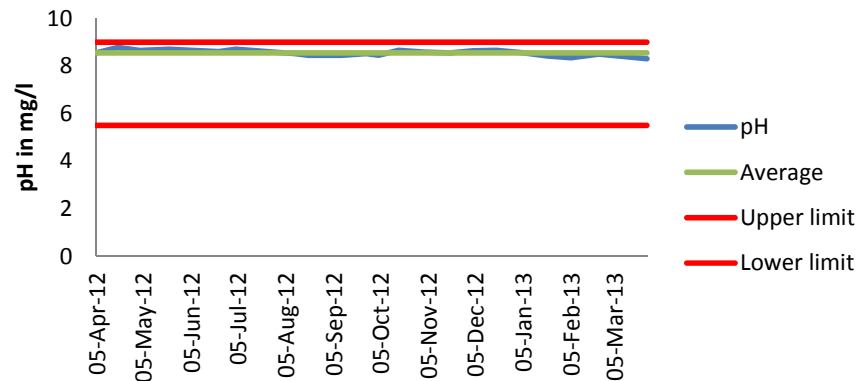
Variation in COD at O&G outlet in Hingula OCP



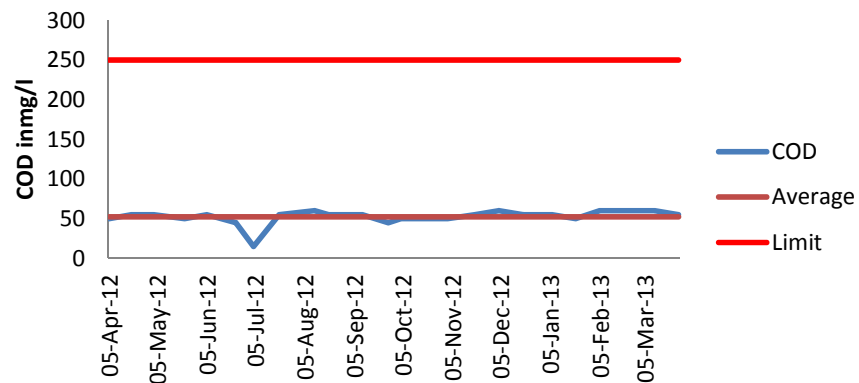
Variation in TSS at Mine Discharge water in Hingula OCP



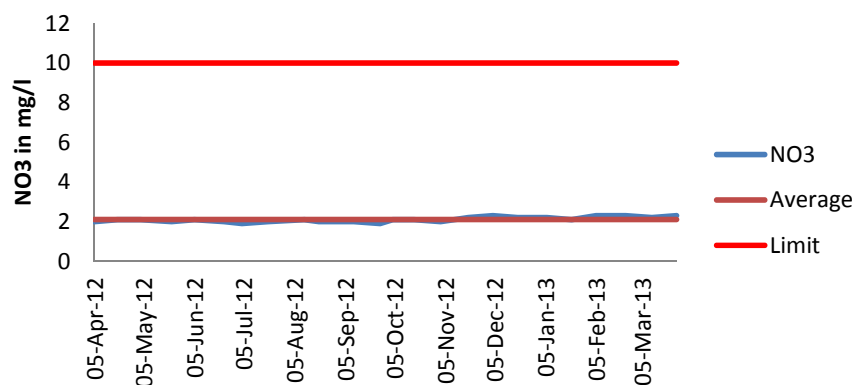
Variation in pH at Mine Discharge water in Hingula OCP



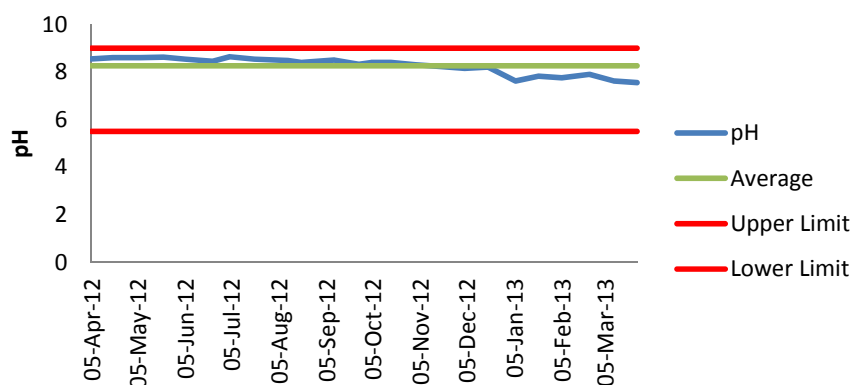
Variation in COD at Mine Discharge water in Hingula OCP



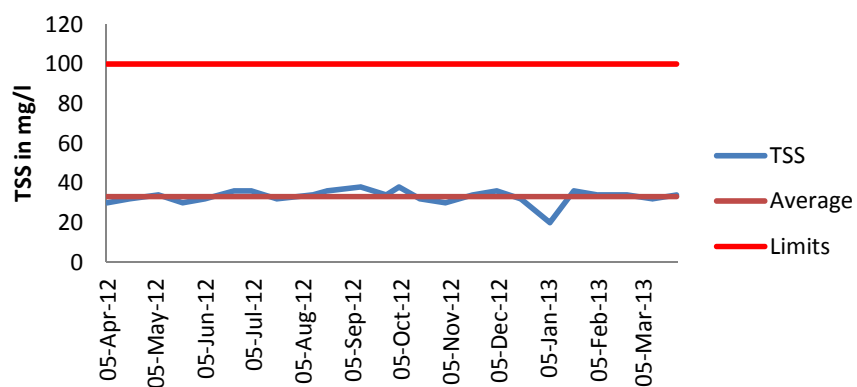
Variation in NO3 at Mine Discharge water in Hingula OCP



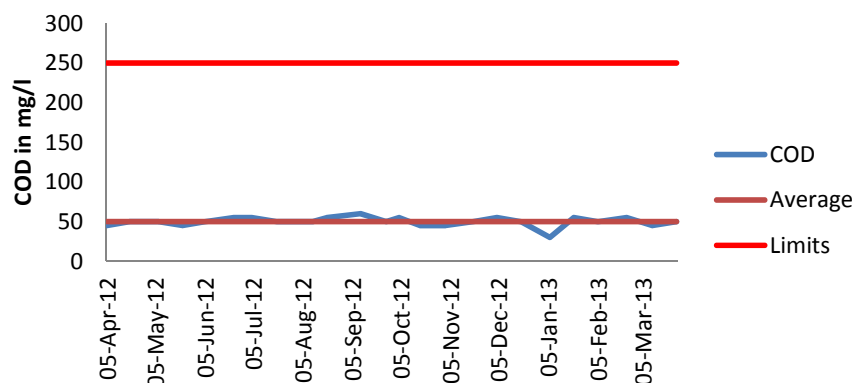
Variation in pH at Singhda Jhor in Hingula OCP



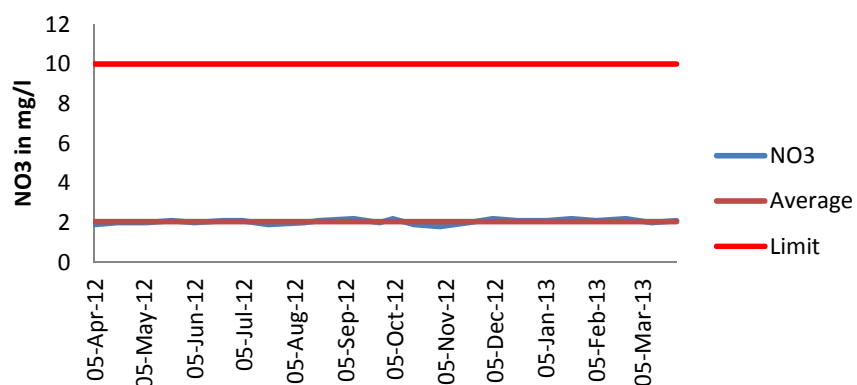
Variation in TSS at Singhda Jhor in Hingula OCP



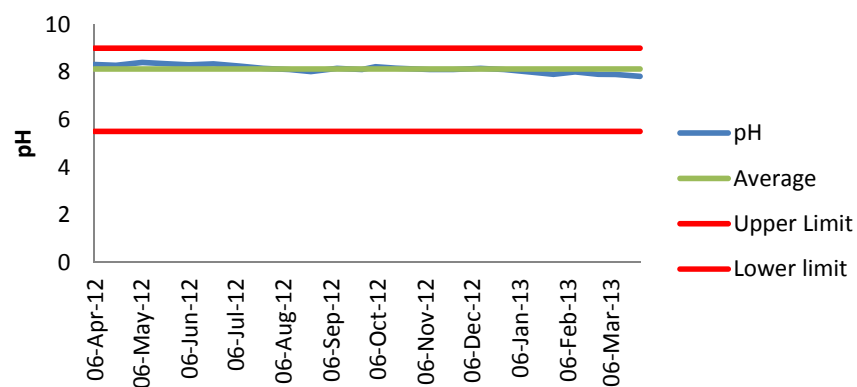
Variation in COD at Singhda Jhor in Hingula OCP



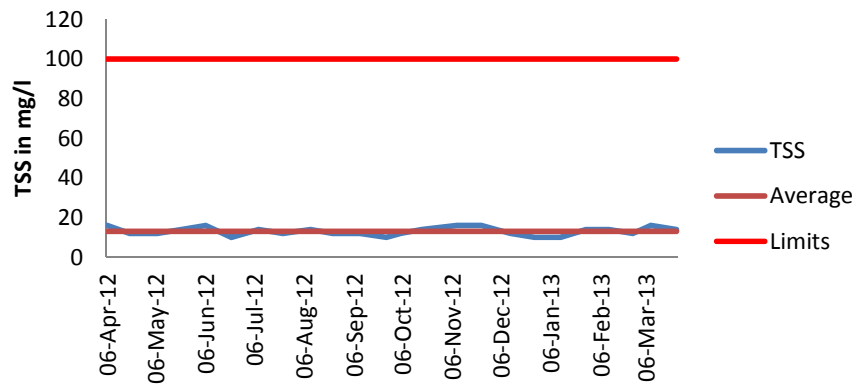
Variation in NO3 at Singhda Jhor in Hingula OCP



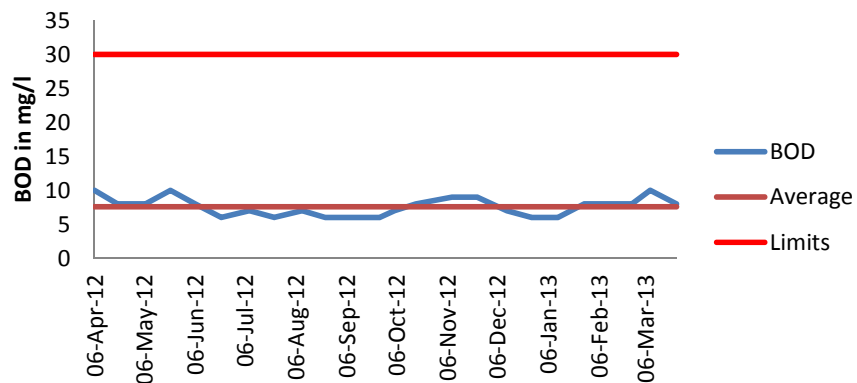
Variation in pH at DETP Outlet in Balram OCP



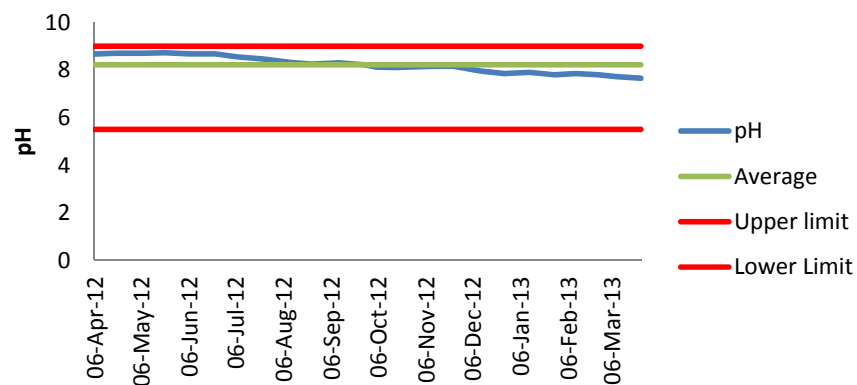
Variation in TSS at DETP Outlet in Balram OCP



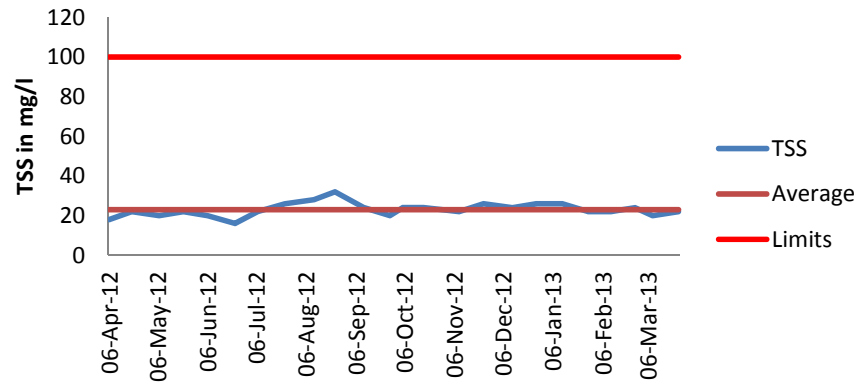
Variation in BOD at DETP Outlet in Balram OCP



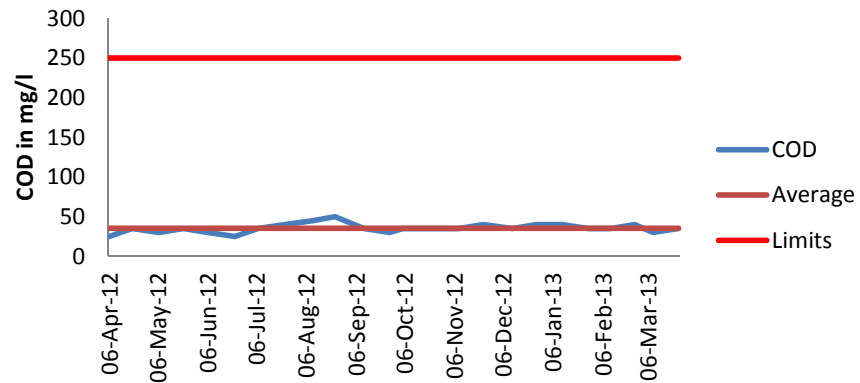
Variation in pH at O&G Trap in Balram OCP



Variation in TSS at O&G Trap in Balram OCP



Variation in COD at O&G Trap in Balram OCP



Yearly Effluent Data

Area: Hingula

Area	<i>Hingula</i>
Project	<i>Hingula OCP</i>
Date of sampling	17-Oct-12
Name of the station	Final Discharge Point
Colour	Acceptable
Odour	Agreeable
Temperature, °C	13.2
Amonical Nitrogen	0.23
TKN	2.36
BOD	10
Arsenic	<0.01
Lead	<0.05
Hexavalent chromium	<0.01
Total chromium	<0.1
Copper	<0.02
Zinc	0.34
Selenium	<0.01
Nickel	<0.1
Fluoride	0.58
Dissolved phosphate	0.18
Sulphide	0.003
Phenolics	<0.001
Manganese	<0.05
Iron	0.18
Nitrate Nitrogen	2.1

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Hingula OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Near Workshop	59.9	53.2
30-Apr-12	Near Workshop	61.3	52.1
15-May-12	Near Workshop	60.5	55.6
31-May-12	Near Workshop	62.1	54.7
15-Jun-12	Near Workshop	60.5	57.4
30-Jun-12	Near Workshop	60.5	53.6
14-Jul-12	Near Workshop	62.6	55.6
31-Jul-12	Near Workshop	59.6	56.7
14-Aug-12	Near Workshop	60.2	53.8
31-Aug-12	Near Workshop	60.4	55.3
15-Sep-12	Near Workshop	51.8	48.3
29-Sep-12	Near Workshop	59.4	54.2
15-Oct-12	Near Workshop	60.5	56.8
31-Oct-12	Near Workshop	51.6	46.3
15-Nov-12	Near Workshop	62.7	57.6
30-Nov-12	Near Workshop	62.3	58.9
15-Dec-12	Near Workshop	61.8	57.5
31-Dec-12	Near Workshop	62.6	58.3
15-Jan-13	Near Workshop	59.3	56.8
31-Jan-13	Near Workshop	60.1	53.2
15-Feb-13	Near Workshop	62.2	57.5

28-Feb-13	Near Workshop	59.5	55.8
15-Mar-13	Near Workshop	61.4	54.4
30-Mar-13	Near Workshop	60.3	56.9

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Hingula OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Bhalugadia Village	49.6	42.1
30-Apr-12	Bhalugadia Village	50.7	40.6
15-May-12	Bhalugadia Village	51.7	43.2
31-May-12	Bhalugadia Village	51.7	44.5
15-Jun-12	Bhalugadia Village	52.5	42.6
30-Jun-12	Bhalugadia Village	50.1	40.7
14-Jul-12	Bhalugadia Village	52.3	44.5
31-Jul-12	Bhalugadia Village	52.3	42.6
14-Aug-12	Bhalugadia Village	50.1	43.2
31-Aug-12	Bhalugadia Village	52.1	44.8
15-Sep-12	Bhalugadia Village	56.1	42.5
29-Sep-12	Bhalugadia Village	53.4	44.8
15-Oct-12	Bhalugadia Village	52.1	43.2
31-Oct-12	Bhalugadia Village	58.4	44.0
15-Nov-12	Bhalugadia Village	52.6	43.9
30-Nov-12	Bhalugadia Village	52.1	43.2
15-Dec-12	Bhalugadia Village	52.3	44.8
31-Dec-12	Bhalugadia Village	52.5	46.7
15-Jan-13	Bhalugadia Village	50.5	43.2
31-Jan-13	Bhalugadia Village	50.8	44.1
15-Feb-13	Bhalugadia Village	52.2	44.5

28-Feb-13	Bhalugadia Village	51.1	41.1
15-Mar-13	Bhalugadia Village	52.8	42.4
30-Mar-13	Bhalugadia Village	53.4	42.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Hingula OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Gopalprasad Village	51.2	43.2
30-Apr-12	Gopalprasad Village	52.4	41.3
15-May-12	Gopalprasad Village	50.6	42.5
31-May-12	Gopalprasad Village	50.8	42.4
15-Jun-12	Gopalprasad Village	52.9	46.8
30-Jun-12	Gopalprasad Village	53.2	41.6
14-Jul-12	Gopalprasad Village	52.9	47.8
31-Jul-12	Gopalprasad Village	51.6	43.6
14-Aug-12	Gopalprasad Village	51.2	40.5
31-Aug-12	Gopalprasad Village	51.9	46.5
15-Sep-12	Gopalprasad Village	50.6	41.5
29-Sep-12	Gopalprasad Village	54.0	43.4
15-Oct-12	Gopalprasad Village	52.6	45.6
31-Oct-12	Gopalprasad Village	51.6	42.3
15-Nov-12	Gopalprasad Village	51.9	45.7
30-Nov-12	Gopalprasad Village	52.4	47.6
15-Dec-12	Gopalprasad Village	53.2	46.3
31-Dec-12	Gopalprasad Village	51.6	44.5
15-Jan-13	Gopalprasad Village	51.3	42.5
31-Jan-13	Gopalprasad Village	50.9	42.8
15-Feb-13	Gopalprasad Village	51.6	43.5

28-Feb-13	Gopalprasad Village	51.4	44.3
15-Mar-13	Gopalprasad Village	52.7	42.8
30-Mar-13	Gopalprasad Village	52.4	45.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Hingula OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
14-Apr-12	Near Kumunda Basti	52.1	40.8
30-Apr-12	Near Kumunda Basti	52.2	42.5
15-May-12	Near Kumunda Basti	51.6	42.8
31-May-12	Near Kumunda Basti	50.4	40.6
15-Jun-12	Near Kumunda Basti	51.6	44.6
30-Jun-12	Near Kumunda Basti	52.1	45.5
14-Jul-12	Near Kumunda Basti	52.6	42.5
31-Jul-12	Near Kumunda Basti	52.1	44.8
14-Aug-12	Near Kumunda Basti	51.1	42.8
31-Aug-12	Near Kumunda Basti	52.6	44.5
15-Sep-12	Near Kumunda Basti	49.9	44.8
29-Sep-12	Near Kumunda Basti	53.1	46.9
15-Oct-12	Near Kumunda Basti	52.6	44.8
31-Oct-12	Near Kumunda Basti	51.5	45.8
15-Nov-12	Near Kumunda Basti	52.6	44.5
30-Nov-12	Near Kumunda Basti	52.2	43.4
15-Dec-12	Near Kumunda Basti	52.7	44.3
31-Dec-12	Near Kumunda Basti	53.4	43.4
15-Jan-13	Near Kumunda Basti	51.2	41.3
31-Jan-13	Near Kumunda Basti	49.6	42.4
15-Feb-13	Near Kumunda Basti	52.4	45.7

28-Feb-13	Near Kumunda Basti	50.1	43.8
15-Mar-13	Near Kumunda Basti	51.9	41.1
30-Mar-13	Near Kumunda Basti	51.3	40.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Balaram OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	On backfill/internal dump	60.5	54.1
27-Apr-12	On backfill/internal dump	57.3	44.4
12-May-12	On backfill/internal dump	60.7	56.7
29-May-12	On backfill/internal dump	61.3	57.9
13-Jun-12	On backfill/internal dump	61.6	58.1
28-Jun-12	On backfill/internal dump	60.7	45.9
12-Jul-12	On backfill/internal dump	60.6	56.7
28-Jul-12	On backfill/internal dump	60.8	58.3
11-Aug-12	On backfill/internal dump	60.1	54.3
27-Aug-12	On backfill/internal dump	62.3	57.8

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Balaram OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
13-Sep-12	On backfilled/internal dump	55.2	51.1
27-Sep-12	On backfilled/internal dump	60.8	54.6
12-Oct-12	On backfilled/internal dump	62.6	57.9
29-Oct-12	On backfilled/internal dump	60.7	56.4
12-Nov-12	On backfilled/internal dump	60.2	57.2
28-Nov-12	On backfilled/internal dump	62.9	57.5
13-Dec-12	On backfilled/internal dump	62.5	58.5
28-Dec-12	On backfilled/internal dump	61.6	59.2
12-Jan-13	On backfilled/internal dump	63.9	56.7
29-Jan-13	On backfilled/internal dump	58.2	53.2
13-Feb-13	On backfilled/internal dump	62.6	57.5
26-Feb-13	On backfilled/internal dump	60.6	55.9
13-Mar-13	On backfilled/internal dump	57.4	48.1
27-Mar-13	On backfilled/internal dump	62.8	57.5

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Hingula*

PROJECT : *Balaram OCP*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Kalamchhuin Village	50.2	42.1
27-Apr-12	Kalamchhuin Village	50.1	43.6
12-May-12	Kalamchhuin Village	51.6	44.5
29-May-12	Kalamchhuin Village	49.4	45.3
13-Jun-12	Kalamchhuin Village	52.5	47.6
28-Jun-12	Kalamchhuin Village	56.1	44.7
12-Jul-12	Kalamchhuin Village	52.2	44.7
28-Jul-12	Kalamchhuin Village	52.9	45.1
11-Aug-12	Kalamchhuin Village	50.9	44.3
27-Aug-12	Kalamchhuin Village	52.4	47.8
13-Sep-12	Kalamchhuin Village	54.3	44.1
27-Sep-12	Kalamchhuin Village	52.4	46.9
12-Oct-12	Kalamchhuin Village	52.4	44.7
29-Oct-12	Kalamchhuin Village	50.1	41.0
12-Nov-12	Kalamchhuin Village	52.3	44.4
28-Nov-12	Kalamchhuin Village	52.4	44.5
13-Dec-12	Kalamchhuin Village	51.3	45.9
28-Dec-12	Kalamchhuin Village	52.6	47.3
12-Jan-13	Kalamchhuin Village	53.2	48.3
29-Jan-13	Kalamchhuin Village	50.1	40.3
13-Feb-13	Kalamchhuin Village	52.6	46.5

26-Feb-13	Kalamchhuin Village	51.1	43.6
13-Mar-13	Kalamchhuin Village	52.5	46.4
27-Mar-13	Kalamchhuin Village	53.4	46.4

TABLE--
NOISE LEVEL MONITORING DATA

AREA : Hingula

PROJECT : Balaram OCP

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Near land farming site on OB dump	62.1	54.1
27-Apr-12	Near land farming site on OB dump	60.6	56.5
12-May-12	Near land farming site on OB dump	61.7	58.9
29-May-12	Near land farming site on OB dump	62.7	57.2
13-Jun-12	Near land farming site on OB dump	62.1	58.5
28-Jun-12	Near land farming site on OB dump	62.4	57.1
12-Jul-12	Near land farming site on OB dump	62.6	58.9
28-Jul-12	Near land farming site on OB dump	60.7	57.4
11-Aug-12	Near land farming site on OB dump	60.6	54.1
27-Aug-12	Near land farming site on OB dump	65.6	58.1
13-Sep-12	Near land farming site on OB dump	52.9	48.3
27-Sep-12	Near land farming site on OB dump	61.7	54.0
12-Oct-12	Near land farming site on OB dump	60.5	56.8
29-Oct-12	Near land farming site on OB dump	58.3	53.7
12-Nov-12	Near land farming site on OB dump	62.5	58.7
28-Nov-12	Near land farming site on OB dump	62.5	57.8
13-Dec-12	Near land farming site on OB dump	60.4	57.8
28-Dec-12	Near land farming site on OB dump	60.5	57.2
12-Jan-13	Near land farming site on OB dump	64.6	58.3
29-Jan-13	Near land farming site on OB dump	60.1	51.3
13-Feb-13	Near land farming site on OB dump	60.7	54.7

26-Feb-13	Near land farming site on OB dump	61.3	55.1
13-Mar-13	Near land farming site on OB dump	60.6	51.6
27-Mar-13	Near land farming site on OB dump	62.1	57.8

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : Hingula

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Hingula OCP	Kusumpal village well	3.51
12-Apr-12	Balaram OCP	Nakaiposi village well	5.82
12-Apr-12	Balaram OCP	Danara village well	6.27
13-Aug-12	Hingula OCP	Kusumpal village well	2.01
13-Aug-12	Balaram OCP	Nakaiposi village well	3.10
13-Aug-12	Balaram OCP	Danara village well	2.90
14-Nov-12	Hingula OCP	Kusumpal village well	3.24
14-Nov-12	Balaram OCP	Nakaiposi village well	3.83
14-Nov-12	Balaram OCP	Danara village well	4.23
12-Jan-13	Hingula OCP	Kusumpal village well	4.62
12-Jan-13	Balaram OCP	Nakaiposi village well	2.90
12-Jan-13	Balaram OCP	Danara village well	6.17

SILTATION STUDY AT TALCHER COALFIELD

HINGULA AREA

MONTH : JULY 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	04.07.12	28
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	04.07.12	34
	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	07.07.12	30
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	07.07.12	36

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	24.07.12	26
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	24.07.12	30
	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	24.07.12	28
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	24.07.12	34

SILTATION STUDY AT TALCHER COALFIELD

HINGULA AREA

MONTH : August 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	10.08.12	28
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	10.08.12	32
	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	10.08.12	30
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	10.08.12	34

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	20.08.12	26
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	20.08.12	30
	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	24.08.12	28
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	24.08.12	32

SILTATION STUDY AT TALCHER COALFIELD

HINGULA AREA (Hingula OCP)

MONTH : September 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	10.09.12	28
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	10.09.12	32

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Hingula OCP	100m U/S of the pt. of confluence of mine disc. Water with Singada Jhar	26.09.12	30
		100m D/S of the pt. of confluence of mine disc. Water with Singada Jhar	26.09.12	34

SILTATION STUDY AT TALCHER COALFIELD

HINGULA AREA (Balaram OCP)

MONTH : September 2012

1ST PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	10.09.12	30
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	10.09.12	34

2nd PHASE

Area	Project	Monitoring Station	Date of Sampling	TSS
Hingula	Balaram OCP	100m U/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	26.09.12	32
		100m D/S of the pt. of confluence of Mitty quarry water with Bangaru nallah	26.09.12	36

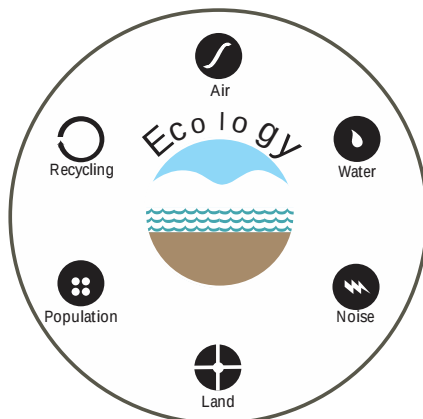


Annual Compiled Monitoring Report Of Talcher Area For 2012-2013

(Deulbera Colliery (U/G), Talcher Colliery (U/G),
Nandira Colliery (U/G))

Talcher Coalfields

Mahanadi Coalfields Limited



Prepared by:



Central Mine Planning & Design Institute Ltd.

(A Subsidiary of Coal India Ltd.)

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[Assistance from Environment Division, CMPDI(HQs), Ranchi]

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2	Air Environment	II	
3	Water Environment	III	
4	Noise Environment	IV	

CHAPTER-I

INTRODUCTION

1.1 Brief Description of the Mine(s) / Project(s)

Talcher area, Mahanadi Coalfields Limited is located in Talcher Coalfield, Angul district, Orissa. This area has three U/G mines under its administrative control. The underground mines are Talcher U/G mine, Deulbera U/G mine and Nandira U/G mine.

Talcher Colliery

This underground mine lies between latitudes $20^{\circ} 55' 51''$ and $20^{\circ} 57' 24''$ N and longitudes $85^{\circ} 08' 13''$ & $85^{\circ} 11' 14''$ E.

The boundary of the underground mine is as follows :

East	=	Handidhua colliery
West	=	Ananta opencast project
North	=	Fault No.12
South	=	Jagannath opencast mine

Talcher colliery is well connected by rail and road. The surface in and around the mine is predominantly soil covered and gently undulating. The general slope of the area is towards north.

The elevation of the area varies from 98 to 118 m above MSL.

The drainage of the area is controlled mainly by the Brahmani river on the eastern side of the mine. The mean temperature ranges from 6.7° (winter) to 44.1° (summer).

Deulbera U/G Mine

The mine lies between latitudes $20^{\circ} 56' 45''$ and $20^{\circ} 58' 60''$ and longitudes $85^{\circ} 11' 45''$ and $85^{\circ} 13' 20''$.

The mine is closed.

The boundary of the mine is as follows :

East	:	Brahmani river
North	:	Fault No.11
West	:	Handidhua colliery
South	:	Incrop or non-coal bearing area.

The surface in and around the mine is predominantly soil covered and gently undulating. The elevation of the area varies from 63 to 109 m above MSL. The drainage is controlled mainly by the Brahmani river. The capacity of the mine is 0.200 Mty.

Nandira U/G Mine

Nandira U/G mine lies between latitudes 20° 53' 58" and 20° 56' 10" N and longitudes 85° 05' 40" and 85° 08' 14" E.

The mine is well connected by rail & road.

The surface in and around Nandira U/G mine is predominantly soil covered and gently undulating. The elevation of the area varies from 124.29 m to 161.91 m above MSL.

The drainage is controlled mainly by the Brahmani river on the eastern side of the mine.

The annual target is 0.33 million tonne. The coal from this project is linked to basket consumers of Talcher coalfield.

1.2 Frequency of Environmental Monitoring

(i) Ambient air quality monitoring

To assess the pollution level in ambient air of the area located in and around the coal mines/projects and also determine the efficacy of mitigation measures, regular monitoring of the following parameters is being carried out.

Respirable particulate matter (RPM)	:	One sample per fortnight
Suspended particulate matter (SPM)	:	
Sulphur dioxide (SO ₂)	:	
Nitrogen oxides (NO _x)	:	

(ii) Drinking water monitoring : Every month.

(iii) Effluent quality monitoring

5 parameters : Once in every fortnight.

21 parameters : Once in a year

(iv) Well water level monitoring : Quarterly

(v) Noise level monitoring : Once in a fortnight

1.3 Environmental Quality Monitoring Stations

The locations of various environmental quality monitoring stations are given in Plate-II and details are given below:

- **Air quality monitoring stations**

Sl.No. Name of Stations

Talcher Colliery

1. Dera Colony
2. Manager's Office

Nandira Colliery

3. Project Office
4. Natedi Village

Deulbera Colliery

5. Manager's Office
6. Deulbera Colony

- **Drinking water quality monitoring stations**

Sl.No. Name of Stations

1. Talcher Town, Tap water

- **Effluent quality monitoring station**

1. Talcher Colliery, Mine discharge water
2. Nandira Colliery, Mine discharge water
3. Deulbera Colliery, Mine discharge water
4. Rani park submersible pump

- **Well water level monitoring station**

1. Naraharipur village well
2. Natedi village well
3. Deulbera colony well

- **Noise level monitoring stations**

Sl.No. Name of Stations

Talcher Colliery

1. Dera Colony
2. Manager's Office

Nandira Colliery

3. Project Office
4. Natedi Village

Deulbera Colliery

5. Deulbera Colony
6. Manager's Office

CHAPTER-II

AIR ENVIRONMENT

2.1 Details of Air Quality Monitoring Stations

Details are given in Table-1.

Table-1
Details of Air Quality Monitoring Stations
along with Sources of Pollution

Sl.No.	Location	Sources of Pollution
Talcher Colliery		
1	Dera Colony	Transport, CHP
2	Manager's Office	Domestic, Transportation
Nandira Colliery		
3	Project Office	Transport, CHP
4	Natedi Village	Domestic, RLS.
Deulbera Colliery		
5	Deulbera Colony	Domestic, Transportation
6	Manager's Office	Domestic, Transportation

2.2 Methodology and Instruments used for Air Quality Analysis

These are given in Table-2.

Table-2
Methodology and Instruments used for Air Quality Analysis

Sl.No.	Parameters	Method	Instruments
1	SPM and RPM	IS:5182 (Part-IV) (Gravimetric method)	High volume samplers, Respirable dust samplers & electronic balance, oven, etc.
2	SO ₂	IS:5182 (Part-II) (Sodium tetrachloro-mercurate method, also known as improved West and Gaeke Method) (Photometric method)	Milton-Roy Spectrophotometer.
3	NO _x	IS:5182 (Part-VI) (Jacob & Hoccheiser Modified Method) (Photometric method)	-do-

2.3 Results

The results of analyses of air samples are given in Tables attached..

2.4 Discussions

Examination of the levels of RPM, SPM, SO₂ and NO_x for all the air stations in Talcher Area reveals the following:

- In coal mining area like Manager's Offices and Project Office, the levels of RPM, SPM, SO₂ and NO_x are observed to be within the limits of the Standards for Coal Mines, barring a few aberated values.
- In residential area, the values are within the limits barring a few aberated values.

2.5 Control Measures

The following mitigatory measures are suggested to maintain the air quality within the stipulated standards:

- Approach roads will be metalled to prevent dust generation on the surface.
- Water sprinkling on transport roads, coal loading and unloading sites at regular and frequent intervals by adding appropriate wetting agents.
- Development of thick greenbelts around the mines, infrastructure sites and residential areas besides plantation on both sides of the roads on the surface using plant species having leaves of high efficacy dust catching nature.

CHAPTER-III

WATER ENVIRONMENT

3.1 Methodology and Instruments used for water & effluent analysis

Details are given in Table.

Table

Methodology & Instruments used for Water and Effluent Analysis

Sl.No.	Parameters	Method/Instruments
1	pH	Electrometric/pH meter
2	Turbidity	Nephelometric/Nepheloturbidity meter
3	Total suspended solids, total dissolved solids, oil & grease and mineral oil	Gravimetric/oven, electronic balance
4	BOD	BOD test and titration/BOD incubator, pipette, burette, etc.
5	COD	Reactor digestion and titration/reactor digester
6	Coliform	MPN test/LTEK MPN kit.
7	Calcium, chloride, hardness, alkalinity	Titrimetric/pipette, burette, etc.
8	Cadmium, copper, iron, lead, manganese, mercury, nickel, total chromium & zinc	Selective absorption/atomic absorption spectro-photometer.
9	Ammonical nitrogen, arsenic, colour, dissolved phosphate, fluoride, hexavalent chromium, nitrate nitrogen phenolics, selenium, sulphate, sulphide, total residual chlorine, total Kjeldahl nitrogen & boron.	Photometric/DR 2000

3.2 Results

The results of analyses of water samples (Drinking water & effluent) are given in Tables attached.. Water level measurement is given in Table- .

3.3 Discussions

(a) Drinking water sample

The examination of analytical results of drinking water sample reveals the following :

- All physico-chemical parameters are well within the limits of the Indian Drinking Water Standard in the drinking water sample.

CHAPTER-IV

NOISE ENVIRONMENT

4.1 Methodology and Instruments used for Noise Level Measurement

Noise is measured in a weighted sound level i.e. dB(A) using a noise level meter once in day time (6:00 AM-10:00 PM) and once in night time (10:00 PM to 6:00 AM) for one day in each quarter from each station.

4.3 Results

The fortnightly noise level measurements for different stations are given in Tables attached.

4.4 Discussions

The noise level monitoring data reveal the following:

- The noise level monitoring data of various stations are within the limits of the prescribed noise level standards barring a few aberrated values.

4.5 Control Measures

The following control measures are recommended to maintain the noise levels within the permissible limits of the prescribed standards:

- Creation of thick greenbelts around the mines, infrastructure sites and residential colony besides avenue plantation on both sides of the roads on the surface using high noise attenuating plant species.
- Sound proof cabin for the machines in the workshop likely to cause high noise level.
- Chute linings in CHP
- Personal protective devices to all persons working in high noise areas.
- Vibrating machinery are to be mounted on vibration absorbing pads.

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Talcher Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
06-Apr-12	Dera Colony	195	91	24	28	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
23-Apr-12	Dera Colony	184	66	20	24	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
07-May-12	Dera Colony	224	73	24	30	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
22-May-12	Dera Colony	286	108	30	36	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
07-Jun-12	Dera Colony	236	92	28	34	Transportation & CHP	Varying from 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Jun-12	Dera Colony	180	67	20	23	Transportation & CHP	Varying from 200m to 500m	East to west & cloudy rain fall
07-Jul-12	Dera Colony	182	68	28	32	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
23-Jul-12	Dera Colony	104	52	19	23	Transportation & CHP	Varying from 200m to 500m	East to west, cloudy and rainfall
07-Aug-12	Dera Colony	98	62	17	24	Transportation & CHP	Varying from 200m to 500m	East to west, cloudy and rainfall
22-Aug-12	Dera Colony	100	81	19	26	Transportation & CHP	Varying from 200m to 500m	East to west, cloudy and rainfall
06-Sep-12	Dera Colony	113	91	20	29	Transportation & CHP	Varying from 200m to 500m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Sep-12	Dera Colony	130	71	21	26	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
08-Oct-12	Dera Colony	94	55	20	23	Transportation & CHP	Varying from 200m to 500m	East to west cloudy and rainfall
22-Oct-12	Dera Colony	164	73	26	32	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
06-Nov-12	Dera Colony	158	85	25	31	Transportation & CHP	Varying from 200m to 500m	South to North & sunny
21-Nov-12	Dera Colony	135	81	24	26	Transportation & CHP	Varying from 200m to 500m	East to west & cloudy
05-Dec-12	Dera Colony	153	94	22	24	Transportation & CHP	Varying from 200m to 500m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

19-Dec-12	Dera Colony	149	92	20	23	Transportation & CHP	Varying from 200m to 500m	East to west & cloudy
04-Jan-13	Dera Colony	138	96	22	24	Transportation & CHP	Varying from 200m to 500m	South to north & sunny
19-Jan-13	Dera Colony	148	92	20	22	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
06-Feb-13	Dera Colony	153	98	21	23	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
20-Feb-13	Dera Colony	179	110	23	26	Transportation & CHP	Varying from 200m to 500m	East to west & sunny
06-Mar-13	Dera Colony	195	127	24	27	Transportation & CHP	Varying from 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Talcher

21-Mar-13	Dera Colony	211	119	23	25	Transportation & CHP	Varying from 200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Talcher Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance fromDGS</i>	<i>Remarks</i>
06-Apr-12	Manager's Office	241	125	28	34	Domestic,Transportation	200m to 500m	East to west & sunny
23-Apr-12	Manager's Office	267	123	24	33	Domestic,Transportation	200m to 500m	East to west & sunny
07-May-12	Manager's Office	266	92	24	34	Domestic,Transportation	200m to 500m	East to west & sunny
22-May-12	Manager's Office	312	122	34	40	Domestic,Transportation	200m to 500m	East to west & sunny
07-Jun-12	Manager's Office	290	118	30	36	Domestic,Transportation	200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Jun-12	Manager's Office	203	72	22	26	Domestic,Transportation	200m to 500m	East to west & cloudy rain fall
07-Jul-12	Manager's Office	212	128	32	36	Domestic,Transportation	200m to 500m	East to west & sunny
23-Jul-12	Manager's Office	167	70	22	27	Domestic,Transportation	200m to 500m	East to west, cloudy and rainfall
07-Aug-12	Manager's Office	112	76	28	32	Domestic,Transportation	200m to 500m	East to west, cloudy and rainfall
22-Aug-12	Manager's Office	106	79	23	30	Domestic,Transportation	200m to 500m	East to west, cloudy and rainfall
06-Sep-12	Manager's Office	101	73	22	31	Domestic,Transportation	200m to 500m	East to west, cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Sep-12	Manager's Office	159	82	24	30	Domestic,Transportation	200m to 500m	East to west & sunny
08-Oct-12	Manager's Office	107	63	23	27	Domestic,Transportation	200m to 500m	East to west cloudy and rainfall
22-Oct-12	Manager's Office	243	104	32	44	Domestic,Transportation	200m to 500m	East to west & sunny
06-Nov-12	Manager's Office	237	100	29	33	Domestic,Transportation	200m to 500m	South to North & sunny
21-Nov-12	Manager's Office	254	109	27	31	Domestic,Transportation	200m to 500m	East to west & cloudy
04-Dec-12	Manager's Office	221	112	25	28	Domestic,Transportation	200m to 500m	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

20-Dec-12	Manager's Office	206	109	23	26	Domestic,Transportation	200m to 500m	East to west & cloudy
04-Jan-13	Manager's Office	227	115	25	27	Domestic,Transportation	200m to 500m	South to north & sunny
19-Jan-13	Manager's Office	208	106	24	26	Domestic,Transportation	200m to 500m	East to west & sunny
06-Feb-13	Manager's Office	216	113	23	25	Domestic,Transportation	200m to 500m	East to west & sunny
20-Feb-13	Manager's Office	228	127	22	25	Domestic,Transportation	200m to 500m	East to west & sunny
06-Mar-13	Manager's Office	234	131	23	26	Domestic,Transportation	200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

21-Mar-13	Manager's Office	247	139	24	27	Domestic,Transport ation	200m to 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Nandira Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Natedi Village	124	63	19	23	Domestic, RLS	500 m	East to west & sunny
20-Apr-12	Natedi Village	154	73	21	25	Domestic, RLS	500 m	South to north & sunny
04-May-12	Natedi Village	172	84	24	28	Domestic, RLS	500 m	East to west & sunny
21-May-12	Natedi Village	185	91	28	33	Domestic, RLS	500 m	South to north & sunny
06-Jun-12	Natedi Village	166	72	22	26	Domestic, RLS	500 m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

21-Jun-12	Natedi Village	134	52	17	20	Domestic, RLS	500 m	South to noth & cloudy rain fall
06-Jul-12	Natedi Village	139	57	17	20	Domestic, RLS	500 m	East to west & sunny
21-Jul-12	Natedi Village	78	46	15	17	Domestic, RLS	500 m	South to North cloudy, and rainfall
06-Aug-12	Natedi Village	85	62	19	25	Domestic, RLS	500 m	South to North cloudy, and rainfall
21-Aug-12	Natedi Village	90	67	18	21	Domestic, RLS	500 m	South to North cloudy, and rainfall
05-Sep-12	Natedi Village	107	81	16	24	Domestic, RLS	500 m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

21-Sep-12	Natedi Village	98	55	14	17	Domestic, RLS	500 m	South to North & sunny
05-Oct-12	Natedi Village	84	51	15	18	Domestic, RLS	500 m	East to west cloudy and rainfall
20-Oct-12	Natedi Village	142	67	20	23	Domestic, RLS	500 m	East to west & sunny
05-Nov-12	Natedi Village	139	95	21	26	Domestic, RLS	500 m	East to west & sunny
20-Nov-12	Natedi Village	127	91	20	22	Domestic, RLS	500 m	East to west hot & sunny
12-Dec-12	Natedi Village	115	95	22	26	Domestic, RLS	500 m	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

27-Dec-12	Natedi Village	127	99	23	25	Domestic, RLS	500 m	South to North & cloudy
10-Jan-13	Natedi Village	137	101	21	24	Domestic, RLS	500 m	East to west & sunny
25-Jan-13	Natedi Village	149	95	22	25	Domestic, RLS	500 m	East to west & sunny
12-Feb-13	Natedi Village	156	104	23	25	Domestic, RLS	500 m	East to west & sunny
22-Feb-13	Natedi Village	176	109	24	26	Domestic, RLS	500 m	East to west & sunny
12-Mar-13	Natedi Village	189	113	25	27	Domestic, RLS	500 m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Talcher

27-Mar-13	Natedi Village	193	121	24	26	Domestic, RLS	500 m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Nandira Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
05-Apr-12	Project Office	285	114	26	36	Transport, CHP	About 500m	East to west & sunny
20-Apr-12	Project Office	302	135	34	40	Transport, CHP	About 500m	South to north & sunny
04-May-12	Project Office	330	140	36	48	Transport, CHP	About 500m	East to west & sunny
21-May-12	Project Office	376	135	36	44	Transport, CHP	About 500m	South to north & sunny
06-Jun-12	Project Office	326	125	34	40	Transport, CHP	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

21-Jun-12	Project Office	214	69	22	29	Transport, CHP	About 500m	South to north & cloudy rain fall
06-Jul-12	Project Office	241	84	32	38	Transport, CHP	About 500m	East to west & sunny
21-Jul-12	Project Office	169	72	24	29	Transport, CHP	About 500m	South to North cloudy, and rainfall
06-Aug-12	Project Office	153	74	21	32	Transport, CHP	About 500m	South to North cloudy, and rainfall
21-Aug-12	Project Office	136	86	20	31	Transport, CHP	About 500m	South to North cloudy, and rainfall
05-Sep-12	Project Office	125	93	18	27	Transport, CHP	About 500m	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

21-Sep-12	Project Office	187	91	26	32	Transport, CHP	About 500m	South to North & sunny
05-Oct-12	Project Office	176	71	30	35	Transport, CHP	About 500m	East to west cloudy and rainfall
20-Oct-12	Project Office	287	119	30	36	Transport, CHP	About 500m	East to west & sunny
05-Nov-12	Project Office	267	111	28	32	Transport, CHP	About 500m	East to west & sunny
20-Nov-12	Project Office	274	105	24	27	Transport, CHP	About 500m	East to west hot & sunny
12-Dec-12	Project Office	252	109	25	28	Transport, CHP	About 500m	South to North & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

27-Dec-12	Project Office	246	110	24	27	Transport, CHP	About 500m	South to North & cloudy
10-Jan-13	Project Office	234	107	22	25	Transport, CHP	About 500m	East to west & sunny
25-Jan-13	Project Office	216	103	23	26	Transport, CHP	About 500m	East to west & sunny
12-Feb-13	Project Office	234	116	24	26	Transport, CHP	About 500m	East to west & sunny
22-Feb-13	Project Office	218	124	25	27	Transport, CHP	About 500m	East to west & sunny
12-Mar-13	Project Office	237	142	26	28	Transport, CHP	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : Talcher

27-Mar-13	Project Office	246	135	26	28	Transport, CHP	About 500m	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Deulbera Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
06-Apr-12	Deulbera Colony	172	82	22	27	Domestic, Transportation	300m (apprx.)	East to west & sunny
23-Apr-12	Deulbera Colony	223	85	24	28	Domestic, Transportation	300m (apprx.)	East to west & sunny
07-May-12	Deulbera Colony	155	68	22	28	Domestic, Transportation	300m (apprx.)	East to west & sunny
22-May-12	Deulbera Colony	205	98	30	36	Domestic, Transportation	300m (apprx.)	East to west & sunny
07-Jun-12	Deulbera Colony	211	78	26	34	Domestic, Transportation	300m (apprx.)	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Jun-12	Deulbera Colony	149	61	20	24	Domestic, Transportation	300m (apprx.)	East to west & cloudy rain fall
07-Jul-12	Deulbera Colony	137	61	20	23	Domestic, Transportation	300m (apprx.)	West to east & sunny
23-Jul-12	Deulbera Colony	100	48	18	21	Domestic, Transportation	300m (apprx.)	East to west, cloudy and rainfall
07-Aug-12	Deulbera Colony	97	64	23	27	Domestic, Transportation	300m (apprx.)	East to west, cloudy and rainfall
22-Aug-12	Deulbera Colony	103	79	25	31	Domestic, Transportation	300m (apprx.)	South to North cloudy, and rainfall
06-Sep-12	Deulbera Colony	94	72	21	35	Domestic, Transportation	300m (apprx.)	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Sep-12	Deulbera Colony	105	66	22	28	Domestic, Transportation	300m (apprx.)	South to North & sunny
08-Oct-12	Deulbera Colony	116	54	18	21	Domestic, Transportation	300m (apprx.)	East to west cloudy and rainfall
25-Oct-12	Deulbera Colony	176	71	22	27	Domestic, Transportation	300m (apprx.)	West to east & sunny
06-Nov-12	Deulbera Colony	183	98	24	30	Domestic, Transportation	300m (apprx.)	South to North & sunny
21-Nov-12	Deulbera Colony	172	91	21	27	Domestic, Transportation	300m (apprx.)	East to west & cloudy
04-Dec-12	Deulbera Colony	157	98	22	26	Domestic, Transportation	300m (apprx.)	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

19-Dec-12	Deulbera Colony	145	119	24	28	Domestic, Transportation	300m (apprx.)	East to west & cloudy
03-Jan-13	Deulbera Colony	131	110	21	23	Domestic, Transportation	300m (apprx.)	South to north & sunny
18-Jan-13	Deulbera Colony	165	95	20	23	Domestic, Transportation	300m (apprx.)	East to west & sunny
05-Feb-13	Deulbera Colony	176	103	23	25	Domestic, Transportation	300m (apprx.)	South to north & sunny
19-Feb-13	Deulbera Colony	184	112	24	26	Domestic, Transportation	300m (apprx.)	South to north & sunny
05-Mar-13	Deulbera Colony	197	124	25	27	Domestic, Transportation	300m (apprx.)	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

20-Mar-13	Deulbera Colony	185	129	24	27	Domestic, Transportation	300m (apprx.)	South to north & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

Project : **Deulbera Colliery** (conc. in $\mu\text{g}/\text{cu.m.}$)

<i>Date of Sampling</i>	<i>Monitoring Station</i>	<i>SPM</i>	<i>RPM</i>	<i>SO₂</i>	<i>NO_x</i>	<i>Dust Generating Source(DGS)</i>	<i>Distance from DGS</i>	<i>Remarks</i>
06-Apr-12	Manager's Office	267	110	28	34	Domestic, Transportation	500m (Apprx.)	East to West & sunny
23-Apr-12	Manager's Office	319	128	32	37	Domestic, Transportation	500m (Apprx.)	East to West & sunny
07-May-12	Manager's Office	274	108	28	32	Domestic, Transportation	500m (Apprx.)	East to West & sunny
22-May-12	Manager's Office	322	126	32	40	Domestic, Transportation	500m (Apprx.)	East to West & sunny
07-Jun-12	Manager's Office	301	119	28	36	Domestic, Transportation	500m (Apprx.)	West to east & sunny

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

22-Jun-12	Manager's Office	234	73	22	27	Domestic, Transportation	500m (Apprx.)	East to west & cloudy rain fall
07-Jul-12	Manager's Office	250	82	22	26	Domestic, Transportation	500m (Apprx.)	West to east & sunny
23-Jul-12	Manager's Office	148	71	23	28	Domestic, Transportation	500m (Apprx.)	East to west, cloudy and rainfall
07-Aug-12	Manager's Office	134	85	20	32	Domestic, Transportation	500m (Apprx.)	East to west, cloudy and rainfall
22-Aug-12	Manager's Office	125	91	21	35	Domestic, Transportation	500m (Apprx.)	South to North cloudy, and rainfall
06-Sep-12	Manager's Office	117	97	23	30	Domestic, Transportation	500m (Apprx.)	East to west cloudy and rainfall

TABLE--
AMBIENT AIR QUALITY DATA

Area : Talcher

22-Sep-12	Manager's Office	190	96	27	34	Domestic, Transportation	500m (Apprx.)	South to North & sunny
08-Oct-12	Manager's Office	142	65	25	32	Domestic, Transportation	500m (Apprx.)	East to west cloudy and rainfall
25-Oct-12	Manager's Office	224	102	26	30	Domestic, Transportation	500m (Apprx.)	West to east & sunny
06-Nov-12	Manager's Office	219	104	25	31	Domestic, Transportation	500m (Apprx.)	South to North & sunny
21-Nov-12	Manager's Office	234	112	26	30	Domestic, Transportation	500m (Apprx.)	East to west & cloudy
04-Dec-12	Manager's Office	221	112	24	29	Domestic, Transportation	500m (Apprx.)	East to west & cloudy

TABLE--
AMBIENT AIR QUALITY DATA

Area : **Talcher**

19-Dec-12	Manager's Office	238	135	22	26	Domestic, Transportation	500m (Apprx.)	East to west & cloudy
03-Jan-13	Manager's Office	217	115	24	27	Domestic, Transportation	500m (Apprx.)	South to north & sunny
18-Jan-13	Manager's Office	235	124	25	28	Domestic, Transportation	500m (Apprx.)	East to west & sunny
05-Feb-13	Manager's Office	243	129	24	27	Domestic, Transportation	500m (Apprx.)	South to north & sunny
19-Feb-13	Manager's Office	257	138	25	28	Domestic, Transportation	500m (Apprx.)	South to north & sunny
05-Mar-13	Manager's Office	268	149	24	26	Domestic, Transportation	500m (Apprx.)	East to west & sunny

TABLE--
AMBIENT AIR QUALITY DATA

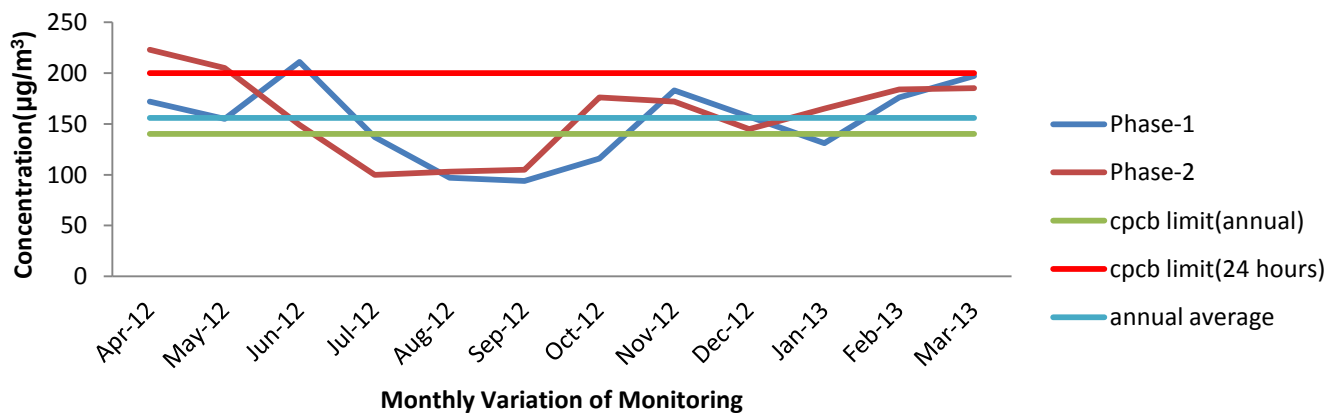
Area : **Talcher**

20-Mar-13	Manager's Office	275	152	26	29	Domestic, Transportation	500m (Apprx.)	South to north & sunny

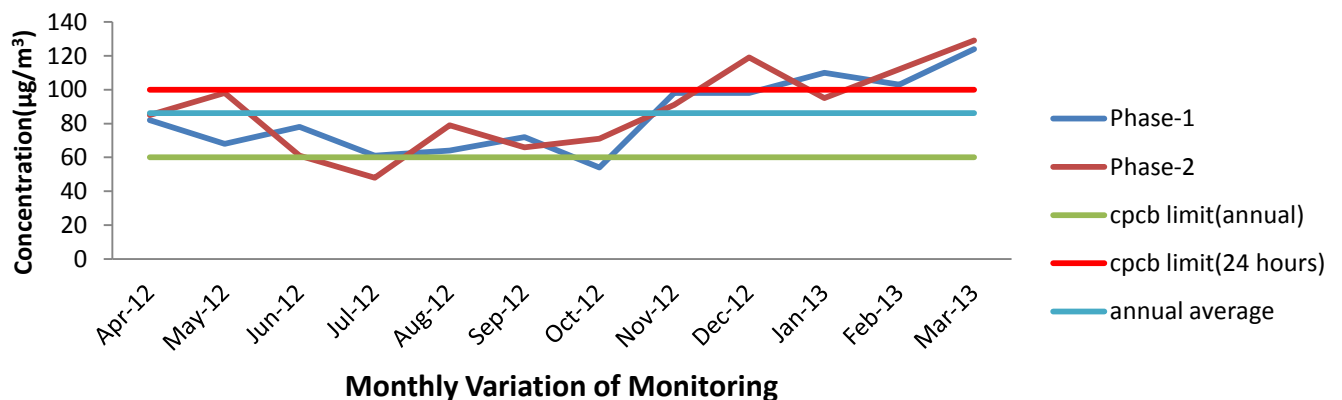


Air Quality Graph of Deulbera Colliery

Graph-1: SPM monitoring of Deulbera Colony of Deulbera Colliery



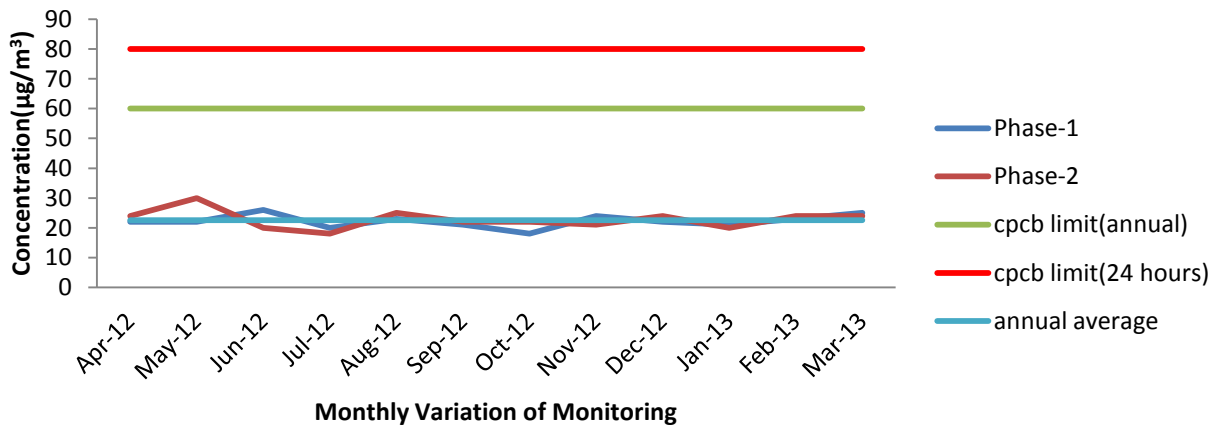
Graph-2: RPM monitoring of Deulbera Colony of Deulbera Colliery



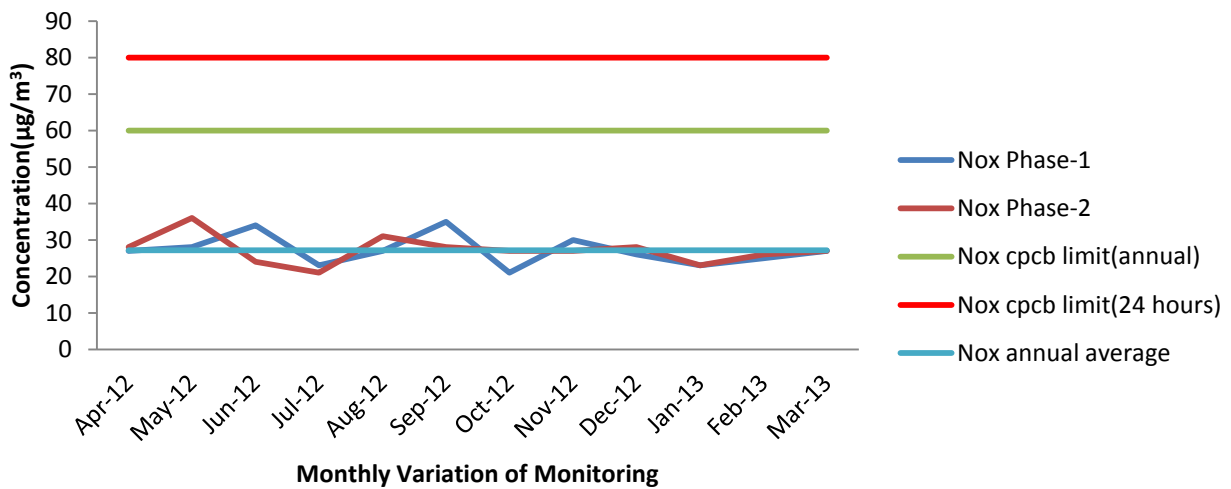


Air Quality Graph of Deulbera Colliery

Graph-3: SO_x monitoring of Deulbera Colony of Deulbera Colliery



Graph-4: NO_x monitoring of Deulbera Colony of Deulbera Colliery



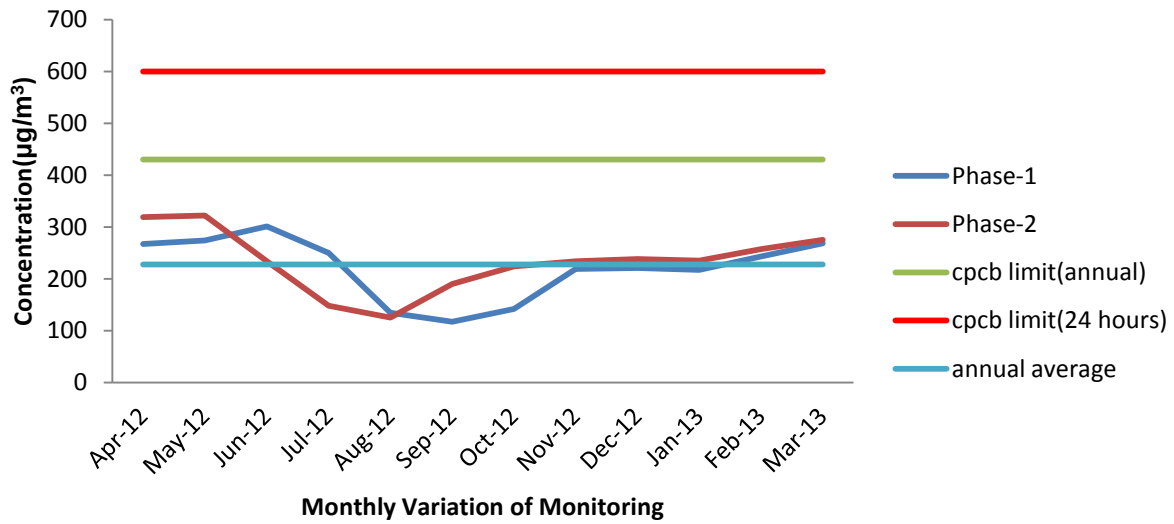
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

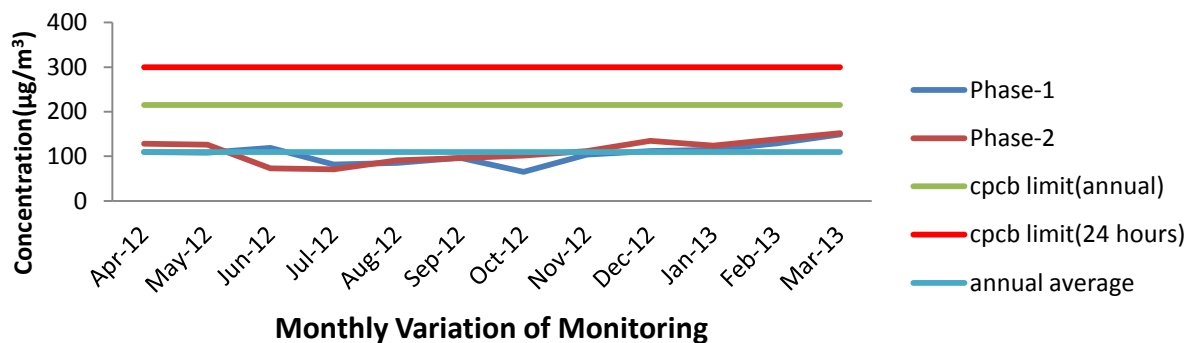


Air Quality Graph of Deulbera Colliery

Graph-5: SPM monitoring of Manager's Office of Deulbera Colliery.



Graph-6: RPM monitoring of Manager's Office of Deulbera Colliery.



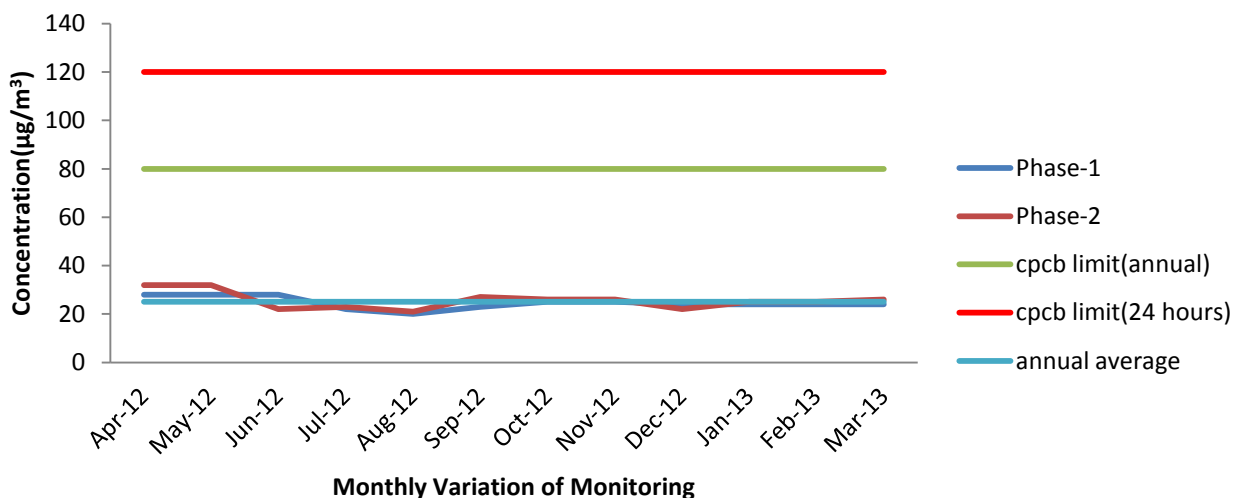
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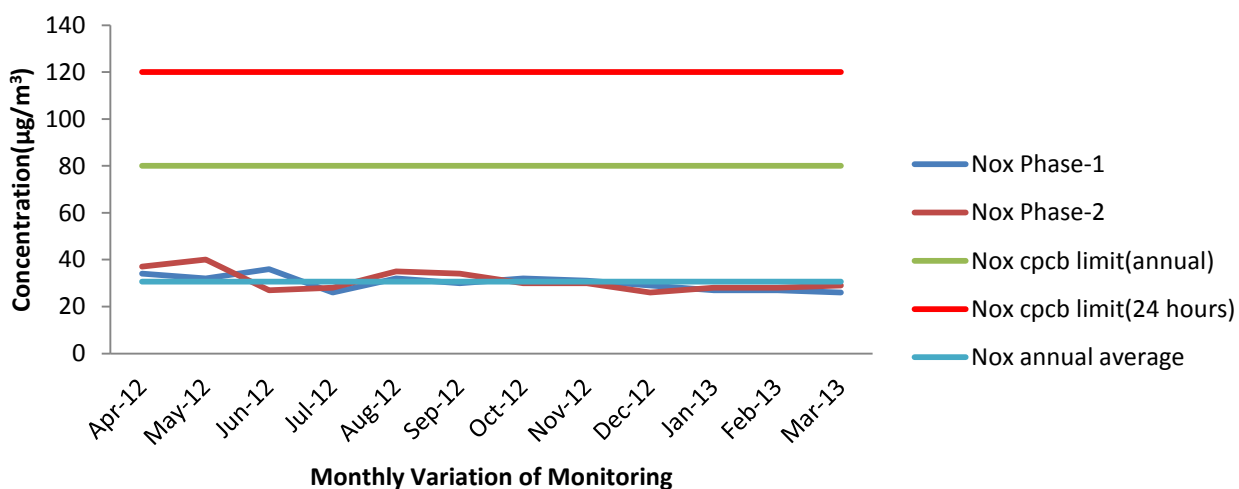


Air Quality Graph of Deulbera Colliery

Graph-7: SO_x monitoring of Manager's Office of Deulbera Colliery.



Graph-8: NO_x monitoring of Manager's Office of Deulbera Colliery.



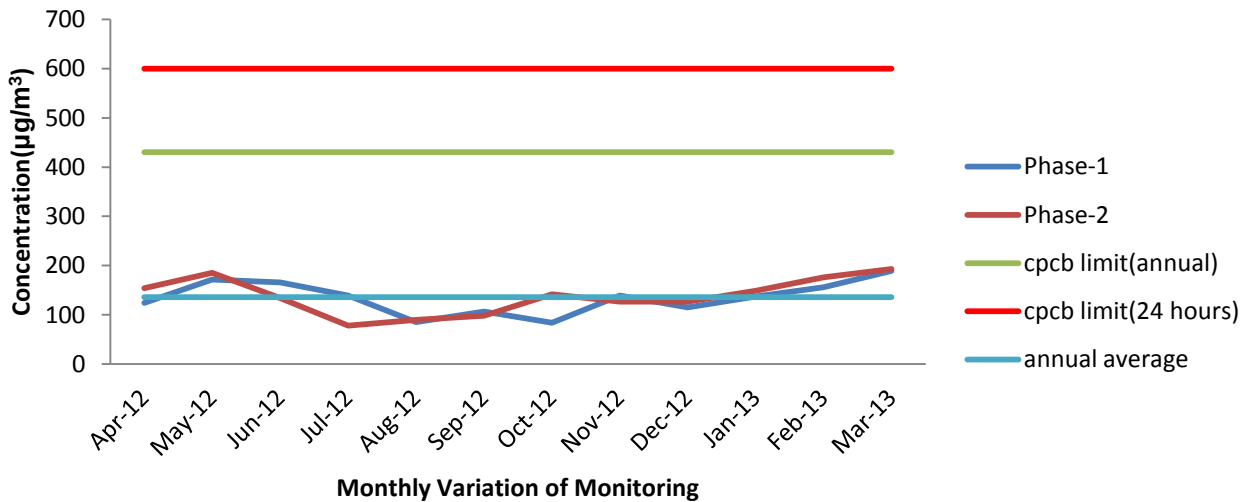
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Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

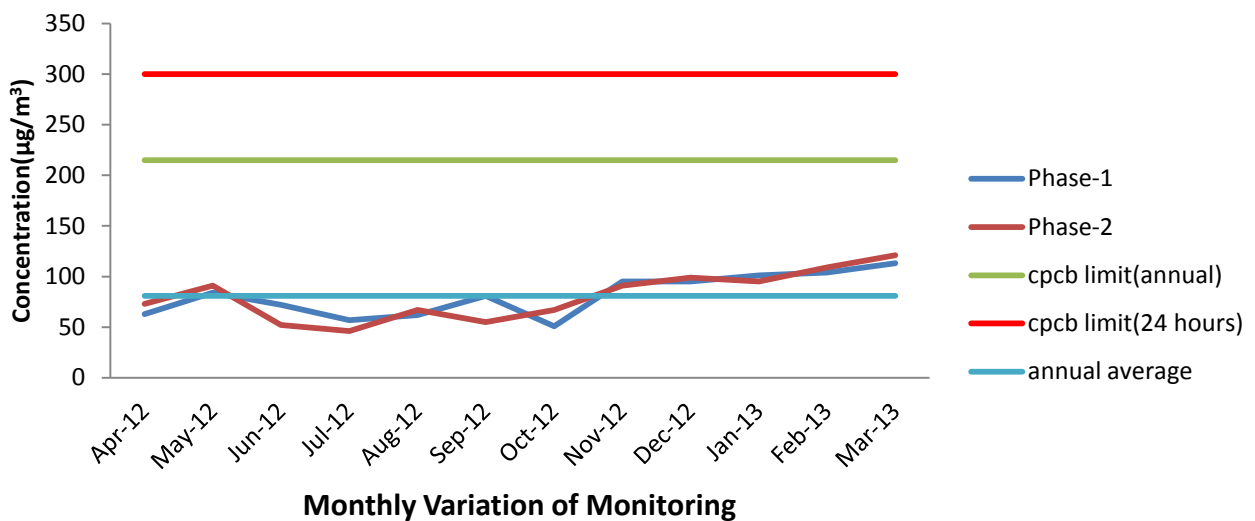


Air Quality Graph of Nandira Colliery

Graph-1: SPM monitoring of Project office of Nandira Colliery.



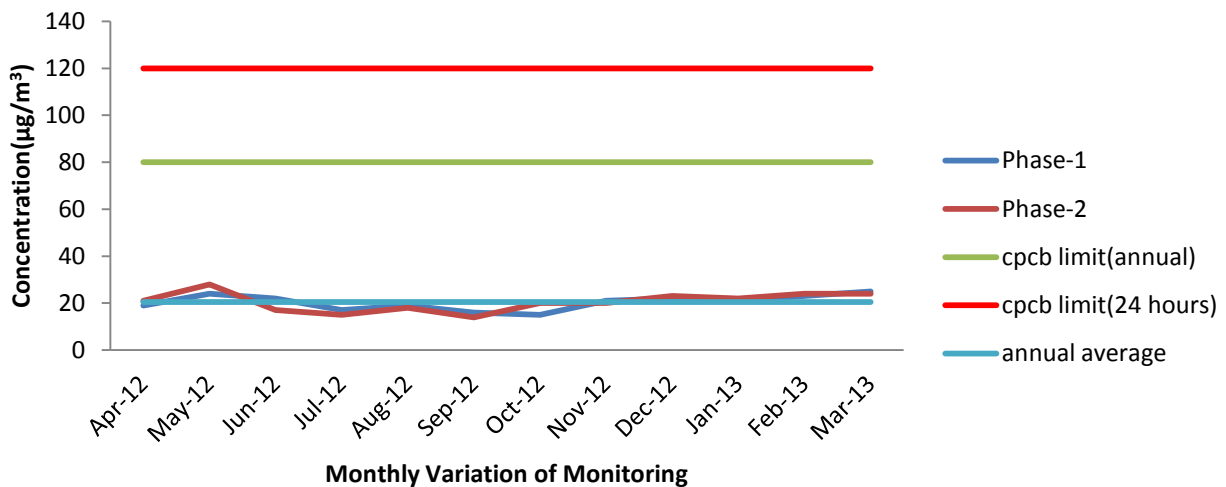
Graph-2: RPM monitoring of Project office of Nandira Colliery.



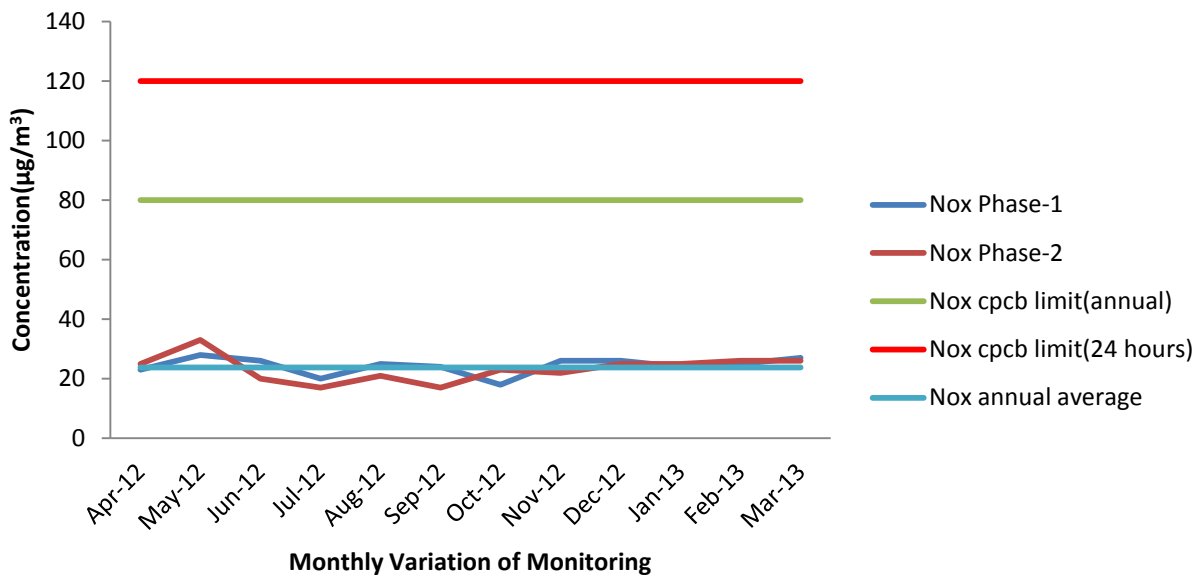


Air Quality Graph of Nandira Colliery

Graph-3: SO_x monitoring of Project office of Nandira Colliery.



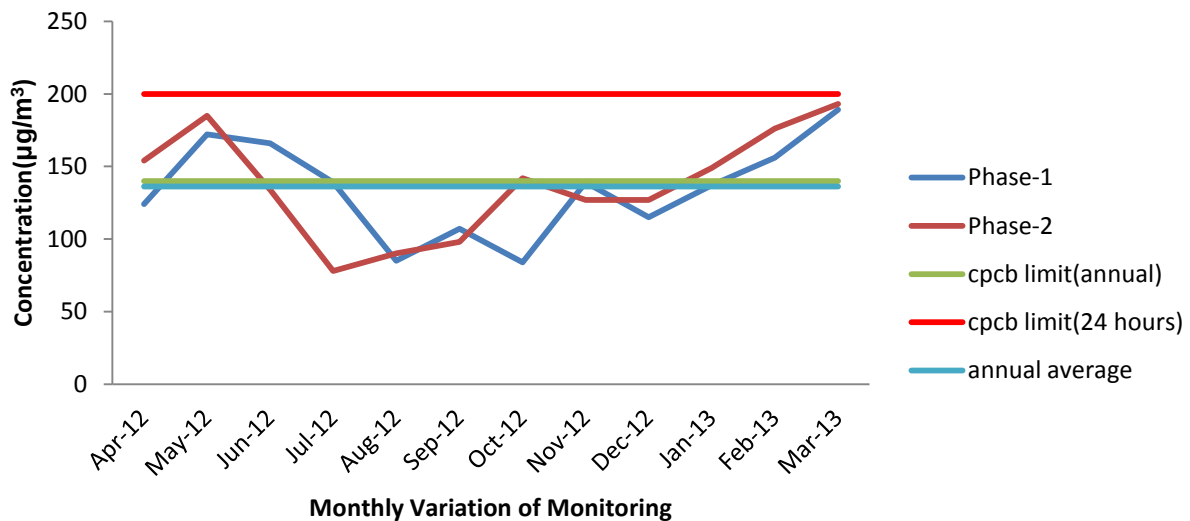
Graph-4: NO_x monitoring of Project office of Nandira Colliery.



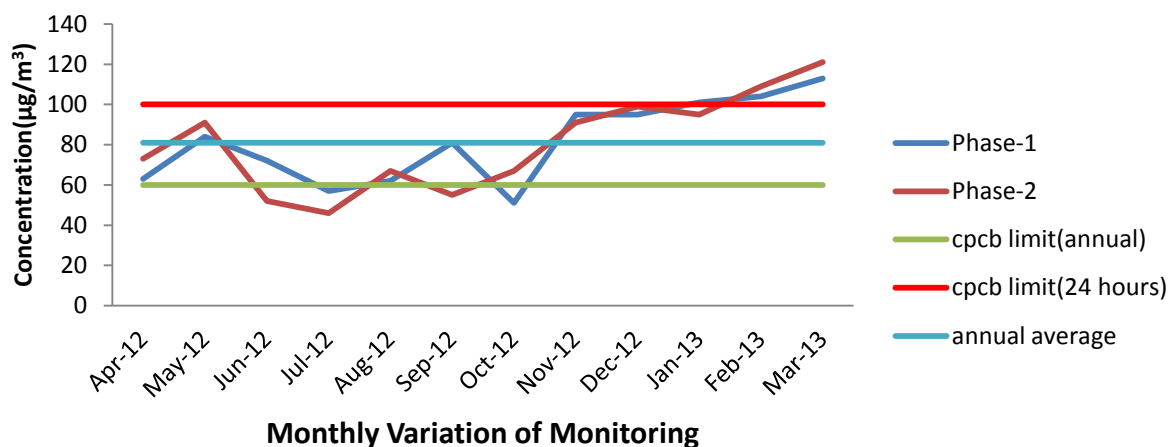


Air Quality Graph of Nandira Colliery

Graph-5: SPM monitoring of Natedi Village of Nandira Colliery.



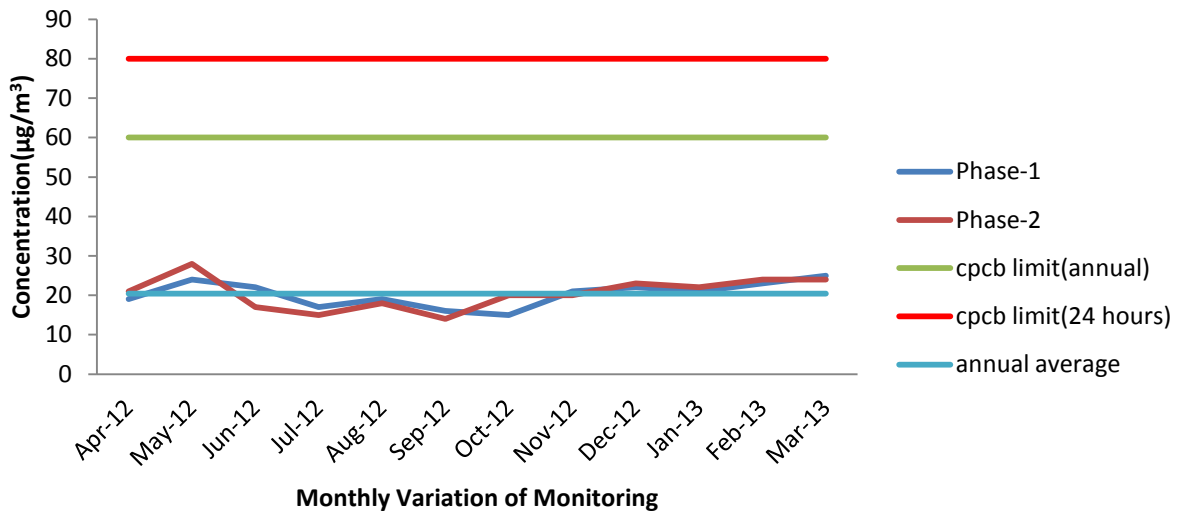
Graph-6: RPM monitoring of Natedi Village of Nandira Colliery.



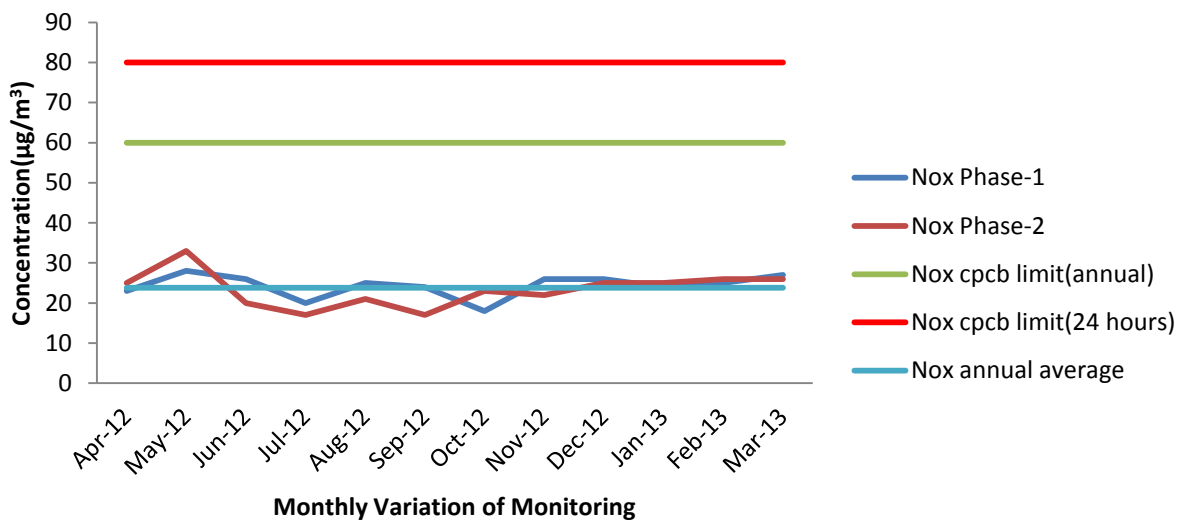


Air Quality Graph of Nandira Colliery

Graph-7: So_x monitoring of Natedi Village of Nandira Colliery.



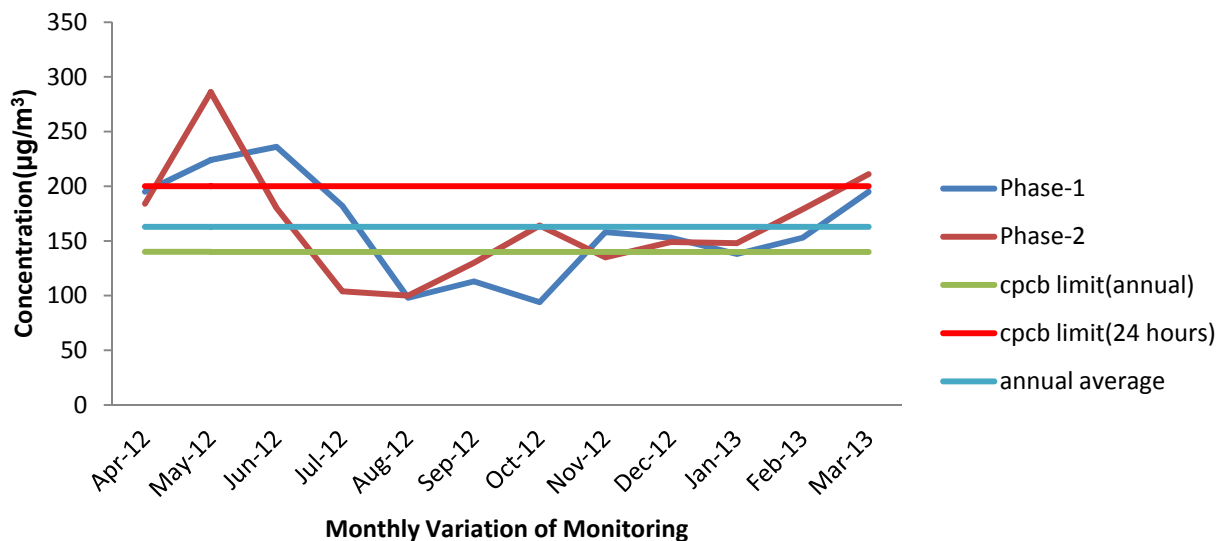
Graph-8: No_x monitoring of Natedi Village of Nandira Colliery.



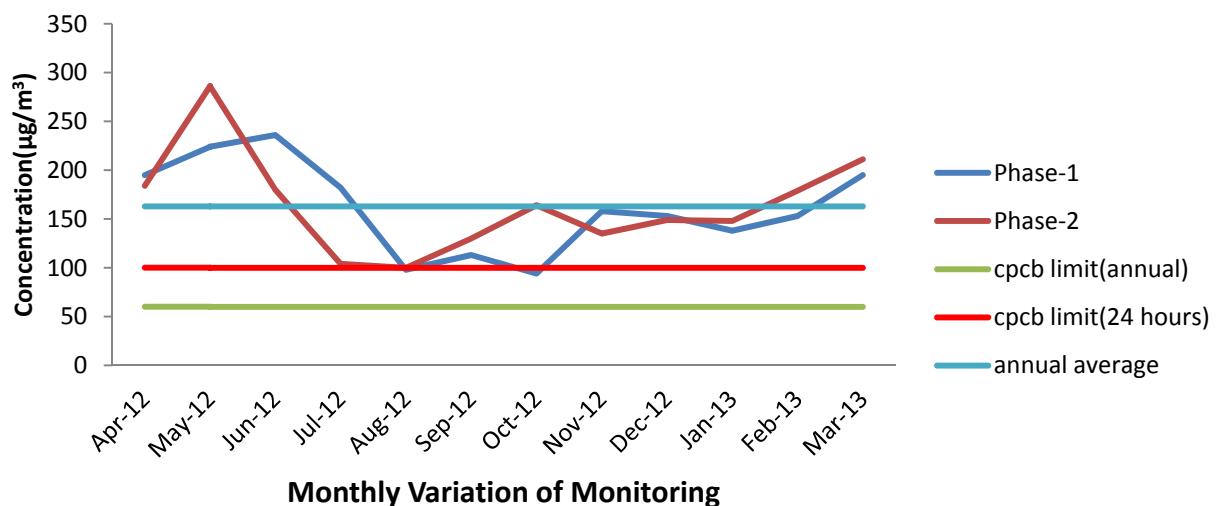


Air Quality Graph of Talcher Colliery

Graph-1: SPM monitoring of Dera Colony of Talcher Colliery.



Graph-2: RPM monitoring of Dera Colony of Talcher Colliery.



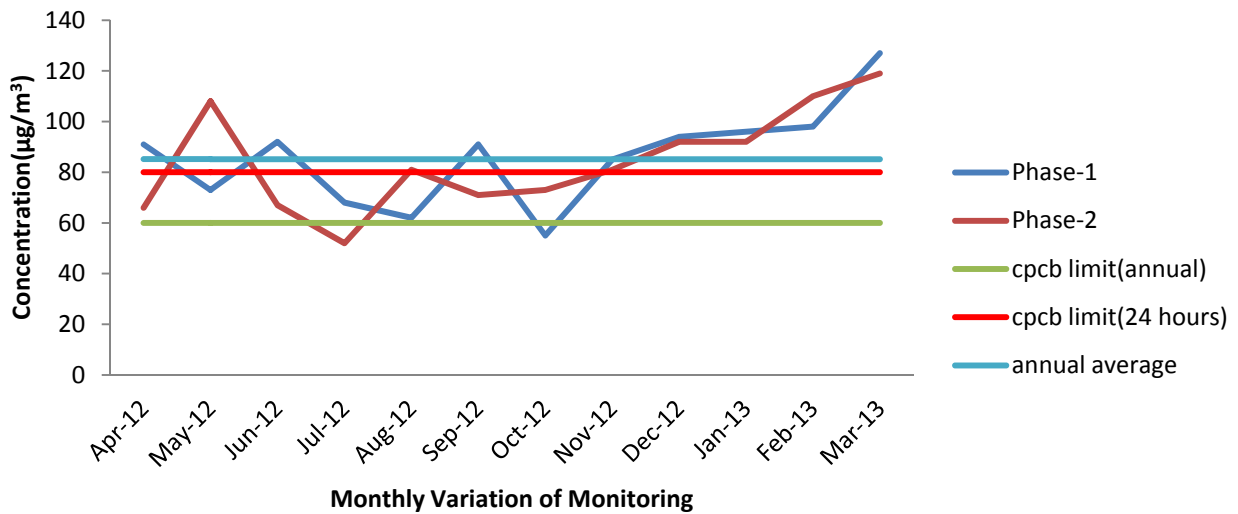
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

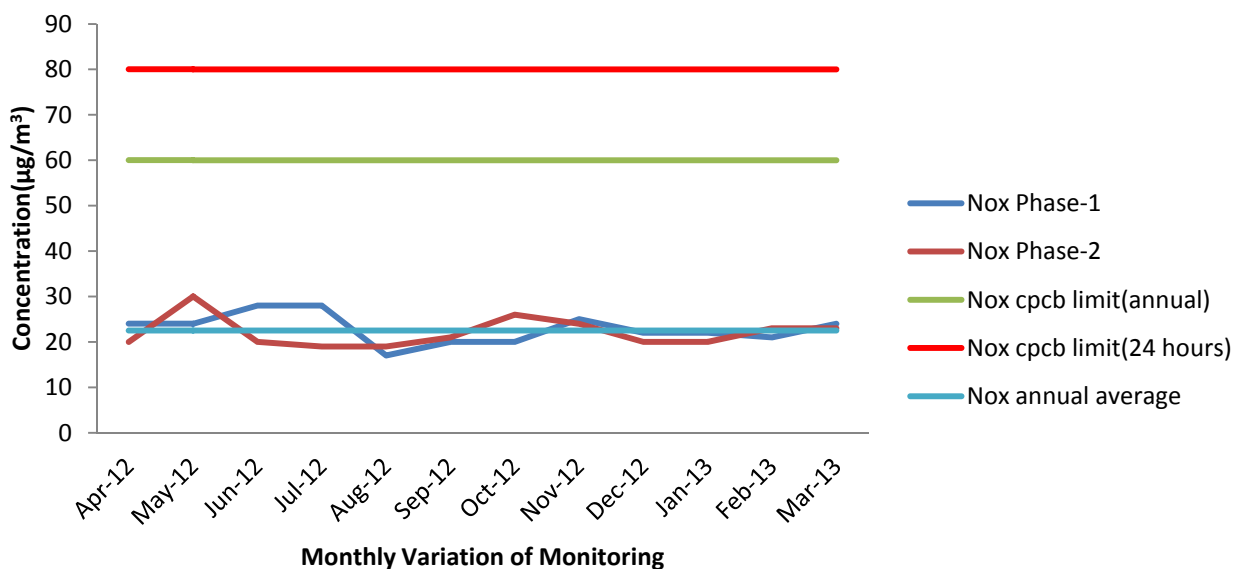


Air Quality Graph of Talcher Colliery

Graph-3: SO_x monitoring of Dera Colony of Talcher Colliery.



Graph-4: NO_x monitoring of Dera Colony of Talcher Colliery.



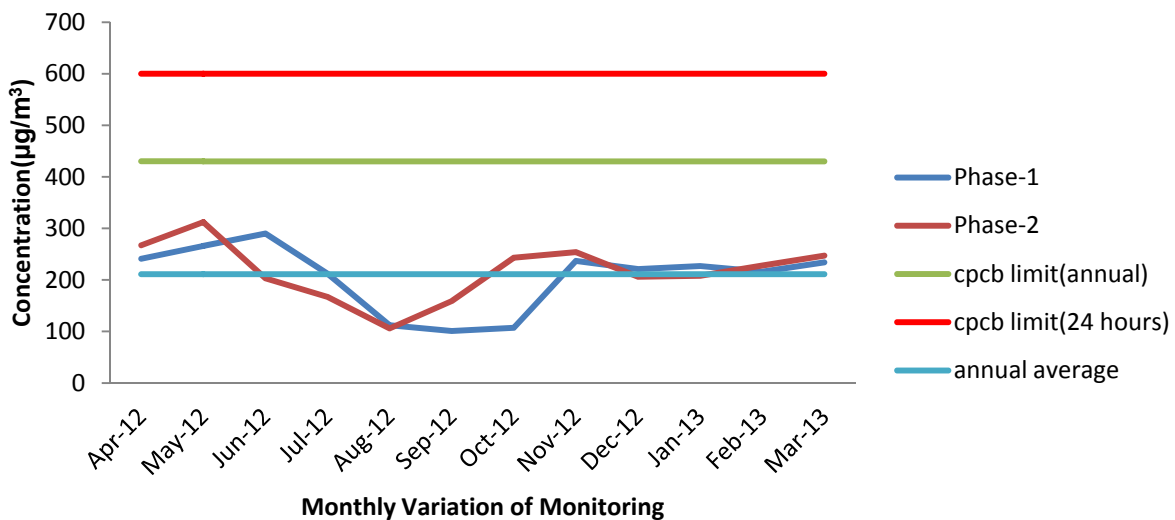
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

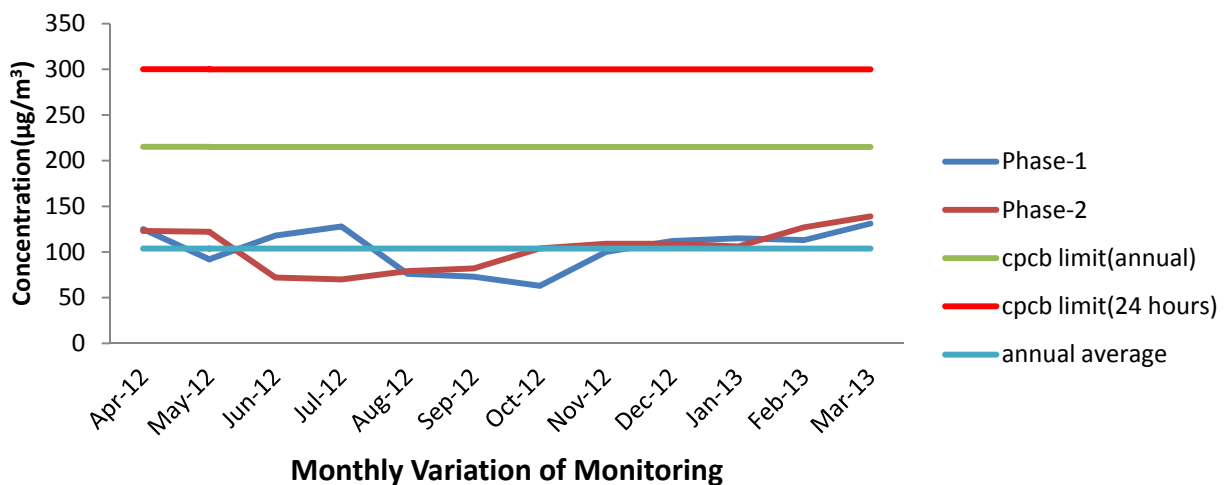


Air Quality Graph of Talcher Colliery

Graph-5: SPM monitoring of Manager's office of Talcher Colliery.



Graph-6: RPM monitoring of Manager's office of Talcher Colliery.



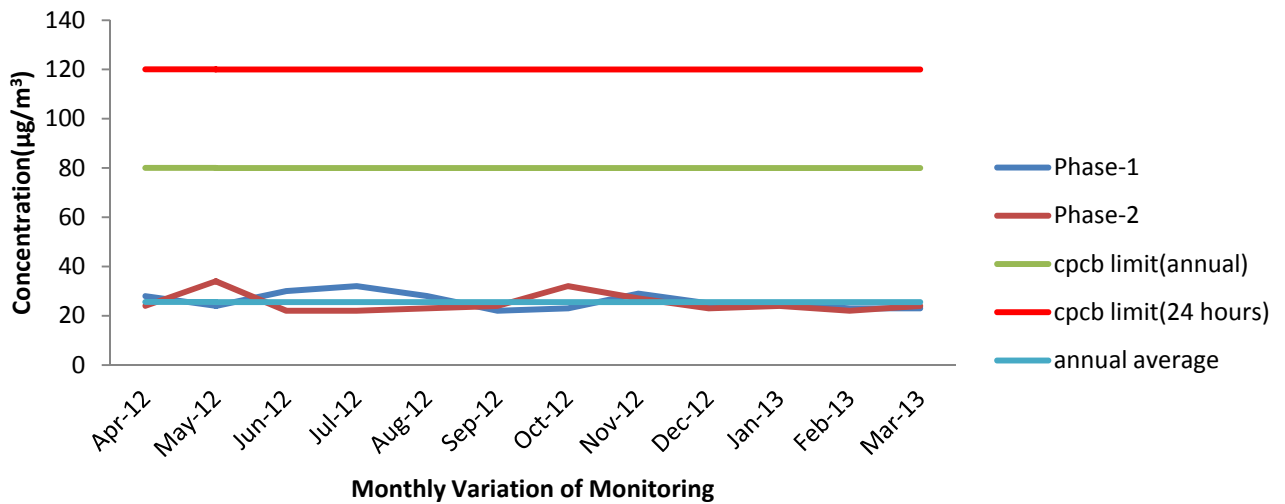
Job no: 750001

Report prepared at CMPDI, RI-VII, Bhubaneswar for MCL.

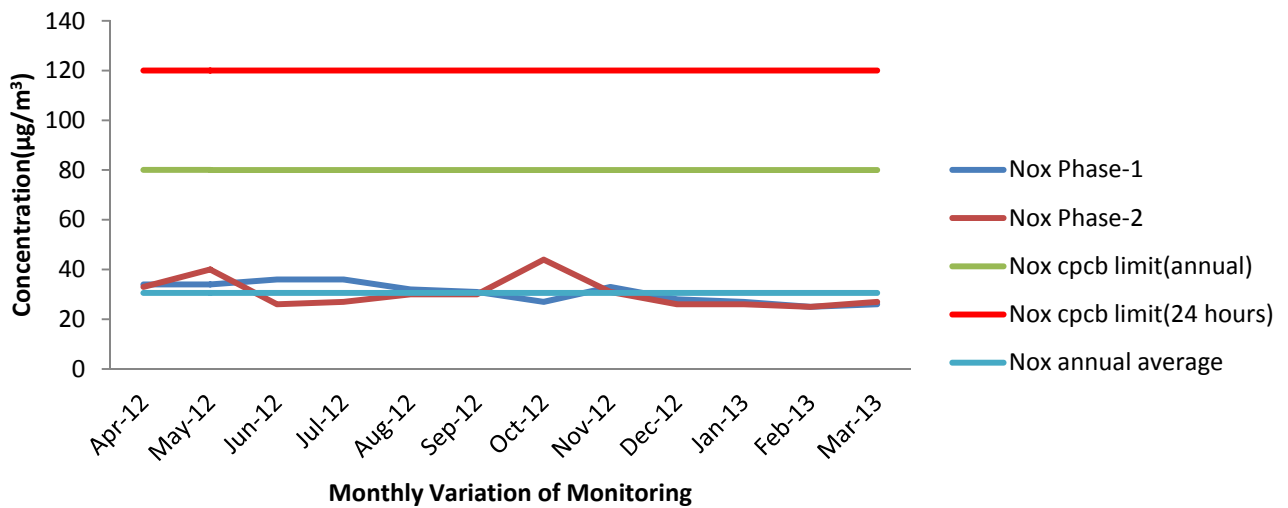


Air Quality Graph of Talcher Colliery

Graph-7: So_x monitoring of Manager's office of Talcher Colliery.



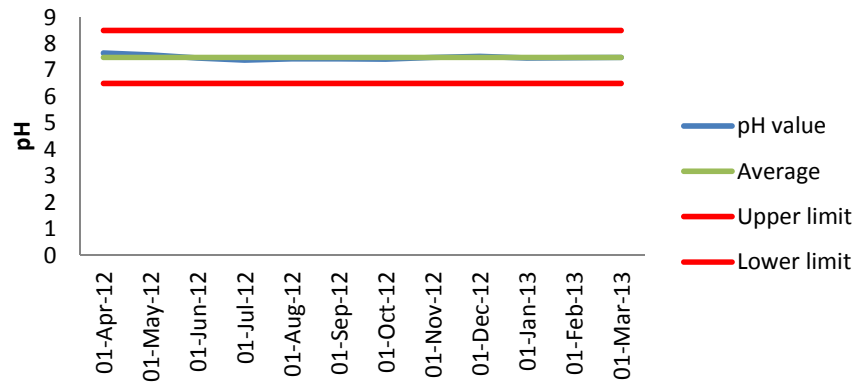
Graph-8: No_x monitoring of Manager's office of Talcher Colliery.



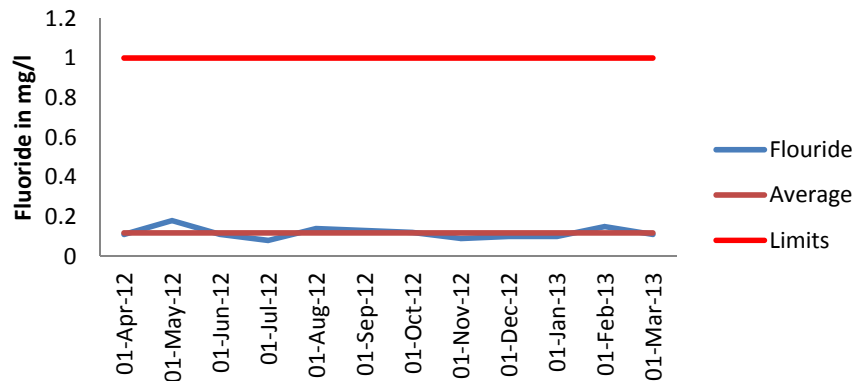
Drinking Water Data Area : Talcher Colliery Project: Talcher Colliery

[illegible]

variation in pH at Talcher town tap water at Talcher Colliery



variation in Flouride at Talcher town tap water at Talcher Colliery



variation in Total Hardness at Talcher town tap water at Talcher Colliery

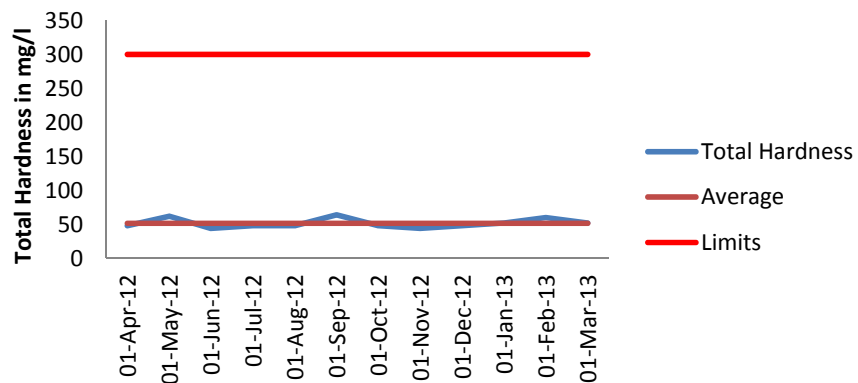


TABLE--
EFFLUENT QUALITY DATA

Area : **Talcher**

Project : **Deulbera Colliery**

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	Mine discharge water	8.85	<1.0	38	60		2.2
20-Apr-12	Mine discharge water	8.80	<1.0	34	50		2.1
05-May-12	Mine discharge water	8.75	<1.0	36	55		2.1
22-May-12	Mine discharge water	8.66	<1.0	32	50		2.0
04-Jun-12	Mine discharge water	8.55	<1.0	28	40		2.0
22-Jun-12	Mine discharge water	8.45	<1.0	24	35		1.8
06-Jul-12	Mine discharge water	8.45	<1.0	30	45		2.0
21-Jul-12	Mine discharge water	8.50	<1.0	32	50		1.9
10-Aug-12	Mine discharge water	8.35	<1.0	36	55		2.2
25-Aug-12	Mine discharge water	8.22	<1.0	34	50		2.1
10-Sep-12	Mine discharge water	8.25	<1.0	34	50		2.1

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

26-Sep-12	Mine discharge water	8.20	<1.0	38	55		2.2
08-Oct-12	Mine discharge water	8.25	<1.0	34	50		2.0
19-Oct-12	Mine discharge water	8.35	<1.0	40	60		2.3
05-Nov-12	Mine discharge water	8.42	<1.0	34	50		2.2
21-Nov-12	Mine discharge water	8.45	<1.0	36	55		2.2
12-Dec-12	Mine discharge water	8.40	<1.0	32	50		2.1
27-Dec-12	Mine discharge water	8.50	<1.0	36	55		2.2
06-Jan-13	Mine discharge water	8.30	<1.0	34	55		2.2
21-Jan-13	Mine discharge water	8.20	<1.0	38	60		2.3
06-Feb-13	Mine discharge water	8.25	<1.0	36	55		2.2
22-Feb-13	Mine discharge water	8.25	<1.0	30	45		2.1
09-Mar-13	Mine discharge water	8.15	<1.0	38	55		2.2

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

25-Mar-13	Mine discharge water	8.10	<1.0	36	50		2.1

Project : Nandira Colliery

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	Mine discharge water	8.20	<1.0	30	45	-	2.1
20-Apr-12	Mine discharge water	8.30	<1.0	32	50	-	2.0
07-May-12	Mine discharge water	8.22	<1.0	32	50	-	2.0
22-May-12	Mine discharge water	8.30	<1.0	30	45	-	2.1
05-Jun-12	Mine discharge water	8.24	<1.0	34	50	-	2.1
22-Jun-12	Mine discharge water	8.25	<1.0	30	45	-	1.9
07-Jul-12	Mine discharge water	8.35	<1.0	38	60	-	2.2
25-Jul-12	Mine discharge water	8.25	<1.0	36	55	-	2.0
10-Aug-12	Mine discharge water	8.15	<1.0	34	50	-	2.1
25-Aug-12	Mine discharge water	8.25	<1.0	36	55	-	2.2

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

10-Sep-12	Mine discharge water	8.40	<1.0	40	60	-	2.3
26-Sep-12	Mine discharge water	8.30	<1.0	36	50	-	2.0
05-Oct-12	Mine discharge water	8.20	<1.0	32	45	-	1.9
18-Oct-12	Mine discharge water	8.45	<1.0	32	45	-	1.9
05-Nov-12	Mine discharge water	8.35	<1.0	36	55	-	2.0
20-Nov-12	Mine discharge water	8.50	<1.0	34	50	-	2.1
12-Dec-12	Mine discharge water	8.55	<1.0	36	55	-	2.2
27-Dec-12	Mine discharge water	8.45	<1.0	40	60	-	2.3
11-Jan-13	Mine discharge water	8.40	<1.0	38	60	-	2.3
28-Jan-13	Mine discharge water	8.25	<1.0	36	55	-	2.2
12-Feb-13	Mine discharge water	8.15	<1.0	32	45	-	2.1
27-Feb-13	Mine discharge water	7.10	<1.0	24	40	-	2.0

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

09-Mar-13	Mine discharge water	8.00	<1.0	32	50	-	2.0
25-Mar-13	Mine discharge water	7.94	<1.0	38	55	-	2.2

Project : Talcher Colliery

(All dimensions are in mg/l unless otherwise stated except pH)

Date of Sampling	Sampling Station	pH	OG	TSS	COD	BOD	NO3N
05-Apr-12	Mine discharge water	8.35	<1.0	34	50	-	2.0
20-Apr-12	Mine discharge water	8.25	<1.0	30	45	-	1.9
07-May-12	Mine discharge water	8.28	<1.0	30	45	-	1.9
22-May-12	Mine discharge water	8.20	<1.0	28	40	-	2.0
04-Jun-12	Mine discharge water	8.15	<1.0	30	45	-	1.9
22-Jun-12	Mine discharge water	8.20	<1.0	34	50	-	2.0
07-Jul-12	Mine discharge water	8.22	<1.0	32	45	-	2.0
25-Jul-12	Mine discharge water	8.30	<1.0	34	50	-	2.1
10-Aug-12	Mine discharge water	8.10	<1.0	30	45	-	1.9

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

25-Aug-12	Mine discharge water	8.15	<1.0	32	50	-	2.0
10-Sep-12	Mine discharge water	8.38	<1.0	38	55	-	2.2
26-Sep-12	Mine discharge water	8.50	<1.0	40	60	-	2.3
08-Oct-12	Mine discharge water	8.40	<1.0	36	55	-	2.2
19-Oct-12	Mine discharge water	8.62	<1.0	36	55	-	2.2
06-Nov-12	Mine discharge water	8.55	<1.0	32	50	-	2.1
21-Nov-12	Mine discharge water	8.30	<1.0	32	50	-	2.0
05-Dec-12	Mine discharge water	8.35	<1.0	30	45	-	1.9
20-Dec-12	Mine discharge water	8.42	<1.0	34	50	-	2.0
06-Jan-13	Mine discharge water	8.25	<1.0	34	50	-	2.0
21-Jan-13	Mine discharge water	8.10	<1.0	32	45	-	1.9
06-Feb-13	Mine discharge water	8.00	<1.0	34	50	-	2.0

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

22-Feb-13	Mine discharge water	8.10	<1.0	32	50	-	1.9
09-Mar-13	Mine discharge water	7.90	<1.0	32	45	-	1.9
25-Mar-13	Mine discharge water	7.82	<1.0	34	50	-	2.0
21-Apr-12	Rani Park Submersible Pump	8.25	<1.0	28	40		2.0
07-May-12	Rani Park Submersible Pump	8.10	<1.0	24	35		2.0
22-May-12	Rani Park Submersible Pump	8.15	<1.0	20	30		1.9
06-Jun-12	Rani Park Submersible Pump	8.10	<1.0	22	35		1.8
22-Jun-12	Rani Park Submersible Pump	8.30	<1.0	26	40		1.9
09-Jul-12	Rani Park Submersible Pump	8.00	<1.0	20	30		1.9
25-Jul-12	Rani Park Submersible Pump	7.95	<1.0	22	35		2.0
10-Aug-12	Rani Park Submersible Pump	7.90	<1.0	24	35		1.8
25-Aug-12	Rani Park Submersible Pump	7.85	<1.0	26	40		1.9

TABLE--
EFFLUENT QUALITY DATA

Area : Talcher

10-Sep-12	Rani Park Submersible Pump	8.05	<1.0	26	40		2.0
26-Sep-12	Rani Park Submersible Pump	8.20	<1.0	30	45		2.1
08-Oct-12	Rani Park Submersible Pump	8.10	<1.0	32	50		2.0
19-Oct-12	Rani Park Submersible Pump	8.30	<1.0	26	40		2.0
06-Nov-12	Rani Park Submersible Pump	8.25	<1.0	24	35		1.9
21-Nov-12	Rani Park Submersible Pump	8.00	<1.0	30	45		1.9
05-Dec-12	Rani Park Submersible Pump	8.10	<1.0	28	40		2.0
20-Dec-12	Rani Park Submersible Pump	8.22	<1.0	30	45		2.1
06-Jan-13	Rani Park Submersible Pump	8.15	<1.0	30	45		2.1
21-Jan-13	Rani Park Submersible Pump	8.00	<1.0	28	40		2.0
06-Feb-13	Rani Park Submersible Pump	7.90	<1.0	30	45		2.1
22-Feb-13	Rani Park Submersible Pump	7.90	<1.0	34	50		-

TABLE--
EFFLUENT QUALITY DATA

Area : *Talcher*

09-Mar-13	Rani Park Submersible Pump	7.80	<1.0	28	40		2.1
25-Mar-13	Rani Park Submersible Pump	7.75	<1.0	30	45		2.2

Yearly Effluent Data

Area: Talcher

Area	<i>Talcher Colliery</i>	<i>Talcher Colliery</i>
Project	<i>Deulbera Colliery</i>	<i>Nandira Colliery</i>
Date of sampling	19-Oct-12	18-Oct-12
Name of the station	Deulbera Colliery Mine Discharge Water	Nandira Colliery Mine Discharge Water
Colour	Acceptable	Acceptable
Odour	Agreeable	Agreeable
Temperature, °C	13.3	13.4
Amonical Nitrogen	0.11	0.13
TKN	2.44	1.56
BOD	16	10
Arsenic	<0.01	<0.01
Lead	<0.05	<0.05
Hexavalent chromium	<0.01	<0.01
Total chromium	<0.1	<0.1
Copper	<0.02	<0.02
Zinc	0.32	0.36
Selenium	<0.01	<0.01
Nickel	<0.1	<0.1
Fluoride	0.66	0.36
Dissolved phosphate	0.28	0.20
Sulphide	0.005	0.004
Phenolics	<0.001	<0.001
Manganese	<0.05	<0.05
Iron	0.13	0.15
Nitrate Nitrogen	2.3	1.9

Yearly Effluent Data

Area: Talcher

Area	<i>Talcher Colliery</i>	<i>Talcher Colliery</i>	<i>Talcher Colliery</i>
Project	<i>Talcher Colliery</i>	<i>Talcher Colliery</i>	<i>Talcher Colliery</i>
Date of sampling	19-Oct-12	19-Oct-12	19-Oct-12
Name of the station	Handidhua Colliery mine discharge	Rani Park Submersible Pump	Talcher Colliery Mine Discharge Water
Colour	Acceptable	Acceptable	Acceptable
Odour	Agreeable	Agreeable	Agreeable
Temperature, °C	13.6	13.6	13.5
Amonical Nitrogen	0.26	0.24	0.24
TKN	1.94	2.00	1.82
BOD	16	14	12
Arsenic	<0.01	<0.01	<0.01
Lead	<0.05	<0.05	<0.05
Hexavalent chromium	<0.01	<0.01	<0.01
Total chromium	<0.1	<0.1	<0.1
Copper	<0.02	<0.02	<0.02
Zinc	0.58	0.56	0.56
Selenium	<0.01	<0.01	<0.01
Nickel	<0.1	<0.1	<0.1
Fluoride	0.46	0.40	0.44
Dissolved phosphate	0.22	0.16	0.22
Sulphide	0.005	0.005	0.003
Phenolics	<0.001	<0.001	<0.001
Manganese	<0.05	<0.05	<0.05
Iron	0.16	0.22	0.22
Nitrate Nitrogen	-	2.0	2.2

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Talcher Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Dera Colony	53.6	44.3
27-Apr-12	Dera Colony	55.2	41.3
12-May-12	Dera Colony	51.5	44.6
29-May-12	Dera Colony	51.7	44.5
13-Jun-12	Dera Colony	52.6	47.5
28-Jun-12	Dera Colony	52.5	44.3
12-Jul-12	Dera Colony	52.6	46.2
28-Jul-12	Dera Colony	52.8	45.8
11-Aug-12	Dera Colony	49.5	43.2
27-Aug-12	Dera Colony	52.6	45.2
13-Sep-12	Dera Colony	54.6	44.2
27-Sep-12	Dera Colony	53.0	43.6
12-Oct-12	Dera Colony	52.6	47.6
29-Oct-12	Dera Colony	54.2	42.5
12-Nov-12	Dera Colony	52.7	46.8
28-Nov-12	Dera Colony	52.8	47.4
13-Dec-12	Dera Colony	51.6	46.5
28-Dec-12	Dera Colony	53.2	47.7
12-Jan-13	Dera Colony	52.6	45.9
29-Jan-13	Dera Colony	50.3	40.2
13-Feb-13	Dera Colony	53.6	46.7

26-Feb-13	Dera Colony	50.3	45.4
13-Mar-13	Dera Colony	51.8	41.4
27-Mar-13	Dera Colony	54.4	46.2

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Talcher Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Manager's Office	62.3	56.9
27-Apr-12	Manager's Office	61.4	50.4
12-May-12	Manager's Office	59.2	53.5
29-May-12	Manager's Office	59.8	51.2
13-Jun-12	Manager's Office	59.1	55.6
28-Jun-12	Manager's Office	62.3	51.6
12-Jul-12	Manager's Office	60.1	55.5
28-Jul-12	Manager's Office	60.1	55.6
11-Aug-12	Manager's Office	61.2	50.3
27-Aug-12	Manager's Office	59.9	54.6
13-Sep-12	Manager's Office	49.8	46.3
27-Sep-12	Manager's Office	59.4	53.6
12-Oct-12	Manager's Office	61.2	57.5
29-Oct-12	Manager's Office	50.6	47.5
12-Nov-12	Manager's Office	60.5	57.4
28-Nov-12	Manager's Office	60.2	54.6
13-Dec-12	Manager's Office	61.7	55.2
28-Dec-12	Manager's Office	62.6	58.3
12-Jan-13	Manager's Office	60.4	56.7
29-Jan-13	Manager's Office	58.6	49.9
13-Feb-13	Manager's Office	60.5	57.4

26-Feb-13	Manager's Office	60.1	56.3
13-Mar-13	Manager's Office	60.4	52.6
27-Mar-13	Manager's Office	60.3	55.9

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Nandira Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Natedi Village	49.3	41.4
27-Apr-12	Natedi Village	51.1	40.3
12-May-12	Natedi Village	51.2	43.6
29-May-12	Natedi Village	56.1	46.3
13-Jun-12	Natedi Village	52.1	45.6
28-Jun-12	Natedi Village	50.6	41.4
12-Jul-12	Natedi Village	51.6	43.4
28-Jul-12	Natedi Village	52.1	44.8
11-Aug-12	Natedi Village	50.2	41.6
27-Aug-12	Natedi Village	51.6	42.4
13-Sep-12	Natedi Village	52.4	40.9
27-Sep-12	Natedi Village	53.1	44.7
12-Oct-12	Natedi Village	50.2	43.5
29-Oct-12	Natedi Village	51.2	44.3
12-Nov-12	Natedi Village	51.4	44.6
28-Nov-12	Natedi Village	52.1	44.5
13-Dec-12	Natedi Village	51.3	43.2
28-Dec-12	Natedi Village	52.8	45.7
12-Jan-13	Natedi Village	51.2	41.5
29-Jan-13	Natedi Village	50.1	42.5
13-Feb-13	Natedi Village	51.4	44.2

26-Feb-13	Natedi Village	50.1	41.2
13-Mar-13	Natedi Village	53.6	41.7
27-Mar-13	Natedi Village	50.4	42.7

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Nandira Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Project Office	61.5	56.7
27-Apr-12	Project Office	56.3	52.1
12-May-12	Project Office	60.1	55.7
29-May-12	Project Office	57.3	52.7
13-Jun-12	Project Office	59.6	56.9
28-Jun-12	Project Office	57.6	51.7
12-Jul-12	Project Office	59.9	50.0
28-Jul-12	Project Office	60.6	52.8
11-Aug-12	Project Office	59.5	51.2
27-Aug-12	Project Office	60.8	55.6
13-Sep-12	Project Office	54.1	50.6
27-Sep-12	Project Office	60.3	54.9
12-Oct-12	Project Office	61.5	54.2
29-Oct-12	Project Office	53.8	45.4
12-Nov-12	Project Office	60.8	54.5
28-Nov-12	Project Office	60.8	55.3
13-Dec-12	Project Office	60.7	54.9
28-Dec-12	Project Office	60.9	58.6
12-Jan-13	Project Office	60.1	56.3
29-Jan-13	Project Office	60.2	52.1
13-Feb-13	Project Office	61.4	56.5

26-Feb-13	Project Office	61.6	58.3
13-Mar-13	Project Office	57.7	50.4
27-Mar-13	Project Office	61.5	57.6

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Deulbera Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Manager's Office	60.4	54.9.
27-Apr-12	Manager's Office	61.4	54.2
12-May-12	Manager's Office	56.4	52.4
29-May-12	Manager's Office	51.2	43.5
13-Jun-12	Manager's Office	58.5	50.7
28-Jun-12	Manager's Office	62.8	54.3
12-Jul-12	Manager's Office	60.1	54.3
28-Jul-12	Manager's Office	59.8	53.8
11-Aug-12	Manager's Office	59.5	51.2
27-Aug-12	Manager's Office	58.2	52.3
13-Sep-12	Manager's Office	56.6	49.7
27-Sep-12	Manager's Office	58.7	54.6
12-Oct-12	Manager's Office	61.5	57.2
29-Oct-12	Manager's Office	56.7	50.3
12-Nov-12	Manager's Office	60.2	57.7
28-Nov-12	Manager's Office	62.1	58.5
13-Dec-12	Manager's Office	60.2	54.5
28-Dec-12	Manager's Office	61.3	58.6
12-Jan-13	Manager's Office	58.6	53.5
29-Jan-13	Manager's Office	54.2	40.3
13-Feb-13	Manager's Office	60.1	55.4

26-Feb-13	Manager's Office	60.2	56.1
13-Mar-13	Manager's Office	60.8	52.9
27-Mar-13	Manager's Office	59.4	50.2

TABLE--
NOISE LEVEL MONITORING DATA

AREA : *Talcher*

PROJECT : *Deulbera Colliery*

DATE OF SAMPLING	STATION	Noise Level Measurement in dB(A)	
		DAY	NIGHT
12-Apr-12	Deulbera Colony	53.1	42.4
27-Apr-12	Deulbera Colony	52.1	48.4
12-May-12	Deulbera Colony	50.6	45.8
29-May-12	Deulbera Colony	52.6	44.3
13-Jun-12	Deulbera Colony	52.8	45.6
28-Jun-12	Deulbera Colony	53.2	46.4
12-Jul-12	Deulbera Colony	52.2	45.1
28-Jul-12	Deulbera Colony	52.4	45.8
11-Aug-12	Deulbera Colony	51.9	42.1
27-Aug-12	Deulbera Colony	52.1	45.2
13-Sep-12	Deulbera Colony	56.9	44.9
27-Sep-12	Deulbera Colony	53.4	47.5
12-Oct-12	Deulbera Colony	52.6	44.6
29-Oct-12	Deulbera Colony	54.2	45.9
12-Nov-12	Deulbera Colony	52.5	47.8
28-Nov-12	Deulbera Colony	52.2	47.6
13-Dec-12	Deulbera Colony	52.6	44.2
28-Dec-12	Deulbera Colony	52.4	45.1
12-Jan-13	Deulbera Colony	50.3	45.5
29-Jan-13	Deulbera Colony	50.1	45.2
13-Feb-13	Deulbera Colony	52.7	44.3

26-Feb-13	Deulbera Colony	51.4	43.4
13-Mar-13	Deulbera Colony	51.9	45.5
27-Mar-13	Deulbera Colony	54.6	43.0

TABLE--
WELL WATER LEVEL MONITORING DATA

Area : Talcher

<i>Date of sampling</i>	<i>Project</i>	<i>Name of the Station</i>	<i>Depth from GL (in m)</i>
12-Apr-12	Talcher Colliery	Deulbera colony well	3.81
12-Apr-12	Talcher Colliery	Natedi village well	4.98
13-Aug-12	Talcher Colliery	Deulbera colony well	2.26
13-Aug-12	Talcher Colliery	Natedi village well	3.56
13-Aug-12	Talcher Colliery	Naraharipur village well	3.23
14-Nov-12	Talcher Colliery	Deulbera colony well	3.49
14-Nov-12	Talcher Colliery	Natedi village well	5.25
14-Nov-12	Talcher Colliery	Naraharipur village well	5.85
12-Jan-13	Talcher Colliery	Deulbera colony well	2.92
12-Jan-13	Talcher Colliery	Natedi village well	4.09
12-Jan-13	Talcher Colliery	Naraharipur village well	5.03