DURGAMANWADI BAUXITE MINE

RADHANAGARI TALUKA,
KOLHAPUR DISTRICT
MAHARASHTRA

M/S HINDALCO INDUSTRIES LIMITED

ENVIRONMENTAL QUALITY MONITORING REPORT

WINTER 2017-18

IND.BH.41.16.0142/HSR

Bhagavathi Ana Labs Pvt. Ltd.,

7-2-C-14, Industrial Estate,
Sanathnagar, Hyderabad
500 018

CONTENTS

TITLE	PAGE NO.
PREFACE	I
EXECUTIVE SUMMARY	II
MICRO-METEOROLOGY	1- 4
ENVIRONMENTAL QUALITY	5- 23
Ambient Air Quality	5 - 8
Ambient Noise Quality	9 -12
Water Quality	13 - 23
ANNEXURE	--
Ambient Air Quality	

PREFACE

M/S Hindalco Industries Limited entrusted environmental quality monitoring at **Durgmanwadi Bauxite Mine** situated Radhanagari Taluka, Kolhapur district, Maharashtra to **Bhagavathi Ana Labs Pvt. Limited,** during winter season of the year 2017-18.

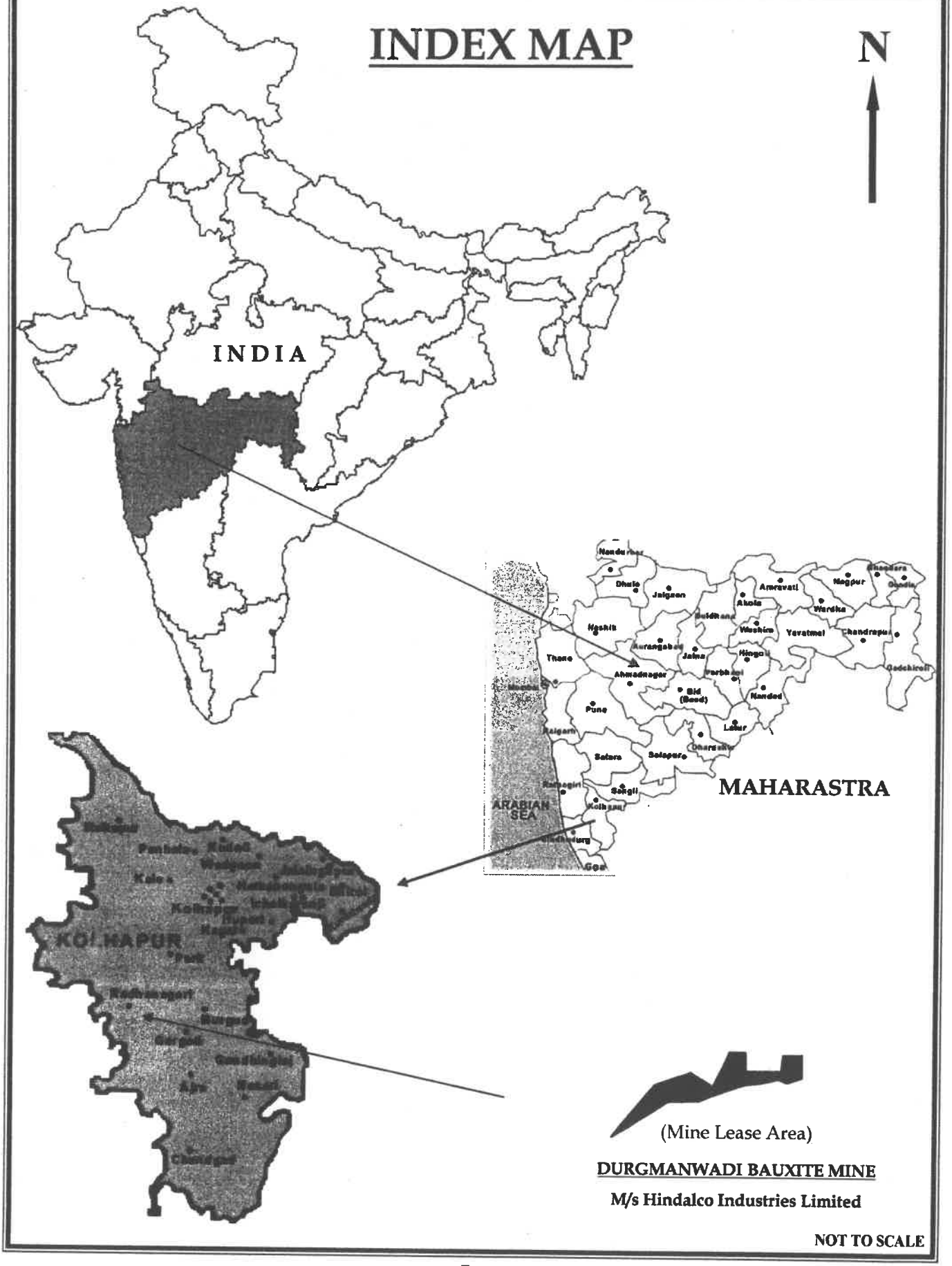
The environmental monitoring was carried out in core zone and buffer zone during the months of December, January & February 2017-18 for the following environmental parameters.

- → Micro-meteorology
- → Ambient air quality
- → Ambient noise level quality
- → Water quality

The data obtained was compiled to assess the current environmental status of the mining as well as the surrounding villages in the study area.

Bhagavathi Ana Labs Pvt. Limited, gratefully acknowledges the cooperation extended by management and staff of M/S Hindalco Industries Limited and the village people to the field staff.

INDEX MAP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INDIA
MAHARASTRA
ARABIAN SEA
KOLHAPUR
Goa
(Mine Lease Area)
DURGMANWADI BAUXITE MINE
M/s Hindalco Industries Limited
NOT TO SCALE

EXECUTIVE SUMMARY

Durgamanwadi Bauxite Mine environmental quality monitoring includes the monitoring of ambient air quality, noise level quality, water quality, & micro-meteorology in core zone and buffer zone around the mine lease area.

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust sampler has been used for monitoring the existing AAQ status. Maximum, minimum, average and percentile values have been computed from the data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels will cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level recorder.

WATER QUALITY MONITORING

Water quality monitoring consists of the study of surface and ground water sources and its quality in the core and buffer zone of the lease area. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Water samples were collected from selected locations during study period and analyzed in the laboratory as per the standard IS&APHA procedures.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area. Meteorological scenario exerts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions

MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

→ Wind Velocity

→ Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

→ Ambient Temperature

MICRO-METEOROLOGICAL DATA

DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
05-12-2017	24	28	26.0	0	21	10.5	SE
07-12-2017	21	30	25.5	0	19	9.5	NNW
12-12-2017	19	30	24.5	0	10	5.0	NW
14-12-2017	18	30	24.0	0	13	6.5	ESE
19-12-2017	18	34	26.0	0	4	2.0	N
21-12-2017	19	34	26.5	0	10	5.0	ESE
26-12-2017	18	34	26.0	0	4	2.0	E
28-12-2017	17	33	25.0	0	6	3.0	ESE

MICRO-METEOROLOGICAL DATA

DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
03-01-2018	16	30	23.0	0	11	5.5	NW
05-01-2018	19	32	25.5	0	5	2.5	N
10-01-2018	19	33	26.0	0	6	3.0	NW
12-01-2018	22	33	27.5	0	9	4.5	E
16-01-2018	21	35	28.0	0	7	3.5	WNW
18-01-2018	20	35	27.5	0	7	3.5	N
23-01-2018	21	31	26.0	0	6	3.0	N
25-01-2018	17	31	24.0	0	6	3.0	NW

MICRO-METEOROLOGICAL DATA

DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
01-02-2018	17	34	25.5	0	9	4.5	NE
05-02-2018	19	35	27.0	0	7	3.5	NNW
08-02-2018	18	32	25.0	0	7	3.5	NW
12-02-2018	18	31	24.5	0	9	4.5	NW
15-02-2018	23	35	29.0	0	11	5.5	NNE
19-02-2018	20	33	26.5	0	6	3.0	SE
22-02-2018	20	32	26.0	0	6	3.0	SSE
26-02-2018	19	37	28.0	0	9	4.5	ESE

ENVIRONMENTAL QUALITY

Environmental monitoring includes air, noise, water quality status within core zone and buffer zone around the Durgmanwadi Bauxite Mines Lease area at Radhanagari Taluka, Kolhapur district, Maharashtra.

AMBIENT AIR QUALITY

The ambient air quality monitoring was to assess the existing levels of the air pollution as well as the regional background concentration in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities.

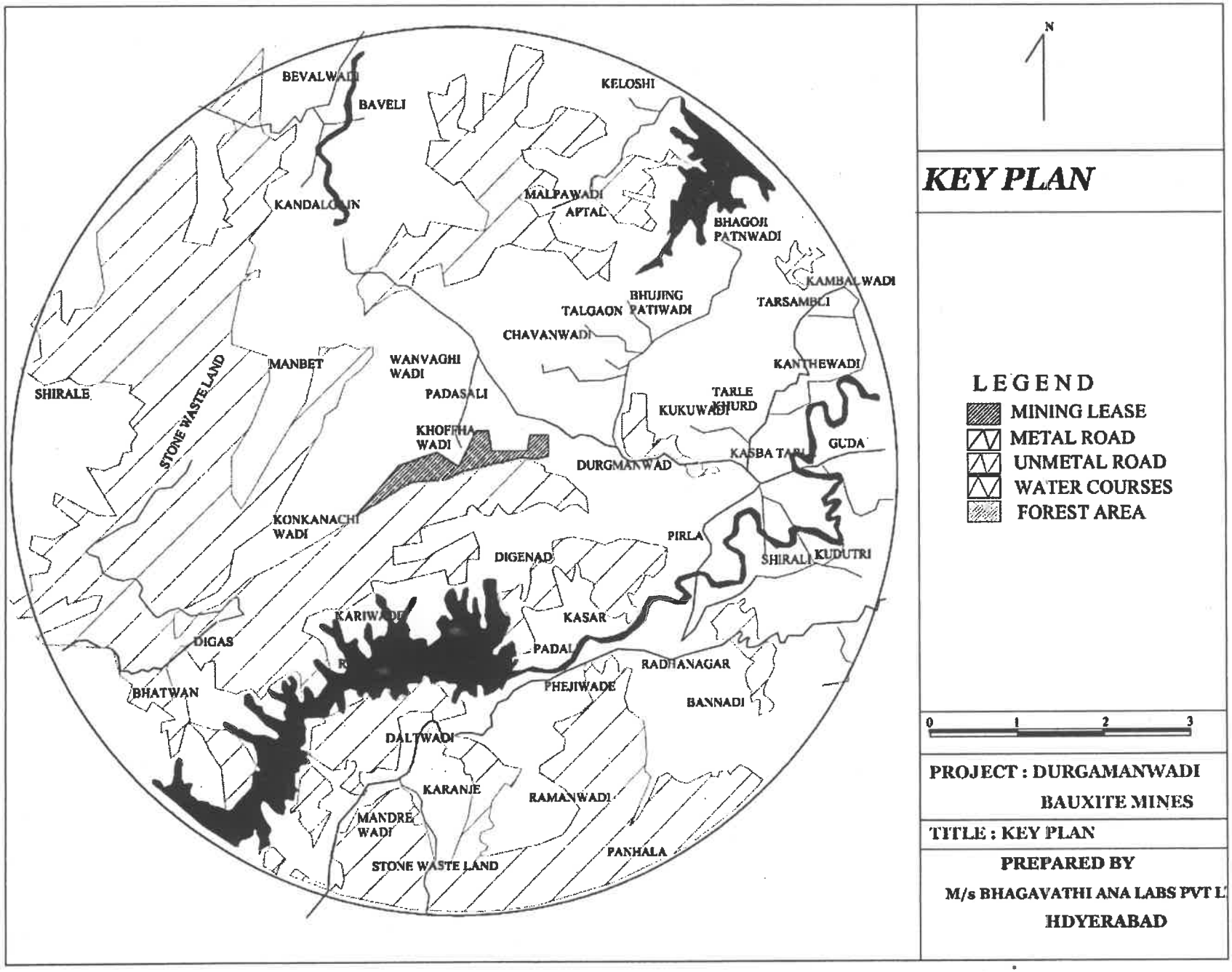
Ambient air quality monitoring stations were set up at eight selected locations, 3 in core zone and 5 in buffer zone.

METHOD OF SAMPLING

Ambient air quality monitoring has been carried out using APM-460BL instruments placed at a height of 3mts from the ground level with a frequency of two days per week at eight locations for one season (i.e. 24 times at each location in a season). The baseline data for air environment is generated for the parameters like suspended particulate matter (SPM), Particulate matter (PM10), Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO2):

AMBIENT AIR QUALITY MONITORING STATIONS

SL. NO	STATION CODE	NAME OF SAMPLING LOCATION	DIRECTION w.r.t MINES
1	A – 1	Core zone	--
2	A – 2	Near Mines office	--
3	A – 3	Near haulage road	--
4	A – 4	Padsali village	N
5	A – 5	Durgmanwadi village	E
6	A – 6	Kariwade village	SW
7	A – 7	Manbet village	NW
8	A – 8	Chavanwadi village	NE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TALGAON
CHAVANWADI
KANTHEWADI
MANBET
WANVAGHI WADI
SHIRALE
STONE WASTE LAND
PADASALI
TARLE KHURD
KUKUWADI
KHOPRA WADI
GUDA
KASBA TARA
DURGMANWAD
KONKANACHI WADI
PIRLA
DIGENAD
SHIRALI
KUDUTRI
KARIWADI
KASAR
DIGAS
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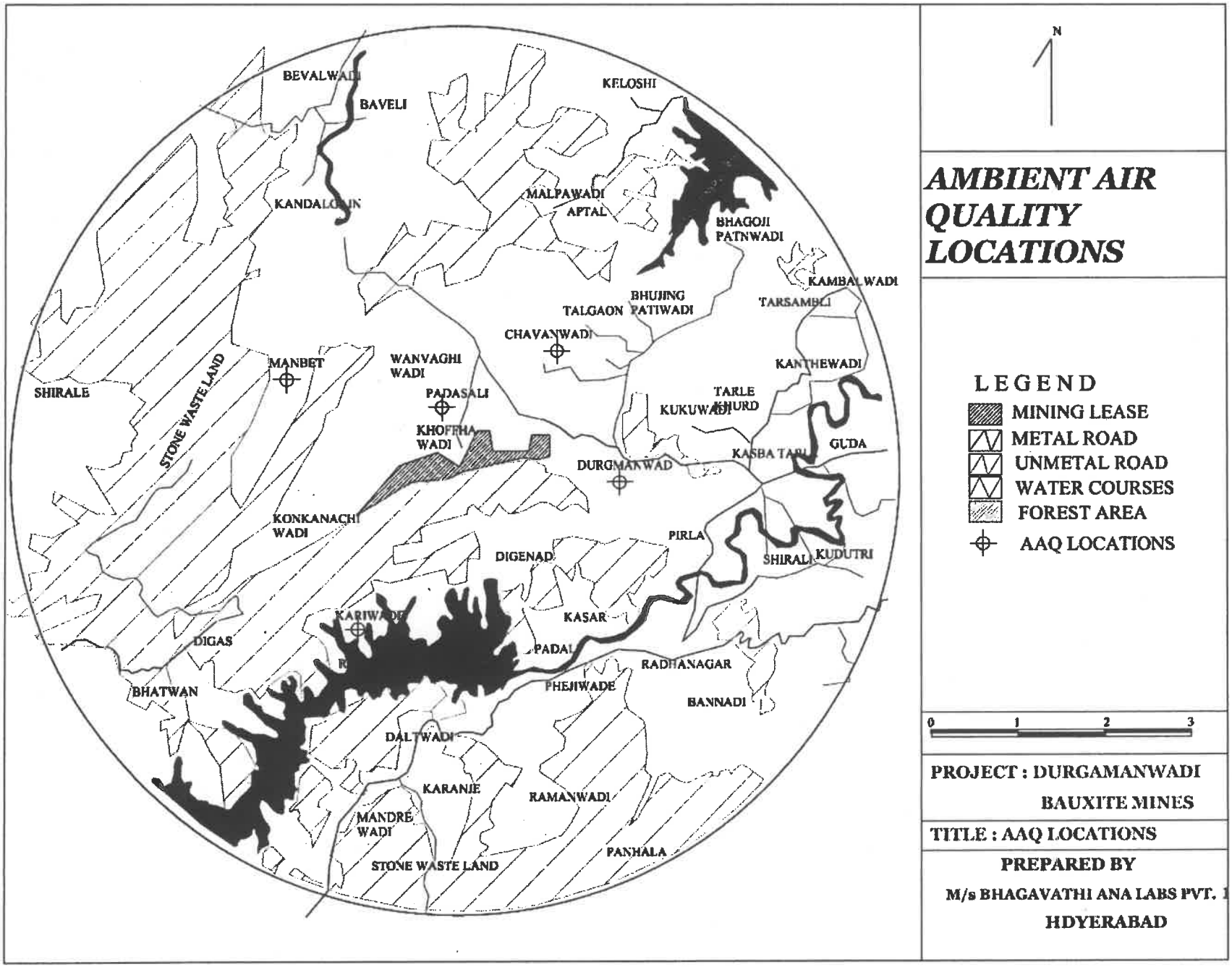
RADHANAGAR
PHEJIWADE
BHATWAN
BANNADI
DALTWADI
KARANJE
RAMANWADI
MANDRE WADI
PANHALA
STONE WASTE LAND
KEY PLAN
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
FOREST AREA
0
1
2
3
PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : KEY PLAN
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT L
HDYERABAD

SUMMARY OF AMBIENT AIR QUALITY RESULTS

Sl. No.	Location		SPM	PM 10	SO_2	NOx
1	Core zone	Min	78.0	23.5	4.0	8.2
		Max	118.7	35.9	5.0	11.2
		Average	99.2	30.3	4.4	9.7
		98th %tile	116.9	35.4	5.0	11.0
2	Near Mine Office	Min	91.5	29.2	4.1	9.2
		Max	109.6	34.6	4.9	11.7
		Average	102.0	32.1	4.6	10.1
		98th %tile	109.0	34.5	4.9	11.5
3	Near Haulage Road	Min	95.1	32.6	4.6	9.8
		Max	135.0	46.3	6.6	14.8
		Average	111.3	38.4	5.4	11.8
		98th %tile	133.2	45.6	6.5	14.4
4	Padsali village	Min	76.4	23.9	4.0	8.9
		Max	129.5	40.6	5.8	13.0
		Average	106.8	33.6	4.9	10.6
		98th %tile	127.9	40.0	5.7	12.8
5	Durgamanwadi village	Min	97.0	31.8	4.5	9.6
		Max	120.9	39.0	5.5	13.0
		Average	110.4	35.9	5.1	11.2
		98th %tile	120.5	39.0	5.5	12.8
6	Kariwade village	Min	93.7	29.6	4.2	8.8
		Max	124.5	38.9	5.5	12.5
		Average	106.9	33.5	4.8	10.1
		98th %tile	122.8	38.3	5.5	11.9
7	Manbet village	Min	105.0	30.7	4.4	9.4
		Max	124.2	36.6	5.1	11.4
		Average	114.5	33.7	4.8	10.5
		98th %tile	122.7	36.2	5.1	11.3
8	Chavanwadi village	Min	92.2	27.6	4.3	9.3
		Max	129.5	37.9	5.5	12.3
		Average	111.9	33.0	4.8	10.5
		98th %tile	128.5	37.7	5.4	12.1

NOTE: The results relate only to the condition prevailing at the time of sampling
Method of measurement: As per IS 5182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KUKUWADI
KHOPRHA WADI
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PANHALA
STONE WASTE LAND
AMBIENT AIR QUALITY LOCATIONS
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
FOREST AREA
AAQ LOCATIONS
0 1 2 3
PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : AAQ LOCATIONS
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT. L
HDYERABAD

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. So noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location. The noise level results are given below.

AMBIENT NOISE LEVEL MONITORING STATIONS

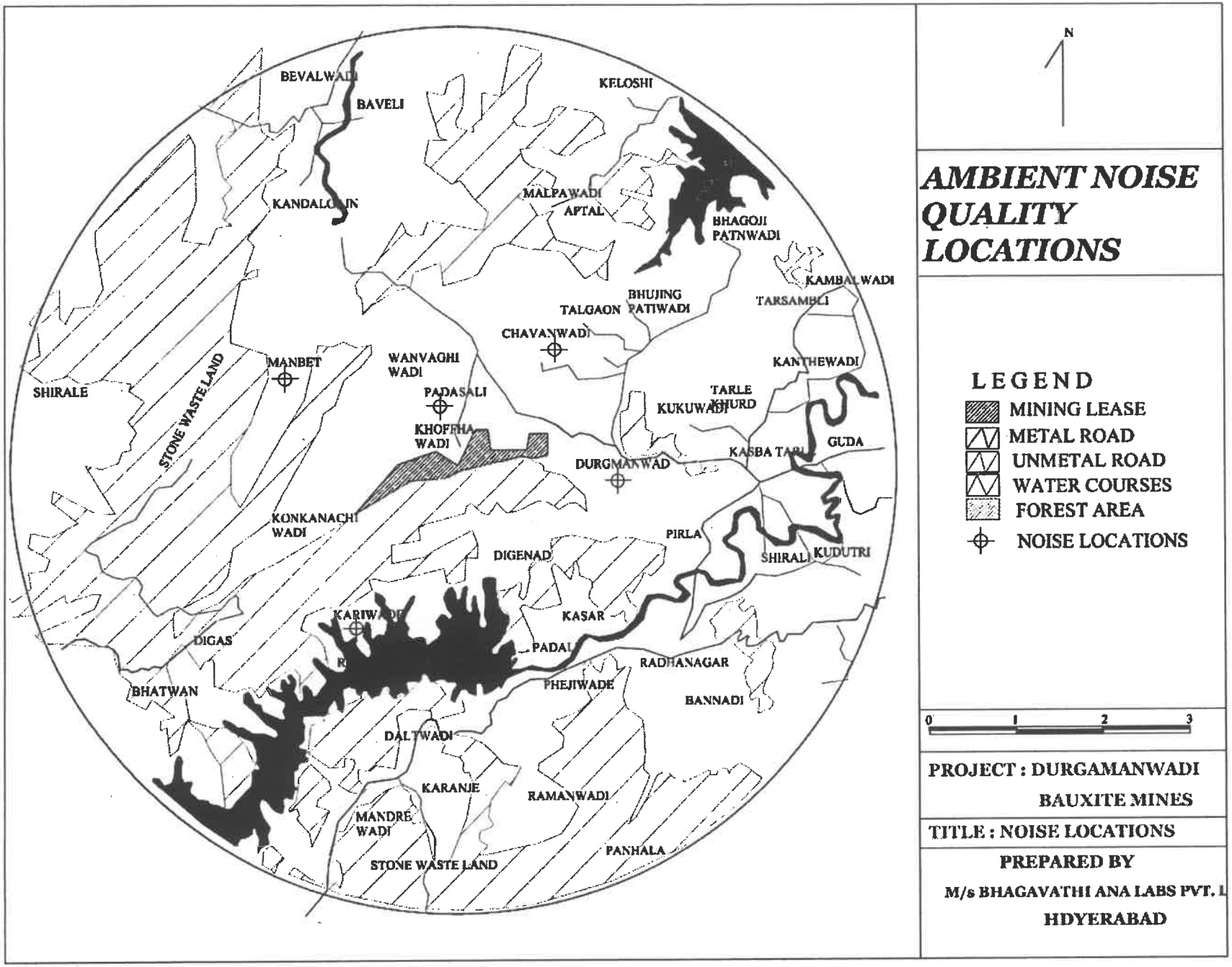
SL. NO	CODE	NAME OF SAMPLING LOCATION	DIRECTION w.r.t. MINES
1	N – 1	Core zone	--
2	N – 2	Near Mines Office	--
3	N – 3	Mines Haulage Road	--
4	N – 4	Padsali village	N
5	N – 5	Durgmanwad village	E
6	N – 6	Kariwade village	SW
7	N – 7	Manbet village	NW
8	N – 8	Chavanwadi village	NE

NOISE AMBIENT STANDARDS

AREA CODE	CATEGORY OF AREA	LIMIT IN dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Area	50	40

Note:

1. **Day time is reckoned in between 6 am and 9 pm.**
2. **Night time is reckoned in between 9 pm and 6 am.**
3. **Silence zone is defined as area upto 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.**
4. **Mixed categories of areas should be declared as "one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.**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AMBIENT NOISE QUALITY LOCATIONS
LEGEND
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UNMETAL ROAD
WATER COURSES
FOREST AREA
NOISE LOCATIONS
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PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : NOISE LOCATIONS
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CORE ZONE NOISE LEVEL MONITORING DATA

Location →	N – 1 CORE ZONE	N – 2 NEAR MINES OFFICE	N – 3 MINES HAULAGE ROAD
Time (Hrs) ↓	dB(A)		
06.00	56.9	58.6	60.6
07.00	58.2	59.4	60.6
08.00	60.3	60.6	62.4
09.00	63.3	64.1	63.1
10.00	65.8	66.4	65.4
11.00	68.2	69.1	68.2
12.00	69.3	68.8	68.7
13.00	68.8	68.9	68.6
14.00	68.5	69.5	70.2
15.00	67.0	67.9	67.3
16.00	72.6	72.9	70.8
17.00	74.4	74.8	68.1
18.00	69.3	71.4	69.7
19.00	65.4	66.0	65.0
20.00	60.8	62.5	61.5
21.00	61.5	61.2	60.7
22.00	60.9	61.9	61.4
23.00	60.9	61.2	60.7
24.00	60.1	61.3	62.0
01.00	59.8	60.8	60.1
02.00	60.4	59.6	59.3
03.00	60.6	60.3	59.6
04.00	59.8	60.8	62.4
05.00	60.0	61.3	61.9
Minimum Value: - (L_{Min})	**56.9**	**58.6**	**59.3**
Maximum Value: - (L_{Max})	**74.4**	**74.8**	**70.8**

NOTE: The results relate only to the condition prevailing at the time of sampling

BUFFER ZONE NOISE LEVEL MONITORING DATA

Location →	N – 4 PADSALI VILLAGE	N – 5 DURGAMANWADI VILLAGE	N – 6 KARIWADE VILLAGE	N – 7 MANBET VILLAGE	N-8 CHAVAN WADI VILLAGE
Time (Hrs) ↓	dB(A)				
06.00	48.0	48.7	48.9	49.7	49.2
07.00	55.6	56.4	57.1	57.9	57.1
08.00	57.9	58.3	59.5	59.7	59.7
09.00	60.6	61.3	62.9	62.3	62.3
10.00	62.6	63.7	65.4	65.0	65.1
11.00	70.7	71.5	74.1	73.2	66.6
12.00	71.5	72.9	75.0	74.5	67.4
13.00	69.5	71.5	74.4	72.4	65.9
14.00	69.4	71.4	74.2	72.2	65.9
15.00	67.6	70.2	72.2	70.8	63.9
16.00	65.6	68.8	70.2	69.3	62.1
17.00	63.7	67.1	68.7	68.1	60.6
18.00	62.1	65.1	66.9	66.8	59.4
19.00	61.3	64.5	66.5	65.7	58.6
20.00	56.3	59.3	60.5	60.5	54.3
21.00	55.4	57.6	59.2	59.2	52.8
22.00	49.1	51.2	52.7	52.4	51.1
23.00	47.6	49.9	52.0	51.2	49.9
24.00	47.8	49.9	52.1	51.1	50.2
01.00	48.1	50.8	53.0	51.9	50.8
02.00	48.5	51.6	53.8	52.7	51.8
03.00	48.8	52.5	54.2	53.7	52.3
04.00	44.1	47.5	49.2	48.2	54.2
05.00	44.2	47.1	49.2	47.3	53.5
Minimum Value: - (L_{Min})	**44.1**	**47.1**	**48.9**	**47.3**	**49.2**
Maximum Value: - (L_{Max})	**71.5**	**72.9**	**75.0**	**74.5**	**67.4**

RESULT & DISCUSSION

The obtained Ld, Ln noise levels are compared with the ambient noise level standards and are found to be within the limit.

WATER QUALITY

Water quality monitoring consists of the study of water sources and its quality in the core and buffer zone of the lease area. Its study consists of following two important systems of water bodies:

- Surface water quality.
- Ground water quality.

The buffer zone is good in ground and surface water source. The rainwater regularly recharges this ground water during rainy season. There are two streams flowing in the study area, which are considered to be good source of water.

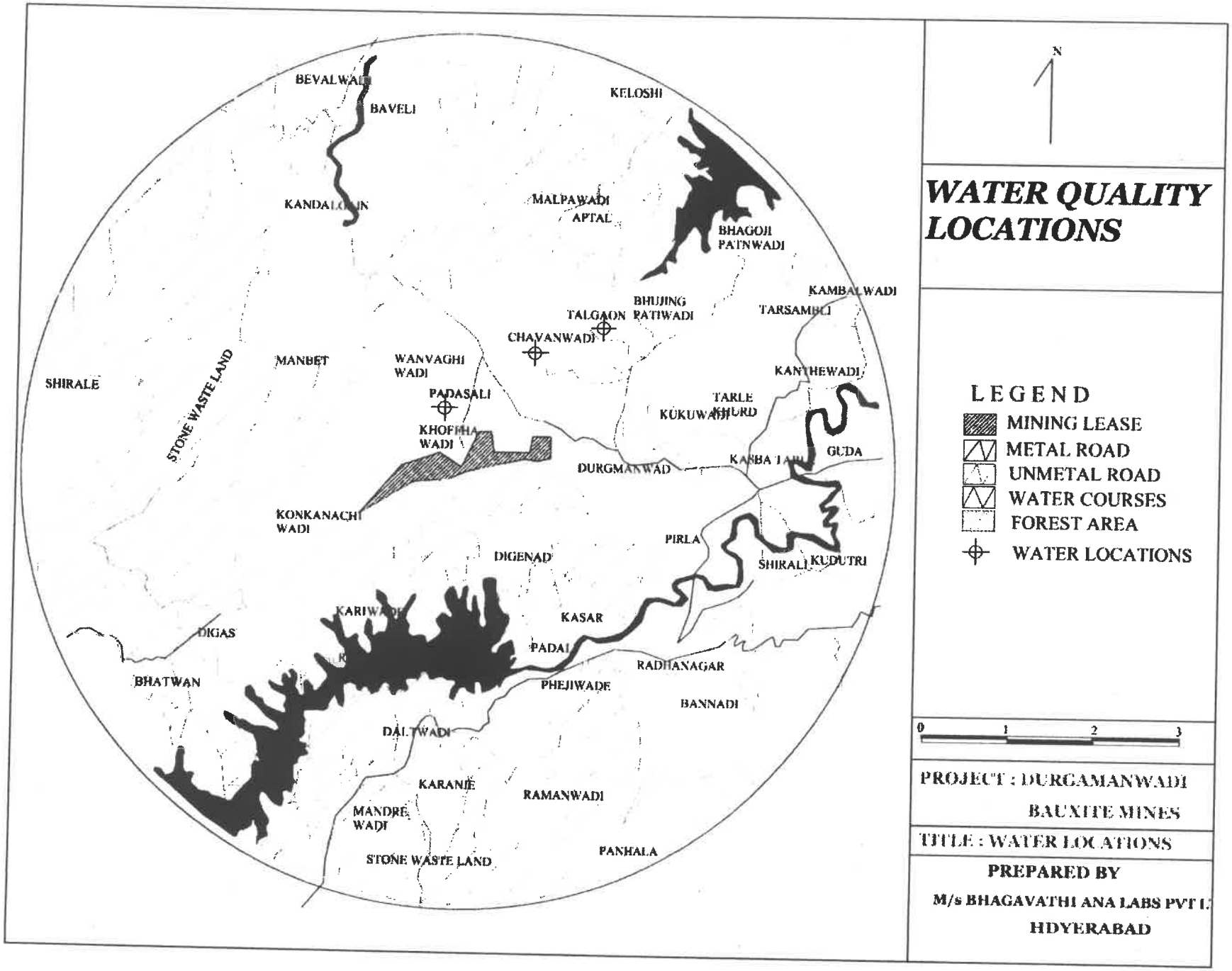
Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the IS 10500 (Drinking Water Standard). A total of 6 quality monitoring stations selected for sample collection in the study area. Location of water quality monitoring stations is given in Table.

WATER QUALITY MONITORING LOCATIONS

Sl. No		Name of Sampling Station	Source of Water
1	W1	Talgaon village	Ground water
2	W2	Durgamanwadi village	Ground water
3	W3	Chavanwadi village	Ground water
4	W4	Padsali village	Surface water
5	W5	Tulsi stream	Surface water
6	W6	Mine Accumulated water	Surface water

SAMPLING DETAILS

The water samples were collected from selected sampling locations, which are coming under core zone and buffer zone around the mine lease area. Samples were collected in the winter season as per the prescribed sample collecting methods and analyzed as per the IS & APHA standard procedures. analysis report of water samples are given below.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PANHALA
STONE WASTE LAND
WATER QUALITY LOCATIONS
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
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WATER LOCATIONS
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PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : WATER LOCATIONS
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TALGAON VILLAGE

Location Name	:	Talgaon village			
Date	:	23.02.2018	Sample Type	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.54
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	5.0
7	Total Dissolved Solids	mg/l	132
8	Total Suspended Solids	mg/l	12
9	Alkalinity as $CaCO_3$	mg/l	62.0
10	Total Hardness as $CaCO_3$	mg/l	82.0
11	Nitrates NO_3	mg/l	0.7
12	Phosphates PO_4	mg/l	0.35
13	Chlorides as Cl	mg/l	15.47
14	Sulphates as SO_4^{2-}	mg/l	1.7
15	Sodium as Na.	mg/l	5
16	Potassium as K	mg/l	0.09
17	Calcium as Ca	mg/l	25
18	Magnesium as Mg	mg/l	6
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.02
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.89
26	Fluoride as F	mg/l	0.03
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	3

BDL: Below Detectable Limit

mg/l: - Milligram per liter

DURGAMANWADI VILLAGE

Location Name	:	Durgamanwadi village			
Date	:	23.02.2018	**Sample Type**	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.59
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	5.10
7	Total Dissolved Solids	mg/l	110
8	Total Suspended Solids	mg/l	9
9	Alkalinity as $CaCO_3$	mg/l	60
10	Total Hardness as $CaCO_3$	mg/l	59.0
11	Nitrates NO_3	mg/l	0.18
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	13
14	Sulphates as SO_4^{2-}	mg/l	2
15	Sodium as Na.	mg/l	5
16	Potassium as K	mg/l	2
17	Calcium as Ca	mg/l	16
18	Magnesium as Mg	mg/l	4
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.02
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.15
26	Fluoride as F	mg/l	0.03
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	4

BDL: Below Detectable Limit

mg/l: - Milligram per liter

CHAVANWADI VILLAGE

Location Name	:	Chavanwadi village			
Date	:	23.02.2018	**Sample Type**	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.57
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	4.30
7	Total Dissolved Solids	mg/l	49
8	Total Suspended Solids	mg/l	7
9	Alkalinity as $CaCO_3$	mg/l	24.0
10	Total Hardness as $CaCO_3$	mg/l	34.0
11	Nitrates NO_3	mg/l	0.011
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	11.6
14	Sulphates as SO_4^{2-}	mg/l	1.1
15	Sodium as Na.	mg/l	0.84
16	Potassium as K	mg/l	0.11
17	Calcium as Ca	mg/l	9
18	Magnesium as Mg	mg/l	3
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.02
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.14
26	Fluoride as F	mg/l	0.03
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	4

BDL: Below Detectable Limit

mg/l: - Milligram per liter

PADSALI VILLAGE

Location Name	:	Padsali village			
Date	:	23.02.2018	**Sample Type**	:	Surface water

Sl. No.	Parameter	Unit	
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.66
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	4.10
7	Total Dissolved Solids	mg/l	45
8	Total Suspended Solids	mg/l	11
9	Alkalinity as $CaCO_3$	mg/l	16
10	Total Hardness as $CaCO_3$	mg/l	30.0
11	Nitrates NO_3	mg/l	0.28
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	10.63
14	Sulphates as SO_4^{2-}	mg/l	0.012
15	Sodium as Na.	mg/l	1.2
16	Potassium as K	mg/l	1.02
17	Calcium as Ca	mg/l	7.2
18	Magnesium as Mg	mg/l	2.88
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.01
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.21
26	Fluoride as F	mg/l	0.02
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	5

BDL: Below Detectable Limit mg/l: - Milligram per liter

TULSI STREAM

Location Name	:	Tulsi stream			
Date	:	23.02.2018	Sample Type	:	Surface Water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.73
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	7.20
7	Total Dissolved Solids	mg/l	132
8	Total Suspended Solids	mg/l	10
9	Alkalinity as $CaCO_3$	mg/l	40
10	Total Hardness as $CaCO_3$	mg/l	104.0
11	Nitrates NO_3	mg/l	0.17
12	Phosphates PO_4	mg/l	0.03
13	Chlorides as Cl	mg/l	14.5
14	Sulphates as SO_4^{2-}	mg/l	0.01
15	Sodium as Na.	mg/l	0.5
16	Potassium as K	mg/l	0.24
17	Calcium as Ca	mg/l	21.6
18	Magnesium as Mg	mg/l	12
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.03
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.14
26	Fluoride as F	mg/l	0.02
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	4

BDL: Below Detectable Limit

mg/l: - Milligram per liter

MINE ACCUMULATED WATER

Location Name	:	Mine Accumulated Water			
Date	:	23.02.2018	**Sample Type**	:	Surface Water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.74
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	6.00
7	Total Dissolved Solids	mg/l	20
8	Total Suspended Solids	mg/l	6
9	Alkalinity as $CaCO_3$	mg/l	16
10	Total Hardness as $CaCO_3$	mg/l	20.0
11	Nitrates NO_3	mg/l	0.37
12	Phosphates PO_4	mg/l	0.01
13	Chlorides as Cl	mg/l	7.73
14	Sulphates as SO_4^{2-}	mg/l	3.8
15	Sodium as Na.	mg/l	0.36
16	Potassium as K	mg/l	0.02
17	Calcium as Ca	mg/l	5.6
18	Magnesium as Mg	mg/l	1.44
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.02
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.49
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	4

DOMESTIC EFFLUENT ANALYSIS

Sample Type: **Canteen waste water**

Date of sampling: 23.2.2018

Sl.No	Test	Result
1	**Total Suspended Solids, mg/l**	**55**
2	**Total Dissolved Solids, mg/l**	**66**
3	**COD, mg/l**	**8**
4	**BOD for 3 days at 27°C, mg/l**	**4**
5	**Total Solids**	**77**
6	**Oil and Grease, mg/l**	**5**

Sample Type: **Canteen waste water**

Date of sampling: 24.2.2018

Sl.No	Test	Result
1	**Total Suspended Solids, mg/l**	**58**
2	**Total Dissolved Solids, mg/l**	**69**
3	**COD, mg/l**	**8**
4	**BOD for 3 days at 27°C, mg/l**	**4**
5	**Total Solids**	**79**
6	**Oil and Grease, mg/l**	**5**

RESULTS & DISCUSSION

→ The pH of the study area varies from 6.54 to 6.74 in the study area. The permissible range of pH is 6.5 to 8.5.

→ Dissolved Oxygen content of the study area has been found to be in the range of 4.10 to 7.20.

→ Total Dissolved Solids found to be in the range of 20 to 132 mg/l in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 500 mg/l and maximum permissible limit is 2000 mg/l.

→ Alkalinity as $CaCO_3$ is found to be in the range of 16 to 62 in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 200 mg/l and maximum permissible limit is 600 mg/l.

→ Total hardness as $CaCO_3$ of the water sample collected in the study area is found to in the range of 20 to 104 mg/l. As per IS 10500 standard for drinking water, the desirable limit is 300 mg/l and maximum permissible limit is 600 mg/l.

→ Chloride content of the water in the study area found to be in the range of 7.73 to 15.47 mg/l. As per IS 10500 standard for drinking water, the desirable limit 250 mg/l and maximum permissible limit is 1000 mg/l.

→ Calcium content of the water in the study area found to be in the range of 5.60 to 25 mg/l. As per IS 10500 standard for drinking water, the desirable limit 75 mg/l and maximum permissible limit is 200 mg/l.

→ Magnesium content of the water in the study area found to be in the range of 1.44 to 12 mg/l.

→ Iron content of the water in the study area found to be in the range of 0.14 to 0.89 mg/l. As per IS 10500 standard for drinking water, the desirable limit 0.3 mg/l and maximum permissible limit is 1.0 mg/l.

DRINKING WATER STANDARDS AS PER IS: 10500

Sl. NO	PARAMETER	UNIT	DESIRABLE LIMIT AS PER IS: 10500	MAXIMUM PERMISSIBLE LIMIT AS PER IS: 10500
1	Odour		Un-objectionable	
2	Taste		Agreeable	
3	Colour	Hazen Units	5	25
4	pH		6.5 –8.5	
5	Turbidity	NTU	5	10
6	Dissolved Oxygen	mg /l	-----	
7	Total Dissolved Solids	mg /l	500	2000
8	Alkalinity as CaCo3	mg /l	200	600
9	Total hardness as CaCo3	mg /l	300	600
10	Nitrates NO3	mg /l	45	100
11	Phosphates PO4	mg /l	-----	
12	Chlorides as Cl	mg /l	250	1000
13	Sulphates, SO42-	mg /l	200	400
14	Sodium as Na	mg /l	-----	
15	Potassium as K	mg /l	-----	
16	Calcium as Ca	mg /l	75	200
17	Magnesium, Mg	mg /l	30	100
18	Lead (Pb)	mg /l	0.05	0.05
19	Manganese	mg /l	0.1	0.3
20	Cadmium (Cd)	mg /l	0.01	0.01
21	Chromium (Cr)	mg /l	0.05	0.05
22	Copper (Cu)	mg /l	0.05	1.5
23	Zinc (Zn)	mg /l	5	15
24	Iron as Fe	mg /l	0.3	1.0
25	Fluoride as F	mg /l	1	1.5
26	Mercury as Hg	mg /l	0.001	0.001
27	Selenium as se	mg /l	0.01	0.01
28	Arsenic as As	mg /l	0.05	0.05
29	Cyanide as CN	mg/l	0.05	0.05
30	Boron as B	mg/l	1	5

DURGAMANWADI MINES

WELL DEPTHS OF VILLAGES

S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
				23.2.2018
1	PADSALI VILLAGE	DMW	7.00	4.10
2	CHAVANWADI VILLAGE	DMW	2.80	2.80

AMBIENT AIR QUALITY

Station: A1, CORE ZONE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3 24 hrs Average	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	103.0	31.2	4.6	9.0
2		07-12-2017	104.0	31.6	4.6	9.2
3		12-12-2017	78.0	23.5	4.7	9.6
4		14-12-2017	99.0	29.9	4.3	9.3
5		19-12-2017	102.0	30.9	4.4	9.9
6		21-12-2017	110.0	33.5	4.7	10.7
7		26-12-2017	89.0	27.7	4.1	10.7
8		28-12-2017	90.0	27.6	4.3	11.2
1	Jan-18	03-01-2018	110.1	33.2	4.6	9.4
2		05-01-2018	110.7	34.2	4.9	10.4
3		10-01-2018	82.1	25.3	4.2	9.5
4		12-01-2018	94.9	29.3	4.3	9.6
5		16-01-2018	102.1	31.2	4.5	9.6
6		18-01-2018	114.8	34.9	5.0	10.1
7		23-01-2018	92.5	28.1	4.0	8.2
8		25-01-2018	96.5	29.7	4.2	9.1
1	Feb-18	01-02-2018	107.5	32.8	4.2	9.5
2		05-02-2018	103.8	31.8	4.4	9.9
3		08-02-2018	85.7	26.2	4.3	9.4
4		12-02-2018	92.5	27.9	4.6	9.3
5		15-02-2018	97.8	30.2	4.2	9.9
6		19-02-2018	118.7	35.9	5.0	10.7
7		22-02-2018	96.0	29.1	4.0	9.0
8		26-02-2018	100.5	30.4	4.3	8.9

	Min		78.0	23.5	4.0	8.2
	Max		118.7	35.9	5.0	11.2
	Mean		99.2	30.3	4.4	9.7
	10th percentile		86.7	26.7	4.2	9.0
	30th percentile		94.7	29.0	4.3	9.3
	50th percentile		99.7	30.3	4.4	9.5
	95th percentile		114.2	34.8	5.0	10.7
	98th percentile		116.9	35.4	5.0	11.0

BDL: BELOW DETECTABLE LIMIT

AMBIENT AIR QUALITY

Station: A2, NEAR MINES OFFICE						
S.No.	Month	Date	SPM	PM 10	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
			$\mu g/m^3$	$\mu g/m^3$	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	99.0	31.6	4.4	9.4
2		07-12-2017	103.4	32.5	4.5	10.2
3		12-12-2017	100.6	31.5	4.5	9.2
4		14-12-2017	101.0	32.0	4.6	10.7
5		19-12-2017	98.0	30.4	4.4	10.8
6		21-12-2017	100.0	31.7	4.5	9.7
7		26-12-2017	97.0	30.5	4.2	9.5
8		28-12-2017	103.0	32.6	4.5	9.3
1	Jan-18	03-01-2018	106.6	33.2	4.6	10.7
2		05-01-2018	110.3	34.5	4.9	11.0
3		10-01-2018	105.6	33.6	4.9	10.5
4		12-01-2018	101.1	31.4	4.5	10.2
5		16-01-2018	91.8	29.2	4.7	9.7
6		18-01-2018	104.9	33.1	4.6	10.5
7		23-01-2018	100.6	31.5	4.4	9.9
8		25-01-2018	97.2	30.2	4.2	9.1
1	Feb-18	01-02-2018	104.5	32.5	4.6	10.4
2		05-02-2018	103.5	32.9	4.8	9.8
3		08-02-2018	108.8	34.6	4.9	11.2
4		12-02-2018	104.5	32.9	4.7	11.4
5		15-02-2018	95.3	29.6	4.1	9.2
6		19-02-2018	108.8	34.1	4.7	9.7
7		22-02-2018	103.8	32.4	4.5	10.4
8		26-02-2018	100.7	31.8	4.5	11.0

	Min		91.8	29.2	4.1	9.1
	Max		110.3	34.6	4.9	11.4
	Mean		102.1	32.1	4.6	10.1
	10th percentile		97.1	30.3	4.3	9.2
	30th percentile		100.5	31.5	4.5	9.7
	50th percentile		102.1	32.2	4.5	10.2
	95th percentile		108.8	34.4	4.9	11.2
	98th percentile		109.6	34.6	4.9	11.3

AMBIENT AIR QUALITY

Station: A3,NEAR HAULAGE ROAD						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	112.0	39.1	5.5	11.8
2		07-12-2017	102.0	34.9	4.8	10.8
3		12-12-2017	104.0	35.9	5.1	10.7
4		14-12-2017	107.0	37.3	5.4	11.6
5		19-12-2017	124.0	42.8	6.2	13.7
6		21-12-2017	127.0	43.5	6.1	13.1
7		26-12-2017	106.0	36.6	5.0	11.4
8		28-12-2017	101.0	34.5	4.9	10.3
1	Jan-18	03-01-2018	119.7	41.0	5.9	12.8
2		05-01-2018	108.3	37.5	5.5	12.1
3		10-01-2018	104.3	35.8	5.0	10.8
4		12-01-2018	107.9	37.1	5.1	11.5
5		16-01-2018	117.5	40.8	5.8	12.2
6		18-01-2018	132.0	45.2	6.5	14.1
7		23-01-2018	109.9	38.3	5.5	12.1
8		25-01-2018	95.6	32.7	4.6	9.8
1	Feb-18	01-02-2018	117.3	40.5	5.6	12.6
2		05-02-2018	101.7	35.0	5.0	10.4
3		08-02-2018	104.9	36.5	5.3	11.4
4		12-02-2018	108.7	37.4	5.5	12.0
5		15-02-2018	115.2	39.8	5.5	12.4
6		19-02-2018	135.2	46.4	6.6	14.8
7		22-02-2018	112.9	38.7	5.4	11.3
8		26-02-2018	99.0	34.4	5.0	10.8

	Min		95.6	32.7	4.6	9.8
	Max		135.2	46.4	6.6	14.8
	Mean		111.4	38.4	5.4	11.8
	10th percentile		101.2	34.7	4.9	10.5
	30th percentile		104.9	36.4	5.1	11.3
	50th percentile		108.5	37.5	5.4	11.7
	95th percentile		131.2	44.9	6.5	14.0
	98th percentile		133.7	45.8	6.6	14.5

AMBIENT AIR QUALITY

Station: A4, PADSALI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m³)	NO_x (µg/m³)
			µg/m³	µg/m³	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	79.0	25.2	4.2	9.0
2		07-12-2017	117.0	37.1	5.1	11.5
3		12-12-2017	106.0	32.9	4.7	9.8
4		14-12-2017	104.0	32.4	4.7	10.1
5		19-12-2017	107.0	33.7	4.9	10.8
6		21-12-2017	122.0	37.9	5.3	11.4
7		26-12-2017	103.0	32.0	4.4	9.9
8		28-12-2017	109.0	34.6	4.9	10.3
1	Jan-18	03-01-2018	79.7	25.2	4.2	9.0
2		05-01-2018	123.6	38.8	5.7	12.5
3		10-01-2018	110.3	35.1	4.9	10.6
4		12-01-2018	99.1	31.7	5.1	11.6
5		16-01-2018	113.5	35.6	5.1	10.6
6		18-01-2018	126.0	39.3	5.7	12.3
7		23-01-2018	103.4	32.8	4.7	10.4
8		25-01-2018	103.2	32.4	4.5	9.8
1	Feb-18	01-02-2018	77.4	24.2	4.0	9.1
2		05-02-2018	117.4	36.8	5.2	11.0
3		08-02-2018	114.1	36.2	5.2	11.3
4		12-02-2018	97.0	31.1	4.5	10.0
5		15-02-2018	111.4	35.3	4.9	11.0
6		19-02-2018	129.5	40.5	5.8	12.9
7		22-02-2018	104.4	32.8	4.5	9.6
8		26-02-2018	107.0	33.7	4.9	10.6

	Min		77.4	24.2	4.0	9.0
	Max		129.5	40.5	5.8	12.9
	Mean		106.8	33.6	4.9	10.6
	10th percentile		84.9	26.9	4.3	9.2
	30th percentile		103.4	32.4	4.7	10.0
	50th percentile		107.0	33.7	4.9	10.6
	95th percentile		125.7	39.3	5.7	12.4
	98th percentile		127.9	40.0	5.7	12.7

AMBIENT AIR QUALITY

Station: A 5, DURGAMANWADI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	113.0	36.7	5.1	11.0
2		07-12-2017	107.0	34.9	4.9	11.0
3		12-12-2017	97.0	31.1	4.4	9.6
4		14-12-2017	106.0	34.5	5.0	11.5
5		19-12-2017	105.0	34.1	4.9	12.1
6		21-12-2017	113.0	36.7	5.2	11.2
7		26-12-2017	105.0	34.3	4.7	9.7
8		28-12-2017	108.0	34.7	4.8	9.9
1	Jan-18	03-01-2018	120.6	38.7	5.4	12.5
2		05-01-2018	113.9	37.3	5.3	11.4
3		10-01-2018	101.9	32.7	4.7	10.2
4		12-01-2018	111.1	36.3	5.2	11.8
5		16-01-2018	112.9	36.9	5.2	10.7
6		18-01-2018	117.2	37.6	5.2	11.9
7		23-01-2018	108.6	35.7	5.0	10.2
8		25-01-2018	109.0	35.3	4.9	10.6
1	Feb-18	01-02-2018	118.2	38.6	5.5	12.3
2		05-02-2018	107.5	35.0	5.1	10.4
3		08-02-2018	104.9	34.2	4.8	11.1
4		12-02-2018	114.8	36.8	5.2	12.6
5		15-02-2018	110.6	35.4	4.9	11.0
6		19-02-2018	120.7	39.1	5.4	11.1
7		22-02-2018	112.3	36.1	5.1	10.6
8		26-02-2018	112.2	36.8	5.2	12.8

	Min		97.0	31.1	4.4	9.6
	Max		120.7	39.1	5.5	12.8
	Mean		110.4	35.8	5.1	11.1
	10th percentile		104.9	34.1	4.8	10.0
	30th percentile		107.5	34.8	4.9	10.6
	50th percentile		110.8	35.9	5.1	11.0
	95th percentile		120.3	38.7	5.4	12.7
	98th percentile		120.7	38.9	5.5	12.8

AMBIENT AIR QUALITY

Station: A6, KARIWADE VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	107.0	33.5	4.9	11.1
2		07-12-2017	101.0	31.5	4.6	9.2
3		12-12-2017	116.0	36.3	5.3	10.8
4		14-12-2017	103.0	32.3	4.6	10.0
5		19-12-2017	98.0	30.9	4.4	9.9
6		21-12-2017	103.0	32.8	4.6	10.5
7		26-12-2017	101.0	31.7	5.0	9.8
8		28-12-2017	99.0	31.3	4.9	9.8
1	Jan-18	03-01-2018	114.5	35.7	4.9	10.1
2		05-01-2018	107.1	33.7	4.8	10.3
3		10-01-2018	120.4	37.9	5.6	12.5
4		12-01-2018	109.0	34.5	5.0	11.3
5		16-01-2018	105.1	33.4	4.8	9.6
6		18-01-2018	107.7	33.6	4.8	9.7
7		23-01-2018	104.5	33.4	4.8	9.8
8		25-01-2018	93.8	29.7	4.7	10.1
1	Feb-18	01-02-2018	111.9	35.5	4.2	9.5
2		05-02-2018	100.6	32.1	4.5	10.0
3		08-02-2018	123.9	38.6	5.3	9.4
4		12-02-2018	112.8	35.9	5.1	11.0
5		15-02-2018	108.2	34.5	4.8	9.9
6		19-02-2018	111.4	34.9	4.8	10.4
7		22-02-2018	107.9	34.2	4.7	10.6
8		26-02-2018	97.1	30.7	4.4	9.0

	Min		93.8	29.7	4.2	9.0
	Max		123.9	38.6	5.6	12.5
	Mean		106.8	33.7	4.8	10.2
	10th percentile		98.3	31.0	4.4	9.4
	30th percentile		102.8	32.3	4.7	9.8
	50th percentile		107.0	33.6	4.8	10.0
	95th percentile		119.8	37.7	5.3	11.3
	98th percentile		122.3	38.3	5.5	12.0

AMBIENT AIR QUALITY

Station: A7, MANBET VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m³)	NO_x (µg/m³)
			µg/m³	µg/m³	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	105.0	31.4	4.6	9.6
2		07-12-2017	112.0	33.1	4.8	10.5
3		12-12-2017	112.0	32.5	4.6	9.8
4		14-12-2017	108.0	31.3	4.5	10.1
5		19-12-2017	109.0	32.0	4.4	9.5
6		21-12-2017	112.0	32.6	4.8	10.7
7		26-12-2017	117.0	33.9	4.8	10.0
8		28-12-2017	106.0	31.2	4.4	9.7
1	Jan-18	03-01-2018	112.9	33.1	4.8	10.3
2		05-01-2018	118.9	35.3	4.9	11.1
3		10-01-2018	116.2	33.9	4.9	10.5
4		12-01-2018	113.7	33.3	4.6	10.4
5		16-01-2018	116.2	33.9	4.9	10.4
6		18-01-2018	116.0	34.5	4.9	10.7
7		23-01-2018	120.9	35.8	5.0	10.8
8		25-01-2018	112.5	33.4	4.8	10.4
1	Feb-18	01-02-2018	110.9	33.0	4.6	9.9
2		05-02-2018	112.7	33.3	4.8	10.8
3		08-02-2018	119.4	35.1	4.9	11.0
4		12-02-2018	117.6	34.4	5.0	11.1
5		15-02-2018	117.0	34.9	4.8	10.4
6		19-02-2018	119.1	34.8	5.0	11.3
7		22-02-2018	124.4	36.6	5.1	11.0
8		26-02-2018	116.5	33.9	4.9	10.5

	Min		105.0	31.2	4.4	9.5
	Max		124.4	36.6	5.1	11.3
	Mean		114.4	33.6	4.8	10.4
	10th percentile		108.3	31.6	4.5	9.7
	30th percentile		112.0	33.1	4.7	10.3
	50th percentile		114.9	33.6	4.8	10.4
	95th percentile		120.6	35.7	5.0	11.1
	98th percentile		122.8	36.2	5.1	11.2

AMBIENT AIR QUALITY

Station: A 8, CHAVANWADI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Dec-17	05-12-2017	99.0	29.2	4.6	9.6
2		07-12-2017	106.0	31.5	4.6	10.0
3		12-12-2017	109.0	32.6	4.6	9.8
4		14-12-2017	113.0	33.0	4.8	10.7
5		19-12-2017	117.0	34.6	4.8	10.3
6		21-12-2017	122.0	35.5	5.2	11.7
7		26-12-2017	106.0	31.1	4.4	9.2
8		28-12-2017	98.0	29.1	4.3	9.5
1	Jan-18	03-01-2018	106.6	30.9	4.5	9.6
2		05-01-2018	112.2	32.6	4.6	10.3
3		10-01-2018	113.3	33.3	4.8	10.3
4		12-01-2018	118.3	35.1	4.9	11.0
5		16-01-2018	124.6	36.8	5.4	11.3
6		18-01-2018	126.4	37.2	5.2	11.5
7		23-01-2018	109.3	32.4	4.6	9.8
8		25-01-2018	92.5	27.5	4.3	9.2
1	Feb-18	01-02-2018	104.1	30.2	4.2	9.1
2		05-02-2018	106.1	31.1	4.5	11.0
3		08-02-2018	116.9	34.8	4.8	10.9
4		12-02-2018	121.8	35.7	5.2	11.5
5		15-02-2018	128.4	37.4	5.2	11.2
6		19-02-2018	129.6	38.2	5.5	12.5
7		22-02-2018	113.0	33.6	4.7	11.5
8		26-02-2018	96.3	28.2	4.5	9.6
	Min		92.5	27.5	4.2	9.1
	Max		129.6	38.2	5.5	12.5
	Mean		112.1	33.0	4.7	10.5
	10th percentile		98.3	29.1	4.4	9.3
	30th percentile		106.1	31.1	4.5	9.8
	50th percentile		112.6	32.8	4.6	10.3
	95th percentile		128.1	37.3	5.4	11.7
	98th percentile		129.0	37.8	5.5	12.1

BDL for SOx-2.0 & NOx-4.5

NOTE: The results relate only to the conditions prevailing at the time of sampling

Method of measurement: As per CPCB Manual & IS 5182

DURGAMANWADI BAUXITE MINE

RADHANAGARI TALUKA,
KOLHAPUR DISTRICT
MAHARASHTRA

M/S HINDALCO INDUSTRIES LIMITED

ENVIRONMENTAL QUALITY MONITORING REPORT

POST MONSOON 2017

IND.BH.41.16.0322/HSR

Bhagavathi Ana Labs Pvt. Ltd.,

7-2-C-14, Industrial Estate,
Sanathnagar, Hyderabad
500 018

CONTENTS

TITLE	PAGE NO.
PREFACE	I
EXECUTIVE SUMMARY	II
MICRO-METEOROLOGY	1- 4
ENVIRONMENTAL QUALITY	5- 23
Ambient Air Quality	5 - 8
Ambient Noise Quality	9 -12
Water Quality	13 - 23
ANNEXURE	--
Ambient Air Quality	

BHAGAVATHI ANA LABS PVT. LTD. GOA

PREFACE

M/S Hindalco Industries Limited entrusted environmental quality monitoring at **Durgmanwadi Bauxite Mine** situated Radhanagari Taluka, Kolhapur district, Maharashtra to **Bhagavathi Ana Labs Pvt. Limited, Hyderabad** during Post Monsoon season of the year 2017.

The environmental monitoring was carried out in core zone and buffer zone during the months of September, October & November 2017 for the following environmental parameters.

- → Micro-meteorology
- → Ambient air quality
- → Ambient noise level quality
- → Water quality

The data obtained was compiled to assess the current environmental status of the mining as well as the surrounding villages in the study area.

Bhagavathi Ana Labs Pvt. Limited, Hyderabad gratefully acknowledges the cooperation extended by management and staff of M/S Hindalco Industries Limited and the village people to the field staff.

EXECUTIVE SUMMARY

Durgamanwadi Bauxite Mine environmental quality monitoring includes the monitoring of ambient air quality, noise level quality, water quality, & micro-meteorology in core zone and buffer zone around the mine lease area.

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust sampler has been used for monitoring the existing AAQ status. Maximum, minimum, average and percentile values have been computed from the raw data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels will cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level recorder.

WATER QUALITY MONITORING

Water quality monitoring consists of the study of surface and ground water sources and its quality in the core and buffer zone of the lease area. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Water samples were collected from selected locations during study period and analyzed in the laboratory as per the standard IS&APHA procedures.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area. Meteorological scenario exerts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions

MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

→ Wind Velocity

→ Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

→ Ambient Temperature

MICRO-METEOROLOGICAL DATA

DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
06-09-2017	25	32	28.5	0	2.3	1.2	SE
08-09-2017	25	32	28.5	0	6	3.0	SE
12-09-2017	25	32	28.5	0	4.3	2.2	SSE
15-09-2017	24	30	27.0	0	3	1.5	W
19-09-2017	23	27	25.0	0	5.2	2.6	SW
21-09-2017	23	26	24.5	0	3.4	1.7	SE
25-09-2017	25	31	28.0	0	4.2	2.1	SE
27-09-2017	25	31	28.0	0	4	2.0	SSE

MICRO-METEOROLOGICAL DATA							
DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
02-10-2017	24	31	27.5	0	2	1.0	W
03-10-2017	23	31	27.0	0	4	2.0	NW
09-10-2017	25	32	28.5	0	1.3	0.7	SSW
10-10-2017	25	32	28.5	0	3.2	1.6	E
16-10-2017	25	31	28.0	0	4.3	2.2	E
17-10-2017	23.1	33.4	28.3	0	2.1	1.1	SSE
23-10-2017	25	32	28.5	0	2	1.0	SSE
24-10-2017	25	35	30.0	0	1.6	0.8	NE

MICRO-METEOROLOGICAL DATA							
DATE	TEMPERATURE			WIND SPEED Km/h			WIND DIRECTION
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
02-11-2017	23	36	29.5	0	2.3	1.2	W
04-11-2017	19	35	27.0	0	3.1	1.6	SW
07-11-2017	23	35	29.0	0	1.8	0.9	SW
08-11-2017	21	36	28.5	0	2.8	1.4	SSE
13-11-2017	18	34	26.0	0	3	1.5	SE
14-11-2017	17	36	26.5	0	2.7	1.4	SE
20-11-2017	24	33	28.5	0	1.9	1.0	E
21-11-2017	25	35	30.0	0	2.9	1.5	SE

INDEX MAP

(Mine Lease Area)

DURGMANWADI BAUXITE MINE

M/s Hindalco Industries Limited

NOT TO SCALE

ENVIRONMENTAL QUALITY

Environmental monitoring includes air, noise, water quality status within core zone and buffer zone around the Durgmanwadi Bauxite Mines Lease area at Radhanagari Taluka, Kolhapur district, Maharashtra.

AMBIENT AIR QUALITY

The ambient air quality monitoring was to assess the existing levels of the air pollution as well as the regional background concentration in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities.

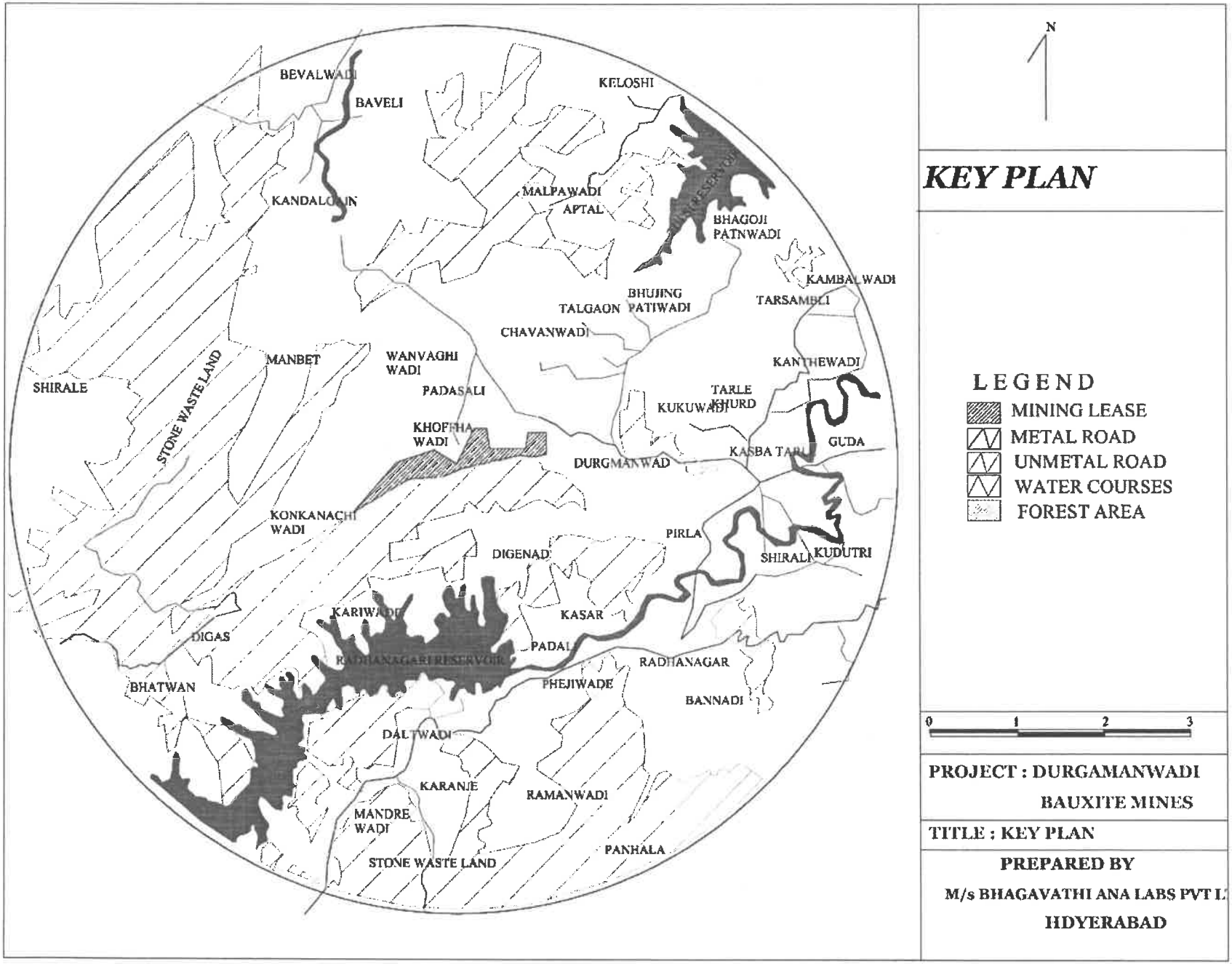
Ambient air quality monitoring stations were set up at eight selected locations, 3 in core zone and 5 in buffer zone.

METHOD OF SAMPLING

Ambient air quality monitoring has been carried out using APM-460BL instruments placed at a height of 3mts from the ground level with a frequency of two days per week at eight locations for one season (i.e. 24 times at each location in a season). The baseline data for air environment is generated for the parameters like suspended particulate matter (SPM), Particulate matter (PM10), Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO2):

AMBIENT AIR QUALITY MONITORING STATIONS

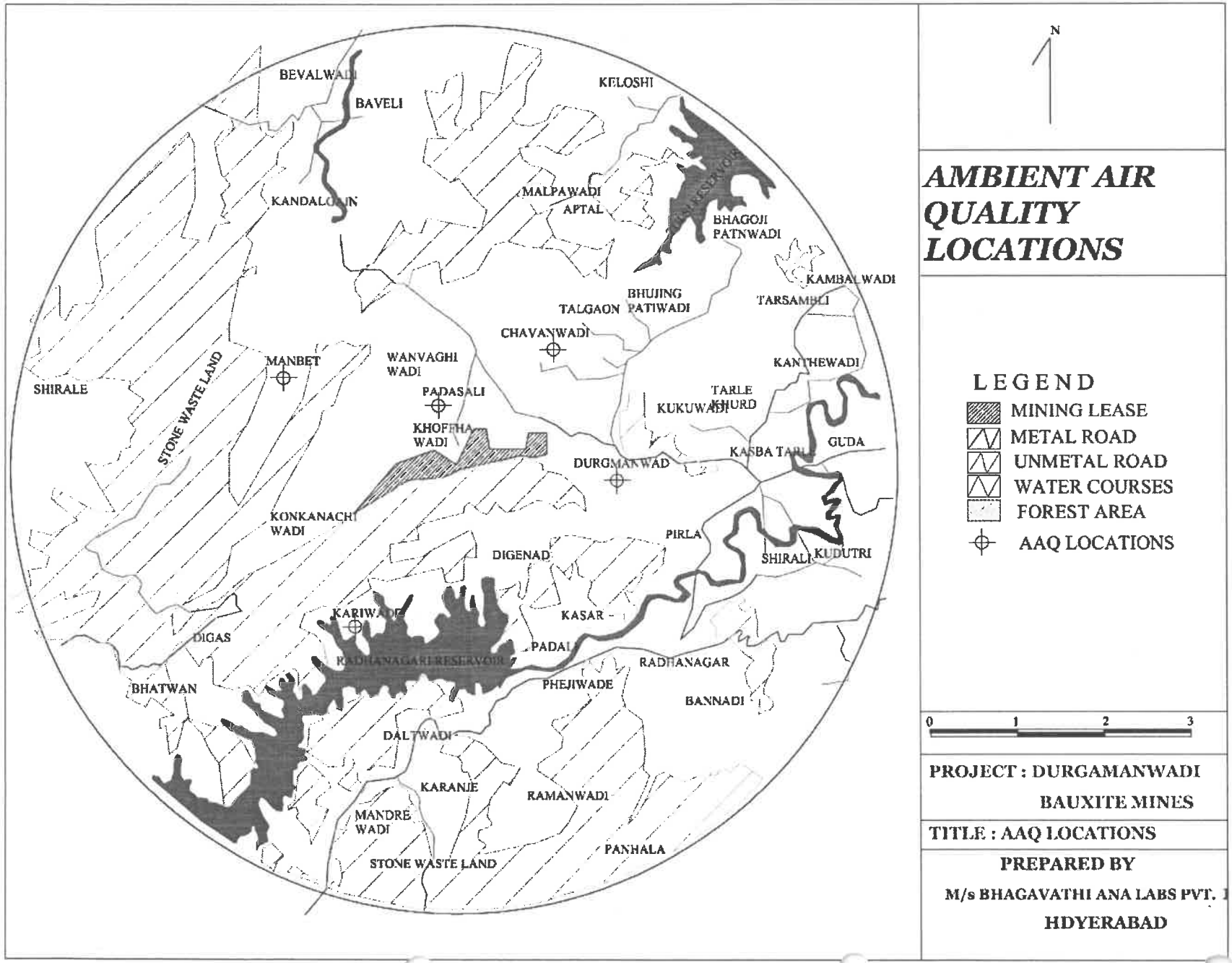
SL. NO	STATION CODE	NAME OF SAMPLING LOCATION	DIRECTION w.r.t MINES
1	A – 1	Core zone	--
2	A – 2	Near Mines office	--
3	A – 3	Near haulage road	--
4	A – 4	Padsali village	N
5	A – 5	Durgmanwadi village	E
6	A – 6	Kariwade village	SW
7	A – 7	Manbet village	NW
8	A – 8	Chavanwadi village	NE


N
KEY PLAN
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
FOREST AREA
0 1 2 3
PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : KEY PLAN
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT L
HDYERABAD
BEVALWADI
BAVELI
KELOSHI
KANDALGAON
MALPAWADI
APTAL
BHAGOJI PATNWADI
KAMBALWADI
TARSAMBLI
BHUJING PATIWADI
TALGAON
CHAVANWADI
KANTHEWADI
MANBET
WANVAGHI WADI
SHIRALE
STONE WASTE LAND
PADASALI
TARLE KHURD
KUKUWADI
KHOPHA WADI
GUDA
KASBA TARU
DURGMANWAD
KONKANACHI WADI
PIRLA
DIGENAD
SHIRALI
KUDUTRI
KARIWADI
KASAR
DIGAS
PADAL
RADHANAGARI RESERVOIR
RADHANAGAR
BHATWAN
PHEJIWADE
BANNADI
DALTWADI
KARANJE
RAMANWADI
MANDRE WADI
PANHALA
STONE WASTE LAND

SUMMARY OF AMBIENT AIR QUALITY RESULTS

Sl. No.	Location		SPM	PM 10	SO_2	NOx
1	Core zone	Min	75.0	22.9	6.3	8.2
		Max	119.4	36.7	10.0	13.6
		Average	101.4	30.9	8.3	11.4
		98th %tile	119.0	36.6	10.0	13.5
2	Near Mine Office	Min	103.4	36.0	7.5	9.6
		Max	241.5	82.3	13.2	17.6
		Average	157.1	54.0	9.9	13.2
		98th %tile	240.2	82.1	12.9	17.2
3	Near Haulage Road	Min	87.7	30.4	4.2	9.1
		Max	140.8	48.3	6.7	14.8
		Average	108.3	37.0	5.3	11.4
		98th %tile	139.1	47.6	6.7	14.6
4	Padsali village	Min	86.5	27.5	6.1	8.3
		Max	173.6	53.9	11.9	15.8
		Average	128.0	40.3	9.6	12.4
		98th %tile	172.8	53.9	11.9	15.8
5	Durgamanwadi village	Min	103.0	33.5	7.8	9.1
		Max	131.8	42.6	10.5	15.6
		Average	114.5	37.1	8.7	13.3
		98th %tile	130.5	42.2	10.4	15.5
6	Kariwade village	Min	101.0	32.2	6.4	10.7
		Max	123.0	38.7	8.2	13.3
		Average	112.0	35.3	7.3	11.9
		98th %tile	122.6	38.5	8.1	13.2
7	Manbet village	Min	98.5	29.0	6.4	8.8
		Max	128.1	37.9	9.1	16.4
		Average	112.8	33.3	7.8	13.5
		98th %tile	126.7	37.2	8.9	16.2
8	Chavanwadi village	Min	97.4	29.0	6.7	10.8
		Max	115.1	33.7	8.2	13.0
		Average	107.5	31.8	7.4	12.1
		98th %tile	114.5	33.7	8.1	12.9

NOTE: The results relate only to the condition prevailing at the time of sampling
Method of measurement: As per IS 5182


BEVALWADI
BAVELI
KELOSHI
KANDALGAON
MALPAWADI
APTAL
BHAGOJI PATNWADI
KAMBALWADI
TARSAMBLI
BHUJING PATIWADI
TALGAON
CHAVANWADI
MANBET
WANVAGHI WADI
SHIRALE
STONE WASTE LAND
PADASALI
KHOPHA WADI
KUKUWADI
TARLE KHURD
KANTHEWADI
GUDA
KASBA TARLE
DURGMAKWAD
KONKANACHI WADI
PIRLA
DIGENAD
SHIRALI
KUDUTRI
KARIWADE
KASAR
DIGAS
PADALI
RADHANAGARI RESERVOIR
RADHANAGAR
PHEJIWADE
BHATWAN
BANNADI
DALTWADI
KARANJE
RAMANWADI
MANDRE WADI
PANHALA
STONE WASTE LAND
N
AMBIENT AIR QUALITY LOCATIONS
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
FOREST AREA
AAQ LOCATIONS
0
1
2
3
PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : AAQ LOCATIONS
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT. L
HDYERABAD

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. So noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location. The noise level results are given below.

AMBIENT NOISE LEVEL MONITORING STATIONS

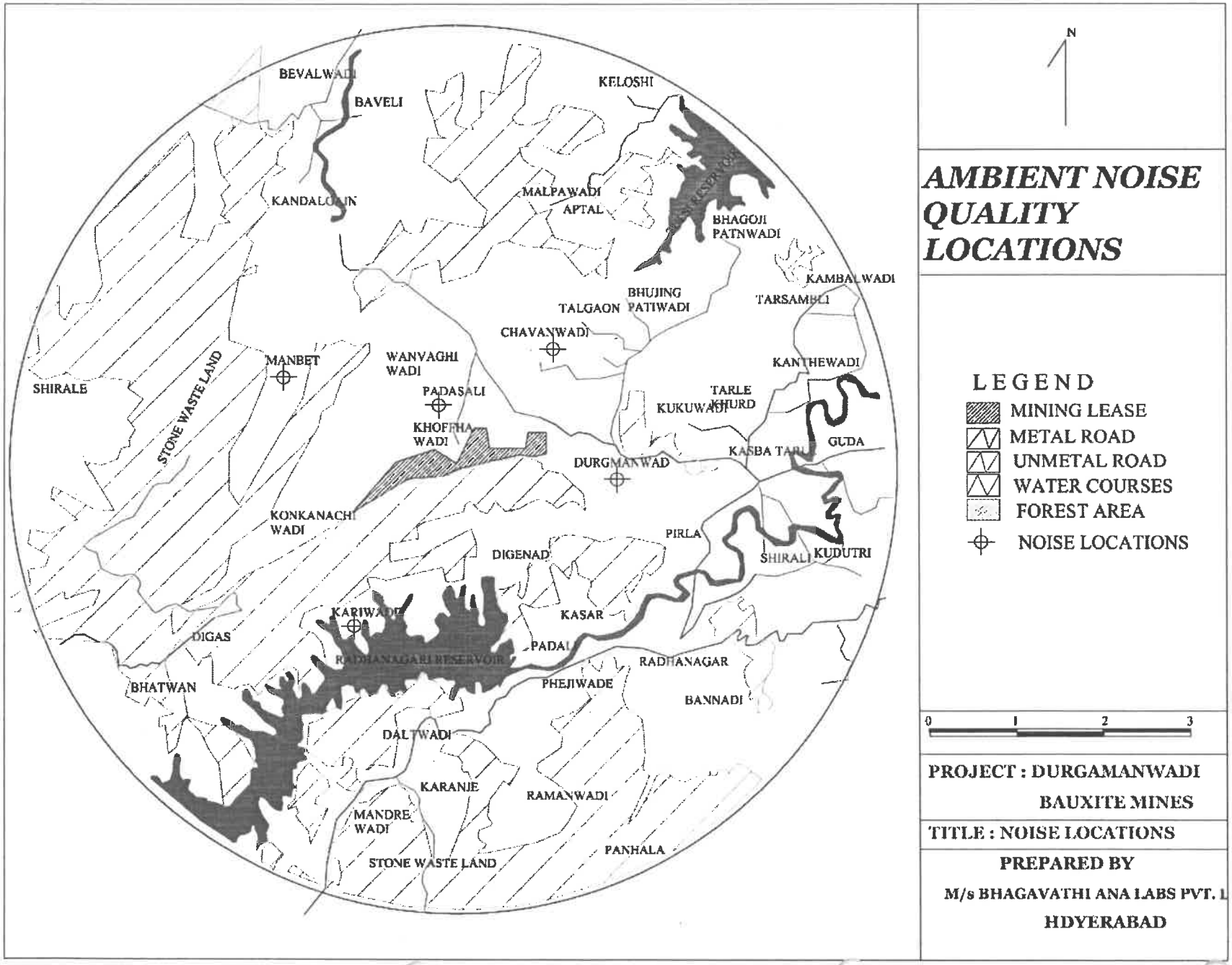
SL. NO	CODE	NAME OF SAMPLING LOCATION	DIRECTION w.r.t. MINES
1	N – 1	Core zone	--
2	N – 2	Near Mines Office	--
3	N – 3	Mines Haulage Road	--
4	N – 4	Padsali village	N
5	N – 5	Durgmanwad village	E
6	N – 6	Kariwade village	SW
7	N – 7	Manbet village	NW
8	N – 8	Chavanwadi village	NE

NOISE AMBIENT STANDARDS

AREA CODE	CATEGORY OF AREA	LIMIT IN dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Area	50	40

Note:

1. **Day time is reckoned in between 6 am and 9 pm.**
2. **Night time is reckoned in between 9 pm and 6 am.**
3. **Silence zone is defined as area upto 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.**
4. **Mixed categories of areas should be declared as "one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.**


N
AMBIENT NOISE QUALITY LOCATIONS
LEGEND
MINING LEASE
METAL ROAD
UNMETAL ROAD
WATER COURSES
FOREST AREA
NOISE LOCATIONS
BEVALWADI
BAVELI
KELOSHI
KANDALGAON
MALPAWADI
APTAL
BHAGOJI PATNWADI
KAMBALWADI
TARSAMBLI
BHUJING PATIWADI
TALGAON
CHAVANWADI
MANBET
WANVAGHI WADI
KANTHEWADI
SHIRALE
STONE WASTE LAND
PADASALI
TARLE KHURD
KUKUWADI
KHOPHA WADI
GUDA
KASBA TARU
DURGMANWAD
KONKANACHI WADI
PIRLA
DIGENAD
SHIRALI
KUDUTRI
KARIWADI
KASAR
DIGAS
PADAL
RADHANAGARI RESERVOIR
RADHANAGAR
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BHATWAN
BANNADI
DALTWADI
KARANJE
RAMANWADI
MANDRE WADI
PANHALA
STONE WASTE LAND
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PROJECT : DURGAMANWADI BAUXITE MINES
TITLE : NOISE LOCATIONS
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT. L
HDYERABAD

CORE ZONE NOISE LEVEL MONITORING DATA

Location →	N – 1 CORE ZONE	N – 2 NEAR MINES OFFICE	N – 3 MINES HAULAGE ROAD
Time (Hrs) ↓	dB(A)		
06.00	47.7	48.8	48.5
07.00	55.1	57.2	56.4
08.00	57.0	59.0	58.7
09.00	59.5	62.4	62.0
10.00	61.9	64.5	64.8
11.00	69.8	73.1	73.0
12.00	71.5	74.4	74.7
13.00	70.3	72.5	73.2
14.00	69.9	71.8	73.2
15.00	68.5	69.9	71.8
16.00	66.6	67.9	69.9
17.00	65.0	66.8	67.8
18.00	63.2	65.6	66.7
19.00	62.2	64.4	65.9
20.00	56.7	58.8	60.6
21.00	55.9	57.5	59.0
22.00	49.8	51.3	52.3
23.00	48.4	49.9	51.0
24.00	48.6	49.6	50.7
01.00	48.9	49.6	51.1
02.00	49.3	49.8	51.7
03.00	49.4	50.5	52.5
04.00	44.1	45.4	46.9
05.00	43.9	44.5	46.3
Minimum Value: - (L_{Min})	**43.9**	**44.5**	**46.3**
Maximum Value: - (L_{Max})	**71.5**	**74.4**	**74.7**

NOTE: The results relate only to the condition prevailing at the time of sampling

BUFFER ZONE NOISE LEVEL MONITORING DATA

Location →	N – 4 PADSALI VILLAGE	N – 5 DURGAMANWADI VILLAGE	N – 6 KARIWADE VILLAGE	N – 7 MANBET VILLAGE	N-8 CHAVAN WADI VILLAGE
Time (Hrs) ↓	dB(A)				
06.00	49.2	54.3	56.0	57.8	58.6
07.00	56.8	55.8	57.2	58.5	58.0
08.00	58.9	57.3	58.9	59.9	60.0
09.00	61.5	61.1	61.6	61.3	61.5
10.00	64.2	63.1	63.7	63.2	64.6
11.00	72.8	65.6	67.0	66.3	66.6
12.00	74.2	66.2	66.4	65.9	67.5
13.00	72.7	66.5	66.0	66.7	67.3
14.00	72.3	65.5	66.9	67.9	67.7
15.00	70.4	65.1	65.3	64.8	65.6
16.00	69.1	69.7	71.2	68.3	69.2
17.00	67.8	70.9	72.4	65.8	69.8
18.00	66.5	67.0	68.3	67.1	68.7
19.00	66.0	63.3	63.4	62.6	64.0
20.00	60.2	59.0	59.1	59.3	59.5
21.00	58.5	58.3	59.3	58.5	58.5
22.00	52.5	57.8	59.6	59.3	59.3
23.00	51.5	58.4	58.5	58.5	59.0
24.00	51.4	57.7	58.5	59.9	60.4
01.00	51.6	57.8	58.1	58.0	59.3
02.00	52.6	57.3	57.1	56.7	58.4
03.00	53.3	57.7	57.9	57.7	58.6
04.00	47.7	57.7	58.7	60.1	60.2
05.00	46.9	57.3	58.7	59.6	60.3
Minimum Value: - (L_{Min})	**46.9**	**54.3**	**56.0**	**56.7**	**58.0**
Maximum Value: - (L_{Max})	**74.2**	**70.9**	**72.4**	**68.3**	**69.8**

RESULT & DISCUSSION

The obtained Ld, Ln noise levels are compared with the ambient noise level standards and are found to be within the limit.

WATER QUALITY

Water quality monitoring consists of the study of water sources and its quality in the core and buffer zone of the lease area. Its study consists of following two important systems of water bodies:

- ➔ Surface water quality.
- ➔ Ground water quality.

The buffer zone is good in ground and surface water source. The rainwater regularly recharges this ground water during rainy season. There are two streams flowing in the study area, which are considered to be good source of water.

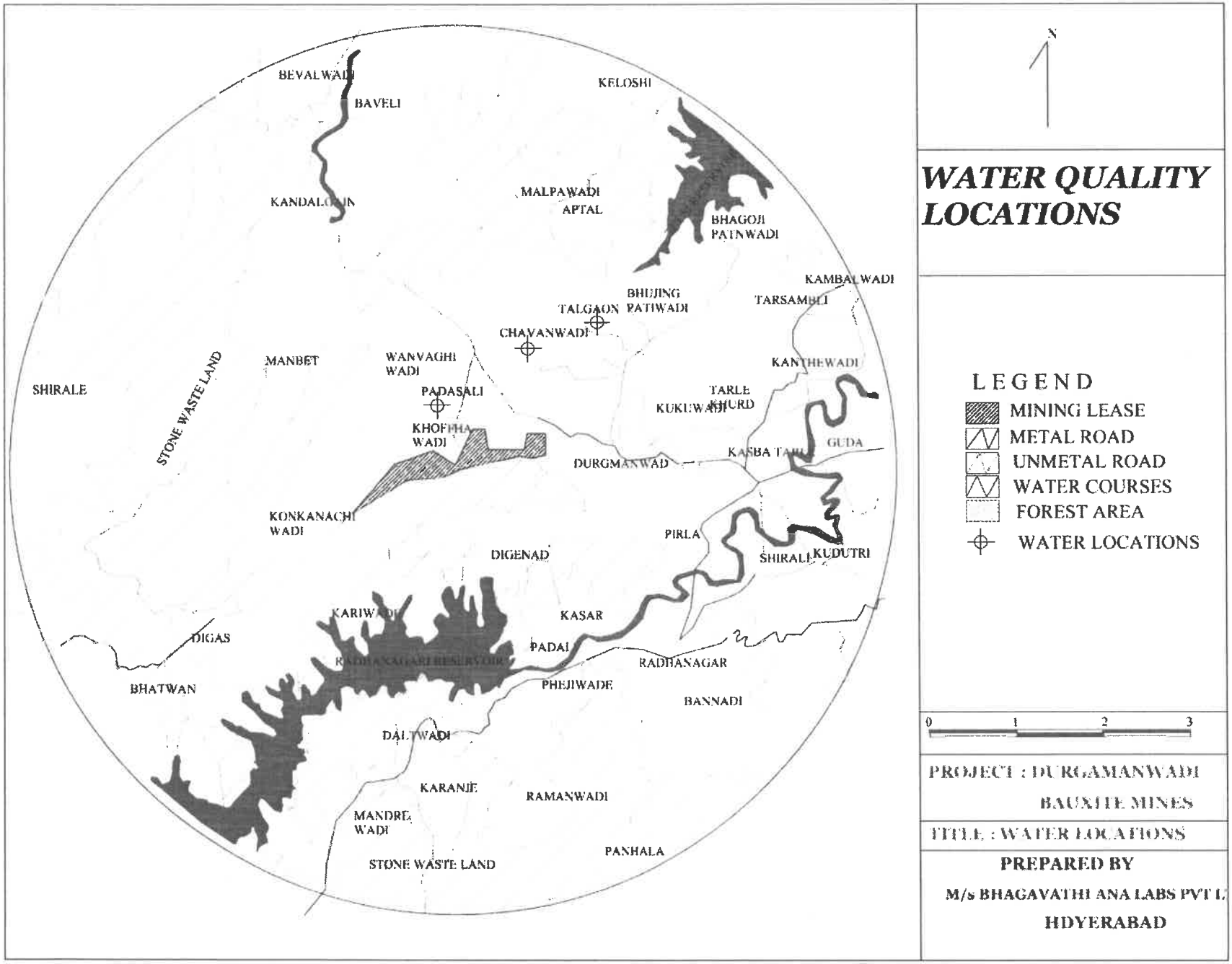
Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the IS 10500 (Drinking Water Standard). A total of 6 quality monitoring stations selected for sample collection in the study area. Location of water quality monitoring stations is given in Table.

WATER QUALITY MONITORING LOCATIONS

Sl. No		Name of Sampling Station	Source of Water
1	W1	Talgaon village	Ground water
2	W2	Durgamanwadi village	Ground water
3	W3	Chavanwadi village	Ground water
4	W4	Padsali village	Surface water
5	W5	Tulsi stream	Surface water
6	W6	Mine Accumulated water	Surface water

SAMPLING DETAILS

The water samples were collected from selected sampling locations, which are coming under core zone and buffer zone around the mine lease area. Samples were collected in the Post Monsoon season as per the prescribed sample collecting methods and analyzed as per the IS & APHA standard procedures. analysis report of water samples are given below.


BEVALWADI
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MALPAWADI
APTAL
BHAGOJI
PATNWADI
KAMBALWADI
TARSAMBLI
BHUJING
PATIWADI
TALGAON
CHAVANWADI
MANBET
WANVAGHI
WADI
KANTHEWADI
SHIRALE
STONE WASTE LAND
PADASALI
TARLE
KHURD
KUKUWADI
KHOPHA
WADI
GUDA
KASBA TARLE
DURGMANWAD
KONKANACHI
WADI
PIRLA
DIGENAD
SHIRALI
KUDUTRI
KARIWADI
KASAR
DIGAS
PADAL
RADHANAGARI RESERVOIR
RADHANAGAR
BHATWAN
PHEJIWADE
BANNADI
DALTWADI
KARANJE
RAMANWADI
MANDRE
WADI
PANHALA
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WATER QUALITY LOCATIONS
LEGEND
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METAL ROAD
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WATER COURSES
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WATER LOCATIONS
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PROJECT : DURGAMANWADI
BAUXITE MINES
TITLE : WATER LOCATIONS
PREPARED BY
M/s BHAGAVATHI ANA LABS PVT L
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TALGAON VILLAGE

Location Name	:	Talgaon village			
Date	:	23.11.2017	Sample Type	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.50
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	4.9
7	Total Dissolved Solids	mg/l	46
8	Total Suspended Solids	mg/l	12
9	Alkalinity as $CaCO_3$	mg/l	16.0
10	Total Hardness as $CaCO_3$	mg/l	36.0
11	Nitrates NO_3	mg/l	0.2
12	Phosphates PO_4	mg/l	0.22
13	Chlorides as Cl	mg/l	13.5
14	Sulphates as SO_4^{2-}	mg/l	1
15	Sodium as Na.	mg/l	1.65
16	Potassium as K	mg/l	0.06
17	Calcium as Ca	mg/l	9.6
18	Magnesium as Mg	mg/l	2.88
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.02
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.30
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	7

BDL: Below Detectable Limit mg/l: - Milligram per liter

DURGAMANWADI VILLAGE

Location Name	:	Durgamanwadi village			
Date	:	23.11.2017	Sample Type	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.77
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	5.00
7	Total Dissolved Solids	mg/l	97
8	Total Suspended Solids	mg/l	11
9	Alkalinity as $CaCO_3$	mg/l	16
10	Total Hardness as $CaCO_3$	mg/l	64.0
11	Nitrates NO_3	mg/l	0.22
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	10.63
14	Sulphates as SO_4^{2-}	mg/l	1.3
15	Sodium as Na.	mg/l	4.82
16	Potassium as K	mg/l	0.08
17	Calcium as Ca	mg/l	16
18	Magnesium as Mg	mg/l	5.7
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.01
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.17
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	4

BDL: Below Detectable Limit mg/l: - Milligram per liter

CHAVANWADI VILLAGE

Location Name	:	Chavanwadi village			
Date	:	23.11.2017	**Sample Type**	:	Ground water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.53
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	5.00
7	Total Dissolved Solids	mg/l	57.42
8	Total Suspended Solids	mg/l	8
9	Alkalinity as $CaCO_3$	mg/l	20.0
10	Total Hardness as $CaCO_3$	mg/l	56.0
11	Nitrates NO_3	mg/l	0.17
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	14.5
14	Sulphates as SO_4^{2-}	mg/l	1.1
15	Sodium as Na.	mg/l	2.55
16	Potassium as K	mg/l	0.12
17	Calcium as Ca	mg/l	13.6
18	Magnesium as Mg	mg/l	5.28
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.03
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.40
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	6

BDL: Below Detectable Limit mg/l: - Milligram per liter

PADSALI VILLAGE

Location Name	:	Padsali village			
Date	:	23.11.2017	Sample Type	:	Surface water

Sl. No.	Parameter	Unit	
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.67
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	4.70
7	Total Dissolved Solids	mg/l	29.04
8	Total Suspended Solids	mg/l	10
9	Alkalinity as $CaCO_3$	mg/l	16
10	Total Hardness as $CaCO_3$	mg/l	42.0
11	Nitrates NO_3	mg/l	0.24
12	Phosphates PO_4	mg/l	0.02
13	Chlorides as Cl	mg/l	9.61
14	Sulphates as SO_4^{2-}	mg/l	1
15	Sodium as Na.	mg/l	2.66
16	Potassium as K	mg/l	0.21
17	Calcium as Ca	mg/l	10.4
18	Magnesium as Mg	mg/l	3.84
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.03
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.30
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	5

BDL: Below Detectable Limit mg/l: - Milligram per liter

TULSI STREAM

Location Name	:	Tulsi stream			
Date	:	23.11.2017	**Sample Type**	:	Surface Water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.77
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	7.00
7	Total Dissolved Solids	mg/l	120.78
8	Total Suspended Solids	mg/l	34
9	Alkalinity as $CaCO_3$	mg/l	12
10	Total Hardness as $CaCO_3$	mg/l	68.0
11	Nitrates NO_3	mg/l	0.17
12	Phosphates PO_4	mg/l	0.03
13	Chlorides as Cl	mg/l	7.73
14	Sulphates as SO_4^{2-}	mg/l	2
15	Sodium as Na.	mg/l	5.33
16	Potassium as K	mg/l	0.04
17	Calcium as Ca	mg/l	20.8
18	Magnesium as Mg	mg/l	3.84
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.05
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.30
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	9

BDL: Below Detectable Limit mg/l: - Milligram per liter

MINE ACCUMULATED WATER

Location Name	:	Mine Accumulated Water			
Date	:	23.11.2017	**Sample Type**	:	Surface Water

Sl. No.	Parameter	Unit	Result
1	Odour		Un-objectionable
2	Taste		Agreeable
3	Colour	Hazen Units	<5
4	pH		6.88
5	Turbidity	NTU	<5
6	Dissolved Oxygen	mg/l	7.40
7	Total Dissolved Solids	mg/l	34.98
8	Total Suspended Solids	mg/l	22
9	Alkalinity as $CaCO_3$	mg/l	16
10	Total Hardness as $CaCO_3$	mg/l	62.0
11	Nitrates NO_3	mg/l	0.2
12	Phosphates PO_4	mg/l	0.01
13	Chlorides as Cl	mg/l	9.5
14	Sulphates as SO_4^{2-}	mg/l	0.4
15	Sodium as Na.	mg/l	2.68
16	Potassium as K	mg/l	0.11
17	Calcium as Ca	mg/l	13.1
18	Magnesium as Mg	mg/l	6.72
19	Lead (Pb)	mg/l	BDL
20	Manganese as Mn	mg/l	0.03
21	Cadmium (Cd)	mg/l	BDL
22	Chromium (Cr)	mg/l	BDL
23	Copper (Cu)	mg/l	BDL
24	Zinc (Zn)	mg/l	BDL
25	Iron as Fe	mg/l	0.29
26	Fluoride as F	mg/l	0.01
27	Mercury as (Hg)	mg/l	BDL
28	Selenium as Se	mg/l	BDL
29	Arsenic as As	mg/l	BDL
30	Cyanide as CN	mg/l	BDL
31	Boron as B	mg/l	BDL
32	B.O.D (3 days 27°C)	mg/l	10

DOMESTIC EFFLUENT ANALYSIS

Sample Type: **Canteen waste water**

Date of sampling: 23.11.2017

Sl.No	Test	Result
1	**Total Suspended Solids, mg/l**	**67**
2	**Total Dissolved Solids, mg/l**	**98**
3	**COD, mg/l**	**12**
4	**BOD for 3 days at 27°C, mg/l**	**9**
5	**Total Solids**	**90**
6	**Oil and Grease, mg/l**	**5**

Sample Type: **Canteen waste water**

Date of sampling: 24.11.2017

Sl.No	Test	Result
1	**Total Suspended Solids, mg/l**	**88**
2	**Total Dissolved Solids, mg/l**	**100**
3	**COD, mg/l**	**12**
4	**BOD for 3 days at 27°C, mg/l**	**7**
5	**Total Solids**	**87**
6	**Oil and Grease, mg/l**	**5**

RESULTS & DISCUSSION

→ The pH of the study area varies from 6.54 to 6.97 in the study area. The permissible range of pH is 6.5 to 8.5.

→ Dissolved Oxygen content of the study area has been found to be in the range of 4.90 to 7.20.

→ Total Dissolved Solids found to be in the range of 31.5 to 111.30 mg/l in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 500 mg/l and maximum permissible limit is 2000 mg/l.

→ Alkalinity as $CaCO_3$ is found to be in the range of 9.30 to 36.4 in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 200 mg/l and maximum permissible limit is 600 mg/l.

→ Total hardness as $CaCO_3$ of the water sample collected in the study area is found to in the range of 16.7 to 64.0 mg/l. As per IS 10500 standard for drinking water, the desirable limit is 300 mg/l and maximum permissible limit is 600 mg/l.

→ Chloride content of the water in the study area found to be in the range of 8.0 to 32.0 mg/l. As per IS 10500 standard for drinking water, the desirable limit 250 mg/l and maximum permissible limit is 1000 mg/l.

→ Calcium content of the water in the study area found to be in the range of 3.9 to 16.4 mg/l. As per IS 10500 standard for drinking water, the desirable limit 75 mg/l and maximum permissible limit is 200 mg/l.

→ Magnesium content of the water in the study area found to be in the range of 1.7 to 5.6 mg/l.

→ Iron content of the water in the study area found to be in the range of 0.12 to 0.21 mg/l. As per IS 10500 standard for drinking water, the desirable limit 0.3 mg/l and maximum permissible limit is 1.0 mg/l.

BHAGAVATHI ANA LABS PVT. LTD.

DRINKING WATER STANDARDS AS PER IS: 10500

Sl. NO	PARAMETER	UNIT	DESIRABLE LIMIT AS PER IS: 10500	MAXIMUM PERMISSIBLE LIMIT AS PER IS: 10500
1	Odour		Un-objectionable	
2	Taste		Agreeable	
3	Colour	Hazen Units	5	25
4	pH		6.5 –8.5	
5	Turbidity	NTU	5	10
6	Dissolved Oxygen	mg /l	-----	
7	Total Dissolved Solids	mg /l	500	2000
8	Alkalinity as CaCo3	mg /l	200	600
9	Total hardness as CaCo3	mg /l	300	600
10	Nitrates NO3	mg /l	45	100
11	Phosphates PO4	mg /l	-----	
12	Chlorides as Cl	mg /l	250	1000
13	Sulphates, SO42-	mg /l	200	400
14	Sodium as Na	mg /l	-----	
15	Potassium as K	mg /l	-----	
16	Calcium as Ca	mg /l	75	200
17	Magnesium, Mg	mg /l	30	100
18	Lead (Pb)	mg /l	0.05	0.05
19	Manganese	mg /l	0.1	0.3
20	Cadmium (Cd)	mg /l	0.01	0.01
21	Chromium (Cr)	mg /l	0.05	0.05
22	Copper (Cu)	mg /l	0.05	1.5
23	Zinc (Zn)	mg /l	5	15
24	Iron as Fe	mg /l	0.3	1.0
25	Fluoride as F	mg /l	1	1.5
26	Mercury as Hg	mg /l	0.001	0.001
27	Selenium as se	mg /l	0.01	0.01
28	Arsenic as As	mg /l	0.05	0.05
29	Cyanide as CN	mg/l	0.05	0.05
30	Boron as B	mg/l	1	5

DURGAMANWADI MINES

WELL DEPTHS OF VILLAGES

S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
				23.11.2017
1	PADSALI VILLAGE	**DMW**	7.00	3.5
2	CHAVANWADI VILLAGE	**DMW**	2.80	1.17

AMBIENT AIR QUALITY

Station: A1, CORE ZONE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3 24 hrs Average	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	93.0	28.5	7.4	11.4
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	75.0	22.9	6.3	8.2
4		15/09/2017	104.0	31.9	8.5	11.8
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	99.0	29.7	7.9	10.9
7		26/09/2017	112.0	34.1	9.3	12.5
8		28/09/2017	103.0	31.4	8.6	11.5
1	Oct-17	03/10/2017	112.0	34.1	9.2	12.5
2		06/10/2017	100.2	30.9	8.1	11.4
3		10/10/2017	107.9	32.7	8.5	11.9
4		13/10/2017	79.8	24.5	6.8	9.6
5		17/10/2017	99.6	30.3	8.0	11.1
6		20/10/2017	99.3	29.8	7.9	11.0
7		24/10/2017	116.3	35.4	9.7	13.0
8		27/10/2017	106.1	32.4	8.9	11.9
1	Nov-17	07/11/2017	118.5	36.5	9.9	13.4
2		09/11/2017	98.1	29.9	7.8	11.0
3		14/11/2017	101.9	31.5	8.1	11.5
4		16/11/2017	83.7	25.2	7.0	9.1
5		21/11/2017	96.7	29.4	7.8	10.8
6		23/11/2017	95.2	28.7	7.6	10.5
7		28/11/2017	119.4	36.7	10.0	13.6
8		30/11/2017	109.7	33.2	9.1	12.3

	Min		**75.0**	**22.9**	**6.3**	**8.2**
	Max		**119.4**	**36.7**	**10.0**	**13.6**
	Mean		**101.4**	**30.9**	**8.3**	**11.4**
	10th percentile		**84.6**	**25.5**	**7.0**	**9.7**
	30th percentile		**98.4**	**29.7**	**7.8**	**11.0**
	50th percentile		**101.1**	**31.1**	**8.1**	**11.4**
	95th percentile		**118.4**	**36.4**	**9.9**	**13.4**
	98th percentile		**119.0**	**36.6**	**10.0**	**13.5**

BDL: BELOW DETECTABLE LIMIT

AMBIENT AIR QUALITY

Station: A2, NEAR MINES OFFICE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	116.0	40.4	8.2	11.2
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	106.0	36.9	8.0	10.1
4		15/09/2017	157.0	54.0	11.4	15.4
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	234.0	80.1	12.1	16.0
7		26/09/2017	207.0	70.7	12.5	16.6
8		28/09/2017	109.0	38.0	7.9	10.3
1	Oct-17	03/10/2017	123.4	42.1	8.6	11.7
2		06/10/2017	130.3	44.8	9.1	12.3
3		10/10/2017	106.9	36.6	7.9	9.9
4		13/10/2017	157.0	54.2	11.4	15.5
5		17/10/2017	193.7	66.0	10.4	14.1
6		20/10/2017	238.3	81.7	13.2	17.6
7		24/10/2017	210.6	72.3	11.7	15.5
8		27/10/2017	103.4	36.0	7.5	9.6
1	Nov-17	07/11/2017	120.7	41.6	8.5	11.6
2		09/11/2017	124.3	42.8	8.7	11.7
3		14/11/2017	107.1	36.7	8.0	10.0
4		16/11/2017	158.0	54.0	11.4	15.4
5		21/11/2017	191.1	65.7	10.3	14.0
6		23/11/2017	241.5	82.3	11.3	15.0
7		28/11/2017	214.2	73.6	11.9	15.8
8		30/11/2017	107.4	36.9	7.7	9.9

	Min		**103.4**	**36.0**	**7.5**	**9.6**
	Max		**241.5**	**82.3**	**13.2**	**17.6**
	Mean		**157.1**	**54.0**	**9.9**	**13.2**
	10th percentile		**107.0**	**36.7**	**7.9**	**9.9**
	30th percentile		**117.4**	**40.7**	**8.3**	**11.3**
	50th percentile		**143.7**	**49.4**	**9.7**	**13.2**
	95th percentile		**238.1**	**81.7**	**12.5**	**16.6**
	98th percentile		**240.2**	**82.1**	**12.9**	**17.2**

AMBIENT AIR QUALITY

Station: A3,NEAR HAULAGE ROAD						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m³)	NO_x (µg/m³)
			µg/m³	µg/m³	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	95.4	32.5	4.5	9.8
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	88.7	30.9	4.4	9.2
4		15/09/2017	91.1	31.7	4.6	9.9
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	102.9	35.0	4.9	10.5
7		26/09/2017	133.8	46.4	6.4	14.4
8		28/09/2017	129.5	44.3	6.3	13.2
1	Oct-17	03/10/2017	102.8	35.7	5.2	11.1
2		06/10/2017	121.5	42.1	6.2	13.5
3		10/10/2017	88.9	30.4	4.2	9.1
4		13/10/2017	91.6	32.0	4.4	9.9
5		17/10/2017	89.8	30.7	4.4	9.2
6		20/10/2017	107.5	36.7	5.3	11.4
7		24/10/2017	136.8	46.6	6.7	14.8
8		27/10/2017	124.1	42.6	6.0	12.8
1	Nov-17	07/11/2017	100.2	34.4	4.7	10.7
2		09/11/2017	129.8	39.1	5.5	11.7
3		14/11/2017	88.9	30.5	4.4	9.5
4		16/11/2017	91.9	31.2	4.6	10.0
5		21/11/2017	87.7	31.0	4.3	9.6
6		23/11/2017	110.8	38.6	5.5	12.3
7		28/11/2017	140.8	48.3	6.7	14.1
8		30/11/2017	127.5	43.6	6.4	13.7

	Min		87.7	30.4	4.2	9.1
	Max		140.8	48.3	6.7	14.8
	Mean		108.3	37.0	5.3	11.4
	10th percentile		88.9	30.8	4.4	9.2
	30th percentile		91.7	31.8	4.5	9.9
	50th percentile		102.9	35.3	5.0	10.9
	95th percentile		136.7	46.6	6.7	14.4
	98th percentile		139.1	47.6	6.7	14.6

AMBIENT AIR QUALITY

Station: A4, PADSALI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	89.0	28.5	6.4	8.6
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	107.0	33.3	8.9	10.2
4		15/09/2017	134.0	42.1	9.9	13.4
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	133.0	41.7	10.0	14.2
7		26/09/2017	156.0	49.0	11.9	15.8
8		28/09/2017	134.0	41.6	9.9	13.0
1	Oct-17	03/10/2017	89.2	28.1	6.8	8.5
2		06/10/2017	106.3	33.2	7.4	10.0
3		10/10/2017	111.1	35.1	8.6	10.9
4		13/10/2017	129.7	40.8	10.6	12.9
5		17/10/2017	173.6	53.9	11.4	13.8
6		20/10/2017	137.9	43.8	10.5	13.8
7		24/10/2017	156.5	48.8	11.8	15.7
8		27/10/2017	128.5	40.6	10.4	12.7
1	Nov-17	07/11/2017	86.5	27.5	6.1	8.3
2		09/11/2017	100.1	31.4	7.9	9.4
3		14/11/2017	114.5	36.3	8.9	11.3
4		16/11/2017	127.0	40.2	10.7	12.7
5		21/11/2017	171.5	53.9	11.0	13.8
6		23/11/2017	141.2	44.6	10.7	14.1
7		28/11/2017	157.4	49.1	11.9	15.8
8		30/11/2017	132.3	41.9	9.9	13.1

	Min		**86.5**	**27.5**	**6.1**	**8.3**
	Max		**173.6**	**53.9**	**11.9**	**15.8**
	Mean		**128.0**	**40.3**	**9.6**	**12.4**
	10th percentile		**90.3**	**28.8**	**6.9**	**8.7**
	30th percentile		**112.1**	**35.5**	**8.9**	**11.0**
	50th percentile		**131.0**	**41.2**	**10.0**	**12.9**
	95th percentile		**170.8**	**53.6**	**11.9**	**15.8**
	98th percentile		**172.8**	**53.9**	**11.9**	**15.8**

AMBIENT AIR QUALITY

Station: A 5, DURGAMANWADI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m³)	NO_x (µg/m³)
			µg/m³	µg/m³	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	107.0	34.8	7.9	9.1
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	123.0	40.2	9.9	14.7
4		15/09/2017	103.0	33.5	7.8	12.0
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	113.0	36.7	8.7	13.2
7		26/09/2017	105.0	34.4	8.2	12.4
8		28/09/2017	104.0	33.8	7.9	11.9
1	Oct-17	03/10/2017	114.0	37.2	8.5	13.5
2		06/10/2017	128.6	41.1	9.4	14.8
3		10/10/2017	127.9	41.7	10.2	15.2
4		13/10/2017	108.0	34.8	8.1	12.6
5		17/10/2017	114.9	37.2	8.7	13.6
6		20/10/2017	117.9	38.2	9.1	13.8
7		24/10/2017	108.3	35.1	8.4	12.7
8		27/10/2017	109.0	35.1	8.2	12.5
1	Nov-17	07/11/2017	111.5	36.5	8.4	13.2
2		09/11/2017	121.9	39.5	9.0	14.2
3		14/11/2017	131.8	42.6	10.5	15.6
4		16/11/2017	111.9	36.0	8.4	13.0
5		21/11/2017	112.0	36.2	8.4	13.2
6		23/11/2017	121.1	39.6	9.5	14.3
7		28/11/2017	112.0	36.5	8.7	13.2
8		30/11/2017	112.8	36.3	8.5	13.0

	Min		103.0	33.5	7.8	9.1
	Max		131.8	42.6	10.5	15.6
	Mean		114.5	37.1	8.7	13.3
	10th percentile		105.2	34.5	8.0	12.1
	30th percentile		109.8	35.4	8.4	12.8
	50th percentile		112.4	36.5	8.5	13.2
	95th percentile		128.6	41.7	10.2	15.2
	98th percentile		130.5	42.2	10.4	15.5

AMBIENT AIR QUALITY

Station: A6, KARIWADE VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	104.0	33.1	6.6	11.1
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	112.0	35.1	7.6	11.8
4		15/09/2017	113.0	35.9	7.3	12.2
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	109.0	34.5	7.0	11.7
7		26/09/2017	101.0	32.2	6.7	10.7
8		28/09/2017	104.0	32.8	6.9	11.0
1	Oct-17	03/10/2017	123.0	38.2	7.9	12.8
2		06/10/2017	111.1	34.5	6.9	11.7
3		10/10/2017	110.9	35.2	6.9	11.7
4		13/10/2017	116.6	36.3	7.9	12.3
5		17/10/2017	118.1	36.8	7.5	12.5
6		20/10/2017	116.0	36.5	7.5	12.5
7		24/10/2017	105.8	33.7	7.1	11.2
8		27/10/2017	107.6	33.5	7.1	11.3
1	Nov-17	07/11/2017	117.6	37.3	7.8	12.5
2		09/11/2017	108.4	34.6	6.9	11.7
3		14/11/2017	104.7	32.7	6.4	10.7
4		16/11/2017	119.6	37.6	8.2	12.8
5		21/11/2017	122.0	38.7	8.0	13.3
6		23/11/2017	119.9	38.2	7.8	13.1
7		28/11/2017	109.3	34.4	7.2	11.5
8		30/11/2017	110.7	34.9	7.4	11.8

	Min		**101.0**	**32.2**	**6.4**	**10.7**
	Max		**123.0**	**38.7**	**8.2**	**13.3**
	Mean		**112.0**	**35.3**	**7.3**	**11.9**
	10th percentile		**104.1**	**32.9**	**6.7**	**11.0**
	30th percentile		**108.6**	**34.5**	**7.0**	**11.6**
	50th percentile		**111.0**	**35.0**	**7.3**	**11.8**
	95th percentile		**121.9**	**38.2**	**8.0**	**13.1**
	98th percentile		**122.6**	**38.5**	**8.1**	**13.2**

AMBIENT AIR QUALITY

Station: A7, MANBET VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	101.0	30.2	6.8	12.5
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	105.0	31.3	7.6	12.9
4		15/09/2017	107.0	31.7	7.3	15.5
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	111.0	33.1	7.8	13.6
7		26/09/2017	121.0	35.5	8.5	16.4
8		28/09/2017	112.0	32.8	7.7	15.9
1	Oct-17	03/10/2017	108.8	32.5	7.4	13.5
2		06/10/2017	105.3	31.2	6.9	15.0
3		10/10/2017	109.1	32.1	7.8	13.2
4		13/10/2017	112.4	33.4	7.7	13.9
5		17/10/2017	113.9	34.0	7.9	14.3
6		20/10/2017	115.0	33.4	7.9	13.8
7		24/10/2017	124.7	36.3	8.7	11.3
8		27/10/2017	118.8	34.6	8.1	8.8
1	Nov-17	07/11/2017	106.4	31.8	7.2	13.2
2		09/11/2017	98.5	29.0	6.4	11.6
3		14/11/2017	112.2	32.6	7.9	13.5
4		16/11/2017	115.8	34.0	7.9	14.2
5		21/11/2017	114.4	33.7	7.8	14.1
6		23/11/2017	118.7	34.7	8.2	14.4
7		28/11/2017	128.1	37.9	9.1	11.5
8		30/11/2017	121.9	36.3	8.5	15.0

	Min		98.5	29.0	6.4	8.8
	Max		128.1	37.9	9.1	16.4
	Mean		112.8	33.3	7.8	13.5
	10th percentile		105.0	31.2	7.0	11.6
	30th percentile		108.9	32.2	7.6	13.2
	50th percentile		112.3	33.2	7.8	13.7
	95th percentile		124.6	36.3	8.7	15.9
	98th percentile		126.7	37.2	8.9	16.2

AMBIENT AIR QUALITY

Station: A 8, CHAVANWADI VILLAGE						
S.No.	Month	Date	SPM	PM 10	SO_2 (µg/m^3)	NO_x (µg/m^3)
			µg/m^3	µg/m^3	24 hrs Average	24 hrs Average
1	Sep-17	05/09/2017	103.0	30.1	6.8	11.4
2		08/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
3		12/09/2017	107.0	31.9	7.8	12.1
4		15/09/2017	101.0	29.7	6.8	11.3
5		19/09/2017	MONITORING IS NOT CARRIED OUT DUE TO RAIN			
6		22/09/2017	106.0	31.5	7.4	11.9
7		26/09/2017	107.0	31.6	7.5	12.1
8		28/09/2017	103.0	30.7	7.1	11.5
1	Oct-17	03/10/2017	110.4	32.9	7.5	12.6
2		06/10/2017	108.7	32.0	7.1	12.0
3		10/10/2017	111.4	33.1	8.1	12.6
4		13/10/2017	106.1	31.5	7.2	12.0
5		17/10/2017	109.5	32.0	7.4	12.3
6		20/10/2017	110.2	32.1	7.6	12.2
7		24/10/2017	110.2	32.6	7.8	12.5
8		27/10/2017	97.4	29.0	6.7	10.8
1	Nov-17	07/11/2017	107.7	32.0	7.2	12.2
2		09/11/2017	102.2	30.3	6.7	11.3
3		14/11/2017	115.1	33.6	8.2	12.8
4		16/11/2017	109.1	32.2	7.4	12.3
5		21/11/2017	112.6	32.7	7.6	12.6
6		23/11/2017	113.6	33.1	7.8	12.6
7		28/11/2017	113.7	33.7	8.1	13.0
8		30/11/2017	101.0	30.1	7.0	11.2

	Min		97.4	29.0	6.7	10.8
	Max		115.1	33.7	8.2	13.0
	Mean		107.5	31.8	7.4	12.1
	10th percentile		101.1	30.1	6.8	11.3
	30th percentile		106.0	31.5	7.2	11.9
	50th percentile		108.2	32.0	7.4	12.1
	95th percentile		113.7	33.6	8.1	12.8
	98th percentile		114.5	33.7	8.1	12.9

BDL for SO_2-2.0 & NO_2-4.5

NOTE: The results relate only to the conditions prevailing at the time of sampling

Method of measurement: As per CPCB Manual & IS 5182

BHAGAVATHI ANA LABS PVT. LTD. GOA