

# MONITORING OF ENVIRONMENTAL PARAMETERS

(INTERIM REPORT FOR WINTER -2020)

*FOR*

***MADHARAM DOLOMITE MINE***

**of**

**M/s. Rashtriya Ispat Nigam Limited.**

**(GOVERNMENT OF INDIA ENTERPRISE)**

**VISAKHAPATNAM STEEL PLANT**

**Madharam (V), Khammam (Dist)**

**Telangana.**

**Prepared By**

**M/s. SV ENVIRO LABS & CONSULTANTS**

**(MOEF Recognized, NABL & NABET Accredited And  
ISO 9001 Certified Laboratory)**

**Enviro House, B1, Block-B, Autonagar, Visakhapatnam -12**



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## **CHAPTER – 1**

# **INTRODUCTION**

## 1.0 INTRODUCTION

Rashtriya Ispat Nigam Limited, the corporate entity of Visakhapatnam Steel Plant is a Navratna PSE under the Ministry of Steel. Visakhapatnam Steel Plant fondly called Vizag steel. It is the first shore based Integrated Steel Plant in the country and is known for its quality products delighting the customers. It is a market leader in long products and it caters to the needs of diverse industrial sectors. It is the first Steel plant to be certified ISO 9001:2008 (presently 2015), ISO 14001:2004 (presently 2015), OHSAS 18001:2007 and ISO/IEC 27001:2013 Standards. It is also the first PSE to be certified ISO 50001:2011 – Energy Management Systems and has acquired CMMI Level 3 Certification for S/W development.

The Infrastructure of Visakhapatnam Steel Plant comprises of Coke Ovens and Coal Chemical Plant, Sinter Plant, Blast furnace, Calcining and Refractory Material Plant, Steel Melt Shop and Continuous Casting, Light and Medium Merchant Mill, Medium Merchant and Structural Mill, Wire rod mill, Steel melt shop, Thermal power plant.

Rashtriya Ispat Nigam Limited, has captive mines namely Jaggayyapeta Limestone Mine, Madharam Dolomite Mine, Garbham Manganese Mine, Saripalli Sand Mine and Kintada Quartz Mine.

RINL has retained M/s. SV ENVIRO LABS & CONSULTANTS, to carry out the environmental monitoring studies at Madharam Dolomite Mine.

This report presents the environmental monitoring data of Winter Season – February '2020 at Madharam Dolomite Mine.

## 1.1 LOCATION OF THE PROJECT

The Project site is located at Madharam Dolomite Mine of M/s. Rashtriya Ispat Nigam Limited located at Madharam-507 122 , District Khammam, Andhra Pradesh.

## **CHAPTER – 2**

### **SCOPE OF WORK**

## 2.0 SCOPE OF WORK

The scope of the studies include monitoring of the following environmental components

1. Meteorological data
2. Ambient Air Quality
3. Dustfall Rate
4. Noise Level monitoring at Work zones
5. Water quality

The parameters covered under the scope for each of the above attributes are given below:

### SCOPE OF WORK

S.No	Attribute	Scope
1.	<b>Meteorological Data</b>	<p>Collection of micrometeorological data at project site for 15 days in a season by installing an weather monitoring station at plant site covering the following parameters :</p> <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Relative humidity</li> <li>• Wind speed</li> <li>• Wind direction</li> <li>• Rainfall</li> </ul> <p><b>Frequency</b> : Micro-meteorological data for 15days continuously in a season for three seasons i.e. Post Monsoon, Winter and Summer seasons. Yearly rainfall data to be collected.</p>
2.	<b>Ambient Air Quality</b>	<p>Sampling of ambient air at 04 stations for analyzing the following parameters:</p> <ul style="list-style-type: none"> <li>• SPM</li> <li>• PM10</li> </ul>

		<ul style="list-style-type: none"> <li>• PM2.5</li> <li>• SO2</li> <li>• NOx</li> <li>• CO</li> </ul> <p><b>Frequency</b> : At each station samples will be collected on 8 hourly basis for 24hrs duration, 2days per week for two weeks alternatively in a month for three seasons i.e. Post Monsoon, Winter and Summer seasons</p>
3.	<b>Dustfall Rate</b>	<p>Collection of dustfall at 4 locations for 15days continuously in a month.</p> <ul style="list-style-type: none"> <li>• Dustfall</li> </ul> <p><b>Frequency</b> : 15 days continuously in a month for three seasons i.e. Post Monsoon, Winter and Summer seasons</p>
4.	<b>Noise Levels</b>	<p>Monitoring of noise levels at seven locations at work zones.</p> <p><b>Frequency</b> : Readings recorded on 8 hourly basis at one hour interval at all locations in a month of a season for three seasons i.e. Post Monsoon, Winter and Summer seasons.</p>
5.	<b>Water quality</b>	<p>Collection and analysis of mine discharge water/well water and treated water as per</p> <ul style="list-style-type: none"> <li>• IS 10500 (Drinking water specifications)</li> <li>• GSR 422 (E) –Inland surface water</li> </ul> <p><b>Frequency</b> : Once in a season for all the four seasons at all locations</p>



## **CHAPTER – 3**

# **METHODOLOGY**

### 3.0 METHODOLOGY

Methodologies adopted for sampling and analysis for each of the above parameters are detailed below

Methods of monitoring and analysis for various parameters

S.No	Attributes	Measurement Technique		
1.	<b>Meteorological parameters</b>	WEATHER STATION		
2.	<b>Ambient Air Quality</b>	SPM	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-IV)
		PM <sub>10</sub>	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-XXIII)
		PM <sub>2.5</sub>	Fine Particulate Sampler (Gravimetric method)	IS-5182 (Part-XXIV)
		Sulphur dioxide	Modified West and Gaeke	IS-5182 (Part-II)
		Oxides of Nitrogen	Jacob & Hochheiser	IS-5182 (Part-VI)
		CO	Grab sample	IS-5182 (Part – X)
3.	<b>Dustfall Rate</b>	IS-5182 ( Part – 1) (Gravimetric method)		
4.	<b>Noise Monitoring</b>	Pre calibrated Sound Level Meter		
5.	<b>Water Quality (Surface water, Mine discharge water, Well Water and Treated water)</b>	As per APHA 23 <sup>rd</sup> Edition'2017		

## CHAPTER – 4

# **ENVIRONMENTAL MONITORING STUDIES**

**4.0 ENVIRONMENTAL MONITORING STUDIES – FEBRUARY - 2020**

S.No	ATTRIBUTE	SCOPE	STUDIES CARRIED OUT
1.	Ambient Air Quality	Collection of ambient air at four locations.	Ambient Air samples collected at four locations at Mines Site Office - 14 <sup>th</sup> , 15 <sup>th</sup> , 25 <sup>th</sup> and 26 <sup>th</sup> February'2020 Ore Handling Plant - 14 <sup>th</sup> , 15 <sup>th</sup> , 25 <sup>th</sup> and 26 <sup>th</sup> February'2020 Loading point - 14 <sup>th</sup> , 15 <sup>th</sup> , 25 <sup>th</sup> and 26 <sup>th</sup> February'2020 Madharam Village - 16 <sup>th</sup> , 17 <sup>th</sup> , 27 <sup>th</sup> and 28 <sup>th</sup> February'2020 for SPM, PM10, PM2.5, SO2, NOx & CO.
2.	Meteorological parameters	Collection of micrometeorological data at project site for 15 days continuously	Collected for the period of 14.02.2020 to 28.02.2020.
3.	Dustfall rate	Collection of dustfall at four locations.	Dust fall samples were collected at four locations for the period of 14.02.2020 to 28.02.2020. <ul style="list-style-type: none"> <li>• Mines Site Office</li> <li>• Ore Handling Plant</li> <li>• Loading point</li> <li>• Madharam Village</li> </ul>

4.	Water Quality	Collection of Mine discharge water, Well Water and Treated water	Mangal Tanda Well water, Mine discharge water, Raw Water , Township tap water and Madharam borewell water samples have been collected on 19-02-2020.
5.	Noise Level Monitoring	Monitoring of noise levels at seven locations at work zones.	<p>Monitoring of noise levels at seven locations at work zones.</p> <ul style="list-style-type: none"> <li>• Mining Area</li> <li>• Admin Office</li> <li>• Ore Handling Plant</li> <li>• Loading Plant</li> <li>• VSP Township</li> <li>• Near Hydraulic Excavator</li> <li>• Near DTH Drill</li> </ul>

#### 4.1 METEOROLOGICAL DATA

Meteorological data was collected on hourly basis by installing a weather monitoring station at Plant site. The report depicted hereunder represents the data for 14<sup>th</sup> February to 28<sup>th</sup> February'2020.

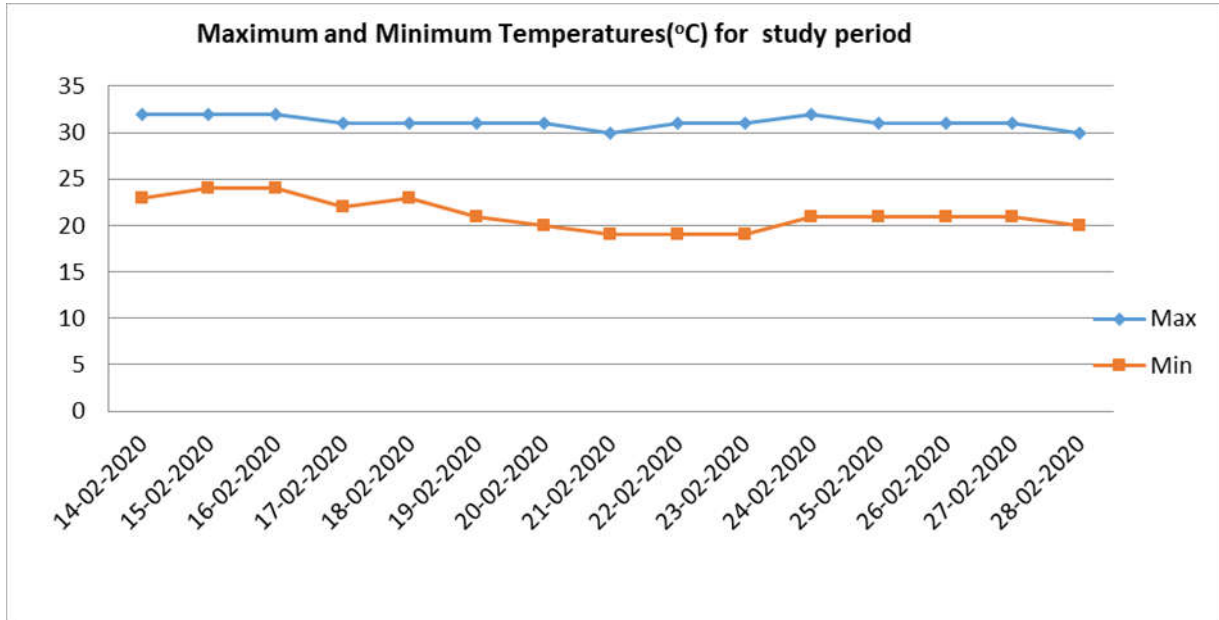
The following parameters were recorded

- Wind speed
- Wind direction
- Temperature
- Relative humidity
- Rainfall

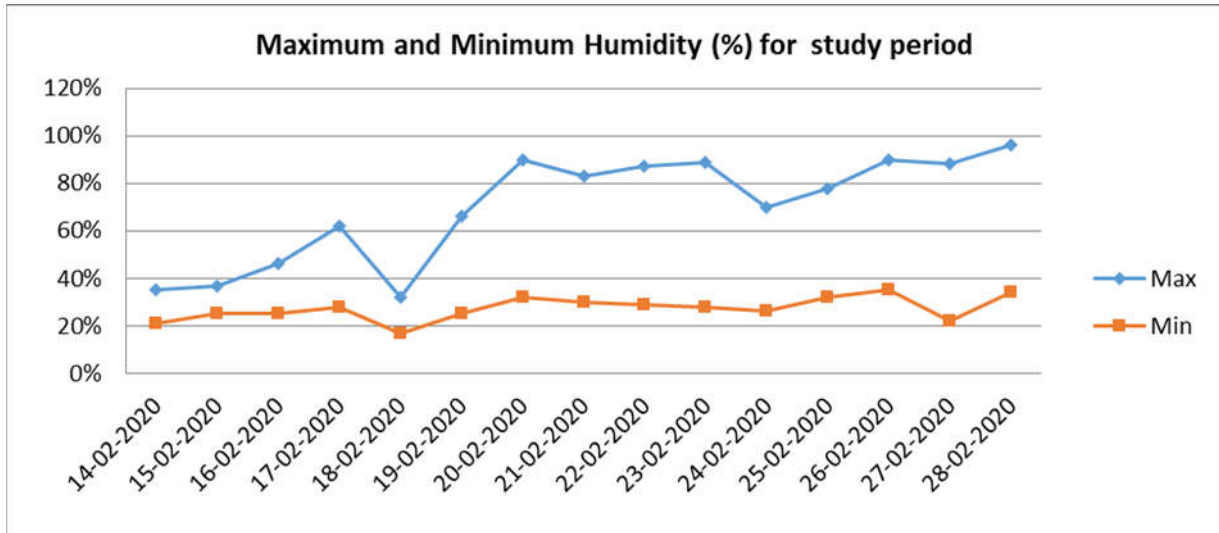
#### MINIMUM AND MAXIMUM VALUES OF RELATIVE HUMIDITY, TEMPERATURE AND RAINFALL DURING STUDY PERIOD

	Temperature in °C	Relative Humidity %	Rainfall in mm
<b>Minimum</b>	19	17	-
<b>Maximum</b>	32	96	-
<b>Mean</b>	25.5	56.5	-
<b>Total</b>	-	-	Nil

**Fig – 1 .Graphical interpretation of Minimum and Maximum values of Temperature during study period.**



**Fig – 2 .Graphical interpretation of Minimum and Maximum values of Relative Humidity during study period.**



**WIND PATTERN – February’ 2020**

<b>Duration</b>	<b>Predominant Wind directions</b>	<b>Wind rose Enclosed as</b>
00:00 – 07.00 hrs	SE	Fig – 3
08.00 – 15.00 hrs	SE	Fig – 4
16.00 – 23.00 hrs	SE	Fig – 5
00.00 – 23.00 hrs	SE	Fig – 6



Fig- 3. Wind rose diagram for 00.00 – 07.00 hrs (8hrly)

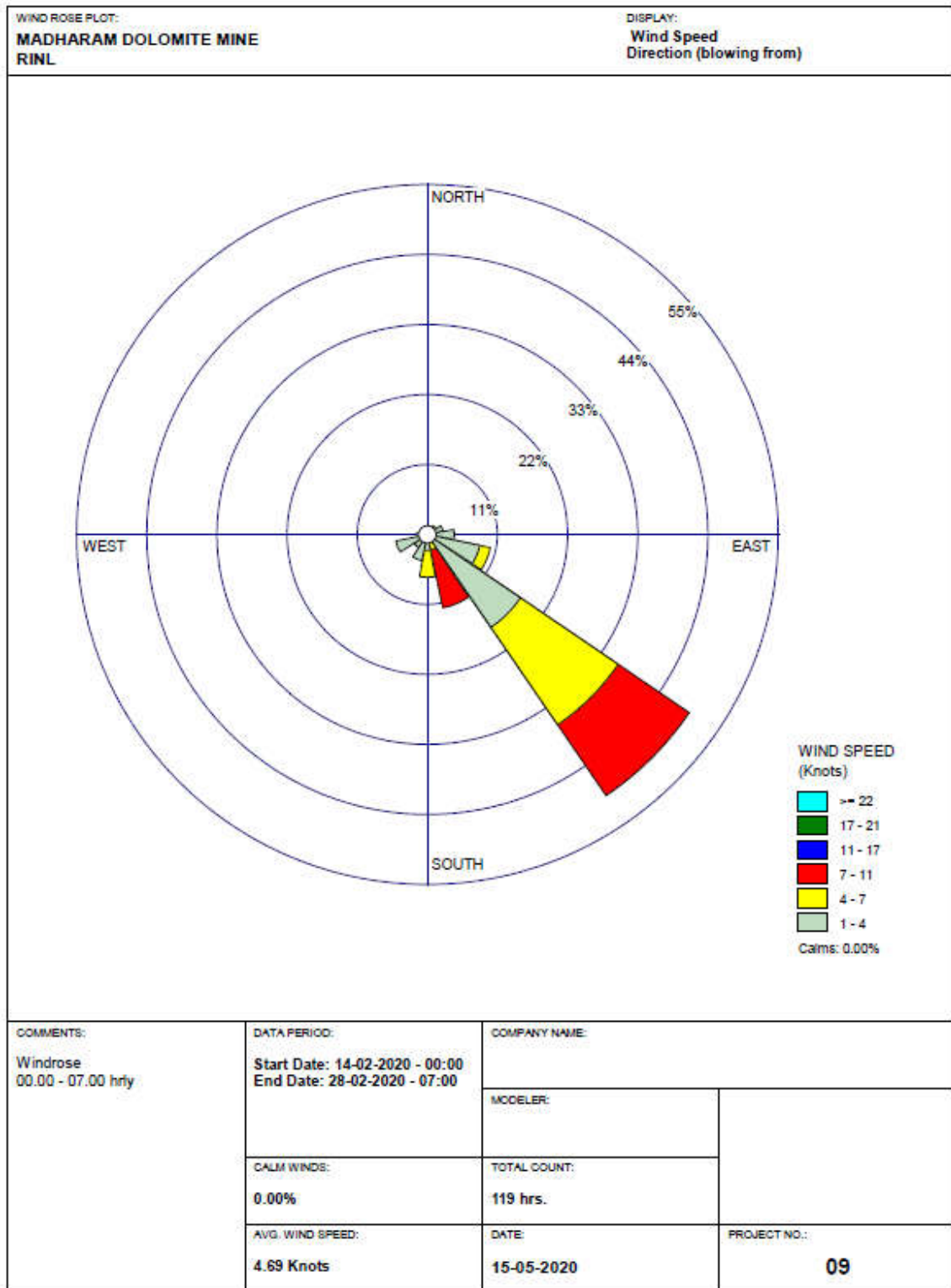


Fig –4. Wind rose diagram for 08.00 – 15.00 hrs ( 8hrly)

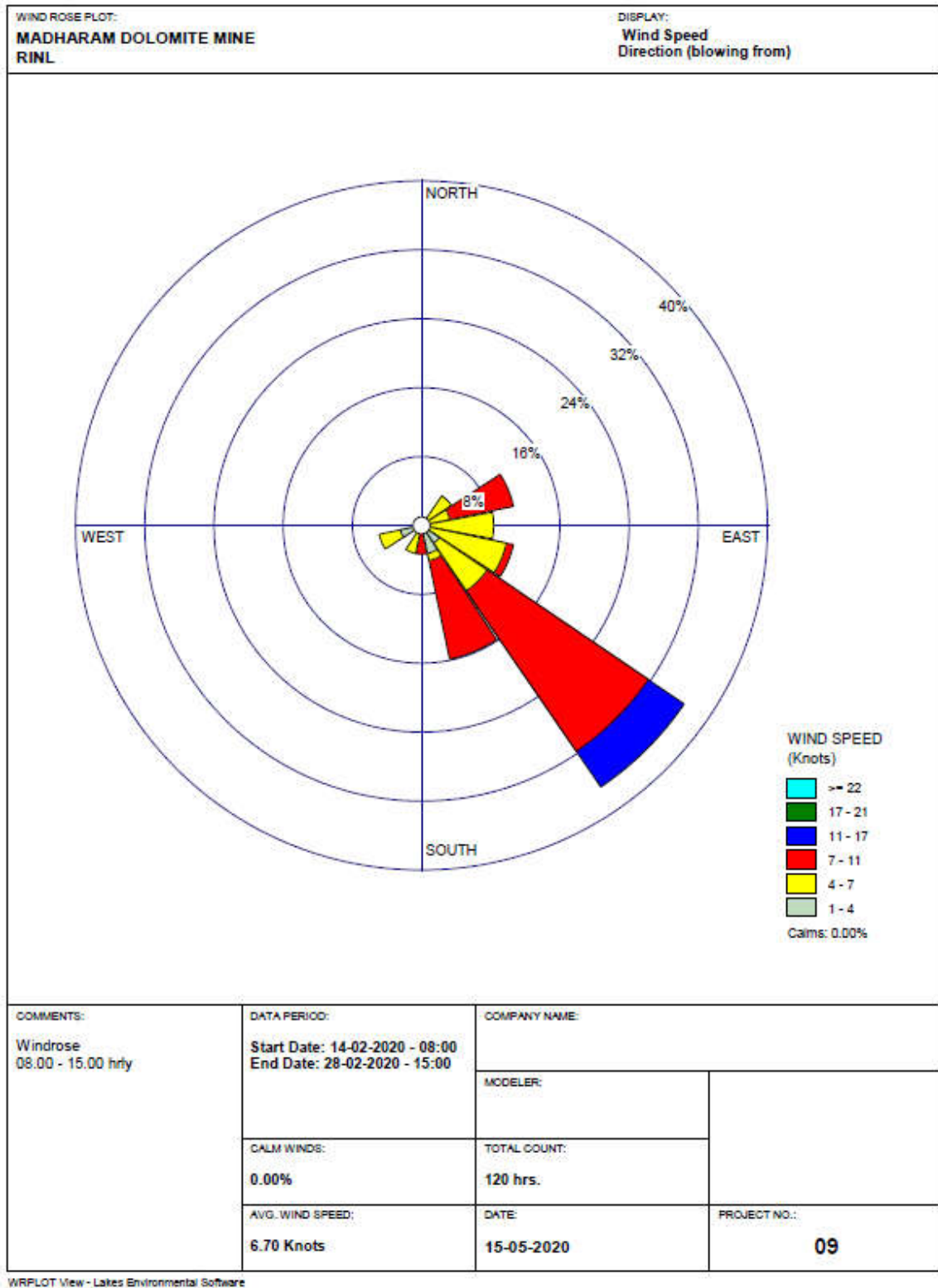


Fig – 5. Wind rose diagram for 16.00 – 23.00 hrs ( 8hrly)

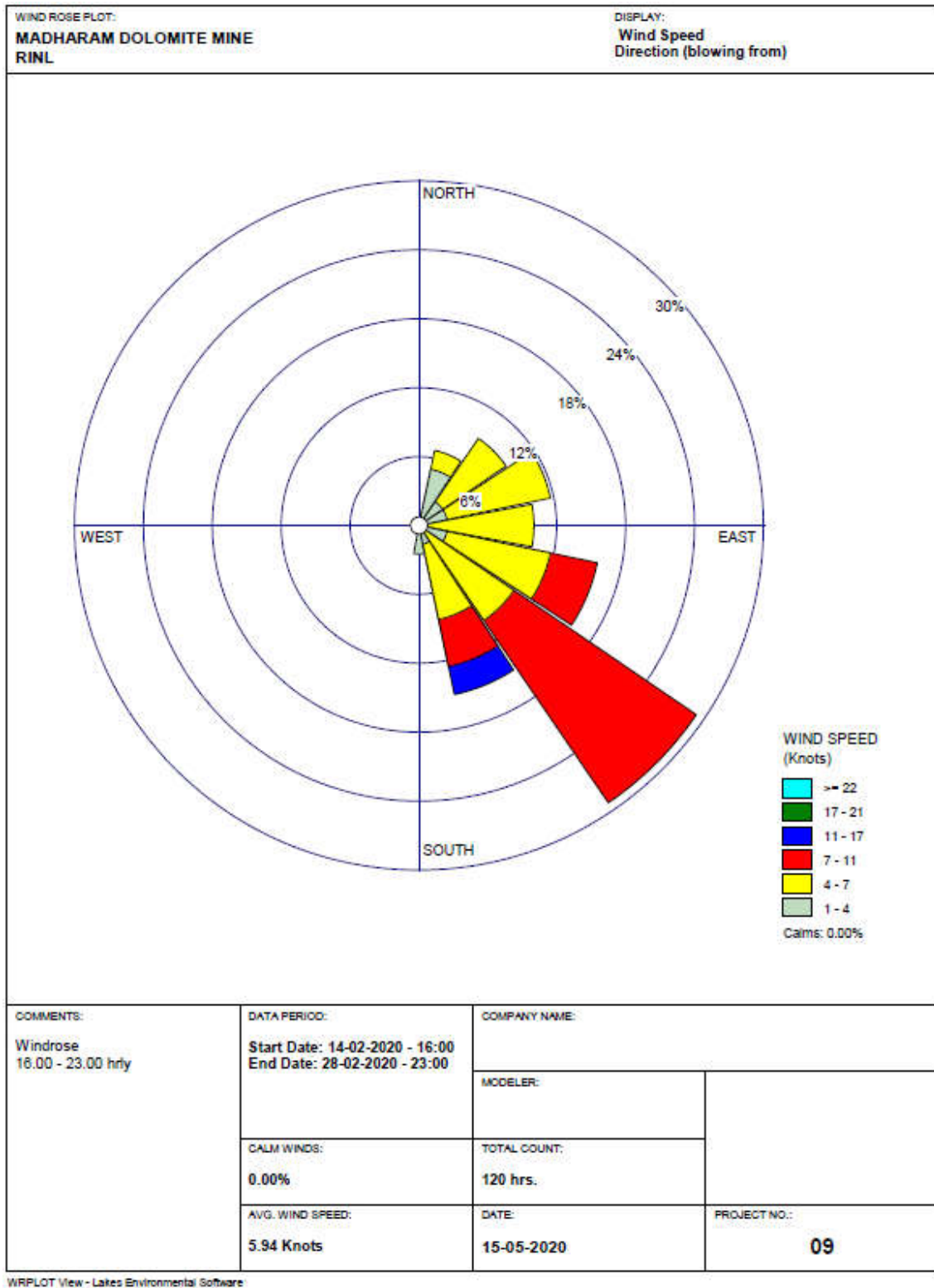
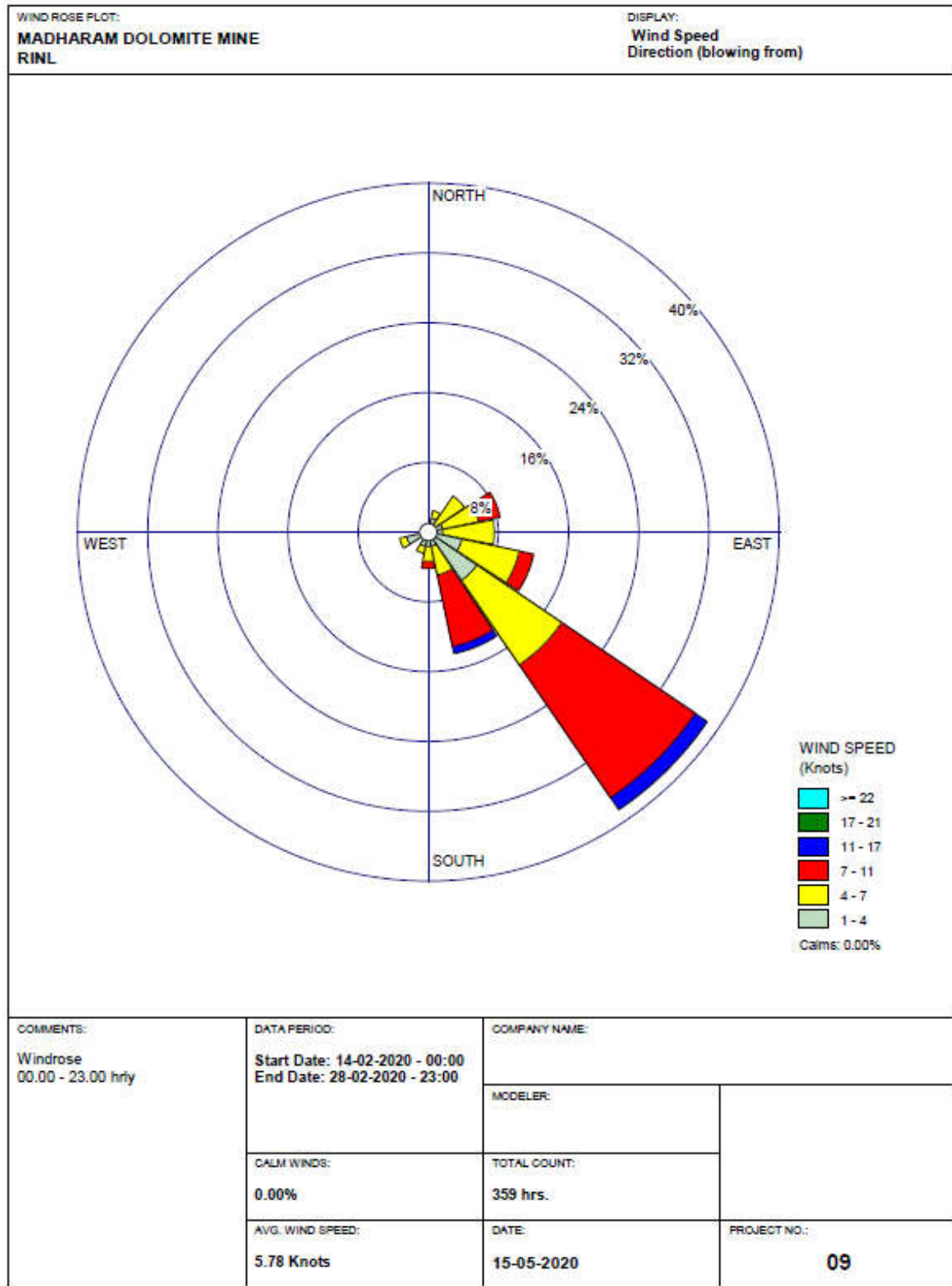


Fig –6. Wind rose diagram for 00.00 – 23.00 hrs ( 24hrly)



## WIND PERCENTAGE FREQUENCY

	Directions / Wind Classes (Knots)	01-04	04-07	07-11	11-17	17 - 21	>= 22	Total (%)
1	348.75 - 11.25	0	0	0	0	0	0	0
2	11.25 - 33.75	1.67131	0.83565	0	0	0	0	2.5
3	33.75 - 56.25	0.83565	4.17827	0	0	0	0	5
4	56.25 - 78.75	1.67131	4.17827	2.50696	0	0	0	8.33333
5	78.75 - 101.25	1.67131	5.84958	0	0	0	0	7.5
6	101.25 - 123.75	3.89972	6.68524	1.67131	0	0	0	12.2222
7	123.75 - 146.25	6.68524	11.6992	18.3844	1.67131	0	0	38.3333
8	146.25 - 168.75	1.67131	3.34262	8.35655	0.83565	0	0	14.1667
9	168.75 - 191.25	1.67131	1.67131	0.83565	0	0	0	4.16667
10	191.25 - 213.75	1.67131	0.83565	0	0	0	0	2.5
11	213.75 - 236.25	0.83565	0	0	0	0	0	0.83333
12	236.25 - 258.75	2.50696	0.83565	0	0	0	0	3.33333
13	258.75 - 281.25	0.83565	0	0	0	0	0	0.83333
14	281.25 - 303.75	0	0	0	0	0	0	0
15	303.75 - 326.25	0	0	0	0	0	0	0
16	326.25 - 348.75	0	0	0	0	0	0	0
	<b>Sub-Total</b>	25.5556	40	31.6667	2.5	0	0	99.7222
	<b>Calms</b>							0
	<b>Missing/Incomplete</b>							0.27778
	<b>Total</b>							100

## 4.2 AMBIENT AIR QUALITY MONITORING

The ambient air quality was assessed through a network of 04 AAQM stations.

The locations of ambient air quality stations are given below:

Station code	Location	Environmental setting
A1	Mine Site Office	Industrial
A2	Ore Handling Plant	Industrial
A3	Loading Point	Industrial
A4	Madharam Village	Residential

**Monitoring reports are enclosed as Annexure – I**

## 4.3 DUST FALL MEASUREMENT

Dust fall monitoring was conducted at 04 stations. Details of locations mentioned hereunder:

Station code	Location	Environmental setting
DF1	Mine Site Office	Industrial
DF2	Ore Handling Plant	Industrial
DF3	Loading Point	Industrial
DF4	Madharam Village	Residential

**Monitoring reports are enclosed as Annexure – II**

#### 4.4 NOISE LEVEL MONITORING

Noise levels were monitoring at seven locations mentioned hereunder:

Station code	Location	Environmental setting
N1	Mining Area	Industrial
N2	Administrative office	Industrial
N3	Ore Handling Plant	Industrial
N4	Loading Point	Industrial
N5	VSP Township	Residential
N6	Near Hydraulic Excavator	Industrial
N7	Near DTH Drill	Industrial

Monitoring reports are enclosed as Annexure – III

#### 4.5 WATER QUALITY

Water samples were collected at the following points.

Station code	Location	Environmental setting
W1	Tap water-Township (Raw water)	Ground Water
W2	Mangal Tanda Well Water	Ground Water
W3	Mine Discharge Water	Surface Water
W4	Madharam well Water	Ground water
W5	Township RO Outlet	Drinking water

The methodology for sample collection and preservation techniques was followed as per the Standard Operating Procedures (SOP) mentioned in table hereunder:

**Standard Operating Procedures (SOP) For Water Sampling**

Parameter	Sample Collection	Sample Size	Storage/ Preservation
pH	Grab sampling Plastic /glass container	50 ml	Refrigeration, can be stored for 7 days
Electrical Conductivity	Grab sampling Plastic /glass container	50 ml	Refrigeration, can be stored for 7 days
Total suspended solids	Grab sampling Plastic /glass container	100 ml	Refrigeration, can be stored for 7 days
Total Dissolved Solids	Grab sampling Plastic /glass container	100 ml	Refrigeration, can be stored for 7 days
BOD	Grab sampling Plastic /glass container	500 ml	Refrigeration, 48 hrs
Hardness	Grab sampling Plastic /glass container	100 ml	Add HNO <sub>3</sub> to pH<2, refrigeration; 6 months
Chlorides	Grab sampling Plastic /glass container	50 ml	Not required; 28 days
Sulphates	Grab sampling Plastic /glass container	100 ml	Refrigeration; 28 days
Nitrates	Plastic containers	100 ml	Refrigeration; 48 hrs
Fluorides	Plastic containers only	100 ml	Not required; 28 days
Alkalinity	Plastic/ glass containers	100 ml	Refrigeration; 14 days
Ammonia	Plastic/ glass containers	100 ml	Add H <sub>2</sub> SO <sub>4</sub> to pH>2, refrigeration, 28 days
Heavy Metals (Ar, Cd, Mn, Cu, Fe, Zn, Pb etc.)	Plastic/ Glass rinse with 1+1 HNO <sub>3</sub>	500 ml	Filter, add HNO <sub>3</sub> to pH>2; Grab sample; 6 months

Source: Standard Methods for the Examination of Water and Wastewater, Published By APHA, 23rd Edition, 2017



The analytical techniques used for water analysis is given in the table hereunder:

**Analytical Techniques For Water Analysis**

S.No	Parameter	Method
1.	pH	APHA, 4500-H+B, 23rd Ed., 2017
2.	Colour	APHA, 2120-C/2120-B, 23rd Ed., 2017
3.	Odour	APHA, 2150, 23rd Ed., 2017
4.	Temperature	APHA, 2550-A+B, 23rd Ed., 2017
5.	Oil & Grease	APHA, 5520-D, 23rd Ed., 2017
6.	Total Suspended Solids	APHA, 2540-D, 23rd Ed., 2017
7.	Total Dissolved Solids	APHA, 2540-C, 23rd Ed., 2017
8.	Total Residual Chlorine	APHA, 4500-Cl B, 23rd Ed., 2017
9.	Biochemical Oxygen Demand	APHA, 5210-B, 23rd Ed., 2017 4500-OC, 23rd Ed., 2017
10.	Chemical Oxygen Demand	APHA, 5220-B, 23rd Ed., 2017
11.	Free Ammonia	IS 3025
12.	Ammonical Nitrogen	APHA, 4500-NH <sub>3</sub> B, 23rd Ed., 2017
13.	Total Kjeldhal Nitrogen	APHA, 4500-Norg B, 23rd Ed., 2017
14.	Zinc	APHA, 3111-B, 23rd Ed., 2017
15.	Lead	APHA, 3111-B, 23rd Ed., 2017
16.	Cadmium	APHA, 3111-B, 23rd Ed., 2017
17.	Mercury	APHA, 3112-B, 23rd Ed., 2017
18.	Arsenic	APHA, 3114-B, 23rd Ed., 2017
19.	Copper	APHA, 3111-B, 23rd Ed., 2017
20.	Nickel	APHA, 3111-B, 23rd Ed., 2017
21.	Cyanide	APHA, 4500-CNB, 23rd Ed., 2017
22.	Fluoride	APHA, 4500-FD, 23rd Ed., 2017 (SPANDS Methods)
23.	Phosphates	APHA, 4500-PD, 23rd Ed., 2017
24.	Sulphates	APHA, 4500-SO <sub>4</sub> <sup>2-</sup> E, 23rd Ed., 2017
25.	Sulphide	APHA, 4500-S <sup>2-</sup> , 23rd Ed., 2017
26.	Manganese	APHA, 3111-B, 23rd Ed., 2017
27.	Iron	APHA, 3111-B, 23rd Ed., 2017
28.	Phenolic Compounds	APHA, 5530-B, 23rd Ed., 2017
29.	Bio Assay Test	IS 6582

Analysis results of the water samples collected from the above locations are enclosed as **Annexure – IV.**

**ANNEXURE – I**  
**(Ambient Air Monitoring Reports)**



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Ref: SVELC/RIL-MDM/20-02/01

Date: 14-03-2020

**NAME AND ADDRESS** : **M/s. MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District , Telangana.

**SAMPLE PARTICULARS** : **AMBIENT AIR QUALITY**

**SOURCE OF COLLECTION** : **LOADING AREA**

**DURATRION OF SAMPLING** : **24 Hrs**

**ATMOSPHERE CONDITION** : **Clear Sky**

## TEST REPORT

Date of Monitoring	Week	SPM ( $\mu\text{g}/\text{m}^3$ )	PM10 ( $\mu\text{g}/\text{m}^3$ )	PM2.5 ( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	NO2 ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )
14.02.2020	I	239	81.2	45.6	11.9	16.1	0.43
15.02.2020	I	221	80.4	43.6	11.5	15.8	0.42
25.02.2020	II	248	83.6	46.7	12.2	16.3	0.45
26.02.2020	II	255	84.8	46.2	12.0	16.0	0.49
<b>Maximum</b>		255	84.8	46.7	12.2	16.3	0.49
<b>Minimum</b>		221	80.4	43.6	11.5	15.8	0.42
<b>Average</b>		240	82.5	45.5	11.9	16.1	0.45
<b>IBM Standards</b>		<b>700</b>	-	-	-	-	-
<b>CPCB Standards</b>		-	<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>



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Ref: SVELC/RIL-MDM/20-02/02

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

SAMPLE PARTICULARS : AMBIENT AIR QUALITY

SOURCE OF COLLECTION : MINE SITE OFFICE

DURATRION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

## TEST REPORT

Date of Monitoring	Week	SPM ( $\mu\text{g}/\text{m}^3$ )	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )
14.02.2020	I	186	11.9	14.6	0.40
15.02.2020	I	192	12.3	14.8	0.44
25.02.2020	II	198	12.7	15.0	0.46
26.02.2020	II	202	12.7	15.1	0.45
Maximum		202	12.7	15.1	0.46
Minimum		186	11.9	14.6	0.4
Average		194	12.4	14.9	0.44
IBM Standards		700	-	-	-
CPCB Standards		-	80	80	4

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Ref: SVELC/RIL-MDM/20-02/03

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District, Telangana.

SAMPLE PARTICULARS : AMBIENT AIR QUALITY

SOURCE OF COLLECTION : ORE HANDLING AREA

DURATION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

## TEST REPORT

Date of Monitoring	Week	SPM ( $\mu\text{g}/\text{m}^3$ )	PM10 ( $\mu\text{g}/\text{m}^3$ )	PM2.5 ( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	NO2 ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )
14.02.2020	I	218	86.3	43.5	12.8	16.1	0.55
15.02.2020	I	208	83.9	44.0	12.5	16.0	0.52
25.02.2020	II	195	81.9	40.1	13.1	16.0	0.50
26.02.2020	II	230	86.0	43.9	13.3	16.3	0.56
Maximum		230	86.3	44	13.3	16.3	0.56
Minimum		195	81.9	40.1	12.5	16	0.5
Average		212	84.5	42.9	12.9	16.1	0.53
IBM Standards		700	-	-	-	-	-
CPCB Standards		-	100	60	80	80	4

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(Environmental Engineers & Consultants in Pollution Control)

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Ref: SVELC/RIL-MDM/20-02/04

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District, Telangana.

SAMPLE PARTICULARS : AMBIENT AIR QUALITY

SOURCE OF COLLECTION : MADHARAM VILLAGE

DURATRION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

## TEST REPORT

Date of Monitoring	Week	SPM ( $\mu\text{g}/\text{m}^3$ )	PM10 ( $\mu\text{g}/\text{m}^3$ )	PM2.5 ( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	NO2 ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )
16.02.2020	I	133	66.3	24.1	10.9	13.1	0.33
17.02.2020	I	142	67.0	24.8	11.2	13.9	0.35
27.02.2020	II	146	65.2	26.6	11.3	13.9	0.34
28.02.2020	II	135	65.0	25.1	11.0	12.8	0.35
Maximum		146	67	26.6	11.3	13.9	0.35
Minimum		133	65	24.1	10.9	12.8	0.33
Average		139	65.9	25.2	11.1	13.4	0.34
IBM Standards		700	-	-	-	-	-
CPCB Standards		-	100	60	80	80	4

4.5/11

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**ANNEXURE – II**  
**(Dustfall Monitoring Reports)**





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Ref: SVELC/RIL-MDM/20-02/05

Date: 14-03-2020

**NAME AND ADDRESS** : **M/s. MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

**SAMPLE PARTICULARS** : **DUSTFALL**

**SOURCE OF COLLECTION** : **LOADING AREA**

**ATMOSPHERE CONDITION** : **Clear Sky**

## TEST REPORT

S.No	Parameters	Unit	Result
1	Insoluble Particles	Tons/Km <sup>2</sup> /Month	3.93
2	Soluble Particles	Tons/Km <sup>2</sup> /Month	4.62
3	Total Particles	Tons/Km <sup>2</sup> /Month	8.55

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Ref: SVELC/RIL-MDM/20-02/06

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

SAMPLE PARTICULARS : DUSTFALL

SOURCE OF COLLECTION : VSP TOWNSHIP

ATMOSPHERE CONDITION : Clear Sky

## TEST REPORT

S.No	Parameters	Unit	Result
1	Insoluble Particles	Tons/Km <sup>2</sup> /Month	3.79
2	Soluble Particles	Tons/Km <sup>2</sup> /Month	2.54
3	Total Particles	Tons/Km <sup>2</sup> /Month	6.33

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Ref: SVELC/RIL-MDM/20-02/07

Date: 14-03-2020

**NAME AND ADDRESS** : **M/s. MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

**SAMPLE PARTICULARS** : **DUSTFALL**

**SOURCE OF COLLECTION** : **MINE SITE OFFICE**

**ATMOSPHERE CONDITION** : **Clear Sky**

## TEST REPORT

S.No	Parameters	Unit	Result
1	Insoluble Particles	Tons/Km <sup>2</sup> /Month	3.01
2	Soluble Particles	Tons/Km <sup>2</sup> /Month	3.92
3	Total Particles	Tons/Km <sup>2</sup> /Month	6.93

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Ref: SVELC/RIL-MDM/20-02/08

Date: 14-03-2020

**NAME AND ADDRESS** : **M/s. MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

**SAMPLE PARTICULARS** : **DUSTFALL**

**SOURCE OF COLLECTION** : **ORE HANDLING AREA**

**ATMOSPHERE CONDITION** : **Clear Sky**

## TEST REPORT

S.No	Parameters	Unit	Result
1	Insoluble Particles	Tons/Km <sup>2</sup> /Month	3.69
2	Soluble Particles	Tons/Km <sup>2</sup> /Month	4.83
3	Total Particles	Tons/Km <sup>2</sup> /Month	8.52

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Ref: SVELC/RIL-MDM/20-02/09

Date: 14-03-2020

**NAME AND ADDRESS** : **M/s. MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

**SAMPLE PARTICULARS** : **DUSTFALL**

**SOURCE OF COLLECTION** : **MADHARAM VILLAGE**

**ATMOSPHERE CONDITION** : **Clear Sky**

## TEST REPORT

S.No	Parameters	Unit	Result
1	Insoluble Particles	Tons/Km <sup>2</sup> /Month	2.46
2	Soluble Particles	Tons/Km <sup>2</sup> /Month	1.67
3	Total Particles	Tons/Km <sup>2</sup> /Month	4.13

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**ANNEXURE – III**  
**(Noise Monitoring Reports)**



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Ref: SVELC/RIL-MDM/20-02/10

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

SAMPLE PARTICULARS : NOISE LEVEL MONITORING

DATE OF COLLECTION : 14-02-2020 To 19-02-2020

## TEST REPORT

Period	Time	Source of collection				
		Minig Area	Admin office	Ore Handling Plant	Loading Point	VSP Township
Day	6.00	49.1	48.3	48.8	56.8	45.8
	7.00	48.6	47.4	50.6	60.2	44.6
	8.00	47.4	54.6	54.3	54.3	48.3
	9.00	46.2	62.5	63.4	59.6	54.9
	10.00	65.3	59.6	65.6	65.3	58.3
	11.00	64.8	64.8	69.9	66.8	61.2
	12.00	70.6	69.3	70.2	70.2	59.6
	13.00	68.4	68.4	72.1	71.5	58.3
	14.00	60.2	61.5	71.3	70.8	57.4
	15.00	73.1	67.4	76.8	65.5	59.6
	16.00	70.4	65.2	78.9	65.6	57.8
	17.00	68.6	61.6	76.4	66.8	55.4
	18.00	67.5	62.4	75.2	68.3	57.2
	19.00	66.8	63.6	74.3	65.4	58.3
	20.00	69.5	65.5	70.2	63.6	54.8
	21.00	72.4	58.3	66.8	62.5	55.6
Night	22.00	58.3	54.6	65.4	61.2	49.8
	23.00	56.5	52.1	63.3	56.6	48.3
	24.00	54.8	49.3	60.2	55.4	46.5
	1.00	52.1	48.8	58.3	53.8	44.2
	2.00	50.6	46.5	51.2	51.6	45.8
	3.00	48.3	45.4	50.6	53.4	46.3
	4.00	46.4	43.2	48.3	49.6	44.5
	5.00	49.5	45.8	49.5	48.8	46.5
Leq Day		68.3	64.4	73.0	66.9	57.4
Leq Night		54.3	50.3	60.4	56.1	47.4

CPCB Standards for Noise levels	Day Time	Night Time
	75	70

Note :Day time shall mean from 6.00 am to 10.00 pm

Night time shall mean from 10.00 p.m. to 6.00 a.m.



AUTHORIZED SIGNATORY  
B. RAVI PRASAD





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Ref: SVELC/RIL-MDM/20-02/11

Date: 14-03-2020

NAME AND ADDRESS : M/s. MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122.  
Khammam District ,Telangana.

SAMPLE PARTICULARS : NOISE LEVEL MONITORING

DATE OF COLLECTION : 20.02.2020

## TEST REPORT

Period	Time	Source of collection	
		Near Hydraulic Excavator	Near DTH Drill
Day	6.00	53.3	46.6
	7.00	56.8	45.2
	8.00	55.1	54.3
	9.00	62.4	58.3
	10.00	66.8	65.5
	11.00	68.3	70.6
	12.00	63.4	71.2
	13.00	70.6	68.8
	14.00	68.3	67.4
	15.00	65.2	71.2
	16.00	65.4	69.9
	17.00	61.1	62.4
	18.00	59.6	58.3
	19.00	62.2	55.6
	20.00	61.3	59.4
	21.00	54.8	57.2
Night	22.00	52.6	53.8
	23.00	55.5	63.4
	24.00	54.3	52.2
	1.00	52.2	48.3
	2.00	49.6	46.5
	3.00	48.8	45.2
	4.00	46.5	49.3
	5.00	45.2	46.8
Leq Day		64.9	66.7
Leq Night		52.4	56.1

CPCB Standards for Noise levels	Day Time	Night Time
	75	70

Note :Day time shall mean from 6.00 am to 10.00 pm

Night time shall mean from 10.00 p.m. to 6.00 a.m.



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**ANNEXURE – IV**  
**(Water Analysis Reports)**





# SV ENVIRO LABS & CONSULTANTS

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Ref: SVELC/RIL-MDM/20-02/12

Date: 14-03-2020

**NAME AND ADDRESS** : **M/S.MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122  
Khammam District, Telangana.

**SAMPLE PARTICULARS** : **RAW WATER SAMPLE**

**SOURCE OF COLLECTION** : **TAP WATER - TOWN SHIP**

**DATE OF COLLECTION** : **19-02-2020**

## TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	<sup>0</sup> C	28.2	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.85	1.0
6.	pH	-	7.89	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	425	500
8.	Total Alkalinity as CaCO <sub>3</sub>	mg/l	271	200
9.	Total Hardness as CaCO <sub>3</sub>	mg/l	305	200
10.	Calcium as Ca	mg/l	52.0	75
11.	Magnesium as Mg	mg/l	42.5	30
12.	Chlorides as Cl <sup>-</sup>	mg/l	43.0	250
13.	Fluorides as F <sup>-</sup>	mg/l	0.31	1.0
14.	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	5.20	45
15.	Sulphates as SO <sub>4</sub> <sup>2-</sup>	mg/l	8.31	200
16.	Iron as Fe	mg/l	0.06	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.0005	0.001
19.	Copper as Cu	mg/l	< 0.01	0.05
20.	Manganese as Mn	mg/l	< 0.01	0.1
21.	Zinc as Zn	mg/l	0.08	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.1	0.5
24.	Sulphide as H <sub>2</sub> S	mg/l	< 0.01	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.01	0.2
26.	Barium as Ba	mg/l	< 0.1	0.7
27.	Chloramines (as Cl <sub>2</sub> )	mg/l	<1.0	4.0
28.	Ammonia as total ammonia-N	mg/l	< 0.01	0.5
29.	Mineral Oil	mg/l	< 0.01	0.5
30.	Selenium as Se	mg/l	< 0.005	0.01
31.	Silver as Ag	mg/l	< 0.01	0.1
32.	Cadmium as Cd	mg/l	<0.001	0.003
33.	Cyanide as CN	mg/l	<0.01	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001
36.	Molybdenum as Mo	mg/l	<0.01	0.07
37.	Nickel as Ni	mg/l	<0.01	0.02



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38.	Total Arsenic as As	mg/l	<0.01	0.01
39.	Total Chromium as Cr	mg/l	<0.01	0.05
40.	Polychlorinated biphenyls	mg/l	<0.0001	0.0005
41.	Polynuclear aromatic Hydrocarbons as PAH	mg/l	<0.0001	0.0001
<b>MICROBIOLOGY:</b>				
42.	<i>E. coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
43.	<i>Total coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
44.	<i>Faecal coliforms</i>	CFU/100mL	Not detected	-
<b>PESTICIDES:</b>				
45.	Alpha HCH	µg/l	BDL	0.01
46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
48.	Chlorpyrifos	µg/l	BDL	30
49.	Delta HCH	µg/l	BDL	0.04
50.	2,4- Dichlorophenoxyacetic Acid	µg/l	BDL	30
51.	DDT (o,p and p,p-Isomers of DDT, DDE and DDD)	µg/l	BDL	1.0
52.	Endosulfan (alpha, beta and Sulphate)	µg/l	BDL	0.4
53.	Ethion	µg/l	BDL	3.0
54.	Gamma-HCH (Lindane)	µg/l	BDL	2.0
55.	Isoproturon	µg/l	BDL	9.0
56.	Malathion	µg/l	BDL	190
57.	Methyl Parathion	µg/l	BDL	0.3
58.	Alachlor	µg/l	BDL	20
59.	Atrazine	µg/l	BDL	2.0
60.	Aldrin/ Dieldrin	µg/l	BDL	0.03
61.	Monocrotophos	µg/l	BDL	1.0
62.	Phorate	µg/l	BDL	2.0
<b>TRIHALOMETHANE</b>				
63.	Bromoform	mg/l	<0.05	0.1
64.	Dibromochloromethane	mg/l	<0.05	0.1
65.	Bromodichloromethane	mg/l	<0.05	0.06
66.	chloroform	mg/l	<0.05	0.2

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.02 µg/l

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Ref: SVELC/RIL-MDM/20-02/13

Date: 14-03-2020

NAME AND ADDRESS : M/S.MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122  
Khammam District, Telangana.

SAMPLE PARTICULARS : GROUND WATER

SOURCE OF COLLECTION : MANGAL TANDA WELL WATER

DATE OF COLLECTION : 19-02-2020

## TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	<sup>0</sup> C	28.3	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.89	1.0
6.	pH	-	7.82	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	448	500
8.	Total Alkalinity as CaCO <sub>3</sub>	mg/l	281	200
9.	Total Hardness as CaCO <sub>3</sub>	mg/l	310	200
10.	Calcium as Ca	mg/l	31	75
11.	Magnesium as Mg	mg/l	56.4	30
12.	Chlorides as Cl <sup>-</sup>	mg/l	42.3	250
13.	Fluorides as F	mg/l	0.41	1.0
14.	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	4.98	45
15.	Sulphates as SO <sub>4</sub> <sup>2-</sup>	mg/l	8.22	200
16.	Iron as Fe	mg/l	0.17	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.0005	0.001
19.	Copper as Cu	mg/l	< 0.01	0.05
20.	Manganese as Mn	mg/l	< 0.01	0.1
21.	Zinc as Zn	mg/l	0.46	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.1	0.5
24.	Sulphide as H <sub>2</sub> S	mg/l	< 0.01	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.01	0.2
26.	Barium as Ba	mg/l	< 0.1	0.7
27.	Chloramines (as Cl <sub>2</sub> )	mg/l	<1.0	4.0
28.	Ammonia as total ammonia-N	mg/l	< 0.01	0.5
29.	Mineral Oil	mg/l	< 0.01	0.5
30.	Selenium as Se	mg/l	< 0.005	0.01
31.	Silver as Ag	mg/l	< 0.01	0.1
32.	Cadmium as Cd	mg/l	<0.001	0.003
33.	Cyanide as CN	mg/l	<0.01	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001
36.	Molybdenum as Mo	mg/l	<0.01	0.07



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37.	Nickel as Ni	mg/l	<0.01	0.02
38.	Total Arsenic as As	mg/l	<0.01	0.01
39.	Total Chromium as Cr	mg/l	<0.01	0.05
40.	Polychlorinated biphenyls	mg/l	<0.0001	0.0005
41.	Polynuclear aromatic Hydrocarbons as PAH	mg/l	<0.0001	0.0001
<b>MICROBIOLOGY:</b>				
42.	<i>E. coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
43.	<i>Total coliforms</i>	CFU/100mL	18	Shall not be detected in 100 ml
44.	<i>Faecal coliforms</i>	CFU/100mL	Not detected	-
<b>PESTICIDES:</b>				
45.	Alpha HCH	µg/l	BDL	0.01
46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
48.	Chlorpyrifos	µg/l	BDL	30
49.	Delta HCH	µg/l	BDL	0.04
50.	2,4- Dichlorophenoxyacetic Acid	µg/l	BDL	30
51.	DDT (o,p and p,p-Isomers of DDT, DDE and DDD)	µg/l	BDL	1.0
52.	Endosulfan (alpha, beta and Sulphate)	µg/l	BDL	0.4
53.	Ethion	µg/l	BDL	3.0
54.	Gamma-HCH (Lindane)	µg/l	BDL	2.0
55.	Isoproturon	µg/l	BDL	9.0
56.	Malathion	µg/l	BDL	190
57.	Methyl Parathion	µg/l	BDL	0.3
58.	Alachlor	µg/l	BDL	20
59.	Atrazine	µg/l	BDL	2.0
60.	Aldrin/ Dieldrin	µg/l	BDL	0.03
61.	Monocrotophos	µg/l	BDL	1.0
62.	Phorate	µg/l	BDL	2.0
<b>TRIHALOMETHANE</b>				
63.	Bromoform	mg/l	<0.05	0.1
64.	Dibromochloromethane	mg/l	<0.05	0.1
65.	Bromodichloromethane	mg/l	<0.05	0.06
66.	chloroform	mg/l	<0.05	0.2

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.02 µg/l



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Ref: SVELC/RIL-MDM/20-02/13

Date: 14-03-2020

NAME AND ADDRESS : M/S.MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122  
Khammam District, Telangana.

SAMPLE PARTICULARS : WATER

SOURCE OF COLLECTION : MINE DISCHARGE WATER

DATE OF COLLECTION : 20-02-2020

## TEST REPORT

S.No	Parameter	Unit	Result	Standards as per GSR 422 (E)
1	Colour	Hazen	< 1.0	5
2	Odour	Agreeable	Agreeable	Agreeable
3	Turbidity	NTU	0.41	5 - 25
4	pH	-	7.23	5.5 to 9.0
5	Total Dissolved Solids	mg/l	65.2	500 – 2000
6	Total suspended solids	mg/l	<1.0	100
7	Fluorides as F	mg/l	0.21	2.0
8	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	< 0.01	10
9	Iron as Fe	mg/l	0.03	3.0
10	Total Residual Chlorine	mg/l	<0.1	1.0
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.0005	1.0
12	Copper as Cu	mg/l	< 0.01	3.0
13	Manganese as Mn	mg/l	<0.01	2.0
14	Zinc as Zn	mg/l	<0.01	5.0
15	Sulphide as S	mg/l	< 0.01	2.0
16	Cadmium as Cd	mg/l	<0.01	2.0
17	Lead as Pb	mg/l	<0.01	0.1
18	Mercury as Hg	mg/l	<0.001	0.01
19	Nickel as Ni	mg/l	<0.01	3.0
20	Total Arsenic as As	mg/l	<0.01	0.2
21	Total Chromium as Cr	mg/l	<0.01	2.0
22	Hexavalent chromium as Cr <sup>+6</sup>	mg/l	< 0.05	0.1
23	Vanadium as V	mg/l	<0.01	0.2
24	Ammonical nitrogen as N	mg/l	< 0.01	50
25	Free ammonia as NH <sub>3</sub>	mg/l	< 0.1	5
26	Chemical oxygen demand -COD	mg/l	<10.0	250
27	Biochemical oxygen demand –BOD	mg/l	<3.0	30
28	Oil & Grease	mg/l	<1.0	10
29	Selenium as Se	mg/l	<0.01	0.05

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017



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Ref: SVELC/RIL-MDM/20-02/14

Date: 14-03-2020

**NAME AND ADDRESS** : **M/S.MADHARAM DOLOMITE MINE,**  
Visakhapatnam Steel Plant,  
Madharam-507122  
Khammam District, Telangana.

**SAMPLE PARTICULARS** : **GROUND WATER**

**SOURCE OF COLLECTION** : **MADHARAM WELL(RAW WATER)**

**DATE OF COLLECTION** : **20-02-2020**

## TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	<sup>0</sup> C	28.0	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.60	1.0
6.	pH	-	7.86	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	453	500
8.	Total Alkalinity as CaCO <sub>3</sub>	mg/l	275	200
9.	Total Hardness as CaCO <sub>3</sub>	mg/l	315	200
10.	Calcium as Ca	mg/l	25.0	75
11.	Magnesium as Mg	mg/l	61.3	30
12.	Chlorides as Cl <sup>-</sup>	mg/l	43.5	250
13.	Fluorides as F	mg/l	0.25	1.0
14.	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	5.68	45
15.	Sulphates as SO <sub>4</sub> <sup>2-</sup>	mg/l	7.65	200
16.	Iron as Fe	mg/l	0.11	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.0005	0.001
19.	Copper as Cu	mg/l	< 0.01	0.05
20.	Manganese as Mn	mg/l	< 0.01	0.1
21.	Zinc as Zn	mg/l	0.06	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.1	0.5
24.	Sulphide as H <sub>2</sub> S	mg/l	< 0.01	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.01	0.2
26.	Barium as Ba	mg/l	< 0.1	0.7
27.	Chloramines (as Cl <sub>2</sub> )	mg/l	<1.0	4.0
28.	Ammonia as total ammonia-N	mg/l	< 0.01	0.5
29.	Mineral Oil	mg/l	< 0.01	0.5
30.	Selenium as Se	mg/l	< 0.005	0.01
31.	Silver as Ag	mg/l	< 0.01	0.1
32.	Cadmium as Cd	mg/l	<0.001	0.003
33.	Cyanide as CN	mg/l	<0.01	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001
36.	Molybdenum as Mo	mg/l	<0.01	0.07



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37.	Nickel as Ni	mg/l	<0.01	0.02
38.	Total Arsenic as As	mg/l	<0.01	0.01
39.	Total Chromium as Cr	mg/l	<0.01	0.05
40.	Polychlorinated biphenyls	mg/l	<0.0001	0.0005
41.	Polynuclear aromatic Hydrocarbons as PAH	mg/l	<0.0001	0.0001
<b>MICROBIOLOGY:</b>				
42.	<i>E. coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
43.	<i>Total coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
44.	<i>Faecal coliforms</i>	CFU/100mL	Not detected	-
<b>PESTICIDES:</b>				
45.	Alpha HCH	µg/l	BDL	0.01
46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
48.	Chlorpyrifos	µg/l	BDL	30
49.	Delta HCH	µg/l	BDL	0.04
50.	2,4- Dichlorophenoxyacetic Acid	µg/l	BDL	30
51.	DDT (o,p and p,p-Isomers of DDT, DDE and DDD)	µg/l	BDL	1.0
52.	Endosulfan (alpha, beta and Sulphate)	µg/l	BDL	0.4
53.	Ethion	µg/l	BDL	3.0
54.	Gamma-HCH (Lindane)	µg/l	BDL	2.0
55.	Isoproturon	µg/l	BDL	9.0
56.	Malathion	µg/l	BDL	190
57.	Methyl Parathion	µg/l	BDL	0.3
58.	Alachlor	µg/l	BDL	20
59.	Atrazine	µg/l	BDL	2.0
60.	Aldrin/ Dieldrin	µg/l	BDL	0.03
61.	Monocrotophos	µg/l	BDL	1.0
62.	Phorate	µg/l	BDL	2.0
<b>TRIHALOMETHANE</b>				
63.	Bromoform	mg/l	<0.05	0.1
64.	Dibromochloromethane	mg/l	<0.05	0.1
65.	Bromodichloromethane	mg/l	<0.05	0.06
66.	chloroform	mg/l	<0.05	0.2

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.02 µg/L

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Ref: SVELC/RIL-MDM/20-02/15

Date: 14-03-2020

NAME AND ADDRESS : M/S.MADHARAM DOLOMITE MINE,  
Visakhapatnam Steel Plant,  
Madharam-507122  
Khammam District, Telangana.

SAMPLE PARTICULARS : DRINKING WATER SAMPLE

SOURCE OF COLLECTION : RO OUTLET (TOWN SHIP)

DATE OF COLLECTION : 19-02-2020

## TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	<sup>0</sup> C	27.5	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.30	1.0
6.	pH	-	7.65	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	398	500
8.	Total Alkalinity as CaCO <sub>3</sub>	mg/l	255	200
9.	Total Hardness as CaCO <sub>3</sub>	mg/l	290	200
10.	Calcium as Ca	mg/l	36.0	75
11.	Magnesium as Mg	mg/l	48.6	30
12.	Chlorides as Cl <sup>-</sup>	mg/l	38.4	250
13.	Fluorides as F	mg/l	0.12	1.0
14.	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	5.55	45
15.	Sulphates as SO <sub>4</sub> <sup>2-</sup>	mg/l	7.46	200
16.	Iron as Fe	mg/l	0.04	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.0005	0.001
19.	Copper as Cu	mg/l	< 0.01	0.05
20.	Manganese as Mn	mg/l	< 0.01	0.1
21.	Zinc as Zn	mg/l	0.05	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.1	0.5
24.	Sulphide as H <sub>2</sub> S	mg/l	< 0.01	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.01	0.2
26.	Barium as Ba	mg/l	< 0.1	0.7
27.	Chloramines (as Cl <sub>2</sub> )	mg/l	<1.0	4.0
28.	Ammonia as total ammonia-N	mg/l	< 0.01	0.5
29.	Mineral Oil	mg/l	< 0.01	0.5
30.	Selenium as Se	mg/l	< 0.005	0.01
31.	Silver as Ag	mg/l	< 0.01	0.1
32.	Cadmium as Cd	mg/l	<0.001	0.003
33.	Cyanide as CN	mg/l	<0.01	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001
36.	Molybdenum as Mo	mg/l	<0.01	0.07





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37.	Nickel as Ni	mg/l	<0.01	0.02
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40.	Polychlorinated biphenyls	mg/l	<0.0001	0.0005
41.	Polynuclear aromatic Hydrocarbons as PAH	mg/l	<0.0001	0.0001
<b>MICROBIOLOGY:</b>				
42.	<i>E. coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
43.	<i>Total coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
44.	<i>Faecal coliforms</i>	CFU/100mL	Not detected	-
<b>PESTICIDES:</b>				
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46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
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49.	Delta HCH	µg/l	BDL	0.04
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51.	DDT (o,p and p,p-Isomers of DDT, DDE and DDD)	µg/l	BDL	1.0
52.	Endosulfan (alpha, beta and Sulphate)	µg/l	BDL	0.4
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56.	Malathion	µg/l	BDL	190
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<b>TRIHALOMETHANE</b>				
63.	Bromoform	mg/l	<0.05	0.1
64.	Dibromochloromethane	mg/l	<0.05	0.1
65.	Bromodichloromethane	mg/l	<0.05	0.06
66.	chloroform	mg/l	<0.05	0.2

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.02 µg/l

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