MONITORING OF ENVIRONMENTAL PARAMETERS

(INTERIM REPORT FOR WINTER SEASON -2023)

FOR

SARIPALLI SAND MINE

of

M/s. Rashtriya Ispat Nigam Limited.

(GOVERNMENT OF INDIA ENTERPRISE)
VISAKHAPATNAM STEEL PLANT
Saripalli (V), Nellimarla (M), Vizianagaram (Dist)

Andhra Pradesh.

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

TABLE OF CONTENTS

CONTENTS

LISTS OF FIGURES

LIST OF ANNEXURES

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 Saripalli Sand Mine.

This report presents the environmental monitoring data of Winter Season-2023 at Saripalli Sand Mine.

1.1 LOCATION OF THE PROJECT

The Project site is located at Saripalli Sand Mine of M/s. Rashtriya Ispat Nigam Limited located at Saripalli Village, Nellimarla Mandal, Vizianagaram District, 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.	**Meteorological Data**	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 : • Temperature • Relative humidity • Wind speed • Wind direction • Rainfall **Frequency** : 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.
2.	**Ambient Air Quality**	Sampling of ambient air at 03 stations for analyzing the following parameters: • SPM • PM10

		• PM2.5 • SO2 • NOx • CO **Frequency** : 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
3.	**Dustfall Rate**	Collection of dustfall at 3 locations for 15days continuously in a month. • Dustfall **Frequency** : Continuously in a month for three seasons i.e. Post Monsoon, Winter and Summer seasons
4.	**Noise Levels**	Monitoring of noise levels at four locations at work zones. **Frequency** : 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.
5.	**Water quality**	Collection and analysis of Surface water and well water as per • IS 10500 (Drinking water specifications) • GSR 422 (E) –Inland surface water **Frequency** : Once in a season for all the four seasons at all locations

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.	**Meteorological parameters**	WEATHER STATION		
2.	**Ambient Air Quality**	SPM	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-IV)
		PM_{10}	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-XXIII)
		$PM_{2.5}$	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.	**Dustfall Rate**	IS-5182 (Part – 1) (Gravimetric method)		
4.	**Noise Monitoring**	Pre calibrated Sound Level Meter		
5.	**Water Quality (Surface water, Mine discharge water, Well Water and Treated water)**	As per APHA 23rd Edition'2017		

CHAPTER – 4

ENVIRONMENTAL MONITORING STUDIES

4.0 ENVIRONMENTAL MONITORING STUDIES WINTER SEASON - 2022

S.No	ATTRIBUTE	SCOPE	STUDIES CARRIED OUT
1.	Ambient Air Quality	Collection of ambient air at three locations.	Ambient Air samples collected at three locations at Mining Area - 06th, 07th, 20th, 21st February'2023. Kudipi Village - 06th, 07th, 20th, 21st February'2023. Saripalli Village - 06th, 07th, 20th, 21st February'2023. 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 06.02.2023 to 21.02.2023.
3.	Dustfall rate	Collection of dustfall at three locations.	Dust fall samples were collected at three locations for the period of 01.02.2023 to 28.02.2023. • Mining Area • Kudipi Village • Saripalli Village

4.	Water Quality	Collection of Surface water and Well Water	Champavathi river upstream and downstream, Kudipi and Sarepalli well water samples have been collected on 06-02-2023.
5.	Noise Level Monitoring	Monitoring of noise levels at four locations at work zones.	Monitoring of noise levels at four locations at work zones. • Mining Area • Kudipi Village • Loading Plant • Saripalli Village

4.1.1 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 06th to 21st February '2023.

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
Minimum	18	26	-
Maximum	33	100	-
Mean	25	76	-
Total	-	-	-

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

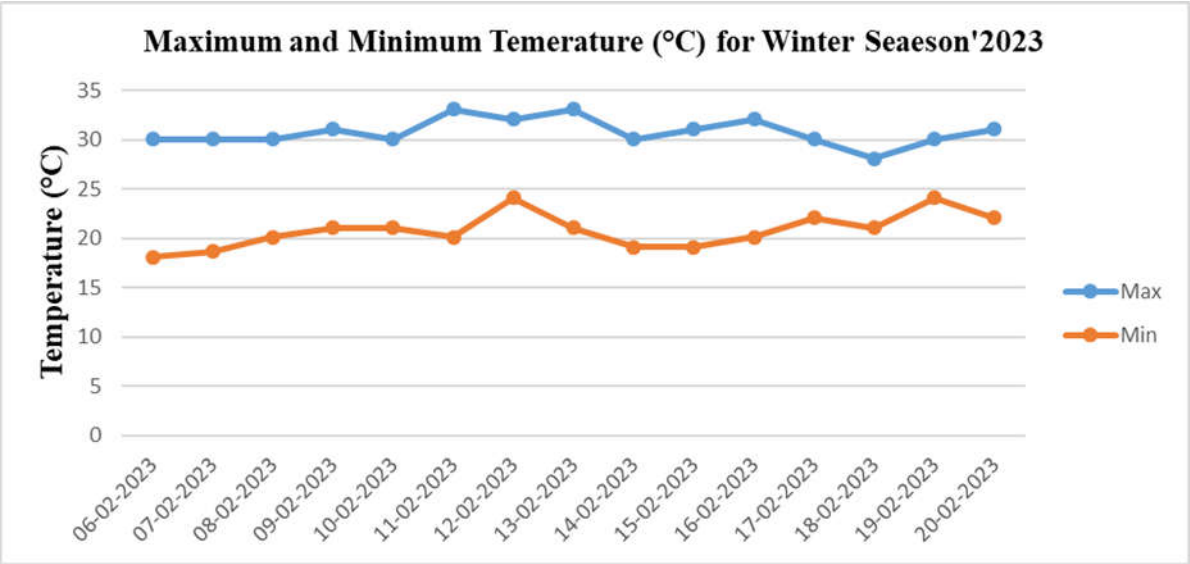
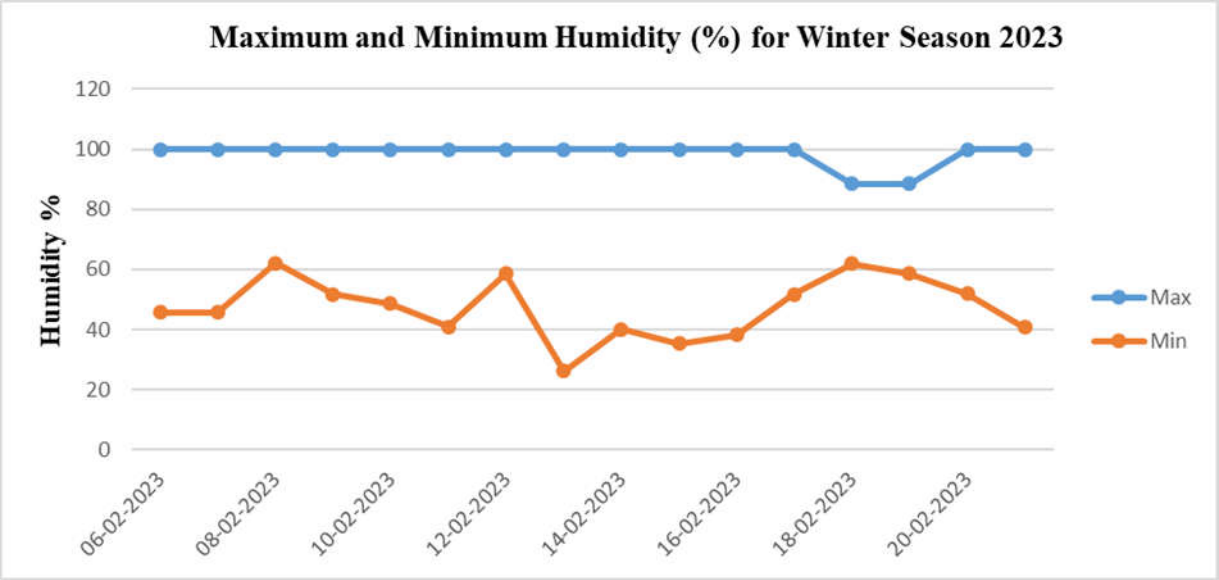


Fig – 2 .Graphical interpretation of Minimum and Maximum values of Relative Humidity during study period.



WIND PATTERN – WINTER SEASON 2023.

Duration	Predominant Wind directions	Wind rose Enclosed as
00:00 – 07.00 hrs	NW	Fig – 3
08.00 – 15.00 hrs	SSW	Fig – 4
16.00 – 23.00 hrs	SSW	Fig – 5
00.00 – 23.00 hrs	SW	Fig – 6

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

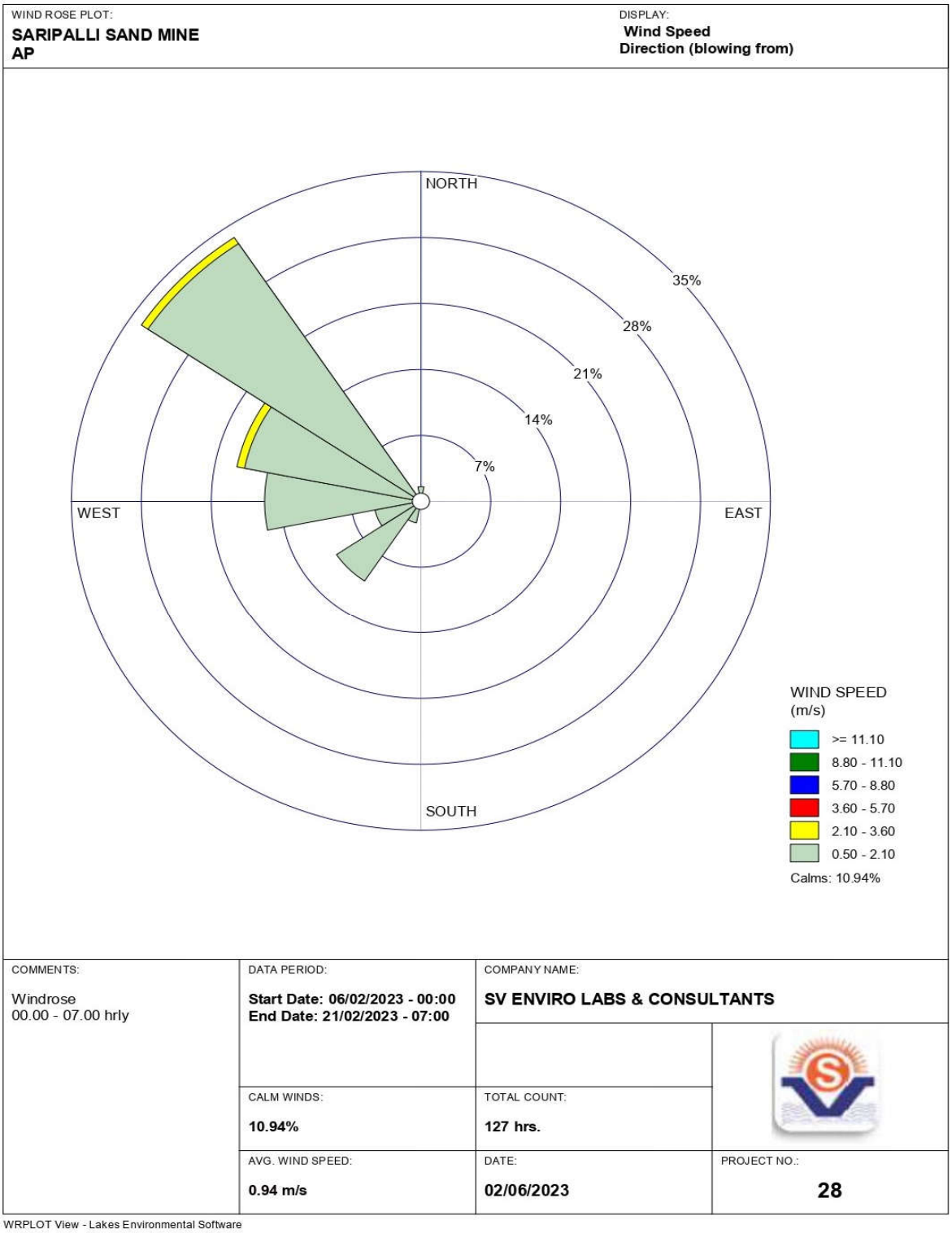


Fig –4. Wind rose diagram for 08.00 – 15.00 hrs (8hrly)

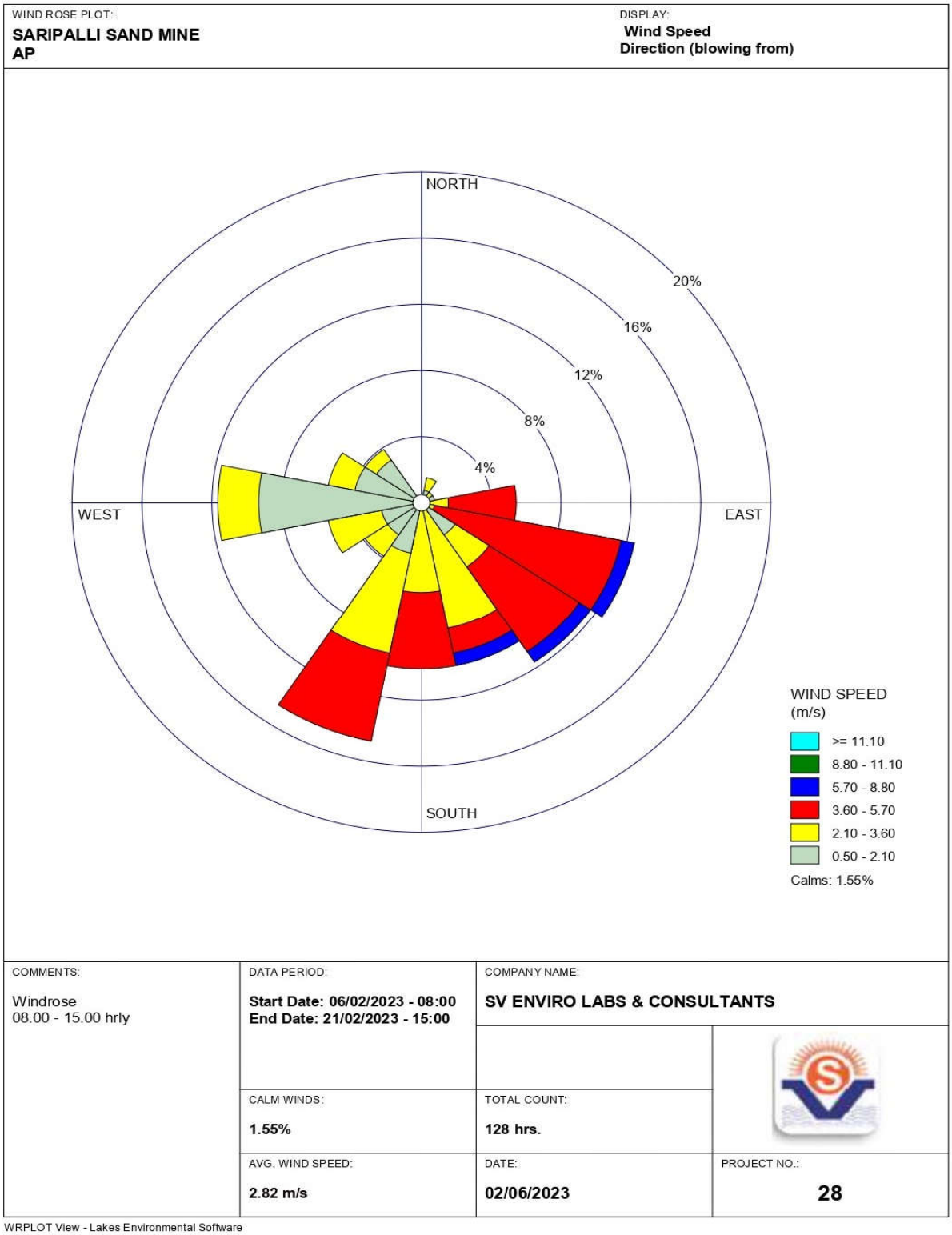


Fig – 5. Wind rose diagram for 16.00 – 23.00 hrs (8hrly)

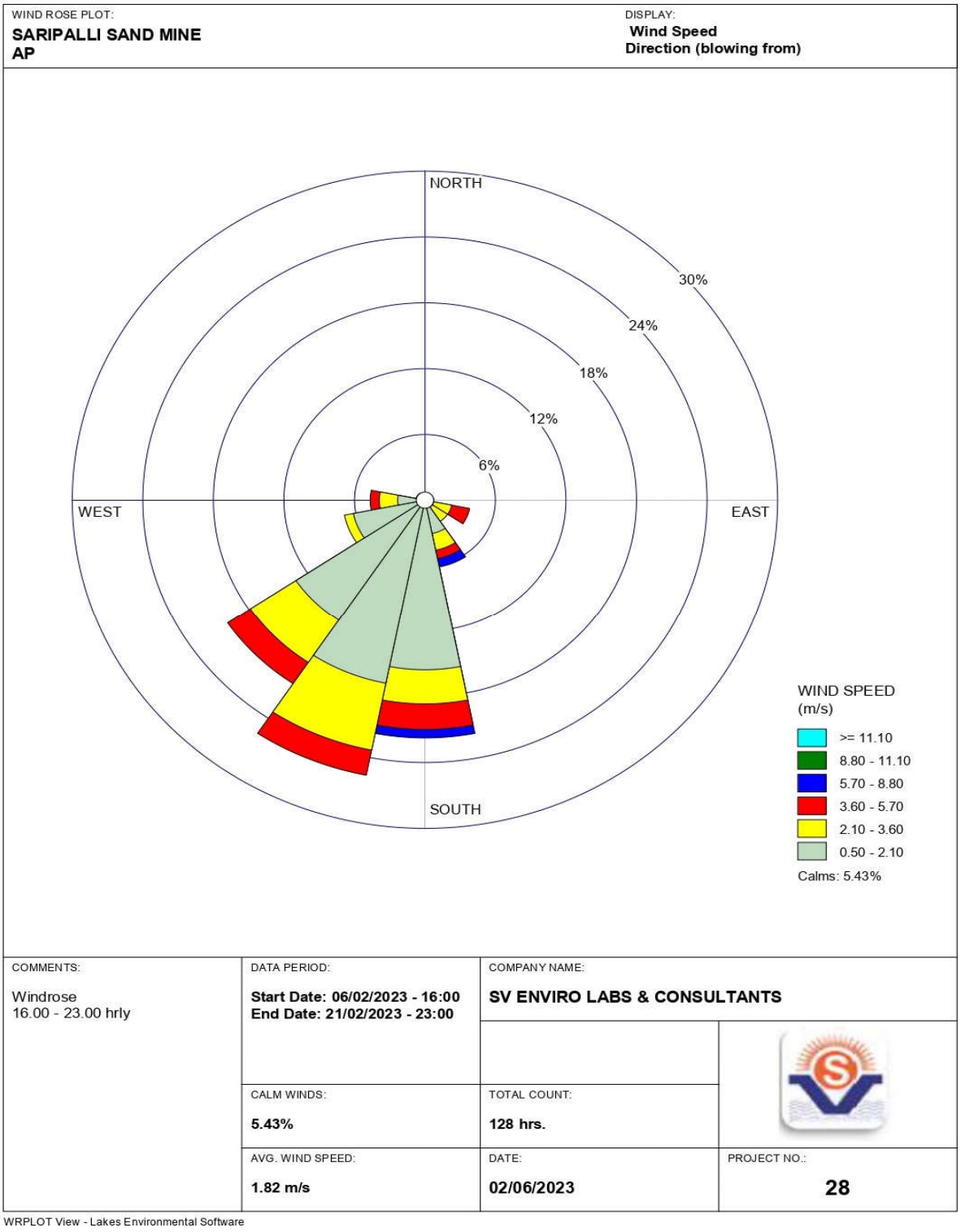
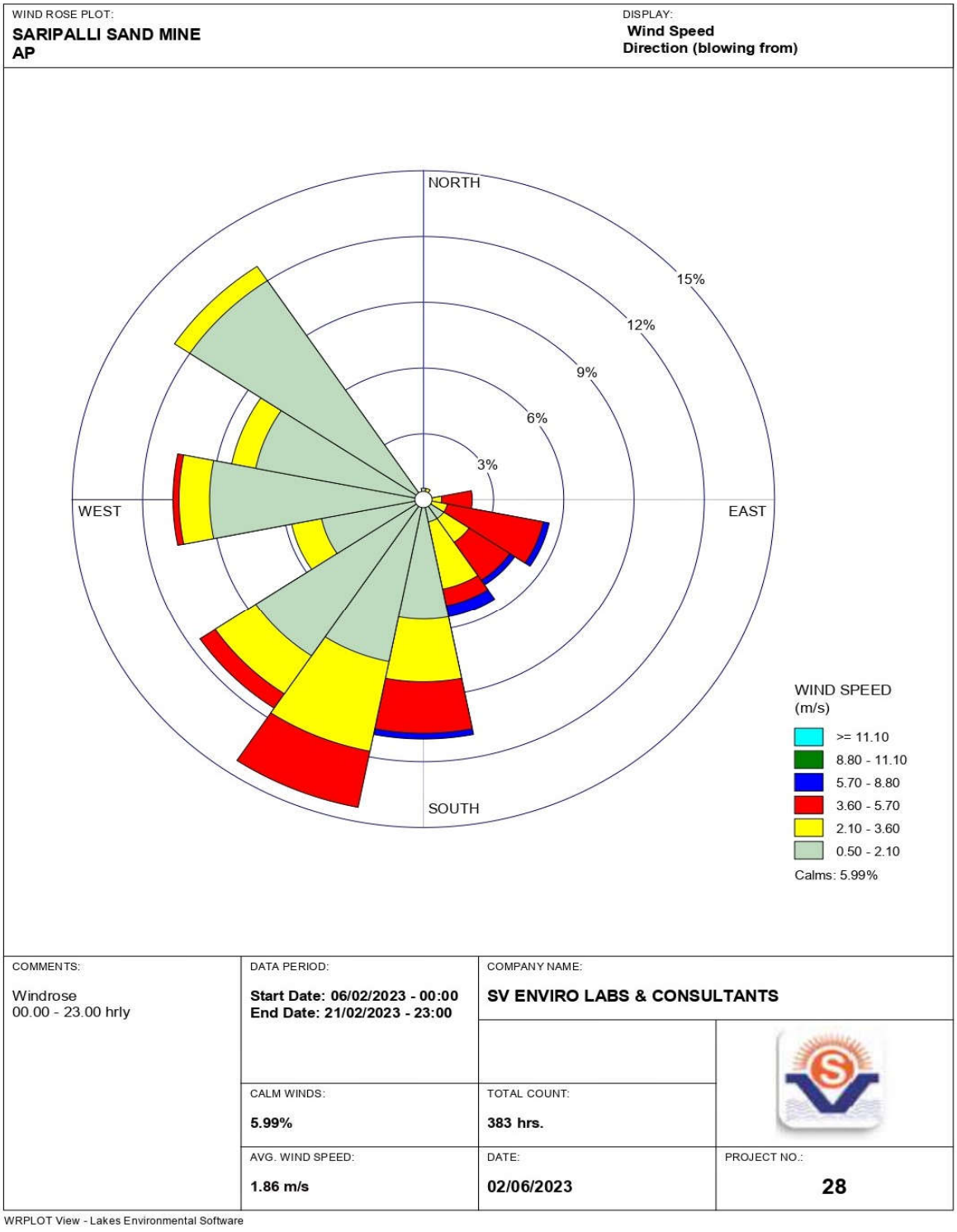


Fig –6. Wind rose diagram for 00.00 – 23.00 hrs (24hrly)



WIND PERCENTAGE FREQUENCY

	Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total (%)
1	348.75 - 11.25	0.52083	0	0	0	0	0	0.52083
2	11.25 - 33.75	0.26042	0.26042	0	0	0	0	0.52083
3	33.75 - 56.25	0	0.26042	0	0	0	0	0.26042
4	56.25 - 78.75	0.26042	0	0	0	0	0	0.26042
5	78.75 - 101.25	0	0.78125	1.30208	0	0	0	2.08333
6	101.25 - 123.75	0.26042	0.78125	4.16667	0.26042	0	0	5.46875
7	123.75 - 146.25	1.04167	1.30208	2.08333	0.26042	0	0	4.6875
8	146.25 - 168.75	1.04167	3.125	0.78125	0.52083	0	0	5.46875
9	168.75 - 191.25	5.46875	2.86458	2.34375	0.26042	0	0	10.9375
10	191.25 - 213.75	7.55208	4.16667	2.60417	0	0	0	14.3229
11	213.75 - 236.25	8.59375	2.08333	0.78125	0	0	0	11.4583
12	236.25 - 258.75	4.42708	1.30208	0	0	0	0	5.72917
13	258.75 - 281.25	9.11458	1.30208	0.26042	0	0	0	10.6771
14	281.25 - 303.75	7.29167	1.04167	0	0	0	0	8.33333
15	303.75 - 326.25	11.9792	0.78125	0	0	0	0	12.7604
16	326.25 - 348.75	0.26042	0	0	0	0	0	0.26042
	Sub-Total	**58.0729**	**20.0521**	**14.3229**	**1.30208**	**0**	**0**	**93.75**
	Calms							**5.98958**
	Missing/Incomplete							**0.26042**
	Total							**100**

4.2 AMBIENT AIR QUALITY MONITORING

The ambient air quality was assessed through a network of 03 AAQM stations. The locations of ambient air quality stations are given below:

Station code	Location	Environmental setting
A1	Mining Area	Industrial
A2	Kudipi Village	Residential
A3	Saripalli Village	Residential

Monitoring reports are enclosed as Annexure – I

4.3 DUST FALL MEASUREMENT

Dust fall monitoring was conducted at 03 stations. Details of locations mentioned hereunder:

Station code	Location	Environmental setting
DF1	Mining Area	Industrial
DF2	Kudipi Village	Industrial
DF3	Saripalli Village	Industrial

Monitoring reports are enclosed as Annexure – II

4.4 NOISE LEVEL MONITORING

Noise levels were monitoring at four locations mentioned hereunder:

Station code	Location	Environmental setting
N1	Mining Area	Industrial
N2	Kudipi Village	Residential
N3	Loading Point	Industrial
N4	Saripalli Village	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	Champavathi River Upstream	Surface water
W2	Champavathi Downstream	Surface water
W3	Kudipi Village Well Water	Ground water
W4	Sarepalli Village Well Water	Ground 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_3 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_2SO_4 to pH>2, refrigeration, 28 days
Heavy Metals (Ar, Cd, Mn, Cu, Fe, Zn, Pb etc.)	Plastic/ Glass rinse with 1+1 HNO_3	500 ml	Filter, add HNO_3 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_3 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_4^{2-} E, 23rd Ed., 2017
25.	Sulphide	APHA, 4500-S^{2-}, 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

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

ANNEXURE – I

(Ambient Air Monitoring Reports)

SV ENVIRO LABS & CONSULTANTS

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Balkampet Road, S.R. Nagar, Hyderabad-500038

Recognized by Govt. of India-MoEF & CC, New Delhi, Accredited by: NABL & NABET

Ref: SVELC/RIL-SSM/23-02/01

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **AMBIENT AIR QUALITY**

SOURCE OF COLLECTION : KUDIPI VILLAGE

DURATRION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

Date of Monitoring	Week	SPM ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
06.02.2023	I	156	66.2	27.4	11.2	13.6	0.31
07.02.2023	I	151	64.6	25.2	10.9	12.5	0.27
20.02.2023	II	160	67.4	28.3	11.6	13.2	0.29
21.02.2023	II	141	63.2	24.6	12.2	14.4	0.32
Maximum		**160**	67.4	**28.3**	**11.6**	14.4	**0.32**
Minimum		**141**	**63.2**	24.6	**10.9**	12.5	0.27
Average		152	**65.3**	**26.3**	**11.4**	**13.4**	**0.29**
CPCB Standards		-	**100**	**60**	**80**	**80**	4

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Balkampet Road, S.R. Nagar, Hyderabad-500038

Recognized by Govt. of India-MoEF & CC, New Delhi, Accredited by: NABL & NABET

Ref: SVELC/RIL-SSM/23-02/02

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **AMBIENT AIR QUALITY**

SOURCE OF COLLECTION : SARIPALLI VILLAGE

DURATRION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

Date of Monitoring	Week	SPM ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
06.02.2023	I	150	65.2	26.3	10.1	12.4	0.30
07.02.2023	I	136	61.4	22.6	10.5	12.1	0.26
20.02.2023	II	155	66.6	27.2	11.3	13.6	0.31
21.02.2023	II	144	64.2	25.3	9.8	11.5	0.29
Maximum		**155**	**66.6**	**27.2**	**11.3**	**13.6**	**0.31**
Minimum		**136**	**61.4**	**22.6**	**9.8**	**11.5**	**0.26**
Average		**146**	**64.3**	**25.3**	**10.4**	**12.4**	**0.29**
CPCB Standards		-	**100**	**60**	**80**	**80**	**4**

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Hyderabad Office : Flat No. 302, H.No.7-1-396/B/12, Sai Ram Residency,
Balkampet Road, S.R. Nagar, Hyderabad-500038

Recognized by Govt. of India-MoEF & CC, New Delhi, Accredited by: NABL & NABET

Ref: SVELC/RIL-SSM/23-02/03

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **AMBIENT AIR QUALITY**

SOURCE OF COLLECTION : MINING AREA

DURATRION OF SAMPLING : 24 Hrs

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

Date of Monitoring	Week	SPM ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
06.02.2023	I	163	66.4	26.2	11.8	13.2	0.35
07.02.2023	I	180	67.6	27.5	12.2	14.6	0.31
20.02.2023	II	165	63.2	24.6	10.6	12.8	0.30
21.02.2023	II	151	62.4	23.8	11.1	14.2	0.27
Maximum		**180**	**67.6**	**27.5**	**12.2**	**14.6**	**0.35**
Minimum		**151**	**62.4**	**23.8**	**10.6**	**12.8**	**0.27**
Average		**164**	**64.9**	**25.5**	**11.4**	**13.7**	**0.30**
CPCB Standards		-	**100**	**60**	**80**	**80**	**4**

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ANNEXURE – II

(Dustfall Monitoring Reports)

SV ENVIRO LABS & CONSULTANTS

(Environmental Engineers & Consultants in Pollution Control)

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Ref: SVELC/RIL-SSM/23-02/04

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **DUSTFALL**

SOURCE OF COLLECTION : KUDIPI VILLAGE

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

S.No	Parameters	Unit	01-02-2023 to 14-02-2023	15-02-2023 to 28-02-2023
1	Insoluble Particles	Tons/Km^2/Month	2.38	2.59
2	Soluble Particles	Tons/Km^2/Month	1.63	1.10
3	Total Particles	Tons/Km^2/Month	4.01	3.69

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Ref: SVELC/RIL-SSM/23-02/05

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **DUSTFALL**

SOURCE OF COLLECTION : SARIPALLI VILLAGE

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

S.No	Parameters	Unit	01-02-2023 to 14-02-2023	15-02-2023 to 28-02-2023
1	Insoluble Particles	Tons/Km^2/Month	2.11	2.26
2	Soluble Particles	Tons/Km^2/Month	1.05	1.12
3	Total Particles	Tons/Km^2/Month	3.16	3.38

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(Environmental Engineers & Consultants in Pollution Control)

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Balkampet Road, S.R. Nagar, Hyderabad-500038

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Ref: SVELC/RIL-SSM/23-02/06

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **DUSTFALL**

SOURCE OF COLLECTION : MINING AREA

ATMOSPHERE CONDITION : Clear Sky

TEST REPORT

S.No	Parameters	Unit	01-02-2023 to 14-02-2023	15-02-2023 to 28-02-2023
1	Insoluble Particles	Tons/Km^2/Month	3.11	3.02
2	Soluble Particles	Tons/Km^2/Month	2.23	2.14
3	Total Particles	Tons/Km^2/Month	5.34	5.16

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ANNEXURE – III

(Noise Monitoring Reports)

SV ENVIRO LABS & CONSULTANTS

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Ref: SVELC/RIL-SSM/23-02/07

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripalli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : **NOISE LEVEL MONITORING**

DATE OF COLLECTION : 06.02.2023 to 07.02.2023

TEST REPORT

Period	Time	Source of Collection			
		Mining Area	Kudipi village	Loading Point	Saripalli village
Day	6.00	55.2	50.6	52.7	47.9
	7.00	54.4	52.2	51.4	52.3
	8.00	56.1	55.7	54.1	51.6
	9.00	57.8	54.4	56.8	52.7
	10.00	59.5	56.1	60.5	56.4
	11.00	58.2	57.8	61.2	53.1
	12.00	56.9	54.5	60.9	56.8
	13.00	57.6	55.2	64.6	58.5
	14.00	58.3	52.9	63.3	57.2
	15.00	59.7	51.5	68.7	59.9
	16.00	60.4	57.2	71.4	60.6
	17.00	66.1	58.9	72.1	61.3
	18.00	68.8	57.6	73.8	56.7
	19.00	60.2	58.3	72.5	57.4
	20.00	58.9	57.2	70.2	58.1
	21.00	57.6	54.6	71.9	56.8
Night	22.00	56.3	55.7	64.6	57.5
	23.00	55.7	52.4	60.3	54.2
	24.00	54.4	49.1	56.7	53.9
	1.00	53.1	48.5	52.4	51.6
	2.00	52.8	46.2	50.1	48.3
	3.00	54.5	45.9	46.8	47.7
	4.00	50.2	44.6	48.5	46.4
	5.00	52.9	46.3	47.2	44.1
Leq Day		**58.9**	**53.1**	**60.5**	**54.2**
Leq Night		**53.4**	**47.6**	**51.7**	**49.5**

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

(Environmental Engineers & Consultants in Pollution Control)

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Ref: SVELC/RIL-SSM/23-02/01

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripallli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : SURFACE WATER

SOURCE OF COLLECTION : CHAMPAVATI RIVER UPSTREAM

DATE OF COLLECTION : 06-02-2023

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	<1.0	1.0
4	pH	-	7.45	5.5 to 9.0
5	Total Dissolved Solids	mg/l	265	500 – 2000
6	Total Suspended Solids	mg/l	<1.0	100
7	Fluorides as F	mg/l	0.48	2.0
8	Nitrates as NO_3^-	mg/l	0.84	10
9	Iron as Fe	mg/l	0.05	3.0
10	Total Residual Chlorine	mg/l	<0.1	1.0
11	Phenolic Compounds as C_6H_5OH	mg/l	<0.005	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	0.04	5.0
15	Sulphide as S	mg/l	< 0.1	2.0
16	Cadmium as Cd	mg/l	<0.001	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^{+6}	mg/l	< 0.1	0.1
23	Vanadium as V	mg/l	<0.01	0.2
24	Ammonical nitrogen as N	mg/l	BDL	50
25	Free ammonia as NH_3	mg/l	< 0.1	5
26	Chemical Oxygen Demand -COD	mg/l	48.6	250
27	Biochemical Oxygen Demand –BOD	mg/l	15.0	30
28	Oil & Grease	mg/l	1.2	10
29	Selenium as Se	mg/l	<0.01	0.05

Note: All the above parameters are tested as per APHA methods, 23rd Edition, 2017
BDL- Below detectable limit, Detectable limit- <0.005 µg/l

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Ref: SVELC/RIL-SSM/23-02/02

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripallli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : SURFACE WATER

SOURCE OF COLLECTION : CHAMPAVATI RIVER DOWN STREAM

DATE OF COLLECTION : 06-02-2023

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	<1.0	1.0
4	pH	-	7.56	5.5 to 9.0
5	Total Dissolved Solids	mg/l	296	500 – 2000
6	Total Suspended Solids	mg/l	14.0	100
7	Fluorides as F	mg/l	0.46	2.0
8	Nitrates as NO_3^-	mg/l	1.83	10
9	Iron as Fe	mg/l	0.04	3.0
10	Total Residual Chlorine	mg/l	<0.1	1.0
11	Phenolic Compounds as C_6H_5OH	mg/l	<0.005	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	0.07	5.0
15	Sulphide as S	mg/l	< 0.1	2.0
16	Cadmium as Cd	mg/l	<0.001	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^{+6}	mg/l	< 0.1	0.1
23	Vanadium as V	mg/l	<0.01	0.2
24	Ammonical nitrogen as N	mg/l	BDL	50
25	Free ammonia as NH_3	mg/l	< 0.1	5
26	Chemical Oxygen Demand -COD	mg/l	55.6	250
27	Biochemical Oxygen Demand –BOD	mg/l	18.0	30
28	Oil & Grease	mg/l	1.4	10
29	Selenium as Se	mg/l	<0.01	0.05

Note: All the above parameters are tested as per APHA methods, 23rd Edition, 2017
BDL- Below detectable limit, Detectable limit: <0.005 µg/l

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Ref: SVELC/RIL-SSM/23-02/03

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripallli Village,Nellimarla Mandal,
Vizianagaram District ,A.P.

SAMPLE PARTICULARS : GROUND WATER

SOURCE OF COLLECTION : KUDIPI VILLAGE WELL WATER

DATE OF COLLECTION : 06-02-2023

TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	<1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	^0C	28.5	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.10	1.0
6.	pH	-	7.36	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	280	500
8.	Total Alkalinity as $CaCO_3$	mg/l	240	200
9.	Total Hardness as $CaCO_3$	mg/l	160	200
10.	Calcium as Ca	mg/l	45.2	75
11.	Magnesium as Mg	mg/l	11.6	30
12.	Chlorides as Cl^-	mg/l	27.4	250
13.	Fluorides as F	mg/l	0.57	1.0
14.	Nitrates as NO_3^-	mg/l	<1.0	45
15.	Sulphates as SO_4^{2-}	mg/l	11.3	200
16.	Iron as Fe	mg/l	0.16	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C_6H_5OH	mg/l	<0.001	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	0.59	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.01	0.5
24.	Sulphide as H_2S	mg/l	< 0.1	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.1	0.2
26.	Barium as Ba	mg/l	< 0.01	0.7
27.	Chloramines (as Cl2)	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	< 0.01	0.01
31.	Silver as Ag	mg/l	< 0.01	0.1
32.	Cadmium as Cd	mg/l	<0.01	0.003
33.	Cyanide as CN	mg/l	<0.02	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001

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36.	Molybdenum as Mo	mg/l	<0.01	0.07
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
MICROBIOLOGY:				
42.	*E. coliforms*	CFU/ 100mL	Not detected	Shall not be detected in 100 ml
43.	*Total coliforms*	CFU/ 100mL	28	Shall not be detected in 100 ml
44.	*Faecal coliforms*	MPN/ 100mL	Not detected	-
PESTICIDES:				
45.	Alpha HCH	µg/l	BDL	0.01
46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
48.	Chlorpyriphos	µg/l	BDL	30
49.	Delta HCH	µg/l	BDL	0.04
50.	2,4- Dicholorophenoxyacetic 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
TRIHALOMETHANE				
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, 23rd Edition, 2017
BDL- Below detectable limit, Detectable limit- <0.005 µg

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Ref: SVELC/RIL-SSM/23-02/04

Date: 06-03-2023

NAME AND ADDRESS : **M/s. SARIPALLI SAND MINE,**
Visakhapatnam Steel Plant,
Saripallli Village, Nellimarla Mandal,
Vizianagaram District, A.P.

SAMPLE PARTICULARS : GROUND WATER

SOURCE OF COLLECTION : SAREPALLI WELL WATER

DATE OF COLLECTION : 06-02-2023

TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	3.63	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	^0C	29.0	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	0.76	1.0
6.	pH	-	7.18	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	264	500
8.	Total Alkalinity as $CaCO_3$	mg/l	230	200
9.	Total Hardness as $CaCO_3$	mg/l	117	200
10.	Calcium as Ca	mg/l	46.2	75
11.	Magnesium as Mg	mg/l	10.4	30
12.	Chlorides as Cl^-	mg/l	25.2	250
13.	Fluorides as F	mg/l	0.51	1.0
14.	Nitrates as NO_3^-	mg/l	<1.0	45
15.	Sulphates as SO_4^{2-}	mg/l	13.2	200
16.	Iron as Fe	mg/l	<0.01	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C_6H_5OH	mg/l	<0.001	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	0.43	5.0
22.	Aluminum as Al	mg/l	< 0.01	0.03
23.	Boron as B	mg/l	< 0.01	0.5
24.	Sulphide as H_2S	mg/l	< 0.1	0.05
25.	Anionic Detergents (as MBAS)	mg/l	< 0.1	0.2
26.	Barium as Ba	mg/l	< 0.01	0.7
27.	Chloramines (as Cl2)	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	< 0.01	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	<0.02	0.05
34.	Lead as Pb	mg/l	<0.01	0.01
35.	Mercury as Hg	mg/l	<0.001	0.001

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36.	Molybdenum as Mo	mg/l	<0.01	0.07
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
MICROBIOLOGY:				
42.	*E. coliforms*	CFU/ 100mL	Not detected	Shall not be detected in 100 ml
43.	*Total coliforms*	CFU/ 100mL	Not detected	Shall not be detected in 100 ml
44.	*Faecal coliforms*	MPN/ 100mL	Not detected	-
PESTICIDES:				
45.	Alpha HCH	µg/l	BDL	0.01
46.	Beta HCH	µg/l	BDL	0.04
47.	Butachlor	µg/l	BDL	125
48.	Chlorpyriphos	µg/l	BDL	30
49.	Delta HCH	µg/l	BDL	0.04
50.	2,4- Dicholorophenoxyacetic 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
TRIHALOMETHANE				
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, 23rd Edition, 2017
BDL- Below detectable limit, Detectable limit- <0.005 µg/l

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SV ENVIRO LABS & CONSULTANTS

SV ENVIRO LABS & CONSULTANTS VISAKHAPATNAM