

MONITORING OF ENVIRONMENTAL PARAMETERS

(INTERIM REPORT FOR RAINY SEASON -2020)

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



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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 Saripalli Sand Mine.

This report presents the environmental monitoring data of Rainy Season – August '2020 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. 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.	Water quality	Collection and analysis of river water/mine discharge water/well water and treated water as per <ul style="list-style-type: none"> • 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.	Water Quality (Surface water, Mine discharge water, Well Water and Treated water)	As per APHA 23 rd Edition'2017

CHAPTER – 4

WATER QUALITY

4.0 STUDY OF WATER QUALITY – AUGUST – 2020

S.No	ATTRIBUTE	SCOPE	STUDIES CARRIED OUT
1.	Water Quality	Collection of Surface water, Mine discharge water, Well Water and Treated water	Champavathi river upstream and downstream, Kudipi and Sarepalli well water samples have been collected on 28-08-2020.

Water samples were collected at the following points.

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

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 ₂ SO 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 – I.**

ANNEXURE – I
(Water Analysis Reports)



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Ref: SVELC/RIL-SSM/20-08/01

Date: 18-09-2020

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

SAMPLE PARTICULARS : SURFACE WATER

SOURCE OF COLLECTION : CHAMPAVATI RIVER UPSTREAM

DATE OF COLLECTION : 28-08-2020

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	<0.01	5 - 25
4	pH	-	8.74	5.5 to 9.0
5	Total Dissolved Solids	mg/l	331	500 – 2000
6	Total suspended solids	mg/l	85.0	100
7	Fluorides as F	mg/l	0.23	2.0
8	Nitrates as NO ₃ ⁻	mg/l	0.42	10
9	Iron as Fe	mg/l	0.02	3.0
10	Total Residual Chlorine	mg/l	<0.1	1.0
11	Phenolic Compounds as C ₆ H ₅ 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	0.03	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 ⁺⁶	mg/l	< 0.05	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	50	250
27	Biochemical oxygen demand -BOD	mg/l	18.6	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, 23rd Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.005 µg/l



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

Date: 18-09-2020

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

SAMPLE PARTICULARS : SURFACE WATER

SOURCE OF COLLECTION : CHAMPAVATI RIVER DOWN STREAM

DATE OF COLLECTION : **28-08-2020**

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	4.12	5 - 25
4	pH	-	9.79	5.5 to 9.0
5	Total Dissolved Solids	mg/l	311	500 – 2000
6	Total suspended solids	mg/l	23	100
7	Fluorides as F	mg/l	0.22	2.0
8	Nitrates as NO ₃ ⁻	mg/l	0.37	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 ₆ H ₅ 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	0.09	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 ⁺⁶	mg/l	< 0.05	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	<10	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, 23rd Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.005 µg/l

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Ref: SVELC/RIL-SSM/20-08/03

Date: 18-09-2020

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

SAMPLE PARTICULARS : **GROUND WATER**

SOURCE OF COLLECTION : **KUDIPI VILLAGE WELL WATER**

DATE OF COLLECTION : **28-08-2020**

TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	°C	28.2	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	1.98	1.0
6.	pH	-	7.1	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	744	500
8.	Total Alkalinity as CaCO ₃	mg/l	328	200
9.	Total Hardness as CaCO ₃	mg/l	432	200
10.	Calcium as Ca	mg/l	113	75
11.	Magnesium as Mg	mg/l	36.4	30
12.	Chlorides as Cl ⁻	mg/l	114	250
13.	Fluorides as F	mg/l	1.2	1.0
14.	Nitrates as NO ₃ ⁻	mg/l	107	45
15.	Sulphates as SO ₄ ²⁻	mg/l	35.0	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 ₆ H ₅ 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	0.62	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 ₂ 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 ₂)	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	<0.01	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
38.	Total Arsenic as As	mg/l	<0.01	0.01



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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.	<i>E. coliforms</i>	CFU/100mL	Not detected	Shall not be detected in 100 ml
43.	<i>Total coliforms</i>	CFU/100mL	15	Shall not be detected in 100 ml
44.	<i>Faecal coliforms</i>	CFU/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.	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
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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Date: 18-09-2020

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

SAMPLE PARTICULARS : GROUND WATER

SOURCE OF COLLECTION : SAREPALLI WELL WATER

DATE OF COLLECTION : 28-08-2020

TEST REPORT

S.No	Parameter	Unit	Result	IS 10500:2012 Specifications
1.	Colour	Hazen	< 1.0	5.0
2.	Odour	-	Agreeable	Agreeable
3.	Temperature	°C	27.9	-
4.	Taste	-	Agreeable	Agreeable
5.	Turbidity	NTU	4.41	1.0
6.	pH	-	7.28	6.5 – 8.5
7.	Total Dissolved Solids	mg/l	738	500
8.	Total Alkalinity as CaCO ₃	mg/l	332	200
9.	Total Hardness as CaCO ₃	mg/l	436	200
10.	Calcium as Ca	mg/l	110	75
11.	Magnesium as Mg	mg/l	38.8	30
12.	Chlorides as Cl ⁻	mg/l	116	250
13.	Fluorides as F	mg/l	0.76	1.0
14.	Nitrates as NO ₃ ⁻	mg/l	106	45
15.	Sulphates as SO ₄ ²⁻	mg/l	33.1	200
16.	Iron as Fe	mg/l	0.05	0.3
17.	Free Residual Chlorine	mg/l	< 0.1	0.2
18.	Phenolic Compounds as C ₆ H ₅ 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	0.48	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 ₂ 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 ₂)	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	<0.01	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
MICROBIOLOGY:				
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	-
PESTICIDES:				
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
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

CHECKED BY



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