The Sandur Manganese & Iron Ores Limited

(An ISO 9001:2015; ISO 14001:2015 and 45001:2018 certified company)
CIN: L85110KA1954PLC000759; Website: www.sandurgroup.com

REGISTERED OFFICE
'SATYALAYA', No.266
Ward No.1, Palace Road
Sandur – 583 119, Ballari District
Karnataka, India
Tel: +91 8395 260301/ 283173-199
Fax: +91 8395 260473

CORPORATE OFFICE
'SANDUR HOUSE', No.9
Bellary Road, Sadashivanagar
Bengaluru – 560 080
Karnataka, India
Tel: +91 80 4152 0176 - 79 / 4547 3000
Fax: +91 80 4152 0182

Ref No: SMIORE/MINES/ENV/2024-25/2679/471

08 July 2024

To,
The Environmental Officer,
Karnataka State Pollution Control Board,
Ward No.25, 4th Main Road,
Kuvempu Nagar,
Ballari – 583104

Dear Sir,

Sub: Submission of reports pertaining to monitoring of environmental parameters for the month of June 2024 in respect of Mining Lease No. 2679.

Ref: 1. Environmental Clearance No. 110015/88/2006-IA.II(M) dated 24 January 2007.
2. Consent for Operation No. AW-337273 dated 10 April 2023.

With reference to the letters cited above, we are enclosing herewith environmental monitoring reports prepared after monitoring the stipulated environmental parameters for the month of June 2024 in respect of Mining Lease No. 2679 of The Sandur Manganese & Iron Ores Limited.

Kindly acknowledge the receipt of the reports.

Thank you,

for The Sandur Manganese & Iron Ores Limited,

Md. Abdul Saleem,
Whole Time Director
& Company Secretary.

The Sandur Manganese & Iron Ores Ltd.

Encl: Monitoring Reports

ENVIRONMENTAL MONITORING REPORT

June, 2024

Project : Ramgad Manganese Ore Mine
ML No. 2679
Ramgad Village, Sandur Taluk,
Ballari Dist., Karnataka.

Lessee

The Sandur Manganes & Iron Ores Limited

ENVIRONMENTAL LABORATORY
(Unit of Mineral Engineering Services)
(Accredited by NABL &, MOEF&CC Under E(P) 1986)
#948, 2nd Cross, Kammanahalli Main Road,
St Thomas Town Post, Bangalore- 560 084, Karnataka,

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

ENVIRONMENTAL LABORATORY (UNIT OF MINERAL ENGINEERING SERVICES)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

#948, 2ND CROSS, ST.THOMAS TOWN POST, KAMMANAHALLI MAIN ROAD, BENGALURU, BENGALURU URBAN, KARNATAKA, INDIA

in the field of

TESTING

Certificate Number: TC-6172

Issue Date: 24/05/2023 **Valid Until:** 23/05/2025

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : ENVIRONMENTAL LABORATORY (UNIT OF MINERAL ENGINEERING SERVICES)

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT FOREST & CLIMATE CHANGE GOVT OF INDIA

Speed Post

F.No. LB/99/7/2021-INST LAB-HO-CPCB-HO/Pvt./ 1601

Dated: 28th January 2023
07th June 2023

Recognition Certificate

To,

Head of Laboratory,
M/s Environmental Laboratory (Unit of Mineral Engineering Services),
#948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084,
Karnataka.

Subject: Recognition of M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka, as Environmental laboratory under the Environmental (Protection) Act- 1986.

Sir,

I am directed to refer the online application, dated 27/10/2022 for the recognition of your laboratory under Environmental (Protection) Act, 1986. Based on the recommendations of the concerned Division, approval of Competent Authority for recognition of Environmental laboratories and your acceptance of the revised terms and conditions at Annexure-III & IV of the guidelines for recognition of environmental laboratories, CPCB approves the renewal of recognition **M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka** and shall be notified in the Gazette of India. Considering the current requirement of mandatory accreditation/ certifications of the laboratory, **this recognition shall be valid up to 23/05/2025.**

2. As sought in the aforementioned application, **M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka** may undertake the following tests:

   i. **Physical Tests**-Conductivity, Colour, pH, Fixed & Volatile Solids, Total Solids, Total Dissolved Solids, Total Suspended Solids, Turbidity, Temperature, Velocity & Discharge Measurement of Industrial Effluent Stream, Flocculation Test (Jar test), Odour, Salinity, Settleable Solids and Sludge Volume Index.
   ii. **Inorganic (General and Non-metallic):** Acidity, Alkalinity, Ammonical Nitrogen, Chloride, Chlorine Residual, Dissolved Oxygen, Fluoride, Total Hardness, Total Kjeldahl Nitrogen (TKN), Nitrite Nitrogen, Nitrate Nitrogen, Phosphate, Sulphate, , Silica, Cyanide and Sulphide.
   iii. **Inorganic (Trace Metals):** Boron, Cadmium, Calcium, Total Chromium, Chromium Hexavalent, Copper, Iron, Lead, Magnesium, Mercury, Nickel, Potassium, Sodium, Sodium Absorption Ratio, Zinc, Arsenic, Aluminium, Barium, Selenium, Tin, Antimony, Cobalt and Vanadium,
   iv. **Organics (General) and Trace Organics:** Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Phenolic Compounds, Pesticides (each) (Organo-Chlorine and Organo Nitrogen-Phosphorus), Surfactant, Tanin & Lignin, Poly-Chlorinated biphenyl (PCB's) each, Poly-Nuclear Aromatic Hydrocarbon (PAH).
   v. **Microbiological Test:** Total Coliform, Faecal Coliform, *E. coli, Faecal Streptococci* and Total Plate Count.
   vi. **Toxicological Tests:** Bioassay Method for Evaluation of Toxicity using Fish and Measurement of Toxicity Using Daphnia or Other Organism.
   vii. **Biological Test:** Macrophytic Identification, Planktonic Identification Count and Chlorophyll.

Contd.

'परिवेश भवन' पर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032
दूरभाष/Tel : 43102030, 22305792, वेबसाईट/Website : www.cpcb.nic.in

viii. **Characterization of Hazardous Waste:** Corrosivity, Ignibility (Flash point) and Measurement of Heavy Metals/Pesticides in the Waste/Leachate.

ix. **Soil/Sludge/Sediment and Solid Waste:** Boron, Cation Exchange Capacity (CEC), Electrical Conductivity, Nitrogen (Available), Organic Carbon/Matter (Chemical Method), pH, Phosphorous (Available), Phosphate (Ortho), Phosphate (Total), Potassium, SAR in Soil Extract, Sodium, Soil moisture, TKN, Calorific Value, Ammonia, Bicarbonate, Calcium, Calcium Carbonate, Chloride, Colour, H.Acid, Heavy Metal, Magnesium, Nitrate, Nitrite, PAH, Pesticide, Potash (Available), Sulphate, Sulphur, Total Organic Carbon, Total Water Soluble Salt and Water Holding Capacity.

x. **Ambient Air/ Fugitive Emissions:** Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Total Suspended Particulate Matter, Respirable Suspended Particulate Matter PM_{10}, Ammonia, Carbon Monoxide, Chlorine, Lead, Ozone, Benzene Toluene Xylene (BTX), Polycyclic Aromatic Hydrocarbon (PAH) Benzo-a-Pyrine & others and $PM_{2.5}$.

xi. **Stack Gases/ Source Emission:** Particulate Matter, Sulphur Dioxide, Velocity & Flow, Carbon Dioxide, Carbon Monoxide, Temperature, Oxygen, Oxides of Nitrogen, Acid Mist, Ammonia, Total Hydrocarbon, Hydrogen Sulphide and Carbon Disulphide.

xii. **Noise Level:** Noise Level Measurement (20-140 dBa) and Ambient Noise and Source Specific Noise.

xiii. **Meteorological:** Ambient Temperature, Wind Direction, Wind Speed, Relative Humidity, Solar Radiation and Rainfall.

3. Further, the following analysts have been approved as Government Analysts.

   i. M. Sachin Raju
   ii. Binu Mani
   iii. Arshiya Kousar

4. The laboratory shall compulsorily participate in the Analytical Quality Exercise conducted by the Central Pollution Control Board (CPCB) to ascertain the capability of the laboratory and analysis carried out and shall submit quarterly progress report to CPCB.

5. The surprise inspection/periodic surveillance of the recognized environment laboratory will be undertaken by CPCB to assess its proper functioning systematic operation and reliability of data generated at the laboratory.

6. It is also mandatory for the laboratory to have requisite accreditations of the ISO: 17025 and ISO:45001 and its renewal as per accreditation rules. This recognition is subject to such accreditations and renewals as applicable. The laboratory is required to apply online for further renewal of recognition through CPCB web portal after renewal of the mandatory accreditations / certifications concerned.

7. The laboratory should compulsorily follow the accepted terms and conditions. In case of serious non-compliance of any of the terms and conditions, the laboratory may be black listed for a minimum period of two years and civil/criminal proceedings, as applicable, may be initiated for performing functions on behalf of the Government in an unauthorized manner.

Yours faithfully,

K. Ranganathan 7/6/23

(Dr. K. Ranganathan)
Scientist-E & Divisional Head
Instrumentation laboratory

डॉ. के. रंगनाथन / Dr. K. Ranganathan
वैज्ञानिक 'ई' सरकारी विश्लेषक / Scientist 'E' Govt. Analyst
केंद्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
(M/o Environment, Forest & Climate Change, Govt. of India)
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली–110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

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ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES LLP)

Recognised by BIS, FSSAI, ISO:45001:2018 Certified Laboratory

Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.1

AMBIENT AIR QUALITY

Name of the Client	: The Sandur Manganese & Iron Ores Limited
Name of the Project	: Mining Lease No. 2679
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Station at & Code	: A1, Core Zone (ML Area)
Duration	: 24 Hrs
Issue date	: 01.07.2024
Reference	IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	
01.06.2024	N/24/06/2-0010	10	12	45	24	0.35
07.06.2024	N/24/06/2-0106	9	11	38	26	0.22
08.06.2024	N/24/06/3-0016	7	9	55	30	0.41
12.06.2024	N/24/06/4-0129	8	10	47	26	0.28
13.06.2024	N/24/06/4-0132	7	9	36	21	0.34
19.06.2024	N/24/06/5-0082	9	11	56	32	0.33
20.06.2024	N/24/06/5-0097	12	13	45	24	0.45
24.06.2024	N/24/06/5-0332	10	12	50	28	0.25
25.06.2024	N/24/06/5-0443	8	10	27	19	0.31
30.06.2024	N/24/07/1-0024	10	11	55	33	0.25
Limits for Industrial, Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES LLP)

Recognised by BIS, FSSAI, ISO:45001:2018 Certified Laboratory

Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.2

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A2, Core Zone (Myadara Banda Block)

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0011	7	10	42	25	0.24
07.06.2024	N/24/06/2-0107	9	11	40	22	0.21
08.06.2024	N/24/06/3-0017	11	16	54	33	0.22
10.06.2024	N/24/06/4-0011	13	15	36	15	0.28
11.06.2024	N/24/06/4-0069	8	12	39	20	0.21
21.06.2024	N/24/06/5-0128	6	10	44	27	0.26
22.06.2024	N/24/06/5-0215	8	11	34	19	0.41
24.06.2024	N/24/06/5-0333	9	15	30	20	0.41
25.06.2024	N/24/06/5-0444	12	11	43	23	0.33
30.06.2024	N/24/07/1-0025	10	12	49	27	0.34
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
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Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.3

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A3, Core Zone (Governor Point)

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0012	7	9	48	25	0.32
07.06.2024	N/24/06/2-0108	11	13	37	22	0.23
08.06.2024	N/24/06/3-0018	9	11	51	28	0.25
12.06.2024	N/24/06/4-0115	6	13	36	15	0.29
13.06.2024	N/24/06/4-0133	8	15	45	25	0.24
19.06.2024	N/24/06/5-0083	7	12	53	28	0.35
20.06.2024	N/24/06/5-0098	10	14	39	21	0.27
24.06.2024	N/24/06/5-0334	8	12	44	20	0.27
25.06.2024	N/24/06/5-0445	11	17	40	17	0.21
30.06.2024	N/24/07/1-0026	12	13	49	37	0.28
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

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Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.4

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A4, Core Zone (Neerlabi)

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0013	7	9	54	29	0.21
07.06.2024	N/24/06/2-0109	9	11	39	19	0.26
08.06.2024	N/24/06/3-0019	10	19	47	25	0.4
12.06.2024	N/24/06/4-0116	8	10	33	22	0.28
13.06.2024	N/24/06/4-0134	11	14	44	19	0.21
19.06.2024	N/24/06/5-0084	10	15	57	33	0.31
20.06.2024	N/24/06/5-0099	8	13	54	28	0.24
24.06.2024	N/24/06/5-0335	10	15	36	27	0.22
25.06.2024	N/24/06/5-0446	12	16	43	22	0.36
30.06.2024	N/24/07/1-0027	8	14	29	17	0.24
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

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ENVIRONMENTAL LABORATORY

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Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.5

AMBIENT AIR QUALITY

Name of the Client	: The Sandur Manganese & Iron Ores Limited
Name of the Project	: Mining Lease No. 2679
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Station at & Code	: A5, Ramghad village
Duration	: 24 Hrs
Issue date	: 01.07.2024
Reference	IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	
01.06.2024	N/24/06/2-0014	7	16	38	21	0.22
07.06.2024	N/24/06/2-0110	8	12	39	19	0.29
08.06.2024	N/24/06/3-0020	8	14	55	32	0.33
12.06.2024	N/24/06/4-0117	12	11	47	25	0.27
13.06.2024	N/24/06/4-0135	11	12	30	19	0.24
19.06.2024	N/24/06/5-0085	10	11	46	22	0.26
20.06.2024	N/24/06/5-0100	11	14	50	24	0.22
24.06.2024	N/24/06/5-0336	10	12	40	23	0.42
25.06.2024	N/24/06/5-0447	8	13	39	21	0.31
30.06.2024	N/24/07/1-0028	10	11	55	28	0.21
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

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Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.6

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A6, Dharmapura village

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0015	7	9	36	18	0.21
07.06.2024	N/24/06/2-0111	11	12	40	24	0.25
08.06.2024	N/24/06/3-0021	12	16	58	28	0.28
12.06.2024	N/24/06/4-0118	11	14	32	15	0.21
13.06.2024	N/24/06/4-0136	7	13	40	23	0.35
19.06.2024	N/24/06/5-0086	10	11	49	26	0.22
20.06.2024	N/24/06/5-0101	11	15	49	21	0.24
24.06.2024	N/24/06/5-0337	12	13	44	29	0.24
25.06.2024	N/24/06/5-0448	10	14	53	30	0.22
30.06.2024	N/24/07/1-0029	8	10	30	15	0.23
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

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Recognised by MoEFCC(CPCB) under E(P) Act 1986 recognition valid upto 23.05.2025

TEST REPORT

Table No.7

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A7, Garaga village

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0016	10	12	35	20	0.26
07.06.2024	N/24/06/2-0112	7	11	35	19	<0.2
08.06.2024	N/24/06/3-0022	11	15	30	15	0.2
12.06.224	N/24/06/4-0130	9	10	42	22	0.23
13.06.2024	N/24/06/4-0137	11	14	35	19	0.25
19.06.2024	N/24/06/5-0087	8	12	43	21	0.31
20.06.2024	N/24/06/5-0102	12	13	53	27	0.22
24.06.2024	N/24/06/5-0338	8	12	43	22	0.26
25.06.2024	N/24/06/5-0449	11	14	41	20	0.28
30.06.2024	N/24/07/1-0030	8	9	52	28	0.21
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No.8

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A8, Yeswanthanagar

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0176	9	12	46	24	0.31
07.06.2024	N/24/06/2-0105	10	11	37	22	0.22
08.06.2024	N/24/06/3-0010	7	9	50	28	0.31
10.06.2024	N/24/06/4-0010	10	12	48	22	0.46
11.06.2024	N/24/06/4-0068	12	13	36	16	0.38
21.06.2024	N/24/06/5-0122	10	12	50	29	0.35
22.06.2024	N/24/06/5-0209	7	9	58	33	0.33
24.06.2024	N/24/06/5-0331	11	14	47	24	0.28
25.06.2024	N/24/06/5-0442	9	11	38	21	0.36
30.06.2024	N/24/07/1-0023	10	13	50	24	0.42
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No.9

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A9, Subbarayanahalli

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0006	11	14	51	29	0.29
07.06.2024	N/24/06/2-0101	7	16	44	23	0.42
08.06.2024	N/24/06/3-0006	12	14	50	26	0.36
10.06.2024	N/24/06/4-0006	10	13	39	20	0.38
11.06.2024	N/24/06/4-0064	8	11	48	22	0.48
21.06.2024	N/24/06/5-0118	14	15	46	19	0.41
22.06.2024	N/24/06/5-0205	13	18	43	21	0.36
24.06.2024	N/24/06/5-0327	10	16	31	19	0.28
25.06.2024	N/24/06/5-0438	8	17	51	27	0.26
30.06.2024	N/24/07/1-0020	5	9	48	24	0.33
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No.10

AMBIENT AIR QUALITY

Name of the Client : The Sandur Manganese & Iron Ores Limited

Name of the Project : Mining Lease No. 2679

Sample Collected by : Environmental Laboratory (Unit of Mineral Engineering Services)

Station at & Code : A10, Siddapura village

Duration : 24 Hrs

Issue date : 01.07.2024

Reference IS 5182 & Lab SOP

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m^3	Nitrogen Dioxide (NO_2), µg/m^3	Particulate Matter		Carbon Monoxide* (CO), mg/m^3
				PM_{10}, (µg/m^3)	$PM_{2.5}$, (µg/m^3)	
01.06.2024	N/24/06/2-0017	11	13	45	19	0.22
07.06.2024	N/24/06/2-0113	7	10	47	26	0.26
08.06.2024	N/24/06/3-0023	12	14	44	23	0.38
12.06.2024	N/24/06/4-0131	10	15	55	27	0.21
13.06.2024	N/24/06/4-0138	8	10	45	25	0.25
19.06.2024	N/24/06/5-0088	12	13	57	30	0.41
20.06.2024	N/24/06/5-0103	7	10	40	25	0.33
24.06.2024	N/24/06/5-0339	7	13	49	25	0.28
25.06.2024	N/24/06/5-0450	12	10	43	24	0.26
30.06.2024	N/24/07/1-0031	10	11	54	32	0.31
Limits for Industrial , Residential, Rural and other Areas		**80 24 Hrs**	**80 24 Hrs**	**100 24 Hrs**	**60 24 Hrs**	**2 8 Hr**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 11

Fugitive Emission

Name of the Client	**: The Sandur Manganese & Iron Ores Limited**
Name of the Project	**: Mining Lease No. 2679**
Sample Collected by	**: Environmental Laboratory (Unit of Mineral Engineering Services)**
Duration	**: 08 Hrs**
Issue Date	**: 01.07.2024**

Station at & Code	Date of sample	Lab Code	Particulate mater (µg/m^3)
FA1, Loading point	13.06.2024	N/24/06/4-0139	196
FA2, Dumping point	13.06.2024	N/24/06/4-0140	154
FA3, Haulage Road	13.06.2024	N/24/06/4-0141	212
FA4, Stack Yard	13.06.2024	N/24/06/4-0142	263
FA5, Drilling Point	13.06.2024	N/24/06/4-0143	285
FA6, Waste Dumping Point	13.06.2024	N/24/06/4-0144	213

Ref : Environmental (Protection) Rules, 2010 (Sixth Amendment)

	Particulate mater (µg/m^3)
Permissible limits for Fugitive Emissions	**600 µg/m^3**

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 12

Analysis Report of Dust Fall Measurement

1	Name of the Client	The Sandur Manganese & Iron Ores Limited
2	Name of the Project	Mining Lease No. 2679
3	Month	01.06.2024 to 30.06.2024
4	Sample Type	Total Dust Fall Rate
5	Duration of Monitoring	One Month
6	Issue Date	01.07.2024

Result

Code	Location	Result	unit	Reference Method
DF1	Mine Office Area	0.012	g/m^2 month	IS 5182 (Part 01) : 2006
DF2	Near Crusher Area	0.018	g/m^2 month	IS 5182 (Part 01) : 2006

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 13

AMBIENT NOISE LEVEL DATA

Report No : ELMES0032406

Name of the Client	: The Sandur Manganese & Iron Ores Limited
Name of the Project	: Mining Lease No. 2679
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Date of monitoring	: 12.06.2024
Issue Date	: 01.07.2024

Code No.	Monitoring stations	Day			Night		
		L_{min}	L_{eq}	L_{max}	L_{min}	L_{eq}	L_{max}
	Corezone						
N1	Core zone ML Area	37.5	49.1	55.0	34.0	43.1	45.3
N2	Myadara Banda Block	37.6	50.6	56.3	34.5	42.4	45.8
N3	Goerner Point	36.5	51.1	55.9	33.8	39.6	44.8
N4	Neerlabbi	37.5	48.6	54.3	34.0	39.0	43.5
	Buffer zone						
N5	Ramgad village	36.5	51.9	56.0	33.4	40.8	43.6
N6	Dharmapura	37.0	48.0	53.0	34.0	40.6	44.0
N7	Garaga village	36.0	44.5	47.0	34.0	40.1	43.8
N8	Yeshwanthanagar	40.0	50.0	55.2	34.0	42.6	48.0
N9	Subbarayanahalli	37.0	50.3	56.0	35.0	43.6	48.6
N10	Siddapura	38.0	51.5	56.8	34.2	43.1	46.0

Permissible Limits of Ambient Noise Levels as per CPCB Guidelines

	Leq. Limit dB(A) Day	Night
Industrial areas	75	70
Commercial area	65	55
Residential area	55	45

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 14

NOISE LEVEL DATA

Report No : ELMES0042406

Name of the Client	: M/s. Sandur Manganese & Iron Ores Limited
Name of the Project	: Mining Lease No. 2679
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Date of monitoring	: 13.06.2024
Issue Date	: 01.07.2024

Code No.	Monitoring stations	Day			Remarks
		L_{min}	L_{eq}	L_{max}	
	Source				
N1	Loading Point	38.0	67.0	75.0	During operation
N2	Dumping Point	41.0	62.2	72.0	During operation
N3	Haulage Road	43.0	68.6	78.0	During operation
	Heavy Earth Moving Machineries				
N4	Wheel Loader	44.0	76.9	80.0	During operation in side of the cabin
		40.0	74.1	77.0	During operation 10mts outside of the cabin
N5	Tata Hitachi 200LC	43.0	72.3	78.0	During operation in side of the cabin
		41.0	71.4	75.6	During operation 10mts outside of the cabin

Permissible limits as per ILO Code of Practice

For Unprotected ear - 8 hrs working shift

Warning limit - 85 dB(A)

Danger limit - 90 dB(A)

Worker not to be exposed for more than 115 dB(A)

With ear protection -

130 dB(A) 'Impulse' or 120 dB(A) 'Fast'

No entry when noise level exceeds 140 dB(A)

Permissible Limits of Ambient Noise Levels as per CPCB Guidelines

	Leq. Limit dB(A) Day	Night
Industrial areas	75	70
Commerecial area	65	55
Residential area	55	45

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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(UNIT OF MINERAL ENGINEERING SERVICES LLP)

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TEST REPORT

Table No.15

Name of the Client	: The Sandur Manganese & Iron Ores Limited
Name of the Project	: Mining Lease No. 2679
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Particulars of sample collected	: SW1 - Ragavapura kere water, SW2 - Dhananayakana kere water
	: SW3 - Narihalla Upstream water, SW4 - Narihalla Downstream water
Date of sample collection	: 12.06.2024
Issue Date	: 24.06.2024

Ref:IS : 2296, 1982 Class C Norms (Stream Water Standards)

Sl.No.	Sample Code / Lab Code / Parameters	SW1 / N/24/06/3-0152 / Results	SW2 / N/24/06/3-0153 / Results	SW3 / N/24/06/3-0093 / Results	SW4 / N/24/06/3-0094 / Results	Limits For Stream Water Standards	Method of Testing
1	pH	6.89	7.45	7.25	7.84	6.5 to 8.5	IS:3025(Part-11)2022
2	Colour (Hazen Units), Max	5	5	10	15	300	IS:3025(Part-4)2021
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	-	IS:3025 (P-5) 2018
4	Total Dissolved Solids (mg/l), Max	420	680	175	457	1500	IS:3025(Part-16)2023
5	Total Suspended Solids, mg/l	18	67	<5.0	32	-	IS 3025 (P-17) 2022
6	Dissolved Oxygen (as O_2), mg/l, Max	5.1	5.3	5.40	5.10	Min 4	IS:3025(Part-38)1989RA 2019
7	Biochemical Oxygen Demand (as O_2), mg/l	<3.0	<3.0	<3	<3	3	IS:3025(P-44) 2014
8	Oil & Greease, mg/l	<0.1	<0.1	<0.1	<0.1	0.1	IS:3025(Part 39)2021
9	Total Hardness (as $CaCO_3$),mg/l,Max	220	460	30	90.21	-	IS:3025 (P-21):2009 RA 2019
10	Sulphates as SO_4 (mg/l), Max	58	132	11.2	61.4	400	IS:3025(P-24)Sec 1 2022
11	Phosphates (as P), mg/l	<0.05	<0.05	<0.05	<0.05	-	IS 3025 (P-31) Sec 1 2022
12	Chloride (as Cl),mg/l, Max	86	456	26.67	107.13	600	IS:3025(Part-32) ;1988RA2019
13	Fluoride (as F),mg/l, Max	0.2	0.8	0.4	0.3	1.5	APHA 23rd Edition 4500F
14	Sulphide (as H_2S) , mg/l, Max	<0.01	<0.01	<0.01	<0.01	-	IS:3025 (P-29):1986 RA 2019
15	Boron (as B), mg/l, Max	<0.1	<0.1	<0.1	<0.1	-	IS:3025 (Part-57)2021
16	Iron (as Fe),mg/l, Max	<0.005	0.18	<0.005	<0.005	50	IS:3025(P-2) 2019
17	Percent of Sodium (%)	22.56	32.5	22.00	20.00	-	IS 11624 .2009
18	Residual Sodium Carbonate (meq/l)	<0.05	<0.05	<0.05	<0.05	-	IS:2488 (P-5) 1976
19	Total Coliform, MPN/100ml	58	76	63	70	5000	IS:1622:1981

"'END OF REPORT"

BINU MANI
T.M. - Microbiology
Govt. Analyst / Authorised Signatory

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 18

Stack Monitoring Report

Report No. M015824063

Name of the Client :	The Sandur Manganese & Iron Ores Limited
Name of the Mine	: RAMGAD MANGANESE & IRON ORE MINE (ML NO. 2679)
Location	: Mining Lease No. 2679
Stack ID & Capcity	: DG Set 35 KVA Ramgad-KK1 Mines
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Date of Collection	: 12.06.2024
Particulars of Sample Collected	: Emissions from stack collected through stack sample VSS1
Date of Sample Receipt	: 13.06.2024
Issue date	: 21.06.2024

STACK DETAILS		
1	Fuel Used	Diesel
2	AmbientTemperature (^{0}C)	31
3	Stack Temperature (^{0}C)	110
4	Velocity (m/s)	5.85
5	Stack diameter (M)	0.15
6	Quanitity of flue Gas Discharged into atmosphere (Nm^3/hr)	273
7	Sample Condition When Received	Satisfactory
8	Model of the Equipment used for Monitoring	Vayubodhan Stack Sampler VSS1
9	Serial No. of the Equipment	338 DTH 14
10	Calibration done on and due on	Done on 19.11.2022 and Due on 18.11.2024
11	Sampling and Analysis Method	IS 11255 & flue gas analyser

Pollutional Parameters (Result)

Sl.No	Parameters	Unit	Results	Standard
1	Particulate Matter	g/Kw-hr	0.139	<0.2
2	CO	g/Kw-hr	0.08	<3.5
3	Nox +HC	g/Kw-hr	0.14	<4.0

INFERENCE	as per KSPCB **Report Status** - The measured values for the above parameters for those standards have been specified were observed to be within the said standards

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 19

Stack Monitoring Report

Report No. M015924063

Name of the Client :	The Sandur Manganese & Iron Ores Limited
Name of the Mine	: RAMGAD MANGANESE & IRON ORE MINE (ML NO. 2679)
Location	: Mining Lease No. 2679
Stack ID & Capcity	: DG Set 20 KVA Ramgad Mines
Sample Collected by	: Environmental Laboratory (Unit of Mineral Engineering Services)
Date of Collection	: 12.06.2024
Particulars of Sample Collected	: Emissions from stack collected through stack sample VSS1
Date of Sample Receipt	: 13.06.2024
Issue date	: 21.06.2024

STACK DETAILS		
1	Fuel Used	Diesel
2	AmbientTemperature (^{0}C)	31
3	Stack Temperature (^{0}C)	124
4	Velocity (m/s)	3.66
5	Stack diameter (M)	0.15
6	Quanitity of flue Gas Discharged into atmosphere (Nm^3/hr)	165
7	Sample Condition When Received	Satisfactory
8	Model of the Equipment used for Monitoring	Vayubodhan Stack Sampler VSS1
9	Serial No. of the Equipment	338 DTH 14
10	Calibration done on and due on	Done on 19.11.2022 and Due on 18.11.2024
11	Sampling and Analysis Method	IS 11255 & flue gas analyser

Pollutional Parameters (Result)

Sl.No	Parameters	Unit	Results	Standard
1	Particulate Matter	g/Kw-hr	0.124	<0.2
2	CO	g/Kw-hr	0.07	<3.5
3	Nox +HC	g/Kw-hr	0.22	<4.0

INFERENCE	as per KSPCB **Report Status** - The measured values for the above parameters for those standards have been specified were observed to be within the said standards

ARSHIYA KOUSAR
Dy. T.M. - Chemical
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

BLASTING VIBRATION STUDIES

At

Dabaxi Kolla section of Ramgad Manganese Ore Mine (ML-2679)

of

The Sandur Manganese & Iron Ores Ltd., Sandur

July, 2024

CONSULTANT

MINERAL ENGINEERING SERVICES
Accredited By NABET (QCI)
Mining & Environmental Engineers
25/XXV, Club Road, BALLARI - 583 103.

Tel/Fax:08392-267421
E-mail:mes_msraju@yahoo.co.uk

A study of Ground Vibration and Airblast Limits at
DABAXI Kolla section of Ramgad Manganese and Iron Ore Mine (ML-2679)

1. Introduction :

Blasting is conducted using explosives in Quarry for breaking hard formations rocks. Out of the total energy of explosives only 20 to 30% is utilized for fragmentation. Rest of the energy is wasted in the form of ground vibration, fly rock, air overpressure and noise.

The blasting can cause ground vibrations and noise and have a negative impact on the persons and other living beings in addition to the likely damage caused to buildings and sensitive structures in the vicinity. Blasting results in both ground and airborne vibration. Air borne vibrations result in audible noise and vibration known as air blast.

2. Statutory Provisions :

The Directorate General of Mines Safety issued a circular vide (DGMS) (Tech)/(S&T) Circular No. 7 of 1997 dated 29.08.1997 for compliance by all the mine owners using explosives for blasting.

The circular envisages that all the mine operators design their blasting operations to see that the peak particle velocity (ppv) at any given distance from the site of blasting to any building or sensitive structure at various frequency limits is within the permissible limits as given in **Table No. 1**.

Table No. 1 : Permissible Peak Particle Velocity (ppv) at the foundation level of structures in Mining areas in mm/s.

Type of structure	Dominant excitation Frequency, Hz		
	<8 Hz	8-25 Hz	>25 Hz
(A) Building/structures not belong to the owner			
(i) Domestic house/structures (kuchha, brick & cement)	5	10	15
(ii) Industrial Building (RCC & Framed structures)	10	20	25
(iii) Objects of historical importance & sensitive structures	2	5	10
(B) Building belonging to owner with limited span of life			
(i) Domestic houses/structures (kuchha, brick & cement)	10	15	25
(ii) Industrial Building (RCC & Framed structures)	15	25	50

It is obligatory that the mine operator abide by the above permissible limits by suitably designing the blast.

The factors affecting particle velocity of ground vibration are type and amount of explosive used/delay, distance from the charge to the point of observation; geological, structural and physical properties of the rock that transmits the vibrations, height of structures and blast geometry. Use of safe charge/delay, proper spacing and burden, inclined holes, deck charge, air deck, sequential blasting, clearing of loose pieces of rocks from the blast site and proper stemming shall reduce ground vibrations.

In the present case there is no sensitive and other structures close-by. Therefore, it was decided to locate the seismograph at 200 m distance. The habitations and other structures around the mine, which are more than 900 m away.

A Google map showing the location of blasting site and location of vibrograph instrument are enclosed vide **Fig. 1**

3. Blasting Studies

One number of blast were conducted at Dabaxi Kolla section of Ramgad Manganese (ML-2679) on 24.06.2024 using a Nomis Seismograph for recording the frequencies and Peak Particle Velocities and noise levels. The data sheets with details of blast are given below vide **Table No. 2.** Blast is conducted in side burden having share indormations

Table No. 2 : Blast Vibration study report of Ramgad Manganese Ore (ML-2679)

Sl. No.	Description	
1	Blast No.	1
2	Location	N 15^{0}07'57.7" E 76^{0}27'17.5" Bench No-4 RL - 900 m
3	No. of holes	30
4	Depth of holes (m)	7.5
5	Burden(m) x spacing (m)	3.5 X 2.5
6	Diameter of hole (mm)	100
7	Explosives used	Solar Prime (NONEL)
8	Total Explosives used (kg)	330.05
9	Maximum charge/delay (kg)	30
10	Location of Nomis Seismograph	N 15^{0}07'52.4" E 76^{0}27'14.1"

The waveform graph for the blast enclosed vide Annexure-1

4. Results :

The results show that at 200 m distance, ground vibration (ppv) are well within the permissible limits for the blast design parameters chosen and hence safe from any ill effects of blast from this Mine.

Table No. 3 : Results of study for Dabaxi Kolla Section of Ramgad Manganese and Iron Ore Mine (ML-2679)

Particulars	Blast - 1	Permissible limits for Domestic Houses/ Structure
PPV (mm/s)	1.75	15.0
Frequency (Hz)	25.6	>25
Air Pressure Level (dBL)	91.5	--

Therefore, it may be concluded from the above study that the blast parameters used for the above blasts are safe to continue in future also which shall not affect any buildings and sensitive structures.

For MINERAL ENGINEERING SERVICES

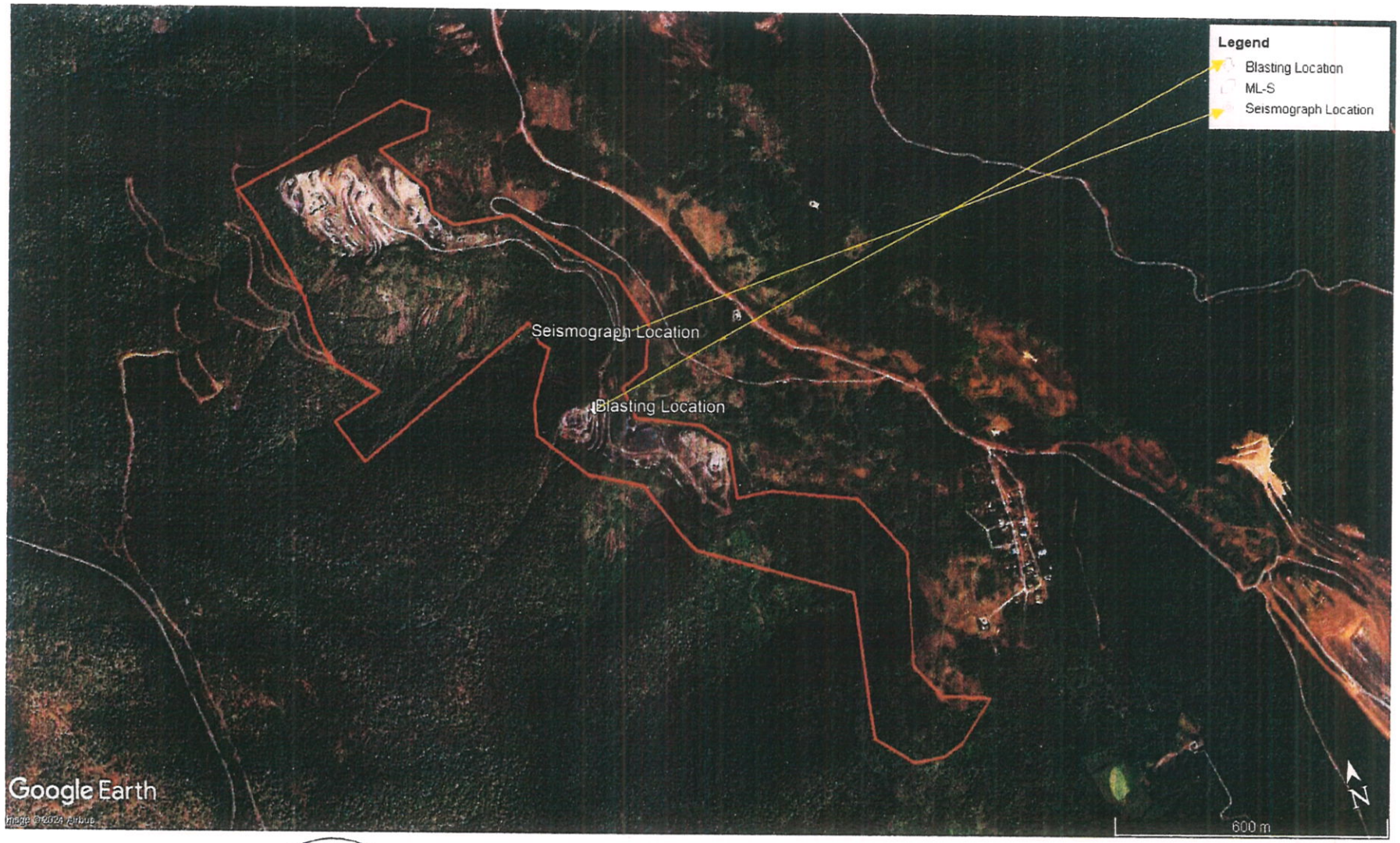
MINERAL ENGG SERVICES BELLARY

(M.S. RAJU)
NABET Consultant

Date : 09.07.2024
Place : Ballari

Google Earth Plan showing Blasting Location at DABAXI Kolla ,

Section of Ramgad Mine ML No-2679



MINERAL ENGG SERVICES BELLARY.

Fig-1

Annexure-1

Version 4.2.4
Executable Date: 18Oct2017

Nomis Seismographs, Inc.

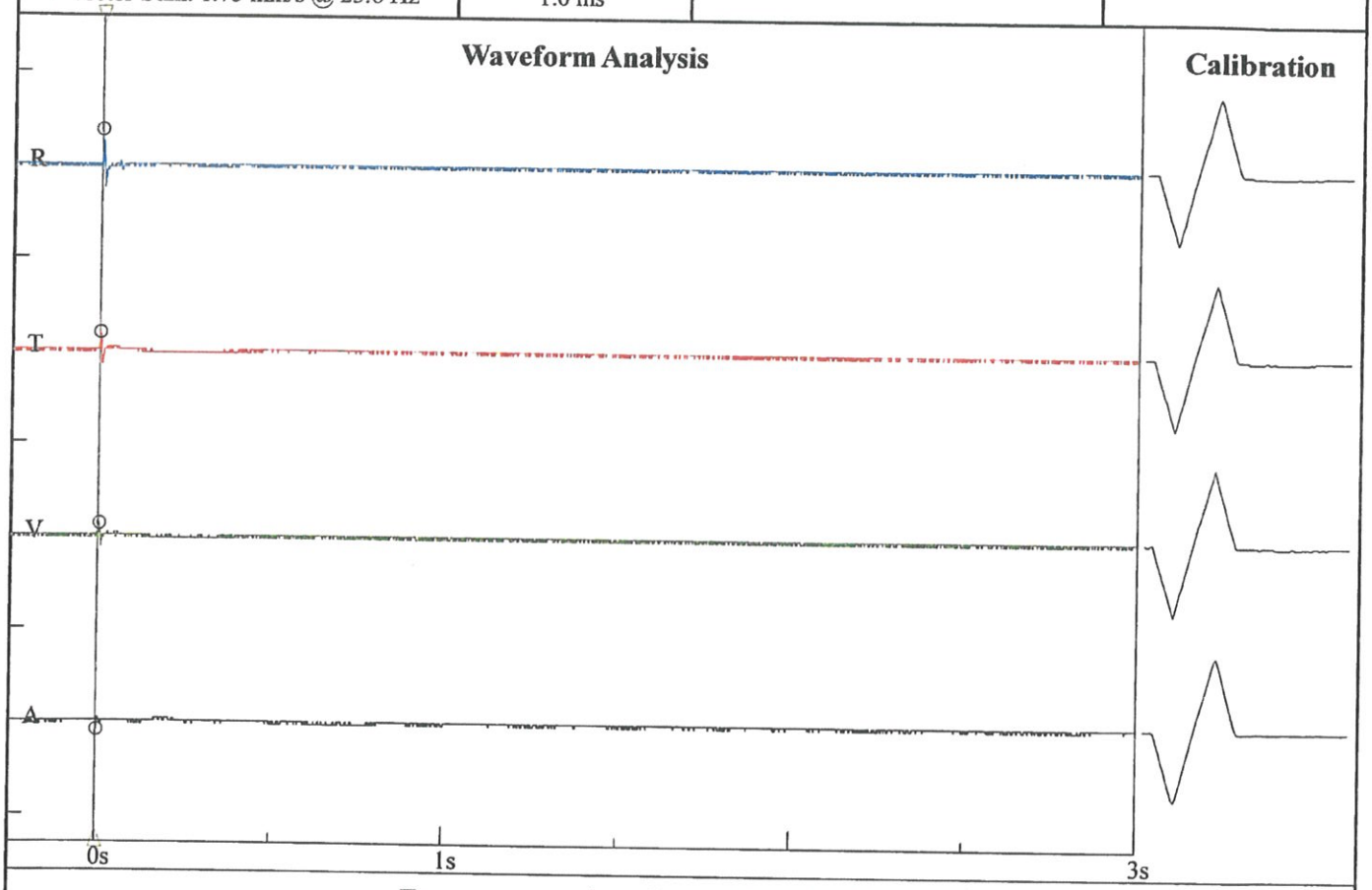
Mineral Engineering Services - Report

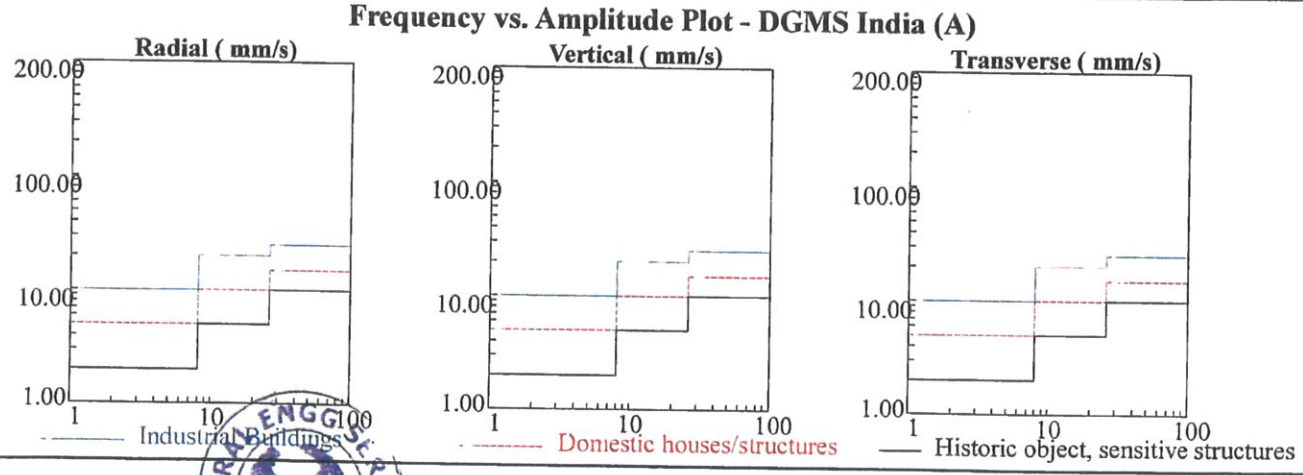
Telephone: 25/XXV Club Road Ballari

Company: The Sandur Manganese & Iron Ores Ltd.,
Location: DBX RL B.No -4 m RL -900 ML No 2679
Operator: B Vallibasha
Notes: 30 Nos of holes of 100mm dia, 7.5m depth, 3.5m Spacing and 2.5 m Burden

24/06/2024 at 14:10:06 Event # 270
Graph: 20617
Record Duration: 3 sec
Sample Rate: 1024/sec

Amplitudes / Frequencies	Trigger >>> Peak	Scales / Triggers	Charge / Distance
○ Radial: 1.524 mm/s @ 256 Hz	1.0 ms	Air Scale: .00799 kPa/div.	Wgt. Per Delay: 330 kg
○ Transverse: 0.762 mm/s @ 256 Hz	1.0 ms	Seismic Scale: 4.06 mm/s/div.	Distance: 200 m
○ Vertical: 0.508 mm/s @ 170.6 Hz	3.9 ms	Air Trigger: N	Scaled Distance: 11.0
○ Air: 91.5 dBL @ 0Hz / .0007kPa	2.0 ms	Seismic Trigger: .889 mm/s	
▽ Vector Sum: 1.75 mm/s @ 25.6 Hz	1.0 ms		





MINERAL ENGG SERVICES