



जवाहरलाल नेहरू एल्युमीनियम अनुसंधान विकास एवं अभिकल्प केन्द्र नागपुर

JNARDDC

JAWAHARLAL NEHRU ALUMINIUM RESEARCH DEVELOPMENT & DESIGN CENTRE, NAGPUR

Autonomous Body, Ministry of Mines, Govt. of India



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An ISO/IEC-17025:2017 & ISO-17034:2016 NABL accredited lab

Ref.No: 544/JNARDDC/TESTING/24-25

Date : Oct 14, 2024

Mr. Ashutosh Temle
General Manager (Mines)
Madhya Pradesh State Mining Corporation Limited
Bhopal

Sub: Chemical Analysis of 110 Limestone Samples.

Ref: Your Letter No. क्रमांक: पूर्वक्षण/न.क्र. 124/452-453 दिनांक २२/०८/२०२४
Your Samples Received On Dated 07.10.2024
Your E-mail message dated 23.08.2024
Our Letter No.421/JNARDDC/TESTING/24-25 dated 27.08.2024.

Dear Sir,

We refer to above. We are enclosing Chemicals Analysis Report for the above samples. Kindly acknowledge the receipt.

Kindly note that the sample received from you were given our own code numbers and then analyzed. Hence the enclosed analysis report carries the JNARDDC sample code numbers. The customer identification numbers and their corresponding JNARDDC samples code number are given in **Annexure - 272** for your interpretation.

Thanking You.

Yours faithfully,

(N.N.Warhadpande)
Incharge (CTSC)

Encl: Annexure – 272
Analysis Report



**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
NAGPUR**



ULR No.: TC825424000000272F

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Test Report

Name of the Laboratory	Chemical Laboratory, JNARDDC	Address of the Laboratory		Analytical Division, JNARDDC, Amravati road, Wadi, Nagpur	
Receipt Date of Sample	07/10/2024	Test Report No.	JNARDDC/ANAL/24-25/33-A		
Condition of the Sample	OK	Report Date	10/10/2024		
Name of the Item Tested	110 Limestone Samples (JNA/24-25/NAB/OCT/31 to 140)				
Date of Analysis	07/10/2024 - 09/10/2024	Env.Condition During Analysis	Temp.	21.3 °C	
Equipment Used for Testing	XRF, Muffle Furnace	Test Procedure Method Used	R.Humidity	57 %	
			JNARDDC/QTP/XRF JNARDDC/QTP/WCL		

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
1	JNA/24-25/NAB/OCT/31	30.26	----	0.58	3.88	0.50	----	0.05	0.12	44.41
2	JNA/24-25/NAB/OCT/32	30.41	9.96	4.02	----	1.42	----	0.03	0.69	32.02
3	JNA/24-25/NAB/OCT/33	28.88	10.45	4.10	----	1.36	----	0.03	0.62	31.61
4	JNA/24-25/NAB/OCT/34	26.71	11.08	4.32	----	1.51	----	0.03	0.66	30.01
5	JNA/24-25/NAB/OCT/35	33.37	8.44	2.93	----	0.99	----	0.03	0.39	33.38
6	JNA/24-25/NAB/OCT/36	37.50	7.14	3.43	----	1.12	----	0.03	0.71	33.73
7	JNA/24-25/NAB/OCT/37	38.99	6.00	3.06	----	1.10	----	0.02	0.65	35.21
8	JNA/24-25/NAB/OCT/38	35.67	7.49	3.60	----	1.17	----	0.02	0.74	33.73
9	JNA/24-25/NAB/OCT/39	35.42	7.93	3.45	----	1.23	----	0.03	0.53	33.6
10	JNA/24-25/NAB/OCT/40	30.75	10.15	3.38	----	1.24	----	0.03	0.63	32.33
11	JNA/24-25/NAB/OCT/41	26.48	10.45	3.62	----	1.37	----	0.02	0.48	29.5
12	JNA/24-25/NAB/OCT/42	36.71	7.16	3.46	----	1.10	----	0.03	0.63	33.73
13	JNA/24-25/NAB/OCT/43	30.10	10.13	4.02	----	1.55	----	0.02	0.63	31.23
14	JNA/24-25/NAB/OCT/44	33.84	9.06	3.99	----	1.44	----	0.04	0.72	32.74
15	JNA/24-25/NAB/OCT/45	31.54	9.35	4.06	----	1.34	----	0.03	0.86	31.82
16	JNA/24-25/NAB/OCT/46	27.73	10.66	4.80	----	1.56	----	0.02	1.00	30.73
17	JNA/24-25/NAB/OCT/47	30.09	9.86	4.09	----	1.39	----	0.02	0.69	31.35
18	JNA/24-25/NAB/OCT/48	25.38	11.36	4.49	----	1.62	----	0.03	0.97	29.53
19	JNA/24-25/NAB/OCT/49	32.62	9.15	3.23	----	1.15	----	0.02	0.62	31.95
20	JNA/24-25/NAB/OCT/50	30.94	9.99	3.52	----	1.23	----	0.02	0.67	32.94
21	JNA/24-25/NAB/OCT/51	29.65	10.47	4.08	----	1.47	----	0.03	0.81	31.99
22	JNA/24-25/NAB/OCT/52	33.25	9.07	3.69	----	1.25	----	0.02	0.65	33.19

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
NAGPUR**



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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
23	JNA/24-25/NAB/OCT/53	29.55	----	0.80	4.82	0.44	----	0.04	0.13	43.95
24	JNA/24-25/NAB/OCT/54	31.29	9.49	3.39	----	1.24	----	0.02	0.38	33.08
25	JNA/24-25/NAB/OCT/55	40.43	4.64	2.46	----	0.86	----	0.03	0.21	35.85
26	JNA/24-25/NAB/OCT/56	37.61	5.65	3.43	----	1.14	----	0.03	0.38	34.68
27	JNA/24-25/NAB/OCT/57	37.79	5.39	4.02	----	1.31	----	0.05	0.61	33.14
28	JNA/24-25/NAB/OCT/58	41.56	3.45	2.03	----	0.68	----	0.02	0.26	36.34
29	JNA/24-25/NAB/OCT/59	32.34	9.07	2.89	----	1.10	----	0.02	0.50	33.98
30	JNA/24-25/NAB/OCT/60	31.12	9.75	3.50	----	1.25	----	0.03	0.60	33.72
31	JNA/24-25/NAB/OCT/61	24.93	12.45	4.60	----	1.67	----	0.04	0.76	30.85
32	JNA/24-25/NAB/OCT/62	29.41	10.32	4.31	----	1.34	----	0.03	0.73	32.67
33	JNA/24-25/NAB/OCT/63	30.94	9.49	3.69	----	1.17	----	0.03	0.64	33.96
34	JNA/24-25/NAB/OCT/64	42.46	3.48	2.01	----	0.81	----	0.02	0.32	36.19
35	JNA/24-25/NAB/OCT/65	33.09	8.88	3.12	----	1.14	----	0.03	0.67	34.17
36	JNA/24-25/NAB/OCT/66	33.86	9.03	3.07	----	1.07	----	0.03	0.71	35.34
37	JNA/24-25/NAB/OCT/67	32.76	8.80	3.51	----	1.16	----	0.02	0.65	33.71
38	JNA/24-25/NAB/OCT/68	29.38	10.25	4.58	----	1.47	----	0.03	0.92	31.38
39	JNA/24-25/NAB/OCT/69	25.71	11.01	----	----	1.70	----	0.06	0.89	29.95
40	JNA/24-25/NAB/OCT/70	26.55	11.12	4.55	----	1.61	----	0.03	0.82	30.18
41	JNA/24-25/NAB/OCT/71	28.63	10.71	3.55	----	1.44	----	0.03	0.68	31.84
42	JNA/24-25/NAB/OCT/72	27.96	9.84	4.13	----	1.41	----	0.03	0.66	30.65
43	JNA/24-25/NAB/OCT/73	22.90	11.96	----	----	1.66	----	0.04	0.92	28.95
44	JNA/24-25/NAB/OCT/74	32.90	8.85	3.73	----	1.18	----	0.03	0.72	33.40
45	JNA/24-25/NAB/OCT/75	29.78	18.71	0.89	6.55	0.50	----	0.03	0.11	43.31
46	JNA/24-25/NAB/OCT/76	24.43	10.60	4.14	----	1.56	----	0.03	0.55	28.42
47	JNA/24-25/NAB/OCT/77	24.39	11.24	4.50	----	1.54	----	0.03	0.49	29.02
48	JNA/24-25/NAB/OCT/78	28.26	10.26	3.56	----	1.36	----	0.02	0.44	31.33
49	JNA/24-25/NAB/OCT/79	24.26	11.14	3.44	----	1.40	----	0.01	0.43	29.37
50	JNA/24-25/NAB/OCT/80	26.54	9.80	3.44	----	1.20	----	0.02	0.37	29.39

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
51	JNA/24-25/NAB/OCT/81	25.77	11.08	3.96	----	1.43	----	0.04	0.39	29.12
52	JNA/24-25/NAB/OCT/82	24.20	12.27	4.36	----	1.55	----	0.04	0.57	29.10
53	JNA/24-25/NAB/OCT/83	23.97	11.33	4.03	----	1.51	----	0.04	0.55	28.40
54	JNA/24-25/NAB/OCT/84	----	14.05	----	----	----	----	0.04	0.93	23.74
55	JNA/24-25/NAB/OCT/85	----	13.45	----	----	----	----	0.05	0.91	25.24
56	JNA/24-25/NAB/OCT/86	24.70	10.97	3.34	----	1.49	----	0.05	0.43	29.29
57	JNA/24-25/NAB/OCT/87	21.49	12.43	----	----	1.82	----	0.02	0.75	26.58
58	JNA/24-25/NAB/OCT/88	21.95	12.21	----	----	1.88	----	0.03	0.80	27.11
59	JNA/24-25/NAB/OCT/89	20.99	12.96	----	----	1.94	----	0.02	0.78	26.71
60	JNA/24-25/NAB/OCT/90	22.45	12.41	4.91	----	1.91	----	0.02	0.70	27.50
61	JNA/24-25/NAB/OCT/91	25.90	10.96	4.40	----	1.69	----	0.03	0.75	30.73
62	JNA/24-25/NAB/OCT/92	27.22	11.05	4.42	----	1.66	----	0.03	0.79	30.56
63	JNA/24-25/NAB/OCT/93	26.02	11.27	4.76	----	1.72	----	0.03	0.74	29.46
64	JNA/24-25/NAB/OCT/94	28.08	10.54	4.64	----	1.55	----	0.02	0.69	30.45
65	JNA/24-25/NAB/OCT/95	26.26	11.00	4.91	----	1.83	----	0.04	0.78	29.56
66	JNA/24-25/NAB/OCT/96	26.02	10.76	4.80	----	1.62	----	0.02	0.80	29.09
67	JNA/24-25/NAB/OCT/97	29.51	19.68	0.59	5.58	0.46	----	0.04	----	44.01
68	JNA/24-25/NAB/OCT/98	39.52	4.92	3.12	----	0.99	----	0.01	0.48	35.09
69	JNA/24-25/NAB/OCT/99	37.25	6.01	2.98	----	1.02	----	0.02	0.33	33.89
70	JNA/24-25/NAB/OCT/100	23.67	12.78	4.47	----	1.53	----	0.02	0.62	30.25
71	JNA/24-25/NAB/OCT/101	24.63	10.06	----	----	1.65	----	0.03	0.88	27.88
72	JNA/24-25/NAB/OCT/102	27.18	9.71	4.15	----	1.29	----	0.02	0.57	30.38
73	JNA/24-25/NAB/OCT/103	29.95	9.83	3.98	----	1.37	----	0.04	0.61	31.43
74	JNA/24-25/NAB/OCT/104	34.58	8.03	3.49	----	1.20	----	0.02	0.46	33.35
75	JNA/24-25/NAB/OCT/105	23.70	11.60	4.98	----	1.94	----	0.02	0.83	28.42
76	JNA/24-25/NAB/OCT/106	22.15	12.16	----	----	1.98	----	0.05	----	27.22
77	JNA/24-25/NAB/OCT/107	31.15	9.21	3.59	----	1.29	----	0.03	0.54	32.02
78	JNA/24-25/NAB/OCT/108	29.11	10.21	3.91	----	1.46	----	0.04	0.64	31.32

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
NAGPUR**



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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
79	JNA/24-25/NAB/OCT/109	21.70	13.24	----	----	1.96	----	0.03	0.87	28.07
80	JNA/24-25/NAB/OCT/110	25.28	11.23	4.22	----	1.61	----	0.03	0.60	29.59
81	JNA/24-25/NAB/OCT/111	24.85	11.70	4.15	----	1.49	----	0.02	0.64	29.31
82	JNA/24-25/NAB/OCT/112	23.20	12.56	----	----	1.84	----	0.02	0.86	28.28
83	JNA/24-25/NAB/OCT/113	25.65	11.56	----	----	1.70	----	0.04	0.85	29.16
84	JNA/24-25/NAB/OCT/114	22.18	12.92	----	----	1.96	----	0.03	0.99	27.61
85	JNA/24-25/NAB/OCT/115	25.00	11.50	----	----	1.84	----	0.02	0.80	28.98
86	JNA/24-25/NAB/OCT/116	23.40	12.18	4.96	----	1.78	----	0.05	0.78	28.24
87	JNA/24-25/NAB/OCT/117	24.92	12.07	3.34	----	1.37	----	0.02	0.42	30.44
88	JNA/24-25/NAB/OCT/118	24.07	12.14	4.52	----	1.62	----	0.03	0.63	29.78
89	JNA/24-25/NAB/OCT/119	29.51	19.45	0.71	6.00	0.52	----	0.04	----	43.67
90	JNA/24-25/NAB/OCT/120	32.30	6.67	3.79	----	1.20	----	0.03	0.46	31.34
91	JNA/24-25/NAB/OCT/121	29.96	8.73	3.09	----	1.22	----	0.02	0.40	32.17
92	JNA/24-25/NAB/OCT/122	25.70	10.83	4.28	----	1.42	----	0.03	0.58	29.84
93	JNA/24-25/NAB/OCT/123	21.88	12.66	----	----	1.89	----	0.05	0.76	27.82
94	JNA/24-25/NAB/OCT/124	25.56	11.96	3.56	----	1.38	----	0.02	0.54	31.35
95	JNA/24-25/NAB/OCT/125	23.78	13.13	4.06	----	1.53	----	0.04	0.60	30.50
96	JNA/24-25/NAB/OCT/126	23.90	12.93	----	----	1.64	----	0.04	0.71	29.43
97	JNA/24-25/NAB/OCT/127	22.83	12.43	----	----	1.82	----	0.06	0.84	29.01
98	JNA/24-25/NAB/OCT/128	33.33	8.87	3.14	----	1.11	----	0.02	0.51	34.05
99	JNA/24-25/NAB/OCT/129	26.99	11.61	3.97	----	1.44	----	0.02	0.55	31.55
100	JNA/24-25/NAB/OCT/130	24.97	12.43	3.59	----	1.38	----	0.01	0.50	31.36
101	JNA/24-25/NAB/OCT/131	29.07	11.01	3.34	----	1.34	----	0.03	0.58	32.90
102	JNA/24-25/NAB/OCT/132	25.48	12.50	4.26	----	1.52	----	0.04	0.77	31.09
103	JNA/24-25/NAB/OCT/133	25.16	11.91	4.77	----	1.75	----	0.02	0.79	30.39
104	JNA/24-25/NAB/OCT/134	30.77	9.53	3.84	----	1.39	----	0.04	0.58	31.35
105	JNA/24-25/NAB/OCT/135	28.64	9.85	3.22	----	1.38	----	0.01	0.51	31.27
106	JNA/24-25/NAB/OCT/136	26.34	12.02	2.84	----	1.28	----	0.02	0.34	32.28

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
NAGPUR**



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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
107	JNA/24-25/NAB/OCT/137	29.21	10.62	3.61	----	1.38	----	0.03	0.57	32.54
108	JNA/24-25/NAB/OCT/138	30.28	10.01	3.38	----	1.20	----	0.02	0.62	32.61
109	JNA/24-25/NAB/OCT/139	28.97	10.86	3.04	----	1.24	----	0.02	0.49	32.65
110	JNA/24-25/NAB/OCT/140	26.98	11.21	3.94	----	1.45	----	0.03	0.67	30.72

Signature			
Name	A S Gijare / D R Meshram	Dr Papa Rao Mondi	Dr Upendra Singh
Designation	Sci Asst-IV / Sci Asst-IV	Scientist	Sr Principal Scientist & HoD
Authority	Tested by	Reviewed by	Approved by

NOTE :

1. Sample is tested on as received basis & Laboratory is not involved in sampling.
2. Limits/Standard values are given only for interpretation of results and may not represent acceptability/rejection of material.
3. This test report refers only to particular item(s) submitted for Testing
4. This test report shall not be reproduced, except in full, unless written permission for the publication of an approved abstract has been obtained from JNARDDC
5. The test results reported in this report are valid at the time and under the stated conditions of test
6. "-" Scope not covered in Accreditation.
7. All disputes are subject to Nagpur Jurisdiction

- End Report -

FOR CTSC USE ONLY :

Name & Code of the Customer	Mr. Ashutosh Temle
Address of the Customer	General Manager (Mines) Madhya Pradesh State Mining Corporation Limited Bhopal
Name & Signature of CTSC Head	

Details of the Sample ID and corresponding JNARDDC sample code no's is enclosed.
(Please refer Annexure - 212)

ANNEXURE - 272

Name of the Customer	Address of the Customer	Date of Receipt of sample by CTSC	Customer Sample ID and Corresponding JNARDDC sample code no. for the interpretation of the customer
Mr. Ashutosh Temle	General Manager (Mines) Madhya Pradesh State Mining Corporation Limited Bhopal	07.10.2024	

Sl No.	Customer Sample ID	JNARDDC Sample Code No.
1.	M00001	JNA/24-25/NAB/Oct/31
2.	M00002	JNA/24-25/NAB/Oct/32
3.	M00003	JNA/24-25/NAB/Oct/33
4.	M00004	JNA/24-25/NAB/Oct/34
5.	M00005	JNA/24-25/NAB/Oct/35
6.	M00006	JNA/24-25/NAB/Oct/36
7.	M00007	JNA/24-25/NAB/Oct/37
8.	M00008	JNA/24-25/NAB/Oct/38
9.	M00009	JNA/24-25/NAB/Oct/39
10.	M00010	JNA/24-25/NAB/Oct/40
11.	M00011	JNA/24-25/NAB/Oct/41
12.	M00012	JNA/24-25/NAB/Oct/42
13.	M00013	JNA/24-25/NAB/Oct/43
14.	M00014	JNA/24-25/NAB/Oct/44

15.	M00015	JNA/24-25/NAB/Oct/45
16.	M00016	JNA/24-25/NAB/Oct/46
17.	M00017	JNA/24-25/NAB/Oct/47
18.	M00018	JNA/24-25/NAB/Oct/48
19.	M00019	JNA/24-25/NAB/Oct/49
20.	M00020	JNA/24-25/NAB/Oct/50
21.	M00021	JNA/24-25/NAB/Oct/51
22.	M00022	JNA/24-25/NAB/Oct/52
23.	M00023	JNA/24-25/NAB/Oct/53
24.	M00024	JNA/24-25/NAB/Oct/54
25.	M00025	JNA/24-25/NAB/Oct/55
26.	M00026	JNA/24-25/NAB/Oct/56
27.	M00027	JNA/24-25/NAB/Oct/57
28.	M00028	JNA/24-25/NAB/Oct/58
29.	M00029	JNA/24-25/NAB/Oct/59
30.	M00030	JNA/24-25/NAB/Oct/60
31.	M00031	JNA/24-25/NAB/Oct/61
32.	M00032	JNA/24-25/NAB/Oct/62
33.	M00033	JNA/24-25/NAB/Oct/63
34.	M00034	JNA/24-25/NAB/Oct/64
35.	M00035	JNA/24-25/NAB/Oct/65
36.	M00036	JNA/24-25/NAB/Oct/66

37.	M00037	JNA/24-25/NAB/Oct/67
38.	M00038	JNA/24-25/NAB/Oct/68
39.	M00039	JNA/24-25/NAB/Oct/69
40.	M00040	JNA/24-25/NAB/Oct/70
41.	M00041	JNA/24-25/NAB/Oct/71
42.	M00042	JNA/24-25/NAB/Oct/72
43.	M00043	JNA/24-25/NAB/Oct/73
44.	M00044	JNA/24-25/NAB/Oct/74
45.	M00045	JNA/24-25/NAB/Oct/75
46.	M00046	JNA/24-25/NAB/Oct/76
47.	M00047	JNA/24-25/NAB/Oct/77
48.	M00048	JNA/24-25/NAB/Oct/78
49.	M00049	JNA/24-25/NAB/Oct/79
50.	M00050	JNA/24-25/NAB/Oct/80
51.	M00051	JNA/24-25/NAB/Oct/81
52.	M00052	JNA/24-25/NAB/Oct/82
53.	M00053	JNA/24-25/NAB/Oct/83
54.	M00054	JNA/24-25/NAB/Oct/84
55.	M00055	JNA/24-25/NAB/Oct/85
56.	M00056	JNA/24-25/NAB/Oct/86
57.	M00057	JNA/24-25/NAB/Oct/87
58.	M00058	JNA/24-25/NAB/Oct/88

59.	M00059	JNA/24-25/NAB/Oct/89
60.	M00060	JNA/24-25/NAB/Oct/90
61.	M00061	JNA/24-25/NAB/Oct/91
62.	M00062	JNA/24-25/NAB/Oct/92
63.	M00063	JNA/24-25/NAB/Oct/93
64.	M00064	JNA/24-25/NAB/Oct/94
65.	M00065	JNA/24-25/NAB/Oct/95
66.	M00066	JNA/24-25/NAB/Oct/96
67.	M00067	JNA/24-25/NAB/Oct/97
68.	M00068	JNA/24-25/NAB/Oct/98
69.	M00069	JNA/24-25/NAB/Oct/99
70.	M00070	JNA/24-25/NAB/Oct/100
71.	M00071	JNA/24-25/NAB/Oct/101
72.	M00072	JNA/24-25/NAB/Oct/102
73.	M00073	JNA/24-25/NAB/Oct/103
74.	M00074	JNA/24-25/NAB/Oct/104
75.	M00075	JNA/24-25/NAB/Oct/105
76.	M00076	JNA/24-25/NAB/Oct/106
77.	M00077	JNA/24-25/NAB/Oct/107
78.	M00078	JNA/24-25/NAB/Oct/108
79.	M00079	JNA/24-25/NAB/Oct/109
80.	M00080	JNA/24-25/NAB/Oct/110

81.	M00081	JNA/24-25/NAB/Oct/111
82.	M00082	JNA/24-25/NAB/Oct/112
83.	M00083	JNA/24-25/NAB/Oct/113
84.	M00084	JNA/24-25/NAB/Oct/114
85.	M00085	JNA/24-25/NAB/Oct/115
86.	M00086	JNA/24-25/NAB/Oct/116
87.	M00087	JNA/24-25/NAB/Oct/117
88.	M00088	JNA/24-25/NAB/Oct/118
89.	M00089	JNA/24-25/NAB/Oct/119
90.	M00090	JNA/24-25/NAB/Oct/120
91.	M00091	JNA/24-25/NAB/Oct/121
92.	M00092	JNA/24-25/NAB/Oct/122
93.	M00093	JNA/24-25/NAB/Oct/123
94.	M00094	JNA/24-25/NAB/Oct/124
95.	M00095	JNA/24-25/NAB/Oct/125
96.	M00096	JNA/24-25/NAB/Oct/126
97.	M00097	JNA/24-25/NAB/Oct/127
98.	M00098	JNA/24-25/NAB/Oct/128
99.	M00099	JNA/24-25/NAB/Oct/129
100.	M00100	JNA/24-25/NAB/Oct/130
101.	M00101	JNA/24-25/NAB/Oct/131
102.	M00102	JNA/24-25/NAB/Oct/132

103.	M00103	JNA/24-25/NAB/Oct/133
104.	M00104	JNA/24-25/NAB/Oct/134
105.	M00105	JNA/24-25/NAB/Oct/135
106.	M00106	JNA/24-25/NAB/Oct/136
107.	M00107	JNA/24-25/NAB/Oct/137
108.	M00108	JNA/24-25/NAB/Oct/138
109.	M00109	JNA/24-25/NAB/Oct/139
110.	M00110	JNA/24-25/NAB/Oct/140





**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
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Test Report

Name of the Laboratory	Chemical Laboratory, JNARDDC	Address of the Laboratory	Analytical Division, JNARDDC, Amravati road, Wadi, Nagpur
Receipt Date of Sample	07/10/2024	Test Report No.	JNARDDC/ANAL/24-25/33-B
Condition of the Sample	OK	Report Date	10/10/2024
Name of the Item Tested	110 Limestone Samples (JNA/24-25/NAB/OCT/31 to 140)		
Date of Analysis	07/10/2024 - 09/10/2024	Env. Condition During Analysis	Temp. 21.3 °C R. Humidity 57 %
Equipment Used for Testing	XRF, Muffle Furnace	Test Procedure Method Used	JNARDDC/QTP/XRF JNARDDC/QTP/WCL

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
1	JNA/24-25/NAB/OCT/31	----	20.14	----	----	----	0.014	----	----	----
2	JNA/24-25/NAB/OCT/32	----	----	----	20.83	----	0.043	----	----	----
3	JNA/24-25/NAB/OCT/33	----	----	----	22.64	----	0.027	----	----	----
4	JNA/24-25/NAB/OCT/34	----	----	----	25.32	----	0.057	----	----	----
5	JNA/24-25/NAB/OCT/35	----	----	----	19.27	----	0.133	----	----	----
6	JNA/24-25/NAB/OCT/36	----	----	----	15.94	----	0.150	----	----	----
7	JNA/24-25/NAB/OCT/37	----	----	----	14.68	----	0.115	----	----	----
8	JNA/24-25/NAB/OCT/38	----	----	----	17.15	----	0.145	----	----	----
9	JNA/24-25/NAB/OCT/39	----	----	----	16.63	----	0.095	----	----	----
10	JNA/24-25/NAB/OCT/40	----	----	----	20.41	----	0.089	----	----	----
11	JNA/24-25/NAB/OCT/41	----	----	----	26.86	----	0.091	----	----	----
12	JNA/24-25/NAB/OCT/42	----	----	----	15.99	----	0.185	----	----	----
13	JNA/24-25/NAB/OCT/43	----	----	----	21.73	----	0.147	----	----	----
14	JNA/24-25/NAB/OCT/44	----	----	----	17.63	----	0.146	----	----	----
15	JNA/24-25/NAB/OCT/45	----	----	----	19.69	----	0.185	----	----	----
16	JNA/24-25/NAB/OCT/46	----	----	----	22.07	----	0.177	----	----	----
17	JNA/24-25/NAB/OCT/47	----	----	----	21.06	----	0.128	----	----	----
18	JNA/24-25/NAB/OCT/48	----	----	----	25.16	----	0.166	----	----	----
19	JNA/24-25/NAB/OCT/49	----	----	----	20.72	----	0.095	----	----	----
20	JNA/24-25/NAB/OCT/50	----	----	----	19.29	----	0.121	----	----	----
21	JNA/24-25/NAB/OCT/51	----	----	----	20.11	----	0.119	----	----	----
22	JNA/24-25/NAB/OCT/52	----	----	----	17.77	----	0.121	----	----	----

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
23	JNA/24-25/NAB/OCT/53	----	20.12	----	----	----	0.005	----	----	----
24	JNA/24-25/NAB/OCT/54	----	----	----	20.83	----	0.017	----	----	----
25	JNA/24-25/NAB/OCT/55	----	----	----	15.35	----	0.005	----	----	----
26	JNA/24-25/NAB/OCT/56	----	----	----	15.86	----	0.013	----	----	----
27	JNA/24-25/NAB/OCT/57	----	----	----	17.28	----	0.005	----	----	----
28	JNA/24-25/NAB/OCT/58	----	----	----	14.93	----	0.006	----	----	----
29	JNA/24-25/NAB/OCT/59	----	----	----	19.84	----	0.031	----	----	----
30	JNA/24-25/NAB/OCT/60	----	----	----	18.99	----	0.011	----	----	----
31	JNA/24-25/NAB/OCT/61	----	----	----	23.45	----	0.041	----	----	----
32	JNA/24-25/NAB/OCT/62	----	----	----	20.19	----	0.016	----	----	----
33	JNA/24-25/NAB/OCT/63	----	----	----	19.09	----	0.025	----	----	----
34	JNA/24-25/NAB/OCT/64	----	----	----	14.59	----	0.004	----	----	----
35	JNA/24-25/NAB/OCT/65	----	----	----	17.82	----	0.008	----	----	----
36	JNA/24-25/NAB/OCT/66	----	----	----	16.68	----	0.046	----	----	----
37	JNA/24-25/NAB/OCT/67	----	----	----	18.42	----	0.084	----	----	----
38	JNA/24-25/NAB/OCT/68	----	----	----	21.46	----	0.183	----	----	----
39	JNA/24-25/NAB/OCT/69	----	----	5.18	24.09	----	0.150	----	----	----
40	JNA/24-25/NAB/OCT/70	----	----	----	23.89	----	0.146	----	----	----
41	JNA/24-25/NAB/OCT/71	----	----	----	21.95	----	0.128	----	----	----
42	JNA/24-25/NAB/OCT/72	----	----	----	24.17	----	0.145	----	----	----
43	JNA/24-25/NAB/OCT/73	----	----	5.01	27.05	----	0.145	----	----	----
44	JNA/24-25/NAB/OCT/74	----	----	----	18.07	----	0.082	----	----	----
45	JNA/24-25/NAB/OCT/75	----	----	----	----	----	0.011	----	----	----
46	JNA/24-25/NAB/OCT/76	----	----	----	29.26	----	0.021	----	----	----
47	JNA/24-25/NAB/OCT/77	----	----	----	27.67	----	0.029	----	----	----
48	JNA/24-25/NAB/OCT/78	----	----	----	23.63	----	0.030	----	----	----
49	JNA/24-25/NAB/OCT/79	----	----	----	28.88	----	0.037	----	----	----
50	JNA/24-25/NAB/OCT/80	----	----	----	28.27	----	0.103	----	----	----

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
51	JNA/24-25/NAB/OCT/81	----	----	----	27.13	----	0.131	----	----	----
52	JNA/24-25/NAB/OCT/82	----	----	----	26.63	----	0.127	----	----	----
53	JNA/24-25/NAB/OCT/83	----	----	----	29.11	----	0.143	----	----	----
54	JNA/24-25/NAB/OCT/84	16.64	----	6.30	34.28	2.14	0.215	----	----	----
55	JNA/24-25/NAB/OCT/85	17.92	----	6.15	32.29	2.18	0.211	----	----	----
56	JNA/24-25/NAB/OCT/86	----	----	----	28.62	----	0.052	----	----	----
57	JNA/24-25/NAB/OCT/87	----	----	5.18	30.35	----	0.188	----	----	----
58	JNA/24-25/NAB/OCT/88	----	----	5.22	29.00	----	0.222	----	----	----
59	JNA/24-25/NAB/OCT/89	----	----	5.35	29.69	----	0.162	----	----	----
60	JNA/24-25/NAB/OCT/90	----	----	----	28.42	----	0.161	----	----	----
61	JNA/24-25/NAB/OCT/91	----	----	----	24.96	----	0.186	----	----	----
62	JNA/24-25/NAB/OCT/92	----	----	----	22.72	----	0.143	----	----	----
63	JNA/24-25/NAB/OCT/93	----	----	----	24.48	----	0.216	----	----	----
64	JNA/24-25/NAB/OCT/94	----	----	----	22.35	----	0.148	----	----	----
65	JNA/24-25/NAB/OCT/95	----	----	----	23.81	----	0.153	----	----	----
66	JNA/24-25/NAB/OCT/96	----	----	----	25.28	----	0.184	----	----	----
67	JNA/24-25/NAB/OCT/97	----	----	----	----	----	0.014	----	0.07	----
68	JNA/24-25/NAB/OCT/98	----	----	----	15.58	----	0.005	----	----	----
69	JNA/24-25/NAB/OCT/99	----	----	----	17.47	----	0.014	----	----	----
70	JNA/24-25/NAB/OCT/100	----	----	----	25.51	----	0.028	----	----	----
71	JNA/24-25/NAB/OCT/101	----	----	5.52	27.78	----	0.030	----	----	----
72	JNA/24-25/NAB/OCT/102	----	----	----	25.65	----	0.018	----	----	----
73	JNA/24-25/NAB/OCT/103	----	----	----	22.42	----	0.069	----	----	----
74	JNA/24-25/NAB/OCT/104	----	----	----	18.47	----	0.006	----	----	----
75	JNA/24-25/NAB/OCT/105	----	----	----	27.42	----	0.064	----	----	----
76	JNA/24-25/NAB/OCT/106	----	----	6.07	28.13	----	0.087	----	1.05	----
77	JNA/24-25/NAB/OCT/107	----	----	----	21.37	----	0.027	----	----	----
78	JNA/24-25/NAB/OCT/108	----	----	----	22.30	----	0.083	----	----	----

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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
79	JNA/24-25/NAB/OCT/109	----	----	5.70	26.91	----	0.126	----	----	----
80	JNA/24-25/NAB/OCT/110	----	----	----	25.91	----	0.234	----	----	----
81	JNA/24-25/NAB/OCT/111	----	----	----	27.38	----	0.155	----	----	----
82	JNA/24-25/NAB/OCT/112	----	----	5.09	26.74	----	0.217	----	----	----
83	JNA/24-25/NAB/OCT/113	----	----	5.03	24.73	----	0.185	----	----	----
84	JNA/24-25/NAB/OCT/114	----	----	5.71	27.30	----	0.186	----	----	----
85	JNA/24-25/NAB/OCT/115	----	----	5.18	25.19	----	0.189	----	----	----
86	JNA/24-25/NAB/OCT/116	----	----	----	27.00	----	0.187	----	----	----
87	JNA/24-25/NAB/OCT/117	----	----	----	26.37	----	0.061	----	----	----
88	JNA/24-25/NAB/OCT/118	----	----	----	26.02	----	0.076	----	----	----
89	JNA/24-25/NAB/OCT/119	----	----	----	----	----	0.005	----	0.05	----
90	JNA/24-25/NAB/OCT/120	----	----	----	23.10	----	0.006	----	----	----
91	JNA/24-25/NAB/OCT/121	----	----	----	23.50	----	0.018	----	----	----
92	JNA/24-25/NAB/OCT/122	----	----	----	26.06	----	0.007	----	----	----
93	JNA/24-25/NAB/OCT/123	----	----	5.38	28.53	----	0.031	----	----	----
94	JNA/24-25/NAB/OCT/124	----	----	----	24.61	----	0.028	----	----	----
95	JNA/24-25/NAB/OCT/125	----	----	----	24.60	----	0.045	----	----	----
96	JNA/24-25/NAB/OCT/126	----	----	5.25	25.68	----	0.042	----	----	----
97	JNA/24-25/NAB/OCT/127	----	----	5.58	26.12	----	0.037	----	----	----
98	JNA/24-25/NAB/OCT/128	----	----	----	17.99	----	0.038	----	----	----
99	JNA/24-25/NAB/OCT/129	----	----	----	22.98	----	0.047	----	----	----
100	JNA/24-25/NAB/OCT/130	----	----	----	24.64	----	0.042	----	----	----
101	JNA/24-25/NAB/OCT/131	----	----	----	21.39	----	0.082	----	----	----
102	JNA/24-25/NAB/OCT/132	----	----	----	23.97	----	0.105	----	----	----
103	JNA/24-25/NAB/OCT/133	----	----	----	23.87	----	0.085	----	----	----
104	JNA/24-25/NAB/OCT/134	----	----	----	21.23	----	0.159	----	----	----
105	JNA/24-25/NAB/OCT/135	----	----	----	24.17	----	0.086	----	----	----
106	JNA/24-25/NAB/OCT/136	----	----	----	23.72	----	0.101	----	----	----

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**JAWAHARLAL NEHRU ALUMINIUM RESEARCH
DEVELOPMENT & DESIGN CENTRE (JNARDDC),
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Test Report

Test Procedure		JNARDDC/QTP/XRF								JNARDDC/QTP/WCL
S No.	SAMPLE ID	CaO (%)	MgO (%)	Al ₂ O ₃ (%)	SiO ₂ (%)	Fe ₂ O ₃ (%)	SO ₃ (%)	P ₂ O ₅ (%)	K ₂ O (%)	LOI (%)
107	JNA/24-25/NAB/OCT/137	----	----	----	20.87	----	0.125	----	----	----
108	JNA/24-25/NAB/OCT/138	----	----	----	20.77	----	0.155	----	----	----
109	JNA/24-25/NAB/OCT/139	----	----	----	21.53	----	0.117	----	----	----
110	JNA/24-25/NAB/OCT/140	----	----	----	23.73	----	0.141	----	----	----

Signature			
Name	A S Gijare / D R Meshram	Dr Papa Rao Mondi	Dr Upendra Singh
Designation	Sci Asst-IV / Sci Asst-IV	Scientist	Sr Principal Scientist & HoD
Authority	Tested by	Reviewed by	Approved by

NOTE :

1. Sample is tested on as received basis & Laboratory is not involved in sampling.
2. Limits/Standard values are given only for interpretation of results and may not represent acceptability/rejection of material.
3. This test report refers only to particular item(s) submitted for Testing
4. This test report shall not be reproduced, except in full, unless written permission for the publication of an approved abstract has been obtained from JNARDDC
5. The test results reported in this report are valid at the time and under the stated conditions of test
6. "-" Scope covered in Accreditation.
7. All disputes are subject to Nagpur Jurisdiction

- End Report -

FOR CTSC USE ONLY :

Name & Code of the Customer	Mr. Ashutosh Temle
Address of the Customer	General Manager (Mines) Madhya Pradesh State Mining Corporation Limited Bhopal
Name & Signature of CTSC Head	 (Roshan Jasrajkar)