

Geological Report on Preliminary Exploration (G3 Stage) For Limestone in Northwest of Boro Lakhindong, Dima Hasao District, Assam



**Under
National Mineral Exploration Trust Secretariat
Ministry of Mines
Wing-F, Room No. 325 & 326,
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F.Y 2024-2025

F.No.23/444/2023/NMET/599

Prepared By



**Certificate No.
NABET/AEA-MPPA/IA/007**

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LIST OF ABBREVIATIONS

General Terms & Organizations

- CAD – Computer-Aided Design
- CIA – Chemical Index of Alteration
- CIW – Chemical Index of Weathering
- CMPDIL – Central Mine Planning and Design Institute Limited
- DGM – Directorate of Geology and Mining
- DGPS – Differential Global Positioning System
- DMS – Degrees Minutes Seconds (coordinate format)
- E-I / E-II – Exploration Stage I / II
- F.S. – Field Season
- G3 – Stage of Investigation (Preliminary Stage)
- G4 – Inferred Resource (lower confidence resource classification)
- GIS – Geographic Information System
- GSI – Geological Survey of India
- IBM – Indian Bureau of Mines
- ICV – Index of Compositional Variability
- IMD – India Meteorological Department
- LGB Airport – Lokpriya Gopinath Bordoloi International Airport
- MMDR – Mines and Minerals (Development and Regulation) Act
- NABL – National Accreditation Board for Testing and Calibration Laboratories
- NABET – National Accreditation Board for Education and Training
- NMET – National Mineral Exploration Trust
- NPEA – Notified Private Exploration Agency
- PBH – Proposed Boreholes
- PPL – Plane-Polarized Light (used in microscopy to observe optical properties of minerals)
- RQD – Rock-Quality Designation
- SMS (LD) – Steel Melting Shop (Linz-Donawitz)
- SMS (OH) – Steel Melting Shop (Open Hearth)
- TCC – Technical-Cum-Cost Committee
- UNFC – United Nations Framework Classification
- WGS 1984 – World Geodetic System 1984 (coordinate system)
- XPL – Cross-Polarized Light (used in microscopy to observe optical properties of minerals)
- XRF – X-ray Fluorescence (used for chemical analysis)
- sp. – Species (used in scientific names)

Measurement Units

- km – Kilometer
- m – Meter
- m.a./ Ma – Million years ago
- mm – Millimeter
- m.s.l. – Mean Sea Level
- RL – Reduced Level (elevation measurement)
- sq. km – Square Kilometer
- μm – Micrometer

कार्यकारी सारांश

वित्त वर्ष 2024-2025 के दौरान असम के दीमा हसाओ जिले स्थित उत्तर-पश्चिम बोरोलखीदोंग ब्लॉक में चूना पत्थर की प्रारंभिक खोज (G-3) की गई, जिसका उद्देश्य विभिन्न ग्रेड के चूना पत्थर संसाधनों का मूल्यांकन करना था। यह ब्लॉक टोपोशीट संख्या 83C/11 का हिस्सा है, जो लगभग 4.82 वर्ग किमी क्षेत्र को आच्छादित करता है। खोज कार्यों में विस्तृत भूवैज्ञानिक मानचित्रण (1:40000 के स्केल पर) 2 मीटर के कंटूर अंतराल के साथ, DGPS सर्वेक्षण यंत्र की सहायता से किया गया। साथ ही 800 मीटर के अंतरिक्ष में पाँच बोरहोल्स में कुल 500 मीटर की ड्रिलिंग की गई। इन बोरहोल्स से 50 संख्याओं में बेडरॉक नमूनों का संग्रहण किया गया तथा 5 कोर और बेडरॉक नमूनों को पेट्रोलॉजिकल अध्ययन हेतु एकत्र किया गया। खोज के दौरान एकत्र किए गए 451 कोर नमूनों का रासायनिक विश्लेषण NABL मान्यता प्राप्त शिवा एनालिटिकल प्रयोगशाला में किया गया तथा इनका 10% बाहरी परीक्षण NABL मान्यता प्राप्त SGS इंडिया लिमिटेड में करवाया गया। प्राप्त आंकड़ों के आधार पर विभिन्न ग्रेड के चूना पत्थर का वर्गीकरण और संसाधन मूल्यांकन किया गया।

भूवैज्ञानिक दृष्टिकोण से इस ब्लॉक का लगभग 60% क्षेत्र शैला समूह की ऊपरी सिलहट चूना पत्थर इकाई से आच्छादित है, जबकि कोपिली निर्माण ब्लॉक के उत्तर-पूर्वी, दक्षिण-पश्चिमी एवं कुछ दक्षिण-पूर्वी भागों में प्रमुखता से प्रकट होता है। ऊपरी सिलहट चूना पत्थर कोपिली निर्माण द्वारा अधिरोपित है और यह प्रमुख चूना पत्थर इकाई है, जिसमें कठोर, महीन से मध्यम दानेदार, जीवाश्म युक्त चूना पत्थर पाया जाता है, जिसमें कुछ स्थानों पर शैल की अंतःस्तरित परतें भी विद्यमान हैं। कोपिली निर्माण मुख्यतः सफेद से पीले-भूरे रंग का, अच्छी तरह से छँटा हुआ, महीन से मध्यम दानेदार बलुआ पत्थर, ग्रे से हल्के ग्रे रंग का शैल तथा कुछ स्थानों पर जीवाश्म युक्त चूना पत्थर की पतली परतों से बना है। ये शैल इकाइयाँ क्षैतिज से उप-क्षैतिज अवस्था में हैं, जिनकी स्ट्राइक दिशा NNE-SSW से NE-SW के मध्य बदलती है और इनकी ढाल 2-3 डिग्री दक्षिण-पूर्व की ओर है। प्राथमिक संरचनाओं में परतबद्धता और लेमिनेशन प्रमुख हैं, जबकि द्वितीयक संरचनाओं में स्टायलोलाइट्स, घुलन संरचनाएँ, गह्वर भराव, भ्रंश, सिंकहोल्स और भूमिगत गुफाएँ पाई जाती हैं, जो चूना पत्थर क्षेत्रों में सामान्य रूप से देखी जाती हैं।

बोरहोलों में चूना पत्थर की मोटाई में महत्वपूर्ण भिन्नता देखी गई है, जो PBH-01 में 4.00 मीटर से 82.76 मीटर, PBH-02 में 4.40 मीटर से 100.00 मीटर, PBH-03 में 15.78 मीटर से 100.00 मीटर, PBH-04 में 15.80 मीटर से 100.00 मीटर तथा PBH-05 में 16.14 मीटर से 100.00 मीटर तक पाई गई है। इन पाँचों बोरहोलों में दर्ज चूना पत्थर की मोटाइयों के आधार पर औसत मोटाई 85.32 मीटर आंकी गई है। उपसतही अवलोकनों से यह ज्ञात हुआ कि चूना पत्थर का ऊपरी भाग फेरूजिनस, बर्फ रंग का है, जिसमें *Discocyclina* sp., *Asterocyclina* sp. और *Nummulite* sp. जैसे मेगाफॉसिल्स पाए गए। मध्य भाग में हल्के से गहरे ग्रे रंग का, ठोस, मध्यम दानेदार, अत्यधिक जीवाश्म युक्त चूना पत्थर पाया गया, जबकि निचले भाग में यह शैल के साथ अंतःस्तरित रूप में उपस्थित है। इसमें पाए जाने वाले प्रमुख फोरामिनिफेरा प्रजातियाँ *Nummulites* sp., *Discocyclina* sp., *Assilina* sp., *Alveolina* sp. और *Asterocyclina* sp. हैं, जो इस चूना पत्थर को मध्य से उत्तर इओसीन काल

(Middle to Late Eocene) का दर्शक बनाती हैं।

कोर नमूनों के रासायनिक विश्लेषण से प्राप्त परिणाम इस प्रकार हैं: CaO – 34.14% से 52.93%, MgO – 0.67% से 4.58%, SiO₂ – 1.49% से 15.83%, Al₂O₃ – 0.93% से 6.44% तथा Fe₂O₃ – 0.75% से 19.78%। प्राप्त आंकड़ों के आधार पर बहुभुज विधि (Polygonal Method) और ठोस मॉडलिंग तकनीक का उपयोग करते हुए विभिन्न ग्रेडों में संसाधन मूल्यांकन किया गया। UNFC वर्गीकरण के अनुसार 333 श्रेणी के अंतर्गत इस ब्लॉक में कुल 498.96 मिलियन टन चूना पत्थर संसाधनों का अनुमान लगाया गया है, जिनमें ग्रेडवार वितरण इस प्रकार है: 195.29 मिलियन टन – पोर्टलैंड सीमेंट ग्रेड, 144.40 मिलियन टन – ब्लेंडेबल/बेनिफिशिएबल सीमेंट ग्रेड, 155.68 मिलियन टन – एसएमएस (OH) ग्रेड, और 3.58 मिलियन टन – अन्य/अवर्गीकृत श्रेणी।

EXECUTIVE SUMMARY

The preliminary exploration for limestone in Northwest of Boro Lakhindong Block, Dima Hasao district, Assam (G-3) was carried out during F.Y.2024-2025 to assess the resources of different grades of limestone. Northwest of Boro Lakhindong Block is part of toposheet no. 83C/11, covering an area of 4.82 sq. km.

The various work components of the preliminary exploration in the block including detailed geological mapping (on 1:4000 scale) with contour interval of 2m with aid of DGPS surveying instrument, drilling of five boreholes placed at space of 800m respectively, with collection of 50 nos. of bedrock samples, and 5 nos. of core & bedrock samples for petrological study and to classify the different grades of limestone. Total drilling of 500m in 5 boreholes was carried out during this exploration and 451 nos. of core samples were analyzed at NABL accredited Shiva Analytical laboratory and 10% external check samples of core were analyzed at NABL accredited SGS laboratory, India Ltd.

Geologically, the 60% of the block is covered with Upper Sylhet limestone of Shella Formation. Kopilli Formation is exposed mostly on the north-eastern, south-western and some part in the south-eastern of the block. Upper Sylhet limestone is overlain by Kopili Formation. Upper Sylhet limestone of Shella Formation is the most important limestone horizon and it comprises hard, fine-medium grained fossiliferous limestone with occasional shale intercalation in some places. Kopili Formation consists of fine to medium grained, whitish to brownish yellow, well sorted, less compact sandstone, grey to light grey shale and occasionally it is also interbedded with fossiliferous limestone. These lithological units are horizontal to sub-horizontal in attitude with strike varying from NNE-SSW to NE-SW dipping at 2-3°southeasterly. Primary structures such as bedding and laminations are common. The secondary structures, observed in the area, are stylolite. Stylolite, a solution structure, cavity fillings, fracture zone, sinkholes and underground caverns are common in the limestone.

The thickness of limestone varies significantly across the boreholes, ranging from 4.00 m to 82.76 m in PBH-01, 4.40 m to 100.00 m in PBH-02, 15.78 m to 100.00 m in PBH-03, 15.80 m to 100.00 m in PBH-04, and 16.14 m to 100.00 m in PBH-05. Based on the limestone thicknesses recorded in all five boreholes, the average thickness has been calculated to be 85.32 m. From the sub surface data, it is observed that the upper part of the limestone is ferruginous, buff colour with mega fossil of *Discocyclus* sp., *Asterocyclus* sp., and *Nummulite* sp.

In the middle part, light greyish to dark greyish colour, massive, medium grained, hard and compact, highly fossiliferous limestone variant are observed and at the bottom part, limestone is dark greyish in colour and it is intercalated with shale. The common species of foraminifera present in the Upper Sylhet Limestone are Nummilites sp., Discocyclus sp., Assilina sp., Alveolina sp. and Asterocyclina sp. This assemblage of fossils indicates Middle to Late Eocene age.

Chemical analysis results of 451 numbers of core samples of limestone show 34.14 to 52.93% CaO, 0.67 to 4.58% MgO, 1.49 to 15.83% SiO₂, 0.93 to 6.44% Al₂O₃ and 0.75 to 19.78% Fe₂O₃. A total 498.96 million tonnes of limestone resource (categorized under 333 of UNFC classification) is estimated from Northwest of Boro Lakhindong Block. Further, Grade wise resources are estimated. 195.29 million tonnes of Cement (Portland) grade, 144.40 million tonnes of Cement (Blendable / Beneficiable) grade, 155.68 million tonnes of SMS (OH) grade and 3.58 million tonnes of Unclassified or Others category.

CHAPTER 1

INTRODUCTION

The present work entitled “Preliminary Exploration for Limestone in Northwest of Boro Lakhindong Block, Dima Hasao district Assam” was taken up for G-3 stage exploration during FY 2024-2025 with F.No. 23/444/2023-NMET/599. The UNFC guideline of G-3 Stage of exploration was initially followed to accomplish the preliminary exploration of limestone. It is located in Dima Hasao district of Assam, India near Assam-Meghalaya border in toposheet no 83C/11. In the study area, the Kopili River flows all along Southwestern corner of the Block. Exposed limestone in the area belongs to the Upper Sylhet Limestone member of the Shella Formation of the Jaintia Group of Eocene age (~34Ma). The limestone occurs as thick bedded sequence, suggested to have been deposited over platform areas under stable shelf conditions along the southern fringe of Meghalaya plateau, further extending easterly toward the Dima Hasao district of Assam.

1.1 INVESTIGATION AGENCY

The exploration Block (Northwest of Boro Lakhindong) is investigated by M/S. Maheshwari Mining Pvt. Ltd, **Notified Private Exploration Agency (NPEA) under** second provision to sub section (1) of section-4 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) and consequent upon accreditation provided by the National Accreditation Board for Education and Training of the Quality Council of India (QCI-NABET), the Central Government hereby notifies the M/s. Maheshwari Mining Private Limited under ‘Category A Exploration Agencies’ as specified in the guidelines for notification of accredited private exploration agencies issued by the Government of India in the Ministry of Mines vide order No. M.VI-16/15/2021-Mines VI, dated the 12th August, 2021. The notification has been annexed to this report (**Annexure-VIII**).

1.2 PRESENT WORK

The various work components of the preliminary exploration in the block include detailed geological mapping (on 1:4000 scale) with contour interval of 2m with aid of DGPS surveying instrument, systematic drilling of 500m of 5 boreholes placed at space of 800m respectively, collection of 50nos of bedrock samples, and 5 nos of petrological study of core & bedrock samples to classify the different grade of limestone. The quantity of the work component has been given in the **Table.1.1**.

Table 1.1: Nature, quantum of work & achievement during FY 2024-2025				
Sr No	Toposheet No	Nature of Work	Total workload envisaged	Total Achievement
1	83C11	1. Geological Survey a. Detailed Mapping on 1:4000 scale (sq. km)	4.82	4.82
2	83C11	2. Technological Survey a. Subsurface exploration i.e. Drilling (m)	500	500
3	83C11	3. Sampling (in number) a. Core Sample (CS)	500	451
4	83C11	b. Bedrock Sample (BRS)	50	50
5	83C11	4. Petrological/Mineralogical Studies (number) a. Petrographical Study (PS)	5	5
6	83C11	5. Petrochemical Analysis (number)	10	10

1.3 OBJECTIVE OF INVESTIGATION

To assess the block potentiality with estimation of resource (under 333 category) of different grades of Upper Sylhet Limestone member of Shella Formation.

1.4 PERSONNEL ASSOCIATED WITH THE INVESTIGATION

Table 1.2: Overall Supervision and Geological Report Preparation	
Responsibility	Name
Overall Coordination	Mr. Ambika Prasad Samantaray, President & CEO Exploration Mr. Pradipta Tarafdar, Advisor Geology Dr. Suman Krishnan Sit, Vice President Exploration Mr. Sourabh Sarkar, DGM Geology
Headquarter Coordination	Mr. Balkrishan Vishwakarma, Manager (Geology) Mrs. Moulipriya Bhakta, Deputy Manager (Geology) Mr. Promit Roy (Geologist)
Geological field report preparation and documentation	Mr. Sudev Mahato, Geologist Mr. Souvik Duya, Geologist Mr. Padamata Sai Chandu, Geologist
Field Geologist & Field Coordinator	Mr. Sudev Mahato, Geologist Mr. Souvik Duya, Geologist
Petrographic Study	Ms. Medha Sarkar, Geologist Mr. Sudev Mahato, Geologist
ArcGIS	Mr. Saswat Subedit, Deputy Manager, Geology Mr. Sudev Mahato, Geologist
Resource Modelling	Mr. Saswat Subedit, Deputy Manager, Geology
Draughtsman	Mrs. Susmita Dolai, Ms. Gargi Roy Chowdhury
Peer Reviewer	Shri Bharat Kumar Gazarasan, Ex GM (Geology), CMPDIL
Site In-charge (Drilling Unit)	Mr. Gobinda Dasgupta, Drilling Unit In-charge

1.5 MODE OF OPERATIONS OF DIFFERENT WORK COMPONENTS AND ASSOCIATED AGENCIES:

Detailed geological mapping on 1:4,000 scale in G3 stage, surface and subsurface sampling, drilling, DGPS survey, and petrographic studies were conducted by Maheshwari Mining Private Limited. Core cutting and sample preparations were done by in-house resources and samples analysed from different NABL laboratories shown in **Table 1.3**.

Table 1.3: Analysis of samples at different NABL laboratories			
Agency	Methodology	Quantum of work	
		Nature of samples	No. of samples
M/s Shiva Analyticals	XRF	Core samples	451
M/s Shiva Analyticals	XRF	Bedrock samples	50
M/s Shiva Analyticals	XRF	Petrochemical Studies	10
M/s SGS India Ltd	XRF	Check samples	50

1.6 ACKNOWLEDGEMENT

The authors express their sincere gratitude to the National Mineral Exploration Trust (NMET), Ministry of Mines, Government of India for approving the project and funding it. The Directorate of Geology and Mining (DGM, Assam) is thankfully acknowledged for monitoring the program.

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In addition, relentless support from seniors & colleagues of Maheshwari Mining Private Limited is being acknowledged humbly.

Support by the local administration/authorities of Dima Hasao district, Assam, and relentless support of the North Cachar Hills Autonomous Council are being thankfully acknowledged. Thanks are due to the local authorities for their cooperation for accomplishment of the project.

CHAPTER 2

PROPERTY DESCRIPTION

The land of Northwest of Boro Lakhindong block is owned by people of Boro Lakhindong and Choto Lakhindong village under the administration and jurisdiction of Deputy Commissioner, Dima Hasao District and Chief Executive Member, North Cachar Hill Autonomous Council, Haflong, Dima Hasao. The land is either privately owned or community owned. The required description in detail is given below.

2.1 DETAILS OF THE AREA

2.1.1 VILLAGE NAME, DISTRICT, STATE

Village: Boro Lakhindong and Choto Lakhindong

District: Dima Hasao

State: Assam

2.1.2 SURVEY OF INDIA TOPOSHEET NO.

Survey of India Toposheet No: 83C/11

2.1.3 CO-ORDINATES OF ALL CARDINAL POINTS OF THE INVESTIGATED BLOCK

Boundary co-ordinates are surveyed through DGPS. The details of the Cardinal Points of the block are given below in Table 2.1.

Table 2.1: Cardinal Points of the Investigated Block

Point ID	DMS		UTM (ZONE 46)	
	Latitude	Longitude	Easting (X)	Northing (Y)
A	25°28'45.23''	92°35'37.65''	459169.8	2818076
B	25°28'41.67''	92°37'40.45''	462598.3	2817957
C	25°27'52.98''	92°37'41.15''	462613.6	2816459

Point ID	DMS		UTM (ZONE 46)	
	Latitude	Longitude	Easting (X)	Northing (Y)
D	25°27'57.37''	92°36'00.95''	459816	2816602
E	25°28'12.31''	92°35'51.37''	459549.9	2817062
F	25°28'16.26''	92°35'36.92''	459146.7	2817185

2.1.4 CADASTRAL DETAILS OF THE AREA WITH LAND USE/COVER

The exploration block under investigation is primarily owned by private parties, particularly from Boro Lakhingdong and Choto Lakhindong. It falls within the administrative jurisdiction of the North Cachar Hills Autonomous Council, Haflong. The region is characterized by dense vegetation cover, with Jhum cultivation, also known as shifting or slash-and-burn agriculture, is a traditional agricultural practice widely practiced in many parts of Northeast India, including the block near the Kopili River.

Despite its traditional significance, the Jhum cultivation has raised environmental concerns, particularly regarding soil erosion, loss of biodiversity, and the long-term sustainability of the land.

2.1.5 FREEHOLD/LEASEHOLD. IF LEASE HOLD, GIVE THE STATUS

At present, the land of the investigation block is leasehold and the leasehold premise eventually belongs to the North Cachar Hills Autonomous Council, Haflong.

2.1.6 LOCATION AND ACCESSIBILITY

The area of investigation is about 34 km southwest of the Umrongso town. The area is located in Dima Hasao district of Assam, India near Assam-Meghalaya border in toposheet no. 83C/11 (**Fig.2.1**). Nearest railway station is Lanka railway station. The Umrongso area can be reached from Lanka town by Lanka-Umrongso Road (NH 627 or SH20) which is at a distance of 77km. Bus services are available from Umrongso town to Lanka and to Guwahati. Nearest airport is LGB international airport, Guwahati.

2.1.7 CLIMATE

The region has a tropical monsoon climate, characterized by high humidity and distinct seasonal changes. The average annual rainfall ranges 220 to 300 cm, making it a region with substantial precipitation. The rainy season lasts from mid-May to September, bringing heavy downpours and contributing to the lush vegetation in the area. October and November are relatively cooler, offering a brief respite from the intense rains. However, during the winter months, from December to February, the climate becomes significantly colder, with temperatures ranging from 2°C to 10°C, making it quite chilly. During the summer times, the temperature ranges from 24° to 30°C (Source from <https://mausam.imd.gov.in/>).

2.1.8 FLORA AND FAUNA

The area is densely vegetated, with pine (*Pinus*), bamboo (*Bambusoideae*), banana (*Paradisiaca*), and various bushes forming the main plant life. Notable tree species include *Gmelina arborea*, *Phyllanthus emblica*, *Sterculia villosa*, and *Monoon longifolium*, while the forest floor hosts a variety of ferns and orchids. Fauna includes a range of insects, birds, and reptiles, though wild animals are rare. Occasionally, wild cats (*Felissilvestris*), snakes (*Serpentes*), and leeches (*Hirudinea*) may be spotted, especially during the rainy season.

2.2 INFRA-STRUCTURE & ENVIRONMENT

The local population near the investigation block relies on natural resources, agriculture, lumbering, and fishing for their livelihoods. The area faces poverty, with limited access to basic amenities such as roads, sewage systems, and drinking water. The Kopili River serves as the primary source for drinking water, transportation, fishing, and recreation.

The area is accessible from Lanka town via a 72 km long road shown in **Fig.2.2**. The Dalmia Cement factory is located near Umrangso town, and a reservoir nearby supplies water to the NEEPCO (Northeastern Electric Power Corporation) for electricity production. Education levels are generally low due to the absence of good, affordable schools. High rainfall supports abundant forest growth in the region. All residents of the Boro Lakhindong village belong to Scheduled Tribe (Karbi). There is only one government primary school in the village. The nearest secondary school is in Umrangso. The nearest Community Health Centres or Primary Health Centres is in Umrangso. The telephonic coverage for communication is very

poor to non-existent. There are no archaeological or historical sites in the area; however certain caves hold religious significance for the people.

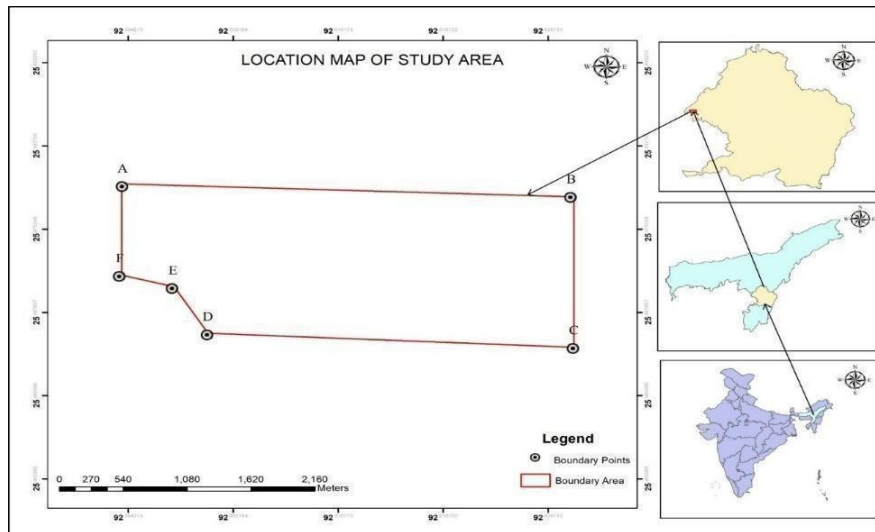


Fig 2.1: Location of the Northwest of Boro Lakhindong Block in Dima Hasao district, Assam

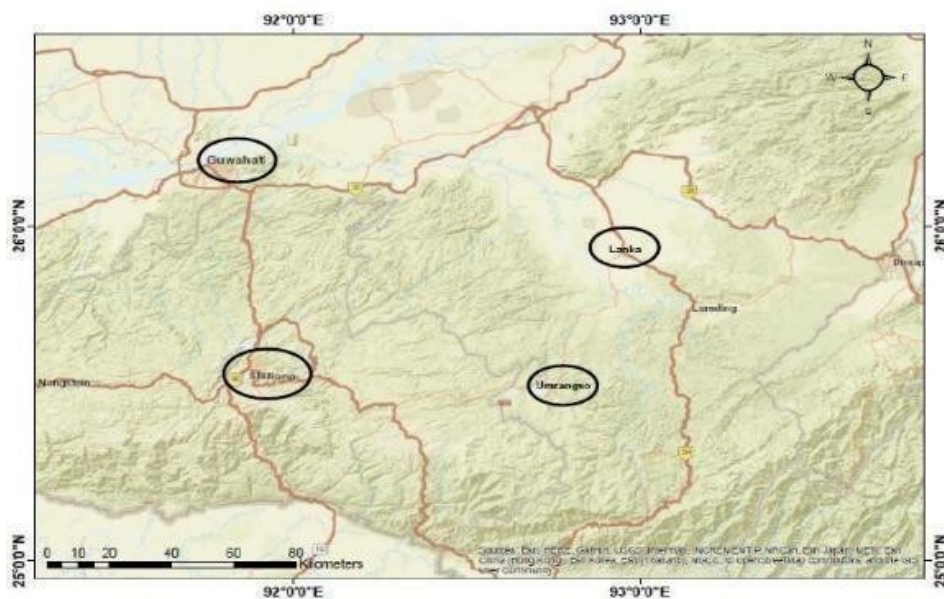


Fig 2.2: Location and accessibility map of the Northwest of Boro Lakhindong Block, Dima Hasao district, Assam

CHAPTER 3

PREVIOUS EXPLORATION WORK

3.1 PREVIOUS EXPLORATION/INVESTIGATION

The earliest geological work in Jaintia Hills dates back to the 19th century, starting with Oldham (1859) and followed up by Medlicot (1869), who contributed to establish the stratigraphy of the area. Evans (1932) divided the Jaintia series into three stages: Therria, Sylhet Limestone, and Kopili in ascending order. Later on, Wilson and Metre (1953) revised Evans' classification, subdividing the Sylhet Limestone into various stages like Lakadong Limestone, Lakadong Sandstone, Umlatdoh limestone, Narpuh sandstone and Prang limestone in ascending order. The lower sandstone and limestone bands of Therria ghat section is designated as Upper Therria substage and Lower Therria substage by them.

Limestone exploration has been done in several periods in Jaintia Hills by GSI, particularly in Litang Valley. Later Duara & Burman (1966-67) mapped a 0.35 sq. km area in the west of Nongkhlieh Ridge and estimated limestone resource of 16 million tonnes. Deb Adhikari (1969-70) reported a 60m-thick limestone deposit near Umkyrpong village, situated in north-eastern flank of Jaintia Hills. Murthy et al. (1976) introduced the Shella Formation to replace the Sylhet Limestone stages. The Therria Sandstone below the Lakadong Limestone in Therriaghat section was included as part of Shella Formation and the underlying fourth band of limestone and shale were grouped as Langpar Formation. They also introduced new terms like 'Sylhet Sandstone' and reorganized the stratigraphy. The term Lakadong, Umlatdoh and Narpuh were replaced by the names Lower, Middle and Upper Sylhet Sandstone, Limestone respectively.

A detailed geological survey was conducted by Chawade et al. (1990) on 1:50,000 scale around Litang Valley, identifying limestone over 100 sq. km. Based on this, Thiruvengadam et al. (1989-93) estimated a potential resource of 2,265 million tonnes of limestone over all grades with an area of 16 sq. km in the western part of the Litang river as per E-I stage investigation. Exploration for limestone under E-II stage commenced during FS 1992-93. Thereafter exploration in different stages has been done and estimated a resource of approximately 9,915 million tonnes (Sumar, 2018).

In Assam, different cement grade limestone blocks have been explored by State D.G.M. in Garampani and Umrangso area of Dima Hasao district. The estimated resource of the

limestone blocks are estimated to be 4.6 million tonnes in Tumbung area, 26.7 million tonnes and 105.6 million tonnes in 16 KM and 21 KM posts, respectively, on the Garampani-Lanka Road and 44.14 million tonnes in New Umrangshu (Kakati and Kalita, 1974 and Kakati et al., 1982).

During FS 2019-20, two adjacent limestone blocks were explored by GSI under G-3 stage in Dima Hasao district of Assam, namely North Boro Hundong Block and South Boro Hundong Block. About 474.78 million tonnes & 592.63 million tonnes of limestone resource (categorized under 333 class of UNFC classification) is estimated for North Boro Hundong Block and South Boro Hundong Block, respectively.

3.2 DETAILS OF EARLIER AEROGEOPHYSICAL AND GEOPHYSICAL MAPPING

No Aerogeophysical and geophysical mapping was carried out in the study area.

CHAPTER 4

GEOLOGY OF THE AREA

4.1 REGIONAL GEOLOGY

The Assam-Meghalaya Granites and Gneisses, dating to the Archean-Proterozoic, form the basement of the region. Overlying these are the Proterozoic Shillong Group rocks, intruded by Neo-Proterozoic to Early Paleozoic granites, followed by Gondwana sediments, which are intruded by Cretaceous Sylhet Traps and alkaline rocks. The Shella Formation (Paleocene-Eocene) directly overlies the granitic basement and consists of alternating sandstone and limestone sequences, with the Upper Sylhet Limestone at its top. The Kopili Formation, which sharply overlays the Upper Sylhet Limestone, contains greyish shale, sandstone, black shale, and fossiliferous limestone. The region is tectonically active, with the Kopili Fault marking a NW-SE trending strike-slip fault, alongside other thrust and minor faults resulting from the subduction of the Indian plate beneath the Eurasian plate. The regional geology of the area is shown in **Fig.4.1** and the regional stratigraphy table is shown in **Table 4.1**.

4.2 ASSAM-MEGHALAYA GNEISSIC COMPLEX

The Assam-Meghalaya Gneissic Complex, located to the north, forms the basement beneath the unconformably overlying Shella Formation of the Jaintia Group. Comprising para- and ortho-gneiss, migmatites, and metasedimentary layers, it is intruded by amphibolites, metadolerites, and metapyroxenites. Biotite-bearing quartzo-feldspathic gneisses are the most common. This complex has undergone multiple deformation and metamorphic events (GSI, 2009) and is considered an extension of the Peninsular India (Evans, 1932), with the Dawki Fault separating the Shillong Plateau from the Indian shield. It is widespread across central Assam and found in isolated inselbergs in the western Brahmaputra plains (GSI, 2019).

4.3 JAINTIA GROUP

4.3.1 *Langpar Formation*

The Cretaceous-Eocene sequence exposed in the southern and southeastern margin of the Shillong Plateau consists of Mahadek Formation overlain by Langpar Formation.

Langpar Formation is exposed in Meghalaya and comprises a 200 m thick succession of impure sandy limestones and shales containing molluscan shells of Danian age. The micro-faunal assemblage of the Langpar Formation includes *Angulogerina*, *Anomalina*, *Cibicides*, *Coleites*, *Globigerina*, *Trifarina*, and *Veginulina*. The faunal assemblages of Mahadek and Langpar Formations indicate shallow water open sea environments of deposition.

4.3.2 Shella Formation

The Jaintia Group that conformably overlies the Langpar Formation has been subdivided into two formations. It is well-developed, consisting of three limestone bands intercalated with three clastic sandstone units. The basal Theria-Cherra Sandstone Member has been reclassified as the Lower Sylhet Sandstone Member. The Upper Sylhet Limestone Member has been traced north-eastward from the Jaintia Hills into the North Cachar and Mikir Hills (GSI, 2019).

In the Garampani area, a single limestone horizon is underlain by sandstone, marking the base of the formation. The limestone, referred to as the Sylhet Limestone Member in Meghalaya, corresponds to the Upper Sylhet Limestone Member found along the southern scarp of Meghalaya. The underlying Lower Sylhet Sandstone Member in Assam represents a facies variant of the limestone and sandstone units exposed along the southern scarp of the Meghalaya Plateau. The Lower Sylhet Sandstone in Garampani unconformably rests over the Precambrian basement and includes thick sandstone beds interbedded with shale, carbonaceous shale, and thin coal seams. In some areas, the sandstone is quartzitic in nature (GSI, 2019).

The overlying Upper Sylhet Limestone in Garampani consists of thick beds of foraminiferal limestone with minor shale and marl bands. The limestone is hard and compact, with several sets of vertical joints, which have created karst topography and solution channels. Fossils such as *Nummulites bagelensis*, *Assilina spira*, *Coperculina sp.*, and *Alveolina elliptica* in the Upper Sylhet Limestone indicate a Middle to Upper Eocene age (GSI, 2019).

4.3.3 Kopili Formation

The Shella Formation is conformably overlain by the Kopili Formation, which consists mainly of greyish, ferruginous, splintery shales interbedded with sandstone and calcareous marl of variable thickness. It follows a similar conformable trend to the underlying Shella

Formation. The Kopili sequence includes white sandstone, calcareous or grey shales, sandy shales, ferruginous shales, and coaly material (GSI, 2019).

The Kopili Formation has a gradational contact with the Shella Formation, marked by a highly fossiliferous limestone layer, rich in mega fossils of *Nummulites*, *Discocyclus*, and shell fragments. The lower part of the Kopili Formation, predominantly dark brown to dark grey shale, contains abundant phosphatic nodules. Fossils such as *Nummulites Pengaroensis* and *Globigerina semi Involuta* found in the Kopili Formation indicate an Upper Eocene age (GSI, 2019).

4.4 METAMORPHISM AND STRUCTURAL FABRIC OF THE AREA

The area is mostly covered by Tertiary sediments, with no regional metamorphism occurring. The bedding in the Tertiary Group rocks trends NNE-SSW to NE-SW with a moderate dip southeast. The Assam-Meghalaya Gneissic Complex (AMGC) is rarely exposed but has undergone regional metamorphism, ranging from amphibolite to granulite facies. The structural framework of the complex is complex, showing evidence of polyphase deformation and intrusion. At least two folding phases are recognized: one along an E-W axis and another along a NE-SW axis, with a third phase indicated by N-S upwarps and tight synforms.

4.5 SURFACE INDICATION OF MINERALISATION

The fossiliferous upper sylhet limestone of the Shella Formation covers 60% of the block. This limestone forms gentle undulations in the landscape, creating a relatively smooth and rolling topography. The beds of limestone are generally horizontal or sub-horizontal, and they appear at the surface as outcrops. These outcrops often develop karst topography, which is characterized by features like sinkholes, caves, and other erosion-related landforms. The limestone is also exposed along nalas (small streams or seasonal watercourses) and other areas like sinkholes, further indicating its presence across the region.

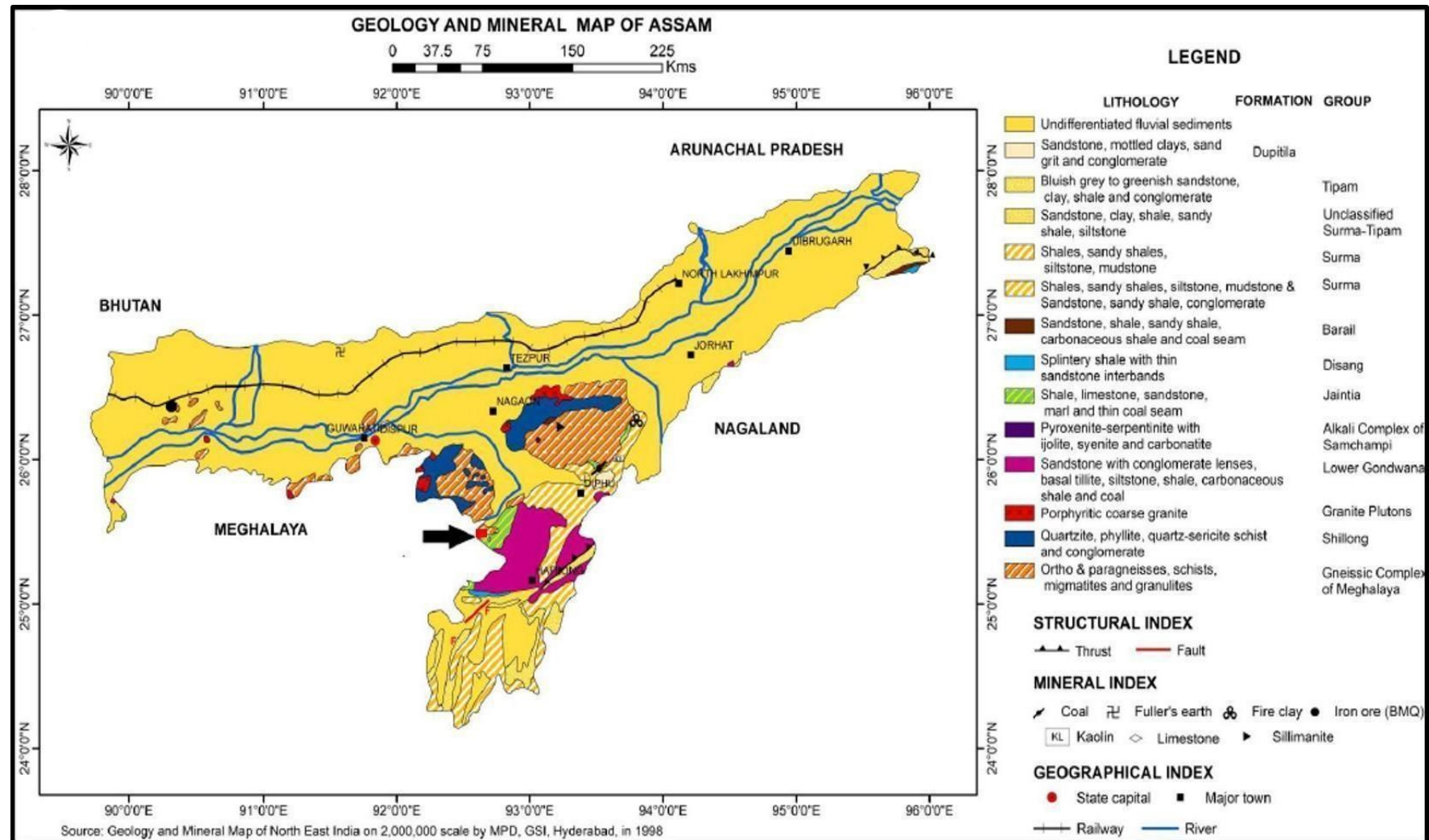


Fig. 4.1 Regional Geological Map of Assam

Table-4.1: Regional stratigraphy of the Meghalaya and adjoining areas of Assam

Table-4.1: Regional stratigraphy of the Meghalaya and adjoining areas of Assam				
Sr No	Toposheet No	AGE	GROUP	FORMATION/ROCK TYPE
1	83C11	Holocene	Newer Alluvium	Sand, Silt and Clay
2	83C11	Pleistocene	Older Alluvium	Sand, Clay, Pebble, Gravel & Boulder deposits
3	83C11	Pliocene- Pleistocene	Dupitila	Dupitila- Siltstones, clays, conglomerates
4	83C11	Mio -Pliocene	Garo Group	Chengapara/Barengapara/Boldangiri/Angortoli- Siltstones, clay and minor calcareous bands
5	83C11	Miocene		Baghmara Formation/Dalu- Siltstones, conglomerates& minor sandstones
6	83C11	Eocene- Oligocene		Simsang Formation/Chokpotgiri Formation (Khasi Hills) - Siltstones & mudstone
7	83C11	Palaeocene- Eocene		Jaintia Group
8	83C11	Late Cretaceous-Early Tertiary	Sung (Khasi Hills) Alkaline complex	Pyroxenite, ijolite, syenite & carbonatite
9	83C11	Late Cretaceous	Khasi Group	Mahadek Formation- sandstone, Bottom Conglomerate – conglomerate, Jadukata Formation- sandstone
10	83C11	Jurassic- Cretaceous	Sylhet Trap	Basic Volcanics
11	83C11	Late Carboniferous- Permian	Lower Gondwana (Garo Hills)	Karharbari Sandstone and minor coal Talchir Formation
12	83C11	Neoproterozoic -	Kyrden, Nongpoh,	Pink and grey porphyritic granitoids with mafic (boninite plutonic equivalents),
13	83C11	Early Paleozoic	Myliem granite, South Khasi Batholith, Seindhuli	diorite, granodiorite or mangerite/gabbroic, anorthositic, early differentiates.
14	83C11	Mesoproterozoic(?) (1450&1462 Ma)	Basic Intrusives	Norite, noritic gabbro and diorite
15	83C11	Meso- Proterozoic (<2500 M.a.)	Shillong Group	Quartzite, phyllite, with minor meta rhyolite, tuffs and conglomerates
16	83C11	Paleo to Meso-Proterozoic (1150to 1714 + 44 Ma)	Meghalaya- Assam Gneissic Complex	Pink granite & augen gneisses, charnockitic gneiss and charnockites
17	83C11	Paleo-MesoProterozoic(?)	Umsning Schist Belt	Quartz mica schist, micaceous quartzite, black biotite-quartzite and carbonaceous phyllite/graphitic schist, quartz-hornblende biotite schist with sillimanite, sillimanite rock, etc.
18	83C11	Archaean- Early Proterozoic (?)	Older Gneisses (2230+13 to 2637+55 Ma)	Grey dioritic gneiss & tonalitic granulite
19	83C11		Older Basic Intrusives	Basic granulite occasionally associated with magnetite& cordierite- spinel-sphene granulite; anthophyllite-sapphirine & tremolite-actinolite with hornblende rocks
20	83C11		Riangdo or Sonapahar High-Grade Metasedimentaries	Sillimanite-corundum rocks, sapphirine spinel bearing rocks, sillimanite-quartzite, garnet-sillimanite quartzofeldspathic rock, sillimanite ferruginous schist (Khondalite?), BMQ, calc-granulite & chert (occurring as caught up patches and enclaves in gneisses).
			- Basement unknown -	

CHAPTER 5

GEOSCIENCE INVESTIGATION

5.1 DETAILED GEOLOGICAL MAPPING

An area of 4.82 sq. km was mapped on 1:4,000 scale with a contour interval of 2m using DGPS. The contour plan is shown in the **Fig.5.1**. A Differential Global Positioning System (DGPS) survey (**Fig.5.2**) was conducted over the entire block to generate accurate topographic contours. High-precision DGPS equipment, supported by a fixed base station, was used to collect precise elevation data. This data was processed using GIS and CAD software to develop detailed contour maps for surface modeling and resource estimation. The NW of Boro Lakhindong block is exposed with the sedimentary rocks comprising of Shella and Kopili Formations of Jaintia Group of Eocene age. The upper sylhet limestone member of the Shella Formation is exposed in approximately 60% of the block area. The remaining area is covered by Kopili Formation, exposed mainly in the north-eastern, south- eastern and south-western part of the given block (**Plate-II**). The Litho-stratigraphy succession in the area is given in **Table 5.1**.

Table 5.1 Litho-stratigraphy of the study area

Age	Group	Formation	Member	Lithology
Paleocene-Eocene	Jaintia Group	Kopili Formation	-	Greyish shale, marl & reddish-brown sandstone. Lower part has phosphatic nodules
		Shella Formation	Upper Sylhet Limestone	Light grey to dark grey, highly fossiliferous, compact limestone
			Upper Sylhet Sandstone**	Medium-grained grey sandstone with coal streaks, dark shale and specks of pyrites

**Not exposed but intersected in boreholes (PBH-01). The RL of PBH-01 is 731.00m and Upper Sylhet Sandstone member of Shella Fm. is encountered at 82.76m depth in that borehole.

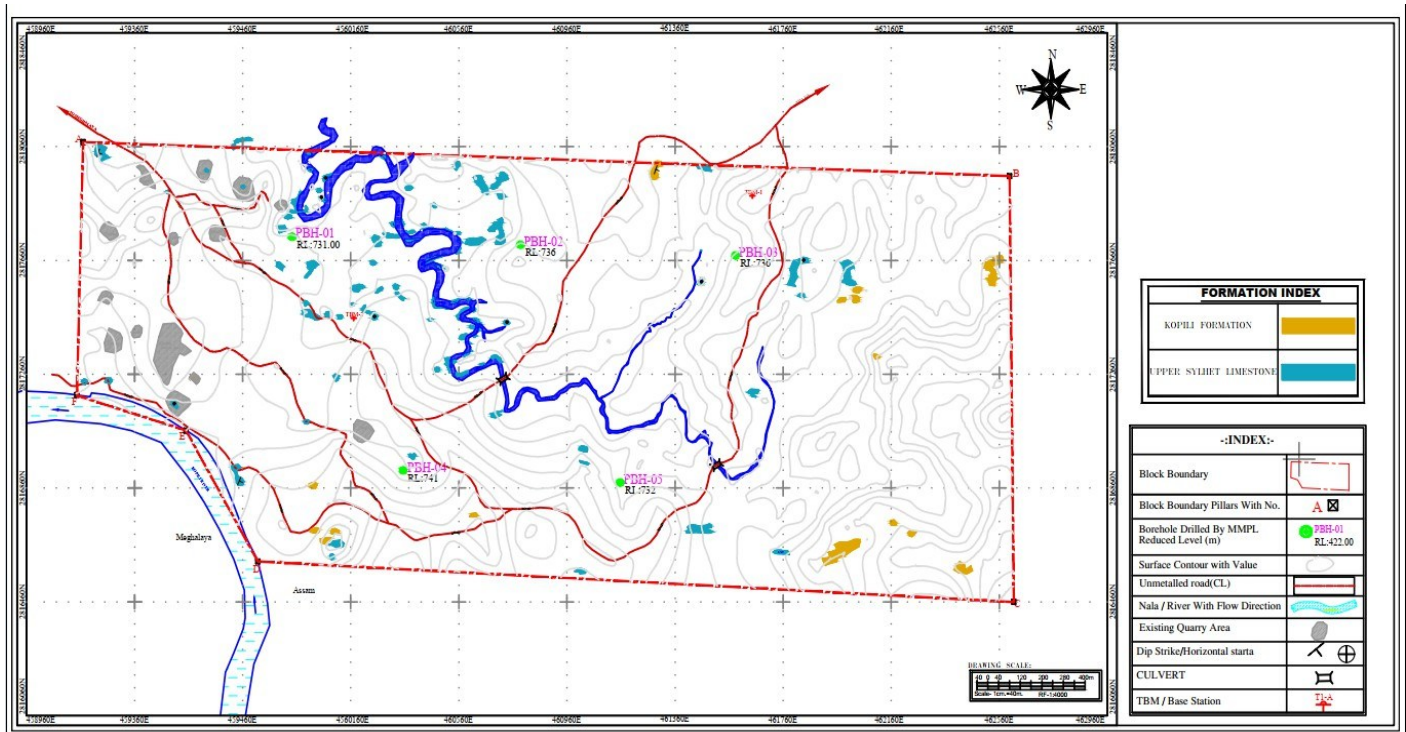


Fig. 5.1 Topographical map of Northwest of Boro Lakhindong showing contours and proposed borehole locations.



Fig.5.2: Topographical survey done by DGPS

5.2 DESCRIPTION OF LITHOLOGY

The various litho-units are exposed in the block as well as those which are encountered in the boreholes are described below.

The Shella Formation is divided into two members: the lower Upper Sylhet Sandstone and the topmost Upper Sylhet Limestone. The Upper Sylhet Sandstone is not exposed in the area but it is encountered only in one borehole. Around 60% of the block is covered with the Upper Sylhet Limestone of the Shella Formation.

Upper Sylhet Sandstone, the contact between the Upper Sylhet Sandstone and the overlying Upper Sylhet Limestone is gradational in nature (**Fig.5.3**). It comprises of medium to coarse grained, grey coloured sandstone and laminations of black shale. Streaks and patches of coal are also found in this member. The Upper Sylhet Sandstone is not exposed on the surface but is encountered in the core of borehole PBH-01(**Fig.5.4**). It mainly consists of alternating layers of sandstone and black shale. The contact between the Upper Sylhet Limestone and Upper Sylhet Sandstone is indicated by subsurface drilling data (**Fig.5.3**).

Upper Sylhet Limestone, The Upper Sylhet Limestone occupies the central and north-western part of the block area. This comprises thickly bedded, light to dark grey, mostly medium grained, fossiliferous (**Fig.5.5 & 5.6**) and compact limestone. On surface, it is often exposed as a stacked body of rock & bedded deposits. Bedded limestone deposits are observed on the banks of Kopili River and in the nearby nala sections of the block (**Fig.5.8**). Due to the extensive dissolution of limestone, it has led to the development of Karst topography (**Fig.5.7**) in the area. Small caves and gully like features are seen in this area.



Fig 5.3. Photograph of core showing contact between Upper Sylhet Limestone & Upper Sylhet Sandstone member.



Fig 5.4. Photograph of core showing intercalation of shale and sandstone of Upper Sylhet Sandstone member

The thickness of limestone varies significantly across the boreholes, ranging from 4.00 m to 82.76 m in PBH-01, 4.40 m to 100.00 m in PBH-02, 15.78 m to 100.00 m in PBH-03, 15.80 m to 100.00 m in PBH-04, and 16.14 m to 100.00 m in PBH-05 as it is evident from **Table 7.1**. Based on the limestone thicknesses recorded in all five boreholes, the average thickness has been calculated to be 85.32 m. This average represents the mean value of limestone thickness across the boreholes, highlighting the substantial and relatively consistent presence of limestone in the area. Shale intercalations are common in the upper part of Upper Sylhet Limestone due to its gradational nature of contact with the overlying Kopili Formation (Fig.5.14). These intercalations of shale which are recorded in all boreholes except in borehole (PBH-01), situated in the north-western part of the area. These intercalations may be the reason for the grade fall of limestone in the upper part of the Upper Sylhet Limestone. The strike of the limestone beds is N10°E-S10°W, dipping towards south-east and the dipping of the limestone beds are sub-horizontal to horizontal in nature (**Fig.5.8**).

In cores, bedding parallel stylolites and mud partings are observed (Fig.5.11). The Upper Sylhet Limestone has well preserved fossils of Nummulite sp., Assilina sp., Discocyclina sp., Alveolina sp., etc. (**Fig.5.9**).



Fig 5.5. Field Photograph of Upper Sylhet Limestone showing Nummulite sp. and Alveolina sp. fossils.



Fig 5.6. Field photograph of Upper Sylhet Limestone showing Nummulites fossils in abundance.



Fig 5.7. Field photograph showing a karst feature outcrop of Upper Sylhet Limestone.



Fig 5.8. Field photograph showing thickly bedded outcrop of Upper Sylhet Limestone.



Fig 5.9. Photograph of core of brownish cherry red fossiliferous limestone showing *Discocyclus* sp and *Alveolina* sp fossils (PBH-02).



Fig 5.10. Photograph of core of highly fossiliferous limestone of Upper Sylhet Limestone encountered in borehole PBH-01 (15.92m to 19.93m depth)



Fig 5.11. Photograph of core of Upper Sylhet Limestone showing Stylolite.

Kopili Formation, The Kopili Formation overlies the Upper Sylhet Limestone Member of Shella Formations having a gradational contact (**Fig.5.14**). Around 40% of the area is covered by rocks of Kopili Formation.

It consists of grey-coloured shale (**Fig.5.13**) and fine to medium grained, reddish-brown sandstone (**Fig.5.12**). The shale of Kopili Formation is encountered in boreholes in all the boreholes except PBH-01.



Fig 5.12. Field Photograph of Sandstone of Kopili Formation.



Fig 5.13. Field Photograph of Shale & Sandstone of Kopili Formation.



Fig 5.14. Photograph of core showing contact between Kopili Formation and Upper Sylhet Limestone (PBH-03).

5.3 PETROLOGICAL STUDIES

Petrographic examination of thin sections of 2 bedrock samples and 3 borehole core samples from Northwest of Boro Lakhingdong Block, Assam has been conducted. This study was aimed at elucidating the mineralogical and textural variations in the samples.

PETROGRAPHIC STUDY OF LIMESTONE SAMPLES:

5.3.1 SAMPLE ID: BLD 37 (BEDROCK SAMPLE)

The bedrock comprises fossiliferous limestone classified as biomicrite, dominated by microcrystalline calcite (micrite) forming a dense matrix as shown in **Fig.5.15**. The allochemical fraction primarily consists of foraminiferal fossils, including Nummulites, Assilina, Alveolina, and Discocyclina sp., with occasional bivalve fragments.

Fossil shells and quartz grains exhibit partial to complete calcite replacement, while sparry calcite infills pore spaces and fossil chambers. Intraclasts appear as fine-grained, dark grey fragments, whereas oolites and peloids are rare. The presence of micritic lime mud suggests a low-energy depositional setting, while polysynthetic twinning in calcite grains indicates diagenetic overprinting.

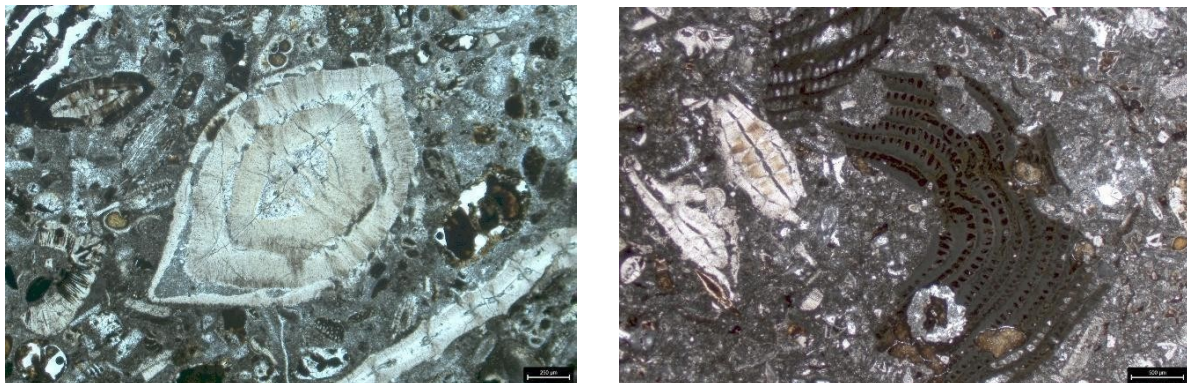


Fig 5.15: Photomicrograph from BLD37 showing *Nummulites* and *Alveolina* foraminifera in a micritic cement (in PPL)

5.3.2 SAMPLE ID: BLD/C1 (CORE SAMPLE)**BOREHOLE NO.: PBH-01****DEPTH OF SAMPLE: 18.30 m**

This sample consists of a fine to medium-grained limestone matrix dominated by microcrystalline calcite and lime mud (micrite), characteristic of the Upper Sylhet Limestone. It contains an abundance of *Discocyclus* sp., with megafossils distinctly visible. Fossil cores exhibit partial to complete replacement by microcrystalline calcite, while the matrix remains micritic, embedding terrigenous components. The presence of lime mud and calcitic infillings in fossil chambers suggests a low-energy, shallow marine depositional setting. Photomicrographs shown in **Fig.5.16**.

5.3.3 SAMPLE ID: BLD/C2(CORE SAMPLE)**BOREHOLE No.: PBH-02****DEPTH OF SAMPLE: 96.70 m**

This limestone sample is dominated by *Nummulites* sp., which are almost entirely replaced by granular calcite. The matrix consists of sparry calcite cement, filling pore spaces and fossil chambers, indicating post-depositional recrystallization. Other completely calcified fossil fragments are embedded within the calcite groundmass, with occasional intraclasts present as fine-grained, dark grey fragments. The reduced presence of micrite compared to other samples and increase of sparry cement suggest a higher-energy setting with significant diagenetic overprinting. Photomicrographs shown in **Fig.5.17**.

5.3.4 SAMPLE ID: BLD/C3(CORE SAMPLE)**BOREHOLE No.: PBH-04****DEPTH OF SAMPLE: 62.50 m**

This sample is primarily composed of microcrystalline calcite, forming a dense micritic groundmass. *Nummulites* sp. dominates the allochemical fraction, with *Discocyclus* also present in notable amounts. Some fossil shells show partial calcite replacement, while others retain well-preserved structures. The presence of fine-grained lime mud, coupled with embedded allochemicals, indicates a low-energy depositional environment, characteristic of the Upper Sylhet Limestone. Photomicrographs shown in **Fig.5.18**.



Fig 5.16: Photomicrograph from BLD/C1 showing *Discocyclina* sp foraminifera in PPL embedded in micritic cement and some fossil cores being altered to calcite grains.



Fig 5.17: Photomicrograph from BLD/C2 showing calcified fossils within sparry cement



Fig 5.18: Photomicrograph from BLD/C3 showing *Nummulites* and some *Discocyclina* sp foraminifera in micritic cement (in PPL)

OVERVIEW OF THE OBSERVATIONS:

MEGASCOPIC DESCRIPTION

The limestones in the study area exhibit a color range from light greyish- white to dark grey and are predominantly fine- to medium-grained.

MICROSCOPIC DESCRIPTION

Petrographic examination reveals that the limestones are primarily composed of microcrystalline calcite, classifying them within the orthochemical group. Fossils form the dominant allochemical component, primarily composed of Nummulites sp., along with other foraminifera such as Assilina sp., Alvelina sp. and Discocyclina sp. The detailed petrographic observations are described below.

(a) Mineralogical Composition

• Orthochemical Constituents

The matrix of the limestone is composed of microcrystalline calcite and lime mud (micrite). These micritic calcium carbonate muds play a crucial role in the formation of the Upper Sylhet Limestone. The terrigenous components and allochemical constituents are embedded within a fine-grained calcite groundmass. In some cases, fossil shells and quartz grains exhibit partial to complete replacement by microcrystalline calcite. Certain samples display a matrix composed entirely of micrite, with occasional polysynthetic twinning observed in calcite grains. The microcrystalline calcite also occupies pore spaces within fossil chambers and sometimes replaces quartz.

• Allochemical Constituents

Allochems are chemically or biochemically precipitated materials that have undergone limited transportation within the depositional basin. The allochemical fraction in the Upper Sylhet Limestone predominantly comprises fossil allochems, constituting >50% of the rock. The foraminiferal assemblage includes Nummulites sp., Assilina sp., Alveolina sp., and Discocyclina sp. (Fig. 5.16–5.19), forming the major allochemical components. Broken skeletal fragments are also prevalent. There are some bivalve fossils also present within these samples. In most cases, these fossils are composed of calcite, with granular calcitic material infilling their internal cavities. Oolites and pellets are rarely observed, while intraclasts appear as fine-grained, dark grey fragments.

Based on Folk's (1959) classification, the fossiliferous limestone of the Upper Sylhet Limestone is categorized as a biomicrite.

Identifying Properties of Limestone in this thin section

i. Optical Properties

- **PPL:** Light to dark brown (micrite) or colorless (pure calcite).
- **XPL:** Low to high birefringence, depending on grain size.
- **Relief:** Low.

ii. Mineralogy

- **Dominant:** Microcrystalline calcite (micrite) or sparry calcite.
- **Secondary:** Quartz (undulatory extinction), clay.

iii. Texture & Fabric

- **Micrite Matrix:** Fine-grained, dense groundmass.
- **Sparry Calcite:** Coarser cement filling pore spaces.
- **Fossils:** *Nummulites*, *Discocyclina*, *Assilina*, *Alveolina* sp., often well-preserved.
- **Ooids/Peloids:** Rare, but some in some places indicating high-energy settings.

iv. Diagenetic Features

- **Recrystallization:** Micrite transforming into sparry calcite.
- **Stylolites:** Wavy pressure-solution seams.
- **Compaction Effects:** Fossil compression under burial stress.

Classification

- **Micrite-Dominated:** Low-energy settings (lagoon, deep marine).
- **Fossiliferous:** High biogenic productivity.

Feature	Micritic Limestone
Grain Size	<4 μm (fine)
Birefringence	Low
Texture	Dense, compact
Fossil Content	High
Cement Type	Calcitic cement

The presence of *Nummulites* sp., *Assilina* sp., *Alveolina* sp., and *Discocyclus* sp. confirms the Eocene age (Lutetian–Bartonian) of the deposit, aligning with the known fossil assemblage of the Upper Sylhet Limestone. This validates the formation classification and its deposition in a shallow marine setting.

The following photomicrographs visually depict the discussed fossil assemblage and micritic groundmass, confirming the petrographic characteristics of the Upper Sylhet Limestone (**Fig.5.19-5.48**).



Fig 5.19: Photomicrograph showing *Nummulites attacius* foraminifera (in PPL)



Fig 5.20: Photomicrograph showing bivalve fossil under PPL



Fig 5.21: Photomicrograph showing rotalida foraminifera in PPL



Fig 5.22: Photomicrograph showing *Nummulites* sp. foraminifera (in PPL)



Fig 5.23: Photomicrograph showing broken skeletal fragments

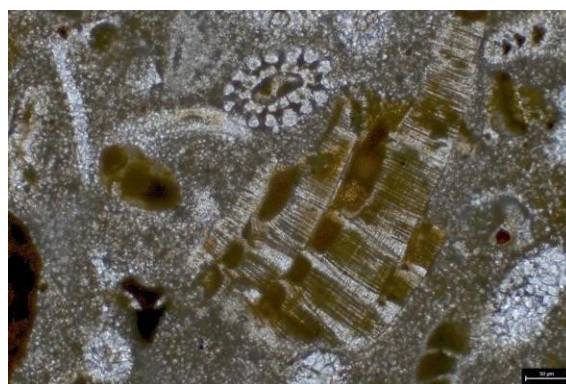


Fig 5.24: Photomicrograph showing broken shell of *Nummulites attacius* Foraminifera and a small echinoderm (in PPL)

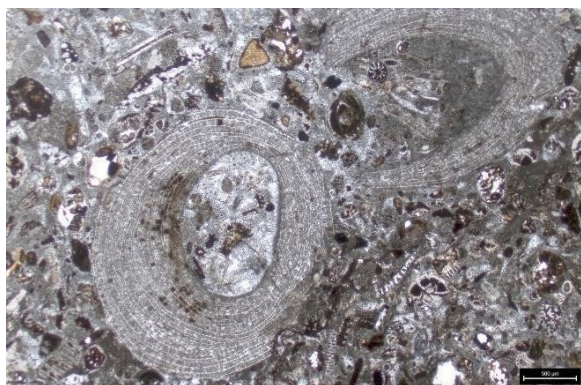


Fig 5.25: Photomicrograph showing ooid with concentric rings of numulites and a central core replaced by calcite (in PPL)

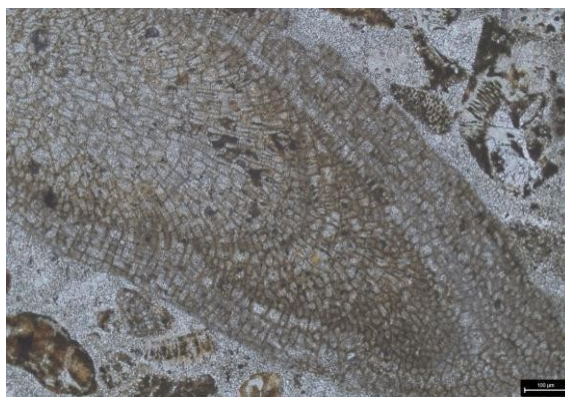


Fig 5.26: Photomicrograph showing Nummulitessp. foraminifera (in PPL)



Fig 5.27: Photomicrograph showing Nummulitessp. foraminifera (in PPL)



Fig 5.28: Photomicrograph showing Rotalida foraminifera in PPL



Fig 5.29: Photomicrograph showing Nummulitessp. Foraminifera in PPL



Fig 5.30: Photomicrograph showing Nummulitessp. Foraminifera in PPL



Fig 5.31: Photomicrograph showing *Assilina spinosa* foraminifera (in PPL)

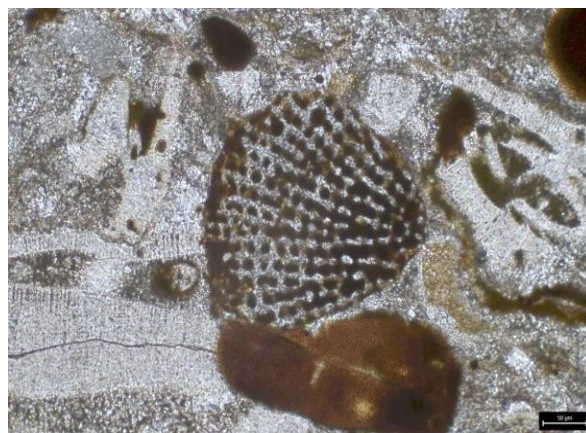


Fig 5.32: Photomicrograph showing *Cuneolina* in PPL



Fig 5.33: Photomicrograph showing *Praechrysalidina* sp. Longitudinal sections (in PPL)



Fig 5.34: Photomicrograph showing bivalve fossil in PPL



Fig 5.35: Photomicrograph showing *Alveolina oblonga* (in PPL).



Fig 5.36: Photomicrograph showing *Assilina* sp. Foraminifera (in PPL)



Fig 5.37: Photomicrograph showing broken part of *Alveolina nuttalli*. (in PPL).

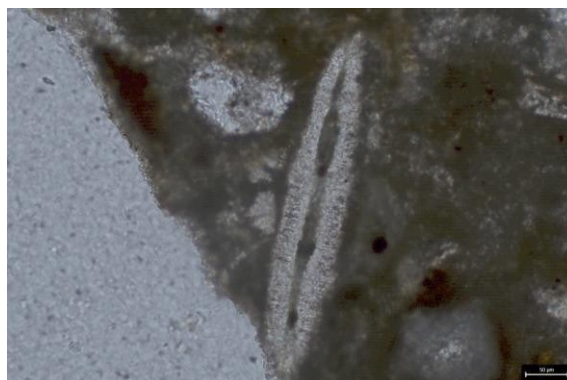


Fig 5.38: Photomicrograph showing *Assilina* sp. Foraminifera (in PPL)



Fig 5.39: Photomicrograph showing *Nummulites* sp. Foraminifera (in PPL)



Fig 5.40: Photomicrograph showing *Asterocyclina* sp. Completely altered by calcite



Fig 5.41: Photomicrograph showing benthic foraminifera *lepidocyclina* sp. (*Dicyclina* cf. *schlumbergeri*) in PPL



Fig 5.42: Photomicrograph showing *Nummulites* sp. Foraminifera of age Miocene (in PPL)



Fig 5.43: Photomicrograph showing
Assilina spinosa foraminifera (in PPL)

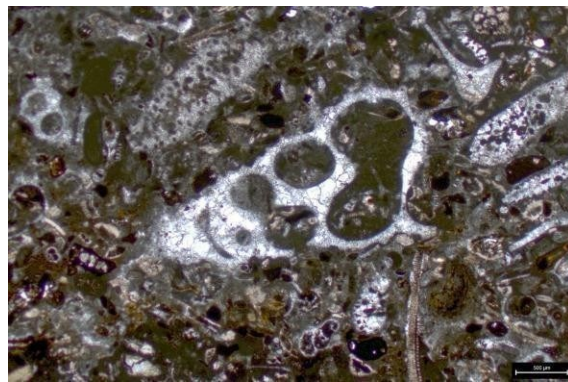


Fig 5.44: Photomicrograph showing
Praechrysalidina sp. Longitudinal sections (in PPL)



Fig 5.45: Photomicrograph showing of broken
parts of *lepidocyclus* sp. in PPL



Fig 5.46: Photomicrograph showing
Assilina spinosa foraminifera (in PPL)

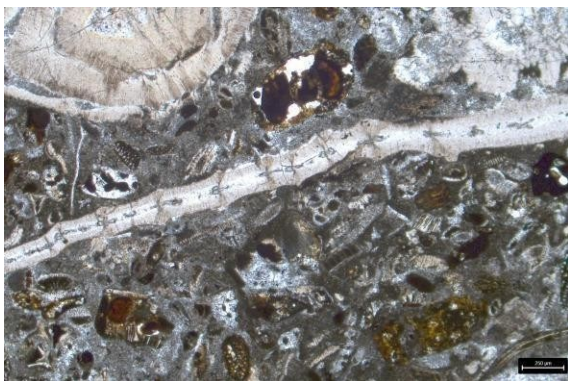


Fig 5.47: Photomicrograph showing
Operculina sp. foraminifera (in PPL).



Fig 5.48: Photomicrograph showing
Nummulites sp. Foraminifera (in PPL)

PETROGRAPHIC STUDY OF OTHER LITHOLOGICAL SAMPLES:

SAMPLE ID: BLD 41(BEDROCK SAMPLE)

The thin section reveals a composition primarily of quartz and feldspar grains, bound by a ferruginous cement. Lithic fragments are also present. Quartz grains are medium to fine-grained, sub-angular to sub-rounded, and exhibit moderate sphericity (**Fig.5.49**). Both monocrystalline and polycrystalline quartz, the latter displaying undulose extinction, are observed. Grain contacts are predominantly long-contact, though concavo-convex contacts are also noted. In some instances, three or more grains are in direct contact. Heavy minerals are present in minor amounts. Modal analysis indicates quartz content exceeding 95%, with a matrix proportion of less than 15%. Based on this composition, the sandstone is classified as quartz arenite.

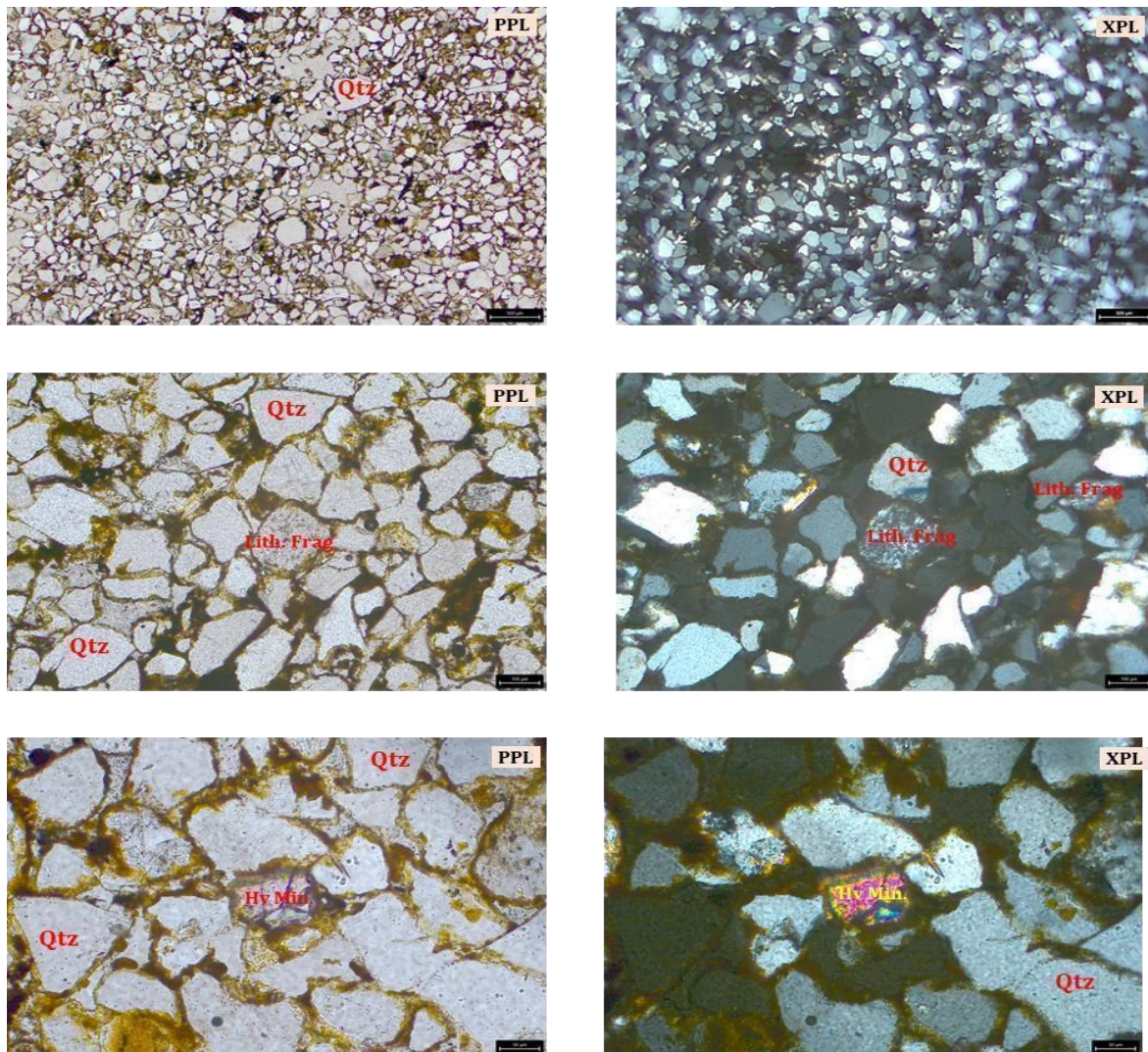


Fig 5.49: Photomicrograph showing of quartz grains within ferruginous cement under PPL and XPL

5.4 STRUCTURE

Primary structures: Bedding planes (**Fig.5.8**) are the most common primary structures. The general attitude of all the litho-units (Kopili Formation & Shella Formation) is sub-horizontal to horizontal in nature with a strike of N10°E-S10°W, dipping 1°-4° towards east and south-east. Laminations of dark grey shale are present in Fossiliferous Limestone, especially near the contact zone with overlying and underlying litho-units.

Secondary structures: Bedding-parallel stylolites (**Fig.5.11**), consisting of a series of relatively small, alternating, interlocked, toothlike columns of stone, are found abundantly in limestone and are also observed within the core sections. Some vertical fractures are also observed in the cores.

On the basis of drilling data, there may be a presence of fault deciphered in the north western part of the block. According to the graphical lithologs correlation of drilled data a prominent shale layer is present in all the drilled boreholes except PBH-01 and Upper Sylhet Sandstone is encountered in PBH-01 at a depth of 82.76m (**PLATE-IV**). Whereas in the other boreholes, the Upper Sylhet Limestone is continuing upto 100m depth. So, there may be a presence of low-angle dip fault or upliftment of strata due to some tectonic movements within the block. The fault is shown in detailed geological map as F-F between PBH-1 & 2, trending N27°E, with a throw of 25m towards ESE (**PLATE-II**). There is no surficial evidence of the presence of the fault.

5.5 METAMORPHISM

No metamorphism has been observed within the study area as the area is comprises of fossiliferous limestone, Sandstone and Shale of Shella and Kopili Formation.

5.6 MINERALOGY OF THE ORE ZONES AND ORE TEXTURES

Fossiliferous Limestones exposed in the study areas are fine-medium grained and mainly composed of calcite mineral. Calcite form the major mineral of the shell of the fossils which is the major allochemical constituent of the limestone of Shella Formation. The microcrystalline calcite grained also occurred as groundmass where allochems are embedded.

5.7 SAMPLING

5.7.1 Petrological samples: 5 nos of petrological samples of different rock types or lithology have been collected from cores and outcrop of different lithology. Thin sections have been prepared in Shiva Analytical (INDIA) Private Limited. Petrographical study of the thin sections are described in section 5.3.

5.7.2 Petrochemical samples: 10 nos of samples from both bed rock and core samples have been chemically analysed at Shiva Analytical (INDIA) Private Limited. (ANNEXURE-VI)

5.7.3 Core sampling: 451 nos. of core samples have been collected from the mineralized zone of the cores and chemical analysis have been done at Shiva Analytical (INDIA) Private Limited (Annexure-IV). The processing of the analysed samples has been described in the later section 8.11 of Chapter 8. Core samples were collected at 1.00 m interval from the mineral zone.

5.8 DETAILS OF INTERPRETED ORE ZONES

In the exploration block, the fossiliferous limestone of Upper Sylhet Limestone covered 60 % of the block. This limestone occurred as thick bedded deposit and it exposed on the surface mainly on the north-western and southern side as an isolated outcrop within the soil covered near the nala sections. This limestone body have horizontal to sub-horizontal bedding with strike trending NNE-SSW to NE-SW with moderate dipping of 2 to 3° south-easterly.

5.9 ENVIRONMENT OF DEPOSITION

The collision of the Indian and Eurasian plates during the Paleocene marked the beginning of the extensive Himalayan foreland basin's formation, which subsequently became a depocenter for Paleocene-Eocene sequences, including the Kopili shale (Alam et al., 2003). Previous studies have documented various diagenetic alterations in the sandstones of the Kopili Formation, such as quartz grain fracturing, sutured grain boundaries, reduced porosity due to quartz replacement, and the precipitation of silica and iron oxide cement (Boruah and Pandey, 2023; Mout and Sarmah, 2024a). The depositional environment of the Kopili shale transitioned from shallow marine to estuarine and deltaic facies (Sarmah and Borgohain, 2012; Trivedi and Ranhotra, 2015; Devi et al., 2021; Mout and Sarmah, 2024a).

Despite these findings, inconsistencies remain in the interpretations of the paleo-weathering, redox conditions, provenance, and tectonic settings associated with the deposition of the Kopili shale. Geochemical proxies, such as CIA, CIW, and ICD, indicate intense chemical weathering under semi-arid to semi-humid conditions during the paleo-weathering of the Kopili shale (Boruah and Pandey, 2023).

The Upper Sylhet Limestone consists of thick nummulitic limestones that were deposited in a shallow marine environment within a gradually shallowing basin. This led to a coarsening-upward sedimentary sequence (Najman et al., 2008; Whiso et al., 2009; Biswal et al., 2021, 2022). The deposition of the Upper Sylhet Limestone began with the formation of a carbonate platform, where carbonate sediments, similar to those found in the sedimentary cycles of the Mediterranean and the Middle East, were deposited (Jauhri and Agarwal, 2001). Fossil assemblages indicate that the Upper Sylhet Limestone was deposited under warm, high-energy conditions in shallow-marine environments (Sarkar, 2019; Singh et al., 2023). The presence of coal patches in Upper Sylhet Sandstone towards the bottom of some core sections indicates an anoxic environment.

5.10 GEOPHYSICAL EXPLORATION

Geophysical exploration was not carried out in Northwest of Boro Lakhindong block.

5.11 GEOCHEMICAL EXPLORATION

Correlation matrix of the major oxide (**Table 5.2**) was prepared from the chemical analysis of 451 nos. of cores samples. It is observed that the CaO have negative correlation with other oxides i.e., Fe₂O₃, K₂O, MgO, TiO₂ & SiO₂. The grade of limestone decreases in ferruginous limestone

and intercalation with shale as the value of CaO have inverse correlation with Fe_2O_3 , SiO_2 and Al_2O_3 . The inverse relationship of CaO with other oxides is also shown in Bivariant plot in Fig.5.50.

Table 5.2 Correlation matrix of oxides of limestone core samples

Sr No	Toposheet No	Oxides	Al_2O_3 (%)	CaO (%)	Fe_2O_3 (%)	K_2O (%)	MgO (%)	TiO_2 (%)	SiO_2 (%)
1	83C11	Al_2O_3 (%)	1						
2	83C11	CaO (%)	-0.929	1					
3	83C11	Fe_2O_3 (%)	0.484	-0.601	1				
4	83C11	K_2O (%)	0.983	-0.916	0.438	1			
5	83C11	MgO (%)	0.332	-0.316	0.52	0.30209	1		
6	83C11	TiO_2 (%)	0.913	-0.934	0.404	0.91692	0.167	1	
7	83C11	SiO_2 (%)	0.852	-0.948	0.36	0.85989	0.106	0.929	1

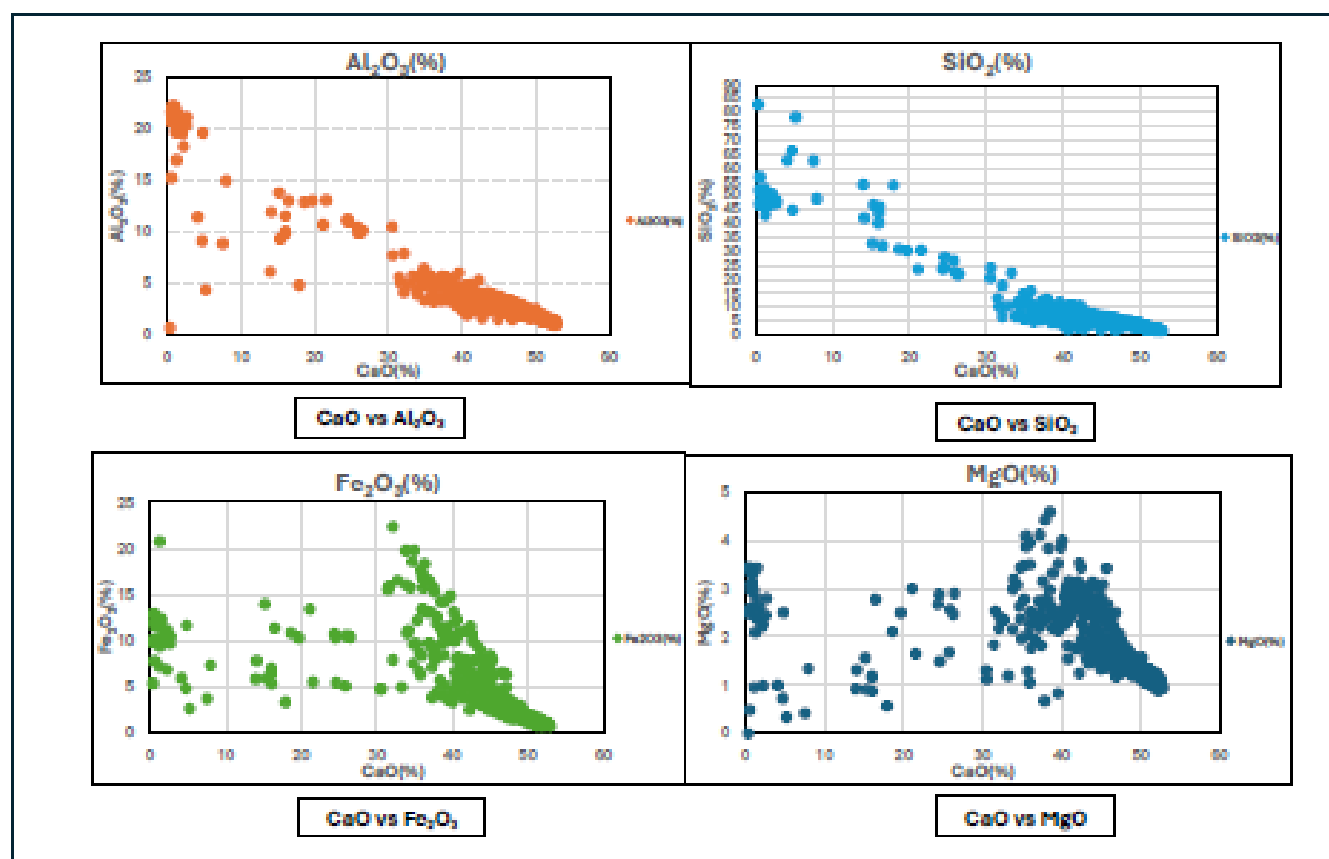


Fig 5.50. Bivariate plots showing relationship between CaO and Al_2O_3 , SiO_2 , Fe_2O_3 & MgO

CHAPTER 6

INTEGRATION OF GEOLOGY, GEOPHYSICS (WITH AVAILABLE AERO GEOPHYSICAL DATA) AND GEOCHEMICAL EXPLORATION DATA AND THE INTERPRETATION

Not required for bedded type deposit as well as it is also not a part of the NQT.

CHAPTER 7

MINERAL DEPOSIT

7.1 SURFACE INDICATION OF MINERALIZED ZONE

The Upper Sylhet Limestone Member of Shella Formation is the target rock for limestone exploration in Northwest of Boro Lakhindong block and thick beds of limestones are exposed in sections in the block. The maximum thickness exposed is 3.25m (**Fig.5.8**) in central northwest part of the block. Upper Sylhet Limestone disposition is sub horizontal to horizontal, trending N20°E with 1° to 4° dip. The limestone bed is well exposed in approximately 60% of the block area and is mainly exposed along the hill slopes, nala section where it is covered by thick soil cover. The outcrops of limestone are fine to medium grained, hard & compact fossiliferous with fossils of Nummulites sp., Alveolina sp. and Discocyclus sp., highly dissected, rugged with numerous small caves and fractures.

7.2 MODE OF OCCURRENCE

The limestone in the Northwest Boro Lakhindong block is deposited from the accumulation of exoskeletons or tests of marine organisms and cemented by chemically precipitated carbonate. It occurs in the form of a regular, almost sub-horizontal to horizontal, primary bedded deposit with a N20°E, strike and dipping 1° to 4° towards the ESE.

7.3 NATURE OF MINERALIZATION

The limestone is of marine origin, bioclastic, and was deposited as cemented shell fragments and biologically derived precipitates in a euxinic environment on a stable shelf. The Sylhet Limestone, which is exposed in the Mikir, Garo, Khasi and Jaintia Hills, was deposited in a shallow, open marine, warm water environment (Bhandari et al., 1973). The mineralization exhibits a bedded sedimentary nature, formed by the accumulation of loose shells from dead marine organisms. Over time, these shells were transformed into bioclastic limestone through the addition of a chemically precipitated carbonate cement that binds the shell fragments together.

7.4 DETAILS OF MINERALISED ZONES

The Upper Sylhet Limestone is intersected in all drilled boreholes of Northwest of Boro Lakhindong Block. The Upper Sylhet Limestone is overlain by Kopili Formation and underlain by Upper Sylhet Sandstone. The borehole wise thicknesses of Upper Sylhet Limestone are summarized below (**Table 7.1**) and graphical litholog of drilled boreholes in the block have been given in (**Plate- IV**). Based on the limestone thicknesses recorded in all five boreholes, the average thickness has been calculated to be 85.32 m. The overburden comprises of regolith and Kopili Formation and its thickness ranges between 03.00m and 16.14m.

Table 7.1: Borehole wise total thickness of Upper Sylhet Limestone						
Sr No	Toposheet No	Borehole No	Total depth (m)	Intersection of Limestone		Thickness of limestone (m)
				From (m)	To (m)	
1	83C11	PBH-01	100.00	4.00	82.76	78.76
2	83C11	PBH-02	100.00	4.40	100.00	95.60
3	83C11	PBH-03	100.00	15.78	100.00	84.22
4	83C11	PBH-04	100.00	15.80	100.00	84.20
5	83C11	PBH-05	100.00	16.14	100.00	83.86

7.5 GENESIS OF MINERALIZATION/GENETIC MODEL FOR MINERALIZATION

The Upper Sylhet Limestone of the Shella Formation was formed during the Eocene period under shelf conditions (Mathur & Evans, 1964). The limestone was deposited in a marine shelf environment, as evidenced by the presence of foraminifers and its association with shale (Biswal et al., 2021). Most of the fossils are well-preserved, suggesting a relatively low-energy environment. The ferruginous limestone at the top indicates deposition in an oxic environment. The pelitic sediment deposits reflect a period of marine transgression or deepening of the ocean basin. Fossil assemblages such as *Nummulites* sp., *Alveolina* sp., *Discocyclus* sp., *Asterocyclus* sp., *Assilina* sp., and others observed in the limestone point to a shallow marine environment under stable shelf conditions.

The coal-bearing sandstone, encountered in PBH-01 of the Upper Sylhet Sandstone was deposited in estuarine or lagoonal margins. By the Late Eocene, the area transitioned to a deeper marine environment, leading to the deposition of thick shale units of the Kopili Formation.

CHAPTER 8

EXPLORATION BY DRILLING

Exploration by drilling (core) was carried out in Northwest of Boro Lakhindong Block in an area of 4.82 sq. km to assess the potentiality of different grades of limestone. A total of 500m drilling was carried out in 05 vertical boreholes (at a space of 800 m interval) i.e., PBH-1, PBH-2, PBH-3, PBH-4, and PBH-5. The five boreholes are plotted in the detailed geological map which is shown in **Fig.8.1**.

8.1 STAGE OF EXPLORATION

The investigation of the block was initiated under G-3 stage of UNFC, i.e. 'Prospecting Stage, as the limestone continuity can be established in the area, where grade variation will be known by drill core sample analysis. In addition to drilling programme, detailed mapping of 4.82 sq. km with bed rock, core and petrographic sampling have been carried out.

8.2 DRILLING METHODOLOGY

Two rigs were deployed to carry out the drilling in the block. All the drill machines were hydrostatic rigs with model CSD500L and CSD1300L having the capacity of drilling upto 500m and 1000m respectively. Diamond bits were used for the core drilling process. The azimuth of all the drilling boreholes was vertical as the targeted strata is sub-horizontal to horizontal. Generally wet drilling method has been deployed except in the overburden and loose formations.

8.3 CO-ORDINATE AND RL OF THE COLLARS OF THE BOREHOLES

The co-ordinate and RL of the collars of the boreholes are taken from DGPS survey, given in the Table 8.1 below.

Table 8.1 Co-ordinate and RL of drilled boreholes in Northwest of Boro Lakhindong Block

Borehole No.	Latitude	Longitude	RL of the Collar
PBH-01	25°28'34.72"N	92°36'6.56"E	731.00m
PBH-02	25°28'33.56"N	92°36'35.44"E	736.00m

Borehole No.	Latitude	Longitude	RL of the Collar
PBH-03	25°28'32.41"N	92°37'4.06"E	736.00m
PBH-04	25°28'7.79"N	92°36'19.95"E	741.00m
PBH-05	25°28'5.2"N	92°36'48.3"E	732.00m

8.4 BOREHOLE PLANNING

Total no of 5 boreholes has been planned at a space of 800m along east-west direction since the bedding of the limestone is sub-horizontal to horizontal in nature and the shape of the block boundary is irregular. This grid pattern was planned as per the UNFC norm of G3 stage of exploration and review of TCC meeting. However, slight deviations from the grid pattern have been initiated due to topography of outcrop of the limestone and inaccessibility caused by dense forests and abandoned quarries in certain locations. Details of boreholes and intersection depths of limestone are given in the **Table 8.2**.

Table 8.2 Details of drilled boreholes and intersection depths of limestone in Northwest of Boro Lakhindong Block.

Borehole No.	Date of commencement	Date of closure	Final depth (in m)	Intersection of Limestone		Limestone Thickness (m)
				From (m)	To (m)	
PBH-01	09.12.2024	11.12.2024	100m	4.00	82.76	78.76
PBH-02	04.12.2024	07.12.2024	100m	4.4	100.00	95.60
PBH-03	04.12.2024	06.12.2024	100m	15.78	100.00	84.22
PBH-04	09.12.2024	12.12.2024	100m	15.80	100.00	84.20
PBH-05	14.12.2024	16.12.2024	100m	16.14	100.00	83.86

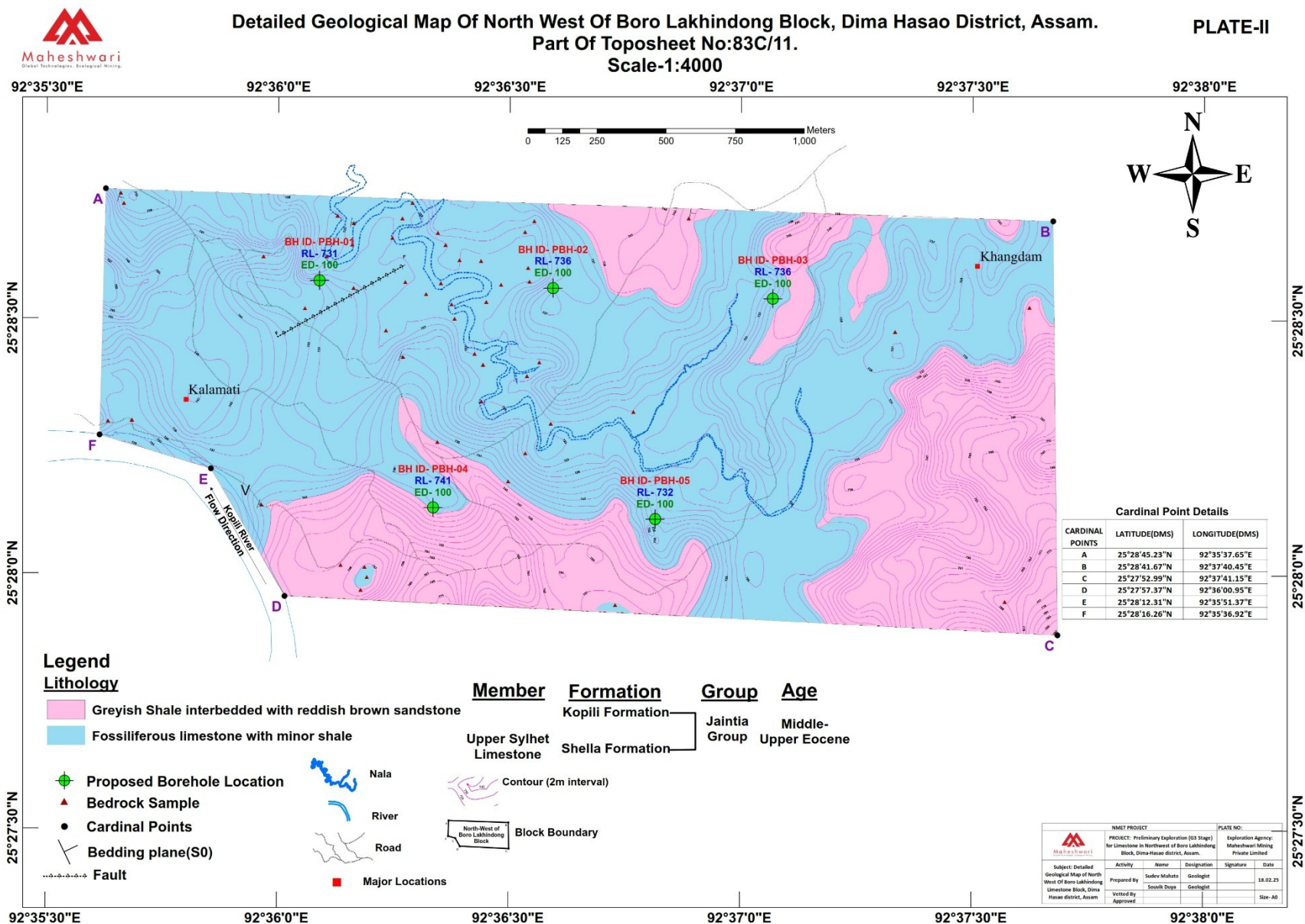


Fig. 8.1: Showing borehole locations in detailed geological map.

8.5 BOREHOLE LOGGING

The drill cores have been logged in details to study the lithology, variation in colour, grain size, nature and details of fossils and structural features. During detailed logging, special care has been taken to distinguish the variation of fossil content, variation in fossil shapes and deformation, variation in grain size, present of mud partings and shale intercalations. The lithologs of boreholes are given in summarized form in Annexure-II and graphical lithologs in Plate-IV. A brief description of all 5 nos. of boreholes is given below.

PBH-01: This borehole is located at latitude 25°28'34.72"N and longitude 92°36'6.56"E. Drilling on this borehole commenced on 09.12.2024 and finished on 11.12.2024. Final depth of this borehole is 100m. Soil was intersected from 0 to 4m depth. Upper Sylhet limestone i.e. mineralized zone was intersected from 4m to 82.76m. Upper Sylhet sandstone was intersected from 82.76 to 100m.

PBH-02: This borehole is located at latitude 25°28'33.56"N and longitude 92°36'35.44"E. Drilling on this borehole commenced on 04.12.2024 and finished on 07.12.2024. Final depth of this borehole is 100m. Soil was intersected from 0 to 2m depth. Kopili Shale was intersected from 2.00 to 4.40m. Upper Sylhet limestone i.e. mineralized zone was intersected from 4.40m to 100.00m.

PBH-03: This borehole is located at latitude 25°28'32.41"N and longitude 92°37'4.06"E. Drilling on this borehole commenced on 04.12.2024 and finished on 06.12.2024. Final depth of this borehole is 100m. Soil was intersected from 0 to 5.50m depth. Kopili Shale was intersected from 5.50 to 15.78m. Upper Sylhet limestone i.e. mineralized zone was intersected from 15.78m to 100.00m.

PBH-04: This borehole is located at latitude 25°28'7.79"N and longitude 92°36'19.95"E. Drilling on this borehole commenced on 09.12.2024 and finished on 12.12.2024. Final depth of this borehole is 100m. Soil was intersected from 0 to 3m depth. Kopili Shale was intersected from 3.00 to 15.80m. Upper Sylhet limestone i.e. mineralized zone was intersected from 15.80m to 100.00m.

PBH-05: This borehole is located at latitude 25°28'5.2"N and longitude 92°36'48.3"E. Drilling on this borehole commenced on 14.12.2024 and finished on 16.12.2024. Final depth of this borehole is 100m. Soil was intersected from 0 to 3m depth. Kopili Shale was intersected from 3.00 to 16.14m. Upper Sylhet limestone i.e. mineralized zone was intersected from 16.14m to 100.00m.

8.6 Core recovery percentage

The core recovery of all boreholes is good on an average. The core recovery of the targeted strata, the Upper Sylhet Limestone, is very good (85-90%) where there are no fracture zones. However, in areas where the borehole passes through fracture zones, the core recovery is reduced. Core recovery is low in shale as it is mostly fractured and splintery in nature. Borehole-wise details of core recovery are provided in the **Table 8.3**.

Table 8.3: Core recovery of boreholes of Northwest of Boro Lakhindong Block.			
Sr No	Toposheet No	Borehole No	Core recovery (%)
1	83C11	PBH-01	98.51
2	83C11	PBH-02	96.02
3	83C11	PBH-03	96.3
4	83C11	PBH-04	97.07
5	83C11	PBH-05	98.91

8.7 Geophysical logging of boreholes

As per the Nature and Quantum of work approved for this limestone block, there was no geophysical logging.

8.8 Minerology of the ore zone

Mineralogically, the Upper Sylhet Limestone is primarily composed of the mineral calcite, which occurs in the form of microcrystalline grains in the groundmass. Limestone encountered in all the boreholes is Biomicrite. It is mainly dark grey to light grey in colour, medium grain and hard and compact. It is mainly composed of calcite mineral. Calcite occurs as microcrystalline grains in the matrix and shells of the fossils. Vertical variation of fossils content is more prominent in the limestone.

8.9 Borehole deviation test and methodology

As the boreholes were drilled out at vertical angle, no deviation test was carried out.

8.10 Methodology of ore zone sampling

Core samples were obtained from the mineralized zone at 1-meter intervals, with each sample representing 1 meter of core. During sample collection, core recovery and necessary adjustments were made to ensure accurate representation of the zone.

8.11 Sample powder preparation & chemical analysis with laboratory procedures

Core samples were collected at 1.00m interval from the mineralized zone. Then, the samples were split into two longitudinal equal halves by using a core splitter. Thereafter 6mm chip samples were made out of the half core samples. After coning & quartering of 500-600 grams chip samples that 200-300g was powdered to -100 mesh sizes. The remaining chip samples are preserved for future perspective. Rest one half of the core has been preserved in the core box and sent to core repository. The 200-300g powdered samples was repeatedly coned and quartered to obtain primary sample of about 150-200 grams of powder which was divided into two halves. One half was submitted to NABL laboratory (Shiva Analytics) for chemical analysis and the other half was preserved as a duplicate sample. The primary samples were analyzed for CaO, MgO, SiO₂, Al₂O₃, Fe₂O₃, SO₃, P₂O₅, Na₂O, K₂O, and LOI by X-ray fluorescence machine using the standards.

A total of 451 nos. core samples from 5 boreholes were collected, processed and analyzed. In addition to core samples, 50nos of bed rock samples were also collected and chemical composition analyzed.

8.12 Check samples

45 numbers of the core samples and 5 no's of bedrock samples were prepared as check samples and it is analyzed at the SGS Lab (Annexure-V) in order to compare the accuracy of the chemical composition of the original samples. While comparing the chemical result of the check sample with original samples, it is found that the results are almost similar or less deviated.

8.13 Details of the intersected limestone

A total of 500m drilling was carried out in 5 no's of boreholes. The targeted Upper Sylhet Limestone has been intersected in all the boreholes and depth of intersections are described in the Table. However, the grade of limestone in the block is considered by cut-off value of CaO to be 34% (IBM, 2019). The limestone was intersected in all the boreholes at different depth. In boreholes

no PBH-01, 02, 03, 04 and 05 the Upper Sylhet Limestone been intersected from 4.00m to 82.76m, 4.40m to 100m, 15.78m to 100m, 15.80m to 100m and 16.14m to 100m respectively.

Table 8.4: Detailed of intersected of limestone of boreholes drilled						
Sr No	Toposheet No	Borehole No	Final depth (in m)	Intersection of Limestone		Thickness (m)
				From (m)	To (m)	
1	83C11	PBH-01	100	4.00	82.76	78.76
2	83C11	PBH-02	100	4.40	100.00	95.6
3	83C11	PBH-03	100	15.78	100.00	84.22
4	83C11	PBH-04	100	15.80	100.00	84.2
5	83C11	PBH-05	100	16.14	100.00	83.86

8.14 Depth of Groundwater

As of drilled borehole, the water table varies from 17m to 25m w.r.t the topography in the area. And as the Kopili River and several nalas are present in the northwest and northern part of the block, the water table is present nearly or near about 10m.

CHAPTER-9

GEOTECHNICAL STUDIES

In-situ Bulk density of Limestone and RQD of core samples are measured under geotechnical studies.

9.1 BULK DENSITY

The bulk density of limestone samples was determined by Shiva Analyticals Laboratory using the **Pycnometer Method**, a standard laboratory procedure for accurately measuring the density of solid materials. In this method, finely crushed and oven-dried limestone samples are placed into a pycnometer—a calibrated glass vessel. The volume of the sample is then determined by measuring the displacement of a fluid, usually distilled water, within the pycnometer. By comparing the mass of the dry sample to the volume it displaces, the bulk density (in g/cm³ or t/m³) is calculated with high precision.

This method is particularly suitable for irregular and porous geological samples, as it provides a reliable estimate of true or particle density, excluding pore spaces. The obtained average bulk density value of 2.53 t/m³ (**Table 9.1**) was applied across the deposit for resource estimation purposes. The details of laboratory results are provided in Annexure VII.

Table 9.1: Average bulk density of limestone samples collected			
Sr No	Toposheet No	Samples No	Bulk Density (gm/cc)
1	83C11	1	2.48
2	83C11	2	2.61
3	83C11	3	2.49
		Average	2.526666667

9.2 RQD (ROCK QUALITY DESIGNATION)

The RQD for all the cores of the drilled boreholes is calculated as per the formula

$$\text{RQD} = (\text{Sum of the length of core pieces} > 100\text{mm} / \text{total length of the core run}) \times 100\%$$

The average RQD of the limestone encountered in all the borehole is excellent i.e. above 90%.

Table 9.2 Summarized RQD of Boreholes				
Sr No	Toposheet No	Boreholes No	Lithology	RQD (%)
1	83C11	PBH-01	Limestone	89.57
			Intercalation of shale and sandstone	66.46
2	83C11	PBH-02	Limestone (fracture)	83.52
			Shale	17.31
			Limestone	92.32
			Intercalation of shale and limestone	79.5
3	83C11	PBH-03	Shale	23.64
			Limestone (fracture)	88.96
			Shale	20.58
			Limestone	90.19
4	83C11	PBH-04	Intercalation of shale and limestone	36.47
			Limestone (fracture)	80.92
			Shale	37.33
			Limestone	90.33
5	83C11	PBH-05	Intercalation of shale and limestone	21.67
			Limestone (fracture)	83.24
			Shale	41.67
			Limestone	88.21

CHAPTER 10

RESOURCE ESTIMATION

10.1 INTRODUCTION

To assess the grade-wise resource of limestone in the Northwest of Boro Lakhindong block, a G-3 stage (Preliminary Exploration) was conducted over an area of 4.82 sq. km. As per the exploration plan, vertical boreholes were drilled at an 800-meter spacing, conforming to the guidelines for pros-level investigations in limestone deposits. A total of 500 meters of core drilling was completed, with each of the five boreholes reaching a depth of 100 meters. The primary objectives of the investigation were to examine depth continuity of the limestone horizons and to enable grade-wise resource estimation based on subsurface lithological and chemical analysis data. Based on drilling and surface sampling, the entire area is mineralized (**Fig:8.1**).

10.2 DETAILED DESCRIPTION OF LIMESTONE

The Upper Sylhet Limestone which is encountered in all the boreholes is grey to dark grey in colour, fine to medium grained, hard and compact and mostly fossiliferous limestone. From the sub surface data of the drilled boreholes, it is observed that the Upper Sylhet Limestone is thickly bedded with low dipping of 1° to 4° south-easterly. Different grades of limestone like Portland (Cement), Cement (Blendable), SMS (OH) and unclassified were encountered in all the boreholes.

The detailed of the limestone and different grade of limestone encountered in drilled borehole are given in the **Table 10.1** respectively.

Table 10.1 Details of the limestone encountered in drilled boreholes

Borehole ID	Intersection of Limestone		Limestone thickness(m)
	From (m)	To (m)	
PBH-01	4.00	82.76	78.76
PBH-02	4.40	100.00	95.60
PBH-03	15.78	100.00	84.22
PBH-04	15.80	100.00	84.20
PBH-05	16.14	100.00	83.86

10.3 CORE RECOVERY

The core recovery of the all boreholes is good. The average core recovery percentage is 98.51 within the mineralized zone. Hence, the recovered thickness is considered as actual thickness.

10.4 CUT-OFF GRADE CONSIDERATION

The resource estimation is calculated the limestone was classified into various grades based on the End User Grade Classification, which takes into account its chemical composition. A cut-off grade of 34% CaO has been applied to ensure that only material meeting the minimum industrial requirements is considered. The main categories of limestone grades, based on their chemical content. These classification values are based on the recent publication by the Indian Bureau of Mines (IBM Annual Report, 2019) given in **Table 10.2** below.

Table 10.2: End Use Grade Classification for Limestone

Grade	CaO%	MgO %	SiO ₂ %	Al ₂ O ₃ %	Fe ₂ O ₃ %
Cement (Portland)	44 to 52%	3.5 % (max)			
Cement (Blendable/Beneficiable)	38 to 44 %	5% (max)			
Steel Melting Shop (Open Hearth)	48 % (max)	4% (max)	4% (max)		
Steel Melting Shop (Linz-Donawitz)	52 % (min)	Below 2%	1% (max)		
Chemical	50% (min)		2% (max)		0.25% (max)
B.F.	42% (min)	6% (max)	4% (max)		

White Cement	48% (min)			1% (max)	1% (max)
Others (Unclassified)	Estimation for such grade though usable cannot be classified under any grades				

The primary chemical components of limestone include CaO, MgO, SiO₂, Fe₂O₃, and Al₂O₃, which are crucial in determining the grade of limestone based on its suitability for various industries such as cement, iron and steel, chemicals, fertilizers, and glass production. Additionally, other elements like SO₃, P₂O₅, Na₂O, K₂O, and MnO also need to be analyzed, as they significantly influence the grading and overall quality of limestone for these applications. Limestone plays a crucial role in steelmaking, particularly in Steel Melting Shops (SMS) that use processes such as the Open Hearth (OH) furnace or Linz-Donawitz (LD) furnace, the latter being a type of Basic Oxygen Furnace (BOF) technology.

10.5 MINIMUM STOPING WIDTH CONSIDERATION

Stoping width is not applicable for open cast mining.

10.6 GRADE OF LIMESTONE AND CORRELATION

The limestone encountered in each borehole can be classified into different grades based on key chemical constituents such as CaO, MgO, SiO₂, Fe₂O₃, and Al₂O₃. Chemical analysis shows that the majority of the Upper Sylhet Limestone falls into the Cement (Blendable and Portland) grade, SMS (OH) and the Unclassified grade. Limestone with a CaO content ranging from 34% to just under 38% is categorized as unclassified. This is shown in **Table 10.3**.

Table 10.3: Depth wise grade classification of each borehole								
Sr No	Toposheet No	Borehole No	From (m)	To (m)	Thickness (m)	WtAv. CaO%	Grade	Member
1	83C/11	PBH-01	4	13	9	46.213	Cement (P)	UPPER SYLHET LIMESTONE
			13	23	10	41.074	Cement (B)	
			23	32	9	47.44022	Cement (P)	
			32	54	22	50.28641	SMS(OH)	
			54	65	11	45.14209	Cement (P)	
			65	80	15	—	Waste	
2	83C/11	PBH-02	80	82.76	2.76	37.72349	Unclassified	UPPER SYLHET LIMESTONE
			5	13	8	38.44	Cement (B)	
			13	23	10	44.7816	Cement (P)	
			23	31.62	8.62	39.62604	Cement (B)	
			31.62	36	4.38	—	Waste	

			36	47	11	45.42436	Cement (P)	
			47	53	6	41.526	Cement (B)	
			53	64	11	45.12118	Cement (P)	
			64	91	27	50.39893	SMS(OH)	
			91	97	6	45.59367	Cement (P)	
			97	100	3	—	Waste	
3	83C/11	PBH-03	15.7	26	10.3	38.43314	Cement (B)	UPPER SYLHET LIMESTONE
			26	33	7	44.45843	Cement (P)	
			33	42.26	9.26	38.47947	Cement (B)	
			42.26	47	4.74	—	Waste	
			47	58	11	45.27636	Cement (P)	
			58	65	7	40.87357	Cement (B)	
			65	75	10	45.5171	Cement (P)	
			75	100	25	50.29412	SMS(OH)	
4	83C/11	PBH-04	15.8	25	9.2	38.6338	Cement (B)	UPPER SYLHET LIMESTONE
			25	33	8	44.608	Cement (P)	
			33	42	9	38.30089	Cement (B)	
			42	46	4	—	Waste	
			46	57	11	44.73073	Cement (P)	
			57	66	9	41.50744	Cement (B)	
			66	75	9	46.94611	Cement (P)	
			75	100	25	50.50204	SMS(OH)	
5	83C/11	PBH-05	16.14	24	7.86	40.67196	Cement (B)	UPPER SYLHET LIMESTONE
			24	33	9	44.35567	Cement (P)	
			33	42	9	39.77267	Cement (B)	
			42	46	4	—	Waste	
			46	58	12	45.43558	Cement (P)	
			58	68	10	41.8506	Cement (B)	
			68	77	9	47.02544	Cement (P)	
			77	100	23	50.81952	SMS(OH)	

10.7 GRADE WISE CORRELATION OF LIMESTONE

Fence diagram provides a way to visualize the space between multiple overlapping surfaces in 3D space, such as stratigraphic data. Fence diagram has been prepared for correlation of the grade variation of limestone in each borehole.

The analysis of the 3D fence diagram reveals that in the northwestern part of the block, limestone of cement (Portland) and SMS (OH) grades occurs in the upper sections of the boreholes, directly beneath the soil cover. In contrast, in the eastern, southwestern, and southeastern parts of the block, limestone of cement (Portland), cement (Blendable/beneficiable), and SMS (OH) grades is found below the Kopili Formation. This indicates that the limestone bedding is sub-horizontally dipping toward the southeastern side.

10.8 METHODOLOGY OF RESOURCE ESTIMATION

Limestone resource estimation for the Northwest of Boro Lakhindong block has been carried out using the Theissen Polygonal Method.

The following steps were undertaken for the estimation of limestone resources:

- a) According to The Minerals (Evidence of Mineral Contents) Rules, 2015 (as amended up to 14th December, 2021), Ministry of Mines, Government of India, issued by the Controller General, IBM, Nagpur (January, 2022) rule five boreholes were approved with space of 800m, considering the horizontal to sub-horizontal attitude of the limestone. Part-III of Schedule-I of the above rule allows 800m grid spacing of boreholes for G3 level of exploration in limestone. NMET-TCC approved these five boreholes. To make the area of influence, best fit strike lines are drawn to match maximum boreholes.
- b) The area of influence for each positive borehole is limited to half the distance between two positive borehole points along strike and two consecutive strike lines along dip.
- c) When the other borehole is not available as control the area of influence for each borehole is limited either to 350m and 400 m along strike and across strike or to the block boundary.
- d) The influence area for resource estimation has been considered in accordance with the drilled borehole locations.
- e) The block boundary of the block is irregular in outline. Therefore, the area near to the boundary where the influence of the boreholes is beyond the permissible limit is excluded from the resource calculation.
- f) The thickness of limestone measured in each borehole has been considered to be uniform throughout the area of influence of the particular borehole.
- g) The limestone is considered to be of uniform characteristics throughout the volume of a particular grade and there is no variation in grade of limestone.
- h) Bulk density of 2.53 has been considered/ assumed to the entire deposit as calculated from the borehole cores. It was determined using the pycnometry method, and the analysis was carried out at Shiva Analyticals Laboratory, given in Annexure -VII.

The area of influence is determined using the polygonal method, where area of influence is marked by constructing polygon around each borehole using method demonstrated in **Fig.10.1**.

The area of influence for G3 resource estimation was defined based on drilled borehole locations. Half the distance between two positive boreholes was considered to delineate the influence zone, while a buffer of 400 meters was applied in undrilled areas to limit extrapolation. The remaining portions of the block, where no boreholes were present, were classified under the

G4 category. Although surface indications of limestone exist in these areas, the absence of subsurface data made it unsuitable for higher confidence categorization. Therefore, the overall resource estimation has been reported as a combined total of G3 and G4 categories (**Fig. 10.1**). The thickness of the limestone is determined from the borehole intersection. To calculate the volume, the area of influence is multiplied by the limestone thickness. This volume is then multiplied by the bulk density to estimate the gross tonnage. To calculate the net tonnage for each borehole, 15% of the gross tonnage is subtracted, accounting for the likely presence of underground caverns, solution cavities, or structural discontinuities within the limestone deposit. The bulk density of the limestone is calculated from the core of the limestone, given in Section 9.1. Bulk density is 2.53 gm/ cm³ or tonnes/m³.

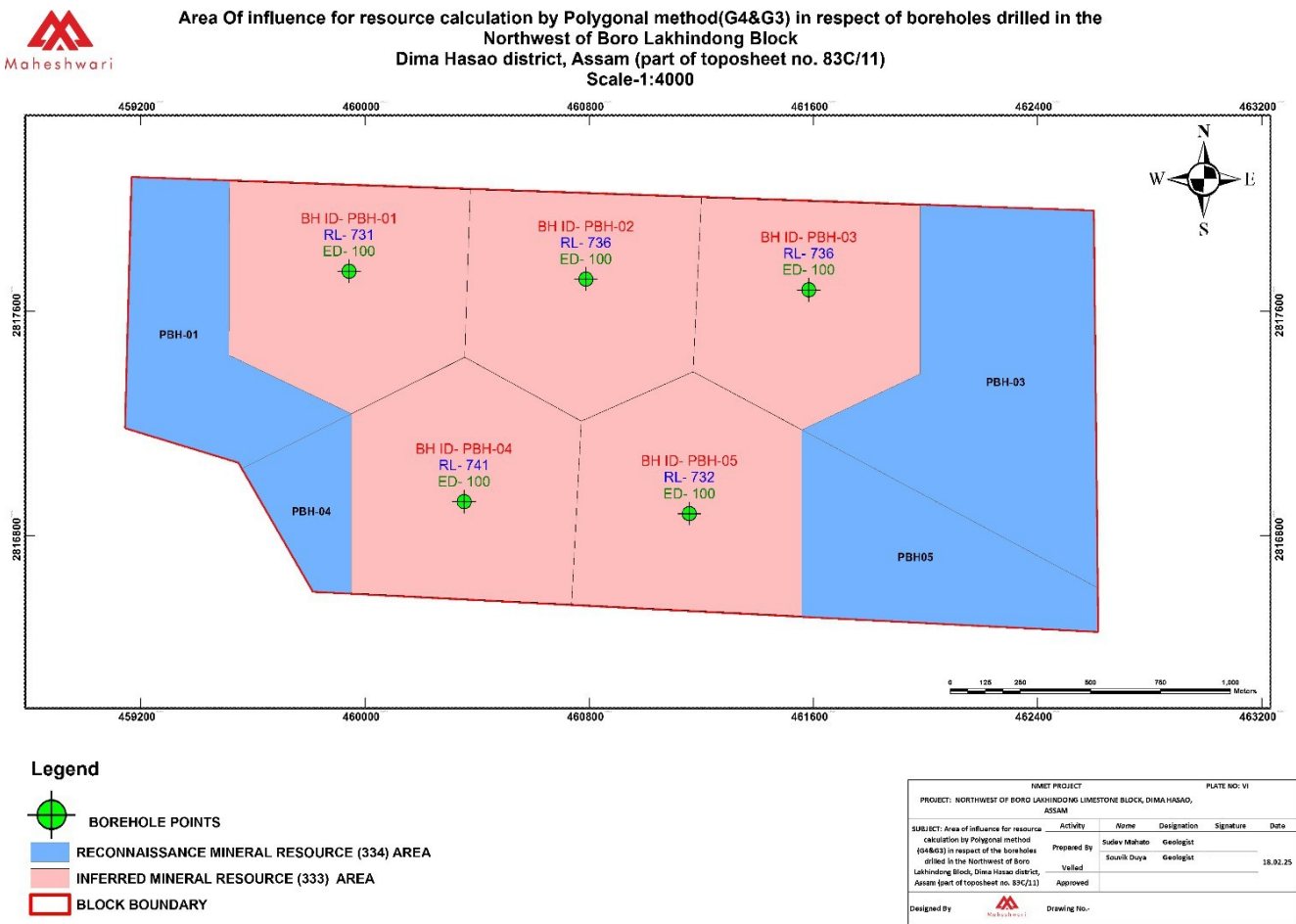


Fig. 10.1: Schematic diagram showing construction of polygons for determining area of influence.

In this method also, the volume of the polygonal area has been calculation by considering the assumption given above.

Volume of polygon= S x T,

Where S = Area of polygon,

T= Thickness of limestone intersected in borehole.

Resources have been estimated by the formula

Resource of one block of rectangle/polygonal area = R = V x Bd = S x T x Bd

Where Bd = Bulk density

R = Resource of one rectangle/polygon

Resource of total deposit = RE = R1 + R2 + R3 Rn

Grade of the deposit is calculated as per the chemical grade of the limestone for each borehole.

10.9 RESOURCE

Table 10.4: Showing Category wise Net Resource by using Polygonal Method

Method	Category	Net Resource	Grade (In million tonnes)				UNFC Classification
			Cement (Blendable/Beneficial)	Cement (Portland)	SMS (OH)	Unclassified / Others	
Polygonal	G3	498.97	144.4	195.29	155.68	3.59	Class 333
Polygonal	G4	300.79	90.35	113.58	94.32	2.54	Class 334
Polygonal	Total (G3 + G4)	799.76	234.75	308.87	249.99	6.13	Class 334

Table 10.5: Showing the Total Net Resource (G3 as Category 333 of UNFC Classification) by using Polygonal Method

Borehole No	From	To	Thickness (m)	Wt. Average (%)			Grade	Area of influence (sqm)	Volume (m ³)	Bulk density g/cc	Gross Resource (tonnes)	Net Resource (15% deduction) (tonnes)	Total Net Resource (tonnes)	Total grade wise net resource(tonnes) in each borehole	
				CaO	MgO	SiO ₂									
PBH-01	0	4	4	—	—	—	Waste	604776.1 254	241910 4.5	0	0	0	82924410. 64	Cement (P)	37716560.67 386
	4	13	9	46.213	2.0528 889	4.7315 556	Cement (P)	604776.1 254	544298 5.1	2.53	13770752. 38	11705139. 52		Cement (B)	13005710.57 719
	13	23	10	41.074	2.9296	7.7539	Cement (B)	604776.1 254	604776 1.3	2.53	15300835. 97	13005710. 58		SMS(OH)	28612563.26 983
	23	32	9	47.440 222	1.4943 333	2.2273 158	Cement (P)	604776.1 254	544298 5.1	2.53	13770752. 38	11705139. 52		Unclassified	3589576.119 31
	32	54	22	50.286 409	1.1557 727	2.8146 818	SMS (OH)	604776.1 254	133050 75	2.53	33661839. 14	28612563. 27			
	54	65	11	45.142 091	1.4778 182	6.57	Cement (P)	604776.1 254	665253 7.4	2.53	16830919. 57	14306281. 63			
	65	80	15	—	—	—	Waste	604776.1 254	907164 1.9	0	0	0			
	80	82.7 76	2.76	37.723 493	0.9548 986	13.543 507	Unclassified	604776.1 254	166918 2.1	2.53	4223030.7 29	3589576.1 19			
	82.7 6	100	17.24	—	—	—	Waste	604776.1 254	104263 40	0	0	0			
PBH-02	0	5	5	—	—	—	Waste	582791.3 913	291395 7	0	0	0	109813522 .8	Cement (P)	47625129.70 390
	5	13	8	38.44	2.9466 25	6.0782 5	Cement (B)	582791.3 913	466233 1.1	2.53	11795697. 76	10026343. 1		Cement (B)	28349485.10 269
	13	23	10	44.781 6	1.8989	4.5403	Cement (P)	582791.3 913	582791 3.9	2.53	14744622. 2	12532928. 87		SMS(OH)	33838907.94 751
	23	31.6 62	8.62	39.626 042	2.3534 524	7.5847 285	Cement (B)	582791.3 913	502366 1.8	2.53	12709864. 34	10803384. 69		Unclassified	0
	31.6 2	36	4.38	—	—	—	Waste	582791.3 913	255262 6.3	0	0	0			
	36	47	11	45.424 364	2.3476 364	5.9724 545	Cement (P)	582791.3 913	641070 5.3	2.53	16219084. 42	13786221. 76			
	47	53	6	41.526	3.3335	7.719	Cement (B)	582791.3 913	349674 8.3	2.53	8846773.3 2	7519757.3 22			
	53	64	11	45.121 182	2.1749 091	6.2195 455	Cement (P)	582791.3 913	641070 5.3	2.53	16219084. 42	13786221. 76			
	64	91	27	50.398 926	1.3561 111	3.1197 407	SMS (OH)	582791.3 913	157353 68	2.53	39810479. 94	33838907. 95			

	91	97	6	45.593 667	1.555	6.2958 333	Cement (P)	582791.3 913	349674 8.3	2.53	8846773.3 2	7519757.3 22			
	97	100	3	—	—	—	Waste	582791.3 913	174837 4.2	0	0	0			
PBH-03	0	15. 7	15.7	—	—	—	Waste	568885.6 675	893150 5	0	0	0	97332799. 24	Cement (P)	34254881.58 100
	15.7	26	10.3	38.433 136	2.3128 544	5.9461 165	Cement (B)	568885.6 675	585952 2.4	2.53	14824591. 61	12600902. 87		Cement (B)	32493201.95 683
	26	33	7	44.458 429	1.6612 857	4.2415 714	Cement (P)	568885.6 675	398219 9.7	2.53	10074965. 17	8563720.3 95		SMS(OH)	30584715.69 732
	33	42. 26	9.26	38.479 467	2.0347 343	7.1687 279	Cement (B)	568885.6 675	526788 1.3	2.53	13327739. 64	11328578. 69		Unclassified	0
	42.2 6	47	4.74	—	—	—	Waste	568885.6 675	269651 8.1	0	0	0			
	47	58	11	45.276 364	2.1146 364	5.5010 909	Cement (P)	568885.6 675	625774 2.3	2.53	15832088. 13	13457274. 91			
	58	65	7	40.873 571	3.0035 714	7.9198 571	Cement (B)	568885.6 675	398219 9.7	2.53	10074965. 17	8563720.3 95			
	65	75	10	45.517 1	1.8577	5.5466	Cement (P)	568885.6 675	568885 6.7	2.53	14392807. 39	12233886. 28			
	75	100	25	50.294 12	1.1774 8	2.8563 2	SMS(OH)	568885.6 675	142221 42	2.53	35982018. 47	30584715. 7			
PBH-04	0	15. 8	15.8	—	—	—	Waste	607449.7 622	959770 6.2	0	0	0	104766921 .2	Cement (P)	36576979.98 118
	15.8	25	9.2	38.633 803	2.3661 533	6.2222 957	Cement (B)	607449.7 622	558853 7.8	2.53	14139000. 66	12018150. 57		Cement (B)	35531923.41 029
	25	33	8	44.608	1.6317 5	4.4755	Cement (P)	607449.7 622	485959 8.1	2.53	12294783. 19	10450565. 71		SMS(OH)	32658017.84 034
	33	42	9	38.300 889	2.065	7.401	Cement (B)	607449.7 622	546704 7.9	2.53	13831631. 09	11756886. 42		Unclassified	0
	42	46	4	—	—	—	Waste	607449.7 622	242979 9	0	0	0			
	46	57	11	44.730 727	2.1306 364	6.0154 545	Cement (P)	607449.7 622	668194 7.4	2.53	16905326. 88	14369527. 85			
	57	66	9	41.507 444	2.9502 222	7.516	Cement (B)	607449.7 622	546704 7.9	2.53	13831631. 09	11756886. 42			
	66	75	9	46.946 111	1.5818 889	5.2183 333	Cement (P)	607449.7 622	546704 7.9	2.53	13831631. 09	11756886. 42			

	75	100	25	50.502 04	1.1876 8	2.9020 8	SMS (OH)	607449.7 622	151862 44	2.53	38421197. 46	32658017. 84					
PBH-05	0	16. 14	16.14	—	—	—	Waste	606339.0 36	978631 2	0	0	0	104132017 .3	Cement (P)	39117962.90 781		
	16.1 4	24	7.86	40.671 963	2.5523 397	5.4082 481	Cement (B)	606339.0 36	476582 4.8	2.53	12057536. 8	10248906. 28		Cement (B)	35023616.12 346		
	24	33	9	44.355 667	1.9238 889	5.0414 444	Cement (P)	606339.0 36	545705 1.3	2.53	13806339. 85	11735388. 87		SMS(OH)	29990438.22 932		
	33	42	9	39.772 667	2.2982 222	7.1897 778	Cement (B)	606339.0 36	545705 1.3	2.53	13806339. 85	11735388. 87		Unclassified	0		
	42	46	4	—	—	—	Waste	606339.0 36	242535 6.1	0	0	0					
	46	58	12	45.435 583	2.4371 917	5.8343 083	Cement (P)	606339.0 36	727606 8.4	2.53	18408453. 13	15647185. 16					
	58	68	10	41.850 6	3.2323 4	7.8074	Cement (B)	606339.0 36	606339 0.4	2.53	15340377. 61	13039320. 97					
	68	77	9	47.025 444	1.7408 333	5.3302 111	Cement (P)	606339.0 36	545705 1.3	2.53	13806339. 85	11735388. 87					
	77	100	23	50.819 522	1.2850 217	2.8948 391	SMS (OH)	606339.0 36	139457 98	2.53	35282868. 51	29990438. 23					
Total										587023142 .496		498969671 .122		498969671 .122		Total resource	
																Cement (P)	195291514.8 4775
																Cement (B)	144403937.1 7046
																SMS(OH)	155684642.9 8431
																Unclassified	3589576.119 31

Table 10.6: Showing the Total Net Resource (G4 as Category 334 of UNFC Classification) by using Polygonal Method

Borehole No	From	To	Thickness (m)	Wt. Average (%)			Grade	Area of influence (sqm)	Volume (m ³)	Bulk density g/cc	Gross Resource (tonnes)	Net Resource (15% deduction) (tonnes)	Total Net Resource (tonnes)	Total grade wise net resource (tonnes) in each borehole	
				CaO	MgO	SiO ₂									
PBH-01	0	4	4	–	–	–	Waste	428150	1712599.9	0	0	0	58706161.8	Cement (P)	26701359.66282
	4	13	9	46.213	2.0528889	4.7315556	Cement (P)	428150	3853349.9	2.53	9748975.13	8286628.861		Cement (B)	9207365.40097
	13	23	10	41.074	2.9296	7.7539	Cement (B)	428150	4281499.8	2.53	10832194.59	9207365.401		SMS(OH)	20256203.88214
	23	32	9	47.440222	1.4943333	2.2273158	Cement (P)	428150	3853349.9	2.53	9748975.13	8286628.861		Unclassified	2541232.85067
	32	54	22	50.286409	1.1557727	2.8146818	SMS (OH)	428150	9419299.6	2.53	23830828.1	20256203.88			
	54	65	11	45.142091	1.4778182	6.57	Cement (P)	428150	4709649.8	2.53	11915414.05	10128101.94			
	65	80	15	–	–	–	Waste	428150	6422249.8	0	0	0			
	80	82.76	2.76	37.723493	0.9548986	13.543507	Unclassified	428150	1181694	2.53	2989685.707	2541232.851			
	82.76	100	17.24	–	–	–	Waste	428150	7381305.7	0	0	0			
PBH-03	0	15.7	15.7	–	–	–	Waste	827424	12990557	0	0	0	141567098.2	Cement(P)	49822508.15512
	15.7	26	10.3	38.433136	2.3128544	5.9461165	Cement (B)	827424	8522467.1	2.53	21561841.76	18327565.5		Cement (B)	47260207.73571
	26	33	7	44.458429	1.6612857	4.2415714	Cement (P)	827424	5791967.9	2.53	14653678.87	12455627.04		SMS(OH)	44484382.28135
	33	42.26	9.26	38.479467	2.0347343	7.1687279	Cement (B)	827424	7661946.2	2.53	19384723.76	16477015.2		Unclassified	0
	42.26	47	4.74	–	–	–	Waste	827424	3921989.7	0	0	0			
	47	58	11	45.276364	2.1146364	5.5010909	Cement (P)	827424	9101663.9	2.53	23027209.65	19573128.2			
	58	65	7	40.873571	3.0035714	7.9198571	Cement (B)	827424	5791967.9	2.53	14653678.87	12455627.04			
	65	75	10	45.5171	1.8577	5.5466	Cement (P)	827424	8274239.9	2.53	20933826.96	17793752.91			

	75	100	25	50.294 12	1.1774 8	2.8563 2	SMS(OH)	82742 4	206856 00	2.53	52334567. 39	44484382. 28			
PBH-04	0	15. 8	15.8	—	—	—	Waste	15306 9.6	241849 9.6	0	0	0	26399928. 37	Cement (P)	9216932.598 87
	15.8	25	9.2	38.633 803	2.3661 533	6.2222 957	Cement (B)	15306 9.6	140824 0.3	2.53	3562847.8 95	3028420.7 11		Cement (B)	8953591.667 47
	25	33	8	44.608	1.6317 5	4.4755	Cement (P)	15306 9.6	122455 6.8	2.53	3098128.6 05	2633409.3 14		SMS(OH)	8229404.106 13
	33	42	9	38.300 889	2.065	7.401	Cement (B)	15306 9.6	137762 6.4	2.53	3485394.6 8	2962585.4 78		Unclassified	0
	42	46	4	—	—	—	Waste	15306 9.6	612278 .38	0	0	0			
	46	57	11	44.730 727	2.1306 364	6.0154 545	Cement (P)	15306 9.6	168376 5.5	2.53	4259926.8 31	3620937.8 07			
	57	66	9	41.507 444	2.9502 222	7.516	Cement (B)	15306 9.6	137762 6.4	2.53	3485394.6 8	2962585.4 78			
	66	75	9	46.946 111	1.5818 889	5.2183 333	Cement (P)	15306 9.6	137762 6.4	2.53	3485394.6 8	2962585.4 78			
	75	100	25	50.502 04	1.1876 8	2.9020 8	SMS(OH)	15306 9.6	382673 9.9	2.53	9681651.8 9	8229404.1 06			
PBH-05	0	16. 14	16.14	—	—	—	Waste	43154 8.4	696519 1.8	0	0	0	74113667. 29	Cement (P)	27841347.59 196
	16.1 4	24	7.86	40.671 963	2.5523 397	5.4082 481	Cement (B)	43154 8.4	339197 0.7	2.53	8581685.9 64	7294433.0 69		Cement (B)	24927286.54 400
	24	33	9	44.355 667	1.9238 889	5.0414 444	Cement (P)	43154 8.4	388393 6	2.53	9826357.9 74	8352404.2 78		SMS(OH)	21345033.15 383
	33	42	9	39.772 667	2.2982 222	7.1897 778	Cement (B)	43154 8.4	388393 6	2.53	9826357.9 74	8352404.2 78		Unclassified	0
	42	46	4	—	—	—	Waste	43154 8.4	172619 3.8	0	0	0			
	46	58	12	45.435 583	2.4371 917	5.8343 083	Cement (P)	43154 8.4	517858 1.3	2.53	13101810. 63	11136539. 04			
	58	68	10	41.850 6	3.2323 4	7.8074	Cement (B)	43154 8.4	431548 4.4	2.53	10918175. 53	9280449.1 97			
	68	77	9	47.025 444	1.7408 333	5.3302 111	Cement (P)	43154 8.4	388393 6	2.53	9826357.9 74	8352404.2 78			
	77	100	23	50.819 522	1.2850 217	2.8948 391	SMS (OH)	43154 8.4	992561 4.1	2.53	25111803. 71	21345033. 15			

Total	353866888 .978	300786855 .631	300786855 .631	Total resource	
				Cement (P)	113582148.0 0876
				Cement (B)	90348451.34 815
				SMS(OH)	94315023.42 346
				Unclassified	2541232.850 67

Table 10.7: Showing the Total Net Resource (G3+G4) of UNFC Classification by using Polygonal Method

Borehole No	From	To	Thickness (m)	Wt. Average (%)			Grade	Area of influence (sqm)	Volume (m³)	Bulk density g/cc	Gross Resource (tonnes)	Net Resource (15% deduction) (tonnes)	Total Net Resource (tonnes)	Total gradewise net resource (tonnes) in each borehole	
				CaO	MgO	SiO ₂									
PBH-01	0	4	4	—	—	—	Waste	1032926.109192	4131704.43677	0	0.00000	0.00000	141630572	Cement (P)	64417920.33669
	4	13	9	46.213	2.0528889	4.7315556	Cement (P)	1032926.109192	9296334.98273	2.53	23519727.50630	19991768.38035		Cement (B)	22213075.97817
	13	23	10	41.074	2.9296	7.7539	Cement (B)	1032926.109192	10329261.09192	2.53	26133030.56255	22213075.97817		SMS(OH)	48868767.15197
	23	32	9	47.440222	1.4943333	2.2273158	Cement (P)	1032926.109192	9296334.98273	2.53	23519727.50630	19991768.38035		Unclassified	6130808.96997
	32	54	22	50.286409	1.1557727	2.8146818	SMS (O H)	1032926.109192	22724374.40222	2.53	57492667.23761	48868767.15197			
	54	65	11	45.142091	1.4778182	6.57	Cement (P)	1032926.109192	11362187.20111	2.53	28746333.61881	24434383.57599			
	65	80	15	—	—	—	Waste	1032926.109192	15493891.63788	0	0.00000	0.00000			
	80	82.76	2.76	37.723493	0.9548986	13.543507	Unclassified	1032926.109192	2850876.06137	2.53	7212716.43526	6130808.96997			
	82.76	100	17.24	—	—	—	Waste	1032926.109192	17807646.12247	0	0.00000	0.00000			
PBH-02	0	5	5	—	—	—	Waste	582791.391279	2913956.95639	0	0.00000	0.00000	109813523	Cement (P)	47625129.70390
	5	13	8	38.44	2.946625	6.07825	Cement (B)	582791.391279	4662331.13023	2.53	11795697.75948	10026343.09556		Cement (B)	28349485.10269
	13	23	10	44.7816	1.8989	4.5403	Cement (P)	582791.391279	5827913.91279	2.53	14744622.19935	12532928.86945		SMS(OH)	33838907.94751
	23	31.62	8.62	39.626042	2.3534524	7.5847285	Cement (B)	582791.391279	5023661.79282	2.53	12709864.33584	10803384.68546		Unclassified	0
	31.62	36	4.38	—	—	—	Waste	582791.391279	2552626.29380	0	0.00000	0.00000			
	36	47	11	45.424364	2.3476364	5.9724545	Cement (P)	582791.391279	6410705.30407	2.53	16219084.41929	13786221.75639			
	47	53	6	41.526	3.3335	7.719	Cement (B)	582791.391279	3496748.34767	2.53	8846773.31961	7519757.32167			

	53	64	11	45.121 182	2.1749 091	6.2195 455	Cement (P)	582791.39 1279	6410705.3 0407	2.53	16219084.41 929	13786221.75 639			
	64	91	27	50.398 926	1.3561 111	3.1197 407	SMS (O H)	582791.39 1279	15735367. 56452	2.53	39810479.93 825	33838907.94 751			
	91	97	6	45.593 667	1.555	6.2958 333	Cement (P)	582791.39 1279	3496748.3 4767	2.53	8846773.319 61	7519757.321 67			
	97	100	3	—	—	—	Waste	582791.39 1279	1748374.1 7384	0	0.00000	0.00000			
PBH-03	0	15. 7	15.7	—	—	—	Waste	1396309.6 57822	21922061. 62781	0	0.00000	0.00000	238899 897	Cement (P)	84077389.7 3611
	15.7	26	10.3	38.433 136	2.3128 544	5.9461 165	Cement (B)	1396309.6 57822	14381989. 47557	2.53	36386433.37 319	30928468.36 721		Cement (B)	79753409.6 9254
	26	33	7	44.458 429	1.6612 857	4.2415 714	Cement (P)	1396309.6 57822	9774167.6 0476	2.53	24728644.04 003	21019347.43 403		SMS (OH)	75069097.9 7867
	33	42. 26	9.26	38.479 467	2.0347 343	7.1687 279	Cement (B)	1396309.6 57822	12929827. 43143	2.53	32712463.40 153	27805593.89 130		Unclassified	0
	42.2 6	47	4.74	—	—	—	Waste	1396309.6 57822	6618507.7 7808	0	0.00000	0.00000			
	47	58	11	45.276 364	2.1146 364	5.5010 909	Cement (P)	1396309.6 57822	15359406. 23605	2.53	38859297.77 719	33030403.11 061			
	58	65	7	40.873 571	3.0035 714	7.9198 571	Cement (B)	1396309.6 57822	9774167.6 0476	2.53	24728644.04 003	21019347.43 403			
	65	75	10	45.517 1	1.8577	5.5466	Cement (P)	1396309.6 57822	13963096. 57822	2.53	35326634.34 290	30027639.19 147			
	75	100	25	50.294 12	1.1774 8	2.8563 2	SMS (O H)	1396309.6 57822	34907741. 44556	2.53	88316585.85 726	75069097.97 867			
PBH-04	0	15. 8	15.8	—	—	—	Waste	760519.35 7293	12016205. 84523	0	0.00000	0.00000	131166 850	Cement (P)	45793912.5 8005
	15.8	25	9.2	38.633 803	2.3661 533	6.2222 957	Cement (B)	760519.35 7293	6996778.0 8710	2.53	17701848.56 036	15046571.27 630		Cement (B)	44485515.0 7776
	25	33	8	44.608	1.6317 5	4.4755	Cement (P)	760519.35 7293	6084154.8 5835	2.53	15392911.79 161	13083975.02 287		SMS (OH)	40887421.9 4647
	33	42	9	38.300 889	2.065	7.401	Cement (B)	760519.35 7293	6844674.2 1564	2.53	17317025.76 557	14719471.90 073		Unclassified	0
	42	46	4	—	—	—	Waste	760519.35 7293	3042077.4 2917	0	0.00000	0.00000			
	46	57	11	44.730 727	2.1306 364	6.0154 545	Cement (P)	760519.35 7293	8365712.9 3022	2.53	21165253.71 347	17990465.65 645			
	57	66	9	41.507 444	2.9502 222	7.516	Cement (B)	760519.35 7293	6844674.2 1564	2.53	17317025.76 557	14719471.90 073			

	66	75	9	46.946 111	1.5818 889	5.2183 333	Cement (P)	760519.35 7293	6844674.2 1564	2.53	17317025.76 557	14719471.90 073			
	75	100	25	50.502 04	1.1876 8	2.9020 8	SMS (OH)	760519.35 7293	19012983. 93233	2.53	48102849.34 879	40887421.94 647			
PBH-05	0	16. 14	16.14	—	—	—	Waste	1037887.4 75777	16751503. 85904	0	0.00000	0.00000	178245 685	Cement (P)	66959310.4 9976
	16.1 4	24	7.86	40.671 963	2.5523 397	5.4082 481	Cement (B)	1037887.4 75777	8157795.5 5961	2.53	20639222.76 581	17543339.35 094		Cement (B)	59950902.6 6745
	24	33	9	44.355 667	1.9238 889	5.0414 444	Cement (P)	1037887.4 75777	9340987.2 8199	2.53	23632697.82 345	20087793.14 993		SMS (OH)	51335471.3 8315
	33	42	9	39.772 667	2.2982 222	7.1897 778	Cement (B)	1037887.4 75777	9340987.2 8199	2.53	23632697.82 345	20087793.14 993		Unclassified	0
	42	46	4	—	—	—	Waste	1037887.4 75777	4151549.9 0311	0	0.00000	0.00000			
	46	58	12	45.435 583	2.4371 917	5.8343 083	Cement (P)	1037887.4 75777	12454649. 70933	2.53	31510263.76 459	26783724.19 990			
	58	68	10	41.850 6	3.2323 4	7.8074	Cement (B)	1037887.4 75777	10378874. 75777	2.53	26258553.13 716	22319770.16 659			
	68	77	9	47.025 444	1.7408 333	5.3302 111	Cement (P)	1037887.4 75777	9340987.2 8199	2.53	23632697.82 345	20087793.14 993			
	77	100	23	50.819 522	1.2850 217	2.8948 391	SMS (O H)	1037887.4 75777	23871411. 94287	2.53	60394672.21 547	51335471.38 315			
Total										940890031.4 73971	799756526.7 52875	799756 527	Total resource		
													Cement (P)	308873662. 85651	
													Cement (B)	234752388. 51862	
													SMS(OH)	249999666. 40777	
													Unclassified	6130808.96 997	

10.10 RESOURCE ESTIMATION BY BLOCK MODEL FOR VALIDATION

In order to validate the resource estimation carried out using the Polygonal Method, an alternative estimation was conducted using a three-dimensional Block Model. The validated resource corresponds to the total block area, encompassing G3+G4 categories, under 334 of UNFC classification. A total net resource of 861.80 million tonnes (G3 + G4) was estimated using the Block Model (**Table 10.8**), in comparison to 799.76 million tonnes (G3 + G4) estimated through the Polygonal Method (**Table 10.7**). The block model resource estimation yielded a total resource within approximately 5% of the estimate derived from the Polygonal Method.

Due to the minor difference in estimated tonnage between the two methods, the resource figure derived from the Polygonal Method, reflecting a comparatively lower tonnage has been retained for reporting.

A threshold grade of 34% CaO was adopted as the cutoff to distinguish between ore and waste:

- **Borehole intercepts with CaO > 34%** were classified as **ore**.
- **Borehole intercepts with CaO < 34%** were considered as **waste**.

Using the block model, the total resources were calculated on a depth-wise and grade-wise basis. The block model allowed the estimation of:

- **Total volume and tonnage of ore**
- **Average grade (CaO%) per block**
- **Spatial distribution of grade**

The output provided a comprehensive picture of the resource distribution across the block, supporting further mine planning and economic evaluation. The grade-tonnage relationship, as well as sectional and 3D visualizations, were generated and represented in the accompanying below figures (**Fig.10.2-Fig.10.4**).

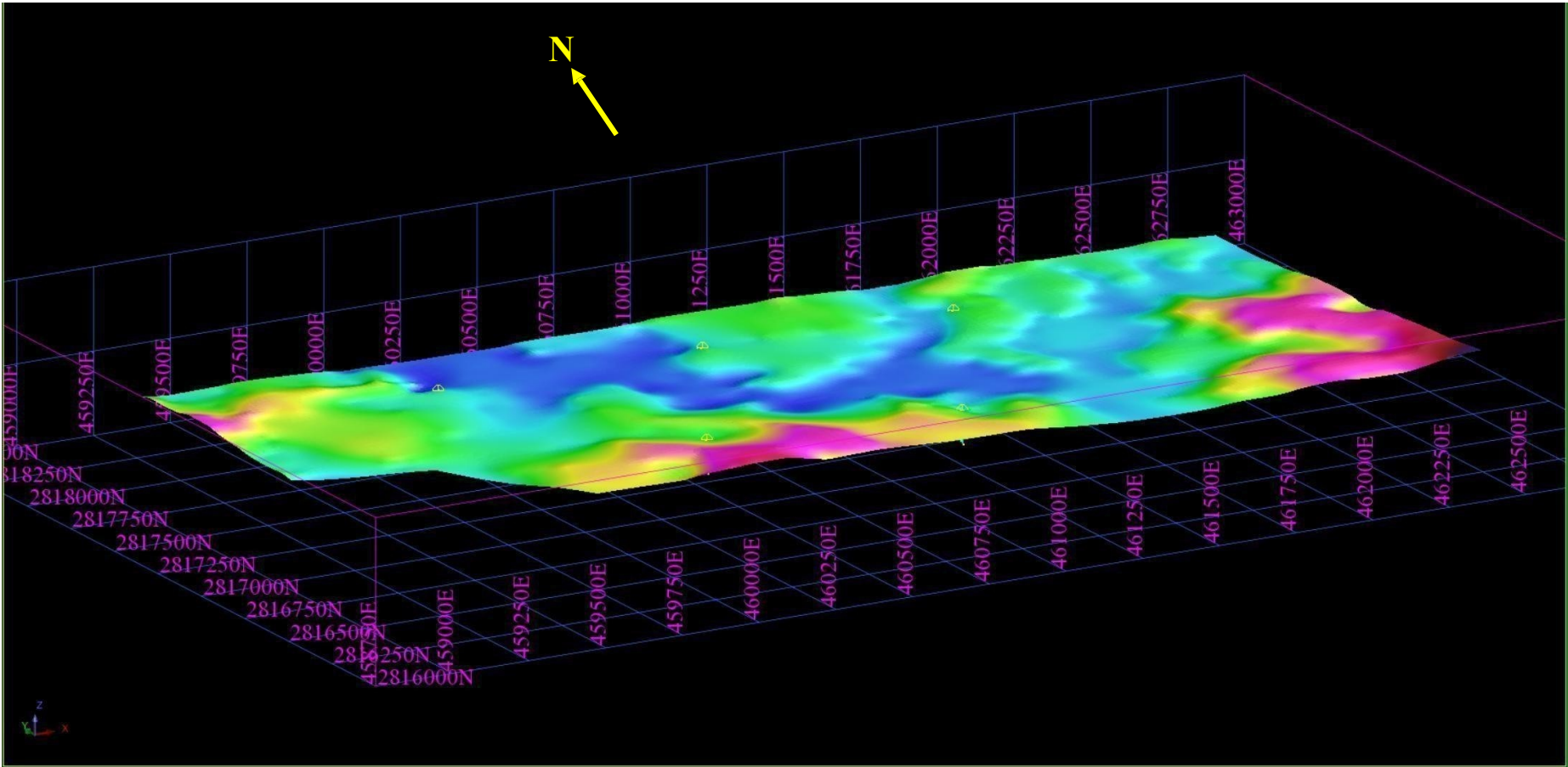


Fig 10.2 Showing 3D Topography of the area

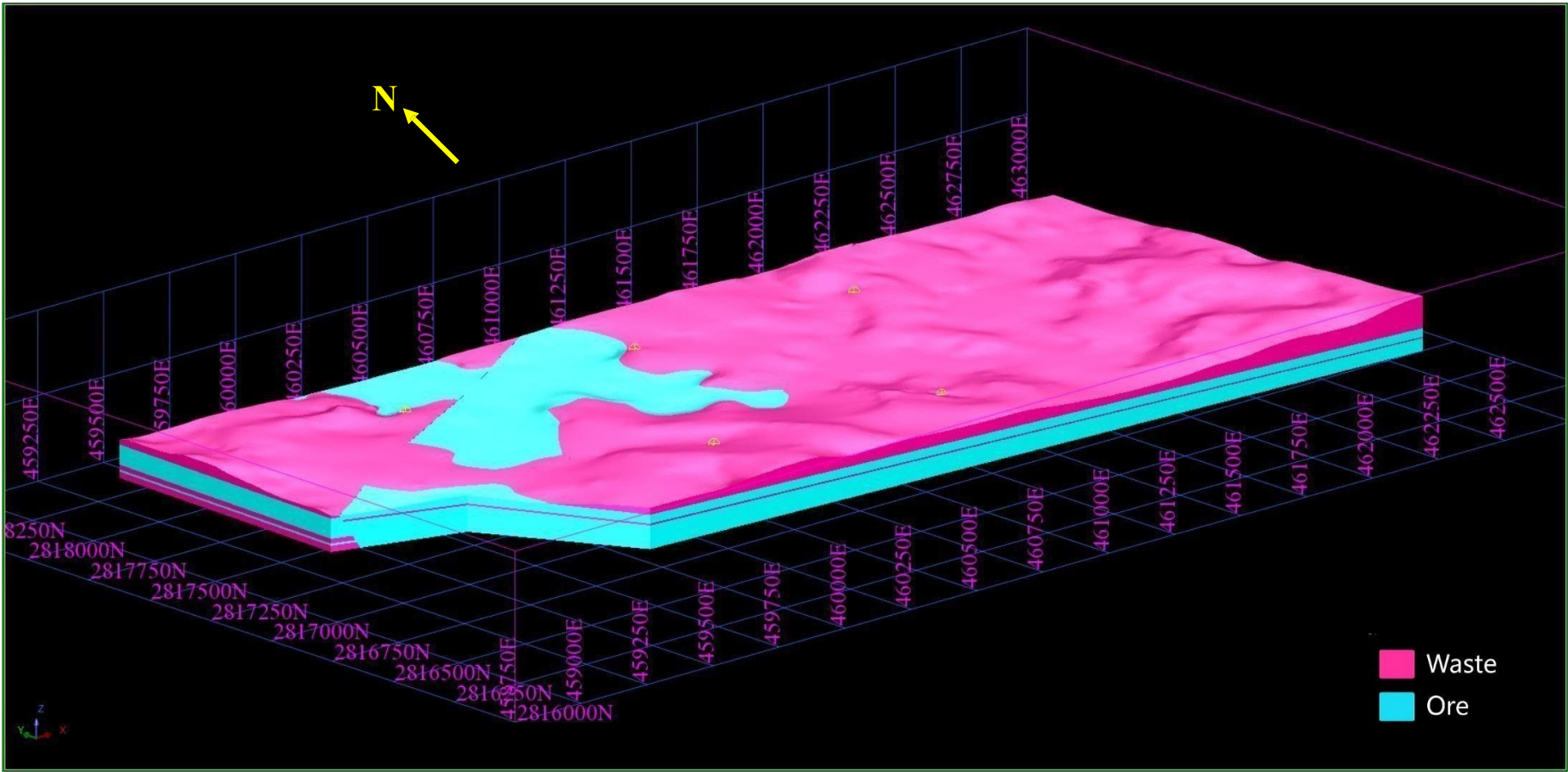


Fig 10.3 3D Solid model showing ore and waste material within the Block

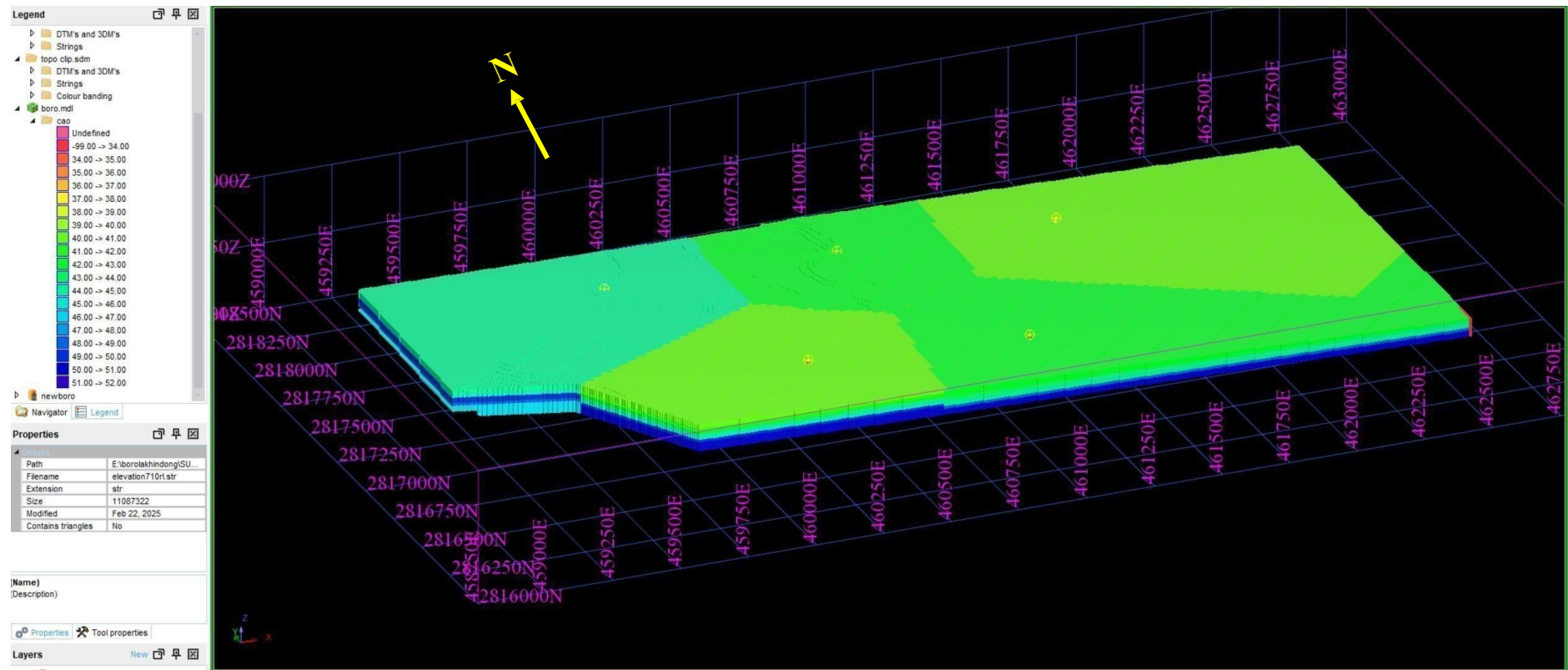


Fig 10.4 3D Solid model Showing distribution of Cao %

Table 10.8: Showing the Gross Total Resource of the block by using Solid Model

CaO (%)	CaO (%)	RL (from)	RL (to)	Volume	Tonnes	CaO (%)	MgO (%)	SiO ₂ (%)
40	42	690	700	24000	60720	41.57	2.14	6.32
		700	710	18089562.5	45766593.13	40.93	1.98	5.74
		710	720	19865062.5	50258608.13	41.13	2.06	5.44
		720	730	6245500	15801115	40.88	1.97	5.42
		730	740	583375	1475938.75	40.91	1.97	5.46
42	44	640	650	7375	18658.75	43.06	1.17	8.72
		650	660	1000	2530	43.92	1.23	7.94
		670	680	8000	20240	43.92	2.38	6.08
		680	690	19194562.5	48562243.13	43.05	2.41	6.42
		690	700	31715375	80239898.75	42.41	2.21	6.18
		700	710	12151375	30742978.75	42.53	2.22	5.69
		710	720	3897500	9860675	42.39	2.18	5.41
		720	730	4189625	10599751.25	42.17	2.24	5.24
		730	740	148937.5	376811.875	42.16	2.25	5.23
44	46	640	650	34562.5	87443.125	45.63	1.27	6.48
		650	660	14000	35420	45.45	1.27	6.63
		660	670	24160250	61125432.5	45.34	2.17	5.72
		670	680	29499375	74633418.75	44.5	2.39	5.99
		680	690	13440750	34005097.5	44.26	2.47	6.11
		700	710	8953187.5	22651564.38	45.64	1.95	5.47
		710	720	9662437.5	24445966.88	44.01	2.37	6.08
		720	730	6597750	16692307.5	44.01	2.37	6.08
		730	740	1494937.5	3782191.875	44.01	2.37	6.08
		740	750	22812.5	57715.625	44.01	2.37	6.08
46	48	620	630	793125	2006606.25	46.43	1.28	5.82
		630	640	3210937.5	8123671.875	46.44	1.28	5.81
		640	650	5011312.5	12678620.63	46.44	1.28	5.81
		650	660	5068687.5	12823779.38	46.44	1.28	5.8
		660	670	5117187.5	12946484.38	46.45	1.28	5.8
		670	680	5904750	14939017.5	46.58	2.06	5.27
48	50	620	630	1285437.5	3252156.875	49.09	1.43	3.99
		630	640	5367187.5	13578984.38	49.09	1.43	4
		640	650	5634750	14255917.5	49.09	1.43	4
		650	660	24308750	61501137.5	49.26	1.38	3.57
		660	670	7581500	19181195	49.01	1.39	3.86
		670	680	10295000	26046350	48.12	1.31	4.38
		680	690	10311000	26086830	49.84	1.2	3.16
		690	700	10311000	26086830	49.62	1.22	3.27
50	52	620	630	7951562.5	20117453.13	50.41	1.21	2.95
		630	640	31846250	80571012.5	50.41	1.21	2.95
		640	650	31878250	80651972.5	50.4	1.21	2.93
		650	660	13221687.5	33450869.38	50.53	1.25	2.98
		660	670	5646500	14285645	50.35	1.35	3.1

CaO (%)	CaO (%)	RL (from)	RL (to)	Volume	Tonnes	CaO (%)	MgO (%)	SiO ₂ (%)
Grand Total (Gross)				400746187.5	1013887854	46.15	1.79	4.8

10.11 CATEGORY OF RESOURCES AS PER UNFC CLASSIFICATION

Investigation stage of the exploration in Northwest of Boro Lakhindong block was of G-3 stage, so it is categorized under 333 class of UNFC classification. The categorization of resources in UNFC code is given in **Table 10.9** for polygonal method.

Table 10.9 UNFC compliance required for resource estimation			
Sr No	Toposheet No	Geological interpretation	The Upper Sylhet Limestone is overlain by intercalation of shale and sandstone of Kopili Formation. It is thickly bedded and horizontal or sub horizontal in nature. Besides the valley region limestone is covered by soil. It can be categorized as type-I of UNFC classification that is Stratiform, Strata bound and tabular deposits of Regular Habit.
1	83C11	Statement of tonnage & grade	Cement (Blendable/Beneficiable): 144.40 million tonnes Cement (Portland): 195.29 million tonnes SMS(OH): 155.68 million tonnes Unclassified/others: 3.58 million tonnes
2	83C11	Geometry of Mineralisation assumed	Horizontal to Sub-horizontal bedded
3	83C11	Method adopted to arrive estimation	Polygonal method
4	83C11	Estimation	498.97 million tonnes (after 15% deduction)

CHAPTER 11

CONCLUSION AND RECOMMENDATION

11.1 CONCLUSION:

Preliminary exploration (G3 Stage) for limestone in the northwest part of the Boro Lakhindong block was undertaken during the financial year 2024–25. The primary objective of this exploration was to assess the potential of different grades of limestone within the area. The planned quantum of work for FY 2024–25 was successfully achieved and included detailed geological mapping on a 1:4000 scale, collection of 50 bedrock samples, and five core and bedrock samples for petrological studies. Additionally, a total of 500 meters of vertical drilling was carried out through five boreholes.

The target mineralized horizon for limestone exploration is the Upper Sylhet Limestone of the Shella Formation, which is part of the Jaintia Group. The area also features intercalations of sandstone and shale belonging to the Kopili Formation. The contact between the Kopili Formation and the underlying Upper Sylhet Member of the Shella Formation was established at approximately 727 m RL in the northwestern part and around 721 m RL in the northeastern, central, and remaining parts of the block.

The Upper Sylhet Limestone encountered during drilling is light to medium grey in color, compact, and highly fossiliferous. Notable fossils include Nummulites sp., Discocyclus sp., Alveolina sp., and Assilina sp. Stylolites and thin intercalations of shale and mud are common features. The upper part of the limestone near the contact with the Kopili Formation is ferruginous. Structurally, the limestone unit trends N20°E and dips gently (less than 4°) towards the southeast. Based on borehole data, a subsurface normal fault was interpreted in the northwestern part of the block, located between boreholes PBH-01 and PBH-02. Lithological characteristics and fossil assemblages suggest deposition in a stable, shallow marine environment.

The Upper Sylhet Limestone conformably overlies the Upper Sylhet Sandstone, which is a coal-bearing, grey-colored, medium- to coarse-grained sandstone unit intersected in borehole PBH-

01. All boreholes were drilled vertically at a space of 800 m, covering a total area of 4.82 sq. km.

The Upper Sylhet Limestone was intersected at shallow depths, with thickness ranging from 4.00 m to 100.00 m, and an average thickness of 85.32 m. Overburden thickness ranges from 0.00 m to 16.14 m, with an average of 3.22 m. Core recovery within the mineralized zone was excellent, averaging 97.36%.

Chemical analysis of 451 limestone core samples revealed CaO content ranging from 34.14% to 52.93%, MgO from 0.67% to 4.58%, SiO₂ from 1.49% to 15.83%, Al₂O₃ from 0.93% to 6.44%, and Fe₂O₃ from 0.75% to 19.78%.

Based on the exploration results, a total of 498.96 million tonnes of limestone resource has been estimated and classified under Category 333 (G3 Stage) of the UNFC classification. The grade-wise distribution of this resource is as follows:

Cement (Portland): 195.29 million tonnes

Cement (Blendable/Beneficiable): 144.40 million tonnes

SMS (OH): 155.68 million tonnes

Unclassified/Others: 3.58 million tonnes

11.2 RECOMMENDATION:

In the G3 stage of investigation in the Northwest of Boro Lakhindong Block, total net resource of all grade limestone calculated from all the 05 boreholes of the block as per **UNFC classification** class 333 is estimated to be 498.97 million tonnes with 144.40million tonnes under Cement (Blendable/Beneficiable), 195.29 million tonnes under Cement (Portland), 155.68 million tonnes of SMS (OH) grade and 3.58 million tonnes under unclassified or others category.

The area may be explored for G-2 stage with further closed spacing considering the continuity and considerable resource of limestone in the block.

The overburden ratio is acceptable; hence large-scale open cast mining can be undertaken using modern technology after G-2 stage of investigation.

CHAPTER 12

LOCALITY INDEX

LOCALITY INDEX												
Sr No	Toposheet No	Locality	Latitude	D	M	S	Lat	Longitude	D1	M1	S1	Long
1	83C11	Boro Lakhindong	25°27'37.17"	25	27	37.17	25.46033	92°37'55.5"	92	37	55.5	92.63208
2	83C11	Lanka	25°55'28.56"	25	55	28.56	25.9246	92°56'51.36"	92	56	51.36	92.9476
3	83C11	Lobang	25°26'37.20"	25	26	37.2	25.44367	92°41'38.36"	92	41	38.36	92.69399
4	83C11	Nepali Kunti	25°26'28.12"	25	26	28.12	25.44114	92°37'19.04"	92	37	19.04	92.62196
5	83C11	Tharbe Langso	25°27'20.32"	25	27	20.32	25.45564	92°37'56.73"	92	37	56.73	92.63243
6	83C11	Umrangso	25°30'37.06"	25	30	37.06	25.51029	92°45'42.40"	92	45	42.4	92.76178

REFERENCES

- Alam, M., Alam, M.M., Curray, J.R., Chowdhury, M.L.R. & Gani, M.R. (2003). An overview of the sedimentary geology of the Bengal Basin in relation to the regional tectonic framework and basin-fill history. *Sedimentary Geology*, 155(3–4), 179–208.
- Bhandari, L.L., Fuloria, R.C. and Sastri, V.V., 1973. Stratigraphy of Assam Valley, India. *AAPG Bulletin*, 57(4), pp.642-654.
- Biswal, S., Lokho, K., Shukla, U.K., Whiso, K. and Prakash, K., 2021. Eocene larger foraminiferal biostratigraphy, depositional history and paleogeography of the Sylhet Limestone of the Mikir Hills of Assam, NE India. *Micropaleontology*, 67(5), pp.427-446.
- Biswal, S., Lokho, K., Needham, A., Bhandari, A., Shukla, U.K., Whiso, K. & Prakash, K. (2022). Record of additional Middle Eocene vertebrate remains from the Mikir Hills, NE India: Implications on paleoenvironment and paleobiogeography. *International Journal of Geosciences*, 13(8), 609–626.
- Boruah, M. & Pandey, N. (2023). Petro-geochemical signatures as evidences for tectonic setting, palaeoweathering and provenance of Eocene Kopili sandstones, Meghalaya, Northeast India. *Journal of the Geological Society of India*, 99(7), 929–940.
- Chawade, M.P., Roy, A., Gangopadhyay, K.K., Katti, S. & Mitra, M.M. (1990). Systematic geological mapping in parts of Jaintia Hills district, Meghalaya, in collaboration with PGRS Division. Unpublished GSI Progress Report, F.S. 1989–90.
- Deb Adhikari (1969–70). Technical Data on the Various Limestone Deposits of Meghalaya. Unpublished Report, GSI.
- Devi, N.R., Singh, Y.R., Abbott, M.B. & Devi, A.B. (2021). Palynology, palynofacies and organic geochemistry analysis of the late Eocene shale from Meghalaya, Northeast India. *Journal of Earth System Science*, 130, 1–16.
- Duara, B.K. & Barman, G. (1967). Systematic mapping and mineral investigation in the southeastern part of Jaintia Hills, Assam. Unpublished GSI Progress Report, F.S. 1966–67

- Evans, P. (1932). Tertiary succession in Assam. Transactions of the Mining, Geological and Metallurgical Institute of India, 27(3).
- GSI (2009). Miscellaneous Publication No. 30, Part IV, Vol. 2(ii): Geology and Mineral Resources of Meghalaya.
- GSI (2019). Miscellaneous Publication No. 30, Part IV, Vol. 2(i): Geology and Mineral Resources of Assam.
- GSI (2019–20). General exploration for limestone in North Boro Hundong Block, Dima Hasao District, Assam. Unpublished Report, GSI.
- GSI (2019–20). General exploration for limestone in South Boro Hundong Block, Dima Hasao District, Assam. Unpublished Report, GSI.
- Jauhri, A.K. & Agarwal, K.K. (2001). Early Palaeogene in the South Shillong Plateau, NE India: Local biostratigraphic signals of global tectonic and oceanic changes. Palaeogeography, Palaeoclimatology, Palaeoecology, 168(1–2), 187–203.
- Kakati, R. & Kalita, J. (1974). Detailed investigation of cement grade limestone near Garampani, N.C. Hills. Directorate of Geology and Mining, Govt. of Assam, F.S. 1973–74.
- Kakati, R., Kalita, J. & Barkakati, N. (1982). Geological investigation of cement grade limestone near Umrangshu (16th KM post), N.C. Hills. Directorate of Geology and Mining, Govt. of Assam, F.S. 1981–82.
- Kakati, R., Kalita, J. & Gogoi, R.G. (1982). Investigation of cement grade limestone near New Umrangshu, N.C. Hills. Directorate of Geology and Mining, Govt. of Assam, F.S. 1980–82.
- Medicott, B.B. (1869). Geological sketch of the Shillong Plateau. Memoirs of the Geological Survey of India, 7(1).
- Moni Mout, J. & Sarmah, R.K. (2024). Diagenesis, provenance, tectonic setting and palaeoclimate of the Eocene Kopili Sandstone, Assam, India: A petrographic study. Journal of

the Geological Society of India, 100(4), 495–502.

- Murthy, M.V.N., Chakravorty, C. & Talukdar, S.C. (1976). Stratigraphic revision of the Cretaceous–Tertiary sediments on the Shillong Plateau. Records of the Geological Survey of India, 107(2).
- Najman, Y., Bickle, M., BouDagher-Fadel, M., Carter, A., Garzanti, E., Paul, M., Wijbrans, J., Willett, E., Oliver, G., Parrish, R. & Akhter, S.H. (2008). The Paleogene record of Himalayan erosion: Bengal Basin, Bangladesh. Earth and Planetary Science Letters, 273(1–2), 1–14.
- Oldham, T. (1859). On the geological structure of a portion of the Khasi Hills, Bengal. Memoirs of the Geological Survey of India, 1(2).
- Sarkar, S. (2020). Ecostratigraphic implications of a Late Palaeocene shallow-marine benthic community from the Jaintia Hills, Meghalaya, NE India. Journal of Earth System Science, 129(1), 10.
- Sarmah, R.K. & Borgohain, R. (2012). Lithostratigraphy of the Paleogene shelf sediments in Assam and Meghalaya—A review. Indian Streams Research Journal, 12, 1–4.
- Singh, Y.R., Singh, S.P., Devi, K.B., Singh, W.A. & Singh, N.S. (2024). Middle Eocene molluscan fossils from the Siju Formation of the Garo Hills, Meghalaya, India. Journal of the Palaeontological Society of India, 69(1), 37–50.
- Sumar (2018). Preliminary exploration for limestone in East of Laphet area, Litang Valley, East Jaintia Hills District, Meghalaya (G-3 Stage). Unpublished GSI Report, F.S. 2017–18.
- Thiruvengadam, A., Rath, S.C., David, J.S. & Bhattacharya, C. (1996). Regional investigation for limestone in and around Litang River Valley, Jaintia Hills District, Meghalaya (E-I stage). Unpublished GSI Progress Report, F.S. 1989–1993.
- Trivedi, G.K. & Ranhotra, P.S. (2015). Palynofloral evidence for palaeoecology and depositional environment of the Kopili Formation (Late Eocene), Jaintia Hills, Meghalaya. Journal of the Geological Society of India, 86, 33–40.

- Wilson, G.F. & Metre, W.B. (1953). Assam and Arakan. In: Illing, V.C. (Ed.), The World's Oil Fields: The Eastern Hemisphere. Oxford University Press, Oxford, pp. 119–123.

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
1	83C11	PBH-01	0	4	4	27	Silty clay residual soil, brownish grey in colour, present as sludge
2	83C11	PBH-01	4	12	8	99	Grey to dark grey, fine to medium grained hard fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp., Assilina sp. Stylolites are prominent. Vertical fractures and mud partings are present.
3	83C11	PBH-01	12	33	21	98.29	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of fossils Assilina sp., Alveolina sp., and Discocyclina sp., Asterocyclina sp.
4	83C11	PBH-01	33	66	33	99	Grey, fine to medium grained hard fossiliferous limestone with fossils of mainly Nummulite sp., Assilina sp., Discocyclina sp. Vertical fractures present at several depths.

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
5	83C11	PBH-01	66	82.7 6	16.76	99.33	Grey to dark grey, fine to medium grained hard & compact fossiliferous limestone with presence of Discocyclus sp., Nummulite sp., and Assilina sp., mixed up with unfossiliferous and calcareous shale. Secondary infilling of calcite is observed.
6	83C11	PBH-01	82.76	84	1.24	93.33	Medium to coarse grained sandstone, greyish in colour, Carb. Streak present.
7	83C11	PBH-01	84	85.2 5	1.25	97.67	Fine grained sandstone mixed up with grey unfossiliferous shale.
8	83C11	PBH-01	85.25	85.7 8	0.53	100	Grey fossiliferous limestone containing fossil of Nummulite sp. In minor quantity.
9	83C11	PBH-01	85.78	89.7 5	3.97	97.5	Grey to dark grey shale, mixed with SSFG at middle
10	83C11	PBH-01	89.75	90.5 3	0.78	98.71	Medium grained sandstone, reddish grey-grey

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
							in colour, slightly ferruginous
11	83C11	PBH-01	90.53	92.86	2.33	98.71	Grey shale mixed up with fine to medium grained, greyish sandstone.
12	83C11	PBH-01	92.86	95.16	2.3	97.39	Fine to medium grained sandstone, reddish grey in colour
13	83C11	PBH-01	95.16	97.5	2.34	95.72	Greyish shale mixed with fine grained sandstone.
14	83C11	PBH-01	97.5	100	2.5	99.2	Medium to coarse grained sandstone, greyish in colour, shale and coal patches are observed.
15	83C11	PBH-02	0	2	2	40	Silty clay residual soil, brownish in colour, loose and broken
16	83C11	PBH-02	2	4.4	2.4	65	Grey calcareous shale mixed up with fossiliferous limestone
17	83C11	PBH-02	4.4	18	13.6	88.2	Grey to dark grey, medium grained, hard & compact limestone with dominant fossils of Nummulite sp., Discocyclina sp., along with minor abundance

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
							of Alveolina sp. fossils. Mud parting present at places.
18	83C11	PBH-02	18	31.6 2	13.62	96.73	Grey to dark grey, fine to mediumgrained, hard & compact, fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp. Stylolites are observed at places.
19	83C11	PBH-02	31.62	34.7	3.08	90.58	Dark grey, unfossiliferous, calcareous shale. Loose at bottom parts.
20	83C11	PBH-02	34.7	54	19.3	96.48	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with high abundance of Nummulite sp., Discocyclina sp., Asterocyclina sp. fossils.
21	83C11	PBH-02	54	96	42	98.74	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulites sp., Assilina sp., Asterocyclina sp.

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
							and Discocyclina sp. fossils. Stylolites & fractures are prominent.
22	83C11	PBH-02	96	100	4	97.17	Grey-dark grey, fine-medium grained, hard & compact fossiliferous limestone mixed with unfossiliferous greyish shale at top. Fossils present in fossiliferous limestone are Alveolina sp. and Discocyclina sp.
23	83C11	PBH-03	0	5.5	5.5	45.56	Silty clay residual soil, brownish-greyish in colour
24	83C11	PBH-03	5.5	15.7 8	10.28	90.33	Unfossiliferous shale, grey-dark grey in colour, calcareous
25	83C11	PBH-03	15.78	42.2 6	26.48	95.93	Grey, medium grained, compact fossiliferous limestone with abundance of Nummulite sp., along with minor Assilina sp. And Alveolina sp., fractures present. Cavityfilling of calcite is observed.

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
26	83C11	PBH-03	42.26	45.5	3.24	95.37	Dark grey, unfossiliferous, calcareous shale
27	83C11	PBH-03	45.5	100	54.5	97.44	Grey, fine-medium grained, hard & compact, fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp., Asterocyclina sp., and less abundance of Assilina sp. Stylolites & fractures are prominent at parts.
28	83C11	PBH-04	0	3	3	30	Silty clay residual soil, brownishyellow-greyish in colour
29	83C11	PBH-04	3	15.8	12.8	93.67	Calcareousshale, unfossiliferous mixed up with fossiliferous limestone. Greyish to brownish in colour. Fractures present.
30	83C11	PBH-04	15.8	24	8.2	96.11	Greyish-Reddish white, fine to medium grained, hard & compact fossiliferous limestone along with major fossils Nummulite sp., Assilina sp.

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
							Slightly ferruginous.
31	83C11	PBH-04	24	42	18	97.22	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Asterocyclina sp., Discocyclina sp., Nummulite sp., Assilina sp. Mixed up with shale. Stylolites & fractures are present.
32	83C11	PBH-04	42	45	3	94	Grey to dark grey, calcareous shale, unfossiliferous
33	83C11	PBH-04	45	100	55	98.25	Grey, fine to medium grained, hard & compact fossiliferous limestone with major fossils of Nummulite sp., Asterocyclina sp., Discocyclina sp., Assilina sp. mainly. Shale partings & stylolites are present at places.
34	83C11	PBH-05	0	3	3	44	Silty clay residual soil, brownish-dark grey in colour

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
35	83C11	PBH-05	3	16.14	13.14	95.8	Grey fossiliferous limestone with abundance of Asterocyclina sp., Discocyclina sp. fossils mixed up with grey Calcareous shale. Fractured and broken.
36	83C11	PBH-05	16.14	42	25.86	99.29	Whitish Grey-Grey, fine to mediumgrained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp. fossils. Vertical fractures are observed. Secondary growth of calcite is seen within fractures. Mud partings present.
37	83C11	PBH-05	42	45	3	98.33	Dark grey shale, unfossiliferous and calcareous
38	83C11	PBH-05	45	87	42	99.67	Whitish grey-grey, fine to mediumgrained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp., Alveolina sp. Fractures and

ANNEXURE-I: SUMMARIZED LITHOLOGS OF BOREHOLES DRILLED IN NORTHWEST OF BORO LAKHINDONG							
Sr No	Toposheet no	Borehole No	Depth (m)		Thickness (m)	Recovery (%)	Description of lithology
			From	To			
							stylolites are present.
39	83C11	PBH-05	87	100	13	99.4	Whitish grey- grey, fine to medium grained, hard & compact fossiliferous limestone with low abundance of fossil content.

ANNEXURE-I (B): Co-ordinate and RL of drilled boreholes in Northwest of Boro Lakhindong Block

Toposheet No	Borehole No	Latitude	D	M	S	Lat	Longitude	D1	M1	S1	Long	RL of the Collar
83C11	PBH-01	25°28'34.72"N	25	28	34.72	25.48	92°36'6.56"E	92	36	6.56	92.60	731.00m
83C11	PBH-02	25°28'33.56"N	25	28	33.56	25.48	92°36'35.44"E	92	36	35.44	92.61	736.00m
83C11	PBH-03	25°28'32.41"N	25	28	32.41	25.48	92°37'4.06"E	92	37	4.06	92.62	736.00m
83C11	PBH-04	25°28'7.79"N	25	28	7.79	25.47	92°36'19.95"E	92	36	19.95	92.6	741.00m
83C11	PBH-05	25°28'05.2"N	25	28	5.2	25.47	92°36'48.3"E	92	36	48.3	92.61	732.00m

ANNEXURE II									
LITHOLOGS OF BOREHOLES DRILLED IN NW OF BORO LAKHINDONG BLOCK, DIMA HASAO DISTRICT, ASSAM									
BH No.- PBH01							Date of Commencement: 09/12/2024		
Latitude - N 25°28'34.7"							Date of Closing: 11/12/2024		
Longitude - E 92°36'06.6"							Final Depth: 100m		
Azimuth- Vertical							R.L.: 731m		
Depth(m)		Run	DEPTH & THICKNESS AFTER ADJUSTMENT (m)		Recovery(m)	Recovery (%)	RQD%	Rock type	Description of Lithology
			From	Thickness					
From(m)	To(m)								
0.00	0.50	0.50	0.00	0.50	0.15	30.00		Regolith	Regolith, yellowish brown in colour
0.50	1.00	0.50	0.50	0.50	0.18	36.00		Regolith	Regolith, yellowish brown in colour
1.00	2.00	1.00	1.00	1.00	0.25	25.00		Regolith	Regolith, yellowish brown in colour
2.00	3.00	1.00	2.00	1.00	0.20	20.00		Regolith	Regolith, yellowish brown in colour
3.00	4.00	1.00	3.00	1.00	0.24	24.00		Residual soil	Silty clay residual soil, brownish grey in colour, present as sludge

4.00	6.00	2.00	4.00	2.00	1.96	98.00	87.50	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp., and minor abundance of Discocyclina sp. Clay is present at top.
6.00	9.00	3.00	6.00	3.00	2.99	99.67	88.00	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of fossils Nummulite sp., Assilina sp., and Alveolina sp. Stylolite is present at depth of 8.12m.
9.00	12.00	3.00	9.00	3.00	2.98	99.33	86.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp., Assilina sp. Stylolites are prominent. Vertical fractures and mud partings are present.

12.00	15.00	3.00	12.00	3.00	2.97	99.00	90.00	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of fossils Asterocyclina sp., Assilina sp., and Discocyclina sp.
15.00	18.00	3.00	15.00	3.00	2.92	97.33	88.66	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of fossils Asterocyclina sp., Assilina sp., and Discocyclina sp.
18.00	21.00	3.00	18.00	3.00	2.95	98.33	91.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of mainly Discocyclina sp., Asterocyclina sp., Assilina sp., along with minor amount of Nummulite sp. fossils.

21.00	24.00	3.00	21.00	3.00	2.95	98.33	86.66	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with major fossils of Discocyclina sp., Asterocyclina sp., Alveolina sp. Shale parting present at top and middle.
24.00	27.00	3.00	24.00	3.00	2.93	97.67	90.66	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of fossils Nummulite sp., Assilina sp., and Discocyclina sp.
27.00	30.00	3.00	27.00	3.00	2.95	98.33	93.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of fossils Nummulite sp., Alveolina sp., and Discocyclina sp.

30.00	33.00	3.00	30.00	3.00	2.97	99.00	96.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of fossils Assilina sp., Alveolina sp., and Discocyclus sp.
33.00	36.00	3.00	33.00	3.00	2.93	97.67	79.00	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp. fossils. Fractures present at 34.05m depth.
36.00	39.00	3.00	36.00	3.00	2.95	98.33	86.33	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing less amount of fossils Nummulite sp., Alveolina sp. Vertical fractures present at top and middle.

39.00	42.00	3.00	39.00	3.00	2.96	98.67	90.66	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard fossiliferous limestone with abundance of mainly Nummulite sp., Discocyclina sp.
42.00	45.00	3.00	42.00	3.00	2.99	99.67	97.00	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of fossils Nummulite sp., Assilina sp., and Discocyclina sp.
45.00	48.00	3.00	45.00	3.00	2.95	98.33	97.00	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of fossils Nummulite sp., and Discocyclina sp. Stylolites are prominent at places.
48.00	51.00	3.00	48.00	3.00	2.97	99.00	96.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard fossiliferous limestone with abundance of mainly Nummulite sp.,

									Discocyclina sp., Alveolina sp.
51.00	54.00	3.00	51.00	3.00	2.98	99.33	90.66	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard fossiliferous limestone with high abundance of mainly Nummulite sp., Assilina sp., Discocyclina sp.
54.00	57.00	3.00	54.00	3.00	2.97	99.00	93.67	Fossiliferous Limestone	Grey, fine to medium grained hard fossiliferous limestone with fossils of mainly Nummulite sp., Assilina sp., Discocyclina sp. Vertical fractures present.
57.00	60.00	3.00	57.00	3.00	2.98	99.33	95.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained compact fossiliferous limestone with fossil abundance of Nummulite sp., Assilina sp., Discocyclina sp.

60.00	63.00	3.00	60.00	3.00	3.00	100.00	88.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard fossiliferous limestone with presence of Nummulite sp. Stylolites are prominent at some places. Secondary infilling of calcite is present.
63.00	66.00	3.00	63.00	3.00	2.99	99.67	68.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard & compact fossiliferous limestone with presence of Discocyclus sp., and Assilina sp. Shale parting present at middle.
66.00	69.00	3.00	66.00	3.00	2.96	98.67	75.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard & compact fossiliferous limestone with presence of Discocyclus sp., and Assilina sp., mixed up with unfossiliferous and

									calcareous shale. Secondary infilling of calcite is observed.
69.00	72.00	3.00	69.00	3.00	2.97	99.00	92.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard & compact fossiliferous limestone containing fossils of Discocyclus sp., and Alveolina sp., and mixed up with unfossiliferous and calcareous shale.
72.00	75.00	3.00	72.00	3.00	2.98	99.33	94.67	Fossiliferous Limestone	Dark grey fossiliferous limestone mixed up with dark grey calcareous, unfossiliferous shale, streaks of coal are observed.
75.00	78.00	3.00	75.00	3.00	3.00	100.00	97.13	Fossiliferous Limestone	Grey to dark grey, fine to medium grained hard & compact fossiliferous limestone containing fossils of Discocyclus sp., and Assilina sp., and mixed up with

									unfossiliferous and calcareous shale.
78.00	81.00	3.00	78.00	3.00	2.99	99.67	93.33	Fossiliferous Limestone	Grey, fine to medium grained hard fossiliferous limestone with fossils of mainly Nummulite sp., Assilina sp., Discocyclina sp. Shale parting is present at some part.
81.00	84.00	3.00	81.00	1.76	1.72	93.33	85.22	Fossiliferous Limestone	Grey, fine to medium grained hard and compact fossiliferous limestone with fossils of mainly Assilina sp., Discocyclina sp. Shale parting present at 81.30m depth.
			82.76	1.24	1.08		43.54	SSMGTCG	Medium to coarse grained sandstone, greyish in colour, Carb. Streak present.
84.00	87.00	3.00	84.00	1.25	1.20	97.67	39.20	SSFG	Fine grained sandstone mixed up with grey unfossiliferous shale

			85.25	0.53	0.53		100.00	Fossiliferous Limestone	Grey fossiliferous limestone containing fossil of Nummulite sp. In minor quantity.
			85.78	1.22	1.20		56.67	Shale	Dark grey calcareous shale
87.00	90.00	3.00	87.00	2.75	2.68	97.33	48.56	Shale	Grey to dark grey shale, mixed with SSFG at middle
			89.75	0.25	0.24		76.00	SSMG	Medium grained sandstone, reddish grey in colour
90.00	93.00	3.00	90.00	0.53	0.53	99.00	64.15	SSMG	Medium grained sandstone, reddish grey-grey in colour, slightly ferruginous
			90.53	2.33	2.30		48.56	Shale	Grey shale mixed up with fine to medium grained, greyish sandstone
			92.86	0.14	0.14			SSFGTMG	Fine to medium grained sandstone, reddish grey in colour
93.00	96.00	3.00	93.00	2.16	2.10	96.67	53.70	SSMG	Medium grained sandstone, Greyish white in colour

			95.16	0.84	0.80		86.25	Shale	Greyish shale mixed with fine grained sandstone. Some plants fossils are present.
96.00	99.00	3.00	96.00	1.50	1.44	98.00	52.00	Shale	Grey to dark grey shale, Plant fossil present
			97.50	1.50	1.50		98.67	SSMG	Medium grained sandstone, greyish in colour, shale patch and coal streak present.
99.00	100.00	1.00	99.00	1.00	0.98	98.00	96.63	SSMGTCG	Medium to coarse grained sandstone, greyish in colour, shale and coal patches are observed.
			100.00						
Borehole closed at the depth of 100.00 meters									

ANNEXURE II									
LITHOLOGS OF BOREHOLES DRILLED IN NW OF BORO LAKHINDONG BLOCK, DIMA HASAO DISTRICT, ASSAM									
BH No.- PBH02						Date of Commencement: 04/12/2024			
Latitude - N 25°28'33.6"						Date of Closing: 07/12/2024			
Longitude - E 92°36'35.4"						Final Depth: 100m			
Azimuth- Vertical						R.L.: 736m			
Depth(m)		Run	DEPTH & THICKNESS AFTER ADJUSTMENT (m)		Recovery (m)	Recovery (%)	RQD%	Rock type	Description of Lithology
			From	Thickness					
From (m)	To (m)								
0.00	0.50	0.50	0.00	0.50	0.20	40.00		Regolith	Regolith, Brownish in colour
0.50	2.00	1.50	0.50	1.50	0.60	40.00		Soil	Silty clay residual soil, brownish in colour, loose and broken
2.00	3.00	1.00	2.00	1.00	0.40	40.00		Shale	Grey calcareous shale, unfossiliferous, broken at bootom

3.00	6.00	3.00	3.00	1.40	0.90	70.00		Shale	Grey calcareous shale mixed up with fossiliferous limestone
			4.40	1.60	1.20			Fossiliferous Limestone	Grey, fine to medium grained fossiliferous limestone, broken
6.00	9.00	3.00	6.00	3.00	2.60	86.67	59.33	Fossiliferous Limestone	Grey, fine to medium grained, compact fossiliferous limestone with abundance of Nummulite sp., and Discocyclina sp.
9.00	12.0 0	3.00	9.00	3.00	2.87	95.67	88.34	Fossiliferous Limestone	Grey to dark grey, medium grained, hard & compact limestone with dominant fossils of Nummulite sp., Discocyclina sp., along with minor abundance of Alveolina sp. fossils. Mud parting present at middle.
12.00	15.0 0	3.00	12.00	3.00	2.84	94.67	79.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact limestone with mostly fossils of Nummulite sp., and Discocyclina sp. Stylolites are prominent at places. Fractures and mud partings are observed.
15.00	18.0 0	3.00	15.00	3.00	2.82	94.00	77.32	Fossiliferous Limestone	Grey, medium grained, hard & compact, fossiliferous limestone along with presence of Nummulite sp., Discocyclina sp. fossils. Mud partings present and broken at places.
18.00	21.0 0	3.00	18.00	3.00	2.95	98.33	90.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact limestone with mostly fossils of Nummulite sp., Discocyclina sp., and Assilina sp. . Stylolites are prominent at places.
21.00	24.0 0	3.00	21.00	3.00	2.90	96.67	87.34	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact, fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp. Stylolites are observed at places.

24.00	27.0 0	3.00	24.00	3.00	2.91	97.00	92.35	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, fossiliferous limestone with abundance of Nummulite sp. Fossils. Stylolites are present.
27.00	30.0 0	3.00	27.00	3.00	2.96	98.67	90.00	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp. fossils mostly.
30.00	33.0 0	3.00	30.00	1.62	1.54	93.00	87.04	Fossiliferous Limestone	Grey-dark grey, medium grained, hard & compact, fossiliferous limestone containing high fossil abundance of Nummulite sp., Assilina sp., along with minor amount of Asterocyclina sp.
			31.62	1.38	1.25		18.32	shale	Dark grey, unfossiliferous, calcareous shale
33.00	36.0 0	3.00	33.00	1.70	1.54	88.67	16.30	shale	Dark grey, unfossiliferous, calcareous shale. Loose at bottom parts.
			34.70	1.30	1.12		72.30	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard fossiliferous limestone containing fossils of Nummulite sp., Assilina sp. Mixed with shale at middle. Broken at bottom part.
36.00	39.0 0	3.00	36.00	3.00	2.89	96.33	77.67	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with dominant fossils of Nummulite sp., assilina sp., Discocyclina sp., mixed up with dark grey shale at top.

39.00	42.0 0	3.00	39.00	3.00	2.91	97.00	91.67	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with presence of Nummulite sp., Alveolina sp., Assilina sp. fossils.
42.00	45.0 0	3.00	42.00	3.00	2.89	96.33	87.67	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Discocyclina sp., Alveolina sp. Stylolites are observed at some parts.
45.00	48.0 0	3.00	45.00	3.00	2.97	99.00	96.34	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with high abundance of Nummulite sp., Discocyclina sp., Asterocyclina sp. fossils.
48.00	51.0 0	3.00	48.00	3.00	2.95	98.33	91.67	Fossiliferous Limestone	Dark Grey, fine to medium grained, hard & compact fossiliferous limestone containing high abundance of Discocyclina sp., Assilina sp., Asterocyclina sp. fossils.
51.00	54.0 0	3.00	51.00	3.00	2.99	99.67	97.67	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone containing high abundance of Asterocyclina sp., Assilina sp., Discocyclina sp.
54.00	57.0 0	3.00	54.00	3.00	2.99	99.67	92.67	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact limestone with fossils of Nummulite sp., Assilina sp.
57.00	60.0 0	3.00	57.00	3.00	2.97	99.00	96.67	Fossiliferous Limestone	Grey, medium grained, hard & compact limestone with dominant fossils of Nummulite sp., Assilina sp., Discocyclina sp. Fractures present.
60.00	63.0 0	3.00	60.00	3.00	2.96	98.67	94.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone

									containing fossil abundance of Nummulite sp., Discocyclina sp., Alveolina sp.
63.00	66.0 0	3.00	63.00	3.00	2.94	98.00	90.34	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulites sp., Assilina sp., and Discocyclina sp. fossils. Stylolites are prominent.
66.00	69.0 0	3.00	66.00	3.00	2.93	97.67	86.67	Fossiliferous Limestone	Grey, fine-medium grained, hard & compact fossiliferous limestone with less abundance of Nummulite sp., Assilina sp., fossils. Fractures present.
69.00	72.0 0	3.00	69.00	3.00	2.97	99.00	99.67	Fossiliferous Limestone	Grey-dark grey, fine-medium grained, hard & compact, fossiliferous limestone with abundance of Alveolina sp., Assilina sp. fossils.
72.00	75.0 0	3.00	72.00	3.00	2.91	97.00	95.67	Fossiliferous Limestone	Grey-dark grey, medium grained, hard & compact fossiliferous limestone with less abundant fossils of Nummulite sp., Alveolina sp.
75.00	78.0 0	3.00	75.00	3.00	2.95	98.33	98.00	Fossiliferous Limestone	Grey-dark grey, fine-medium grained, hard & compact fossiliferous limestone containing fossils of mainly Nummulite sp., Assilina sp.
78.00	81.0 0	3.00	78.00	3.00	2.96	98.67	92.00	Fossiliferous Limestone	Dark grey, fine to medium grained, fossiliferous limestone with less amount of fossil content as such Nummulite sp., Assilina sp. mainly.

81.00	84.0 0	3.00	81.00	3.00	2.97	99.00	97.00	Fossiliferous Limestone	Dark Grey, medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp. fossils.
84.00	87.0 0	3.00	84.00	3.00	2.99	99.67	94.00	Fossiliferous Limestone	Dark grey, fine to medium grained, hard and compact fossiliferous limestone with fossil content of Discocyclina sp., Alveolina sp.
87.00	90.0 0	3.00	87.00	3.00	2.98	99.33	96.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Discocyclina sp., Asterocyclina sp., Assilina sp.
90.00	93.0 0	3.00	90.00	3.00	2.99	99.67	95.33	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Asterocyclina sp., Nummulite sp., Assilina sp., Discocyclina sp.
93.00	96.0 0	3.00	93.00	3.00	2.96	98.67	94.33	Fossiliferous Limestone	Grey-dark grey, fine to medium grained, hard fossiliferous limestone with abundance of Nummulite sp., Asterocyclina sp., Discocyclina sp., fossils.
96.00	99.0 0	3.00	96.00	3.00	2.95	98.33	83.00	Fossiliferous Limestone	Dark grey, hard and compact, fine to medium grained fossiliferous limestone with presence of Alveolina sp., Discocyclina sp. fossils in less abundance. Mixed up with greyish shale at middle and bottom.
99.00	100. 00	1.00	99.00	1.00	0.96	96.00	76.00	Fossiliferous Limestone	Grey-dark grey, fine-medium grained, hard & compact fossiliferous limestone mixed with unfossiliferous greyish shale at top.

									Fossils present in fossiliferous limestone are Alveolina sp. and Discocyclina sp.
			100.0 0						
Borehole closed at the depth of 100.00 meters									

ANNEXURE II									
LITHOLOGS OF BOREHOLES DRILLED IN NW OF BORO LAKHINDONG BLOCK, DIMA HASAO DISTRICT, ASSAM									
BH No.- PBH03						Date of Commencement: 04/12/2024			
Latitude - N 25°28'32.4"						Date of Closing: 06/12/2024			
Longitude - E 92°37'04.1"						Final Depth: 100m			
Azimuth- Vertical						R.L.: 736m			
Depth(m)		Run	DEPTH & THICKNESS AFTER ADJUSTMENT (m)		Recovery (m)	Recovery (%)	RQD %	ROCK TYPE	Description of Lithology
			From	Thickness					
From (m)	To (m)								
0.00	0.50	0.50	0.00	0.50	0.20	40.00		Regolith	Regolith
0.50	2.50	2.00	0.50	2.00	0.60	30.00		Soil	Silty clay residual soil, brownish in colour
2.50	5.50	3.00	2.50	3.00	2.00	66.67		Soil	Silty clay residual soil, brownish-greyish in colour
5.50	8.50	3.00	5.50	3.00	2.76	92.00	16.62	Shale	Unfossiliferous shale, grey in colour, calcareous
8.50	11.50	3.00	8.50	3.00	2.72	90.67	24.26	Shale	Unfossiliferous shale, grey-dark grey in colour
11.50	14.50	3.00	11.50	3.00	2.65	88.33	30.00	Shale	Unfossiliferous shale, grey-dark grey in colour, calcareous
14.50	17.50	3.00	14.50	1.28	1.06	90.33	23.67	Shale	Unfossiliferous shale, grey-dark grey in colour
			15.78	1.20	1.16		89.16	Fossiliferous limestone	Grey, fine to medium grained, hard & compact, fossiliferous limestone containing fossil abundance of Nummulite sp.

			16.98	0.20	0.18			Shale	Calcareous shale, unfossiliferous, dark grey in colour
			17.18	0.32	0.31		93.75	Fossiliferous limestone	Grey, fine to medium grained, hard & compact, fossiliferous limestone containing fossil abundance of Nummulite sp.
17.50	20.50	3.00	17.50	3.00	2.87	95.67	84.33	Fossiliferous limestone	Grey-reddish, fine to medium grained, fossiliferous limestone with abundance of Nummulite sp., Alveolina sp. Fossils, broken at parts, slightly ferruginous
20.50	23.50	3.00	20.50	3.00	2.89	96.33	80.33	Fossiliferous limestone	Grey, medium grained, compact fossiliferous limestone with abundance of Nummulite sp. Fossils, fractures present. Cavity filling of calcite is observed.
23.50	26.50	3.00	23.50	3.00	2.86	95.33	90.00	Fossiliferous limestone	Grey, fine to medium grained, hard & compact, fossiliferous limestone containing fossil abundance of Nummulite sp. along with mud intercalation. Fractures present.
26.50	29.50	3.00	26.50	3.00	2.89	96.33	88.67	Fossiliferous limestone	Grey, medium grained, hard & compact fossiliferous limestone with fossil content of Nummulite sp., fractured at top
29.50	32.50	3.00	29.50	3.00	2.94	98.00	91.33	Fossiliferous limestone	Grey, medium grained, hard fossiliferous limestone with dominant fossils of Nummulites sp., assilina sp. along with minor Alveolina sp. Fossils.
32.50	35.50	3.00	32.50	3.00	2.91	97.00	82.67	Fossiliferous limestone	Grey-dark grey, medium grained, hard & compact fossiliferous limestone with dominance of Nummulites sp. along with minor Assilina sp. And Alveolina sp. fossils
35.50	38.50	3.00	35.50	3.00	2.93	97.67	88.67	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with high abundance of Nummulites sp.

38.50	41.50	3.00	38.50	3.00	2.90	96.67	92.33	Fossiliferous limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with high abundance of Discocyclina sp., Assilina sp., and Alveolina sp. Fossils.
41.50	44.50	3.00	41.50	0.76	0.74	96.00	97.36	Fossiliferous limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of Discocyclina sp., Alveolina sp., Asterocyclina sp. Fossils
			42.26	2.24	2.14		21.60	Shale	Dark grey, unfossiliferous, calcareous shale
44.50	47.50	3.00	44.50	1.00	0.95	96.33	19.56	Shale	Dark grey, unfossiliferous, calcareous shale
			45.50	2.00	1.94		94.00	Fossiliferous limestone	Grey-dark grey, fine to medium grained, compact fossiliferous limestone is present with shale intercalation. Fossils of Alveolina sp. and Discocyclina sp. are present.
47.50	50.50	3.00	47.50	3.00	2.89	96.33	90.00	Fossiliferous limestone	Grey, fine to medium grained, hard & compact limestone with dominant fossils of Nummulite sp., Assilina sp., along with minor abundance of Alveolina sp.
50.50	53.50	3.00	50.50	3.00	2.93	97.67	91.67	Fossiliferous limestone	Grey, medium grained, hard & compact limestone with dominant fossils of Nummulite sp., Assilina sp., along with minor abundance of Alveolina sp. Fractures present. Prominent stylolites are observed.
53.50	56.50	3.00	53.50	3.00	2.86	95.33	86.67	Fossiliferous limestone	Grey, fine to medium grained, hard & compact limestone with more abundance of Nummulite sp. fossils.
56.50	59.50	3.00	56.50	3.00	2.90	96.67	89.00	Fossiliferous limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of Nummulites sp., Assilina sp., and Alveolina sp. fossils.

59.50	62.50	3.00	59.50	3.00	2.93	97.67	93.00	Fossiliferous limestone	Grey, medium grained, hard & compact fossiliferous limestone with abundance of Discocyclus sp., Alveolina sp., Asterocyclus sp. Fossils
62.50	65.50	3.00	62.50	3.00	2.92	97.33	87.67	Fossiliferous limestone	Grey, fine-medium grained, hard & compact, fossiliferous limestone with abundance of Nummulite sp., Discocyclus sp., Asterocyclus sp., and less abundance of Assilina sp.
65.50	68.50	3.00	65.50	3.00	2.96	98.67	97.00	Fossiliferous limestone	Grey-dark grey, fine-medium grained, hard & compact limestone with abundant fossils of Discocyclus sp., Asterocyclus sp.
68.50	71.50	3.00	68.50	3.00	2.95	98.33	95.67	Fossiliferous limestone	Grey-dark grey, fine-medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp., Alveolina sp.
71.50	74.50	3.00	71.50	3.00	2.93	97.67	94.00	Fossiliferous limestone	Grey-dark grey, fine to medium grained, hard fossiliferous limestone with abundance of Assilina sp., Discocyclus sp., Nummulite sp. fossils.
74.50	77.50	3.00	74.50	3.00	2.96	98.67	94.00	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing less amount of fossils- Discocyclus sp., Alveolina sp., Calcite cavity present.
77.50	80.50	3.00	77.50	3.00	2.96	98.67	89.67	Fossiliferous limestone	Grey, fine to medium grained, hard and compact fossiliferous limestone with fossil content of Discocyclus sp., Alveolina sp., fractures present.
80.50	83.50	3.00	80.50	3.00	2.94	98.00	88.00	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with less amount of Nummulite sp., Alveolina sp. Fossils. Stylolites are prominent at parts.

83.50	86.50	3.00	83.50	3.00	2.95	98.33	90.67	Fossiliferous limestone	Grey-dark grey, medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp., Discocyclina sp.
86.50	89.50	3.00	86.50	3.00	2.93	97.67	88.33	Fossiliferous limestone	Grey-dark grey, fine to medium grained, hard fossiliferous limestone with abundance of Nummulite sp., Alveolina sp., Discocyclina sp., fossils. Stylolites are present at places.
89.50	92.50	3.00	89.50	3.00	2.97	99.00	89.00	Fossiliferous limestone	Grey-dark grey, fine to medium grained, compact fossiliferous limestone with fossils of Nummulite sp., Assilina sp. and Discocyclina sp. are present.
92.50	95.50	3.00	92.50	3.00	2.90	96.67	79.67	Fossiliferous limestone	Grey-dark grey, medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Assilina sp. and Discocyclina sp.
95.50	98.50	3.00	95.50	3.00	2.87	95.67	87.67	Fossiliferous limestone	Grey-dark grey, fine to medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Alveolina sp. and Discocyclina sp.
98.50	100.00	1.50	98.50	1.50	1.45	96.67	88.00	Fossiliferous limestone	Grey-dark grey, medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Assilina sp.
			100.00						
Borehole closed at the depth of 100.00 meters									

ANNEXURE II									
LITHOLOGS OF BOREHOLES DRILLED IN NW OF BORO LAKHINDONG BLOCK, DIMA HASAO DISTRICT, ASSAM									
BH No.- PBH04						Date of Commencement: 09/12/2024			
Latitude - N 25°28'07.8"						Date of Closing: 12/12/2024			
Longitude - E 92°36'20.0"						Final Depth: 100m			
Azimuth- Vertical						R.L.: 741m			
Depth(m)		Run	DEPTH & THICKNESS AFTER ADJUSTMENT (m)		Recovery (m)	Recovery (%)	RQD %	Rock type	Description of Lithology
			From	Thickness					
From (m)	To (m)								
0.00	1.00	1.00	0.00	1.00	0.30	30.00		Soil	Silty clay residual soil, Brownish in colour
1.00	2.00	1.00	1.00	1.00	0.35	35.00		Soil	Silty clay residual soil, Brownish-yellowish in colour
2.00	3.00	1.00	2.00	1.00	0.25	25.00		Soil	Silty clay residual soil, brownish yellow-greyish in colour
3.00	6.00	3.00	3.00	3.00	2.56	85.33	13.33	Shale	Grey, Calcareous shale, unfossiliferous, broken in parts
6.00	9.00	3.00	6.00	3.00	2.88	96.00	15.92	Shale	Calcareous shale, unfossiliferous mixed up with fossiliferous limestone at bottom. Greyish to brownish in colour. Fractures present at bottom.
9.00	12.00	3.00	9.00	0.22	0.20	92.00		Shale	Unfossiliferous shale, calcareous, brownish yellow in colour

			9.22	1.78	1.72		87.64	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Discocyclus sp., Asterocyclus sp. Cavity of calcite is present.
			11.00	1.00	0.84		15.00	Shale	Grey, unfossiliferous shale, calcareous. Loose at top.
12.00	15.00	3.00	12.00	2.00	1.95		16.57	Shale	Grey to dark grey, calcareous shale mixed up with fossiliferous limestone at bottom, loose at some parts.
			14.00	0.28	0.28	97.67	100.00	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Discocyclus sp., Asterocyclus sp.
			14.28	0.72	0.70		20.83	Shale	Grey to dark grey, calcareous shale, unfossiliferous
15.00	18.00	3.00	15.00	0.80	0.72		22.50	Shale	Grey to dark grey, calcareous shale, unfossiliferous
			15.80	2.20	2.20	97.33	90.45	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Alveolina sp. Parting of shale is present at depth of 16.72m.
18.00	21.00	3.00	18.00	3.00	2.95	98.33	88.33	Fossiliferous Limestone	Greyish-Reddish white, fine to medium grained, hard & compact fossiliferous limestone along with major fossils Nummulite sp., Assilina sp. Slightly ferruginous.
21.00	24.00	3.00	21.00	1.03	0.90	92.67	55.33	Fossiliferous Limestone	Reddish-Greyish, fine to medium grained hard fossiliferous limestone along with major fossil Nummulite sp. Slightly ferruginous.

			22.03	0.34	0.30			Shale	Dark grey, calcareous shale
			22.37	1.63	1.58		56.44	Fossiliferous Limestone	Grey, medium grained, hard fossiliferous limestone containing fossils of Nummulite sp., Discocyclina sp. Broken at some places.
24.00	27.00	3.00	24.00	3.00	2.90	96.67	68.00	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with minor amount of Nummulite sp. fossils. Fractures present at middle, mud parting observed.
27.00	30.00	3.00	27.00	3.00	2.89	96.33	92.67	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp. Stylolites present.
30.00	33.00	3.00	30.00	3.00	2.92	97.33	94.33	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing major fossils Nummulite sp., Discocyclina sp.
33.00	36.00	3.00	33.00	3.00	2.90	96.67	88.33	Fossiliferous Limestone	Grey to dark grey, medium grained, hard & compact fossiliferous limestone with fossils of mainly Nummulite sp.
36.00	39.00	3.00	36.00	3.00	2.94	98.00	82.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp.
39.00	42.00	3.00	39.00	3.00	2.95	98.33	93.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp. mainly.
42.00	45.00	3.00	42.00	3.00	2.82	94.00	37.33	Shale	Grey to dark grey, calcareous shale, unfossiliferous

45.00	48.00	3.00	45.00	3.00	2.94	98.00	77.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Asterocyclina sp., Discocyclina sp., Nummulite sp., Assilina sp. Mixed up with shale at middle portion.
48.00	51.00	3.00	48.00	3.00	2.93	97.67	89.33	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp.
51.00	54.00	3.00	51.00	3.00	2.98	99.33	94.00	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Nummulite sp., with minor amount of Discocyclina sp., Alveolina sp. Stylolites prominent at places.
54.00	57.00	3.00	54.00	3.00	2.99	99.67	89.67	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Discocyclina sp. mainly. Stylolites present at 55.20m depth.
57.00	60.00	3.00	57.00	3.00	3.00	100.00	90.67	Fossiliferous Limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with major fossils of Nummulite sp., Asterocyclina sp., Discocyclina sp., Assilina sp. mainly.
60.00	63.00	3.00	60.00	3.00	2.87	95.67	89.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard and compact fossiliferous limestone containing fossils of Discocyclina sp., Asterocyclina sp., Alveolina sp., with minor amount of Nummulite sp. Fossils.
63.00	66.00	3.00	63.00	3.00	2.94	98.00	84.67	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Discocyclina sp., Nummulite sp., Alveolina sp.

66.00	69.00	3.00	66.00	3.00	2.93	97.67	95.33	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone containing fossils of Discocyclina sp., Nummulite sp., Assilina sp.
69.00	72.00	3.00	69.00	3.00	2.96	98.67	91.00	Fossiliferous Limestone	Grey to dark grey, medium grained, hard & compact fossiliferous limestone containing Nummulite sp., Asterocyclina sp, Assilina sp. Fossils. Stylolites are observed at some parts.
72.00	75.00	3.00	72.00	3.00	2.89	96.33	91.33	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone with mostly Discocyclina sp., Nummulite sp., Asterocyclina sp, Assilina sp. fossils.
75.00	78.00	3.00	75.00	3.00	2.99	99.67	88.67	Fossiliferous Limestone	Grey, fine to medium grained, hard fossiliferous limestone containing less amount of Nummulite sp., and Assilina sp. Fossils. Stylolites are present. Fractures are present.
78.00	81.00	3.00	78.00	3.00	2.90	96.67	92.67	Fossiliferous Limestone	Grey, fine to medium grained, hard fossiliferous limestone containing less amount of Nummulite sp., and Alveolina sp. Fossils.
81.00	84.00	3.00	81.00	3.00	2.90	96.67	95.00	Fossiliferous Limestone	Grey, fine to medium grained, hard and compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp., Discocyclina sp. fossils.
84.00	87.00	3.00	84.00	3.00	2.91	97.00	92.67	Fossiliferous Limestone	Grey, fine to medium grained, hard fossiliferous limestone with fossil content of Assilina sp., Nummulite sp., and Alveolina sp.

87.00	90.00	3.00	87.00	3.00	2.99	99.67	97.33	Fossiliferous Limestone	Grey, fine to medium grained, compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp. Calcite vein present at 89.30m depth.
90.00	93.00	3.00	90.00	3.00	3.00	100.00	95.00	Fossiliferous Limestone	Grey, medium grained, hard & compact fossiliferous limestone containing less amount of Nummulite sp., Assilina sp., fossils. Stylolites are prominent. Less amount of Discocyclusina sp. fossils.
93.00	96.00	3.00	93.00	3.00	2.96	98.67	89.00	Fossiliferous Limestone	Grey, fine to medium grained, compact fossiliferous limestone containing fossils of Nummulite sp., Assilina sp., and Discocyclusina sp. Veins of calcite present.
96.00	99.00	3.00	96.00	3.00	2.95	98.33	86.00	Fossiliferous Limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., and Alveolina sp. fossils mainly. Fractures present.
99.00	100.00	1.00	99.00	1.00	0.99	99.00	87.00	Fossiliferous Limestone	Grey to dark grey, medium grained, hard and compact fossiliferous limestone containing fossils of mainly Nummulite sp., Discocyclusina sp.
			100.00						
Borehole closed at the depth of 100.00 meters									

ANNEXURE II									
LITHOLOGS OF BOREHOLES DRILLED IN NW OF BORO LAKHINDONG BLOCK, DIMA HASAO DISTRICT, ASSAM									
BH No.- PBH05						Date of Commencement:14/12/2024			
Latitude - N 25°28'05.2"						Date of Closing: 16/12/2024			
Longitude - E 92°36'48.3"						Final Depth: 100m			
Azimuth- Vertical						R.L.: 732m			
Depth(m)		Run	DEPTH & THICKNESS AFTER ADJUSTMENT (m)		Recovery (m)	Recovery (%)	RQD %	Rock type	Description of Lithology
			From	Thickness					
From (m)	To (m)								
0.00	1.00	1.00	0.00	1.00	0.25	25.00		Soil	Soil, Brownish yellow in colour
1.00	2.00	2.00	1.00	1.00	0.30	15.00		Soil	Soil, Brownish yellow-yellow in colour
2.00	3.00	1.00	2.00	0.40	0.38	92.00		Soil	Silty clay residual soil, brownish-dark grey in colour
			2.40	0.60	0.54			Shale	Grey-dark grey, unfossiliferous and calcareous shale
3.00	6.00	3.00	3.00	3.00	2.80	93.33	13.56	Shale	Grey, calcareous and unfossiliferous shale. Loose at middle and bottom.
6.00	9.00	3.00	6.00	0.57	0.56	98.33	12.67	Shale	Grey-dark grey, unfossiliferous and calcareous shale

			6.57	1.51	1.50		46.29	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of <i>Asterocyclina</i> sp., <i>Discocyclina</i> sp. fossils.
			8.08	0.92	0.89		19.73	Shale	Grey-dark grey, unfossiliferous and calcareous shale
9.00	12.00	3.00	9.00	0.46	0.42		15.13	Shale	Grey-dark grey, unfossiliferous and calcareous shale
			9.46	1.47	1.37	91.67	39.45	Fossiliferous limestone	Grey fossiliferous limestone mixed up with grey shale at middle. Fractured and broken.
			10.93	1.07	0.96		14.95	Shale	Grey, calcareous and unfossiliferous shale.
12.00	15.00	3.00	12.00	1.88	1.85		16.72	Shale	Grey to dark grey calcareous shale, mixed up with fossiliferous limestone at bottom.
			13.88	0.70	0.68	97.67	22.70	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of <i>Nummulite</i> sp., <i>Discocyclina</i> sp. fossils.
			14.58	0.42	0.40			Shale	Grey-dark grey, unfossiliferous and calcareous shale
15.00	18.00	3.00	15.00	1.14	1.10		15.40	Shale	Grey-dark grey, unfossiliferous and calcareous shale
			16.14	1.86	1.84	98.00	56.45	Fossiliferous limestone	Dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of <i>Nummulite</i> sp., <i>Discocyclina</i> sp. fossils. Cavity of calcite present.
18.00	21.00	3.00	18.00	3.00	2.96	98.67	75.67	Fossiliferous limestone	Whitish Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of <i>Nummulite</i> sp., <i>Assilina</i> sp. fossils. Vertical fractures are observed at top and bottom. Secondary growth of calcite is seen within fractures.

21.00	24.00	3.00	21.00	3.00	2.99	99.67	84.00	Fossiliferous limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Asterocyclina sp. fossils. Mixed up with shale at middle. Cavity of calcite is present.
24.00	27.00	3.00	24.00	3.00	2.98	99.33	87.67	Fossiliferous limestone	Grey to dark grey, medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Asterocyclina sp. fossils. Shale is present at top portion. Stylolite is also present.
27.00	30.00	3.00	27.00	3.00	3.00	100.00	89.00	Fossiliferous limestone	Whitish Grey, fine to medium grained, hard & compact fossiliferous limestone with fossil abundance of Nummulite sp. Mud parting is present.
30.00	33.00	3.00	30.00	3.00	2.93	97.67	90.67	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp. fossils.
33.00	36.00	3.00	33.00	3.00	2.98	99.33	98.33	Fossiliferous limestone	Grey to dark grey, medium grained, hard & compact fossiliferous limestone with abundance of Nummulite sp., Assilina sp. fossils.
36.00	39.00	3.00	36.00	3.00	2.99	99.67	79.33	Fossiliferous limestone	Whitish grey-grey, fine to medium grained, hard & compact fossiliferous limestone with presence of Nummulite sp., Assilina sp. Fossils mostly.
39.00	42.00	3.00	39.00	3.00	3.00	100.00	88.00	Fossiliferous limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp. Sub-vertical fractures are present at bottom.

42.00	45.00	3.00	42.00	3.00	2.95	98.33	41.67	Shale	Dark grey shale, unfossiliferous and calcareous
45.00	48.00	3.00	45.00	3.00	3.00	100.00	94.67	Fossiliferous limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp., Asterocyclina sp., Assilina sp. Shale patch is present at middle.
48.00	51.00	3.00	48.00	3.00	3.00	100.00	98.22	Fossiliferous limestone	Grey, medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp., Assilina sp. Fractures present.
51.00	54.00	3.00	51.00	3.00	3.00	100.00	91.67	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with fossils of Nummulite sp., Discocyclina sp., Assilina sp.
54.00	57.00	3.00	54.00	3.00	2.96	98.67	93.33	Fossiliferous limestone	Grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp., Assilina sp.
57.00	60.00	3.00	57.00	3.00	2.97	99.00	92.00	Fossiliferous limestone	Grey to dark grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp., Asterocyclina sp., Assilina sp.
60.00	63.00	3.00	60.00	3.00	3.00	100.00	90.33	Fossiliferous limestone	Grey to dark grey, medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclina sp., Asterocyclina sp.
63.00	66.00	3.00	63.00	3.00	3.00	100.00	86.00	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the

									presence of fossils Nummulite sp., Discocyclus sp., Alveolina sp.
66.00	69.00	3.00	66.00	3.00	2.99	99.67	74.67	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp.
69.00	72.00	3.00	69.00	3.00	3.00	100.00	92.67	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp.
72.00	75.00	3.00	72.00	3.00	3.00	100.00	84.33	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclus sp., Alveolina sp.
75.00	78.00	3.00	75.00	3.00	2.99	99.67	87.33	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Discocyclus sp. Fractures present at bottom part.
78.00	81.00	3.00	78.00	3.00	3.00	100.00	81.67	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp.
81.00	84.00	3.00	81.00	3.00	3.00	100.00	93.67	Fossiliferous limestone	Whitish grey-grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp., Alveolina sp.
84.00	87.00	3.00	84.00	3.00	2.95	98.33	90.67	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Alveolina sp., Assilina sp.

87.00	90.00	3.00	87.00	3.00	2.96	98.67	93.67	Fossiliferous limestone	Whitish grey-grey, fine to medium grained, hard & compact fossiliferous limestone with the presence of fossils Nummulite sp., Assilina sp.
90.00	93.00	3.00	90.00	3.00	3.00	100.00	95.67	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with low abundance of fossil content
93.00	96.00	3.00	93.00	3.00	2.99	99.67	88.00	Fossiliferous limestone	Whitish grey-grey, fine to medium grained, hard & compact fossiliferous limestone with low abundance of fossil content
96.00	99.00	3.00	96.00	3.00	2.99	99.67	74.33	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with low abundance of fossil content
99.00	100.00	1.00	99.00	1.00	0.99	99.00	73.00	Fossiliferous limestone	Whitish grey, fine to medium grained, hard & compact fossiliferous limestone with low abundance of fossil content
			100.00						
Borehole closed at the depth of 100.00 meters									

ANNEXURE III**DETAILS OF ANALYTICAL RESULTS OF BED ROCK SAMPLES**

S. No.	SAMPLE ID	LITHOLOGY	CaO %	MgO %	SiO ₂ %	INFERRED GRADE	Al ₂ O ₃ %	BaO %	Cr ₂ O ₃ %	Total Iron as Fe %	Total Iron as Fe ₂ O ₃	K ₂ O %	MgO %	MnO %	Na ₂ O %	P ₂ O ₅ %	SO ₃ %	TiO ₂ %	SiO ₂ %	V ₂ O ₅ %	LOI %
1	BLD-01	Limestone	46.86	1.16	4.49	Cement (Portland)	2.59	<0.05	<0.05	3.05	4.36	0.23	1.16	<0.05	<0.08	0.05	0.20	0.12	4.49	<0.05	39.72
2	BLD-02	Limestone	49.34	0.88	1.42	SMS (OH)	1.15	<0.05	<0.05	3.22	4.61	0.10	0.88	1.10	<0.08	0.12	0.10	<0.05	1.42	<0.05	40.92
3	BLD-05	Limestone	46.01	1.15	5.93	Cement (Portland)	2.64	<0.05	<0.05	2.83	4.05	0.29	1.15	0.07	<0.08	0.22	0.10	0.12	5.93	<0.05	39.23
4	BLD-06	Limestone	49.68	1.30	3.54	SMS (OH)	1.99	<0.05	<0.05	0.92	1.31	0.15	1.30	<0.05	<0.08	<0.05	0.48	0.08	3.54	<0.05	41.29
5	BLD-07	Limestone	49.60	1.31	3.41	SMS (OH)	1.85	<0.05	<0.05	1.21	1.73	0.14	1.31	<0.05	<0.08	<0.05	0.66	0.07	3.41	<0.05	41.07
6	BLD-08	Limestone	44.43	1.37	2.79	Cement (Portland)	1.97	<0.05	<0.05	6.17	8.82	0.11	1.37	1.31	<0.08	0.28	0.11	0.07	2.79	<0.05	38.53
7	BLD-09	Limestone	48.43	1.23	2.72	SMS (OH)	1.64	<0.05	<0.05	2.93	4.18	0.10	1.23	0.18	<0.08	0.05	1.00	0.07	2.72	<0.05	40.19
8	BLD-10	Limestone	49.23	1.37	3.51	SMS (OH)	1.91	<0.05	<0.05	1.36	1.95	0.16	1.37	<0.05	<0.08	<0.05	0.75	0.07	3.51	<0.05	40.84
9	BLD-11	Limestone	47.72	1.20	3.44	Cement (Portland)	2.08	<0.05	<0.05	3.08	4.41	0.17	1.20	<0.05	<0.08	<0.05	0.18	0.09	3.44	<0.05	40.44
10	BLD-12	Limestone	52.25	0.96	1.43	SMS (L.D.)	1.08	<0.05	<0.05	0.61	0.87	0.06	0.96	<0.05	<0.08	<0.05	0.09	<0.05	1.43	<0.05	43.07
11	BLD-13	Limestone	50.43	1.09	2.72	SMS (OH)	1.70	<0.05	<0.05	1.02	1.45	0.12	1.09	<0.05	<0.08	<0.05	0.22	0.06	2.72	<0.05	42.06
12	BLD-14	Limestone	45.82	1.42	3.27	Cement (Portland)	1.95	<0.05	<0.05	4.71	6.73	0.07	1.42	0.41	<0.08	0.06	1.14	0.06	3.27	<0.05	38.89
13	BLD-16	Limestone	33.47	1.37	9.88	-	4.90	<0.05	<0.05	12.06	17.24	0.45	1.37	0.48	<0.08	0.57	0.19	0.24	9.88	<0.05	31.00
14	BLD-17	Limestone	42.64	1.29	8.45	Cement (Blendable)	2.23	<0.05	<0.05	4.95	7.07	0.23	1.29	0.79	<0.08	0.31	0.10	0.10	8.45	<0.05	36.58

15	BLD-18	Limestone	40.24	1.60	4.22	Cement (Blendable)	2.55	<0.0 5	<0.0 5	9.84	14.0 6	0.15	1.60	0.31	<0.0 8	0.38	0.09	0.10	4.22	<0.0 5	36.0 8
16	BLD-19	Limestone	47.16	1.28	4.39	Cement (Portland)	2.42	<0.0 5	<0.0 5	2.48	3.55	0.21	1.28	0.17	<0.0 8	0.06	1.01	0.11	4.39	<0.0 5	39.4 7
17	BLD-20	Limestone	50.46	1.10	2.60	SMS (OH)	1.75	<0.0 5	<0.0 5	1.08	1.55	0.11	1.10	<0.0 5	<0.0 8	<0.0 5	0.62	0.05	2.60	<0.0 5	41.6 0
18	BLD-21	Limestone	46.71	1.23	3.19	Cement (Portland)	1.78	<0.0 5	<0.0 5	4.53	6.47	0.10	1.23	0.39	<0.0 8	0.07	0.07	0.06	3.19	<0.0 5	39.7 7
19	BLD-22	Limestone	41.44	1.40	4.19	Cement (Blendable)	2.57	<0.0 5	<0.0 5	8.54	12.2 1	0.16	1.40	0.24	<0.0 8	0.29	0.08	0.10	4.19	<0.0 5	37.1 4
20	BLD-23	Limestone	49.51	1.12	2.59	SMS (OH)	1.51	<0.0 5	<0.0 5	1.90	2.72	0.10	1.12	0.26	<0.0 8	<0.0 5	0.29	0.06	2.59	<0.0 5	41.6 5
21	BLD-24	Limestone	47.79	1.38	3.48	Cement (Portland)	1.94	<0.0 5	<0.0 5	2.85	4.07	0.16	1.38	0.17	<0.0 8	<0.0 5	0.09	0.09	3.48	<0.0 5	40.6 0
22	BLD-25	Limestone	47.98	1.10	3.53	Cement (Portland)	1.87	<0.0 5	<0.0 5	2.76	3.95	0.17	1.10	0.13	<0.0 8	0.05	0.09	0.09	3.53	<0.0 5	40.9 0
23	BLD-26	Limestone	48.64	1.07	2.36	SMS (OH)	1.26	<0.0 5	<0.0 5	3.62	5.17	0.08	1.07	0.20	<0.0 8	<0.0 5	0.08	0.06	2.36	<0.0 5	40.8 7
24	BLD-27	Limestone	44.51	1.47	4.09	Cement (Portland)	2.21	<0.0 5	<0.0 5	5.69	8.13	0.16	1.47	0.77	<0.0 8	0.05	0.09	0.08	4.09	<0.0 5	38.2 4
25	BLD-28	Limestone	41.99	1.37	4.16	Cement (Blendable)	2.45	<0.0 5	<0.0 5	8.35	11.9 3	0.20	1.37	0.23	<0.0 8	0.16	0.08	0.10	4.16	<0.0 5	37.1 3
26	BLD-29	Limestone	46.21	1.39	4.46	Cement (Portland)	2.27	<0.0 5	<0.0 5	3.61	5.16	0.21	1.39	0.17	<0.0 8	<0.0 5	0.09	0.10	4.46	<0.0 5	39.6 8
27	BLD-30	Limestone	44.38	1.22	4.17	Cement (Portland)	2.05	<0.0 5	<0.0 5	6.41	9.16	0.13	1.22	0.39	<0.0 8	0.10	0.06	0.08	4.17	<0.0 5	38.0 7
28	BLD-31	Limestone	44.30	1.13	3.75	Cement (Portland)	1.91	<0.0 5	<0.0 5	6.66	9.52	0.10	1.13	0.27	<0.0 8	0.11	0.07	0.07	3.75	<0.0 5	38.5 7
29	BLD-32	Limestone	48.28	1.02	3.48	SMS (OH)	1.81	<0.0 5	<0.0 5	2.81	4.02	0.18	1.02	0.15	<0.0 8	<0.0 5	0.08	0.10	3.48	<0.0 5	40.6 8
30	BLD-33	Limestone	48.28	1.09	3.53	SMS (OH)	1.82	<0.0 5	<0.0 5	2.73	3.90	0.16	1.09	0.12	<0.0 8	<0.0 5	0.09	0.09	3.53	<0.0 5	40.7 2
31	BLD-34	Limestone	44.24	1.78	4.01	Cement (Portland)	1.91	<0.0 5	<0.0 5	5.94	8.49	0.09	1.78	0.46	<0.0 8	0.06	1.35	0.07	4.01	<0.0 5	37.3 6
32	BLD-35	Limestone	49.68	1.01	2.67	SMS (OH)	1.63	<0.0 5	<0.0 5	1.91	2.72	0.11	1.01	0.41	<0.0 8	<0.0 5	0.09	0.06	2.67	<0.0 5	41.4 4
33	BLD-36	Limestone	41.43	1.39	5.81	Cement (Blendable)	3.32	<0.0 5	<0.0 5	7.05	10.0 9	0.28	1.39	0.17	<0.0 8	0.13	0.07	0.16	5.81	<0.0 5	36.9 7

34	BLD-37	Limestone	41.39	1.33	5.74	Cement (Blendable)	2.94	<0.0 5	<0.0 5	7.44	10.6 4	0.27	1.33	0.16	<0.0 8	0.14	0.07	0.16	5.74	<0.0 5	36.9 6
35	BLD-38	Limestone	47.33	1.15	3.17	Cement (Portland)	1.99	<0.0 5	<0.0 5	3.52	5.04	0.15	1.15	0.46	<0.0 8	0.08	0.08	0.08	3.17	<0.0 5	40.2 9
36	BLD-39	Limestone	45.38	1.07	1.73	Cement (Portland)	1.36	<0.0 5	<0.0 5	6.65	9.51	<0.0 5	1.07	1.35	<0.0 8	0.22	<0.0 5	<0.0 5	1.73	<0.0 5	39.0 3
37	BLD-40	Limestone	44.42	1.54	4.23	Cement (Portland)	2.01	<0.0 5	<0.0 5	5.64	8.07	0.12	1.54	0.81	<0.0 8	<0.0 5	0.07	0.07	4.23	<0.0 5	38.3 9
38	BLD-44	Limestone	48.79	1.01	3.31	SMS (OH)	1.74	<0.0 5	<0.0 5	2.43	3.47	0.17	1.01	0.15	<0.0 8	<0.0 5	0.08	0.09	3.31	<0.0 5	40.9 9
39	BLD-45	Limestone	48.86	1.07	2.33	SMS (OH)	1.55	<0.0 5	<0.0 5	2.90	4.15	0.12	1.07	0.47	<0.0 8	<0.0 5	0.10	0.06	2.33	<0.0 5	41.1 0
40	BLD-46	Limestone	48.16	1.12	2.96	SMS (OH)	1.76	<0.0 5	<0.0 5	3.00	4.28	0.12	1.12	0.48	<0.0 8	<0.0 5	0.14	0.07	2.96	<0.0 5	40.7 2
41	BLD-47	Limestone	44.59	1.35	3.80	Cement (Portland)	2.46	<0.0 5	0.05	5.29	7.56	0.27	1.35	0.55	<0.0 8	0.49	0.09	0.10	3.80	<0.0 5	38.5 0
42	BLD-48	Limestone	44.20	1.32	4.85	Cement (Portland)	2.14	<0.0 5	<0.0 5	5.35	7.66	0.15	1.32	0.75	<0.0 8	0.15	0.07	0.08	4.85	<0.0 5	38.4 2
43	BLD-49	Limestone	49.00	1.01	2.94	SMS (OH)	1.75	<0.0 5	<0.0 5	2.19	3.12	0.13	1.01	0.42	<0.0 8	<0.0 5	0.10	0.06	2.94	<0.0 5	41.2 8
44	BLD-50	Limestone	44.82	1.32	3.34	Cement (Portland)	1.96	<0.0 5	<0.0 5	5.22	7.47	0.13	1.32	1.47	<0.0 8	0.11	0.11	0.08	3.34	<0.0 5	38.9 8
45	BLD-51	Limestone	45.60	1.29	3.56	Cement (Portland)	2.04	<0.0 5	<0.0 5	4.87	6.97	0.22	1.29	0.68	<0.0 8	0.22	0.09	0.10	3.56	<0.0 5	39.0 4
46	BLD-52	Limestone	44.93	1.34	3.06	Cement (Portland)	1.91	<0.0 5	<0.0 5	5.31	7.60	0.14	1.34	1.38	<0.0 8	0.07	0.11	0.08	3.06	<0.0 5	39.1 7
47	BLD-53	Limestone	49.47	1.10	2.87	SMS (OH)	1.48	<0.0 5	<0.0 5	1.92	2.74	0.11	1.10	0.28	<0.0 8	<0.0 5	0.17	0.06	2.87	<0.0 5	41.5 3
1	BLD-03	Sandstone	0.13	<0.0 5	87.9 0	-	1.96	<0.0 5	<0.0 5	4.96	7.10	0.13	<0.0 5	<0.0 5	0.08	0.07	<0.0 5	0.18	87.9 0	<0.0 5	2.35
2	BLD-04	Sandstone	0.06	<0.0 5	94.4 6	-	1.99	<0.0 5	<0.0 5	1.02	1.46	0.20	<0.0 5	<0.0 5	0.08	<0.0 5	<0.0 5	0.18	94.4 6	<0.0 5	1.48
3	BLD-41	Sandstone	0.14	<0.0 5	91.5 7	-	1.92	<0.0 5	<0.0 5	2.40	3.43	0.39	<0.0 5	0.37	0.08	<0.0 5	<0.0 5	0.30	91.5 7	<0.0 5	1.60
4	BLD-42	Sandstone	0.24	<0.0 5	92.3 3	-	2.09	<0.0 5	<0.0 5	2.05	2.94	0.19	<0.0 5	<0.0 5	0.08	<0.0 5	<0.0 5	0.20	92.3 3	<0.0 5	1.80
5	BLD-43	Sandstone	0.25	<0.0 5	89.6 8	-	1.95	<0.0 5	<0.0 5	3.91	5.58	0.14	<0.0 5	<0.0 5	0.08	0.07	<0.0 5	0.18	89.6 8	<0.0 5	1.97
6	BLD-15	Sandstone	0.40	<0.0 5	92.0 3	-	1.33	<0.0 5	<0.0 5	2.80	4.01	0.10	<0.0 5	<0.0 5	0.08	<0.0 5	<0.0 5	0.15	92.0 3	<0.0 5	1.78

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-01

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	BLD/PBH01/01	4.00	5.00	1.00	3.58	<0.05	42.25	<0.05	2.85	4.07	0.35	2.59	<0.05	<0.08	<0.05	1.30	0.15	8.74	0.11	<0.05	36.72
2	BLD/PBH01/02	5.00	6.00	1.00	2.51	<0.05	45.90	<0.05	2.14	3.06	0.23	2.22	0.06	<0.08	<0.05	1.02	0.10	5.60	0.10	<0.05	39.09
3	BLD/PBH01/03	6.00	7.00	1.00	2.44	<0.05	45.36	<0.05	2.59	3.71	0.22	2.57	0.11	<0.08	<0.05	1.29	0.10	5.08	0.09	<0.05	38.89
4	BLD/PBH01/04	7.00	8.00	1.00	2.18	<0.05	46.62	<0.05	2.76	3.95	0.19	2.09	0.20	<0.08	<0.05	1.29	0.08	4.08	0.11	<0.05	39.08
5	BLD/PBH01/05	8.00	9.00	1.00	1.84	<0.05	47.59	<0.05	2.19	3.14	0.14	1.90	0.32	<0.08	<0.05	1.62	0.07	3.45	0.09	<0.05	39.73
6	BLD/PBH01/06	9.00	10.00	1.00	2.66	<0.05	44.43	<0.05	3.81	5.45	0.21	2.27	0.31	<0.08	<0.05	2.14	0.10	4.94	0.08	<0.05	37.26
7	BLD/PBH01/07	10.00	11.00	1.00	2.23	<0.05	47.29	<0.05	2.32	3.31	0.20	1.62	0.24	<0.08	<0.05	1.72	0.09	4.08	0.08	<0.05	39.02
8	BLD/PBH01/08	11.00	12.00	1.00	1.72	<0.05	48.98	<0.05	2.10	3.01	0.11	1.50	0.31	<0.08	<0.05	1.27	0.06	3.05	0.08	<0.05	39.79
9	BLD/PBH01/09	12.00	13.00	1.00	2.11	<0.05	47.50	<0.05	2.11	3.02	0.15	1.70	0.19	<0.08	<0.05	1.69	0.08	3.58	0.08	<0.05	39.78
10	BLD/PBH01/10	13.00	14.00	1.00	3.03	<0.05	43.30	<0.05	3.60	5.15	0.29	2.81	0.13	<0.08	0.09	0.86	0.15	5.88	0.08	<0.05	38.13
11	BLD/PBH01/11	14.00	15.00	1.00	3.35	<0.05	42.19	<0.05	4.64	6.64	0.32	3.14	0.13	<0.08	0.06	0.68	0.16	6.17	0.10	<0.05	36.94
12	BLD/PBH01/12	15.00	16.00	1.00	3.32	<0.05	42.23	<0.05	4.35	6.22	0.32	2.94	<0.05	<0.08	0.07	0.70	0.16	5.97	0.10	<0.05	37.82
13	BLD/PBH01/13	16.00	17.00	1.00	3.43	<0.05	42.73	<0.05	4.17	5.96	0.33	2.61	<0.05	<0.08	0.09	0.78	0.17	6.29	0.11	<0.05	37.37
14	BLD/PBH01/14	17.00	18.00	1.00	4.65	<0.05	39.62	<0.05	3.15	4.50	0.54	3.52	<0.05	<0.08	0.11	0.70	0.24	9.63	0.11	<0.05	36.29
15	BLD/PBH01/15	18.00	19.00	1.00	5.66	<0.05	35.55	<0.05	4.68	6.69	0.65	4.08	<0.05	<0.08	0.10	0.64	0.28	11.78	0.10	<0.05	34.35
16	BLD/PBH01/16	19.00	20.00	1.00	5.03	<0.05	37.48	<0.05	6.31	9.02	0.52	2.71	<0.05	<0.08	0.15	0.64	0.25	9.79	0.11	<0.05	34.19
17	BLD/PBH01/17	20.00	21.00	1.00	2.96	<0.05	44.59	<0.05	1.96	2.80	0.30	2.61	<0.05	<0.08	<0.05	0.74	0.15	6.43	0.10	<0.05	39.19
18	BLD/PBH01/18	21.00	22.00	1.00	4.50	<0.05	40.47	<0.05	3.83	5.48	0.45	2.57	<0.05	<0.08	0.09	1.03	0.23	8.97	0.10	<0.05	36.00
19	BLD/PBH01/19	22.00	23.00	1.00	3.51	<0.05	42.59	<0.05	4.27	6.10	0.33	2.30	<0.05	<0.08	0.12	1.29	0.17	6.63	0.10	<0.05	36.75
20	BLD/PBH01/20	23.00	24.00	1.00	2.81	<0.05	45.49	<0.05	2.90	4.14	0.25	1.70	<0.05	<0.08	0.06	1.59	0.13	5.13	0.08	<0.05	38.51
21	BLD/PBH01/21	24.00	25.00	1.00	2.73	<0.05	47.22	<0.05	2.48	3.54	0.18	1.66	<0.05	<0.08	<0.05	1.60	0.10	4.72	0.07	<0.05	38.04
22	BLD/PBH01/22	25.00	26.00	1.00	2.72	<0.05	45.78	<0.05	2.40	3.43	0.19	1.63	<0.05	<0.08	0.06	1.92	0.11	4.84	0.07	<0.05	39.13
23	BLD/PBH01/23	26.00	27.00	1.00	2.48	<0.05	50.05	<0.05	1.22	1.74	0.19	1.33	<0.05	<0.08	<0.05	0.95	0.11	4.13	0.07	<0.05	38.84

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-01

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
24	BLD/PBH01/24	27.00	28.00	1.00	2.32	<0.05	48.82	<0.05	1.19	1.70	0.18	1.28	<0.05	<0.08	<0.05	0.92	0.11	3.96	0.07	<0.05	40.53
25	BLD/PBH01/25	28.00	29.00	1.00	2.42	<0.05	48.05	<0.05	1.46	2.08	0.21	1.40	<0.05	<0.08	<0.05	0.98	0.12	4.45	0.09	<0.05	40.09
26	BLD/PBH01/26	29.00	30.00	1.00	2.48	<0.05	47.30	<0.05	1.69	2.42	0.22	1.35	<0.05	<0.08	<0.05	1.82	0.12	4.59	0.09	<0.05	39.50
27	BLD/PBH01/27	30.00	31.00	1.00	2.50	<0.05	48.35	<0.05	1.29	1.85	0.20	1.41	<0.05	<0.08	<0.05	0.80	0.11	4.49	0.07	<0.05	40.13
28	BLD/PBH01/28	31.00	32.00	1.00	3.16	<0.05	45.90	<0.05	2.00	2.86	0.25	1.71	<0.05	<0.08	<0.05	1.21	0.12	6.01	0.09	<0.05	38.57
29	BLD/PBH01/29	32.00	33.00	1.00	1.45	<0.05	50.88	<0.05	1.00	1.43	0.07	1.11	<0.05	<0.08	<0.05	0.59	<0.05	2.35	0.06	<0.05	41.92
30	BLD/PBH01/30	33.00	34.00	1.00	1.28	<0.05	50.83	<0.05	1.05	1.50	0.07	1.11	<0.05	<0.08	<0.05	0.89	<0.05	2.08	0.06	<0.05	41.81
31	BLD/PBH01/31	34.00	35.00	1.00	1.84	<0.05	49.95	<0.05	1.18	1.68	0.09	1.20	<0.05	<0.08	<0.05	1.00	0.05	2.77	<0.05	<0.05	41.27
32	BLD/PBH01/32	35.00	36.00	1.00	1.56	<0.05	50.55	<0.05	1.01	1.44	0.11	1.15	<0.05	<0.08	<0.05	0.78	0.06	2.79	0.05	<0.05	41.41
33	BLD/PBH01/33	36.00	37.00	1.00	1.48	<0.05	51.34	<0.05	0.79	1.12	0.09	1.01	<0.05	<0.08	<0.05	0.70	<0.05	2.09	<0.05	<0.05	41.97
34	BLD/PBH01/34	37.00	38.00	1.00	1.68	<0.05	50.83	<0.05	0.83	1.19	0.12	1.05	<0.05	<0.08	<0.05	0.69	0.06	2.47	<0.05	<0.05	41.75
35	BLD/PBH01/35	38.00	39.00	1.00	1.87	<0.05	50.47	<0.05	0.81	1.16	0.13	1.11	<0.05	<0.08	<0.05	0.67	0.06	2.65	<0.05	<0.05	41.73
36	BLD/PBH01/36	39.00	40.00	1.00	1.84	<0.05	50.28	<0.05	0.92	1.32	0.16	1.09	<0.05	<0.08	<0.05	0.84	0.07	2.98	0.05	<0.05	41.26
37	BLD/PBH01/37	40.00	41.00	1.00	2.30	<0.05	48.76	<0.05	1.36	1.94	0.20	1.29	<0.05	<0.08	<0.05	1.26	0.08	3.82	0.05	<0.05	40.17
38	BLD/PBH01/38	41.00	42.00	1.00	1.63	<0.05	50.82	<0.05	0.87	1.24	0.13	1.07	<0.05	<0.08	<0.05	0.84	0.06	2.34	0.05	<0.05	41.72
39	BLD/PBH01/39	42.00	43.00	1.00	1.69	<0.05	50.39	<0.05	0.90	1.28	0.17	1.11	<0.05	<0.08	<0.05	0.67	0.07	2.93	0.06	<0.05	41.53
41	BLD/PBH01/40	43.00	44.00	1.00	2.01	<0.05	49.78	<0.05	1.08	1.55	0.17	1.23	<0.05	<0.08	<0.05	0.88	0.07	3.09	0.05	<0.05	41.06
42	BLD/PBH01/41	44.00	45.00	1.00	1.40	<0.05	50.53	<0.05	1.30	1.86	0.11	1.11	<0.05	<0.08	<0.05	1.08	<0.05	2.46	0.05	<0.05	41.23
43	BLD/PBH01/42	45.00	46.00	1.00	1.84	<0.05	50.02	<0.05	1.01	1.44	0.17	1.17	<0.05	<0.08	<0.05	0.81	0.07	3.20	0.06	<0.05	41.11
44	BLD/PBH01/43	46.00	47.00	1.00	1.51	<0.05	51.32	<0.05	0.68	0.97	0.09	1.05	<0.05	<0.08	<0.05	0.46	<0.05	1.92	<0.05	<0.05	42.49
45	BLD/PBH01/44	47.00	48.00	1.00	1.38	<0.05	50.97	<0.05	0.86	1.23	0.11	1.11	<0.05	<0.08	<0.05	0.57	0.05	2.40	0.06	<0.05	42.01
46	BLD/PBH01/45	48.00	49.00	1.00	1.49	<0.05	50.70	<0.05	1.06	1.51	0.10	1.16	<0.05	<0.08	<0.05	0.70	<0.05	2.41	0.05	<0.05	41.72
47	BLD/PBH01/46	49.00	50.00	1.00	1.39	<0.05	51.32	<0.05	0.80	1.15	0.09	1.09	<0.05	<0.08	<0.05	0.59	<0.05	2.10	0.06	<0.05	42.04

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-01

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
48	BLD/PBH01/47	50.00	51.00	1.00	2.03	<0.05	49.89	<0.05	0.86	1.23	0.17	1.18	<0.05	<0.08	<0.05	0.59	0.08	3.56	0.06	<0.05	41.09
49	BLD/PBH01/48	51.00	52.00	1.00	2.43	<0.05	48.44	<0.05	1.39	1.99	0.18	1.39	<0.05	<0.08	<0.05	0.78	0.09	4.26	0.06	<0.05	40.29
50	BLD/PBH01/49	52.00	53.00	1.00	1.99	<0.05	49.53	<0.05	1.30	1.85	0.14	1.29	<0.05	<0.08	<0.05	0.66	0.06	3.29	<0.05	<0.05	41.01
51	BLD/PBH01/50	53.00	54.00	1.00	2.11	<0.05	48.71	<0.05	1.49	2.14	0.19	1.37	<0.05	<0.08	<0.05	0.72	0.07	3.97	0.06	<0.05	40.54
52	BLD/PBH01/51	54.00	55.00	1.00	2.94	<0.05	46.61	<0.05	1.94	2.77	0.30	1.54	<0.05	<0.08	<0.05	0.93	0.11	5.70	0.06	<0.05	38.92
53	BLD/PBH01/52	55.00	56.00	1.00	2.82	<0.05	47.07	<0.05	1.80	2.57	0.24	1.51	<0.05	<0.08	<0.05	0.95	0.09	5.01	0.07	<0.05	39.55
54	BLD/PBH01/53	56.00	57.00	1.00	2.88	<0.05	46.13	<0.05	2.44	3.48	0.26	1.65	<0.05	<0.08	<0.05	1.25	0.11	5.86	0.07	<0.05	38.18
55	BLD/PBH01/54	57.00	58.00	1.00	3.13	<0.05	44.96	<0.05	2.59	3.70	0.31	1.60	<0.05	<0.08	<0.05	1.66	0.13	6.61	0.07	<0.05	37.69
56	BLD/PBH01/55	58.00	59.00	1.00	3.13	<0.05	46.23	<0.05	2.00	2.86	0.29	1.46	<0.05	<0.08	<0.05	1.15	0.14	5.94	0.08	<0.05	38.61
57	BLD/PBH01/56	59.00	60.00	1.00	3.62	<0.05	45.05	<0.05	2.48	3.54	0.33	1.49	<0.05	<0.08	<0.05	1.52	0.16	6.60	0.07	<0.05	37.45
58	BLD/PBH01/57	60.00	61.00	1.00	4.12	<0.05	43.48	<0.05	3.31	4.73	0.44	1.44	<0.05	<0.08	<0.05	1.70	0.21	7.41	0.06	<0.05	36.27
59	BLD/PBH01/58	61.00	62.00	1.00	2.88	<0.05	46.88	<0.05	2.31	3.30	0.26	1.18	<0.05	<0.08	<0.05	1.47	0.14	4.94	0.07	<0.05	38.75
60	BLD/PBH01/59	62.00	63.00	1.00	3.62	<0.05	44.96	<0.05	2.37	3.38	0.30	1.33	<0.05	<0.08	<0.05	1.53	0.17	6.66	0.07	<0.05	37.84
61	BLD/PBH01/60	63.00	64.00	1.00	3.46	<0.05	44.38	<0.05	2.72	3.89	0.28	1.48	<0.05	<0.08	<0.05	1.46	0.17	6.99	0.08	<0.05	37.54
62	BLD/PBH01/61	64.00	65.00	1.00	4.75	<0.05	40.86	<0.05	3.23	4.62	0.42	1.55	<0.05	<0.08	<0.05	2.11	0.31	10.59	<0.05	<0.05	34.58
63	BLD/PBH01/62	65.00	66.00	1.00	11.02	<0.05	24.59	<0.05	3.80	5.44	1.26	1.49	<0.05	<0.08	0.06	3.06	1.02	27.90	<0.05	<0.05	23.94
64	BLD/PBH01/63	66.00	67.00	1.00	7.72	<0.05	30.57	<0.05	3.34	4.77	0.94	1.13	<0.05	<0.08	<0.05	2.66	0.92	24.16	<0.05	<0.05	26.92
65	BLD/PBH01/64	67.00	68.00	1.00	10.52	<0.05	30.51	<0.05	3.31	4.73	1.03	1.31	<0.05	<0.08	<0.05	2.54	0.75	20.44	<0.05	<0.05	27.99
66	BLD/PBH01/65	68.00	69.00	1.00	5.72	<0.05	33.27	<0.05	3.46	4.94	0.74	1.19	<0.05	<0.08	<0.05	2.12	0.67	22.25	<0.05	<0.05	28.82
67	BLD/PBH01/66	69.00	70.00	1.00	6.14	<0.05	13.99	<0.05	4.09	5.84	1.16	0.92	<0.05	<0.08	<0.05	2.57	1.10	54.00	<0.05	<0.05	13.91
68	BLD/PBH01/67	70.00	71.00	1.00	10.10	<0.05	16.03	<0.05	4.43	6.34	1.53	1.16	<0.05	<0.08	<0.05	2.73	1.08	43.62	<0.05	<0.05	17.15
69	BLD/PBH01/68	71.00	72.00	1.00	15.01	<0.05	7.96	<0.05	5.12	7.31	1.74	1.35	<0.05	<0.08	0.05	2.99	1.39	48.89	<0.05	<0.05	13.02
70	BLD/PBH01/69	72.00	73.00	1.00	11.96	<0.05	14.12	<0.05	5.45	7.80	1.65	1.32	<0.05	<0.08	0.11	2.99	1.20	42.02	<0.05	<0.05	16.59

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-01

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
71	BLD/PBH01/70	73.00	74.00	1.00	11.59	<0.05	16.01	<0.05	4.92	7.04	1.53	1.19	<0.05	<0.08	0.07	3.33	1.15	40.24	<0.05	<0.05	17.61
72	BLD/PBH01/71	74.00	75.00	1.00	4.36	<0.05	5.21	<0.05	1.84	2.63	0.63	0.34	<0.05	<0.08	<0.05	1.55	0.70	78.26	<0.05	<0.05	6.07
73	BLD/PBH01/72	75.00	76.00	1.00	4.83	<0.05	17.90	<0.05	2.33	3.34	0.64	0.57	<0.05	<0.08	<0.05	1.63	0.97	53.76	<0.05	<0.05	15.99
74	BLD/PBH01/73	76.00	77.00	1.00	9.32	<0.05	15.32	<0.05	4.13	5.91	1.31	0.91	<0.05	<0.08	0.06	3.36	1.08	46.77	<0.05	<0.05	15.70
75	BLD/PBH01/74	77.00	78.00	1.00	9.83	<0.05	16.07	<0.05	3.73	5.33	1.29	0.88	<0.05	<0.08	<0.05	2.57	1.02	46.20	<0.05	<0.05	16.53
76	BLD/PBH01/75	78.00	79.00	1.00	11.48	<0.05	4.12	<0.05	4.14	5.92	2.06	1.00	<0.05	<0.08	<0.05	2.53	1.72	62.84	<0.05	<0.05	7.94
77	BLD/PBH01/76	79.00	80.00	1.00	9.16	<0.05	4.73	<0.05	3.36	4.81	1.66	0.73	<0.05	<0.08	<0.05	3.06	1.58	66.31	<0.05	<0.05	7.58
78	BLD/PBH01/77	80.00	81.00	1.00	5.69	<0.05	35.77	<0.05	4.39	6.28	0.69	1.29	0.09	<0.08	0.09	2.50	0.49	15.83	<0.05	<0.05	31.10
79	BLD/PBH01/78	81.00	82.00	1.00	6.02	<0.05	39.56	<0.05	2.50	3.57	0.56	0.83	0.11	<0.08	0.07	3.14	0.36	11.70	<0.05	<0.05	33.92
80	BLD/PBH01/79	82.00	82.76	0.76	4.68	<0.05	37.88	<0.05	5.66	8.09	0.40	0.68	0.12	<0.08	<0.05	8.30	0.26	12.96	<0.05	<0.05	26.47
81	BLD/PBH01/80	82.76	84.00	1.24	0.66	<0.05	0.34	<0.05	3.77	5.39	0.10	<0.05	<0.05	<0.08	<0.05	7.63	0.17	82.82	<0.05	<0.05	2.63
82	BLD/PBH01/81	84.00	85.25	1.25	15.32	<0.05	0.57	<0.05	5.44	7.78	1.28	0.49	<0.05	<0.08	<0.05	2.84	0.98	56.73	<0.05	<0.05	13.77
83	BLD/PBH01/82	85.25	85.78	0.53	8.89	<0.05	7.51	<0.05	2.59	3.70	0.87	0.42	<0.05	<0.08	<0.05	4.88	0.78	62.65	<0.05	<0.05	9.91
84	BLD/PBH01/83	85.78	87.00	1.22	20.20	<0.05	2.22	<0.05	4.79	6.85	2.21	0.99	<0.05	<0.08	<0.05	6.39	1.21	47.28	<0.05	<0.05	12.40
85	BLD/PBH01/84	87.00	88.00	1.00	19.74	<0.05	1.17	<0.05	5.01	7.16	2.09	0.96	<0.05	<0.08	0.05	5.55	1.30	48.28	<0.05	<0.05	13.50

ANNEXURE IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-02

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	BLD/PBH02/01	3.00	4.40	1.40	13.07	<0.05	19.67	<0.05	7.22	10.32	1.75	2.50	0.27	<0.08	0.20	1.06	0.73	30.28	<0.05	<0.05	20.13
2	BLD/PBH02/02	4.40	5.00	0.60	4.92	<0.05	35.33	<0.05	8.54	12.20	0.47	2.78	0.63	<0.08	0.19	0.32	0.23	11.10	<0.05	<0.05	31.81
3	BLD/PBH02/03	5.00	6.00	1.00	4.72	<0.05	34.43	<0.05	10.99	15.71	0.42	3.08	0.61	<0.08	0.55	0.53	0.22	8.77	<0.05	<0.05	30.94
4	BLD/PBH02/04	6.00	7.00	1.00	3.81	<0.05	37.99	<0.05	8.79	12.56	0.28	2.75	1.22	<0.08	0.26	2.09	0.16	6.66	<0.05	<0.05	32.20
5	BLD/PBH02/05	7.00	8.00	1.00	2.69	<0.05	41.05	<0.05	7.58	10.84	0.16	2.68	1.24	<0.08	0.21	1.63	0.11	4.75	<0.05	<0.05	34.62
6	BLD/PBH02/06	8.00	9.00	1.00	2.91	<0.05	40.76	<0.05	7.47	10.68	0.14	3.01	1.31	<0.08	0.24	0.58	0.10	4.04	<0.05	<0.05	36.21
7	BLD/PBH02/07	9.00	10.00	1.00	3.26	<0.05	38.47	<0.05	9.95	14.23	0.13	2.96	1.18	<0.08	0.34	1.20	0.12	4.44	<0.05	<0.05	33.63
8	BLD/PBH02/08	10.00	11.00	1.00	4.54	<0.05	36.04	<0.05	9.32	13.33	0.32	3.50	1.21	<0.08	0.35	0.68	0.19	7.10	<0.05	<0.05	32.72
9	BLD/PBH02/09	11.00	12.00	1.00	3.03	<0.05	40.43	<0.05	6.99	10.00	0.21	2.85	0.90	<0.08	0.17	1.47	0.12	6.47	<0.05	<0.05	34.33
10	BLD/PBH02/10	12.00	13.00	1.00	4.24	<0.05	38.36	<0.05	7.96	11.38	0.24	2.75	0.59	<0.08	0.24	3.55	0.14	6.39	<0.05	<0.05	32.08
11	BLD/PBH02/11	13.00	14.00	1.00	2.73	<0.05	45.18	<0.05	4.18	5.98	0.17	1.91	0.47	<0.08	0.13	2.14	0.10	4.20	<0.05	<0.05	36.96
12	BLD/PBH02/12	14.00	15.00	1.00	2.98	<0.05	44.92	<0.05	3.35	4.79	0.19	1.78	0.38	<0.08	0.08	2.63	0.11	4.83	<0.05	<0.05	37.30
13	BLD/PBH02/13	15.00	16.00	1.00	2.12	<0.05	47.08	<0.05	2.49	3.56	0.17	1.49	0.33	<0.08	0.09	3.06	0.09	3.90	<0.05	<0.05	38.08
14	BLD/PBH02/14	16.00	17.00	1.00	2.27	<0.05	47.78	<0.05	2.24	3.21	0.12	1.56	0.31	<0.08	0.07	2.57	0.08	3.53	<0.05	<0.05	38.49
15	BLD/PBH02/15	17.00	18.00	1.00	3.30	<0.05	43.86	<0.05	3.69	5.28	0.19	2.16	0.31	<0.08	0.09	3.13	0.11	5.66	<0.05	<0.05	35.89
16	BLD/PBH02/16	18.00	19.00	1.00	2.96	<0.05	44.90	<0.05	3.56	5.10	0.13	2.06	0.32	<0.08	0.11	2.37	0.10	4.85	<0.05	<0.05	37.08
17	BLD/PBH02/17	19.00	20.00	1.00	2.78	<0.05	43.92	<0.05	4.29	6.13	0.15	2.18	0.35	<0.08	0.13	2.32	0.09	5.43	<0.05	<0.05	36.47
18	BLD/PBH02/18	20.00	21.00	1.00	2.03	<0.05	46.45	<0.05	4.51	6.45	0.09	1.79	0.40	<0.08	0.17	1.32	0.06	3.35	<0.05	<0.05	37.86
19	BLD/PBH02/19	21.00	22.00	1.00	2.70	<0.05	44.04	<0.05	5.68	8.13	0.16	1.92	0.27	<0.08	0.20	1.86	0.10	4.70	<0.05	<0.05	35.90
20	BLD/PBH02/20	22.00	23.00	1.00	3.16	<0.05	39.69	<0.05	10.36	14.81	0.18	2.14	0.18	<0.08	0.35	1.66	0.14	4.96	<0.05	<0.05	32.71
21	BLD/PBH02/21	23.00	24.00	1.00	4.76	<0.05	34.67	0.08	12.98	18.56	0.28	2.64	0.16	<0.08	0.37	1.26	0.18	6.98	<0.05	<0.05	30.06
22	BLD/PBH02/22	24.00	25.00	1.00	4.18	<0.05	37.64	<0.05	10.67	15.25	0.26	2.35	0.15	<0.08	0.34	1.68	0.16	6.15	<0.05	<0.05	31.81
23	BLD/PBH02/23	25.00	26.00	1.00	2.99	<0.05	42.37	<0.05	8.09	11.57	0.18	1.90	0.11	<0.08	0.32	1.29	0.11	4.18	<0.05	<0.05	34.95
24	BLD/PBH02/24	26.00	27.00	1.00	2.28	<0.05	48.38	<0.05	2.00	2.86	0.18	1.41	0.12	<0.08	0.08	1.29	0.11	3.96	<0.05	<0.05	39.32
25	BLD/PBH02/25	27.00	28.00	1.00	3.72	<0.05	43.29	<0.05	4.30	6.15	0.36	1.85	0.10	<0.08	0.16	1.64	0.18	6.63	<0.05	<0.05	35.91
26	BLD/PBH02/26	28.00	29.00	1.00	4.65	<0.05	40.48	<0.05	5.60	8.01	0.44	2.26	0.10	<0.08	0.25	1.21	0.22	7.87	<0.05	<0.05	34.50
27	BLD/PBH02/27	29.00	30.40	1.40	6.11	<0.05	34.81	<0.05	6.73	9.62	0.63	3.43	0.06	<0.08	0.35	1.02	0.30	11.78	<0.05	<0.05	31.86
28	BLD/PBH02/28	30.40	31.62	1.22	5.40	<0.05	37.72	<0.05	6.20	8.86	0.53	2.53	0.06	<0.08	0.31	0.83	0.25	10.76	<0.05	<0.05	32.73
29	BLD/PBH02/29	31.62	33.00	1.38	22.28	<0.05	0.63	<0.05	8.42	12.05	3.03	3.35	<0.05	0.46	0.58	0.94	1.03	47.45	<0.05	<0.05	8.17
30	BLD/PBH02/30	33.00	34.00	1.00	22.24	<0.05	0.98	<0.05	8.46	12.09	2.95	3.37	<0.05	0.37	0.43	1.28	1.04	47.10	<0.05	<0.05	8.12
31	BLD/PBH02/31	34.00	34.70	0.70	21.68	<0.05	0.51	<0.05	9.02	12.90	2.81	3.45	<0.05	0.30	0.12	1.74	1.02	46.92	<0.05	<0.05	8.54
32	BLD/PBH02/32	34.70	36.00	1.30	11.19	<0.05	24.50	<0.05	7.22	10.32	1.36	2.87	<0.05	<0.08	0.19	0.91	0.52	24.33	<0.05	<0.05	23.71

ANNEXURE IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-02

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
33	BLD/PBH02/33	36.00	37.00	1.00	4.66	<0.05	40.59	<0.05	3.98	5.68	0.49	2.35	0.06	<0.08	0.14	1.00	0.21	10.15	<0.05	<0.05	34.64
34	BLD/PBH02/34	37.00	38.00	1.00	4.86	<0.05	41.15	<0.05	2.79	4.00	0.53	2.53	<0.05	<0.08	0.09	0.81	0.21	10.69	<0.05	<0.05	35.06
35	BLD/PBH02/35	38.00	39.00	1.00	3.98	<0.05	42.67	<0.05	2.29	3.28	0.37	2.95	<0.05	<0.08	0.07	1.13	0.15	8.95	<0.05	<0.05	36.40
36	BLD/PBH02/36	39.00	40.00	1.00	2.59	<0.05	46.87	<0.05	1.76	2.52	0.23	2.50	<0.05	<0.08	0.05	0.81	0.10	5.65	<0.05	<0.05	38.61
37	BLD/PBH02/37	40.00	41.00	1.00	2.61	<0.05	45.26	<0.05	2.12	3.04	0.21	3.08	0.11	<0.08	0.07	1.32	0.09	5.20	<0.05	<0.05	38.99
38	BLD/PBH02/38	41.00	42.00	1.00	2.99	<0.05	45.14	<0.05	2.52	3.60	0.25	2.39	0.20	<0.08	0.07	1.78	0.10	5.71	<0.05	<0.05	37.73
39	BLD/PBH02/39	42.00	43.00	1.00	2.26	<0.05	46.60	<0.05	2.49	3.56	0.16	2.21	0.30	<0.08	0.08	2.02	0.08	4.26	<0.05	<0.05	38.45
40	BLD/PBH02/40	43.00	44.00	1.00	2.76	<0.05	45.19	<0.05	3.02	4.32	0.20	2.76	0.29	<0.08	0.10	1.68	0.09	4.61	<0.05	<0.05	37.99
41	BLD/PBH02/41	44.00	45.00	1.00	1.76	<0.05	49.38	<0.05	1.52	2.17	0.13	1.57	0.22	<0.08	0.06	1.31	0.07	3.19	<0.05	<0.05	40.12
42	BLD/PBH02/42	45.00	46.00	1.00	1.81	<0.05	48.63	<0.05	1.71	2.44	0.15	1.67	0.20	<0.08	0.06	1.59	0.08	3.67	<0.05	<0.05	39.69
43	BLD/PBH02/43	46.00	47.00	1.00	2.12	<0.05	48.19	<0.05	1.73	2.48	0.14	1.80	0.15	<0.08	0.06	1.66	0.08	3.63	<0.05	<0.05	39.68
44	BLD/PBH02/44	47.00	48.00	1.00	3.22	<0.05	43.62	<0.05	3.24	4.63	0.31	2.99	0.12	<0.08	0.15	0.74	0.16	6.24	<0.05	<0.05	37.78
45	BLD/PBH02/45	48.00	49.00	1.00	3.71	<0.05	42.36	<0.05	4.21	6.03	0.35	2.91	0.17	<0.08	0.14	0.75	0.17	7.05	<0.05	<0.05	36.36
46	BLD/PBH02/46	49.00	50.00	1.00	3.42	<0.05	42.46	<0.05	4.23	6.05	0.32	3.43	0.06	<0.08	0.30	0.67	0.15	5.98	<0.05	<0.05	37.14
47	BLD/PBH02/47	50.00	51.00	1.00	3.89	<0.05	42.30	<0.05	4.00	5.71	0.36	2.85	<0.05	<0.08	0.24	0.70	0.18	7.03	<0.05	<0.05	36.72
48	BLD/PBH02/48	51.00	52.00	1.00	4.60	<0.05	40.07	<0.05	2.35	3.35	0.50	4.00	<0.05	<0.08	0.08	0.50	0.22	9.74	<0.05	<0.05	36.90
49	BLD/PBH02/49	52.00	53.00	1.00	5.01	<0.05	38.36	<0.05	3.97	5.68	0.53	3.83	<0.05	<0.08	0.16	0.61	0.24	10.27	<0.05	<0.05	35.28
50	BLD/PBH02/50	53.00	54.00	1.00	4.73	<0.05	40.36	<0.05	4.59	6.56	0.44	2.82	<0.05	<0.08	0.20	0.60	0.22	8.90	<0.05	<0.05	35.16
51	BLD/PBH02/51	54.00	55.00	1.00	3.14	<0.05	44.85	<0.05	1.71	2.45	0.29	2.89	<0.05	<0.08	0.09	0.82	0.14	6.45	<0.05	<0.05	38.85
52	BLD/PBH02/52	55.00	56.00	1.00	5.56	<0.05	38.92	<0.05	3.63	5.19	0.52	3.32	<0.05	<0.08	0.15	0.87	0.26	10.45	<0.05	<0.05	34.76
53	BLD/PBH02/53	56.00	57.00	1.00	3.06	<0.05	45.68	<0.05	1.91	2.73	0.27	2.29	<0.05	<0.08	0.12	1.09	0.13	5.52	<0.05	<0.05	39.09
54	BLD/PBH02/54	57.00	58.00	1.00	3.50	<0.05	44.60	<0.05	3.15	4.50	0.26	2.15	<0.05	<0.08	0.15	1.41	0.13	5.72	<0.05	<0.05	37.56
55	BLD/PBH02/55	58.00	59.00	1.00	2.60	<0.05	47.01	<0.05	2.10	3.00	0.19	1.96	<0.05	<0.08	0.10	1.43	0.09	4.85	<0.05	<0.05	38.76
56	BLD/PBH02/56	59.00	60.00	1.00	3.28	<0.05	45.74	<0.05	2.18	3.11	0.22	1.89	<0.05	<0.08	0.10	1.81	0.11	5.64	<0.05	<0.05	38.07
57	BLD/PBH02/57	60.00	61.00	1.00	2.47	<0.05	47.89	<0.05	1.72	2.47	0.17	1.68	<0.05	<0.08	0.12	1.72	0.09	4.37	<0.05	<0.05	38.99
58	BLD/PBH02/58	61.00	62.00	1.00	2.78	<0.05	48.00	<0.05	1.03	1.47	0.23	1.53	<0.05	<0.08	<0.05	0.93	0.12	5.00	<0.05	<0.05	39.87
59	BLD/PBH02/59	62.00	63.00	1.00	3.16	<0.05	46.89	<0.05	1.49	2.13	0.24	1.72	<0.05	<0.08	0.06	1.22	0.13	5.46	<0.05	<0.05	38.96
60	BLD/PBH02/60	63.00	64.00	1.00	3.44	<0.05	46.40	<0.05	1.36	1.95	0.29	1.67	<0.05	<0.08	<0.05	1.32	0.15	6.07	<0.05	<0.05	38.65
61	BLD/PBH02/61	64.00	65.00	1.00	2.94	<0.05	48.09	<0.05	1.16	1.66	0.19	1.62	<0.05	<0.08	<0.05	1.01	0.11	4.84	<0.05	<0.05	39.48
62	BLD/PBH02/62	65.00	66.00	1.00	1.72	<0.05	50.26	<0.05	1.09	1.55	0.10	1.57	<0.05	<0.08	0.06	0.79	0.06	3.13	<0.05	<0.05	40.72
63	BLD/PBH02/63	66.00	67.00	1.00	1.17	<0.05	52.02	<0.05	0.78	1.12	<0.05	1.23	<0.05	<0.08	<0.05	0.50	<0.05	1.84	<0.05	<0.05	41.96
64	BLD/PBH02/64	67.00	68.00	1.00	0.93	<0.05	52.60	<0.05	0.65	0.93	<0.05	1.14	<0.05	<0.08	0.05	0.73	<0.05	1.49	<0.05	<0.05	42.02

ANNEXURE IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-02

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
65	BLD/PBH02/65	68.00	69.00	1.00	1.46	<0.05	51.92	<0.05	0.62	0.88	0.07	1.15	<0.05	<0.08	<0.05	0.65	<0.05	1.86	<0.05	<0.05	41.89
66	BLD/PBH02/66	69.00	70.00	1.00	1.11	<0.05	52.25	<0.05	0.56	0.80	0.09	1.09	<0.05	<0.08	0.05	0.67	<0.05	2.04	<0.05	<0.05	41.83
67	BLD/PBH02/67	70.00	71.00	1.00	1.40	<0.05	52.00	<0.05	0.60	0.86	0.09	1.10	<0.05	<0.08	0.06	0.69	<0.05	1.98	<0.05	<0.05	41.74
68	BLD/PBH02/68	71.00	72.00	1.00	1.91	<0.05	50.59	<0.05	0.80	1.14	0.14	1.29	<0.05	<0.08	<0.05	0.81	0.07	2.94	<0.05	<0.05	41.04
69	BLD/PBH02/69	72.00	73.00	1.00	2.00	<0.05	50.48	0.06	0.72	1.03	0.15	1.24	<0.05	<0.08	<0.05	0.66	0.06	3.01	<0.05	<0.05	41.25
70	BLD/PBH02/70	73.00	74.00	1.00	2.32	<0.05	49.43	<0.05	0.94	1.34	0.18	1.33	<0.05	<0.08	0.06	0.96	0.08	3.72	<0.05	<0.05	40.54
71	BLD/PBH02/71	74.00	75.00	1.00	1.86	<0.05	50.47	<0.05	0.87	1.24	0.14	1.36	<0.05	<0.08	0.06	0.85	0.06	2.88	<0.05	<0.05	41.04
72	BLD/PBH02/72	75.00	76.00	1.00	1.54	<0.05	51.37	<0.05	0.65	0.94	0.13	1.24	<0.05	<0.08	<0.05	0.57	0.05	2.45	<0.05	<0.05	41.64
73	BLD/PBH02/73	76.00	77.00	1.00	2.07	<0.05	50.01	<0.05	0.93	1.33	0.16	1.38	<0.05	<0.08	<0.05	0.80	0.06	3.27	<0.05	<0.05	40.84
74	BLD/PBH02/74	77.00	78.00	1.00	1.60	<0.05	50.85	<0.05	1.04	1.48	0.10	1.33	<0.05	<0.08	0.05	1.02	<0.05	2.36	<0.05	<0.05	41.13
75	BLD/PBH02/75	78.00	79.00	1.00	1.74	<0.05	50.36	<0.05	1.07	1.53	0.14	1.36	<0.05	<0.08	0.06	1.04	0.06	2.92	<0.05	<0.05	40.78
76	BLD/PBH02/76	79.00	80.00	1.00	1.28	<0.05	51.97	<0.05	0.66	0.94	0.11	1.19	<0.05	<0.08	<0.05	0.59	<0.05	2.35	<0.05	<0.05	41.47
77	BLD/PBH02/77	80.00	81.00	1.00	1.10	<0.05	52.19	<0.05	0.64	0.91	0.09	1.19	<0.05	<0.08	<0.05	0.51	<0.05	1.96	<0.05	<0.05	41.94
78	BLD/PBH02/78	81.00	82.00	1.00	1.43	<0.05	51.07	<0.05	0.88	1.27	0.11	1.34	<0.05	<0.08	<0.05	0.72	0.05	2.76	<0.05	<0.05	41.17
79	BLD/PBH02/79	82.00	83.00	1.00	1.45	<0.05	51.60	<0.05	0.60	0.85	0.11	1.21	<0.05	<0.08	<0.05	0.54	<0.05	2.36	<0.05	<0.05	41.77
80	BLD/PBH02/80	83.00	84.00	1.00	1.89	<0.05	50.90	<0.05	0.56	0.80	0.14	1.25	<0.05	<0.08	<0.05	0.44	0.07	2.93	<0.05	<0.05	41.52
81	BLD/PBH02/81	84.00	85.00	1.00	2.23	<0.05	49.64	<0.05	0.94	1.35	0.17	1.45	<0.05	<0.08	<0.05	0.66	0.08	3.95	<0.05	<0.05	40.43
82	BLD/PBH02/82	85.00	86.00	1.00	2.03	<0.05	50.04	<0.05	1.03	1.47	0.15	1.48	<0.05	<0.08	<0.05	0.67	0.06	3.54	<0.05	<0.05	40.48
83	BLD/PBH02/83	86.00	87.00	1.00	2.16	<0.05	49.60	<0.05	1.20	1.72	0.17	1.54	<0.05	<0.08	<0.05	0.68	0.06	3.92	<0.05	<0.05	40.07
84	BLD/PBH02/84	87.00	88.00	1.00	2.50	<0.05	48.57	<0.05	1.31	1.88	0.23	1.59	<0.05	<0.08	<0.05	0.81	0.08	4.67	<0.05	<0.05	39.60
85	BLD/PBH02/85	88.00	89.00	1.00	2.70	<0.05	47.90	<0.05	1.44	2.06	0.20	1.62	<0.05	<0.08	<0.05	1.04	0.08	4.52	<0.05	<0.05	39.81
86	BLD/PBH02/86	89.00	90.00	1.00	2.60	<0.05	47.31	<0.05	1.77	2.53	0.21	1.69	<0.05	<0.08	0.07	1.28	0.10	5.01	<0.05	<0.05	39.18
87	BLD/PBH02/87	90.00	91.00	1.00	2.69	<0.05	47.28	<0.05	1.67	2.39	0.25	1.64	<0.05	<0.08	0.07	1.02	0.11	5.56	<0.05	<0.05	38.98
88	BLD/PBH02/88	91.00	92.00	1.00	3.51	<0.05	45.68	<0.05	1.70	2.43	0.32	1.67	<0.05	<0.08	0.05	1.04	0.15	6.80	<0.05	<0.05	38.34
89	BLD/PBH02/89	92.00	93.00	1.00	3.21	<0.05	46.19	<0.05	2.12	3.03	0.27	1.55	<0.05	<0.08	0.07	1.36	0.13	5.57	<0.05	<0.05	38.59
90	BLD/PBH02/90	93.00	94.00	1.00	3.35	<0.05	45.73	<0.05	2.69	3.84	0.30	1.49	<0.05	<0.08	0.08	1.35	0.15	5.62	<0.05	<0.05	38.07
91	BLD/PBH02/91	94.00	95.00	1.00	3.78	<0.05	45.11	<0.05	2.31	3.31	0.33	1.45	<0.05	<0.08	0.07	1.61	0.17	6.51	<0.05	<0.05	37.65
92	BLD/PBH02/92	95.00	96.00	1.00	3.35	<0.05	45.99	<0.05	1.86	2.65	0.26	1.48	<0.05	<0.08	<0.05	1.30	0.14	6.13	<0.05	<0.05	38.63
93	BLD/PBH02/93	96.00	97.00	1.00	3.62	<0.05	44.86	<0.05	2.32	3.31	0.26	1.70	<0.05	<0.08	0.08	1.35	0.15	7.14	<0.05	<0.05	37.48
94	BLD/PBH02/94	97.00	98.00	1.00	10.49	<0.05	25.79	<0.05	3.54	5.07	1.12	1.68	<0.05	<0.08	0.05	2.68	0.96	26.61	<0.05	<0.05	25.53
95	BLD/PBH02/95	98.00	99.12	1.12	13.12	<0.05	21.55	<0.05	3.85	5.50	1.33	1.65	<0.05	<0.08	<0.05	2.80	1.12	30.44	<0.05	<0.05	22.44
96	BLD/PBH02/96	99.12	100.00	0.88	5.27	<0.05	42.27	<0.05	1.75	2.50	0.47	1.24	<0.05	<0.08	0.08	1.12	0.34	10.53	<0.05	<0.05	36.16

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	BLD/PBH03/01	14.00	15.00	1.00	18.34	<0.05	2.22	<0.05	7.85	11.23	2.68	2.27	0.06	<0.08	0.44	2.13	1.09	48.33	<0.05	<0.05	11.01
2	BLD/PBH03/02	15.00	15.70	0.70	20.13	<0.05	1.51	<0.05	6.79	9.70	3.01	2.37	<0.05	<0.08	0.14	1.42	1.17	50.81	<0.05	<0.05	9.52
3	BLD/PBH03/03	15.70	17.00	1.30	3.99	<0.05	36.05	<0.05	9.43	13.48	0.39	2.26	0.67	<0.08	0.22	0.38	0.20	8.52	0.10	<0.05	33.61
4	BLD/PBH03/04	17.00	18.00	1.00	5.02	<0.05	31.65	<0.05	11.16	15.96	0.53	2.54	1.47	<0.08	0.21	2.61	0.24	10.18	0.07	<0.05	29.33
5	BLD/PBH03/05	18.00	19.00	1.00	2.25	<0.05	40.32	<0.05	8.40	12.02	0.11	2.27	1.38	<0.08	0.17	1.63	0.08	3.55	0.09	<0.05	35.97
6	BLD/PBH03/06	19.00	20.00	1.00	2.18	<0.05	40.91	<0.05	7.61	10.88	0.09	2.62	1.48	<0.08	0.09	1.41	0.07	3.10	0.10	<0.05	36.88
7	BLD/PBH03/07	20.00	21.00	1.00	3.21	<0.05	36.13	<0.05	11.70	16.73	0.14	2.52	1.22	<0.08	0.16	1.09	0.11	4.79	0.08	<0.05	33.61
8	BLD/PBH03/08	21.00	22.00	1.00	4.38	<0.05	33.85	<0.05	11.23	16.06	0.31	2.98	1.21	<0.08	0.17	0.85	0.17	7.11	0.08	0.05	32.64
9	BLD/PBH03/09	22.00	23.00	1.00	2.86	<0.05	39.56	<0.05	7.33	10.48	0.18	2.40	0.91	<0.08	0.11	1.39	0.11	6.66	0.08	<0.05	35.12
10	BLD/PBH03/10	23.00	24.00	1.00	3.59	<0.05	37.85	<0.05	8.32	11.90	0.27	2.35	0.63	<0.08	0.23	3.30	0.15	6.14	0.08	<0.05	33.28
11	BLD/PBH03/11	24.00	25.00	1.00	2.98	<0.05	42.60	<0.05	5.43	7.76	0.21	1.81	0.46	<0.08	0.16	2.31	0.12	5.07	0.08	<0.05	36.32
12	BLD/PBH03/12	25.00	26.00	1.00	2.25	<0.05	46.13	<0.05	3.12	4.47	0.14	1.40	0.45	<0.08	<0.05	2.27	0.08	3.58	0.08	<0.05	39.04
13	BLD/PBH03/13	26.00	27.00	1.00	1.93	<0.05	47.64	<0.05	2.34	3.35	0.13	1.25	0.36	<0.08	<0.05	2.39	0.08	2.91	0.07	<0.05	39.77
14	BLD/PBH03/14	27.00	28.00	1.00	2.62	<0.05	44.82	<0.05	3.38	4.83	0.16	1.53	0.34	<0.08	<0.05	3.08	0.10	4.61	0.07	<0.05	37.71

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
15	BLD/PBH03/15	28.00	29.00	1.00	2.51	<0.05	44.64	<0.05	3.81	5.45	0.15	1.77	0.38	<0.08	<0.05	2.57	0.10	4.60	0.07	<0.05	37.64
16	BLD/PBH03/16	29.00	30.00	1.00	2.72	<0.05	44.01	<0.05	4.48	6.41	0.12	1.82	0.38	<0.08	<0.05	2.36	0.09	4.44	0.06	<0.05	37.44
17	BLD/PBH03/17	30.00	31.00	1.00	2.71	<0.05	42.73	<0.05	5.47	7.82	0.16	2.01	0.40	<0.08	0.05	2.44	0.10	5.08	0.07	<0.05	36.31
18	BLD/PBH03/18	31.00	32.00	1.00	2.25	<0.05	43.65	<0.05	6.33	9.05	0.11	1.68	0.42	<0.08	0.09	1.45	0.08	3.90	0.06	<0.05	37.14
19	BLD/PBH03/19	32.00	33.00	1.00	2.51	<0.05	43.73	<0.05	5.69	8.13	0.13	1.57	0.29	<0.08	0.09	2.06	0.09	4.16	0.06	<0.05	37.06
20	BLD/PBH03/20	33.00	34.00	1.00	3.38	<0.05	34.96	<0.05	13.84	19.78	0.20	1.97	0.24	<0.08	0.23	1.56	0.13	5.64	0.06	0.05	31.70
21	BLD/PBH03/21	34.00	35.00	1.00	3.91	<0.05	33.86	<0.05	13.81	19.74	0.26	2.16	0.28	<0.08	0.29	1.31	0.16	6.49	0.06	0.05	31.33
22	BLD/PBH03/22	35.00	36.00	1.00	3.58	<0.05	36.60	<0.05	11.63	16.63	0.23	1.95	0.19	<0.08	0.22	1.58	0.14	5.64	0.06	<0.05	33.05
23	BLD/PBH03/23	36.00	37.00	1.00	2.19	<0.05	45.13	<0.05	5.59	7.99	0.15	1.40	0.17	<0.08	0.11	0.93	0.09	3.55	0.07	<0.05	38.12
24	BLD/PBH03/24	37.00	38.00	1.00	2.89	<0.05	45.45	<0.05	3.31	4.74	0.23	1.36	0.10	<0.08	<0.05	1.89	0.13	4.71	0.07	<0.05	38.30
25	BLD/PBH03/25	38.00	39.00	1.00	3.82	<0.05	41.73	<0.05	5.55	7.94	0.37	1.75	0.15	<0.08	0.11	1.40	0.19	6.71	0.08	<0.05	35.63
26	BLD/PBH03/26	39.00	40.00	1.00	5.21	<0.05	37.45	<0.05	6.53	9.34	0.55	2.37	0.11	<0.08	0.18	1.28	0.27	9.44	0.07	<0.05	33.60
27	BLD/PBH03/27	40.00	41.00	1.00	5.46	<0.05	34.14	<0.05	7.78	11.12	0.60	3.10	0.08	<0.08	0.23	0.93	0.29	11.40	0.08	<0.05	32.42
28	BLD/PBH03/28	41.00	42.26	1.26	4.92	<0.05	37.31	<0.05	6.55	9.37	0.50	2.21	0.06	<0.08	0.19	0.78	0.24	10.17	0.08	<0.05	34.03
29	BLD/PBH03/29	42.26	43.00	0.74	17.05	<0.05	1.23	<0.05	14.51	20.74	3.73	2.46	<0.05	0.27	0.14	1.16	1.35	43.03	0.12	<0.05	8.50

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
30	BLD/PBH03/30	43.00	44.20	1.20	21.64	<0.05	0.74	<0.05	8.04	11.49	3.21	2.96	<0.05	0.54	0.12	1.26	1.03	47.71	<0.05	<0.05	9.13
31	BLD/PBH03/31	44.20	45.50	1.30	21.26	<0.05	0.83	<0.05	8.37	11.97	3.00	3.12	<0.05	0.46	0.12	1.17	1.03	47.77	<0.05	<0.05	9.10
32	BLD/PBH03/32	45.50	46.40	0.90	9.95	<0.05	26.33	<0.05	7.29	10.42	1.24	2.47	0.06	0.09	0.16	1.15	0.46	21.64	0.06	<0.05	25.87
33	BLD/PBH03/33	46.40	47.00	0.60	7.93	<0.05	32.12	<0.05	5.53	7.91	0.99	2.41	<0.05	0.09	0.27	0.85	0.37	17.78	0.08	<0.05	29.09
34	BLD/PBH03/34	47.00	48.00	1.00	5.69	<0.05	37.31	<0.05	4.97	7.10	0.67	2.40	<0.05	<0.08	0.14	1.18	0.26	12.13	0.09	<0.05	32.88
35	BLD/PBH03/35	48.00	49.00	1.00	3.69	<0.05	42.62	<0.05	2.69	3.85	0.36	2.52	<0.05	<0.08	<0.05	1.05	0.15	8.55	0.12	<0.05	36.93
36	BLD/PBH03/36	49.00	50.00	1.00	2.76	<0.05	45.52	<0.05	2.11	3.02	0.25	2.43	<0.05	<0.08	<0.05	0.89	0.11	5.97	0.11	<0.05	38.82
37	BLD/PBH03/37	50.00	51.00	1.00	2.40	<0.05	46.22	<0.05	2.12	3.03	0.21	2.35	0.08	<0.08	<0.05	1.04	0.10	4.98	0.08	<0.05	39.40
38	BLD/PBH03/38	51.00	52.00	1.00	2.65	<0.05	45.04	<0.05	2.85	4.08	0.22	2.44	0.18	<0.08	<0.05	1.68	0.10	4.96	0.10	<0.05	38.42
39	BLD/PBH03/39	52.00	53.00	1.00	1.91	<0.05	47.74	<0.05	2.19	3.13	0.14	1.75	0.26	<0.08	<0.05	1.60	0.07	3.53	0.10	<0.05	39.68
40	BLD/PBH03/40	53.00	54.00	1.00	2.66	<0.05	43.47	<0.05	3.79	5.42	0.23	2.69	0.34	<0.08	0.07	2.28	0.11	5.25	0.09	<0.05	37.29
41	BLD/PBH03/41	54.00	55.00	1.00	2.42	<0.05	45.89	<0.05	3.09	4.41	0.18	1.92	0.23	<0.08	<0.05	1.82	0.09	4.21	0.08	<0.05	38.60
42	BLD/PBH03/42	55.00	56.00	1.00	1.62	<0.05	49.34	<0.05	1.68	2.40	0.12	1.35	0.24	<0.08	<0.05	1.40	0.06	2.92	0.08	<0.05	40.36
43	BLD/PBH03/43	56.00	57.00	1.00	2.05	<0.05	48.08	<0.05	2.15	3.07	0.14	1.49	0.16	<0.08	<0.05	1.74	0.07	3.57	0.08	<0.05	39.46
44	BLD/PBH03/44	57.00	58.00	1.00	2.35	<0.05	46.82	<0.05	2.09	2.99	0.20	1.93	0.16	<0.08	<0.05	1.25	0.11	4.45	0.08	<0.05	39.54

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
45	BLD/PBH03/45	58.00	59.00	1.00	3.56	<0.05	41.87	<0.05	4.87	6.96	0.37	2.64	0.16	<0.08	0.09	0.60	0.18	7.00	0.09	<0.05	36.36
46	BLD/PBH03/46	59.00	60.00	1.00	3.51	<0.05	41.84	<0.05	4.77	6.82	0.35	2.88	0.08	<0.08	0.10	0.73	0.17	6.62	0.11	<0.05	36.69
47	BLD/PBH03/47	60.00	61.00	1.00	3.88	<0.05	40.96	<0.05	4.82	6.89	0.41	2.98	0.12	<0.08	0.07	0.77	0.19	7.61	0.11	<0.05	35.90
48	BLD/PBH03/48	61.00	62.00	1.00	3.32	<0.05	43.14	<0.05	3.65	5.22	0.32	2.63	<0.05	<0.08	<0.05	0.57	0.16	6.39	0.12	<0.05	37.95
49	BLD/PBH03/49	62.00	63.00	1.00	4.44	<0.05	39.91	<0.05	2.69	3.84	0.55	3.84	<0.05	<0.08	<0.05	0.55	0.23	9.93	0.12	<0.05	36.43
50	BLD/PBH03/50	63.00	64.00	1.00	5.15	<0.05	35.57	<0.05	6.07	8.69	0.58	3.87	<0.05	<0.08	0.13	0.54	0.26	10.87	0.10	<0.05	34.12
51	BLD/PBH03/51	64.00	65.00	1.00	3.68	<0.05	42.83	<0.05	3.76	5.38	0.35	2.18	<0.05	<0.08	0.12	0.58	0.18	7.02	0.11	<0.05	37.45
52	BLD/PBH03/52	65.00	66.00	1.00	3.45	<0.05	43.59	<0.05	2.21	3.16	0.35	2.54	<0.05	<0.08	<0.05	0.94	0.17	7.12	0.10	<0.05	38.45
53	BLD/PBH03/53	66.00	67.00	1.00	3.92	<0.05	41.76	<0.05	3.62	5.17	0.36	2.85	<0.05	<0.08	0.10	0.92	0.19	7.25	0.11	<0.05	37.26
54	BLD/PBH03/54	67.00	68.00	1.00	2.68	<0.05	46.74	<0.05	2.04	2.91	0.23	1.76	<0.05	<0.08	<0.05	1.12	0.12	4.71	0.09	<0.05	39.49
55	BLD/PBH03/55	68.00	69.00	1.00	3.14	<0.05	43.84	<0.05	3.82	5.47	0.26	2.09	<0.05	<0.08	0.10	1.34	0.13	5.63	0.09	<0.05	37.81
56	BLD/PBH03/56	69.00	70.00	1.00	3.26	<0.05	44.29	<0.05	2.80	4.00	0.25	1.90	<0.05	<0.08	<0.05	1.91	0.13	6.04	0.08	<0.05	37.98
57	BLD/PBH03/57	70.00	71.00	1.00	2.85	<0.05	45.37	<0.05	2.73	3.90	0.21	1.69	<0.05	<0.08	<0.05	2.13	0.11	5.39	0.07	<0.05	38.12
58	BLD/PBH03/58	71.00	72.00	1.00	1.94	<0.05	48.45	<0.05	1.74	2.49	0.16	1.40	<0.05	<0.08	<0.05	1.44	0.10	3.97	0.09	<0.05	39.82
59	BLD/PBH03/59	72.00	73.00	1.00	2.92	<0.05	46.96	<0.05	1.57	2.24	0.23	1.42	<0.05	<0.08	<0.05	1.62	0.13	5.18	0.07	<0.05	39.12

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
60	BLD/PBH03/60	73.00	74.00	1.00	2.96	<0.05	46.35	<0.05	1.93	2.75	0.26	1.57	<0.05	<0.08	<0.05	1.38	0.14	5.52	0.09	<0.05	38.85
61	BLD/PBH03/61	74.00	75.00	1.00	2.71	<0.05	47.84	<0.05	1.28	1.83	0.23	1.35	<0.05	<0.08	<0.05	1.13	0.13	4.66	0.09	<0.05	39.93
62	BLD/PBH03/62	75.00	76.00	1.00	2.57	<0.05	48.04	<0.05	1.37	1.95	0.19	1.46	<0.05	<0.08	<0.05	0.83	0.11	4.60	0.07	<0.05	40.05
63	BLD/PBH03/63	76.00	77.00	1.00	1.92	<0.05	49.46	<0.05	1.40	2.00	0.11	1.44	<0.05	<0.08	<0.05	0.83	0.07	3.26	0.09	<0.05	40.72
64	BLD/PBH03/64	77.00	78.00	1.00	1.49	<0.05	50.75	<0.05	1.16	1.66	0.07	1.26	<0.05	<0.08	<0.05	0.65	<0.05	2.41	0.06	<0.05	41.51
65	BLD/PBH03/65	78.00	79.00	1.00	1.36	<0.05	50.98	<0.05	1.05	1.50	0.08	1.12	<0.05	<0.08	<0.05	1.01	<0.05	2.16	0.06	<0.05	41.60
66	BLD/PBH03/66	79.00	80.00	1.00	1.04	<0.05	52.27	<0.05	0.70	1.00	0.06	0.89	<0.05	<0.08	<0.05	0.71	<0.05	1.49	<0.05	<0.05	42.36
67	BLD/PBH03/67	80.00	81.00	1.00	1.42	<0.05	51.64	<0.05	0.66	0.94	0.08	0.96	<0.05	<0.08	<0.05	0.57	<0.05	1.97	<0.05	<0.05	42.22
68	BLD/PBH03/68	81.00	82.00	1.00	1.14	<0.05	52.11	<0.05	0.69	0.99	0.07	0.91	<0.05	<0.08	<0.05	0.58	<0.05	1.75	0.05	<0.05	42.24
69	BLD/PBH03/69	82.00	83.00	1.00	1.59	<0.05	50.81	<0.05	0.96	1.37	0.12	1.08	<0.05	<0.08	<0.05	0.79	0.06	2.56	0.05	<0.05	41.43
70	BLD/PBH03/70	83.00	84.00	1.00	1.82	<0.05	50.88	<0.05	0.80	1.14	0.13	1.07	<0.05	<0.08	<0.05	0.66	0.06	2.64	<0.05	<0.05	41.45
71	BLD/PBH03/71	84.00	85.00	1.00	2.39	<0.05	49.06	<0.05	1.14	1.62	0.20	1.20	<0.05	<0.08	<0.05	1.01	0.08	3.67	<0.05	<0.05	40.62
72	BLD/PBH03/72	85.00	86.00	1.00	1.82	<0.05	49.80	<0.05	1.21	1.73	0.14	1.21	<0.05	<0.08	<0.05	1.09	0.06	2.99	0.05	<0.05	40.99
73	BLD/PBH03/73	86.00	87.00	1.00	1.83	<0.05	50.75	<0.05	0.80	1.14	0.13	1.11	<0.05	<0.08	<0.05	0.61	0.06	2.37	<0.05	<0.05	41.85
74	BLD/PBH03/74	87.00	88.00	1.00	1.76	<0.05	50.30	<0.05	1.03	1.48	0.15	1.17	<0.05	<0.08	<0.05	0.75	0.06	2.92	0.06	<0.05	41.24

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-03

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
75	BLD/PBH03/75	88.00	89.00	1.00	1.48	<0.05	50.69	<0.05	1.22	1.74	0.10	1.15	<0.05	<0.08	<0.05	1.03	<0.05	2.32	0.05	<0.05	41.28
76	BLD/PBH03/76	89.00	90.00	1.00	1.85	<0.05	49.67	<0.05	1.38	1.97	0.14	1.24	<0.05	<0.08	<0.05	1.05	0.05	2.93	0.05	<0.05	40.92
77	BLD/PBH03/77	90.00	91.00	1.00	1.55	<0.05	50.78	<0.05	0.97	1.39	0.12	1.12	<0.05	<0.08	<0.05	0.77	0.05	2.49	0.06	<0.05	41.54
78	BLD/PBH03/78	91.00	92.00	1.00	1.22	<0.05	51.87	<0.05	0.69	0.98	0.08	1.05	<0.05	<0.08	<0.05	0.44	<0.05	1.86	0.06	<0.05	42.30
79	BLD/PBH03/79	92.00	93.00	1.00	1.76	<0.05	50.24	<0.05	1.16	1.66	0.12	1.23	<0.05	<0.08	<0.05	0.76	0.06	2.88	0.05	<0.05	41.12
80	BLD/PBH03/80	93.00	94.00	1.00	1.46	<0.05	51.10	<0.05	0.91	1.30	0.11	1.11	<0.05	<0.08	<0.05	0.60	<0.05	2.40	0.06	<0.05	41.70
81	BLD/PBH03/81	94.00	95.00	1.00	1.38	0.05	51.59	<0.05	0.63	0.91	0.10	1.03	<0.05	<0.08	<0.05	0.49	<0.05	2.04	0.06	<0.05	42.21
82	BLD/PBH03/82	95.00	96.00	1.00	2.45	<0.05	49.26	<0.05	1.02	1.45	0.18	1.22	<0.05	<0.08	<0.05	0.78	0.09	3.87	0.06	<0.05	40.54
83	BLD/PBH03/83	96.00	97.00	1.00	1.88	<0.05	49.70	<0.05	1.17	1.68	0.15	1.30	<0.05	<0.08	<0.05	0.68	0.06	3.36	0.05	<0.05	41.03
84	BLD/PBH03/84	97.00	98.00	1.00	2.06	<0.05	48.98	<0.05	1.29	1.84	0.17	1.32	<0.05	<0.08	<0.05	0.68	0.07	3.95	0.05	<0.05	40.75
85	BLD/PBH03/85	98.00	99.00	1.00	2.20	<0.05	49.13	<0.05	1.39	1.99	0.18	1.33	<0.05	<0.08	<0.05	0.68	0.07	3.72	0.05	<0.05	40.54
86	BLD/PBH03/86	99.00	100.00	1.00	2.71	<0.05	47.52	<0.05	1.69	2.42	0.25	1.46	<0.05	<0.08	<0.05	0.97	0.10	4.80	0.06	<0.05	39.58

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-04

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
3	BLD/PBH04/01	8.00	9.22	1.22	13.84	<0.05	15.17	<0.05	9.77	13.97	1.95	1.56	0.21	<0.08	0.33	0.51	0.77	32.85	<0.05	<0.05	18.64
4	BLD/PBH04/02	9.22	10.00	0.78	3.69	<0.05	35.97	<0.05	12.09	17.29	0.32	1.06	0.48	<0.08	0.33	0.22	0.18	7.47	0.09	<0.05	32.76
5	BLD/PBH04/03	10.00	11.00	1.00	5.56	<0.05	31.47	<0.05	10.86	15.53	0.53	1.83	0.71	<0.08	0.22	0.74	0.29	13.15	0.09	<0.05	29.72
6	BLD/PBH04/04	11.00	12.00	1.00	19.77	<0.05	1.25	<0.05	6.53	9.34	2.93	2.09	<0.05	<0.08	0.13	1.14	1.18	52.59	<0.05	<0.05	9.36
7	BLD/PBH04/05	12.00	13.00	1.00	19.57	<0.05	2.08	<0.05	7.00	10.01	2.85	2.21	<0.05	<0.08	0.15	0.91	1.15	50.87	<0.05	<0.05	9.95
8	BLD/PBH04/06	13.00	14.28	1.28	12.92	<0.05	18.60	<0.05	7.58	10.84	1.79	2.11	0.26	<0.08	0.23	1.34	0.72	30.87	<0.05	<0.05	20.10
9	BLD/PBH04/07	14.28	15.00	0.72	20.44	<0.05	2.61	<0.05	6.74	9.64	3.20	2.45	<0.05	<0.08	0.12	1.27	1.14	48.52	<0.05	<0.05	10.40
10	BLD/PBH04/08	15.00	15.80	0.80	20.79	<0.05	1.78	<0.05	7.59	10.85	3.20	2.61	<0.05	<0.08	0.12	1.33	1.13	48.15	<0.05	<0.05	9.84
11	BLD/PBH04/09	15.80	17.00	1.20	4.91	<0.05	32.71	<0.05	11.54	16.50	0.48	2.36	0.66	<0.08	0.30	0.66	0.25	10.32	0.10	<0.05	30.61
13	BLD/PBH04/10	17.00	18.00	1.00	2.81	<0.05	39.24	<0.05	8.06	11.52	0.16	2.39	1.43	<0.08	0.09	3.57	0.11	4.40	0.09	<0.05	33.86
14	BLD/PBH04/11	18.00	19.00	1.00	1.59	<0.05	42.71	<0.05	6.91	9.88	0.06	2.44	1.39	<0.08	0.14	0.45	0.06	2.34	0.10	<0.05	38.70
15	BLD/PBH04/12	19.00	20.00	1.00	1.89	<0.05	40.66	<0.05	8.60	12.29	0.06	3.01	1.44	<0.08	0.14	0.11	0.06	2.27	0.10	<0.05	37.84
16	BLD/PBH04/13	20.00	21.00	1.00	2.34	<0.05	40.18	<0.05	9.17	13.11	0.11	2.58	1.21	<0.08	0.08	0.21	0.09	3.17	0.10	<0.05	36.67
17	BLD/PBH04/14	21.00	22.03	1.03	3.31	<0.05	39.16	<0.05	7.61	10.89	0.24	2.22	0.92	<0.08	0.17	0.79	0.14	7.41	0.09	<0.05	34.53
18	BLD/PBH04/15	22.03	22.53	0.50	10.72	<0.05	21.13	<0.05	9.40	13.44	1.46	3.00	0.39	<0.08	0.10	2.97	0.56	23.54	<0.05	<0.05	22.48
19	BLD/PBH04/16	22.53	24.00	1.47	3.65	<0.05	39.57	<0.05	7.28	10.41	0.23	2.13	0.60	<0.08	0.15	3.45	0.14	5.85	0.08	<0.05	33.60
20	BLD/PBH04/17	24.00	25.00	1.00	2.79	<0.05	44.32	<0.05	4.09	5.84	0.20	1.61	0.48	<0.08	0.05	2.37	0.12	4.69	0.08	<0.05	37.36
21	BLD/PBH04/18	25.00	26.00	1.00	2.06	<0.05	46.57	<0.05	3.07	4.39	0.17	1.31	0.42	<0.08	0.06	2.82	0.09	3.92	0.10	<0.05	37.99
22	BLD/PBH04/19	26.00	27.00	1.00	2.19	<0.05	47.28	<0.05	2.62	3.74	0.14	1.24	0.32	<0.08	<0.05	3.15	0.09	3.39	0.07	<0.05	38.28
23	BLD/PBH04/20	27.00	28.00	1.00	2.18	<0.05	46.18	<0.05	3.26	4.66	0.13	1.57	0.32	<0.08	<0.05	2.80	0.09	4.09	0.07	<0.05	37.69
25	BLD/PBH04/21	28.00	29.00	1.00	3.38	<0.05	42.83	<0.05	4.12	5.89	0.24	1.86	0.33	<0.08	<0.05	2.85	0.14	6.43	0.07	<0.05	35.83
26	BLD/PBH04/22	29.00	30.00	1.00	2.53	<0.05	44.04	<0.05	4.81	6.88	0.14	1.90	0.36	<0.08	<0.05	2.81	0.10	4.79	0.07	<0.05	36.22
27	BLD/PBH04/23	30.00	31.00	1.00	2.72	<0.05	44.21	<0.05	5.15	7.36	0.13	1.90	0.39	<0.08	0.06	1.95	0.09	4.66	0.06	<0.05	36.36
28	BLD/PBH04/24	31.00	32.00	1.00	2.58	<0.05	42.52	<0.05	7.48	10.69	0.13	1.73	0.37	<0.08	0.12	1.78	0.09	4.50	0.06	<0.05	35.29
29	BLD/PBH04/25	32.00	33.00	1.00	2.39	<0.05	43.24	<0.05	6.61	9.46	0.13	1.55	0.26	<0.08	0.10	2.00	0.09	4.03	0.06	<0.05	36.57
30	BLD/PBH04/26	33.00	34.00	1.00	4.10	<0.05	32.11	<0.05	15.63	22.35	0.25	2.17	0.21	<0.08	0.29	1.22	0.17	6.66	0.06	0.06	30.23
31	BLD/PBH04/27	34.00	35.00	1.00	3.61	<0.05	35.81	<0.05	12.37	17.68	0.25	2.06	0.25	<0.08	0.25	1.39	0.16	6.12	0.07	0.05	32.18
32	BLD/PBH04/28	35.00	36.00	1.00	3.36	<0.05	36.92	<0.05	11.48	16.41	0.23	1.89	0.22	<0.08	0.22	1.76	0.15	5.64	0.07	<0.05	32.99
33	BLD/PBH04/29	36.00	37.00	1.00	2.14	<0.05	47.12	<0.05	3.46	4.94	0.17	1.24	0.14	<0.08	0.05	1.11	0.11	3.71	0.07	<0.05	39.10
34	BLD/PBH04/30	37.00	38.00	1.00	3.02	<0.05	43.88	<0.05	4.79	6.85	0.27	1.56	0.12	<0.08	0.08	1.69	0.15	5.34	0.08	<0.05	36.76
36	BLD/PBH04/31	38.00	39.00	1.00	4.11	<0.05	40.81	<0.05	5.72	8.18	0.43	1.82	0.13	<0.08	0.12	1.41	0.22	7.52	0.08	<0.05	35.03
37	BLD/PBH04/32	39.00	40.00	1.00	5.12	<0.05	36.89	<0.05	6.81	9.74	0.55	2.45	0.12	<0.08	0.18	1.07	0.27	9.62	0.08	<0.05	33.76
38	BLD/PBH04/33	40.00	41.00	1.00	5.54	<0.05	34.00	<0.05	7.55	10.80	0.59	3.19	0.08	<0.08	0.26	1.08	0.27	11.61	0.07	<0.05	32.36

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-04

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
39	BLD/PBH04/34	41.00	42.00	1.00	5.12	<0.05	37.17	<0.05	6.67	9.53	0.52	2.20	0.07	<0.08	0.20	0.97	0.25	10.38	0.08	<0.05	33.37
40	BLD/PBH04/35	42.00	43.50	1.50	21.27	<0.05	0.83	<0.05	8.41	12.02	3.13	3.09	<0.05	0.56	0.14	1.31	1.01	47.55	<0.05	<0.05	8.93
41	BLD/PBH04/36	43.50	45.00	1.50	21.25	<0.05	0.73	<0.05	8.33	11.91	3.06	3.07	<0.05	0.49	0.13	1.27	1.03	47.84	<0.05	<0.05	9.06
42	BLD/PBH04/37	45.00	46.00	1.00	9.91	<0.05	25.88	<0.05	7.35	10.51	1.30	2.57	<0.05	0.12	0.12	0.93	0.48	22.51	0.07	<0.05	25.49
43	BLD/PBH04/38	46.00	47.00	1.00	6.44	<0.05	34.84	<0.05	5.25	7.50	0.81	2.37	0.07	0.09	0.12	1.10	0.31	14.78	0.09	<0.05	31.40
44	BLD/PBH04/39	47.00	48.00	1.00	4.51	<0.05	40.64	<0.05	3.56	5.09	0.51	2.35	<0.05	<0.08	0.08	1.04	0.20	9.95	0.10	<0.05	35.37
45	BLD/PBH04/40	48.00	49.00	1.00	3.35	<0.05	42.93	<0.05	2.70	3.86	0.34	2.53	<0.05	<0.08	<0.05	1.35	0.14	8.03	0.12	<0.05	37.20
48	BLD/PBH04/41	49.00	50.00	1.00	2.38	<0.05	46.57	<0.05	2.06	2.94	0.22	2.14	<0.05	<0.08	<0.05	0.91	0.09	5.09	0.10	<0.05	39.42
49	BLD/PBH04/42	50.00	51.00	1.00	2.50	<0.05	45.07	<0.05	2.64	3.78	0.21	2.55	0.10	<0.08	<0.05	1.78	0.10	4.94	0.08	<0.05	38.75
50	BLD/PBH04/43	51.00	52.00	1.00	2.07	<0.05	47.49	<0.05	2.18	3.11	0.16	1.92	0.22	<0.08	<0.05	1.21	0.08	3.78	0.10	<0.05	39.75
51	BLD/PBH04/44	52.00	53.00	1.00	1.89	<0.05	47.08	<0.05	2.43	3.47	0.15	2.05	0.28	<0.08	<0.05	1.56	0.07	3.71	0.10	<0.05	39.52
52	BLD/PBH04/45	53.00	54.00	1.00	2.64	<0.05	43.06	<0.05	4.03	5.76	0.24	2.90	0.30	<0.08	<0.05	2.03	0.11	5.28	0.09	<0.05	37.43
53	BLD/PBH04/46	54.00	55.00	1.00	1.78	<0.05	47.84	<0.05	2.35	3.36	0.14	1.58	0.24	<0.08	<0.05	1.77	0.07	3.44	0.09	<0.05	39.56
54	BLD/PBH04/47	55.00	56.00	1.00	1.55	<0.05	49.20	<0.05	1.89	2.70	0.12	1.32	0.20	<0.08	<0.05	1.66	0.07	3.08	0.08	<0.05	39.93
55	BLD/PBH04/48	56.00	57.00	1.00	2.03	<0.05	47.33	<0.05	2.34	3.35	0.18	1.74	0.16	<0.08	<0.05	1.63	0.09	4.09	0.08	<0.05	39.20
56	BLD/PBH04/49	57.00	58.00	1.00	3.29	<0.05	43.23	<0.05	4.13	5.90	0.30	2.57	0.12	<0.08	0.09	0.73	0.16	5.75	0.08	<0.05	37.68
58	BLD/PBH04/50	58.00	59.00	1.00	3.20	<0.05	43.08	<0.05	3.65	5.22	0.33	2.90	0.12	<0.08	0.06	0.75	0.16	6.09	0.11	<0.05	37.78
59	BLD/PBH04/51	59.00	60.00	1.00	3.13	<0.05	42.01	<0.05	5.35	7.65	0.31	2.72	0.05	<0.08	0.10	0.55	0.15	5.95	0.11	<0.05	37.15
60	BLD/PBH04/52	60.00	61.00	1.00	3.25	<0.05	42.93	<0.05	4.23	6.04	0.33	2.73	<0.05	<0.08	0.06	0.60	0.17	6.26	0.12	<0.05	37.38
61	BLD/PBH04/53	61.00	62.00	1.00	5.58	<0.05	37.30	<0.05	2.68	3.83	0.67	4.11	<0.05	<0.08	<0.05	0.58	0.28	11.78	0.11	<0.05	35.62
62	BLD/PBH04/54	62.00	63.00	1.00	5.02	<0.05	36.00	<0.05	5.88	8.40	0.57	3.95	<0.05	<0.08	0.11	0.51	0.25	10.61	0.10	<0.05	34.37
63	BLD/PBH04/55	63.00	64.00	1.00	3.88	<0.05	42.60	<0.05	4.01	5.73	0.36	2.24	<0.05	<0.08	0.06	0.69	0.19	7.33	0.10	<0.05	36.71
64	BLD/PBH04/56	64.00	65.00	1.00	3.05	<0.05	44.53	<0.05	1.96	2.80	0.31	2.60	<0.05	<0.08	<0.05	0.89	0.16	6.54	0.10	<0.05	38.89
65	BLD/PBH04/57	65.00	66.00	1.00	3.82	<0.05	41.95	<0.05	3.50	5.00	0.37	2.70	<0.05	<0.08	0.08	0.85	0.19	7.34	0.11	<0.05	37.48
66	BLD/PBH04/58	66.00	67.00	1.00	2.83	<0.05	46.52	<0.05	2.11	3.02	0.26	1.73	<0.05	<0.08	<0.05	1.48	0.13	5.04	0.08	<0.05	38.77
67	BLD/PBH04/59	67.00	68.00	1.00	3.13	<0.05	44.35	<0.05	3.84	5.48	0.26	2.02	<0.05	<0.08	0.09	1.44	0.13	5.68	0.09	<0.05	37.20
68	BLD/PBH04/60	68.00	69.00	1.00	3.01	<0.05	45.23	<0.05	2.85	4.08	0.24	1.76	<0.05	<0.08	<0.05	1.96	0.12	5.85	0.07	<0.05	37.42
70	BLD/PBH04/61	69.00	70.00	1.00	2.62	<0.05	46.52	<0.05	2.69	3.85	0.19	1.69	<0.05	<0.08	0.07	2.13	0.11	5.02	0.08	<0.05	37.61
71	BLD/PBH04/62	70.00	71.00	1.00	2.34	<0.05	48.76	<0.05	1.53	2.19	0.17	1.34	<0.05	<0.08	<0.05	1.33	0.10	3.87	0.07	<0.05	39.71
72	BLD/PBH04/63	71.00	72.00	1.00	2.29	<0.05	49.31	<0.05	1.08	1.55	0.21	1.26	<0.05	<0.08	<0.05	0.83	0.11	4.38	0.08	<0.05	39.87
73	BLD/PBH04/64	72.00	73.00	1.00	3.09	<0.05	46.69	<0.05	1.94	2.78	0.26	1.54	<0.05	<0.08	<0.05	1.25	0.14	5.83	0.09	<0.05	38.18
74	BLD/PBH04/65	73.00	74.00	1.00	3.30	<0.05	46.57	<0.05	1.76	2.51	0.30	1.46	<0.05	<0.08	<0.05	1.49	0.16	6.29	0.11	<0.05	37.69
75	BLD/PBH04/66	74.00	75.00	1.00	2.66	<0.05	48.57	<0.05	1.32	1.89	0.22	1.43	<0.05	<0.08	<0.05	0.87	0.12	5.00	0.07	<0.05	39.05

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-04

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
76	BLD/PBH04/67	75.00	76.00	1.00	1.98	<0.05	50.06	<0.05	1.38	1.98	0.14	1.45	<0.05	<0.08	<0.05	0.85	0.08	3.63	0.09	<0.05	39.63
77	BLD/PBH04/68	76.00	77.00	1.00	1.55	<0.05	51.61	<0.05	1.03	1.48	0.08	1.20	<0.05	<0.08	<0.05	0.85	<0.05	2.32	0.07	<0.05	40.68
78	BLD/PBH04/69	77.00	78.00	1.00	1.28	<0.05	52.57	<0.05	0.79	1.12	0.06	1.05	<0.05	<0.08	<0.05	0.79	<0.05	1.77	0.06	<0.05	41.13
80	BLD/PBH04/70	78.00	79.00	1.00	1.36	<0.05	52.72	<0.05	0.66	0.94	0.07	1.03	<0.05	<0.08	<0.05	0.56	<0.05	1.75	<0.05	<0.05	41.37
81	BLD/PBH04/71	79.00	80.00	1.00	1.48	<0.05	52.29	<0.05	0.71	1.01	0.09	1.05	<0.05	<0.08	<0.05	0.61	<0.05	2.15	0.05	<0.05	41.10
82	BLD/PBH04/72	80.00	81.00	1.00	1.59	<0.05	51.97	<0.05	0.85	1.21	0.09	1.06	<0.05	<0.08	<0.05	0.82	0.05	2.20	0.05	<0.05	40.84
83	BLD/PBH04/73	81.00	82.00	1.00	1.78	<0.05	50.28	<0.05	0.95	1.36	0.14	1.15	<0.05	<0.08	<0.05	0.81	0.07	2.91	0.06	<0.05	41.34
84	BLD/PBH04/74	82.00	83.00	1.00	1.76	<0.05	50.61	<0.05	0.82	1.18	0.14	1.07	<0.05	<0.08	<0.05	0.68	0.07	2.81	0.06	<0.05	41.53
85	BLD/PBH04/75	83.00	84.00	1.00	2.07	<0.05	48.95	<0.05	1.30	1.87	0.18	1.24	<0.05	<0.08	<0.05	1.26	0.08	3.70	0.06	<0.05	40.48
86	BLD/PBH04/76	84.00	85.00	1.00	1.54	<0.05	50.90	<0.05	0.93	1.33	0.12	1.15	<0.05	<0.08	<0.05	0.75	0.05	2.51	0.06	<0.05	41.49
87	BLD/PBH04/77	85.00	86.00	1.00	1.69	<0.05	50.67	<0.05	0.81	1.16	0.17	1.11	<0.05	<0.08	<0.05	0.60	0.07	2.83	0.06	<0.05	41.51
88	BLD/PBH04/78	86.00	87.00	1.00	1.91	<0.05	50.23	<0.05	1.00	1.43	0.15	1.19	<0.05	<0.08	<0.05	0.76	0.06	2.85	0.05	<0.05	41.25
89	BLD/PBH04/79	87.00	88.00	1.00	1.56	<0.05	50.86	<0.05	1.15	1.64	0.10	1.15	<0.05	<0.08	<0.05	0.90	<0.05	2.21	0.05	<0.05	41.39
90	BLD/PBH04/80	88.00	89.00	1.00	1.54	<0.05	50.75	<0.05	1.04	1.48	0.12	1.13	<0.05	<0.08	<0.05	0.90	0.05	2.44	0.05	<0.05	41.43
92	BLD/PBH04/81	89.00	90.00	1.00	1.17	<0.05	52.10	<0.05	0.57	0.82	0.08	1.01	<0.05	<0.08	<0.05	0.41	<0.05	1.67	0.06	<0.05	42.54
93	BLD/PBH04/82	90.00	91.00	1.00	1.29	<0.05	51.41	<0.05	0.86	1.22	0.09	1.10	<0.05	<0.08	<0.05	0.57	<0.05	2.18	0.06	<0.05	41.92
94	BLD/PBH04/83	91.00	92.00	1.00	1.55	<0.05	50.44	<0.05	1.17	1.67	0.11	1.20	<0.05	<0.08	<0.05	0.85	0.05	2.72	0.06	<0.05	41.23
95	BLD/PBH04/84	92.00	93.00	1.00	1.20	<0.05	51.59	<0.05	0.74	1.06	0.09	1.07	<0.05	<0.08	<0.05	0.58	<0.05	2.10	0.06	<0.05	42.09
96	BLD/PBH04/85	93.00	94.00	1.00	2.01	<0.05	50.09	<0.05	0.82	1.17	0.17	1.15	<0.05	<0.08	<0.05	0.59	0.08	3.59	0.07	<0.05	40.97
97	BLD/PBH04/86	94.00	95.00	1.00	1.74	<0.05	49.99	<0.05	1.22	1.75	0.15	1.27	<0.05	<0.08	<0.05	0.74	0.07	3.41	0.06	<0.05	40.70
98	BLD/PBH04/87	95.00	96.00	1.00	1.81	<0.05	49.83	<0.05	1.28	1.83	0.14	1.29	<0.05	<0.08	<0.05	0.66	0.06	3.30	0.06	<0.05	40.91
99	BLD/PBH04/88	96.00	97.00	1.00	2.05	<0.05	49.41	<0.05	1.40	2.00	0.16	1.32	<0.05	<0.08	<0.05	0.76	0.06	3.38	0.06	<0.05	40.70
100	BLD/PBH04/89	97.00	98.00	1.00	2.31	<0.05	49.09	<0.05	1.34	1.91	0.20	1.30	<0.05	<0.08	<0.05	0.71	0.08	3.86	0.06	<0.05	40.36
101	BLD/PBH04/90	98.00	99.00	1.00	2.67	<0.05	47.37	<0.05	1.91	2.73	0.23	1.46	<0.05	<0.08	<0.05	1.37	0.10	4.86	0.08	<0.05	39.01
103	BLD/PBH04/91	99.00	100.00	1.00	2.68	<0.05	46.76	<0.05	2.12	3.03	0.26	1.51	<0.05	<0.08	<0.05	1.39	0.11	5.41	0.09	<0.05	38.63

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-05

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
2	BLD/PBH05/01	5.50	6.57	1.07	19.65	<0.05	4.81	<0.05	8.15	11.65	2.68	2.51	<0.05	<0.08	0.58	0.91	1.08	44.87	<0.05	<0.05	11.20
3	BLD/PBH05/02	6.57	7.40	0.83	4.64	<0.05	36.18	<0.05	10.97	15.68	0.39	1.77	0.40	<0.08	0.68	0.23	0.21	7.87	<0.05	<0.05	31.92
4	BLD/PBH05/03	7.40	8.08	0.68	3.32	<0.05	37.48	<0.05	11.05	15.80	0.21	1.82	0.64	<0.08	0.63	0.46	0.15	6.82	<0.05	<0.05	32.66
5	BLD/PBH05/04	8.08	9.46	1.38	21.14	<0.05	0.55	<0.05	7.08	10.13	2.85	2.49	<0.05	<0.08	0.11	0.87	1.22	52.43	<0.05	<0.05	8.20
6	BLD/PBH05/05	9.46	10.93	1.47	13.06	<0.05	16.47	<0.05	7.93	11.34	1.70	2.78	0.37	<0.08	0.31	1.18	0.74	32.02	<0.05	<0.05	20.02
7	BLD/PBH05/06	10.93	12.00	1.07	21.01	<0.05	0.88	<0.05	7.07	10.11	2.86	2.59	0.08	<0.08	0.17	0.41	1.18	51.79	<0.05	<0.05	8.87
8	BLD/PBH05/07	12.00	12.94	0.94	20.73	<0.05	0.56	<0.05	6.79	9.71	2.97	2.58	<0.05	<0.08	0.15	1.07	1.18	51.50	<0.05	<0.05	9.50
9	BLD/PBH05/08	12.94	13.88	0.94	20.76	<0.05	1.37	<0.05	8.49	12.14	2.77	2.77	<0.05	<0.08	0.12	1.35	1.12	48.28	<0.05	<0.05	9.28
10	BLD/PBH05/09	13.88	14.58	0.70	11.14	<0.05	24.37	<0.05	7.49	10.71	1.35	2.67	0.35	<0.08	0.17	0.86	0.57	23.56	<0.05	<0.05	24.21
11	BLD/PBH05/10	14.58	15.14	0.56	21.22	<0.05	2.69	<0.05	7.29	10.43	3.00	2.80	<0.05	<0.08	0.08	1.13	1.13	47.43	<0.05	<0.05	10.06
13	BLD/PBH05/11	15.14	16.14	1.00	21.70	<0.05	1.06	<0.05	8.11	11.59	3.03	2.95	<0.05	<0.08	0.09	1.55	1.13	47.42	<0.05	<0.05	9.45
14	BLD/PBH05/12	16.14	17.07	0.93	4.92	<0.05	36.57	<0.05	9.16	13.09	0.34	2.38	0.55	<0.08	0.37	0.39	0.22	9.01	<0.05	<0.05	32.15
15	BLD/PBH05/13	17.07	18.00	0.93	3.56	<0.05	37.12	<0.05	9.17	13.11	0.23	2.74	1.41	<0.08	0.33	4.44	0.16	5.32	<0.05	<0.05	31.55
16	BLD/PBH05/14	18.00	19.00	1.00	1.48	<0.05	46.81	<0.05	4.54	6.50	<0.05	2.05	1.11	<0.08	0.16	0.34	0.06	1.86	<0.05	<0.05	39.58
17	BLD/PBH05/15	19.00	20.00	1.00	1.48	<0.05	44.93	<0.05	5.88	8.41	<0.05	2.48	1.15	<0.08	0.21	0.18	0.06	2.00	<0.05	<0.05	39.03
18	BLD/PBH05/16	20.00	21.00	1.00	2.21	<0.05	41.86	<0.05	7.78	11.12	0.07	3.12	1.25	<0.08	0.18	0.21	0.07	2.70	<0.05	<0.05	37.18
19	BLD/PBH05/17	21.00	22.00	1.00	3.98	<0.05	39.93	<0.05	7.04	10.06	0.36	2.48	0.89	<0.08	0.23	0.45	0.18	7.10	<0.05	<0.05	34.32
20	BLD/PBH05/18	22.00	23.00	1.00	3.77	<0.05	38.79	<0.05	6.82	9.75	0.32	2.58	0.69	<0.08	0.25	1.78	0.16	8.96	<0.05	<0.05	32.94
21	BLD/PBH05/19	23.00	24.00	1.00	4.06	<0.05	38.83	<0.05	7.37	10.54	0.31	2.59	0.55	<0.08	0.17	3.54	0.16	6.56	<0.05	<0.05	32.69
23	BLD/PBH05/20	24.00	25.00	1.00	2.80	<0.05	44.45	<0.05	4.29	6.14	0.23	1.95	0.46	<0.08	0.11	2.30	0.10	4.84	<0.05	<0.05	36.60
24	BLD/PBH05/21	25.00	26.00	1.00	2.63	<0.05	45.03	<0.05	3.01	4.31	0.22	1.62	0.35	<0.08	0.06	2.82	0.12	5.21	<0.05	<0.05	37.62
25	BLD/PBH05/22	26.00	27.00	1.00	2.67	<0.05	46.29	<0.05	2.44	3.49	0.22	1.54	0.30	<0.08	0.09	2.86	0.11	4.26	<0.05	<0.05	38.16
26	BLD/PBH05/23	27.00	28.00	1.00	2.29	<0.05	45.69	<0.05	3.08	4.40	0.15	1.80	0.32	<0.08	0.08	3.07	0.09	4.55	<0.05	<0.05	37.55
27	BLD/PBH05/24	28.00	29.00	1.00	3.91	<0.05	41.04	<0.05	4.50	6.43	0.28	2.40	0.30	<0.08	0.11	2.97	0.15	7.49	<0.05	<0.05	34.90
28	BLD/PBH05/25	29.00	30.00	1.00	3.74	<0.05	41.12	<0.05	5.32	7.60	0.19	2.47	0.31	<0.08	0.10	3.26	0.13	6.54	<0.05	<0.05	34.50

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-05

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
29	BLD/PBH05/26	30.00	31.00	1.00	2.39	<0.05	45.43	<0.05	4.45	6.37	0.10	2.01	0.38	<0.08	0.13	1.50	0.07	4.07	<0.05	<0.05	37.54
30	BLD/PBH05/27	31.00	32.00	1.00	2.02	<0.05	45.23	<0.05	5.54	7.92	0.11	1.77	0.36	<0.08	0.23	1.52	0.08	3.77	<0.05	<0.05	36.98
31	BLD/PBH05/28	32.00	33.00	1.00	2.26	<0.05	44.92	<0.05	5.02	7.18	0.17	1.76	0.24	<0.08	0.17	2.07	0.10	4.63	<0.05	<0.05	36.50
32	BLD/PBH05/29	33.00	34.00	1.00	3.61	<0.05	36.31	<0.05	12.82	18.33	0.23	2.29	0.13	<0.08	0.42	1.36	0.16	5.79	<0.05	<0.05	31.34
33	BLD/PBH05/30	34.00	35.00	1.00	4.27	<0.05	36.13	<0.05	11.81	16.89	0.28	2.50	0.17	<0.08	0.37	1.26	0.19	6.62	<0.05	<0.05	31.30
35	BLD/PBH05/31	35.00	36.00	1.00	3.57	<0.05	38.88	0.05	9.93	14.20	0.25	2.18	0.12	<0.08	0.35	1.71	0.16	5.81	<0.05	<0.05	32.73
36	BLD/PBH05/32	36.00	37.00	1.00	1.93	<0.05	47.11	<0.05	4.37	6.24	0.13	1.49	0.14	<0.08	0.20	0.82	0.08	3.00	<0.05	<0.05	38.85
37	BLD/PBH05/33	37.00	38.00	1.00	3.49	<0.05	44.33	<0.05	3.97	5.68	0.27	1.75	0.10	<0.08	0.14	1.68	0.15	5.49	<0.05	<0.05	36.90
38	BLD/PBH05/34	38.00	39.00	1.00	3.75	<0.05	43.43	<0.05	4.09	5.85	0.38	1.83	0.11	<0.08	0.19	1.42	0.19	6.63	<0.05	<0.05	36.21
39	BLD/PBH05/35	39.00	40.00	1.00	5.62	<0.05	37.68	<0.05	5.85	8.36	0.55	2.71	0.08	<0.08	0.29	1.13	0.28	9.84	<0.05	<0.05	33.43
40	BLD/PBH05/36	40.00	41.00	1.00	5.79	<0.05	35.27	<0.05	6.77	9.68	0.60	3.48	<0.05	<0.08	0.36	0.90	0.28	11.58	<0.05	<0.05	31.99
41	BLD/PBH05/37	41.00	42.00	1.00	5.01	<0.05	38.83	<0.05	5.90	8.43	0.49	2.45	0.05	<0.08	0.33	0.76	0.23	9.95	<0.05	<0.05	33.43
42	BLD/PBH05/38	42.00	43.50	1.50	22.32	<0.05	0.92	<0.05	8.31	11.88	3.07	3.29	<0.05	0.48	0.43	0.97	1.05	47.51	<0.05	<0.05	8.05
43	BLD/PBH05/39	43.50	45.00	1.50	21.52	<0.05	1.46	<0.05	8.63	12.34	2.82	3.42	<0.05	0.35	0.11	1.23	1.01	45.95	<0.05	<0.05	9.77
45	BLD/PBH05/40	45.00	46.00	1.00	10.21	<0.05	26.47	<0.05	7.27	10.39	1.25	2.89	<0.05	0.08	0.43	0.93	0.50	22.05	<0.05	<0.05	24.77
46	BLD/PBH05/41	46.00	47.00	1.00	4.44	<0.05	40.86	<0.05	3.79	5.42	0.52	2.36	<0.05	<0.08	0.16	0.99	0.21	10.32	<0.05	<0.05	34.68
47	BLD/PBH05/42	47.00	48.00	1.00	4.35	<0.05	41.59	<0.05	2.63	3.76	0.49	2.60	<0.05	<0.08	0.10	1.03	0.19	10.25	<0.05	<0.05	35.61
48	BLD/PBH05/43	48.00	49.00	1.00	3.03	<0.05	43.90	<0.05	2.03	2.90	0.32	3.13	<0.05	<0.08	0.06	0.92	0.13	7.77	<0.05	<0.05	37.80
49	BLD/PBH05/44	49.00	50.00	1.00	2.35	<0.05	46.39	<0.05	1.89	2.70	0.23	2.47	<0.05	<0.08	0.05	1.10	0.10	5.52	<0.05	<0.05	39.03
50	BLD/PBH05/45	50.00	51.00	1.00	2.14	<0.05	45.73	<0.05	2.12	3.02	0.21	3.42	0.13	<0.08	0.07	0.88	0.09	4.90	<0.05	<0.05	39.39
51	BLD/PBH05/46	51.00	52.00	1.00	2.56	<0.05	46.34	<0.05	2.17	3.10	0.22	2.26	0.21	<0.08	0.08	1.47	0.09	4.98	<0.05	<0.05	38.67
52	BLD/PBH05/47	52.00	53.00	1.00	2.15	<0.05	47.40	<0.05	2.10	3.00	0.15	2.05	0.30	<0.08	0.07	2.03	0.07	3.71	<0.05	<0.05	39.06
53	BLD/PBH05/48	53.00	54.00	1.00	2.70	<0.05	44.15	<0.05	3.23	4.62	0.25	3.10	0.26	<0.08	0.12	2.14	0.11	5.39	<0.05	<0.05	37.15
54	BLD/PBH05/49	54.00	55.00	1.00	1.79	<0.05	48.51	<0.05	1.75	2.50	0.16	1.63	0.20	<0.08	0.06	1.78	0.08	3.57	<0.05	<0.05	39.70
56	BLD/PBH05/50	55.00	56.00	1.00	1.86	<0.05	48.29	<0.05	1.65	2.37	0.15	1.63	0.16	<0.08	0.05	1.76	0.09	3.84	<0.05	<0.05	39.78

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-05

S.No.	Sample No	From	To	Thickness	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
57	BLD/PBH05/51	56.00	57.00	1.00	2.23	<0.05	47.56	<0.05	1.89	2.70	0.17	1.90	0.13	<0.08	0.06	1.60	0.09	4.08	<0.05	<0.05	39.47
58	BLD/PBH05/52	57.00	58.00	1.00	3.19	<0.05	44.52	<0.05	2.72	3.88	0.29	2.71	0.11	<0.08	0.12	0.82	0.14	5.68	<0.05	<0.05	38.51
59	BLD/PBH05/53	58.00	59.00	1.00	3.57	<0.05	42.99	<0.05	3.61	5.16	0.36	3.04	0.14	<0.08	0.16	0.70	0.17	6.68	<0.05	<0.05	37.03
60	BLD/PBH05/54	59.00	60.00	1.00	3.53	<0.05	42.27	<0.05	3.92	5.60	0.34	3.53	<0.05	<0.08	0.12	0.67	0.16	6.37	<0.05	<0.05	37.35
61	BLD/PBH05/55	60.00	61.00	1.00	3.31	<0.05	44.20	<0.05	3.06	4.38	0.30	2.78	<0.05	<0.08	0.12	0.58	0.15	6.04	<0.05	<0.05	38.09
62	BLD/PBH05/56	61.00	62.00	1.00	4.86	<0.05	38.55	<0.05	2.82	4.03	0.52	4.58	<0.05	<0.08	0.19	0.68	0.23	10.09	<0.05	<0.05	36.23
63	BLD/PBH05/57	62.00	63.00	1.00	5.09	<0.05	37.96	<0.05	3.15	4.50	0.60	4.42	<0.05	<0.08	0.15	0.52	0.25	11.12	<0.05	<0.05	35.39
64	BLD/PBH05/58	63.00	64.00	1.00	5.68	<0.05	37.67	<0.05	5.58	7.98	0.54	3.15	<0.05	<0.08	0.22	0.61	0.26	10.43	<0.05	<0.05	33.44
65	BLD/PBH05/59	64.00	65.00	1.00	2.74	<0.05	45.80	<0.05	1.53	2.19	0.27	2.68	<0.05	<0.08	0.07	0.75	0.13	6.08	<0.05	<0.05	39.27
67	BLD/PBH05/60	65.00	66.00	1.00	4.79	<0.05	40.95	<0.05	3.12	4.46	0.40	3.15	<0.05	<0.08	0.15	0.80	0.22	8.88	<0.05	<0.05	36.17
68	BLD/PBH05/61	66.00	67.00	1.00	3.94	<0.05	44.13	<0.05	2.31	3.30	0.34	2.60	<0.05	<0.08	0.17	1.17	0.16	6.34	<0.05	<0.05	37.83
69	BLD/PBH05/62	67.00	68.00	1.00	3.79	<0.05	43.99	<0.05	3.39	4.85	0.29	2.41	<0.05	<0.08	0.18	1.38	0.15	6.05	<0.05	<0.05	36.90
70	BLD/PBH05/63	68.00	69.00	1.00	2.84	<0.05	46.74	<0.05	2.05	2.93	0.19	1.88	<0.05	<0.08	0.09	1.57	0.10	4.76	<0.05	<0.05	38.88
71	BLD/PBH05/64	69.00	70.00	1.00	3.44	<0.05	45.34	<0.05	2.23	3.18	0.23	1.96	<0.05	<0.08	0.09	1.72	0.12	5.99	<0.05	<0.05	37.90
72	BLD/PBH05/65	70.00	71.00	1.00	2.80	<0.05	47.32	<0.05	1.60	2.29	0.20	1.71	<0.05	<0.08	0.09	1.51	0.11	4.86	<0.05	<0.05	39.09
73	BLD/PBH05/66	71.00	72.00	1.00	3.08	<0.05	47.35	<0.05	1.14	1.64	0.25	1.68	<0.05	<0.08	<0.05	1.00	0.13	5.40	<0.05	<0.05	39.41
74	BLD/PBH05/67	72.00	73.00	1.00	3.08	<0.05	46.40	<0.05	1.64	2.35	0.27	1.82	<0.05	<0.08	<0.05	1.28	0.14	6.00	<0.05	<0.05	38.59
75	BLD/PBH05/68	73.00	74.00	1.00	3.06	<0.05	47.11	<0.05	1.35	1.92	0.28	1.61	<0.05	<0.08	0.05	1.29	0.14	5.88	<0.05	<0.05	38.65
76	BLD/PBH05/69	74.00	75.00	1.00	2.38	<0.05	48.69	<0.05	1.08	1.55	0.21	1.58	<0.05	<0.08	<0.05	0.81	0.11	4.97	<0.05	<0.05	39.66
78	BLD/PBH05/70	75.00	76.00	1.00	2.63	<0.05	48.48	<0.05	1.26	1.80	0.13	1.70	<0.05	<0.08	0.06	0.81	0.09	4.34	<0.05	<0.05	39.92
79	BLD/PBH05/71	76.00	77.00	1.00	3.35	<0.05	45.79	<0.05	1.64	2.35	0.19	1.73	<0.05	<0.08	0.05	1.42	0.10	5.78	<0.05	<0.05	39.21
80	BLD/PBH05/72	77.00	78.00	1.00	1.32	<0.05	51.82	<0.05	0.60	0.85	0.06	1.05	<0.05	<0.08	<0.05	0.58	<0.05	1.52	<0.05	<0.05	42.68
81	BLD/PBH05/73	78.00	79.00	1.00	1.48	<0.05	51.95	<0.05	0.59	0.84	0.09	1.09	<0.05	<0.08	<0.05	0.65	<0.05	2.00	<0.05	<0.05	41.80
82	BLD/PBH05/74	79.00	80.00	1.00	1.41	<0.05	52.09	<0.05	0.55	0.78	0.08	1.10	<0.05	<0.08	0.05	0.61	<0.05	1.96	<0.05	<0.05	41.84
83	BLD/PBH05/75	80.00	81.00	1.00	1.01	<0.05	52.94	<0.05	0.53	0.75	0.07	0.94	<0.05	<0.08	0.06	0.57	<0.05	1.52	<0.05	<0.05	42.09

ANNEXURE-IV: ANALYTICAL RESULT OF CORE SAMPLES FOR BOREHOLE PBH-05

S.No.	Sample No	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
84	BLD/PBH05/76	81.00	82.00	1.00	1.71	<0.05	50.78	<0.05	0.82	1.17	0.15	1.26	<0.05	<0.08	0.05	0.85	0.07	3.11	<0.05	<0.05	40.84
85	BLD/PBH05/77	82.00	83.00	1.00	1.54	<0.05	50.25	<0.05	0.89	1.28	0.11	1.32	<0.05	<0.08	<0.05	0.76	0.05	2.82	<0.05	<0.05	41.81
86	BLD/PBH05/78	83.00	84.00	1.00	2.09	<0.05	49.05	<0.05	1.10	1.57	0.19	1.41	<0.05	<0.08	<0.05	1.04	0.08	4.06	<0.05	<0.05	40.44
87	BLD/PBH05/79	84.00	85.00	1.00	1.19	<0.05	51.84	<0.05	0.71	1.01	0.12	1.22	<0.05	<0.08	0.05	0.63	0.05	2.48	<0.05	<0.05	41.37
89	BLD/PBH05/80	85.00	86.00	1.00	1.76	<0.05	51.00	<0.05	0.72	1.02	0.15	1.34	<0.05	<0.08	<0.05	0.68	0.08	3.03	<0.05	<0.05	40.87
90	BLD/PBH05/81	86.00	87.00	1.00	1.61	<0.05	51.06	<0.05	0.85	1.22	0.14	1.31	<0.05	<0.08	0.09	0.81	0.05	2.68	<0.05	<0.05	41.00
91	BLD/PBH05/82	87.00	88.00	1.00	1.29	<0.05	51.65	<0.05	1.04	1.48	0.08	1.27	<0.05	<0.08	0.06	0.94	<0.05	2.16	<0.05	<0.05	41.00
92	BLD/PBH05/83	88.00	89.00	1.00	1.87	<0.05	50.76	<0.05	0.83	1.18	0.14	1.32	<0.05	<0.08	<0.05	0.81	0.06	2.89	<0.05	<0.05	40.90
93	BLD/PBH05/84	89.00	90.00	1.00	1.51	<0.05	51.92	<0.05	0.55	0.79	0.11	1.16	<0.05	<0.08	<0.05	0.49	<0.05	2.26	<0.05	<0.05	41.64
94	BLD/PBH05/85	90.00	91.00	1.00	1.38	<0.05	51.92	<0.05	0.62	0.89	0.10	1.21	<0.05	<0.08	<0.05	0.51	<0.05	2.16	<0.05	<0.05	41.73
95	BLD/PBH05/86	91.00	92.00	1.00	1.90	<0.05	50.62	<0.05	0.76	1.09	0.16	1.23	<0.05	<0.08	<0.05	0.73	0.07	3.19	<0.05	<0.05	40.95
96	BLD/PBH05/87	92.00	93.00	1.00	1.17	<0.05	51.99	<0.05	0.69	0.99	0.09	1.20	<0.05	<0.08	<0.05	0.73	<0.05	2.15	<0.05	<0.05	41.59
97	BLD/PBH05/88	93.00	94.00	1.00	1.86	<0.05	51.21	<0.05	0.54	0.77	0.13	1.23	<0.05	<0.08	<0.05	0.50	0.06	2.77	<0.05	<0.05	41.42
98	BLD/PBH05/89	94.00	95.00	1.00	2.38	<0.05	49.19	<0.05	1.08	1.55	0.16	1.52	<0.05	<0.08	<0.05	0.76	0.08	3.97	<0.05	<0.05	40.34
100	BLD/PBH05/90	95.00	96.00	1.00	1.88	<0.05	50.17	<0.05	0.98	1.40	0.11	1.45	<0.05	<0.08	<0.05	0.65	0.09	3.34	<0.05	<0.05	40.84
101	BLD/PBH05/91	96.00	97.00	1.00	2.05	<0.05	49.63	<0.05	1.08	1.55	0.18	1.48	<0.05	<0.08	<0.05	0.67	0.07	3.89	<0.05	<0.05	40.42
102	BLD/PBH05/92	97.00	98.00	1.00	1.64	<0.05	50.62	<0.05	0.96	1.37	0.15	1.34	<0.05	<0.08	<0.05	0.63	0.06	3.16	<0.05	<0.05	40.96
103	BLD/PBH05/93	98.00	99.00	1.00	2.22	<0.05	48.39	<0.05	1.56	2.24	0.20	1.57	<0.05	<0.08	0.05	1.32	0.09	4.56	<0.05	<0.05	39.35
104	BLD/PBH05/94	99.00	100.00	1.00	2.40	<0.05	48.02	<0.05	1.50	2.15	0.23	1.56	<0.05	<0.08	<0.05	1.18	0.10	4.94	<0.05	<0.05	39.36

ANNEXURE-V: ANALYTICAL RESULT OF CHECK SAMPLE (DUPLICATE SAMPLES)

Sr No	Sample No	SiO2 (%)	TiO2 (%)	Al2O3 (%)	Fe2O3(T) (%)	MnO (%)	MgO (%)	CaO (%)	Na2O (%)	K2O (%)	P2O5 (%)	SO3 (%)	L.O.I (%)
1	BLD/PBH-01/11	6.641	0.157	3.136	5.947	0.103	3.26	42.163	0.016	0.334	0.082	0.508	37.401239
2	BLD/PBH-01/22	5.217	0.108	2.331	3.062	<0.01	1.582	47.368	0.074	0.185	0.058	1.461	38.32998
3	BLD/PBH-01/33	2.43	0.047	1.182	0.92	<0.01	0.969	52.384	<0.01	0.102	0.026	0.668	41.198655
4	BLD/PBH-01/44	2.757	0.052	1.283	1.028	<0.01	1.066	51.659	0.029	0.118	0.019	0.534	41.296554
5	BLD/PBH-01/55	6.543	0.132	2.822	2.533	<0.01	1.453	47.057	0.014	0.303	0.038	1.163	37.801393
6	BLD/PBH-01/66	55.719	0.341	6.278	5.817	<0.01	0.969	14.538	0.022	1.161	0.046	2.37	12.498037
7	BLD/PBH-01/75	66.643	0.609	11.54	5.454	<0.01	1.001	3.665	0.073	1.935	0.054	1.939	6.492835
8	BLD/PBH-01/84	51.439	1.057	20.868	7.249	0.018	1.028	0.81	0.026	2.119	0.051	1.637	13.421441
9	BLD/PBH02/10	6.887	0.184	3.651	12.026	0.538	2.559	38.468	0.018	0.278	0.141	3.283	31.713985
10	BLD/PBH02/20	5.514	0.145	2.862	15.717	0.119	1.873	39.105	0.025	0.191	0.243	1.312	32.556365
11	BLD/PBH02/30	48.827	1.078	21.32	11.311	<0.01	3.147	0.889	0.541	2.951	0.366	1.065	8.0785724
12	BLD/PBH02/40	4.969	0.109	2.273	4.541	0.257	2.533	45.464	<0.01	0.21	0.063	1.675	37.606838
13	BLD/PBH02/50	9.333	0.221	4.473	6.931	<0.01	2.644	40.487	0.028	0.454	0.141	0.435	34.730481
14	BLD/PBH02/60	6.315	0.147	3.128	2.01	<0.01	1.463	46.857	0.041	0.3	0.026	1.335	38.198639
15	BLD/PBH02/70	3.88	0.082	1.875	1.359	<0.01	1.16	50.042	<0.01	0.2	0.029	1.014	40.170643
16	BLD/PBH02/80	3.063	0.064	1.517	0.807	<0.01	1.034	51.2	0.02	0.145	0.016	0.48	41.284404
17	BLD/PBH02/90	5.939	0.144	3.052	4.041	0.011	1.307	46.391	<0.01	0.308	0.055	1.285	37.248865
18	BLD/PBH02/96	10.839	0.247	5.115	2.536	<0.01	1.102	42.666	0.019	0.476	0.064	1.031	35.548007
19	BLD/PBH03/10	6.697	0.18	3.587	11.101	0.506	2.473	39.488	0.012	0.278	0.244	2.692	32.551247
20	BLD/PBH03/20	6.065	0.166	3.215	18.645	0.126	2.027	36.585	0.024	0.209	0.268	1.081	31.245849
21	BLD/PBH03/30	49.088	1.105	21.8	11.178	<0.01	3.089	0.224	0.763	3.159	0.122	0.884	7.8380483
22	BLD/PBH03/40	5.547	0.122	2.516	4.851	0.284	2.805	44.303	0.028	0.234	0.098	1.928	36.976679
23	BLD/PBH03/50	11.498	0.258	5.081	7.896	<0.01	4.118	36.026	0.082	0.578	0.137	0.312	33.64235
24	BLD/PBH03/60	5.881	0.132	2.82	2.386	<0.01	1.621	47.061	0.011	0.271	0.043	1.247	38.360021

ANNEXURE-V: ANALYTICAL RESULT OF CHECK SAMPLE (DUPLICATE SAMPLES)

Sr No	Sample No	SiO2 (%)	TiO2 (%)	Al2O3 (%)	Fe2O3(T) (%)	MnO (%)	MgO (%)	CaO (%)	Na2O (%)	K2O (%)	P2O5 (%)	SO3 (%)	L.O.I. (%)
25	BLD/PBH03/70	2.929	0.058	1.408	0.922	<0.01	1.002	51.524	<0.01	0.143	0.027	0.63	41.091756
26	BLD/PBH03/80	2.733	0.05	1.238	1.049	<0.01	1.055	51.833	0.03	0.112	0.016	0.579	41.108085
27	BLD/PBH03/86	5.166	0.11	2.386	2.099	<0.01	1.444	48.262	0.02	0.265	0.027	0.924	39.057617
28	BLD/PBH-04/10	4.774	0.142	2.826	10.654	1.237	2.554	40.15	<0.01	0.157	0.106	2.779	34.202567
29	BLD/PBH-04/20	4.366	0.096	2.071	4.143	0.273	1.619	47.312	<0.01	0.135	0.047	2.331	37.453184
30	BLD/PBH-04/30	5.781	0.14	2.898	6.26	0.079	1.602	45.02	0.011	0.279	0.112	1.514	36.156226
31	BLD/PBH-04/40	8.576	0.157	3.212	3.439	0.019	2.635	43.335	0.036	0.352	0.039	1.226	36.776719
32	BLD/PBH-04/50	6.663	0.148	2.997	4.625	0.101	3.059	43.405	0.06	0.336	0.089	0.625	37.317694
33	BLD/PBH-04/60	6.193	0.137	2.839	3.554	<0.01	1.767	45.646	0.07	0.245	0.064	1.339	37.753883
34	BLD/PBH-04/70	1.845	0.03	0.882	0.76	<0.01	0.926	53.249	0.044	0.076	0.033	0.52	41.522207
35	BLD/PBH-04/80	2.582	0.051	1.22	1.232	<0.01	1.087	51.606	0.037	0.121	0.027	0.818	40.980075
36	BLD/PBH-04/90	5.077	0.112	2.385	2.349	<0.01	1.464	48.045	0.042	0.231	0.037	1.229	38.845554
37	BLD/PBH05/10	48.403	1.024	20.163	9.689	<0.01	2.595	2.627	0.174	3.037	0.106	0.886	10.981818
38	BLD/PBH05/20	5.138	0.13	2.694	6.561	0.383	1.771	44.75	0.038	0.208	0.082	1.78	36.157507
39	BLD/PBH05/30	7.253	0.2	3.89	18.104	0.108	2.259	35.81	0.019	0.286	0.257	0.764	30.780484
40	BLD/PBH05/40	22.64	0.504	9.938	10.408	<0.01	2.727	26.157	0.206	1.254	0.327	0.612	24.675962
41	BLD/PBH05/50	4.028	0.084	1.831	2.484	0.135	1.453	48.589	0.049	0.179	0.027	1.602	39.272819
42	BLD/PBH05/60	9.216	0.213	4.266	4.59	<0.01	2.952	41.176	0.05	0.433	0.096	0.734	35.74061
43	BLD/PBH05/70	4.476	0.097	2.108	1.799	<0.01	1.467	49.003	0.031	0.173	0.032	0.797	39.803357
44	BLD/PBH05/80	3.167	0.067	1.542	1.031	<0.01	1.133	51.176	0.048	0.186	0.02	0.605	40.901633
45	BLD/PBH05/90	3.496	0.07	1.599	1.416	<0.01	1.239	50.625	0.017	0.147	0.025	0.546	40.66442
46	BLD-06	3.873	0.077	1.78	1.121	<0.01	1.266	50.53	0.09	0.16	0.01	0.415	40.527241
47	BLD-12	1.552	0.027	0.78	0.676	<0.01	0.89	53.74	0.12	0.07	0.02	0.041	42.0298
48	BLD-21	3.496	0.069	1.51	5.883	0.32	1.191	48.38	0.06	0.11	0.10	<0.01	38.909542

ANNEXURE-V: ANALYTICAL RESULT OF CHECK SAMPLE (DUPLICATE SAMPLES)

Sr No	Sample No	SiO2 (%)	TiO2 (%)	Al2O3 (%)	Fe2O3(T) (%)	MnO (%)	MgO (%)	CaO (%)	Na2O (%)	K2O (%)	P2O5 (%)	SO3 (%)	L.O.I. (%)
49	BLD-26	2.637	0.046	1.09	4.591	0.15	1.028	49.84	0.06	0.09	0.08	<0.01	40.18596
50	BLD-35	2.92	0.062	1.44	2.345	0.37	0.96	50.84	0.02	0.12	0.04	<0.01	40.81381

ANNEXURE-VI: ANALYTICAL RESULT (MAJOR OXIDES) OF PETROCHEMICAL SAMPLES

S.NO	Sample ID	From	To	Thickness	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe (T)	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	SiO ₂	SrO	V ₂ O ₅	LOI
1	BLD/PBH01/15	18.00	19.00	1.00	5.66	<0.05	35.55	<0.05	4.68	6.69	0.65	4.08	<0.05	<0.08	0.10	0.64	0.28	11.78	0.10	<0.05	34.35
2	BLD/PBH01/70	73.00	74.00	1.00	11.59	<0.05	16.01	<0.05	4.92	7.04	1.53	1.19	<0.05	<0.08	0.07	3.33	1.15	40.24	<0.05	<0.05	17.61
3	BLD/PBH02/24	26.00	27.00	1.00	2.28	<0.05	48.38	<0.05	2.00	2.86	0.18	1.41	0.12	<0.08	0.08	1.29	0.11	3.96	<0.05	<0.05	39.32
4	BLD/PBH02/94	97.00	98.00	1.00	10.49	<0.05	25.79	<0.05	3.54	5.07	1.12	1.68	<0.05	<0.08	0.05	2.68	0.96	26.61	<0.05	<0.05	25.53
5	BLD/PBH03/25	38.00	39.00	1.00	3.82	<0.05	41.73	<0.05	5.55	7.94	0.37	1.75	0.15	<0.08	0.11	1.40	0.19	6.71	0.08	<0.05	35.63
6	BLD/PBH03/64	77.00	78.00	1.00	1.49	<0.05	50.75	<0.05	1.16	1.66	0.07	1.26	<0.05	<0.08	<0.05	0.65	<0.05	2.41	0.06	<0.05	41.51
7	BLD/PBH04/13	20.00	21.00	1.00	2.34	<0.05	40.18	<0.05	9.17	13.11	0.11	2.58	1.21	<0.08	0.08	0.21	0.09	3.17	0.10	<0.05	36.67
8	BLD/PBH04/54	62.00	63.00	1.00	5.02	<0.05	36.00	<0.05	5.88	8.40	0.57	3.95	<0.05	<0.08	0.11	0.51	0.25	10.61	0.10	<0.05	34.37
9	BLD/PBH05/37	41.00	42.00	1.00	5.01	<0.05	38.83	<0.05	5.90	8.43	0.49	2.45	0.05	<0.08	0.33	0.76	0.23	9.95	<0.05	<0.05	33.43
10	BLD/PBH05/71	76.00	77.00	1.00	3.35	<0.05	45.79	<0.05	1.64	2.35	0.19	1.73	<0.05	<0.08	0.05	1.42	0.10	5.78	<0.05	<0.05	39.21

ANNEXURE-VII: BULK DENSITY OF CORE SAMPLES

Sl. No.	Customer Code	Customer Description	METHOD	SOP/OM/094
			UNITS	gm/cm3
			Lab ID	Bulk Density
1	BLD/PBH02/93	Powder	G621-1	2.48
2	BLD/PBH01/15	Powder	G621-2	2.61
3	BLD/PBH04/54	Powder	G621-3	2.49

ANNEXURE-VIII: NPEA Certificate of Accreditation



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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खान मंत्रालय

अधिसूचना

नई दिल्ली, 29 अगस्त, 2022

का.आ. 4038(अ).—केंद्रीय सरकार, खान और खनिज (विकास और विनियमन) अधिनियम, 1957 (1957 का 67) की धारा 4 की उपधारा (1) के दूसरे परंतुक द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और भारतीय गुणवत्ता परिषद् के राष्ट्रीय शिक्षा और प्रशिक्षण प्रत्यायन बोर्ड (क्यूसीआई-एनएबीईटी) द्वारा उपबंधित प्रत्यायन के परिणामस्वरूप, उक्त अधिनियम की धारा 4 की उपधारा (1) के उक्त दूसरे परंतुक के प्रयोजनों के लिए भारत सरकार के खान मंत्रालय के आदेश संख्यांक एम.वी-16/15/2021-खान VI, तारीख 12 अगस्त, 2021 (जिसे इसमें इसके पश्चात् प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचना के लिए उक्त मार्गदर्शक सिद्धांत कहा गया है) द्वारा जारी प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचना के लिए मार्गदर्शक सिद्धांतों में यथा विनिर्दिष्ट “प्रवर्ग ‘क’ खोज अभिकरण” के अधीन मैसर्स महेश्वरी माईनिंग प्राइवेट लिमिटेड को अधिसूचित करती है।

2. अभिकरण, प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचनाओं के लिए मार्गदर्शक सिद्धांतों में विनिर्दिष्ट शर्तों की अनुपालना के साथ पूर्वेक्षण संक्रियाएं करेगा।

3. यह अधिसूचना राजपत्र में इसके प्रकाशन की तारीख को प्रवृत्त होगी और अधिसूचना की तारीख से तीन वर्ष की अवधि के लिए या उसकी समाप्ति तक या प्रदत्त प्रत्यायन की समाप्ति तक, जो भी पहले हो विधिमान्य होगी।

[फा. सं. एम-वी-16/22/2022-खान VI]

डॉ. वीणा कुमारी डरमल, संयुक्त सचिव

MINISTRY OF MINES**NOTIFICATION**

New Delhi, the 29th August, 2022

S.O. 4038(E).—In exercise of the powers conferred under the second proviso to sub-section (1) of section 4 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) and consequent upon accreditation provided by the National Accreditation Board for Education and Training of the Quality Council of India (QCI-NABET), the Central Government hereby notifies the M/s. Maheshwari Mining Private Limited under 'Category A Exploration Agencies' as specified in the guidelines for notification of accredited private exploration agencies issued by the Government of India in the Ministry of Mines vide order No. M.VI-16/15/2021-Mines VI, dated the 12th August, 2021 (hereafter referred to as the said guidelines for notification of accredited private exploration agencies) for the purposes of the said second proviso to sub-section (1) of section 4 of the said Act.

2. The agency shall carry out prospecting operations in compliance with the conditions specified in the said guidelines for notifications of accredited private exploration agencies.

3. This notification shall come into force on the date of its publication in the Official Gazette and shall remain valid for a period of three years from the date of notification or till expiry or termination of the accreditation granted, whichever is earlier.

[F. No. M.VI-16/22/2022-Mines VI]

Dr. VEENA KUMARI DERMAL, Jt. Secy.

ANNEXURE-IX: Comments of the Peer Reviewer on “Preliminary Exploration (G3 stage) for Limestone in Northwest of Boro Lakhindong Block, Dima Hasao district, Assam”

Examined the Geological Report on Preliminary Exploration (G3 Stage) for Limestone in Northwest of Boro Lakhindong, Dima Hasao District, Assam and observations are as follows:

CONCLUSION AND RECOMMENDATION

The Geological Report on Preliminary Exploration (G3 Stage) for Limestone in Northwest of Boro Lakhindong, Dima Hasao District, Assam covering an area of 4.82 sq.km and involving 500m of drilling is a nice work done by team of M/s MMPL with very good documentation of data and presentation through photographs.

The block with net resource of 498.97 MT (Class 333 as per UNFC) under different grades viz. Cement (Portland) 195.29 MT, Cement (Blendable) 144.40 MT and SMS (OH) 155.68 MT appears to be very potential.

Further assessment of resource of 300.79 MT (Class 334 as per UNFC) carried out beyond the area of BH influence and up to the block boundary is encouraging and attracts further investigation in the entire area under G2 Level of exploration with closer bore hole spacing.

The overburden ratio appears to be favorable and large scale open cast quarry may be envisaged after G2 Level of exploration.

I appreciate the restrictions put on M/s MMPL under the quantum of work already defined earlier due to which bore holes PBH-02 to 05 have been closed at 100m depth only while intersecting the limestone mineralized zone, otherwise it would have been prudent to deepen any one of the above four boreholes up to Upper Sylhet Sandstone to decipher the total limestone column.

Sl. No	Comments/Observations
1.	<p>Executive Summary may not be assigned a Chapter.</p> <p>Introduction should start with Chapter-1 and corrections may be made accordingly for the following chapters along with number of Tables and Figures therein for the respective chapters.</p> <p>There should be a page for list of abbreviations used in the report so as to clarify what is SMS(OH) grade (at last line of page 4), XRF and SGS in table 2.3 at page 7, LGB International</p>

	Airport at page 9, PPL & XPL(Optical properties) at page 32, NQT at page 44 and so on
2.	<p>Chapter 2 Introduction</p> <p>6th line of first para</p> <p>The study area is bounded by Kopili River from the Western and Southern side.</p> <p>As per Plate I, II & IIA of the report, Kopili River appears to flow only in the south western corner of the block making a natural boundary. All sides of the Block boundary may be defined precisely.</p> <p>Para 2.1</p> <p>Notification in respect of M/s Maheshwari Mining Pvt. Ltd. as Notified Private Exploration Agency(NPEA) and further as ‘Category A Exploration Agencies’ may be annexed in the report</p>
3.	<p>Chapter 3 Property Description</p> <p>Para 3.1.3 Table 3.1</p> <p>Values in the table do not match with Header. May be corrected</p> <p>Longitudinal value of Point ID “C” at third row may be re-examined</p> <p>Para 3.1.7 Climate</p> <p>Source of data pertaining to rainfall and temperature may be indicated</p>
4.	<p>Chapter 6 Geoscience Investigation</p> <p>First line of page 24, (and also at the first line of last para of Executive Summary(page 3)) it is mentioned</p> <p><i>‘In boreholes, the thickness of limestone varies from 4.00m to 100m with the average being 88.56m’</i></p> <p>The statement is not clear.</p> <p>Thickness of limestone varies from 78.76m (PBH-01) to 95.60m (PBH-02) as is evident from Table 8.1 at page 46.</p> <p>Occurrence of limestone has been intersected at 4.0m depth in borehole PBH-01 and continues up to 100m depth in boreholes PBH-02, 03, 04 & 05.</p> <p>Documentation in respect of thickness/occurrence of limestone may be corrected accordingly.</p>

5.	<p>Chapter 11 Resource Estimation</p> <p>Table 11.1(page 57)</p> <p>From(m) value for intersection of limestone in borehole PBH-04 & 05 may be rechecked, it does not match with Table 8.1(page 46) or Table 9.2(page 49)</p>
6.	<p>Point 11.4 Cut-off Grade Considerations</p> <p>Table 11.2</p> <p>Please expand SMS (OH) and SMS (LD). It may be mentioned in the list of abbreviation also. Limestone is used in steel making industries also and as such SMS(OH) may be Steel Melting Shop (Open Hearth) and SMS(LD) may be Steel Melting Shop(Low Density/Low Dolomite) for Basic Oxygen Furnace</p>
7.	<p>Point 11.8 Methodology of Resource Estimation</p> <p>Sub para a)</p> <p>Please expand MEMC rule</p> <p>It should be - The Minerals (Evidence of Mineral Contents) Rules 2015, (As amended up to 14th December, 2021) Ministry of Mines, Govt. of India issued by the Controller General, IBM, Nagpur(January, 2022)</p> <p>Part-III of Schedule-I of the above rule allows 800m grid spacing of boreholes for G3 level of exploration in limestone.</p> <p>Five or any number of boreholes is the choice of exploratory agency subject to the area of exploration and approval by the approving authority (here it is NMET).</p>
8.	<p>Observation on plans</p> <p>Plate : I , II & IIA</p> <p>Scale is missing</p> <p>River name is missing</p> <p>Road is missing in legend</p> <p>Important location within the block or surrounding the area may be indicated on plan</p> <p>Roads joining places with their names at both end may be given on map</p>

	<p>Plate: III Geological cross section</p> <p>Monogram is missing</p> <p>Vertical Exaggeration: 1x means that the vertical and horizontal scales on a map or profile are the same.</p> <p>Plate- I, II, IIA & III are on same scale (1:4000). But distances between BH PBH-03 & 05 on X-sec. line U-U1 and PBH-04 & 05 on X-sec. line V-V1 does not exactly match with their distance on plans. Plotting of BH on X-sec. may be rechecked</p> <p>Plate IV Graphic Litholog</p> <p>Having a look at the graphic log has always been the first choice by a geologist or a mining engineer. I feel that M/s MMPL has maintained a very high degree of austerity here. Please take care. At least it should be vivid and readable.</p>
<p>All comments and suggestions made by the Peer Reviewer have been duly complied with by</p> <p>M/S. Maheshwari Mining Private Limited.</p>	



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TEST REPORT

Customer Name Maheshwari Mining Private Limited-Assam
Nil Umrang so Umrang so-788931

Discipline & Group Chemical & Ores and Minerals.

Customer Ref. MMPL/2023/WO-11

Commodity Limestone

Lab ID G8981

Date Received/Start of Analysis 19-Jul-24

Date Completed/Report 23-Jul-24

Sample Count 53

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			DL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Total Iron as Fe	Total Iron as Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	V2O5	LOI
1	AMIS0461	CRM	Cert.	0.80	N.A	48.31	0.38	0.55	0.78	N.A	0.83	0.05	N.A	N.A	0.05	0.05	10.10	N.A	38.71
3	BLD-01	Powder	G8981-1	2.59	<0.05	46.86	<0.05	3.05	4.36	0.23	1.16	<0.05	<0.08	0.05	0.20	0.12	4.49	<0.05	39.72
5	BLD-02	Powder	G8981-2	1.15	<0.05	49.34	<0.05	3.22	4.61	0.10	0.88	1.10	<0.08	0.12	0.10	<0.05	1.42	<0.05	40.92
7	BLD-03	Powder	G8981-3	1.96	<0.05	0.13	<0.05	4.96	7.10	0.13	<0.05	<0.05	0.08	0.07	<0.05	0.18	87.90	<0.05	2.35
9	BLD-04	Powder	G8981-4	1.99	<0.05	0.06	<0.05	1.02	1.46	0.20	<0.05	<0.05	0.08	<0.05	<0.05	0.18	94.46	<0.05	1.48
11	BLD-05	Powder	G8981-5	2.64	<0.05	46.01	<0.05	2.83	4.05	0.29	1.15	0.07	<0.08	0.22	0.10	0.12	5.93	<0.05	39.23
13	BLD-06	Powder	G8981-6	1.99	<0.05	49.68	<0.05	0.92	1.31	0.15	1.30	<0.05	<0.08	<0.05	0.48	0.08	3.54	<0.05	41.29
15	BLD-07	Powder	G8981-7	1.85	<0.05	49.60	<0.05	1.21	1.73	0.14	1.31	<0.05	<0.08	<0.05	0.66	0.07	3.41	<0.05	41.07
17	BLD-08	Powder	G8981-8	1.97	<0.05	44.43	<0.05	6.17	8.82	0.11	1.37	1.31	<0.08	0.28	0.11	0.07	2.79	<0.05	38.53
19	BLD-09	Powder	G8981-9	1.64	<0.05	48.43	<0.05	2.93	4.18	0.10	1.23	0.18	<0.08	0.05	1.00	0.07	2.72	<0.05	40.19
21	BLD-10	Powder	G8981-10	2.03	<0.05	49.15	<0.05	1.36	1.95	0.16	1.37	<0.05	<0.08	<0.05	0.75	0.07	3.47	<0.05	40.87
23	BLD-10	Powder	G8981-10	1.91	<0.05	49.23	<0.05	1.36	1.95	0.16	1.37	<0.05	<0.08	<0.05	0.75	0.07	3.51	<0.05	40.84
25	BLD-11	Powder	G8981-11	2.08	<0.05	47.72	<0.05	3.08	4.41	0.17	1.20	<0.05	<0.08	<0.05	0.18	0.09	3.44	<0.05	40.44
27	BLD-12	Powder	G8981-12	1.08	<0.05	52.25	<0.05	0.61	0.87	0.06	0.96	<0.05	<0.08	<0.05	0.09	<0.05	1.43	<0.05	43.07
29	BLD-13	Powder	G8981-13	1.70	<0.05	50.43	<0.05	1.02	1.45	0.12	1.09	<0.05	<0.08	<0.05	0.22	0.06	2.72	<0.05	42.06
31	BLD-14	Powder	G8981-14	1.95	<0.05	45.82	<0.05	4.71	6.73	0.07	1.42	0.41	<0.08	0.06	1.14	0.06	3.27	<0.05	38.89
33	BLD-15	Powder	G8981-15	1.33	<0.05	0.40	<0.05	2.80	4.01	0.10	<0.05	<0.05	0.08	<0.05	<0.05	0.15	92.03	<0.05	1.78
35	BLD-16	Powder	G8981-16	4.90	<0.05	33.47	<0.05	12.06	17.24	0.45	1.37	0.48	<0.08	0.57	0.19	0.24	9.88	<0.05	31.00
37	BLD-17	Powder	G8981-17	2.23	<0.05	42.64	<0.05	4.95	7.07	0.23	1.29	0.79	<0.08	0.31	0.10	0.10	8.45	<0.05	36.58
39	BLD-18	Powder	G8981-18	2.55	<0.05	40.24	<0.05	9.84	14.06	0.15	1.60	0.31	<0.08	0.38	0.09	0.10	4.22	<0.05	36.08
41	BLD-19	Powder	G8981-19	2.42	<0.05	47.16	<0.05	2.48	3.55	0.21	1.28	0.17	<0.08	0.06	1.01	0.11	4.39	<0.05	39.47
43	BLD-20	Powder	G8981-20	1.75	<0.05	50.46	<0.05	1.08	1.55	0.11	1.10	<0.05	<0.08	<0.05	0.62	0.05	2.60	<0.05	41.60
45	BLD-20	Powder	G8981-20	1.71	<0.05	50.15	<0.05	1.07	1.53	0.11	1.10	<0.05	<0.08	<0.05	0.63	0.05	2.56	<0.05	41.98
47	AMIS0461	CRM	Meas.	0.82	-	48.37	0.40	0.56	0.80	-	0.81	0.06	-	-	-	0.06	10.12	-	38.68
49	BLD-21	Powder	G8981-21	1.78	<0.05	46.71	<0.05	4.53	6.47	0.10	1.23	0.39	<0.08	0.07	0.07	0.06	3.19	<0.05	39.77
51	BLD-22	Powder	G8981-22	2.57	<0.05	41.44	<0.05	8.54	12.21	0.16	1.40	0.24	<0.08	0.29	0.08	0.10	4.19	<0.05	37.14
53	BLD-23	Powder	G8981-23	1.51	<0.05	49.51	<0.05	1.90	2.72	0.10	1.12	0.26	<0.08	<0.05	0.29	0.06	2.59	<0.05	41.65
55	BLD-24	Powder	G8981-24	1.94	<0.05	47.79	<0.05	2.85	4.07	0.16	1.38	0.17	<0.08	<0.05	0.09	0.09	3.48	<0.05	40.60
57	BLD-25	Powder	G8981-25	1.87	<0.05	47.98	<0.05	2.76	3.95	0.17	1.10	0.13	<0.08	0.05	0.09	0.09	3.53	<0.05	40.90
59	BLD-26	Powder	G8981-26	1.26	<0.05	48.64	<0.05	3.62	5.17	0.08	1.07	0.20	<0.08	<0.05	0.08	0.06	2.36	<0.05	40.87
61	BLD-27	Powder	G8981-27	2.21	<0.05	44.51	<0.05	5.69	8.13	0.16	1.47	0.77	<0.08	0.05	0.09	0.08	4.09	<0.05	38.24
63	BLD-28	Powder	G8981-28	2.45	<0.05	41.99	<0.05	8.35	11.93	0.20	1.37	0.23	<0.08	0.16	0.08	0.10	4.16	<0.05	37.13
65	BLD-29	Powder	G8981-29	2.27	<0.05	46.21	<0.05	3.61	5.16	0.21	1.39	0.17	<0.08	<0.05	0.09	0.10	4.46	<0.05	39.68
67	BLD-30	Powder	G8981-30	2.10	<0.05	44.27	<0.05	6.39	9.14	0.13	1.22	0.37	<0.08	0.10	0.07	0.08	4.20	<0.05	38.14



SHIVA ANALYTICALS (INDIA) PRIVATE LIMITED

Plot No. 24D [P] & 34 D, KIADB Industrial Area, Hoskote
Bangalore – 562 114. Phone No: 080 – 2801 5333,
Website: www.shivaanalyticals.com

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			DL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Total Iron as Fe	Total Iron as Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	V2O5	LOI
69	BLD-30	Powder	G8981-30	2.05	<0.05	44.38	<0.05	6.41	9.16	0.13	1.22	0.39	<0.08	0.10	0.06	0.08	4.17	<0.05	38.07
71	BLD-31	Powder	G8981-31	1.91	<0.05	44.30	<0.05	6.66	9.52	0.10	1.13	0.27	<0.08	0.11	0.07	0.07	3.75	<0.05	38.57
73	BLD-32	Powder	G8981-32	1.81	<0.05	48.28	<0.05	2.81	4.02	0.18	1.02	0.15	<0.08	<0.05	0.08	0.10	3.48	<0.05	40.68
75	BLD-33	Powder	G8981-33	1.82	<0.05	48.28	<0.05	2.73	3.90	0.16	1.09	0.12	<0.08	<0.05	0.09	0.09	3.53	<0.05	40.72
77	BLD-34	Powder	G8981-34	1.91	<0.05	44.24	<0.05	5.94	8.49	0.09	1.78	0.46	<0.08	0.06	1.35	0.07	4.01	<0.05	37.36
79	BLD-35	Powder	G8981-35	1.63	<0.05	49.68	<0.05	1.91	2.72	0.11	1.01	0.41	<0.08	<0.05	0.09	0.06	2.67	<0.05	41.44
81	BLD-36	Powder	G8981-36	3.32	<0.05	41.43	<0.05	7.05	10.09	0.28	1.39	0.17	<0.08	0.13	0.07	0.16	5.81	<0.05	36.97
83	BLD-37	Powder	G8981-37	2.94	<0.05	41.39	<0.05	7.44	10.64	0.27	1.33	0.16	<0.08	0.14	0.07	0.16	5.74	<0.05	36.96
85	BLD-38	Powder	G8981-38	1.99	<0.05	47.33	<0.05	3.52	5.04	0.15	1.15	0.46	<0.08	0.08	0.08	0.08	3.17	<0.05	40.29
87	BLD-39	Powder	G8981-39	1.36	<0.05	45.38	<0.05	6.65	9.51	<0.05	1.07	1.35	<0.08	0.22	<0.05	<0.05	1.73	<0.05	39.03
89	BLD-40	Powder	G8981-40	2.18	<0.05	44.40	<0.05	5.62	8.03	0.12	1.54	0.79	<0.08	<0.05	0.07	0.08	4.21	<0.05	38.33
91	BLD-40	Powder	G8981-40	2.01	<0.05	44.42	<0.05	5.64	8.07	0.12	1.54	0.81	<0.08	<0.05	0.07	0.07	4.23	<0.05	38.39
93	AMIS0461	CRM	Meas.	0.84	-	48.32	0.36	0.51	0.74	-	0.79	0.06	-	-	-	0.05	10.09	-	38.73
95	BLD-41	Powder	G8981-41	1.92	<0.05	0.14	<0.05	2.40	3.43	0.39	<0.05	0.37	0.08	<0.05	<0.05	0.30	91.57	<0.05	1.60
97	BLD-42	Powder	G8981-42	2.09	<0.05	0.24	<0.05	2.05	2.94	0.19	<0.05	<0.05	0.08	<0.05	<0.05	0.20	92.33	<0.05	1.80
99	BLD-43	Powder	G8981-43	1.95	<0.05	0.25	<0.05	3.91	5.58	0.14	<0.05	<0.05	0.08	0.07	<0.05	0.18	89.68	<0.05	1.97
101	BLD-44	Powder	G8981-44	1.74	<0.05	48.79	<0.05	2.43	3.47	0.17	1.01	0.15	<0.08	<0.05	0.08	0.09	3.31	<0.05	40.99
103	BLD-45	Powder	G8981-45	1.55	<0.05	48.86	<0.05	2.90	4.15	0.12	1.07	0.47	<0.08	<0.05	0.10	0.06	2.33	<0.05	41.10
105	BLD-46	Powder	G8981-46	1.76	<0.05	48.16	<0.05	3.00	4.28	0.12	1.12	0.48	<0.08	<0.05	0.14	0.07	2.96	<0.05	40.72
107	BLD-47	Powder	G8981-47	2.46	<0.05	44.59	0.05	5.29	7.56	0.27	1.35	0.55	<0.08	0.49	0.09	0.10	3.80	<0.05	38.50
109	BLD-48	Powder	G8981-48	2.14	<0.05	44.20	<0.05	5.35	7.66	0.15	1.32	0.75	<0.08	0.15	0.07	0.08	4.85	<0.05	38.42
111	BLD-49	Powder	G8981-49	1.75	<0.05	49.00	<0.05	2.19	3.12	0.13	1.01	0.42	<0.08	<0.05	0.10	0.06	2.94	<0.05	41.28
113	BLD-50	Powder	G8981-50	1.95	<0.05	44.69	<0.05	5.23	7.48	0.14	1.33	1.48	<0.08	0.11	0.11	0.08	3.32	<0.05	39.11
115	BLD-50	Powder	G8981-50	1.96	<0.05	44.82	<0.05	5.22	7.47	0.13	1.32	1.47	<0.08	0.11	0.11	0.08	3.34	<0.05	38.98
117	BLD-51	Powder	G8981-51	2.04	<0.05	45.60	<0.05	4.87	6.97	0.22	1.29	0.68	<0.08	0.22	0.09	0.10	3.56	<0.05	39.04
119	BLD-52	Powder	G8981-52	1.91	<0.05	44.93	<0.05	5.31	7.60	0.14	1.34	1.38	<0.08	0.07	0.11	0.08	3.06	<0.05	39.17
121	BLD-53	Powder	G8981-53	1.48	<0.05	49.47	<0.05	1.92	2.74	0.11	1.10	0.28	<0.08	<0.05	0.17	0.06	2.87	<0.05	41.53

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

Certi. -- Certified

Meas. -- Measured

DL--Detection Limit

Accuracy, Precision, Matrix Method and Instrument dependent.

AMIS0461: Certified Reference Material Standard

SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

** END OF THE REPORT **

1. The results listed above pertain only to the tested samples and applicable parameters. 2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is limited to the invoiced amount. 4. This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission. 5. In case any reconfirmation of contents of this test certificate is required, please contact our office. 6. Sampling is not done by us unless otherwise specified. 7. Any discrepancy in the Test Certificate should be notified within 30 days.

Customer Name	Maheshwari Mining Pvt Limited -Assam Umrangso-788931
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Discipline & Group Chemical & Ores and Minerals.
Customer Ref. MMPL/SHIVA/2024/WO-02 (PBH-01)
Commodity Geological Rock Powders
Lab ID G470
Sample Receipt Date 05-Feb-25
Analysis Completion Date 11-Feb-25
Date of Reporting 11-Feb-25
Sample Count 84

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	IPT-61	CRM	Cert.	0.05	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	99.79	N.A	N.A	N.A
2	IPT-44	CRM	Cert.	0.33	N.A	50.55	N.A	0.21	0.30	0.12	2.93	N.A	N.A	N.A	N.A	N.A	2.69	N.A	N.A	42.90
3	BLD/PBH01/01	Powder	G470-1	3.58	<0.05	42.25	<0.05	2.85	4.07	0.35	2.59	<0.05	<0.08	<0.05	1.30	0.15	8.74	0.11	<0.05	36.72
4	BLD/PBH01/02	Powder	G470-2	2.51	<0.05	45.90	<0.05	2.14	3.06	0.23	2.22	0.06	<0.08	<0.05	1.02	0.10	5.60	0.10	<0.05	39.09
5	BLD/PBH01/03	Powder	G470-3	2.44	<0.05	45.36	<0.05	2.59	3.71	0.22	2.57	0.11	<0.08	<0.05	1.29	0.10	5.08	0.09	<0.05	38.89
6	BLD/PBH01/04	Powder	G470-4	2.18	<0.05	46.62	<0.05	2.76	3.95	0.19	2.09	0.20	<0.08	<0.05	1.29	0.08	4.08	0.11	<0.05	39.08
7	BLD/PBH01/05	Powder	G470-5	1.84	<0.05	47.59	<0.05	2.19	3.14	0.14	1.90	0.32	<0.08	<0.05	1.62	0.07	3.45	0.09	<0.05	39.73
8	BLD/PBH01/06	Powder	G470-6	2.66	<0.05	44.43	<0.05	3.81	5.45	0.21	2.27	0.31	<0.08	<0.05	2.14	0.10	4.94	0.08	<0.05	37.26
9	BLD/PBH01/07	Powder	G470-7	2.23	<0.05	47.29	<0.05	2.32	3.31	0.20	1.62	0.24	<0.08	<0.05	1.72	0.09	4.08	0.08	<0.05	39.02
10	BLD/PBH01/08	Powder	G470-8	1.72	<0.05	48.98	<0.05	2.10	3.01	0.11	1.50	0.31	<0.08	<0.05	1.27	0.06	3.05	0.08	<0.05	39.79
11	BLD/PBH01/09	Powder	G470-9	2.11	<0.05	47.50	<0.05	2.11	3.02	0.15	1.70	0.19	<0.08	<0.05	1.69	0.08	3.58	0.08	<0.05	39.78
12	BLD/PBH01/10	Powder	G470-10	3.03	<0.05	43.30	<0.05	3.60	5.15	0.29	2.81	0.13	<0.08	0.09	0.86	0.15	5.88	0.08	<0.05	38.13
13	BLD/PBH01/10	Powder	G470-10	2.99	<0.05	43.28	<0.05	3.62	5.18	0.29	2.81	0.14	<0.08	0.09	0.87	0.15	5.83	0.08	<0.05	38.19
14	BLD/PBH01/11	Powder	G470-11	3.35	<0.05	42.19	<0.05	4.64	6.64	0.32	3.14	0.13	<0.08	0.06	0.68	0.16	6.17	0.10	<0.05	36.94
15	BLD/PBH01/12	Powder	G470-12	3.32	<0.05	42.23	<0.05	4.35	6.22	0.32	2.94	<0.05	<0.08	0.07	0.70	0.16	5.97	0.10	<0.05	37.82
16	BLD/PBH01/13	Powder	G470-13	3.43	<0.05	42.73	<0.05	4.17	5.96	0.33	2.61	<0.05	<0.08	0.09	0.78	0.17	6.29	0.11	<0.05	37.37
17	BLD/PBH01/14	Powder	G470-14	4.65	<0.05	39.62	<0.05	3.15	4.50	0.54	3.52	<0.05	<0.08	0.11	0.70	0.24	9.63	0.11	<0.05	36.29
18	BLD/PBH01/15	Powder	G470-15	5.66	<0.05	35.55	<0.05	4.68	6.69	0.65	4.08	<0.05	<0.08	0.10	0.64	0.28	11.78	0.10	<0.05	34.35
19	BLD/PBH01/16	Powder	G470-16	5.03	<0.05	37.48	<0.05	6.31	9.02	0.52	2.71	<0.05	<0.08	0.15	0.64	0.25	9.79	0.11	<0.05	34.19
20	BLD/PBH01/17	Powder	G470-17	2.96	<0.05	44.59	<0.05	1.96	2.80	0.30	2.61	<0.05	<0.08	<0.05	0.74	0.15	6.43	0.10	<0.05	39.19
21	BLD/PBH01/18	Powder	G470-18	4.50	<0.05	40.47	<0.05	3.83	5.48	0.45	2.57	<0.05	<0.08	0.09	1.03	0.23	8.97	0.10	<0.05	36.00
22	BLD/PBH01/19	Powder	G470-19	3.51	<0.05	42.59	<0.05	4.27	6.10	0.33	2.30	<0.05	<0.08	0.12	1.29	0.17	6.63	0.10	<0.05	36.75
23	BLD/PBH01/20	Powder	G470-20	2.81	<0.05	45.49	<0.05	2.90	4.14	0.25	1.70	<0.05	<0.08	0.06	1.59	0.13	5.13	0.08	<0.05	38.51
24	BLD/PBH01/20	Powder	G470-20	2.78	<0.05	45.44	<0.05	2.90	4.15	0.23	1.75	<0.05	<0.08	0.06	1.66	0.12	5.15	0.07	<0.05	38.57
25	BLD/PBH01/21	Powder	G470-21	2.73	<0.05	47.22	<0.05	2.48	3.54	0.18	1.66	<0.05	<0.08	<0.05	1.60	0.10	4.72	0.07	<0.05	38.04
26	BLD/PBH01/22	Powder	G470-22	2.72	<0.05	45.78	<0.05	2.40	3.43	0.19	1.63	<0.05	<0.08	0.06	1.92	0.11	4.84	0.07	<0.05	39.13
27	BLD/PBH01/23	Powder	G470-23	2.48	<0.05	50.05	<0.05	1.22	1.74	0.19	1.33	<0.05	<0.08	<0.05	0.95	0.11	4.13	0.07	<0.05	38.84
28	BLD/PBH01/24	Powder	G470-24	2.32	<0.05	48.82	<0.05	1.19	1.70	0.18	1.28	<0.05	<0.08	<0.05	0.92	0.11	3.96	0.07	<0.05	40.53
29	BLD/PBH01/25	Powder	G470-25	2.42	<0.05	48.05	<0.05	1.46	2.08	0.21	1.40	<0.05	<0.08	<0.05	0.98	0.12	4.45	0.09	<0.05	40.09

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
30	BLD/PBH01/26	Powder	G470-26	2.48	<0.05	47.30	<0.05	1.69	2.42	0.22	1.35	<0.05	<0.08	<0.05	1.82	0.12	4.59	0.09	<0.05	39.50
31	BLD/PBH01/27	Powder	G470-27	2.50	<0.05	48.35	<0.05	1.29	1.85	0.20	1.41	<0.05	<0.08	<0.05	0.80	0.11	4.49	0.07	<0.05	40.13
32	BLD/PBH01/28	Powder	G470-28	3.16	<0.05	45.90	<0.05	2.00	2.86	0.25	1.71	<0.05	<0.08	<0.05	1.21	0.12	6.01	0.09	<0.05	38.57
33	BLD/PBH01/29	Powder	G470-29	1.45	<0.05	50.88	<0.05	1.00	1.43	0.07	1.11	<0.05	<0.08	<0.05	0.59	<0.05	2.35	0.06	<0.05	41.92
34	BLD/PBH01/30	Powder	G470-30	1.28	<0.05	50.83	<0.05	1.05	1.50	0.07	1.11	<0.05	<0.08	<0.05	0.89	<0.05	2.08	0.06	<0.05	41.81
35	BLD/PBH01/30	Powder	G470-30	1.26	<0.05	50.78	<0.05	1.05	1.51	0.07	1.07	<0.05	<0.08	<0.05	0.91	<0.05	2.13	0.07	<0.05	41.86
36	BLD/PBH01/31	Powder	G470-31	1.84	<0.05	49.95	<0.05	1.18	1.68	0.09	1.20	<0.05	<0.08	<0.05	1.00	0.05	2.77	<0.05	<0.05	41.27
37	BLD/PBH01/32	Powder	G470-32	1.56	<0.05	50.55	<0.05	1.01	1.44	0.11	1.15	<0.05	<0.08	<0.05	0.78	0.06	2.79	0.05	<0.05	41.41
38	BLD/PBH01/33	Powder	G470-33	1.48	<0.05	51.34	<0.05	0.79	1.12	0.09	1.01	<0.05	<0.08	<0.05	0.70	<0.05	2.09	<0.05	<0.05	41.97
39	BLD/PBH01/34	Powder	G470-34	1.68	<0.05	50.83	<0.05	0.83	1.19	0.12	1.05	<0.05	<0.08	<0.05	0.69	0.06	2.47	<0.05	<0.05	41.75
40	BLD/PBH01/35	Powder	G470-35	1.87	<0.05	50.47	<0.05	0.81	1.16	0.13	1.11	<0.05	<0.08	<0.05	0.67	0.06	2.65	<0.05	<0.05	41.73
41	BLD/PBH01/36	Powder	G470-36	1.84	<0.05	50.28	<0.05	0.92	1.32	0.16	1.09	<0.05	<0.08	<0.05	0.84	0.07	2.98	0.05	<0.05	41.26
42	BLD/PBH01/37	Powder	G470-37	2.30	<0.05	48.76	<0.05	1.36	1.94	0.20	1.29	<0.05	<0.08	<0.05	1.26	0.08	3.82	0.05	<0.05	40.17
43	BLD/PBH01/38	Powder	G470-38	1.63	<0.05	50.82	<0.05	0.87	1.24	0.13	1.07	<0.05	<0.08	<0.05	0.84	0.06	2.34	0.05	<0.05	41.72
44	BLD/PBH01/39	Powder	G470-39	1.69	<0.05	50.39	<0.05	0.90	1.28	0.17	1.11	<0.05	<0.08	<0.05	0.67	0.07	2.93	0.06	<0.05	41.53
45	BLD/PBH01/40	Powder	G470-40	1.99	<0.05	49.78	<0.05	1.08	1.54	0.17	1.21	<0.05	<0.08	<0.05	0.89	0.07	3.08	0.06	<0.05	41.05
46	BLD/PBH01/40	Powder	G470-40	2.01	<0.05	49.78	<0.05	1.08	1.55	0.17	1.23	<0.05	<0.08	<0.05	0.88	0.07	3.09	0.05	<0.05	41.06
47	IPT-61	CRM	Meas.	0.06	-	-	-	-	-	-	-	-	-	-	-	-	99.76	-	-	-
48	BLD/PBH01/41	Powder	G470-41	1.40	<0.05	50.53	<0.05	1.30	1.86	0.11	1.11	<0.05	<0.08	<0.05	1.08	<0.05	2.46	0.05	<0.05	41.23
49	BLD/PBH01/42	Powder	G470-42	1.84	<0.05	50.02	<0.05	1.01	1.44	0.17	1.17	<0.05	<0.08	<0.05	0.81	0.07	3.20	0.06	<0.05	41.11
50	BLD/PBH01/43	Powder	G470-43	1.51	<0.05	51.32	<0.05	0.68	0.97	0.09	1.05	<0.05	<0.08	<0.05	0.46	<0.05	1.92	<0.05	<0.05	42.49
51	BLD/PBH01/44	Powder	G470-44	1.38	<0.05	50.97	<0.05	0.86	1.23	0.11	1.11	<0.05	<0.08	<0.05	0.57	0.05	2.40	0.06	<0.05	42.01
52	BLD/PBH01/45	Powder	G470-45	1.49	<0.05	50.70	<0.05	1.06	1.51	0.10	1.16	<0.05	<0.08	<0.05	0.70	<0.05	2.41	0.05	<0.05	41.72
53	BLD/PBH01/46	Powder	G470-46	1.39	<0.05	51.32	<0.05	0.80	1.15	0.09	1.09	<0.05	<0.08	<0.05	0.59	<0.05	2.10	0.06	<0.05	42.04
54	BLD/PBH01/47	Powder	G470-47	2.03	<0.05	49.89	<0.05	0.86	1.23	0.17	1.18	<0.05	<0.08	<0.05	0.59	0.08	3.56	0.06	<0.05	41.09
55	BLD/PBH01/48	Powder	G470-48	2.43	<0.05	48.44	<0.05	1.39	1.99	0.18	1.39	<0.05	<0.08	<0.05	0.78	0.09	4.26	0.06	<0.05	40.29
56	BLD/PBH01/49	Powder	G470-49	1.99	<0.05	49.53	<0.05	1.30	1.85	0.14	1.29	<0.05	<0.08	<0.05	0.66	0.06	3.29	<0.05	<0.05	41.01
57	BLD/PBH01/50	Powder	G470-50	2.11	<0.05	48.71	<0.05	1.49	2.14	0.19	1.37	<0.05	<0.08	<0.05	0.72	0.07	3.97	0.06	<0.05	40.54
58	BLD/PBH01/50	Powder	G470-50	2.16	<0.05	48.68	<0.05	1.49	2.13	0.19	1.38	<0.05	<0.08	<0.05	0.72	0.07	3.94	0.06	<0.05	40.54
59	BLD/PBH01/51	Powder	G470-51	2.94	<0.05	46.61	<0.05	1.94	2.77	0.30	1.54	<0.05	<0.08	<0.05	0.93	0.11	5.70	0.06	<0.05	38.92
60	BLD/PBH01/52	Powder	G470-52	2.82	<0.05	47.07	<0.05	1.80	2.57	0.24	1.51	<0.05	<0.08	<0.05	0.95	0.09	5.01	0.07	<0.05	39.55
61	BLD/PBH01/53	Powder	G470-53	2.88	<0.05	46.13	<0.05	2.44	3.48	0.26	1.65	<0.05	<0.08	<0.05	1.25	0.11	5.86	0.07	<0.05	38.18
62	BLD/PBH01/54	Powder	G470-54	3.13	<0.05	44.96	<0.05	2.59	3.70	0.31	1.60	<0.05	<0.08	<0.05	1.66	0.13	6.61	0.07	<0.05	37.69
63	BLD/PBH01/55	Powder	G470-55	3.13	<0.05	46.23	<0.05	2.00	2.86	0.29	1.46	<0.05	<0.08	<0.05	1.15	0.14	5.94	0.08	<0.05	38.61
64	BLD/PBH01/56	Powder	G470-56	3.62	<0.05	45.05	<0.05	2.48	3.54	0.33	1.49	<0.05	<0.08	<0.05	1.52	0.16	6.60	0.07	<0.05	37.45
65	BLD/PBH01/57	Powder	G470-57	4.12	<0.05	43.48	<0.05	3.31	4.73	0.44	1.44	<0.05	<0.08	<0.05	1.70	0.21	7.41	0.06	<0.05	36.27
66	BLD/PBH01/58	Powder	G470-58	2.88	<0.05	46.88	<0.05	2.31	3.30	0.26	1.18	<0.05	<0.08	<0.05	1.47	0.14	4.94	0.07	<0.05	38.75
67	BLD/PBH01/59	Powder	G470-59	3.62	<0.05	44.96	<0.05	2.37	3.38	0.30	1.33	<0.05	<0.08	<0.05	1.53	0.17	6.66	0.07	<0.05	37.84
68	BLD/PBH01/60	Powder	G470-60	3.73	<0.05	44.34	<0.05	2.70	3.86	0.27	1.51	<0.05	<0.08	<0.05	1.44	0.16	6.95	0.07	<0.05	37.52
69	BLD/PBH01/60	Powder	G470-60	3.46	<0.05	44.38	<0.05	2.72	3.89	0.28	1.48	<0.05	<0.08	<0.05	1.46	0.17	6.99	0.08	<0.05	37.54
70	BLD/PBH01/61	Powder	G470-61	4.75	<0.05	40.86	<0.05	3.23	4.62	0.42	1.55	<0.05	<0.08	<0.05	2.11	0.31	10.59	<0.05	<0.05	34.58
71	BLD/PBH01/62	Powder	G470-62	11.02	<0.05	24.59	<0.05	3.80	5.44	1.26	1.49	<0.05	<0.08	0.06	3.06	1.02	27.90	<0.05	<0.05	23.94

Prepared by: Naveen

Verified by: Satyanarayana

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
72	BLD/PBH01/63	Powder	G470-63	7.72	<0.05	30.57	<0.05	3.34	4.77	0.94	1.13	<0.05	<0.08	<0.05	2.66	0.92	24.16	<0.05	<0.05	26.92	
73	BLD/PBH01/64	Powder	G470-64	10.52	<0.05	30.51	<0.05	3.31	4.73	1.03	1.31	<0.05	<0.08	<0.05	2.54	0.75	20.44	<0.05	<0.05	27.99	
74	BLD/PBH01/65	Powder	G470-65	5.72	<0.05	33.27	<0.05	3.46	4.94	0.74	1.19	<0.05	<0.08	<0.05	2.12	0.67	22.25	<0.05	<0.05	28.82	
75	BLD/PBH01/66	Powder	G470-66	6.14	<0.05	13.99	<0.05	4.09	5.84	1.16	0.92	<0.05	<0.08	<0.05	2.57	1.10	54.00	<0.05	<0.05	13.91	
76	BLD/PBH01/67	Powder	G470-67	10.10	<0.05	16.03	<0.05	4.43	6.34	1.53	1.16	<0.05	<0.08	<0.05	2.73	1.08	43.62	<0.05	<0.05	17.15	
77	BLD/PBH01/68	Powder	G470-68	15.01	<0.05	7.96	<0.05	5.12	7.31	1.74	1.35	<0.05	<0.08	0.05	2.99	1.39	48.89	<0.05	<0.05	13.02	
78	BLD/PBH01/69	Powder	G470-69	11.96	<0.05	14.12	<0.05	5.45	7.80	1.65	1.32	<0.05	<0.08	0.11	2.99	1.20	42.02	<0.05	<0.05	16.59	
79	BLD/PBH01/70	Powder	G470-70	11.59	<0.05	16.01	<0.05	4.92	7.04	1.53	1.19	<0.05	<0.08	0.07	3.33	1.15	40.24	<0.05	<0.05	17.61	
80	BLD/PBH01/70	Powder	G470-70	11.55	<0.05	16.00	<0.05	4.96	7.09	1.52	1.21	<0.05	<0.08	0.07	3.35	1.16	40.26	<0.05	<0.05	17.65	
81	BLD/PBH01/71	Powder	G470-71	4.36	<0.05	5.21	<0.05	1.84	2.63	0.63	0.34	<0.05	<0.08	<0.05	1.55	0.70	78.26	<0.05	<0.05	6.07	
82	BLD/PBH01/72	Powder	G470-72	4.83	<0.05	17.90	<0.05	2.33	3.34	0.64	0.57	<0.05	<0.08	<0.05	1.63	0.97	53.76	<0.05	<0.05	15.99	
83	BLD/PBH01/73	Powder	G470-73	9.32	<0.05	15.32	<0.05	4.13	5.91	1.31	0.91	<0.05	<0.08	0.06	3.36	1.08	46.77	<0.05	<0.05	15.70	
84	BLD/PBH01/74	Powder	G470-74	9.83	<0.05	16.07	<0.05	3.73	5.33	1.29	0.88	<0.05	<0.08	<0.05	2.57	1.02	46.20	<0.05	<0.05	16.53	
85	BLD/PBH01/75	Powder	G470-75	11.48	<0.05	4.12	<0.05	4.14	5.92	2.06	1.00	<0.05	<0.08	<0.05	2.53	1.72	62.84	<0.05	<0.05	7.94	
86	BLD/PBH01/76	Powder	G470-76	9.16	<0.05	4.73	<0.05	3.36	4.81	1.66	0.73	<0.05	<0.08	<0.05	3.06	1.58	66.31	<0.05	<0.05	7.58	
87	BLD/PBH01/77	Powder	G470-77	5.69	<0.05	35.77	<0.05	4.39	6.28	0.69	1.29	0.09	<0.08	0.09	2.50	0.49	15.83	<0.05	<0.05	31.10	
88	BLD/PBH01/78	Powder	G470-78	6.02	<0.05	39.56	<0.05	2.50	3.57	0.56	0.83	0.11	<0.08	0.07	3.14	0.36	11.70	<0.05	<0.05	33.92	
89	BLD/PBH01/79	Powder	G470-79	4.68	<0.05	37.88	<0.05	5.66	8.09	0.40	0.68	0.12	<0.08	<0.05	8.30	0.26	12.96	<0.05	<0.05	26.47	
90	BLD/PBH01/80	Powder	G470-80	0.66	<0.05	0.34	<0.05	3.77	5.39	0.10	<0.05	<0.05	<0.08	<0.05	7.63	0.17	82.82	<0.05	<0.05	2.63	
91	BLD/PBH01/80	Powder	G470-80	0.69	<0.05	0.34	<0.05	3.77	5.39	0.10	<0.05	<0.05	<0.08	<0.05	7.61	0.17	82.79	<0.05	<0.05	2.64	
92	BLD/PBH01/81	Powder	G470-81	15.32	<0.05	0.57	<0.05	5.44	7.78	1.28	0.49	<0.05	<0.08	<0.05	2.84	0.98	56.73	<0.05	<0.05	13.77	
93	BLD/PBH01/82	Powder	G470-82	8.89	<0.05	7.51	<0.05	2.59	3.70	0.87	0.42	<0.05	<0.08	<0.05	4.88	0.78	62.65	<0.05	<0.05	9.91	
94	BLD/PBH01/83	Powder	G470-83	20.20	<0.05	2.22	<0.05	4.79	6.85	2.21	0.99	<0.05	<0.08	<0.05	6.39	1.21	47.28	<0.05	<0.05	12.40	
95	BLD/PBH01/84	Powder	G470-84	19.74	<0.05	1.17	<0.05	5.01	7.16	2.09	0.96	<0.05	<0.08	0.05	5.55	1.30	48.28	<0.05	<0.05	13.50	
96	IPT-44	CRM	Meas.	0.36	-	50.56	-	0.24	0.34	0.12	2.94	-	-	-	-	-	2.61	-	-	42.89	

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

LOQ--Limit of Quantification

IPT-61: Certified Reference Material Standard

IPT-44: Certified Reference Material Standard

Certi. -- Certified

Meas. -- Measured

Accuracy, Precision, Matrix Method and instrument dependent.



SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

**** END OF THE REPORT ****

1. The results listed above pertain only to the tested samples and applicable parameters. 2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is limited to the invoiced amount. 4. This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission. 5. In case any reconfirmation of contents of this test certificate is required, please contact our office. 6. Sampling is not done by us unless otherwise specified. 7. Any discrepancy in the Test Certificate should be notified within 30 days.

Customer Name	Maheshwari Mining Pvt Limited -Assam Umrangso-788931
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Discipline & Group Chemical & Ores and Minerals.
Customer Ref. MMPL/SHIVA/2024/WO-02
Commodity Geological Rock Powders
Lab ID G508
Sample Receipt Date 10-Feb-25
Analysis Completion Date 20-Feb-25
Date of Reporting 20-Feb-25
Sample Count 96

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	IPT-44	CRM	Cert.	0.33	N.A	50.55	N.A	0.21	0.30	0.12	2.93	N.A	N.A	N.A	0.43	N.A	2.69	N.A	N.A	42.90
2	BLD/PBH02/01	Powder	G508-1	13.07	<0.05	19.67	<0.05	7.22	10.32	1.75	2.50	0.27	<0.08	0.20	1.06	0.73	30.28	<0.05	<0.05	20.13
3	BLD/PBH02/02	Powder	G508-2	4.92	<0.05	35.33	<0.05	8.54	12.20	0.47	2.78	0.63	<0.08	0.19	0.32	0.23	11.10	<0.05	<0.05	31.81
4	BLD/PBH02/03	Powder	G508-3	4.72	<0.05	34.43	<0.05	10.99	15.71	0.42	3.08	0.61	<0.08	0.55	0.53	0.22	8.77	<0.05	<0.05	30.94
5	BLD/PBH02/04	Powder	G508-4	3.81	<0.05	37.99	<0.05	8.79	12.56	0.28	2.75	1.22	<0.08	0.26	2.09	0.16	6.66	<0.05	<0.05	32.20
6	BLD/PBH02/05	Powder	G508-5	2.69	<0.05	41.05	<0.05	7.58	10.84	0.16	2.68	1.24	<0.08	0.21	1.63	0.11	4.75	<0.05	<0.05	34.62
7	BLD/PBH02/06	Powder	G508-6	2.91	<0.05	40.76	<0.05	7.47	10.68	0.14	3.01	1.31	<0.08	0.24	0.58	0.10	4.04	<0.05	<0.05	36.21
8	BLD/PBH02/07	Powder	G508-7	3.26	<0.05	38.47	<0.05	9.95	14.23	0.13	2.96	1.18	<0.08	0.34	1.20	0.12	4.44	<0.05	<0.05	33.63
9	BLD/PBH02/08	Powder	G508-8	4.54	<0.05	36.04	<0.05	9.32	13.33	0.32	3.50	1.21	<0.08	0.35	0.68	0.19	7.10	<0.05	<0.05	32.72
10	BLD/PBH02/09	Powder	G508-9	3.03	<0.05	40.43	<0.05	6.99	10.00	0.21	2.85	0.90	<0.08	0.17	1.47	0.12	6.47	<0.05	<0.05	34.33
11	BLD/PBH02/10	Powder	G508-10	4.26	<0.05	38.34	<0.05	7.93	11.34	0.26	2.80	0.60	<0.08	0.20	3.59	0.15	6.42	<0.05	<0.05	32.01
12	BLD/PBH02/10	Powder	G508-10	4.24	<0.05	38.36	<0.05	7.96	11.38	0.24	2.75	0.59	<0.08	0.24	3.55	0.14	6.39	<0.05	<0.05	32.08
13	BLD/PBH02/11	Powder	G508-11	2.73	<0.05	45.18	<0.05	4.18	5.98	0.17	1.91	0.47	<0.08	0.13	2.14	0.10	4.20	<0.05	<0.05	36.96
14	BLD/PBH02/12	Powder	G508-12	2.98	<0.05	44.92	<0.05	3.35	4.79	0.19	1.78	0.38	<0.08	0.08	2.63	0.11	4.83	<0.05	<0.05	37.30
15	BLD/PBH02/13	Powder	G508-13	2.12	<0.05	47.08	<0.05	2.49	3.56	0.17	1.49	0.33	<0.08	0.09	3.06	0.09	3.90	<0.05	<0.05	38.08
16	BLD/PBH02/14	Powder	G508-14	2.27	<0.05	47.78	<0.05	2.24	3.21	0.12	1.56	0.31	<0.08	0.07	2.57	0.08	3.53	<0.05	<0.05	38.49
17	BLD/PBH02/15	Powder	G508-15	3.30	<0.05	43.86	<0.05	3.69	5.28	0.19	2.16	0.31	<0.08	0.09	3.13	0.11	5.66	<0.05	<0.05	35.89
18	BLD/PBH02/16	Powder	G508-16	2.96	<0.05	44.90	<0.05	3.56	5.10	0.13	2.06	0.32	<0.08	0.11	2.37	0.10	4.85	<0.05	<0.05	37.08
19	BLD/PBH02/17	Powder	G508-17	2.78	<0.05	43.92	<0.05	4.29	6.13	0.15	2.18	0.35	<0.08	0.13	2.32	0.09	5.43	<0.05	<0.05	36.47
20	BLD/PBH02/18	Powder	G508-18	2.03	<0.05	46.45	<0.05	4.51	6.45	0.09	1.79	0.40	<0.08	0.17	1.32	0.06	3.35	<0.05	<0.05	37.86
21	BLD/PBH02/19	Powder	G508-19	2.70	<0.05	44.04	<0.05	5.68	8.13	0.16	1.92	0.27	<0.08	0.20	1.86	0.10	4.70	<0.05	<0.05	35.90
22	BLD/PBH02/20	Powder	G508-20	3.20	<0.05	39.66	<0.05	10.35	14.80	0.19	2.11	0.17	<0.08	0.36	1.68	0.13	4.98	<0.05	<0.05	32.70
23	BLD/PBH02/20	Powder	G508-20	3.16	<0.05	39.69	<0.05	10.36	14.81	0.18	2.14	0.18	<0.08	0.35	1.66	0.14	4.96	<0.05	<0.05	32.71
24	BLD/PBH02/21	Powder	G508-21	4.76	<0.05	34.67	0.08	12.98	18.56	0.28	2.64	0.16	<0.08	0.37	1.26	0.18	6.98	<0.05	<0.05	30.06
25	BLD/PBH02/22	Powder	G508-22	4.18	<0.05	37.64	<0.05	10.67	15.25	0.26	2.35	0.15	<0.08	0.34	1.68	0.16	6.15	<0.05	<0.05	31.81
26	BLD/PBH02/23	Powder	G508-23	2.99	<0.05	42.37	<0.05	8.09	11.57	0.18	1.90	0.11	<0.08	0.32	1.29	0.11	4.18	<0.05	<0.05	34.95
27	BLD/PBH02/24	Powder	G508-24	2.28	<0.05	48.38	<0.05	2.00	2.86	0.18	1.41	0.12	<0.08	0.08	1.29	0.11	3.96	<0.05	<0.05	39.32
28	BLD/PBH02/25	Powder	G508-25	3.72	<0.05	43.29	<0.05	4.30	6.15	0.36	1.85	0.10	<0.08	0.16	1.64	0.18	6.63	<0.05	<0.05	35.91
29	BLD/PBH02/26	Powder	G508-26	4.65	<0.05	40.48	<0.05	5.60	8.01	0.44	2.26	0.10	<0.08	0.25	1.21	0.22	7.87	<0.05	<0.05	34.50
30	BLD/PBH02/27	Powder	G508-27	6.11	<0.05	34.81	<0.05	6.73	9.62	0.63	3.43	0.06	<0.08	0.35	1.02	0.30	11.78	<0.05	<0.05	31.86
31	BLD/PBH02/28	Powder	G508-28	5.40	<0.05	37.72	<0.05	6.20	8.86	0.53	2.53	0.06	<0.08	0.31	0.83	0.25	10.76	<0.05	<0.05	32.73
32	BLD/PBH02/29	Powder	G508-29	22.28	<0.05	0.63	<0.05	8.42	12.05	3.03	3.35	<0.05	0.46	0.58	0.94	1.03	47.45	<0.05	<0.05	8.17
33	BLD/PBH02/30	Powder	G508-30	22.24	<0.05	0.98	<0.05	8.46	12.09	2.95	3.37	<0.05	0.37	0.43	1.28	1.04	47.10	<0.05	<0.05	8.12

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
34	BLD/PBH02/30	Powder	G508-30	22.23	<0.05	0.96	<0.05	8.47	12.11	2.93	3.39	<0.05	0.36	0.40	1.32	1.02	47.08	<0.05	<0.05	8.14
35	BLD/PBH02/31	Powder	G508-31	21.68	<0.05	0.51	<0.05	9.02	12.90	2.81	3.45	<0.05	0.30	0.12	1.74	1.02	46.92	<0.05	<0.05	8.54
36	BLD/PBH02/32	Powder	G508-32	11.19	<0.05	24.50	<0.05	7.22	10.32	1.36	2.87	<0.05	<0.08	0.19	0.52	24.33	<0.05	<0.05	23.71	
37	BLD/PBH02/33	Powder	G508-33	4.66	<0.05	40.59	<0.05	3.98	5.68	0.49	2.35	0.06	<0.08	0.14	1.00	0.21	10.15	<0.05	<0.05	34.64
38	BLD/PBH02/34	Powder	G508-34	4.86	<0.05	41.15	<0.05	2.79	4.00	0.53	2.53	<0.05	<0.08	0.09	0.81	0.21	10.69	<0.05	<0.05	35.06
39	BLD/PBH02/35	Powder	G508-35	3.98	<0.05	42.67	<0.05	2.29	3.28	0.37	2.95	<0.05	<0.08	0.07	1.13	0.15	8.95	<0.05	<0.05	36.40
40	BLD/PBH02/36	Powder	G508-36	2.59	<0.05	46.87	<0.05	1.76	2.52	0.23	2.50	<0.05	<0.08	0.05	0.81	0.10	5.65	<0.05	<0.05	38.61
41	BLD/PBH02/37	Powder	G508-37	2.61	<0.05	45.26	<0.05	2.12	3.04	0.21	3.08	0.11	<0.08	0.07	1.32	0.09	5.20	<0.05	<0.05	38.99
42	BLD/PBH02/38	Powder	G508-38	2.99	<0.05	45.14	<0.05	2.52	3.60	0.25	2.39	0.20	<0.08	0.07	1.78	0.10	5.71	<0.05	<0.05	37.73
43	BLD/PBH02/39	Powder	G508-39	2.26	<0.05	46.60	<0.05	2.49	3.56	0.16	2.21	0.30	<0.08	0.08	2.02	0.08	4.26	<0.05	<0.05	38.45
44	BLD/PBH02/40	Powder	G508-40	2.76	<0.05	45.19	<0.05	3.02	4.32	0.20	2.76	0.29	<0.08	0.10	1.68	0.09	4.61	<0.05	<0.05	37.99
45	BLD/PBH02/40	Powder	G508-40	2.77	<0.05	45.17	<0.05	3.01	4.30	0.23	2.77	0.27	<0.08	0.09	1.65	0.10	4.65	<0.05	<0.05	37.96
46	BLD/PBH02/41	Powder	G508-41	1.76	<0.05	49.38	<0.05	1.52	2.17	0.13	1.57	0.22	<0.08	0.06	1.31	0.07	3.19	<0.05	<0.05	40.12
47	BLD/PBH02/42	Powder	G508-42	1.81	<0.05	48.63	<0.05	1.71	2.44	0.15	1.67	0.20	<0.08	0.06	1.59	0.08	3.67	<0.05	<0.05	39.69
48	BLD/PBH02/43	Powder	G508-43	2.12	<0.05	48.19	<0.05	1.73	2.48	0.14	1.80	0.15	<0.08	0.06	1.66	0.08	3.63	<0.05	<0.05	39.68
49	BLD/PBH02/44	Powder	G508-44	3.22	<0.05	43.62	<0.05	3.24	4.63	0.31	2.99	0.12	<0.08	0.15	0.74	0.16	6.24	<0.05	<0.05	37.78
50	BLD/PBH02/45	Powder	G508-45	3.71	<0.05	42.36	<0.05	4.21	6.03	0.35	2.91	0.17	<0.08	0.14	0.75	0.17	7.05	<0.05	<0.05	36.36
51	BLD/PBH02/46	Powder	G508-46	3.42	<0.05	42.46	<0.05	4.23	6.05	0.32	3.43	0.06	<0.08	0.30	0.67	0.15	5.98	<0.05	<0.05	37.14
52	BLD/PBH02/47	Powder	G508-47	3.89	<0.05	42.30	<0.05	4.00	5.71	0.36	2.85	<0.05	<0.08	0.24	0.70	0.18	7.03	<0.05	<0.05	36.72
53	BLD/PBH02/48	Powder	G508-48	4.60	<0.05	40.07	<0.05	2.35	3.35	0.50	4.00	<0.05	<0.08	0.08	0.50	0.22	9.74	<0.05	<0.05	36.90
54	BLD/PBH02/49	Powder	G508-49	5.01	<0.05	38.36	<0.05	3.97	5.68	0.53	3.83	<0.05	<0.08	0.16	0.61	0.24	10.27	<0.05	<0.05	35.28
55	BLD/PBH02/50	Powder	G508-50	4.73	<0.05	40.36	<0.05	4.59	6.56	0.44	2.82	<0.05	<0.08	0.20	0.60	0.22	8.90	<0.05	<0.05	35.16
56	BLD/PBH02/50	Powder	G508-50	4.75	<0.05	40.31	<0.05	4.57	6.53	0.43	2.85	<0.05	<0.08	0.16	0.58	0.20	8.98	<0.05	<0.05	35.18
57	BLD/PBH02/51	Powder	G508-51	3.14	<0.05	44.85	<0.05	1.71	2.45	0.29	2.89	<0.05	<0.08	0.09	0.82	0.14	6.45	<0.05	<0.05	38.85
58	BLD/PBH02/52	Powder	G508-52	5.56	<0.05	38.92	<0.05	3.63	5.19	0.52	3.32	<0.05	<0.08	0.15	0.87	0.26	10.45	<0.05	<0.05	34.76
59	BLD/PBH02/53	Powder	G508-53	3.06	<0.05	45.68	<0.05	1.91	2.73	0.27	2.29	<0.05	<0.08	0.12	1.09	0.13	5.52	<0.05	<0.05	39.09
60	BLD/PBH02/54	Powder	G508-54	3.50	<0.05	44.60	<0.05	3.15	4.50	0.26	2.15	<0.05	<0.08	0.15	1.41	0.13	5.72	<0.05	<0.05	37.56
61	BLD/PBH02/55	Powder	G508-55	2.60	<0.05	47.01	<0.05	2.10	3.00	0.19	1.96	<0.05	<0.08	0.10	1.43	0.09	4.85	<0.05	<0.05	38.76
62	BLD/PBH02/56	Powder	G508-56	3.28	<0.05	45.74	<0.05	2.18	3.11	0.22	1.89	<0.05	<0.08	0.10	1.81	0.11	5.64	<0.05	<0.05	38.07
63	BLD/PBH02/57	Powder	G508-57	2.47	<0.05	47.89	<0.05	1.72	2.47	0.17	1.68	<0.05	<0.08	0.12	1.72	0.09	4.37	<0.05	<0.05	38.99
64	BLD/PBH02/58	Powder	G508-58	2.78	<0.05	48.00	<0.05	1.03	1.47	0.23	1.53	<0.05	<0.08	<0.05	0.93	0.12	5.00	<0.05	<0.05	39.87
65	BLD/PBH02/59	Powder	G508-59	3.16	<0.05	46.89	<0.05	1.49	2.13	0.24	1.72	<0.05	<0.08	0.06	1.22	0.13	5.46	<0.05	<0.05	38.96
66	BLD/PBH02/60	Powder	G508-60	3.44	<0.05	46.40	<0.05	1.36	1.95	0.29	1.67	<0.05	<0.08	<0.05	1.32	0.15	6.07	<0.05	<0.05	38.65
67	BLD/PBH02/60	Powder	G508-60	3.42	<0.05	46.38	<0.05	1.38	1.97	0.25	1.69	<0.05	<0.08	<0.05	1.35	0.14	6.09	<0.05	<0.05	38.64
68	BLD/PBH02/61	Powder	G508-61	2.94	<0.05	48.09	<0.05	1.16	1.66	0.19	1.62	<0.05	<0.08	<0.05	1.01	0.11	4.84	<0.05	<0.05	39.48
69	BLD/PBH02/62	Powder	G508-62	1.72	<0.05	50.26	<0.05	1.09	1.55	0.10	1.57	<0.05	<0.08	0.06	0.79	0.06	3.13	<0.05	<0.05	40.72
70	BLD/PBH02/63	Powder	G508-63	1.17	<0.05	52.02	<0.05	0.78	1.12	<0.05	1.23	<0.05	<0.08	<0.05	0.50	<0.05	1.84	<0.05	<0.05	41.96
71	BLD/PBH02/64	Powder	G508-64	0.93	<0.05	52.60	<0.05	0.65	0.93	<0.05	1.14	<0.05	<0.08	0.05	0.73	<0.05	1.49	<0.05	<0.05	42.02
72	BLD/PBH02/65	Powder	G508-65	1.46	<0.05	51.92	<0.05	0.62	0.88	0.07	1.15	<0.05	<0.08	<0.05	0.65	<0.05	1.86	<0.05	<0.05	41.89
73	BLD/PBH02/66	Powder	G508-66	1.11	<0.05	52.25	<0.05	0.56	0.80	0.09	1.09	<0.05	<0.08	0.05	0.67	<0.05	2.04	<0.05	<0.05	41.83
74	BLD/PBH02/67	Powder	G508-67	1.40	<0.05	52.00	<0.05	0.60	0.86	0.09	1.10	<0.05	<0.08	0.06	0.69	<0.05	1.98	<0.05	<0.05	41.74
75	BLD/PBH02/68	Powder	G508-68	1.91	<0.05	50.59	<0.05	0.80	1.14	0.14	1.29	<0.05	<0.08	<0.05	0.81	0.07	2.94	<0.05	<0.05	41.04
76	BLD/PBH02/69	Powder	G508-69	2.00	<0.05	50.48	0.06	0.72	1.03	0.15	1.24	<0.05	<0.08	<0.05	0.66	0.06	3.01	<0.05	<0.05	41.25
77	BLD/PBH02/70	Powder	G508-70	2.35	<0.05	49.39	<0.05	0.94	1.35	0.19	1.34	<0.05	<0.08	0.05	0.98	0.08	3.75	<0.05	<0.05	40.50
78	BLD/PBH02/70	Powder	G508-70	2.32	<0.05	49.43	<0.05	0.94	1.34	0.18	1.33	<0.05	<0.08	0.06	0.96	0.08	3.72	<0.05	<0.05	40.54
79	BLD/PBH02/71	Powder	G508-71	1.86	<0.05	50.47	<0.05	0.87	1.24	0.14	1.36	<0.05	<0.08	0.06	0.85	0.06	2.88	<0.05	<0.05	41.04

Prepared by: Naveen

Verified by: Satyanarayana

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
80	BLD/PBH02/72	Powder	G508-72	1.54	<0.05	51.37	<0.05	0.65	0.94	0.13	1.24	<0.05	<0.08	<0.05	0.57	0.05	2.45	<0.05	<0.05	41.64
81	BLD/PBH02/73	Powder	G508-73	2.07	<0.05	50.01	<0.05	0.93	1.33	0.16	1.38	<0.05	<0.08	<0.05	0.80	0.06	3.27	<0.05	<0.05	40.84
82	BLD/PBH02/74	Powder	G508-74	1.60	<0.05	50.85	<0.05	1.04	1.48	0.10	1.33	<0.05	<0.08	0.05	1.02	<0.05	2.36	<0.05	<0.05	41.13
83	BLD/PBH02/75	Powder	G508-75	1.74	<0.05	50.36	<0.05	1.07	1.53	0.14	1.36	<0.05	<0.08	0.06	1.04	0.06	2.92	<0.05	<0.05	40.78
84	BLD/PBH02/76	Powder	G508-76	1.28	<0.05	51.97	<0.05	0.66	0.94	0.11	1.19	<0.05	<0.08	<0.05	0.59	<0.05	2.35	<0.05	<0.05	41.47
85	BLD/PBH02/77	Powder	G508-77	1.10	<0.05	52.19	<0.05	0.64	0.91	0.09	1.19	<0.05	<0.08	<0.05	0.51	<0.05	1.96	<0.05	<0.05	41.94
86	BLD/PBH02/78	Powder	G508-78	1.43	<0.05	51.07	<0.05	0.88	1.27	0.11	1.34	<0.05	<0.08	<0.05	0.72	0.05	2.76	<0.05	<0.05	41.17
87	BLD/PBH02/79	Powder	G508-79	1.45	<0.05	51.60	<0.05	0.60	0.85	0.11	1.21	<0.05	<0.08	<0.05	0.54	<0.05	2.36	<0.05	<0.05	41.77
88	BLD/PBH02/80	Powder	G508-80	1.87	<0.05	50.88	<0.05	0.55	0.79	0.14	1.23	<0.05	<0.08	<0.05	0.48	0.06	2.94	<0.05	<0.05	41.54
89	BLD/PBH02/80	Powder	G508-80	1.89	<0.05	50.90	<0.05	0.56	0.80	0.14	1.25	<0.05	<0.08	<0.05	0.44	0.07	2.93	<0.05	<0.05	41.52
90	BLD/PBH02/81	Powder	G508-81	2.23	<0.05	49.64	<0.05	0.94	1.35	0.17	1.45	<0.05	<0.08	<0.05	0.66	0.08	3.95	<0.05	<0.05	40.43
91	BLD/PBH02/82	Powder	G508-82	2.03	<0.05	50.04	<0.05	1.03	1.47	0.15	1.48	<0.05	<0.08	<0.05	0.67	0.06	3.54	<0.05	<0.05	40.48
92	BLD/PBH02/83	Powder	G508-83	2.16	<0.05	49.60	<0.05	1.20	1.72	0.17	1.54	<0.05	<0.08	<0.05	0.68	0.06	3.92	<0.05	<0.05	40.07
93	BLD/PBH02/84	Powder	G508-84	2.50	<0.05	48.57	<0.05	1.31	1.88	0.23	1.59	<0.05	<0.08	<0.05	0.81	0.08	4.67	<0.05	<0.05	39.60
94	BLD/PBH02/85	Powder	G508-85	2.70	<0.05	47.90	<0.05	1.44	2.06	0.20	1.62	<0.05	<0.08	<0.05	1.04	0.08	4.52	<0.05	<0.05	39.81
95	BLD/PBH02/86	Powder	G508-86	2.60	<0.05	47.31	<0.05	1.77	2.53	0.21	1.69	<0.05	<0.08	0.07	1.28	0.10	5.01	<0.05	<0.05	39.18
96	BLD/PBH02/87	Powder	G508-87	2.69	<0.05	47.28	<0.05	1.67	2.39	0.25	1.64	<0.05	<0.08	0.07	1.02	0.11	5.56	<0.05	<0.05	38.98
97	BLD/PBH02/88	Powder	G508-88	3.51	<0.05	45.68	<0.05	1.70	2.43	0.32	1.67	<0.05	<0.08	0.05	1.04	0.15	6.80	<0.05	<0.05	38.34
98	BLD/PBH02/89	Powder	G508-89	3.21	<0.05	46.19	<0.05	2.12	3.03	0.27	1.55	<0.05	<0.08	0.07	1.36	0.13	5.57	<0.05	<0.05	38.59
99	BLD/PBH02/90	Powder	G508-90	3.35	<0.05	45.73	<0.05	2.69	3.84	0.30	1.49	<0.05	<0.08	0.08	1.35	0.15	5.62	<0.05	<0.05	38.07
100	BLD/PBH02/90	Powder	G508-90	3.34	<0.05	45.71	<0.05	2.69	3.85	0.28	1.50	<0.05	<0.08	0.08	1.33	0.16	5.64	<0.05	<0.05	38.08
101	BLD/PBH02/91	Powder	G508-91	3.78	<0.05	45.11	<0.05	2.31	3.31	0.33	1.45	<0.05	<0.08	0.07	1.61	0.17	6.51	<0.05	<0.05	37.65
102	BLD/PBH02/92	Powder	G508-92	3.35	<0.05	45.99	<0.05	1.86	2.65	0.26	1.48	<0.05	<0.08	<0.05	1.30	0.14	6.13	<0.05	<0.05	38.63
103	BLD/PBH02/93	Powder	G508-93	3.62	<0.05	44.86	<0.05	2.32	3.31	0.26	1.70	<0.05	<0.08	0.08	1.35	0.15	7.14	<0.05	<0.05	37.48
104	BLD/PBH02/94	Powder	G508-94	10.49	<0.05	25.79	<0.05	3.54	5.07	1.12	1.68	<0.05	<0.08	0.05	2.68	0.96	26.61	<0.05	<0.05	25.53
105	BLD/PBH02/95	Powder	G508-95	13.12	<0.05	21.55	<0.05	3.85	5.50	1.33	1.65	<0.05	<0.08	<0.05	2.80	1.12	30.44	<0.05	<0.05	22.44
106	BLD/PBH02/96	Powder	G508-96	5.27	<0.05	42.27	<0.05	1.75	2.50	0.47	1.24	<0.05	<0.08	0.08	1.12	0.34	10.53	<0.05	<0.05	36.16
107	IPT-44	CRM	Meas.	0.36	-	50.60	-	0.23	0.33	0.11	3.00	-	-	-	0.42	-	2.67	-	-	42.87

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

Certi. -- Certified

Meas. -- Measured

LOQ--Limit of Quantification

IPT-44: Certified Reference Material Standard



SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

** END OF THE REPORT **

1. The results listed above pertain only to the tested samples and applicable parameters.2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is limited to the invoiced amount. 4.This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission.5. In case any reconfirmation of contents of this test certificate is required,please contact our office.6. Sampling is not done by us unless otherwise specified.7. Any discrepancy in the Test Certificate should be notified within 30 days.

Customer Name	Maheshwari Mining Pvt Limited -Assam Umrangso-788931
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Discipline & Group Chemical & Ores and Minerals.
Customer Ref. MMPL/SHIVA/2024/WO-02 (PBH-03)
Commodity Geological Rock Powders
Lab ID G469
Sample Receipt Date 05-Feb-25
Analysis Completion Date 10-Feb-25
Date of Reporting 11-Feb-25
Sample Count 86

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	IPT-61	CRM	Cert.	0.05	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
2	IPT-44	CRM	Cert.	0.33	N.A	50.55	N.A	0.21	0.30	0.12	2.93	N.A	N.A	N.A	N.A	N.A	2.69	N.A	N.A	42.90
3	BLD/PBH03/01	Powder	G469-1	18.34	<0.05	2.22	<0.05	7.85	11.23	2.68	2.27	0.06	<0.08	0.44	2.13	1.09	48.33	<0.05	<0.05	11.01
4	BLD/PBH03/02	Powder	G469-2	20.13	<0.05	1.51	<0.05	6.79	9.70	3.01	2.37	<0.05	<0.08	0.14	1.42	1.17	50.81	<0.05	<0.05	9.52
5	BLD/PBH03/03	Powder	G469-3	3.99	<0.05	36.05	<0.05	9.43	13.48	0.39	2.26	0.67	<0.08	0.22	0.38	0.20	8.52	0.10	<0.05	33.61
6	BLD/PBH03/04	Powder	G469-4	5.02	<0.05	31.65	<0.05	11.16	15.96	0.53	2.54	1.47	<0.08	0.21	2.61	0.24	10.18	0.07	<0.05	29.33
7	BLD/PBH03/05	Powder	G469-5	2.25	<0.05	40.32	<0.05	8.40	12.02	0.11	2.27	1.38	<0.08	0.17	1.63	0.08	3.55	0.09	<0.05	35.97
8	BLD/PBH03/06	Powder	G469-6	2.18	<0.05	40.91	<0.05	7.61	10.88	0.09	2.62	1.48	<0.08	0.09	1.41	0.07	3.10	0.10	<0.05	36.88
9	BLD/PBH03/07	Powder	G469-7	3.21	<0.05	36.13	<0.05	11.70	16.73	0.14	2.52	1.22	<0.08	0.16	1.09	0.11	4.79	0.08	<0.05	33.61
10	BLD/PBH03/08	Powder	G469-8	4.38	<0.05	33.85	<0.05	11.23	16.06	0.31	2.98	1.21	<0.08	0.17	0.85	0.17	7.11	0.08	0.05	32.64
11	BLD/PBH03/09	Powder	G469-9	2.86	<0.05	39.56	<0.05	7.33	10.48	0.18	2.40	0.91	<0.08	0.11	1.39	0.11	6.66	0.08	<0.05	35.12
12	BLD/PBH03/10	Powder	G469-10	3.59	<0.05	37.85	<0.05	8.32	11.90	0.27	2.35	0.63	<0.08	0.23	3.30	0.15	6.14	0.08	<0.05	33.28
13	BLD/PBH03/10	Powder	G469-10	3.69	<0.05	37.80	<0.05	8.30	11.87	0.27	2.33	0.62	<0.08	0.23	3.35	0.15	6.11	0.08	<0.05	33.36
14	BLD/PBH03/11	Powder	G469-11	2.98	<0.05	42.60	<0.05	5.43	7.76	0.21	1.81	0.46	<0.08	0.16	2.31	0.12	5.07	0.08	<0.05	36.32
15	BLD/PBH03/12	Powder	G469-12	2.25	<0.05	46.13	<0.05	3.12	4.47	0.14	1.40	0.45	<0.08	<0.05	2.27	0.08	3.58	0.08	<0.05	39.04
16	BLD/PBH03/13	Powder	G469-13	1.93	<0.05	47.64	<0.05	2.34	3.35	0.13	1.25	0.36	<0.08	<0.05	2.39	0.08	2.91	0.07	<0.05	39.77
17	BLD/PBH03/14	Powder	G469-14	2.62	<0.05	44.82	<0.05	3.38	4.83	0.16	1.53	0.34	<0.08	<0.05	3.08	0.10	4.61	0.07	<0.05	37.71
18	BLD/PBH03/15	Powder	G469-15	2.51	<0.05	44.64	<0.05	3.81	5.45	0.15	1.77	0.38	<0.08	<0.05	2.57	0.10	4.60	0.07	<0.05	37.64
19	BLD/PBH03/16	Powder	G469-16	2.72	<0.05	44.01	<0.05	4.48	6.41	0.12	1.82	0.38	<0.08	<0.05	2.36	0.09	4.44	0.06	<0.05	37.44
20	BLD/PBH03/17	Powder	G469-17	2.71	<0.05	42.73	<0.05	5.47	7.82	0.16	2.01	0.40	<0.08	0.05	2.44	0.10	5.08	0.07	<0.05	36.31
21	BLD/PBH03/18	Powder	G469-18	2.25	<0.05	43.65	<0.05	6.33	9.05	0.11	1.68	0.42	<0.08	0.09	1.45	0.08	3.90	0.06	<0.05	37.14
22	BLD/PBH03/19	Powder	G469-19	2.51	<0.05	43.73	<0.05	5.69	8.13	0.13	1.57	0.29	<0.08	0.09	2.06	0.09	4.16	0.06	<0.05	37.06
23	BLD/PBH03/20	Powder	G469-20	3.43	<0.05	34.91	<0.05	13.82	19.76	0.20	1.98	0.22	<0.08	0.23	1.58	0.13	5.66	0.06	0.05	31.68
24	BLD/PBH03/20	Powder	G469-20	3.38	<0.05	34.96	<0.05	13.84	19.78	0.20	1.97	0.24	<0.08	0.23	1.56	0.13	5.64	0.06	0.05	31.70
25	BLD/PBH03/21	Powder	G469-21	3.91	<0.05	33.86	<0.05	13.81	19.74	0.26	2.16	0.28	<0.08	0.29	1.31	0.16	6.49	0.06	0.05	31.33
26	BLD/PBH03/22	Powder	G469-22	3.58	<0.05	36.60	<0.05	11.63	16.63	0.23	1.95	0.19	<0.08	0.22	1.58	0.14	5.64	0.06	<0.05	33.05
27	BLD/PBH03/23	Powder	G469-23	2.19	<0.05	45.13	<0.05	5.59	7.99	0.15	1.40	0.17	<0.08	0.11	0.93	0.09	3.55	0.07	<0.05	38.12
28	BLD/PBH03/24	Powder	G469-24	2.89	<0.05	45.45	<0.05	3.31	4.74	0.23	1.36	0.10	<0.08	<0.05	1.89	0.13	4.71	0.07	<0.05	38.30
29	BLD/PBH03/25	Powder	G469-25	3.82	<0.05	41.73	<0.05	5.55	7.94	0.37	1.75	0.15	<0.08	0.11	1.40	0.19	6.71	0.08	<0.05	35.63

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/05	SOP/OM/05	SOP/OM/105	SOP/OM/05	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
30	BLD/PBH03/26	Powder	G469-26	5.21	<0.05	37.45	<0.05	6.53	9.34	0.55	2.37	0.11	<0.08	0.18	1.28	0.27	9.44	0.07	<0.05	33.60	
31	BLD/PBH03/27	Powder	G469-27	5.46	<0.05	34.14	<0.05	7.78	11.12	0.60	3.10	0.08	<0.08	0.23	0.93	0.29	11.40	0.08	<0.05	32.42	
32	BLD/PBH03/28	Powder	G469-28	4.92	<0.05	37.31	<0.05	6.55	9.37	0.50	2.21	0.06	<0.08	0.19	0.78	0.24	10.17	0.08	<0.05	34.03	
33	BLD/PBH03/29	Powder	G469-29	17.05	<0.05	1.23	<0.05	14.51	20.74	3.73	2.46	<0.05	0.27	0.14	1.16	1.35	43.03	0.12	<0.05	8.50	
34	BLD/PBH03/30	Powder	G469-30	21.64	<0.05	0.74	<0.05	8.04	11.49	3.21	2.96	<0.05	0.54	0.12	1.26	1.03	47.71	<0.05	<0.05	9.13	
35	BLD/PBH03/30	Powder	G469-30	21.59	<0.05	0.74	<0.05	8.01	11.45	3.22	2.97	<0.05	0.56	0.12	1.27	1.03	47.75	<0.05	<0.05	9.14	
36	BLD/PBH03/31	Powder	G469-31	21.26	<0.05	0.83	<0.05	8.37	11.97	3.00	3.12	<0.05	0.46	0.12	1.17	1.03	47.77	<0.05	<0.05	9.10	
37	BLD/PBH03/32	Powder	G469-32	9.95	<0.05	26.33	<0.05	7.29	10.42	1.24	2.47	0.06	0.09	0.16	1.15	0.46	21.64	0.06	<0.05	25.87	
38	BLD/PBH03/33	Powder	G469-33	7.93	<0.05	32.12	<0.05	5.53	7.91	0.99	2.41	<0.05	0.09	0.27	0.85	0.37	17.78	0.08	<0.05	29.09	
39	BLD/PBH03/34	Powder	G469-34	5.69	<0.05	37.31	<0.05	4.97	7.10	0.67	2.40	<0.05	<0.08	0.14	1.18	0.26	12.13	0.09	<0.05	32.88	
40	BLD/PBH03/35	Powder	G469-35	3.69	<0.05	42.62	<0.05	2.69	3.85	0.36	2.52	<0.05	<0.08	<0.05	1.05	0.15	8.55	0.12	<0.05	36.93	
41	BLD/PBH03/36	Powder	G469-36	2.76	<0.05	45.52	<0.05	2.11	3.02	0.25	2.43	<0.05	<0.08	<0.05	0.89	0.11	5.97	0.11	<0.05	38.82	
42	BLD/PBH03/37	Powder	G469-37	2.40	<0.05	46.22	<0.05	2.12	3.03	0.21	2.35	0.08	<0.08	<0.05	1.04	0.10	4.98	0.08	<0.05	39.40	
43	BLD/PBH03/38	Powder	G469-38	2.65	<0.05	45.04	<0.05	2.85	4.08	0.22	2.44	0.18	<0.08	<0.05	1.68	0.10	4.96	0.10	<0.05	38.42	
44	BLD/PBH03/39	Powder	G469-39	1.91	<0.05	47.74	<0.05	2.19	3.13	0.14	1.75	0.26	<0.08	<0.05	1.60	0.07	3.53	0.10	<0.05	39.68	
45	BLD/PBH03/40	Powder	G469-40	2.71	<0.05	43.41	<0.05	3.76	5.38	0.23	2.71	0.33	<0.08	0.07	2.28	0.10	5.20	0.08	<0.05	37.30	
46	BLD/PBH03/40	Powder	G469-40	2.66	<0.05	43.47	<0.05	3.79	5.42	0.23	2.69	0.34	<0.08	0.07	2.28	0.11	5.25	0.09	<0.05	37.29	
47	IPT-61	CRM	Meas.	0.06	-	-	-	-	-	-	-	-	-	-	-	-	99.76	-	-	-	
48	BLD/PBH03/41	Powder	G469-41	2.42	<0.05	45.89	<0.05	3.09	4.41	0.18	1.92	0.23	<0.08	<0.05	1.82	0.09	4.21	0.08	<0.05	38.60	
49	BLD/PBH03/42	Powder	G469-42	1.62	<0.05	49.34	<0.05	1.68	2.40	0.12	1.35	0.24	<0.08	<0.05	1.40	0.06	2.92	0.08	<0.05	40.36	
50	BLD/PBH03/43	Powder	G469-43	2.05	<0.05	48.08	<0.05	2.15	3.07	0.14	1.49	0.16	<0.08	<0.05	1.74	0.07	3.57	0.08	<0.05	39.46	
51	BLD/PBH03/44	Powder	G469-44	2.35	<0.05	46.82	<0.05	2.09	2.99	0.20	1.93	0.16	<0.08	<0.05	1.25	0.11	4.45	0.08	<0.05	39.54	
52	BLD/PBH03/45	Powder	G469-45	3.56	<0.05	41.87	<0.05	4.87	6.96	0.37	2.64	0.16	<0.08	0.09	0.60	0.18	7.00	0.09	<0.05	36.36	
53	BLD/PBH03/46	Powder	G469-46	3.51	<0.05	41.84	<0.05	4.77	6.82	0.35	2.88	0.08	<0.08	0.10	0.73	0.17	6.62	0.11	<0.05	36.69	
54	BLD/PBH03/47	Powder	G469-47	3.88	<0.05	40.96	<0.05	4.82	6.89	0.41	2.98	0.12	<0.08	0.07	0.77	0.19	7.61	0.11	<0.05	35.90	
55	BLD/PBH03/48	Powder	G469-48	3.32	<0.05	43.14	<0.05	3.65	5.22	0.32	2.63	<0.05	<0.08	<0.05	0.57	0.16	6.39	0.12	<0.05	37.95	
56	BLD/PBH03/49	Powder	G469-49	4.44	<0.05	39.91	<0.05	2.69	3.84	0.55	3.84	<0.05	<0.08	<0.05	0.55	0.23	9.93	0.12	<0.05	36.43	
57	BLD/PBH03/50	Powder	G469-50	5.15	<0.05	35.57	<0.05	6.07	8.69	0.58	3.87	<0.05	<0.08	0.13	0.54	0.26	10.87	0.10	<0.05	34.12	
58	BLD/PBH03/50	Powder	G469-50	5.18	<0.05	35.53	<0.05	6.06	8.67	0.58	3.85	<0.05	<0.08	0.13	0.56	0.26	10.84	0.10	<0.05	34.18	
59	BLD/PBH03/51	Powder	G469-51	3.68	<0.05	42.83	<0.05	3.76	5.38	0.35	2.18	<0.05	<0.08	0.12	0.58	0.18	7.02	0.11	<0.05	37.45	
60	BLD/PBH03/52	Powder	G469-52	3.45	<0.05	43.59	<0.05	2.21	3.16	0.35	2.54	<0.05	<0.08	<0.05	0.94	0.17	7.12	0.10	<0.05	38.45	
61	BLD/PBH03/53	Powder	G469-53	3.92	<0.05	41.76	<0.05	3.62	5.17	0.36	2.85	<0.05	<0.08	0.10	0.92	0.19	7.25	0.11	<0.05	37.26	
62	BLD/PBH03/54	Powder	G469-54	2.68	<0.05	46.74	<0.05	2.04	2.91	0.23	1.76	<0.05	<0.08	<0.05	1.12	0.12	4.71	0.09	<0.05	39.49	
63	BLD/PBH03/55	Powder	G469-55	3.14	<0.05	43.84	<0.05	3.82	5.47	0.26	2.09	<0.05	<0.08	0.10	1.34	0.13	5.63	0.09	<0.05	37.81	
64	BLD/PBH03/56	Powder	G469-56	3.26	<0.05	44.29	<0.05	2.80	4.00	0.25	1.90	<0.05	<0.08	<0.05	1.91	0.13	6.04	0.08	<0.05	37.98	
65	BLD/PBH03/57	Powder	G469-57	2.85	<0.05	45.37	<0.05	2.73	3.90	0.21	1.69	<0.05	<0.08	<0.05	2.13	0.11	5.39	0.07	<0.05	38.12	
66	BLD/PBH03/58	Powder	G469-58	1.94	<0.05	48.45	<0.05	1.74	2.49	0.16	1.40	<0.05	<0.08	<0.05	1.44	0.10	3.97	0.09	<0.05	39.82	
67	BLD/PBH03/59	Powder	G469-59	2.92	<0.05	46.96	<0.05	1.57	2.24	0.23	1.42	<0.05	<0.08	<0.05	1.62	0.13	5.18	0.07	<0.05	39.12	
68	BLD/PBH03/60	Powder	G469-60	2.96	<0.05	46.35	<0.05	1.93	2.75	0.26	1.57	<0.05	<0.08	<0.05	1.38	0.14	5.52	0.09	<0.05	38.85	
69	BLD/PBH03/60	Powder	G469-60	2.94	<0.05	46.33	<0.05	1.92	2.75	0.26	1.56	<0.05	<0.08	<0.05	1.37	0.14	5.54	0.09	<0.05	38.90	
70	BLD/PBH03/61	Powder	G469-61	2.71	<0.05	47.84	<0.05	1.28	1.83	0.23	1.35	<0.05	<0.08	<0.05	1.13	0.13	4.66	0.09	<0.05	39.93	
71	BLD/PBH03/62	Powder	G469-62	2.57	<0.05	48.04	<0.05	1.37	1.95	0.19	1.46	<0.05	<0.08	<0.05	0.83	0.11	4.60	0.07	<0.05	40.05	

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
72	BLD/PBH03/63	Powder	G469-63	1.92	<0.05	49.46	<0.05	1.40	2.00	0.11	1.44	<0.05	<0.08	<0.05	0.83	0.07	3.26	0.09	<0.05	40.72	
73	BLD/PBH03/64	Powder	G469-64	1.49	<0.05	50.75	<0.05	1.16	1.66	0.07	1.26	<0.05	<0.08	<0.05	0.65	<0.05	2.41	0.06	<0.05	41.51	
74	BLD/PBH03/65	Powder	G469-65	1.36	<0.05	50.98	<0.05	1.05	1.50	0.08	1.12	<0.05	<0.08	<0.05	1.01	<0.05	2.16	0.06	<0.05	41.60	
75	BLD/PBH03/66	Powder	G469-66	1.04	<0.05	52.27	<0.05	0.70	1.00	0.06	0.89	<0.05	<0.08	<0.05	0.71	<0.05	1.49	<0.05	<0.05	42.36	
76	BLD/PBH03/67	Powder	G469-67	1.42	<0.05	51.64	<0.05	0.66	0.94	0.08	0.96	<0.05	<0.08	<0.05	0.57	<0.05	1.97	<0.05	<0.05	42.22	
77	BLD/PBH03/68	Powder	G469-68	1.14	<0.05	52.11	<0.05	0.69	0.99	0.07	0.91	<0.05	<0.08	<0.05	0.58	<0.05	1.75	0.05	<0.05	42.24	
78	BLD/PBH03/69	Powder	G469-69	1.59	<0.05	50.81	<0.05	0.96	1.37	0.12	1.08	<0.05	<0.08	<0.05	0.79	0.06	2.56	0.05	<0.05	41.43	
79	BLD/PBH03/70	Powder	G469-70	1.82	<0.05	50.88	<0.05	0.80	1.14	0.13	1.07	<0.05	<0.08	<0.05	0.66	0.06	2.64	<0.05	<0.05	41.45	
80	BLD/PBH03/70	Powder	G469-70	1.91	<0.05	50.72	<0.05	0.80	1.15	0.13	1.07	<0.05	<0.08	<0.05	0.65	0.07	2.59	<0.05	<0.05	41.57	
81	BLD/PBH03/71	Powder	G469-71	2.39	<0.05	49.06	<0.05	1.14	1.62	0.20	1.20	<0.05	<0.08	<0.05	1.01	0.08	3.67	<0.05	<0.05	40.62	
82	BLD/PBH03/72	Powder	G469-72	1.82	<0.05	49.80	<0.05	1.21	1.73	0.14	1.21	<0.05	<0.08	<0.05	1.09	0.06	2.99	0.05	<0.05	40.99	
83	BLD/PBH03/73	Powder	G469-73	1.83	<0.05	50.75	<0.05	0.80	1.14	0.13	1.11	<0.05	<0.08	<0.05	0.61	0.06	2.37	<0.05	<0.05	41.85	
84	BLD/PBH03/74	Powder	G469-74	1.76	<0.05	50.30	<0.05	1.03	1.48	0.15	1.17	<0.05	<0.08	<0.05	0.75	0.06	2.92	0.06	<0.05	41.24	
85	BLD/PBH03/75	Powder	G469-75	1.48	<0.05	50.69	<0.05	1.22	1.74	0.10	1.15	<0.05	<0.08	<0.05	1.03	<0.05	2.32	0.05	<0.05	41.28	
86	BLD/PBH03/76	Powder	G469-76	1.85	<0.05	49.67	<0.05	1.38	1.97	0.14	1.24	<0.05	<0.08	<0.05	1.05	0.05	2.93	0.05	<0.05	40.92	
87	BLD/PBH03/77	Powder	G469-77	1.55	<0.05	50.78	<0.05	0.97	1.39	0.12	1.12	<0.05	<0.08	<0.05	0.77	0.05	2.49	0.06	<0.05	41.54	
88	BLD/PBH03/78	Powder	G469-78	1.22	<0.05	51.87	<0.05	0.69	0.98	0.08	1.05	<0.05	<0.08	<0.05	0.44	<0.05	1.86	0.06	<0.05	42.30	
89	BLD/PBH03/79	Powder	G469-79	1.76	<0.05	50.24	<0.05	1.16	1.66	0.12	1.23	<0.05	<0.08	<0.05	0.76	0.06	2.88	0.05	<0.05	41.12	
90	BLD/PBH03/80	Powder	G469-80	1.42	<0.05	51.06	<0.05	0.90	1.28	0.11	1.11	<0.05	<0.08	<0.05	0.60	<0.05	2.44	0.06	<0.05	41.75	
91	BLD/PBH03/80	Powder	G469-80	1.46	<0.05	51.10	<0.05	0.91	1.30	0.11	1.11	<0.05	<0.08	<0.05	0.60	<0.05	2.40	0.06	<0.05	41.70	
92	BLD/PBH03/81	Powder	G469-81	1.38	0.05	51.59	<0.05	0.63	0.91	0.10	1.03	<0.05	<0.08	<0.05	0.49	<0.05	2.04	0.06	<0.05	42.21	
93	BLD/PBH03/82	Powder	G469-82	2.45	<0.05	49.26	<0.05	1.02	1.45	0.18	1.22	<0.05	<0.08	<0.05	0.78	0.09	3.87	0.06	<0.05	40.54	
94	BLD/PBH03/83	Powder	G469-83	1.88	<0.05	49.70	<0.05	1.17	1.68	0.15	1.30	<0.05	<0.08	<0.05	0.68	0.06	3.36	0.05	<0.05	41.03	
95	BLD/PBH03/84	Powder	G469-84	2.06	<0.05	48.98	<0.05	1.29	1.84	0.17	1.32	<0.05	<0.08	<0.05	0.68	0.07	3.95	0.05	<0.05	40.75	
96	BLD/PBH03/85	Powder	G469-85	2.20	<0.05	49.13	<0.05	1.39	1.99	0.18	1.33	<0.05	<0.08	<0.05	0.68	0.07	3.72	0.05	<0.05	40.54	
97	BLD/PBH03/86	Powder	G469-86	2.71	<0.05	47.52	<0.05	1.69	2.42	0.25	1.46	<0.05	<0.08	<0.05	0.97	0.10	4.80	0.06	<0.05	39.58	
98	IPT-44	CRM	Meas.	0.36	-	50.59	-	0.23	0.33	0.12	2.89	-	-	-	-	-	2.66	-	-	42.86	

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

LOQ--Limit of Quantification

IPT-61: Certified Reference Material Standard

IPT-44: Certified Reference Material Standard

Certi. -- Certified

Meas. -- Measured

Accuracy, Precision, Matrix Method and instrument dependent.



SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

**** END OF THE REPORT ****

1. The results listed above pertain only to the tested samples and applicable parameters. 2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is limited to the invoiced amount. 4. This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission. 5. In case any reconfirmation of contents of this test certificate is required, please contact our office. 6. Sampling is not done by us unless otherwise specified. 7. Any discrepancy in the Test Certificate should be notified within 30 days.

Customer Name	Maheshwari Mining Pvt Limited -Assam Umrangso-788931
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Discipline & Group Chemical & Ores and Minerals.
Customer Ref. MMPL/SHIVA/2024/WO-02 (PBH-04)
Commodity Geological Rock Powders
Lab ID G471
Sample Receipt Date 05-Feb-25
Analysis Completion Date 12-Feb-25
Date of Reporting 12-Feb-25
Sample Count 91

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	IPT-61	CRM	Cert.	0.05	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	99.79	N.A	N.A	N.A
2	IPT-44	CRM	Cert.	0.33	N.A	50.55	N.A	0.21	0.30	0.12	2.93	N.A	N.A	N.A	N.A	N.A	2.69	N.A	N.A	42.90
3	BLD/PBH04/01	Powder	G471-1	13.84	<0.05	15.17	<0.05	9.77	13.97	1.95	1.56	0.21	<0.08	0.33	0.51	0.77	32.85	<0.05	<0.05	18.64
4	BLD/PBH04/02	Powder	G471-2	3.69	<0.05	35.97	<0.05	12.09	17.29	0.32	1.06	0.48	<0.08	0.33	0.22	0.18	7.47	0.09	<0.05	32.76
5	BLD/PBH04/03	Powder	G471-3	5.56	<0.05	31.47	<0.05	10.86	15.53	0.53	1.83	0.71	<0.08	0.22	0.74	0.29	13.15	0.09	<0.05	29.72
6	BLD/PBH04/04	Powder	G471-4	19.77	<0.05	1.25	<0.05	6.53	9.34	2.93	2.09	<0.05	<0.08	0.13	1.14	1.18	52.59	<0.05	<0.05	9.36
7	BLD/PBH04/05	Powder	G471-5	19.57	<0.05	2.08	<0.05	7.00	10.01	2.85	2.21	<0.05	<0.08	0.15	0.91	1.15	50.87	<0.05	<0.05	9.95
8	BLD/PBH04/06	Powder	G471-6	12.92	<0.05	18.60	<0.05	7.58	10.84	1.79	2.11	0.26	<0.08	0.23	1.34	0.72	30.87	<0.05	<0.05	20.10
9	BLD/PBH04/07	Powder	G471-7	20.44	<0.05	2.61	<0.05	6.74	9.64	3.20	2.45	<0.05	<0.08	0.12	1.27	1.14	48.52	<0.05	<0.05	10.40
10	BLD/PBH04/08	Powder	G471-8	20.79	<0.05	1.78	<0.05	7.59	10.85	3.20	2.61	<0.05	<0.08	0.12	1.33	1.13	48.15	<0.05	<0.05	9.84
11	BLD/PBH04/09	Powder	G471-9	4.91	<0.05	32.71	<0.05	11.54	16.50	0.48	2.36	0.66	<0.08	0.30	0.66	0.25	10.32	0.10	<0.05	30.61
12	BLD/PBH04/10	Powder	G471-10	2.83	<0.05	39.19	<0.05	8.08	11.55	0.16	2.41	1.39	<0.08	0.09	3.50	0.11	4.41	0.08	<0.05	33.85
13	BLD/PBH04/10	Powder	G471-10	2.81	<0.05	39.24	<0.05	8.06	11.52	0.16	2.39	1.43	<0.08	0.09	3.57	0.11	4.40	0.09	<0.05	33.86
14	BLD/PBH04/11	Powder	G471-11	1.59	<0.05	42.71	<0.05	6.91	9.88	0.06	2.44	1.39	<0.08	0.14	0.45	0.06	2.34	0.10	<0.05	38.70
15	BLD/PBH04/12	Powder	G471-12	1.89	<0.05	40.66	<0.05	8.60	12.29	0.06	3.01	1.44	<0.08	0.14	0.11	0.06	2.27	0.10	<0.05	37.84
16	BLD/PBH04/13	Powder	G471-13	2.34	<0.05	40.18	<0.05	9.17	13.11	0.11	2.58	1.21	<0.08	0.08	0.21	0.09	3.17	0.10	<0.05	36.67
17	BLD/PBH04/14	Powder	G471-14	3.31	<0.05	39.16	<0.05	7.61	10.89	0.24	2.22	0.92	<0.08	0.17	0.79	0.14	7.41	0.09	<0.05	34.53
18	BLD/PBH04/15	Powder	G471-15	10.72	<0.05	21.13	<0.05	9.40	13.44	1.46	3.00	0.39	<0.08	0.10	2.97	0.56	23.54	<0.05	<0.05	22.48
19	BLD/PBH04/16	Powder	G471-16	3.65	<0.05	39.57	<0.05	7.28	10.41	0.23	2.13	0.60	<0.08	0.15	3.45	0.14	5.85	0.08	<0.05	33.60
20	BLD/PBH04/17	Powder	G471-17	2.79	<0.05	44.32	<0.05	4.09	5.84	0.20	1.61	0.48	<0.08	0.05	2.37	0.12	4.69	0.08	<0.05	37.36
21	BLD/PBH04/18	Powder	G471-18	2.06	<0.05	46.57	<0.05	3.07	4.39	0.17	1.31	0.42	<0.08	0.06	2.82	0.09	3.92	0.10	<0.05	37.99
22	BLD/PBH04/19	Powder	G471-19	2.19	<0.05	47.28	<0.05	2.62	3.74	0.14	1.24	0.32	<0.08	<0.05	3.15	0.09	3.39	0.07	<0.05	38.28
23	BLD/PBH04/20	Powder	G471-20	2.18	<0.05	46.18	<0.05	3.26	4.66	0.13	1.57	0.32	<0.08	<0.05	2.80	0.09	4.09	0.07	<0.05	37.69
24	BLD/PBH04/20	Powder	G471-20	2.19	<0.05	46.17	<0.05	3.25	4.65	0.13	1.59	0.34	<0.08	<0.05	2.79	0.09	4.10	0.07	<0.05	37.66
25	BLD/PBH04/21	Powder	G471-21	3.38	<0.05	42.83	<0.05	4.12	5.89	0.24	1.86	0.33	<0.08	<0.05	2.85	0.14	6.43	0.07	<0.05	35.83
26	BLD/PBH04/22	Powder	G471-22	2.53	<0.05	44.04	<0.05	4.81	6.88	0.14	1.90	0.36	<0.08	<0.05	2.81	0.10	4.79	0.07	<0.05	36.22
27	BLD/PBH04/23	Powder	G471-23	2.72	<0.05	44.21	<0.05	5.15	7.36	0.13	1.90	0.39	<0.08	0.06	1.95	0.09	4.66	0.06	<0.05	36.36
28	BLD/PBH04/24	Powder	G471-24	2.58	<0.05	42.52	<0.05	7.48	10.69	0.13	1.73	0.37	<0.08	0.12	1.78	0.09	4.50	0.06	<0.05	35.29
29	BLD/PBH04/25	Powder	G471-25	2.39	<0.05	43.24	<0.05	6.61	9.46	0.13	1.55	0.26	<0.08	0.10	2.00	0.09	4.03	0.06	<0.05	36.57
30	BLD/PBH04/26	Powder	G471-26	4.10	<0.05	32.11	<0.05	15.63	22.35	0.25	2.17	0.21	<0.08	0.29	1.22	0.17	6.66	0.06	0.06	30.23

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
31	BLD/PBH04/27	Powder	G471-27	3.61	<0.05	35.81	<0.05	12.37	17.68	0.25	2.06	0.25	<0.08	0.25	1.39	0.16	6.12	0.07	0.05	32.18	
32	BLD/PBH04/28	Powder	G471-28	3.36	<0.05	36.92	<0.05	11.48	16.41	0.23	1.89	0.22	<0.08	0.22	1.76	0.15	5.64	0.07	<0.05	32.99	
33	BLD/PBH04/29	Powder	G471-29	2.14	<0.05	47.12	<0.05	3.46	4.94	0.17	1.24	0.14	<0.08	0.05	1.11	0.11	3.71	0.07	<0.05	39.10	
34	BLD/PBH04/30	Powder	G471-30	3.02	<0.05	43.88	<0.05	4.79	6.85	0.27	1.56	0.12	<0.08	0.08	1.69	0.15	5.34	0.08	<0.05	36.76	
35	BLD/PBH04/30	Powder	G471-30	3.06	<0.05	43.81	<0.05	4.77	6.83	0.26	1.55	0.12	<0.08	0.08	1.68	0.16	5.36	0.08	<0.05	36.70	
36	BLD/PBH04/31	Powder	G471-31	4.11	<0.05	40.81	<0.05	5.72	8.18	0.43	1.82	0.13	<0.08	0.12	1.41	0.22	7.52	0.08	<0.05	35.03	
37	BLD/PBH04/32	Powder	G471-32	5.12	<0.05	36.89	<0.05	6.81	9.74	0.55	2.45	0.12	<0.08	0.18	1.07	0.27	9.62	0.08	<0.05	33.76	
38	BLD/PBH04/33	Powder	G471-33	5.54	<0.05	34.00	<0.05	7.55	10.80	0.59	3.19	0.08	<0.08	0.26	1.08	0.27	11.61	0.07	<0.05	32.36	
39	BLD/PBH04/34	Powder	G471-34	5.12	<0.05	37.17	<0.05	6.67	9.53	0.52	2.20	0.07	<0.08	0.20	0.97	0.25	10.38	0.08	<0.05	33.37	
40	BLD/PBH04/35	Powder	G471-35	21.27	<0.05	0.83	<0.05	8.41	12.02	3.13	3.09	<0.05	0.56	0.14	1.31	1.01	47.55	<0.05	<0.05	8.93	
41	BLD/PBH04/36	Powder	G471-36	21.25	<0.05	0.73	<0.05	8.33	11.91	3.06	3.07	<0.05	0.49	0.13	1.27	1.03	47.84	<0.05	<0.05	9.06	
42	BLD/PBH04/37	Powder	G471-37	9.91	<0.05	25.88	<0.05	7.35	10.51	1.30	2.57	<0.05	0.12	0.12	0.93	0.48	22.51	0.07	<0.05	25.49	
43	BLD/PBH04/38	Powder	G471-38	6.44	<0.05	34.84	<0.05	5.25	7.50	0.81	2.37	0.07	0.09	0.12	1.10	0.31	14.78	0.09	<0.05	31.40	
44	BLD/PBH04/39	Powder	G471-39	4.51	<0.05	40.64	<0.05	3.56	5.09	0.51	2.35	<0.05	<0.08	0.08	1.04	0.20	9.95	0.10	<0.05	35.37	
45	BLD/PBH04/40	Powder	G471-40	3.35	<0.05	42.93	<0.05	2.70	3.86	0.34	2.53	<0.05	<0.08	<0.05	1.35	0.14	8.03	0.12	<0.05	37.20	
46	BLD/PBH04/40	Powder	G471-40	3.36	<0.05	42.89	<0.05	2.71	3.88	0.34	2.54	<0.05	<0.08	<0.05	1.35	0.14	8.02	0.12	<0.05	37.22	
47	IPT-61	CRM	Meas.	0.07	-	-	-	-	-	-	-	-	-	-	-	-	99.73	-	-	-	
48	BLD/PBH04/41	Powder	G471-41	2.38	<0.05	46.57	<0.05	2.06	2.94	0.22	2.14	<0.05	<0.08	<0.05	0.91	0.09	5.09	0.10	<0.05	39.42	
49	BLD/PBH04/42	Powder	G471-42	2.50	<0.05	45.07	<0.05	2.64	3.78	0.21	2.55	0.10	<0.08	<0.05	1.78	0.10	4.94	0.08	<0.05	38.75	
50	BLD/PBH04/43	Powder	G471-43	2.07	<0.05	47.49	<0.05	2.18	3.11	0.16	1.92	0.22	<0.08	<0.05	1.21	0.08	3.78	0.10	<0.05	39.75	
51	BLD/PBH04/44	Powder	G471-44	1.89	<0.05	47.08	<0.05	2.43	3.47	0.15	2.05	0.28	<0.08	<0.05	1.56	0.07	3.71	0.10	<0.05	39.52	
52	BLD/PBH04/45	Powder	G471-45	2.64	<0.05	43.06	<0.05	4.03	5.76	0.24	2.90	0.30	<0.08	<0.05	2.03	0.11	5.28	0.09	<0.05	37.43	
53	BLD/PBH04/46	Powder	G471-46	1.78	<0.05	47.84	<0.05	2.35	3.36	0.14	1.58	0.24	<0.08	<0.05	1.77	0.07	3.44	0.09	<0.05	39.56	
54	BLD/PBH04/47	Powder	G471-47	1.55	<0.05	49.20	<0.05	1.89	2.70	0.12	1.32	0.20	<0.08	<0.05	1.66	0.07	3.08	0.08	<0.05	39.93	
55	BLD/PBH04/48	Powder	G471-48	2.03	<0.05	47.33	<0.05	2.34	3.35	0.18	1.74	0.16	<0.08	<0.05	1.63	0.09	4.09	0.08	<0.05	39.20	
56	BLD/PBH04/49	Powder	G471-49	3.29	<0.05	43.23	<0.05	4.13	5.90	0.30	2.57	0.12	<0.08	0.09	0.73	0.16	5.75	0.08	<0.05	37.68	
57	BLD/PBH04/50	Powder	G471-50	3.28	<0.05	43.03	<0.05	3.65	5.22	0.33	2.93	0.12	<0.08	0.06	0.74	0.16	6.11	0.10	<0.05	37.72	
58	BLD/PBH04/50	Powder	G471-50	3.20	<0.05	43.08	<0.05	3.65	5.22	0.33	2.90	0.12	<0.08	0.06	0.75	0.16	6.09	0.11	<0.05	37.78	
59	BLD/PBH04/51	Powder	G471-51	3.13	<0.05	42.01	<0.05	5.35	7.65	0.31	2.72	0.05	<0.08	0.10	0.55	0.15	5.95	0.11	<0.05	37.15	
60	BLD/PBH04/52	Powder	G471-52	3.25	<0.05	42.93	<0.05	4.23	6.04	0.33	2.73	<0.05	<0.08	0.06	0.60	0.17	6.26	0.12	<0.05	37.38	
61	BLD/PBH04/53	Powder	G471-53	5.58	<0.05	37.30	<0.05	2.68	3.83	0.67	4.11	<0.05	<0.08	<0.05	0.58	0.28	11.78	0.11	<0.05	35.62	
62	BLD/PBH04/54	Powder	G471-54	5.02	<0.05	36.00	<0.05	5.88	8.40	0.57	3.95	<0.05	<0.08	0.11	0.51	0.25	10.61	0.10	<0.05	34.37	
63	BLD/PBH04/55	Powder	G471-55	3.88	<0.05	42.60	<0.05	4.01	5.73	0.36	2.24	<0.05	<0.08	0.06	0.69	0.19	7.33	0.10	<0.05	36.71	
64	BLD/PBH04/56	Powder	G471-56	3.05	<0.05	44.53	<0.05	1.96	2.80	0.31	2.60	<0.05	<0.08	<0.05	0.89	0.16	6.54	0.10	<0.05	38.89	
65	BLD/PBH04/57	Powder	G471-57	3.82	<0.05	41.95	<0.05	3.50	5.00	0.37	2.70	<0.05	<0.08	0.08	0.85	0.19	7.34	0.11	<0.05	37.48	
66	BLD/PBH04/58	Powder	G471-58	2.83	<0.05	46.52	<0.05	2.11	3.02	0.26	1.73	<0.05	<0.08	<0.05	1.48	0.13	5.04	0.08	<0.05	38.77	
67	BLD/PBH04/59	Powder	G471-59	3.13	<0.05	44.35	<0.05	3.84	5.48	0.26	2.02	<0.05	<0.08	0.09	1.44	0.13	5.68	0.09	<0.05	37.20	
68	BLD/PBH04/60	Powder	G471-60	3.01	<0.05	45.23	<0.05	2.85	4.08	0.24	1.76	<0.05	<0.08	<0.05	1.96	0.12	5.85	0.07	<0.05	37.42	
69	BLD/PBH04/60	Powder	G471-60	3.03	<0.05	45.23	<0.05	2.85	4.07	0.24	1.76	<0.05	<0.08	<0.05	1.97	0.12	5.87	0.08	<0.05	37.48	
70	BLD/PBH04/61	Powder	G471-61	2.62	<0.05	46.52	<0.05	2.69	3.85	0.19	1.69	<0.05	<0.08	0.07	2.13	0.11	5.02	0.08	<0.05	37.61	
71	BLD/PBH04/62	Powder	G471-62	2.34	<0.05	48.76	<0.05	1.53	2.19	0.17	1.34	<0.05	<0.08	<0.05	1.33	0.10	3.87	0.07	<0.05	39.71	
72	BLD/PBH04/63	Powder	G471-63	2.29	<0.05	49.31	<0.05	1.08	1.55	0.21	1.26	<0.05	<0.08	<0.05	0.83	0.11	4.38	0.08	<0.05	39.87	

S.No	Customer Code	Sample Description	METHOD	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/105	SOP/OM/103	
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
73	BLD/PBH04/64	Powder	G471-64	3.09	<0.05	46.69	<0.05	1.94	2.78	0.26	1.54	<0.05	<0.08	<0.05	1.25	0.14	5.83	0.09	<0.05	38.18	
74	BLD/PBH04/65	Powder	G471-65	3.30	<0.05	46.57	<0.05	1.76	2.51	0.30	1.46	<0.05	<0.08	<0.05	1.49	0.16	6.29	0.11	<0.05	37.69	
75	BLD/PBH04/66	Powder	G471-66	2.66	<0.05	48.57	<0.05	1.32	1.89	0.22	1.43	<0.05	<0.08	<0.05	0.87	0.12	5.00	0.07	<0.05	39.05	
76	BLD/PBH04/67	Powder	G471-67	1.98	<0.05	50.06	<0.05	1.38	1.98	0.14	1.45	<0.05	<0.08	<0.05	0.85	0.08	3.63	0.09	<0.05	39.63	
77	BLD/PBH04/68	Powder	G471-68	1.55	<0.05	51.61	<0.05	1.03	1.48	0.08	1.20	<0.05	<0.08	<0.05	0.85	<0.05	2.32	0.07	<0.05	40.68	
78	BLD/PBH04/69	Powder	G471-69	1.28	<0.05	52.57	<0.05	0.79	1.12	0.06	1.05	<0.05	<0.08	<0.05	0.79	<0.05	1.77	0.06	<0.05	41.13	
79	BLD/PBH04/70	Powder	G471-70	1.35	<0.05	52.70	<0.05	0.67	0.96	0.07	1.02	<0.05	<0.08	<0.05	0.57	<0.05	1.82	<0.05	<0.05	41.31	
80	BLD/PBH04/70	Powder	G471-70	1.36	<0.05	52.72	<0.05	0.66	0.94	0.07	1.03	<0.05	<0.08	<0.05	0.56	<0.05	1.75	<0.05	<0.05	41.37	
81	BLD/PBH04/71	Powder	G471-71	1.48	<0.05	52.29	<0.05	0.71	1.01	0.09	1.05	<0.05	<0.08	<0.05	0.61	<0.05	2.15	0.05	<0.05	41.10	
82	BLD/PBH04/72	Powder	G471-72	1.59	<0.05	51.97	<0.05	0.85	1.21	0.09	1.06	<0.05	<0.08	<0.05	0.82	0.05	2.20	0.05	<0.05	40.84	
83	BLD/PBH04/73	Powder	G471-73	1.78	<0.05	50.28	<0.05	0.95	1.36	0.14	1.15	<0.05	<0.08	<0.05	0.81	0.07	2.91	0.06	<0.05	41.34	
84	BLD/PBH04/74	Powder	G471-74	1.76	<0.05	50.61	<0.05	0.82	1.18	0.14	1.07	<0.05	<0.08	<0.05	0.68	0.07	2.81	0.06	<0.05	41.53	
85	BLD/PBH04/75	Powder	G471-75	2.07	<0.05	48.95	<0.05	1.30	1.87	0.18	1.24	<0.05	<0.08	<0.05	1.26	0.08	3.70	0.06	<0.05	40.48	
86	BLD/PBH04/76	Powder	G471-76	1.54	<0.05	50.90	<0.05	0.93	1.33	0.12	1.15	<0.05	<0.08	<0.05	0.75	0.05	2.51	0.06	<0.05	41.49	
87	BLD/PBH04/77	Powder	G471-77	1.69	<0.05	50.67	<0.05	0.81	1.16	0.17	1.11	<0.05	<0.08	<0.05	0.60	0.07	2.83	0.06	<0.05	41.51	
88	BLD/PBH04/78	Powder	G471-78	1.91	<0.05	50.23	<0.05	1.00	1.43	0.15	1.19	<0.05	<0.08	<0.05	0.76	0.06	2.85	0.05	<0.05	41.25	
89	BLD/PBH04/79	Powder	G471-79	1.56	<0.05	50.86	<0.05	1.15	1.64	0.10	1.15	<0.05	<0.08	<0.05	0.90	<0.05	2.21	0.05	<0.05	41.39	
90	BLD/PBH04/80	Powder	G471-80	1.54	<0.05	50.75	<0.05	1.04	1.48	0.12	1.13	<0.05	<0.08	<0.05	0.90	0.05	2.44	0.05	<0.05	41.43	
91	BLD/PBH04/80	Powder	G471-80	1.54	<0.05	50.73	<0.05	1.04	1.49	0.12	1.13	<0.05	<0.08	<0.05	0.90	0.05	2.45	0.05	<0.05	41.43	
92	BLD/PBH04/81	Powder	G471-81	1.17	<0.05	52.10	<0.05	0.57	0.82	0.08	1.01	<0.05	<0.08	<0.05	0.41	<0.05	1.67	0.06	<0.05	42.54	
93	BLD/PBH04/82	Powder	G471-82	1.29	<0.05	51.41	<0.05	0.86	1.22	0.09	1.10	<0.05	<0.08	<0.05	0.57	<0.05	2.18	0.06	<0.05	41.92	
94	BLD/PBH04/83	Powder	G471-83	1.55	<0.05	50.44	<0.05	1.17	1.67	0.11	1.20	<0.05	<0.08	<0.05	0.85	0.05	2.72	0.06	<0.05	41.23	
95	BLD/PBH04/84	Powder	G471-84	1.20	<0.05	51.59	<0.05	0.74	1.06	0.09	1.07	<0.05	<0.08	<0.05	0.58	<0.05	2.10	0.06	<0.05	42.09	
96	BLD/PBH04/85	Powder	G471-85	2.01	<0.05	50.09	<0.05	0.82	1.17	0.17	1.15	<0.05	<0.08	<0.05	0.59	0.08	3.59	0.07	<0.05	40.97	
97	BLD/PBH04/86	Powder	G471-86	1.74	<0.05	49.99	<0.05	1.22	1.75	0.15	1.27	<0.05	<0.08	<0.05	0.74	0.07	3.41	0.06	<0.05	40.70	
98	BLD/PBH04/87	Powder	G471-87	1.81	<0.05	49.83	<0.05	1.28	1.83	0.14	1.29	<0.05	<0.08	<0.05	0.66	0.06	3.30	0.06	<0.05	40.91	
99	BLD/PBH04/88	Powder	G471-88	2.05	<0.05	49.41	<0.05	1.40	2.00	0.16	1.32	<0.05	<0.08	<0.05	0.76	0.06	3.38	0.06	<0.05	40.70	
100	BLD/PBH04/89	Powder	G471-89	2.31	<0.05	49.09	<0.05	1.34	1.91	0.20	1.30	<0.05	<0.08	<0.05	0.71	0.08	3.86	0.06	<0.05	40.36	
101	BLD/PBH04/90	Powder	G471-90	2.67	<0.05	47.37	<0.05	1.91	2.73	0.23	1.46	<0.05	<0.08	<0.05	1.37	0.10	4.86	0.08	<0.05	39.01	
102	BLD/PBH04/90	Powder	G471-90	2.62	<0.05	47.33	<0.05	1.92	2.75	0.23	1.45	<0.05	<0.08	<0.05	1.35	0.10	4.85	0.08	<0.05	39.02	
103	BLD/PBH04/91	Powder	G471-91	2.68	<0.05	46.76	<0.05	2.12	3.03	0.26	1.51	<0.05	<0.08	<0.05	1.39	0.11	5.41	0.09	<0.05	38.63	
104	IPT-44	CRM	Meas.	0.34	-	50.58	-	0.21	0.31	0.13	2.99	-	-	-	-	-	2.65	-	-	42.88	

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

LOQ--Limit of Quantification

IPT-61: Certified Reference Material Standard

IPT-44: Certified Reference Material Standard

Certi. -- Certified

Meas. -- Measured



SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

**** END OF THE REPORT ****

1. The results listed above pertain only to the tested samples and applicable parameters. 2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is to the invoiced amount. 4. This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission. 5. In case any reconfirmation of contents of this test certificate is required, please contact our office. 6. Sampling is not done by us unless otherwise specified. 7. Any discrepancy in the Test Certificate should be notified within 30 days.

Customer Name	Maheshwari Mining Pvt Limited -Assam Umrangso-788931
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Discipline & Group Chemical & Ores and Minerals.
Customer Ref. MMPL/SHIVA/2024/WO-02
Commodity Geological Rock Powders
Lab ID G509
Sample Receipt Date 10-Feb-25
Analysis Completion Date 21-Feb-25
Date of Reporting 21-Feb-25
Sample Count 94

S.No	Customer Code	Sample Description	METHOD	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM
			LOQ	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
1	IPT-44	CRM	Cert.	0.33	N.A	50.55	N.A	0.21	0.30	N.A	2.93	N.A	N.A	N.A	0.43	N.A	2.69	N.A	N.A	42.90
2	BLD/PBH05/01	Powder	G509-1	19.65	<0.05	4.81	<0.05	8.15	11.65	2.68	2.51	<0.05	<0.08	0.58	0.91	1.08	44.87	<0.05	<0.05	11.20
3	BLD/PBH05/02	Powder	G509-2	4.64	<0.05	36.18	<0.05	10.97	15.68	0.39	1.77	0.40	<0.08	0.68	0.23	0.21	7.87	<0.05	<0.05	31.92
4	BLD/PBH05/03	Powder	G509-3	3.32	<0.05	37.48	<0.05	11.05	15.80	0.21	1.82	0.64	<0.08	0.63	0.46	0.15	6.82	<0.05	<0.05	32.66
5	BLD/PBH05/04	Powder	G509-4	21.14	<0.05	0.55	<0.05	7.08	10.13	2.85	2.49	<0.05	<0.08	0.11	0.87	1.22	52.43	<0.05	<0.05	8.20
6	BLD/PBH05/05	Powder	G509-5	13.06	<0.05	16.47	<0.05	7.93	11.34	1.70	2.78	0.37	<0.08	0.31	1.18	0.74	32.02	<0.05	<0.05	20.02
7	BLD/PBH05/06	Powder	G509-6	21.01	<0.05	0.88	<0.05	7.07	10.11	2.86	2.59	0.08	<0.08	0.17	0.41	1.18	51.79	<0.05	<0.05	8.87
8	BLD/PBH05/07	Powder	G509-7	20.73	<0.05	0.56	<0.05	6.79	9.71	2.97	2.58	<0.05	<0.08	0.15	1.07	1.18	51.50	<0.05	<0.05	9.50
9	BLD/PBH05/08	Powder	G509-8	20.76	<0.05	1.37	<0.05	8.49	12.14	2.77	2.77	<0.05	<0.08	0.12	1.35	1.12	48.28	<0.05	<0.05	9.28
10	BLD/PBH05/09	Powder	G509-9	11.14	<0.05	24.37	<0.05	7.49	10.71	1.35	2.67	0.35	<0.08	0.17	0.86	0.57	23.56	<0.05	<0.05	24.21
11	BLD/PBH05/10	Powder	G509-10	21.22	<0.05	2.69	<0.05	7.29	10.43	3.00	2.80	<0.05	<0.08	0.08	1.13	1.13	47.43	<0.05	<0.05	10.06
12	BLD/PBH05/10	Powder	G509-10	21.23	<0.05	2.64	<0.05	7.33	10.48	2.99	2.77	<0.05	<0.08	0.08	1.14	1.11	47.47	<0.05	<0.05	10.05
13	BLD/PBH05/11	Powder	G509-11	21.70	<0.05	1.06	<0.05	8.11	11.59	3.03	2.95	<0.05	<0.08	0.09	1.55	1.13	47.42	<0.05	<0.05	9.45
14	BLD/PBH05/12	Powder	G509-12	4.92	<0.05	36.57	<0.05	9.16	13.09	0.34	2.38	0.55	<0.08	0.37	0.39	0.22	9.01	<0.05	<0.05	32.15
15	BLD/PBH05/13	Powder	G509-13	3.56	<0.05	37.12	<0.05	9.17	13.11	0.23	2.74	1.41	<0.08	0.33	4.44	0.16	5.32	<0.05	<0.05	31.55
16	BLD/PBH05/14	Powder	G509-14	1.48	<0.05	46.81	<0.05	4.54	6.50	<0.05	2.05	1.11	<0.08	0.16	0.34	0.06	1.86	<0.05	<0.05	39.58
17	BLD/PBH05/15	Powder	G509-15	1.48	<0.05	44.93	<0.05	5.88	8.41	<0.05	2.48	1.15	<0.08	0.21	0.18	0.06	2.00	<0.05	<0.05	39.03
18	BLD/PBH05/16	Powder	G509-16	2.21	<0.05	41.86	<0.05	7.78	11.12	0.07	3.12	1.25	<0.08	0.18	0.21	0.07	2.70	<0.05	<0.05	37.18
19	BLD/PBH05/17	Powder	G509-17	3.98	<0.05	39.93	<0.05	7.04	10.06	0.36	2.48	0.89	<0.08	0.23	0.45	0.18	7.10	<0.05	<0.05	34.32
20	BLD/PBH05/18	Powder	G509-18	3.77	<0.05	38.79	<0.05	6.82	9.75	0.32	2.58	0.69	<0.08	0.25	1.78	0.16	8.96	<0.05	<0.05	32.94
21	BLD/PBH05/19	Powder	G509-19	4.06	<0.05	38.83	<0.05	7.37	10.54	0.31	2.59	0.55	<0.08	0.17	3.54	0.16	6.56	<0.05	<0.05	32.69
22	BLD/PBH05/20	Powder	G509-20	2.78	<0.05	44.42	<0.05	4.31	6.17	0.20	1.91	0.42	<0.08	0.12	2.34	0.12	4.87	<0.05	<0.05	36.64
23	BLD/PBH05/20	Powder	G509-20	2.80	<0.05	44.45	<0.05	4.29	6.14	0.23	1.95	0.46	<0.08	0.11	2.30	0.10	4.84	<0.05	<0.05	36.60
24	BLD/PBH05/21	Powder	G509-21	2.63	<0.05	45.03	<0.05	3.01	4.31	0.22	1.62	0.35	<0.08	0.06	2.82	0.12	5.21	<0.05	<0.05	37.62
25	BLD/PBH05/22	Powder	G509-22	2.67	<0.05	46.29	<0.05	2.44	3.49	0.22	1.54	0.30	<0.08	0.09	2.86	0.11	4.26	<0.05	<0.05	38.16
26	BLD/PBH05/23	Powder	G509-23	2.29	<0.05	45.69	<0.05	3.08	4.40	0.15	1.80	0.32	<0.08	0.08	3.07	0.09	4.55	<0.05	<0.05	37.55
27	BLD/PBH05/24	Powder	G509-24	3.91	<0.05	41.04	<0.05	4.50	6.43	0.28	2.40	0.30	<0.08	0.11	2.97	0.15	7.49	<0.05	<0.05	34.90
28	BLD/PBH05/25	Powder	G509-25	3.74	<0.05	41.12	<0.05	5.32	7.60	0.19	2.47	0.31	<0.08	0.10	3.26	0.13	6.54	<0.05	<0.05	34.50
29	BLD/PBH05/26	Powder	G509-26	2.39	<0.05	45.43	<0.05	4.45	6.37	0.10	2.01	0.38	<0.08	0.13	1.50	0.07	4.07	<0.05	<0.05	37.54
30	BLD/PBH05/27	Powder	G509-27	2.02	<0.05	45.23	<0.05	5.54	7.92	0.11	1.77	0.36	<0.08	0.23	1.52	0.08	3.77	<0.05	<0.05	36.98
31	BLD/PBH05/28	Powder	G509-28	2.26	<0.05	44.92	<0.05	5.02	7.18	0.17	1.76	0.24	<0.08	0.17	2.07	0.10	4.63	<0.05	<0.05	36.50
32	BLD/PBH05/29	Powder	G509-29	3.61	<0.05	36.31	<0.05	12.82	18.33	0.23	2.29	0.13	<0.08	0.42	1.36	0.16	5.79	<0.05	<0.05	31.34
33	BLD/PBH05/30	Powder	G509-30	4.27	<0.05	36.13	<0.05	11.81	16.89	0.28	2.50	0.17	<0.08	0.37	1.26	0.19	6.62	<0.05	<0.05	31.30

S.No	Customer Code	Sample Description	METHOD	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM	SOP/OM
			LOQ	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105	/105
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI	
34	BLD/PBH05/30	Powder	G509-30	4.30	<0.05	36.11	<0.05	11.82	16.90	0.26	2.47	0.19	<0.08	0.39	1.31	0.19	6.57	<0.05	<0.05	31.25	
35	BLD/PBH05/31	Powder	G509-31	3.57	<0.05	38.88	0.05	9.93	14.20	0.25	2.18	0.12	<0.08	0.35	1.71	0.16	5.81	<0.05	<0.05	32.73	
36	BLD/PBH05/32	Powder	G509-32	1.93	<0.05	47.11	<0.05	4.37	6.24	0.13	1.49	0.14	<0.08	0.20	0.82	0.08	3.00	<0.05	<0.05	38.85	
37	BLD/PBH05/33	Powder	G509-33	3.49	<0.05	44.33	<0.05	3.97	5.68	0.27	1.75	0.10	<0.08	0.14	1.68	0.15	5.49	<0.05	<0.05	36.90	
38	BLD/PBH05/34	Powder	G509-34	3.75	<0.05	43.43	<0.05	4.09	5.85	0.38	1.83	0.11	<0.08	0.19	1.42	0.19	6.63	<0.05	<0.05	36.21	
39	BLD/PBH05/35	Powder	G509-35	5.62	<0.05	37.68	<0.05	5.85	8.36	0.55	2.71	0.08	<0.08	0.29	1.13	0.28	9.84	<0.05	<0.05	33.43	
40	BLD/PBH05/36	Powder	G509-36	5.79	<0.05	35.27	<0.05	6.77	9.68	0.60	3.48	<0.05	<0.08	0.36	0.90	0.28	11.58	<0.05	<0.05	31.99	
41	BLD/PBH05/37	Powder	G509-37	5.01	<0.05	38.83	<0.05	5.90	8.43	0.49	2.45	0.05	<0.08	0.33	0.76	0.23	9.95	<0.05	<0.05	33.43	
42	BLD/PBH05/38	Powder	G509-38	22.32	<0.05	0.92	<0.05	8.31	11.88	3.07	3.29	<0.05	0.48	0.43	0.97	1.05	47.51	<0.05	<0.05	8.05	
43	BLD/PBH05/39	Powder	G509-39	21.52	<0.05	1.46	<0.05	8.63	12.34	2.82	3.42	<0.05	0.35	0.11	1.23	1.01	45.95	<0.05	<0.05	9.77	
44	BLD/PBH05/40	Powder	G509-40	10.23	<0.05	26.44	<0.05	7.28	10.41	1.23	2.92	<0.05	<0.08	0.42	0.90	0.47	22.08	<0.05	<0.05	24.80	
45	BLD/PBH05/40	Powder	G509-40	10.21	<0.05	26.47	<0.05	7.27	10.39	1.25	2.89	<0.05	0.08	0.43	0.93	0.50	22.05	<0.05	<0.05	24.77	
46	BLD/PBH05/41	Powder	G509-41	4.44	<0.05	40.86	<0.05	3.79	5.42	0.52	2.36	<0.05	<0.08	0.16	0.99	0.21	10.32	<0.05	<0.05	34.68	
47	BLD/PBH05/42	Powder	G509-42	4.35	<0.05	41.59	<0.05	2.63	3.76	0.49	2.60	<0.05	<0.08	0.10	1.03	0.19	10.25	<0.05	<0.05	35.61	
48	BLD/PBH05/43	Powder	G509-43	3.03	<0.05	43.90	<0.05	2.03	2.90	0.32	3.13	<0.05	<0.08	0.06	0.92	0.13	7.77	<0.05	<0.05	37.80	
49	BLD/PBH05/44	Powder	G509-44	2.35	<0.05	46.39	<0.05	1.89	2.70	0.23	2.47	<0.05	<0.08	0.05	1.10	0.10	5.52	<0.05	<0.05	39.03	
50	BLD/PBH05/45	Powder	G509-45	2.14	<0.05	45.73	<0.05	2.12	3.02	0.21	3.42	0.13	<0.08	0.07	0.88	0.09	4.90	<0.05	<0.05	39.39	
51	BLD/PBH05/46	Powder	G509-46	2.56	<0.05	46.34	<0.05	2.17	3.10	0.22	2.26	0.21	<0.08	0.08	1.47	0.09	4.98	<0.05	<0.05	38.67	
52	BLD/PBH05/47	Powder	G509-47	2.15	<0.05	47.40	<0.05	2.10	3.00	0.15	2.05	0.30	<0.08	0.07	2.03	0.07	3.71	<0.05	<0.05	39.06	
53	BLD/PBH05/48	Powder	G509-48	2.70	<0.05	44.15	<0.05	3.23	4.62	0.25	3.10	0.26	<0.08	0.12	2.14	0.11	5.39	<0.05	<0.05	37.15	
54	BLD/PBH05/49	Powder	G509-49	1.79	<0.05	48.51	<0.05	1.75	2.50	0.16	1.63	0.20	<0.08	0.06	1.78	0.08	3.57	<0.05	<0.05	39.70	
55	BLD/PBH05/50	Powder	G509-50	1.90	<0.05	48.27	<0.05	1.68	2.40	0.17	1.60	0.15	<0.08	<0.05	1.72	0.08	3.83	<0.05	<0.05	39.81	
56	BLD/PBH05/50	Powder	G509-50	1.86	<0.05	48.29	<0.05	1.65	2.37	0.15	1.63	0.16	<0.08	0.05	1.76	0.09	3.84	<0.05	<0.05	39.78	
57	BLD/PBH05/51	Powder	G509-51	2.23	<0.05	47.56	<0.05	1.89	2.70	0.17	1.90	0.13	<0.08	0.06	1.60	0.09	4.08	<0.05	<0.05	39.47	
58	BLD/PBH05/52	Powder	G509-52	3.19	<0.05	44.52	<0.05	2.72	3.88	0.29	2.71	0.11	<0.08	0.12	0.82	0.14	5.68	<0.05	<0.05	38.51	
59	BLD/PBH05/52	Powder	G509-53	3.57	<0.05	42.99	<0.05	3.61	5.16	0.36	3.04	0.14	<0.08	0.16	0.70	0.17	6.68	<0.05	<0.05	37.03	
60	BLD/PBH05/54	Powder	G509-54	3.53	<0.05	42.27	<0.05	3.92	5.60	0.34	3.53	<0.05	<0.08	0.12	0.67	0.16	6.37	<0.05	<0.05	37.35	
61	BLD/PBH05/55	Powder	G509-55	3.31	<0.05	44.20	<0.05	3.06	4.38	0.30	2.78	<0.05	<0.08	0.12	0.58	0.15	6.04	<0.05	<0.05	38.09	
62	BLD/PBH05/56	Powder	G509-56	4.86	<0.05	38.55	<0.05	2.82	4.03	0.52	4.58	<0.05	<0.08	0.19	0.68	0.23	10.09	<0.05	<0.05	36.23	
63	BLD/PBH05/57	Powder	G509-57	5.09	<0.05	37.96	<0.05	3.15	4.50	0.60	4.42	<0.05	<0.08	0.15	0.52	0.25	11.12	<0.05	<0.05	35.39	
64	BLD/PBH05/58	Powder	G509-58	5.68	<0.05	37.67	<0.05	5.58	7.98	0.54	3.15	<0.05	<0.08	0.22	0.61	0.26	10.43	<0.05	<0.05	33.44	
65	BLD/PBH05/59	Powder	G509-59	2.74	<0.05	45.80	<0.05	1.53	2.19	0.27	2.68	<0.05	<0.08	0.07	0.75	0.13	6.08	<0.05	<0.05	39.27	
66	BLD/PBH05/60	Powder	G509-60	4.74	<0.05	40.92	<0.05	3.13	4.48	0.42	3.14	<0.05	<0.08	0.14	0.84	0.21	8.90	<0.05	<0.05	36.18	
67	BLD/PBH05/60	Powder	G509-60	4.79	<0.05	40.95	<0.05	3.12	4.46	0.40	3.15	<0.05	<0.08	0.15	0.80	0.22	8.88	<0.05	<0.05	36.17	
68	BLD/PBH05/61	Powder	G509-61	3.94	<0.05	44.13	<0.05	2.31	3.30	0.34	2.60	<0.05	<0.08	0.17	1.17	0.16	6.34	<0.05	<0.05	37.83	
69	BLD/PBH05/62	Powder	G509-62	3.79	<0.05	43.99	<0.05	3.39	4.85	0.29	2.41	<0.05	<0.08	0.18	1.38	0.15	6.05	<0.05	<0.05	36.90	
70	BLD/PBH05/63	Powder	G509-63	2.84	<0.05	46.74	<0.05	2.05	2.93	0.19	1.88	<0.05	<0.08	0.09	1.57	0.10	4.76	<0.05	<0.05	38.88	
71	BLD/PBH05/64	Powder	G509-64	3.44	<0.05	45.34	<0.05	2.23	3.18	0.23	1.96	<0.05	<0.08	0.09	1.72	0.12	5.99	<0.05	<0.05	37.90	
72	BLD/PBH05/65	Powder	G509-65	2.80	<0.05	47.32	<0.05	1.60	2.29	0.20	1.71	<0.05	<0.08	0.09	1.51	0.11	4.86	<0.05	<0.05	39.09	
73	BLD/PBH05/66	Powder	G509-66	3.08	<0.05	47.35	<0.05	1.14	1.64	0.25	1.68	<0.05	<0.08	<0.05	1.00	0.13	5.40	<0.05	<0.05	39.41	
74	BLD/PBH05/67	Powder	G509-67	3.08	<0.05	46.40	<0.05	1.64	2.35	0.27	1.82	<0.05	<0.08	<0.05	1.28	0.14	6.00	<0.05	<0.05	38.59	
75	BLD/PBH05/68	Powder	G509-68	3.06	<0.05	47.11	<0.05	1.35	1.92	0.28	1.61	<0.05	<0.08	0.05	1.29	0.14	5.88	<0.05	<0.05	38.65	
76	BLD/PBH05/69	Powder	G509-69	2.38	<0.05	48.69	<0.05	1.08	1.55	0.21	1.58	<0.05	<0.08	<0.05	0.81	0.11	4.97	<0.05	<0.05	39.66	
77	BLD/PBH05/70	Powder	G509-70	2.64	<0.05	48.46	<0.05	1.23	1.76	0.17	1.68	<0.05	<0.08	0.05	0.87	0.09	4.31	<0.05	<0.05	39.95	
78	BLD/PBH05/70	Powder	G509-70	2.63	<0.05	48.48	<0.05	1.26	1.80	0.13	1.70	<0.05	<0.08	0.06	0.81	0.09	4.34	<0.05	<0.05	39.92	
79	BLD/PBH05/71	Powder	G509-71	3.35	<0.05	45.79	<0.05	1.64	2.35	0.19	1.73	<0.05	<0.08	0.05	1.42	0.10	5.78	<0.05	<0.05	39.21	

S.No	Customer Code	Sample Description	METHOD	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /05	SOP/OM /105	SOP/OM /05	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /105	SOP/OM /103
			LOQ	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.1
			UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
			Lab ID	Al2O3	BaO	CaO	Cr2O3	Fe (T)	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	TiO2	SiO2	SrO	V2O5	LOI
80	BLD/PBH05/72	Powder	G509-72	1.32	<0.05	51.82	<0.05	0.60	0.85	0.06	1.05	<0.05	<0.08	<0.05	0.58	<0.05	1.52	<0.05	<0.05	42.68
81	BLD/PBH05/73	Powder	G509-73	1.48	<0.05	51.95	<0.05	0.59	0.84	0.09	1.09	<0.05	<0.08	<0.05	0.65	<0.05	2.00	<0.05	<0.05	41.80
82	BLD/PBH05/74	Powder	G509-74	1.41	<0.05	52.09	<0.05	0.55	0.78	0.08	1.10	<0.05	<0.08	0.05	0.61	<0.05	1.96	<0.05	<0.05	41.84
83	BLD/PBH05/75	Powder	G509-75	1.01	<0.05	52.94	<0.05	0.53	0.75	0.07	0.94	<0.05	<0.08	0.06	0.57	<0.05	1.52	<0.05	<0.05	42.09
84	BLD/PBH05/76	Powder	G509-76	1.71	<0.05	50.78	<0.05	0.82	1.17	0.15	1.26	<0.05	<0.08	0.05	0.85	0.07	3.11	<0.05	<0.05	40.84
85	BLD/PBH05/77	Powder	G509-77	1.54	<0.05	50.25	<0.05	0.89	1.28	0.11	1.32	<0.05	<0.08	<0.05	0.76	0.05	2.82	<0.05	<0.05	41.81
86	BLD/PBH05/78	Powder	G509-78	2.09	<0.05	49.05	<0.05	1.10	1.57	0.19	1.41	<0.05	<0.08	<0.05	1.04	0.08	4.06	<0.05	<0.05	40.44
87	BLD/PBH05/79	Powder	G509-79	1.19	<0.05	51.84	<0.05	0.71	1.01	0.12	1.22	<0.05	<0.08	0.05	0.63	0.05	2.48	<0.05	<0.05	41.37
88	BLD/PBH05/80	Powder	G509-80	1.79	<0.05	50.98	<0.05	0.72	1.03	0.18	1.30	<0.05	<0.08	<0.05	0.65	0.07	3.07	<0.05	<0.05	40.88
89	BLD/PBH05/80	Powder	G509-80	1.76	<0.05	51.00	<0.05	0.72	1.02	0.15	1.34	<0.05	<0.08	<0.05	0.68	0.08	3.03	<0.05	<0.05	40.87
90	BLD/PBH05/81	Powder	G509-81	1.61	<0.05	51.06	<0.05	0.85	1.22	0.14	1.31	<0.05	<0.08	0.09	0.81	0.05	2.68	<0.05	<0.05	41.00
91	BLD/PBH05/82	Powder	G509-82	1.29	<0.05	51.65	<0.05	1.04	1.48	0.08	1.27	<0.05	<0.08	0.06	0.94	<0.05	2.16	<0.05	<0.05	41.00
92	BLD/PBH05/83	Powder	G509-83	1.87	<0.05	50.76	<0.05	0.83	1.18	0.14	1.32	<0.05	<0.08	<0.05	0.81	0.06	2.89	<0.05	<0.05	40.90
93	BLD/PBH05/84	Powder	G509-84	1.51	<0.05	51.92	<0.05	0.55	0.79	0.11	1.16	<0.05	<0.08	<0.05	0.49	<0.05	2.26	<0.05	<0.05	41.64
94	BLD/PBH05/85	Powder	G509-85	1.38	<0.05	51.92	<0.05	0.62	0.89	0.10	1.21	<0.05	<0.08	<0.05	0.51	<0.05	2.16	<0.05	<0.05	41.73
95	BLD/PBH05/86	Powder	G509-86	1.90	<0.05	50.62	<0.05	0.76	1.09	0.16	1.23	<0.05	<0.08	<0.05	0.73	0.07	3.19	<0.05	<0.05	40.95
96	BLD/PBH05/87	Powder	G509-87	1.17	<0.05	51.99	<0.05	0.69	0.99	0.09	1.20	<0.05	<0.08	<0.05	0.73	<0.05	2.15	<0.05	<0.05	41.59
97	BLD/PBH05/88	Powder	G509-88	1.86	<0.05	51.21	<0.05	0.54	0.77	0.13	1.23	<0.05	<0.08	<0.05	0.50	0.06	2.77	<0.05	<0.05	41.42
98	BLD/PBH05/89	Powder	G509-89	2.38	<0.05	49.19	<0.05	1.08	1.55	0.16	1.52	<0.05	<0.08	<0.05	0.76	0.08	3.97	<0.05	<0.05	40.34
99	BLD/PBH05/90	Powder	G509-90	1.93	<0.05	50.15	<0.05	0.97	1.38	0.15	1.43	<0.05	<0.08	<0.05	0.62	0.06	3.36	<0.05	<0.05	40.86
100	BLD/PBH05/90	Powder	G509-90	1.88	<0.05	50.17	<0.05	0.98	1.40	0.11	1.45	<0.05	<0.08	<0.05	0.65	0.09	3.34	<0.05	<0.05	40.84
101	BLD/PBH05/91	Powder	G509-91	2.05	<0.05	49.63	<0.05	1.08	1.55	0.18	1.48	<0.05	<0.08	<0.05	0.67	0.07	3.89	<0.05	<0.05	40.42
102	BLD/PBH05/92	Powder	G509-92	1.64	<0.05	50.62	<0.05	0.96	1.37	0.15	1.34	<0.05	<0.08	<0.05	0.63	0.06	3.16	<0.05	<0.05	40.96
103	BLD/PBH05/93	Powder	G509-93	2.22	<0.05	48.39	<0.05	1.56	2.24	0.20	1.57	<0.05	<0.08	0.05	1.32	0.09	4.56	<0.05	<0.05	39.35
104	BLD/PBH05/94	Powder	G509-94	2.40	<0.05	48.02	<0.05	1.50	2.15	0.23	1.56	<0.05	<0.08	<0.05	1.18	0.10	4.94	<0.05	<0.05	39.36
105	IPT-44	CRM	Meas.	0.34	-	50.51	-	0.23	0.32	-	3.02	-	-	-	0.40	-	2.71	-	-	42.88

Abbreviations:

SOP/OM/105: Borate Fusion Bead followed by WDXRF Finish

SOP/OM/103: Loss On Ignition followed by Gravimetry Finish

Certi. – Certified

Meas. – Measured

LOQ–Limit of Quantification

IPT-44: Certified Reference Material Standard



SATYANARAYANA - MANAGER - ORES & MINERALS - AUTHORIZED SIGNATORY.

**** END OF THE REPORT ****

1. The results listed above pertain only to the tested samples and applicable parameters.2. Samples which are degradable will be disposed immediately after testing and others will be disposed after one month from the date of issue of test certificate unless otherwise specified. 3. Total liability of our laboratory is limited to the invoiced amount. 4.This report is not to be reproduced either wholly or in part and cannot be used as an evidence in the Court of Law and should not be used in any advertising media without prior written permission.5. In case any reconfirmation of contents of this test certificate is required,please contact our office.6. Sampling is not done by us unless otherwise specified.7. Any discrepancy in the Test Certificate should be notified within 30 days.



Test Report

Certificate No.TC-5867

Print Date : 25/02/2025

Report Control No. : BMR0000045254

Job Number : BM25-000226

Sample not Drawn by Laboratory

Sample Described by Customer as : LIMESTONE
Customer Name : MAHESWARI MINING PRIVATE LIMITED
Customer Address : Dima Hasao(North cachar hills)
City : Umrangso
State : Assam
Sample Condition & Size : Stapled & Fines
Sample Received Date : 20/02/2025
Test Start Date : 20/02/2025
DISCIPLINE : CHEMICAL

Postal Code : 788931
Country : INDIA

Registration Date : 20/02/2025
Test End Date : 25/02/2025

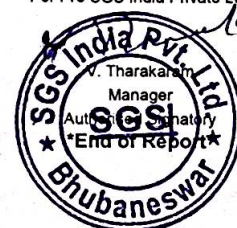
Group : Ores & Minerals : Limestone

Test Name	Test Protocol
Iron as Fe2O3%, Silica as SiO2%, Alumina as Al2O3%, Sulfur as SO3 % (on dry basis)	ASTM C1271 - 99 (Reapproved 2020)
Phosphorus as P2O5 %, Calcium oxide as CaO%, Magnesia as MgO% (on dry basis)	
Manganese as MnO%, Titania as TiO2%, Potassium as K2O %, Sodium as Na2O % (on dry basis)	
Vanadium Pentoxide as V2O5 %, Chromium Oxide as Cr2O3% (on dry basis)	
Loss of Ignition as LOI (on dry basis)%	IS:1760 (Part 1) - 1991 Reaff.2022

NABL Accredited Tests ULR No.: TC58672510000980F - TC586725100001024F Against Sample No. BM25-000226.001 - 45

Sl No.	Sample No.	Sample Mark	Sample Qty(g)	Fe2O3 %	SiO2 %	Al2O3 %	SO3 %	P2O5 %	CaO %	MgO %	MnO %	TiO2 %	K2O %	Na2O %	V2O5 %	Cr2O3 %	LOI %
1	BM25-000226.001-A	BLD/CH/01	Approx 50	-	6.64	3.14	-	0.08	42.16	3.26	0.10	0.16	0.33	-	-	-	37.40
2	BM25-000226.002-A	BLD/CH/02	Approx 50	3.06	5.22	2.33	-	0.06	47.37	1.58	-	0.11	0.19	-	-	-	38.33
3	BM25-000226.003-A	BLD/CH/03	Approx 50	0.92	2.43	1.18	-	0.03	52.38	0.97	-	0.05	0.10	-	-	-	41.20
4	BM25-000226.004-A	BLD/CH/04	Approx 50	1.03	2.76	1.28	-	0.02	51.66	1.07	-	0.05	0.12	-	-	-	41.30
5	BM25-000226.005-A	BLD/CH/05	Approx 50	2.53	6.54	2.82	-	0.04	47.06	1.45	-	0.13	0.30	-	-	-	37.80
6	BM25-000226.006-A	BLD/CH/06	Approx 50	-	-	-	-	0.05	14.54	0.97	-	0.34	-	-	-	-	-
7	BM25-000226.007-A	BLD/CH/07	Approx 50	-	-	-	-	0.05	-	1.00	-	0.61	-	-	-	-	-
8	BM25-000226.008-A	BLD/CH/08	Approx 50	-	-	-	-	0.05	-	1.03	0.02	1.06	-	-	-	-	-
9	BM25-000226.009-A	BLD/CH/09	Approx 50	-	6.89	3.65	-	0.14	38.47	2.56	0.54	0.18	0.28	-	-	-	31.71
10	BM25-000226.010-A	BLD/CH/10	Approx 50	-	5.51	2.86	-	0.24	39.11	1.87	0.12	0.15	0.19	-	-	-	32.56
11	BM25-000226.011-A	BLD/CH/11	Approx 50	-	-	-	-	0.37	-	3.15	-	1.08	-	-	-	-	-
12	BM25-000226.012-A	BLD/CH/12	Approx 50	4.54	4.97	2.27	-	0.06	45.46	2.53	0.26	0.11	0.21	-	-	-	37.61
13	BM25-000226.013-A	BLD/CH/13	Approx 50	-	9.33	4.47	-	0.14	40.49	2.64	-	0.22	0.45	-	-	-	34.73
14	BM25-000226.014-A	BLD/CH/14	Approx 50	2.01	6.32	3.13	-	0.03	46.86	1.46	-	0.15	0.30	-	-	-	38.20
15	BM25-000226.015-A	BLD/CH/15	Approx 50	1.36	3.88	1.88	-	0.03	50.04	1.16	-	0.08	0.20	-	-	-	40.17
16	BM25-000226.016-A	BLD/CH/16	Approx 50	0.81	3.06	1.52	-	0.02	51.20	1.03	-	0.06	0.15	-	-	-	41.28
17	BM25-000226.017-A	BLD/CH/17	Approx 50	4.04	5.94	3.05	-	0.06	46.39	1.31	0.01	0.14	0.31	-	-	-	37.25
18	BM25-000226.018-A	BLD/CH/18	Approx 50	2.54	10.84	-	-	0.06	42.67	1.10	-	0.25	0.48	-	-	-	35.55
19	BM25-000226.019-A	BLD/CH/19	Approx 50	-	6.70	3.59	-	0.24	39.49	2.47	0.51	0.18	0.28	-	-	-	32.55
20	BM25-000226.020-A	BLD/CH/20	Approx 50	-	6.07	3.22	-	0.27	36.59	2.03	0.13	0.17	0.21	-	-	-	31.25
21	BM25-000226.021-A	BLD/CH/21	Approx 50	-	-	-	-	0.12	-	3.09	-	1.11	-	-	-	-	-
22	BM25-000226.022-A	BLD/CH/22	Approx 50	4.85	5.55	2.52	-	0.10	44.30	2.81	0.28	0.12	0.23	-	-	-	36.98
23	BM25-000226.023-A	BLD/CH/23	Approx 50	-	11.50	-	-	0.14	36.03	4.12	-	0.26	0.58	-	-	-	33.64
24	BM25-000226.024-A	BLD/CH/24	Approx 50	2.39	5.88	2.82	-	0.04	47.06	1.62	-	0.13	0.27	-	-	-	38.36
25	BM25-000226.025-A	BLD/CH/25	Approx 50	0.92	2.93	1.41	-	0.03	51.52	1.00	-	0.06	0.14	-	-	-	41.09
26	BM25-000226.026-A	BLD/CH/26	Approx 50	1.05	2.73	1.24	-	0.02	51.83	1.06	-	0.05	0.11	-	-	-	41.11
27	BM25-000226.027-A	BLD/CH/27	Approx 50	2.10	5.17	2.39	-	0.03	48.26	1.44	-	0.11	0.27	-	-	-	39.06
28	BM25-000226.028-A	BLD/CH/28	Approx 50	-	4.77	2.83	-	0.11	40.15	2.55	-	0.14	0.16	-	-	-	34.20
29	BM25-000226.029-A	BLD/CH/29	Approx 50	4.14	4.37	2.07	-	0.05	47.31	1.62	0.27	0.10	0.14	-	-	-	37.45
30	BM25-000226.030-A	BLD/CH/30	Approx 50	-	5.78	2.90	-	0.11	45.02	1.60	0.08	0.14	0.28	-	-	-	36.16

Per Pro SGS India Private Ltd



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No decision rule is applied, when comparing the measurement result(s) with the applicable limit(s) according to the specification in the respective standard or as shared by the customer.

SGS India Pvt. Ltd.

Laboratory Services C/o - Pioneer Paper Plasta private Limited H O S 3/21, Sector -A, Zone -B Mancheswar Industrial Estate Bhubaneswar-751010, Odisha Phone/Fax:-0674 2580879

Member of the SGS Group (SGS SA)



Test Report

Certificate No. TC-5867

Print Date : 25/02/2025

Report Control No. : BMR0000045254

Job Number : BM25-000226

Sample not Drawn by Laboratory

Sample Described by Customer as : LIMESTONE
 Customer Name : MAHESWARI MINING PRIVATE LIMITED
 Customer Address : Dima Hasao (North Cachar hills)
 City : Umrangso
 State : Assam
 Sample Condition & Size : Stapled & Fines
 Sample Received Date : 20/02/2025
 Test Start Date : 20/02/2025
 DISCIPLINE : CHEMICAL

Postal Code : 788931
 Country : INDIA

Registration Date : 20/02/2025

Test End Date : 25/02/2025

Group : Ores & Minerals : Limestone

Test Name	Test Protocol
Iron as Fe2O3%, Silica as SiO2%, Alumina as Al2O3%, Sulfur as SO3 % (on dry basis)	ASTM C1271 - 99 (Reapproved 2020)
Phosphorus as P2O5 %, Calcium oxide as CaO%, Magnesia as MgO% (on dry basis)	
Manganese as MnO%, Titania as TiO2%, Potassium as K2O %, Sodium as Na2O % (on dry basis)	
Vanadium Pentoxide as V2O5 %, Chromium Oxide as Cr2O3% (on dry basis)	
Loss of Ignition as LOI (on dry basis)%	IS:1760 (Part 1) - 1991 Reaff.2022

NABL Accredited Tests ULR No.: TC586725100000980F - TC586725100001024F Against Sample No. BM25-000226.001 - 45

SI No.	Sample No.	Sample Mark	Sample Qty(g)	Fe2O3 %	SiO2 %	Al2O3 %	SO3 %	P2O5 %	CaO %	MgO %	MnO %	TiO2 %	K2O %	Na2O %	V2O5 %	Cr2O3 %	LOI %
31	BM25-000226.031-A	BLD/CH/31	Approx 50	3.44	8.58	3.21	-	0.04	43.34	2.64	0.02	0.16	0.35	-	-	-	36.78
32	BM25-000226.032-A	BLD/CH/32	Approx 50	4.63	6.66	3.00	-	0.09	43.41	3.06	0.10	0.15	0.34	-	-	-	37.32
33	BM25-000226.033-A	BLD/CH/33	Approx 50	3.55	6.19	2.84	-	0.06	45.65	1.77	-	0.14	0.25	-	-	-	37.75
34	BM25-000226.034-A	BLD/CH/34	Approx 50	0.76	1.85	0.88	-	0.03	53.25	0.93	-	0.03	0.08	-	-	-	41.52
35	BM25-000226.035-A	BLD/CH/35	Approx 50	1.23	2.58	1.22	-	0.03	51.61	1.09	-	0.05	0.12	-	-	-	40.98
36	BM25-000226.036-A	BLD/CH/36	Approx 50	2.35	5.08	2.39	-	0.04	48.05	1.46	-	0.11	0.23	-	-	-	38.85
37	BM25-000226.037-A	BLD/CH/37	Approx 50	-	-	-	-	0.11	-	2.60	-	1.02	-	-	-	-	-
38	BM25-000226.038-A	BLD/CH/38	Approx 50	-	5.14	2.69	-	0.08	44.75	1.77	0.38	0.13	0.21	-	-	-	36.16
39	BM25-000226.039-A	BLD/CH/39	Approx 50	-	7.25	3.89	-	0.26	35.81	2.26	0.11	0.20	0.29	-	-	-	30.78
40	BM25-000226.040-A	BLD/CH/40	Approx 50	-	-	-	-	0.33	26.16	2.73	-	0.50	-	-	-	-	-
41	BM25-000226.041-A	BLD/CH/41	Approx 50	2.48	4.03	1.83	-	0.03	48.59	1.45	0.14	0.08	0.18	-	-	-	39.27
42	BM25-000226.042-A	BLD/CH/42	Approx 50	4.59	9.22	4.27	-	0.10	41.18	2.95	-	0.21	0.43	-	-	-	35.74
43	BM25-000226.043-A	BLD/CH/43	Approx 50	1.80	4.48	2.11	-	0.03	49.00	1.47	-	0.10	0.17	-	-	-	39.80
44	BM25-000226.044-A	BLD/CH/44	Approx 50	1.03	3.17	1.54	-	0.02	51.18	1.13	-	0.07	0.19	-	-	-	40.90
45	BM25-000226.045-A	BLD/CH/45	Approx 50	1.42	3.50	1.60	-	0.03	50.63	1.24	-	0.07	0.15	-	-	-	40.66

Per Pro SGS India Private Ltd.



WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) were said to be extracted.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 07 days (in case of perishable items) and 30 days for all other samples from the date of issue of report. The samples from the regulatory bodies are to be retained as specified. This document cannot be reproduced, except in full, without prior written approval of the company.

No decision rule is applied, when comparing the measurement result(s) with the applicable limit(s) according to the specification in the respective standard or as shared by the customer.

SGS India Pvt. Ltd.

Laboratory Services Co - Pioneer Paper Mills private limited H O S 3/21 Sector -A Zone -B Mancheswar Industrial Estate Bhubaneswar-751010 Odisha Phone/Fax -0674 2580879

Member of the SGS Group (SGS SA)



Test Report

Job Number : BM25-000226

Print Date : 25/02/2025
Report Control No. : BMR0000045254

Sample Described by Customer as : LIMESTONE
Customer Name : MAHESWARI MINING PRIVATE LIMITED
Customer Address : Dima Hasao(North cachar hills)
City : Umrangso
State : Assam
Sample Condition & Size : Stapled & Fines
Sample Received Date : 20/02/2025
Test Start Date : 20/02/2025
DISCIPLINE : CHEMICAL

Sample not Drawn by Laboratory

Postal Code : 788931
Country : INDIA

Registration Date : 20/02/2025
Test End Date : 25/02/2025

Group : Ores & Minerals : Limestone

Test Name	Test Protocol
Iron as Fe2O3%, Silica as SiO2%, Alumina as Al2O3%, Sulfur as SO3 % (on dry basis)	ASTM C1271 - 99 (Reapproved 2020)
Phosphorus as P2O5 %, Calcium oxide as CaO%, Magnesia as MgO% (on dry basis)	
Manganese as MnO%, Titania as TiO2%, Potassium as K2O %, Sodium as Na2O % (on dry basis)	
Vanadium Pentoxide as V2O5 %, Chromium Oxide as Cr2O3% (on dry basis)	
Loss of Ignition as LOI (on dry basis)%	IS:1760 (Part 1) - 1991 Reaff 2022

Non-Accredited Tests

SI No.	Sample No.	Sample Mark	Sample Qty(g)	Fe2O3 %	SiO2 %	Al2O3 %	SO3 %	P2O5 %	CaO %	MgO %	MnO %	TiO2 %	K2O %	Na2O %	V2O5 %	Cr2O3 %	LOI %
1	BM25-000226.001-B	BLD/CH/01	Approx 50	5.95	-	-	0.51	-	-	-	-	-	-	0.02	0.01	<0.01	-
2	BM25-000226.002-B	BLD/CH/02	Approx 50	-	-	-	1.46	-	-	-	<0.01	-	-	0.07	<0.01	<0.01	-
3	BM25-000226.003-B	BLD/CH/03	Approx 50	-	-	-	0.67	-	-	-	<0.01	-	-	<0.01	<0.01	<0.01	-
4	BM25-000226.004-B	BLD/CH/04	Approx 50	-	-	-	0.53	-	-	-	<0.01	-	-	0.03	<0.01	<0.01	-
5	BM25-000226.005-B	BLD/CH/05	Approx 50	-	-	-	1.16	-	-	-	<0.01	-	-	0.01	<0.01	<0.01	-
6	BM25-000226.006-B	BLD/CH/06	Approx 50	5.82	55.72	6.28	2.37	-	-	-	<0.01	-	1.16	0.02	0.02	<0.01	12.50
7	BM25-000226.007-B	BLD/CH/07	Approx 50	5.45	66.64	11.54	1.94	-	3.67	-	<0.01	-	1.94	0.07	<0.01	<0.01	6.49
8	BM25-000226.008-B	BLD/CH/08	Approx 50	7.25	51.44	20.87	1.64	-	0.81	-	-	-	2.12	0.03	0.01	0.02	13.42
9	BM25-000226.009-B	BLD/CH/09	Approx 50	12.03	-	-	3.28	-	-	-	-	-	-	0.02	0.03	<0.01	-
10	BM25-000226.010-B	BLD/CH/10	Approx 50	15.72	-	-	1.31	-	-	-	-	-	-	0.03	0.04	<0.01	-
11	BM25-000226.011-B	BLD/CH/11	Approx 50	11.31	48.83	21.32	1.07	-	0.89	-	<0.01	-	2.95	0.54	0.04	0.01	8.08
12	BM25-000226.012-B	BLD/CH/12	Approx 50	-	-	-	1.68	-	-	-	-	-	-	<0.01	<0.01	<0.01	-
13	BM25-000226.013-B	BLD/CH/13	Approx 50	6.93	-	-	0.44	-	-	-	<0.01	-	-	0.03	0.02	<0.01	-
14	BM25-000226.014-B	BLD/CH/14	Approx 50	-	-	-	1.34	-	-	-	<0.01	-	-	0.04	0.01	<0.01	-
15	BM25-000226.015-B	BLD/CH/15	Approx 50	-	-	-	1.01	-	-	-	<0.01	-	-	<0.01	<0.01	<0.01	-
16	BM25-000226.016-B	BLD/CH/16	Approx 50	-	-	-	0.48	-	-	-	<0.01	-	-	0.02	<0.01	<0.01	-
17	BM25-000226.017-B	BLD/CH/17	Approx 50	-	-	-	1.29	-	-	-	-	-	-	<0.01	0.01	0.01	-
18	BM25-000226.018-B	BLD/CH/18	Approx 50	-	-	5.12	1.03	-	-	-	<0.01	-	-	0.02	<0.01	<0.01	-
19	BM25-000226.019-B	BLD/CH/19	Approx 50	11.10	-	-	2.69	-	-	-	-	-	-	0.01	0.03	<0.01	-
20	BM25-000226.020-B	BLD/CH/20	Approx 50	18.65	-	-	1.08	-	-	-	-	-	-	0.02	0.06	0.02	-
21	BM25-000226.021-B	BLD/CH/21	Approx 50	11.18	49.09	21.80	0.88	-	0.22	-	<0.01	-	3.16	0.76	0.03	0.02	7.84
22	BM25-000226.022-B	BLD/CH/22	Approx 50	-	-	-	1.93	-	-	-	-	-	-	0.03	<0.01	<0.01	-
23	BM25-000226.023-B	BLD/CH/23	Approx 50	7.90	-	5.08	0.31	-	-	-	<0.01	-	-	0.08	0.02	<0.01	-
24	BM25-000226.024-B	BLD/CH/24	Approx 50	-	-	-	1.25	-	-	-	<0.01	-	-	0.01	<0.01	<0.01	-
25	BM25-000226.025-B	BLD/CH/25	Approx 50	-	-	-	0.63	-	-	-	<0.01	-	-	<0.01	<0.01	<0.01	-
26	BM25-000226.026-B	BLD/CH/26	Approx 50	-	-	-	0.58	-	-	-	<0.01	-	-	0.03	<0.01	<0.01	-
27	BM25-000226.027-B	BLD/CH/27	Approx 50	-	-	-	0.92	-	-	-	<0.01	-	-	0.02	<0.01	<0.01	-
28	BM25-000226.028-B	BLD/CH/28	Approx 50	10.65	-	-	2.78	-	-	-	1.24	-	-	<0.01	0.04	<0.01	-
29	BM25-000226.029-B	BLD/CH/29	Approx 50	-	-	-	2.33	-	-	-	-	-	-	<0.01	0.01	<0.01	-
30	BM25-000226.030-B	BLD/CH/30	Approx 50	6.26	-	-	1.51	-	-	-	-	-	-	0.01	0.02	<0.01	-

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No decision rule is applied, when comparing the measurement result(s) with the applicable limit(s) according to the specification in the respective standard or as shared by the customer.



Test Report

Job Number : BM25-000226

Print Date : 25/02/2025
Report Control No. : BMR0000045254

Sample Described by Customer as : LIMESTONE
Customer Name : MAHESWARI MINING PRIVATE LIMITED
Customer Address : Dima Hasao(North cachar hills)
City : Umrangso
State : Assam
Sample Condition & Size : Stapled & Fines
Sample Received Date : 20/02/2025
Test Start Date : 20/02/2025
DISCIPLINE : CHEMICAL

Postal Code : 788931
Country : INDIA

Registration Date : 20/02/2025
Test End Date : 25/02/2025

Group : Ores & Minerals : Limestone

Test Name	Test Protocol
Iron as Fe2O3%, Silica as SiO2%, Alumina as Al2O3%, Sulfur as SO3 % (on dry basis)	ASTM C1271 - 99 (Reapproved 2020)
Phosphorus as P2O5 %, Calcium oxide as CaO%, Magnesia as MgO% (on dry basis)	
Manganese as MnO%, Titania as TiO2%, Potassium as K2O %, Sodium as Na2O % (on dry basis)	
Vanadium Pentoxide as V2O5 %, Chromium Oxide as Cr2O3% (on dry basis)	
Loss of Ignition as LOI (on dry basis)%	IS:1760 (Part 1) - 1991 Reaff 2022

Non-Accredited Tests

SI No.	Sample No.	Sample Mark	Sample Qty(g)	Fe2O3 %	SiO2 %	Al2O3 %	SO3 %	P2O5 %	CaO %	MgO %	MnO %	TiO2 %	K2O %	Na2O %	V2O5 %	Cr2O3 %	LOI %
31	BM25-000226.031-B	BLD/CH/31	Approx 50	-	-	-	1.23	-	-	-	-	-	-	0.04	<0.01	<0.01	-
32	BM25-000226.032-B	BLD/CH/32	Approx 50	-	-	-	0.63	-	-	-	-	-	-	0.06	0.01	<0.01	-
33	BM25-000226.033-B	BLD/CH/33	Approx 50	-	-	-	1.34	-	-	-	<0.01	-	-	0.07	<0.01	<0.01	-
34	BM25-000226.034-B	BLD/CH/34	Approx 50	-	-	-	0.52	-	-	-	<0.01	-	-	0.04	<0.01	<0.01	-
35	BM25-000226.035-B	BLD/CH/35	Approx 50	-	-	-	0.82	-	-	-	<0.01	-	-	0.04	<0.01	<0.01	-
36	BM25-000226.036-B	BLD/CH/36	Approx 50	-	-	-	1.23	-	-	-	<0.01	-	-	0.04	<0.01	<0.01	-
37	BM25-000226.037-B	BLD/CH/37	Approx 50	9.69	48.40	20.16	0.89	-	2.63	-	<0.01	-	3.04	0.17	0.03	<0.01	10.98
38	BM25-000226.038-B	BLD/CH/38	Approx 50	6.56	-	-	1.78	-	-	-	-	-	-	0.04	0.01	<0.01	-
39	BM25-000226.039-B	BLD/CH/39	Approx 50	18.10	-	-	0.76	-	-	-	-	-	-	0.02	0.05	<0.01	-
40	BM25-000226.040-B	BLD/CH/40	Approx 50	10.41	22.64	9.94	0.61	-	-	-	<0.01	-	1.25	0.21	0.02	<0.01	24.68
41	BM25-000226.041-B	BLD/CH/41	Approx 50	-	-	-	1.60	-	-	-	-	-	-	0.05	<0.01	<0.01	-
42	BM25-000226.042-B	BLD/CH/42	Approx 50	-	-	-	0.73	-	-	-	<0.01	-	-	0.05	0.02	<0.01	-
43	BM25-000226.043-B	BLD/CH/43	Approx 50	-	-	-	0.80	-	-	-	<0.01	-	-	0.03	<0.01	<0.01	-
44	BM25-000226.044-B	BLD/CH/44	Approx 50	-	-	-	0.61	-	-	-	<0.01	-	-	0.05	<0.01	<0.01	-
45	BM25-000226.045-B	BLD/CH/45	Approx 50	-	-	-	0.55	-	-	-	<0.01	-	-	0.02	<0.01	<0.01	-

Per Pro SGS India Private Ltd



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No decision rule is applied, when comparing the measurement result(s) with the applicable limit(s) according to the specification in the respective standard or as shared by the customer.

Test Report

Certificate No. TC-5867

Job Number : BM25-000228

Print Date : 25/02/2025
Report Control No. : BMR0000045255

Sample Described by Customer as : LIMESTONE Sample not Drawn by Laboratory

Customer Name : MAHESWARI MINING PRIVATE LIMITED
Customer Address : Dima Hasao (North Cachar hills)
City : Umrangso
State : Assam
Sample Condition & Size : Stapled & Fines
Sample Received Date : 20/02/2025
Test Start Date : 20/02/2025
DISCIPLINE : CHEMICAL

Postal Code : 788931
Country : INDIA

Registration Date : 20/02/2025
Test End Date : 25/02/2025

Group : Ores & Minerals : Limestone

Test Name	Test Protocol
Iron as Fe2O3%, Silica as SiO2%, Alumina as Al2O3%, Sulfur as SO3 % (on dry basis)	ASTM C1271 - 99 (Reapproved 2020)
Phosphorus as P2O5 %, Calcium oxide as CaO%, Magnesia as MgO% (on dry basis)	
Manganese as MnO%, Titania as TiO2%, Potassium as K2O %, Sodium as Na2O % (on dry basis)	
Vanadium Pentoxide as V2O5 %, Chromium Oxide as Cr2O3% (on dry basis)	
Loss of Ignition as LOI (on dry basis)%	IS:1760 (Part 1) - 1991 Reaff. 2022

NABL Accredited Tests ULR No.: TC586725100001025F - TC586725100001029F Against Sample No. BM25-000228.001 - 05

SI No.	Sample No.	Sample Mark	Sample Qty(g)	Fe2O3 %	SiO2 %	Al2O3 %	SO3 %	P2O5 %	CaO %	MgO %	MnO %	TiO2 %	K2O %	Na2O %	V2O5 %	Cr2O3 %	LOI %
1	BM25-000228.001-A	BLD-06	Approx 50	1.12	3.87	1.78	-	0.01	50.53	1.27	-	0.08	0.16	-	-	-	40.53
2	BM25-000228.002-A	BLD-12	Approx 50	0.68	1.55	0.78	-	0.02	53.74	0.89	-	0.03	0.07	-	-	-	42.03
3	BM25-000228.003-A	BLD-21	Approx 50	-	3.50	1.51	-	0.10	48.38	1.19	0.32	0.07	0.11	-	-	-	38.91
4	BM25-000228.004-A	BLD-26	Approx 50	4.59	2.64	1.09	-	0.08	49.84	1.03	0.15	0.05	0.09	-	-	-	40.19
5	BM25-000228.005-A	BLD-35	Approx 50	2.35	2.92	1.44	-	0.04	50.84	0.96	0.37	0.06	0.12	-	-	-	40.81

Per Pro SGS India Private Ltd



TEST REPORT				
Customer Name		Maheshwari Mining Pvt Limited-Chattisgarh Hiuse No. 92/1 Near Bus Stand Mainpath Vill and Po-Narmadapur, Mainpath-497111		
Discipline & Group		Chemical & Ores and Minerals.		
Customer Ref.		Samples Received by courier		
Commodity		Geological Rock Powders		
Lab ID		G9846.		
Sample Receipt Date		20-Feb-25		
Analysis Completion Date		22-Feb-25		
Date of Reporting		22-Feb-25		
Sample Count		3		
Sl. No.	Customer Code	Customer Description	METHOD	SOP/OM/094
			UNITS	gm/cm3
			Lab ID	Bulk Density
1	BLD/PBH02/93	Powder	G621-1	2.48
2	BLD/PBH01/15	Powder	G621-2	2.61
3	BLD/PBH04/54	Powder	G621-3	2.49



SATYANARAYANA -MANAGER - ORES & MINERALS
AUTHORISED SIGNATORY.

** END OF THE REPORT **	
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