

**GEOLOGICAL REPORT ON PRELIMINARY EXPLORATION (G3)
FOR LIMESTONE IN REVURU BLOCK**

SURYAPET DISTRICT, TELANGANA
TEXT, ANNEXURES, AND PLATES



MINERAL EXPLORATION AND CONSULTANCY LIMITED
(Formerly known as Mineral Exploration Corporation Limited)

A Government of India Enterprise
CORPORATE OFFICE, NAGPUR

MARCH 2026

CONTENTS

CHAPTER No.	DESCRIPTION	PAGE No.
	SALIENT FEATURES	i
	CHAPTER- 1	1-3
1.0.0	कार्यकारी सारांश	a-c
1.0.0	EXECUTIVE SUMMARY	1-3
	CHAPTER- 2	4
2.0.0	DETAILS OF THE QUALIFIED PERSON(S)/ EXPLORATION AGENCY	4
2.1.0	INVESTIGATING AGENCY	4
2.2.0	PERSONAL INVOLVED WITH PRELIMINARY EXPLORATION (G3) IN REVURU BLOCK, DISTRICT-SURYAPET, TELANGANA.	4
	CHAPTER- 3	5-6
3.0.0	TITLE OF THE REPORT & OWNERSHIP	5
3.1.0	DETAILS ABOUT PERIOD OF PROSPECTING	5
3.2.0	DETAILS OF EXPLORATION AGENCY, QUALIFICATION, AND EXPERIENCE OF ASSOCIATED TECHNICAL PERSONS ENGAGED IN EXPLORATION	5-6
	CHAPTER- 4	7-9
4.0.0	DETAILS OF THE AREA	7
4.1.0	LOCATION OF THE BLOCK	7
4.2.0	DETAILS OF THE AREA WITH LAND USE	7
4.3.0	MINERAL(S) UNDER INVESTIGATION	8
	CHAPTER- 5	10-12
5.0.0	PHYSIOGRAPHY AND ENVIRONMENT	10
5.1.0	RELIEF OF THE AREA WITH MINIMUM AND MAXIMUM ELEVATION, DRAINAGE PATTERN, NATURAL WATER COURSES, RESERVOIRS, ETC.	10
5.2.0	ROADS, RAILWAY TRACK, ELECTRIC TRANSMISSION LINE, TELEPHONE LINE, ETC.	10
5.3.0	HOST POPULATION (LOCAL TRIBES), HUMAN SETTLEMENTS WITHIN AND NEARBY THE AREA	10
5.4.0	SOCIO DEMOGRAPHIC PROFILE OF THE AREA AND NEARBY	10-11
5.5.0	HISTORICAL SITES AND ARCHAEOLOGICAL MONUMENTS, PLACES OF WORSHIP, PUBLIC UTILITIES ETC.	11
5.6.0	FOREST, SANCTUARIES, NATIONAL PARK AND WILD LIFE SANCTUARIES ETC.	11
5.7.0	FLORA AND FAUNA WITHIN AND NEARBY	11
5.8.0	WATER BODIES SUCH AS RIVER, NALA, STREAM, RESERVOIR, ETC	11
5.9.0	CLIMATIC CONDITIONS	11
5.10.0	OTHER PHYSIOGRAPHIC, SOCIAL AND ENVIRONMENTAL FACTOR	11-12
	CHAPTER- 6	13
6.0.0	INFRASTRUCTURE AND ENVIRONMENT	13
6.1.0	LOCAL INFRASTRUCTURE DETAILS	13
6.2.0	HOST POULATION AND HISTORICAL SITES	13
	CHAPTER- 7	14-23

CHAPTER No.	DESCRIPTION	PAGE No.
7.0.0	GEOLOGY OF THE AREA	14
7.1.0	REGIONAL GEOLOGY	14-15
7.2.0	REGIONAL STRUCTURE	15-16
7.3.0	REGIONAL MINERALIZATION	16-17
7.4.0	GEOLOGY OF THE BLOCK	18-19
7.5.0	DESCRIPTION OF ROCK TYPES IN THE BLOCK	20-21
7.6.0	STRUCTURAL FEATURES OBSERVED IN THE BLOCK	21
7.7.0	PETROGRAPHIC STUDIES	21-23
7.8.0	MINERALISATION IN THE BLOCK	23
	CHAPTER- 8	24-25
8.0.0	PREVIOUS WORK	24
8.1.0	DETAILS OF PREVIOUS EXPLORATION CARRIED OUT BY OTHER AGENCIES/PARTIES	24-25
8.2.0	PREVIOUS WORK DONE BY MECL	25
	CHAPTER- 9	26
9.0.0	GEOPHYSICAL EXPLORATION	26
	CHAPTER- 10	27-29
10.0.0	EXPLORATION UNDERTAKEN DURING CURRENT INVESTIGATION	27
10.1.0	OBJECTIVES OF INVESTIGATION	27
10.2.0	EXPLORATION ACTIVITIES TAKEN UP	27-29
10.3.0	DETAILS OF SURFACE SAMPLING, DRILLING ETC.	29
	CHAPTER- 11	30-31
11.0.0	LOCATION OF DATA POINTS	30
11.1.0	ACCURACY AND QUALITY OF SURVEY USED TO LOCATE BLOCK BOUNDARY AND DRILL HOLES	30
11.2.0	QUALITY AND ADEQUACY OF TOPOGRAPHIC CONTROL	31
	CHAPTER- 12	32-33
12.0.0	SAMPLING TECHNIQUE	32
12.1.0	NATURE AND QUALITY OF SAMPLING AND MEASURES TAKEN TO ENSURE SAMPLE REPRESENTATIVITY	32
12.2.0	NATURE, QUALITY AND APPROPRIATENESS OF THE SAMPLE PREPARATION TECHNIQUE	32
12.3.0	QUALITY CONTROL PROCEDURES ADOPTED	32
12.4.0	MEASURES TAKEN TO ENSURE THE SAMPLING IS REPRESENTATIVE OF THE IN-SITU MATERIAL COLLECTED	33
12.5.0	WHETHER SAMPLE SIZES ARE APPROPRIATE TO THE GRAINSIZE OF THE MATERIAL BEING SAMPLED	33
	CHAPTER- 13	34-37
13.0.0	DRILLING TECHNIQUES AND DRILL SAMPLING EMPLOYED	34
13.1.0	DRILLING TYPES AND DETAILS	34
13.2.0	DEVIATION SURVEY IN DRILLING	34
13.3.0	WHETHER CORE AND CHIP SAMPLE RECOVERIES HAVE BEEN PROPERLY RECORDED AND RESULTS ASSAYED	35
13.4.0	MEASURES TAKEN TO MAXIMIZE SAMPLE RECOVERY AND ENSURE REPRESENTATIVE NATURE OF THE SAMPLES	35

CHAPTER No.	DESCRIPTION	PAGE No.
13.5.0	WHETHER THE RELATIONSHIP EXISTS BETWEEN SAMPLE RECOVERY AND GRADE	36
13.6.0	CORE LOGGING	36-37
	CHAPTER- 14	38-39
14.0.0	SUB SAMPLING TECHNIQUES AND SAMPLE PREPARATION	38
14.1.0	WHETHER CUT OR DRAWN AND WHETHER QUARTER, HALF OR ALL CORE TAKEN	38
14.2.0	NATURE, QUALITY AND APPROPRIATENESS OF THE SAMPLE PREPARATION TECHNIQUE	38
14.3.0	QUALITY CONTROL PROCEDURES ADOPTED	38
14.4.0	MEASURES TAKEN TO ENSURE THAT THE SAMPLING IS REPRESENTATIVE OF THE INSITU MATERIAL COLLECTED	39
14.5.0	WHETHER SAMPLE SIZES ARE APPROPRIATE TO THE GRAIN SIZE OF THE MATERIAL BEING SAMPLED	39
	CHAPTER- 15	40-48
15.0.0	QUALITY OF ASSAY DATA AND LABORATORY TESTS	40
15.1.0	THE NATURE, QUALITY AND APPROPRIATENESS OF THE ASSAYING AND LABORATORY PROCEDURES	40
15.2.0	STANDARD OPERATING PROCEDURE (SoP) FOR THE ANALYSIS BY JNARDDC, NAGPUR	40-41
15.3.0	STANDARD OPERATING PROCEDURE (SoP) FOR THE ANALYSIS BY MECL LAB, NAGPUR	41-42
15.4.0	NATURE OF QUALITY CONTROL PROCEDURES ADOPTED	43-48
15.5.0	SECURITY AND CHAIN OF CONTROL OF SAMPLES SHOULD BE CLEARLY MENTIONED	48
	CHAPTER- 16	49
16.0.0	MOISTURE	49
	CHAPTER- 17	50
17.0.0	BULK DENSITY	50
	CHAPTER- 18	51
18.0.0	BENEFICIATION STUDIES	51
	CHAPTER- 19	52-57
19.0.0	RESOURCE ESTIMATION TECHNIQUE	52
19.1.0	GENERAL	52
19.2.0	ASSUMPTIONS FOR RESOURCE ESTIMATION	52-53
19.3.0	PARAMETERS FOR RESOURCE ESTIMATION	53-54
19.4.0	OVERBURDEN	54
19.5.0	METHODOLOGY	54
19.6.0	METHODOLOGY ADOPTED IN CROSS-SECTION METHOD FOR RESOURCE ESTIMATION (PRINCIPAL METHOD)	54-55
19.7.0	METHODOLOGY ADOPTED IN POLYGONAL METHOD FOR RESOURCE ESTIMATION (CHECK METHOD)	55-56
19.8.0	COMPUTATION OF AVERAGE GRADE	56-57
19.9.0	CATEGORISATION OF RESOURCE	57
	CHAPTER- 20	58-63
20.0.0	REPORTING OF RESOURCE	58

CHAPTER No.	DESCRIPTION	PAGE No.
20.1.0	RESOURCE ESTIMATION	58
20.2.0	RESOURCE BY POLYGON METHOD	58-59
20.3.0	RELIABILITY OF RESOURCE	59-63
	CHAPTER- 21	64-65
21.0.0	SUMMARY AND RECOMMENDATIONS	64
21.1.0	SUMMARY	64-65
21.2.0	RECOMMENDATIONS	65
	CHAPTER- 22	66
22.0.0	PLATES AND MAPS	66
	CHAPTER- 23	67
23.0.0	ANNEXURE / ENCLOSURES TO THE REPORT	67
	CHAPTER- 24	68-71
24.0.0	ANY OTHER INFORMATION	68
24.1.0	UTILISATION ASPECTS AND MINEABILITY (AS PER NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS)	68-71
	CHAPTER- 25	72
25.0.0	CERTIFICATE FROM THE QUALIFIED PERSON WITH NAME, DATE AND SIGNATURE	72
	REFERENCES	73
	ABBREVIATIONS USED	74

LIST OF ANNEXURES

ANNEXURE No.	TITLE	PAGE No.
I-A	Statement showing Co-ordinates of cardinal points (in WGS-84) of block boundary in Revuru Block, District: Suryapet, Telangana.	1
I-B	Statement showing Co-ordinates (In WGS-84), reduced levels of boreholes drilled in Revuru Block, District: Suryapet, Telangana.	1
II-A	Statement Showing run-wise lithologs of boreholes MRB-01, 02, 03, 04 and 05 drilled in Revuru Block, District: Suryapet, Telangana.	1-10
II-B	Statement Showing Concise lithologs of boreholes MRB-01, 02, 03, 04 and 05 drilled in Revuru Block, District: Suryapet, Telangana.	1
III-A	Statement Showing Primary Analysis for borehole core samples generated by MECL, Revuru Block, District: Suryapet, Telangana.	1-5
III-B	Statement Showing External Check Analysis for borehole core samples done at JNARDDC, Nagpur in Revuru Block, District: Suryapet, Telangana.	1
III-C	Statement showing Primary Vs. Check analysis (External) of core samples of boreholes drilled in Revuru Block, District: Suryapet, Telangana.	1
IV-A	Statement showing borehole-wise intersections of Cement Grade limestone in Boreholes drilled in Revuru Block, District: Suryapet, Telangana.	1
IV-B	Statement showing borehole-wise intersections of Blendable Grade limestone in Boreholes drilled in Revuru Block, District: Suryapet, Telangana.	1
V	Statement showing Petrography study report of core samples of boreholes drilled in Revuru Block.	1-2
VI	Statement showing Bulk Density study report of core samples of boreholes drilled in Revuru Block.	1
VII-A	Statement showing polygon wise, borehole wise Inferred category of resources (333) of Cement Grade Limestone, Estimated by polygonal method in Revuru Block, District: Suryapet, Telangana.	1
VII-B	Statement showing polygon wise, borehole wise Inferred category of resources (333) of Blendable Grade Limestone, Estimated by polygonal method in Revuru Block, District: Suryapet, Telangana	1
VII-C	Statement showing section wise, borehole wise Inferred category of resources (333) of Cement Grade Limestone, Estimated by cross sectional method in Revuru Block, District: Suryapet, Telangana.	1
VII-D	Statement showing Polygon wise, borehole wise Inferred category of resources (333) of Cement Grade Limestone, Estimated by Polygonal method in Revuru Block, District: Suryapet, Telangana.	1
VIII-A	Recommendation of 80 th TCC-1 for Revuru Block, District: Suryapet, Telangana.	1-8
VIII-B	Office Memorandum for work order of exploration work for Revuru Block, District: Suryapet, Telangana.	1-8
IX	End Use Grade Classification Limestone as per IBM.	1-2
X-A	Peer Reviewer Comments of Revuru Block.	1-2
X-B	Peer Reviewer Comments and MECL Response of Revuru Block.	1
XI	Baseline survey report of Revuru Block, Dist: Suryapet, Telangana.	1-43

LIST OF PLATES

PLATE No.	TITLE	R. F
I	Location Map of Revuru Block, District: Suryapet, Telangana.	1:50,000
II	Regional Geological Map of Revuru Block, Part of Palnad Sub-Basin (GSI), District: Suryapet, Telangana.	1:50,000
III	Topographical and Geological map of Revuru Block, District: Suryapet, Telangana.	1:4000
IV	Graphic Lithologs of boreholes drilled in Revuru Block, District: Suryapet, Telangana.	1:1000
V	Polygon Map of All Grades of Limestone in Revuru Block, District: Suryapet, Telangana.	1:4,000
VI	Geological Cross Sections of Revuru Block (S1–S1', S2–S2' and S3–S3').	1:2000

LIST OF TEXT FIGURES

TEXT FIGURE No.	TITLE	PAGE No.
01	Location Map of Revuru Block, District: Suryapet, Telangana.	9
02	Regional Geological Map of Revuru Block, Part of Palnad Sub-Basin (GSI), District: Suryapet, Telangana.	17
03	Topographical and Geological map of Revuru Block, District: Suryapet, Telangana.	19

LIST OF FIGURES

FIGURE No.	DESCRIPTION	PAGE No.
1	Limestone exposure in south eastern corner of the block	21
2	Limestone zone of borehole no. MRB-01 from 9.00m to 14.00m	36
3	Limestone zone of borehole no. MRB-03 from 30.00m to 34.60m	37
4	Limestone zone of borehole no. MRB-04 from 32.60m to 37.90m	37
5	Limestone zone of borehole no. MRB-05 from 38.80m to 44.00m	37
6	Photographs showing WD-XRF instrument (Rigaku, Japan) at Chemical Lab, MECL, Nagpur	42

LIST OF MICROPHOTOGRAPHS

SAMPLE No	DESCRIPTION	PAGE No.
Pmg-1	Pmg – 1: Photomicrograph showing parallel alignment of micrite and quartz clusters within foliated impure micritic limestone as seen under crossed nicols. Specimen No.: MRB-PG-01 Magnification: 100X	22
Pmg-2	Pmg – 2: Photomicrograph showing rotational movement of coarse sparry calcite patch within foliated impure micritic limestone as seen under crossed nicols. Specimen No.: MRB-PG-03 Magnification: 40	23

LIST OF TABLES

TABLE No.	DESCRIPTION	PAGE No.
4.1	Co-ordinates of corner points of explored Revuru Block, Suryapet District, Telangana.	7
7.1	Regional Stratigraphy of the Cuddapah basin.	14-15
7.3	Stratigraphic Sequence of Litho-units exposed in and around the Block.	18
10.1	Quantum of Work - Proposed Vs Achieved in Revuru Block, Suryapet District, Telangana.	27-28
11.1	The R.L & Coordinates of the SOI CORS Base Point – SURVEY OF INDIA BASE STATION-NIDA, Revuru Block, Suryapet District, Telangana.	30
13.1	Details of Co-ordinates (in WGS-84), Reduced Levels of boreholes drilled in Revuru Block.	34
19.2	Borehole zone wise intersection of Cement Grade Limestone Zones in boreholes drilled in Revuru Block, Suryapet District, Telangana.	56
19.3	Borehole wise intersection of Blendable Grade Limestone Zones in boreholes drilled in Revuru Block, Suryapet District, Telangana.	56
20.1	Comparison of Gross In-situ Resources estimated by Polygonal Method (Principal Method) with Cross Sectional Method (Check Method) in Revuru Block.	59
20.2	Polygon wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Cement Grade Limestone by Polygonal Method for Revuru Block, Dist: Suryapet, Telangana.	60
20.3	Polygon wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Blendable Grade Limestone by Polygonal Method for Revuru Block, Dist: Suryapet, Telangana.	61
20.4	Section wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Cement Grade Limestone by Cross Sectional Method for Revuru Block, Dist: Suryapet, Telangana.	62
20.5	Section wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Blendable Grade Limestone by Cross Sectional Method for Revuru Block, Dist: Suryapet, Telangana.	63
24.1	Cement Industry Specification for Limestone.	68
24.2	B. I. S. (Bureau of Indian Standards) Specification for Limestone.	69
24.3	Iron and Steel Industry Specification for Limestone.	69
24.4	Chemical Industry Specification for Limestone.	69-70
24.5	Foundry Industry Specification for Limestone.	70
24.6	Cement, Iron and Steel and Chemical Industry Specification for Limestone.	70-71

GEOLOGICAL REPORT ON PRELIMINARY EXPLORATION (G3) FOR LIMESTONE IN REVURU BLOCK, DISTRICT: SURYAPET, TELANGANA

SALIENT FEATURES

1.	Name of the block	Revuru Block, Tahsil - Mattampally, District - Suryapet, State - Telangana																						
2.	Mineral	Limestone																						
3.	Total Area	4.87 sq.km.																						
4.	Area covered under present scheme	4.87 sq.km.																						
5.	Period of Exploration	December 2025 to March 2026																						
6.	Meterage drilled by Outsourcing Party (M/s Soiltech India Pvt. Ltd.)	Total 250.00 m																						
7.	No. of Boreholes drilled by M/s Soiltech India Pvt. Ltd.	Total 05 Nos																						
8.	Thickness of Different Grades of Limestone	Cement Grade Limestone - Thickness 32m (min), 44m (max.). Blendable Grade Limestone- Thickness 6m (min), 6m (max)																						
9.	Cut-off grade	As per end use grade classification recommended by Indian Bureau of Mines (IBM).																						
		<table><tr><th rowspan="2">Grade</th><th>CaO (Min.)</th><th>MgO (Max.)</th><th>SiO₂ (Max.)</th></tr><tr><th>%</th><th>%</th><th>%</th></tr><tr><td>Cement Grade Limestone</td><td>≥44</td><td>3.5</td><td>16</td></tr><tr><td>Blendable Grade Limestone</td><td>38-44</td><td>5</td><td>16- 18</td></tr><tr><td>Blendable Grade Limestone</td><td>≥34</td><td>6</td><td>18</td></tr></table>				Grade	CaO (Min.)	MgO (Max.)	SiO ₂ (Max.)	%	%	%	Cement Grade Limestone	≥44	3.5	16	Blendable Grade Limestone	38-44	5	16- 18	Blendable Grade Limestone	≥34	6	18
							Grade	CaO (Min.)	MgO (Max.)	SiO ₂ (Max.)														
						%		%	%															
						Cement Grade Limestone	≥44	3.5	16															
						Blendable Grade Limestone	38-44	5	16- 18															
Blendable Grade Limestone	≥34	6	18																					
10.	Resources	Cement Grade Limestone: 510.64 MT* with an average grade 52.21% CaO, 0.59% MgO, 6.31% SiO ₂ . Blendable Grade Limestone: 19.82 MT* with an average grade 42.94% CaO, 0.50% MgO, 12.08% SiO ₂ . * MT – Million Tonnes																						
11.	Grade	Cement Grade Limestone & Blendable Grade Limestone																						
12.	UNFC Category	Inferred Category (333)																						
13.	Report Submission	March 2026																						

चूना पत्थर के लिए प्रारंभिक गवेषण (जी3) पर भूवैज्ञानिक रिपोर्ट रेवुरु ब्लॉक, जिला-सूर्यपेट, तेलंगाना

अध्याय - 1

1.1.0 कार्यकारी सारांश

- 1.1.1 एमएमडीआर संशोधित अधिनियम, 2015 से पहले दिए गए प्रोस्पेक्टिंग लाइसेंस (पीएल) में गवेषण चरण की रिपोर्ट (जी4, जी3, आदि) शामिल थी। हालाँकि, अधिनियम में 2021 के संशोधनों ने इन पीएल रिपोर्टों को अयोग्य बना दिया, जिससे खनिज ब्लॉकों को नीलामी से गुजरना पड़ा। इसके परिणामस्वरूप, खनिज (खनिज सामग्री के साक्ष्य) नियम, 2015 के तहत ऐसी 19 पीएल रिपोर्टों का पुनर्मूल्यांकन करने की आवश्यकता है। उनकी जांच करने के लिए, राज्य सरकार ने एक जांच समिति (जी.ओ.एम.एस. नं.8, दिनांक 12.03.2025) का गठन किया। जीएसआई, एमईसीएल और आईबीएम के साथ दिनांक 04.06.2025 को एक बैठक आयोजित हुई तथा जांच समिति ने निष्कर्ष निकाला कि आगे की गवेषण को वैध करने के लिए फील्ड गवेषण आवश्यक था।
- 1.1.2 इस क्षेत्र में चूना पत्थर के लिए मौजूदा खनन पट्टे हैं, प्रॉस्पेक्टिंग लाइसेंस (पीएल) ब्लॉकों के आसपास, संबंधित एजेंसियों ने जी3 स्तर का गवेषण किया है, जिससे चूना पत्थर की उपस्थिति की पुष्टि हुई है।
- 1.1.3 उपरोक्त को देखते हुए, एमईसीएल ने रेवुरु ब्लॉक में जी3 स्तर के गवेषण को शामिल करते हुए गवेषण प्रस्ताव तैयार किया है जो मेसर्स सागर सीमेंट लिमिटेड, मायहोम इंडस्ट्रीज के पूर्ववर्ती पीएल क्षेत्रों से निकट हैं।
- 1.1.4 एमईसीएल ने तेलंगाना के सूर्यपेट जिले के मट्टमापल्ली तहसील के रेवुरु गांव और उसके आसपास जी3 स्तर पर 05 बोरहोल में 250 मीटर ड्रिलिंग के लिए गवेषण प्रस्ताव तैयार किया।
- 1.1.5 रेवुरु ब्लॉक (4.87 वर्ग किमी) के लिए गवेषण प्रस्ताव (जी3) प्रस्तुत किया गया और दिनांक 28-29 अगस्त, 2025 और दिनांक 1 सितंबर, 2025 को आयोजित 80वीं टीसीसी-1 की बैठक में इस पर विचार-विमर्श किया गया। समिति ने 10ए (2) (बी) मामलों और एमईसीएल के माध्यम से इन पीएल क्षेत्रों की गवेषण के लिए तेलंगाना सरकार के अनुरोध पर ध्यान दिया। तदनुसार, 80वीं टीसीसी-1 समिति ने ईसी, एनएमईडीटी को रेवुरु ब्लॉक (4.87 वर्ग किमी), सूर्यपेट जिले, तेलंगाना में चूना पत्थर के लिए प्रारंभिक गवेषण (जी3 स्तर) शीर्षक वाले परियोजना प्रस्ताव की सिफारिश की।
- 1.1.6 एनएमईडीटी की 80वीं टीसीसी-1 की सिफारिश पर दिनांक 10 नवंबर, 2025 को दिनांकित पत्र संख्या F.No.117/1/2025/NMET/491 के माध्यम से आयोजित परियोजना स्वीकृति समिति (पीएससी) ने 70.84 लाख रुपये की लागत वाली परियोजना को मंजूरी दी।
- 1.1.7 तेलंगाना के सूर्यपेट जिले में स्थित रेवुरु ब्लॉक 4.87 वर्ग किमी क्षेत्र में फैला हुआ है, जो देशांतर 079°57'41.55" पूर्व से 079°59'46.48" पूर्व और अक्षांश 16°47'56.08" उत्तर से 16°49'1.91" उत्तर तक है और तहसील मट्टमापल्ली में रेवुरु, मेलाचेरु, गुदिमालकापुरम और डोंडापाडु गांवों को शामिल करता है, जो टोपोशीट नंबर 56 पी/13 के हिस्से में आता है।

- 1.1.8 एनएमईटी से अनुमोदन प्राप्त होने के बाद, एमईसीएल ने रेवुरु ब्लॉक में जी3 स्तर का गवेषण किया है। एमईसीएल ने 1:4000 पैमाने पर ड्रिलिंग के साथ 250 मीटर की कुल मीटरिंग और 203 कोर नमूनों और 20 बाहरी जांच नमूनों के साथ वर्टिकल बोरहोलों की संख्या पर भूवैज्ञानिक मानचित्रण और स्थलाकृतिक सर्वेक्षण किया, जिनका CaO , MgO , SiO_2 , Fe_2O_3 , Al_2O_3 , SO_3 , P_2O_5 , K_2O , Na_2O और LOI के लिए विश्लेषण किया गया था। कोरड्रिलिंग, सतह के नीचे निरंतरता को रेखांकित करने और खनिज संसाधनों का आकलन करने के लिए मैपिंग डेटा पर विचार किया गया था।
- 1.1.9 गवेषित क्षेत्र पलनाड उप-बेसिन का एक हिस्सा है और कुडप्पा बेसिन के उत्तरपूर्वी भाग में स्थित है। बेसिन का प्रमुख हिस्सा नियोप्रोटेरोजोइक युग की कुर्नूल समूह की चट्टानों से घिरा हुआ है। विलियम किंग (1872) ने पलनाड बेसिन के सबसे पहले भूवैज्ञानिक विवरण का दस्तावेजीकरण किया है। रामलिंगस्वामी, जी (1976-77) ने टोपोशीट नंबर 56पी/13 के कुछ हिस्सों में क्षेत्र का मानचित्रण किया है। चक्रधर इत्यादि (1980-83), रवींद्र बाबू इत्यादि (1989), रामकृष्णैया इत्यादि (2012-13), जगदीशवर बाबू के और तिरुमरुगन एम (2013) तथा सुगाथन और रिम्पल कार (2013) ने पलनाड उप-बेसिन के कुछ हिस्सों में चूने के पत्थर की जांच की है।
- 1.1.10 इस क्षेत्र में चूना पत्थर प्रोटेरोजोइक पलनाड बेसिन के एक भाग का निर्माण करता है जो कुर्नूल समूह के नारजी चूना पत्थर गठन के समतुल्य है। नारजी चूना पत्थर की इन कार्बोनेट चट्टानों को कई अलग-अलग लिथोलॉजिकल इकाइयों में उप-विभाजित किया गया है। बेड की नतिलंब उत्तर 30° पूर्व - दक्षिण 30° पश्चिम है और दक्षिण पूर्व की ओर 2° से 4° तक ढलान भिन्न होती है।
- 1.1.11 आईबीएम ग्रेड कट ऑफ के आधार पर क्षेत्रों को सीमांकित किया गया था:

श्रेणी	CaO (न्यून.) %	MgO (अधि.) %	SiO ₂ (अधि.) %
सिमेंट ग्रेड चूनापत्थर	≥ 44	3.5	16
मिश्रण योग्य ग्रेड चूनापत्थर	38-44	5	16-18
थ्रेसहोल्ड ग्रेड चूनापत्थर	≥ 34	5	18

- 1.1.12 सिमेंट ग्रेड चूना पत्थर को सभी पांच बोरहोलों में प्रतिच्छेदित हुआ था, अर्थात् एमआरबी-01 से एमआरबी-05 तक, जिनकी मोटाई क्रमशः 42.80 मीटर, 44 मीटर, 32 मीटर, 38 मीटर और 44 मीटर है। मिश्रणीय ग्रेड चूना पत्थर को केवल एक बोरहोल यानी एमआरबी-03 में काटा गया था, जिसकी मोटाई 9 मीटर है।
- 1.1.13 सिमेंट ग्रेड और ब्लेंडेबल ग्रेड चूना पत्थर के लिए आईबीएम ग्रेड कट-ऑफ के वर्गीकरण के आधार पर एमईएमसी नियमों 2015 (2021 में संशोधित) के अनुसार भूवैज्ञानिक सकल यथास्थाने संसाधनों का अनुमान बहुभुज विधि द्वारा प्रमुख विधि के रूप में और क्रॉस सेक्शनल चेक विधि के रूप में किया गया था। संसाधनों के आकलन के लिए 2.68 ग्राम/ सीसी (कैलिपर मेथड) के थोक घनत्व पर विचार किया गया था।

चूना पत्थर के अनुमानित भूवैज्ञानिक सकल यथास्थाने संसाधन निम्नानुसार हैं:

Sl. No.	संसाधनों का प्रकार	भौगोलिक सकल यथास्थाने संसाधन (मिलियन टन)	औसत गुणवत्ता		
			CaO %	MgO %	SiO ₂ %
1	सिमेंट ग्रेड चूनापत्थर	510.64	52.21	0.59	6.31
2	मिश्रणयोग्य ग्रेड चूनापत्थर	19.82	42.94	0.50	12.08

- 1.1.14 अनुशंसित: एमईसीएल द्वारा रेवुरु ब्लॉक में प्रारंभिक गवेषण (जी3) किया गया और सीमेंट ग्रेड और ब्लेंड करने योग्य ग्रेड चूना पत्थर संसाधनों की स्थापना की गई, जिन्हें यूएनएफसी नामकरण के अनुसार 333 श्रेणी के तहत रखा गया है। यह रिपोर्ट राज्य सरकार तेलंगाना को ब्लॉक की नीलामी के लिए सुविधा प्रदान करेगी।

GEOLOGICAL REPORT ON PRELIMINARY EXPLORATION (G3) FOR LIMESTONE IN REVURU BLOCK, DISTRICT- SURYAPET, TELANGANA

CHAPTER - 1

1.1.0 EXECUTIVE SUMMARY

- 1.1.1 Prospecting Licences (PLs) granted before the MMDR Amendment Act, 2015 included exploration stage reports (G4, G3, etc.). However, the 2021 amendments to the Act rendered these PL reports ineligible, requiring mineral blocks to go through auction. As a result, 19 such PL reports need re-evaluation under the Minerals (Evidence of Mineral Contents) Rules, 2015. To scrutinize them, the State Government formed a Scrutiny Committee (G.O.Ms.No.8, dated 12.03.2025). A meeting held with GSI, MECL, and IBM on 04.06.2025 and scrutiny committee concluded that further field exploration was necessary to validate with further exploration.
- 1.1.2 The area hosts existing mining leases for limestone, in the vicinity of the Prospecting License (PL) blocks, the respective agencies have undertaken G3 level exploration, confirming the presence of limestone.
- 1.1.3 In view of the above, MECL has prepared the exploration proposal involving G3 level exploration in Revuru block which are adjacent to erstwhile PL areas of M/s Sagar cement ltd, Myhome industries.
- 1.1.4 MECL formulated exploration proposal involving 250m drilling in 05 boreholes at G3 level of exploration in and around Revuru village of Tehsil Mattampally, District: Suryapet, Telangana.
- 1.1.5 Exploration Proposal (G3) for Revuru block (4.87 sq.km.) was submitted and deliberated in 80th TCC-1 meeting held on 28th - 29th August 2025 and 1st September 2025. Committee, noted 10A(2)(b) cases and request of Govt. of Telangana for exploration of these PL areas through MECL. Accordingly, 80th TCC-1 committee recommended the project proposal titled as “Preliminary Exploration (G3 Level) for Limestone in Revuru block (4.87 sq.km.), Suryapet District, Telangana” to Project Sanctioning Committee (PSC), NMEDT.
- 1.1.6 On recommendation of 80th TCC-1, 1st Project Sanctioning Committee (PSC) of NMEDT meeting held on 9th October 2025, vide letter no F.No. 117/1/2025/NMET/491, Dated 10th November, 2025 approved the project with cost of ₹ 70.84 lakhs.

- 1.1.7 The Revuru Block, located in Suryapet District of Telangana, spans 4.87 sq.km. area, is bounded by Longitude 079°57'41.55"E to 079°59'46.48"E and Latitude 16°47'56.08"N to 16°49'1.91"N and encompasses the villages of Revuru, Mellacheruvu, Gudimalkapuram and Dondapadu in Tehsil Mattampally falling within part of Toposheet No. 56 P/13.
- 1.1.8 After receipt of approval from NMET, The MECL has carried out G3 level exploration in Revuru Block. MECL carried out geological mapping and topographical survey on 1:4000 scale with drilling 5 no of vertical boreholes with total meterage of 250m and generating 203 no of core samples and 20 external check samples were analysed for CaO, MgO, SiO₂, Fe₂O₃, Al₂O₃, SO₃, P₂O₅, K₂O, Na₂O & LOI. Core drilling, mapping data was considered to delineate subsurface continuity and assess mineral resources.
- 1.1.9 The explored area is a part of Palnad Sub-Basin and is located in the northeastern part of the Cudappah Basin. The major portion of the basin is occupied by Kurnool Group of rocks of Neoproterozoic age. William King (1872) documented the earliest geological account of Palnad basin. Ramalingaswamy, G. (1976-77) has mapped area in parts of Toposheet No.56P/10. Krupanidhi (1966-67), Nagaeswara Rao and Varaprasada Rao (1967-68), Chakradhar et al, (1980-83), Ravindra Babu et al, (1989), Ramakrishnaiah et al, (2012-13), Jagadishwar Babu. K and Tirumurugan. M. (2013) and Sugathan & Rimpal Kar (2013) have carried out investigation for limestone in parts of Palnad sub-basin.
- 1.1.10 The limestone in the area forms a part of Proterozoic Palnadu Basin equivalents to Narji Limestone formation of Kurnool Group. These carbonate rocks of Narji Limestone are sub divided in to several distinct lithological units. The strike of the beds is N30°E – S30°W and dip varies from 2° to 4° towards Southeast.
- 1.1.11 Zones were demarcated based on IBM grade cut off, the grades cut off table as follow:

Grade	CaO (Min.) %	MgO (Max.) %	SiO₂ (Max.) %
Cement Grade Limestone	≥44	3.5	16
Blendable Grade Limestone	38-44	5	16-18
Threshold Grade Limestone	≥34	5	18

- 1.1.12 Cement Grade Limestone was intersected in all the five boreholes namely MRB-01 to MRB-05, whose thickness are 42.80m, 44m, 32m, 38m and 44m respectively.

Blendable Grade Limestone was intersected in only one borehole i.e. MRB-03, whose thickness is 9m.

- 1.1.13 Geological Gross In-Situ resources were estimated by polygon method as principal method and cross sectional as check method as per MEMC Rules 2015 (Amended 2021) for Cement Grade and Blendable Grade Limestone based on classification of IBM grade cut-off, bulk density of 2.68 gm/cc (Caliper Method) was considered for estimation of resources.

Estimated geological gross in-situ resources of limestone are as follows:

Sl. No.	Type of Resources	Geological Gross In-Situ Resources (Million Tonnes)	Average Quality		
			CaO %	MgO %	SiO ₂ %
1	Cement Grade Limestone	510.64	52.21	0.59	6.31
2	Blendable Grade Limestone	19.82	42.94	0.50	12.08

- 1.1.14 Recommendation: Preliminary exploration (G3) was carried out by MECL in Revuru Block and established Cement Grade and Blendable Grade Limestone resources, which are placed under 333 category as per UNFC nomenclature. This report will facilitate state Govt. of Telangana for auction of the block.

CHAPTER – 2

2.0.0 DETAILS OF THE QUALIFIED PERSON(S) / EXPLORATION AGENCY

2.1.0 INVESTIGATING AGENCY

MINERAL EXPLORATION& CONSULTANCY LIMITED

(A Govt. of India Enterprise Miniratna PSE)

Dr. Babasaheb Ambedkar Bhavan, High Land Drive Road,

Seminary Hills, Nagpur-440006

2.2.0 PERSONNEL INVOLVED WITH PRELIMINARY EXPLORATION (G3) FOR LIMESTONE IN REVURU BLOCK, DISTRICT - SURYAPET, TELANGANA.

1	Overall Guidance	Shri Shrikant Sharma, HOD (Exploration)
2	Overall Planning, Co-ordination & Supervision	Shri Shrikant Sharma, HOD (Exploration) Shri Dr. Kuppusamy E, Dy. G M (Exploration) Rtd. Shri Naveen Kumar Pala, Sr. Manager (Geology)
3	Project Management	Shri Dipankar Manna, Project Manager, Kumaraswamy Project (Upto 20-02-2026) Shri M. Rampramod, Project Manager, Kumaraswamy Project (From 21-02-2026 to Till date)
4	Physical Execution of work	
	a) Geology	Shri M. Rampramod K, Manager (Geology) Shri Sathish Kumar Inaparathi, Sr. Tech. (Sampling)
	b) Survey	Shri Tanmoy Giri, Sr. Tech. (S & D)
	c) Drilling	Shri Deepak Choudary, Sr. Supervisor (Drilling), <i>Drilling is out sourced to M/s Soiltech India Pvt. Ltd.</i>
5	Sample Processing	Shri Ankush Haridas Wagh, Sr. Tech. (Sampling)
		Shri Nagaraju Vaddi, Sr. Tech. (Sampling)
		Shri Pushpraj Tiwari, Tech. (Sampling)
6	Chemical Laboratory	Shri Shrikant Sharma, HOD (Exploration), NEM
		Shri Rohit Sharma, Manager (Chemistry)
		Dr. Deepti Rahangdale, Manager (Chemistry)
7	Petrographic Studies	Shri Sayantan Pal, Manager (Geology)
8	Documentation	Shri Naveen Kumar Pala, Sr. Manager (Geology)
		Shri Lakshmanarao Kaddala, Sr. Manager (Geology)
		Smt. Pooja Singh, Young Professional (Geology)
9	Non-Coal Geological Report Cell	Shri N C S Reddy, Superintendent (Information Technology)
		Shri Uday Patil, Sr. Computer Operator
		Shri Ashok Kumar, Sr. Computer Operator
10	Hindi Translation	Shri Shreekant Rai, Sr. Hindi Translator
11	Reprography and Printing	Shri Pratap Singh Negi, Assistant Survey & Map Officer
		Shri Durgesh Devarshee, Assistant Survey & Map Officer

CHAPTER - 3

3.0.0 TITLE OF THE REPORT & OWNERSHIP

Title: Geological Report on Preliminary Exploration (G3) for Limestone in Revuru Block in Suryapet district, Telangana.

Ownership: Department of Mines and Geology, Government of Telangana.

3.1.0 DETAILS ABOUT PERIOD OF PROSPECTING

The exploratory drilling in the block commenced on 30.12.2025 and completed on 27.01.2026 in Revuru Block through outsourcing party i.e. M/s Soiltech India Pvt. Ltd. Total 05 boreholes were drilled with the cumulative meterage of 250 m and borehole core sampling etc. were completed simultaneously. The analytical / laboratory studies were also carried out simultaneously in laboratories of MECL, Nagpur and other NABL accredited laboratories (JNARDDC), Nagpur.

3.2.0 DETAILS OF EXPLORATION AGENCY, QUALIFICATION, AND EXPERIENCE OF ASSOCIATED TECHNICAL PERSONS ENGAGED IN EXPLORATION

Exploration Agency	Mineral Exploration and Consultancy Limited (Formerly Mineral Exploration Corporation Limited) A Govt. of India Enterprise – Mini Ratna – 1 CPSE
Qualification	M.Sc. / M. Sc. Tech. (Geology)
Experience	Organisation have more than 50 years of experience with inception of MECL since 1972
Address of the Prospector	Dr. Babasaheb Ambedkar Bhavan, High Land Drive Road, Seminary Hills, Nagpur, Pin- 440006
Email	cmd@gov.in; gm-exploration@mecl.gov.in
Phone No.	0712-2510289; 0712-2511829

Sl.No.	Name of the Person	Designation	Qualification	Experience
1	Shri Shrikant Sharma	HOD (Exploration)	M.Sc., Geology	23 Years
2	Shri Naveen Kumar Pala	Sr. Manager (Geology)	M.Sc. (Tech.), Applied Geology	21 Years
3	Shri Dipankar Manna	Project Manager, Kumaraswamy Project / Asst. Manager (Geology)	M.Sc. (Geology)	8 Years
4	Shri Lakshmanarao Kaddala	Sr. Manager (Geology)	M.Sc. (Tech.), Applied Geology	19 Years
5	Shri Rohit Kumar Sharma	Manager (Chemical Lab)	M.Sc., Chemistry	15 Years
6	Shri M. Rampramod K	Manager (Geology)	M.Sc. (Geology) & M.Tech. (Petroleum Exploration)	12 Years

CHAPTER - 4

4.0.0 DETAILS OF THE AREA

4.1.0 LOCATION OF THE BLOCK

4.1.1 The explored Revuru Block falls in the jurisdiction of Mattampally Mandal (Taluk), Suryapet District, Telangana. The block can be approached from the nearest Mattampally Mandal (Taluk), Taluk head-quarters towards south-east at a distance of around 15 kms by single lane asphalted village roads.

4.1.2 All the villages in the area are well connected to each other and to the national highway located at a distance of about 40 km away from National Highway No. 9 connecting Vijayawada- Hyderabad. Nearest Railway Station is Miryalaguda about 60 km towards NNW direction. The nearest airport is Vijayawada Airport at 135 km from the block and the location map of the block is shown in **Plate-I**. The Blocks fall in the Survey of India Toposheet No. 56 P/13 and the co-ordinates of the 10 cardinal points of the Revuru are given in the following Table No: 4.1.

Table No: 4.1
Co-ordinates of corner points of explored in Revuru Block,
Mattampally Mandal, Suryapet District, Telangana

Boundary Points	Latitude (N)	Longitude (E)	UTM (m)		RL (MSL)
			Easting	Northing	
A	16°49'01.96"	79°59'21.47"	392309.239	1859609.014	88.236
B	16°48'15.12"	79°59'31.49"	392598.369	1858168.052	91.900
C	16°48'10.74"	79°59'46.50"	393042.060	1858031.088	90.266
D	16°48'09.09"	79°59'03.31"	391763.282	1857986.899	100.163
E	16°48'09.66"	79°58'57.36"	391587.188	1858005.558	100.591
F	16°48'06.71"	79°58'48.35"	391320.093	1857916.308	100.342
G	16°47'55.92"	79°58'09.55"	390169.791	1857590.469	106.120
H	16°48'51.02"	79°57'41.54"	389349.315	1859288.186	102.841
I	16°48'59.80"	79°58'05.39"	390056.749	1859554.356	99.340
J	16°48'08.26"	79°58'30.16"	390781.686	1857966.713	102.675

All the coordinates of corner points Revuru Block are given in Annexure-I-A.

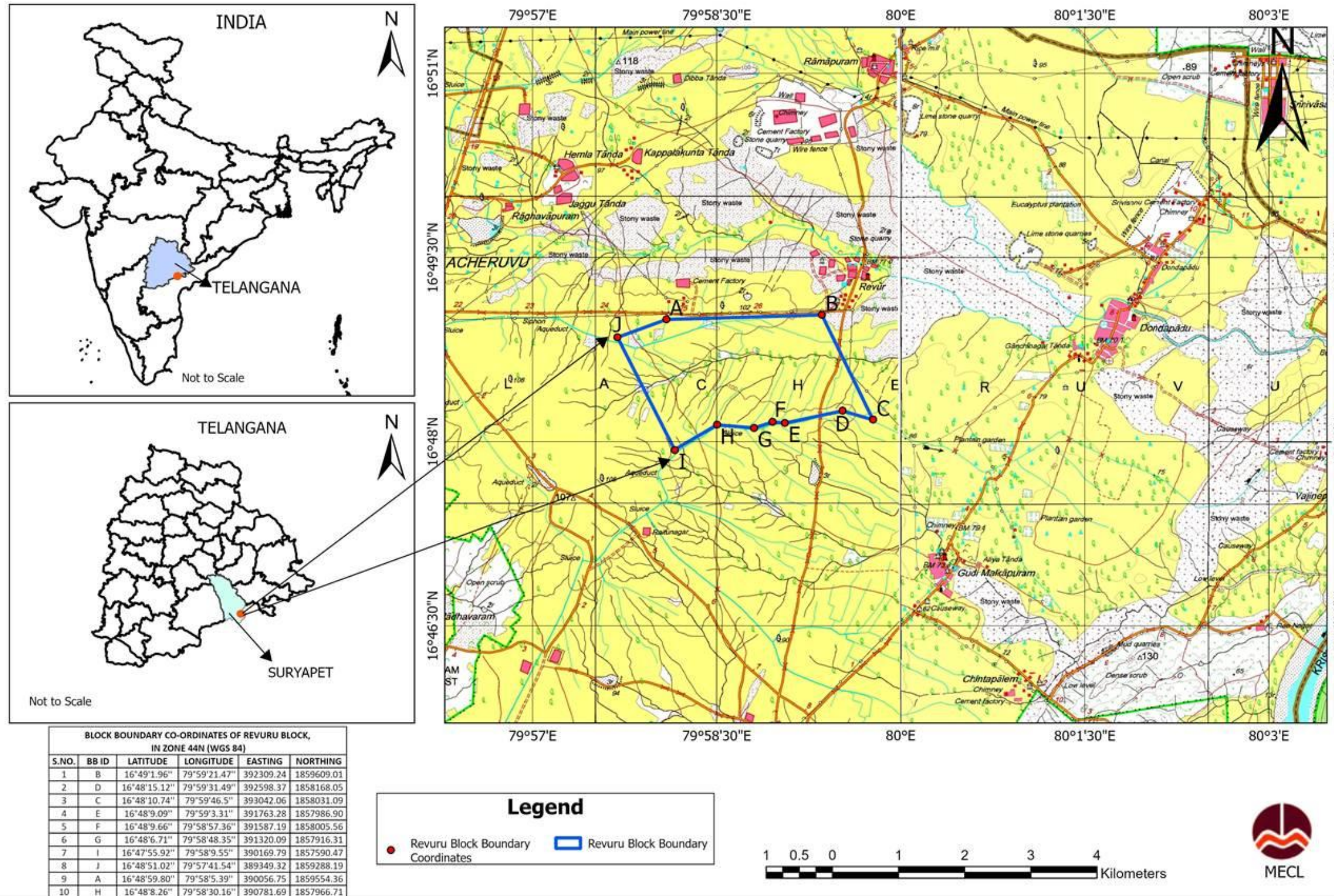
4.2.0 DETAILS OF THE AREA WITH LAND USE

4.2.1 Cadastral details of the area with land use, area under forest with type of forest. In case the cadastral details are not available an indicative data of breakup of government, private and forest land. Data is not available.

4.3.0 MINERAL(S) UNDER INVESTIGATION

4.3.1 Mineral (s) under investigation or granted under license or lease is Limestone.

Location Map Showing Revuru Block (4.87 Sq Km), Suryapet District, Telangana (Part of Toposheet no.56P13)



Text Figure No. 1: Location Map of Revuru Block, District: Suryapet, Telangana

CHAPTER – 5

5.0.0 PHYSIOGRAPHY AND ENVIRONMENT

5.1.0 RELIEF OF THE AREA WITH MINIMUM AND MAXIMUM ELEVATION, DRAINAGE PATTERN, NATURAL WATER COURSES, RESERVOIRS ETC.

5.1.1 The area is flat with gentle slope towards east. The entire area is covered by black soil. The elevation of the area ranges from 90m MSL in the west to 104m MSL above mean sea level in the east of Revuru Block. The general slope of the topography in the blocks is from NW to SE.

5.2.0 ROADS, RAILWAY TRACK, ELECTRIC TRANSMISSION LINE, TELEPHONE LINE ETC.

5.2.1 The explored Revuru Block falls in the jurisdiction of Mattampally Mandal (Taluk), Suryapet District. The block can be approached from the nearest town Mattampally Mandal (Taluk), Taluk head-quarters towards south-west a distance of around 15 kms by single lane asphalted village roads.

5.2.2 The block area is well connected to each other and to the highway located at a distance of about 40 km away from National Highway No. 9 connecting Vijayawada-Hyderabad, nearest railway station is Miryalaguda about 60 km NNW. The nearest airport is Vijayawada Airport at 135 km from the block.

5.3.0 HOST POPULATION (LOCAL TRIBES), HUMAN SETTLEMENTS WITHIN AND NEARBY THE AREA

5.3.1 The initial provisional data released by Census India 2011, shows the density of Suryapet District for 2011 had population of 155,422 of which male and female were 77,072 and 75,350 respectively.

5.3.2 Revuru Block falls in Mattampally Mandal (Taluka) of Suryapet District of Telangana. Total population of Mattampally Mandal (Taluka) is 6597 out of which Males are 3276 (49.70%) and Females are 3321 (50.30%). The total literacy rate is 50.30% out of this Males are 50.20% and females are 20.50%.

5.4.0 SOCIO DEMOGRAPHIC PROFILE OF THE AREA AND NEARBY

5.4.1 Mattampally Mandal of Suryapet District has a population of 44,939 out of which 22,579 are male and 22,360 females. literacy rate combined is 55.98% (Male 58.80% & Female 40.64%), out of total population 6,446 (14.34%) belong to SC community

and 14,160 (31.51%) belong to ST community. The sex ratio of Mattampally is 990 females for 1000 men.

- 5.4.2 Professionally there are workers, agricultural farmers and labourers in Mattampally Mandal (Taluka). Out of total population of 44,939, a number of 24,173 were engaged in work activities. Out of total 24,173 of workers 1,676 (6.93%) describe their work as Main work (Employment or Earning more than 6 months) while 22,497 (93.07%) were involved in marginal activity providing livelihood for less than 6 months.

5.5.0 HISTORICAL SITES AND ARCHAEOLOGICAL MONUMENTS, PLACES OF WORSHIP, PUBLIC UTILITIES ETC. WITHIN OR NEARBY

- 5.5.1 No historical sites, monuments and archaeological monuments, places of worships within 10 km radius of Revuru Block. However, few Hindu temples of Historical importance are there in Pillamarri and Durijpally near Suryapet town.

5.6.0 FOREST, SANCTUARIES, NATIONAL PARK AND WILD LIFE SANCTUARY

- 5.6.1 No Forest, Sanctuaries, National Park and Wild Life Sanctuaries within the 10 kms from the explored block.

5.7.0 FLORA AND FAUNA

- 5.7.1 The area is characterised by scanty vegetation and dry crop cultivation. Chilli, maize, groundnut, gingili and pulses are the common dry crops cultivated by rotation. Study area is fertile. Black gram is cultivated in the study area.
- 5.7.2 The area has no rare endangered species of flora. The species of fauna found in the area are rat, squirrel, lizard and house crow and reptiles.
- 5.7.3 The block area is partly cultivated by agricultural activities.

5.8.0 WATER BODIES SUCH AS RIVER, NALA, STREAM, RESERVOIR ETC

- 5.8.1 There is a river Krishna in the southern part of the block running from west to east and seasonal nalas flowing west to east and joining the river Krishna which is located at about 10 kms to the south.

5.9.0 CLIMATE CONDITIONS

- 5.9.1 The climate of the area is tropical monsoon type. The temperature during winter month seldom goes to 20° C, while in the peak summer it rises up to 45° C. The average rain fall is around 1000 mm and the relative humidity varies from 70% in summer to 90%.

5.10.0 OTHER PHYSIOGRAPHIC, SOCIAL AND ENVIRONMENT FACTOR

5.10.1 The block area is generally flat with moderately sloping down terrain from west to east. Generally, the area is covered by soil cover, agriculture lands with scanty limestone exposures along seasonal water way. The main source of the income is agriculture. The block area is surrounded by cement manufacturing industries and some of them are as follows in the Suryapet District:

- * M/s Rain Industries Ltd: Based in Nalgonda, with operations in Suryapet.
M/s Sri Sai Cement Work,
M/s Kodada Cements Pvt. Ltd,
M/s Penna Cement Industries Limited,
M/s NCL Industries Ltd: Headquartered in Hyderabad, with operations in Suryapet,
M/s My Home Cement Industries.
- * M/s Deccan Cements Limited: Located in Bhavanipuram, Janpahad P.O., Suryapet,
M/s NCL Industries Limited: Based in Simhapuri, Mattampally Mandal, Suryapet,
M/s Sagar Cements Ltd: Has a presence in Mattampally, Suryapet,
M/s Parasakti Cement Industries Ltd,
Another cement manufacturing unit in Suryapet, M/s Parasakti Cement Industries Ltd. in Suryapet District.

CHAPTER - 6

6.0.0 INFRASTRUCTURE AND ENVIRONMENT

6.1.0 LOCAL INFRASTRUCTURE DETAILS

6.1.1 The Revuru Block area is well connected to each other and to the highway located at a distance of about 40 km away from National Highway No. 9 connecting Vijayawada-Hyderabad, nearest railway station is Miryalaguda about 60 km towards NNW. The nearest airport is Vijayawada Airport at 135km from the block.

6.1.2 Banking, Government medical facility, Postal, Police facilities are available at Mattampally Mandal (Taluka) which is 26 km from the explored block, educational and other major facilities are available at Sedam Taluk.

6.2.0 HISTORICAL SITES

6.2.1 No major historical sites are within the buffer zone of 10 kms.

6.3.0 FORESTS, SANCTUARIES, NATIONAL PARK AND ENVIRONMENT SETTING OF THE AREA

6.3.1 No major environment wild Life Sanctuaries, Forest areas are within the buffer zone of 10 kms.

CHAPTER – 7

7.0.0 GEOLOGY OF THE AREA

7.1.0 REGIONAL GEOLOGY

- 7.1.1 The Revuru Block is a part of Palnad Sub-Basin and is located in the northeastern part of the Cuddappah Basin. The major portion of the basin is occupied by Kurnool Group of rocks of Neoproterozoic age. William King (1872) documented the earliest geological account of Palnad basin. Ramalingaswamy, G. (1976-77) has mapped area in parts of Toposheet No.56P/10. Krupanidhi (1966-67), Nagaeswara Rao and Varaprasada Rao(1967-68), Chakradhar et al, (1980-83), Ravindra Babu et al, (1989), Rama Krishnaiah et al, (2012-13), Jagadishwar Babu. K and Tirumurugan. M. (2013) and Sugathan & RimpalKar (2013) have carried out investigation for limestone in parts of Palnad sub-basin.
- 7.1.2 The Cuddappah Basin extends from Nagari in the south to Amaravati in the north east over a length of about 440 km. with width ranging from 80 to 145 km. encompassing an area of about 44000 sq. km. Rocks belonging to Kurmool Group are younger than rocks of Cuddappah Group and are well preserved in the Cuddappah Basin. Cuddapahs and associated younger Kurmoos occupy a unique position in Indian Stratigraphy because of economic interest and hence have been the subject of studies for more than seven decades. Kurnool Group of rocks are found confined to two small areas in Cuddappah viz., the area between Cuddappah and Kurmool and the area west of Amaravati. The latter is also referred to as the Palnads.
- 7.1.3 The Detailed Stratigraphy after GSI is as per the table given below:

Table no 7.1

Regional Stratigraphy of the Cuddappah basin

	SERIES	STAGE
C U D D A P A H	Kurnool Series	Nandyal shale
		Koilkuntla Limestone
		Paniam Quartzite
		Auk Shale
		Narji Limestone
		Banganapalle Quartzite
		Unconformity
	Krishna Series	Srisailam quartzite
		Kolamnala shale
		Irlakonda quartzite
		Unconformity

S Y S T E M	Nallamalai Series	Cumbum Formation Bairenkonda Quartzite
		Unconformity
	Cheyair Series	Gandikota quartzite Pullampet shales (Tadpatri) Nagri/ Pulivendala quartzite
		Unconformity
	Papaghni Series	Vempalle limestone and shale Gulcheru quartzite
		Unconformity
Archean schist and gneisses		

7.2.0 REGIONAL STRUCTURE

7.2.1 The general strike of the formation is NNE-SSW dipping gently (2° to 4°) towards ESE and the sloping direction is from west to east. The variation in dip direction and amount may be attributed to warps and minor folds. Open asymmetrical synform and antiform folds are preserved in the western part of the study area which are having trend $N70^{\circ}W-S70^{\circ}E$ (axial plane) and plunging towards SE. Minor folds are formed in calcite and quartz vein within the massive grey limestone, the axial plane is trending in E-W direction.

7.2.2 PRIMARY SEDIMENTARY STRUCTURES

The preservation of primary sedimentary structure is relatively poor. In terms of primary sedimentary structure, bedding planes and laminations are common within limestone-shale unit. Bedding planes are usually marked by variation in colour, composition and grain size.

7.2.3 The general strike of the formation is NNE-SSW dipping gently (2° to 4°) towards ESE and dipping from west to east. The variation in dip direction and amount may be attributed to warps and minor folds. Open asymmetrical synform and antiform folds are preserved in the western part of the study area which are having trend $N70^{\circ}W-S70^{\circ}E$ (axial plane) and plunging towards SE. Minor folds are formed in calcite and quartz vein within the massive grey limestone, the axial plane is trending in E-W direction.

7.2.4 SECONDARY/ DIAGENETIC STRUCTURE

Joints: Open, systematic joint sets are common, often with NNE-SSW trend.

Stylolites: Pressure-solution features (stylolite) can form parallel to bedding sometimes creating “pseudo-bedding”. Within the massive limestone, intercalations of

thin quartzite veins are seen at place of core. Sedimentary deformation structures are present at places in siliceous limestone.

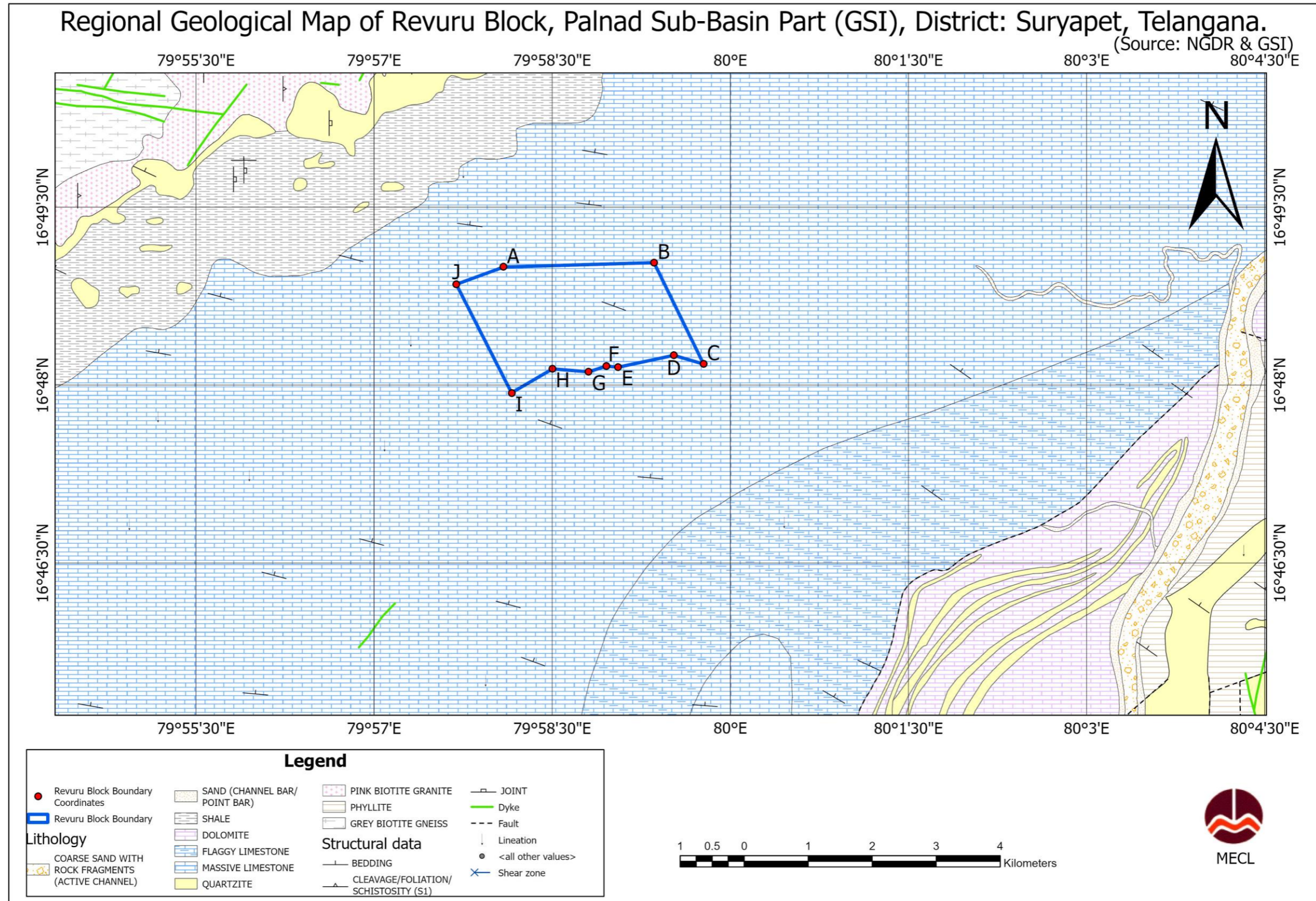
The general trend of all formations is NNE–SSW, and limestone beds dip 2° to 4° due SE.

7.3.0 REGIONAL MINERALISATION

- 7.3.1 The Palnad Basin in Suryapet District, Telangana, is primarily known for its significant limestone resources, with extensive exploration confirming large reserves for cement and other industries. While limestone is the dominant commodity, the basin also shows potential for uranium mineralization, especially unconformity-related, with deposits established in the marginal parts of Srisailam and Palnad Sub-basins, Nalgonda and Guntur districts, Andhra Pradesh.

The uranium mineralisation is mainly localised along fracture zones proximal to basement–cover sediment unconformity and occur as elongated pods, fine veins and cavity and grain boundary fillings. Mineralised zones are invariably associated with significant alteration features like illitisation, chloritisation and kaolinization. Primary uranium ore minerals viz. pitchblende, uraninite and coffinite are found generally associated with sulphides and organic matter. However, there is marginal difference in mineralisation pattern in these sub-basins as uranium is mainly hosted by granitoids just below the unconformity in Srisailam Sub-basin while it is dominantly associated with cover sediments in Palnad Sub-basin. Recent integrated surface and sub-surface studies have also indicated uranium potential in deeper parts of these sub-basins. (Ref: P.V. Ramesh Bapu, Rahul Banrrjee and K.K. Achar AMD, Hyderabad).

Other minor minerals occurrences might exist, but limestone and uranium are the key mineral focuses. Regional Geological map of Bhima basin is provided as Text Figure No.2 & Plate- II.



Text Figure No. 2: Regional Geological Map of Revuru Block, Part of Palnadu Sub Basin, District: Suryapet, Telangana

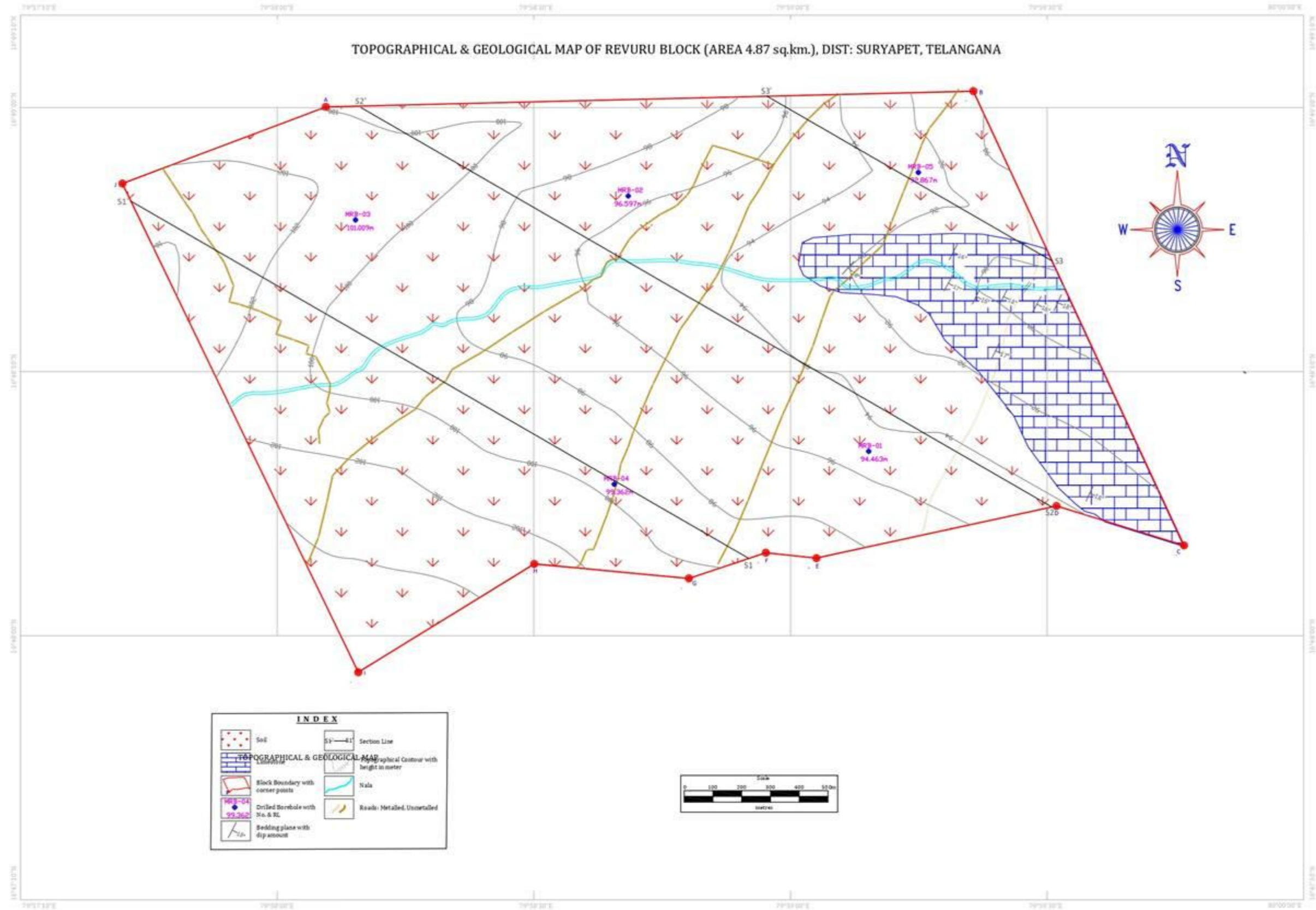
7.4.0 GEOLOGY OF THE BLOCK

7.4.1 The rock types exposed in the block belongs to the Narji Formation of Kurnool Group of Palnad Basin. The stratigraphic sequence of the litho units exposed in and around the block based on field observations and available data/literature from nearby mine/areas is given in Table No: 7.3. The Topographical & Geological Map of the Revuru Block is enclosed as Plate-III in 1: 4000 Scale.

Table No: 7.3
Stratigraphic Sequence of Litho-units exposed in and around the Block

Age	Group	Formation	Litho Units
Quaternary	-	Recent	Top soil (Brown)
Neoproterozoic	Kurnool	Narji Limestone	Upper: Siliceous/flaggy limestone
			Middle: Massive grey limestone
			Lower: Purple shale

Most part of the area has outcrop of mostly massive to flaggy limestone & impure (silicified) limestone of Narji Formation of Kurnool Group. The uniform horizontal to sub horizontal disposition of the sedimentary sequence in the area of investigation indicates that the area has not undergone any major tectonic disturbance. Among the primary sedimentary structures, bedding planes and laminations are common. The secondary structures observed in the area are joints. The generalized strike of the strata is N30⁰E-S30⁰W with dips varying 10°-20° towards Southeast. Strike & dip recorded on the surface from limestone outcrops are shown on the Topographical and Geological Map (Plate-III).



Text Figure No. 3: Topographical & Geological Map of Revuru Block, District: Suryapet, Telangana

7.5.0 DESCRIPTION OF ROCK TYPES IN THE BLOCK

7.5.1 The recent soil cover for about three fourth of the block area is seen in the west. Limestone exposed almost one fourth of the block in the east of the block. The limestone is greyish white and hard by nature. There is a river called, Yarra vagu in the south of the block running west to east and it is tributary to Krishna River. The lithological description of litho-units from top to bottom as obtained from drilled boreholes as well as from nearby mines is given below:

7.5.2 Top Soil

The top soil is brown in colour, fine to silty, friable when dry and sticky when wet. The top soil covers almost all entire the block except south east corner of the block. The thickness of the soil as intersected in boreholes varies from 3.00 m (MRB-04) to about 6.45 m (MRB-01).

7.5.3 Limestone

Upper Flaggy Limestone: The upper flaggy limestone is thin bedded, light grey to white in colour. The individual thickness of beds varies from few cm to 10cm.

Middle Massive Limestone: Massive limestone is dark grey to light grey in colour, micritic, fine grained and compact. Stylolitic structures are often noticed. All the drilled boreholes intersected limestone. The massive grey limestone is Cement Grade to high grade encountered with intermittent parting with Blendable grade limestone zone. Over all the cement grade limestone is + 52% CaO, with +6.00% SiO₂ and Blendable grade limestone is + 42% CaO with +12.00 % SiO₂. Generally, limestone is grey to light grey in color, micritic, fine grained and compact.

7.5.4 Lower Purple Shale

The purple shale constitutes lower most of narji Formation and it is not exposed in the block.



Figure 1: Limestone exposure in south eastern corner of the block

7.6.0 STRUCTURAL FEATURES OBSERVED IN THE BLOCK

7.6.1 STRUCTURE OF THE BLOCK

The rock formations of the Block are horizontally disposed in the south eastern corner and mostly concealed under top soil in the block. Generally, limestone beds dip 10° to 20° due SE. Two sets of prominent joints parallel to the bedding and across traverse the rock profusely.

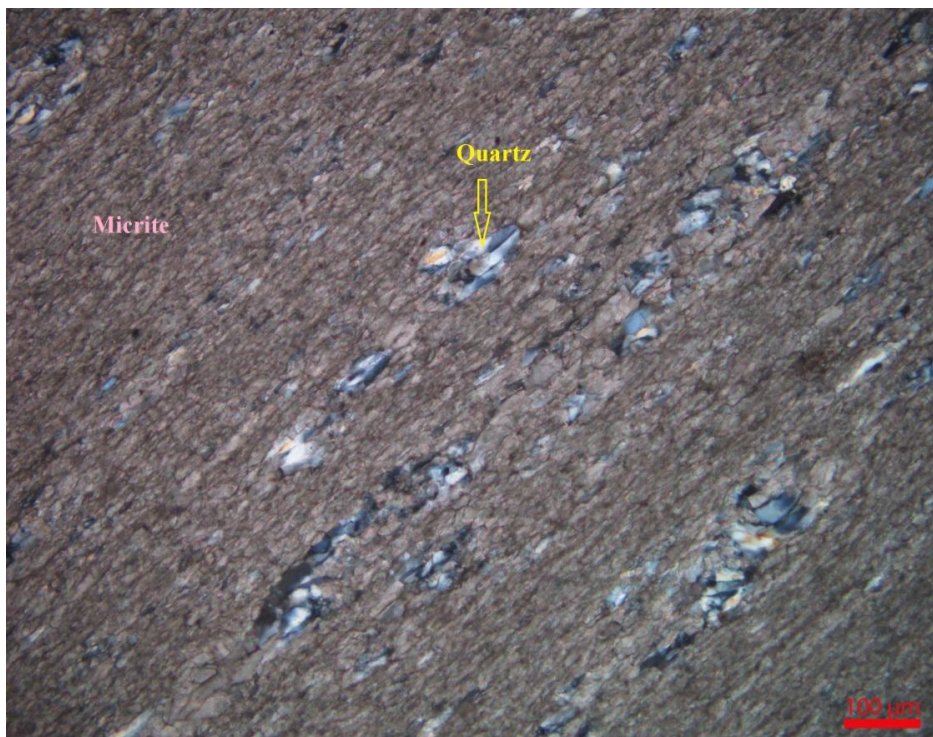
7.7.0 PETROGRAPHIC STUDIES

7.7.1 A total of 3 core samples, each one from borehole MRB-03, 04 and 05 and the detailed study report is given in Annexure - V. The summary is tabulated in the following table.

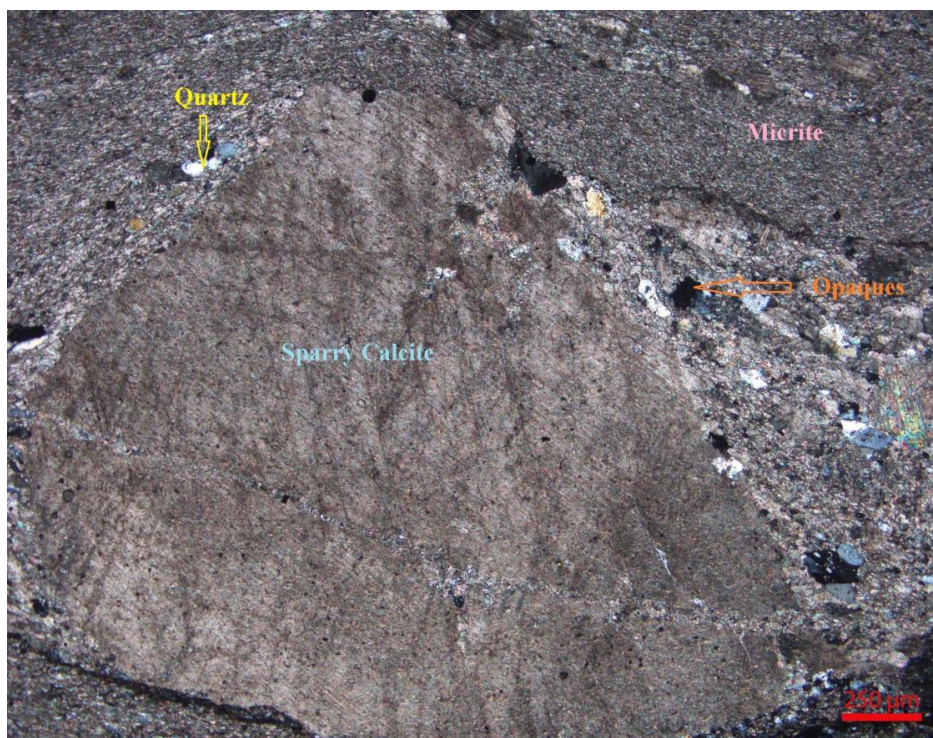
SL No	Sample No	BH No.	Depth (m)		Thick (m)	Lithology
			From	To		
1	MRB-PG-1	MRB-03	12.00	12.10	0.10	Foliated impure micritic limestone
2	MRB-PG-2	MRB-04	27.00	27.15	0.15	Foliated impure micritic limestone
3	MRB-PG-3	MRB-05	17.00	17.10	0.10	Foliated impure micritic limestone

7.7.2 PHOTOMICROGRAPHIC STUDIES

The photomicrographs of limestone indicate deformation and recrystallization. PMG–1 shows parallel alignment of micrite and quartz clusters suggesting development of weak foliation under directed stress, while PMG–2 shows rotational movement of sparry calcite patches within the micritic matrix, indicating deformation-related grain rotation and recrystallization



Pmg – 1: Photomicrograph showing parallel alignment of micrite and quartz clusters within foliated impure micritic limestone as seen under crossed nicols.
Specimen No. : MRB-PG-01 **Magnification : 100X**



Pmg – 2: Photomicrograph showing rotational movement of coarse sparry calcite patch within foliated impure micritic limestone as seen under crossed nicols.

Specimen No. : MRB-PG-03

Magnification : 40X

7.8.0 MINERALISATION IN THE BLOCK

7.8.1 Massive limestone is dark grey to light grey in colour, micritic, fine grained and compact. Stylolitic structures are often noticed. The intersection of soil cover, cement grade limestone and blendable grade limestone is tabulated below.

Borehole	Soil		Cement Grade Limestone		Blendable Grade Limestone	
	From	To	From	To	From	To
MRB-01	0	6.45	7.20	50.00		
MRB-02	0	6.00	6.00	50.00		
MRB-03	0	6.00	18.00	50.00	9.00	15.00
MRB-04	0	3.00	12.00	50.00		
MRB-05	0	6.00	6.00	50.00		

The massive grey limestone is Cement Grade to high grade zones with intermittent partitions of Blendable grade limestone zones. The limestone is dark grey to light grey in colour, micritic, fine grained and compact.

CHAPTER – 8

8.0.0 PREVIOUS WORK

8.1.0 DETAILS OF PREVIOUS EXPLORATION CARRIED OUT BY OTHER AGENCIES/PARTIES

- 8.1.1 The block forms part of Palnad Sub-basin and is located in the north-eastern portion of the Cuddappah Basin. The earliest geological account of Palnad Sub-basin was documented by William King (1872).
- 8.1.2 Mukherji and Syed Kazim (1947) of erstwhile Hyderabad Geological Survey carried out geological mapping of Palnad Sub-basin covering parts of Nalgonda district.
- 8.1.3 Systematic geological mapping and mineral investigation in this part of Palnad Sub-basin was carried out by Ziauddin and Sharma (1959-61) Ramalinga swamy, G. (1976-77) has mapped area in parts of Toposheet No. 56P/10. Krupanidhi (1966-67), Nageswara Rao and Varaprasada Rao (1967-68), Chakradhar et. al, (1980-83), Ravindra Babu et. al, (1989), Rama krishnaiah et al, (2012-13), Jagadishwar Babu. K and. Tirumurugan. M. (2013) and Sugathan & Rimpal Kar (2013) have carried out investigation for limestone in parts of Palnad sub-basin.
- 8.1.4 Mining activities are currently ongoing in surrounding areas and limestone being excavated for manufacturing cement.
- 8.1.5 Two clusters of blocks, namely Mattampally Cluster-2 over an area 14.65 sq.km were explored by TSMDC with NMET funding. These clusters lie around 2km in southwest direction from the proposed block. Geological Reports (GRs) for both clusters were submitted in January 2020. Exploration drilling comprised four vertical boreholes drilled for 50m depth. The details and results of these boreholes are presented below.

Table 8.1
Details of boreholes drilled in Mattampally Cluster-2, Suryapet Dist, Telangana

BH No.	From (m)	To (m)	Thick (m)	SiO₂ (%)	CaO (%)	MgO (%)
MTPCCBH-1	6.00	45.00	39.00	10.21	48.46	0.45
MTPCCBH-2	26.00	50.00	24.00	10.36	47.80	1.26
MTPCCBH-3	7.50	50.00	42.50	9.40	48.28	1.43
MTPCCBH-4	24.75	50.00	25.25	8.89	48.64	1.41

- 8.1.6 Resources of 593 million tonnes with average grade of 46.05% CaO (334) were estimated in Mattampally Cluster-2.

8.1.7 Two cluster of Blocks namely Ramapuram Cluster 5 and Dondapadu Cluster 6 were explored by TSMDC through NMET funding and these blocks are located North and South of the proposed block respectively. The GR were submitted in Jan 2020. Two boreholes were drilled in Ramapuram Cluster 5 and four boreholes were drilled in Dondapadu Cluster 6. The details and findings of the boreholes are as follows.

Table 8.2
Details of boreholes drilled in Ramapuram Cluster-5 (RMPCBH) and Dondapadu Cluster-6 (DDPCBH), Suryapet Dist, Telangana

BH No	RL (m)	Latitude (E)	Longitude (N)	From (m)	To (m)	Thick (m)	SiO ₂ (%)	CaO (%)	MgO (%)
DDPCBH-1	81	80°01'20.19"	16°47'45.90"	16.00	33.00	17.00	18.00	44.06	0.45
				40.00	49.50	9.50	16.19	45.43	0.45
DDPCBH-2	66	80°01'48.37"	16°47'39.50"	29.25	42.75	13.50	16.40	45.35	0.47
				48.00	50.00	2.00	13.36	47.38	0.43
DDPCBH-3	48	80°02'45.19"	16°48'2.73"	34.50	36.00	1.50	16.42	43.93	0.50
DDPCBH-3	49	80°02'46.64"	16°47'37.88"	15.00	29.00	14.00	16.65	44.53	0.62
RMPCBH-1	85	80°01'13.39"	16°50'55.04"	30.75	39.75	9.00	15.96	45.34	0.36
				46.50	50.00	3.50	18.00	44.21	0.38
RMPCBH-1	87	80°01'11.06"	16°50'30.79"	19.00	50.00	31.00	14.39	46.46	0.48

8.1.8 Resources of 675 million tonnes with average grade of 46.05% CaO (334) were estimated in Ramapuram Cluster 5.

8.1.9 Resources of 452 million tonnes with average grade of 44.82% CaO (334) were estimated in Dondapadu Cluster 6

8.1.10 Four limestone blocks i.e. Mukteswarapuram, Pedaveedu East, Pedaveedu West and West of Yepalamadhavaram were approved by NMET in 2025 for G3 level exploration to MECL. These blocks are located in the vicinity of the block area.

8.2.0 PREVIOUS WORK DONE BY MECL

8.1.1 During FY 2017–2018, MECL carried out G3 level exploration in the adjoining areas covering the Sultanpur, Saidulnama, and Pasupalabodu blocks. The studies established the continuity of limestone formations as well as the resources in these blocks. Among them, the Saidulnama and Sultanpur blocks were subsequently auctioned in 2024. The thickness of limestone intercepted in these explorations ranged from 10.5 m to 36.0 m.

CHAPTER – 9

9.0.0 GEO PHYSICAL EXPLORATION

Geophysical/Geochemical survey was not carried out by MECL and it was also not proposed to the NMET for the approval.

CHAPTER - 10

10.0.0 EXPLORATION UNDERTAKEN DURING CURRENT INVESTIGATION

10.1.0 OBJECTIVES OF INVESTIGATION

The exploration was proposed with following objectives:

- i) To confirm the continuity of limestone occurrences within the block area by drilling of 5 boreholes in Revuru Block at G3 level of exploration to estimate the grade wise limestone inferred resources in the block area as per UNFC norms of G3 level of exploration.
- ii) To carry out preliminary exploration (G3) as per the Minerals (Evidence and Mineral Contents) Amendment Rules 2021, Mineral Auction Rule 2015 Amended up to 2021, MMDR Amendment Act 2015 in turn to facilitate the State Government (Telangana) for auctioning of the block.

10.2.0 EXPLORATION ACTIVITIES TAKEN UP

After the receipt of approval vide approved vide F. No. 117/1/2025-NMET/491, dated 10-11-2025 with an estimated cost of Rs 70.84 lakhs from the National Mineral Exploration and Development Trust (NMEDT). Mineral Exploration & Consultancy Ltd. (MECL) has undertaken exploration activities in the designated areas. The details regarding the nature, scope, and quantum of works completed are presented in **Table No. 10.1** below for Revuru Block.

Table No: 10.1
Quantum of Work - Proposed Vs Achieved Revuru Block
District: Suryapet, Telangana

Sl. No.	Item of Work	Unit	Target	Achieved
1	Topographic Survey & Geological Mapping on 1:4000 scale	sq.km.	4.25	4.87
2	Boundary and borehole demarcation with DGPS	Nos	16	15
3	Exploratory Drilling *	m.	250.00 05 Bhs	250.00 05 Bhs
4	Laboratory Studies			
	i) Chemical Analysis; Primary samples for 10 radicals, CaO, MgO, SiO ₂ , Fe ₂ O ₃ , Al ₂ O ₃ , SO ₃ , P ₂ O ₅ , K ₂ O, Na ₂ O & LOI by XRF. (BRS & Core samples)	Nos.	220	203
	ii) External Check (NABL) samples (10% of Primary samples) for analysis of for 10 radicals, CaO, MgO, SiO ₂ , Fe ₂ O ₃ , Al ₂ O ₃ , SO ₃ , P ₂ O ₅ , K ₂ O,	Nos.	22	20

Sl. No.	Item of Work	Unit	Target	Achieved
	Na ₂ O & LOI by XRF			
5	Physical Studies			
	a) Bulk Density Determinations	Nos.	2	2
	b) Petrological Studies	Nos.	3	3
	c) Digital Photomicrograph of thin polished Section	Nos	3	3
6	Report Preparation (5 Hard copies with one soft copy)	Nos.	1	1
7	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	Nos.	1	1

* Core drilling was outsourced to M/s Soiltech India Pvt. Ltd. by MECL as per SoC Item Sl. No. 2.2.1.1b in OM order no. F.No. 117/1/2025-NMET/491, dated 10-11-2025 issued by NMEDT.

Exploratory drilling commenced with borehole no. MRB-01 on 30.12.2025 in Revuru Block and was completed with the closure of borehole no. MRB-05 on 27.01.2026. The allied field-works including surveying, drilling and borehole core sampling etc. were completed simultaneously. The analytical / laboratory studies were also carried out simultaneously in laboratories of MECL (Primary) and other NABL accredited laboratories, JNARDDC (External check), Nagpur.

10.2.1 Topographical Survey:

The block boundaries of Revuru Block is surveyed with the help of DGPS (TRIMBLE make) and topographical survey by total station in WGS-84 datum. Triangulation network has been laid in the explored area (as per proposed boundary coordinates) of 4.87 sq.km. for Revuru Block, however the approved block area (as per OM) is 4.25 sq.km. Surface Contouring done at 2m contour intervals along with survey of surface features for Revuru Block (Scale 1:4,000). During current exploration boreholes are fixed on the ground. RL's and co-ordinates of survey and exploration points are determined by DGPS survey. The RL and co-ordinates of corner points and boreholes have been determined and furnished as Annexure-I-A and I-B respectively.

10.2.2 Geological Mapping

Geological mapping of the Revuru Block was carried out on a 1:4,000 scale covering an area of 4.87 sq.km. The block area is covered with limestone exposures and

soil/alluvium, and the same is marked in the Topographical and Geological Map enclosed as **Plate-III** on 1: 4000 Scale for Revuru Block.

10.2.3 Exploratory Drilling

Geological logging of borehole cores was properly done along-with all the structural, lithological and mineralogical observations (Annexure-II-A and II-B) limestone bands have been encountered in all of the 5 boreholes in Revuru Block.

Borehole co-ordinates along with RL have been determined for all the boreholes with the help of WGS-84 Datum. The drilling commenced on 30.12.2025 with MRB-01 and concluded with MRB-05 on 27.01.2026.

10.3.0. DETAILS OF SURFACE SAMPLING, DRILLING ETC.

- 10.3.1 About 203 numbers of primary core samples are generated from the drilled boreholes, which were analysed for 10 radicals i.e., CaO, MgO, SiO₂, Fe₂O₃, Al₂O₃, SO₃, P₂O₅, K₂O, Na₂O & LOI by XRF method, compiled as Annexure-III-A.
- 10.3.2 10% samples of primary drill core samples, about 20 nos. samples were analysed at JNARDDC Lab, Nagpur for external check analysis for 10 radicals i.e. CaO, MgO, SiO₂, Fe₂O₃, Al₂O₃, SO₃, P₂O₅, K₂O, Na₂O & LOI by XRF method and presented as Annexure-III-B.
- 10.3.3 A total of 3 no. of samples were studied for petrological study and 2 no. of samples for bulk density determination which is enclosed as Annexure-V and VI respectively.

CHAPTER – 11

11.0.0 LOCATION DATA POINTS

11.1.0 ACCURACY AND QUALITY OF SURVEY USED TO LOCATE BLOCK BOUNDARY AND DRILL HOLES

11.1.1 The Revuru Block area (4.87 sq.km.) is located north of Krishna River in Suryapet District, Telangana and covered under Survey of India Toposheet No 56P/13. The block area is located less than 01 km towards south west direction from Revuru village. The Revuru block is moderately well connected by road and rail networks to the nearest towns and cities.

11.1.2 The Topographical survey, Borehole connection and Block Boundary demarcation in this block has been carried out by the GNSS DA2 Catalyst Instrument.

11.1.3 The Survey of India (SOI) base station was utilized for Topographical survey, Borehole connection and Block Boundary demarcation. The base stations used from the Survey of India CORS network named '*NIDA*' through online GNSS Post processing method.

The coordinates of the SOI base station are provided in **Table No: 11.1**.

Table-11.1
The R.L & Coordinates of the SOI CORS Base Point

Base Station	Latitude	Longitude	Easting (m)	Northing (m)	RL (m)
SURVEY OF INDIA BASE STATION – <i>NIDA</i>	N16°49'19.50971"	E79°22'04.96052"	1860590.317	326106.609	141.644

11.1.4 TECHNICAL SPECIFICATIONS OF DGPS

- **Make:** Trimble GNSS
- **Model:** DA-2 Catalyst
- **Year:** 2025

Measurement Accuracy:

- Static Mode
 - Horizontal: 10 mm + 0.1 ppm or better
 - Vertical: 20 mm + 0.4 ppm or better

11.1.5 Baseline Processing Results:

Total 10 no. of block boundary corner points and 5 no. of Boreholes points have been fixed by MECL as part of present G3 stage exploration. Co-ordinates & Reduced level (RL) of the borehole are given in **Annexure-I-A & Annexure-I-B** and also shown in **Plate-III**.

11.2.0 QUALITY AND ADEQUACY OF TOPOGRAPHIC CONTROL

11.2.1 The survey work has been carried out with the help of DGPS(GNSS) for higher level measurement accuracy. A point list was then generated as .csv file for topographical points and summary was attached along with report. The baseline processing results are also enclosed with this report. Survey work carried out by the experienced qualified surveyor as per the prevailing standard procedures.

CHAPTER – 12

12.0.0 SAMPLING TECHNIQUES

12.1.0 NATURE AND QUALITY OF SAMPLING AND MEASURES TAKEN TO ENSURE SAMPLE REPRESENTATIVITY

12.1.1 The sampling and analyses have been carried out for the entire mineralized zones/length encountered in bed rocks and boreholes drilled on visual identification basis. The primary samples have been marked in the mineralized zones based on type and concentration of mineralisation/lithology and in general the sample length has been kept as 1.00 m to 2.00 m which varies in some instances because of variation in lithology and type and concentration of mineralisation. The mineralized core has been split into two equal halves in such a way that the concentrations of ore minerals are uniform in both the equal halves. One half of the core sample has been crushed to (-) 200 mesh size. By progressive coning and quartering and repeatedly mixing the sample has been reduced to 600 g. A representative sample of 200 g has been collected and analyzed for CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃, Na₂O, SO₃, P₂O₅, K₂O and LOI at Chemical Laboratory of MECL, Nagpur.

12.2.0 NATURE, QUALITY AND APPROPRIATENESS OF THE SAMPLE PREPARATION TECHNIQUE

12.2.1 The details of sampling procedure for primary samples are described in Para 12.1.1. Quality of the sample preparation is maintained by proper cleaning, maintenance of the equipment and proper crushing, sieving and coning and quartering of samples. For sample preparation proper technique and expertise has been used.

12.3.0 QUALITY CONTROL PROCEDURES ADOPTED

12.3.1 The primary core samples have been collected from entire mineralized zones/length intersected in the boreholes drilled and the samples have been prepared at centralized mechanized sampling unit. The standard sampling procedure in supervision of qualified sampling technician has been adopted to control the quality of samples. Similarly, internal check and external check samples have also been prepared under the supervision of qualified sampling technician following the standard sampling procedure.

12.4.0 MEASURES TAKEN TO ENSURE THE SAMPLING IS REPRESENTATIVE OF THE IN-SITU MATERIAL COLLECTED

- 12.4.1 All the primary samples have been marked and prepared from limestone cores. During the preparation of primary samples, the mineralised cores have been studied meticulously and samples have been marked properly. These mineralised cores are subjected for preparation of primary samples as per the sampling procedure for primary samples are described in Para 12.1.1. The proper marking of primary samples from drilled cores and following standard procedure for sample preparation shows the representative samples have been collected from the in-situ materials.

12.5.0 WHETHER SAMPLE SIZES ARE APPROPRIATE TO THE GRAIN SIZE OF THE MATERIAL BEING SAMPLED

- 12.5.1 The primary samples have been prepared (-) 200 mesh size and all the other samples have been prepared from primary samples. As per the previous studies in the area, (-) 200 mesh size is appropriate for the analysis of limestone mineralization in the block area.

CHAPTER – 13

13.0.0 DRILLING TECHNIQUES AND DRILL SAMPLING EMPLOYED

13.1.0 DRILLING TYPES AND DETAILS: The core drilling was out sourced to M/s Soiltech India Pvt. Ltd. Totally 5 nos. of boreholes were drilled with a cumulative meterage of 250 m and other associated geological, analytical works in the Revuru Block. The header details of boreholes are given in Annexure-I-B and summary of boreholes is given in Table-13.1.

Table No. 13.1

**Details of Co-ordinates (in WGS-84), Reduced Levels of
boreholes drilled in Revuru Block**

Sl. No.	Borehole No.	Easting (m)	Northing (m)	RL (m)	Date of Commencement	Date of Closure	Total Depth (m)
1	MRB-01	390160.168	1859161.519	101.009	30.12.2025	05.01.2026	50.00
2	MRB-02	391108.613	1859245.031	96.597	02.01.2026	13.01.2026	50.00
3	MRB-03	391059.999	1858243.668	99.362	14.01.2026	23.01.2026	50.00
4	MRB-04	391945.325	1858357.769	94.463	17.01.2026	27.01.2026	50.00
5	MRB-05	392117.994	1859326.911	92.867	18.01.2026	27.01.2026	50.00
Total Drilling Meterage							250.00

13.1.2 The Drilling operation in the block was performed by skid mounted Voltas 90 Drill Rig. All the boreholes in the block were drilled in NQ size with double tube barrel wire line, wet core drilling method. Initially 0.00 m to 6.00m HW casing was set in each borehole by using HW casing short piece. After setting HW casing, drilling advanced in NQ size till to the total depth of each borehole.

Drilling was done by NQ Diamond bit, (Hyden, Sandwik) till closure of the borehole.

13.1.3 The quality of drilling was ensured during the operation. After closure, all the boreholes have been properly plugged and sealed with cement pillars.

13.2.0 DEVIATION SURVEY IN DRILLING

13.2.1 All the exploratory boreholes drilled in the block are vertical and drilled up to 50m depth in each of boreholes MRB-01, 02, 03, 04 and 05. Since the depth is shallow and no deviation occurred hence deviation survey was not performed for the boreholes.

13.3.0 WHETHER CORE AND CHIP SAMPLE RECOVERIES HAVE BEEN PROPERLY RECORDED AND RESULTS ASSAYED

- 13.3.1 The core samples have been recorded properly and the detailed run wise lithologs and summarized concise lithologs for boreholes are given in Annexure-II-A and Annexure-II-B respectively. The logging of run wise core as well as the cuttings from boreholes has helped in discerning the physical characters like colour, shape, size and nature of the mineralisation as well as texture, structural features and identification of different litho units.
- 13.3.2 Core recovery with reference to the lithologies are properly recorded and presented in Annexure-II-A.
- 13.3.3 The mineralised zones /length recorded during the geological core logging have been sampled for limestone analysis consisting 10 radicals i.e., CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃, Na₂O, SO₃, P₂O₅, K₂O and LOI at Chemical Laboratory of MECL, Nagpur. The primary sample had been marked in the mineralized zones intersected in the borehole based on visual inspection/lithology and in general the sample length has been kept as 1.00m to 2.00m, which varied in some instances because of variation in lithology and type and concentration of mineralisation. The details of analysis of primary core samples are given in Annexure-III-A.

13.4.0 MEASURES TAKEN TO MAXIMIZE SAMPLE RECOVERY AND ENSURE REPRESENTATIVE NATURE OF THE SAMPLES

- 13.4.1 The drilling has been done by NQ size diamond drill bit with single barrel wire line, wet core drilling method. Initially 0.00m to 6.00m HW casing was set in each borehole by using HW casing short piece. After setting HW casing, drilling advanced in NQ size till NW casing was set in the drilled ranging from 10m to 25m depending on the formation of the boreholes. The polymer was used as drilling fluid to flush out the cuttings and stabilize the borehole wall. The drilling fluid also works as a coolant to avoid burning of drill bits. Proper core recovery of more than 90% was maintained in limestone by using double tube core barrel, however in case of weathered, loose and fractured zone and in solution cavities, the core recovery was low. Whenever core recovery is less, the grade of the recovered portion has been extrapolated over the non-recovered section. However, all the precautions like modulated water pressure, proper liner, optimum head pressure and the hands of an expert drilling technician had been taken to maintain the quality of drilling.

13.5.0 WHETHER CORE AND CHIP SAMPLE RECOVERIES HAVE BEEN PROPERLY RECORDED AND RESULTS ASSAYED

13.5.1 The core samples have been recorded properly and the detailed borehole wise run wise lithologs and summarized lithologs for boreholes are given in Annexure-IIA and Annexure-IIB respectively. The run wise lithologs of drilled core as well as the cuttings from boreholes have helped in discerning the physical characters like colour, shape, size and nature of the mineralisation as well as texture, structural features and identification of different litho units.

13.6.0 CORE LOGGING

13.6.1 The core recovered by drilling was logged systematically in detail describing lithological units with mineralisation details that can be observed by visual inspection. The details of lithology, grain size, colour, texture, structural features, presence of intercalations and cavities have been recorded. Wherever the recovery is less than 100%, extrapolations of drilled depth were done on proportionate basis considering the physical characteristics of individual units recovered. All the cores were kept and preserved properly in the GI core boxes of specifications given by NMEDT following “Book pattern”. The detailed run wise lithologs and summarized lithologs for boreholes are given in Annexure- II-A and Annexure-II-B respectively.

Core Photographs:

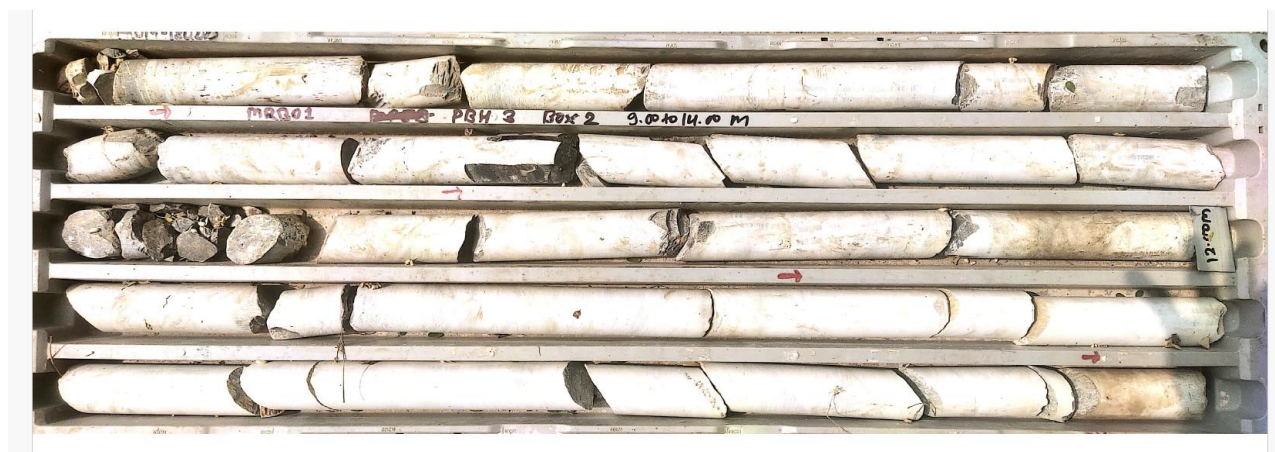


Figure 2: Limestone zone of borehole no. MRB-01 from 9.00m to 14.00m



Figure 3: Limestone zone of borehole no. MRB-03 from 30.00m to 34.60m



Figure 4: Limestone zone of borehole no. MRB-04 from 32.60m to 37.90m



Figure 5: Limestone zone of borehole no. MRB-05 from 38.80m to 44.00m

CHAPTER - 14

14.0.0 SUB SAMPLING TECHNIQUES AND SAMPLE PREPARATION

14.1.0 WHETHER CUT OR DRAWN AND WHETHER QUARTER, HALF OR ALL CORE TAKEN

- 14.1.1 The core sampling and chemical analysis of core samples have been carried out for entire mineralized zones/length intersected in the boreholes drilled. Samples were marked in limestone zones marked on the basis of visual inspection. The mineralized core has been split into two equal halves by core splitter in such a way that the concentrations of ore minerals are uniform in both the equal halves. The whole quantity of half portion of the sample was crushed to (-) 200 mesh and about 600g representative sample of was drawn by coning and quartering method of gradual size reduction with the help of crusher and pulveriser. Two sample pouches weighing samples 200g each were drawn, one of which was analysed for limestone analysis of 10 radicals CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃, Na₂O, SO₃, P₂O₅, K₂O and LOI were analysed in at Chemical Laboratory of MECL, Nagpur and external check samples were analysed in Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur (NABL accredited Laboratory). The remaining 200g fraction was kept for future purpose including composite sample analysis etc.

14.2.0 NATURE, QUALITY AND APPROPRIATENESS OF THE SAMPLE PREPARATION TECHNIQUE

- 14.2.1 Quality of the sample preparation is maintained by proper cleaning, maintenance of the equipment and proper crushing, sieving and coning and quartering of samples. For sample preparation, proper technique and expertise has been used.

14.3.0 QUALITY CONTROL PROCEDURES ADOPTED

- 14.3.1 The primary core samples have been collected from entire mineralized zones/length intersected in the boreholes drilled and the samples have been prepared at centralized mechanized sampling unit, MECL, Nagpur. The standard sampling procedure in supervision of qualified sampling technician has been adopted to control the quality of samples. Similarly external check samples have also been prepared under the supervision of qualified sampling technician following the standard sampling procedure and analysed at NABL accredited external lab.

14.4.0 MEASURES TAKEN TO ENSURE THE SAMPLING IS REPRESENTATIVE OF THE INSITU MATERIAL COLLECTED

- 14.4.1 All the primary samples have been marked and prepared from mineralised cores. During the preparation of primary samples, the mineralised cores have been studied meticulously and samples have been marked properly. These mineralised cores are subjected for preparation of primary samples as per the sampling procedure for primary samples are described in Para 14.1.0. The proper marking of primary samples from drilled cores and following standard procedure for sample preparation shows the representative samples have been collected from the in-situ materials.

14.5.0 WHETHER SAMPLE SIZES ARE APPROPRIATE TO THE GRAIN SIZE OF THE MATERIAL BEING SAMPLED

- 14.5.1 The primary samples have been prepared (-) 200 mesh size and all the other samples have been prepared from primary samples. As per the previous studies in the area (-) 200 mesh size is appropriate for the analysis of limestone etc. mineralization in the block area.

CHAPTER - 15

15.0.0 QUALITY OF ASSAY DATA AND LABORATORY TESTS

15.1.0 THE NATURE, QUALITY AND APPROPRIATENESS OF THE ASSAYING AND LABORATORY PROCEDURES

15.1.1 The primary samples from limestone mineralization have been analyzed for 10 radicals i.e., CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃, Na₂O, SO₃, P₂O₅, K₂O and LOI by in Chemical Laboratory of MECL, Nagpur and external check samples for same 10 radicals have been analysed in Jawaharlal Nehru Aluminium Research Development and Design Centre, (JNARDDC), Nagpur a NABL accredited Laboratory.

15.2.0 STANDARD OPERATING PROCEDURE (SoP) FOR THE ANALYSIS BY JNARDDC, NAGPUR

CHEMICAL ANALYSIS

- 1. Pellet Method (using XRF)**
- 2. XRF (model Axiosm Ax, (Panalytical make))**
- 3. CRM used- NCSDC-16006**

Procedure for Preparation of Pellets by Hydraulic Press:

For XRF measurement a sample must be homogenized, pulverized to -100 mesh and pressed into pellet.

- (i) Weigh accurately 5 gms of sample and used 10 gms of boric acid as a binder
- (ii) Press the sample at a pressure of around 20-22 tons on a hydraulic press (Pellet Making Machine) with a diameter of 40 mm
- (iii) Calibrate the XRF equipment using known standards for elements present in limestone (Calcium, Magnesium etc)
- (iv) Ensure the instrument is set up correctly according to standard guidelines
- (v) Place the prepared pellet into the sample holder
- (vi) Ensure the sample cup is positioned correctly in the instrument for carrying out analysis
- (vii) Start the XRF analysis using software and initiate the analysis process automatically
- (viii) Allow the XRF instrument to scan the sample. It will emit X-rays onto the sample, causing the atoms to emit fluorescence

- (ix) Record the results in a report, including elemental concentrations and any relevant information about the analysis conditions
- (x) Intermediate check also performed using bead with inbuilt software

LOSS ON IGNITION

WCL procedure for determination of LOI:

Weighed quantity of sample (duly dried at 110°C) is placed in platinum crucible and heated to 1000°C for about an hour. Sample is again weighed after it is cooled. Difference in weight expressed in percentage as LOI.

15.3.0 STANDARD OPERATING PROCEDURE (SoP) FOR THE ANALYSIS BY MECL LAB, NAGPUR.

15.3.1 SOP OF ANALYSIS BY XRF

Sample Particle Size:

The Sample is ground to a particle size <75µm, but <50µm is ideal.

Sample preparation: Pellets preparation

The process of making pressed pellets for XRF analysis includes grinding the sample

to fine particle size and pressing the sample at pressure of between 15 to 35 ton.

Instrumentation:

1. X-ray irradiates the sample.
 2. Sample emits secondary X-ray characteristic of a particular element.
 3. Analyzing sample rotates to accurately diffract each wavelength and satisfy Bragg's Law.
 4. Detector measures position and intensity of XRF peaks
- Photograph of WD-XRF instrument (Rigaku, Japan) at Chemical Lab, MECL, Nagpur have been represented in photo 15.



Figure 6: Photographs showing WD-XRF instrument (Rigaku, Japan) at Chemical Lab, MECL, Nagpur

Photo - 12: Photographs showing WD-XRF instrument (Rigaku, Japan) at Chemical Lab, MECL, Nagpur

15.3.2 STANDARD OPERATING PROCEDURE (SoP) FOR THE DETERMINATION OF LOSS ON IGNITION (L.O.I.) AT MECL LAB

Procedure

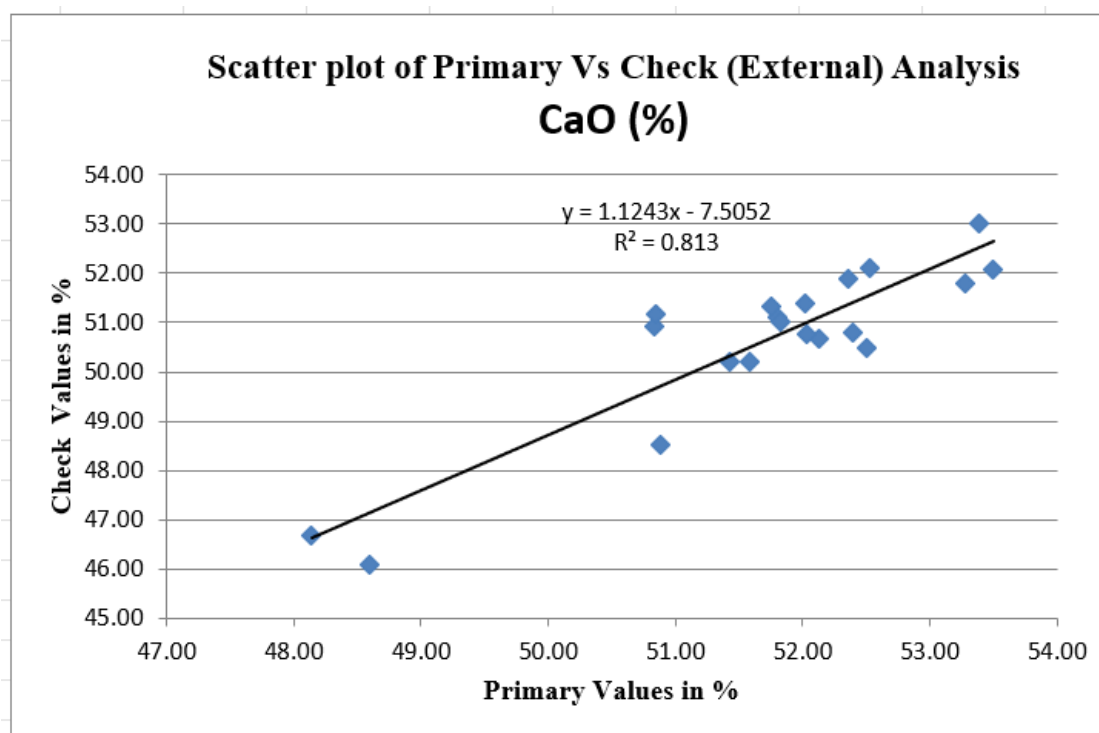
1. Weigh 1 g of dry sample in silica or platinum crucible.
2. Place this crucible in muffle furnace at a temperature below 300°C. Raise the temperature of the furnace to 1000°C. Keep this at this temperature for about 30 minutes.
3. Cool the crucible in desiccators and weigh the crucible.
4. Find the loss in weight.

$$5. \text{ \% Loss on Ignition (LOI)} = \left(\frac{\text{Loss in weight}}{\text{Sample Weight}} \right) \times 100$$

15.4.0 NATURE OF QUALITY CONTROL PROCEDURES ADOPTED

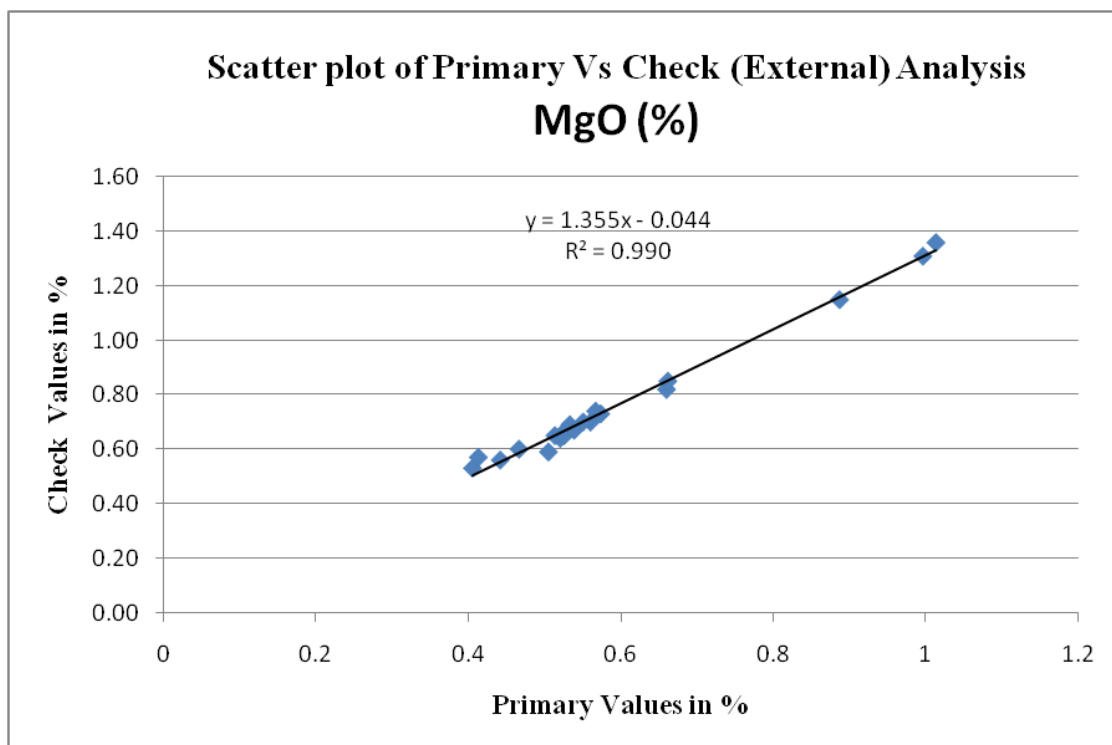
15.4.1 In order to ensure the accuracy of the analyzed samples, **NCSDC-16006** has been used as certified reference material. The Certified Reference Material (CRM) was processed under similar conditions as samples and run after every 20 samples.

15.4.2 A total 20 nos. of external check samples have been analysed at JNARDDC, Nagpur for 10 radicals. However, 5 radicals i.e. CaO, MgO, SiO₂, Fe₂O₃ and Al₂O₃ analysis have been statistically compared to check the reliability of chemical analysis and the results are given in Annexure-III-C. Statistical comparison has been furnished in the following figures and corresponding tables:



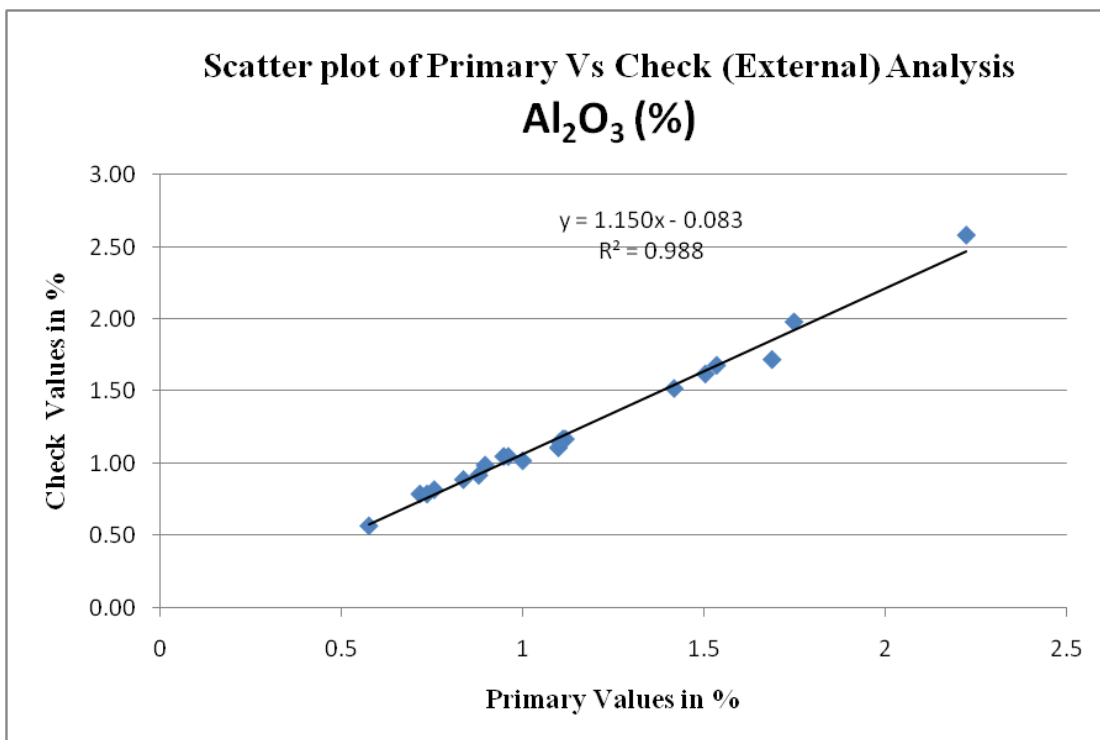
COMPARISON OF PRIMARY Vs. EXTERNAL CHECK ANALYSIS

COMPARISON INDEX	CaO %	
	Primary	Check
No. of Sample Pairs	20	
Arithmetic Mean	51.692	49.966
Standard Deviation	1.339	1.569
Std. Error of Mean	0.299	0.351
Variance	1.793	2.461
Mean of Deviation	1.726	
Standard Deviation (Error)	0.891	
Correlation Coefficient	0.824	
Mean Absolute Error	1.767	
Mean Relative Random Error	3.418%	
Paired T value	8.666	
F - test value	0.728	



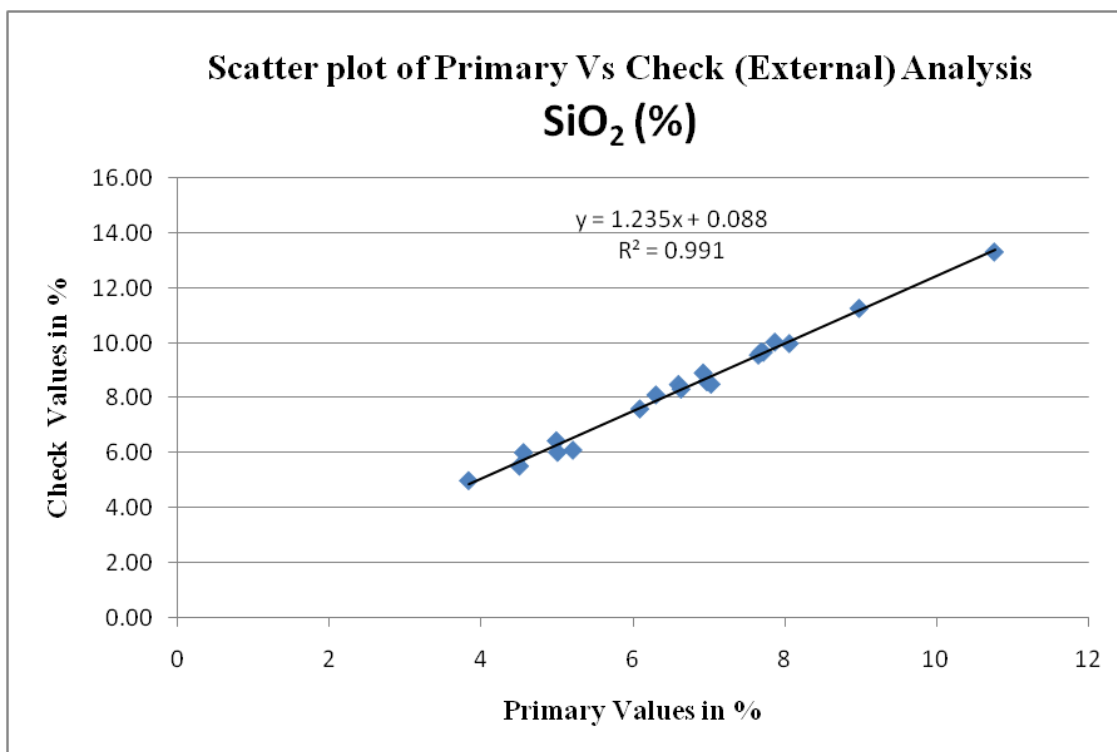
COMPARISON OF PRIMARY Vs. EXTERNAL CHECK ANALYSIS

COMPARISON INDEX	MgO %	
	Primary	Check
No. of Sample Pairs	20	
Arithmetic Mean	0.592	0.759
Standard Deviation	0.171	0.232
Std. Error of Mean	0.038	0.052
Variance	0.029	0.054
Mean of Deviation	-0.167	
Standard Deviation (Error)	0.064	
Correlation Coefficient	0.995	
Mean Absolute Error	0.167	
Mean Relative Random Error	28.105%	
Paired T value	-11.598	
F - test value	0.543	



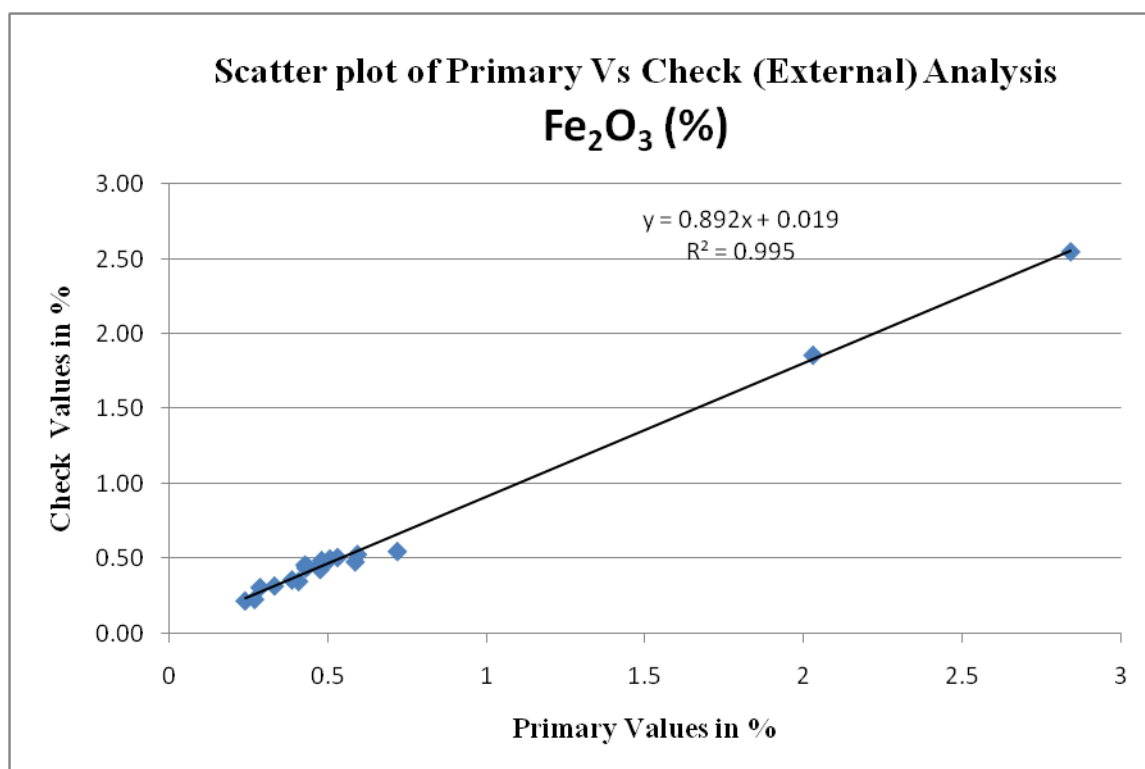
COMPARISON OF PRIMARY Vs. EXTERNAL CHECK ANALYSIS

COMPARISON INDEX	Al ₂ O ₃ %	
	Primary	Check
No. of Sample Pairs	20	
Arithmetic Mean	1.142	1.23
Standard Deviation	0.408	0.472
Std. Error of Mean	0.091	0.106
Variance	0.167	0.223
Mean of Deviation	-0.087	
Standard Deviation (Error)	0.081	
Correlation Coefficient	0.994	
Mean Absolute Error	0.087	
Mean Relative Random Error	7.662%	
Paired T value	-4.854	
F - test value	0.747	



COMPARISON OF PRIMARY Vs. EXTERNAL CHECK ANALYSIS

COMPARISON INDEX	SiO ₂ %	
	Primary	Check
No. of Sample Pairs	20	
Arithmetic Mean	6.68	8.344
Standard Deviation	1.645	2.042
Std. Error of Mean	0.368	0.457
Variance	2.707	4.171
Mean of Deviation	-1.664	
Standard Deviation (Error)	0.433	
Correlation Coefficient	0.996	
Mean Absolute Error	1.664	
Mean Relative Random Error	24.903%	
Paired T value	-17.177	
F - test value	0.649	



COMPARISON OF PRIMARY Vs. EXTERNAL CHECK ANALYSIS

COMPARISON INDEX	Fe ₂ O ₃ %	
	Primary	Check
No. of Sample Pairs	20	
Arithmetic Mean	0.647	0.598
Standard Deviation	0.62	0.554
Std. Error of Mean	0.139	0.124
Variance	0.384	0.307
Mean of Deviation	0.05	
Standard Deviation (Error)	0.077	
Correlation Coefficient	0.997	
Mean Absolute Error	0.058	
Mean Relative Random Error	8.94%	
Paired T value	2.888	
F - test value	1.249	

15.4.3 It has been observed that:

- i) The scatter plots clearly show scatter of values along a band closely following the bisector.
- ii) The arithmetic means of principal and check assays show an excellent agreement for all the radicals.
- iii) The correlation coefficient, which is an index assays showing value for CaO% 0.824, MgO% 0.995, Al₂O₃% 0.994, SiO₂% 0.996 and Fe₂O₃% 0.997,

which implies excellent/agreement for the dataset of primary and check analysis of radicals.

15.5.0 SECURITY AND CHAIN OF CONTROL OF SAMPLES SHOULD BE CLEARLY MENTIONED

15.5.1 The samples have been prepared at centralized mechanized sampling unit with proper labelling and tag and sent to chemical laboratory in supervision of qualified sampling technician. At the sampling unit, standard procedure has been followed and all the precautionary measures have been taken to avoid the contamination. The sampling unit is separate from the chemical laboratory, so there is no chance of contamination.

CHAPTER – 16

16.0.0 MOISTURE

16.1.0 All the analysis of borehole core samples has been carried out with natural moisture.

CHAPTER – 17

17.0.0 BULK DENSITY

17.1.0 BULK DENSITY ANALYSIS DETAILS

17.1.1 A total 2 no. of core samples are subjected to bulk density studies detailed procedure is given below:

Applicability: This method shall be applicable in hard litho units, where regular solid cylindrical drill cores are obtained during the course of drilling. The drill core samples to be used for the study should be of NQ or larger diameter.

Sample Preparation: Take a full cylindrical drill core sample of minimum fifteen (15) centimeters - length with both ends trimmed smoothly at right angle to the core axis using a mechanical core cutter to form a regular cylinder.

Procedure: Measure the length of the sample, at-least at four locations along its axis by suitably rotating the sample. Measure the diameter of the sample using a Caliper scale, at least at four locations, preferably at regular interval. Weigh the air-dried sample in a platform balance.

Calculation: Take mean average of all the readings for length and diameter. Divide the average mean value of diameter by two to arrive at the radius of the sample. The volume of a core sample is obtained by using formulae: $V = \pi r^2 h$ (where V = volume, r = radius and h = height or length of the cylindrical core). The bulk density of the sample is determined by using the formula: $B.D = M/V$ where B. D= bulk density, M= mass (weight) of the sample and V= volume of the sample.

17.1.2 **Number of Samples studied:** Total 2 no. of core samples are studied, where a total of five observations are carried out for each sample. The average of these observations results for each sample may be taken as the final bulk density for the purpose of estimation of resources. Bulk density determination results are mentioned below:

Sl. No.	Sample No.	BH. No.	From (m)	To (m)	Bulk Density (gm/cc)
1	MRB-BD-01	MRB-01	20.40	20.60	2.67
2	MRB-BD-02	MRB-02	40.00	40.20	2.69
Average Bulk Density					2.68

The average bulk density of the limestone zones in the block is determined as 2.68 gm/cc, which has been utilised for the resources estimation. Bulk density study report is analysed as Annexure-VI.

CHAPTER – 18

18.0.0 BENEFICIATION STUDIES

18.1.0 The present exploration has no provision for beneficiation studies.

CHAPTER – 19

19.0.0 RESOURCE ESTIMATION TECHNIQUE

19.1.0 GENERAL

19.1.1 The limestone resources of the block has been estimated by “**Polygon**” and “**Geological cross-section**” methods. Certain axiomatic assumptions are inherently involved in estimation of overall grade and resources of the deposit, which are given below:

1. The rule of gradual change or law of linear function has been applied (Constantine C. Popoff, 1966) along with the rule of nearest points for application of influence of half way between successive boreholes.
2. The boreholes which did not intersect any mineralisation have been considered as negative boreholes and completely eliminated from resources estimation.
3. The thickness and grade of each mineralized zone intersected in the borehole have been considered as it is for the entire influence area of the borehole.

19.1.2 Grades and Resources have been assessed on the basis of end-use grade classification given by IBM’s National Mineral Inventory (NMI) in following two categories

- i) Cement grade ($\geq 44\%$ CaO, $< 3.5\%$ MgO and $< 16\%$ SiO₂)
- ii) Blendable grade (≥ 38 to $< 44\%$ CaO, $< 5\%$ MgO and $< 18\%$ SiO₂).

19.1.3 Further Resources have been estimated and categorized as per UNFC and placed as Inferred Resources (333) category by polygonal method (Principal Method) and calculated by cross sectional method also for check method.

19.2.0 ASSUMPTIONS FOR RESOURCE ESTIMATION

19.2.1 Resources was computed by “Polygonal method” as well as by “Cross-sectional method”. Certain axiomatic assumptions are inherently involved in estimating overall grade and resource of a deposit, are given below.

19.2.2 Grades and resources were categorized based on end-use grade classification given by IBM threshold in following categories for Cement Grade Limestone and Blendable Grade Limestone are presented in Annexure-IX.

19.2.3 For limestone grade categorization into Cement and Blendable grades are considered.

19.2.4 Resources estimated for Cement grade limestone CaO $\geq 44\%$, 3.5% MgO (Max) and 16% SiO₂ (Max), Blendable Grade CaO $\geq 38\%$ to $< 44\%$, 5.00% MgO (Max) are considered for the assessment of limestone resources.

- 19.2.5 The zones of different grades have been demarcated from the values of primary sample analysis as per cut-off limits by End Use Grade specifications by IBM for CaO, MgO and SiO₂. The minimum cumulative thickness of 1.00m of all grades has been considered for resources calculation in both methods.
- 19.2.6 The exploration scheme was formulated for G3 level exploration. After completing the exploration program, which involved drilling 5 boreholes (MRB-01, 02, 03, 04 and 05) fall along three parallel cross-section lines (S1-S1', S2-S2' and S3-S3') oriented in the N60°W / S60°E direction within the Revuru Block.
- 19.2.7 The Limestone body is bedded and continuous within the block. For resources estimation by cross-section method, resources are categorized under Inferred Resources (333) of UNFC (as per MEMC 2015 and 2021) Rules.
- 19.2.8 The grade classification and categorisation marked in the cross sections are suitable indexed and enclosed as Plate-VI for Revuru Block. Along strike and dip the influence of maximum 400 m from control point towards the lease boundary has been categorized in Inferred Category (333).
- 19.2.9 The average bulk density of limestone has been taken as 2.68 gm/cc as determined by Calliper's method from 2 limestone samples in MECL Laboratory, Nagpur. This value is taken for computation of resources for Cement and Blendable grade of limestone.
- 19.2.10 Polygonal resources is calculated for Cement and Blendable grades for thickness of limestone zone of respective grades encountered in each borehole is enclosed as Annexure-VII-A and VII-B for Polygonal resources.
- 19.2.11 Cross sectional resources of inferred category estimated for Cement and Blendable grades for thickness of limestone zone of respective grades encountered in boreholes is enclosed as Annexure-VII-C and VII-D.

19.3.0 PARAMETERS FOR RESOURCE ESTIMATION

19.3.1 SAMPLING PROCEDURE

The primary samples have been collected as per the litho-contact and sample length of one meter has been taken, however due to lithological variations in very few places the sample length was also taken less than 1.00m, but resources has not been calculated for the zones which are less than 1.00m. Samples from bore hole cores were crushed to (-) 200 mesh size, cone and quartered, thoroughly mixed and representative samples of 200g were prepared and sent to laboratory for analysis of 10

radicals i.e. CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃, Na₂O, SO₃, P₂O₅, K₂O and LOI at Chemical Laboratory of MECL, Nagpur and results were obtained to delineate the ore zones.

19.3.2 CHEMICAL ANALYSIS

A total of 203 nos. of samples generated from the 5 boreholes drilled (MRB-01, 02, 03, 04, 05) in Revuru Block were analyzed by MECL, Chemical lab, Nagpur and the results are enclosed as Annexure-III-A and 20 nos. of external check samples have been analysed in JNARDDC Laboratory, Nagpur and the results enclosed as Annexure-III-B.

Considering the open cast potentiality of the block, the minimum workable thickness / minimum stopping width of 1.00 m and minimum non ore parting of 1.00 m is considered for resources estimation.

19.4.0 OVERBURDEN

Overburden of limestone includes top layer of soil and subsequent sticky clay which lies immediately above Limestone in Revuru Block. The minimum overburden of soil cover is 3.00m in MRB-04 and maximum is 6.45m in MRB-01. The average thickness of the overburden in the block is around 5.50m.

19.5.0 METHODOLOGY

The resources have been estimated by polygonal method as per MEMC rules, 2015 (Amended 2021). The methodology adopted, keeping the above assumptions in view, for resources estimation are described further.

19.6.0 METHODOLOGY ADOPTED IN POLYGONAL METHOD FOR RESOURCE ESTIMATION (PRINCIPAL METHOD)

19.6.1 The main objective of this method is to demarcate the area of influence of the limestone intersected by a particular borehole. The influence area has been obtained by constructing polygons by drawing perpendicular bisector of triangles, rectangles that connect the adjoining boreholes. The area of the influence of zones has been ascertained by Auto-Cad software. The area of non-development of respective zones is shown on the resources plan. The height of polygons is the cumulative thickness of limestone horizon/bands encountered by the corresponding borehole. The entire limestone body in block is divided into number of polygons.

The zone wise borehole wise resources estimation by Polygonal method for Cement Grade and Blendable Grade Limestone of this block are calculated.

The grade assigned to the polygon blocks is same as the weighted average grade of the corresponding boreholes. The area of non-development of particular grade in borehole has been deducted.

The formula of resources estimation is as follows:

$$R = P_A \times Th \times \text{Bulk Density}$$

Where, P_A = Area of Polygon

R = Resources/ Tonnage

Th = Thickness of Limestone

- 19.6.2 The resources are estimated polygon wise, borehole wise presented as **Annexure-VIIA and VIIB** for Cement Grade and Blendable grade limestones respectively. Polygonal map for Cement grade and Blendable grade limestones provided as Plate-V for Revuru Block.

19.7.0 METHODOLOGY ADOPTED IN CROSS-SECTIONAL METHOD FOR RESOURCES ESTIMATION (CHECK METHOD)

- 19.7.1 A total of 5 boreholes are located along three parallel cross-section lines, S1-S1', S2-S2' and S3-S3', drawn in the N60°W / S60°E direction from west to east throughout the Revuru Block which is marked on Plate-III.
- 19.7.2 The limestone intersected in all the drilled boreholes and continuous within the block. Efforts were made to pass these sections through drilled borehole locations wherever possible. The boreholes which have not fallen on section lines are projected on to the nearest section line. Since the beds are generally sub-horizontal with very low dip of 10° to 20° due SE direction and boreholes drilled are all vertical, hence true thickness will be the same as thickness intersected in the exploratory boreholes. Geological cross sections are generated by GDM software. Cross sectional area on each section has been measured with the help of Auto CAD map 2018 software and recorded systematically. Strike influence between two section lines and boreholes has been taken up-to half way distance. However, the influence is up to block boundary has been taken in section S1-S1' and S3-S3' up to 400m in inferred (333) category. Each of these areas has been multiplied with sectional influence / strike influence of the section lines to give volume. The volume is then multiplied with average specific gravity, to estimate geological in-situ gross resources.

$$R = S_v (X) T (X) \text{ Avg Specific Gravity}$$

Where in,

R = Resources / Tonnage

S_v = Sectional area of limestone

T = Influence between successive section lines

Sp. Gr. = Specific Gravity of limestone

19.8.0 COMPUTATION OF AVERAGE GRADE

19.8.1 All calculations for grade estimation are made by weighted average method. The sample interval was uniformly maintained at 1.00m interval with the exception of minor variations or structural implications and the weighted average method of calculation is made by the following formula:

$$\text{Weighted average grade} = \frac{V_1XG_1 + V_2XG_2 + V_3XG_3 + \dots + V_nXG_n}{V_1 + V_2 + V_3 + \dots + V_n}$$

Where 'V' = Volume of Limestone in individual borehole

'G' = Grade of the respective Limestone in the corresponding borehole

Table No. 19.2
Borehole wise intersection of Cement Grade Limestone Zones in boreholes drilled in Revuru Block, Suryapet District, Telangana.

BH. No.	From (m)	To (m)	Thickness (m)	CaO%	MgO%	Al ₂ O ₃ %	SiO ₂ %	GRADE
MRB-01	7.20	50.00	42.80	52.54	0.61	0.84	6.68	CEMENT GRADE LIMESTONE
MRB-02	6.00	50.00	44.00	52.52	0.55	1.38	4.69	
MRB-03	18.00	50.00	32.00	52.62	0.52	1.20	5.91	
MRB-04	12.00	50.00	38.00	51.42	0.61	1.05	7.32	
MRB-05	6.00	50.00	44.00	51.98	0.66	0.92	6.74	

19.8.2 As mentioned earlier, Limestone is classified into different grades on the basis of three major constituents viz. CaO, MgO and SiO₂. The Other major chemical constituents of limestone are Al₂O₃, Fe₂O₃ and LOI. The Cement grade limestone intersected in borehole no. MRB-01 to MRB-05 and blendable grade limestone intersected in borehole no. MRB-03 in Revuru Block.

Table No. 19.3
Borehole wise intersection of Blendable Grade Limestone Zones in boreholes drilled in Revuru Block, Suryapet District, Telangana.

BH. No.	From (m)	To (m)	Thickness (m)	CaO%	MgO%	Al ₂ O ₃ %	SiO ₂ %	GRADE
MRB-03	9.00	15.00	6.00	42.94	0.50	3.24	12.08	BLENDABLE GRADE LIMESTONE

19.8.2.1 Deleterious Constituents

19.8.2.1.1 The most deleterious constituent of cement is MgO. It affects the soundness of setting time of cement. It mostly adds through limestone. The Indian cement

manufacturers considered 4% as the safe limit. The average MgO % estimated for Cement grade zone is 0.54. which is within the limit.

- 19.8.2.1.2 Another harmful impurity in limestone for cement making is sulphur. The SO_3 % content in limestone should not exceed 1.7%, because it forms sulpho-aluminate which has marked swelling property. The average SO_3 content in Primary samples analyzed is 0.07% which is well-within the limit.

Minor Constituents

- 19.8.2.1.3 Besides above broad chemical specifications, Cement grade limestone bound to have some limitations in the content of minor elements and constituents. Although these minor constituents do not have direct significance in assessing the suitability of a limestone, however, their presence beyond certain limits is undesirable as these may affect the manufacturing process or the quality of cement adversely.
- 19.8.2.1.4 Phosphorus: Content of P_2O_5 should not exceed 1% as excess phosphorus which inhibits clinker minerals formation and reduces the strength of cement appreciably. Average P_2O_5 content is 0.10% which is within the permissible limit.

19.9.0 CATEGORISATION OF RESOURCE

- 19.9.1 Resources have been categorised under Inferred (333) category of resources as per UNFC classification. The assumptions and parameters are already discussed earlier in this chapter under 19.2.0 and 19.6.0.
- 19.9.2 Limestone zones are computed are categorised based on end use grade specifications prescribed by Indian Bureau of Mines.
- 19.9.3 The average grades for 3 radicals CaO , MgO and SiO_2 have been calculated. Thus, average grade of the block is calculated for all grades of limestone.

CHAPTER – 20

20.0.0 REPORTING OF RESOURCE

20.1.0 RESOURCE ESTIMATION

20.1.1 Resources are estimated by polygonal method. The main objective of this method is to demarcate the area of influence of the limestone intersected by a particular borehole and the same is discussed earlier under chapter 19.6.0 of this report.

20.1.2 The grade assigned to the polygon blocks is same as the weighted average grade of the corresponding boreholes. The area of non-development of particular grade in borehole has been deducted. Polygon-wise, borehole-wise polygonal area is tabulated hereunder.

Block	Borehole No.	Polygon No.	Polygonal Area (m²)
Revuru Block	MRB-01	P4	1016960.12
	MRB-02	P2	797070.62
	MRB-03	P1	1232810.59
	MRB-04	P5	1124689.32
	MRB-05	P3	676204.98

20.1.3 A total 510.64 MT of Cement Grade Limestone resources estimated by polygonal method with an average grade of 52.21 % CaO, 0.59% MgO and 6.31% SiO₂. The Polygon-wise, grade wise, borehole-wise resources estimated by Polygonal method for Cement Grade Limestone are given in Table number 20.2. (Annexure-VII-A).

20.1.4 A total 19.82 MT of Blendable Grade Limestone resources estimated by polygonal method with an average grade of 42.94% CaO, 0.50% MgO and 12.08% SiO₂. The Polygon-wise, grade wise, borehole-wise resources estimated by Polygonal method for Blendable Grade Limestone are given in Table number 20.3. (Annexure-VII-B).

20.2.0 RESOURCE BY POLYGONAL METHOD

The Resources of limestone have been estimated borehole wise, polygon wise in polygonal method for different intersected zones/grade wise as per specifications and basic assumptions enumerated earlier. The resources of limestone have been estimated with borehole wise for limestone intersected in the boreholes as per specifications by polygonal method. The resources are also estimated by cross

sectional method (check method) for validation of resources. The category wise and grade wise estimated resources are given in Table No. 20.4 (Annexure-VII-C) for Cement Grade Limestone and Blendable Grade Limestone are given in Table No. 20.5 (Annexure-VII-D).

20.3.0 RELIABILITY OF RESOURCE

20.3.1 The Limestone resources estimated at different end use cut-off grade by the polygonal method and cross-sectional method were compared to ascertain the confidence level of estimation. The resources are estimated grade wise, borehole wise by both polygonal and cross sectional methods, and presented as Annexure-VII-A, VII-B, VII-C & VII-D respectively.

20.3.2 In Revuru Block, the relative difference in resources by two methods comes to 3.98%. The resources calculated by polygonal method are bit higher side due to irregular shape of the block. Hence, the polygonal method resources are considered for reporting. The comparison of resources is given in the Table 20.1.

Table No: 20.1

Comparison of Gross In-situ Resources estimated by Polygonal Method (Principal Method) with Cross Sectional Method (Check Method) in Revuru Block

Sl.No.	Category of Resources	Polygonal Method (MT)	Cross Sectional Method (MT)	Relative Difference %
1	Cement Grade Limestone	510.64	490.44	4.04
2	Blendable Grade Limestone	19.82	19.27	2.80



Table 20.2

**Polygon wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Cement Grade Limestone by Polygonal Method for
Revuru Block, Dist: Suryapet, Telangana**

Bulk Density: 2.68 gm/cc

Polygon No.	BH No.	Polygonal Area (m ²)	From (m)	To (m)	Thick. (m)	Volume (m ³)	Geological Gross in-situ Resources (tonnes)	Average Quality									
								CaO %	MgO %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	SO ₃ %	P ₂ O ₅ %	K ₂ O %	LOI %
P4	MRB-01	1016960.12	7.20	50.00	42.80	43525893.14	116649393.60	52.54	0.61	0.84	6.68	0.41	0.09	0.16	0.16	0.15	37.96
P2	MRB-02	797070.62	6.00	50.00	44.00	35071107.28	93990567.51	52.52	0.55	1.38	4.69	0.56	0.06	0.02	0.04	0.27	39.71
P1	MRB-03	1232810.59	18.00	50.00	32.00	39449938.88	105725836.20	52.62	0.52	1.20	5.91	0.55	0.04	0.02	0.07	0.22	38.68
P5	MRB-04	1124689.32	12.00	50.00	38.00	42738194.16	114538360.35	51.42	0.61	1.05	7.32	0.47	0.09	0.11	0.14	0.20	38.30
P3	MRB-05	676204.98	6.00	50.00	44.00	29753019.12	79738091.24	51.98	0.66	0.92	6.74	0.39	0.02	0.03	0.15	0.17	38.77
Total Geological Gross in-situ Resources of Cement Grade Limestone in Tonnes							510642248.90	52.21	0.59	1.07	6.31	0.48	0.07	0.07	0.11	0.20	38.63
Total Geological Gross in-situ Resources of Cement Grade Limestone in Million Tonnes							510.64										



Table 20.3

**Polygon wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Blendable Grade Limestone by Polygonal Method for
Revuru Block, Dist: Suryapet, Telangana**

Bulk Density: 2.68 gm/cc

Polygon No.	BH No.	Polygonal Area (m ²)	From (m)	To (m)	Thick. (m)	Volume (m ³)	Geological Gross in-situ Resources (tonnes)	Average Quality									
								CaO %	MgO %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	SO ₃ %	P ₂ O ₅ %	K ₂ O %	LOI %
P1	MRB-03	1232810.59	9.00	15.00	6.00	7396863.54	19823594.29	42.94	0.50	3.24	12.08	6.95	0.09	0.06	0.08	0.24	33.39
Total Geological Gross in-situ Resources of Blendable Grade Limestone in Tonnes							19823594.29	42.94	0.50	3.24	12.08	6.95	0.09	0.06	0.08	0.24	33.39
Total Geological Gross in-situ Resources of Blendable Grade Limestone in Million Tonnes							19.82										



Table 20.4

Section wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Cement Grade Limestone by Cross Sectional Method for Revuru Block, Dist: Suryapet, Telangana

Bulk Density: 2.68 gm/cc

BH.No.	Section Line	Sectional Area (m ²)	Strike Influence (m)	Volume (m ³)	Geological Gross In-situ Resources (tonnes)	Average Quality									
						CaO %	MgO %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	SO ₃ %	P ₂ O ₅ %	K ₂ O %	LOI %
MRB-01	S2-S2'	59421.86	755.79	44910447.57	120359999.49	52.54	0.61	0.84	6.68	0.41	0.09	0.16	0.16	0.15	37.96
MRB-02	S2-S2'	60732.88	696.49	42299843.59	113363580.82	52.52	0.55	1.38	4.69	0.56	0.06	0.02	0.04	0.27	39.71
MRB-03	S1-S1'	39373.56	636.10	25045521.52	67121997.66	49.37	0.51	1.85	7.78	3.00	0.05	0.03	0.08	0.24	36.84
MRB-04	S1-S1'	48207.30	716.05	34518837.17	92510483.60	51.42	0.61	1.05	7.32	0.47	0.09	0.11	0.14	0.20	38.30
MRB-05	S3-S3'	46626.83	776.92	36225316.76	97083848.93	51.98	0.66	0.92	6.74	0.39	0.02	0.03	0.15	0.17	38.77
Total Geological Gross In-situ Resources of Cement Grade Limestone in Tonnes					490439910.50	51.78	0.59	1.16	6.50	0.81	0.07	0.07	0.12	0.20	38.43
Total Geological Gross In-situ Resources of Cement Grade Limestone in Million Tonnes (MT)					490.44										



Table 20.5

Section wise, Borehole wise Geological Gross In-Situ Resources (333) estimated for Blendable Grade Limestone by Cross Sectional Method for Revuru Block, Dist: Suryapet, Telangana

Bulk Density: 2.68 gm/cc

BH.No.	Section Line	Sectional Area (m ²)	Strike Influence (m)	Volume (m ³)	Geological Gross In-situ Resources (tonnes)	Average Quality									
						CaO%	MgO %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	SO ₃ %	P ₂ O ₅ %	K ₂ O %	LOI %
MRB-03	S1-S1'	11305.85	636.10	7191651.19	19273625.18	42.94	0.50	3.24	12.08	6.95	0.09	0.06	0.08	0.24	33.39
Total Geological Gross In-situ Resources of Blendable Grade Limestone in Tonnes					19273625.18	42.94	0.50	3.24	12.08	6.95	0.09	0.06	0.08	0.24	33.39
Total Geological Gross In-situ Resources of Blendable Grade Limestone in Million Tonnes (MT)					19.27										

CHAPTER – 21

21.0.0 SUMMARY AND RECOMMENDATIONS

21.1.0 SUMMARY

21.1.1 The Revuru Block for Preliminary Exploration (G3 stage) for limestone which lies in the Palnad Basin of Suryapet District, Telangana. It falls in part of the Survey of India Toposheet No. 56P/13 in Mattampally Mandal (Taluka) of Suryapet District, Telangana.

21.1.2 Major portion of the explored block area is limestone. The general stratigraphic succession of the Revuru Block in 1: 4000 scale geological mapping done by MECL along-with current exploration, available data and literature.

21.1.3 The total absence of fossils rules out the sediments of Bhima Group transgresses into the Cambrian. Thus envisaged the upper age limit is not less than 600 million years.

21.1.4 The rock types exposed in the block belongs to the Narji Limestone Formation of Kurnool Group of Palnad Basin, the limestone exposed about 1/5 of the block area in south east corner and quaternary sediments i.e. soil cover is seen in the entire area of the block.

21.1.5 The limestone formation of the block is horizontally disposed with strike of N 30°E to S30°W dips 10° to 20° due SE. A total of 5 boreholes drilled, are located along three parallel cross-section lines, S1-S1', S2-S2' & S3-S3' are drawn in the N 60° W / S 60° E direction from west to east throughout the Revuru Block, which is marked on Plate-III. All the 5 boreholes intersected limestone zones.

The intersected limestone is of Cement Grade to high grade encountered with intermittent partitions of Blendable grade limestone zone. A total of 2 grades of limestones are intersected in Revuru Block i.e. Cement Grade Limestone and Blendable Grade Limestone. Borehole wise intersection of various grades limestone zones, are discussed under Chapter 10.

21.1.5 A total of 203 nos. of borehole primary samples and 20 nos. of external check samples were generated in Revuru Block. All the primary samples are analysed in MECL Chemical Lab, MECL, Nagpur and external check samples are analysed from JNARDDC Lab, Nagpur and the results of primary samples are enclosed as Annexure-III-A (Primary) and external check samples analysis presented as Annexure-III-B. Considering the open cast potentiality of the block, the minimum workable thickness /

minimum stopping width of 1.00 m and minimum non ore parting of 1.00 m is considered for resources estimation.

21.1.6 Limestone zones are demarcated based on End use classification of IBM.

21.1.7 A total of 2 nos. of limestone core samples from drilled boreholes were subjected to bulk density determination by Caliper Method. The average bulk density of these 2 samples has been determined as 2.68 gm/cc and the same have been considered for estimation of resources.

21.1.8 Geological Gross In-situ resources were estimated by polygonal method.

21.1.9 A total of **510.64 Million Tonnes (MT)** of Cement Grade Limestone has been estimated as gross in-situ resources, with an average grade of 52.21% CaO, 0.59% MgO, 6.31% SiO₂. In addition, **19.82 MT** of Blendable Grade Limestone has been estimated with average grade 42.94% CaO, 0.50% MgO, 12.08% SiO₂.

21.2.0 RECOMMENDATIONS

21.2.1 MECL has undertaken Preliminary Exploration (G3 level) over an area of 4.87 sq.km in the Revuru Block. The exploration programme has established the presence of Cement Grade Limestone and Blendable Grade Limestone. Based on lithological characteristics Limestone in the block is suitable for potential utilization in the cement industry. The exploration is carried out as per Mineral (Evidence of Mineral Contents) Rule-2015, Mineral Auction Rule-2015, MMDR Amendment Act - 2015 and in accordance with the Minerals (Evidence of Mineral Contents) Amendments Rules 2021.

21.2.2 The study area suggests that any future mining project may generate employment for the local people and will increase socio-economic status of the people residing in the nearby areas.

21.2.3 The estimated mineral resources have been classified under the 333 category of the United Nations Framework Classification (UNFC) system. The findings of this geological report provide a sound technical basis for the Government of Telangana to proceed with auctioning of the block for grant of a Mining Lease.

CHAPTER - 22

22.0.0 PLATES AND MAPS

- 22.1.0 Location Map of Revuru Block, Suryapet District, Telangana on 1: 50,000 Scale is given as Plate-I.
- 22.2.0 Regional Geological Map of Revuru Block, Part of Palnad Sub-Basin (GSI), Suryapet District, Telangana on 1:50,000 scale is given as Plate-II.
- 22.3.0 Topographical and Geological Map of Revuru Block, Suryapet District, Telangana on 1:4,000 scale is given as Plate-III.
- 22.4.0 Graphic Lithologs of boreholes drilled by MECL in Revuru Block on 1:1000 scale is given as Plate-IV.
- 22.5.0 Polygon Map of Cement Grade and Blendable Grade Limestone in Revuru Block on 1: 4,000 scale is given as Plate-V.
- 22.6.0 Geological Cross Sections of Revuru Block (S1–S1', S2–S2' and S3–S3') on 1:2000 scale is given as Plate-VI.

CHAPTER - 23

23.0.0 ANNEXURE / ENCLOSURES TO THE REPORT

23.1.0 The report includes all the relevant annexure and maps/ plans, sections and photographs etc. List of annexures, tables, maps/plans/sections, photographs, text figures etc. are provided before the start of the text and part of the Geological Report.

CHAPTER – 24

24.0.0 ANY OTHER INFORMATION

24.1.0 UTILISATION ASPECTS AND MINEABILITY (AS PER NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS)

24.1.1 The specifications of limestone for various industrial used are as follows

1. CEMENT INDUSTRY SPECIFICATION

Table 24.1

Cement Industry Specification for Limestone

CaO	:	44% (min.) to 46%
MgO	:	3.50% (max.)
SiO ₂	:	16% (max.)
Al ₂ O ₃	:	2 (max.)
Fe ₂ O ₃	:	2% (max.)
SO ₃	:	1.75% (max.)

$$\text{Lime Saturation Factor (LSF)} = \frac{\text{CaO}}{2.8 (\text{SiO}_2) + 1.2 (\text{Al}_2\text{O}_3) + 0.65 (\text{Fe}_2\text{O}_3)}$$

(ideal to be at 0.66 to 1.02)

$$\text{Silica Modules} = \frac{\text{SiO}_2}{\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3} = \text{ideal at (1.2 to 4.0)}$$

$$\text{Iron Modules} = \frac{\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3}{\text{Fe}_2\text{O}_3} = \text{ideal at (1.7 to 2.4)}$$

$$\text{Hydraulic Modules} = \frac{\text{Al}_2\text{O}_3}{\text{Fe}_2\text{O}_3} = \text{ideal at (0.65 (min.))}$$

2. **B. I. S. (BUREAU OF INDIAN STANDARDS) SPECIFICATION**

Table 24.2

B. I. S. (Bureau of Indian Standards) Specification for Limestone

CaO (Min)	42%
MgO (Max.)	2.5%
SiO ₂ (Max.)	15%
P ₂ O ₅ (Max.)	1.5 %
FeS ₂ (Max.)	2%

3. **IRON AND STEEL INDUSTRY:**

Table 24.3

Iron and Steel Industry for Specification for Limestone

Elements	BF Grade	SMS Grade	LD Grade
CaO	42% (Min.)	48% (Min.)	52% (Min.)
MgO	4% (Max.)	3% (Max.)	2% (Max.)
SiO ₂	9% (Max.)	4% (Max.)	1% (Max.)
SiO ₂ + Al ₂ O ₃	11.5% (Max.)	-	-
Total Insoluble	12%	-	-
Acid Insoluble	-	6.5% (Max.)	-

4. **CHEMICAL INDUSTRY SPECIFICATION**

BIS Specifications (1S:3204-1978, Reaffirmed-2003)

Table 24.4

Chemical Industry Specification for Limestone

Characteristics	Requirement in percent by mass for			
	Calcium carbide	Bleaching Powder	Caustic soda	Sugar
CaO (Min.)	54.0	54.0	53.0	50.0
MgO (Max.)	0.8	2.0	1.0	1.0
SiO ₂ (Max.)	1.0	0.75	-	2.0
Fe ₂ O ₃ (Max.)	0.25	0.15	-	-
Mn ₂ O ₃ (Min.)	-	0.06	-	-
CO ₂ (Min.)	42.00	42.00	42.00	41.00
Loss on Ignition (LOI)	46.00	46.00	46.00	44.00
S (Max.)	0.10	-	-	-

P (Max.)	0.01	-	-	-
Al ₂ O ₃ + Fe ₂ O ₃ (Max.)	0.50	-	-	1.5
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃ (Max.)	-	-	3.0	-

5. FERTILIZER INDUSTRY SPECIFICATION

CaCO₃+ MgCO₃: 85 % (Min)

SiO₂ : 5% (Max.)

6. GLASS INDUSTRY SPECIFICATION

CaCO₃ : 94.5%

CaCO₃ +MgCO₃ : 97.5%

Fe₂O₃ : 0.20% (Max)

BIS Specifications (1S:997-1973, Reaffirmed-1998)

CaO : 53.0 %

SiO₂ : 2.5 %

Fe₂O₃ : 0.10 %

CaO + MgO : 54.50 %

7. FOUNDRY INDUSTRY SPECIFICATION

BIS Specifications (1S:4149-1978, Re-affirmed-2008)

Table No: 24.5

Foundry Industry Specification for Limestone

Characteristics	Grade-1	Grade-2	Grade-3
CaO (Min.)	52 %	50 %	45 %
SiO ₂ (Max)	1.5 %	3 %	5 %
R ₂ O ₃ (Al ₂ O ₃ + Fe ₂ O ₃) Max.	1 %	1 %	2 %
MgO	2 %	3 %	5 %
Insoluble matter	0.5	1	2
Sulphur and Phosphorus	Traces	Traces	Traces

8. CEMENT, IRON AND STEEL AND CHEMICAL INDUSTRY SPECIFICATION

Table No: 24.6

Cement, Iron and Steel and Chemical Industry Specification for Limestone

Constituents	Cement Industry (Specification)	Iron and Steel Industry (Specification)			Chemical Industry BIS Specifications (1S:3204-1978, Reaffirmed-2003)			
					Requirement in percent by mass for			
		BF Grade	SMS- OH Grade	SMS- LD	Calcium carbide	Bleaching Powder	Caustic soda	Sugar

CaO (Min.)	44% (Min.) to 48% (Max)	42% (Min.)	48% (Min.)	52% (Min.)	54.0	54.0	53.0	50.0
MgO	3.50% (Max.)	4%	3%	2%	0.8	2.0	1.0	1.0
SiO ₂ (Max.)	16 % (Max.)	9%	4%	1%	1.0	0.75	-	2.0
Fe ₂ O ₃	2% (Max.)				0.25	0.15	-	-
Mn ₂ O ₃	--	--	--	--	-	0.06	-	-
CO ₂ (Min.)	--	--	--	--	42.00	42.00	42.00	41.00
Loss on Ignition	--	--	--	--	46.00	46.00	46.00	44.00
S (Max.)	--	--	--	--	0.10	-	-	-
P (Max.)	--				0.01	-	-	-
Al ₂ O ₃ + Fe ₂ O ₃	2%				0.50	-	-	1.5
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃	--	11.5% (Max.)			-	-	3.0	-
Acid Insoluble			6.5% (Max.)					

CHAPTER – 25

25.0.0 CERTIFICATE FROM THE QUALIFIED PERSON WITH NAME, DATE AND SIGNATURE

This is to certify that geological report has been prepared in respect of Preliminary Exploration Report (G3 stage) for Limestone in Revuru Block, District: Suryapet, Telangana. The report was prepared by Mineral Exploration and Consultancy Limited (MECL) on behalf of the National Mineral Exploration and Development Trust (NMEDT). The report adheres to the Minerals (Evidence of Mineral Contents) Rules, 2015, as specified under the Mineral Auction Rules, 2015 and amended up to 2021.

NAME: SHRIKANT SHARMA

DESIGNATION: HOD (EXPLORATION)

DATE: 31-03-2026

REFERENCES

1. The earliest geological account of Palnad Sub-basin was documented by William King (1872).
2. Geological Report on Preliminary Exploration (G3) for Limestone in Sulthanpur Block, Saiddulnama and Pasupalabodo blocks in Suryapet District of Telangana.
3. Geological report by TSMDC for limestone blocks in Telangana with special reference to the Ramapuram Cluster 5 and Dondapadu Cluster 6 explored by TSMDC through NMET funding and these blocks are located North and South of the proposed block respectively. The GR were submitted in Jan 2020
4. MSTC E commerce Website
5. Demographic and population data from Census India.

ABBREVIATIONS USED

SL. No.	Abbreviation	Full form
1	MECL	Mineral Exploration and Consultancy Limited
2	GSI	Geological Survey of India
3	CGWB	Central Ground Water Board
4	CPSE	Central Public Sector Enterprises
5	NMEDT	National Mineral Exploration and Development Trust
6	TCC	Technical cum Cost Committee
7	EC	Executive Committee
8	DMG, TS	Directorate of Mines and Geology, Telangana
9	UNFC	United Nation Framework Classification
10	NMI	National Mineral Inventory
11	DGCO	Directorate General Camp Office
12	NABL	National Accreditation Board for Testing and Calibration Laboratories
13	JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
14	F.S.P.	Field Season Programme
15	MEMC	Minerals (Evidence of Mineral Contents)
16	MMDR	Mines & Minerals (Development and Regulation)
17	NH	National Highway
18	WGS-84	World Geodetic System-84
19	UTM	Universal Transverse Mercator
20	RL	Reduced Level
21	Cu.m	Cubic Meter
22	DGPS	Differential Global Positioning System
23	DMS	Degree Minute Second
24	M / m	Meter
25	mt	Million Tonne
26	Sq. km/sq.km	Square Kilometer
27	M. Sc.	Master of Science
28	M. Sc. (Tech.)	Master of Science in Technology
29	NDDP	Net District Domestic Product
30	mRL	Reduced Level in metre
31	R.F.	Reserve Forest
32	XRF	X-ray Fluorescence
33	ML	Mining Lease
34	CRM	Certified Reference Material
35	MMT	Million Metric Tonnes
36	GGR	Gross Geological Resources
37	NGR	Net Geological Resources
38	Geol. Res. (Mil. tons)	Geological Resources (Million tons)
39	MT	Million Tonnes
40	RQD	Rock Quality Determination
41	PSC	Project Sanctioning Committee