MAR 20100010: COLISEUM

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PART B

ASSESSMENT REPORT

Metallic and Industrial Mineral Permit Number 9308040392

COLISEUM PROSPECT

NTS: 83C

For

FISH CREEK EXCAVATING LTD.

Submitted by

FISH CREEK EXCAVATING LTD.

May 31, 2010

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COLISEUM PROSPECT

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Metallic and Industrial Mineral Permit Number 9306080829

Map of Current Permits and Boundaries

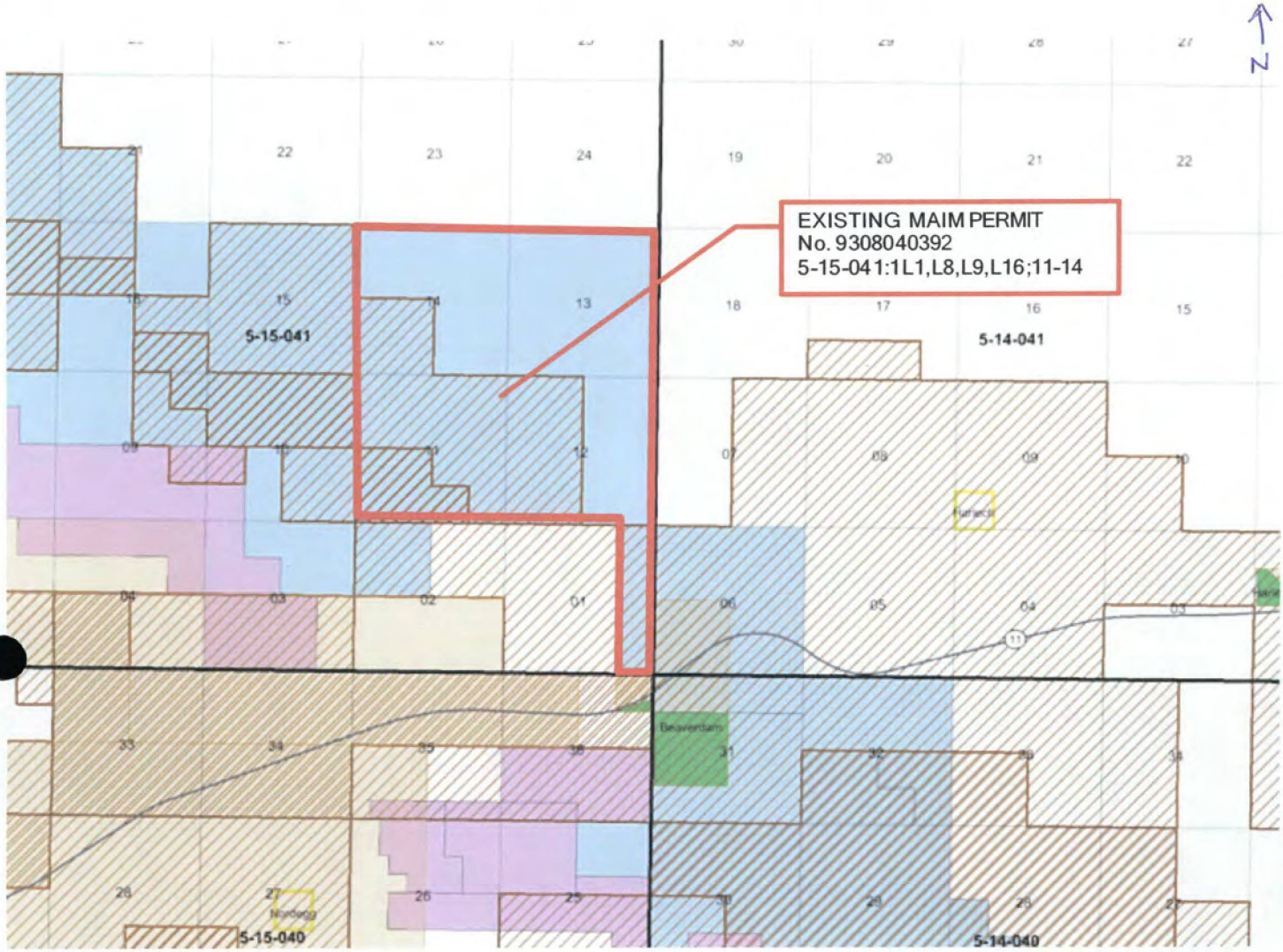

Figure: 1

METALLIC AND INDUSTRIAL MINERALS
PERMIT NO. 9308040392
5-15- 041: 1L1,L8,L9,L16:11-14
W5M

Metallic and Industrial Mineral Permit Number 9308040392

PART B - TECHNICAL REPORT

SUMMARY

Metallic and Industrial Minerals Permit No. 9308040392 Obtained (August 29, 2008)

Exploration performed and grab samples obtained from site April 2010 for Lab testing.

INTRODUCTION

Previous exploration work performed relating to MAIM Permit No. 9306080829 prompted interest in adjacent property to confirm the continuation of a particular rock formation.

An area detailed on a map entitled *Geology of the Nordegg Area* (Figure: 2) showed an potential deposit in 5-14-041: Sec. 6 that contained a formation of rock of particular interest. This formation continues into lands covered be MAIM Permit No. 9308040392. This material again appears identical to high quality aggregate processed and supplied from another quarry in which we have involvement. Site investigation confirmed the existence of a near vertical exposure of rock near Coliseum Mountain. This formation appeared to run in a northwesterly diagonal direction as shown on the Geological map (Figure: 2). Lab testing of samples obtained in this area confirm similar stone properties and composition to other materials we currently provide as construction and landscaping products.

MINERAL ASSESSMENT
EXPENDITURE BREAKDOWN BY TYPE OF WORK

Estimated Expenditure ($2,500.00)

Actual Expenditure ($4,174.50)

Project Name: COLISEUM PROSPECT

AMOUNT

1. Prospecting	$	850.00
3. X-Ray Diffraction / Petrographic Analysis	$	1,905.00
5. Report Preparation	$	1,040.00
SUBTOTAL	**$**	**3,795.00**
6. Administration (up to 10% of subtotal)	$	379.50
TOTAL	**$**	**4,174.50**

[redacted]

June 02 10

SUBMITTED BY (Don Scheurman) DATE

REGIONAL GEOLOGY

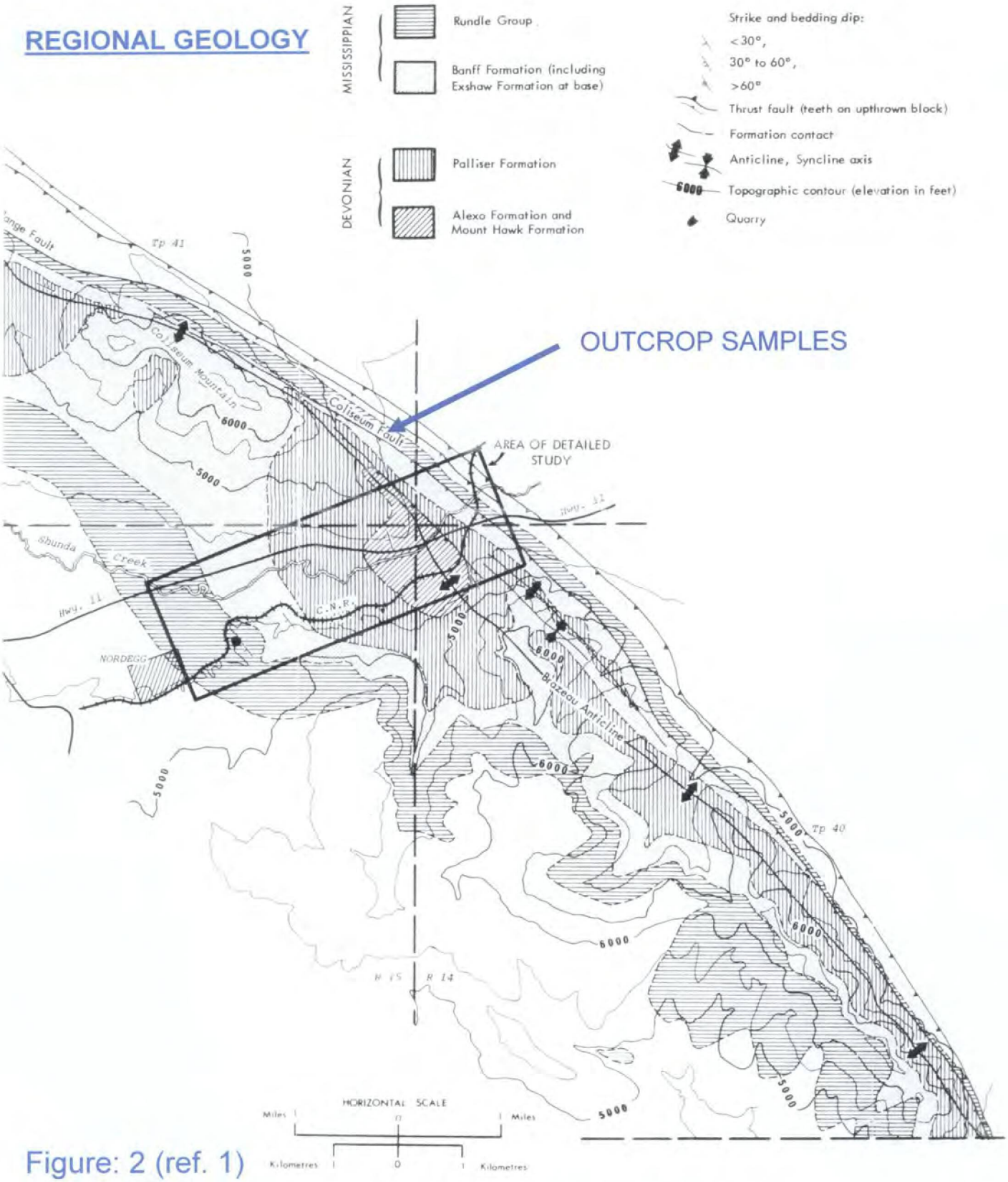

Figure: 2 (ref. 1)

FIGURE 13. GEOLOGY OF THE NORDEGG AREA
(after Erdman, 1950; Douglas, 1956 and 1958)

Metallic and Industrial Mineral Permit Number 9308040392

REGIONAL GEOLOGY

The property included in this Metallic and Industrial Mineral Permit No. 9308040392 lies along the Eastern Slope of the Rocky Mountains in west central Alberta, northeast of the town of Nordegg and is part of the Banff Formation (Mississipian) as indicated in the previous mapping.

Sample #1 Location
N 52deg 30min 30.0sec
W 116deg 01min 33.7sec

Sample #2,#3 Locations
N 52deg 30min 35.75sec
W 116deg 01min 44.18sec

5-15-041: 12

Figure: 3 - Arial Photo of Section 12 shows sampling locations

SITE EXAMINATION

A site visit confirmed the presence of the near vertical formation of high siliceous limestone near the toe of the slope at the S.E. side of Coliseum Mountain. These outcrops were observed in an area where tree blowdown had occurred since the rock formation was covered by a thin layer of soil. (Figure: 4, Figure: 5).

Figure 4:

Photo taken from sample area

looking northwest toward

Coliseum Mountain.

Figure: 5

Photo taken from sample area

looking southeast toward

Highway 11.

COLISEUM PROSPECT - EXPLORATION PROGRAM

Grab samples were obtained from areas of blowdown where topsoil or overburden was thin and outcroppings were exposed. These locations are shown in figures 6,7 below.

Figure: 6 – Sample #2

Near Surface Outcropping

Figure: 7 - Sample #3

Near vertical exposures

under tree roots.

Thin overburden

The samples obtained from this outcropping were taken to the Laboratory for Petrographic Analysis and X-Ray Diffraction.

X-RAY DIFFRACTION

An X-Ray Diffraction analysis of the Coliseum Prospect samples was performed to determine the mineralogy of the deposit. Quantitative measurements indicate the predominant presence of quartz combined with variations calcite and dolomite. The results show that the composition of samples 1 and 2 were similar with a quartz content between 50% to 53%. Sample 3 taken approximately 4 meters west of Sample 2 showed a much higher quartz content (97%). A detailed report is included in Appendix 1.

PETROLOGICAL ANALYSIS

Thin sections were prepared from the Coliseum Prospect samples and analyzed using petrographic analysis to determine the basic mineralogy and texture of the rock. Samples 1&2were described as Dolomitic Siliceous Shale, while Sample 3 was characterized as foraminiferal chert (Highly Siliceous Limestone). The abundance of silica in all samples together with strong compaction (low porosity) strengthen this rock. The properties of this stone are very similar to a product we currently supply as a superior quality construction aggregate and landscaping product.

A copy of this report is included in Appendix 2.

Conclusion

The exploration work performed in Section 12 (Coliseum Prospect) relative to **Metallic and Industrial Mineral Permit Number 9308040392** confirmed the presence of a high quality stone suitable for use in the construction industry. Although the presence of the high quality material was confirmed, additional information acquired through test pit excavation and possibly core drilling may be necessary to determine the extent and quantity of this reserve.

Metallic and Industrial Mineral Permit Number 9308040392

Author Qualifications

I, Don Scheurman, residing at Calgary, Alberta Canada do hereby certify that:

I am the Manager of the Aggregate Division with Fish Creek Excavating Ltd. (7515 – 84 Street S.E., Calgary, Alberta, Canada).

I am a graduate of the University of Lethbridge AB. with a Bachelor of Science Degree and have managed the aggregate division of Fish Creek Excavating Ltd. for the past 25 years.

I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, or the omission to disclose which makes the Report misleading.

[redacted]

Don Scheurman B.Sc.
Aggregate Division Manager
Fish Creek Excavating Ltd.

Signed at Calgary, Alberta, Canada, November 24, 2008

Metallic and Industrial Mineral Permit Number 9308040392

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LIMESTONE RESOURCES OF ALBERTA
M. E. Holter

APPENDIX 1

METALLIC AND INDUSTRIAL MINERAL PERMIT

No. 9308040392

X-Ray Diffraction Report

X-Ray Diffraction Report

Fish Creek Excavating Ltd.

MAIM Permit No. 9308040392

Section 12, 5-15-041

20 May, 2010

Calgary Rock and Materials Services Inc.

Calgary Rock and Materials Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #1 BULK POWDER
FORM: NRDG 01910510

	2 THETA	DENSITY	INTENSITY	FACTOR	WGHT FRACTION	VOL FRACTION
QUARTZ	20.9	2.65	3797	1.00	0.52	0.53
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	159	0.98	0.02	0.02
CALCITE	29.5	2.71	2290	0.78	0.24	0.24
DOLOMITE	30.8	2.84	1553	0.96	0.20	0.19
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	165	0.60	0.01	0.01
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	0	1.30	0.00	0.00
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					1.00	1.00

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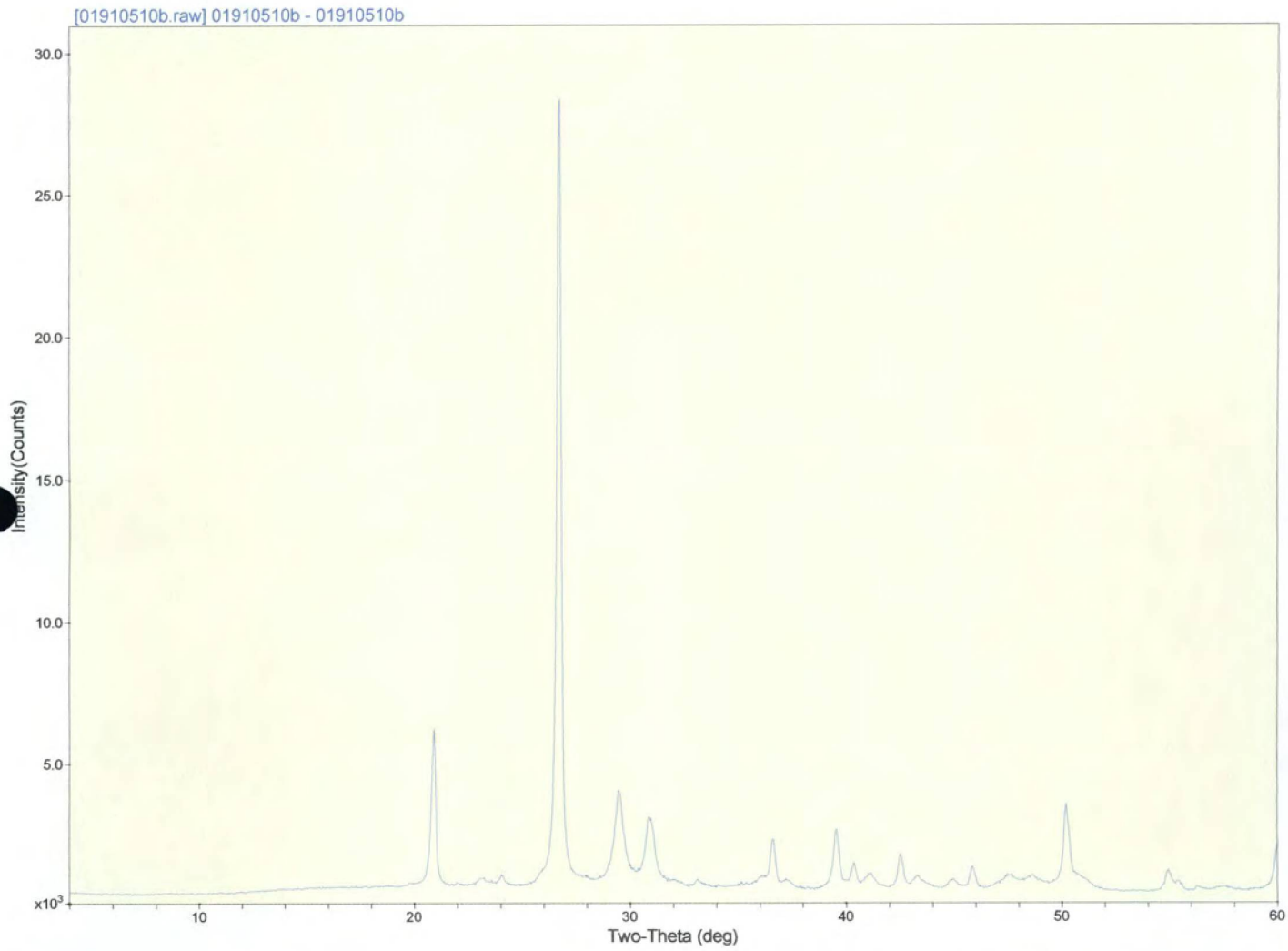

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Calgary Rock and Materials Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #1 CLAY SMEAR < 5 um
FORM: NRDG 01910510

	2 THETA	DENSITY	INTENSITY	FACTOR	WGHT FRACTION	VOL FRACTION
QUARTZ	20.9	2.65	3645	1.00	0.30	0.31
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	130	0.66	0.01	0.01
CALCITE	29.5	2.71	7416	0.78	0.48	0.48
DOLOMITE	30.8	2.84	1989	0.96	0.16	0.15
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	217	0.84	0.02	0.01
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	201	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	46	7.20	0.03	0.03
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

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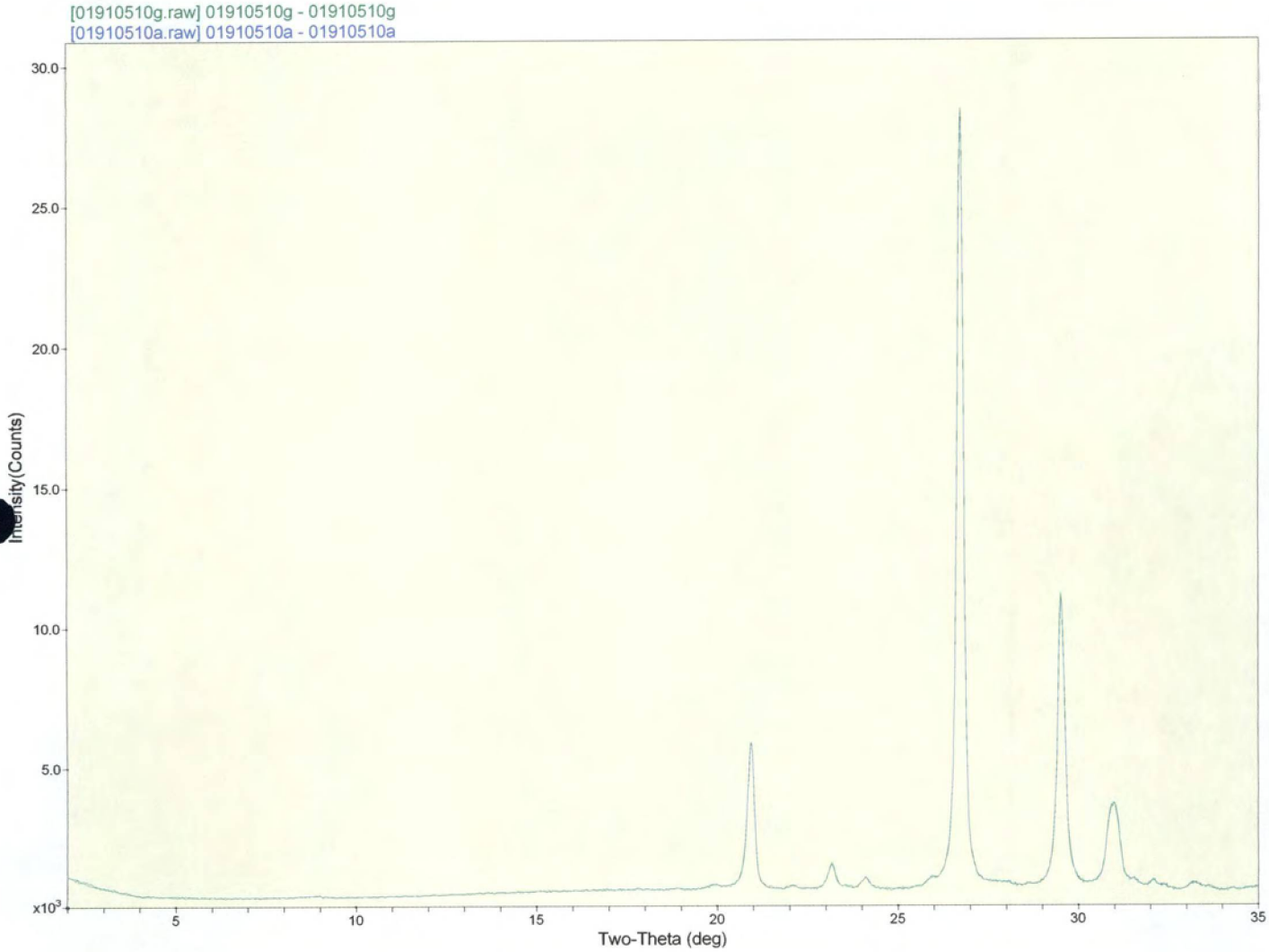

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Calgary Rock and Materials Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #2 BULK POWDER
FORM: NRDG 01920510

	2 THETA	DENSITY	INTENSITY	FACTOR	WGHT FRACTION	VOL FRACTION
QUARTZ	20.9	2.65	4232	1.00	0.48	0.50
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	242	0.98	0.03	0.03
CALCITE	29.5	2.71	724	0.78	0.06	0.06
DOLOMITE	30.8	2.84	3888	0.96	0.42	0.41
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	tr	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	124	0.60	0.01	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	tr	1.30	0.00	0.00
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					1.00	1.00

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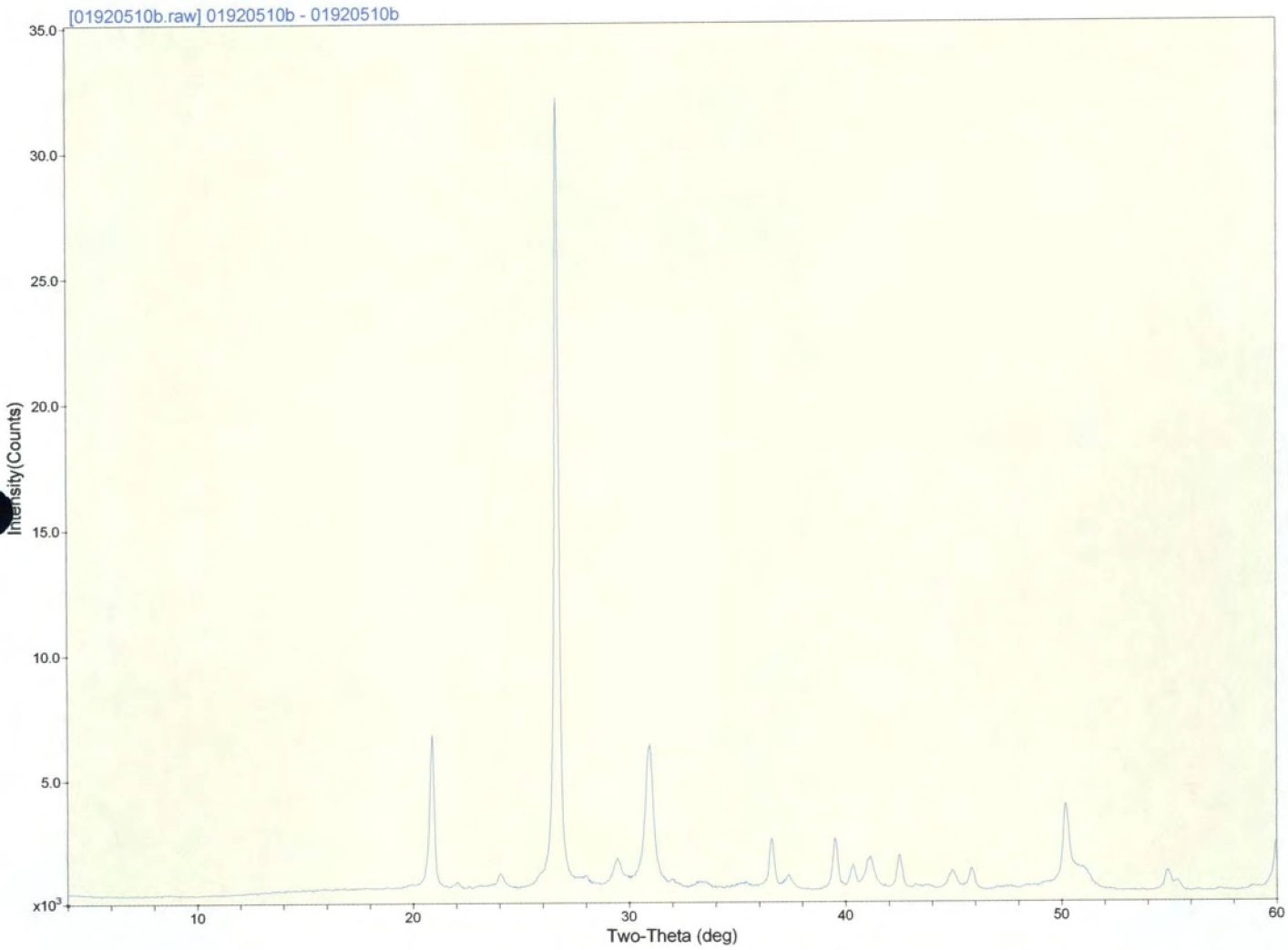

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SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #2 CLAY SMEAR < 5 um
FORM: NRDG 01920510

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QUARTZ	20.9	2.65	4378	1.00	0.35	0.36
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	220	0.66	0.01	0.01
CALCITE	29.5	2.71	2078	0.78	0.13	0.13
DOLOMITE	30.8	2.84	5372	0.96	0.41	0.40
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	212	0.84	0.01	0.01
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	257	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	127	7.20	0.07	0.07
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
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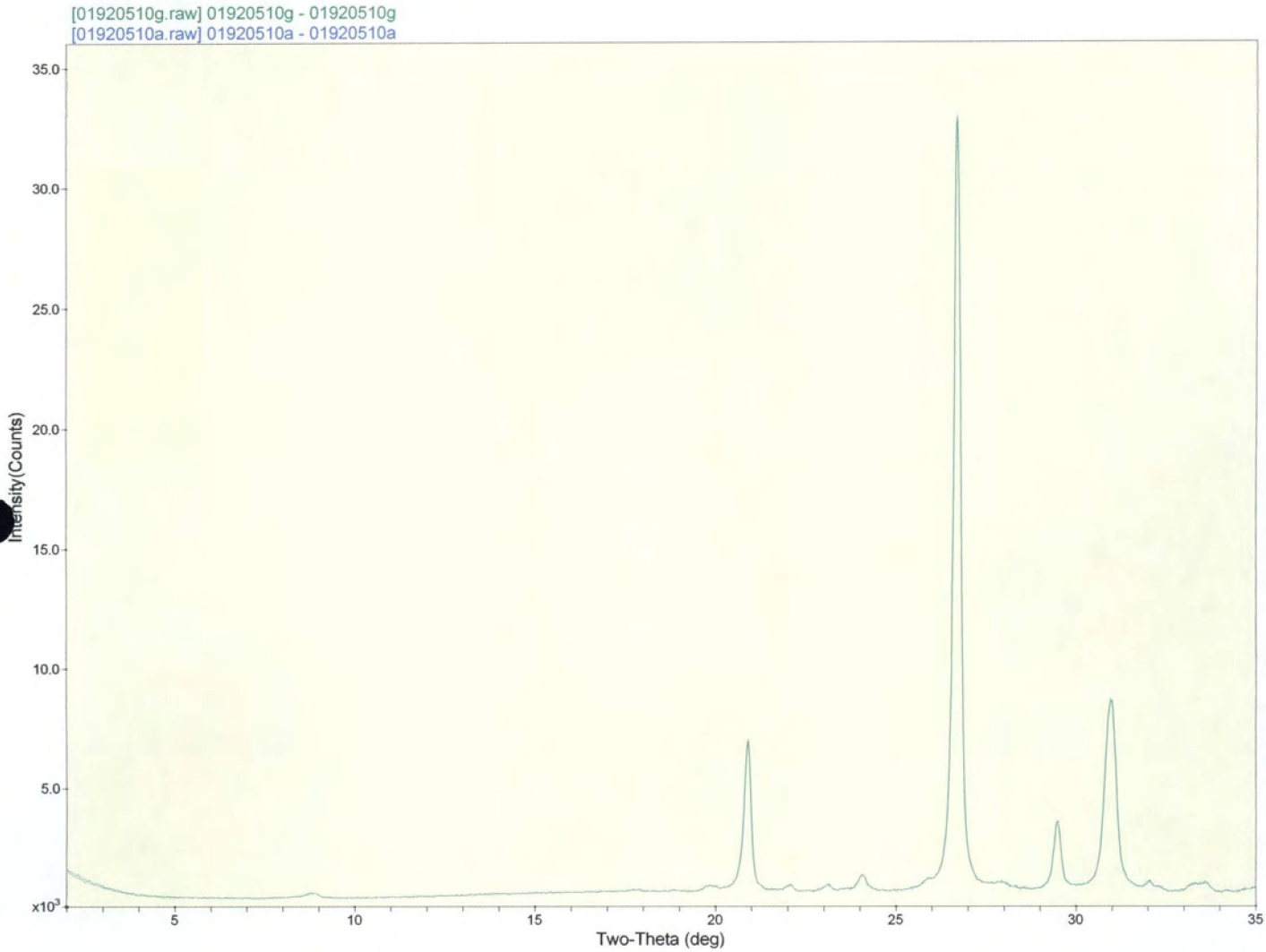

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Calgary Rock and Materials Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #3 BULK POWDER
FORM: NRDG 01930510

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QUARTZ	20.9	2.65	7370	1.00	0.97	0.97
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	tr	0.98	0.00	0.00
CALCITE	29.5	2.71	293	0.78	0.03	0.03
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	0	0.60	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	0	1.30	0.00	0.00
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					1.00	1.00

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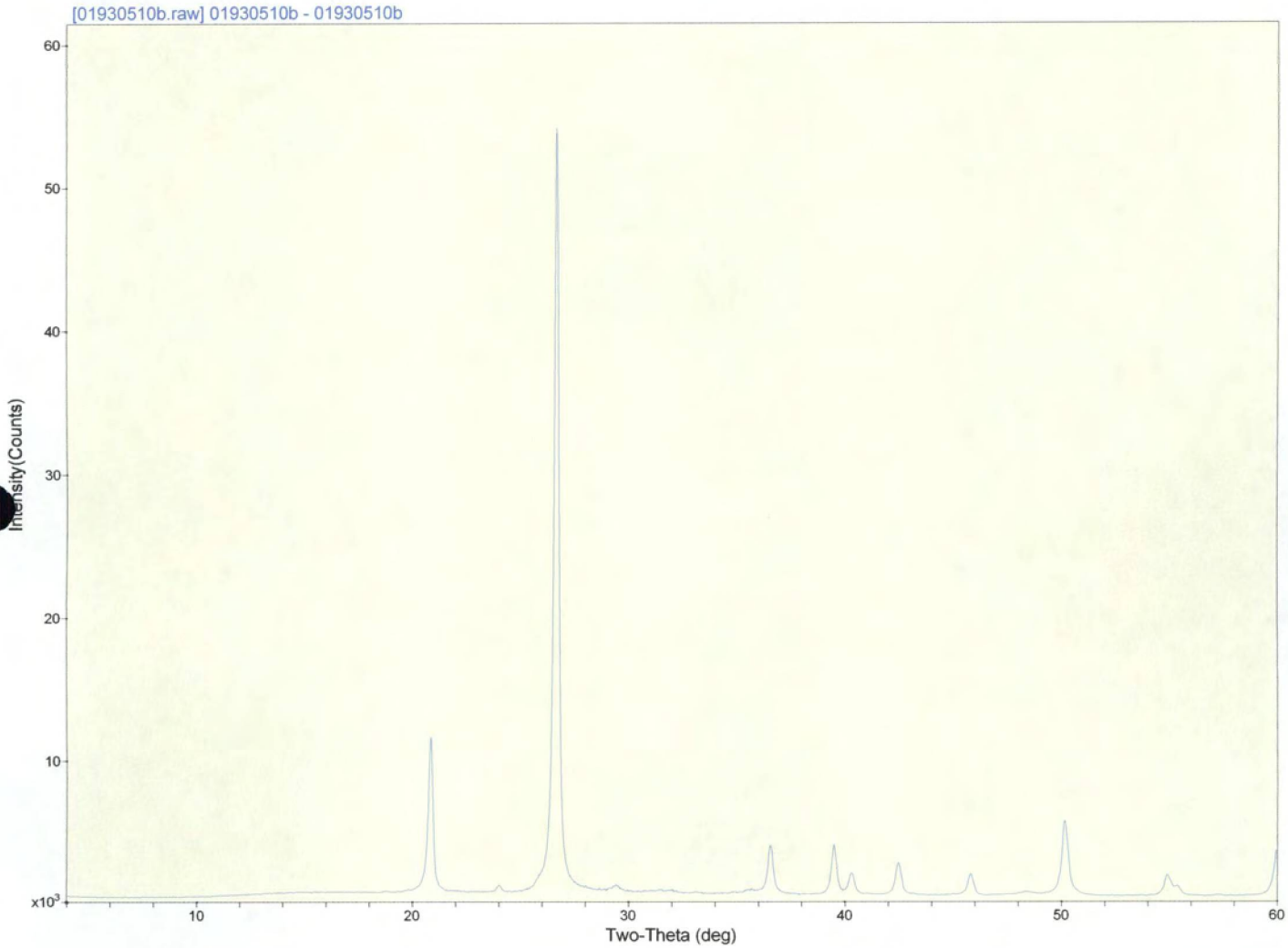

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Calgary Rock and Materials Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: Fish Creek Excavating REQ BY: D. Scheurman
LOCN: Section 12
DEPTH: Sample #3 CLAY SMEAR < 5 um
FORM: NRDG 01930510

	2 THETA	DENSITY	INTENSITY	FACTOR	WGHT FRACTION	VOL FRACTION
QUARTZ	20.9	2.65	8120	1.00	0.74	0.76
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	0	0.66	0.00	0.00
CALCITE	29.5	2.71	775	0.78	0.06	0.06
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	408	0.84	0.03	0.02
APATITE	25.9	3.20	tr	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
MARCASITE	33.2	4.89	244	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	218	7.20	0.14	0.14
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	137	1.00	0.01	0.01
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.73

APPENDIX 2

METALLIC AND INDUSTRIAL MINERAL PERMIT

No. 9308040392

Petrographic Analysis

Petrographic Analysis of Selected Samples from the Nordegg Formation

Fish Creek Excavating Ltd.

25 May, 2010

Calgary Rock and Materials Services Inc.

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INTRODUCTION

The purpose of this study is to evaluate the porosity, permeability, mineralogy, texture and fluid sensitivity issues for three samples from the Nordegg Formation. The study was commissioned by Fish Creek Excavating Ltd.

The thin-sections were produced by impregnating selected core with orasol (blue) dyed epoxy to identify porosity and to prevent delicate structures (e.g. clays) from being destroyed during preparation. The samples were stained with alizarin red S to distinguish calcite and potassium ferricyanide to distinguish ferroan carbonates.

Petrographic results are summarized in Table 1. Described thin-section photomicrographs are presented after the text and petrographic tables.

Listed below (Table A) is a summary of the sample number, lithofacies, formation, rock name, estimated porosity, estimated permeability and reservoir quality for each of the described thin-sections.

TABLE A

Sample Number	Lithofacies	Rock Name	Est. Porosity	Est. Permeability (Kmax)	Reservoir Quality
Sample #1	Litho A	Calcareous Dolomitic Siliceous Shale	up to 1%	<0.001md	poor
Sample #2	Litho A	Dolomitic Siliceous Shale	up to 1%	<0.001md	poor
Sample #3	Litho B	Foraminiferal Chert (Limestone)	1-2% (8-10% locally)	<0.01md (0.08-0.1md locally)	poor

PETROGRAPHIC INTERPRETATION

Petrology and Mineralogy Overview

To evaluate the factors controlling porosity and permeability, fluid-sensitivity issues and reservoir quality within the study wells, petrological and mineralogical information was collected using thin-section analysis assisted by X-Ray Diffractometry (XRD) analysis. Porosity and permeability values are estimated petrographically.

For grain-particle-crystal size the Wentworth Scale was used and is as follows:

Microcrystalline or clay size	<0.004mm	<4μm
Silt size crystalline or silt-size-grained	0.0040-0.0310mm	4-31μm
Coarse silt size crystalline or coarse silt-grained	0.0310-0.0625mm	31-63μm
Very fine crystalline or very fine-grained	0.0625-0.125mm	63-125μm
Fine crystalline or fine-grained	0.125-0.250mm	125-250μm
Medium crystalline or medium-grained	0.250-0.500mm	250-500μm
Coarse crystalline or coarse-grained	0.500-1.000mm	500-1000μm
Very coarse-grained	1.000-2.000mm	1000-2000μm

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PETROGRAPHIC DESCRIPTIONS

Two distinct lithofacies were identified within the samples provided for this study. Lithofacies A is identified as a Calcareous Dolomitic Siliceous Shale to Dolomitic Siliceous Shale and Lithofacies B is identified as a Foraminiferal Chert (Limestone).

1.0 Lithofacies A

Thin-section photomicrographs are illustrated in TS Plate 1 – 2 and Overview Plate 1 – 2. The petrographic summary for each is found in Table 1. Lithofacies A is identified as a Calcareous Shale to Calcareous Dolomitic Shale. It is composed of predominantly clay-sized minerals with a subordinate silt fraction.

The two samples that represent Lithofacies A are similar mineralogically but differ texturally. TS1 displays weak laminations (see Overview Plate 1) compared to TS2 which has been significantly bioturbated (see Overview Plate 2).

Mineralogically, this facies is composed predominantly of quartz (46-54%), dolomite (19-41%) and calcite (6-24%). Minor amounts of carbonaceous material, marcasite and clay minerals are also noted.

Lithofacies A is divided into four fractions: the precipitate fraction, the silt fraction, the clay mineral fraction and the carbonaceous fraction.

1.0.1 Precipitate Fraction

The precipitate fraction represents the bulk of the total rock composition of Lithofacies A. Microcrystalline and cryptocrystalline silica (i.e. quartz) accounts for approximately 41-46% of the total rock component. Although some of the quartz included in this fraction may be detrital but too small to be determined petrographically, it is most likely that a majority of the silica is cement.

Dolomite accounts for 19-41% of the total rock component and is most frequently observed as microcrystalline dolomite. The dolomite often appears light to medium brown in transmitted light due to carbonaceous material and other fines trapped in the between the crystals. Minor amounts of silt-size to very-fine sand-sized euhedral dolomite rhombs are observed scattered throughout the facies (see TS Plate 1, Image M-4 to O-5). Dolomite displays high interference colors in cross-polarized light which are frequently displayed as pastel-colored, occasionally vibrant when crystal size is small.

Calcite accounts for 6-24% of the total rock component. Calcite is easily distinguished by the distinct red coloration it displays due to staining (see TS Plate 1, Image D, E-5 to H-6). The majority of the calcite appears to be relict bioclastic fragments but any distinguishing features have been subsequently obliterated during diagenesis.

1.0.2 Silt Fraction

Approximately 8-10% of the rock is composed of silt-size quartz and plagioclase feldspar grains. The true ratio of silt may be higher but the fine grain size and the interference from other fines within the rock obscure the majority of the grains. Visible grains are predominantly very-fine to medium silt-sized quartz grains with occasional coarse-silt grains noted.

Both quartz and plagioclase feldspar are colorless minerals in transmitted light and they both display low (first order) interference colors. They are very difficult to distinguish from each other when grain size is small. Grain boundaries are frequently obscured by the abundance of carbonaceous material, clay minerals and other fines. The abundance of silica cement also makes distinguishing the quartz grains from the surrounding matrix difficult.

1.0.3 Clay Mineral Fraction

Clay minerals account for less than 1% of the overall rock component. The types and amounts of clay minerals present were determined with X-Ray Diffractometry (XRD).

1.0.4 Carbonaceous Fraction

Carbonaceous material is estimated to account for less than 3% of the total rock composition. It is likely responsible for the overall brown coloration of the rock.

1.2 Porosity and Permeability Controls and Distribution

Porosity is estimated to be below 1% in Lithofacies A, with permeability estimated to be below 0.001md. Dolomitization is extensive as well as silica cementation. Fractures are not a significant feature in Lithofacies A.

2.0 Lithofacies B

Thin-section photomicrographs are illustrated in TS Plate 3 and Overview Plate 3. The petrographic summary is found in Table 1. Lithofacies B is identified as a Foraminiferal Chert (Limestone). It is dominated by coarse silt to very-fine sand-sized foraminifera (50-70μm) which have been extensively silicified. Part of the rock displayed abundant calcitic bioclastic fragments and what appears to be patchy calcite cement. This feature was absent in other areas of the rock sample where its susceptibility to leaching has formed secondary porosity within the rock.

Lithofacies B is divided into four fractions: the precipitate fraction, the silt fraction, the clay mineral fraction and the carbonaceous fraction.

2.0.1 Precipitate Fraction

The precipitate fraction is composed of microcrystalline to cryptocrystalline minerals that form a bulk of the total rock composition in Lithofacies A.

Lithofacies B has undergone extensive silicification/replacement, particularly within the abundant foraminiferal fragments. The fragments can often be observed with slightly brown centers due to impurities trapped in the chambers and colorless rims that replaced the walls of the bioclast. The silica is often observed in the fibrous form called chalcedony, but occasionally in equigranular forms as well (e.g. chert, megaquartz). Chalcedony can be identified by the radial pattern it displays in cross-polarized light.

Calcite accounts for 8-9% of the total rock component and is concentrated toward the center of the rock sampled. Calcite is easily distinguished by the distinct red coloration it displays due to staining. It is most commonly observed in Lithofacies B as bioclastic fragments and relict calcite within the foraminiferal walls.

2.0.2 Silt Fraction

The silt fraction is essentially negligible in Lithofacies B. Any detrital quartz grains are obscured by the extensive silicification that has taken place in this facies.

2.0.3 Clay Mineral Fraction

Clay minerals were only detected in trace amounts by XRD analysis and were determined to be predominantly illite.

2.0.4 Carbonaceous Fraction

Carbonaceous material is estimated to account for 4-5% of the total rock composition in Lithofacies B. The carbonaceous material is dark brown to opaque, and is commonly observed partially occluding the intergranular pore spaces.

2.2 Porosity and Permeability Controls and Distribution

Porosity is estimated to range between 1% and 2% in the areas of Lithofacies B that contain a significant amount of calcite fragments and/or cement, and up to 10% where calcite has been completely leached. Permeability is likely below 0.01md but may be up to 0.1md in the zone where calcite has been leached. Permeability is strongly dependent on how extensive the leaching of calcite is in comparison to the calcite-rich zone.

FORMATION SENSITIVITY ISSUES

Reduced Relative Permeability

The only significant porosity observed in Lithofacies A and the calcite-rich areas of Lithofacies B is microporosity. Relative permeability is an issue when a second phase is introduced. Permeability (overall) is reduced due to relative permeability issues.

Migration/Mobilization of Fines

Clay minerals and carbonaceous material that is commonly observed between the silicified foraminiferal fragments in Lithofacies B could potentially be mobilized due to high flow rates, which could choke pore-throats reducing permeability.

Acid Sensitivity

The silicified foraminiferal fragments that compose the bulk of Lithofacies 3 are secured predominantly by calcite fragments and/or cement. If they come in contact with acid, the bond between them could weaken which may result in the liberation of fines, potentially choking pore-throats and reducing permeability. Acid should be used with caution.

CONCLUSIONS AND RECOMMENDATIONS

Three samples from the Nordegg Formation were analyzed for this report. The following provides a summary of the controls on porosity, permeability and sensitivity issues:

Lithofacies A: Rock is identified as a Calcareous Shale to a Calcareous Dolomitic Shale composed predominantly of silica and dolomite with minor detrital quartz grains, calcite and clay minerals. Porosity is estimated to range between 1% and 2% with permeability estimated to be below 0.001md. Dolomitization and silica cementation are the main controls on porosity and permeability. Potential sensitivity issues are reduced relative permeability and acid sensitivity.

Lithofacies B: Rock is identified as a Foraminiferal Chert (Limestone). The majority of the rock is composed of extensively silicified foraminiferal fragments and calcitic bioclastic fragments, with a minor amount of clay minerals and carbonaceous material trapped in the interstitial pores. Porosity is estimated to range from 1-2% in the calcite-rich zone and can be up to 10% in the leached zone. Permeability is likely below 0. 01md for the majority of the rock but may reach up to 0.1md in the leached zone depending on how extensive this zone may be. Silicification and dissolution are the main controls on porosity and permeability. Potential sensitivity issues are migration/mobilization of fines

Backscatter electron (BSE) imaging will give a visual presentation of porosity and illustrates textural relationships obscured by the fine grain-size and diagenesis. Standard scanning electron microscopy (SEM) would assist in displaying the dolomite textures and intercrystalline contacts and illustrating the fines observed within the interstitial pore spaces. Supplementary geochemical analysis would also be a benefit to the overall understanding of these samples.

[redacted]

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[redacted]

Raymond Strom, Ch.T.
President
Calgary Rock and Materials Services Inc.

APPENDIX A

Table 1
Petrographic Summary Table

Table 1: Petrography Summary
FISH CREEK EXCAVATING LTD.

Sample Number	Sample #1	Sample #2	Sample #3
Formation	DVRN	DVRN	DVRN
Lithofacies	Litho A	Litho A	Litho B
Rock Name	Calcareous Dolomitic Siliceous Shale	Dolomitic Siliceous Shale	Foraminiferal Chert (Limestone)

Precipitate Fraction

Percentage of Total Rock	88-90%	88-90%	95-96%
Calcite	24%	6%	8-9%
Dolomite	19%	41%	
Marcasite	1%	trace	
Authigenic Silica (e.g. chert)	44-46%	41-43%	85-86%
Siderite	-	trace	-
Phosphate	-	-	-

Silt Fraction

Percentage of Total Rock	8-10%	8-9%	?
Quartz	6-8%	5-6%	?
Alkali Feldspar	-	-	-
Plagioclase Feldspar	2%	3%	?

Clay Mineral Fraction

Percentage of Total Rock	trace	<1%	trace
Illite	trace	<1%	trace

Carbonaceous Fraction

Percentage of Total Rock	2%	2-3%	4-5%

Pore Types

Intergranular/Intercrystalline	trace (micro)	trace (micro)	trace (micro) / minor
Secondary Porosity	-	-	common
Fracture	-	-	-

Reservoir Quality

Est. Porosity %	up to 1%	up to 1%	1-2% (8-10% locally)
Est. Permeability Kmax (md)	<0.001md	<0.001md	<0.01md (0.08-0.1md loc.)
Reservoir Quality	poor	poor	poor

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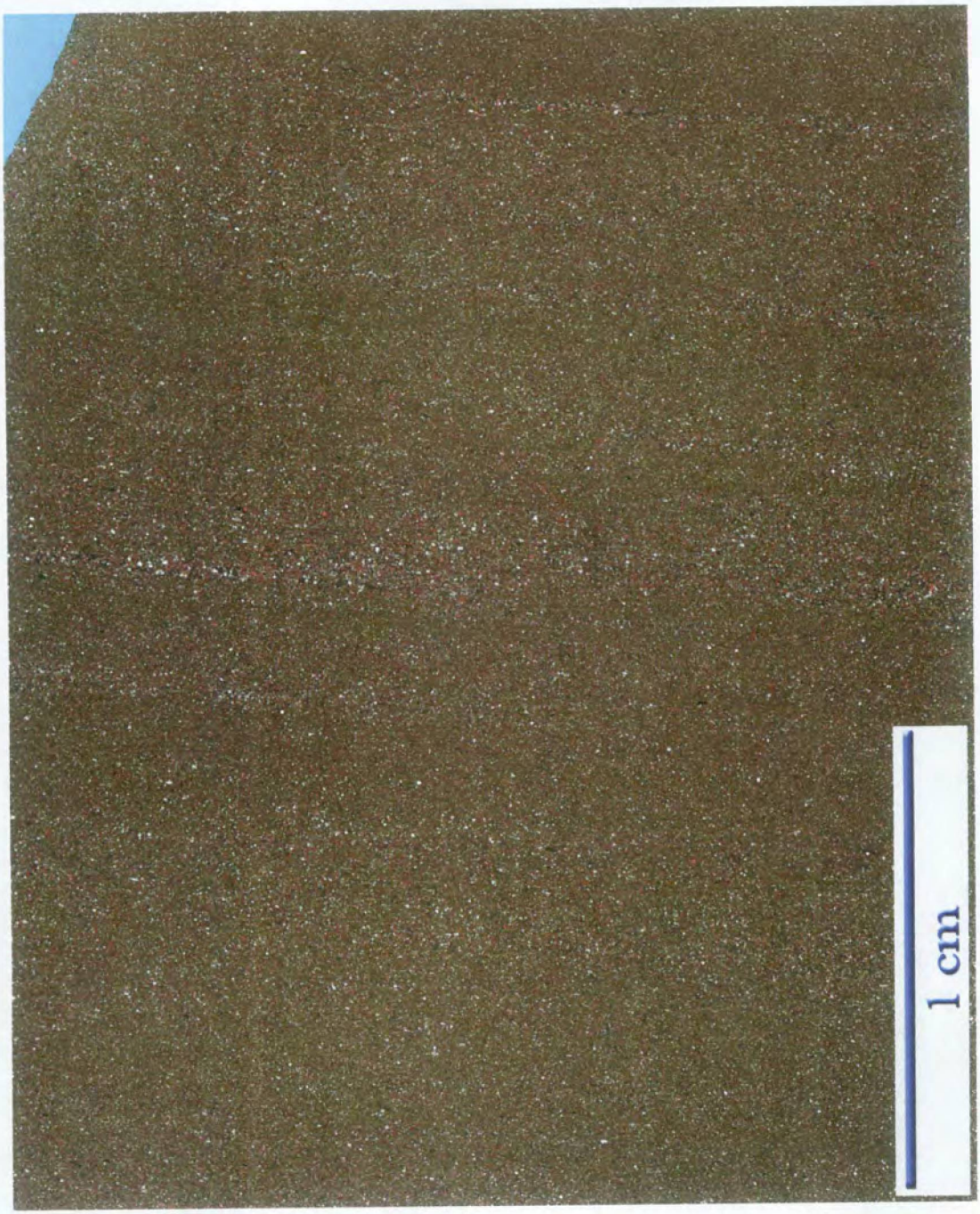
APPENDIX B

Overview 1 – 3
Thin-Section Overview Plates

TS Plate 1 – 3
Described Thin-Section Micrographs

OVERVIEW Plate 1

NORDEGG



Porosity: <1%
Kmax: <0.001md

SAMPLE #1

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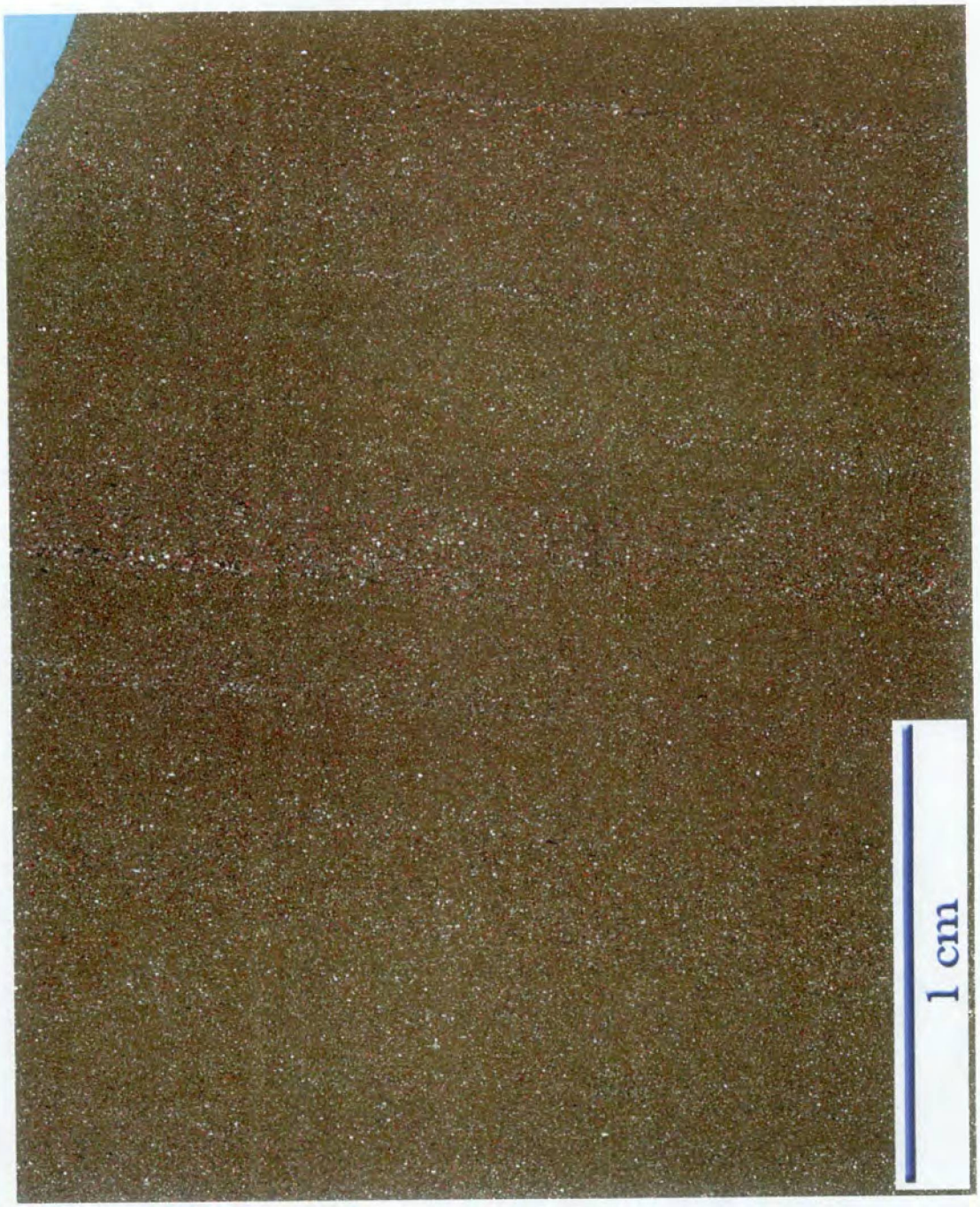
OVERVIEW Plate 1

NORDEGG



Porosity: <1%
Kmax: <0.001md

SAMPLE #1

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OVERVIEW Plate 2

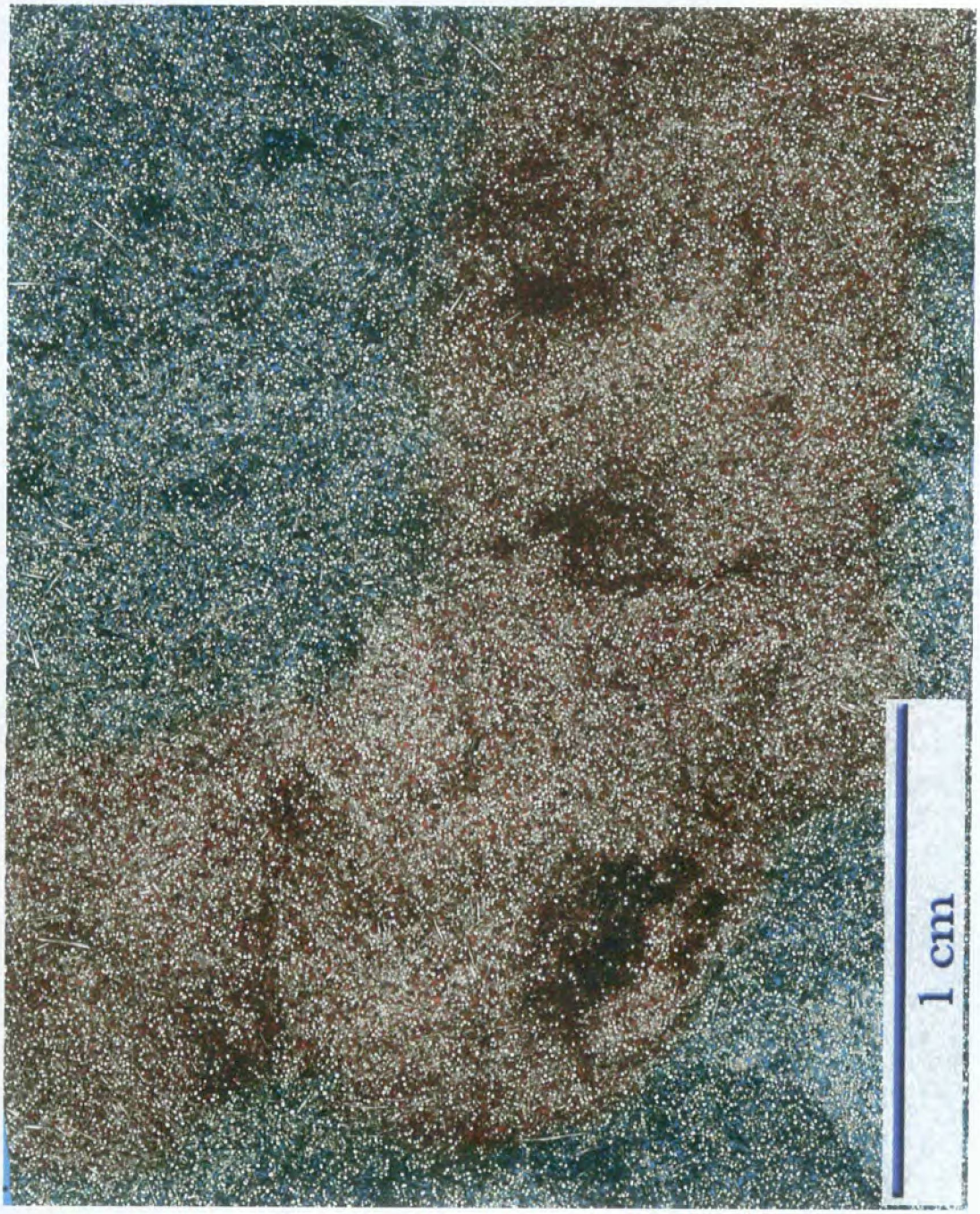
NORDEGG

Porosity: <1%
Kmax: <0.001md

SAMPLE #2

Calgary Rock and Materials Services Inc.

NORDEGG



Porosity: 1-2% (8-10% locally)
Kmax: <0.01md (0.08-0.1md locally)

SAMPLE #3

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Plate TS1

THIN-SECTION PHOTOMICROGRAPHS

NORDEGG FORMATION

A. Sample #1 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 500µm Scale)

Image A is a low magnification view of Lithofacies A. This view illustrates the generally homogeneous nature of the rock. TS 1 displays minor weak laminae which are best observed in the overview image.

B. Sample #1 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 200µm Scale)

Image B is a higher magnification view of Image A. Note the orientation of the minerals is more evident at this magnification which is mainly due to the platy carbonaceous material.

C. Sample #1 Est. Porosity: <1% Est. Kmax: <0.001md (XPL, 200µm Scale)

Image C is the same view as Image B, but in cross-polarized light.

D. Sample #1 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 100µm Scale)

Image D is a high magnification view. The minor amount of opaque material visible is carbonaceous material which is also likely responsible for the brown coloration of the rock. Carbonaceous material accounts for an estimated 2% of the total rock component at this depth.

TS Plate 1

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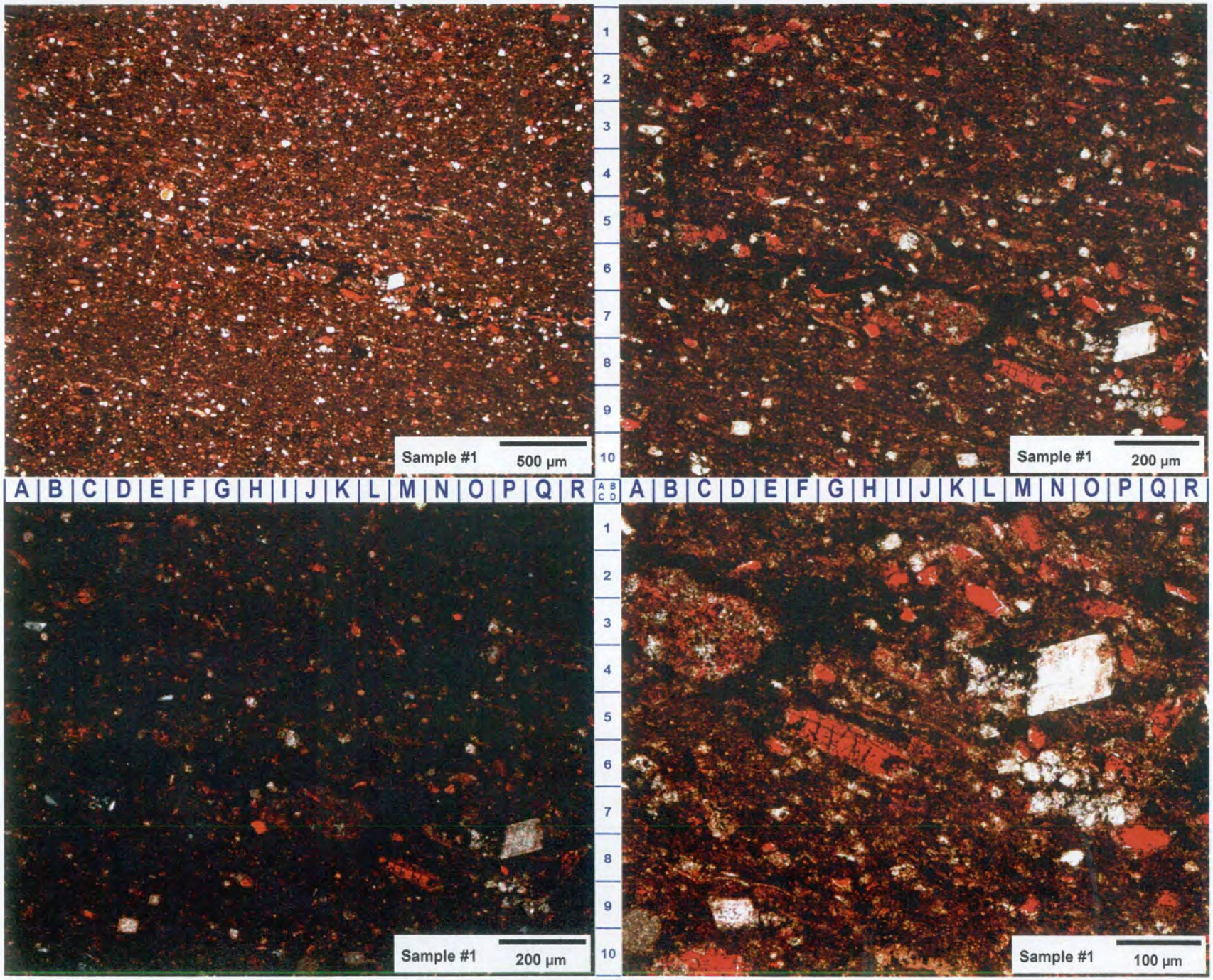

Plate TS2

THIN-SECTION PHOTOMICROGRAPHS

NORDEGG FORMATION

A. Sample #2 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 500µm Scale)

Image A is a low magnification view of Lithofacies A. This view illustrates the generally homogeneous nature of the rock, similar to that in TS1 but TS2 has been extensively bioturbated which is most evident in Overview Plate 2.

B. Sample #2 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 200µm Scale)

Image B is a higher magnification view of Image A.

C. Sample #2 Est. Porosity: <1% Est. Kmax: <0.001md (XPL, 200µm Scale)

Image C is the same view as Image B, but in cross-polarized light.

D. Sample #2 Est. Porosity: <1% Est. Kmax: <0.001md (PPL, 100µm Scale)

Image D is a high magnification view.

TS Plate 2

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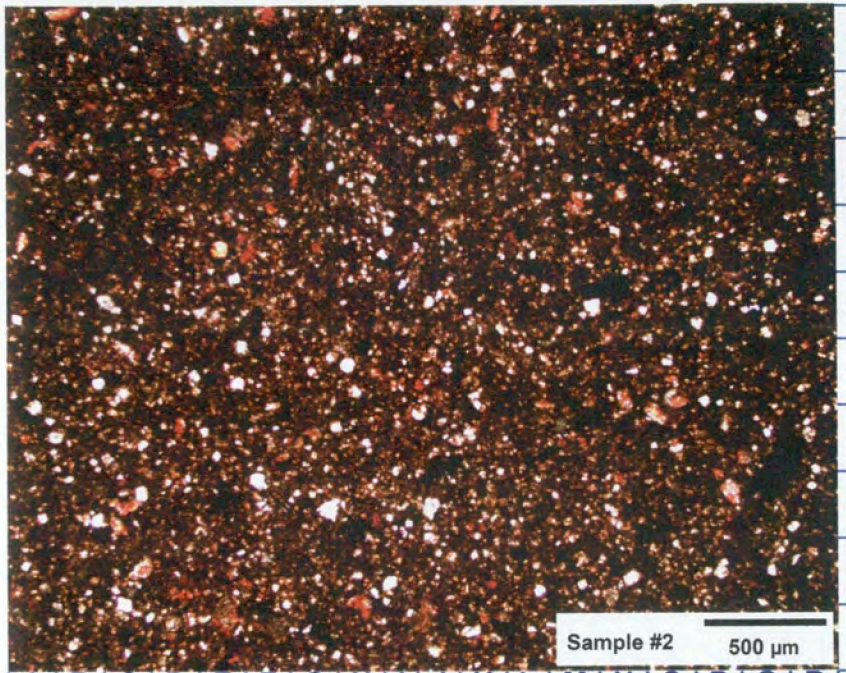

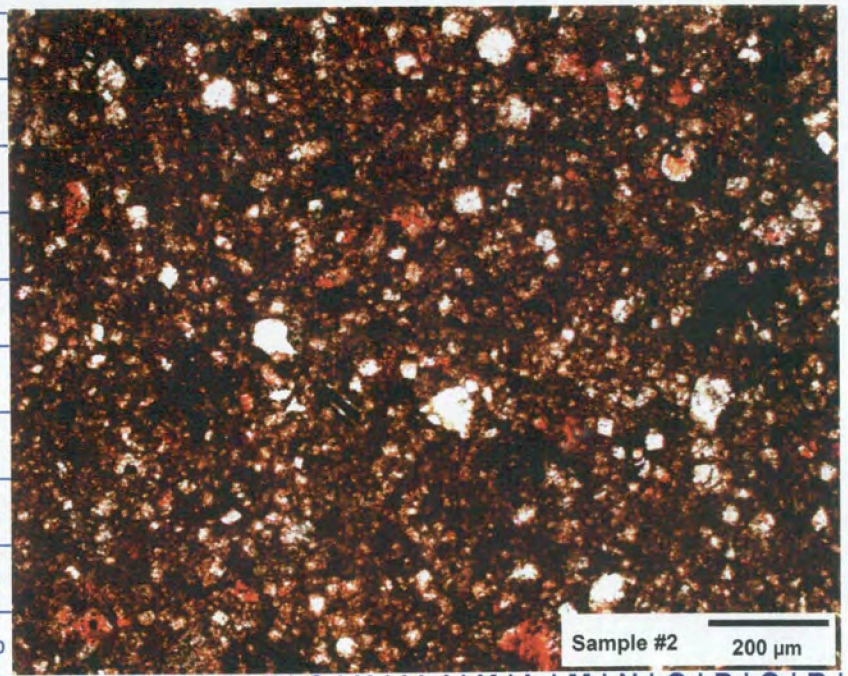

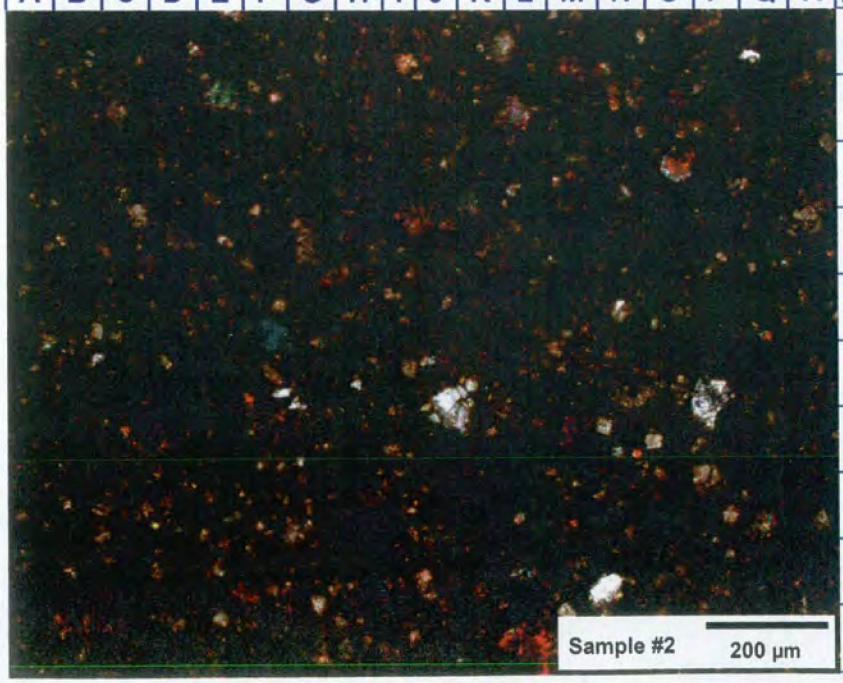

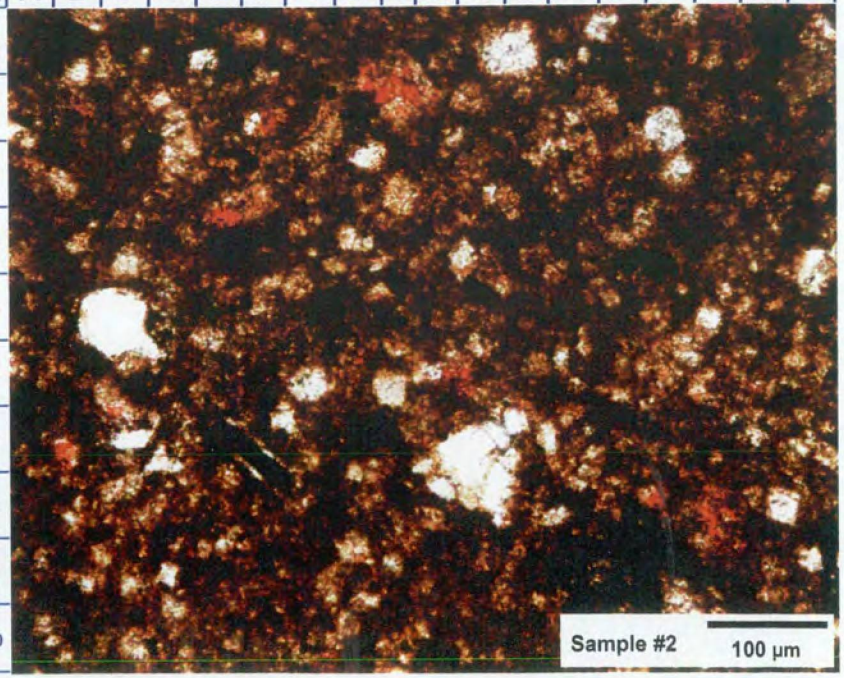

Plate TS3

THIN-SECTION PHOTOMICROGRAPHS

NORDEGG FORMATION

A. Sample #3 Est. Porosity: 1-2% Est. Kmax: <0.01md (PPL, 500µm Scale)

Image A is a low magnification view of Lithofacies B. The majority of the rock is composed of silicified foraminiferal fragments (colorless) with minor calcitic bioclastic fragments (red).

B. Sample #3 Est. Porosity: 1-2% Est. Kmax: <0.01md (PPL, 200µm Scale)

Image B is a higher magnification view of Image A.

C. Sample #3 Est. Porosity: 1-2% Est. Kmax: <0.01md (XPL, 200µm Scale)

Image C is the same view as Image B, but in cross-polarized light.

D. Sample #3 Est. Porosity: 1-2% Est. Kmax: <0.01md (PPL, 100µm Scale)

Image D is a high magnification view. Note the dark centers and light rims to the rounded silicified foraminifera. The darker centers represent the cavities within the forams and would have contained impurities, while the rims represent the walls of the forams.

TS Plate 3

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