KIDD CREEK MINES LTD.

GEOLOGICAL REPORT

HOPKINS BAY CLAIM GROUP

NTS: 52-C-11

RECEIVED
MAR. 24, 1986
MINING LANDS SECTION

March, 1986
M.G. Morrice
SUMMARY AND CONCLUSIONS

This report summarizes results from a geological mapping program undertaken in the Hopkins Bay Area of Rainy Lake, northwestern Ontario, August 25-28, 1986.

The Hopkins Bay Claim Group is underlain by a NE-trending, NW-dipping sequence of metavolcanic and metasedimentary rocks which is intruded by quartz monzonite and granite.

Sulphide mineralization on the Hopkins Bay Claim Group is most common as disseminated pyrite and pyrrhotite in banded iron formation.
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INTRODUCTION

The Hopkins Bay Claim Group comprises 4 contiguous claims (K.839335-839338) in Watten Township, 20 km. northeast of Ft. Frances, northwestern Ontario (Figures 1,2). These claims were staked in January, 1985 to encompass two airborne EM anomalies (OGS, 1980).

The present report summarizes results from geological mapping conducted from August 25-28, 1986. Access to the property is via cottage access roads which lead from the Hopkins Bay Rd., a major access road which connects with Provincial Highway 11. Mapping, at a scale of 1:2400, was done directly on air photograph enlargements. Efforts were made to visit all outcrops on the property. With the exception of late granitic and pegmatitic intrusions all rocks have been metamorphosed; none retain their primary mineralogy. Therefore, for the sake of brevity, the prefix "meta-" has been omitted and will be used only in the general sense, as for example, metavolcanic or metasedimentary.

S. Baillie was responsible for the mapping of the Hopkins Bay Claim Group. She was assisted capably in the field by T. Tennent. The present author offered advice periodically, including a visit in the field.
PREVIOUS WORK

The Rainy Lake area is one of the classic areas of Archaean geology. Lawson (1913) first mapped this area for the Geological Survey of Canada at a scale of 1:63,360. Subsequently, Harris (1974) mapped the Rice Bay Dome and surrounding area at a scale of 1:31,680 for the Ontario Department of Mines (now Ontario Geological Survey). Recently, Poulsen (1984) synthesized the structure and metallogenesis of the Ft. Frances-Mine Centre greenstone belt. The area underlain by the Hopkins Bay Claim Group is included on Map 80496 of the AEM survey of the Atikokan-Mine Centre Area conducted by the Ontario Geological Survey (OGS, 1980).

The only reported indication of sustained exploration activity on the Hopkins Bay Claim Group are trenches at a molybdenite occurrence along the powerline which crosses the property (Harris, 1974). We were not able to locate these trenches during the present program.
The Hopkins Bay Claim Group occurs in the Ft. Frances-Mine Centre greenstone belt, a westward thickening wedge of metavolcanic, metasedimentary and plutonic rocks which is sandwiched between the Wabigoon Subprovince to the north and the Quetico Subprovince to the south. The boundaries of the greenstone belt are defined to the north by the Quetico Fault and by the Seine River-Rainy Lake Fault to the south.

The claims occupy part of the northwest flank of a prominent structural feature, the "Rice Bay Dome" (Lawson, 1913; Harris, 1974; Poulsen, 1984). The Rice Bay Dome comprises a core of quartzofeldspathic gneisses which are flanked by schistose metavolcanic and metasedimentary rocks. Until very recently the structural superposition of flanking units overlying the core of the dome was interpreted to indicate a stratigraphic younging direction away from the core region (Lawson, 1913; Harris, 1974). However, Poulsen et al, (1980) demonstrated that stratigraphic facing directions on the east flank of the dome are towards the centre of the dome, that is the domal sequence is overturned. Kidd Creek's work on the dome's west flank indicate facing directions are away from the centre of the dome; it appears that the flanking metavolcanic and metasedimentary sequence is folded tightly.
LITHOLOGIC DESCRIPTIONS

Introduction

The Hopkins Bay Claim Group is underlain by a NE-striking, NW dipping sequence of metavolcanic, metasedimentary and plutonic rocks. Rocks retain metamorphic mineral assemblages which indicate they have been elevated to amphibolite grade metamorphism. All rocks have a well-developed penetrative fabric. This foliation, parallel to local bedding and the regional trend of lithologic units, trends at 230-250 degrees and dips 70-85 degrees northwest.

The Hopkins Bay Claim Group is underlain by an interlayered sequence of mafic to intermediate volcanic rocks, epiclastic sedimentary rocks, and oxide facies iron formation. This sequence has been intruded by the quartz monzonite phase of the mafic-intermediate Rocky Islet Bay Complex (Harris, 1974). Late granitic sills and dykes occur locally throughout the property (Figure 3).
Mafic Volcanic Rocks (Unit 1)

Mafic volcanic rocks crop out in the southwest part of the Hopkins Bay Claim Group. Massive flows and fine volcaniclastic units are distinguished on the map.

Massive mafic flows (1a) are fine to medium grained amphibolites, composed of 35-50% black hornblende, 35-40% plagioclase, 10-30% calc-silicate minerals (epidote) and less than 1% local pyrolene phenocrysts. Outcrops weather medium to dark grey and are dark grey to light green-grey on fresh surfaces. Local, finely banded mafic tuffs (1b) occur interbedded with the massive flows. Layering is defined by 1-30 mm thick bands of variable plagioclase:hornblende ratios and discrete calc-silicate layers. Some tuffaceous units contain minor amounts of rounded 3-15 mm felsic clasts. Plagioclase-phyric flows with up to 20%, 7mm long, plagioclase phenocrysts are a minor constituent of the mafic volcanic unit.

Sulphide mineralization is restricted to trace amounts of disseminated pyrite.
Intermediate Volcanic Rocks (Unit 2)

Intermediate volcanic rocks form a 20-150 metre thick horizon which crosses the middle of the claim group. Intermediate volcanic rocks are bound by mafic volcanic rocks to the southeast, sedimentary rocks to the southwest and felsic intrusive rocks to the northwest. A 2-5 metre thick band of oxide facies iron formation is interlayered with the intermediate volcanic rocks.

The intermediate volcanic rocks are volcaniclastic in origin. They are fine grained and composed of 20% amphibole, 40-50% plagioclase, 20% quartz and 5-10% biotite. Unit 2 rocks are well bedded with bedding thickness ranging from 1 mm to 3 cm. Bedding is defined by variable plagioclase: amphibole ratios.

Iron Formation (Unit 5)

Banded oxide facies (chert-magnetite) iron formation occurs as a discrete layer within intermediate volcanic rocks of the Hopkins Bay Claim Group. The iron formation is 2-5 metres thick and has been traced for 600 metres along strike. This iron formation consists of alternating, 1-3 cm thick, quartz-rich, magnetite-rich and amphibole-rich layers. Some of these layers have been disrupted. The quartz-rich layers most likely represent meta-chert. The
amphibole-rich layers are composed dominately of fine to medium grained black hornblende. Light brown grunerite occurs locally in layers up to 1 metre thick. Sulphide mineralization within this iron formation consists of fine grained disseminated pyrite associated with magnetite-rich layers.

Epiclastic sedimentary rocks (Unit 6)

Epiclastic sedimentary rocks are confined to the southwest corner of the map area. Here a 70 metre thick epiclastic unit pinches out abruptly to the northeast against intermediate volcanic rocks. Two varieties are distinguished; quartz-plagioclase-biotite schist (6c) and polymict conglomerate (6f).

Quartz-plagioclase-biotite schist is fine-grained and contains 30-45% quartz, 30-40% plagioclase, 5-20% biotite and 1-5% garnet. This unit is locally well layered with discontinuous layers averaging 2-10 mm thick. Layering is defined by variable biotite content. The polymict conglomerate is a 3-5 metre thick clast-supported layer comprised of >60% subrounded to rounded clasts. Clasts vary in size from 1.5-20 cm (average: 7cm) and range in composition from mafic to felsic; many are granitic. Mafic volcanic clasts are highly flattened while granitic clasts are relatively undeformed.
Mafic Intrusive Suite (Unit 10)

The porphyritic quartz monzonite phase (10e) of the Rocky Islet Bay intrusion (Harris, 1974) crops out in a northeast-trending sill-like body in the northwest part of the Hopkins Bay map area. It is intimately associated with fine grained late granitic rocks.

The porphyritic quartz monzonite contains 20% feldspar phenocrysts (average 1-1.5 cm long) in a fine grained groundmass of 10-15% biotite, 30-35% plagioclase and 30% quartz. This unit is not foliated.
STRUCTURE

The Hopkins Bay Claim Group encompasses part of the northwest flank of the Rice Bay Dome, a prominent structural feature in the Ft. Frances - Mine Centre greenstone belt. All lithologies except quartz monzonite and granitic rocks in the northwest part of the map area are well foliated. Lithologic units, local bedding and foliation are parallel and trend at 230–250 degrees and dip 70–85 degrees northwest.

METAMORPHISM

The rocks of the Hopkins Bay map area have undergone amphibolite facies, medium grade regional metamorphism. Mafic and intermediate volcanic rocks contain black amphibole. Epiclastic sedimentary rocks are garnetiferous.
Sulphide mineralization occurs most commonly on the property as disseminated pyrite and pyrrhotite in banded iron formation. Pyrite also occurs along fractures within mafic and intermediate volcanic rocks. Molybdenite was reported associated with a granitic sill emplaced in sedimentary rocks along the powerline in the northeast part of the map area. (Harris, 1974). Airborne EM conductors (OGS, 1980) coincide with the oxide facies iron formation.
REFERENCES


APPENDIX I

Qualifications of Martin G. Morrice

Education:  BSc (Hons.)  1969 Dept. of Earth Sciences, University of Winnipeg, Manitoba
            MSc (1974)  Dept. of Earth Sciences, University of Winnipeg, Manitoba
            PhD (1982)  Earth Sciences Board, University of California, Santa Cruz

Work Experience:

1984-1986  Kidd Creek Mines; Toronto, Winnipeg
1983 (6 mo. contract)  Kidd Creek Mines; Vancouver
1981 (summer)  Falconbridge Ltd.; Winnipeg
1978 (summer)  Amax Exploration Ltd.; Vancouver
1973-1977  Centre for Precambrian Studies, University of Manitoba, Winnipeg
1966-1972 (summer)  Mineral Exploration with several mining companies

【signature】

Martin G. Morrice
Ministry of Northern Affairs and Mines

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

Type of Survey(s)
Geological

Claim Holder(s)
Kidd Creek Mines Ltd.

Address
1455 Waverley Street, Unit 1A, Winnipeg, Manitoba R3T 0P7

Survey Company
Kidd Creek Mines Ltd.

Name and Address of Author (of Geo Technical report)
M.G. Morrice, 1455 Waverley Street, Unit 1A, Winnipeg, Manitoba R3T 0P7

Credits Requested per Each Claim in Columns at right

<table>
<thead>
<tr>
<th>Special Provisions</th>
<th>Geophysical</th>
<th>Days per Claim</th>
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</thead>
<tbody>
<tr>
<td>For first survey:</td>
<td>- Electromagnetic</td>
<td></td>
</tr>
<tr>
<td>Enter 40 days. (This includes line cutting)</td>
<td>- Magnetometer</td>
<td></td>
</tr>
<tr>
<td>For each additional survey:</td>
<td>- Radiometric</td>
<td></td>
</tr>
<tr>
<td>using the same grid:</td>
<td>- Other</td>
<td></td>
</tr>
<tr>
<td>Enter 20 days (for each)</td>
<td>Geological</td>
<td>20</td>
</tr>
<tr>
<td>Geochemical</td>
<td></td>
<td></td>
</tr>
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</table>

Man Days

Complete reverse side and enter total(s) here

Airborne Credits

Note: Special provisions credits do not apply to Airborne Surveys.

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Number</th>
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<tbody>
<tr>
<td>K</td>
<td>839335</td>
<td></td>
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<tr>
<td>839336</td>
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<tr>
<td>839337</td>
<td></td>
<td></td>
</tr>
<tr>
<td>839338</td>
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</tbody>
</table>

Total Expenditures

Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Received

MINING LANDS SECTION

KIDNORA MINE DIV.

MINING REGISTRAR

Jan 21 1986

Total number of mining claims covered by this report of work.

824705

Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only

Total Days Credits Recorded

Date Approved by Recorded

Mining Registrar

Date Certified

Certified by (Signature)

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
M.G. Morrice, Kidd Creek Mines Ltd., 1455 Waverley Street, Unit 1A

Winnipeg, Manitoba R3T 0P7

Jan 20/86

Certified by (Signature)
Assessment Work Breakdown

RECEIVED

APR 14 1986

1. Type of Survey: Geological

2. Township or Area: Watten

3. Numbers of Mining Claims Traversed by Survey: K.839335, 839336, 839337, 839338

4. Number of Miles of Line Cut: Flown

5. Number of Stations Established

6. Make and type of Instrument Used

7. Scale Constant or Sensitivity

8. Frequency Used and Power Output

9. Summary of Assessment Credits (details on reverse side)

   Total 8 hour Technical Days (Include Consultants, Draughting etc.): 13

   Calculation

   Technical Line-cutting

   \[ \frac{13 \times 7 = 91}{13} + \frac{0}{1} = \frac{91}{1} \div \frac{4}{1} = 22.75 \]

   Assessment credits per claim

The dates listed on this form represent working time spent entirely within the limits of the above listed claims. Check: X. Check except for Neveu & Schween who worked on other projects during the noted time period.

Dated: April 10, 1986

Signed: [Signature]

Note: (A) * Complete only if applicable.
(B) Complete list of names, addresses and dates on reverse side.
(C) Submit separate breakdown for each type of survey.
(D) Submit in duplicate.
GEOCHEMICAL SURVEY - PROCEDURE RECORD

Numbers of claims from which samples taken:

Total Number of Samples:
Type of Sample: (Nature of Material)
Average Sample Weight:
Method of Collection:
Soil Horizon Sampled:
Horizon Development:
Sample Depth:
Terrain:
Drainage Development:
Estimated Range of Overburden Thickness:

ANALYTICAL METHODS

Values expressed in: per cent □ p. p. m. □ p. b. □

Cu, Pb, Zn, Ni, Co, Ag, Mo, As (circle)
Others:
Field Analysis (tests)
Extraction Method:
Analytical Method:
Reagents Used:
Field Laboratory Analysis
No. (tests)
Extraction Method:
Analytical Method:
Reagents Used:

SAMPLE PREPARATION

Mesh size of fraction used for analysis:

Commercial Laboratory (tests)
Name of Laboratory:
Extraction Method:
Analytical Method:
Reagents Used:

General:

Geophysical CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.
ENTER 20 days for each additional survey using same grid.

SPECIAL PROVISIONS

Type of Survey(s)
Geological

TOWNSHIP OR AREA
Watten Township

CLAIM HOLDER(s)
Kidd Creek Mines Ltd.

SURVEY COMPANY
Kidd Creek Mines Ltd.

ADDRESS OF AUTHOR
Unit 1A, 1455 Waverley St., Wpg., Man.

COVERING DATES OF SURVEY
25/8/85 - 28/8/85

TOTAL MILES OF LINE CUT:

MINING CLAIMS TRAVERSED

List numerically

SPECIAL PROVISIONS

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)
Magnetometer Electromagnetic Radiometric
ENTER 20 days for each survey.

DATE: March 13/86
SIGNATURE:

Res. Geol. Qualifications: 2.8821

File No. Type Date Claim Holder

TOTAL CLAIMS: 4
Mining Lands Section

Control Sheet

File No 2.8973

TYPE OF SURVEY:

- [ ] GEOPHYSICAL
- [X] GEOLOGICAL
- [ ] GEOCHEMICAL
- [ ] EXPENDITURE

MINING LANDS COMMENTS:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Signature of Assessor

S. Hurst

Date

April 16/86
April 10, 1986

J.C. Smith
Mining Lands Section
Whitney Block, 6th Floor
Queens Park
Toronto, Ontario
M7A 1W3

Dear Mr. Smith,

In response to your letters of March 12, 19, and April 2, 1986, I have enclosed a "man-days breakdown" for mining claims K.824705, et al, (File No. 2.8944), claims K.751042, et al, (File No. 2.8945), and claims K.839335, et al, (File No. 2.8973) all in Watten Township. I hope this is satisfactory.

Yours Sincerely,

[Signature]

Martin Morrice
Kidd Creek Mines Ltd
P.O. Box 40
Commerce Court West
Toronto, Ontario
M5L 1B4

Dear Sirs:

RE: Geological Survey submitted on Mining Claims K 839335, et al, in Watten Township

Examination of your geological reports and maps covering the above-mentioned mining claims, reveals that assessment of your requested credits may not be considered using the Special Provisions method. This is due to the lack of substantial and systematic coverage of each claim in your survey.

Credits will be allowed, however, under the Man-day method provided you complete and return the enclosed Man-day breakdown form.

When returning the above, please quote file 2.8973.

For further information, please contact Susan Hurst at (416) 965-4888.

Yours sincerely,

J.C. Smith, Supervisor
Mining Lands Section
Whitney Block, 6th Floor
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

SH/mc

cc: Mining Recorder
Kenora, Ontario
#10-86
Fac1.
March 18, 1986

Ministry of Northern Development
and Mines
Mining Lands Section
Whitney Block, 6th Floor
Queens Park
Toronto, Ontario
M7A 1W3

Dear Mr. D. Kinvis,

As per our telephone conversation of March 18, 1986 regarding the necessary material to complete the assessment requirements for mining claims K 839335, et al., in Watten Township, I have enclosed two copies of the reports and maps. Duplicate copies were shipped from this office on the 14th of March but have obviously not arrived. I trust these will suffice.

Sincerely,

Peter Lougheed
Geologist, Kidd Creek Mines Ltd.

al/PL
March 13, 1986

Kidd Creek Mines Ltd
Unit 1A
1455 Waverley Street
Winnipeg, Manitoba
R3P 0P7

Attention: M.G. Morrice

Dear Sir:

RE: Mining Claims K 839335, et al.,
in Watten Township

We have not received the reports and maps (in duplicate) for the Geological Survey on the above-mentioned claims.

As the assessment "Report of Work" was recorded by the Mining Recorder on January 21, 1986 the 60 day period allowed by Section 77 of the Mining Act for the submission of the technical reports and maps to this office will expire on March 22, 1986.

If the material is not submitted to this office by March 22, 1986 we will have no alternative but to instruct the Mining Recorder to delete the work credits from the claim record sheets.

For further information, please contact Mr. Arthur Barr at (416) 965-4888.

Yours sincerely,

J.C. Smith, Supervisor
Mining Lands Section

Whitney Block, 6th Floor
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

AB/mc
cc: Mining Recorder
MINERALOGY/ALTERATION

Felsic Volcaniclastic Rocks
- anthophyllite
- biotite
- biotite seams
- biotite wisps
- calc-silicate
- chlorite
- cordierite
- epidote
- garnet
- graphite
- hornblende
- potassic metasomatism
- molybdenite
- magnetite
- pyrrhotite
- pyrite
- quartz
- quartz vein
- sericite
- silicification
- sphalerite
- talc
- tourmaline

Granitic and related rocks

Mafic Intrusive Suite
- Diabase
- Gabbro
- Peridotite/pyroxemite
- Porphyritic quartz monzonite

Intermediate Volcanic Rocks

Mafic Volcanic rocks
- Massive flow
- Pillowed flow
- Fine Graded

Epiclastic Sedimentary Rocks
- Quartz-biotite gneiss ("gray gneiss")
- Quartz-biotite gneiss (with quartz eyes)
- Quartz-biotite plagioclase schist
- "Arkosic" quartz-biotite gneiss
- Knotty schist
- Mymict conglomerate

PRECAMBRIAN

SYMBOLS

Geology