Royal Oak Mines Inc.
Timmins-Michie Property
Assessment Report
November 1996 Drill Program

010

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Royal Oak Mines Inc.
December 20, 1996

File name: a:Timmins/reports/timdrillwpd

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Drill Hole Sections (in Pocket)

1.0 Introduction and Summary

In November 1996, a series of four diamond drill holes totalling 1198 metres of BQ core were used to test geophysical and geological targets on the Timmins-Michie Property held by Royal Oak Mines Inc. (5501 Lakeview Drive, Kirkland Washington 98033 USA) under an option agreement from East West Resource Corporation and Cross Lake Minerals and Canadian Golden Dragon Resources Ltd.

The holes were designed to build up the geological database on the property initiated in early 1996 when Royal Oak drilled the first three holes on the property.

The first two holes were drilled on the main IP trend, the dominant geophysical feature on the surveyed portion of the property. This trend lies across the property at an azimuth of about 360° and is centred on Dougherty Lake. Hole TT96-4, at the south end of this feature, and Hole TT96-16, at the north end of it, both cored tuffaceous sediments and argillites similar to those seen in the first three holes drilled on the property. Disseminated sulphide mineralization within the argillites is the probable cause of the IP anomalies tested by these two holes. The final two holes were drilled underneath the massive sulphide and sericite schist zones which are adjacent to a 100m wide diabase dike. Both holes cored mafic volcanic pillow lavas and breccia, which are variably altered with silica, epidote and hematite, and contained intervals of sulphides in stringers and blebs. A total of 313 samples were taken from the drill core and analysed for gold at Swastika Labs.

2.0 Location and Access

The Timmins-Michie property consists of 25 claims in Timmins Township and 11 claims in Michie Township and totals 463 units or about 7328 ha in size. The property is located about 50 km south-east of Timmins and is accessed via the Gibson Lake Road by driving 30km south from Highway 101. Refer to Figures 1 and 2. Table 1 is the claim list for property.

3.0 Previous Work

Previous work on the property includes a 280km grid with complete coverage by a total field magnetic survey completed by East West Resource Corp. in 1994. East West, and later Royal Oak, had IP surveys completed on the central portion of the grid. Three holes were drilled on the property by Royal Oak during December 1995 and January 1996, results of which were detailed in a report written by the author and submitted for assessment credits on May 24, 1996.

Royal Oak Mines Inc.

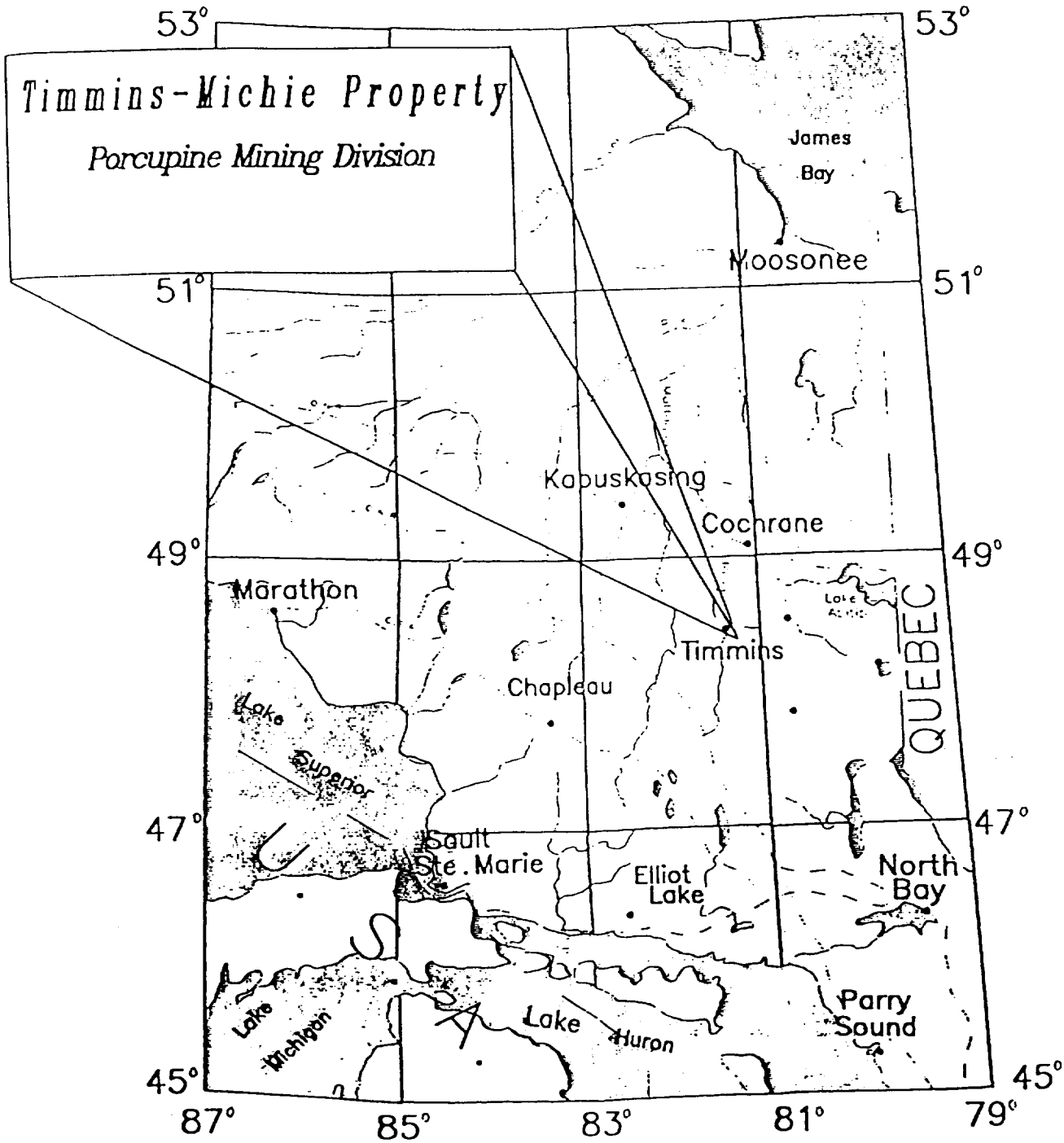
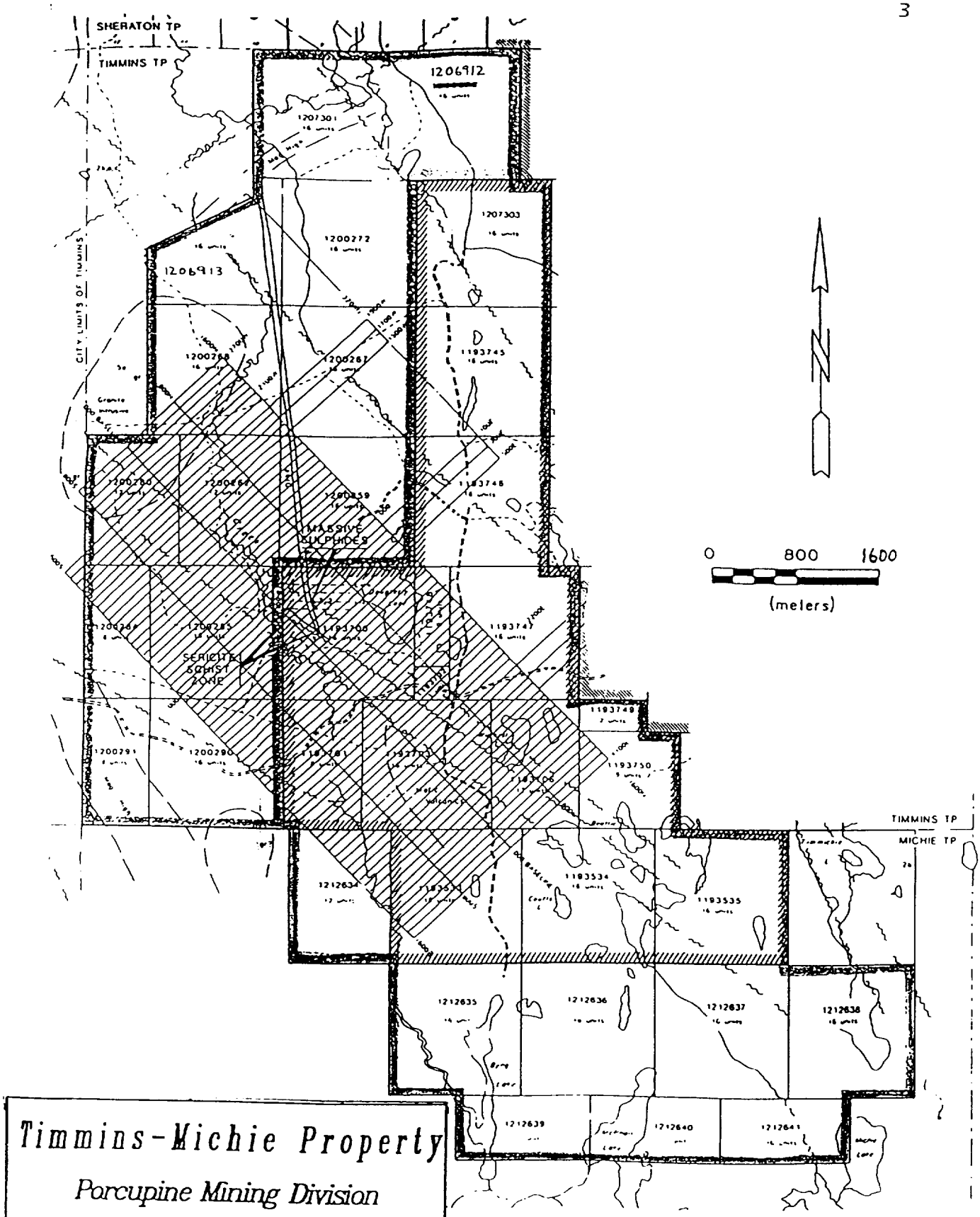


FIGURE 1 LOCATION MAP



Timmins-Michie Property

Porcupine Mining Division

Royal Oak Mines Inc.

American and Toronto Stock Exchanges - Symbol RYO

FIGURE 2 PROPERTY MAP

Table 1 Claim List

Timmins and Michie Townships
50% East West Resource Corporation, 50% Canadian Golden Dragon Resources Ltd.

Claim	Units	Claim	Units
1193700	16	1193748	3
1193701	8	1193749	2
1193702	1	1193750	9
1193703	16	1193533	16
1193706	12	1193534	16
1193745	16	1193535	16
1193746	16	1207303	16
1193747	16		

Total 179 units

Timmins Township
100% East West Resource Corporation

Claim	Units	Claim	Units
1200259	16	1200280	12
1200262	12	1200284	8
1200267	16	1200285	16
1200268	16	1200290	16
1206913	16	1200291	8
1200272	16	1207301	16
1206912	16		

Total 184 units

Michie Township
50% Cross Lake Minerals Limited, 50% Canadian Golden Dragon Resources Ltd.

Claim	Units	Claim	Units
1212634	12	1212638	16
1212635	16	1212639	8
1212636	16	1212640	8
1212637	16	1212641	8

Total 100 units

Grand Total 463 units

4.0 Geology

The property covers about 15km of a 5km wide north-west trending volcanic sequence in Timmins and Michie Townships. The sequence is sandwiched between two granite batholiths and is truncated to the north by a third. North trending diabase dikes obliquely cut the volcanic sequence.

Geological knowledge on the property is hampered by thick overburden. The esker which extends south from Kettle Lakes Provincial Park covers the central and eastern portion of the property with a thick mantle of sand, and the western portion is dominated by spruce and tamarack swamp.

The only significantly large area of bedrock exposure lies south-west of Dougherty Lake on claim 1193700. Here an area about 800m x 400m reveals that the bedrock consists dominantly of mafic volcanics intercalated with felsic volcanics which have been structurally deformed and altered to sericite schists. These sericite schist zones trend at about 300° and dip 70° NE. Trenches and pits dating back several decades expose this geology, and locally quartz veining and semi-massive to massive pyrite within the sericite has been noted. Several diabase dikes trending at 345° are also exposed in this area.

Sediments and mafic volcanics were cored in the three holes drilled by Royal Oak as documented in a report by the author dated May 24, 1996. Sulphide mineralization, consisting of pyrite, pyrrhotite, sphalerite, chalcopyrite and galena were observed in the core occurring in quartz veins and fractures fillings within the sediments.

5.0 November 1996 Drill Program

Commencing on November 4 and finishing November 19 1996, NDS Drilling of Timmins completed four BQ drill holes totalling 1198m to test both geophysical and geological targets. All holes were drilled grid south and collared at -50°.

5.1 TT96-4

The first hole was collared on Line 20+00E at 2+35S to target an IP anomaly between 3+00S and 4+25S. The hole had 76m of sand overburden, and was drilled to a depth of 288.0m.

From 76.0 to 191.3m the hole cored tuffaceous sediments, a chlorite-biotite-garnet schist as was seen in the holes drilled earlier in the year. The sediments were intercalated with argillite from 76.0 to 82.3m, and quartz veinlets containing pyrite, pyrrhotite and sphalerite were noted here. Sulphides are also common as fine dustings on bedding planes through the argillite.

The interval between 191.3 and 205.1m contained lapilli tuff, argillites and chert (exhalite), locally mineralized with disseminated and bedded pyrite. An 8.5m diabase sill was located near the bottom part of this sequence.

The hole ended in tuffaceous sediments similar to those near the top of the hole, but they were silicified and contained feldspar phenocrysts. The probable cause of the IP anomaly is the mineralized lapilli tuff, chert and argillite sequence between 191.3 and 205.1m.

5.2 TT96-16

The second hole drilled was on Line 4+00E at 19+00N, had 85m of sand overburden, and was drilled to 301m.

Bedrock between 85.0 and 136.0m was typical, chloritic tuffaceous sediments. Between 136.0 and 148.4m, the hole cored a crystal tuff, an ash tuff, and a chert exhalite horizon. The tuffs were locally mineralized with pyrite and pyrrhotite stringers, and a 10cm long interval of massive pyrite was cored within the chert exhalite between 148.0 and 148.1m.

From 148.4m to the end of the hole, a thick argillite package was drilled. The argillite was generally well laminated, and variations within it were due to changing amounts of graphite and local silicification. The entire package contained 5-50 % of a 1mm sized white, angular crystalline mineral throughout which gives the unit a "snowflake" texture. This mineral is thought to be some type of a carbonate. Sphalerite mineralization, occurring in low angle quartz veins and fractures, is common throughout the argillite, and is best seen at 167.7-173.4m (a fault zone), 184.0-185.5, and 235.0-255.0m. Chert beds intercalated with the argillite are common between 242.9 and 253.5m, and sphalerite occurs on the chert interbeds at 252.0-253.5m.

5.3 TT96-14

The third hole was drilled on Line 2+00E at 5+10N, at the edge of the area of outcrop south-west of Dougherty Lake, and went to a depth of 311.0m. Historic trenches in the area near Line 1+00E at 4+00N have exposed sulphide mineralization in this area which also has a weak IP response.

The hole cored amygdaloidal pillow lavas to 116.0m, altered with biotite and chlorite, and contained intervals of silicification. Between 116.0 and 118.0m was a sulphide zone, containing stringers and blebs of pyrrhotite and pyrite with a siliceous pillow breccia/fragmental horizon. Below the sulphide zone are amygdaloidal pillow lavas, altered with chlorite, biotite and containing albite phenocrysts. Local variations in this unit between 118 and 231.5m include intervals of 1-5% disseminated pyrite, lapilli tuff, and narrow, fine grained diabase.

Between 231.5 and 241.5m, the pillow lavas are brecciated, and show a strong epidote alteration and contain 2-3% pyrite. Pyrite-epidote "stringers" 1-2cm wide, envelop the fragments. At 237.4 to 240.1m a red fine grained syenite dike cuts the volcanics.

The large, coarse grained diabase observed in outcrop near the historic trenching was cored between 241.5 and 298.6m.

From 298.6 to the end of the hole at 311.0m, the hole cored silica-epidote altered mafic volcanics with trace - 5% pyrite, which is similar to that cored on the north side of the dike.

5.4 TT96-15

The fourth and final hole of the program was collared on Line 3+00E at 1+90N, and collared in the diabase cored in TT96-14.

From 40.9-47.5m, at the "out" contact with the diabase, the hole cored siliceous mafic volcanics with pyrite-epidote stringers similar to that seen adjacent to the diabase in hole TT96-14. The interval from 47.5 to 79.0m had similar, but progressively weaker alteration compared to that seen closer to the diabase. From 79.0m to the end of the hole at 298.0m, the hole cored amygdaloidal pillow lavas, with moderate chlorite-biotite alteration. Intervals of 2-3% disseminated pyrite occur at 100.0 to 103.0m and 121.0 to 128.0m. A narrow feldspar porphyry dike was cored between 203.7 and 204.4m, and an interval of shearing and fault gouge material was seen between 204.4 and 215.0m.

5.5 Assay Results

The drill core was extensively sampled, and in all a total of 313 samples of both sawn core and grab samples were taken from the four holes and sent to Swastika Labs for analysis. Assay results were disappointing, despite significant pyrite and base metal mineralization, the best assay returned from the program was 0.004 opt Au/1.5m from hole TT96-4 at 77.5 to 79.0m.

6.0 Conclusion and Recommendations

The drill program was successful in expanding the geological knowledge of the property and explaining some of the IP anomalies occurring on it. Additionally, two holes were drilled to provide a complete geological section under the historic trenches which expose base-metal and gold mineralization.

Gold assays were disappointing, however the extensive base metal mineralization seen in veins and fracture fillings containing sphalerite and galena within the sediments, along with chert interbeds within these sediments, matrix silicification, and indications of hydrothermal alteration, suggest a nearby base-metal deposit.

Further work is therefore recommended, directed towards locating a base-metal deposit, and would include electromagnetic surveys (ground or airborne), continued IP surveys both north and south of the existing coverage, as well as diamond drilling on selected geophysical targets.

Statement of Qualifications

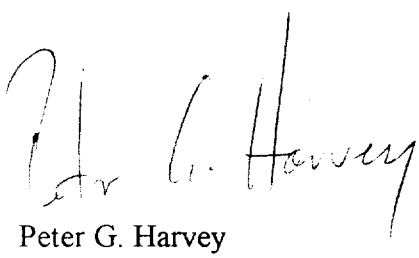
I, Peter G. Harvey, of Timmins, Province of Ontario, do hereby certify that:

1. I received a B. Sc. degree (Honours) in Geology from Lakehead University, Thunder Bay, Ontario, in 1985.

2. I have been employed as a geologist by various mining companies in Ontario since 1985.

3. I am the author of this report.

4. I have no direct interest, nor do I have any shares of any company exploring the properties described in this report, nor on any adjacent properties.



Peter G. Harvey
Project Geologist
Eastern Canada Exploration
Royal Oak Mines Inc.

Appendix

Legend

Drill Hole Plan Maps, Logs and
Assay Certificates

Drill Hole Sections

GENERAL PROCEDURES

Orient core and list footage intervals for each box. This list should be given to Al Lacroix for tagging purposes.

MAJOR CATEGORIES ON LYNX COMPUTER LOG

DIST (Distance at bottom of interval)

Sample intervals should not exceed 5 feet (1.5m). Other intervals may be longer. When resampling is required, add the sample distance, description, etc., to the bottom of the log. New sample intervals can be inserted in the appropriate spot on the log in the computer.

ID (Identification)

These two spaces can be used to put numbers/codes corresponding to rock name/possible faults/structure, etc., which can be referred to at a glance.

RQ-RQD

RQD is an estimated percentage of pieces of core in a sample length which are as long or longer than: AQ = 3", 7.5 cm; BQ = 4", 10 cm; NQ = 5", 12.5 cm. This should represent only natural breaks.

ROCK DESCRIPTION

COM (Competency)

M	Massive, will not break without considerable effort
S	Breaks roughly on shear planes
SS	Breaks easily
SSS	Breaks in hands without effort
B	Broken/blocky
F	Fractured
G	Gouge/fault

GRS (Grain Size)

VFG	Very fine grained	
FG	Fine grained	aphanitic
FMG	Fine medium grained	aphanitic
MG	Medium grained	aphanitic
MCG	Medium coarse grained	aphanitic
CG	Coarse grained	phaneritic
VCG	Very coarse grained	phaneritic

TEXT (Texture)

VAR	Variolitic - globular structures of devitrified glass (basic)
SPH	Spherulitic - globular structures of devitrified glass (acid)
POIK	Poikilitic - small grains floating in one large grain
OPH	Ophitic - euhedral/subhedral feldspar embedded in pyroxene xtal
DIA	Diabasic/doleritic - lath-like feldspar with pyroxene between
POR	Porphyritic - large phenocrysts in fine-grained matrix
GLOM	Glomeroporphyritic - phenocrysts occur in clusters
SERI	Seriate - complete grain range from matrix to phenocryst
AMYG	Amygdaloidal - vesicle filled with minerals

ALIG	Alligator	MOTL	Mottled
BLOT	Blotchy	NED	Needled
BND	Banded	SHD	Sheared
BRX	Brecciated	SPT	Spotted
CLAS	Clastic	SPX	Spinifex
COT	Contorted	SUG	Sugary
CRA	Crackled	VUG	Vuggy
CHLZ	Chill zone	MUD	Muddy
FRAG	Fragmental	QFP	Quartz feldspar phyric
GRAN	Granitic	BED	Bedded
GRT	Gritty	fp	feldspar phyric
RUB	Rubbly	qp	quartz phyric
HOM	Homogeneous	pf	primary fragments
LAM	Laminated	tf	tectonic fragments
MBX	Mild brecciated		

CO (Colour)

AQ	Aqua	LM	Lime
BK	Black	OR	Orange
BL	Blue	PL	Purple
BR	Brown	RB	Red brown
CR	Cream	RD	Red
GBR	Grey brown	RG	Red green
GG	Green grey	TN	Tan
GR	Green	VI	Violet
GTN	Grey tan	WH	White
GY	Grey	YL	Yellow

ALT (Alteration)

ALB	Albitized
BAF	Buff Altn Flecks
BLD	Bleached
CAR	Carbonaceous
CRB	Carbonatization
CCL	Calcite-Chlorite
CHL	Chloritic
CC	Calcitic
EPD	Epidotization
FEL	Felsic
HEM	Hematized (red altn)
HMS	Hematitic Spotted
LCH	Leached
OXD	Oxidized
QCB	Quartz-Carbonate
QCV	Quartz-Carbonate Veining
SCL	Sericitic-Chloritic
SER	Sericitic
SIL	Silicification
SNF	Snowflake
SRP	Serpentinization
SUL	Sulphidization
TAN	Tan Alteration
TCL	Talc Chlorite
LEU	Leucoxene

NAM (Rock Name)

OVB	Overburden	CAS	Casing
L/C or LC	Lost Core	MC	Missing Core

1 KOMATIITIC VOLCANICS

1	Unsubdivided
1s	Serpentinized, massive, polysutured, peridotitic komatiite
1ox	Olivine-spinifex textured peridotitic komatiitic flows
1px	Pyroxene-spinifex textured basaltic komatiitic flows
1mb	Massive basaltic komatiite
1m	Massive
1p	Pillowed
1cb	Carbonatized peridotitic komatiite or carbonate rock
1t	Talcose
1b	Basaltic komatiite
1bcb	Carbonatized basaltic komatiite
1tcb	Talc carbonated komatiite
1fu	Fuchsitic carbonate rock

2 THOLEIITIC VOLCANICS

2	Unsubdivided
2m	Massive
2p	Pillowed
2a	Amygdaloidal
2apl	Amygdaloidal pillow lava
2v	Variolitic
2t	Tuff, lapilli-tuff
2b	Breccia
2cb	Carbonatized
2pb	Pillow Breccia
2h	Hyaloclastite
2ag	Agglomerate
2am	Amphibolitized
2scf	Spherulitic, chicken-feed
2sch	Schistose
2sh	Shear
2F	Dominantly Fe-tholeiite
2M	Dominantly Mg-tholeiite
2AL	Dominantly AL-tholeiite
2I	Dominantly Icelandite

3 CALC-ALKALIC MAFIC VOLCANICS (MAFIC-INTERMEDIATE VOLCANICS)

3	Unsubdivided
3a	Andesite
3m	Massive
3p	Pillowed
3t, 3lt	Tuff, lapilli-tuff
3b	Breccia
3cb	Carbonatized
3am	Amphibolitized
3pb	Pillow brx
3sh	Shear

4 INTERMEDIATE-FELSIC VOLCANICS

4d	Dacite
4rd	Rhyodacite flows
4dt	Dacite tuffs
4dp	Dacite pyroclastics
4da	Agglomerate-breccia, conglomerate
4dlt	Dacite lapilli tuff
4dm	Dacite massive flow
4p	Intermediate-felsic pyroclastics
4r	Rhyolite-undifferentiated
4sch	Intermediate-felsic schist
4sh	Shear
4rm	Massive rhyolite
4rt	Rhyolite tuff
4rlt	Rhyolite lapilli tuff
4ra	Rhyolite agglomerate
qp	(quartz-eye porphyritic)
pp	(plagioclase-porphyritic)
4phyl	Phyllite

P	denotes Primitive
E	denotes Evolved

5 SEDIMENTS

5	Unsubdivided
5a	Argillite
5c	Conglomerate
5g	Greywacke
5sl	Slate
5p	Porphyritic, qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
5d	Debris flow
5q	Quartzite
5qw	Quartz wacke
5gr	Graphite
5ch	Chert
5ag	Agglomerate
5t	Tuffaceous-sediment
5s	Siltstone
5ss	Sandstone
5sch	Schist
5sh	Shear
5ex	Exhalite
5tqp	Quartz porphyritic tuff
5phyl	Phyllite
GFZ	Graphitic Fault Zone

K	denotes Keewatin
T	denotes Timiskaming

6 ULTRAMAFIC INTRUSIVE ROCKS

6	Unsubdivided
6s	Serpentinized diorite-peridotite
6ph	Pyroxene-hornblende
6c	Carbonatized
6tm	Talc-magnesite

7 MAFIC INTRUSIVE ROCKS

7	Unsubdivided
7a	Anorthosite
7d	Diorite
7g	Gabbro
7qg	Quartz gabbro
7pg	Pegmatoidal gabbro
7l	Lamprophyre
7ib	Intrusive breccia
7n	Nipissing Diabase-type sills

8 FELSIC INTRUSIVE ROCKS

8	Unsubdivided
8qp	Quartz porphyry
8fp	Feldspar porphyry
8qfp	Quartz feldspar porphyry
8f	Felsite, p (porphyritic), qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
8hbt	Hornblende-biotite trondhjemite
8pm	Porphyritic monzonite
8gd	Granodiorite
8pg	Porphyritic granodiorite
8lg	Leucocratic granodiorite
8hd	Hornblende diorite
8qd	Quartz diorite
8p	Porphyry
8a	Aplite
8s	Syenite
8g	Granite or quartz-rich syenite
8t	Trachyte

9 MATACHEWAN DIABASE

10 HURONIAN SEDIMENTS

10a	Arkose
10w	Wacke
10arg	Argillite
10c	Conglomerate

11 QUARTZ DIABASE

12 OLIVINE DIABASE

13 IRON FORMATION

IFo	Oxide
IFs	Sulphide (py-po)
IFc	Carbonate
IFj	Jasper
BIF	Banded iron formation
IFchl	Chlorite-rich
IFgr	Graphitic

These abbreviations are used after a lithology name, if desired ("Nam" column must be limited to 5 characters). Allows alteration to be shown with name when drill hole is plotted.

3m,s	Would denote a massive calc-alkalic mafic volcanic which is sericitized
chl	Chloritic
chty	Cherty
s or ser*	Sericitic
sil	Silicified
ank	Ankerite
cc	Calcite
c	Carbon
cb	Carbonate
h	Hematite
alb	Albitized
fu	Fuchsitic
mt	Magnetite
sh	Sheared
tcb	Talc carbonate schist
tcs	Talc chlorite schist
gr	Graphitic
arg	Argillaceous
sch	Schist
gt	Garnet
oxd	Oxidized
bl	Bleached
epd	Epidote
serp	Serpentinized

* where computer space permits, use **ser**

Note: In addition to the percentage of quartz veins being indicated, one should indicate in the Comments column whether the veining is tensional (i.e. cutting foliation) or of the strike variety (i.e. parallel to foliation) or both. For example "10% qtz (t)" or "15% qtz (t + s)".

SULPHIDES

DS	Disseminated sulphides
SS	Stringer sulphides
MS	Massive sulphides
SMS	Semi-massive sulphides

OXIDES

Mt	Magnetite (80-100%)
QAV	Quartz ankerite veining

NAM2

This column has been added to accommodate future changes in geology names.

FORM

A formation column has been added to accommodate extensive geological naming practices. FORM will be used to plot geology, and must be limited to a maximum of eight names or numbers (for the 8 plotter pens).

STRUCTURE

B/S	S	Schistosity	C	Contact
	F	Foliation	V	Vein (primary if more than one occurs)
	B	Bedding		

J/F	J	Joint Plane
	V	Vein (secondary if more than one occurs)
	F	Fault Plane/Fracture

A1/A2

Measurement of above with respect to core axis (C.A.)

MINERALS

GANGUE

ACT	Actinolite	GAR	Garnet
ANH	Anhydrite	HBL	Hornblende
ANK	Ankerite	LEU	Leucoxene
BIO	Biotite	MUS	Muscovite
CC	Calcite	PYR	Pyroxene
CAR	Carbonate	QC	Qtz Carbonate
CHL	Chlorite	QTZ	Quartz
DOL	Dolomite	SER	Sericite
EPD	Epidote	SPR	Serpentine
FSP	Feldspar	TOU	Tourmaline
FUC	Fuchsite		

METALLIC

ASP	Arsenopyrite
CPY	Chalcopyrite
GN/GA	Galena
GRA	Graphite
HEM	Hematite
PO	Pyrrhotite
PY	Pyrite
SID	Siderite
SPH	Sphalerite
STB	Stibnite
VG	Visible Gold

MINERAL %

0.01	Trace
0.05	Minor Occurrence
2.0	2%

SPL

Sample number

WDTH (Width)

T (Sample Type)

C	Core
G	Grab
H	Chip
L	Channel
S	Sludge

COMMENTS

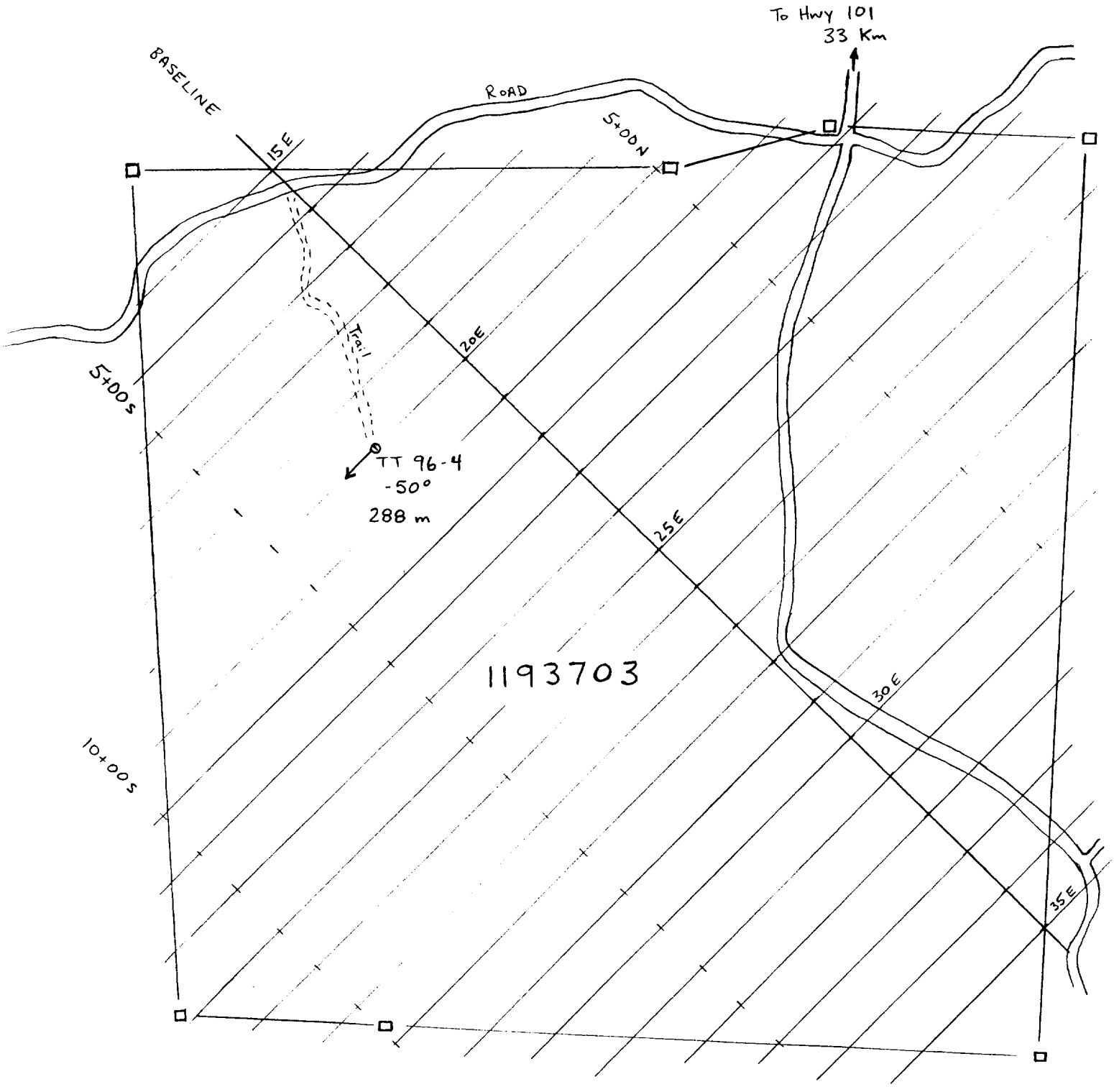
Standard abbreviations should be used where possible so that anyone can refer to this "dictionary" and clearly read the logs. If abbreviations are being used that are not included on this list, please add them.

ANH	Anhedral
BLB	Blebs
BL-QTZ	Blue Quartz
CA	Core Axis
CV	Carbonate Vein
DEFMD	Deformed
DIS	Disseminated
EUH	Euhedral
EXT	Extensive
FOL	Foliation
FUCH	Fuchsite
GRND	Ground (core)
>	Greater Than
IC	In Contact
IVC	In Vein Contact
IRR	Irregular
<	Less Than
MAG	Magnetic
MNR	Minor
MOD	Moderate(ly)
NOD	Nodules
OCC	Occasional
OC	Out Contact
OVC	Out Vein Contact
PLL	Parallel
QCV	Qtz-Carb Vein
QV	Quartz Vein
RXN	Reaction
STR	Strong
STK	Stockwork
STG	Stringer
SUB	Subhedral
TR	Trace
TW	True Width
VNS/VN/V	Veins
VLETS	Veinlets
W	With
WO	Without
WK(LY)	Weak(ly)

ASSAY

Suggested usage for assay columns

AU1	PPB
AU2	Fire Assay (use **FA1** column if available)
ASSAY3, etc	To be used if there is a need to show a relationship with gold, otherwise geochemical analysis is available on other systems



TN

ROYAL OAK MINES INC.
TIMMINS - MICHIE PROPERTY
DRILLING PLAN MAP
CLAIM 1193703
HOLE TT 96-4

0 200
m

Drawn: P.H.	Date: Dec '96	FIGURE No. 3

Peter Harvey

ROYAL OAK MINES INC.

DIVISION: TIMMINS PROJECT: MIDDLETON OPTN. LOGGED BY: P. Harvey DATE LOGGED: Nov 11 '96 DRILL HOLE NO: TT 96-4

	NORTHING	EASTING	ELEVATION	LENGTH	SECTION	LEVEL
Surface Grid:	2+35 S	Line 20+00 E	Surface	288.0 m		
Engineering Grid:						

DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP
0	225	50												
125.0	233	50												
156.0	240	47												
288.0	247	41												

START DATE: NOVEMBER 4, 1996

FINISH DATE: NOVEMBER 8, 1996

TOWNSHIP: TIMMINS

CLAIM NO.: 1193703

DRILLING CONTRACTOR: NDS DRILLING

PURPOSE: TEST I.P. ANOMALY

RESULTS: NO SIGNIFICANT GOLD ASSAYS

WHY HOLE TERMINATED: TARGET INTERSECTED

CORE SIZE: BQ

CASING: 75 m BW Casing left intact and capped.

HOLE CEMENTED:

NO. OF ASSAYS: 66 assays done by Swastika Labs 6W-4886-RA1

NO. OF ICP:

NO. OF WRA:

REJECTS/PULPS SAVED:

CORE STORED (LOCATION): HOLLINGER CORESHEDS

☐ ft
☒ m

Location Sketch

P.A.P. 35361

DRILL HOLE NO: TT96-4

DIST meters	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
76.0							OVB																Casing in Sand overburden
																							BW Casing to 75.0 m
																							Cored 1.5m boulders 74.5-76.0
																							Boulders fg mafic volcanic, amygdular mafic
																							volcanic and pink c.g. granite.
77.5		S	fg	bnd	gy	arg	St		S	55			2			1	2		AX 32001	2.5	S	.000	Tuffaceous sediment grey-black, minor argillaceous
																							component 5% felsic lapilli, strong foltn at
																							50-60° CA. fg py "stringers" par to foltn - esp
																							with argillite/graphite bands.
																							Clay gouge at 76.5. Rare fpo lapilli and
																							fg qtz boudins. Minor mafic vole component
																							throughout.
79.0		S	fg	bnd	g.y	arg	St		S	55						1	5		32002	1.5	S	.004	Tuff - lapilli tuff as at 77.5, significantly more
																							po occurs as irregular masses to cm size - surrounding
																							lapilli fragsparallel to bedding. 5m feldspar porphyry at
																							78.2

DRILL HOLE NO: TT 96-4

DIST m	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po	Sp	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
79.8		S	fg	bnd	gy	arg	5t									1	1		32003	0.8	S	.000	Tr-1% py and po parallel to bedding and in fractures, otherwise as above.
81.0		SS	vfg	bnd	bk		5a		B	60						2	1		32004	1.2	S	.000	Black, very fine grained argillite, fg sulphides parallel to bedding and in fractures <mm felsic 'ghosts' - altd felsic material? - peppered throughout. Uniformly bedded at 60° CA, with qtz-cal fractures.
82.3		SS	vfg	bnd	bk		5a						2			2	1	1	32005	1.3	S	.000	As 81.0 - coarse sphalerite ass w qtz-cal boudins at 81.8, interval includes 20 cm felds po 82.1-82.3.
84.0		S	mg	bnd	gy		5t		B	55			1			1	2		32006	1.7	S	.000	Tuffaceous sediment as 77.5 etc, rhythmically bedded at 55°, qtz-cal fracts <1mm at 90° foliation core, rare cm qtz vein boudins w tr py. mm white spotted mineral - (garnet → muscovite?) peppered throughout, rare 1-3 cm bands of porphyry.
96.7		S	mg	bnd	gy		5t		B	60			1						32007	12.7	G	.000	Rhythmically bedded sediment, bedding on mm-cm scale, light-dark grey, tr qtz boudins w tr py, and tr qtz-cal fractures at high angle to bedding. Tr garnets in bed at 92.0.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt	grams	COMMENTS
97.2		S	mg	bnd	gy		5t						5			2			32008	0.5	S		.001	Tuff as 96.7, with vreq- boudinaged qtz + fg py stringers
100.6		S	mg	bnd	bn	bio	5t		S	55			2			.5			32009	3.4	G		.000	Pale grey tuff - subtle increase in biotite - gives unit paler brown colour. Muscovite porps throughout. Increased mafic component. Mg felds porphyry interval at 98.3-98.5
102.3		S	mg	bnd	bn	bio	5t						2			2			32010	1.7	S		.000	Tuff w porphyritic texture (alt'd garnet), 2x cm qtz-cal boudins w pyrite.
105.0		S	mg	bnd	gy		5t						2			1			32011	2.7	G		.000	Typical grey tuffaceous sediment
106.5		S	mg	bnd	gy		5t						3			1			32012	1.5	S		.000	Grey tuff, 2x1cm qtz boudins, fracture w qtz-sphalerite at 0° CA at 106.0; white mica lmag qtz boudins.
108.0		S	mg	bnd	gy	gar	5t						1			.5			32013	1.5	S		.000	Grey tuff, broken core, qtz boudins <cm, py on fractures. Gar porphs throughout. Mafic interval at 107.5 - 107.7.
109.5		S	mg	bnd	gy	gar	5t						1			.5			32014	1.5	S		.000	As 108.0; py on fractures.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU opt grams	COMMENTS
120.5		S	mg	bnd	bn	bio	5t						1			1			32015	11.0	G	.000	Tuffaceous sediment as above, but with considerable bio content - biotite rich bands 1-3cm common throughout imparts a brown colour throughout. Muscovite 'ghosts' throughout creates mottled texture. Rhythmically bedded on cm scale, rare 'slump' fold, cm qtz-felds po intervals. Low angle q-c fracts common, lined w pyrite. <mm garnet crystals peppered throughout - esp at bio rich bands.
122.0		S	mg	bnd	bn	bio	5t						1			1			32016	1.5	S	.000	Sediment as above, irregular cm qtz veining with coarse sphalerite at 121.1, tr galena/moly?
123.5		M	mg	msv	gg		8fp						1			0.5			32017	1.5	S	.000	Contact at 90° to bedding to med gr massive - weakly foliated grey-green porphyry. Core blocky. Consists of 80% mm sized white felds phenos packed in vfg mafic matrix. Chl filled fractures through interval. bio? in matrix. Vfg py-aspy? peppered through matrix.
124.7		M	mg	msv	gg		8fp									.5			32018	1.2	S	.000	As 123.5
126.0		S	mg	bnd	bn	bio	5t									.5			32019	1.3	S	.000	Biotite rich sediment as 120.5, few wormy qv's.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po	Sp	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
136.8		S	mg	bnd	bn	bio	5t		S	60			1			.5			32020	10.8	G	.000	Interval of 30-50% biotite rich bands 1-10 cm wide, mafic beds 1-20cm also common, rhythmic bedding @ 60° CA, tr-locally 5% <mm pink garnets peppered throughout. Tr qtz veinlets as wormy mm veinlets at low angle to CA.
																							Few coarser beds - 'wacke' - <cm. tr py on fractures.
138.0		M	mg	msv	gn		2																f-mg chloritic mafic volcanic, soft, chloritic, sharp contacts.
145.5		S	mg	bnd	bn	bio	5t		S	60			1						32021	7.5	G	.000	Biotite-rich tuffaceous sediments as at 136.8. Well banded on cm scale at 60° CA few <cm qtz boudins, bleached margins, musc-gar mottled text.
147.0		S	mg	bnd	bn	bio	5t						1			.5			32022	1.5	S	.000	Typical dark grey sods as above, tr py ass w qtz vein/boudin.
148.5		S	mg	bnd	bn	bio	5t						1					1	32023	1.5	S	.000	Typical, mottled texture, mm qtz fract at 20° CA w cg sphalerite.
150.0		S	mg	bnd	bn	bio	5t						1						32024	1.5	S	.000	Typical; musc spots 1mm-3mm throughout, barren low angle fractures.

DRILL HOLE NO: TT 96-4

DIST 150.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po	As	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
151.5		S	mg	bnd	bn	bio	5t						2				1		32025	1.5	S	.000	Typical, mm musc phenos throughout, rare po as fine fracture fillings, well banded.
153.0		S	mg	bnd	bn	bio	5t						1					1	32026	1.5	S	.000	As above, broad 'S' fold 151.5-151.7 spotted w musc + chl phenos retro after garnet, trace q-c fractures - interval unique as is peppered throughout w 1-2% vfg arsenopyrite laths
154.5		S	mg	bnd	bn	bio	5t		S	65			1						32027	1.5	S	.000	Typical, biotite rich, well banded + mottled texture, few chl rich beds throughout + hairline fracts. qtz-cal. at low angle to C.A.
174.0		S	mg	bnd	bn	bio	5t						1						32028	19.5	G	.000	Typical, biotite rich tuffaceous sediment, well banded on cm scale, dark grey colour, patches mottled texture, few qtz fill fracts at low angle to CA, few qtz-cal bands 156.4-156.7 Felds porphyry.
186.0		S	mg	bnd	bn	bio	5t						1						32029	12.0	G	.000	As 174.0, less mottled texture - graded beds at 185 indicates tops up hole. 183.4-183.8 mafic interbed.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
187.5		S	fg	bnd	gn	bio	5t		S	70			1			.5	.5		32030	1.5		.000	finer grained tuff - ash tuff - dark green, tr felsic augens, few chloritic and biotite rich bands, py on fractures, tr po+po veinlets
189.0		S	fg	bnd	bn	bio	5t						3						32031	1.5		.000	As 187.5 - inc vfg bio throughout - almost msv brown vfine laminated texture. Irreg qtz 188.8 - 189.0
190.0		S	fg	bnd	bn	bio	5t						1						32032	1.0		.000	As 189 - increased vfg chloritic
191.3		S	mg	bnd	bn	bio	5t						1						32033	1.3		.000	More typical tuff. sed - rhythmically bedded, few garnets fg bio + dkl beds
192.1		SS	fg	bnd	gy	Sul	5t	SMS					1			20			32034	0.8		.000	Sharp contact to light green-grey ash tuff-lapilli tuff well mineralized with pyrite beds on mm scale throughout - enveloping felsic lapilli - pyrite also occurs in >cm masses towards lower contact
																							192.0 - 192.1 Massive Pyrite, >50% py.
																							Irregular stringers + masses enveloping felsic lapilli generally 2×10 mm.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
193.0		SS	fg	lam	bk		5a		S	7S			1			1			32035	0.9		.000	Argillaceous sediment, thinly laminated, black, spotted w musc (garnet) planes as typical tuff sediments, felsic augens scattered throughout - Tr-1% py as thin whisps along bedding planes.
194.2		SS	fg	lam	bk		5a						1			3			32036	1.2		.001	As 193, pyrite content increasing towards lower contact as thin beds and masses ≤5mm.
195.8		S	v fg	bnd	wh		5ex	5a	B	80			1			10			32037	1.6		.000	Exhalative Horizon. Laminated argillite as 193 etc, py on bedding planes and nodules. 50% of interval is cm scale chert/felsic horizons alternating w argillite + sulphide - esp 194.2-194.6 Blocky 195.6-195.8, vuggy - limonite stained.
197.6		M	fg	msv	gg		12									1			32038	1.8		.000	Fg, magnetic diabase; blocky. Tr diss pyrite 195.8-195.9, otherwise typical diabase, grey-green, tabular joints w chlorite.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION							STRUCTURE B/S		STRUCTURE J/F		GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B	A1	J	A2	Qtz			Py	Po						
202.6		M	fg	msv	gg		12									1			32039	5.0	G	.001	Typical fg diabase; blocky; magnetic.
204.3		M	fg	msv	gg		12									1			32040	1.7	S	.000	Typical fg diabase as above, 1% diss py toward lower contact 204.0-204.3, conformable.
205.1		S	vfg	bnd	wh		5ex	5a					3			30			32041	0.8	S	.000	Exhalative Horizon as at 195.8 Sharp contact at 204.3 at 70° CA to graphitic argillite, nodular and laminated pyrite 204.3-204.6 204.6-204.9 - 'Bedded' chert on mm-cm scale w minor argillite interbeds, massive pyrite 204.7-204.8
206.5		S	mg	bnd	gn	chl	5t										.5		32042	1.4	S	.000	Tuffaceous sediment as 174 etc, but w chloritic and argillaceous interbeds. Tr po as vfg veinlets.
208.0		S	mg	bnd	gn	chl	5t										.5		32043	1.5	S	.000	As 206.5; chloritic tuff.
209.5		S	mg	por	g,y	sil	5t										.5		32044	1.5	S	.001	Tuffaceous sediment as 174 etc; but is moderately siliceous and contains 2-5% mm feldspar phenocrysts peppered throughout which were not seen higher in the hole.

DRILL HOLE NO: TT 96-4

DIST 209.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
222.0		S	mg	por	gy	sil	5t												32045	12.5	G	.000	As 209.5 ; siliceous tuff; harder, fractures have bleached margins throughout and 5% felds phenos given unit porphyritic texture. Banded on cm scale w sericite (buff - pale green) horizons, chloritic horizons and rare felsic and feldspar porphyry lapilli scattered throughout.
234.0		S	mg	por	gy	sil	5t												32046	12.0	G	.000	As 222 etc
240.5		S	mg	por	gy	sil	5t												32047	6.5	G	.000	As 222. Garnets towards lower contact.
242.0		S	mg	gar	gy	sil	5t												32048	1.5	S	.000	Similar to above, with 5% mm-5mm size garnets throughout
242.8		M	cg	por	wh	ser	8fp									2			32049	0.8	S	.000	50-70% 1-5mm feldspar phenocrysts in aphanitic, chloritic matrix, mineralized with 2% fg diss pyrite, qtz-chl fractures w bleached orange margins.
243.7		M	fg	msv	gn	chl	2												32050	0.9	S	.000	Chloritic mafic flow, mixed w fg diss py + possible aspy.

DRILL HOLE NO: TT 96-4

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py							
243.7																							
244.7		S	mg	bnd	gy	ser	5t		S	80						3			32051	1.0	S	.000	Tuffaceous sediment, well banded, sericite bands throughout, alternate with chloritic + biotite bands. Locally well mnz'd w diss fg py on bedding planes.
246.0		S	mg	bnd	gy	ser	5t									1			32052	1.3	S	.000	Stg ser altd bands throughout. Bleached veinlets, chl bands 2-5 cm w diss py
247.5		S	mg, por		gy		5t									5			32053	1.5	S	.000	Typ porphyritic tuff; blocky, 3cm msv py at 246.1, py on low angle fracts.
249.0		S	mg	bnd	gy		5t		S	70									32054	1.5	S	.000	Typical, well banded; few ser bands; mod siliceous.
250.5		S	mg	bnd	bn	ser	5t												32055	1.5	S	.000	Typical, stronger ser bands; siliceous, low angle cm qtz-chl py veinlets.
252.0		S	mg	bnd	bn	ser	5t												32056	1.5	S	.000	As 250.5
253.5		S	mg	bnd	bn	ser	5t												32057	1.5	S	.000	As 250.5
259.5		S	mg	bnd	bn	ser	5t												32058	6.0	G	.000	Typical as 250.5, alternating cm ser and chlorite bands; few biotite rich bands. Few porphyritic intervals; and qtz-chl veinlets at low angle to CA.

DRILL HOLE NO: TT 96-4

DIST 259.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
261.0		S	mg	bnd	bn	ser	5t						2						32059	1.5	S	.000	Well banded, siliceous, 2-3% mm felds phenos,
																							>50% ser bands; Qtz-chl veins at 10° CA.
262.5		S	mg	bnd	bn	ser	5t						1						32060	1.5	S	.000	Stg ser bands as at 261.
264.0		S	mg	bnd	bn	ser	5t						5			2			32061	1.5	S	.000	Ser bands pale brown + pale green; several low angle
																							qtz-chl fractures w fg py; banded py; diss py
																							263.5 - 264.0.
265.5		S	mg	bnd	bn	ser	5t						5			3			32062	1.5	S	.000	Low angle qtz-chl veins, lesser sericite.
267.0		S	mg	bnd	bn	ser	5t						2			1			32063	1.5	S	.000	More chloritic.
268.5		S	mg	bnd	bn	ser	5t						10			3			32064	1.5	S	.000	Quartz chlorite and qtz-sericite veining, irregular,
																							lined w tr-1% mg pyrite.
270.0		S	mg	bnd	gn	chl	5t						2			1			32065	1.5	S	.000	Lesser sericite, increased chlorite.
288.0		S	mg	bnd	gn	chl	5t						2			1			32066	18.0	G	.000	Chloritic tuffaceous sediments few bands buff sericite,
																							5% feldspars peppered throughout. Minor lacey
END																							qtz-cal veinlets. tr diss pyrite and rare
																							cluster of diss pyrite / py masses - especially
																							associated with chlorite,
																							287.7 - 288.0 Feldspar Porphyry.
																							288.0 End.

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-4886-RA1

TT96-4

Company: ROYAL OAK MINES INC
Project: PO# 49258
Attn: P. Coad

Date: NOV-28-96

We hereby certify the following Assay of 66 Core samples submitted NOV-14-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
Ax-32001	Nil	-
Ax-32002	0.004	0.004
Ax-32003	Nil	-
Ax-32004	Nil	-
Ax-32005	Nil	-
Ax-32006	Nil	-
Ax-32007	Nil	-
Ax-32008	0.001	-
Ax-32009	Nil	-
Ax-32010	Nil	-
Ax-32011	Nil	-
Ax-32012	Nil	-
Ax-32013	Nil	-
Ax-32014	Nil	Nil
Ax-32015	Nil	-
Ax-32016	Nil	-
Ax-32017	Nil	-
Ax-32018	Nil	-
Ax-32019	Nil	-
Ax-32020	Nil	-
Ax-32021	Nil	-
Ax-32022	Nil	-
Ax-32023	Nil	-
Ax-32024	Nil	Nil
Ax-32025	Nil	-
Ax-32026	Nil	-
Ax-32027	Nil	-
Ax-32028	Nil	-
Ax-32029	Nil	Nil
Ax-32030	Nil	-

One assay ton portion used.

Certified by G. Leboe

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705)642-3244 FAX (705)642-3300

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-4886-RA1

Company: ROYAL OAK MINES INC
Project: PO# 49258
Attn: P. Coad

Date: NOV-28-96

We hereby certify the following Assay of 66 Core samples submitted NOV-14-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
Ax-32031	Nil	-
Ax-32032	Nil	-
Ax-32033	Nil	-
Ax-32034	Nil	-
Ax-32035	Nil	-
Ax-32036	0.001	Nil
Ax-32037	Nil	-
Ax-32038	Nil	-
Ax-32039	0.001	Nil
Ax-32040	Nil	-
Ax-32041	Nil	Nil
Ax-32042	Nil	-
Ax-32043	Nil	-
Ax-32044	0.001	-
Ax-32045	Nil	-
Ax-32046	Nil	-
Ax-32047	Nil	Nil
Ax-32048	Nil	-
Ax-32049	Nil	-
Ax-32050	Nil	-
Ax-32051	Nil	-
Ax-32052	Nil	-
Ax-32053	Nil	Nil
Ax-32054	Nil	-
Ax-32055	Nil	-
Ax-32056	Nil	-
Ax-32057	Nil	-
Ax-32058	Nil	-
Ax-32059	Nil	-
Ax-32060	Nil	Nil

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-4886-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P. Coad

Date: NOV-28-96

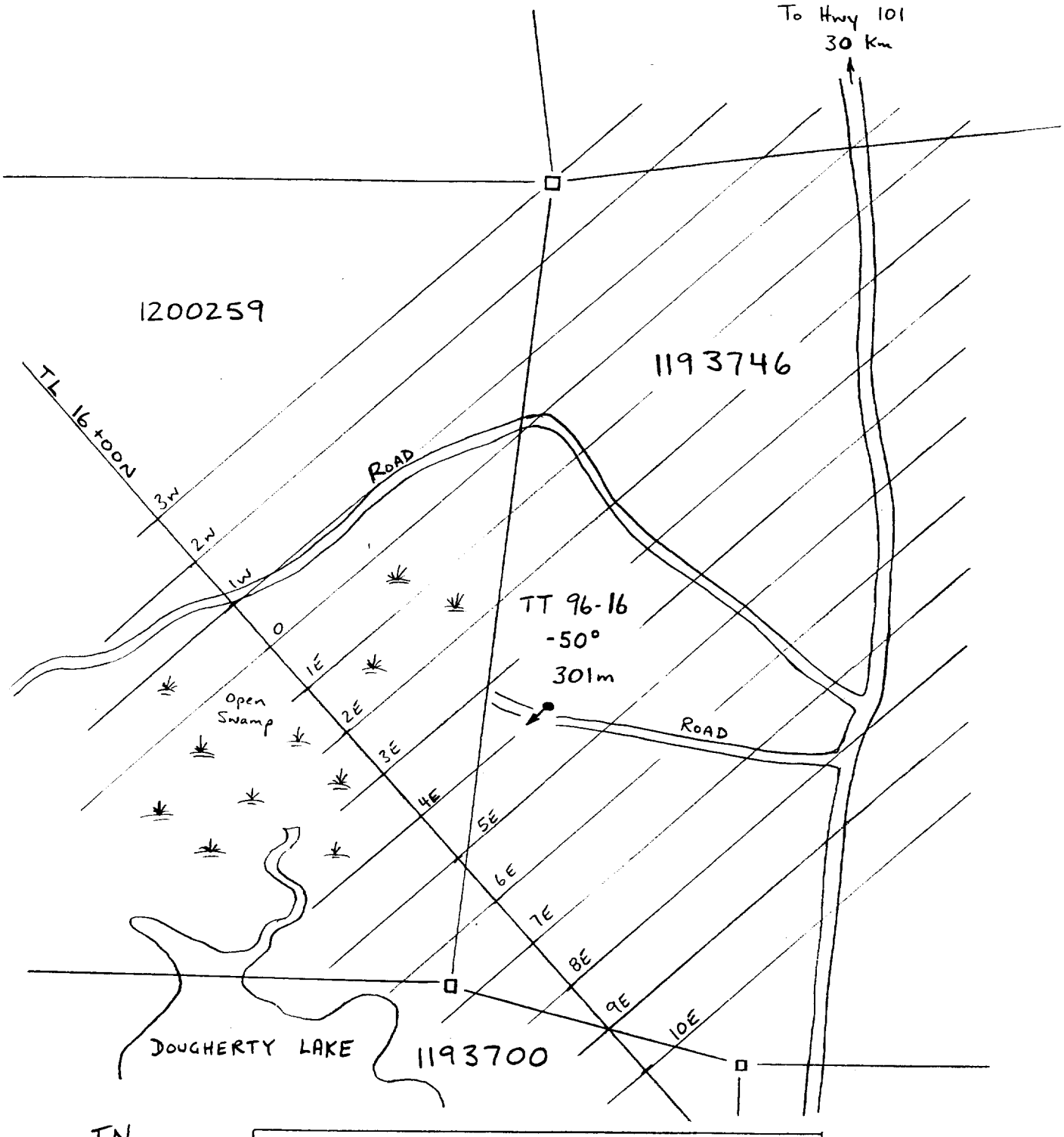
We hereby certify the following Assay of 66 Core samples submitted NOV-14-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
Ax-32061	Nil	-
Ax-32062	Nil	-
Ax-32063	Nil	-
Ax-32064	Nil	-
Ax-32065	Nil	Nil
Ax-32066	Nil	-

One assay ton portion used.

Certified by G. Thompson

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300



TN

ROYAL OAK MINES INC.
TIMMINS - MICHIE PROPERTY
DRILLING PLAN MAP

HOLE TT 96-16

0 200
m

Drawn : P.H.	Date : Dec '96	FIGURE No. 4

ROYAL OAK MINES INC.

DIVISION: TIMMINS PROJECT: MIDDLETON OPT'N LOGGED BY: P Harvey DATE LOGGED: Nov 14 '96 DRILL HOLE NO: TT 96-16

	NORTHING	EASTING	ELEVATION	LENGTH	SECTION	LEVEL
Surface Grid:	19+00 N	4+00 E	Surface	301.0 m		
Engineering Grid:						

DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP
0	225	50												
115	230	52												
200	232	47												
300	235	42												

START DATE: November 9 1996

FINISH DATE: November 11 1996

TOWNSHIP: TIMMINS

CLAIM NO.: 1200259 and 1193746

DRILLING CONTRACTOR: NDS DRILLING LTD

PURPOSE: TEST I.P. ANOMALY

RESULTS:

WHY HOLE TERMINATED: TARGET INTERSECTED

CORE SIZE: BQ

CASING: 85 m BW left in hole

HOLE CEMENTED:

NO. OF ASSAYS: 73

NO. OF ICP:

NO. OF WRA:

REJECTS/PULPS SAVED:

CORE STORED (LOCATION): HOLLINGER CORESHEDS

☐ ft
☒ m

Location Sketch

P.A.P. 35361

DRILL HOLE NO: TT 96-16

DIST meters	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
85.0							OVB																Casing in sand Overburden.
106.0		S	mg	por	gg	chl	St		S	45			1			.5	.5		AX32076	21.0	G	.000	Tuffaceous sediment, generally chloritic but has alternating biotite and sericite rich bands typically 10-50 cm long. Grey-green colour with 5% 1-5 mm albite phenocrysts peppered throughout. Moderately well developed foliation @ 40-50° CA. 1% qtz veins < 1 cm scattered throughout generally subparallel to foliation, most contain trace po+py. Tr veining at high angle to foliation. Locally diss po+py. Veins occasionally w microcline, veins often w bleached margins
121.0		S	mg	por	gg	arg	St		S	45			1			.5	.5		32077	15.0	G	.000	As 106.0 but with bands 20-50 cm throughout containing argillite enveloping felsic lapilli and 5% wispy argillite common to define foliation for entire interval. 5% albite phenos throughout.
125.5		S	mg	por	gg	chl	St		S	45									32078	4.5	G	.000	As 106; lesser mineralization.

DRILL HOLE NO: TT 96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po						
125.5																							
127.0		S	mg	por	gy	sil	5t						3			2			32079	1.5	S	.000	Generally as 106.0, increased veining, silicification pale grey colour. Qtz eyes peppered through matrix along with albite phenocrysts. Cut by cm qtz veins with microcline, bleached margins, lined w chlorite and py
128.5		S	mg	por	gy	ser	5t		S	60			5			1	2		32080	1.5	S	.000	Locally stronger sericite, stg folt'd, qtz-felds phenos, cm qtz veins w cg po, py+po bands along folth
130.0		S	mg	por	gy	chl	5t						5			3	5		32081	1.5	S	.000	cm ribbon qv at 20° CA, py+po bands common on folth and as dissaminations.
131.5		S	mg	por	gy	sil	5t						2			3	5		32082	1.5	S	.000	Well mix'd w stringer and diss py>po; irreg qv's w bleached margins. mm po stringers on folth common. Stg folth w qtz+felds phenos- augen text.
133.0		S	mg	por	gy	sil	5t						2			2	5		32083	1.5	S	.000	As 131.5. Well mix'd; po>py.
134.5		S	mg	por	gy	chl	5t	2p					2			2	5		32084	1.5	S	.000	As 131.5, well mix'd, cm ser bands- pillow selv's? similar to seen on d/c BLO @ 3E. -weakly chloritic
136.0		S	mg	por	g.g	chl	5t						1			3	1		32085	1.5	S	.000	Similar to above; increased chlorite, well mix'd w stringer + diss py>po. few qv's.

DRILL HOLE NO: TT 96-16

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
137.5		S	mg	grt	gn	chl	Spp						1			1	3		32086	1.5	S	.000	Subtle change from above to a 'crystal tuff' variety of mafic and felsic crystals mm n size, in a chloritic, schistose matrix, well mnz'd w po>py
139.0		S	mg	grt	gn	chl	Spp						1			1	2		32087	1.5	S	.000	As 137.5, less mnz'd, qtz-ser bands 1-2cm - pill selv's ? 15cm mafic interbed @ 138.0.
140.5		S	mg	grt	gn	chl	Spp						1			.5	/		32088	1.5	S	.000	Crystal tuff, 15 cm mafic interbed at 139.0, microcline veinlet at 0° CA. Tr diss py.
142.0		S	vfg	lam	gn	chl	Sash						1			/	/		32089	1.5	S	.000	Transition to chloritic ash tuff by ± 141.0. Is vfg, w 5% felds phenos, non mnz'd
142.7		S	vfg	lam	gn	chl	Sash						1						32090	0.7	S	.000	Chloritic ash tuff.
144.5		S	vfg	lam	gy	ser	Sash		S	65			1			2	3		32091	1.8	S	.000	Sericitic-biotite ash tuff, few qtz+ felds phenos, pale grey. Mnz'd nr fg diss py and clusters mcv po at 143.3.
146.1		S	vfg	lam	gn	chl	Sash						-			/	/		32092	1.6	S	.001	chloritic tuff, vfg, with argillaceous component. Nil veining.

DRILL HOLE NO: TT 96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po						
146.5		M	mg	por	gy	chl	8fp									–	–		32093	0.4	S	.000	≤5cm zoned alb crystals in vfg grey matrix. Conformable contacts.
147.3		S	vfg	lam	gy	chl	5ash		S	60			2			1	1		32094	0.8		.000	Chloritic-graphitic vfg ash as 146.1 laminated at 60°. Mnz'd w vfg py+po as dustings in foltn sfs.
148.4		M	vfg	frag	wh	sul	5ch	5ex								5	10		32095	1.1	S	.000	Chert-quartz beds/frags, lapilli sized with po>py enveloping fragments - continuous beds, sometimes ass w chlorite 148.0-148.1 massive sulphides. 30% masses of po>py in grey chert fragments, are laminated, pale ser brown colour.
150.0		S	vfg	lam	bk	car	5a		S	60						30	5		32096	1.6	S	.001	Graphitic argillite - argillaceous beds + lapilli surrounded by 2-5 mm msv py masses. Well bedded at 60°.
151.5		S	vfg	lam	bk	car	5a									10	2		32097	1.5	S	.000	argillite as 150, less mineln, larger argillite lapilli 1-3 cm

DRILL HOLE NO: TT 96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po	Sp					
151.5																							
153.0		S	fg	lam	bk	car	5a		S	70			1			1	1		32098	1.5	S	.000	Argillite, thinly laminated, weakly mnz'd w py>po on bedding planes, some coarser wacke beds.
154.5		S	fg	lam	bk	car	5a						1			1	1		32099	1.5	S	.000	Laminated argillite, soft sed structures, coarser wacke bed 154.0 - 154.3 w cg py>po stringer.
156.0		S	fg	lam	bk	car	5a						1			/	/		32100	1.5	S	.000	Black argillite w 20 cm wacke bed, pale grey, non-mnz'd
157.5		S	fg	lam	bk	car	5a	5g					1			-	-		32101	1.5	S	.000	Interval 50% argillite and 50% pale grey wacke, well laminated
159.0		S	fg	lam	bk	car	5a	5g					3			2			32102	1.5	S	.000	As 157.5, coarse py>po stringers in wacke interval at 158.6
160.5		S	mg	bnd	gy	ser	5g						3			1			32103	1.5	S	.000	Pale grey-green wacke to 160, few vneq qv's, rarely w tr py Weak ser/carb alt'n?
162.0		S	fg	lam	bk	car	5a						1			-			32104	1.5	S	.000	Laminated black argillite, minor calcite in q-c veinlets + bandins.
167.7		S	fg	lam	bk	car	5a		S	60			1			-			32105	5.7	G	.000	Uniform thinly laminated black argillite, <10% light grey wacke interbeds <10cm throughout. Barren - tr py on bedding
173.4		SS	fg	brx	bk	flt	5a	FLT					2			1		1	32106	5.7	G	.000	Fault zone, blocky core, RQ 10; gouge at 168.8-169.2 through black argillite as at 167.7. 5% mm white phenos peppered through. Coarse sphalerite - cpy and po grains in ccm q-c veinlets scattered through interval.

DRILL HOLE NO: TT 96-16

DIST 173.4	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po	Sp	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
179.8		S	fg	por	bk	car	5a		S	65									32107	6.4	G	.000	Uniform, laminated black argillite - well developed spotted 'snowflake' texture w mm white mineral peppered throughout - sample taken at 175 for identification.
180.4		S	fg	por	g.y	bld	5a						5			1			32108	0.6	S	.000	Bleached section centred on cm qv at 20° CA w tr py and galena or moly.
184.0		S	fg	por	bk	car	5a						1						32109	3.6	G	.000	As 179.8
185.5		S	fg	por	g.y	car	5a						1					1	32110	1.5	S	.000	Laminated argillite as 179.8, but mixed w coarse sphalerite in q-c fractures mainly at low angle to CA.
187.0		S	fg	por	g.y	car	5a						1					1	32111	1.5	S	.000	As 185.5, spotted argillite with fine q-c fractures w sphalerite.
189.0		S	fg	por	g.y	car	5a						1						32112	2.0	S	.000	Argillite as 185.5, prog bleached towards 189.0, no sphal observed.

DRILL HOLE NO. TT 96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po	Sp					
189.0																							
190.5		S	fg	lam	g.y	bld	Sa						10			2		2	32113	1.5	S	.000	Bleached argillite. matrix silicification centred on numerous qtz veins mnz'd w py and spal at low angle to CA; poss apsy crystals also in veins. 189.5-190 - continuous cm vein at 0° CA; w coarse spal + tr aspy
192.0		S	fg	lam	g.y	bld	Sa						5			2		2	32114	1.5	S	.000	As 190.5, blocky, coarse spal in low angle qv's, tr py diss in matrix.
193.5		S	fg	lam	g.y	bld	Sa						5			5			32115	1.5	S	.000	Diss py in matrix, cm qv at 193-2, w coarse py in vein and through matrix.
194.5		S	fg	ppr	bk	car	Sa												32116	1.0	S	.000	Argillite as 185.5, lacks 'snowflake' texture, vfg, well laminated.
196.0		S	fg	ppr	bk	car	Sa						5			2		2	32117	1.5	S	.000	Typical black thinly laminated argillite, cut by ccm q-c veins w spal. 1% diss py in matrix.
202.0		S	fg	ppr	bk	car	Sa		S	60			1			2			32118	6.0	G	.000	As 196.0, few 20-30 cm sections paler grey wacke intervals and minor qtz veining. Tr diss py as fine specks along foltn planes.
203.5		S	fg	lam	g.y	bld	Sa						3			5			32119	1.5	S	.000	Weakly bleached intervals 10-30cm in interval adjacent to low angle CA Qtz veins.
205.0		S	fg	lam	g.y	bld	Sa						3			5			32120	1.5	S	.000	Bleached intervals as 203.5; 5% diss f-mg py.

DRILL HOLE NO: TT 96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE	METALLIC		SAMPLE #	WIDTH	T	AU opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz	Py	Po					
205.0																				
206.5		S	fg	por	bk	car	5a						2	2		32121	1.5	G	.000	Black laminated argillite, not bleached, barren low angle QV's. 2% py as fg dissemmations and cm sized masses.
217.0		SS	fg	por	bk	car	5a		5	60			1	3		32122	10.5	G	.000	Black laminated argillite, mineralized throughout w fg pyrite as fine whisps along bedding planes and ass w high angle fractures. Few intervals snowflake text. Blocky, RQD = 50-70% Disc core.
218.8		SS	fg	por	bk	car	5a						5	5		32123	1.8	S	.000	Interval contains sections of wacke beds, cut by mnz'd low angle cm qv's. Veins lined w py + py in bleached margins.
225.0		SS	fg	por	bk	car	5a						1	3		32124	6.2	G	.000	As 217
226.2		SS	fg	por	bk	car	5a	5g								32125	1.2	S	.000	Subtle change from argillite above, section of 10-20 cm of laminated wacke beds. Fg bedded py.
235.0		SS	fg	por	bk	car	5a	FLT								32126	8.8	G	.000	Laminated argillite as 217, well mnz'd w fg py on bedding planes. Fault gouge @ 227.4

DRILL HOLE NO: TT96-16

DIST	ID	ROCK DESCRIPTION							STRUCTURE B/S		STRUCTURE J/F		GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B	A1	J	A2	Qtz			Py	Po	Sp					
235.0																							
236.9		SS	fg	lam	bk	car	5a		B	60						3		3	32127	1.9		.000	Typical laminated argillite, mineralized with wispy bedded sphalerite and py: also sp+py on crossing fractures.
237.5		M	mg	lam	gy	car	5a	5g								5			32128	0.6		.000	Wacke interbed well mineralized w fg diss py + py clusters 10cm long.
239.0		S	fg	lam	bk	car	5a									2		3	32129	1.5		.000	Laminated argillite, snowflake texture, well mineralized with bedded and fracture controlled sphal > py
240.5		S	fg	lam	bk	car	5a									3		5	32130	1.5		.000	Black argillite, well laminated, has 1-10 cm intervals pale grey wacke + chert interbeds, mixed w bedded and fracture sphal > py. Fractures ≤ 3mm of msv spal, minor qtz 240.4-240.5.
242.0		S	fg	lam	bk	car	5a	5ch								2			32131	1.5		.000	Laminated argillite, few pale grey interbeds, fine py on bedding planes, 241.9-242.0 - chert interbed; pale brown-grey, glassy.
242.9		M	mg	msv	gn	chl	2									2			32132	0.9		.000	Mafic interbed, mg mottled texture, diss py
244.3		M	vfg	lam	wh	sil	5ch		B	60						3			32133	1.4		.000	Dominantly chert, laminated pale grey-brown in 1-30 cm intervals with minor argillite between chert. 10cm mafic interbed, mixed w fg diss py

DRILL HOLE NO: TT 96 -16

DIST 244.3	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz				METALLIC Py	Po	Sp	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
245.5		S	fg	por	bk	car	5a										2		3	32134	1.2		.000	Laminated argillite, snowflake texture, minzd w sphal>py on bedding planes and within ccm qvs in interval. Tr cpy in qv at 245.4.
247.0		S	fg	lam	bk	car	5a										1		5	32135	1.5		.000	Laminated argillite, sphalerite fractures and sphal on bedding planes throughout.
248.5		S	fg	lam	bk	car	5a										2		1	32136	1.5		.000	Argillite, lesser sphal inc py minzd as 247
249.5		S	fg	lam	bk	car	5a												5	32137	1.0		.000	Argillite as 245.5 etc, well minzd w sphal.
250.5		SS	fg	bx		sul	QTZ	MS					5						10	32138	1.0		.000	Vein at low angle to CA, breccia 1cm wide minzd w massive sphalerite and moly. Sphalerite pale brown.
252.0		S	fg	lam	bk	car	5a						3				1		1	32139	1.5		.000	Argillite as above vein, weakly minzd; cm qv w cpy and moly at 250.7.
253.5		S	fg	lam	bk	car	5a	5ch									2		3	32140	1.5		.000	Argillite w chert interbeds, esp 252.5-253.0, is grey-green, and glassy grey, minzd w bedded sphal > py.
255.0		S	fg	lam	bk	car	5a													32141	1.5		.000	Argillite as 245.5 etc, rare bedded py, tr sphal.
256.6		S	fg	lam	bk	car	5a										3			32142	1.6		.001	As 245.5; well minzd w diss py; minor mafic interbeds.

DRILL HOLE NO: TT 96-16

DIST 256.6	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qt			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
258.3		M	mg	msv	gg	chl	8fp									5			32143	1.7	S	.000	Porphyry, pale grey cm felds phenos loosely packed in fg pale grey-green matrix, minz'd w diss and fracture pyrite. Few mafic grains throughout. Contacts in argillite bleached.
266.8		S	fg	por	bk	car	5a		S	70						1			32144	8.5	G	.000	Grey-black argillite, well developed snowflake texture as 1-3 mm crystals throughout, minor chert and mafic interbeds < 10 cm. Fault @ 260.5 – 260.8. Weakly minz'd with diss py. tr sp at 261. 263.4 - 263.7 Chert.
267.3		M		msv	gn	chl	8fp									5			32145	0.5	S	.000	Porphyry? Pale grey-green, mm felds phenos tightly packed in vfg green chloritic matrix, well minz'd w diss py
277.0		S	fg	por	bk	car	5a		S	70						2			32146	9.7	G	.000	As 266.8, barren 5 cm q-c vein at 0° CA 268-269, argillite minz'd w fg diss py throughout.
292.0		S	fg	por	bk	car	5a									1			32147	15.0	G	.000	V. weakly minz'd black-grey argillite w felsic phenos 5-10 mm throughout.
301.0		S	fg	pvk	gy	crb	5a												32148	9.0	G	.000	Subtle change from argillite above, paler grey w fg mottled carb specks in matrix 294.7 - 295.7 - Fault / vein at 0° CA. blocky.
301.0																							END.

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

TT 96-16

6W-4905-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P.Coad

Date: DEC-03-96

We hereby certify the following Assay of 73 Core samples submitted NOV-18-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32076	Nil	-
AX32077	Nil	-
AX32078	Nil	-
AX32079	Nil	-
AX32080	Nil	-
AX32081	Nil	-
AX32082	Nil	-
AX32083	Nil	Nil
AX32084	Nil	-
AX32085	Nil	-
AX32086	Nil	-
AX32087	Nil	-
AX32088	Nil	-
AX32089	Nil	-
AX32090	Nil	-
AX32091	Nil	-
AX32092	0.001	-
AX32093	Nil	-
AX32094	Nil	-
AX32095	Nil	-
AX32096	0.001	Nil
AX32097	Nil	-
AX32098	Nil	-
AX32099	Nil	-
AX32100	Nil	-
AX32101	Nil	-
AX32102	Nil	-
AX32103	Nil	-
AX32104	Nil	Nil
AX32105	Nil	-

One assay portion used

Certified by G. Leher

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-4905-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P.Coad

Date: DEC-03-96

We hereby certify the following Assay of 73 Core samples submitted NOV-18-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32106	Nil	-
AX32107	Nil	-
AX32108	Nil	-
AX32109	Nil	-
AX32110	Nil	Nil
AX32111	Nil	-
AX32112	Nil	-
AX32113	Nil	-
AX32114	Nil	-
AX32115	Nil	-
AX32116	Nil	Nil
AX32117	Nil	-
AX32118	Nil	-
AX32119	Nil	-
AX32120	Nil	-
AX32121	Nil	-
AX32122	Nil	-
AX32123	Nil	-
AX32124	Nil	Nil
AX32125	Nil	-
AX32126	Nil	-
AX32127	Nil	-
AX32128	Nil	-
AX32129	Nil	Nil
AX32130	Nil	-
AX32131	Nil	-
AX32132	Nil	-
AX32133	Nil	-
AX32134	Nil	-
AX32135	Nil	-

One assay portion used

Certified by G. Leboss

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-4905-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P.Coad

Date: DEC-03-96

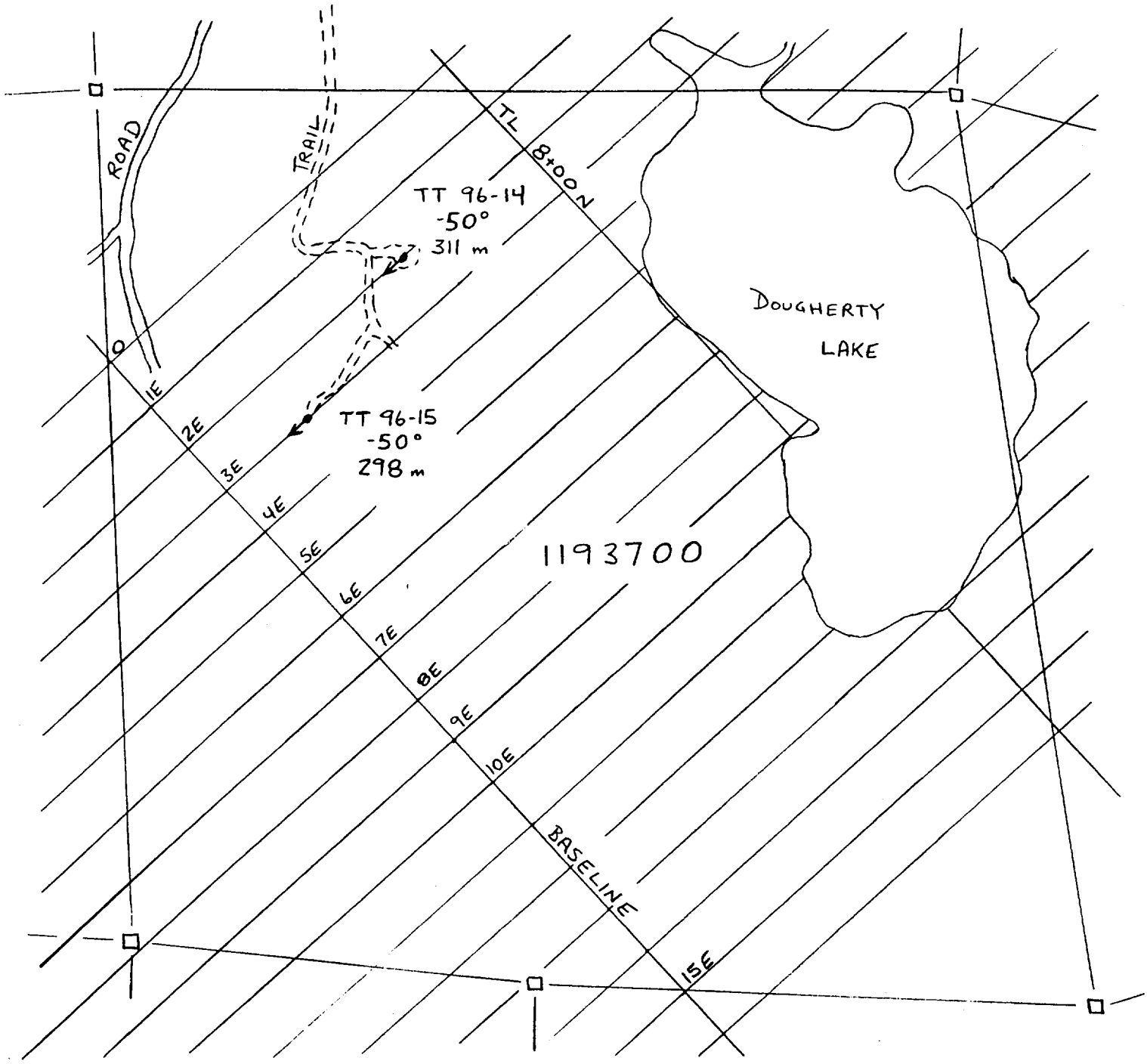
We hereby certify the following Assay of 73 Core samples submitted NOV-18-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32136	Nil	-
AX32137	Nil	Nil
AX32138	Nil	-
AX32139	Nil	-
AX32140	Nil	-
AX32141	Nil	-
AX32142	0.001	-
AX32143	Nil	-
AX32144	Nil	-
AX32145	Nil	-
AX32146	Nil	-
AX32147	Nil	Nil
AX32148	Nil	-

One assay portion used

Certified by ___

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705)642-3244 FAX (705)642-3300



T. N.

ROYAL OAK MINES INC TIMMINS - MICHIE PROPERTY DRILLING PLAN MAP HOLE TT 96-14 HOLE TT 96-15		
0 200 m		
Drawn: P.H.	Date: Dec '96	FIGURE No. 5

ROYAL OAK MINES INC.

Peter Harvey

DIVISION: TIMMINS PROJECT: MIDDLETON OPTN LOGGED BY: P. Harvey DATE LOGGED: Nov. 20 '96 DRILL HOLE NO: TT 96-14

	NORTHING	EASTING	ELEVATION	LENGTH	SECTION	LEVEL
Surface Grid:	5+10 N	Line 2+00 E	Surface	311.0 m		
Engineering Grid:						

DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP
0	225	50												
104	240	46												
200		45												
311		40												

START DATE: NOVEMBER 12, 1996

FINISH DATE: NOVEMBER 15, 1996

TOWNSHIP: TIMMINS

CLAIM NO.: 1193700

DRILLING CONTRACTOR: NDS DRILLING

PURPOSE: TEST GEOLOGY UNDER TRENCHES

RESULTS:

WHY HOLE TERMINATED: TARGET INTERSECTED

CORE SIZE: BQ

CASING: 3.0 m BW Casing left intact and capped

HOLE CEMENTED:

NO. OF ASSAYS: 97

NO. OF ICP:

NO. OF WRA:

REJECTS/PULPS SAVED:

CORE STORED (LOCATION): HOLLINGER CORESHEDS

☐ ft
☒ m

Location Sketch

P.A.P. 3536

DRILL HOLE NO: TT96-14

DIST m	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU opt grams	COMMENTS
3.0							OVB																Casing in overburden.
5.0		M	vfg	brx	gy	sil	2pb						2			3			AX 32151	2.0	S	.000	Blocky rubble core - silicified pillow breccia, qtz-epidote patches, pale grey, mixed w disseminated and stringer pyrite - py stringers ass w chlorite.
6.0		M	vfg	brx	gy	sil	2pb						2			1			32152	1.0	S	.000	As 5.0, prog lesser silicification towards 6.0
12.0		M	vfg	brx	gy	sil	2pb						1			.5			32153	6.0	G	.000	Subtle change - more chloritic - but interval still siliceous and hard to scratch. Minor biotite-rich bands, tr diss py throughout. Pill selvs qtz-epi alth; few large varioles.
13.5		M	vfg		gy	sil	2p						1			2			32154	1.5	S	.000	As 5.0. Strngly siliceous matic vole - poss pill selvs as darker, chloritic bands. Biotite rich bands 5-10 cm common in interval. Disseminated and stringer py throughout; pyrite also in cm breccia vein at 12.2
15.0		M	vfg		gy	sil	2p						1			1			32155	1.5	S	.000	V strong silicification, otherwise as 13.5. Matrix silicification adjacent to well developed fractures.

DRILL HOLE NO: TT 96-14

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po	Cpy					
15.0																							
16.5		M	vfg		gbr	sil	2p						1			1			32156	1.5	S	.000	As 15.0. V strong silicification through bro altd mafic volcanic. Grey-brown colour
18.0		M	vfg		gbr	sil	2p						1			3			32157	1.5	S	.000	As 15.0; mc diss pyrite.
19.5		M	vfg		gbr	sil	2p						1			2			32158	1.5	S	.000	As 15.0, chloritic towards 19.5
21.0		M	vfg		gy	sil	2p						2			3			32159	1.5	S	.000	Similar to above; lacks brittle content. is pale grey, v stg siliceous patches qtz-epidote, few veinlets? through interval, 20.4 Bx'd qv's; diss py through interval.
																							Blocky core. RQD = 30%. Vuggy q-c veinlets,
22.5		M	vfg		gy	sil	2p						2			3		.5	32160	1.5	S	.000	As 21.0. Pale grey w qtz-epi patches, diss fg py and tr cpy. Blocky.
24.0		M	vfg		gy	sil	2p						2			2			32161	1.5	S	.000	As 21.0, blocky, 5cm cemented breccia at 23.0. Mix'd w diss and stringer py.
25.5		M	vfg		gy	sil	2p						2			1			32162	1.5	S	.000	As 21.0, blocky, less mineth
27.0		M	vfg		gy	sil	2p						3			1			32163	1.5	S	.000	As 21.0, blocky, less mineth

DRILL HOLE NO: TT 96-14

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po						
27.0																							
28.5		M	vfg	var	br	bio	2p						2						32164	1.5	S	.000	Transition out of sty silicification, blocky mafics to siliceous, biotite alt'd mafics. Unit pale brown-purple colour, RQD >90%, patches chloritic and qtz-epidote alt'n
38.0		M	vfg	var	br	bio	2p		S	60			2						32165	9.5	G	.000	to 28.5, few >cm varioles, q-c fractures throughout - incipient brecciation + intervals sty silicification.
54.0		M	vfg	var	gr	bio	2p		S	60									32166	16.0	G	.000	Mafic volcanics, possibly pillowed as above, but less silicification and increased chlorite through matrix, but still contains 5-10 cm bands of msv biotite. Few <cm q-c veinlets, locally tr diss py. Few possible selvages and varioles, w local bleaching. Softer than 28.5 etc.
55.5		M	vfg	brx	gy	sil	2p						3			1			32167	1.5	S	.000	Pillow-pillow breccia - matrix silicification adjacent to fractures, qvs and selvs. Microcline veinlets.
57.0		M	vfg	brx	gy	sil	2p						3			2			32168	1.5	S	.000	Silicification and qtz-epidote; clear qv's w cg py.
58.5		M	vfg	brx	gy	sil	2p						1			.5			32169	1.5	S	.000	Minor qtz-epidote patches.
59.6		M	vfg	brx	gy	sil	2p						2			1			32170	1.1	S	.000	2 x ½" clear qv's lined w fg py.

DRILL HOLE NO: TT 96-14

DIST 59.6	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
83.0		M	vfg	amyg	br	bio	2p						1			.5			32171	23.4	G	.000	Strong chlorite and biotite pillow - pillow breccia sections 20-50 cm long through interval comprised of msv brown mg biotite alternating w chlorite rich sections. Minor large irreg q-c veinlets. Qtz-epidote patches throughout, few 10-30 cm intervals of silicification. Amygdules/variolas throughout. Foln weak, irregular, generally at 60° CA.
84.5		M	vfg	amyg	br	bio	2p						2			3			32172	1.5	S	.000	Biotite altd mafics, silicified adjacent to cm qv at 40° CA w mg py.
86.0		M	vfg	amyg	br	bio	2p												32173	1.5	S	.000	few clear qv's, lined w py at 85.9.
101.0		M	vfg	amyg	br	bio	2p												32174	15.0	G	.000	Similar to 83.0, slightly more silicified, tr irreg qtz-cal veinlets lined w mg py, bleached margins.
102.5		M	vfg	amyg	br	bio	2p												32175	1.5	S	.000	Mafic volcanics similar to above biotite + chlorite alth, barren q-c veins, qtz-epidote patches/selvs.
104.0		M	vfg	amyg	br	bio	2p												32176	1.5	S	.000	As above, weakly siliceous, cm qv at 20° CA w cg py

DRILL HOLE NO: TT96-14

DIST 104.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	B/S A1	J/F J	J/F A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU √ opt grams	COMMENTS
105.5		M	vfg	amyg	br	bio	2p						5						32177	1.5	S	.000	Barren cm qv, variolas, qtz-epi patches/bands- ie selvs?
107.0		M	vfg	amyg	br	bio	2p						1						32178	1.5	S	.000	few siliceous patches, mottled chloritic mafic.
108.5		M	vfg	amyg	br	bio	2p						3			2			32179	1.5	S	.000	Bio-chloritic, qtz-silica-epidote patches adjacent to fractures + veinlets. cm qv at 20°CA w mg py at 108.2
110.0		M	vfg	amyg	gn	fuch	2p						5			1	3		32180	1.5	S	.000	Fuchsitic pale green, irreg qtz and qtz-albite veins lined w mg po>py.
111.5		M	vfg	amyg	br	bio	2p						1			.5			32181	1.5	S	.000	Generally biotite throughout few fuchsitic patches, chert/silica intervals; barren.
113.0		M	vfg	amyg	br	bio	2p						1			.5			32182	1.5	S	.000	Biotite throughout, few variolas - irregular qv's.
114.5		M	vfg		gy	sil	2p						1			.5			32183	1.5	S	.000	Biotite, w stronger silicification + irregular stockwork qtz veining. Blocky.
116.0		M	vfg		gy	sil	2p		S	70						2			32184	1.5	S	.000	Biotite throughout w stronger, overprinting silicification, banded / breccia texture, mixed w fg diss/stringer py on foli sfc's at 65-70°.

DIST 116.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po	Sp	SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
117.0		M	vfg	frag	gy	sil	5t	SMS	S	70			2			2	3		32185	1.0	S	.000	Sulphide zone 116-118.
																							Pyrrhotite > pyrite as stringers and masses to
																							2-3 cm in size totalling about 5% of interval,
																							occurs within siliceous, pale grey fragmental/breccia
																							unit - tuff/lapilli tuff? QFP lapilli at 116.8
118.0		M	vfg	frag	gy	sil	5t	SMS	S	70			2			2	3	2	32186	1.0	S	.000	As 117.0; FP lapilli more common, bedded and
																							stringer sphalerite towards lower contact.
																							Bedded/ foltn at 70
119.5		M	vfg	spt	gr	chl	2a						1						32187	1.5	S	.000	Sharp contact at 118.0 to mafic volcanics, chlorite-
																							biotite as above sulphide zone, but contains <mm
																							albite phenocrysts and elliptical amygdules of qtz.
																							Albite phenos give unit spotted texture.
121.0		M	vfg	spt	gr	chl	2a						1						32188	1.5	S	.000	As 119.5; qtz-epi alt patch at cm qv, other
																							minor qv's, w py at 0° CA at 120.5.
122.5		M	vfg	spt	gr	chl	2a						1						32189	1.5	S	.000	As 119.5, albite phenos and qtz veinlets/fractures
																							with bleached margins.
124.3		M	vfg	spt	gr	chl	2a						3			1			32190	1.8	S	.001	As 119.5; qtz-epidote veining 123.7-124.1; 1% py.

DRILL HOLE NO: TT 96-14

DIST 124.3	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
126.0		M	vfg	spt	gr	chl	2a						2			.5			32191	1.7	S	.000	As 119.5; alb phenos, patches bio, minor chlorite,
																							Minor qtz stockwork with bleached margins. Tr py
127.5		M	vfg	spt	gr	chl	2a						2			2			32192	1.5	S	.000	As 119.5, cm qv at 20° CA ~ mg py, py in margins;
																							stronger chlorite.
149.0		M	vfg	spt	gr	chl	2a		S	70			2			.5	1		32193	21.5	G	.000	Generally as 119.5, dominantly chloritic, amygdules
																							and albite phenos throughout, biotite-rich sections <10cm,
																							2% irreg ccm qv's w mg po>py. Weak foln 70°
150.5		M	vfg	spt	gr	chl	2a						5			1			32194	1.5	S	.000	Similar to 119.5, increased silicification, stockwork
																							qv's to cm size, min'd w py.
152.2		M	vfg	spt	gr	chl	2a						5			2			32195	1.7	S	.000	As 150.5 increased veining - stockwork/brd style.
153.8		M	vfg	spt	gr	chl	2a						5			2			32196	1.6	S	.000	As 150.5, veining and fractures throughout.
155.3		M	vfg	spt	gr	chl	2a						1			1			32197	1.5	S	.000	As 150.5; less veining + silicification, inc chloritic;
																							alb phenos throughout.
156.9		M	vfg	spt	gr	chl	2a						1						32198	1.6	S	.000	As 150.5; prog less veining.
160.9		M	mg	msv	gn		12												32199	4.0	G	.000	Irregular contacts to fg msv Diabase, blocky, chloritic
																							fractures, vfg chill margins.

DRILL HOLE NO: TT 96-14

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py							
160.9																							
162.2		M	vfg	spt	gn	chl	2a						5						32200	1.3	S	.000	Dominantly chlorite-biotite altered mafic volcanics, transition to lapilli tuffs by about 169m
																							160.9 - 162.2 - chl-bio mafics, 10% albite phenocrysts,
																							5% qtz amygdules, 5% lacey q-c veinlets, barren.
164.0		M	vfg	spt	gn	chl	2a		S	70			1			2			32201	1.8	S	.000	Paler green-brown colour, banded sericitic alth, few felsic lapilli, tr stringers and clusters of py, biotite bands.
165.5		M	vfg	spt	br	bio	2a						5			3			32202	1.5	S	.000	Stronger biotite, cm clear qv with mg py, matrix silicified, patches diss py. Few qtz eyes.
167.0		M	vfg	spt	br	bio	2a						1			1			32203	1.5	S	.000	Strong alternating chlorite-biotite banding, qtz and albite phenocrysts.
168.5		M	vfg	spt	br	bio	2a												32204	1.5	S	.001	As 167.0
170.0		M	vfg	spt	br	bio	5						1			3			32205	1.5	S	.001	Lapilli tuff. Variety of mafic (fg chloritic) and felsic (qfp) lapilli sized elliptical fragments loosely packed in mg biotite matrix mixed w fg py wisps on foliation. 168.7 - 169.1 mafic dyke/large fragment - alb phenos throughout - as with mafics giving unit overall spotted appearance.

DRILL HOLE NO: TT 96-14

DIST 170.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ☑ opt grams	COMMENTS
171.5		M	vfg	spt	br	bio	5						2			1	1		32206	1.5	S	.000	Lapilli tuff as 170.0, biotite/chlorite matrix, minzd w fg py+po on foliation sfcs. Few barren qv's.
173.0		M	vfg	spt	br	bio	5						1			.5			32207	1.5	S	.000	As 170, bleached adjacent to fractures, few qv's, tr py
174.5		M	vfg	spt	br	bio	5												32208	1.5	S	.000	As 170, mm qtz amygdules, stronger chlorite.
176.0		M	vfg	spt	br	bio	5						1			1			32209	1.5	S	.000	As 170 few <cm qv's, contact zone unit w Lapilli tuff.
177.5		M	vfg	spt	gn	chl	2a						1			2			32210	1.5	S	.000	Generally mafics as 164.0 few cm qv's, bleached margins, minzd w mg py. chl-bio alt'd matrix.
179.0		M	vfg	spt	gn	chl	2a						1			2			32211	1.5	S	.000	As 177.5
180.3		M	vfg	spt	gn	chl	2a						5			5			32212	1.3	S	.000	Dominantly chloritic mafics, cut by qtz veinlet at 0°CA down centre of vein, minzd w mg py, py in wallrock.
181.0		M	vfg	spt	gn	chl	2a												32213	0.7	S	.000	Chlorite-biotite, few lapilli fragments
182.7		M	vfg	spt	gn	chl	2a						2			5			32214	1.7	S	.002	Chl-bio mafics, cut by low angle cm qv's, well minzd + weak bld in matrix.

DRILL HOLE NO: TT 96-14

DIST 182.7	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py	Po		SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
184.5		M	v.fg	spt	br	bio	2a						3			1			32215	1.8	S	.000	Bio-chl alt'n, strong matrix silicification throughout adjacent to stockwork qtz veinlets. cm qv and py ass w chlorite clots.
186.2		M	v.fg	spt	gn	chl	2a						2			1			32216	1.7	S	.000	Dominantly chloritic mm qtz amygdules, few veinlets and tr diss py.
187.8		M	v.fg	spt	gn	chl	2a						1			.5			32217	1.6	S	.000	chl-bio, amygdules and albite phenos, few qv's
189.5		M	v.fg	spt	gn	chl	2a						10			2			32218	1.7	S	.000	10 cm qtz-epidote vein at 188.0, mnzd w mg py, vuggy, balance of interval typical chl-bio w diss fg py.
191.0		M	v.fg	spt	gn	chl	2a						3			2			32219	1.5	S	.000	Manly chloritic, amygdules and few albite phenos throughout, flow angle qv's well mnzd w mg py throughout.
192.5		M	v.fg	spt	gn	chl	2a						3			2			32220	1.5	S	.000	As 191.0
203.0		M	v.fg	spt	gn	chl	2a		S	70			3			1			32221	10.5	G	.000	Dominantly chloritic, dark green, stockwork fractures w bld margins, blue qtz amygdules and few albite phenocrysts throughout. Mnzd w tr-1% fg diss pyrite.

DRILL HOLE NO: TT 96-14

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓	AU opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py	Po							
203.0																								
204.5		M	vfg	spt	gn	chl	2a						2			5			32222	1.5	S		.000	As 203.0, w increased diss py mnzd; ie 10% py
																								204.0 - 204.5; cm qv's w mg py in interval.
206.0		M	vfg	spt	gn	chl	2a						1			.5			32223	1.5	S		.000	As 203, lesser py.
207.5		M	vfg	spt	gn	chl	2a						1			1			32224	1.5	S		.000	As 203; diss py = 1%, few qv's.
214.2		M	vfg	spt	gn	chl	2a						2			.5			32225	6.7	G		.000	Dominantly chloritic, few barren, irreg qv's, cmm amygdules, tr py.
220.2		M	mg	msv	gn		12												32226	6.0	G		.000	Diabase, fg chill margins, mg magnetic through centre, few qtz-chl-epi fractures. Few blocky intervals.
228.5		M	mg	fol	gn	chl	2a		S	70			1			.5			32227	8.3	G		.000	Strongly foliated chloritic mafic volcanic, minor biotite with few qtz filled amygdules scattered throughout, locally tr py, otherwise barren. Qtz-epidote (10cm) altd interval at 225.
230.0		M	mg	fol	gn	chl	2a						1			2			32228	1.5	S		.000	As 228.5, but mineralized w fg diss py, minor qtz-epi patches and locally fragmental texture.
231.5		M	mg	fol	gn	chl	2a						1			5			32229	1.5	S		.000	Increased mineralization, locally fragmental, qtz-epidote common. Py and epidote stringers envelope fragments.

DRILL HOLE NO: TT 96-14

DIST 231.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
233.0		M	fg	frag	lm	epd	2a									.5			32230	1.5	S	.000	Similar to 228.5 etc, but strongly epidote alt'd throughout most of interval. Fragmental texture, tr py
234.5		M	fg	frag	lm	epd	2a						2			3			32231	1.5	S	.000	Qtz and quartz-epidote veining, 2-3% py throughout, fragmental
236.0		M	fg	frag	lm	epd	2a		S	70			1			2			32232	1.5	S	.000	fragmental text, weak epidote alt'n throughout. diss py, stg foltn.
237.4		M	fg	frag	gn	chl	2a						1			3			32233	1.4	S	.000	Chloritic matrix, fragmental texture, few qtz-epidote veinlets, diss pyrite through interval.
239.0		M	vfg	msv	or	epd	8s						2						32234	1.6	S	.000	Contact at 50° to pale red-orange syenite. consists of <mm qtz and feldspar phenocrysts loosely packed in red-orange aphanitic matrix. Cut by Qtz-epidote veinlets w epidote alt'd wallrock adjacent to veinlets. Weakly mineld w tr fg py.
																							237.9 - 238.0 Fragment of mafic volcanic as 228.5.
240.1		M	vfg	msv	or	epd	8fp						2						32235	1.1	S	.000	As 239.0, lower contact at 50°, as w contact at 239 is roughly conformable.
241.5		M	fg	frag	gn	chl	2a		S	70			1			5			32236	1.4	S	.000	Well mineralized, chloritic mafic volc-fragmental. 5% mg diss pyrite throughout. Chlorite clots and stringers Folt'd at 70°, pale grey-brown locally-sericitic.

DRILL HOLE NO: TT 96-14

DIST 241.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
243.0		M	fg	msv	gn		12												32237	1.5	S	.000	fine grained chill margin of diabase; irreg contact at roughly 90° CA. Prog coarser grained towards 243
297.6		M	cg	msv	gn		12												32238	54.6	G	.000	Typical coarse grained, massive diabase. RQD > 90%. Few >cm felds phenos scattered throughout - w epi alt'n.
																							258.0 low angle chloritic slip.
																							282.5 low angle chloritic slip.
298.6		M	fg	msv	gn		12												32239	1.0	S	.000	fg chill margin of diabase, blocky 298.3-298.6
300.3		M	fg	frag	gn	sil	2a						1			3			32240	1.7	S	.000	Siliceous, dark green mafic volcanic/fragmental, albite phenocrysts patchy epidote, well mnzd w fg diss pyrite
302.0		M	fg	frag	lm	epd	2a						1			5			32241	1.7	S	.000	Sharp contact to strong epidote alteration; pale yellow-green; fragmental texture - lapilli tuff fragments loosely packed in epidote - sulphide matrix few qtz veinlets
303.5		M	fg	frag	lm	epd	2a						1			3			32242	1.5	S	.000	As 302.0, prog weaker epidote alt'n, stg silicified, fragmental.

DRILL HOLE NO: TT 96-14

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
305.0		M	fg	spt	g.y	sil	2a		S	65			1			.5			32243	1.5		.000	Dark grey-green, 10% alb phenos throughout, msv-weakly schistose mafic volc, few <mm qz's w bld margins
306.5		M	fg	spt	g.y	sil	2a						1			2			32244	1.5		.000	silicified mafics, pale grey-green, pill selvs, alb phenos, qz's w bleached margins, 1-2% diss py.
308.0		M	fg	spt	g.y	sil	2a						1			2			32245	1.5		.000	As 306.5 1-3% diss py. 307.8 - qtz-epi - poss selvage.
309.5		M	fg	spt	g.y	sil	2a						1			2			32246	1.5		.000	As 308.0 diss py.
311.0		M	fg	spt	g.y	sil	2a						1			2			32247	1.5		.000	As 308, fg diss py, 310.7-310.8 qtz-epidote interval, msv qz's w bld margins.
311.0																							END.

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Assay Certificate

6W-4993-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P. Coad/P. Harvey

TT 96-14

Date DEC-05-96

We hereby certify the following Assay of 97 Core samples submitted NOV-25-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32151	Nil	-
AX32152	Nil	-
AX32153	Nil	-
AX32154	Nil	Nil
AX32155	Nil	-
AX32156	Nil	-
AX32157	Nil	-
AX32158	Nil	
AX32159	Nil	-
AX32160	Nil	-
AX32161	Nil	-
AX32162	Nil	-
AX32163	Nil	-
AX32164	Nil	-
AX32165	Nil	-
AX32166	Nil	Nil
AX32167	Nil	-
AX32168	Nil	-
AX32169	Nil	-
AX32170	Nil	-
AX32171	Nil	-
AX32172	Nil	-
AX32173	Nil	-
AX32174	Nil	-
AX32175	Nil	-
AX32176	Nil	-
AX32177	Nil	-
AX32178	Nil	-
AX32179	Nil	Nil
AX32180	Nil	-

One assay ton portion used.

Certified by G. Leh

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300

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Assay Certificate

6W-4993-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P. Coad/P. Harvey

Date: DEC-05-96

We hereby certify the following Assay of 97 Core samples submitted NOV-25-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32181	Nil	-
AX32182	Nil	-
AX32183	Nil	-
AX32184	Nil	-
AX32185	Nil	-
AX32186	Nil	Nil
AX32187	Nil	-
AX32188	Nil	-
AX32189	Nil	-
AX32190	0.001	-
AX32191	Nil	-
AX32192	Nil	-
AX32193	Nil	-
AX32194	Nil	-
AX32195	Nil	-
AX32196	Nil	-
AX32197	Nil	-
AX32198	Nil	-
AX32199	Nil	-
AX32200	Nil	Nil
AX32201	Nil	-
AX32202	Nil	-
AX32203	Nil	-
AX32204	0.001	-
AX32205	0.001	-
AX32206	Nil	-
AX32207	Nil	-
AX32208	Nil	-
AX32209	Nil	Nil
AX32210	Nil	-

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0
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Assay Certificate

6W-4993-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P. Coad/P. Harvey

Date: DEC-05-96

We hereby certify the following Assay of 97 Core samples submitted NOV-25-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32211	Nil	-
AX32212	Nil	-
AX32213	Nil	-
AX32214	0.002	-
AX32215	Nil	-
AX32216	Nil	-
AX32217	Nil	Nil
AX32218	Nil	-
AX32219	Nil	-
AX32220	Nil	-
AX32221	Nil	-
AX32222	Nil	-
AX32223	Nil	-
AX32224	Nil	-
AX32225	Nil	-
AX32226	Nil	Nil
AX32227	Nil	-
AX32228	Nil	-
AX32229	Nil	-
AX32230	Nil	-
AX32231	Nil	-
AX32232	Nil	-
AX32233	Nil	-
AX32234	Nil	-
AX32235	Nil	-
AX32236	Nil	-
AX32237	Nil	-
AX32238	Nil	-
AX32239	Nil	Nil
AX32240	Nil	-

One assay ton portion used.

Certified by G. Leboss

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Assay Certificate

6W-4993-RA1

Company: **ROYAL OAK MINES INC**
Project: PO# 49258
Attn: P. Coad/P. Harvey

Date: DEC-05-96

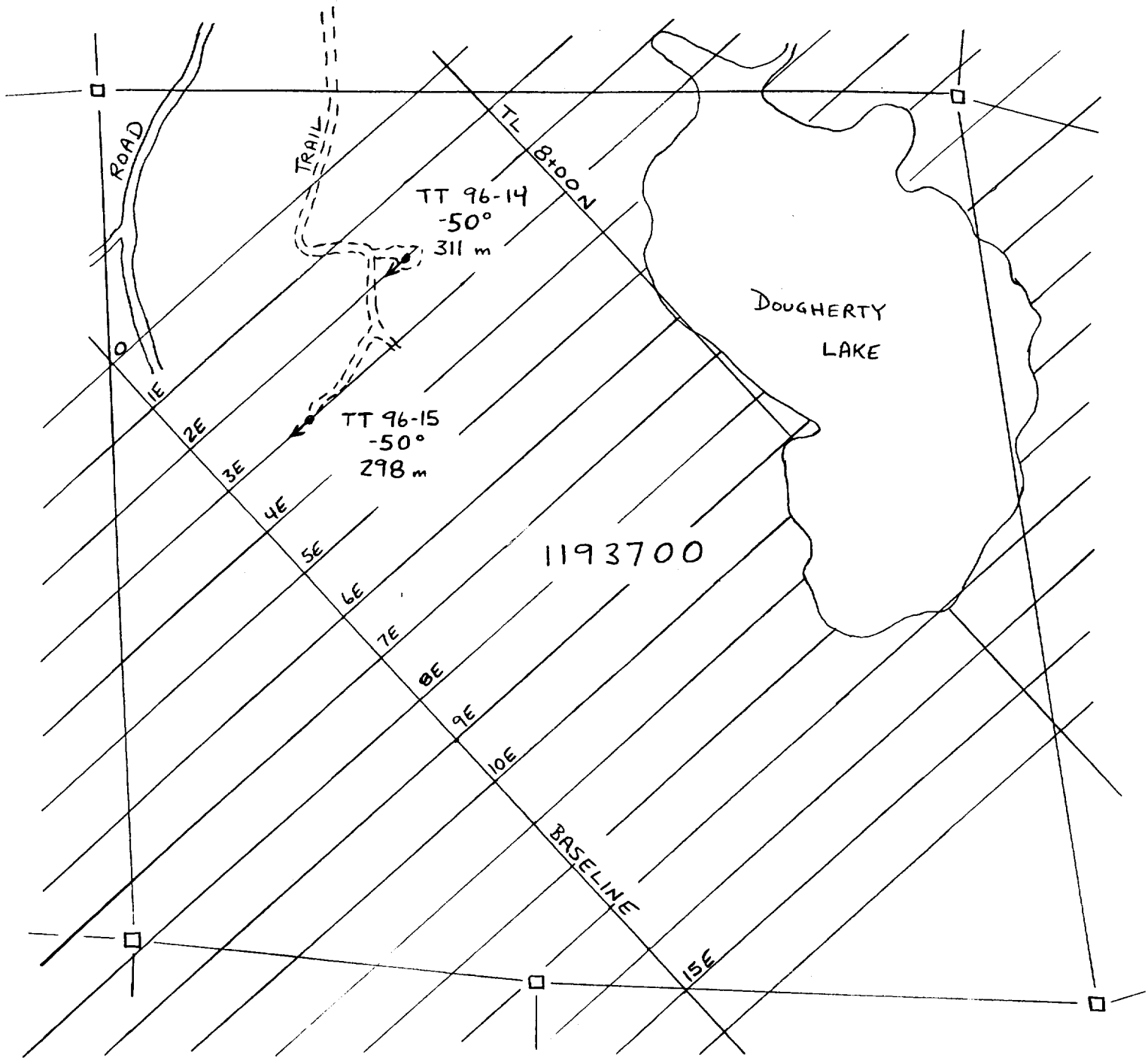
We hereby certify the following Assay of 97 Core samples submitted NOV-25-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX32241	Nil	-
AX32242	Nil	-
AX32243	Nil	-
AX32244	Nil	-
AX32245	Nil	-
AX32246	Nil	-
AX32247	Nil	-

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705)642-3244 FAX (705)642-3300



T. N.

ROYAL OAK MINES INC
TIMMINS - MICHIE PROPERTY
DRILLING PLAN MAP
HOLE TT 96-14
HOLE TT 96-15

0 200
m

Drawn: P.H.	Date: Dec '96	FIGURE No. 5

Peter Harvey

ROYAL OAK MINES INC.

DIVISION: TIMMINS PROJECT: MIDDLETON OPTN LOGGED BY: P. Harvey DATE LOGGED: Nov. 25 '96 DRILL HOLE NO: TT96-15

	NORTHING	EASTING	ELEVATION	LENGTH	SECTION	LEVEL
Surface Grid:	1+90 N	3+00E	Surface	298.0 m		
Engineering Grid:						

DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP	DIST	AZIM	DIP
0	225	50												
50		50												
100		48												
200		45												

START DATE: NOVEMBER 15, 1996

FINISH DATE: NOVEMBER 19, 1996

TOWNSHIP: TIMMINS

CLAIM NO.: 1193700

DRILLING CONTRACTOR: NDS DRILLING

PURPOSE: TEST GEOLOGY UNDER TRENCHES

RESULTS:

WHY HOLE TERMINATED: TARGET INTERSECTED

CORE SIZE: BQ

CASING: 6.0 m BW Casing left intact and capped.

HOLE CEMENTED:

NO. OF ASSAYS: 77

NO. OF ICP:

NO. OF WRA:

REJECTS/PULPS SAVED:

CORE STORED (LOCATION): HOLLINGER CORESHEDS

☐ ft
☒ m

Location Sketch

P.A.P. 35361

DRILL HOLE NO: TT96-15

DIST	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
6.0																							Casing in negligible overburden and bedrock.
39.5		M	cg	msv	gn		12									2			AX 44926	33.5	C	.000	Coarse grained, msv diabase, RQ >90%, >cm epidote
																							altd folds planes scattered throughout, stg magnetic.
																							27.0, 32.0 low angle, chloritic slips.
																							Scattered microcline veinlets, minzd w 1% py as mg
																							grains.
40.9		M	fg	msv	gn		12												44927	1.4	S	.000	fine grained drill margin of diabase.
43.0		M	fg	amyg	gy	sil	2						1			.5			44928	2.1	S	.000	Blocky, rubble core through interval, siliceous biotite matrix,
																							minor epidote, bleached margins on fractures, tr albite
																							phenocrysts, few qtz-chl-py veinlets.
44.5		M	fg	amyg	gy	sil	2						2			1			44929	1.5	S	.000	Siliceous pale gray amygdular mafic, few qtz-epidote veinlets,
																							matrix silicification adjacent to stockwork veinlets.
46.0		M	fg	amyg	gy	sil	2						1			.5			44930	1.5	S	.000	As 44.5 w 30cm epidote alt patches - selvus? -
																							tr py
47.5		M	fg	amyg	gy	sil	2						2			2			44931	1.5	S	.000	3x10cm qtz-epi-sericite(?) alt patches, diss py, qtz
																							amygdules throughout, matrix silicification.
49.0		M	fg	frag	gy	sil	2	SS					2			3			44932	1.5	S	.000	Well mineralized, py ass w chlorite and epidote stringers,
																							fragmental text

DRILL HOLE NO: TT96-15

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py							
49.0																							
50.5		M	fg	frag	g.y	sil	2	SS					2			3			44933	1.5		.000	Well mineralized ar at 49, py as fg disseminated and
																							as stringers w epidote and chlorite, qtz amygdules
																							throughout, stg silicified, epidote stringers envelop fragments.
52.0		M	fg	frag	g.y	sil	2	SS					2			5			44934	1.5		.000	As 50.5, epidote-pyrite stringers, chlorite-pyrite stringers
																							enveloping frags at 51.5-52.0. frags aphanitic, siliceous.
53.5		M	fg	frag	g.y	sil	2	SS					2			5			44935	1.5		.000	As 52.0; well mix'd
55.0		M	fg	frag	g.y	sil	2	SS					2			3			44936	1.5		.000	As 52.0, lesser py, qtz-epi patch 54.6-54.8
																							1-3 cm lapilli interval; locally br'd/fragmental.
56.5		M	fg	frag	g.y	sil	2						2			1			44937	1.5		.000	Stg matrix silicification, py ass w dll stringers, 2x cm
																							qtz-dll stringers.
58.0		M	fg	frag	g.y	sil	2						2			1			44938	1.5		.000	As 52.0, pale grey, stockwork veinlets - stg silica,
																							3x 2-10 cm qtz-epi bands - dll selvs? lime green.
59.5		M	fg	frag	g.y	sil	2						2			1			44939	1.5		.000	As 52, stg silica, epi patches, hematite alt increases
																							towards lower contact, is ass w margins of q-c veinlets.
61.0		M	fg	brx	g.y	sil	2						3						44940	1.5		.000	Strong hematite-orange red colour, blocky, core, stockwork
																							q-c veinlets w chlorite, incipient breccia texture, well
																							developed breccia towards 61.0.

DRILL HOLE NO: TT 96-15

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py							
61.0																							
62.5		M	fg	brx	gy	sil	2						3			2			44941	1.5		.000	As 61.0; lesser hematite, less bxd toward 62.5, qtz amys,
																							cm qv's w hem altd margins, low angle qtz-chl veins.
64.0		M	fg	bnd	gg	chl	2						3			.5			44942	1.5		.000	Banded qtz-epi altn ac 55.0 etc, weak hem, chloritic
																							towards 64.0; tr diss py.
65.5		M	fg	bnd	gg	chl	2						2			3			44943	1.5		.000	Diss py, stringers ass w chlorite, lesser silica, inc chl-bio
																							towards 65.5.
67.0		M	fg	bnd	gg	bio	2						2			3			44944	1.5		.000	Bio/chl altn, diss py, qtz amys- alb phenocrysts, qv's w
																							epi altd wall, 10cm se/epi band at 67.0.
68.5		M	fg	amyg	bn	bio	2		S	70			3			3			44945	1.5		.000	Dominantly bio altn, stringers py/chl, qtz amygdules
70.0		M	fg	amyg	bn	bio	2						2			.5			44946	1.5		.000	As 68.5; tr py. 2× cm qtz-epi bands.
71.5		S	fg	amyg	bn	bio	2		S	70			2						44947	1.5		.000	Bio altn, bands epidote, stg fol'd at 70°, mnor hem
																							stained, low angle fracture cuts core; barren.
73.0		S	fg	amyg	bn	sil	2						2						44948	1.5		.000	Pale grey-brown, with amys + felds phenos, barren, mod
																							silica altn.
74.5		S	fg	amyg	bn	sil	2						3						44949	1.5		.000	Moderate silica/bio altn, 3×2-3cm qtz-epidote.
76.0		S	fg	amyg	bn	sil	2						2						44950	1.5		.000	As 74.5, weak hem altn, qtz-epi veinlets

DRILL HOLE NO: TT96-15

DIST 76.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	Au ✓ opt grams	COMMENTS
77.5		S	fg	amyg	bn	sil	2												44951	1.5	S	.000	Qtz-hem fractures
79.0		S	fg	amyg	bn	sil	2												44952	1.5	S	.000	Qtz-epidote-hematite zone at 77.5-77.7, stg foltn, prog less silica altn towards 79.0
																							Below 79.0 mafic volcanics dominantly chl and bio altn, out of silica-hematite-epidote altn typical from 43.0-79.0 related to the diabase.
100.0		S	vfg	spt	gy	bio	2		S	65			2			.5			44953	21.0	G	.000	Biotite-chlorite altn in mafic voles. few mm scattered amygdules, mod foltn at 60°, few qtz veins ≤ 3cm, locally tr-1% diss py through interval ass w qv's, Few 10cm qtz-epi patches/zones - pill selvages?
101.5		S	vfg	spt	gy	bio	2						3			3			44954	1.5	S	.000	As 100.0: inc silica, several cm qv's w py and diss py through interval
103.0		S	vfg	spt	gy	bio	2						2			2			44955	1.5	S	.000	As 105.0; less pyrite.
121.0		S	vfg	spt	gy	bio	2		S	70									44956	18.0	G	.000	Variably altd amygdaloidal pillow lavas - generally bio-chlorite with overprinting silica. Irreg qtz-chl-hematite veinlets, Tr diss py generally ass w chloritic intervals. 116- Chlorite slip/fault. Minor epidote ass w qtz veinlets.

DRILL HOLE NO: TT 96-15

DIST 121.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
122.5		S	vfg	spt	gy	bio	2						2			2			44957	1.5	S	.000	As 121.0, w increased mineralization, as diss py on biotite
																							foltn planes. Few ccm qv's.
124.0		S	vfg	spt	gy	bio	2						5			2			44958	1.5	S	.000	As 122.5 w irreg clear cm qv's 123.4-123.7.
125.5		S	vfg	spt	gy	bio	2						2			2			44959	1.5	S	.000	As 122.5; pill selv at 124.3
127.0		S	vfg	spt	gy	bio	2						3			2			44960	1.5	S	.000	As 122.5, biotite w overprinting silica, diss and stringer py, diss py.
128.5		S	vfg	spt	gy	bio	2						2			3			44961	1.5	S	.000	As 122.5; diss py on foltn sfcs.
130.0		S	vfg	spt	gy	bio	2						2			1			44962	1.5	S	.000	As 122.5; lesser py.
151.0		S	vfg	amyg	gg	chl	2												44963	21.0	G	.000	Generally uniform chlorite-biotite altd amygdular pillowed
																							mafic volcanics, tr-locally 1% diss pyrite throughout.
																							133.0-134.0 - Qtz-epidote altn.
																							142.4-142.9 blocky, low angle fault.
																							145.5-145.8 barren 10cm qtz, epi altn.
181.0		S	vfg	amyg	gg	chl	2		S	70									44964	30.0	G	.000	As 151.0 Dark grey-green colour. Biotite rich bands
																							2-20 cm throughout. mm amygdules throughout. Mod-strongly foliated, tr py. Tr qtz as cm veinlets, clr margin
																							175.5-175.9 Irreg qtz and epidote altn.

DRILL HOLE NO: TT 96-15

DIST	ID	ROCK DESCRIPTION							STRUCTURE				GANGUE			METALLIC			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
181.0		Com	Grs	Text	Co	Alt	Name 1	Name 2	B/S B	B/S A1	J/F J	J/F A2	Qtz			Py							
195.3		S	vfg	amyg	gg	chl	2		S	70			3			.5			44965	14.3	G	.000	As 151.0, few irreg qtz's, some with weak hematite, weak 'banded' texture w cm epidote/sericite bands. Tr py.
196.5							2	Qtz					10			.5			44966	1.2	S	.000	Chloritic mafics cut by 1x15 and 2x2 cm qtz veins, chloritic margins, barren.
198.0		S	vfg	amyg	gg	chl	2						5			1			44967	1.5	S	.000	Minor shearing/veining as 196.5; tr py on foliation sfcs.
202.0		S	vfg	amyg	gg	chl	2		S	70			1			.5			44968	4.0	G	.000	Dark green chloritic mafics, mod-strong foliated, tr py.
203.7		SS	vfg	shd	gn	chl	2						1			.5			44969	1.7	S	.000	Strong shearing, blocky, disc core, chloritic mafics, minor gouge hematite staining and in qtz veins towards 203.7
204.4		M	mg	por	or	hem	8						5			3			44970	0.7	S	.000	Feldspar porphyry dike. 1-5 mm angular white-orange alb crystals loosely packed in grey-green mafic matrix. Cut by hematite stained qtz veins and low angle qtz vein well mixed w pyrite and moly; epidote stained.
206.0		SS	vfg	shd	gn	chl	2						1			.5			44971	1.6	S	.000	Strong sheared, hem staining, tr py, chloritic.

DRILL HOLE NO: TT 96-15

DIST 206.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
207.5		SS	Vfg	shd	gn	chl	2		S	60			2			2			44972	1.5	S	.000	Strong sheared chloritic matrix, minor biotite on folii, few cm qtz-hematite-pyrite veins/boudins. Hematite on foliation surfaces.
209.0		SS	vfg	shd	gn	chl	2						2			1			44973	1.5	S	.000	As 207.5, fault gouge 207.7. qtz-epi (pillselv?) at 208.1; Qtz-chl-hematite 208.5.
210.5		SS	vfg	shd	gn	chl	2						2			1			44974	1.5	S	.000	Strong sheared, as 207.5. cm qtz veins/boudins, lined w hematite at 209.6
212.0		SS	vfg	shd	gn	chl	2												44975	1.5	S	.000	Sheared; no veining; chlorite, few qtz amygdules.
213.5		SS	vfg	shd	gn	chl	2						1						44976	1.5	S	.000	Chloritic, minor biotite rich intervals, 3cm qtz-chl-tourmaline vein at 212.5.
215.0		SS	vfg	shd	gn	chl	2		S	60			1						44977	1.5	S	.000	Chloritic, sheared, few mm qtz veinlets.
216.5		S	fg	spt	gn	chl	2												44978	1.5	S	.000	Sharp contact at 215.0 to chloritic-biotite-siliceous mafic volcanics with 5% 1-3 mm feldspar phenocrysts scattered through unit, gives spotted texture in mafic volcanics; moderately schistose. Matrix siliceous adjacent to stockwork fractures.
218.0		S	fg	spt	gn	chl	2												44979	1.5		.000	As 216.5, dark chloritic green, nil veining.

DRILL HOLE NO: TT 96-15

DIST 218.0	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
219.5		S	fg	spt	gn	chl	2						2			1			44980	1.5		.000	As 216.5, 2×1 cm clear qtz veins w tr py.
221.0		S	fg	spt	gn	chl	2						3			1			44981	1.5		.000	As 216.5, 3× cm qv's, banded texture w cm scale qtz/epidote or qtz/sericite bands, <mm qtz and albite phenos throughout.
222.5		S	fg	bnd	bn	ser	2		S	70			2			1			44982	1.5		.000	Pale brown (sericite?) bands 1-10 cm scattered through, ass w tr pyrite, py ass w low angle qtz. fractures. Qtz and albite phenocrysts throughout.
224.0		S	fg	bnd	bn	ser	2						3			1			44983	1.5		.000	Well developed banded texture as 222.5, alternating chlorite and sericite (pale brown) bands 1-3 cm wide. Clear, boudinaged cm qtz vein, barren, at 223.4.
225.5		S	fg	spt	gn	chl	2						1			1			44984	1.5		.000	As 216.5, lacks sericite banding. Barren stockwork type veinlets in alt'd margins.
227.0		S	fg	spt	gn	chl	2												44985	1.5		.000	As 225.5.
228.5		S	fg	spt	gn	chl	2												44986	1.5		.000	As 225.5 - progressively stronger chlorite. 227.3 - clear 2-3 cm qtz.

DRILL HOLE NO: TT 96-15

DIST 228.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qz			METALLIC Py			SAMPLE #	WIDTH	T	AU ☑ opt grams	COMMENTS
244.5		S	fg	spt	gg	chl	2						3			.5			44987	16.0	G	.000	Pale grey-green volcanics, 5% feldspar phenocrysts peppered throughout, generally chloritic, cut by few 1-3 cm qtz veins, chloritic margins, locally stockwork fractures, silicified margins. 242.6-242.7 mafic dyke.
246.2		S	fg	spt	bn	ser	2						3			2			44988	1.7	S	.000	Altered volcanics as above, qtz veinlets w sericite altn margins, mixed w mg py, lime green, pale brown ser altn increases towards 246.2; stg sheared, altn throughout.
247.8		M	mg	msv	gn	chl	7						1			.5			44989	1.6	S	.000	Mafic intrusive. Med grained, massive, pale grey-green, feldspar + hornblende - fg diorite in appearance. Cut by few qtz - hematite - pyrite fractures.
249.4		M	mg	msv	gn	chl	7						1			.5			44990	1.6	S	.000	As 247.8
250.5		SS	fg	spt	gg	sil	2						3			2			44991	1.1	S	.000	Sheared and altered as above intrusive, fragmental texture w diorite-pyrite veinlets. Qtz veinlets w bleached margins. Strong silicification.
252.1		SS	fg	spt	gg	chl	2						2			1			44992	1.6	S	.000	As 250.5; prog less silica and increasing chlorite altn.

DRILL HOLE NO: TT 96-15

DIST 252.1	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
260.2		S	fg	spt	g.g	chl	2						2			.5			44993	8.1	4	.000	chl-silica-biotite alt'd mafics as 244.5 etc, increase in albite in both size 2-10 mm and abundance 50-70%. Mod folt'd at 70°, locally banded w 1-3 cm sericite-epidote bands. Qtz w bleached margins. Tr diss py
260.8		M	fmg	msv	g.n	chl	12												———	0.6		———	Mafic-diabase-dike-fmg; magnetic, msv
262.3		S	fg	spt	g.g	chl	2						2			.5			44994	1.5	S	.000	As 260.2; >50% large albite phenocrysts but unit is cut by few <cm clear qv's.
264.0		S	fg	spt	g.g	chl	2						5			1			44995	1.7	S	.000	As 260.2 etc. increased 1-2 cm size qtz veins, margins stg silicified, fg diss py, few sericite bands.
265.5		S	fg	spt	bn	ser	2												44996	1.5	S	.000	As 264.0; sericite bands 5-10 cm through interval.
267.3		S	fg	spt	bn	ser	2						5			1			44997	1.8	S	.000	Patches stronger sericite-yellow-green, schistose-ie 265.6-265.8; diss py; cm vneq qv's common.
269.0		S	fg	spt	g.n	chl	2						1			1			44998	1.7	S	.000	As 267.3, fewer qv's; diss py; lesser sericite, inc chlorite.
270.5		S	fg	spt	g.n	chl	2						1			.5			44999	1.5	S	.000	As 267.3 sericite band 269.5-269.6; tr diss py on folth.
																							269.6-269.7 chloritic mafic dike, rubble core.

DRILL HOLE NO: TT96-15

DIST 270.5	ID	ROCK DESCRIPTION Com	Grs	Text	Co	Alt	Name 1	Name 2	STRUCTURE B/S B	A1	J/F J	A2	GANGUE Qtz			METALLIC Py			SAMPLE #	WIDTH	T	AU ✓ opt grams	COMMENTS
280.0		S	fg	spt	qn	chl	2												44851	9.5	G	.000	Dominantly chloritic, dark green grey colour, 50% alb
																							pheno's >5 mm throughout, moderately foliated, few
																							low angle qtz's w bleached margins.
																							278.5-278.7 pink colour - hem/sericite alt'n?
																							278.7 - 278.0 fg banded mafic dyke.
289.0		S	fg	spt	qn	chl	2		S	60									44852	9.0	G	.000	Darker chloritic green, only 10% albite
																							phenocrysts, interval may be mafic intrusive? Schistose
																							matrix. Few bleached qtz veinlets, barren. Sharp contacts
																							at 280.0 and 289.0 suggests intrusive.
298.0		S	fg	spt	qn	chl	2												44853	9.0	G	.000	As 280.0 intervals 10-30 cm long common of
																							pale green/brown sericite alt'n. Few barren,
																							clear qtz veins.
END																							

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-5035-RA1

Company: ROYAL OAK MINES INC

Project: PO# 49258

Attn: P. Harvey/P. Coad

Date: DEC-09-96

We hereby certify the following Assay of 77 core samples submitted NOV-27-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX44851	Nil	-
AX44852	Nil	Nil
AX44853	Nil	-
AX44926	Nil	-
AX44927	Nil	-
AX44928	Nil	-
AX44929	Nil	-
AX44930	Nil	-
AX44931	Nil	-
AX44932	Nil	-
AX44933	Nil	-
AX44934	Nil	Nil
AX44935	Nil	-
AX44936	Nil	-
AX44937	Nil	-
AX44938	Nil	-
AX44939	Nil	-
AX44940	Nil	-
AX44941	Nil	Nil
AX44942	Nil	-
AX44943	Nil	-
AX44944	Nil	-
AX44945	Nil	-
AX44946	Nil	-
AX44947	Nil	-
AX44948	Nil	-
AX44949	Nil	-
AX44950	Nil	-
AX44951	Nil	-
AX44952	Nil	-

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0

Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories
A Division of TSL/Assayers Inc.
Established 1928
Assaying - Consulting - Representation

Assay Certificate

6W-5035-RA1

Company: ROYAL OAK MINES INC
Project: PO# 49258
Attn: P. Harvey/P. Coad

Date: DEC-09-96

We hereby certify the following Assay of 77 core samples submitted NOV-27-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX44953	Nil	-
AX44954	Nil	-
AX44955	Nil	-
AX44956	Nil	-
AX44957	Nil	Nil
AX44958	Nil	-
AX44959	Nil	-
AX44960	Nil	-
AX44961	Nil	-
AX44962	Nil	-
AX44963	Nil	-
AX44964	Nil	Nil
AX44965	Nil	-
AX44966	Nil	-
AX44967	Nil	-
AX44968	Nil	-
AX44969	Nil	-
AX44970	Nil	-
AX44971	Nil	-
AX44972	Nil	-
AX44973	Nil	-
AX44974	Nil	-
AX44975	Nil	-
AX44976	Nil	-
AX44977	Nil	-
AX44978	Nil	-
AX44979	Nil	-
AX44980	Nil	-
AX44981	Nil	-
AX44982	Nil	-

One assay ton portion used.

Certified by G. Libby

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories

A Division of TSL/Assayers Inc.

Established 1928

Assaying - Consulting - Representation

Assay Certificate

6W-5035-RA1

Company: ROYAL OAK MINES INC
Project: PO# 49258
Attn: P. Harvey/P. Coad

Date DEC-09-96

We hereby certify the following Assay of 77 core samples submitted NOV-27-96 by .

Sample Number	Au oz/ton	Au Check oz/ton
AX44983	Nil	-
AX44984	Nil	-
AX44985	Nil	-
AX44986	Nil	-
AX44987	Nil	-
AX44988	Nil	-
AX44989	Nil	-
AX44990	Nil	-
AX44991	Nil	Nil
AX44992	Nil	-
AX44993	Nil	-
AX44994	Nil	-
AX44995	Nil	-
AX44996	Nil	-
AX44997	Nil	-
AX44998	Nil	-
AX44999	Nil	-

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705)642-3244 FAX (705)642-3300

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use): W9660.00843
Assessment Files Research Imaging

Personal information collected on this form is obtained under the authority of subsections 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, the information is a public record. Th... the mining land holder. Questions about this collection should be di... and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3I...

42A07SE0009 W9660.00843 TIMMINS

900

Instructions: - For work performed ...
- Please type or print i...

1. Recorded holder(s) (Attach a list if necessary)

Name: ROYAL OAK MINES INC.	Client Number: 136226
Address: P.O. BAG 2010	Telephone Number: 360-1141
TIMMINS, ONT. P4N 7X7	Fax Number: 360-1532
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☐ Geotechnical: prospecting, surveys, assays and work under section 18 (regs)
☑ Physical: drilling, stripping, trenching and associated assays
☐ Rehabilitation

Work Type: Diamond Drilling	Office Use
	Commodity
	Total $ Value of Work Claimed: 83,077
Dates Work Performed: From 4 (Day) 11 (Month) 96 (Year) To 19 (Day) 12 (Month) 96 (Year)	NTS Reference
Global Positioning System Data (if available)	Township/Area: TIMMINS TWP
	Mining Division: Porcupine
	M or G-Plan Number: M.314
	Resident Geologist District: Timmins

Please remember to:
- obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name: Peter Harvey	Telephone Number: 360-1141
Address: c/o Royal Oak Mines - as above	Fax Number: 360-1532
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

RECEIVED
DEC 20 1996
PORCUPINE MINING DIVISION

RECORDED
DEC 20 1996
Receipt

4. Certification by Recorded Holder or Agent

I, Peter G. Harvey (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent: Peter Harvey		Date: Dec. 20 '96
Agent's Address: c/o Royal Oak Mines - as above.	Telephone Number	Fax Number

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	**Number of Claim Units.** For other mining land, list hectares.	**Value of work performed** on this claim or other mining land.	**Value of work applied** to this claim.	**Value of work assigned** to other mining claims.	**Bank.** Value of work to be distributed at a future date.
eg	TB 7827	16 ha	$26, 825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8, 892	$ 4,000	0	$4,892
1	1193700	16	42,232	1,456	40,250	526
2	1193703	16	19,972	4,695	15,277	
3	1193746	16	18,030	6,400	11,630	
4	1200259	16	2,843	0	2,843	
5	1200272	16	0	6,400	0	
6	1200268	16	0	6,400	0	
7	1200267	16	0	6,400	0	
8	1193745	16	0	6,400	0	
9	1200280	12	0	4,800	0	
10	1200284	8	0	3,200	0	
11	1200285	16	0	6,400	0	
12	1193748	3	0	1,200	0	
13	1193702	1	0	400	0	
14	1193747	16	0	6,400	0	
15	1200291	8	0	3,200	0	
		Column Totals	SEE	NEXT	PAGE	

I, _____ (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
Pete Harvey	Dec 20 '96

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☑ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☑ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp: RECEIVED DEC 20 1996 955 PORCUPINE MINING DIVISION

Deemed Approved Date	Date Notification Sent
Mar 20/97	
Date Approved Feb 24/97	**Total Value of Credit Approved**
Approved for Recording by Mining Recorder (Signature)	

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	**Number of Claim Units.** For other mining land, list hectares.	**Value of work performed** on this claim or other mining land.	**Value of work applied** to this claim.	**Value of work assigned** to other mining claims.	**Bank.** Value of work to be distributed at a future date.
eg	TB 7827	16 ha	$26, 825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8, 892	$ 4,000	0	$4,892
1	1200290	16	0	6,400		
2	1193701	8	0	3,200		
3	1193706	12	0	4,800		
4	1193749	2	0	800		
5	1193750	9	0	3,600		
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
		Column Totals	83,077	82,551	70,000	526

I, Peter G. Harvey (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing: Peter Harvey — Date: Dec 20 '96

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☑ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☑ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp: DEC 30 1996 — PORCUPINE MINING DIVISION

Deemed Approved Date	Date Notification Sent
Date Approved	Total Value of Credit Approved
Approved for Recording by Mining Recorder (Signature)	

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use): W9660.00843

Personal information collected on this form is obtained under the authority of subsection 6(1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Work Type	Units of Work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
Diamond Drilling	1198 m	$ 56.84/m	$ 68,089
Swastika Labs	313 samples	$ 12.31/each	$ 3,851
Labor - sampling etc.	10 man days	$ 150/day	$ 1,500
Supervision, report etc.	30 man days	$ 225/day	$ 6,750
Associated Costs (e.g. supplies, mobilization and demobilization).			
200 Core boxes		6.69/box	$ 1,337
Core storage, saw blade etc.			$ 800
Transportation Costs			
Truck, gas etc			$ 750
Food and Lodging Costs			
		Total Value of Assessment Work	$ 83,077

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK × 0.50 = Total $ value of worked claimed.

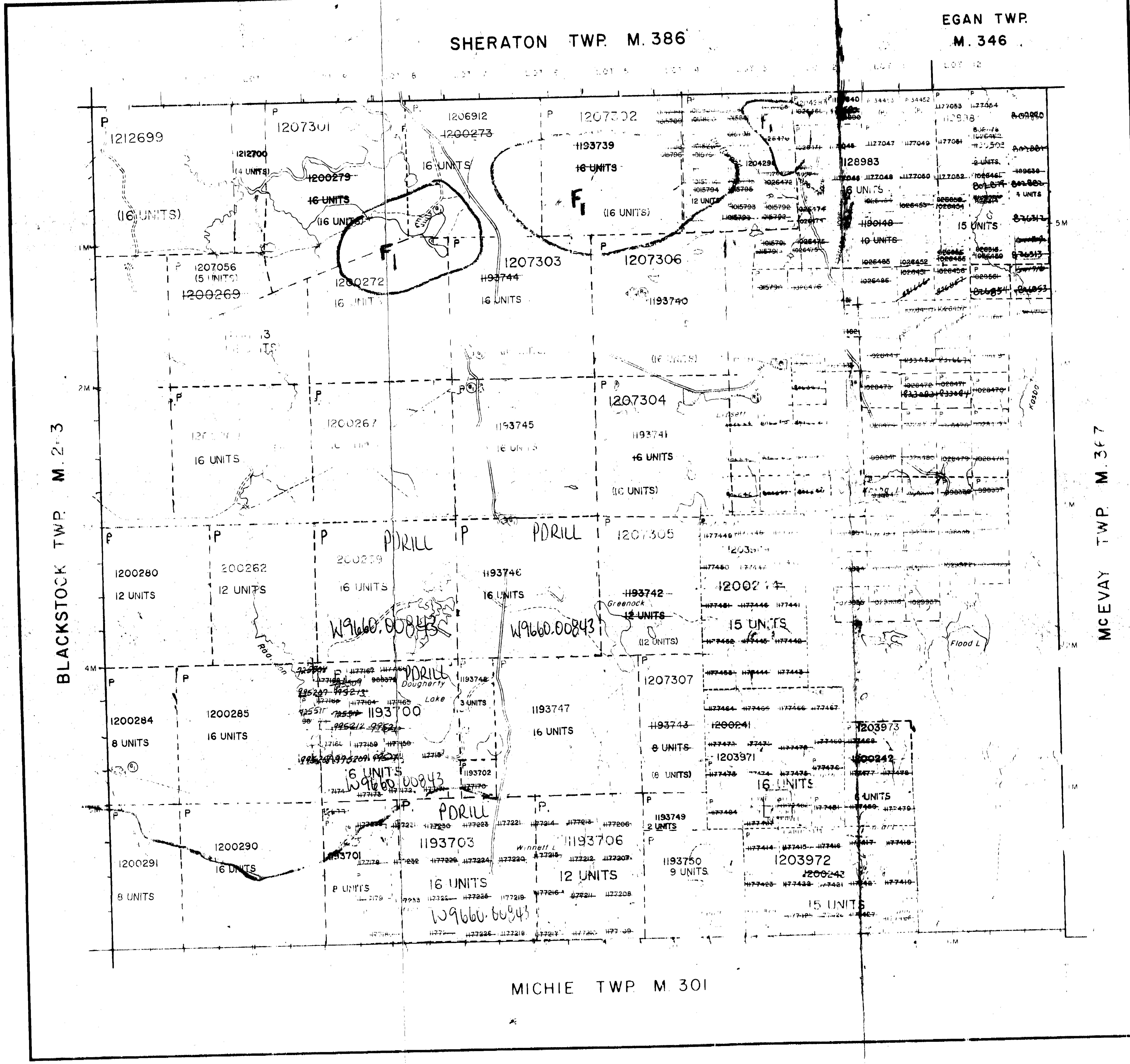
Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, Peter G. Harvey (please print full name), do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as Project Geologist (recorded holder, agent, or state company position with signing authority) I am authorized to make this certification.

RECEIVED
DEC 20 1996
PORCUPINE MINING DIVISION

Signature: [signature] Date: [illegible]



NOTES

400' surface rights reservation along the shores of all lakes and rivers.

Areas withdrawn from staking under Section 43 of the Mining Act, R.S.O. 1970.

Order No.	File	Date	Disposition

SAND and GRAVEL

(Q) Quarry Permit

LEGEND

PATENTED LAND (P) or ●
PATENTED FOR SURFACE RIGHTS ONLY
HIGHWAY & ROUTE NO.
ROADS
TRAILS
RAILWAYS
POWER LINES
MARSH OR MUSKEG
MINES

TOWNSHIP OF

TIMMINS

DISTRICT OF
COCHRANE

PORCUPINE
MINING DIVISION

M.314

MINISTRY OF NATURAL RESOURCES

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

200

M.314

LEGEND

12 OLIVINE DIABASE

11 QUARTZ DIABASE

10 HURONIAN SEDIMENTS

10a	Arkose
10w	Wacke
10arg	Argillite
10c	Conglomerate

9 MATACHEWAN DIABASE

8 FELSIC INTRUSIVE ROCKS

8	Unsubdivided
8qp	Quartz porphyry
8fp	Feldspar porphyry
8qfp	Quartz feldspar porphyry
8f	Felsite, p (porphyritic), qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
8hbt	Hornblende-biotite trondhjemite
8pm	Porphyritic monzonite
8gd	Granodiorite
8pg	Porphyritic granodiorite
8lg	Leucocratic granodiorite
8hd	Hornblende diorite
8qd	Quartz diorite
8p	Porphyry
8a	Aplite
8s	Syenite
8g	Granite or quartz-rich syenite
8t	Trachyte

7 MAFIC INTRUSIVE ROCKS

7	Unsubdivided
7a	Anorthosite
7d	Diorite
7g	Gabbro
7qg	Quartz gabbro
7pg	Pegmatoidal gabbro
7l	Lamprophyre
7ib	Intrusive breccia
7n	Nipissing-type diabase sills

6 ULTRAMAFIC INTRUSIVE ROCKS

6	Unsubdivided
6s	Serpentinized diorite-peridotite
6ph	Pyroxene-hornblende
6c	Carbonatized
6tm	Talc-magnesite

5 SEDIMENTS

5	Unsubdivided
5a	Argillite
5c	Conglomerate
5g	Greywacke
5sl	Slate
5p	Porphyritic, qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
5d	Debris flow
5q	Quartzite
5qw	Quartz wacke
5gr	Graphite
5ch	Chert
5ag	Agglomerate
5t	Tuffaceous-sediment
5s	Siltstone
5ss	Sandstone
5sch	Schist
5sh	Shear
5ex	Exhalite
5tqp	Quartz porphyritic tuff
5phyl	Phyllite
GFZ	Graphitic Fault Zone

K denotes Keewatin
T denotes Timiskaming

4 INTERMEDIATE-FELSIC VOLCANICS

4d	Dacite
4rd	Rhyodacite flows
4dt	Dacite tuffs
4dp	Dacite pyroclastics
4da	Agglomerate-breccia conglomerate
4dlt	Dacite lapilli tuff
4dm	Dacite massive flow
4p	Intermediate-felsic pyroclastics
4r	Rhyolite-undifferentiated
4sch	Intermediate-felsic schist
4sh	Shear
4rm	Massive rhyolite
4rt	Rhyolite tuff
4rlt	Rhyolite lapilli tuff
4ra	Rhyolite agglomerate
qp	(quartz-eye porphyritic)
pp	(plagioclase-porphyritic)
4phyl	Phyllite

P denotes Primitive
E denotes Evolved

3 CALC-ALKALIC MAFIC VOLCANICS (MAFIC-INTERMEDIATE VOLCANICS)

3	Unsubdivided
3a	Andesite
3m	Massive
3p	Pillowed
3t,3lt	Tuff, lapilli-tuff
3b	Breccia
3c	Carbonatized
3am	Amphibolitized
3pb	Pillow brx
3sh	Shear

2 THOLEIITIC VOLCANICS

2	Unsubdivided
2m	Massive
2p	Pillowed
2a	Amygdaloidal
2apl	Amygdaloidal pillow lava
2v	Variolitic
2t	Tuff, lapilli-tuff
2b	Breccia
2c	Carbonatized
2pb	Pillow Breccia
2h	Hyaloclastite
2ag	Agglomerate
2am	Amphibolitized
2scf	Spherulitic, chicken-feed
2sch	Schistose
2sh	Shear
2F	Dominantly Fe-tholeiite
2M	Dominantly Mg-tholeiite
2AL	Dominantly AL-tholeiite
2I	Dominantly Icelandite

1 KOMATIITIC VOLCANICS

1	Unsubdivided
1s	Serpentinized, massive, polysutured, peridotitic komatiite
1ox	Olivine-spinifex textured peridotitic komatiitic flows
1px	Pyroxene-spinifex textured basaltic komatiitic flows
1mb	Massive basaltic komatiite
1m	Massive
1p	Pillowed
1c	Carbonatized peridotitic komatiite
1t	Talcose
1b	Basaltic komatiite
1cb	Carbonatized basaltic komatiite

IRON FORMATION

IFo	Oxide
IFs	Sulphide (py-po)
IFc	Carbonate
IFj	Jasper
BIF	Banded iron formation
IFchl	Chlorite-rich
IFgr	Graphitic

SULPHIDES

DS	Disseminated sulphides
SS	Stringer sulphides
MS	Massive sulphides
SMS	Semi-massive sulphides

OXIDES

Mt	Magnetite (80-100%)
QAV	Quartz ankerite veining

210

Royal Oak Mines Inc.

Timmins-Michie Property
Drill Hole TT96-4
Section 20+00E

SCALE 1" = 10.0 m

Royal Oak Mines Inc.

LEGEND

12 OLIVINE DIABASE

11 QUARTZ DIABASE

10 HURONIAN SEDIMENTS

10a	Arkose
10w	Wacke
10arg	Argillite
10c	Conglomerate

9 MATACHEWAN DIABASE

8 FELSIC INTRUSIVE ROCKS

8	Unsubdivided
8qp	Quartz porphyry
8fp	Feldspar porphyry
8qfp	Quartz feldspar porphyry
8f	Felsite, p (porphyritic), qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
8hbt	Hornblende-biotite trondhjemite
8pm	Porphyritic monzonite
8gd	Granodiorite
8pg	Porphyritic granodiorite
8lg	Leucocratic granodiorite
8hd	Hornblende diorite
8qd	Quartz diorite
8p	Porphyry
8a	Aplite
8s	Syenite
8g	Granite or quartz-rich syenite
8t	Trachyte

7 MAFIC INTRUSIVE ROCKS

7	Unsubdivided
7a	Anorthosite
7d	Diorite
7g	Gabbro
7qg	Quartz gabbro
7pg	Pegmatoidal gabbro
7l	Lamprophyre
7ib	Intrusive breccia
7n	Nipissing-type diabase sills

6 ULTRAMAFIC INTRUSIVE ROCKS

6	Unsubdivided
6s	Serpentinized diorite-peridotite
6ph	Pyroxene-hornblende
6c	Carbonatized
6tm	Talc-magnesite

5 SEDIMENTS

5	Unsubdivided
5a	Argillite
5c	Conglomerate
5g	Greywacke
5sl	Slate
5p	Porphyritic, qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
5d	Debris flow
5q	Quartzite
5qw	Quartz wacke
5gr	Graphite
5ch	Chert
5ag	Agglomerate
5t	Tuffaceous-sediment
5s	Siltstone
5ss	Sandstone
5sch	Schist
5sh	Shear
5ex	Exhalite
5tqp	Quartz porphyritic tuff
5phyl	Phyllite
GFZ	Graphitic Fault Zone

K denotes Keewatin
T denotes Timiskaming

4 INTERMEDIATE-FELSIC VOLCANICS

4d	Dacite
4rd	Rhyodacite flows
4dt	Dacite tuffs
4dp	Dacite pyroclastics
4da	Agglomerate-breccia conglomerate
4dlt	Dacite lapilli tuff
4dm	Dacite massive flow
4p	Intermediate-felsic pyroclastics
4r	Rhyolite-undifferentiated
4sch	Intermediate-felsic schist
4sh	Shear
4rm	Massive rhyolite
4rt	Rhyolite tuff
4rlt	Rhyolite lapilli tuff
4ra	Rhyolite agglomerate
qp	(quartz-eye porphyritic)
pp	(plagioclase-porphyritic)
4phyl	Phyllite

P denotes Primitive
E denotes Evolved

3 CALC-ALKALIC MAFIC VOLCANICS (MAFIC-INTERMEDIATE VOLCANICS)

3	Unsubdivided
3a	Andesite
3m	Massive
3p	Pillowed
3t,3lt	Tuff, lapilli-tuff
3b	Breccia
3c	Carbonatized
3am	Amphibolitized
3pb	Pillow brx
3sh	Shear

2 THOLEIITIC VOLCANICS

2	Unsubdivided
2m	Massive
2p	Pillowed
2a	Amygdaloidal
2apl	Amygdaloidal pillow lava
2v	Variolitic
2t	Tuff, lapilli-tuff
2b	Breccia
2c	Carbonatized
2pb	Pillow Breccia
2h	Hyaloclastite
2ag	Agglomerate
2am	Amphibolitized
2scf	Spherulitic, chicken-feed
2sch	Schistose
2sh	Shear
2F	Dominantly Fe-tholeiite
2M	Dominantly Mg-tholeiite
2AL	Dominantly AL-tholeiite
2I	Dominantly Icelandite

1 KOMATIITIC VOLCANICS

1	Unsubdivided
1s	Serpentinized, massive, polysutured, peridotitic komatiite
1ox	Olivine-spinifex textured peridotitic komatiitic flows
1px	Pyroxene-spinifex textured basaltic komatiitic flows
1mb	Massive basaltic komatiite
1m	Massive
1p	Pillowed
1c	Carbonatized peridotitic komatiite
1t	Talcose
1b	Basaltic komatiite
1cb	Carbonatized basaltic komatiite

IRON FORMATION

IFo	Oxide
IFs	Sulphide (py-po)
IFc	Carbonate
IFj	Jasper
BIF	Banded iron formation
IFchl	Chlorite-rich
IFgr	Graphitic

SULPHIDES

DS	Disseminated sulphides
SS	Stringer sulphides
MS	Massive sulphides
SMS	Semi-massive sulphides

OXIDES

Mt	Magnetite (80-100%)
QAV	Quartz ankerite veining

42A07SE0009 W9660.00843 TIMMINS

220

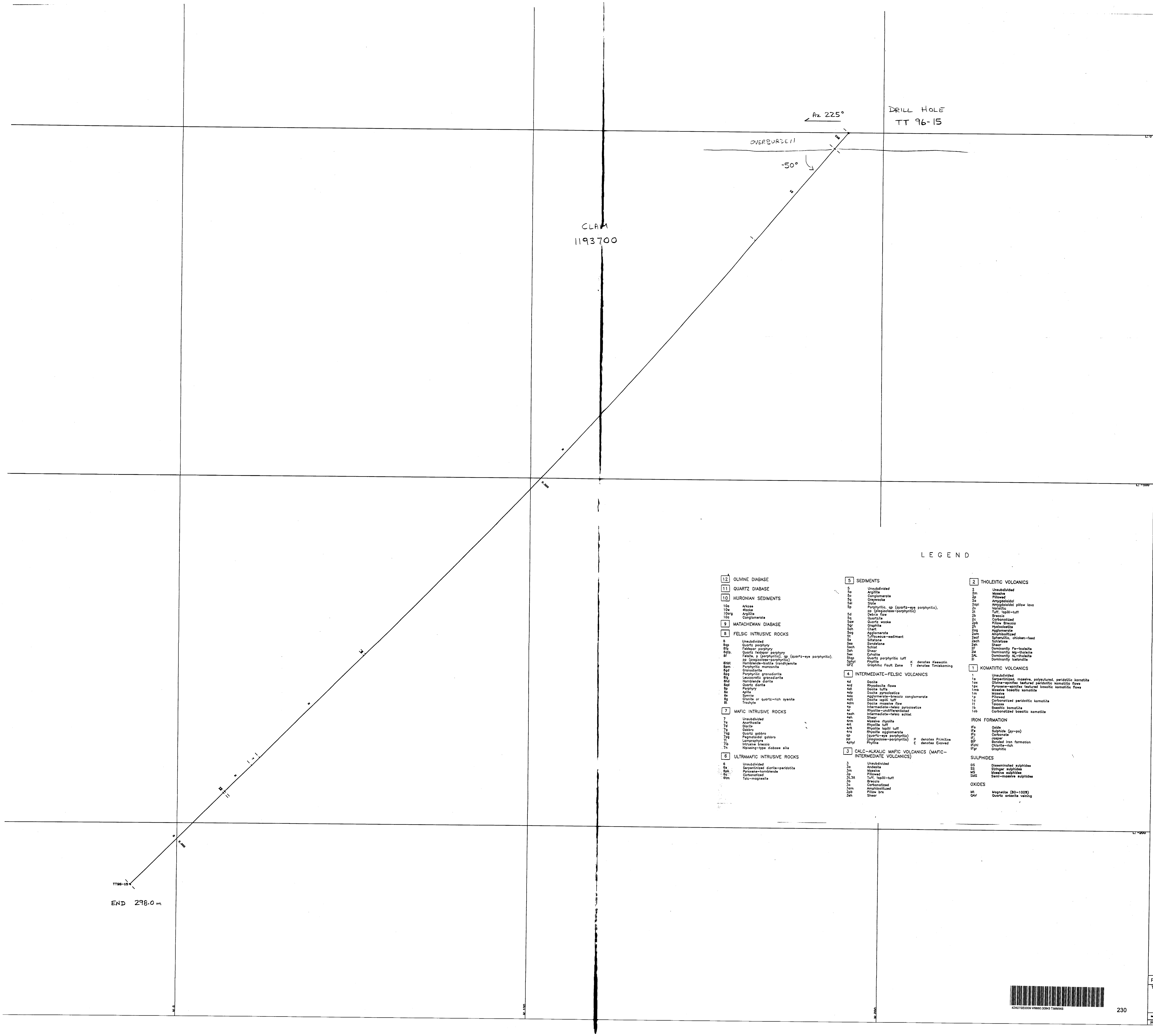
Royal Oak Mines Inc.

Timmins-Michie Property
Drill Hole TT96-14
Section 2+00E

SCALE 1" = 10.0 m
0.0 10.0

December, 1996	Scale 1cm = 3.94m	Dwn: P. Harvey

Royal Oak Mines Inc.



L E G E N D

12 OLIVINE DIABASE

11 QUARTZ DIABASE

10 HURONIAN SEDIMENTS

10a	Arkose
10w	Wacke
10arg	Argillite
10c	Conglomerate

9 MATACHEWAN DIABASE

8 FELSIC INTRUSIVE ROCKS

8	Unsubdivided
8qp	Quartz porphyry
8fp	Feldspar porphyry
8qfp.	Quartz feldspar porphyry
8f	Felsite, p (porphyritic), qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
8hbt	Hornblende-biotite trondhjemite
8pm	Porphyritic monzonite
8gd	Granodiorite
8pg	Porphyritic granodiorite
8lg	Leucocratic granodiorite
8hd	Hornblende diorite
8qd	Quartz diorite
8p	Porphyry
8a	Aplite
8s	Syenite
8g	Granite or quartz-rich syenite
8t	Trachyte

7 MAFIC INTRUSIVE ROCKS

7	Unsubdivided
7a	Anorthosite
7d	Diorite
7g	Gabbro
7qg	Quartz gabbro
7pg	Pegmatoidal gabbro
7l	Lamprophyre
7ib	Intrusive breccia
7n	Nipissing-type diabase sills

6 ULTRAMAFIC INTRUSIVE ROCKS

6	Unsubdivided
6s	Serpentinized diorite-peridotite
6ph	Pyroxene-hornblende
6c	Carbonatized
6tm	Talc-magnesite

5 SEDIMENTS

5	Unsubdivided
5a	Argillite
5c	Conglomerate
5g	Greywacke
5sl	Slate
5p	Porphyritic, qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
5d	Debris flow
5q	Quartzite
5qw	Quartz wacke
5gr	Graphite
5ch	Chert
5ag	Agglomerate
5t	Tuffaceous-sediment
5s	Siltstone
5ss	Sandstone
5sch	Schist
5sh	Shear
5ex	Exhalite
5tqp	Quartz porphyritic tuff
5phyl	Phyllite
GFZ	Graphitic Fault Zone

K denotes Keewatin
T denotes Timiskaming

4 INTERMEDIATE-FELSIC VOLCANICS

4d	Dacite
4rd	Rhyodacite flows
4dt	Dacite tuffs
4dp	Dacite pyroclastics
4da	Agglomerate-breccia conglomerate
4dlt	Dacite lapilli tuff
4dm	Dacite massive flow
4p	Intermediate-felsic pyroclastics
4r	Rhyolite-undifferentiated
4sch	Intermediate-felsic schist
4sh	Shear
4rm	Massive rhyolite
4rt	Rhyolite tuff
4rlt	Rhyolite lapilli tuff
4ra	Rhyolite agglomerate
qp	(quartz-eye porphyritic)
pp	(plagioclase-porphyritic)
4phyl	Phyllite

P denotes Primitive
E denotes Evolved

3 CALC-ALKALIC MAFIC VOLCANICS (MAFIC-INTERMEDIATE VOLCANICS)

3	Unsubdivided
3a	Andesite
3m	Massive
3p	Pillowed
3t,3lt	Tuff, lapilli-tuff
3b	Breccia
3c	Carbonatized
3am	Amphibolitized
3pb	Pillow brx
3sh	Shear

2 THOLEIITIC VOLCANICS

2	Unsubdivided
2m	Massive
2p	Pillowed
2a	Amygdaloidal
2apl	Amygdaloidal pillow lava
2v	Variolitic
2t	Tuff, lapilli-tuff
2b	Breccia
2c	Carbonatized
2pb	Pillow Breccia
2h	Hyaloclastite
2ag	Agglomerate
2am	Amphibolitized
2scf	Spherulitic, chicken-feed
2sch	Schistose
2sh	Shear
2F	Dominantly Fe-tholeiite
2M	Dominantly Mg-tholeiite
2AL	Dominantly AL-tholeiite
2I	Dominantly Icelandite

1 KOMATIITIC VOLCANICS

1	Unsubdivided
1s	Serpentinized, massive, polysutured, peridotitic komatiite
1ox	Olivine-spinifex textured peridotitic komatiitic flows
1px	Pyroxene-spinifex textured basaltic komatiitic flows
1mb	Massive basaltic komatiite
1m	Massive
1p	Pillowed
1c	Carbonatized peridotitic komatiite
1t	Talcose
1b	Basaltic komatiite
1cb	Carbonatized basaltic komatiite

IRON FORMATION

IFo	Oxide
IFs	Sulphide (py-po)
IFc	Carbonate
IFj	Jasper
BIF	Banded iron formation
IFchl	Chlorite-rich
IFgr	Graphitic

SULPHIDES

DS	Disseminated sulphides
SS	Stringer sulphides
MS	Massive sulphides
SMS	Semi-massive sulphides

OXIDES

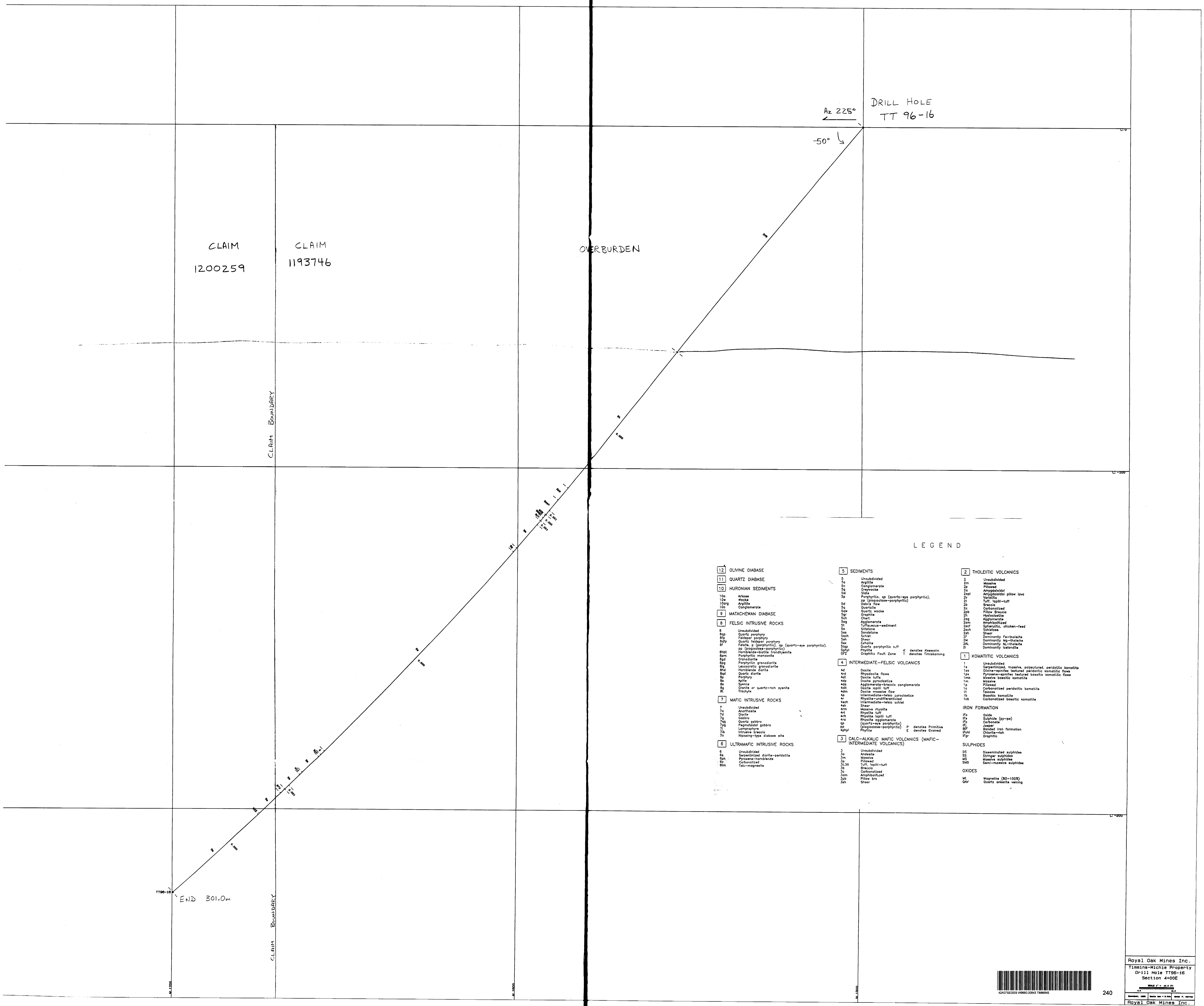
Mt	Magnetite (80-100%)
QAV	Quartz ankerite veining

230

Royal Oak Mines Inc.

Timmins-Michie Property
Drill Hole TT96-15
Section 3+00E

Royal Oak Mines Inc.



DRILL HOLE
TT 96-16
Az 225°
-50°
CLAIM
1200259
CLAIM
1193746
OVERBURDEN
CLAIM BOUNDARY
CLAIM BOUNDARY
TT96-16
END 301.0m
LEGEND
12 OLIVINE DIABASE
11 QUARTZ DIABASE
10 HURONIAN SEDIMENTS
10a Arkose
10w Wacke
10arg Argillite
10c Conglomerate
9 MATACHEWAN DIABASE
8 FELSIC INTRUSIVE ROCKS
8 Unsubdivided
8qp Quartz porphyry
8fp Feldspar porphyry
8qfp Quartz feldspar porphyry
8f Felsite, p (porphyritic), qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
8hbt Hornblende-biotite trondhjemite
8pm Porphyritic monzonite
8gd Granodiorite
8pg Porphyritic granodiorite
8lg Leucocratic granodiorite
8hd Hornblende diorite
8qd Quartz diorite
8p Porphyry
8a Aplite
8s Syenite
8g Granite or quartz-rich syenite
8t Trachyte
7 MAFIC INTRUSIVE ROCKS
7 Unsubdivided
7a Anorthosite
7d Diorite
7g Gabbro
7qg Quartz gabbro
7pg Pegmatoidal gabbro
7l Lamprophyre
7ib Intrusive breccia
7n Nipissing-type diabase sills
6 ULTRAMAFIC INTRUSIVE ROCKS
6 Unsubdivided
6s Serpentinized diorite-peridotite
6ph Pyroxene-hornblende
6c Carbonatized
6tm Talc-magnesite
5 SEDIMENTS
5 Unsubdivided
5a Argillite
5c Conglomerate
5g Greywacke
5sl Slate
5p Porphyritic, qp (quartz-eye porphyritic), pp (plagioclase-porphyritic)
5d Debris flow
5q Quartzite
5qw Quartz wacke
5gr Graphite
5ch Chert
5ag Agglomerate
5t Tuffaceous-sediment
5s Siltstone
5ss Sandstone
5sch Schist
5sh Shear
5ex Exhalite
5tqp Quartz porphyritic tuff
5phyl Phyllite
GFZ Graphitic Fault Zone
K denotes Keewatin
T denotes Timiskaming
4 INTERMEDIATE-FELSIC VOLCANICS
4d Dacite
4rd Rhyodacite flows
4dt Dacite tuffs
4dp Dacite pyroclastics
4da Agglomerate-breccia conglomerate
4dlt Dacite lapilli tuff
4dm Dacite massive flow
4p Intermediate-felsic pyroclastics
4r Rhyolite-undifferentiated
4sch Intermediate-felsic schist
4sh Shear
4rm Massive rhyolite
4rt Rhyolite tuff
4rlt Rhyolite lapilli tuff
4ra Rhyolite agglomerate
qp (quartz-eye porphyritic)
pp (plagioclase-porphyritic)
4phyl Phyllite
P denotes Primitive
E denotes Evolved
3 CALC-ALKALIC MAFIC VOLCANICS (MAFIC-INTERMEDIATE VOLCANICS)
3 Unsubdivided
3a Andesite
3m Massive
3p Pillowed
3t,3lt Tuff, lapilli-tuff
3b Breccia
3c Carbonatized
3am Amphibolitized
3pb Pillow brx
3sh Shear
2 THOLEIITIC VOLCANICS
2 Unsubdivided
2m Massive
2p Pillowed
2a Amygdaloidal
2apl Amygdaloidal pillow lava
2v Variolitic
2t Tuff, lapilli-tuff
2b Breccia
2c Carbonatized
2pb Pillow Breccia
2h Hyaloclastite
2ag Agglomerate
2am Amphibolitized
2scf Spherulitic, chicken-feed
2sch Schistose
2sh Shear
2F Dominantly Fe-tholeiite
2M Dominantly Mg-tholeiite
2AL Dominantly AL-tholeiite
2I Dominantly Icelandite
1 KOMATIITIC VOLCANICS
1 Unsubdivided
1s Serpentinized, massive, polysutured, peridotitic komatiite
1ox Olivine-spinifex textured peridotitic komatiitic flows
1px Pyroxene-spinifex textured basaltic komatiitic flows
1mb Massive basaltic komatiite
1m Massive
1p Pillowed
1c Carbonatized peridotitic komatiite
1t Talcose
1b Basaltic komatiite
1cb Carbonatized basaltic komatiite
IRON FORMATION
IFo Oxide
IFs Sulphide (py-po)
IFc Carbonate
IFj Jasper
BIF Banded iron formation
IFchl Chlorite-rich
IFgr Graphitic
SULPHIDES
DS Disseminated sulphides
SS Stringer sulphides
MS Massive sulphides
SMS Semi-massive sulphides
OXIDES
Mt Magnetite (80-100%)
QAV Quartz ankerite veining
240
Royal Oak Mines Inc.
Timmins-Michie Property
Drill Hole TT96-16
Section 4+00E
0.0
10.0
Royal Oak Mines Inc.