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**NORANDA INC.**  
**REPORT ON DIAMOND DRILLING**  
**1999**  
**THE TWIST ROAD PROPERTY**  
**CECIL TOWNSHIP G-2857**  
**N.T.S. 42F/4**  
**WESTERN CANADA REGION**

**2.19854**

PROJECT NO. 1703  
THUNDER BAY, ONTARIO  
NOVEMBER, 1999

DAVID KING *2.17252*  
PROJECT GEOLOGIST

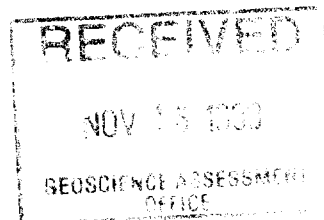




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## **SUMMARY**

The Twist Road Property is located 16 km east of the town of Manitouwadge in Northwestern Ontario and consists of 10 claim blocks (totaling 55 units) held by Noranda Inc. under an option agreement with Gilles Gionet. A single hole diamond drilling program was initiated in late August, 1999, as a follow-up to geophysical surveying (TDEM – King, 1999) completed in the winter of 1999.

The drill hole was targeted on a weak to moderate strength TDEM conductor, at a vertical depth of -75m, beneath known mineralization exposed on surface in trenches. Two thin zones of disseminated to stringer pyrrhotite, pyrite and trace chalcopyrite were intersected at 102.78m and 104.72m downhole. Assays returned 0.11% Cu/0.75m and 0.17% Cu/0.71m, respectively.

## 1.0 INTRODUCTION

The Twist Road Property is located 16 km east of the town of Manitowadge in Northwestern Ontario and consists of 10 claim blocks (totalling 55 units) held by Noranda Inc. under an option agreement with Gilles Gionet. A single diamond drill hole was completed on the property between August 27<sup>th</sup> and September 1<sup>st</sup>, 1999. The hole was targeted on a weak to moderate strength EM conductor outlined by a Time Domain Electromagnetic (TDEM) survey completed in the winter of 1999.

A list of Noranda personnel and contractors who worked on the Twist Lake Property is given in Appendix I. A Statement of Costs is given in Appendix II and a Statement of Qualifications is given in Appendix III

## 2.0 LOCATION AND ACCESS

The Twist Lake Property is located approximately 16 km E-SE of the town of Manitowadge in Northwestern Ontario (Figure 1). The Macutagon River cuts through the western portion of the property. Access to the property is from secondary logging roads east the town of Manitowadge. Access is gained by traveling along the Caramat road east from the eastern edge of Manitowadge Lake. Approximately 8km along the Caramat road the Faries Lake Road turns to the south. The Twist Road extends west from the Faries Lake road and cuts through the claim block.

## 3.0 PROPERTY SUMMARY AND CLAIMS DISPOSITION

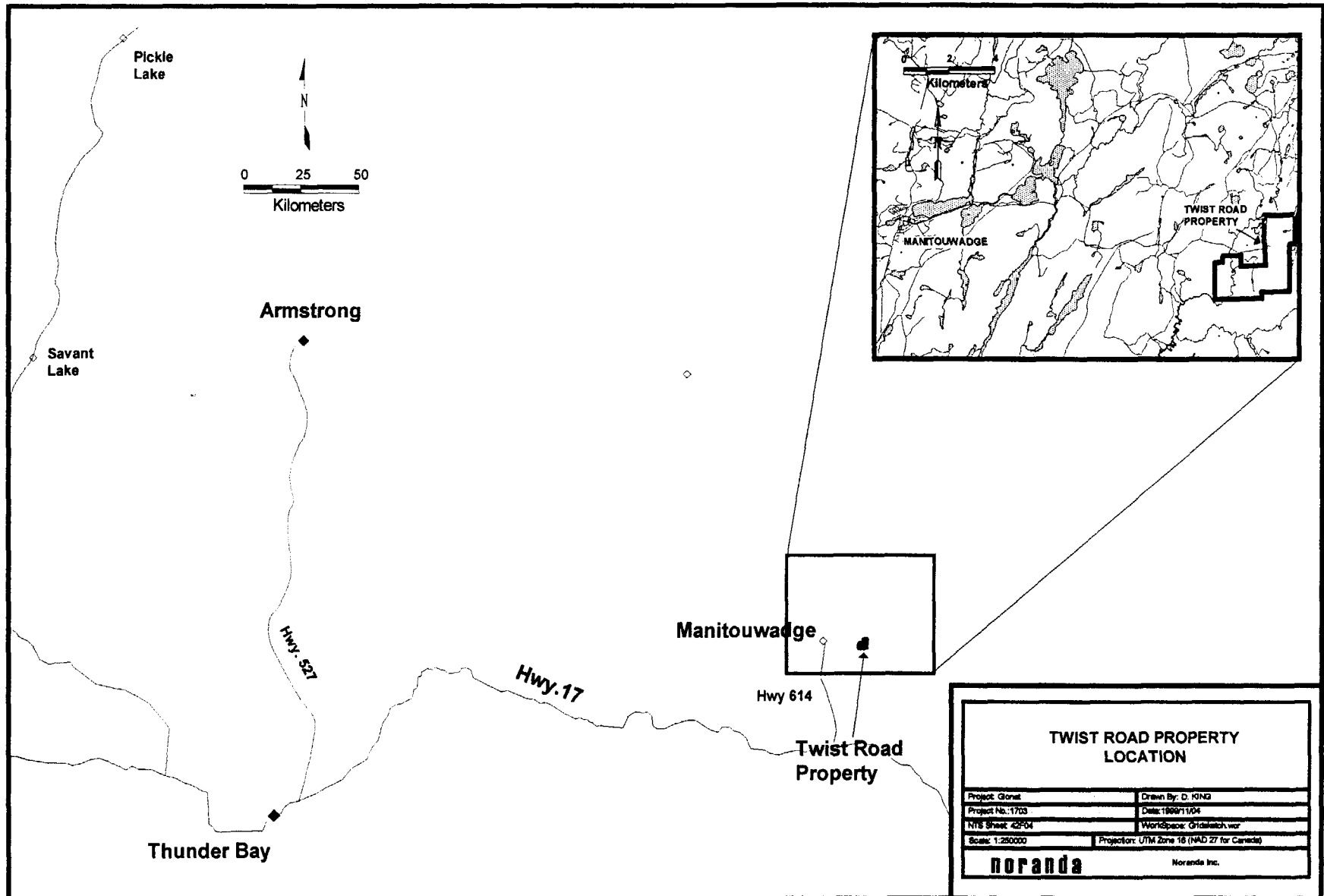
The Twist Road Property consists of 10 contiguous claim blocks totalling 55 claim units, held by Noranda Inc. under an option agreement with Gilles Gionet (Figure 2, back pocket). The property is located in Cecil Township, Map Sheet (G-2857), NTS 42F/4. A table of claim holdings is provided below (Table I)

**TABLE I: Claim Holdings – Twist Road Property**

CLAIM BLOCKS	CLAIM UNITS	RECORDING DATE
TB 1022620	3	July 11, 1997
TB 1022621	4	July 11, 1997
TB 1022622	2	July 11, 1997
TB 1022625	6	May 26, 1997
TB 1022627	15	September 16, 1997
TB 1022628	8	March 4, 1997
TB 1022629	3	September 16, 1997
TB 1141506	6	November 24, 1993
TB 1141507	4	October 24, 1994
TB 1141509	4	October 24, 1994
Total Units	55	

## 4.0 GENERAL GEOLOGY AND PREVIOUS WORK

The Faires Lake area was mapped by Williams and Breaks (1989, 1990) and mafic volcanic and layered mafic intrusive rocks have been identified in the area. In the Faries Lake area, anorthositic rocks structurally



**FIGURE 1**

overlie mafic to felsic metavolcanic rocks. The anorthositic rocks are part of the Moshkinabi and Faries Lake suites, which are described as mafic metavolcanic rocks and associated gabbro and anorthositic rocks, up to 700m thick. The Twist Road property was originally reconnaissance mapped in the summer of 1988 by Noranda Minerals Inc. (Geco Division). The area was then staked in the winter of 1988 and summer of 1989. More detailed mapping was completed in the summer of 1989 (Charlton, 1990) and geophysical surveys (HLEM, Mag) were completed over the property. The mapping program identified a zone of intense hydrothermal alteration in the area west of Rawluk lake, near an interpreted mafic volcanic-anorthosite contact. This alteration is associated with anomalous copper mineralization and coincident magnetic anomalies. A two hole diamond drill program was completed in 1990 testing the alteration zone and a weak HLEM conductor southwest of the alteration zone. Trenching, Beep-mat surveying and sampling was completed on the property in 1997 by Gilles and Micheal Gionet (Gionet, 1999). The property was optioned in 1999 by Noranda Inc. and geophysical surveys were completed in the winter of 1999 (King, 1999) and diamond drilling was completed in late August, 1999 (this report).

## 5.0 DIAMOND DRILLING

A single diamond drill hole (TR99-1) was drilled on the Twist Road property in 1999 as a follow-up to geophysical surveying (TDEM) completed in early 1999. The diamond drilling (NQ core) was carried out by St. Lambert Drilling of Valleyfield, Quebec. A summary of the diamond drill hole is given below in Table II. A diamond drill log is provided in Appendix IV and assay certificates are given in Appendix V.

DDH	LOCATION	DIP	AZIMUTH	DEPTH	TARGET	RESULTS
TR99-1	600N/330W	-50	285	183.0m	TDEM Conductor at 600N/425W	Disseminated to stringer sulphides 0.11% Cu/0.75m and 0.17% Cu/0.71m
			<b>TOTAL</b>	<b>183.0m</b>		

### TR99-1

Diamond drill hole TR99-1 was targeted on a weak to moderate strength TDEM conductor located at L600N/425W at the -75m level. The hole collared in a mixed dioritic unit. The diorite is typically fine- to medium-grained, weakly foliated to equigranular, with local feldspar porphyritic intervals and altered intervals. The diorite continues to a downhole depth of 96.87m, and then the hole passes into a thick sequence of mafic metavolcanics. The mafic metavolcanic rocks are commonly fine-grained, dark green coloured and well foliated to gneissic. Disseminated pyrite and pyrrhotite are common up to approximately 5% combined. The mafic volcanic rocks continue to the end of the hole at 183.0. Two thin cherty intervals with stringer to disseminated pyrrhotite, pyrite and trace chalcopyrite, were intersected at 102.78m and 104.72m downhole. These interval returned assays of 0.11% Cu/0.75m and 0.17% Cu/0.71m, respectively. These mineralized intervals are interpreted as the source of conductivity which was identified by the TDEM survey.

## 6.0 LITHOGEOCHEMISTRY

A total of 8 core samples were collected for whole rock lithochemical analysis at Chemex Laboratories of Mississauga, Ontario. An attempt was made to systematically sample the core at 25m intervals or when there was an obvious unit change. Analysis was carried out by XRF and consists of a standard whole rock package including the major element oxides plus Ba, Zr, Y, Sr, Rb, Nb. Geochemical analysis for Cu and Zn was carried out by Atomic Absorption. Certificates of analysis are given in Appendix V.

In general the geochemical analysis support the interpretation of rock types that were logged. The majority of samples which were described as diorite plot near the andesite/diorite compositional field and the mafic metavolcanic rocks plot near the basaltic field of the discrimination diagram given in Figure 6. The analysis also suggest that none of the samples are highly enriched in either copper or zinc. Sample WR-TR-1-180 has the highest concentration of copper, however it was collected in an area containing disseminated sulphides.

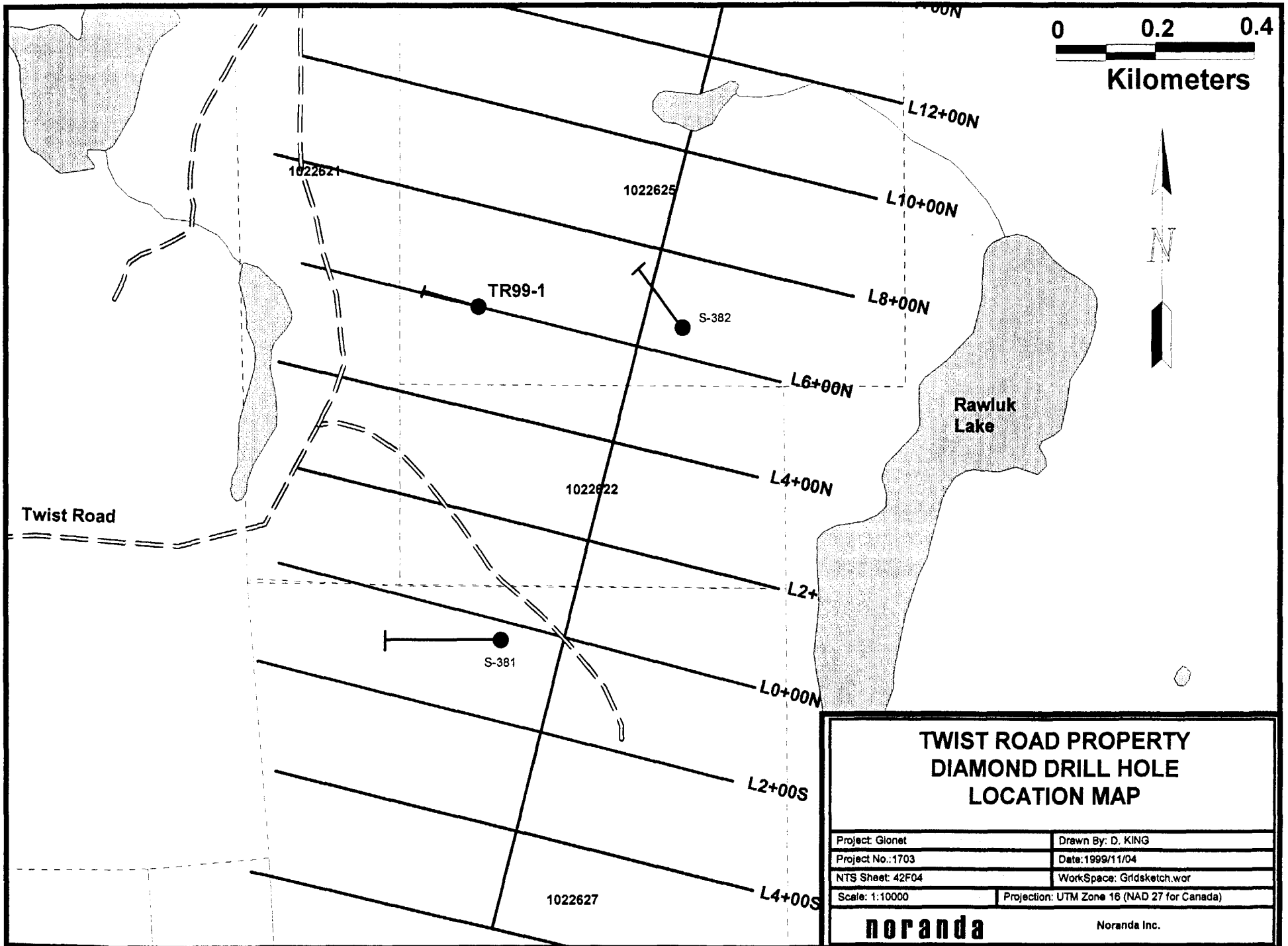


FIGURE 4

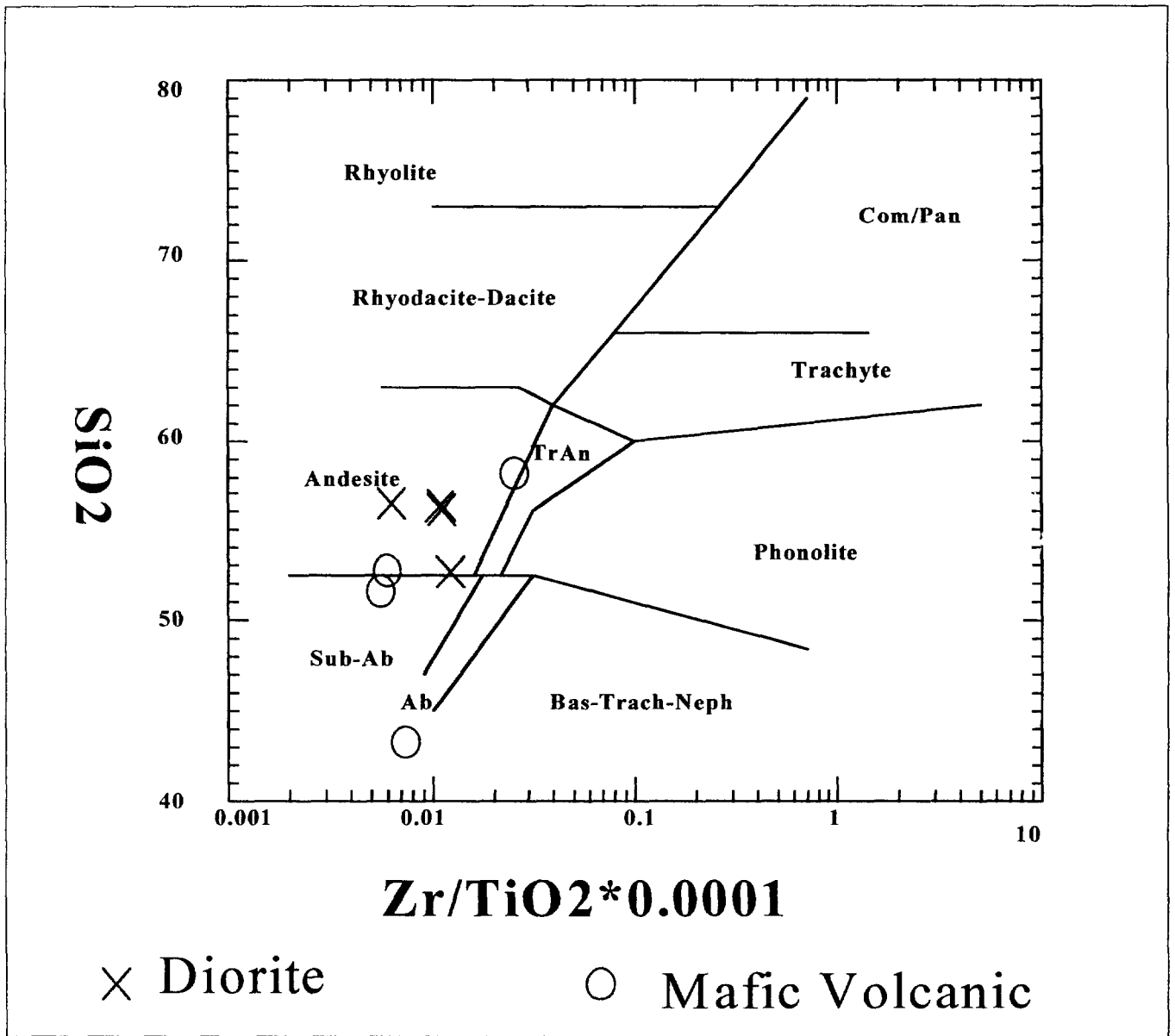


Figure 6 Winchester & Floyd (1977) Discrimination diagram



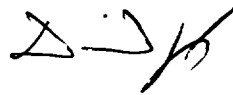
## 7.0 CONCLUSIONS AND RECOMMENDATIONS

A single diamond hole was completed on the Twist Road property as a follow-up to geophysical surveying completed in the winter of 1999. The drill hole was targeted on a weak to moderate strength TDEM conductor, at a vertical depth of -75m, beneath known mineralization exposed on surface in trenches.

Two thin zones of disseminated to stringer pyrrhotite, pyrite and trace chalcopyrite were intersected at 102.78m and 104.72m downhole. Assays returned 0.11% Cu/0.75m and 0.17% Cu/0.71m, respectively. These sulphide zones explain the conductivity identified using surface geophysical techniques, and are interpreted as the down-dip equivalent of the mineralization exposed on surface. The width of mineralization and base metal content do not support any follow-up drilling on this horizon at this time. A bore-hole pulse electromagnetic survey should be completed on the drill hole to identify any significant off-hole conductivity. There is very little space in the up-dip direction from this hole for an economic sulphide body. If a significant anomaly is identified in the down-dip direction, it should be considered for diamond drill testing.

Respectfully submitted,

**NORANDA INC.**



David King  
Project Geologist  
Western Canada Region

Thunder Bay, Ontario  
November, 1999

## LIST OF REFERENCES

- King, D., 1999, Report on Geophysical Surveys (DeepEM) 1999, Twist Road Property, Cecil Township G-2857, 42F/4, Unpublished Assessment Work Report, Noranda Inc.
- Williams, H. R. and Breaks, F. W., 1989. Project Unit 89-13, Geological Studies in the Manitouwadge-Hornpayne Area. In Summary of Field Work and Other Activities, 1989., Ontario Geological Survey Miscellaneous Paper 146.
- Williams, H. R. and Breaks, F. W., 1990. Project Unit 89-13, Geological Studies in the Manitouwadge-Hornpayne Region. In Summary of Field Work and Other Activities, 1990, Ontario Geological Survey Miscellaneous Paper 151.
- Charlton, 1990, North Faires Lake Area, 1989, Unpublished Assessment Work Report, Noranda Minerals Inc. Geco Division.
- Gionet, Gilles and Micheal., 1999, Faires Lake Property, Unpublished Assessment Work Report

**APPENDIX I**  
**ACKNOWLEDGEMENTS**

The following is a list of Noranda personnel who supervised or performed work on the Twist Road Property:

NAME	POSITION	ADDRESS
R. Adair	District Manager	874 Tungsten St., Thunder Bay, ON
D. King	Project Geologist	874 Tungsten St., Thunder Bay, ON
D. MacDonald	Senior Geologist	874 Tungsten St., Thunder Bay, ON

The following is a list of contractors who provided services on the Twist Road Property:

CONTRACTOR	ADDRESS	WORK TYPE
St. Lambert Diamond Drilling	Valleyfield, Quebec	Diamond Drilling
Chemex Labs Ltd.	Mississauga, Ontario	Geochemical Analysis

**APPENDIX II**  
**STATEMENT OF COSTS**

Statement of costs for diamond drilling on the Twist Road Property (Gionet Option) for the period from January 1<sup>st</sup>, 1999 to November 8<sup>th</sup>, 1999.

Labour	\$3207.70
Supplies/Equipment Rental	\$963.98
Lodging	\$137.26
Meals	\$254.51
Transportation	\$195.68
Geochemical Analysis	\$405.04
Diamond Drilling	<u>\$12,446.34</u>
<b>Total</b>	<b>\$17,610.51</b>

  
Laina MacLean  
Branch Accountant

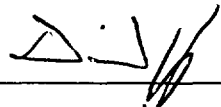
## APPENDIX III

### STATEMENT OF QUALIFICATIONS

I David King, hereby certify that:

1. I am a practicing geologist with Noranda Mining and Exploration Inc. in Thunder Bay, Ontario and reside at 299 Sunflower Street, Thunder Bay, Ontario.
2. I am a graduate of Lakehead University with a degree of H.B.Sc. Geology.
3. I am a graduate of Lakehead University with a degree of M.Sc. Geology.
3. I am a Canadian Citizen.
4. I have practiced my profession for since graduating in 1994.
5. I do not have, nor do I expect to receive, directly or indirectly, any interest in the properties of Noranda Inc.

SIGNATURE:

  
\_\_\_\_\_

DATE:

Nov 8/99

**APPENDIX IV**

**DIAMOND DRILL LOG**



noranda

# NORANDA INC.

## Diamond Drill Log

Hole Number **TR99-1**

Started 8/28/99 Finished: 8/30/99

### Co-ordinates - GEMCOM

Easting: 601240  
Northing: 5441140  
Elevation: 10000  
Length: 183

### Co-ordinates - Grid

Easting: -330.00  
Northing: 600.00  
Elevation: 10000.00  
Grid Azm(T): 15  
Plot\_Sys: UTM Nad 27

### Co-ordinates - UTM

Easting: 601240  
Northing: 5441140  
Elevation:  
UTM Declin:

### Co-ordinates - Lat/Long

Latitude:  
Longitude:

Project: Gionet Property

Prof. #: 1705

UTM Zone: Zone 16

NTS: 42F/04

Claim #: TB 1022625

Target: TDEM conductor at 600N/425W

Logged By: Lynn Donahue

Core Size: NQ

Core Location: Geco Mine

Surveyed: Yes

Contractor: St-Lambert Drilling

Case Pld: no

Case Dep: 3.2

BHP&M: No

Remarks:

### Downhole Survey Data

Distance	Dip	Azimuth	True N Azm	Mag Azm
0.00	-50.00	285.00		
6.00	-52.00	287.50	287.50	294.50
54.00	-51.00	2.00	2.00	9.00
100.00	-50.00	284.00	284.00	301.00
150.00	-49.00	292.00	292.00	299.00
180.00	-48.00	298.00	298.00	305.00

### Lithology and Assay Data

#### Lithology Data

From	To	Code	Rock Name	Description
3.20	7.72		Microdiorite	Hornblende 40%, feldspar 30%, biotite 30%; Greyish green, fine-grained, equigranular; non magnetic; cut by few mm (<3mm) feldspar-carbonate veinlets; elongated feldspar; very weakly foliated @ 73 deg. core axis; Lower contact +/- regular
7.72	22.60		Diorite	Spotted white & dark green; hornblende 45%, feldspar 45%, biotite <10%; strong to weak foliation 53-56-60 degrees to core axis; lower contact gradational; weak feldspar alteration throughout kaolinite? ~3%; rare quartz veins; non magnetic; no mineralization
22.60	24.74		Diorite (Mafic Vol.?)	Hornblende 45%, feldspar 30%, biotite 25%; dark green, fine-grained, +/- equigranular; non magnetic; last 76 cm weakly siliceous; feldspars are weakly altered; 22.65m Fault zone ~ 5 cm wide, broken core.

#### Mineralization Data

From To Code

#### Assay Data

From To Sample Density CU % PB % ZN % Ag g/t Au g/t

## TR99-1

<b>Lithology Data</b>					<b>Mineralization Data</b>			<b>Assay Data</b>								
From	To	Code	Rock Name	Description	From	To	Code	From	To	Sample	Density	CU %	PB %	ZN %	Ag g/t	Au g/t
24.74	30.50		Diorite	Spotted white and dark green; hornblende 50%, biotite <10%, feldspar 40%; subrounded & elongated porphyric feldspar, halo of alteration around crystals; epidotization increases down hole; 1 cm disseminated pyrite band ~ 20% at 25.23m.	25.23	25.24	DS									
30.50	37.29		Altered Quartz Diorite	Feldspar 60%, quartz 5-10%, hornblende 35%; fine- to medium-grained, light pistachio color; Pervasive epidotization (saussuritisation) from plagioclase alteration; non magnetic; weakly siliceous; at ~ 35m core is covered with sand over about 2 m long, no broken core or veins.												
37.29	55.82		Diorite	Spotted white & dark green, equigranular feldspar & hornblende; Feldspar 50%, hornblende 40%, quartz 5-10%, biotite 5%; rare disseminated pyrite in feldspar-quartz-carbonate veinlets; non magnetic; total ~2% quartz-feldspar veinlets-veins; lower contact sharp.												
55.82	64.60		Porphyritic Feldspar Diorite	Patchy white & dark green, medium- to coarse-grained; feldspar 45%, hornblende 55%, porphyritic sub-rounded & elongated feldspar; hornblende veins; rare disseminated pyrrhotite-pyrite; gradational lower contact.	55.82	64.60	DS									
64.60	78.10		Quartz Diorite	Feldspar 50%, quartz 10%, hornblende 40%; fine-grained, dark greenish grey; hematite at veinlets margins and at core fractures ~<1%; cut by 1% quartz-feldspar veins; gradational lower contact.												
78.10	80.50		Altered Diorite	Hornblende 55%, feldspar 45%; patchy buff grey to orange coloured; weakly siliceous; hematite along veins margins and pervasive at different intensity throughout unit~ 15%.												
79.90	80.50		Fault	Broken core, weak sand; talc at core fractures												
80.50	81.13			Hornblende 55% feldspar 45%; patchy buff grey to orange; weakly siliceous; hematite along veins margins and pervasive at different intensity throughout unit~ 15%; lower contact +/- regular.												
81.13	84.82		Porphyritic Feldspar Diorite	Same as 55.82-64.60m; patchy white & dark green, fine- to medium-grained; disseminated pyrrhotite-pyrite ~ 1-2% and blebs <1% throughout unit; lower contact sharp & irregular; last 6 cm consists of quartz-feldspar vein with pyrrhotite-pyrite blebs; moderately Foliated @ 72 degrees to core axis.	81.13	84.82	DS									
84.82	96.87		Diorite	Feldspar 50%, hornblende 40%, quartz <10%; fine-grained, greenish grey coloured; cut by several quartz-feldspar veins/veinlets ~2%; disseminated pyrite-pyrrhotite throughout unit and little clusters or blebs ~3-5%; Moderate foliation @ 67 degrees to core axis; last 30 cm is broken core-fault???; 101.73-102.35m diabase dyke.	84.82	96.87	DS									



## TR99-1

<u>Lithology Data</u>					<u>Mineralization Data</u>			<u>Assay Data</u>								
From	To	Code	Rock Name	Description	From	To	Code	From	To	Sample	Density	CU %	PB %	ZN %	Ag g/t	Au g/t
96.87	102.78		Mafic Volcanic	Fine- to medium-grained; +/- banded or gneissic; feldspar 30%, hornblende 40%, quartz 20%, biotite 10%; strongly foliated @ 66-64 degrees to core axis; disseminated pyrite-pyrrhotite ~2% over 10 cm @ 98.75m; patchy pyrite at core fractures; Lower contact sharp & regular.	98.75	98.85	DS	102.40	102.78	557251	0.00	0.00	0.00	0.00	0.00	0.00
102.78	103.53		Mineralized Zone	Banded cherty zone; pyrite 3-5%, pyrrhotite 7-10%, parallel to banding @ 60 degrees to core axis; cherty zone consist of quartz 45%, feldspar 25%, biotite 10%, hornblende 20%; Total sulphides 10-15%.	102.78	103.53	STR-SM	102.78	103.53	557252	0.00	0.11	0.00	0.00	0.00	0.00
103.53	104.72		Mafic Volcanic	Fine- to medium-grained; +/- banded or gneissic; feldspar 30%, hornblende 40%, quartz 20%, biotite 10%; strongly foliated @ 66-64 degrees to core axis; disseminated pyrite-pyrrhotite ~2% over 10 cm @ 98.75m; patchy pyrite at core fractures.				103.53	104.72	557253	0.00	0.02	0.00	0.00	0.00	0.00
104.72	105.43		Mineralized Zone	Banded cherty zone same as 102.78-103.53m; pyrrhotite ~13%, pyrite 7%, chalcopyrite <0.5%, parallel to banding @ 66 degrees to core axis.	104.72	105.43	STR-SM	104.72	105.43	557254	0.00	0.17	0.00	0.00	0.30	0.00
105.43	107.05		Mafic Volcanic	Fine-grained greenish grey; feldspar 35%, hornblende 40%, biotite 25%; disseminated pyrrhotite-pyrite throughout 3-5%; weakly magnetic.	105.43	107.05	DS	105.43	105.98	557255	0.00	0.03	0.00	0.00	0.00	0.00
107.50	109.00		Mafic Volcanic	Dark green, fine-grained; hornblende 30%, feldspar 35%, biotite 25%, quartz 10%; upper contact gradual, lower contact regular at 70 degrees to core axis; patchy pyrite at core fractures & disseminated pyrrhotite-pyrite throughout ~5%; magnetic in spots; strongly foliated @ 67degrees to core axis.	107.05	109.00	DS									
109.00	110.95		Mafic Volcanic	Hornblende 55%, feldspar 30%, biotite 15%; foliated @ 72 degrees to core axis. Tends toward a banded texture; lower contact +/- sharp; 5% dark reddish brown micas-phlogopite (coarse-grained, elongated parallel to foliation); disseminated pyrrhotite-pyrite 2%; quartz-feldspar-carbonate veins containing pyrite-pyrrhotite, magnetic, total 5% sulphides.												

## TR99-1

<u>Lithology Data</u>					<u>Mineralization Data</u>			<u>Assay Data</u>										
From	To	Code	Rock Name	Description	From	To	Code	From	To	Sample	Density	CU %	PB %	ZN %	Ag g/t	Au g/t		
110.95	137.26		Mafic Volcanic	Dark green to greenish grey, main minerals are hornblende-feldspar-biotite which vary in abundance; 122.3-122.5m Fault Zone broken core; 121.6-129.0m numerous broken core intervals which all have soapy feeling to touch, even fresh surface, sericite? Pyrite at core fractures & disseminated 10%, disseminated pyrrhotite 3%; Phlogopite appears as coarse dark redish brown at times, up to 20% usually with disseminated pyrrhotite-pyrite; foliation at 115m 68 deg CA; 125.84m 48 deg CA; 134.33m 78 deg CA; 135.45m 50 deg CA; Pyrrhotite-pyrite disseminated-blebs-patchy at core fractures 114.60-115.30m ~3% pyrrhotite magnetic core, phlogopite 35-40%, weak pyrite; 115.90-117.50m hornblende (also other amphiboles) 60%, biotite 5-10% phlogopite 25-30%; pyrrhotite 5%, pyrite 2%, weakly to moderately magnetic; 129.0-133.7m pyrrhotite 3-5%, pyrite 7%, phlogopite 20%, biotite 20%, hornblende 45%, feldspar 5%; 133.7-135.2m pyrrhotite 2%, pyrite 3%, hornblende 40%, feldspar 40%, biotite 15%, trace chalcopyrite	114.60	115.30	DS											
					121.60	129.00	DS-str											
					129.00	133.70	DS-str											
					133.70	135.20	DS											
137.26	138.77		Tonalite	Light-medium grey coloured; weakly siliceous; porphyritic feldspar; feldspar 55%, quartz 30%, biotite 15%; sharp lower contact.														
138.77	153.69		Mafic Volcanic	Dark green to greenish grey, main minerals are hornblende-feldspar-biotite which vary in abundance; Phlogopite appears as coarse dark redish brown at times, up to 20% usually with disseminated pyrrhotite-pyrite; pyrrhotite-pyrite disseminated-blebs-patchy at core fractures; 138.77-139.97m pyrrhotite 5%, pyrite 10%; 150.0-151.25m pyrrhotite 3%, pyrite 5%, weakly magnetic.	138.77	139.97	DS											
					150.00	151.25	DS											
153.69	154.40		Tonalite	Light-medium grey coloured; weakly siliceous; porphyritic feldspar; feldspar 55%, quartz 30%, biotite 15%; sharp lower contact.														
154.40	155.36		Mafic Volcanic	Dark green to greenish grey, main minerals are hornblende-feldspar-biotite which vary in abundance; Phlogopite appears as coarse dark redish brown at times, up to 20% usually with disseminated pyrrhotite-pyrite.														
155.36	156.24		Tonalite	Light-medium grey coloured; weakly siliceous; porphyritic feldspar; feldspar 55%, quartz 30%, biotite 15%; sharp upper and lower contact.														
156.24	183.00		Mafic Volcanic	Dark green to greenish grey; main minerals are hornblende-feldspar-biotite which vary in abundance; Phlogopite appears as coarse dark redish brown at times, up to 20% usually with disseminated pyrrhotite-pyrite; Foliation at 157.0m 66 degrees to core axis; 164.50m 60 deg CA; pyrrhotite-pyrite disseminated-blebs-patchy at core fractures; 156.24-183.0m disseminated pyrite throughout varies in % from rare to 5%, pyrrhotite is rare.	156.24	183.00	DS											

**APPENDIX V**  
**ASSAY AND LITHOGEOCHEMICAL**  
**CERTIFICATES OF ANALYSIS**



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers

5175 Timberlea Blvd., Mississauga  
Ontario, Canada L4W 2S3  
PHONE: 905-624-2806 FAX: 905-624-6163

To: NORANDA MINING AND EXPLORATION INC.

874 TUNGSTEN ST.  
THUNDER BAY, ON  
P7B 6J3

OCT - 1 1999

A9929055

Comments: ATTN: DAVE KING

**CERTIFICATE**

**A9929055**

(BUF) - NORANDA MINING AND EXPLORATION INC.

Project: 1703  
P.O. #:

Samples submitted to our lab in Thunder Bay, ON.  
This report was printed on 24-SEP-1999.

## SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
208	5	Assay ring to approx 150 mesh
226	5	0-3 Kg crush and split
3202	5	Rock - save entire reject

## ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
100	5	Au ppb: Fuse 10 g sample	FA-AAS	5	10000
386	5	Ag g/t: Conc. Nitric-HCL dig'n	AAS	0.3	350
301	5	Cu %: Conc. Nitric-HCL dig'n	AAS	0.01	100.0
312	5	Pb %: Conc. Nitric-HCL dig'n	AAS	0.01	100.0
316	5	Zn %: Conc. Nitric-HCL dig'n	AAS	0.01	100.0



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers

5175 Timberlea Blvd., Mississauga  
Ontario, Canada L4W 2S3  
PHONE: 905-624-2806 FAX: 905-624-6163

To: NORANDA MINING AND EXPLORATION INC.

874 TUNGSTEN ST.  
THUNDER BAY, ON  
P7B 6J3

Project : 1703  
Comments: ATTN: DAVE KING

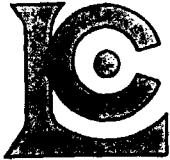
Page Number : 1  
Total Pages : 1  
Certificate Date: 24-SEP-1999  
Invoice No. : 19929055  
P.O. Number :  
Account : BUF

## CERTIFICATE OF ANALYSIS

A9929055

SAMPLE	PREP CODE		Au ppb FA+AA	Ag g/t	Cu %	Pb %	Zn %					
557251	208	226	< 5	< 0.3	< 0.01	< 0.01	< 0.01					
557252	208	226	< 5	< 0.3	0.11	< 0.01	< 0.01					
557253	208	226	< 5	< 0.3	0.02	< 0.01	< 0.01					
557254	208	226	< 5	0.3	0.17	< 0.01	< 0.01					
557255	208	226	< 5	< 0.3	0.03	< 0.01	< 0.01					

CERTIFICATION:



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 5175 Timberlea Blvd., Mississauga  
 Ontario, Canada L4W 2S3  
 PHONE: 905-624-2806 FAX: 905-624-6163

To: NORANDA MINING AND EXPLORATION INC.

874 TUNGSTEN ST.  
 THUNDER BAY, ON  
 P7B 6J3

OCT - 6 1999

A9929053

Comments: ATTN: DAVE KING

<b>CERTIFICATE</b>	<b>A9929053</b>
--------------------	-----------------

(BUF) - NORANDA MINING AND EXPLORATION INC.

Project: 1703  
 P.O. #:

Samples submitted to our lab in Thunder Bay, ON.  
 This report was printed on 30-SEP-1999.

SAMPLE PREPARATION		
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
208	8	Assay ring to approx 150 mesh
226	8	0-3 Kg crush and split
3202	8	Rock - save entire reject
238	8	Nitric-aqua-regia digestion

ANALYTICAL PROCEDURES					
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
902	8	Al2O3 %: XRF	XRF	0.01	100.00
906	8	CaO %: XRF	XRF	0.01	100.00
2590	8	Cr2O3 %: XRF	XRF	0.01	100.00
903	8	Fe2O3 %: XRF	XRF	0.01	100.00
908	8	K2O %: XRF	XRF	0.01	100.00
905	8	MgO %: XRF	XRF	0.01	100.00
1989	8	MnO %: XRF	XRF	0.01	100.00
907	8	Na2O %: XRF	XRF	0.01	100.00
909	8	P2O5 %: XRF	XRF	0.01	100.00
901	8	SiO2 %: XRF	XRF	0.01	100.00
904	8	TiO2 %: XRF	XRF	0.01	100.00
910	8	LOI %: XRF	XRF	0.01	100.00
2540	8	Total %	CALCULATION	0.01	105.00
2891	8	Ba ppm: XRF	XRF	5	50000
2067	8	Rb ppm: XRF	XRF	2	50000
2898	8	Sr ppm: XRF	XRF	2	50000
2973	8	Nb ppm: XRF	XRF	2	50000
2978	8	Zr ppm: XRF	XRF	3	50000
2974	8	Y ppm: XRF	XRF	2	50000
2	8	Cu ppm: HNO3-aqua regia digest	AAS	1	10000
5	8	Zn ppm: HNO3-aqua regia digest	AAS	1	10000



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To: NORANDA MINING AND EXPLORATION INC.

874 TUNGSTEN ST.  
THUNDER BAY, ON  
P7B 6J3

Project : 1703  
Comments: ATTN: DAVE KING

Page Number : 1-A  
Total Pages : 1  
Certificate Date: 30-SEP-1999  
Invoice No. : 19929053  
P.O. Number :  
Account : BUF

## CERTIFICATE OF ANALYSIS

### A9929053

SAMPLE	PREP CODE	Al2O3 % XRF	CaO % XRF	Cr2O3 % XRF	Fe2O3 % XRF	K2O % XRF	MgO % XRF	MnO % XRF	Na2O % XRF	P2O5 % XRF	SiO2 % XRF	TiO2 % XRF	LOI % XRF	TOTAL %	Ba ppm
WR-TR-1-9.15	208 226	16.90	11.44	< 0.01	7.74	0.19	6.71	0.11	2.39	0.07	52.48	0.46	0.59	99.08	40
WR-TR-1-33.7	208 226	15.81	14.13	< 0.01	3.85	0.10	3.89	0.06	2.77	0.54	56.43	1.37	0.59	99.54	45
WR-TR-1-51	208 226	15.96	10.28	< 0.01	6.99	0.16	3.16	0.08	2.98	0.47	57.95	1.11	0.50	99.64	50
WR-TR-1-78.75	208 226	17.02	6.04	< 0.01	4.64	0.70	3.84	0.06	6.40	0.22	57.72	1.28	1.90	99.82	70
WR-TR-1-99.07	208 226	14.60	6.51	< 0.01	7.02	0.19	4.37	0.07	4.82	0.23	59.79	0.54	0.50	98.64	85
WR-TR-1-128.85	208 226	13.17	8.36	< 0.01	13.45	0.13	17.05	0.15	0.87	0.03	43.35	0.32	3.04	99.92	< 5
WR-TR-1-146.8	208 226	14.93	11.65	0.02	9.96	0.45	6.07	0.10	2.72	0.09	51.57	1.13	0.88	99.57	60
WR-TR-1-180	208 226	14.37	6.85	0.08	10.21	0.99	8.26	0.15	3.48	0.01	52.80	0.95	1.55	99.70	135

CERTIFICATION:



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Ontario, Canada L4W 2S3  
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To: NORANDA MINING AND EXPLORATION INC.

874 TUNGSTEN ST.  
THUNDER BAY, ON  
P7B 6J3

Project : 1703  
Comments: ATTN: DAVE KING

Page Number : 1-B  
Total Pages : 1  
Certificate Date: 30-SEP-1999  
Invoice No. : I9929053  
P.O. Number :  
Account : BUF

## CERTIFICATE OF ANALYSIS

### A9929053

SAMPLE	PREP CODE	Rb ppm	Sr ppm	Nb ppm	Zr ppm	Y ppm	Cu ppm	Zn ppm								
WR-TR-1-9.15	208 226	8	208	6	63	12	10	4								
WR-TR-1-33.7	208 226	8	246	8	87	24	7	3								
WR-TR-1-51	208 226	4	256	10	108	22	6	6								
WR-TR-1-78.75	208 226	24	156	10	129	20	4	6								
WR-TR-1-99.07	208 226	6	158	10	123	14	57	4								
WR-TR-1-128.85	208 226	10	< 2	4	24	10	47	13								
WR-TR-1-146.8	208 226	14	184	8	63	20	9	6								
WR-TR-1-180	208 226	30	144	6	57	10	108	12								

CERTIFICATION:





Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Transaction Number (office use)

GIONET-NEW

Assessment Files Research Imaging

11,9940,00286

copy and send to: P.O. Box 9288, Thunder Bay, Ontario, P7E 8B6



ling a claim, use form 0240.

42F04SE2002 2.19854 CECIL 900

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

15854 Revised Copy

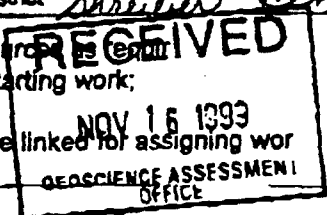
Form with fields for Name, Address, Client Number, Telephone Number, Fax Number. Includes handwritten 'RE' and '176208 176211 RK'.

2. Type of work performed Check [X] and report only ONE of the following groups for this declaratio

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

Work Type: Drilling, Core. Office Use: Commodity, Total \$ Value of Work Claimed: 17,607. Date Work Performed: 26 08 99 To 01 09 99. Mining Division: Thunder Bay. Resident Geologist District: Shredler - Nevada.

Please remember to: - obtain a work permit from the Ministry of natural Resources... - provide proper notice to surface rights holders before starting work...



3. Person or companies who prepared the technical report

Name: RICHARD KRUSE, Address: 874 TUNGSTEN STREET, THUNDER BAY, ONT. Includes RECORDED stamp: NOV 16 1999.

4. Certification by Recorded Holder or Agent

I, RICHARD KRUSE, 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 completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent: Richard Kruse, Date: 15-Nov-99, Telephone Number: 807 623 4339, Fax Number: 623-0452

874 TUNGSTEN ST THUNDER BAY

316

**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.

*W 9940.00296*

**2.19854**

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.
TB 1022625	6	\$17,607.00	\$0.00	\$3,200.00	\$14,407.00
TB 1141507	4	\$0.00	\$1,600.00	\$0.00	\$0.00
TB 1141509	4	\$0.00	\$1,600.00	\$0.00	\$0.00
<b>Column Totals:</b>		\$17,607.00	\$3,200.00	\$3,200.00	\$14,407.00

I, RICHARD KRUSE, 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) *Richard Kruse* Date 15-Nov-99

**6. Instructions for cutting back credits that are not approve**

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

**RECORDED**  
NOV 16 1999

**RECEIVED**  
NOV 16 1999  
GEOSCIENCE ASSESSMENT  
OFFICE



Geoscience Assessment Office  
933 Ramsey Lake Road  
6th Floor  
Sudbury, Ontario  
P3E 6B5

Telephone: (888) 415-9845  
Fax: (877) 670-1555

December 8, 1999

Richard Kruse  
NORANDA INC.  
874 TUNGSTEN STREET  
THUNDER BAY, Ontario  
P7B-6J3

Visit our website at:  
[www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpg.htm](http://www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpg.htm)

Dear Sir or Madam:

**Submission Number:** 2.19854

**Status**

**Subject: Transaction Number(s):** W9940.00296 Approval

---

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section #6 of the Declaration of Assessment work form.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact STEVE BENETEAU by e-mail at [steve.beneteau@ndm.gov.on.ca](mailto:steve.beneteau@ndm.gov.on.ca) or by telephone at (705) 670-5855.

Yours sincerely,



ORIGINAL SIGNED BY  
Blair Kite  
Supervisor, Geoscience Assessment Office  
Mining Lands Section

# Work Report Assessment Results

---

**Submission Number:** 2.19854

**Date Correspondence Sent:** December 08, 1999

**Assessor:** STEVE BENETEAU

---

<b>Transaction Number</b>	<b>First Claim Number</b>	<b>Township(s) / Area(s)</b>	<b>Status</b>	<b>Approval Date</b>
W9940.00296	1022625	CECIL	Approval	December 07, 1999

**Section:**  
16 Drilling PDRILL

**Correspondence to:**

Resident Geologist  
Thunder Bay, ON

Assessment Files Library  
Sudbury, ON

**Recorded Holder(s) and/or Agent(s):**

Richard Kruse  
NORANDA INC.  
THUNDER BAY, Ontario

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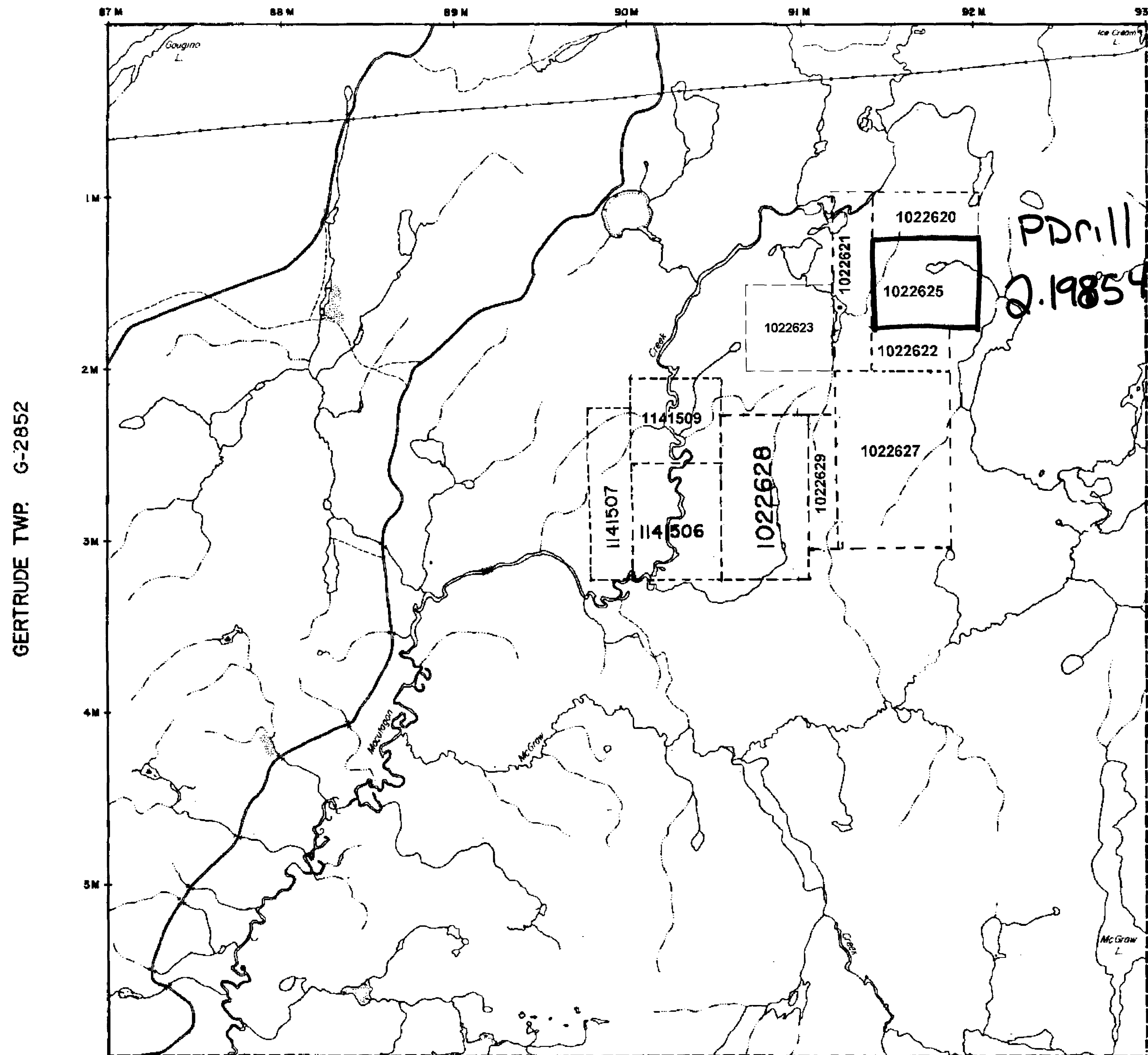
REFERENCES

AREAS WITHDRAWN FROM DISPOSITION

- M.R.O. - MINING RIGHTS ONLY
- S.R.O. - SURFACE RIGHTS ONLY
- M. & S. - MINING AND SURFACE RIGHTS

Description Order No. Date Disposition File

NICKLE TWP. G-2853



GERTRUDE TWP. G-2852

ROBERTA TWP. G-2816

McGRAW LAKE G-602

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.

LEGEND

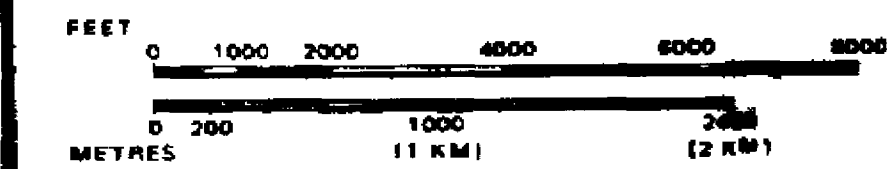
- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES:
  - TOWNSHIPS, BASE LINES, ETC.
  - LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES:
  - LOT LINES
  - PARCEL BOUNDARY
  - MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERENNIAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION OR COMPOSITE PLAN
- RESERVATIONS
- ORIGINAL SHORELINE
- MARSH OR MUSKEG
- MINES
- TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	
" SURFACE RIGHTS ONLY	
" MINING RIGHTS ONLY	
LEASE, SURFACE & MINING RIGHTS	
" SURFACE RIGHTS ONLY	
" MINING RIGHTS ONLY	
LICENCE OF OCCUPATION	
ORDER-IN-COUNCIL	
RESERVATION	
CANCELLED	
SAND & GRAVEL	
LAND USE PERMITS FOR COMMERCIAL TOURISM, OUTPOST CAMPS	

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 9, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 360, SEC. 80, SUBSEC. 1.

SCALE: 1 INCH = 40 CHAINS



TOWNSHIP

CECIL

M.N.R. ADMINISTRATIVE DISTRICT

TERRACE BAY

MINING DIVISION

THUNDER BAY

LAND TITLES / REGISTRY DIVISION

THUNDER BAY



Ministry of Natural Resources and Mines

Ontario MARCH 4, 1982 IN SERVICE

Date NOVEMBER, 1986.

Number

G-2857



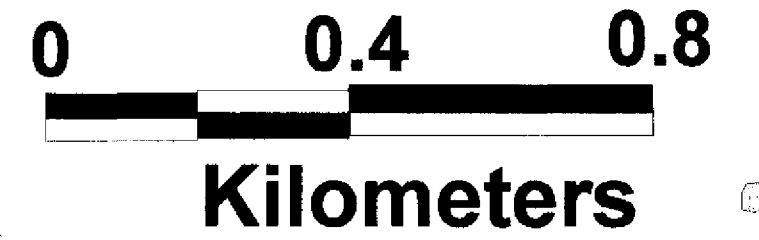
4270482002 2-19854 CECIL

200

Macutagon River

Twist Road

Rawluk Lake



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NOV 16 1999  
GEOSCIENCE ASSESSMENT  
OFFICE

RECEIVED  
NOV 15 1999  
GEOSCIENCE ASSESSMENT  
OFFICE

FIGURE 2

**TWIST ROAD PROPERTY  
CLAIM SKETCH**

Project: Gionet	Drawn By: D. KING
Project No.: 1703	Date: 1999/11/04
NTS Sheet: 42F04	WorkSpace: Claimsketch.wor
Scale: 1:10000	Projection: UTM Zone 16 (NAD 27 for Canada)

**noranda**

Noranda Inc.



42F046E2002 2.19854 CECIL

1141507

1141509

1141506

1022628

1022629

1022627

1022622

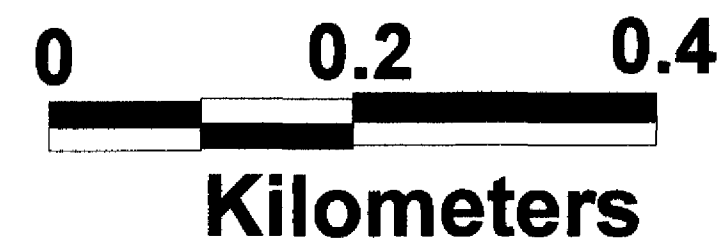
1022625

1022621

1022620

**Twist Road**

B10+00W  
Az 15 deg



**Rawluk Lake**

L16+00N

L14+00N

L12+00N

L10+00N

L8+00N

L6+00N

L4+00N

L2+00N

L0+00N

L2+00S

L4+00S

L6+00S

1022620

1022625

1022622

1022627

1022621

2.19854

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NOV 16 1999  
GEOSCIENCE ASSESSMENT  
OFFICE

FIGURE 3

**TWIST ROAD PROPERTY  
GRID SKETCH**

Project: Gionet	Drawn By: D. KING
Project No.: 1703	Date: 1999/11/04
NTS Sheet: 42F04	WorkSpace: Gridsketch.wor
Scale: 1:5000	Projection: UTM Zone 16 (NAD 27 for Canada)

**noranda**

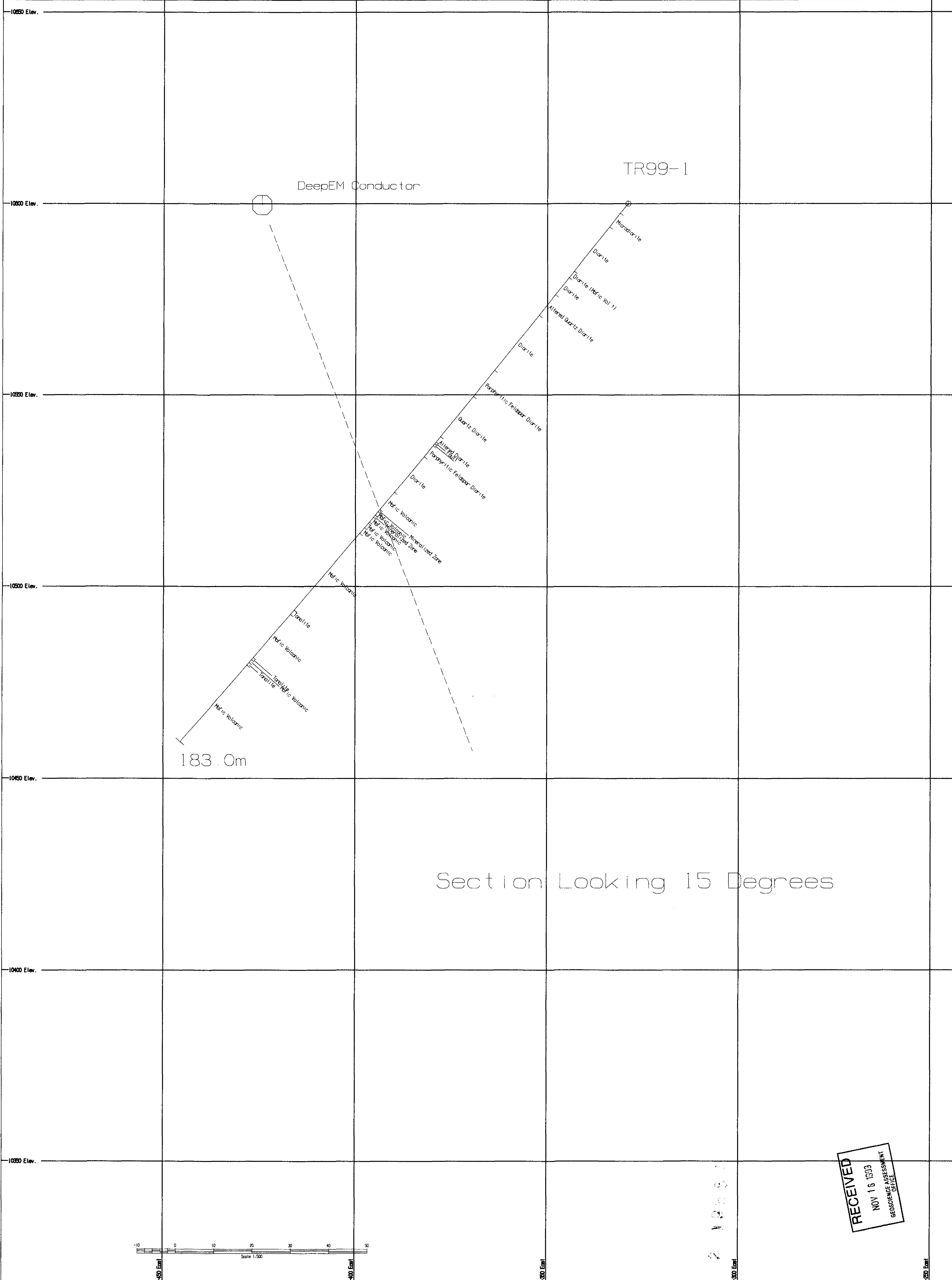
Noranda Inc.



42704582002 2.19854 CRCIL 220

*[Handwritten signature]*



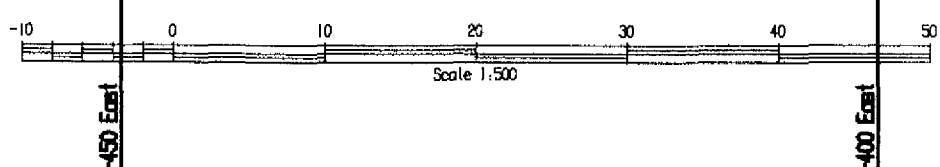


DeepEM Conductor

TR99-1

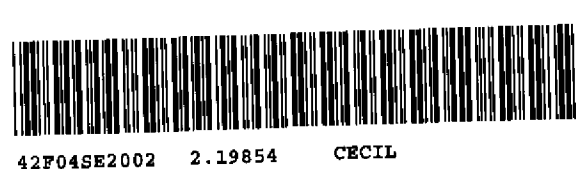
183.0m

Section Looking 15 Degrees



2 1965

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NOV 16 1993  
GEOSCIENCE ASSESSMENT  
OFFICE



427048E2002 2.19854 CRCIL 230

Noranda Inc.  
Thunder Bay Office  
874 Tungsten Street  
Thunder Bay, ON  
Canada P7B 6J3  
UNITS: METRES DATE: 99/11/08 TIME: 15:54:27

TWIST ROAD PROPERTY  
SECTION 600 N  
DDH TR99-1  
FIGURE 5

Set here by Design Software International