COMINCO Ltd.

EXPLORATION — EASTERN DISTRICT

ASSESSMENT REPORT

SHUN PROPERTY **2.13331**

APRIL 11, 1990 — P.M. SMITH

1. SUMMARY

The 25 claim Shun property (Figure 1) is located 55 km west of Chapleau Ontario, in the Archean-aged, Swayze greenstone belt.

Previous work on the property consisted of ground EM and drilling by both Shunsby Mines and Placer Development in 1964 and 1981 respectively. In 1982 the Ontario government carried out an airborne magnetic and Input survey.

In 1989 Cominco completed a program of prospecting and of geological mapping @ 1:5,000. This program discovered numerous sulphide-rich boulders, and abundant felsic to intermediate pyroclastic rocks.

2. PROPERTY

The Shun claim group comprises 25 contiguous claims (p.1116718-742 inc. Figure 2), which were staked between July 8 and 10th, 1989, and recorded on July 14th, 1989. No work is due until July 14th, 1989.

3. OWNERSHIP

All claims are 100% owned by Cominco Ltd.

4. LOCATION AND ACCESS

NTS: 41-O-10
Lat. 47°40'N Long. 82°40'W

The Shun claim group is located in the central part of Cunningham Township, Ontario, about 12km north-northeast of the village of Sultan, and approximately 55km west of the town of Chapleau (Figure 1). Both of these communities lie along the Canadian Pacific Railway. The property can be accessed by a network of well-kept logging roads extending from Highway 667, which ends at Sultan.

5. TOPOGRAPHY

The property is fairly flat and has poor drainage. Much of the western portion is covered by cedar-spruce forest, while the northern part is covered by mixed poplar, spruce, and pine vegetation. Most of the central and eastern regions of the property have been logged (Figure 3) so that exposure and access in those areas has been greatly improved.

6. HISTORY AND DEVELOPMENT

PRE-COMINCO WORK

The following information was gleaned from the Assessment Files Office of Ontario, 77 Grenville St., Toronto, Ontario.

Initial work in the region was conducted by Ridout Mining and later Ridout-Cunningham from 1904-1929. Several very old trenches, and an old camp with rusted drill steel may date back to this period. In the early 1960's Shunsby Mines intersected Zn, Cu, Pb mineralization 600 m north of the Shun claims. Drilling over the next 20 years by various companies outlined 2,400,000 tons assaying 0.39% Cu, and 2.37% Zn.

In 1964 Shunsby Mines drilled four holes (totalling 1259 feet, Figure 3) on an Turam-EM target near the southeast part of the Shun claim group. SH.64-2 intersected brecciated carbonaceous "shale", with lesser chert, brecciated chert, and up to 3 feet of "massive" pyrite, pyrrhotite, and chalcopyrite. SH.64-3 intersected "massive" sulphides in andesite. These assayed 0.2% Cu and 0.07% Zn. SH.64-4 failed to intersect a conductor. SH.64-5 intersected massive pyrite at the overburden-bedrock contact, but it was suspected to be a boulder. A fifth hole (SH.64-1), seems to have been drilled on the same conductor, just south of the Shun property. It intersected brecciated carbonaceous "shale" and up to 5 feet of reportedly "massive" pyrite, pyrrhotite, and chalcopyrite, which assayed up to 0.48% Zn and 0.12% Cu.

In 1980 Placer Development optioned the property from M.W. Resources. Placer conducted an EM-17 survey, on E-W lines and drilled two holes near the centre of the claim group (Figure 3). Only one of the holes (MW.80-3) intersected a conductor (31.5 feet of "massive" pyrrhotite). The other hole (MW.80-4) failed to intersect a conductor. Zn assays were not reported for these holes.

Geological mapping was done in the 1960's by Shunsby, and subsequently by the Ontario Geological Survey (Sirigusa, 1978). This mapping does not recognize the presence of significant volumes of felsic-intermediate, pyroclastic rocks cropping out through much of the Shun Property.

PRESENT PROGRAM

Geological mapping and prospecting were completed over the entire property during the periods July 6th to July 9th and September 21st to September 27th, 1989. As much of the property had been recently logged (Figure 3) it was unnecessary to use cut lines. Instead, this survey was conducted by mapping and prospecting on 1:5,000 airphoto enlargements, using pace and compass, and/or topofill lines.

7. GEOLOGY

REGIONAL GEOLOGY

The Shun claim group lies near the south-central part of the Swazye greenstone belt. Rocks in the region comprise mainly mafic volcanic flows and synvolcanic sills (Siragusa, 1987). These are intercalated with intermediate to felsic pyroclastic rocks, and with ferruginous and non-ferruginous chemical sediments. Differentiated gabbro and ultramafic sills and dikes, and felsic to intermediate plutons have intruded the supracrustal succession. Metamorphic grade is typically greenschist facies.

The Shunsby prospect (2.4 Mt, 0.39 % Cu, 2.37 % Zn), located 600 m north of the Shun property boundary (Figure 3), is hosted within a shallow dipping basal-chert-iron-formation adjacent to a felsic volcanic unit. The known mineralization at Shunsby is above 300 m depth.

PROPERTY GEOLOGY

Rock Types

Most of southern and central parts of the Shun property (Figure 3) are underlain by medium- to dark-green, mafic, pillowed and massive, mafic flows and sills, which are interbedded with thick sequences of buff-weathering, intermediate to felsic pyroclastic rocks. The northern portion is underlain by massive gabbro and peridotite intrusions (Table 1).

Two distinct groups of pyroclastic rocks were identified based on their lithological characteristics.

Group 1 pyroclastic rocks are intimately intercalated with mafic volcanic rocks in the southern part of the area, and comprise intermediate, monolithic, plagioclase-phyric, tuff, lapilli tuff, tuff breccia, and flows. In these pyroclastic rocks the matrix is indistinguishable from the fragments: both are plagioclase-phyric, characterized by 1-4 mm, euhedral, plagioclase phenocrysts.

Group 2 pyroclastic rocks underlie the central part of the property and comprises felsic to intermediate

tuff, lapilli tuff, tuff breccia, and pyroclastic breccia. These rocks are heterolithic and are generally characterized by an aphyric matrix. The fragment population includes; abundant plagioclase-phyric intermediate volcanic rock, massive and flow-banded felsic volcanic rock, massive and amyduloidal mafic volcanic rock, bedded and massive chert, and rare iron formation fragments. 1 to 3 cm pyritic fragments are locally abundant. 1-3mm quartz phenocrysts were noted in some of the more felsic fragments.

The intermediate, plagioclase-phyric fragments found in second group of pyroclastic rocks are morphologically very similar to the first type of intermediate pyroclastic rock. This suggests that Group 2 pyroclastic rocks may contain fragments of, and hence overly Group 1.

In the eastern part of the property, bedded chert and/or flow-banded felsic volcanic rock occurs at the contact between mafic and intermediate-felsic volcanic rocks. Towards the west side of the property graphitic argillite, intercalated with chert and chert breccia, crop out along the road and are exposed in a series of trenches near the mafic volcanic and intermediate-felsic volcanic contact (Figure 3). Up to 30% pyrite and pyrrhotite occur in the sediment as layers, fragments and framboidal concretions.

Massive peridotite, as well as both aphyric and plagioclase-phyric gabbro sills and dikes, intrude the volcano-sedimentary stratigraphy along the western and northern portions of the property.

One felsic dike was noted on the property. The quartz porphyry trends east, and crops out near the road in the south central part of the property.

TABLE 1. Major lithological units.

Rock Type	Description
Peridotite	Reddish-brown weathering, highly magnetic, fine to medium grained, massive, dark green to black
Gabbro	Medium grained, grey-green, massive to locally fractured, equigranular, locally plagioclase-phyric
Volcanogenic Sediment	Interbedded chert, chert breccia, and graphitic argillite, locally containing up to 80% pyrite and/or pyrrhotite in layers, or concretions
Felsic-Intermediate Volcanic Rocks	Aphyric and plagioclase-phyric, heterolithic and monolithic, buff coloured tuff, lapilli tuff, tuff breccia, and flow
Mafic Volcanic Rocks	Fine to coarse grained, medium green, commonly massive, locally poorly defined, amygduloidal pillows occur locally

STRUCTURAL GEOLOGY

Most of the felsic and intermediate pyroclastic rocks on the property are characterized by a, pronounced east-trending, steep-dipping foliation, while the mafic volcanic and intrusive rocks tend to be massive, or fractured to weakly foliated. (Figure 3).

Strike of bedding, where observed, is variable, ranging from southeast to north. Dips range from shallow to nearly vertical. This, combined with curvilinear unit contacts, seem to suggest east-trending fold axes (Figure 3). Only two tops determinations were made, so that the east-plunging, fold axes shown on Figure 3 are mainly inferred.

Several major lineaments can be identified. The most pronounced one trends north and transects the east-central portion of the property (Figure 3). Some units can be traced across this zone, while others terminate against it. Possibly this lineaments marks an underlying vertical fault, that affects some contacts differently, dependant on the dip of the units. Another strong, lineament trends east and corresponds to a cliff cutting through the centre of the property (Figure 3). Rocks along the cliff vary from strongly sheared, sericite schist to less sheared chloritic basalt.

The deformation described above, combined with limited exposure, a high relief depositional environment, and the fact that some of the massive mafic rocks, although mapped as flows, may be intrusive and thus not stratabound, make it extremely difficult to determine the stratigraphy.

8. ALTERATION

Two types of visible alteration were recognized:

1) Pyritization was recognized at numerous locations, where rusty weathering rock was characterized by up to several percent disseminated pyrite.

2) Silicification was observed at two locales; a) pyroclastic rocks along the mafic-intermediate contact near the east edge of the property, b) mafic rocks along the north-trending structure that bisects the property (Figure 3).

9. MINERALIZATION

In trenches, south of the east trending road, 3 m widths of pyrrhotite-rich breccias and pyritic, argillaceous rocks are exposed (Figure 3). Sections of up to 80% po-py over 1m were found. These trenches are coincident with Placer's HLEM conductor and drill hole # 80-3 which reportedly intersected 31.5 feet of massive pyrrhotite (Diamond drill report, assessment files, Assessment Files Office, Toronto).

Abundant po- and py-rich boulders were found in the south part of the property. The pyrite and pyrrhotite occurs as layers, fragments, and as framboidal concretions. In some boulders sulphide content ran as high as 80%. These boulders probably originated from the trenches south of the E-W road described earlier.

Abundant pyrite mineralized boulders were also located in the eastern part of the property. These boulders frequently contained chert fragments similar to that described from the basal chert unit at Shunsby (Siragusa, 1987), and are interpreted to have been derived from that source area.

Up to 10 % rusty weathered pyrite mineralization was recognized along the contact between basalt and intermediate pyroclastics near the centre of the property (Figure 3).

Magnetite-rich, chert iron formation boulders are common throughout the property, however, no iron formation was found in situ.

9. CONCLUSIONS

1) The mapping program on the Shun property outlined abundant, previously unrecognized, intermediate to felsic, pyroclastic rocks.

2) The rocks are folded along east-trending axes and are locally shallow dipping.

3) Stratigraphy is complicated by the presence of of mafic intrusions, as well as subsequent faulting and shearing.

4) Po-py rich boulders discovered on the Shun property can be traced to known strataform chert-graphite-sulphide mineralization near the western side of the property, and to the Shunsby deposit, located 600 m north of the Shun property.

10. REFERENCES

Airborne Electromagnetic and Total Intensity Magnetic Survey, Swayze Area, Isahiah Lake Sheet, District of Sudbury, Ontario Geological Survey, Map 80 546 Geophysical/ Geochemical Series, Scale 1 :20,000.

Siragusa, G.M., 1987. Geology of the Garnet Lake Area, District of Sudbury. Ontario Geological Survey, G.R. 248.

11. STATEMENT OF QUALIFICATIONS

I, P. MARK SMITH, residing at 44 Exeter St., in Toronto, Ontario, M6N 1G2 state that:

1. I graduated from Waterloo University, Waterloo, Ontario with a Honours B.Sc. degree in earth science in May 1981.

2. I graduated from Waterloo University, Waterloo, Ontario with a M.Sc. degree in earth science in October, 1987.

3. From 1976 to 1982 I worked in mineral exploration programs in Ontario, Manitoba, Saskachewan, N.W.T., British Columbia, New Brunswick, and Nova Scotia.

4. From 1983 to 1989 I was employed by the Ontario Geological Survey, with whom I conducted and supervised metallogenic thematic programs, and regional mapping programs.

5. I am presently employed as a geologist with Cominco Limited, Suite 2200, 120 Adelaide St. West, Toronto, Ontario, M5H 1T1

6 I supervised the work on the Shun Property in Cunningham Township, Ontario.

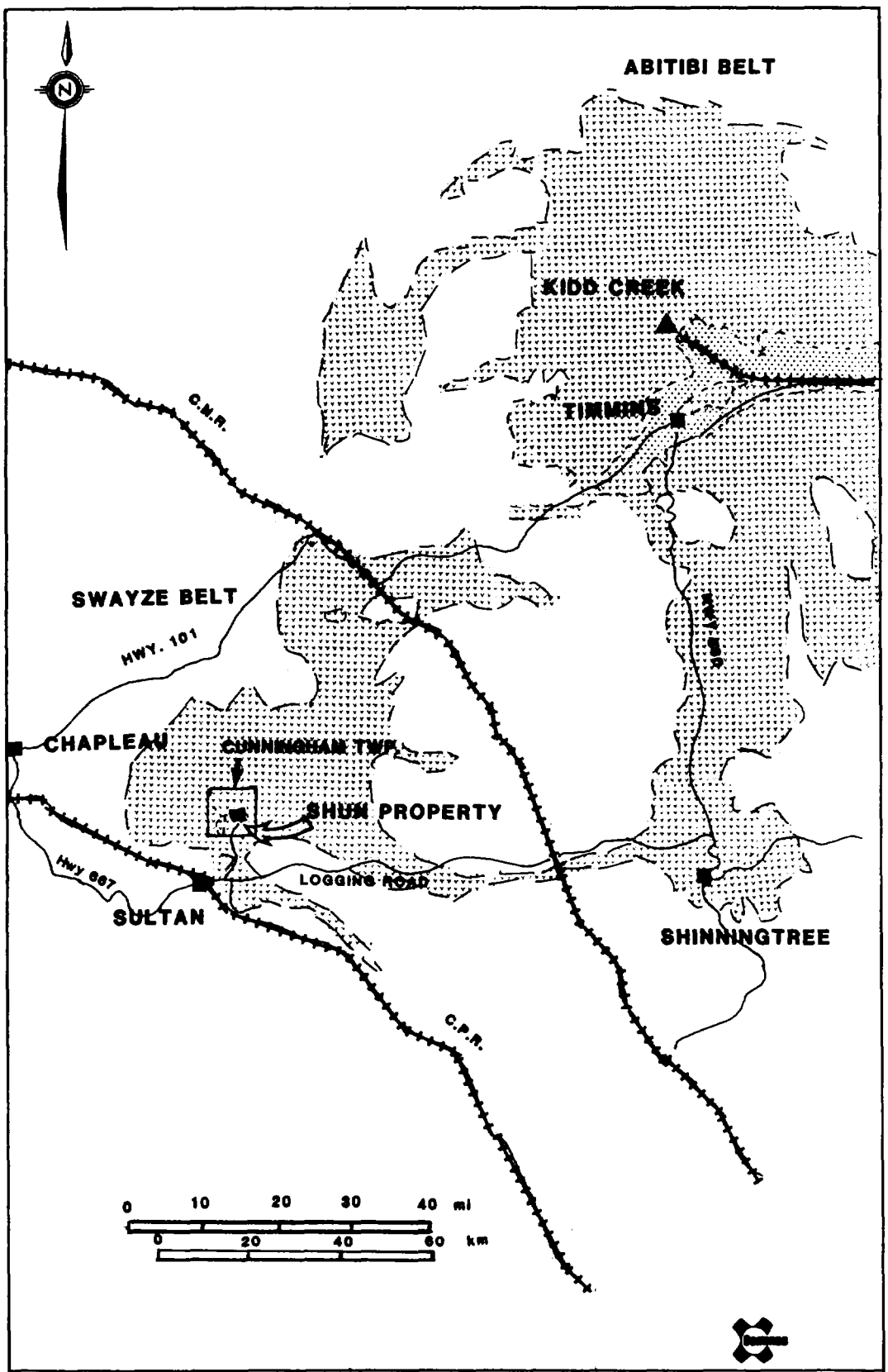
Dated this 11 day of April 1990

2.13331

P. Mark Smith (B.Sc., M.Sc., FGAC)

Cominco Limited
Toronto, Ontario

GEOLOGICAL ASSOCIATION OF CANADA
P. M. Smith
FELLOW



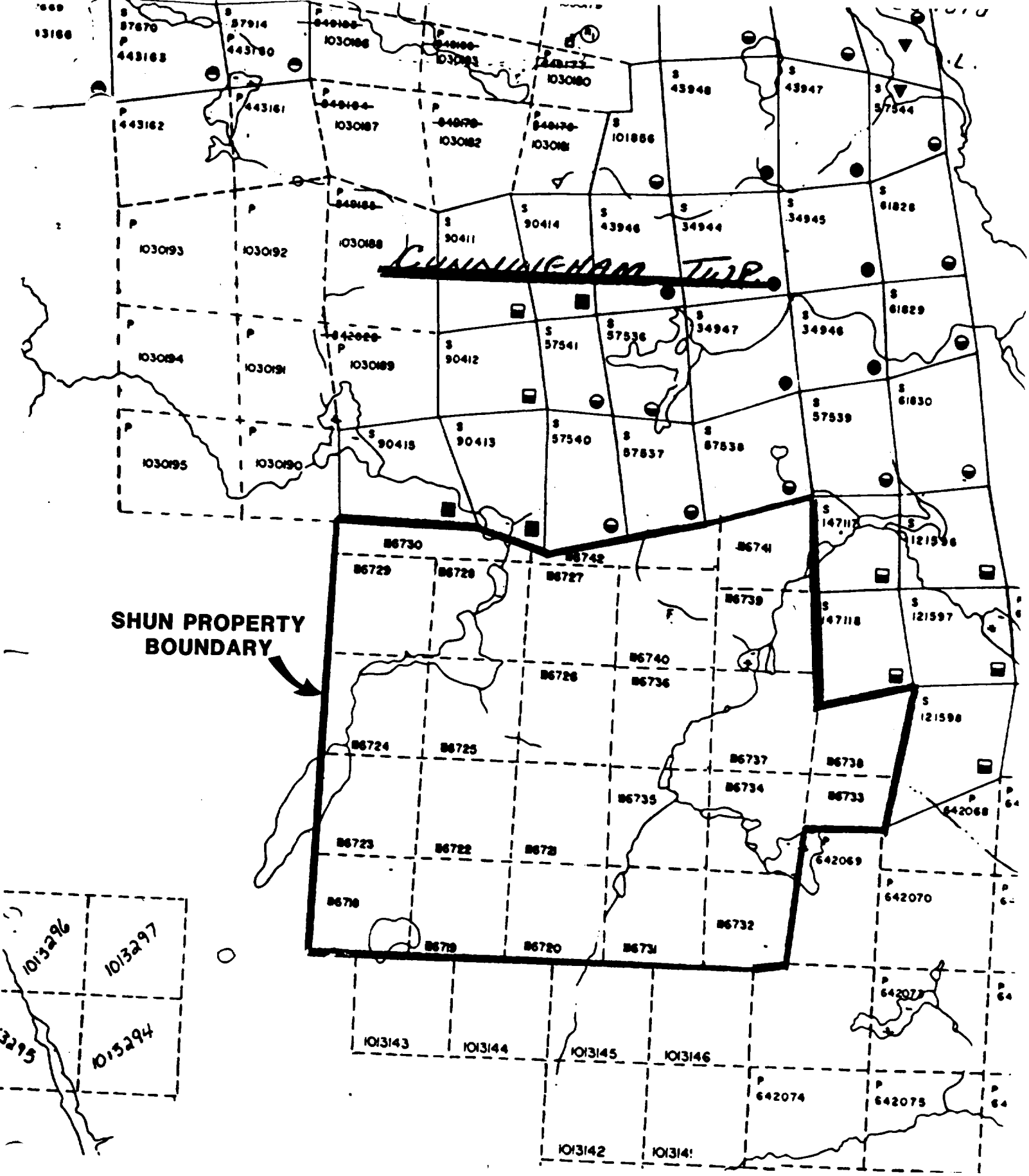
Drawn by: RMJ		Traced by:	
Revised by	Date	Revised by	Date
P.M.S.	05/90	L.S.	05/90

SHUN PROPERTY
LOCATION MAP

Scale: 1" to 16 miles | Date: FEB.90 | Plate: 1

NCI - 112A - CL

210-0610



SHUN PROPERTY

CLAIM MAP

PLATE 2

Ontario

900

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
880 Bay Street, 3rd Floor
Toronto, Ontario
M5S 1Z8

Tel: (416) 965-4888

Your File: W9006.60390
Our File: 2.13331

August 8, 1990

Mining Recorder
Ministry of Northern Development & Mines
60 Wilson Avenue
TIMMINS, Ontario
P4N 2S7

Dear Sir/Madam:

Re: Notice of Intent dated July 9, 1990 for a Geological Survey submitted on Mining Claims P 1116718 et al in the Township of Cunningham.

The assessment work credits, as listed with the above mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

W. R. Cowan
Provincial Manager, Mining Lands
Mines & Minerals Division

LJS:zm
Encl:

cc: Mr. W. D. Tieman
Mining & Lands Commissioner
Toronto, Ontario

Resident Geologist
TIMMINS, Ontario

Cominco Ltd.
Toronto, Ontario

Attn: P. M. Smith

Ontario

Ministry of Northern Development and Mines

Technical Assessment
Work Credits

Date: July 8,1990

2.13331

Mining Recorder's Report of Work No.: W9006.60390

Recorded Holder: Cominco Ltd.

Township or Area: Cunningham

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	P 1116718 to 722 incl. 1116724 to 42 incl.
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological 20 days	
Geochemical _____ days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☐ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

15 days credit for geological work on P 1116723

Note: Credits have been reduced because of lake on claim

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.

Ministry of Northern Development and Mines

Ontario

DOCUMENT No. W 9006.60390 2.13331

Mining Act

Report of Work
(Geophysical, Geological and Geochemical Surveys)

Instructions
- Please type or print.
- Refer to Section 77, the Mining Act for assessment work requirements and maximum credits allowed per survey type.
- If number of mining claims traversed exceeds space on this form attach a list.
- Technical Reports and maps in duplicate should be submitted to Mining Lands Section, Mineral Development and Lands Branch.

Type of Survey(s)	Mining Division	Township or Area
GEOLOGICAL MAPPING AND PROSPECTING	PORCUPINE	CUNNINGHAM

Recorded Holder(s)	Prospector's Licence No.
COMINCO LTD.	A 10043
Address	**Telephone No.**
SUITE 2200-120 ADELAIDE ST. W. TORONTO, ONTARIO M5H ITI	416-869-1850
Survey Company	
COMINCO LTD	
Name and Address of Author (of Geo-Technical Report)	**Date of Survey (from & to)**
P.M. SMITH C/O COMINCO LTD.	06 07 89 / 09 07 89 (21 09 89 / 27 09 89)

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Other	
	Geological	20
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys	Electromagnetic	
	Magnetometer	
	Other	

Total miles flown over claim(s)

Date | Recorded Holder or Agent (Signature)

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number
P	1116718	P	1116735		
	1116719		1116736		
	1116720		1116737		
	1116721		1116738		
	1116722		1116739		
	1116723		1116740		
	1116724		1116741		
	1116725		1116742		
	1116726				
	1116727				
	1116728				
	1116729				
	1116730				
	1116731				
	1116732				
	1116733				
	1116734				

RECEIVED
JUN 29 1990
MINING LANDS SECTION

Total number of mining claims covered by this report of work: 25

Certification Verifying Report of Work

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

Name and Address of Person Certifying: P.M. SMITH 44 EXETER STREET TORONTO, ONTARIO M6N 1G2

Telephone No.	Date	Certified By (Signature)
656-5506	MAY 17, 1990	

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
500	MAY 29 90	Mining Recorder
	Date Approved as Recorded	Province of Manager, Mining Lands

See revised work statement

Received Stamp

RECORDED
MAY 29 1990

Cominco Ltd. • Exploration • Suite 2200 • 120 Adelaide St. W. • Toronto, Ontario • Canada • M5H 1T1
Telephone (416) 869-1850 • Facsimile (416) 869-3480 • Telex 06-22912 • Cable (Comtor)

REGISTERED MAIL

Mr. G. White
Mining Recorder
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

May 24, 1990

2.13331

Dear Mr. White:

Re: Mining Claims P.1116718 et al Cunningham Township

Attached hereto is our Report of Work form requesting an assessment work credit of 20 days per claim on the above mentioned 25 claims over which a geological survey was conducted.

The required reports in duplicate have been forwarded to the Mining Lands Branch at 880 Bay Street, Toronto.

Please advise when this work has been recorded.

Yours truly,

R.C. LaRoche
Records Technician
Exploration, E.D.

RCL/ml

Enc.

cc: S. Selke, Vancouver
cc: Mining Lands Branch

S.R.O. – SURFACE RIGHTS ONLY
M.+S. – MINING AND SURFACE RIGHTS

Description	Order No	Date	Disposition	File

(R) CROWN RESERVE

SWAYZE TWP.

GREENLAW TWP.

GARNET TWP.

BLAMEY TWP.

2.13331

MAGNETIC DECLINATION 9° WEST

OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIPS BASE LINES ETC
LOTS, MINING CLAIMS PARCELS ETC
UNSURVEYED LINES
LOTS, ETC
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
OTHER 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	OC
RESERVATION	(R)
CANCELLED	(C)
SAND & GRAVEL	(S)

NOTE MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6 1913 VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT R.S.O. 1970 CHAP 380 SEC 63 SUBSEC 1

SCALE 1:20 000

PORCUPINE MINING DIVISION
RECEIVED
NOV 2 1989

TOWNSHIP
CUNNINGHAM

M.N.R. ADMINISTRATIVE DISTRICT
CHAPLEAU
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
SUDBURY

Ministry of Natural Resources
Ontario
Ministry of Northern Development and Mines

Date AUGUST, 1986
Number G-1095

41010NE0015 2.13331 CUNNINGHAM
200

SHUNSBY PROSPECT

Hiram Lake

PROPERTY BOUNDARY

Foxfarm Lake

common chert-sulphide boulders

abundant chert-sulphide boulders

POST 116738

SH-64-50

SH-64-5

SH-64-2

TL 10+00S

highly sheared and silicified

METRES
100 0 100 200 300 400 500
SCALE

LEGEND

Feldspar-porphyry intrusive rock

Mafic-ultramafic intrusive rock
- a massive, aphyric gabbro
- b massive, plagioclase-phyric gabbro
- c peridotite

Sedimentary rock
- a chert
- b argillite
- c layered chert-argillite-po,py

Felsic to intermediate volcanic rock (Group 2)
- a unsubdivided
- b tuff, lapilli tuff, tuff breccia
- c flow banded
- d plagioclase phenocrysts

Intermediate volcanic rock (Group 1)
- a massive tuff
- b tuff breccia, lapilli tuff
- c pillowed

1 Mafic volcanic rock
- a massive fine to medium grained
- b massive medium to coarse grained
- c pillowed
- d massive, plagioclase-phyric

CS Cedar & or spruce forest
M Mixed spruce, poplar, pine forest
S Select foresting
CC Clear cut

- Outcrop
- Geological contact
- BH Approximate Shunsby DDH
- P Approximate Placer DDH
- Lineament
- Anticline
- Syncline
- Limit of forested area
- Foliation (vertical,inclined)
- Joint
- Bedding (vertical,inclined)
- Tops (inclined,overturned)
- Lineation
- Glacial striation orientation
- Trench
- Synform
- py Pyrite
- po Pyrrhotite
- cp Calcopyrite

RECEIVED
MAY 29 1990
MINING LANDS SECTION
2.13331

SHUN - ONTARIO

Drawn by: P.M.S. Traced by: L.B.

Revised by	Date	Revised by	Date

COMPILATION MAP
GEOLOGY

Scale: 1:5000 Date: April 1990 Plate. 3

41D16NE0015 2.13331 CUNNINGHAM

210

SCIL - 2004 - G

FORM 21