84-#959 – 12827

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REPORT ON

GEOLOGICAL MAPPING,

JULY AND AUGUST, 1984,

ON THE

NEW YORK CLAIM GROUP

NEAR STEWART, B.C.

Skeena Mining Division
NTS Map-Area 104A/4
Lat. 56° 06'21" N, Long. 129° 47'30" W

Owned and Operated by:

TOURNIGAN MINING EXPLORATIONS LTD.

Prepared By:

W.G. SMITHERINGALE, Ph.D., P. Eng.
W.G. SMITHERINGALE & ASSOCIATES LTD.

Submitted October 31, 1984

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SUMMARY

One and one-half days in July and August of 1984 were spent geologically mapping part of the New York claim group on a scale of 1:5000.

Low grade copper mineralization occurs on the New York group in a 5 m to 10 m thick strataform zone at the base of a cherty tuff and limey argillite unit within volcanic rocks of the Hazelton Group. This sulfide-argillite-cherty tuff unit has regional distribution. The mineralized zone, which is bedded in places, consists of andesitic tuff, secondary epidote and amphibole, graphitic and pyritic quartz and semi-massive to heavily disseminated pyrrhotite, pyrite and chalcopyrite.

In the southern part of the New York group the mineralized zone appears to lie 150 m or less beneath the surface.

The mineralization is interpreted to be volcanogenic. This being the case, its thickness and grade could change laterally, and be greater beneath the southern part of the claim group than where it outcrops.

Further exploration on the New York group should emphasize geological mapping and rock geochemistry, with the objective of recognizing features characteristic of volcanogenic massive sulfide deposits and thereby identifying areas worthy of continued exploration.

INTRODUCTION

Location and Access (Figure 1)

The New York claim group is located about 1050 km (655 miles) north of Vancouver and 22 km (14 miles) north of the coastal town of Stewart, B.C., as follows:

Lat. 56° 06'21" N, Long. 129° 47'30" W
NTS Map-Area 104A/4
Skeena Mining Division

Access is by helicopter from Stewart, a trip of about 25 minutes.

The claim group lies 1 km (0.6 mile) south of Bear River on a steep, north facing mountain slope between elevations 550 m (1,800 ft.) and 1,220 m (4,000 ft.). Although numerous cliffs and very steep pitches are present, foot travel in most parts of the property is not unreasonably difficult. Below timberline, which is about 900 m (2,950 ft.), the area is heavily timbered with fir and spruce.

Property Description (Figure 2)

The New York group consists of five reverted Crown-granted claims with a total area of 67.8 hectares (167.4 acres).

Claim Name	Lot Number	Record Number	Expiry Date
New York	1485	541	March 1, 1985
London	1480	550	"
Boston	1482	551	"
Paris	1483	552	"
Kensington Fraction	1484	553	"

The claims are owned and operated by Tournigan Mining Explorations Ltd. of Vancouver, B.C.

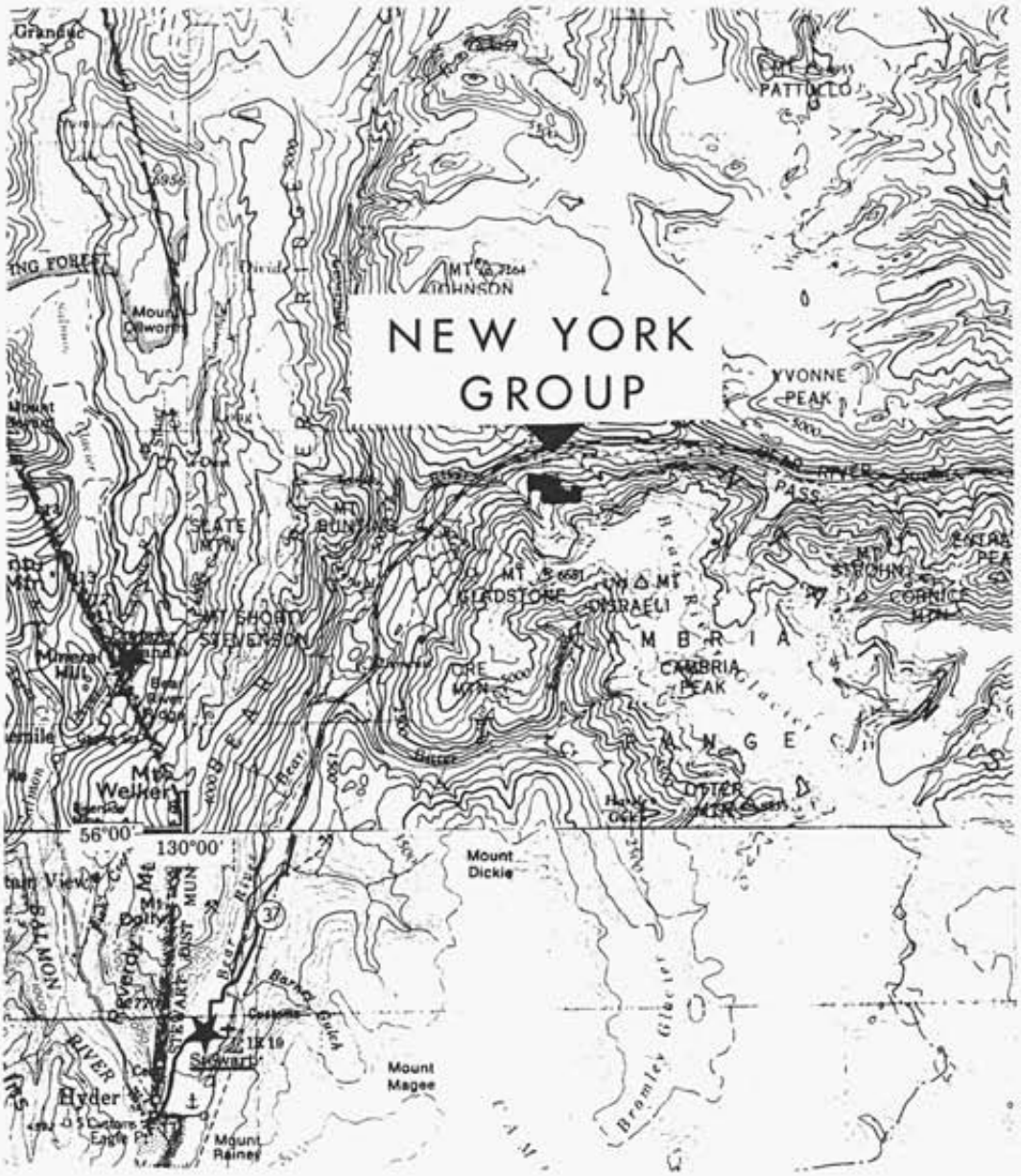

FIGURE 1

TOURNIGAN MINING EXPLORATION LTD.

NEW YORK GROUP

LOCATION MAP

KILOMETRES 0 5 10 KILOMETRES

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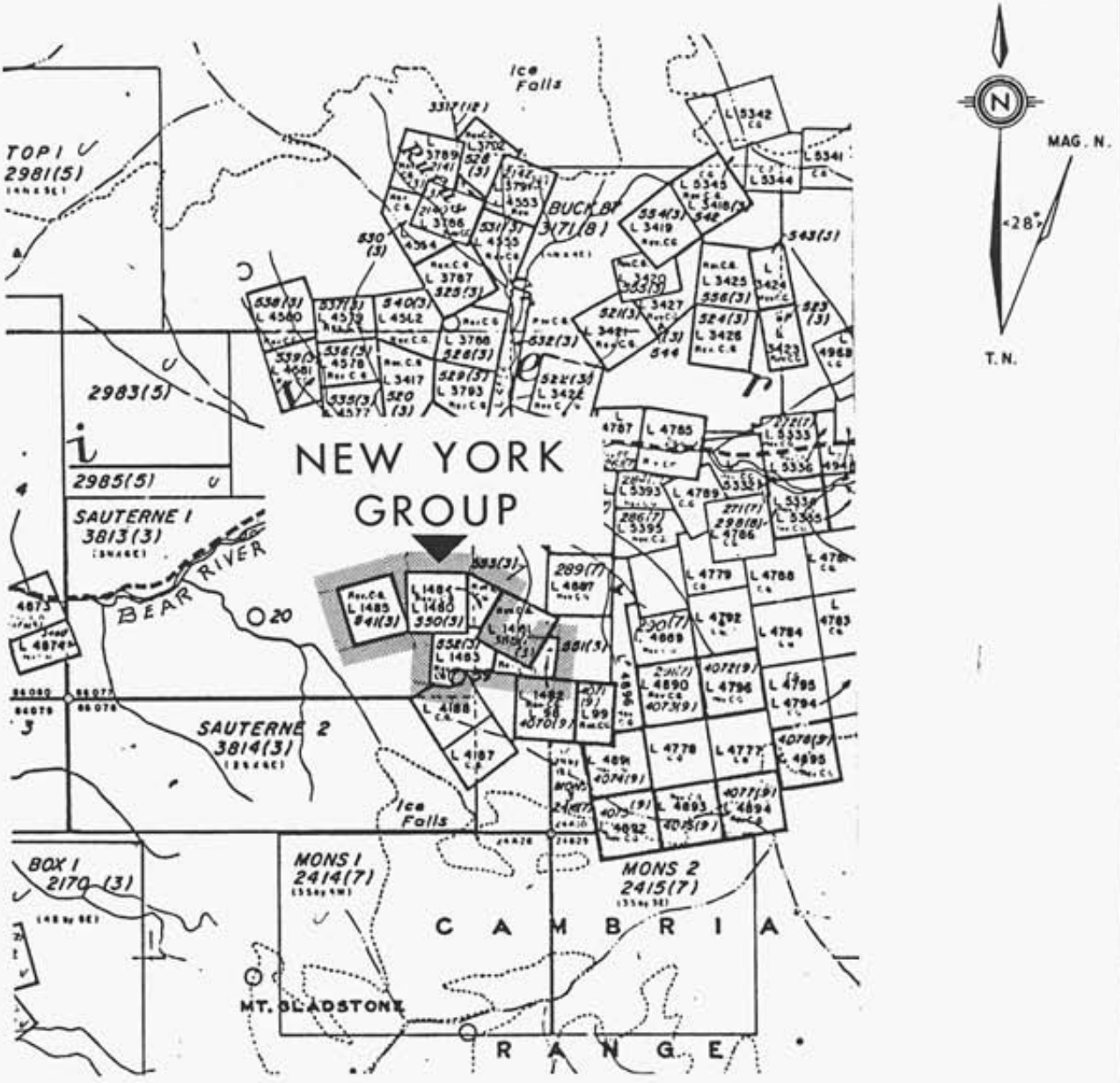

FIGURE 2

TOURNIGAN MINING EXPLORATION LTD.

NEW YORK GROUP

CLAIM MAP

KILOMETRES 0 1 2 KILOMETRES

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Property History (see B.C. Minister of Mines Annual Reports for 1908, 1910, 1929 and 1967.)

The New York and London claims were located in 1908, and the other claims in the group were located shortly afterward. In 1910 the Bear River Mining Co. Ltd. completed a 104 ft. adit on the New York claim. The adit is still open. A number of open cuts in the general area of the adit were probably made about this time. More surface work was conducted in 1929 (including a diamond drill program on the Elgin claim, which lies between the Kensington Fraction and the Boston claim), but the results were discouraging. No further work is reported in the B.C. Minister of Mines Annual Reports until 1967, when Cominco Ltd. optioned the New York group and other nearby claims from Crest Copper Company Ltd. They carried out geological mapping, a magnetometer survey and a small diamond drill program. The information obtained by this and the previous exploration indicated that mineralization on the New York and London claims consists of a flat lying zone several metres thick containing heavily disseminated to massive phyrrhotite, phyrite and some chalcopyrite.

In 1976 Tournigan Mining Explorations Ltd. examined the New York group during a regional program in the upper Bear River area. The claims, which had reverted to the Crown, were acquired by Tournigan in 1978.

Summary of Work Done in 1984

Geological mapping on a scale of 1:5000:

an area approximately 500 m x 300 m on the New York, London and Paris claims.

One and one-half days were spent on this work. Its purpose was to determine the geological setting of the mineralization.

In addition, one-half day was spent mapping on the Elgin claim, because the outcrops there are helpful in interpreting the geology on the Paris and London claims. The data collected from the Elgin claim is included in the following description of the geology and is shown on the accompanying geological map (Figure 3). However, the expenses incurred in collecting and processing this data are not included in the Itemized Cost Statement on page 10 of this report.

GEOLOGY

Regional Geology

The New York claim group is underlain by volcanic and sedimentary rocks belonging to the Hazelton Group of the Lower to Middle Jurassic system. In the upper Bear River area the Hazelton strata generally strike easterly and dip gently northward or southward. However, in places, for example on the New York group, attitudes differ from the general trend. Regional metamorphism in the area has reached the greenschist facies.

The Hazelton Group in the Stewart area is host to the formerly producing Premier (gold-silver-lead-zinc) mine and a host of precious and base metal prospects (Grove, 1971).

The Hazelton strata have been mapped in detail on the George Gold Copper property 2 km to the east of the New York group (Smitheringale, 1976). There the Hazelton sequence consists of a lower unit, probably more than several hundred metres thick, of generally massive, fine-grained flow and pyrolcastic rocks of andesitic composition, a middle unit, 5 m to 35 m thick, composed of cherty iron formation, tuff and argillite, and an upper unit, probably more than several hundred metres thick, of andesitic breccias and tuffs that are more easily recognized as fragmental in origin than the lower andesite unit. The iron formation-tuff-argillite unit contains bedded pyrite-chalcopyrite mineralization believed to be volcanogenic in origin. The unit is recessive. It forms a distinct bench that extends westward from the George Gold Copper property and enters the New York group on the Boston claim at elevation 3,500 ft. From the New York claim the unit has been traced westward and then southeastward to outcrops 200 m south of the Paris claim at elevation 4,000 ft. and 650 m south of the Boston claim at elevation 650 m (Heddle, 1967). A similar, if not the same, iron formation-tuff-argillite unit on the north side of Bear River contains copper mineralization on the Red Top and Veteran claims (Smitheringale, 1976).

Property Geology (Figure 3)

Stratigraphy and Lithology

On the New York group a 5 m to 10 m thick strataform zone of mineralized pyroclastic material is underlain by massive andesitic tuff and is overlain by 150 m to

200 m of bedded and cherty andesitic tuffs containing two black argillite members. The direction of stratigraphic tops has not been recognized. The section is assumed to be upright. Starting with the uppermost unit (unit 7) the succession is as follows:

Rock Unit	Approximate Thickness	Description
7	unknown; top not located	light grey, aphanitic, cherty tuff and light to medium grey, fine-grained, porphyritic (feldspar) tuff.
6	4 m to possibly 15 m	thin bedded (3 cm to 20 cm), black argillite with limey partings; in places laminae of massive pyrite are present; a 0.5 m thick bed of black argillaceous limestone occurs at the top of this unit.
5	130 m minimum, possibly 200 m	light to medium grey and greyish green, porphyritic (plagioclase) ash and lapilli tuff of andesitic composition; bedded in places; some contains fragments of black limestone.
4	25 m	thin bedded, dark grey to black, argillaceous chert, cherty argillite and limey argillite containing thin pyrite laminae.
3	20 m; poorly exposed, may contain faults	light grey, aphanitic, cherty (almost porcelanous) tuff and medium grey, porphyritic (feldspar) tuff.
2	5 m to 10 m	fine-grained, green tuff containing epidote, medium-grained amphibole (forming rosetts in places), semi-massive and heavily disseminated pyrrhotite, pyrite and minor chalcopyrite and lenses of graphitic and pyritic quartz; the immediate hanging wall is light grey, aphanitic, siliceous and often pyritic tuff.
1	unknown, bottom not located	light to medium greyish green, very fine-grained, porphyritic (feldspar and amphibole) lapilli tuff of andesitic composition.

The mapping was not sufficiently detailed to rule out the possibility that some undetected structure has caused repetition of the argillite unit, in which case units 5 and 6 would be the same as units 3 and 4.

Structure

In most of the area mapped strata strike between 090° and 120° and dip between 20° and 50° northward. Local deviations, probably caused by drag folding, are present in the old cuts south of the New York adit. On the Elgin claim, at elevation 3,600 ft., the upper argillite unit (unit 6) is almost horizontal, and probably extends eastward into the Boston claim with this attitude. Near elevation 3,400 ft. on the Elgin claim a northwest trending syncline is present. It probably continues northwestward into the Paris, Kensington Fraction and possibly the London claims.

Several easterly striking faults with dips 50° to 70° southward are exposed in the old cuts south of the New York adit. In so far as these are not accompanied by strong gouge or breccia zones, they appear to be minor faults.

Structural cross-sections drawn SSW from the outcrops of the sulfide-argillite-tuff unit on the London and Elgin claims to the outcrops of this unit higher on the hillside south of the Paris and Boston claims show that if there are no major faults or folds present the sulfide zone lies sub-parallel to the average slope of the hillside and that under the Paris and Boston claims it is between 100 m and 150 m below the surface.

Mineralization

The New York adit is driven in a 10 m (30 ft.) thick mineralized zone consisting of fine-grained andesitic tuff, abundant epidote and amphibole, patches of graphitic and pyritic quartz and semi-massive to heavily disseminated pyrrhotite, pyrite and minor chalcopyrite. Locally the sulfides comprise up to 50% by volume of the rock, but they are irregularly distributed and on the average comprise less than 25% of the rock. In places the components of this zone are bedded. Similar mineralization is exposed in cuts scattered over 80 m southeast of the adit and in outcrop and cuts 140 m and 270 m east of the adit.

Two features of the mineralization suggest that metamorphism and replacement have been involved in the mineralization process. One is that the amphibole is secondary, for in places it occurs in medium-to coarse-grained rosetts. The other is that 80 m SE of the adit the mineralized zone is in disconformable contact with dark grey limestone. Bedding in the mineralized zone strikes 165° and dips 55° to 75° NE, whereas the contact strikes 160° and dips 30° SW. The contact between the sulfide-amphibole rock and the limestone is patchy and gradational over a 20 cm interval.

Interpretation

Copper mineralization on the New York group occurs in a tuffaceous sulfide-epidote-amphibole-quartz zone 5 m to 10 thick that occurs at the bottom of a waterlain tuff and argillite sequence. The strataform nature and geological setting of the mineralization suggest that it is volcanogenic.

Replacement textures in the mineralized zone are regarded as being due to metamorphic recrystallization of primary constituents.

The mineralized zone extends southward from its outcrop area into the hill, where it dips gently northward at an angle roughly the same as the average slope of the hillside. The zone lies 150 m or less beneath the surface of Paris and Boston claims, provided that there are no unrecognized structural complications present.

The sulfide zone exposed on the New York group does not have some of the classic features of volcanogenic massive sulfide deposits such as a jasper mantle, a footwall sulfide stringer zone or a nearby felsic dome. Nevertheless, the mineralizing processes appear to have been volcanogenic in nature.

The grade and thickness of volcanogenic deposits can change rapidly in a lateral direction. Although the grade of mineralization exposed on the New York and London claims is sub-economic (the few assays reported in the literature are less than 2% Cu), the grade beneath the Paris and Boston claims could be higher.

RECOMMENDATIONS

Further exploration on the New York group should consist of:

1) More detailed geological mapping with the aid of a topographically accurate base map produced from aerial photographs.

2) A search for a sulfide stringer zone in the footwall rocks by detailed mapping and/or a soil geochemistry survey for Cu.

3) A search for a center of felsic volcanism in the footwall rocks by geological mapping within and beyond the property limits.

4) Detailed geochemical and stratigraphic studies of the exposed mineralized zone to determine zoning trends. Shallow diamond drilling with a portable drill over the large area where the mineralized zone is only a few metres beneath the surface would be a good way to approach this problem.

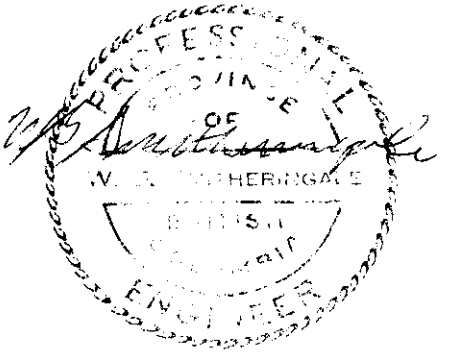
5) Rock geochemistry of the footwall sequence to determine if a rare earth element anomaly, such as is associated with some volcanogenic deposits, is present.

ITEMIZED COST STATEMENT

The following expenses were incurred by exploration on the New York claim group between July 14 and August 7, 1984.

Wages (field and travel)		
Bill Smitheringale, labourer		
2 days @ $80/day	$ 160.00	
W.G. Smitheringale, consultant		
2 days @ $350/day	700.00	$ 860.00
Food and Accommodation		
Field: 3 man days @ $16.08/day	48.24	
Commercial: 2 man days @ $65.40/day	130.80	179.04
Transportation		
Vehicle rental ($693.85/mo plus 12¢/km over 2000 km plus gas = 38.48/day)		
3 days @ 38.48/day	115.44	
Ferry charges to Prince Rupert passenger and vehicle	52.32	
Helicopter charter		
0.3 hr @ $652/hr.	195.60	363.36
Report (including typing, drafting, photo-reproduction, xeroxing and supplies)		400.00
TOTAL		$ 1,802.40

Respectfully submitted,



W.G. Smitheringale, Ph.D., P. Eng.
W.G. SMITHERINGALE & ASSOCIATES LTD.

October 31, 1984

LIST OF REFERENCES

British Columbia Minister of Mines Annual Reports, 1908, 1910, 1929, 1967.

Grove, E.W., 1971: Geology and Mineral Deposits of the Stewart Area, British Columbia; B.C. Dept. Mines and Pet. Res. Bull. 58.

Heddle, D.W., 1967: Geological Report on Mineral Lease No. 150, Bear River Area, Stewart, B.C.; B.C. Dept. Mines and Pet. Res., Assessment Rept. 1109.

Smitheringale, W.G., 1976: Report on the 1976 Exploration Program and Exploration Potential of the Bear Pass Property and Rufus Creek - Bear River Pass Area near Stewart, B.C.; unpublished report prepared for Tournigan Mining Explorations Ltd., Vancouver, B.C.

CERTIFICATION

I, William G. Smitheringale, certify that:

I am a practising Professional Geological Engineer, resident at 4611 Hoskins Road, North Vancouver, B.C.

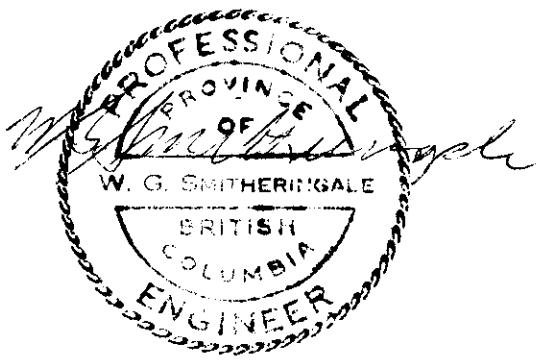
I am a graduate of the University of British Columbia with a degree in Geological Engineering (B.Ap.Sc., 1955) and of the Massachusetts Institute of Technology with the degree of Doctor of Philosophy in Geology (Ph.D., 1962).

I have practised my profession continuously for twenty-two years as Geologist with the Geological Survey of Canada, as Assistant and Associate Professor, Department of Geology, Memorial University of Newfoundland and, since 1974, as a Consulting Geologist.

I am a member in good standing of the Association of Professional Engineers of the Province of British Columbia (Registration No. 10,802).

This report is based on field work conducted by me between July 14 and August 7, 1984.

I have no interest, directly or indirectly, in the New York claim group or in Tournigan Mining Explorations Ltd.



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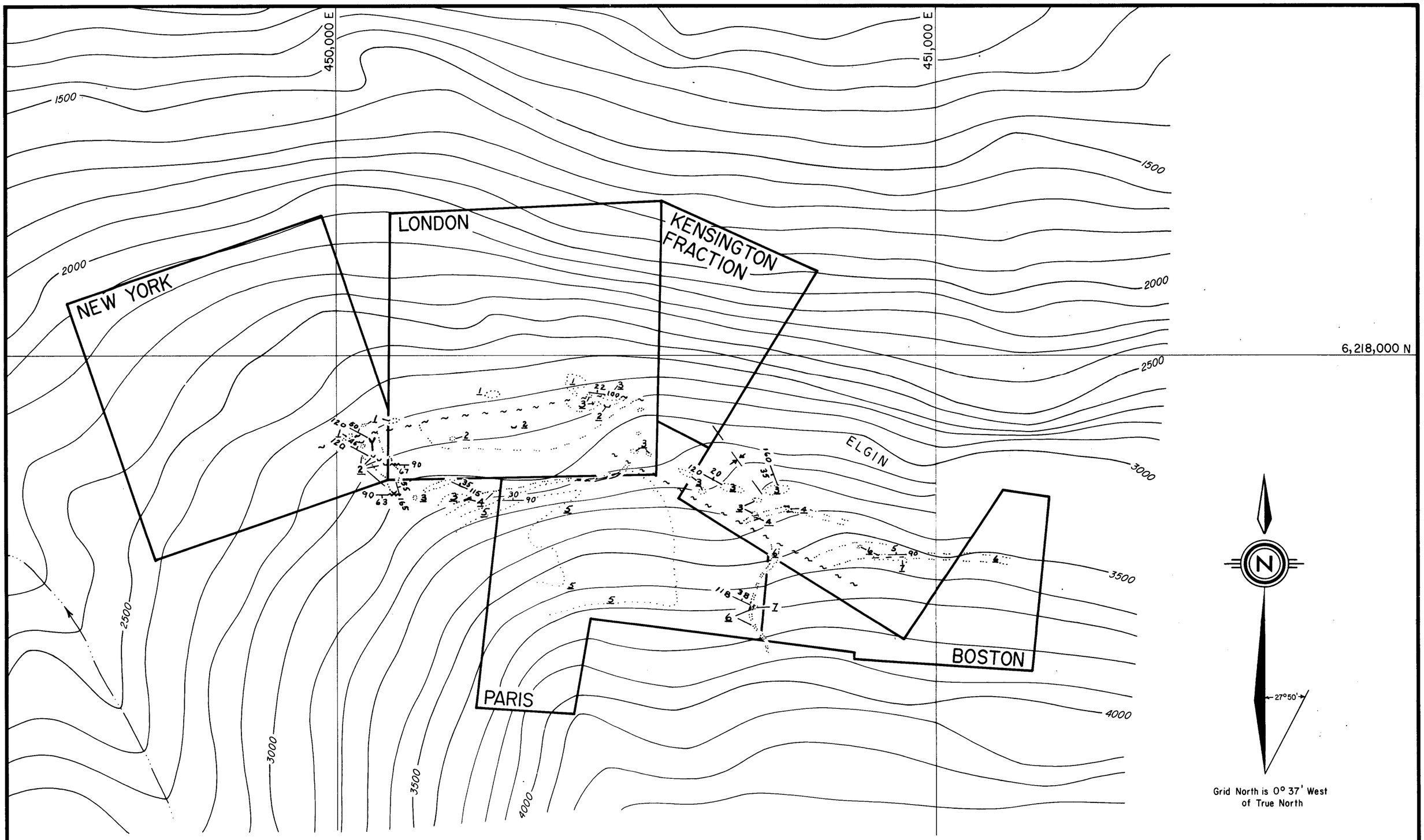

LEGEND

Hazelton Group

7	Light to medium grey, aphanitic, cherty tuff and fine-grained, porphyritic (feldspar) tuff.
6	Thin bedded, black argillite with limey partings; thin limestone beds and lamellae of massive pyrite are present in places.
5	Light to medium grey and greenish grey, porphyritic (plagioclase) ash and lapilli tuff.
4	Thin bedded, dark grey to black, cherty argillite, argillaceous chert and limey argillite; a few pyrite lamellae.
3	Light grey, aphanitic, cherty (almost porcelanous) tuff and medium grey, porphyritic (feldspar) tuff.
2	Fine-grained, green tuff containing epidote, amphibole (some occurs as rosetts), semi massive to heavily disseminated pyrrhotite, pyrite and minor chalcopyrite and lenses of graphitic and pyritic quartz.
1	Light to medium greyish green, very fine-grained, porphyritic (feldspar and amphibole) lapilli tuff; minor light grey, cherty felsite.

- Outcrop or area of outcrops
- Geological contact: observed, inferred
- Bedding
- Fault: observed, inferred
- Syncline
- New York adit
- Open cut or pit

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
W. G. SMITHERINGALE

CONTOUR INTERVAL 100 FT.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,827

FIGURE 3

TOURNIGAN MINING EXPLORATIONS LTD.

NEW YORK GROUP

GEOLOGY

Metres 0 100 200 300 400 500 Metres

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OCTOBER 31, 1984