84-#825 - 13150

1/85

PRELIMINARY GEOLOGY AND GEOCHEMISTRY

OF THE

LORI 1, 2, 3 AND 4 CLAIMS

Mining Division: Clinton
NTS: 92 N 10 E
Latitude: 51 degrees 33 1/2 minutes north
Longitude: 124 degrees 43 3/4 minutes west
Owner: Homestake Mineral Development Company
Operator: Homestake Mineral Development Company

Report By: Peter A. Ronning
August, 1984

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,150

Summary and Conclusions

The Lori 1, 2, 3 and 4 claims are located in the rugged Pacific Ranges of the Coast Mountains of British Columbia. The claims, which comprise 56 units, were staked for Homestake Mineral Development Company in August of 1983 to cover an area in which stream sediments contain anomalous quantities of gold and gold mineralization has been found in-situ.

This report discusses the results of reconnaissance prospecting and rock chip geochemical sampling over most of the claims and detailed geological work and sampling over a small grid in an area referred to as the "A" Zone.

The claims lie along the northeastern margin of the Coast Plutonic Complex. An overthrust sheet of upper Triassic andesitic breccia, tuff and flows with some shale and limestone lies above younger Triassic limestone, shale and greywacke which is in turn overthrust onto Cretaceous siltstone, greywacke and conglomerate. The thrust faults are westerly to southwesterly dipping.

In the A Zone the Mesozoic sediments are intruded by a sill-like body of probable monzonitic composition, which is about 15 meters thick and crops out discontinuously over an area of about 50,000 square meters. Within the intrusion, narrow and widely scattered quartz veins and veinlets carry erratic pyrite-arsenopyrite mineralization, with which gold values of up to about 0.6 ounces per ton are associated. Although very high assays can be obtained from selected samples, the gold is widely scattered and erratic and the situation does not lend itself to a viable mining operation in this remote area.

Prospecting has revealed the presence of several boulders of quartz vein material whose source must be other than the A Zone, which contain very high gold values, up to 89,000 ppb. These boulders should be traced to their source.

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1 Introduction

1.1 Location, Physiography and Access

The Lori Claims are located on Ottarasko Creek in the Pacific Ranges of the Coast Mountains of British Columbia. It is a rugged region with deep, U-shaped glacial valleys, alluvium-filled stream channels and glacier-capped mountain peaks. Elevations on the claims range from about 1,500 meters in the valley of Ottarasko Creek to about 2,600 meters on a rugged peak in the northwest corner of the property. There is scattered timber below 1,800 meters of elevation; otherwise the terrain consists of bare rocky mountain sides with snowfields and glaciers at higher elevations.

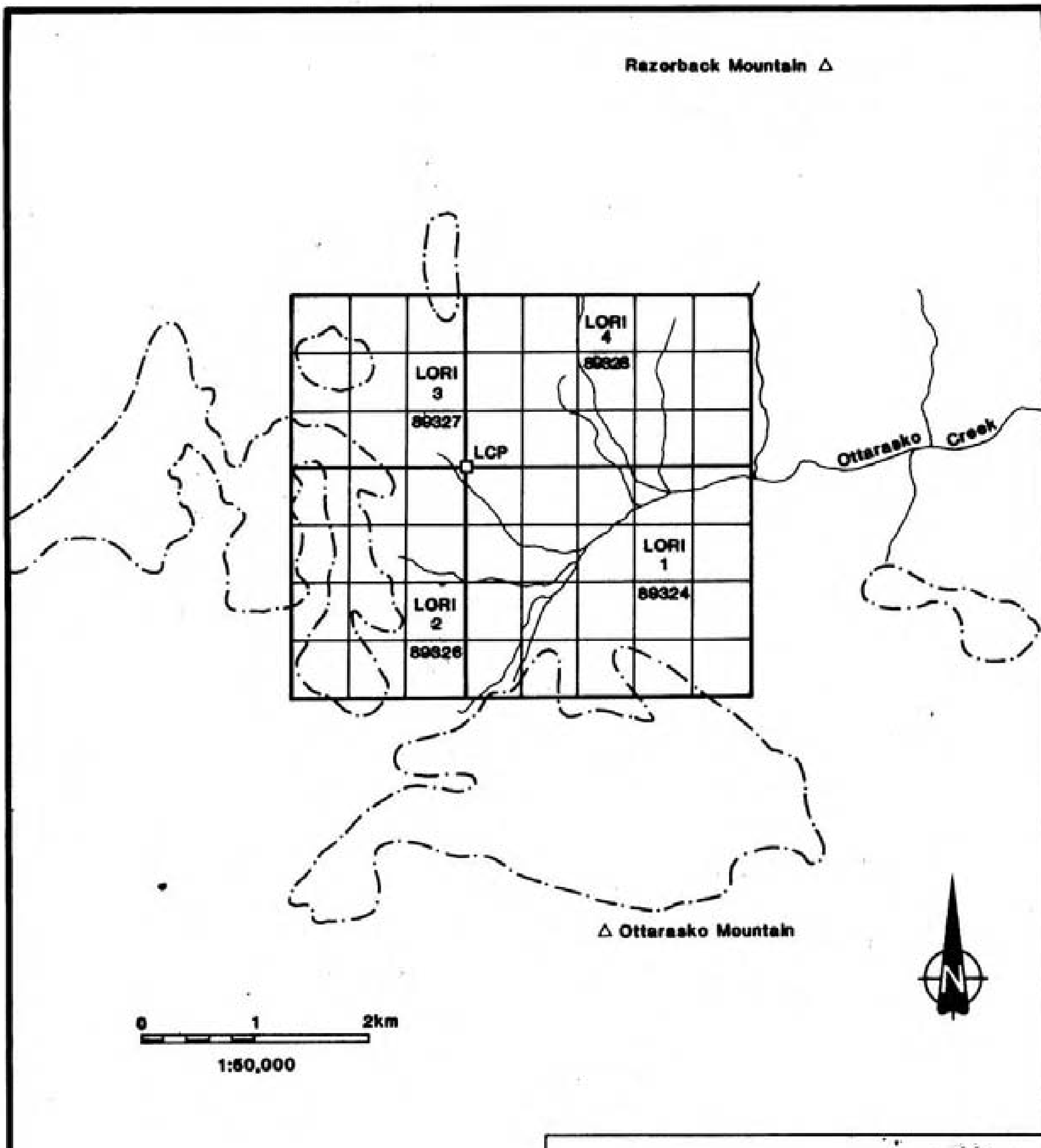
At the time of writing the best access to the property is via helicopter from Bluff Lake, about 20 kilometers north of the Legal Corner Post for the claims. A ranch and helicopter base at Bluff Lake are connected by a gravel road to the town of Tatla Lake on Highway 20. Tatla Lake is 225 kilometers from Williams Lake.

The claims are situated in the Clinton Mining Division, on NTS Map Sheet 92 N 10. The Legal Corner Post is at Latitude 51 degrees 33 1/2 minutes north, Longitude 124 degrees 43 3/4 minutes west.

1.2 Property Definition

In early July of 1983 a prospecting crew working for Homestake Mineral Development Company of Vancouver, B. C. prospected the upper reaches of Ottarasko Creek as part of a regional reconnaissance program. A stream sediment anomaly led Homestake to return to the area in August of that year and the discovery of some gold-bearing arsenopyrite mineralization in-situ led to the staking of the Lori 1, 2, 3 and 4 claims on the 24th and 25th of August. The work described in this report was done on the 26th and 27th of August, 1983. Homestake is the owner and operator of the claims.

Known mineralization on the claims consists of narrow arsenopyrite veins, sometimes with a quartz gangue, which contain gold grades that are locally very high (up to about 0.6 oz. Au /



□ Legal Claim Post

Claim Boundary

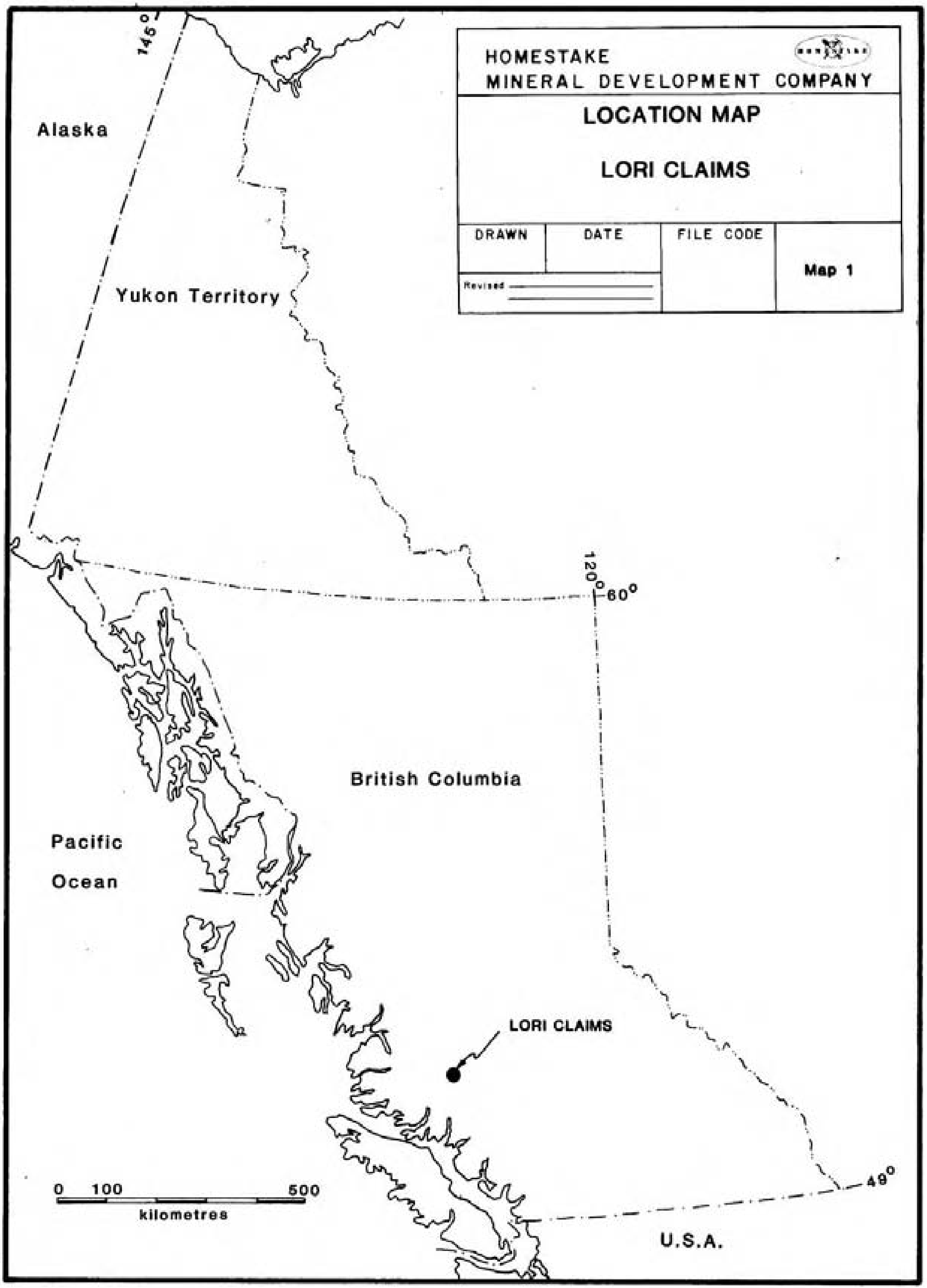
Unit Boundary

Icefield

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

LORI CLAIMS
Vancouver Island, B.C.

DRAWN	DATE	FILE CODE	
KMc	Sept. 1984	NTS	Map 2
Revised		92N/10E	


HOMESTAKE
MINERAL DEVELOPMENT COMPANY
LOCATION MAP
LORI CLAIMS
DRAWN
DATE
FILE CODE
Map 1
Revised
145°
Alaska
Yukon Territory
120°
60°
British Columbia
Pacific
Ocean
LORI CLAIMS
0
100
500
kilometres
49°
U.S.A.

ton) but erratic. The known veins are only a few centimeters wide and very widely scattered, and in general their economic potential is negligible.

2 Work Done

2.1 Reconnaissance Geochemical Sampling

Immediately prior to the staking of the Lori Claims, considerable prospecting, stream sediment sampling and rock chip sampling were done in the claims area. Although the field work was done before the claims were staked the analyses were performed after the staking and their cost is claimed for assessment credits. A list of the number of samples collected from each claim follows:

Lori 1	8 rock chip samples
Lori 2	13 rock chip samples
Lori 3	5 rock chip samples
Lori 4	none

2.2 Grid Establishment

In order to facilitate sampling of one small area where most of the known mineralization occurs, a temporary grid was established on the Lori 1 claim using paint and ribbon as markers. The grid is 310 meters in a north-south direction and 420 meters in an east-west direction (see Map 6, 7 or 8). North-south lines are 10 or 20 meters apart depending on the degree of detail required on different parts of the grid and stations on lines are 10 meters apart.

2.3 Grid Mapping

The grid established on the Lori 1 claim was geologically mapped at a scale of 1:1,000 (see Map 6)

2.4 Rock Chip Sampling

Twenty-five rock chip samples of both mineralized and unmineralized material were collected from the Lori 1 claim at various locations on the A Zone grid. Samples were collected using a rock hammer and a chisel. Some of the samples were continuous chips across mineralization and others were random chips from unmineralized rock. Descriptions of the rock chip samples are tabulated in Appendix 1. Analytical results are tabulated in Appendix 2.

3 Geology

3.1 Regional Geology

This description of the regional geology of the area is derived mainly from Geological Survey of Canada Paper 68 - 33 (Tipper, 1969).

The claims lie along the northeastern margin of the Coast Plutonic Complex. Volcanic and sedimentary rocks of late Triassic to Miocene age flank the complex on the northwest. In immediate contact with the Coast Plutonic rocks are upper Triassic basic volcanic, clastic sedimentary and carbonate rocks. Northwest of these are early late Jurassic through Cretaceous volcanic and clastic sedimentary rocks were deposited in the Tyaughton Trough, a marine inlier which was flanked on the southeast by the then-emerging Coast Plutonic Complex and on the northwest by the North American mainland.

The area is characterized by long northwesterly trending transcurrent faults with right lateral displacement and by mainly southwesterly-dipping thrust faults. Thrust faulting is probably late Cretaceous in age while the transcurrent faulting is late Cretaceous to Mid-Tertiary.

3.2 Geology of the Claims Area (refer to Map 3)

Geological Survey of Canada Map 5-1968 shows the claims area as being underlain by an overthrust sheet of upper Triassic andesitic breccia, tuff and flows with some shale and limestone. It is overthrust on to younger Triassic limestone, shale and greywacke which is in turn overthrust onto Cretaceous siltstone, greywacke and conglomerate. The thrust faults are westerly to southwesterly dipping.

Prospecting and brief examinations by Homestake geologists indicate that the general picture as indicated by Map 5-1968 is probably correct although in detail it is considerably more complex. Except in the A Zone of the Lori 1 claim work by HMDC was too cursory to warrant modification of the existing geological map.

In the A Zone an unmapped intrusion carries gold mineralization. This is described in a later section.

4 Stream Sediment Geochemistry

Stream sediment samples were collected from most of the streams within the claims area and nearby, including Ottarasko Creek and its tributaries. Samples were collected by hand, from the active portions of the streams whenever possible. Most of the streams in the area are very high energy drainages and suitable material is difficult to find. Whenever possible silt sized material was collected but if it was not available sand or even mixtures of sand and fine gravel were collected. The threshold levels used, as indicated on Map 5, are:

Au 25 ppb

Ag 0.5 ppm

As 50 ppm

These thresholds were chosen using judgement based on experience derived from a regional reconnaissance program in the general area surrounding the claims. Mathematical statistical methods were not employed.

During the initial reconnaissance effort in the claims area a sample was collected from Ottarasko Creek just downstream of the present eastern boundary of the claims which contained 280 ppb Au, a highly anomalous concentration of gold in a stream sediment. This, combined with a high gold value obtained from a rock chip sample in what is now the A Zone, led to further reconnaissance in the area immediately prior to staking the Lori claims. Of five more samples collected from Ottarasko Creek itself, four contained anomalous concentrations of gold, in the range 28 ppb to 91 ppb. Note that at least two of these anomalous samples were collected well upstream of the A Zone, indicating that there are other sources of gold in the area.

Four other stream sediment samples were collected from tributaries of Ottarasko Creek. Of these, three contained anomalous concentrations of arsenic, in the range 65 ppm to 150 ppm, and one contained 385 ppb gold. These samples were collected on the north slope of the Ottarasko Creek valley, opposite the A Zone, and again they suggest that other sources of gold are present in the claims area.

5 Reconnaissance Rock Chip Sampling and Mineralization in the Claims Area

Forty-four rock chip samples were collected during the course of reconnaissance prospecting before and after the staking of the Lori Claims. Those collected in what is now the A Zone are discussed elsewhere in this report. Of the remaining samples, three contained very significantly anomalous gold values. These were 670G, 842G and 890F. They contained, respectively, 89,000 ppb Au, 3,100 ppb Au and 4,220 ppb Au. The following descriptions are taken from field notes:

670G — Scree. Sugary-textured quartz vein with very fine grained pyrite and possible arsenopyrite. - G. Cooper

842G — Boulder in moraine. Angular, approximately 25 cm. in diameter. Origin probably somewhere in headwall of cirque. Quartz vein breccia. Fragments of the host rock are bleached to pale grey, crypto-crystalline rock. Probably originated as siltstone. 50% quartz vein material 5% pyrite as coarse euhedral crystals in aggregates within vein material. The fragments of host rock are not pyritiferous. - P. Ronning

890F — Boulder. White quartz vein material, 1/2 m.

wide. Well fractured with rust stains on fractures. Minor malachite on some fracture surfaces. - C. Nicholson.

Note that in all of these samples the mineralization is contained in quartz vein material. All of them were float and the mineralization was not seen in place. In all probability the mineralization is restricted to veins and any economic potential for the property would depend on finding a large vein system with mineable widths of consistent gold mineralization. Much more detailed prospecting is required to determine if any real potential for such mineralization exists.

6 Geology of the A Zone (see Map 6)

In the A Zone the country rock is greywacke of Unit 5 on GSC Map 5 - 1968. The main feature that characterizes the A Zone, however, is a sill - like intrusion of probable monzonitic composition, which is presumably related to the late Mesozoic intrusions of the Coast Plutonic Complex nearby. The sill is about 15 meters thick, has a sub-horizontal attitude and crops out discontinuously over an area of about 50,000 square meters (0.05 square kilometers).

The sill and country rock are cut by at least three types of dike and two types of vein. The lithologic types and the veins are described below. The rock units designations A through E are arbitrary and are not intended to imply age relationships in any way.

6.1 Rock Units in the A Zone

Unit A — Monzonite. Contains 5% opaque white feldspar phenocrysts, sub-hedral to anhedral, 0.5 to 2 mm. in size. 15% specks of biotite, 0.5 mm. to 2 mm. in size, acicular. When viewed from correct perspective, biotite has sub-parallel alignment. The evenly distributed biotite flakes give the rock a "peppery" appearance. 80% of the rock is very finely crystalline, pale whitish grey groundmass. Mineralogy of the groundmass cannot be distinguished; presumably it is quartz or feldspar or more probably a mixture of the two. The rock is monzonitic to quartz monzonitic in composition depending on the proportions of quartz and feldspar in the groundmass. Although it is in many places heavily fractured this rock is almost everywhere very fresh with little or no evidence of any epigenetic alteration.

Unit B

Biotite quartz feldspar hornfels. Dense, hard, tough rock; finely crystalline mixture of biotite, quartz and feldspar. Dark green to black color due largely to biotite. Only very weak foliation. Locally, more felsic phases are hard, dark grey, finely crystalline massive rocks whose mineralogy is indeterminate in the field due to their grain size.

Unit B also contains a few slatey horizons.

Undifferentiated from the main mass of Unit B are some hornblende feldspar phyric rocks of intermediate composition. They contain about 5% opaque white euhedral feldspar phenocrysts, 0.5 mm. to 2 mm. in size and about 10% hornblende phenocrysts up to 3 mm. long. The remainder is a dark greenish grey, very finely crystalline groundmass.

Unit B is believed to be the thermally metamorphosed equivalent of the Triassic siltstones and greywackes of Units 5 and 6 on GSC Map 5-1968. If that is the case then presumably the phyric rocks originated as sills or dikes intruding the sediments. Contacts between the phyric rocks and the others are now diffuse and they are not obviously recognizable as being intrusive.

Unit C

Andesitic Feldspar Porphyry. This unit cuts through Unit B as a dike. It has a medium green, finely crystalline groundmass with about 10 % anhedral feldspar phenocrysts 2 mm to 3 mm in diameter.

Unit D

Mafic Dike. This dike can be traced through rocks of Unit A for about 100 meters. It contains about 20% white subhedral to anhedral feldspar phenocrysts, 1/2 to 2 mm. in size and

40% sub-millimetric mafic minerals, too fine to identify in hand specimen. The remaining 40% is a light coloured, very finely crystalline groundmass, possibly a mixture of quartz and feldspar. The dike is 1 1/2 to 2 meters thick over most of its visible length, though its shallow dip results in the surface trace being considerably wider than that in places. It pinches out to the northwest and disappears under rubble to the southeast.

Unit E — Andesitic Dike. This is a finely crystalline dike, about 1 1/2 meters wide, which cuts through the metasediments of Unit B. It is completely unmineralized.

6.2 Structural Features

The most characteristic feature of rocks in the A Zone from a structural point of view is the abundance of brittle fracturing. In Unit A particularly, this fracturing takes two forms. They are:

1. Conjugate sets of fractures, with a fracture density of 1 to 10 per meter. Although such conjugate sets are easily recognized and some have been measured, the number of measurements is insufficient to make any statistically meaningful conclusions about the orientations of the stress fields involved.

2. Zones of closely spaced fractures which may be up to two meters wide, with a fracture density of up to 5 per decimeter. Although the fracturing which formed these zones was brittle and the slices of rock between the closely spaced fractures are not deformed or comminuted, these fracture zones are probably only one step removed from being shear zones.

Evidence of ductile deformation was not noted in the A Zone. Original layering or other features that could be used to delineate folds have been largely obscured by metamorphism. However an overturned syncline with a northeast trending axis is mapped by Tipper (GSC Map 5-1968) in the A Zone and this syncline is visible in cliffs northeast of the grid. It is presumed that rocks of Unit B have been folded by it, but the lack of fabric in Units A and B suggests that such folding must have taken place prior to the intrusion of Unit A.

6.3 Mineralization in the A Zone

Mineralization in the A Zone is confined entirely to quartz veins which contain pyrite and some arsenopyrite. The presence of arsenopyrite is apparently necessary if gold is to be present, although sample results do not suggest that the gold is actually tied up in the arsenopyrite, since there is not a 1 to 1 relationship between high gold values and high arsenic values.

The highest gold geochemical analyses and assays were obtained from samples collected during the course of reconnaissance work, prior to detailed sampling of the grid. In particular, samples 531F, 885F and 888F contained gold in the range 0.380 oz./ton to 0.594 oz./ton. These samples were collected from a quartz - pyrite - arsenopyrite vein in the center of the mafic dike (Unit D) which contains 5% to 10% coarsely disseminated to blebby mixtures of pyrite and arsenopyrite. The vein is 5 cm. to 10 cm. wide and can be traced for a few meters.

Similar veins occur within the main monzonite sill. They are up to a few centimeters wide and are usually widely spaced. For example sample 889F, containing 2,100 ppb Au, was collected from a series of 0.1 cm. to 4 cm. quartz veinlets which contain bits of massive pyrite/arsenopyrite.

The sampling done on the A Zone grid was done with an eye to determining whether or not there could be any mineable tonnages of mineralized material, so rather than selecting samples of mineralized material samples were collected in a more representative fashion. Samples of veins were representative channel samples across vein widths and samples were collected of wall rock material as well as of vein material. The sample results were generally disappointing, with 390 ppb being the highest gold value obtained.

The results of work in the A Zone indicate that although veins are present which carry gold mineralization, and it is possible to select samples which have very good gold grades, the mineralization is too restricted and too sporadic to support any sort of mining operation.

1 Appendix: Descriptions of Rock Chip Samples

Reconnaissance Samples Collected Prior to Staking

367F	Outcrop on north side of thrust fault. Sandstone, altered by iron carbonate. Quartz and calcite veins and hairline veinlets of quartz. Disseminate pyrite with possible arsenopyrite. Host rock for sample 368F. - G. Cooper
368F	Outcrop at same site as 367F. Quartz-calcite vein in sandstone. Trace pyrite and trace malachite. - G. Cooper
369F	Outcrop on or adjacent to thrust fault. Massive fine grained sandstone with disseminated pyrite up to 5 mm. cubes. No veining. - G. Cooper
372F	Highly oxidized material. 3 to 6 m. of heavy jarosite-limonite alteration. - G. Cooper
528F	Outcrop near toe of glacier. Light grey fine grained sandstone. Light brown weathering surface. Trace disseminated pyrite cubes. Minor pyrite coating carbonate-bearing fracture surfaces. - C. Nicholson
529F	Float boulder in glacial moraine. Purplish grey medium grained tuff. Tan weathered surface. Pyrrhotite coarsely disseminated, less than 5%. Silicified with plagioclase phenocrysts replaced by quartz. - C. Nicholson
530F	Float boulder from glacial moraine. Milky white vein quartz containing 1 - 2 %pyrrhotite in blebs. Weathered surface is dirty white with rusty stains in blotches. - C. Nicholson

531F	Rusty weathering outcrop. Purplish black, medium grained tuff. Rusty weathering. Contains pyritic quartz veins from 0.1 to at least 10 cm. width. Pyrite is in large cubes. Some arsenopyrite associated with the pyrite. Approximately 10% sulphides. Sample is 100% vein material. C. Nicholson
856F	Outcrop 25 m. above 531F. Massive, siliceous, fractured meta-sediment with small veinlets of pyrite, trace disseminated pyrite and rare chalcopyrite. Quartz veins in outcrop but silicification is not evident in hand specimen. Probably originated as a siliceous sediment. Pyrite is restricted to veins. Rock heavily fractured. - G. Cooper
857F	Scree boulder at side of glacier. Breccia. small brecciated fragments of argillite in a Fe - carbonate matrix. Breccia "vein" is beside a relatively undisturbed siltstone which contains some carbonate stringers but is not fragmented. Trace pyrite. - G. Cooper
858F	Float boulder on northeast side of moraine. Breccia. Siliceous fragments in chloritic cement. No sulphides. - G. Cooper
859F	Outcrop. Silicified sandstone. Strongly fractured, strongly quartz veined. Silicified with some argillic alteration. Arsenopyrite and very much lesser pyrite occur on fractures and/or on shear surfaces. - G. Cooper.
884F	Outcrop. Chip sample across 3 m. thick layer of dark grey to black siltstone starting and ending at contacts with the fine grained, silicified sandstone on either side. Siltstone ranges from sandy to phyllitic and contains a zone in the center of the layer consisting of a light brown, rusty quartz vein 5 to 10 cm. wide having 5 to 10 % coarsely disseminated to massive blebs of pyrite/arsenopyrite in it. Sample 531F was an earlier sample collected from the center of this zone. - C. Nicholson
	Note >> This description by Nicholson is erroneous. His "silicified sandstone" is in fact a medium grained monzonite and his black "siltstone" is a very fine grained mafic dike.

- P. Ronning

885F Sample from "center zone" of 884F. - C. Nicholson

886F Outcrop adjacent and to the south of sample 884F. 1 m. chip sample going away from the contact with the siltstone. Light grey/brown, siliceous, fine grained sandstone. Possibly metamorphosed. Weathers tan brown with rusty blotches. - C. Nicholson

Note >> As above, the "siltstone" is in fact a mafic dyke and the "sandstone" is a medium grained, equigranular monzonite. - P. Ronning

887F Outcrop adjacent and to the north of sample 884F. 1 m. chip sample going away from the northern contact with the shale in sample 884F. Sandstone, similar to sample 886F.

Note >> As above, the "shale" is a mafic dyke and the "sandstone" is a medium grained, equigranular monzonite. - P. Ronning

888F Outcrop. From same zone as sample 885F but 15 m. downslope (west) of it. Dark grey to black siltstone. May possibly be a metamorphosed dark grey, fine grained tuff with medium to coarse grained phenocrysts, similar to one which crops out just west of sample site. Sample is 100% vein material. White, fine grained quartz. Vuggy sections of pyrite/arsenopyrite (20%) which have partially weathered out leaving fine grained, dark grey powder.- C. Nicholson

Note >> Nicholson's "dark grey powder" may in fact be scorodite. - P. R.

889F Outcrop. Siliceous, light brown, fine grained sandstone containing 0.1 to 4 cm. quartz veinlets and veinlets up to 1.5 cm. thick of massive pyrite/arsenopyrite. - C. Nicholson

Note >> Nicholson's "siliceous sandstone" is in fact fine grained monzonite. - P. Ronning

890F Boulder. White quartz vein material, 1/2 m. wide. Well fractured with rust stains on fractures. Minor malachite on some fracture surfaces. - C. Nicholson.

601G	Outcrop. Massive, heavily fractured with iron carbonates on fractures. Granular texture with euhedral mafic minerals. Probably an intrusive rock. No mineralization. No veins. - G. Cooper

Reconnaissance Samples Collected During And Subsequent To Staking

571G	Boulder from moraine. Fissile black shale. Dark rusty weathering. 2 to 3 % pyrrhotite in small elongate blebs. - C. Nicholson
572G	Boulder from moraine. Light grey green, fine grained, moderately sheared siltstone or tuff. ! 5 pyrrhotite in elongate blebs. Millimeter scale quartz/calcite veins containing minor cubic pyrite. C. Nicholson
573G	Cliff-forming outcrop. Bull quartz with trace, medium grained disseminated pyrite. Occurs as 1 to 10 cm. wide veins. - C. Nicholson
574G	Cliff-forming outcrop, same location as 573G. Light brown, medium to fine grained, carbonate-rich rock, possibly a sandstone. C. Nicholson
575G	Boulder in a lateral moraine. Fine grained, light grey, slightly siliceous tuff. Rusty weathering. 1% finely disseminated pyrite throughout and in tiny veinlets. C. Nicholson
576G	Boulder form lateral moraine. Fine grained, dark green, andesitic tuff. Slightly foliated. Sample is 100%, quartz vein material, from veins 0.5 to 3 cm. wide. Contains large grains of pyrite. C. Nicholson
577G	Boulder from lateral moraine. Black, slightly

siliceous shale. Minor rust stains on surface but mostly black weathering. 1 to 2 % blebs of pyrrhotite. C. Nicholson

665G	Float boulder in talus pile. Andesitic flow. Chloritic alteration. 1 to 2 cm. wide quartz veinlets with massive sulphides, pyrite, pyrrhotite and chalcopyrite. Minor iron carbonate in fractures and associated with sulphides. - G. Cooper
666G	Outcrop. Silicified siltstone and mudstone. Moderately fractured with disseminated and vein sulphides. Quartz and calcite veinlets throughout. Pyrite and pyrrhotite. - G. Cooper
667G	Outcrop. Same location as 666G. Silicified mudstone/siltstone with disseminated sulphides and massive sulphide veins. Veins are 0.5 to 1 cm. wide and generally trend parallel to bedding. Pyrite is only recognized sulphide. - G. Cooper
668G	Outcrop. Same location as 666G and 667G. Similar rock type but sulphides more on fracture surfaces than in veins. - G. Cooper
669G	Loose boulder lying on outcrop. Andesite containing a 3 to 5 cm. quartz-calcite vein with strongly disseminated sulphides as a halo around the vein. - G. Cooper
670G	Scree. Sugary-textured quartz vein with very fine grained pyrite and possible arsenopyrite. - G. Cooper
671G	Scree. Strongly silicified mudstone. Pyrite occurs in veinlets and along fracture planes. - G. Cooper
672G	Outcrop. Dike rock with hornblende and feldspar phenocrysts. Disseminated pyrite on fracture surfaces. - G. Cooper
673G	Outcrop. Massive, aphanitic, very siliceous rock. Trace pyrite. - G. Cooper
674G	Outcrop. Same location as 673G. Similar rock but more strongly foliated. - G. Cooper
781G	Outcrop. Strongly silicified grey green wacke or

crystal tuff. Heavily fractured due to freeze/thaw. 1 to 2 % disseminated pyrite. Minor $CaCO_3$ alteration. Bleached on weathered surface. Minor Fe oxide stain on weathered surface. - G. Price

782G	Outcrop. Quartz vein in rock as at 781G. Pyrite about 1%. Boxwork after pyrite. - G. Price
783G	Outcrop. Felsic dyke, 2 m. thick. Bleached strongly at contact. Silica and mica alteration. Iron oxide staining. - G. Price
784G	Outcrop. Silicified banded/bedded siltstone. Grey green Chlorite +/- quartz along sheared bedding plane. Minor folds. Strongly fractured. - G. Price
785G	Float. Quartz and silicified tuff breccia. Strong muscovite alteration. Bleached. Minor chlorite. Less than 1 % pyrite. - G. Price
786G	Scree. Black shaley mudstone. 2 to 4 % pyrite disseminated in 1 to 2 mm. cubes. - G. Price
842G	Boulder in moraine. Angular, approximately 25 cm. in diameter. Origin probably somewhere in headwall of cirque. Quartz vein breccia. Fragments of the host rock are bleached to pale grey, crypto-crystalline rock. Probably originated as siltstone. 50% quartz vein material 5% pyrite as coarse euhedral crystals in aggregates within vein material. The fragments of host rock are not pyritiferous. - P. Ronning

<u>Samples from "A" Zone Grid</u>

579G	Outcrop. Grid 41E 60N. Fine to medium grained intrusive rock. Medium grey colour. Weathers to a darker grey with Fe oxide staining.

Heavily fractured. - C. Nicholson

580G Outcrop. Grid 57E 90N. 1/2 m. wide dike in light grey, moderately fractured host intrusive rock. - C. Nicholson

581G Outcrop. Grid 40E 55N. Light grey, slightly to moderately fractured, fine to medium grained intrusive. Sample is of vein material from clear to milky white quartz vein. - C. Nicholson

582G Outcrop. Grid 30E 74N. Sample is from 2 m. wide dike which intrudes monzonite. Fine grained, moderately foliated biotite-quartz rock. - C. Nicholson

583G Outcrop. Grid 56E 05N. Monzonite from main sill. Well fractured with minor 1 cm. quartz veins. Light brownish grey in colour. Iron oxide staining on surface. - C. Nicholson

584G Outcrop. Grid 60E 35S. Main sill. Moderately to intensely fractured. Weathers creamy white to dark grey with Fe oxide staining in places. Sample is slightly foliated and contains 30% biotite. - C. Nicholson

585G Outcrop. Grid 60E 35S. Same location as 584G. Milky white quartz vein material. Veins range up to 5 cm. and tend to be sub-parallel to each other. No sulphides. - C. Nicholson

586G Outcrop. Grid 98E 186S. Dark grey to black siltstone. Contains irregularly shaped quartz veins up to 6 cm. wide at a spacing of 1 per meter. Sample is 100% vein material. - C. Nicholson

587G Outcrop. Grid 160E 220S. Light grey mudstone. Minor tiny black veinlets of unknown composition and quartz veinlets. Trace finely disseminated to blebby pyrite. - C. Nicholson

588G Outcrop. Grid 130E 232S. Dark grey to black siltstone. contains layers which are muddier than the rest. Trace pyrrhotite. - C. Nicholson

589G Outcrop. Grid 140E 85N. Highly fractured zone in the main sill. Fractures at a density of up to

1 per cm. Minor small quartz veins. - C. Nicholson

590G	Outcrop. Grid 145E 110N. Highly fractured and quartz veined zone in main sill. Bleached appearance. - C. Nicholson
591G	Outcrop. Grid 135E 160N. Main sill unit. Highly fractured. - C. Nicholson
675G	Outcrop. Grid 180E 182N. Foliated, fine grained, fractured monzonite with trace pyrite. 1 to 5 mm. thick quartz veinlets at 075 degrees with larger 5 mm. to 10 mm. clear quartz veins at 120 degrees. - G. Cooper
676G	Scree. Grid 210E 120N. Breccia. Monzonite fragments in a quartz-biotite matrix. - G. Cooper
677G	Outcrop. Grid 135E 135N. Fine grained monzonite. Quartz veinlets less than 1 cm. wide averaging 3 to 4 cm. apart. Veins contain pyrite and possibly some pyrrhotite. - G. Cooper
678G	Outcrop. Grid 135E 135N. Same location as 677G. Quartz vein 6 to 10 cm. wide, irregularly laced with brown stringers, some of which are sulphide bearing with pyrrhotite, pyrite and sphalerite. - G. Cooper
679G	Outcrop. Grid 130E 170N. Bleached monzonite with quartz veins 1 to 10 mm. wide, 10 to 15 per dm. Fewer mafics, more massive and less granular than most of the monzonite. - G. Cooper
787G	Outcrop. Grid 000E 020N. Sampled a 1 m. area within a 3 m. wide zone of well fractured rock. Fractures are closely spaced and sub-parallel. Rock is a reddish grey, fine to medium grained intrusive. Main intrusive body in the grid area. Mainly feldspar and quartz, few mafics if any. Minor 1 cm. quartz veins parallel to fracturing. - C. Nicholson
788G	Outcrop. Grid 038E 020N. Intensely fractured, fine to medium grained, pinkish white intrusive. Fracture density up to 1 per mm. Includes minor breccia zones with calcite

filling voids. - C. Nicholson

844G	Outcrop. Grid 000E 020N. Quartz vein, 2 cm. wide. Pyrite in seams and disseminated, 2%. Rusty weathering. - P. Ronning
845G	Outcrop. Grid 010E 190S. Three veins, each about 1m. apart, each 1 cm. to 3 cm. wide. Sample is a random chip from each of the veins. Host rock is a biotite quartz feldspar hornfels. A few specks and seams of chlorite. Minor 2 to 3 mm. spots of rusty weathering calcite. No sulphides. Quartz is not rusty weathering. - P. Ronning
846G	Outcrop. Random chips from NE wall of a gully. Black biotite quartz feldspar hornfels. The wall of the gully is a fracture surface. Within 1 to 5 cm. of the fracture surface the hornfels is bleached to form a white finely crystalline sericite-quartz-feldspar rock. - P. Ronning
847G	Outcrop. Grid 030E 057N. Biotite-bearing quartz vein. About 10 cm. thick. White to clear vein quartz, cut and locally brecciated by black, finely crystalline felty biotite. No visible sulphides; does not weather rusty. Sample is 40% quartz, 60% biotite. - P. Ronning
848G	Outcrop. Grid 040E 055N. White quartz vein. 30 cm. wide, visible over 2m. strike length. No visible mineralization. - P. Ronning
850G	Outcrop. Grid 060E 002N. Quartz vein. Sample is entirely vein material. Approximately 3% pyrite on cross-cutting hairline fractures and lining small vugs. Exposed surface is 50% coated with red-brown to dark purplish brown Fe oxides. Newly broken surfaces contain 20% orange-brown and yellow Fe oxides. - P. Ronning
852G	Piece of loose rubble. Source is adjacent. Grid 080E 065S. Monzonite containing approximately 20% quartz vein material as irregularly oriented veins a few mm. to 2 cm. thick. Minor pyrite, trace chalcopyrite and arsenopyrite. - P. Ronning

2 Appendix: Analytical Results

Rock Chip Samples - Reconnaissance

Note >> All analyses are geochemical except those with results indicated by *___*, which are assays. For assays, gold and silver are in oz./ton, arsenic in %.

Sample Numbers	Cu ppm	Zn ppm	Ag ppm	As ppm	Sb ppm	Au ppb	Hg ppb
571G	62	65	0.1	11	4	1	100
576G	48	5	0.2	7	2	160	5
577G	92	39	0.1	43	2	1	10
601G	6	35	0.1	6	2	1	50
665G	140	88	0.1	11	2	6	50
666G	48	92	0.1	28	2	1	5
667G	59	31	0.1	40	2	1	20
668G	54	299	0.1	65	2	1	10
669G	28	20	0.1	14	2	4	10
670G	273	16	8.4	1540	2	89000	80
671G	86	69	0.1	41	2	59	20
673G	60	14	0.1	1554	2	580	20
674G	6	13	0.1	44	2	32	5
781G	8	76	0.1	3	2	4	5
782G	16	28	0.1	2	2	10	10
783G	2	20	0.1	2	2	1	20
784G	61	45	0.3	15	2	1	70
785G	59	30	0.1	5	2	1	20
786G	37	32	0.6	134	2	8	10
842G	11	11	4.2	72	2	3100	5
367F	39	42	0.3	65	2	1	10
368F	51	47	6.2	20	16	3	40
369F	585	20	0.4	12	2	12	10
372F	27	24	0.1	2	2	1	5
528F	27	71	0.1	66	2	1	20
529F	204	67	0.1	2	2	610	5
530F	31	8	0.1	4	2	2	5
531F			*0.1*			*0.031*	
856F	119	17	0.1	155	2	1660	5

857F	6	54	0.1	39	5	9	10
858F	14	24	0.1	12	2	2	40
859F	119	10	0.9	3485	2	1050	10
884F	148	66	0.1	25	2	370	5
885F			*0.05*	*0.02*		*0.594*	
886F	55	17	0.1	12	2	6	5
887F	14	25	0.1	24	2	4	20
888F			*0.06*			*0.536*	
889F	1360	7	0.6	497	6	2100	5
890F	130	1	2.5	6	2	4220	5

Rock Chip Samples - "A" Zone Grid"

Sample Numbers	Cu ppm	Zn ppm	Ag ppm	As ppm	Sb ppm	Au ppb	Hg ppb
579G	156	16	0.1	2	2	14	10
582G	17	73	0.1	8	2	17	20
583G	25	20	0.1	290	2	31	10
584G	7	34	0.1	14	2	1	5
585G	3	4	0.1	6	2	390	20
586G	6	1	0.1	2	2	1	10
587G	53	46	0.2	38	4	10	140
588G	30	76	0.1	28	2	10	20
590G	40	12	0.1	10	2	12	10
591G	6	23	0.1	10	2	1	20
672G	148	72	0.1	12	2	195	5
675G	21	20	0.1	19	2	16	10
676G	6	16	0.1	5	2	7	5
677G	56	20	0.1	150	2	17	10
678G	121	21	0.1	43	3	37	10
679G	5	7	0.1	5	2	104	5
787G	6	35	0.1	13	2	7	40
788G	2	34	0.1	5	2	1	40
844G	4	11	0.2	126	2	120	5
845G	6	31	0.2	6	2	1	10
846G	24	62	0.2	13	2	2	40
847G	3	30	0.1	4	2	1	20
848G	4	10	0.1	4	2	1	5
850G	194	10	1.2	2029	6	340	20
852G	69	24	0.1	133	7	12	10

Reconnaissance_Stream_Sediment_Samples

Sample Numbers	Cu ppm	Zn ppm	Ag ppm	As ppm	Sb ppm	Au ppb	Hg ppb
370F	89	69	0.1	150	2	18	40
371F	37	70	0.1	122	2	3	15
532F	36	34	0.1	22	2	280	20
578G	38	31	0.1	31	2	85	20
602G	20	33	0.1	23	2	18	10
603G	36	34	0.1	17	2	91	20
604G	36	34	0.1	13	2	31	10
605G	34	35	031	17	2	12	20
840G	63	58	0.1	65	2	385	40
841G	56	73	0.3	57	2	16	20
843G	82	74	0.2	17	2	28	10

3 Appendix - Analytical Techniques

All analyses were done by Acme Analytical Laboratories, 852 East Hastings Street, Vancouver, B. C.

Rock samples were crushed to a - 100 mesh pulp. Half gram samples were then digested in 95 degree celcius dilute aqua regia in a boiling water bath for 1 hour and then diluted to 10 ml. with demineralized water. Copper, zinc, silver, arsenic and antimony were analyzed by Inductively Coupled Argon Plasma.

Gold analyses required a 10.0 to 30.0 gram sample which was subjected to fire assay preconcentration techniques to produce a silver bead. The bead was dissolved and gold content was determined in the solution by graphite furnace Atomic Absorption..

For mercury analysis, 0.5 grams of pulp sample was digested in aqua regia and diluted with 20 % HCl. Mercury in the solution was determined by cold vapour atomic absorption. A small portion of the extract was added to a stannous chloride/hydrochloric acid solution. The reduced mercury was swept out of the solution and passed into a mercury cell where it was measured by atomic absorption.

4 Appendix: Cost Statements

Cost Statement : Lori 1 Claim

Salaries and Wages

Field Work		
P. Ronning, 27 August, 1983		
1 day x $126.50 per day =	$126.50	
G. Cooper, 27 and 29 August, 1983		
2 days x $103.50 per day =	$207.00	
C. Nicholson, 27 and 29 August, 1983		
2 days x $80.50 per day =	$161.00	
Mobilization and De-mobilization		
P. Ronning, 29 August, 1983		
1/2 day x $126.50 per day =	$63.25	
G. Cooper, 30 August, 1983		
1/2 day x $103.50 per day =	$51.75	
C. Nicholson, 30 August, 1983		
1/2 day x $80.50 per day =	$40.25	
Report Writing		
P. Ronning, 28 and 29 August, 1984		
1 1/2 days x $195.00 per day =	$292.50	
Total Salaries and Wages	---------->	$942.25

Room and Board

6 1/2 man days x $50.00 per man day =	---------->	$325.00

Helicopter

27 August, 1983		
0.8 hours x $485.00 per hour =	$388.00	
29 August, 1983		
0.8 hours x $485.00 per hour =	$388.00	

Total Helicopter charges	---------->	$776.00

Vehicle Rental

27, 29 and 30 August, 1983		
2 1/2 days x $50.00 per day =	---------->	$125.00

Laboratory Costs

33 rock chip samples at $14.75 each =	---------->	$486.75

Materials and Supplies

Ribbon, spray paint, markers, sample bags etc.	---------->	$50.00

TOTAL EXPENDITURES, LORI 1 CLAIM		$2,705.00

Cost Statement : Lori 2 and Lori 3 Claims

Salaries_and_Wages

Field Work		
P. Ronning, 26 August, 1983		
1 day x $126.50 per day =	$126.50	
G. Cooper, 26 August, 1983		
1 day x $103.50 per day =	$103.50	
C. Nicholson, 26 August, 1983		
1 day x $80.50 per day =	$80.50	
Mobilization and De-mobilization		
P. Ronning, 29 August, 1983		
1/2 day x $126.50 per day =	$63.25	
G. Cooper, 30 August, 1983		
1/2 day x $103.50 per day =	$51.75	
C. Nicholson, 30 August, 1983		
1/2 day x $80.50 per day =	$40.25	
Report Writing		
P. Ronning, 29 and 30 August, 1984		
1 1/2 days x $195.00 per day =	$292.50	

Total Salaries and Wages	---------->	$758.25

Room_and_Board

4 1/2 man days x $50.00 per man day =	---------->	$225.00

Helicopter

26 August, 1983
0.8 hours x $485.00 per hour = ----------> $388.00

Vehicle Rental

26 and 30 August, 1983
1 1/2 days x $50.00 per day = ----------> $75.00

Laboratory Costs

18 rock chip samples at $14.75 each = ----------> $265.50

Materials and Supplies

Ribbon, spray paint, markers,
sample bags etc. ----------> $50.00

TOTAL EXPENDITURES, LORI 2 AND 3 CLAIMs $1,761.75

References Cited

Tipper, H. W.
1969: Mesozoic and Cenozoic Geology of the Northeast Part of Mount Waddington Map-Area (92 N), Coast District, British Columbia. Geological Survey of Canada Paper 68-33. Map 5-1968 accompanies.

Statement of Qualifications

Peter A. Ronning

I, Peter A. Ronning of Sechelt, British Columbia, hereby certify that:

1. I am a geologist employed in the field of mineral exploration by Homestake Mineral Development Company of Ste. 201, 856 Homer St., Vancouver, B. C.

2. I am a graduate of the University of British Columbia, holding the degree of Bachelor of Applied Science in Geological Engineering, obtained in 1973.

3. I hold the degree of Master of Science, specializing in mineral exploration, from Queen's University at Kingston, Ontario, obtained in 1983.

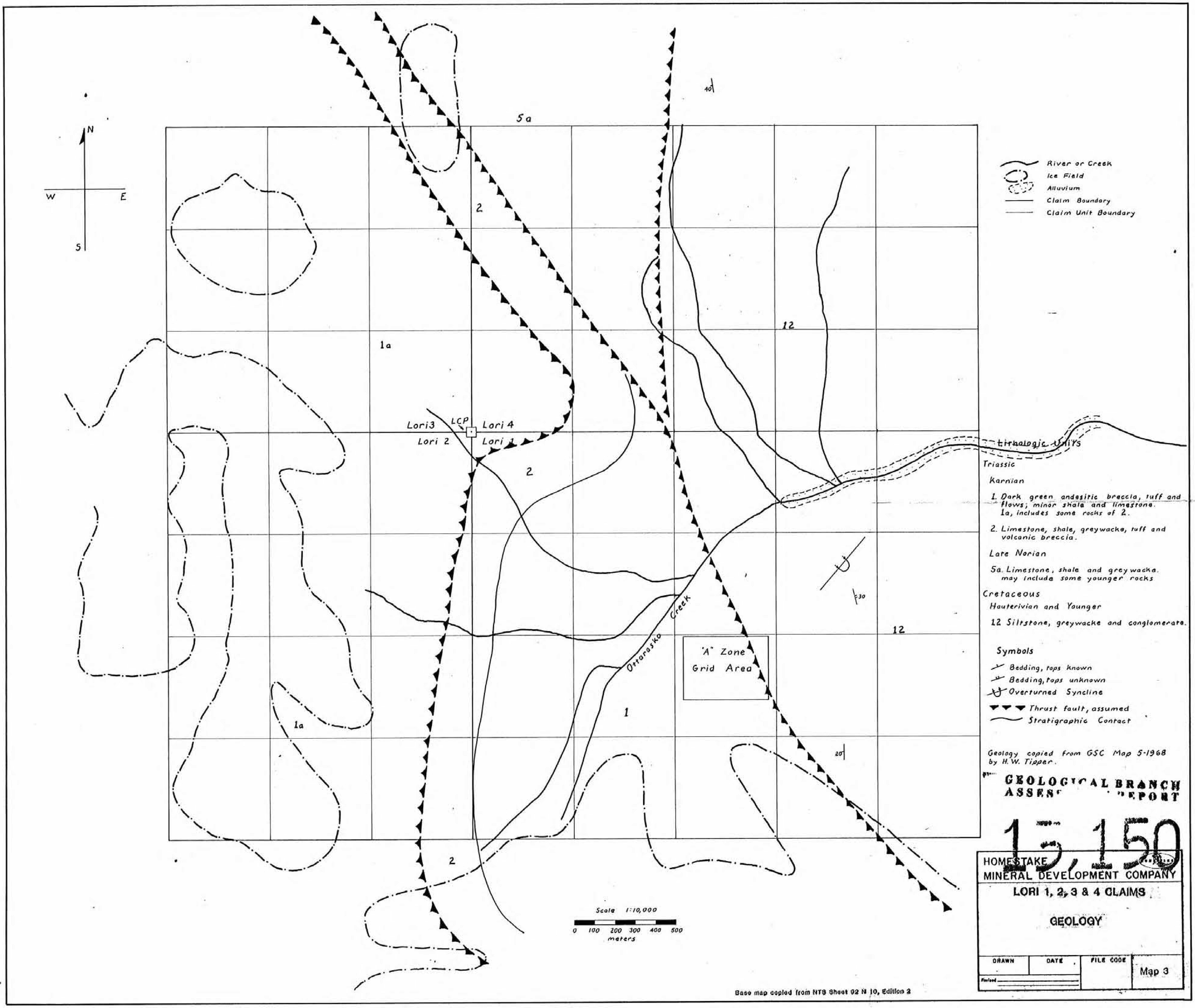
4. I am a fellow of the Geological Association of Canada. I have been employed in the field of mineral exploration since 1973.

5. The work discussed in this report was done by myself or by other persons working under my supervision.

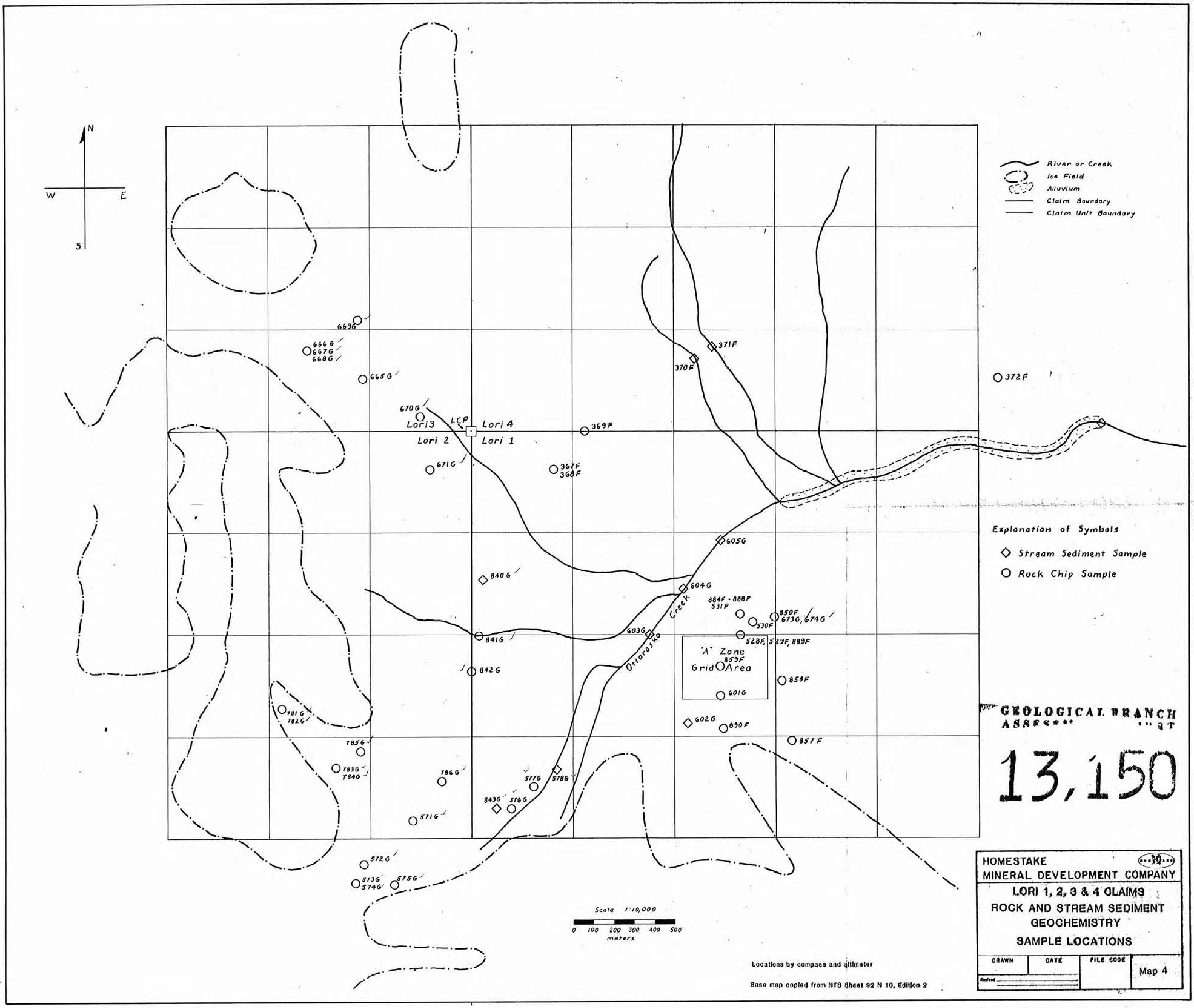
Peter A. Ronning

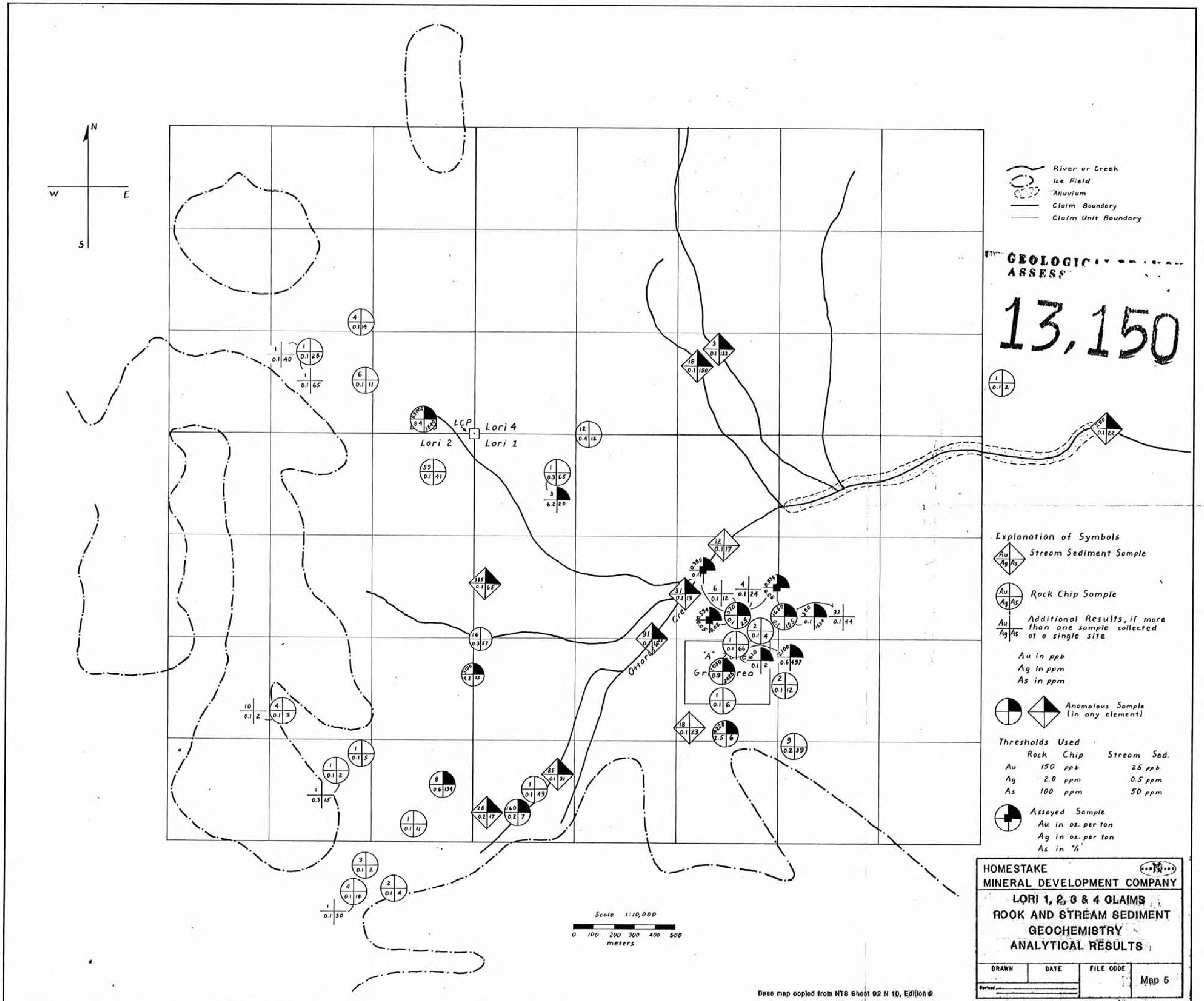
P. Ronning

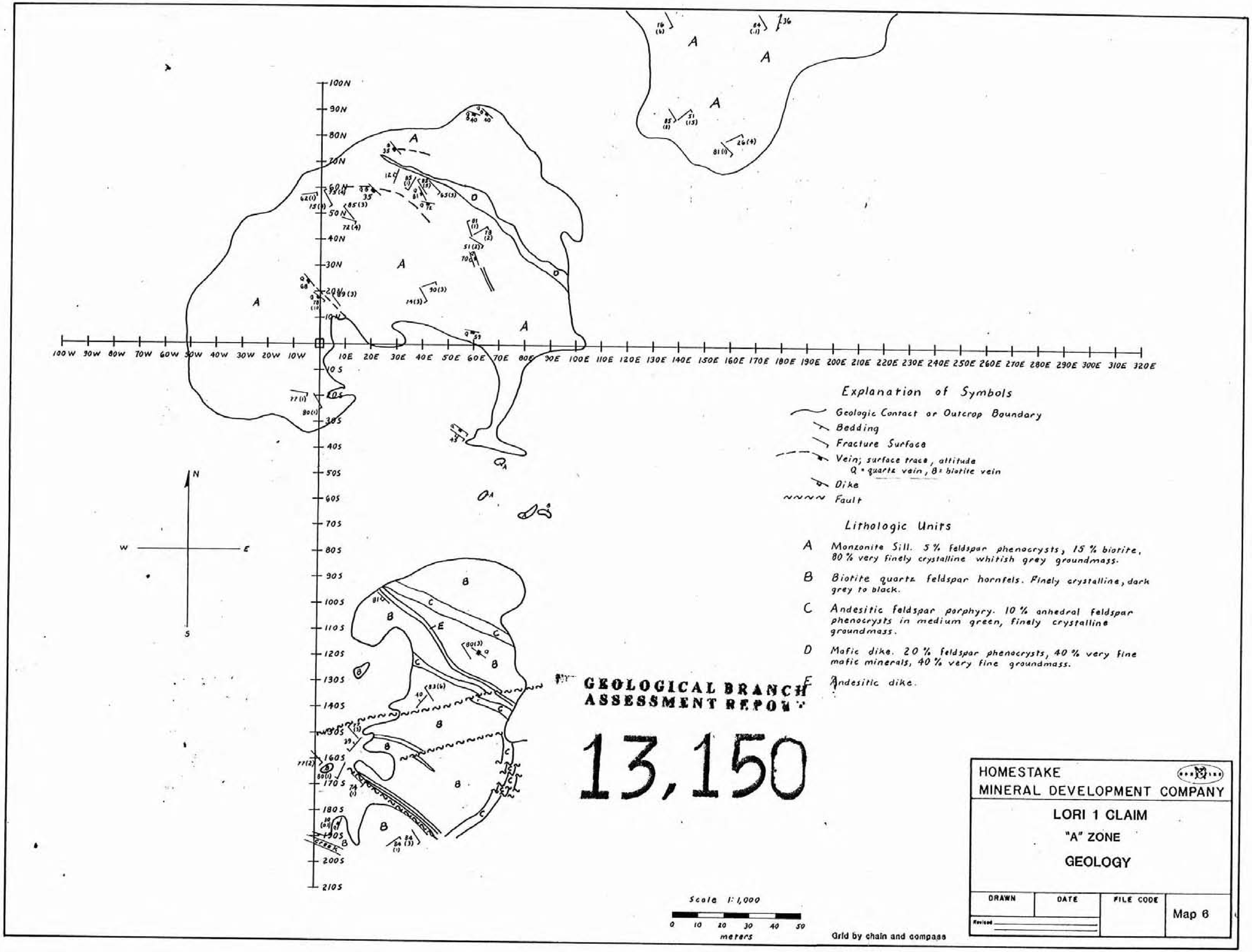
12 September, 1984



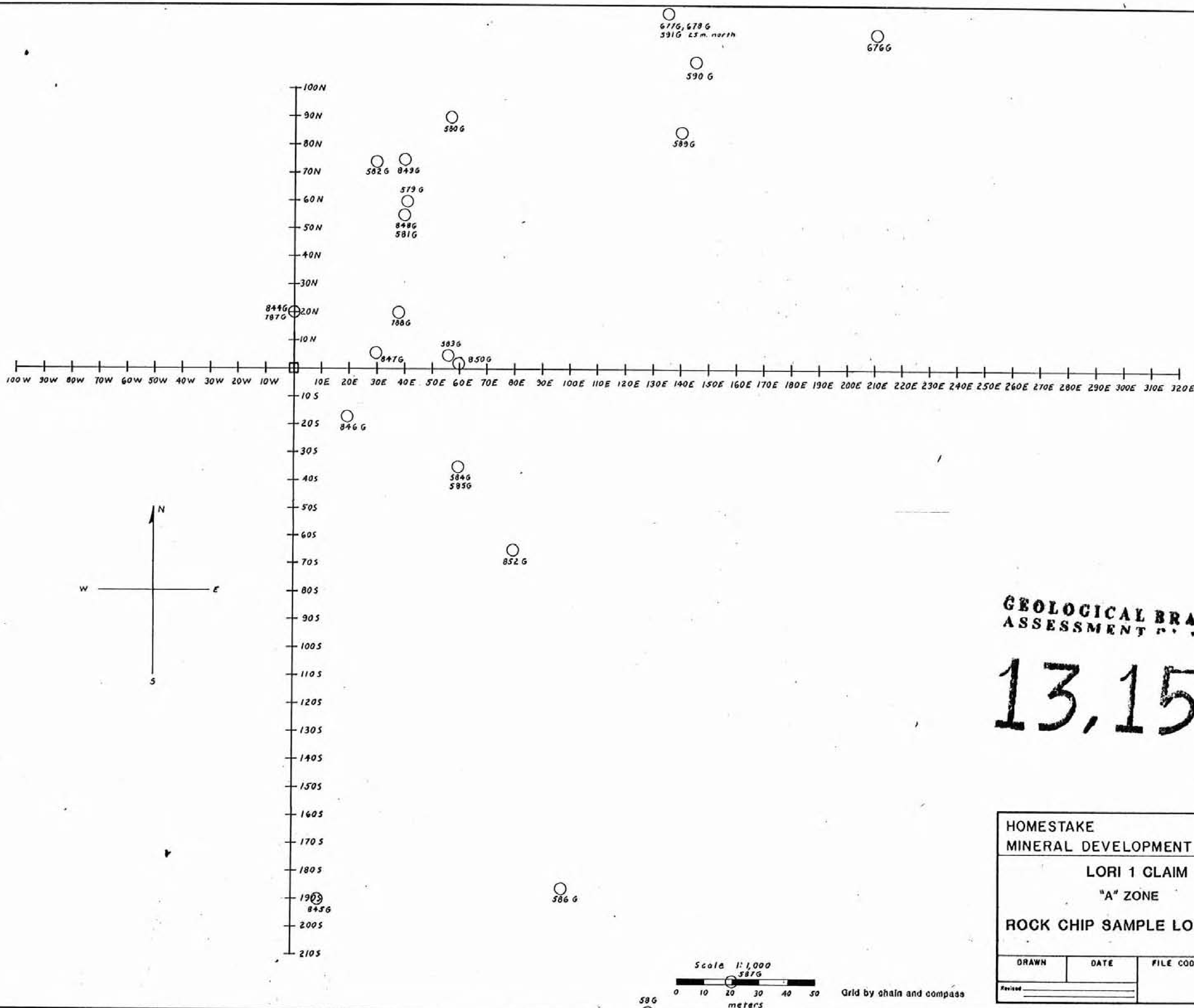
N
W
E
S
5a
2
1a
12
Lori3
LCP
Lori 4
Lori 2
Lori 1
2
1
1a
2
12
"A" Zone
Grid Area
Ottarasko Creek
River or Creek
Ice Field
Alluvium
Claim Boundary
Claim Unit Boundary
Lithologic Units
Triassic
Karnian
1. Dark green andesitic breccia, tuff and flows; minor shale and limestone. 1a, includes some rocks of 2.
2. Limestone, shale, greywacke, tuff and volcanic breccia.
Late Norian
5a. Limestone, shale and greywacke. may include some younger rocks
Cretaceous
Hauterivian and Younger
12 Siltstone, greywacke and conglomerate.
Symbols
Bedding, tops known
Bedding, tops unknown
Overturned Syncline
Thrust fault, assumed
Stratigraphic Contact
Geology copied from GSC Map 5-1968 by H. W. Tipper.
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,150
HOMESTAKE MINERAL DEVELOPMENT COMPANY
LORI 1, 2, 3 & 4 CLAIMS
GEOLOGY
DRAWN
DATE
FILE CODE
Map 3
Revised
Scale 1:10,000
0 100 200 300 400 500
meters
Base map copied from NTS Sheet 92 N 10, Edition 2


N
W
E
S
River or Creek
Ice Field
Alluvium
Claim Boundary
Claim Unit Boundary
Explanation of Symbols
Stream Sediment Sample
Rock Chip Sample
669G
666G
667G
668G
665G
670G
Lori 3
LCP
Lori 4
Lori 2
Lori 1
671G
369F
367F
368F
370F
371F
372F
605G
840G
604G
884F - 888F
531F
530F
850F
673G, 674G
603G
841G
528F, 529F, 889F
Ottarasko Creek
"A" Zone
859F
Grid Area
842G
601G
858F
781G
782G
602G
890F
857F
785G
783G
784G
786G
577G
578G
843G
576G
571G
572G
573G
574G
575G
Scale 1:10,000
0 100 200 300 400 500
meters
Locations by compass and altimeter
Base map copied from NTS Sheet 92 N 10, Edition 2
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,150
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
LORI 1, 2, 3 & 4 CLAIMS
ROCK AND STREAM SEDIMENT
GEOCHEMISTRY
SAMPLE LOCATIONS
DRAWN
DATE
FILE CODE
Revised
Map 4


N
W
E
S
LCP
Lori 4
Lori 2
Lori 1
Ottaro Creek
"A" Grid Area
River or Creek
Ice Field
Alluvium
Claim Boundary
Claim Unit Boundary
GEOLOGICAL BRANCH ASSESSMENT REPORT
13,150
Explanation of Symbols
Au Ag As Stream Sediment Sample
Au Ag As Rock Chip Sample
Au Ag As Additional Results, if more than one sample collected at a single site
Au in ppb
Ag in ppm
As in ppm
Anomalous Sample (in any element)
Thresholds Used
Rock Chip
Stream Sed.
Au 150 ppb 25 ppb
Ag 2.0 ppm 0.5 ppm
As 100 ppm 50 ppm
Assayed Sample
Au in oz. per ton
Ag in oz. per ton
As in %
Scale 1:10,000
0 100 200 300 400 500
meters
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
LORI 1, 2, 3 & 4 CLAIMS
ROCK AND STREAM SEDIMENT
GEOCHEMISTRY
ANALYTICAL RESULTS
DRAWN
DATE
FILE CODE
Revised
Map 5
Base map copied from NTS Sheet 92 N 10, Edition 2



Explanation of Symbols
Geologic Contact or Outcrop Boundary
Bedding
Fracture Surface
Vein; surface trace, attitude
Q = quartz vein, B = biotite vein
Dike
Fault
Lithologic Units
A Monzonite Sill. 5 % feldspar phenocrysts, 15 % biotite, 80 % very finely crystalline whitish grey groundmass.
B Biotite quartz feldspar hornfels. Finely crystalline, dark grey to black.
C Andesitic feldspar porphyry. 10 % anhedral feldspar phenocrysts in medium green, finely crystalline groundmass.
D Mafic dike. 20 % feldspar phenocrysts, 40 % very fine mafic minerals, 40 % very fine groundmass.
E Andesitic dike.
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,150
HOMESTAKE
MINERAL DEVELOPMENT COMPANY
LORI 1 CLAIM
"A" ZONE
GEOLOGY
DRAWN
DATE
FILE CODE
Revised
Map 6
Scale 1:1,000
0 10 20 30 40 50
meters
Grid by chain and compass
N
S
W
E



Grid by chain and compass

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,150

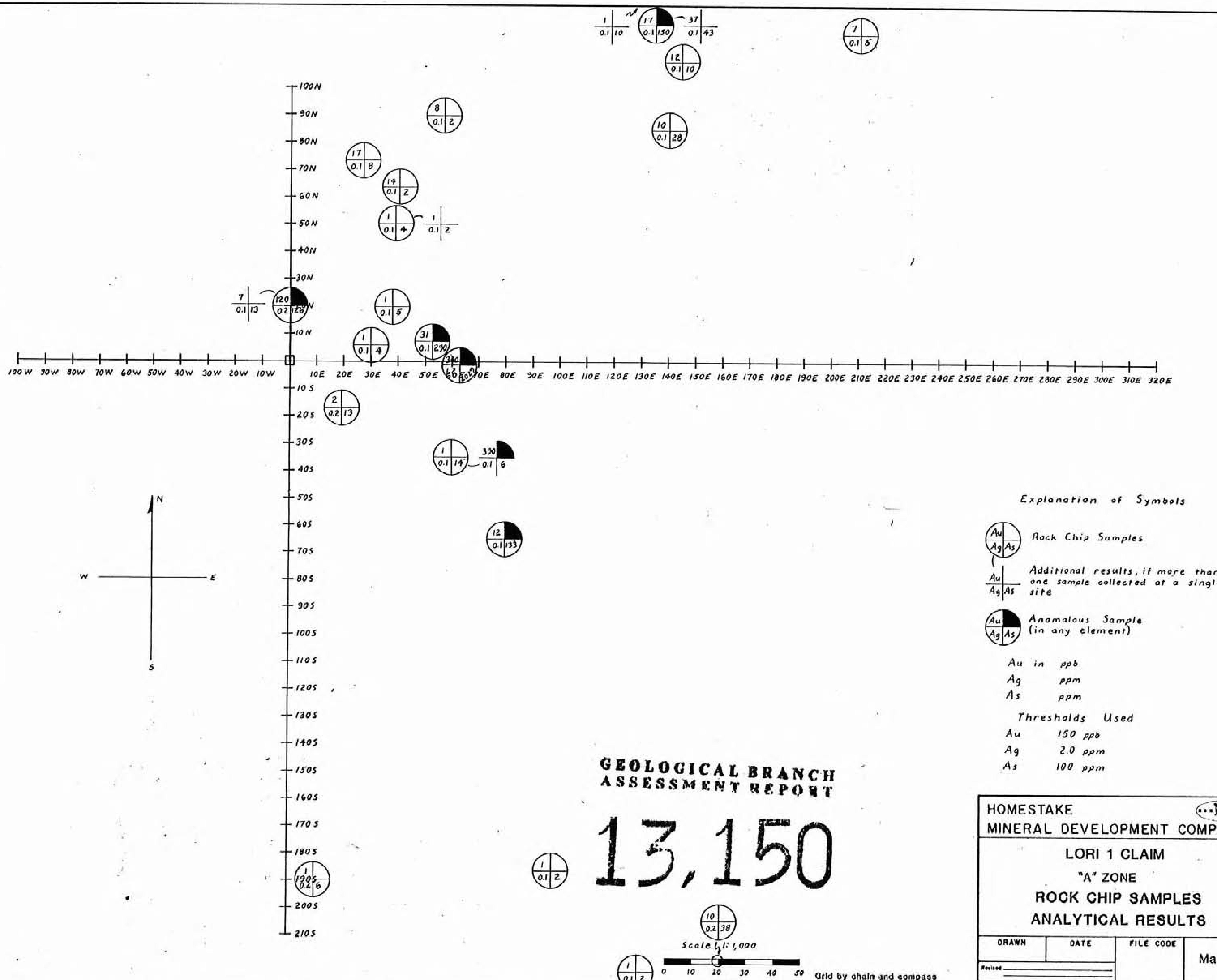
HOMESTAKE
MINERAL DEVELOPMENT COMPANY

LORI 1 CLAIM

"A" ZONE

ROCK CHIP SAMPLE LOCATIONS

DRAWN	DATE	FILE CODE	Map 7
Revised			



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,150

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

LORI 1 CLAIM
"A" ZONE
ROCK CHIP SAMPLES
ANALYTICAL RESULTS

DRAWN	DATE	FILE CODE	
			Map 8