

**GEOLOGICAL AND GEOCHEMICAL
ASSESSMENT REPORT
ON THE PCG 1-12 CLAIMS**

091928

Whitehorse M.D., Yukon
May 31-June 5, 1986

105-D-6

Claims: PCG 1-12 (YA 86918-929)

Location: 1. 40 km S of Whitehorse, Yukon
2. NTS Sheet 105 D/6
3. Latitude $60^{\circ} 21.5' N$
Longitude $135^{\circ} 07' W$

For: **Havilah Gold Mines Ltd.**
208-260 West Esplanade Street
North Vancouver, B.C.
V7M 3G7

By: Harmen J. Keyser, B.Sc.
Aurum Geological Consultants Inc.
604-675 West Hastings Street
Vancouver, B.C.
V6B 1N2

March 13, 1987

This report has been examined by
the Geological Evaluation Unit
under Section 53 (4) Yukon Quartz
Min. Act and is allowed as
representation work in the amount
of: \$ 2400.00.

for *RA Edmond*
Regional Manager, Exploration and
Geological Services for Commissioner
of Yukon Territory.

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INTRODUCTION

Terms of Reference

This report was prepared at the request of Havilah Gold Mines Ltd. Its purpose is to satisfy assessment requirements of the Yukon Quartz Mining Act by describing exploration work carried out from May 31 to June 5, 1986 on the PCG 1-12 claims.

Exploration work described in this report consisted of a reconnaissance program of prospecting, geological mapping, and geochemical rock and soil sampling by D. David, P. Garagan, T. Garagan, and H. Keyser of Aurum Geological Consultants Inc.

Location and Access

The PCG 1-12 claims are located in southwestern Yukon Territory, about 40 km south of Whitehorse (Figure 1). Centered at latitude $60^{\circ} 21.5'N$ and $135^{\circ} 07' W$, the claims cover part of the divide between Thompson Creek and Watson River known as Red Ridge.

Access to the property is by gravel road to Annie Lake from the Whitehorse - Carcross Highway, and then by four wheel drive road along Thompson Creek. Alternatively, access is provided by helicopters based at Whitehorse and seasonally at the abandoned Wheaton River airstrip.

Physiography

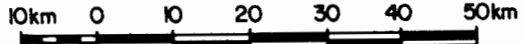
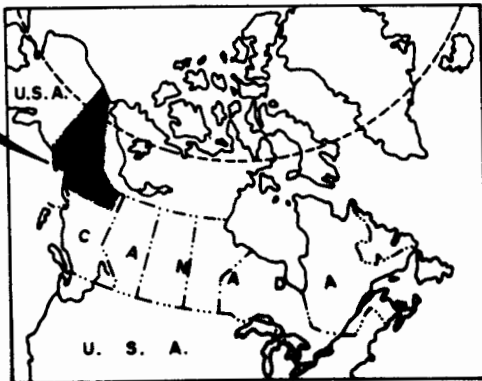
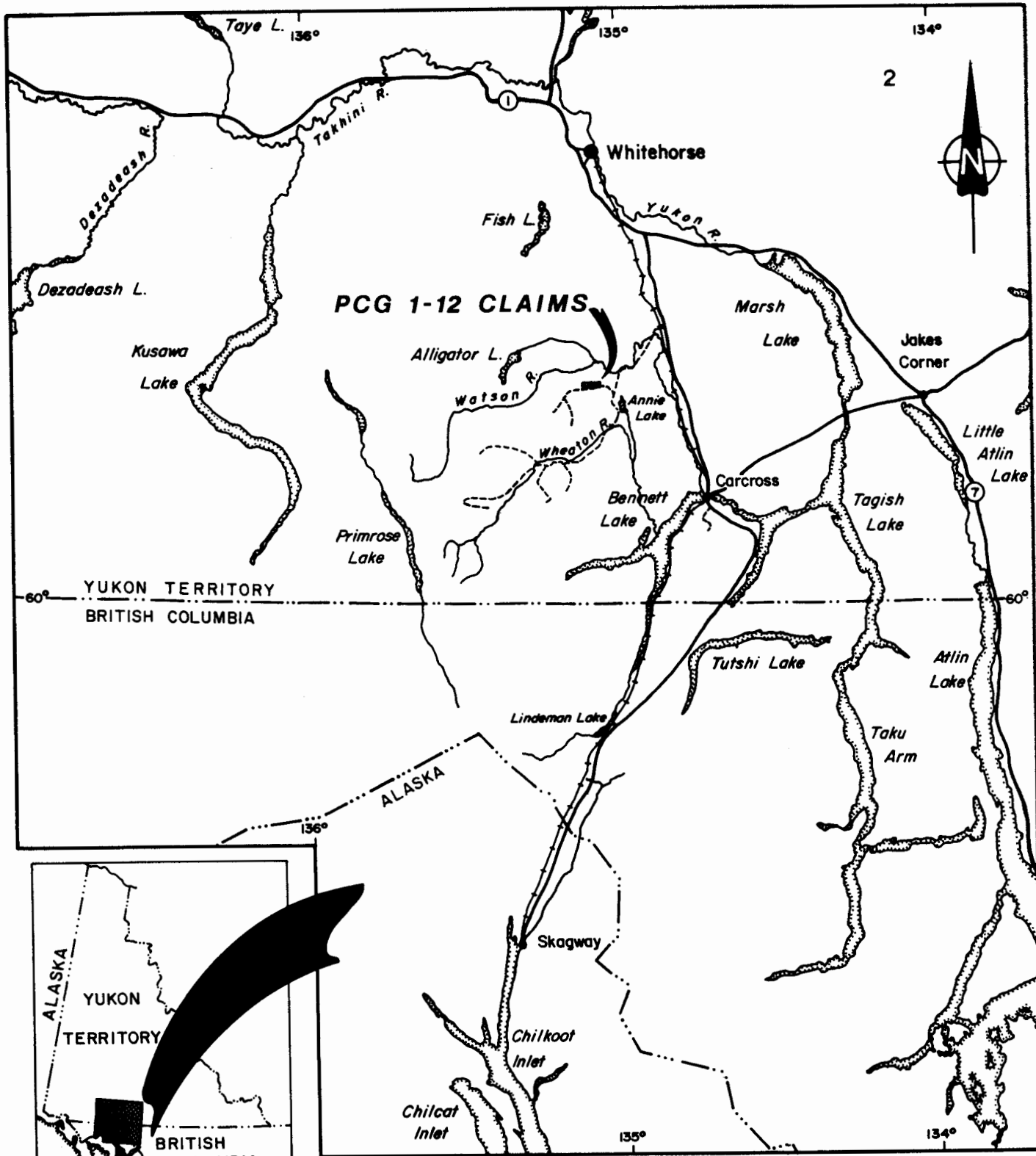
The PCG 1-12 claim group is situated on the eastern flank of the Coast Mountains (Boundary Ranges) and topography is rugged. Elevations range from 3500 to 5100 feet (1060 to 1550 m) above sea level on the property. The area has been greatly modified by Pleistocene glaciation, and such glacial features as U-shaped valleys, aretes and cirques are common.

Most of the PCG claim group is situated above tree line. Talus, felsenmeer, and alpine shrubs and grasses cover the property.

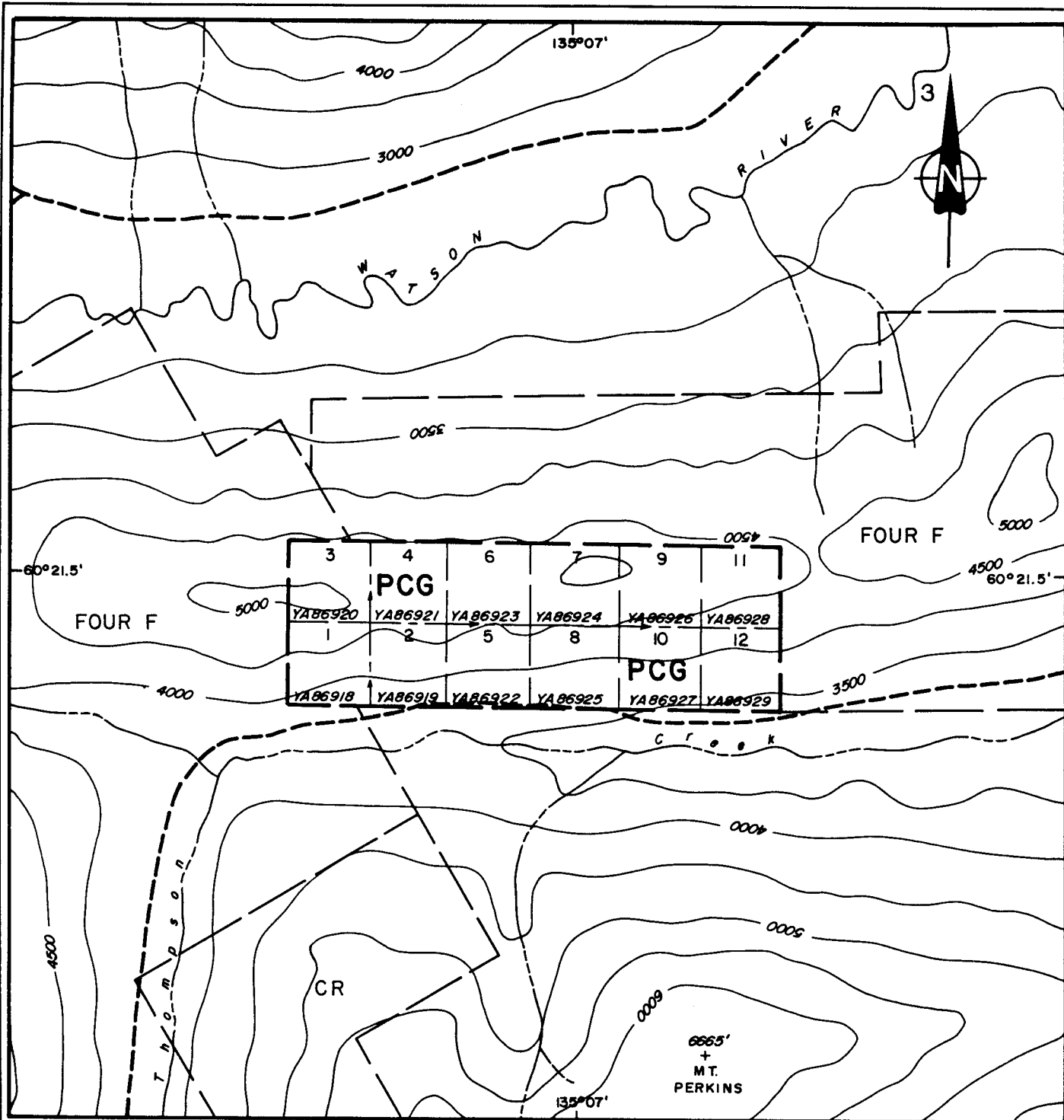
Property

The property consists of 12 contiguous two-post mineral claims (Figure 2) staked under the Yukon Quartz Mining Act totalling approximately 250 hectares. Claim data is as follows:

Claim Name:	PCG 1-12
Grant No.'s:	YA86918-929
Mining District:	Whitehorse
Anniversary Date:	June 7



HAVILAH GOLD MINES LTD.	
PCG CLAIMS	
LOCATION	
<i>Aurum Geological Consultants Inc.</i>	MARCH, 1987
Drawn by N.H. Checked by RAD	Scale 1:1,000,000
FIGURE 1	



LEGEND

- claim boundary
- claim number tag number
- gravel road
- river
- creek
- elevation contour; interval 500ft.

Note - adapted from D.I.A.N.D. claim map sheet 105D-6



SCALE IN METRES

HAVILAH GOLD MINES LTD.			
PCG CLAIMS			
CLAIM MAP			
Aurum Geological Consultants Inc.			MARCH, 1987
NTS 105D/6	DRAWN BY NH	SCALE 1:31,680	FIGURE 2

As of June 7, 1986 the recorded owner of the PCG 1-12 claims is Mr. Graham Davidson, subject to transfer with Havilah Gold Mines Ltd. They are shown on D.I.A.N.D. Quartz and Placer Sheet 105 D-6.

History

There is no record of previous exploration or mineral discoveries on ground covered by the present PCG claims, although gossanous metasediments underlying the property have undoubtedly been examined previously.

The present PCG 1-12 claims were staked by Graham Davidson to cover a large prominent gossan on Red Ridge in June 1985.

GEOLOGY

Regional Geology

The PCG 1-12 claim group is situated on the eastern flank of the Coast Plutonic Belt. Wheeler (1961) has adequately described the regional geology.

The Coast Plutonic Belt is composed of foliated and non-foliated granitoid rocks of primarily upper (?) Mesozoic age flanked by older metamorphosed and unmetamorphosed sedimentary and volcanic strata. Granodiorite, granite and quartz diorite are characteristic of the composite plutons. Gabbro and syenite are rare. Irregular belts of lower Mesozoic to Paleozoic and Precambrian metasedimentary and metavolcanic rocks occur as roof pendants.

Of particular interest are Tertiary felsic to intermediate flows, plugs, and dikes of the Skukum Group which occur in the area.

Faulting, contacts, lithologic attitudes and other regional trends are generally northwest, with some younger northeast structures.

Geology of the PCG 1-12 Claims

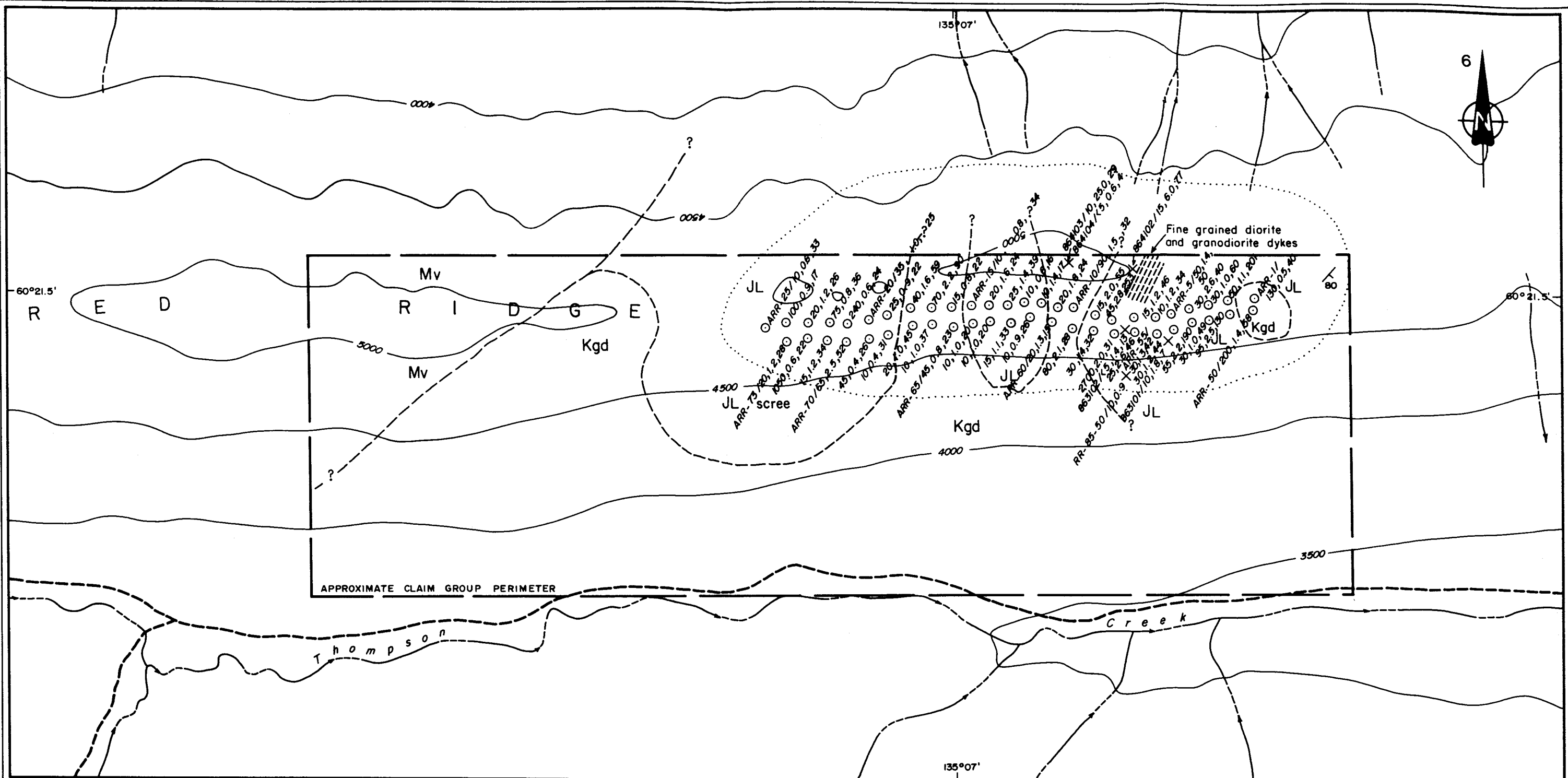
Property geology (Figure 3) is much more complex than can be shown on the previously described regional mapping. Rock outcrops are restricted to the upper part of Red Ridge, and probably constitute less than 20% of the total property area.

Fine grained sedimentary rocks of the Jurassic Laberge Group (map unit JL) are thought to underlie most of the ground. Argillites, limestones, cherts, and sandstones (and their metamorphic equivalents) comprise this unit.

Unnamed mafic to intermediate volcanic rocks (map unit Mv) of probable lower Mesozoic age are exposed in the northwest corner of the PCG claim group. They are typically black, fine grained basaltic andesite flows. Minor volcanic breccias and intervolcanic sediments are known. Relative ages between units JL and Mv have not been established.

Leucocratic medium grained usually equigranular granitoid rocks (map unit Kgd) intrude the lower Mesozoic strata in several locations along Red Ridge, including the PCG claims. Overall mineralogy consists of feldspar (% plagioclase > % orthoclase), 70%; quartz, 15%; and mafic minerals, 15%, and therefore they can be classified as quartz diorite, locally approaching granodiorite. Hornblende and biotite occur in approximately equal, though variable, amounts. These rocks are thought to be Cretaceous in age.

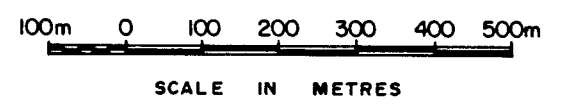
A complex system of rhyolitic, andesitic, and granitoid dikes cut all other lithologies in the Red Ridge area, including the PCG claims. They generally trend northeast, disconformable with the regional trend.



LEGEND

- LITHOLOGIES**
- CRETACEOUS**
- Kgd granodiorite
- JURASSIC**
- RELATIVE AGES UNCERTAIN*
- JL LABERGE GROUP: sediments
 - Mv basaltic andesite

- SYMBOLS**
- soil sample location
 - × rock sample location
 - $\frac{1}{80}$ attitude of structure; bedding
 - - - assumed lithologic contact
 - ⋯ outline of gossanous area
 - - - gravel road
 - - - creek
 - - - elevation contour; interval 500ft.
- sample number / Au ppb, Ag ppm, Pb ppm*



HAVILAH GOLD MINES LTD.	
PCG CLAIMS	
GEOLOGY & GEOCHEMISTRY	
Aurum Geological Consultants Inc.	MARCH, 1987
NTS 105D/8	DRAWN BY NH SCALE 1:10,000 FIGURE 3

1018

Sedimentary strata of the Laberge Group were hornfelsed during emplacement of the Cretaceous granitoid rocks. Primary pyrite was reduced to pyrrhotite during contact metamorphism. Subsequent surface oxidation of the pyrrhotite has yielded a large prominent gossan centered on the PCG claims.

A tabulated geological history of the property and area is given as Table 1.

Table 1. Tabulated geologic history of the Red Ridge area. Relative ages of JL and Mv are uncertain.

<u>Unit</u>	<u>Age *</u>	<u>Event/Lithology</u>
---	Quaternary	Unconsolidated glacial debris.
---	Pleistocene	Glacial erosion; unconformity.
Tr, Ta	Eocene(?)	Intermediate to felsic volcanism. Emplacement of basaltic, andesitic, and rhyolitic dikes. Mineralization(?)
Kgd	Cretaceous	Coast Plutonic Belt. Granitoid intrusions, folding, faulting, metamorphism, erosion.
JL	Jurassic	Laberge Group. Deposition of fine grained sediments disconformably on Lewes River Group.
Mv	Lower Mesozoic(?)	Deposition of mafic to intermediate volcanic flows on unknown basement.

* modified from Wheeler, 1961.

GEOCHEMICAL RESULTS

A total of 49 soil samples and 5 rock samples were taken on the PCG 1-12 claims during the 1986 exploration program. All of the samples were analyzed for total gold, silver, and lead content by Bondar-Clegg and Company Ltd. of Whitehorse and Vancouver.

Results, shown on Figure 3, show that gold in soil ranges from less than 5 to 2700 ppb. Silver ranges from 0.5 to 2.8 ppm and lead ranges from 15 to 253 ppm. In rock samples, gold ranges from less than 5 to 15 ppb, silver from 0.6 to 25 ppm, and lead from 4 to 77 ppm. Selected rock samples were also analyzed for arsenic and mercury; no anomalous results were found.

CONCLUSIONS AND RECOMMENDATIONS

The regional geological setting of the PCG 1-12 claim group is a thick Mesozoic volcano-sedimentary package which has been intruded during the Cretaceous by quartz diorites of the Coast Plutonic Belt. Tertiary hypabyssal andesitic and rhyolitic dikes were emplaced in all of these rock units. Vein-type gold and gold-silver mineralization in the Wheaton River/Watson River district is typically controlled by fault zones now occupied by rhyolitic to andesitic dikes. Diking on the PCG claims therefore provides a setting that is highly permissive for the development of precious metal deposits.

The property is a gold-silver prospect. Although gossanous metasediments underlying the PCG claims have most certainly been examined previously, no records of mineral discoveries are available. Other than narrow quartz and quartz-carbonate veins containing traces of pyrite and galena, no mineralization of economic potential was found during the 1986 exploration program.

Reconnaissance contour soil samples returned anomalous results in gold, silver, and lead from overburden covered areas where mineralization is not known. Bedrock gold +/- silver +/- lead mineralization is therefore indicated. Mineralization may occur as vein-type structures or disseminated in the metasediments.

Based on these results, further exploration work is warranted on the PCG 1-12 claims. The following is recommended:

1. Continue the contour soil sampling program on both the north and south sides of Red Ridge. Sample spacings should be reduced to a maximum of 25 meters along lines no more than 50 metres apart.
2. Attempt to locate the source of metals present in anomalous samples by detailed prospecting, mapping, and trenching, utilizing explosives if necessary.

Respectfully submitted,



Harmen J. Keyser, B.Sc.

March 13, 1987

REFERENCES

Wheeler, J.O., 1961: Whitehorse Map-Area, Yukon Territory. 105D.
Geological Survey of Canada, Memoir 312.

STATEMENT OF QUALIFICATIONS

I, HARMEN J. KEYSER, hereby certify that:

1. I am a geologist with AURUM GEOLOGICAL CONSULTANTS INC., 604-675 West Hastings Street, Vancouver, British Columbia.
2. I am a graduate of Saint Mary's University, Halifax, with a degree in geology (B.Sc., 1981) and have been involved in geology and mineral exploration continuously since then.
3. I am a member of the Geological Association of Canada (A3759).
4. I have no direct or indirect interest in the properties or securities of Havilah Gold Mines Ltd.
5. I am the author of this report on the PCG 1-12 claims, which is based on my personal examination of the property July 5, 1985 and May 31, 1987, as well as data provided by other geologists and referenced sources.
6. This report is intended to be used to satisfy assessment requirements only.



Harmen J. Keyser, B.Sc.

March 13, 1987

APPENDIX

STATEMENT OF COSTS
Surface Work: PCG 1-12 Claims

Operator: Havilah Gold Mines Ltd.
Consultant: Aurum Geological Consultants Inc.

1. Analytical Costs

Analyses by Bondar Clegg and Co. Ltd., Whitehorse/Vancouver:		
50 soils samples @ 19.65 ea. (Au, Ag, Pb)	\$532.50	
6 rock samples @ 26.50 ea. (Au, Ag, As, Pb, Hg, Sb)	159.00	
2 rock samples @ 13.00 ea. (Au, Ag, Pb)	<u>26.00</u>	\$ 717.50

2. Helicopter Costs

May 31, June 5: Hughes 500D on casual charter from Frontier Helicopters Ltd's Wheaton River strip:		
0.9 hours @ 440/hr	\$396.00	
Fuel: 72 litres @ 80¢/litre	57.60	
36 litres @ 75¢/litre	<u>27.00</u>	480.60

3. Labour Costs

T. Garagan: mapping/prospecting: 1 day @ 200/day	\$200.00	
H. Keyser: mapping/prospecting/report writing: 2.5 days @ 160/day	400.00	
P. Garagan: mapping/prospecting/geochemical sampling: 1 day @ 150/day	150.00	
D. David: prospecting/geochemical sampling, data compilation: 2.5 days @ 105/day	<u>262.50</u>	1,012.50

4. Camp Costs

Camp and cook supplied by MBW Surveys Ltd. of Whitehorse @ 40/man day: 7 man days @ 40/day	280.00	
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Subtotal - carry to next page	\$2,490.60	
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Subtotal carried forward

\$2,490.60

5. Mobilization

Fixed mobilization charge of \$200 each
for T. Garagan and H. Keyser (Aurum
invoice 86-62) \$400.00

One-way air tickets for P. Garagan (Calgary/
Whitehorse: \$334.30) and D. David (Vancouver/
Whitehorse: \$294.80) 629.10

\$1,029.10

The costs for assessment are divided up
between PCG 1-12, FOUR F 1-64, 67-109, MH
1-7 and the NEW 1-39 claims (total of 165
claims); therefore, total mobilization costs
for the PCG 1-12 claims = $1029.1 \times 12/165$

74.84

6. Truck Rentals

Nissan 4x4 pickup supplied by Aurum Geological
Consultants Inc. @ 50.00/day: 1 day 50.00

7. Supplies and Map Reproductions

Gas, maps, field equipment on Aurum invoice
86-62 to Havilah Gold Mines \$343.60
Bondar-Clegg sample bags and BCl 117.75

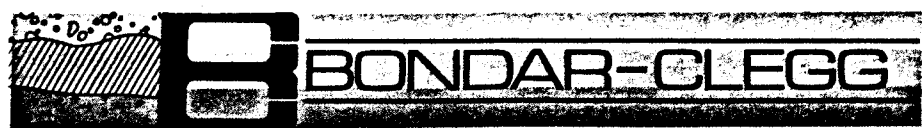
\$461.35

Costs divided up between above-mentioned
four claim groups; therefore total supplies
and map reproduction costs for PCG 1-12 =
 $461.35 \times 12/165$

33.55

TOTAL COSTS OF SURFACE WORK FOR ASSESSMENT PURPOSES

\$2,648.99



REPORT# 126-1773

PROJECT# NONE GIVEN

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	CU PPM	PB PPM	AG PPM	AU PPB	AU/WT G
S1 ARR 001			40	0.5	130	
ARR 002			201	1.1	50	
ARR 003			60	1.0	30	
S1 ARR 004			40	2.6	30	
ARR 005			50	1.4	50	
S1 ARR 006			34	1.2	10	
ARR 007			46	1.2	15	
ARR 008			253	2.8	45	
S1 ARR 009			55	2.0	15	
S1 ARR 010			32	1.5	90	
ARR 011			24	1.8	20	
S1 ARR 012			17	1.4	10	
ARR 013A			16	0.6	10	
ARR 013B			39	1.4	25	
S1 ARR 014			24	1.6	20	
ARR 015			34	0.8	10	
S1 ARR 016			22	0.8	15	
S1 ARR 017			90	2.2	70	
ARR 018			59	1.6	40	
ARR 019			22	0.9	25	
ARR 020			25	1.0	35	
ARR 021			24	0.6	240	
S1 ARR 022			36	0.8	75	
ARR 023			26	1.2	20	
ARR 024			17	0.9	100	
S1 ARR 025			33	0.6	10	
ARR 050			58	1.4	200	
ARR 051			130	2.5	95	
S1 ARR 052			49	1.0	30	
ARR 053			190	2.2	55	
S1 ARR 054			44	1.2	30	
S1 ARR 055			42	1.3	30	
ARR 056			46	2.6	25	
S1 ARR 057			31	2.0	2700	
S1 ARR 058			32	1.4	30	
ARR 059			28	2.1	80	
S1 ARR 060			15	1.3	20	
ARR 061			26	0.9	10	
ARR 062			33	1.1	15	
S1 ARR 063			20	1.0	10	



REPORT: 126-1773

PROJECT: NONE GIVEN

PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Ag PPM	Au PPM	Au/wt G
S1 ARR 064			20	1.0	10	
S1 ARR 065			23	0.8	45	
S1 ARR 066			37	1.0	10	
S1 ARR 067			45	1.0		
S1 ARR 068			31	0.4	10	
S1 ARR 069			26	0.4	45	
S1 ARR 070			52	2.5	65	
S1 ARR 071			34	1.2	15	
S1 ARR 072			22	0.6	1050	
S1 ARR 073			28	1.2	20	
S1 FF-SS 20			27	0.3	5	
S1 FF-SS 21			80	0.3	<5	
S1 FF-SS 22			39	0.4	<5	
S1 FF-SS 23			48	0.3	<5	
S1 FF-SS 24			121	1.0	<5	
S1 FF-SS 25			45	0.2	<5	
S1 FF-SS 26			44	<0.2	5	
S1 FF-SS 27			39	0.2	5	
S1 FF-SS 28			48	0.4	<5	
S1 FF-SS 29			30	0.2	<5	
S1 FF-SS 30			58	0.9	25	
S1 FF-SS 31			36	0.8	25	
S1 FF-SS 32			48	0.7	30	
S1 FF-SS 33			38	0.7	45	5.00
S1 FF-SS 34			40	0.8	35	
S1 FF-SS 35			33	0.5	15	
S1 FF-SS 36			36	0.4	10	
S1 FF-SS 37			35	0.4	15	
S1 FF-SS 38			34	0.2	10	
S1 FF-SS 39			188	1.7	15	
S1 FF-SS 40			59	0.6	10	
S1 FF-SS 41			47	0.7	15	
S1 FF-SS 42			54	0.8	10	
S1 FF-SS 43			56	5.0	25	
S1 FF-SS 44			31	0.6	5	
S1 FF-SS 45			45	0.7	10	
S1 FF-SS 46			82	1.3	15	
S1 FF-SS 47			92	0.9	10	
S1 FF-SS 48			76	1.3	15	
S1 FF-SS 49			87	1.2	40	

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PROJECT: NONE GIVEN

PAGE 6

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Ag PPM	Au PPB	Au/wt G
R2 T-3-4		2020	>10000	>50.0	480	
R2 T-3-5		490	4830	>50.0	260	
R2 T-3-6		140	855	9.6	35	
R2 T-3-7		64	65	3.1	10	
R2 T-3-8		42	37	1.2	<5	
R2 T-3-9		106	4110	32.0	170	
R2 T-4-1		84	38	3.5	5	
R2 T-4-2		910	242	>50.0	20	
R2 T-4-3		350	56	15.0	10	
R2 T-5-1		990	5710	>50.0	130	
R2 T-5-2		970	>10000	>50.0	160	
R2 T-5-3		790	6620	>50.0	60	
R2 T-5-4		242	1745	22.0	45	
R2 860101			132	20.0	240	
R2 860102			7	0.2	<5	
R2 860103			3	0.4	<5	
R2 860104			4	0.4	<5	
R2 860105			57	>50.0	380	
R2 863101			7	1.8	10	
R2 863102			13	1.4	<5	
R2 864301			26	0.4	5	
R2 86-0-1-06			38	0.5	10	
R2 86-2-1-01			10	0.4	25	
R2 86-2-1-02			870	1.0	10	
R2 86-3-1-01			43	0.6	5	
R2 86-3-1-03			15	1.2	5	
R2 86-3-1-04			26	0.4	5	
R2 86-3-1-05			54	0.7	5	
R2 86-3-1-06			9	1.0	5	
R2 86-4-1-07			3	0.4	190	
R2 86-4-1-08			13	1.1	5	
R2 86-4-1-09			17	1.1	80	

PCS

REPORT: 126-1563

PROJECT: RR *H. S. 111* PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Pb PPM	Ag PPM	As PPM	Hg PPB	Au PPB	Sb PPM
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T1 NSS-052		52	0.7	20		<5	
T1 NSS-053		50	0.5	10		<5	
T1 NSS-054		54	0.4	12		<5	
T1 NSS-055		46	0.3	6		<5	
T1 NSS-056		40	0.2	7		<5	

T1 NSS-057		40	0.2	9		15	
T1 NSS-058		58	0.6	20		960	
T1 NSS-059		114	0.9	30		5	
T1 NSS-060		550	2.5	20		5	
T1 NSS-061		123	0.6	21		<5	

T1 NSS-062		280	0.4	20		<5	
T1 NSS-063		35	0.4	21		<5	
T1 NSS-064		880	1.4	30		<5	
T1 RSS-86 01		14	0.4	<2		<5	<2
T1 RSS-86 02		25	0.5	2		<5	<2

R2 860100							<2
R2 864101		240	>50.0	400	375	160	
R2 864102		77	6.0	5	10	15	
R2 864103		29	25.0	5	80	10	
R2 864104		4	0.6	2	5	<5	

R2 864105		9	0.8	<2	5	<5	
R2 864106		<2	0.6	2	<5	50	
R2 APN-1		10	0.2	10	<5	<5	<2
R2 APN-2		10	0.4	5	5	<5	2
R2 ATN-1		16	<0.2	5	<5	<5	<2

R2 ATN-2		12	<0.2	40	<5	<5	<2
R2 ATN-3		24	0.2	100	<5	<5	<2
C2 MH-HM-1			0.3			<5	
C2 MH-HM-2			0.4			<5	