

GEOCHEMICAL REPORT
on the
HARDROCK PROPERTY
Dawson Mining District
Yukon Territory
NTS 1150/14

092953

CLAIMS

HARDROCK 1-10 (YB17763 - YB17772)

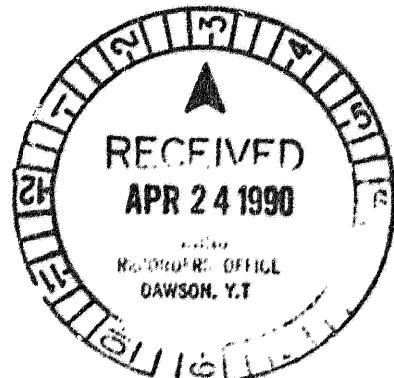
FOR

ROBERT TRUSWELL

BY

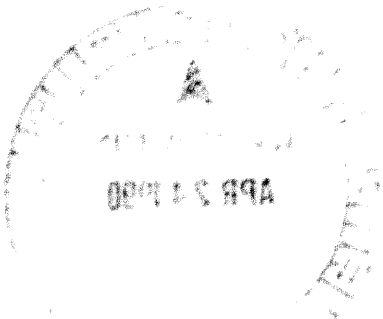
J.M. KOWALCZYK, B.Sc. F.G.A.C.

April 20, 1990



This report has been examined by
the Geological Evaluation Unit
under Section 53 (4) Yukon Quartz
Mining Act and is allowed as
representation work in the amount
of \$ 249,000.

W. H. ...
for Regional Manager, Exploration and
Geological Services for Commissioner
of Yukon Territory.



SUMMARY

Soil and rock sampling on the Hardrock property was negative. One sample ran greater than the detection limit of 5.0 to 10 ppb gold. None of the rock samples assayed higher than normal background in any of the other elements tested. Considering that the creek along which this work was done had been extensively mined as a placer creek, no sign of the source of the gold was found.

The property is not worthy of any further work.e trenches

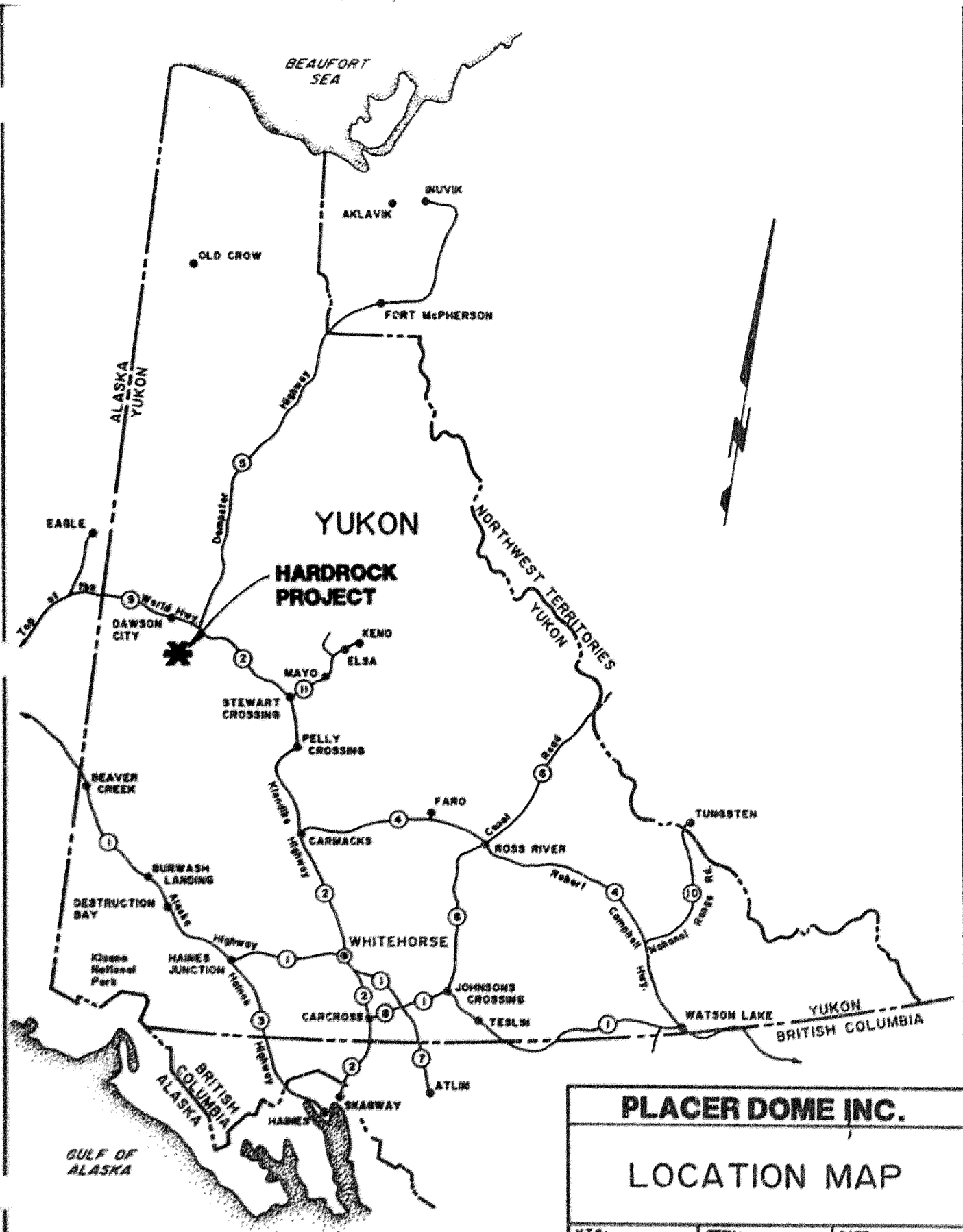
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1150/14



PLACER DOME INC.		
LOCATION MAP		
NTS:	TECH:	DATE:
115 0/14	JMK	JAN 29/90
SCALE:	DRAFTING:	FIGURE:
1" = 12.5mi.	HANDESIGN	1

INTRODUCTION

Robert Truswell, financed by a prospectors grubstake agreement with Placer Dome Inc. took 90 contour soil samples and 4 rock samples on his Hardrock property. One sample ran 60 ppb gold, the only sample to record higher than background or detection levels of any of the seven elements analyzed. The sampling was done in an attempt to locate a bedrock source of placer gold mined at the turn of the century. The field program was unsuccessful in locating any mineralization.

LOCATION AND ACCESS (Figure 1)

The Hardrock Property on map sheet 115 0/14 lies on Calder Creek about 30 km southeast of Dawson City in the Yukon. Access to the property is by road along Eldorado and Bonanza Creeks on over the pass to the Indian River drainage along Calder Creek. The edge of the property comes to within 2 km of the road and straddles a creek flowing south into Calder Creek.

TOPOGRAPHY AND VEGETATION

Topographic relief on the property is quite moderate with maximum relief at 600 feet. Vegetation in the valleys is quite swamping with the development of extensive permafrost. Scrub spruce and dwarf birch grows over all of the property.

MINERAL PROPERTY AND OWNERSHIP (Figure 2)

The property consists of 10 Hardrock claims owned by Robert Truswell. The claim information is as follows:

<u>CLAIM NAME</u>	<u>GRANT NUMBER</u>	<u>ANNIVERSARY DATE</u>
Hardrock 1-10	YB17763-YB17772	September 6

115-0-14b



PLACER DOME INC.

HARDROCK PROJECT

DRAWN BY : JMK

DATE : JAN. 29, 1990

SCALE 1 : 31,680

REVISED :

CLAIM LOCATION

FILE N° : 115 0/14

FIGURE 2

HISTORY

The area was first worked during the Klondike Gold rush as a placer operation. Several signs of old workings where the miners tunnelled under the clay to test the channel were found along the lower parts of the creek.

In 1902 and 1903, J.H. Russell and J. Knox staked the Little Alta and Mountaineer Claims and explored the ground with shallow shafts.

In 1972, Sullivan and Rogers staked the Jen Claim which they optioned to Conwest Exploration Limited. Conwest carried out mapping and geochemical sampling surveys. In 1973, they performed some bulldozer trenching.

In 1987, Feminique Apparel Limited staked the Fox Claim, 3 km southwest which they tested in by churn drilling.

In 1988, Robert Truswell staked the Hardrock Claim.

GEOLOGY and MINERALIZATION

The area is underlain by quartz and feldspar augen-bearing quartz-muscovite schists that are cut by a narrow northwest trending dyke of quartz feldspar porphyry. The Jen Claims were originally staked over an intense, isolated aeromagnetic anomaly. No explanation of the magnetic anomaly was found, however magnetic bearing silicified schist was found in on bulldozer trench.

The Conwest sampling detected scattered anomalous values of copper, silver, lead and molybdenum.

A newspaper account in 1903 reported that a quartz vein at least 2.5 metres wide had been discovered on the Little Alta Claim.

Work by truswell failed to locate this quartz vein. Samples from the trenches gave low values in all elements.

1989 FIELD PROGRAM

Under the direction of the author, Robert Truswell took 90 soil samples. Samples were taken at 20 metre intervals in three lines along the east bank and parallel to the bank of the south flowing creek.

SAMPLE PROCEDURE AND HANDLING

The samples were taken using a shovel in order to get below the thick peat moss layer. Samples were generally taken at a 30 to 50 cm depth. An attempt was made to sample the reddish brown B-horizon at all sample locations. Soils were generally well developed with a thick (30 cm) A-horizon, a 5-10 cm B-horizon and sometimes a light brown C-horizon. In a few cases permafrost made digging difficult, however Mr. Truswell persevered and reached the B-horizon.

The samples were stored in kraft paper bags and sent to the Placer Dome Laboratory in Vancouver where they were dried and a minus 80 mesh sample was analyzed for silver, arsenic, gold, copper, lead and zinc. The analytical techniques are described in Appendix 1.

SOIL RESULTS

The soil sample locations and gold analyses greater than 5 ppb are plotted on Figure 3. The analyses are tabulated in Appendix 2.

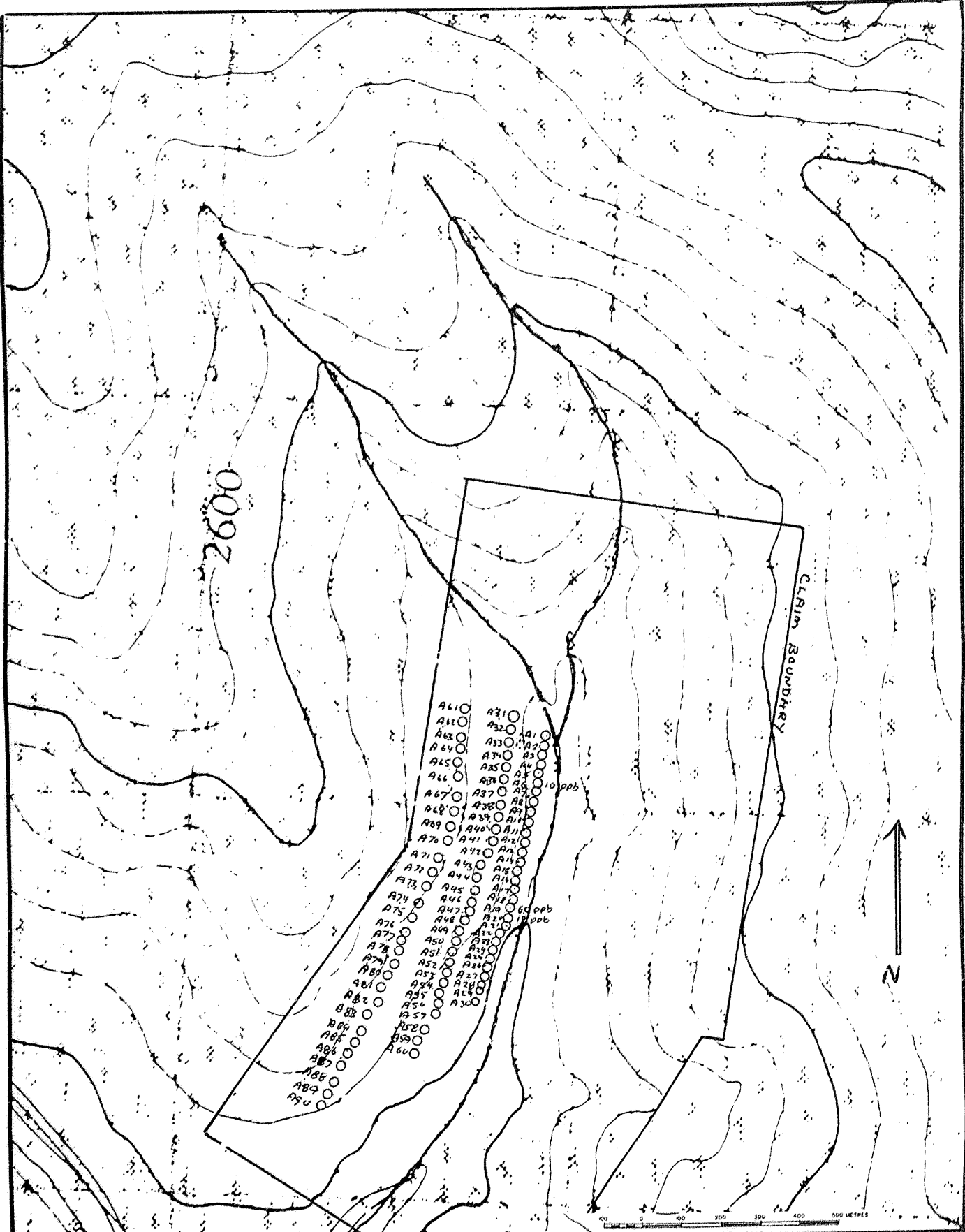
The results are generally negative with all metals recording near detection levels except for one sample which ran 60 ppb gold and an adjacent sample which ran 10 ppb gold.

CONCLUSIONS

The soil geochemistry failed to locate any mineralization. Prospecting also failed to locate the quartz vein which had been reported in the newspaper account. Samples from the old trenches were also negative for all element.

RECOMMENDATIONS

The soil geochemistry on the Hardrock Property suggests that the property is not extensively mineralized. No further work should be done on this property.



PLACER DOME INC.	
HARDROCK PROJECT	
DRAWN BY : HANDESIGN	SAMPLE LOCATION MAP
DATE : APRIL 90	
SCALE : 1:10000	FILE N° : 115014
REVISED :	FIGURE 3

STATEMENT OF EXPENDITURES

PERSONNEL

Robert Truswell
 4 days @ \$150/day
 John Kowalchuk
 1 day @ \$200/day

\$ 600
 200

CAMP COSTS

5 days @ \$40/day

200

VEHICLE EXPENSE

5 days @ \$50/day

250

ASSAYING

90 soils (Ag,As,Au,Cu,Pb,Zn) @ \$12
 4 rocks (Ag,As,Au,Cu,Pb,Zn) @15

1080
 60

REPORT AND DRAFTING

100

TOTAL

\$2490

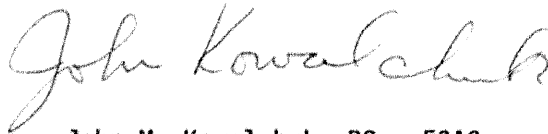
REFERENCES

Archer Cathro and Associates, 1989; Northern Mineral Inventory, 115 0/14
 Jen

STATEMENT OF QUALIFICATIONS

I, JOHN M. KOWALCHUK, do hereby certify that:

1. I am a Geologist, resident at 3086 Mariner Way, Coquitlam, British Columbia.
2. I am a graduate of Mc Master University, Hamilton, Ontario, with a B.Sc. in geology in 1970
3. I am a Fellow of the Geological Association of Canada.
4. I have practised my profession across Canada over the past 20 years.
5. This report is based on a field examination and supervision of work performed by Robert Truswell.



John M. Kowalchuk BSc, FGAC

Whitehorse, Y.T.
April 20, 1990.

APPENDIX NO. 1

ANALYTICAL TECHNIQUES

GENERAL TEST

Elements: Mo Cu Zn Pb Cd Ni Co Ag Mn

Procedure:

1. Weigh 0.50 g of -80 mesh soil, sediment or -100 mesh pulverized rock into numbered 16 x 150 test tubes. Every tenth sample should be a duplicate sample or an internal known reference standard.
2. Add 1 mL of HNO_3 followed by 2 mL HClO_4 . Samples containing carbonates may react vigorously at first so add 1 mL HNO_3 and let stand until the reaction stops before adding 2 mL HClO_4 .
3. Place tubes in test tube block on hot plate at 160°C . The samples will boil vigorously at first and then decrease as the HNO_3 boils away. Organic samples should be watched to see that they do not foam. If they do foam, then take the test tube out of the block and gently tap the bottom of the tube on an asbestos pad. Highly organic soils can be handled by adding the acid and letting them stand overnight.

The temperature of the hot plate should be set so that after the HNO_3 boils away (45 min \longrightarrow 1 h), then the HClO_4 boils gently and refluxes down the sides of the test tube. Total digestion time is 4 hours.

4. Cool the sample by adding 6 mL demineralized water and immersing the test tube rack in cold water for 2 min. After cooling, bring the volume up to 10 mL, cap, and shake.
5. Read on AA using air/acetylene flame for all elements except Mo which should be run using N_2O /acetylene flame. Background correction should be used on Pb, Cd, Ag. Turn burner head for Zn.

1110, Cu, Zn, Pb, Ag
GEOCHEM.

GENERAL TEST
Page 2 of 2

Standards:

- all standards are made in 15% HClO₄
- factor is 20

	Standard Concentrate (µg/ml)	AA Setting (ppm)
Cu Zn Pb Co Ni Mn	5.0	100
	10.0	200
Mo	1.0	20
	2.0	40
	4.0	80
Cd	0.10	2.0
	0.50	10.0
	1.00	20.0
Ag	0.50	1.0
	0.10	2.0
	0.20	4.0

add 2 ml per 100 ml
20% HClO₄ to
STB

Samples giving a reading above the high standard are diluted 1 to 10 with 15% HClO₄ and re-analyzed.

Wavelengths:

Mo	313.3 nm
Cu	324.7
Zn	213.8
Pb	283.3
Cd	228.0
Ni	232.0
Co	240.7
Mn	279.5
Ag	328.0

/ojt
1988-01-15

GOLD TEST

Procedure:

1. Weigh 10.0 g sample into #07 crucible.
2. Heat in furnace for 1 1/2 h @ 600°C.
3. Cool, transfer to 150 mL glass beaker and add 30 mL Aqua Regia (3 parts HCl, 2 parts H₂O, add 1 part HNO₃).
4. Digest at just off the boil for 2 hours.
5. Cool, and bulk up to 110 mL mark on beaker.
6. Stir and leave overnight to settle.
7. Decant 50 mL of sample solution into 25 x 200 mm test tube.
8. Add 7 mL MIBK, cap, and shake in shaker for 3 min.
9. Read organic layer on A.A.

Standards:

1. In 250 mL separate funnel add 10 mL H₂O, 1 mL HCL, 2 drops of HNO₃ and the following amounts of Au:
 - 0.1 mL of 1000µg/mL Au standard = 1 ppm
 - 0.2 mL of 1000µg/mL Au standard = 2 ppm
 - 0.4 mL of 1000µg/mL Au standard = 4 ppm
2. Add 100 mL ^{MIBK} and shake for 3 min.
3. Drain aqueous layer.

For higher samples, standards can be made in 30% aqua regia and the remaining half of the sample can be run in the aqueous phase.

DETERMINATION OF AU BY FIRE ASSAY &

AU
ASSAY METHOD

ATOMIC ABSORPTION

1. Weigh out 25 g sample into a 40 g fire assay crucible containing 150 g flux (2 parts PbO:1 part Na₂CO₃), and 25 g silica flour.
2. Add 1 1/2 tsp flour (~4.5 g) and 1 silver inguart.
3. Mix thoroughly with a large spatula until homogeneous and cover with a thin layer of flux.
4. Place the crucible in a preheated (2000^oF) furnace for 45 min.
5. Remove the molten assay from the furnace and pour into an iron mold. Allow to cool for ~20 min.
6. Break the slag from the lead button and hammer into a cube for cupellation.
7. Place the lead button on a preheated cupel.
8. When cupellation has been completed, the cupel is removed from the furnace and allowed to cool.
9. The prill is removed from the cupel and transferred to a graduated test tube.
10. 5 mL 25% HNO₃ is added to each test tube and the test tube rack is placed in a boiling water bath.
11. Continue heating until all Ag is in solution (no bubbling, and Au appears as black speck.)
12. Cool, decant off acid solution. Wash once with 10 mL deionized H₂O, and decant off H₂O.
13. To each test tube add 0.3 mL acid mixture (5 HCl:1 HNO₃) using a pipette.

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File No. M-002

14. Return test tube rack to water bath and heat until all Au is in solution.
15. Wash down the side of test tube, heat for another 15 min.
16. Remove, cool, and bulk to appropriate volume; making sure the final acid strength is 5% HCl and 1% HNO₃.
17. Stopper test tube & mix by shaking.
18. Run on Atomic Absorption instrument vs Au standards (0-15 ppm).
19. Calculate amount of gold present in sample.

$$\text{ppm Au} = \frac{(\text{AA Reading } [\mu\text{g/mL}]) \times (\text{Volume [mL]})}{\text{Wt Sample}^x (\text{g})}$$

HCW/LDO:ojt
1988-09-16
File No. M-002

APPENDIX NO. 2

ANALYSES

PDI GEOCHEM SYSTEM: Data From: TRUSWELL GRB HARDROCK

GRID	SAMPLE	PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Mo PPM	Pb PPM	Zn PPM
115 0 13		A1 9105	<0.2	6	<5	23	<1	7	51
115 0 13		A2 9105	<0.2	6	<5	16	<1	9	54
115 0 13		A3 9105	<0.2	8	<5	16	<1	9	51
115 0 13		A5 9105	<0.2	8	<5	28	<1	8	76
115 0 13		A6 9105	<0.2	7	<5	28	<1	7	70
115 0 13		A7 9105	<0.2	8	10	26	<1	9	75
115 0 13		A8 9105	<0.2	7	<5	21	<1	7	60
115 0 13		A9 9105	<0.2	3	<5	11	<1	6	40
115 0 13		A10 9105	<0.2	2	<5	16	<1	6	44
115 0 13		A10* 9105	<0.2	2	<5	17	<1	8	48
115 0 13		A11 9105	<0.2	3	<5	21	<1	7	61
115 0 13		A12 9105	<0.2	7	<5	16	<1	8	60
115 0 13		A13 9105	<0.2	11	<5	16	<1	9	66
115 0 13		A14 9105	<0.2	3	<5	18	<1	12	70
115 0 13		A16 9105	<0.2	2	<5	16	<1	8	60
115 0 13		A19 9105	0.2	4	60	16	<1	7	51
115 0 13		A20 9105	0.2	3	10	23	<1	7	72
115 0 13		A21 9105	0.2	6	<5	19	<1	9	116
115 0 13		A22 9105	<0.2	5	<5	14	<1	7	58
115 0 13		A22* 9105	<0.2	7	<5	14	<1	8	56
115 0 13		A23 9105	<0.2	8	<5	14	<1	8	65
115 0 13		A24 9105	<0.2	5	<5	14	<1	7	50
115 0 13		A25 9105	0.2	4	<5	24	<1	8	67
115 0 13		A26 9105	0.2	7	<5	25	<1	8	62
115 0 13		A27 9105	<0.2	<2	<5	24	<1	7	58
115 0 13		A28 9105	<0.2	6	<5	22	<1	8	63
115 0 13		A29 9105	0.2	9	<5	25	<1	8	57
115 0 13		A30 9105	0.2	8	<5	27	<1	8	62
test	STD P1	9105	0.3	16		22	45	50	125
test	STD AU4	9105			525				

END OF LISTING - 30 RECORDS PRINTED

Run on: 89:06:22 at 14:01:01

PDI GEOCHEM SYSTEM: Data From: YT GEN 7104A HARDROCK CLM

GRID	SAMPLE	PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Pb PPM	Sb PPM	Zn PPM
	A4	9490	<0.2	8	5	17	7	<2	56
	A15	9490	<0.2	6	<5	20	11	<2	58
	A17	9490	<0.2	4	<5	20	9	4	61
	A18	9490	<0.2	7	<5	18	6	8	57
	A31	9490	<0.2	7	<5	27	9	5	65
	A32	9490	<0.2	2	<5	23	10	2	62
	A33	9490	<0.2	8	<5	29	17	<2	65
	A35	9490	<0.2	4	<5	22	9	<2	49
	A36	9490	<0.2	6	<5	18	10	<2	51
	A36*	9490	<0.2	7	<5	17	10	<2	49
	A37	9490	<0.2	11	<5	26	10	<2	65
	A38	9490	<0.2	8	<5	24	8	<2	57
	A39	9490	<0.2	5	<5	23	16	<2	66
	A40	9490	<0.2	8	<5	19	19	<2	66
	A41	9490	<0.2	6	<5	19	7	<2	52
	A42	9490	<0.2	6	<5	23	6	<2	52
	A43	9490	<0.2	11	<5	25	7	<2	54
	A44	9490	<0.2	8	<5	21	6	<2	66
	A45	9490	<0.2	7	<5	27	8	<2	69
	A45*	9490	<0.2	9	<5	28	8	<2	70
	A46	9490	<0.2	<2	<5	23	8	<2	57
	A47	9490	<0.2	11	<5	27	8	2	63
	A48	9490	<0.2	12	<5	24	9	<2	56
	A49	9490	<0.2	7	<5	24	9	<2	62
	A50	9490	<0.2	<2	<5	22	6	<2	55
	A51	9490	<0.2	4	5	22	7	<2	57
	A52	9490	<0.2	<2	<5	21	8	<2	62
	A53	9490	<0.2	<2	<5	24	8	<2	65
	A54	9490	<0.2	2	<5	23	8	<2	64
	A54*	9490	<0.2	2	<5	23	8	<2	63
	A55	9490	<0.2	<2	5	26	8	<2	65
	A56	9490	<0.2	<2	<5	23	8	<2	63
	A57	9490	<0.2	<2	<5	19	6	<2	46
	A58	9490	<0.2	<2	<5	27	9	2	76
	A59	9490	<0.2	<2	<5	22	8	3	57
test	STD AU6	9490			400				
test	STD P1	9490	0.2	14		22	47	5	126

END OF LISTING - 37 RECORDS PRINTED

Run on: 89:10:24 at 13:16:14

PDI GEOCHEM SYSTEM: Data From: YT 71-04A HARDROCK

GRID	SAMPLE	PROJECT	Ag PPM	Au1 PPB	Cu PPM	Mo PPM	Pb FPM	Zn PPM
115013	A60	9618	<0.2	<5	14	<1	10	47
115013	A61	9618	<0.2	<5	10	<1	21	46
115013	A62	9618	<0.2	<5	11	<1	13	42
115013	A63	9618	<0.2	<5	20	<1	20	53
115013	A64	9618	<0.2	<5	16	<1	24	95
115013	A65	9618	<0.2	<5	15	<1	13	48
115013	A66	9618	<0.2	<5	12	<1	14	45
115013	A67	9618	<0.2	<5	19	<1	11	55
115013	A68	9618	<0.2	<5	18	<1	14	55
115013	A68*	9618	<0.2	<5	17	<1	15	56
115013	A69	9618	<0.2	<5	22	<1	12	64
115013	A70	9618	<0.2	<5	15	<1	20	58
115013	A71	9618	<0.2	<5	10	<1	20	70
115013	A72	9618	<0.2	<5	9	<1	31	70
115013	A73	9618	<0.2	<5	7	<1	35	62
115013	A74	9618	<0.2	<5	20	<1	27	63
115013	A75	9618	<0.2	<5	13	<1	25	53
115013	A76	9618	<0.2	5	13	<1	16	63
115013	A77	9618	<0.2	<5	16	<1	13	58
115013	A77*	9618	<0.2	<5	16	<1	13	60
115013	A78	9618	<0.2	<5	22	<1	11	62
115013	A79	9618	<0.2	<5	21	<1	12	63
115013	A80	9618	<0.2	<5	25	<1	11	62
115013	A81	9618	<0.2	<5	21	<1	10	58
115013	A82	9618	<0.2	<5	26	<1	12	66
115013	A83	9618	<0.2	<5	26	<1	11	71
115013	A84	9618	<0.2	<5	27	<1	11	66
115013	A85	9618	<0.2	<5	26	<1	11	62
115013	A86	9618	<0.2	<5	25	<1	10	56
115013	A86*	9618	<0.2	<5	25	<1	12	57
115013	A87	9618	<0.2	<5	12	<1	11	61
115013	A88	9618	<0.2	<5	25	<1	13	65
115013	A89	9618	<0.2	<5	21	<1	11	57
115013	AA76	9618	<0.2	<5	15	<1	42	65
115013	A3A	9618	<0.2	<5	18	<1	11	56
115013	A90	9618	<0.2	<5	20	<1	12	61
test	STD P1	9618	0.3		22	50	53	128

END OF LISTING - 37 RECORDS PRINTED Run on: 89:11:03 at 13:35:13

PDI GEOCHEM SYSTEM: Data From: TRUSWELL GRB HARDROCK

GRID	SAMPLE	PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Mo PPM	Pb PPM	Zn PPM
115 0 13		33142	9106	4	<5	115	6	6	51
test	STD P1	9106	<0.2	19		24	50	50	120
test	STD AU4	9106	0.2		250				

END OF LISTING - 3 RECORDS PRINTED Run on: 89:06:21 at 13:00:46

PDI GEOCHEM SYSTEM: Data From: 71-04A HARDROCK

GRID	SAMPLE	PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Pb PPM	Sb PPM	Zn PPM
115N14		H1K 9182	<0.2	<2	<5	3	22	<2	10
115N14		H2K 9182	<0.2	4	15	7	10	<2	24
115N14		H3K 9182	0.4	<2	20	20	55	<2	118
test	STD P1	9182	0.2	16		22	52	5	120
test	STD AU4	9182			315				

END OF LISTING - 5 RECORDS PRINTED Run on: 89:07:19 at 13:22:07

PDI GEOCHEM SYSTEM: Data From: 71-04A HARDROCK

GRID	SAMPLE	PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Pb PPM	Sb PPM	Zn PPM
115N14		H1K 9182	<0.2	<2	<5	3	22	<2	10
115N14		H2K 9182	<0.2	4	15	7	10	<2	24
115N14		H3K 9182	0.4	<2	20	20	55	<2	118
test	STD P1	9182	0.2	16		22	52	5	120
test	STD AU4	9182			315				

END OF LISTING - 5 RECORDS PRINTED Run on: 89:07:19 at 13:22:07

APPENDIX NO 4

Analysis Techniques

GENERAL
TEST.

GEOCHEM

GENERAL TEST

Elements: Mo Cu Zn Pb Cd Ni Co Ag Mn

Procedure:

1. Weigh 0.50 g of -80 mesh soil, sediment or -100 mesh pulverized rock into numbered 16 x 150 test tubes. Every tenth sample should be a duplicate sample or an internal known reference standard.
2. Add 1 mL of HNO_3 followed by 2 mL HClO_4 . Samples containing carbonates may react vigorously at first so add 1 mL HNO_3 and let stand until the reaction stops before adding 2 mL HClO_4 .
3. Place tubes in test tube block on hot plate at 160°C . The samples will boil vigorously at first and then decrease as the HNO_3 boils away. Organic samples should be watched to see that they do not foam. If they do foam, then take the test tube out of the block and gently tap the bottom of the tube on an asbestos pad. Highly organic soils can be handled by adding the acid and letting them stand overnight.

The temperature of the hot plate should be set so that after the HNO_3 boils away (45 min \longrightarrow 1 h), then the HClO_4 boils gently and refluxes down the sides of the test tube. Total digestion time is 4 hours.

4. Cool the sample by adding 6 mL demineralized water and immersing the test tube rack in cold water for 2 min. After cooling, bring the volume up to 10 mL, cap, and shake.
5. Read on AA using air/acetylene flame for all elements except Mo which should be run using N_2O /acetylene flame. Background correction should be used on Pb, Cd, Ag. Turn burner head for Zn.

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1110, Cu, Zn, Pb, Ag
GEOCHEM.

GENERAL TEST
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Standards:

- all standards are made in 15% HClO₄
- factor is 20

	Standard Concentrate (µg/ml)	AA Setting (ppm)
Cu Zn Pb Co Ni Mn	5.0	100
	10.0	200
Mo	1.0	20
	2.0	40
	4.0	80
Cd	0.10	2.0
	0.50	10.0
	1.00	20.0
Ag	0.50	1.0
	0.10	2.0
	0.20	4.0

add 2 ml per 100 ml
20% AlCl₃ to
STI

Samples giving a reading above the high standard are diluted 1 to 10 with 15% HClO₄ and re-analyzed.

Wavelengths:

Mo	313.3 nm
Cu	324.7
Zn	213.8
Pb	283.3
Cd	228.0
Ni	232.0
Co	240.7
Mn	279.5
Ag	328.0

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GOLD TEST

Procedure:

1. Weigh 10.0 g sample into #07 crucible.
2. Heat in furnace for 1 1/2 h @ 600°C.
3. Cool, transfer to 150 mL glass beaker and add 30 mL Aqua Regia (3 parts HCl, 2 parts H₂O, add 1 part HNO₃).
4. Digest at just off the boil for 2 hours.
5. Cool, and bulk up to 110 mL mark on beaker.
6. Stir and leave overnight to settle.
7. Decant 50 mL of sample solution into 25 x 200 mm test tube.
8. Add 7 mL MIBK, cap, and shake in shaker for 3 min.
9. Read organic layer on A.A.

Standards:

1. In 250 mL separate funnel add 10 mL H₂O, 1 mL HCL, 2 drops of HNO₃ and the following amounts of Au:
0.1 mL of 1000µg/mL Au standard = 1 ppm
0.2 mL of 1000µg/mL Au standard = 2 ppm
0.4 mL of 1000µg/mL Au standard = 4 ppm
2. Add 100 mL ^{mibk} and shake for 3 min.
3. Drain aqueous layer.

For higher samples, standards can be made in 30% aqua regia and the remaining half of the sample can be run in the aqueous phase.

/ojt

1987-11-24

DETERMINATION OF AU BY FIRE ASSAY &

AU
ASSAY METHOD

ATOMIC ABSORPTION

1. Weigh out 25 g sample into a 40 g fire assay crucible containing 150 g flux (2 parts PbO:1 part Na₂CO₃), and 25 g silica flour.
2. Add 1 1/2 tsp flour (~4.5 g) and 1 silver inguirt.
3. Mix thoroughly with a large spatula until homogeneous and cover with a thin layer of flux.
4. Place the crucible in a preheated (2000°F) furnace for 45 min.
5. Remove the molten assay from the furnace and pour into an iron mold. Allow to cool for ~20 min.
6. Break the slag from the lead button and hammer into a cube for cupellation.
7. Place the lead button on a preheated cupel.
8. When cupellation has been completed, the cupel is removed from the furnace and allowed to cool.
9. The prill is removed from the cupel and transferred to a graduated test tube.
10. 5 mL 25% HNO₃ is added to each test tube and the test tube rack is placed in a boiling water bath.
11. Continue heating until all Ag is in solution (no bubbling, and Au appears as black speck.)
12. Cool, decant off acid solution. Wash once with 10 mL deionized H₂O, and decant off H₂O.
13. To each test tube add 0.3 mL acid mixture (5 HCl:1 HNO₃) using a pipette.

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- 14. Return test tube rack to water bath and heat until all Au is in solution.
- 15. Wash down the side of test tube, heat for another 15 min.
- 16. Remove, cool, and bulk to appropriate volume; making sure the final acid strength is 5% HCl and 1% HNO₃.
- 17. Stopper test tube & mix by shaking.
- 18. Run on Atomic Absorption instrument vs Au standards (0-15 ppm).
- 19. Calculate amount of gold present in sample.

$$\text{ppm Au} = \frac{(\text{AA Reading } [\mu\text{g/mL}])}{\text{Wt Sample}^x (\text{g})} \times (\text{Volume [mL]})$$