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**ASSESSMENT REPORT
ON THE
1991 GROUNDWATER MONITORING PROGRAM
(CINOLA GOLD PROJECT - HIGH WEST AREA)**

**SKEENA MINING DIVISION
Graham Island, Queen Charlotte Islands,
British Columbia**

**Location:
NTS: 103 F/9W
Latitude: 53° 32'N
Longitude: 132° 17'W**

Claims:

EXPOT

**Owned By:
City Resources (Canada) Ltd.
c/o 800 - 580 Hornby Street
Vancouver, B.C.
V6C 3B6**

Prepared by:

**Dan Charbonneau, P.Eng.
STEFFEN, ROBERTSON AND KIRSTEN (B.C.) INC.
Suite 800 - 580 Hornby Street
Vancouver, B.C.
Canada, V6C 3B6**

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22,071

DECEMBER 1991

62630

**ASSESSMENT REPORT
ON THE
1991 GROUNDWATER MONITORING PROGRAM
(CINOLA GOLD PROJECT - HIGH WEST AREA)**

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**ASSESSMENT REPORT
ON THE
1991 GROUNDWATER MONITORING PROGRAM
(CINOLA GOLD PROJECT - HIGH WEST AREA)**

1.0 INTRODUCTION

A groundwater monitoring program was carried out from September 22 to 25, 1991 on the Expot claim for the purpose of expanding the current groundwater information database as part of the Cinola Gold Project (High West Area), by Steffen Robertson and Kirsten (B.C.) Inc. The field work was conducted by Tim Collett and supervised by the author.

The previously installed piezometers were checked, and a single groundwater quality sample from one piezometer taken by the author.

2.0 LOCATION

The Expot claim is situated approximately 740 km northwest of Vancouver on Central Graham Island in the Queen Charlottes some 20 km southwest of the village of Port Clements (see figures 1 and 2).

The mineral claim is located within the Skeena Mining Division on NTS map sheet 103 F/9w centered on geographic coordinates 53° 32'N latitude and 132° 17'W longitude (see figures 3).

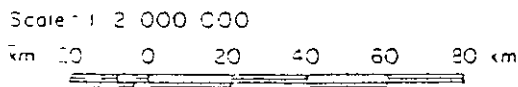
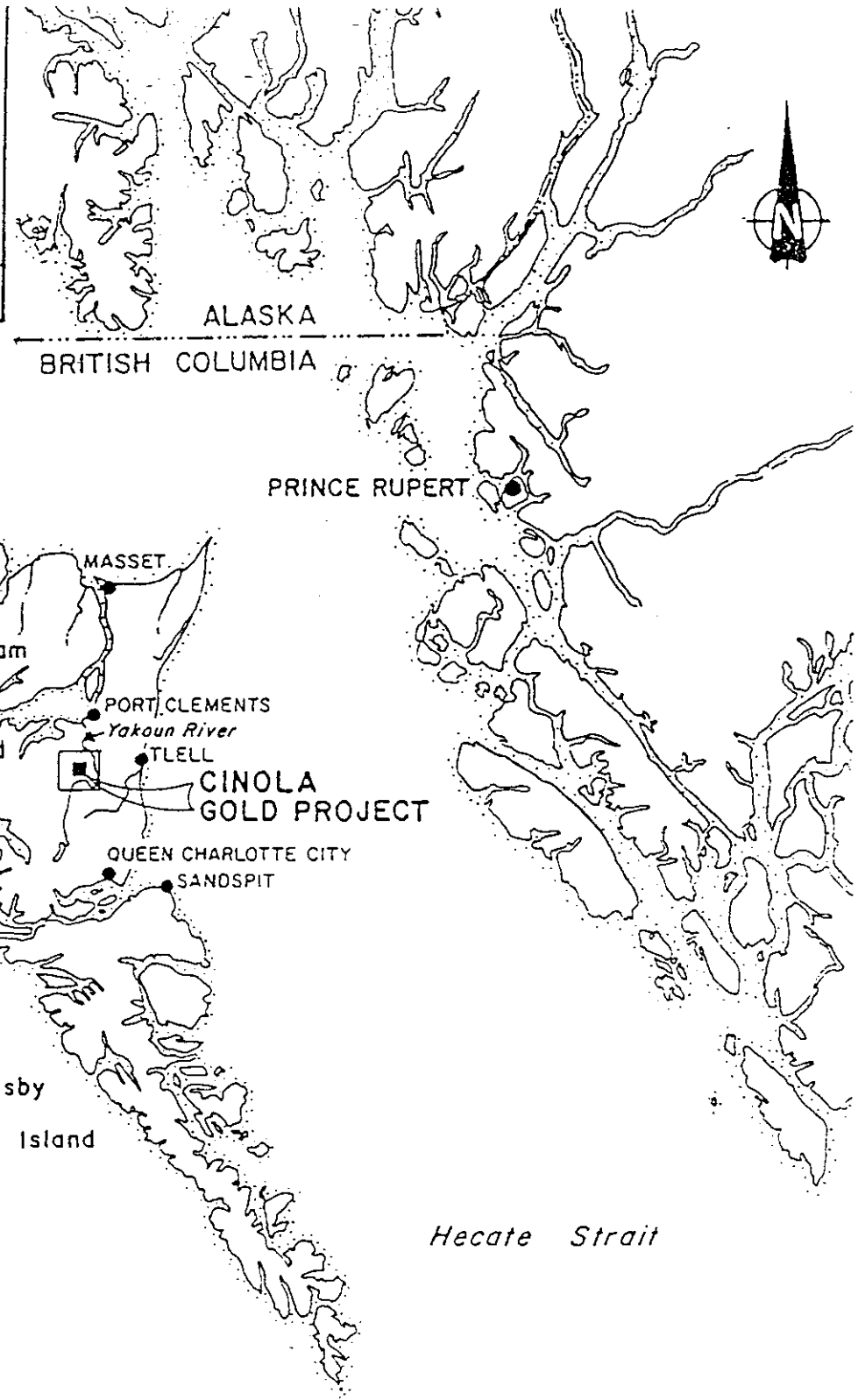
3.0 ACCESS


Drive in access to the property is gained from Port Clements via 20 km of Macmillan Bloedel owned and maintained gravel logging roads. The property is situated near the end of MacMillan Bloedel's "Branch No. 8" road.

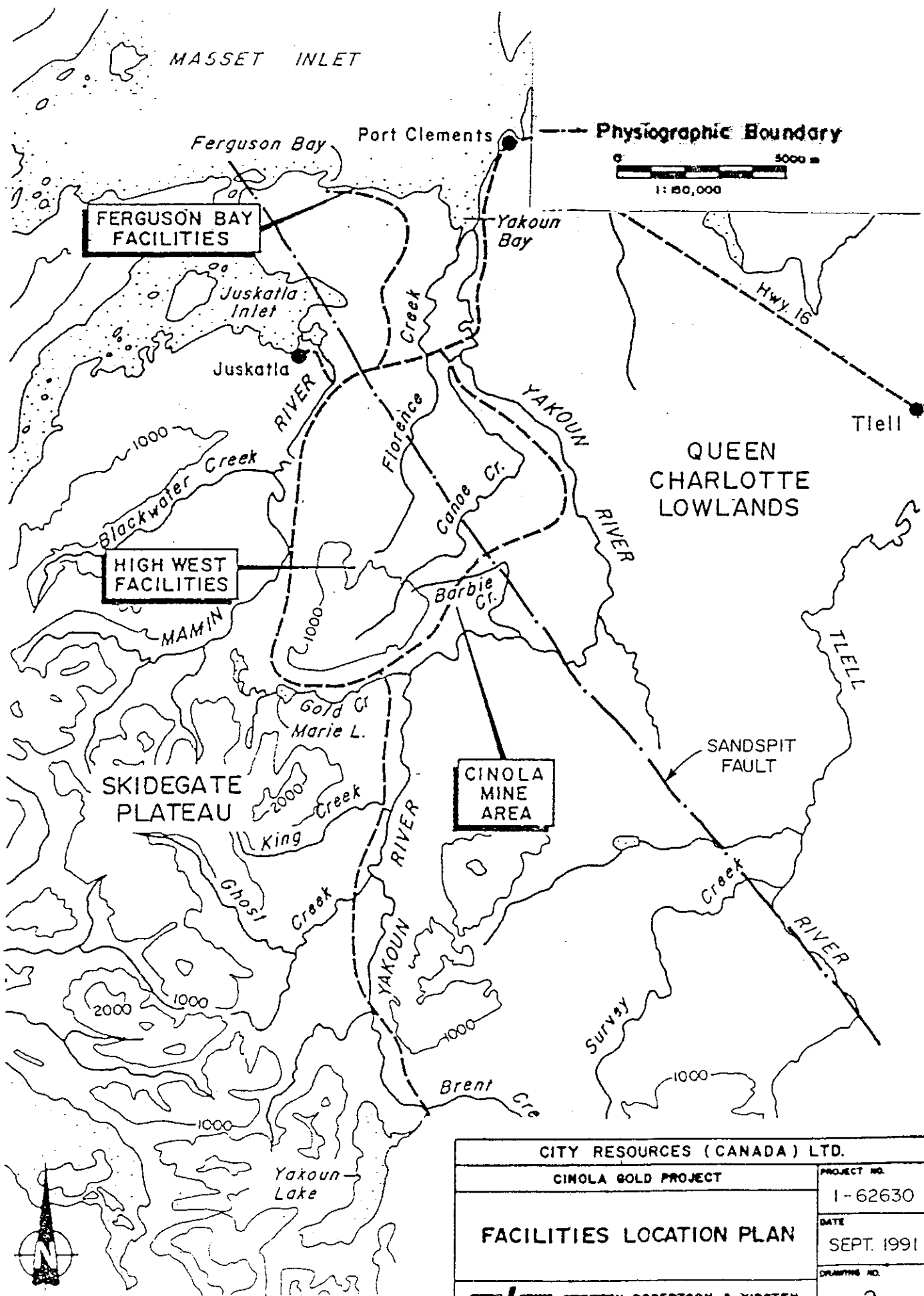
Port Clements can be reached from either Prince Rupert or Vancouver by regularly scheduled Canadian Airlines or Trans-Provincial Airline flights to Sandspit on Moresby Island, thence hourly B.C. Ferry service from Aliford Bay to Skidegate and highway travel to Yellowhead Highway No. 16. Skidegate can also be reached by twice weekly B.C. Ferry service from Prince Rupert.


4.0 TOPOGRAPHY AND VEGETATION

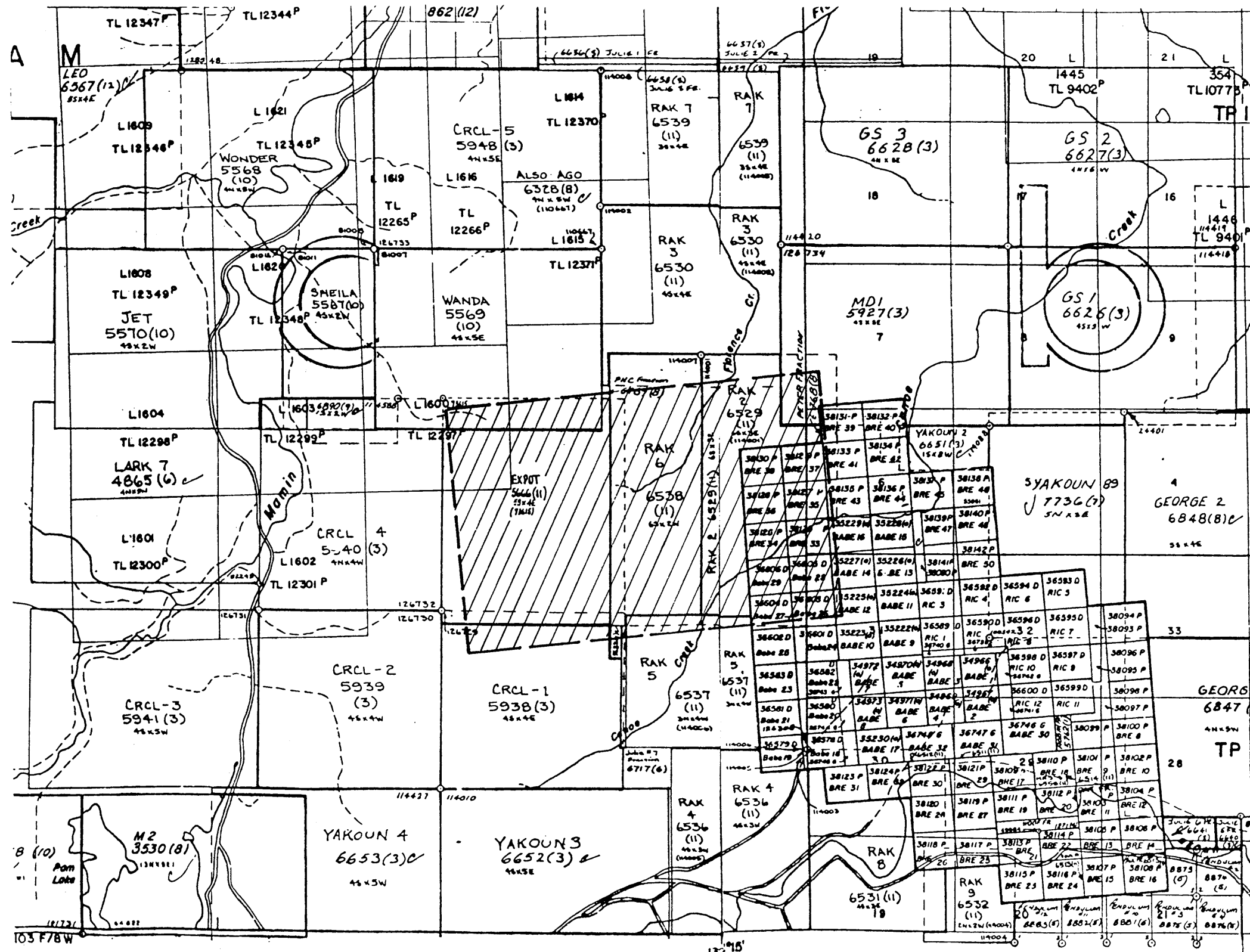
The terrain in the claim area is gently rolling to rugged, ranging in elevation from sea level to 270m. Climatic conditions are typical of the coastal areas of British Columbia with high rainfall.



CITY RESOURCES (CANADA) LTD.	
CINOLA GOLD PROJECT	PROJECT NO. 1-62630
PROJECT LOCATION	DATE SEPT. 1991
	DRAWING NO. 1
 STEFFEN ROBERTSON & KIRSTEN CONSULTING ENGINEERS VANCOUVER, BRITISH COLUMBIA	REVISION




CITY RESOURCES (CANADA) LTD.	
CINOLA GOLD PROJECT	PROJECT NO. 1-62630
FACILITIES LOCATION PLAN	DATE SEPT. 1991
 STEFFEN ROBERTSON & KIRSTEN CONSULTING ENGINEERS VANCOUVER, BRITISH COLUMBIA	DRAWING NO. 2
	REVISION



SCALE - 1: 50000

GEOLOGICAL BRANCH
ASSESSMENT REPORT

22,071

 PIEZOMETER LOCATION
PLAN OUTLINE

CITY RESOURCES (CANADA) LTD.	DATE DEC. 1991
	PROJ. NO. 62630
SKEENA MINING DIVISION EXPOT CLAIM LOCATION (NTS 103 F/9W)	APPROVED
	FIG. NO. 3
STEFFEN ROBERTSON & KIRSTEN, Consulting Engineers	

Most of the claim area has been recently logged or is in second growth with the remaining vegetation consisting primarily of fir, hemlock and spruce.

5.0 CLAIM STATUS

The Expot mineral claim consists of 20 units within the Skeena Mining Division on Graham Island of the Queen Charlotte Islands on NTS sheet 103 F/9W. It is 100% owned by City Resources (Canada) Ltd. and covers an area of approximately 400 ha.

Pertinent data is summarized as follows:

<u>Claim Name</u>	<u>Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
Expot	20	251585	Nov.26, 1991

Assessment credit is applied for under this report.

6.0 HISTORY

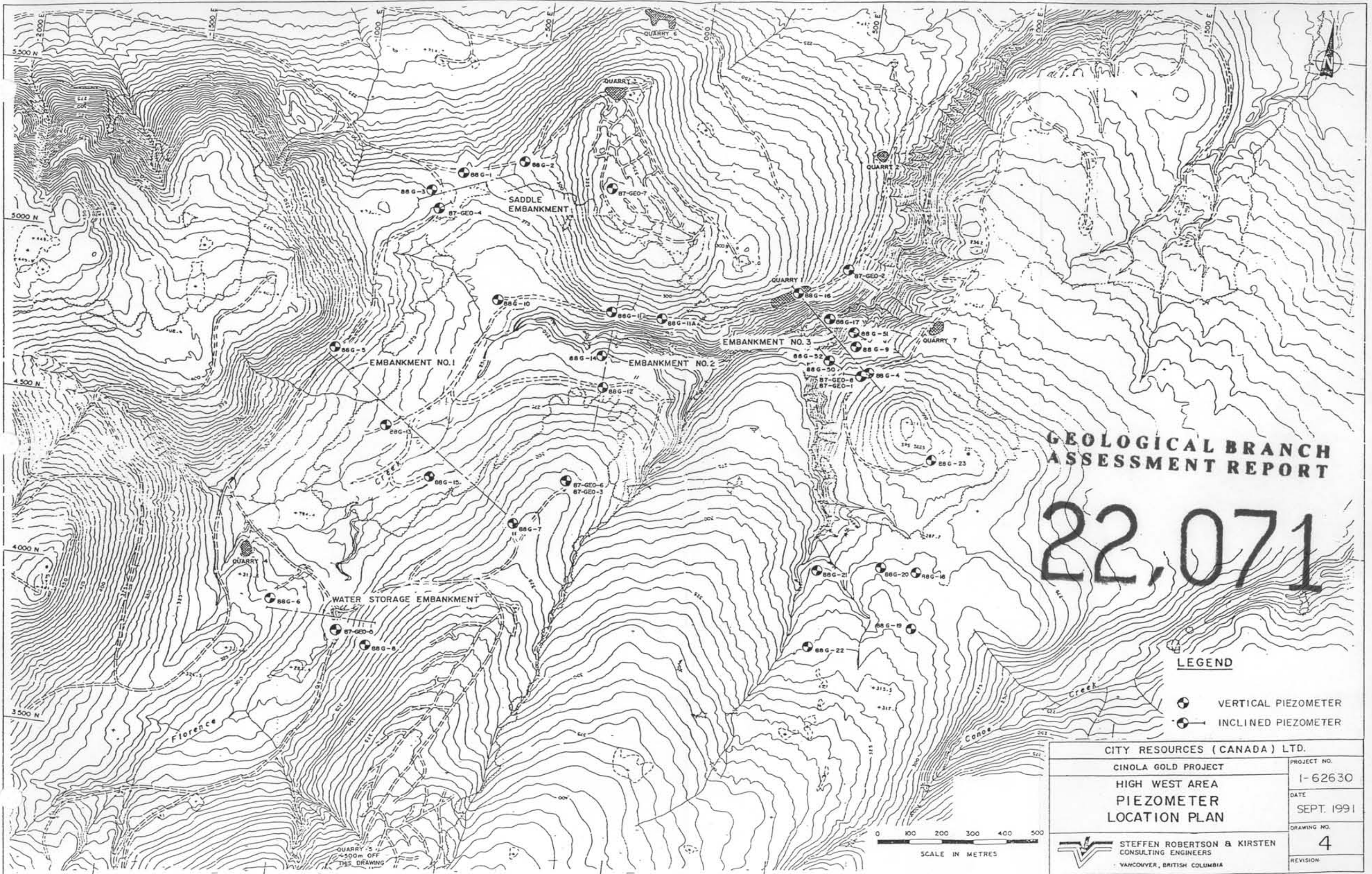
The claims were first staked on November 5, 1986 by Ronald James Robinson of New Westminster, British Columbia with subsequent interest sold to Brian B. Fairbank on November 26, 1987 and then to City Resources (Canada) Ltd. on May 13, 1988. City Resources (Canada) Ltd. acquired 100% ownership.

In December 1987, Wright Engineering Ltd. of Vancouver completed a feasibility study for City Resources (Canada) Ltd. on the Cinola Gold Project. The report included the design of a tailings impoundment and milling facility (High West Area Facilities) over an area including the Expot claims. Several diamond drill holes were completed in 1987 and 1988 to test rock and ground water conditions of the proposed facility site. Piezometers were installed in several of the drill holes for future groundwater monitoring purposes. The 1991 groundwater monitoring program was undertaken to provide the Company with current information to add to their database.

7.0 WORK PROGRAM

A total of 34 piezometers were checked and one groundwater quality sample from one piezometer collected by Steffen, Robertson and Kirsten (B.C.) Inc., 800-580 Hornby Street, Vancouver, B.C. for City Resources (Canada) Ltd., c/o 800-580 Hornby Street Vancouver, B.C.

The piezometer nest locations are shown on Figure 4. They were installed during two drilling programs; the first in April 1987 (drill holes 87-Geo-2 to 87-Geo-8) and the second from July 1988 to October 1988 (drill holes 88G-1 to 88G-23 and 88G-50 to 88G-52). Piezometer monitoring consisted of locating



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

22,071

- LEGEND**
- VERTICAL PIEZOMETER
 - INCLINED PIEZOMETER

CITY RESOURCES (CANADA) LTD.	
CINOLA GOLD PROJECT	PROJECT NO. 1-62630
HIGH WEST AREA PIEZOMETER LOCATION PLAN	DATE SEPT. 1991
STEFFEN ROBERTSON & KIRSTEN CONSULTING ENGINEERS VANCOUVER, BRITISH COLUMBIA	DRAWING NO. 4 REVISION

each piezometer, if possible, evaluating its' condition, and measuring the water level. The condition of each piezometer was evaluated visually at the surface and at depth by sounding with the water level indicator probe to a maximum depth of 30 m, the length of the water level indicator chain. The water levels were measured with a RS Technical Instrument water level indicator.

The results are presented in Appendix I: 1991 Piezometer Data - High West Area. Each piezometer nest is described by drillhole, piezometer number and depth to top as installed. Then the data collected is shown, the sounded depth of each piezometer, which can be compared to the depth to the top as installed, remarks on the condition of each piezometer (test), and the measured water level. The final column contains the range of previous water level measurements compared to the September 1991 measured water level. All the depths are measured from the ground surface in meters and are parallel to the piezometer axis, some of which are inclined.

One groundwater quality sample was taken from 88G-14, piezometer 2, tip depth = 75.0m. There is a rapidly flowing artesian piezometer, and therefore constantly flushed. The water sample was analyzed by Analytical Services Laboratories, 1988 Triumph St., Vancouver, B.C., for general parameters and dissolved metals. The results are presented in Appendix II: Groundwater Quality Analysis (of 88G - 14, Piezometer 2, Tip depth = 75.0 m.)

8.0 GROUNDWATER MONITORING RESULTS

Of the original 34 piezometer rests, all but six (88G-10, 88G-11A, 88G-12, 88G-13, 88G-15 and 87-Geo-4) were located and one (87-Geo-2) was identified as destroyed. Records (1988) indicate that the six piezometers not located were destroyed by logging activity. Two piezometer nests (88G-11 and 88G-23) have been sheared off to the road surface, but are still open and seem to be functioning, as the water levels measured correspond within the range of values previously recorded. Neither of the sheared piezometer nests seem to be acting as a surface runoff drain. Both piezometers in 88G-23 are clear but the piezometers and casing of 88G-11 are blocked above their respective completion zones, probably by sand and gravel that has been pushed and fallen down the casing and piezometers. The top of piezometer 2 at 88G-16 has been broken off inside the casing and is difficult to locate.

Some of the piezometers seem to have some sediment at their tips, but not enough to block the tips, However eight piezometers (88G-1 casing, 88G-5 piezo. 3, 88G-19 piezo.1, 88G-20 piezo.1, 88G-21 piezo.2, 88G-23 piezo tip =17.3 m, 87-Geo-3, and 87-Geo-6) when sounded were between 0.4 m and 1.3 m above the installed depth of the tip, but have water level readings within the range of previous readings.

Three piezometers (88G-2 piezo.2, 88G-11, both piezos.) were sounded greater than 3.5 m above their respective installed tip depths and also have water level readings within the range of previous readings. Two piezometers (88G-50, 88G-52 piezo tip=15.5 m) were sounded to depths above their respective completion zones and were dry. Piezometer 88G-50 was blocked with a brown silty clay that stuck to the probe.

All the water level readings were consistent with previous readings except in the vicinity of the proposed embankment no. 3; water level readings in 88G-16 piezometer 1 and the casing which were respectively 8.91 m and 3.65 m above the highest previously recorded readings. The trend of the water level readings at 88G-9 seem to indicate a very low permeability aquifer, as they slowly rise from April 1988 to the present reading. Also at 88G-51 piezometer 56.5 m (tip), there is not enough data to be certain, but the water levels seem to be slowly rising to the present level of 3.62 m.

Near the proposed embankment no. 3, piezometer nests 88G-4 and 88G-9 indicate upward gradients. Near the proposed embankment no. 2, 88G-14 is artesian and at the site of 88G-15 there is now a spring, which may be from the broken piezometer nest which was previously recorded as artesian.

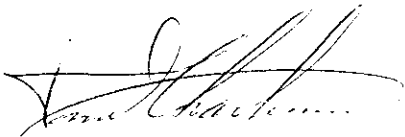
9.0 CONCLUSIONS AND RECOMMENDATIONS

The monitoring program provided an adequate update to the past groundwater database collected as part of the Cinola Gold Project (High West Area).

Further monitoring should be conducted in late 1992 or early 1993 to keep the database up to date.

This report, 62630, Assessment Report on the 1991 Groundwater Monitoring Program (Cinola Gold Project - High West Area), has been prepared by:

STEFFEN, ROBERTSON AND KIRSTEN (B.C.) INC.



Dan J. Charbonneau, P.Eng.

DJC/R-3

APPENDIX I

1991 Piezometer Data - High West Area

**APPENDIX I
1991 PIEZOMETER DATA - HIGH WEST AREA**

- 1) Depths are measured below ground (in meters), parallel to piezometer axis
2) limit of water level indicator = 30 m

Piezometer			Current Data 23-24/09/91			Previous Data	
DDH	#	Tip (m) (as installed)	Piezometer Bottom (m)	Remarks	Water Level (m)	Water Levels (m)	04/88 to 01/89
88G-1	casing	7.0	6.4		4.32	5.00 - 5.15	
	1	13.8	13.6	piezo. broken at top	5.36	4.45 - 7.45	
88G-2	open hole		hole caved in	spring seep starts @ hole	0	0	
	2	30.0	26.1		8.83	2.00 - 12.82	
	1	63.8	>30		17.57	11.43 - 18.36	
88G-3	open hole				0.22	0.05 - 1.94	
	2	29.4	29.1		7.66	6.69 - 8.51	
	1	53.9	>30		18.48	17.09 - 18.82	
88G-4	open hole			water smells of sulphur	0.73	0.43 - 0.70	
	1	49.8	>30		0.96	1.70 - 2.5	
	2	87.3	>30	water level at top of piezo. 2 but not flowing	+0.10	+0.10 - 0	
88G-5	open hole		1.6	blocked	Dry		
	3	3.2	2.8	blocked	2.62	1.65 - dry	
	2	35.0	>30		19.39	19.34 - 20.38	
	1	48.2	>30		19.85	19.50 - 22.20	
88G-6	open hole				2.19	2.23 - 3.79	
	2	19.4	19.3		2.22	2.01 - 4.16	
	1	30.2	>30		3.90	2.29 - 4.17	
88G-7	open hole				4.67	4.95 - 6.17	
		31.6	>30		4.82	3.05 - 7.35	
		60.6	>30		2.51	1.72 - 6.66	
88G-8	open hole				0.32		
	3	2.3	2.0		0.36	0.36 - 1.34	
		22.3	21.86		2.30	3.50 - 5.66	
		30.2	>30		5.02	4.02 - 5.65	
88G-9	open hole				0	0	
	1	2.3	2.2		0	+0.2 - 0.17	
	BQ rod	57.6	>30	@ top of BQ rod - very slow flow, virtually imperceptible	+0.65	4.20 - 2.67	
88G-10				NOT LOCATED		buried	(10/12/88)
88G-11	casing		2.7	casing & piezometers sheared off at road surface.	0.79	0 - dry	
		21.3	17.8		2.24	2.40 - 4.80	

Piezometer			Current Data 23-24/09/91			Previous Data	
DDH	#	Tip (m) (as installed)	Piezometer Bottom (m)	Remarks	Water Level (m)	Water Levels (m)	04/88 to 01/89
		47.3	9.4	possibly gravel fell down casing & piezos. - appears that no surface runoff drains into hole.	4.72	3.66 - 6.20	
88G-11A				NOT LOCATED		destroyed	(6/10/88)
88G-12				NOT LOCATED		destroyed	(28/01/89)
88G-13				NOT LOCATED		broken	(10/12/88)
88G-14	open hole			boggy area.	0	0	
	1	20.5	20.6	some algae near top of both piezos.	slow flow	flowing	
	2	75.0	>30	water sample taken from piezo. 2	fast flow	3 - 4 psi	
88G-15				NOT LOCATED spring starts here at ground surface		buried H ₂ O @ ground level	(30/11/88)
88G-16	casing		>30		22.45	26.10 - 34.42	
	1	55.6		top of piezo. 1 broken inside casing	22.10	31.01 - 33.23	
	2	93.3	>30		>30	33.10 - 33.80	
88G-17	2	30.5	>30	hole filled and top of piezos. tilted due to movement of sand & gravel bar.	5.23	5.56 - 8.05	
	1	60.2	>30		0.46	0.20 - 0.55	
88G-18	open hole				2.83	3.30 - 4.09	
	2	14.8	14.3		3.95	3.68 - 6.45	
	1	23.4	22.9		3.94	3.68 - 7.39	
88G-19	open hole				1.43	2.14 - 2.25	
	2	7.8	7.6		2.36	2.22 - 2.40	
	1	19.5	18.7		1.39	0.15 - 2.50	
88G-20	open hole				0.48	0.53 - 0.63	
	2	11.8	11.7		0.56	0.51 - 0.82	
	1	18.8	17.5		0.30	0.46 - 4.03	
88G-21	open hole			spring at ground surface	0	0	
	2	18.0	17.5	piezo. 2 has stable water level	+0.54	+0.70 - 0.35	
	1	21.9	21.7	bentonite in bottom of piezo.	0.66	0.36 - 3.00	
88G-22	open hole			bog	0	0	
		7.1	7.3	grey clay & coarse sand blocking 7 m piezo.	0	+0.16 - 0.05	
		22.8	22.8		0.76	0 - 0.35	
88G-23		9.5	9.5	piezos. broken at road surface	3.65	3.20 - 4.26	
		17.3	16.9		3.92	3.58 - 6.14	
88G-50		11.6	10.2	blocked with brown silty clay inclined at 55'	dry	7.62 - 9.29	
88G-51		28.5	28.2	water smells of sulphur	1.44	0.39 - 0.83	

Piezometer			Current Data 23-24/09/91			Previous Data	
DDH	#	Tip (m) (as installed)	Piezometer Bottom (m)	Remarks	Water Level (m)	Water Levels (m)	04/88 to 01/89
		56.5	>30	inclined at 45'	3.62	8.32 - 15.21	
88G-52		15.5	10.6	blocked	dry	10.38 - 15.50	
		90.0	>30	inclined at 55'	23.88	23.63 - 24.81	
87-GEO-2				destroyed		destroyed	(22/04/88)
87-GEO-3		13.6	13.0	inclined at 60'	3.19	2.00 - 4.62	
87-GEO-4				NOT LOCATED		destroyed	(22/04/88)
87-GEO-5		50.3	>30	inclined at 60'	0.68	0.60 - 0.80	
87-GEO-6		18.3	17.6		4.52	3.39 - 5.09	
87-GEO-7		22.9	22.8		18.69	18.83 - 19.15	
87-GEO-8		23.0	23.1		1.95	1.68 - 2.50	

APPENDIX II

Groundwater Quality Analysis

APPENDIX II
GROUNDWATER QUALITY OF 88G -14, PIEZOMETER 2,
TIP DEPTH ANALYSIS = 75.0 M

Parameter		Sept 24/91 14:00
Physical Tests		
Conductivity	Umhos/cm	727
Hardness	CaCo3	8.65
pH		8.74
Dissolved Anions		
Acidity	CaCo3	<1.0
Alkalinity	CaCo3	426
Fluoride	F	1.40
Sulphate	SO ₄	3.9
Nutrients		
Ammonia Nitrogen	N	0.014
Nitrate Nitrogen	N	0.020
Nitrite Nitrogen	N	0.006
Total Dissolved Phosphate	P	0.321
Dissolved Metals		
Aluminum	D-Al	<0.20
Antimony	D-Sb	<0.20
Arsenic	D-As	<0.20
Barium	D-Ba	<0.010
Cadmium	D-Cd	<0.010
Calcium	D-Ca	1.42
Chromium	D-Cr	<0.015
Cobalt	D-Co	<0.015
Copper	D-Cu	<0.010
Iron	D-Fe	<0.030
Lead	D-Pb	<0.050
Magnesium	D-Mg	1.24
Maganese	D-Mn	(0.005
Mercury	D-Hg	<0.00005
Molybdenum	D-Mo	<0.30
Nickel	D-Ni	<0.020
Selenium	D-Se	<0.20
Silver	D-Ag	<0.015
Zinc	D-Zn	<0.005

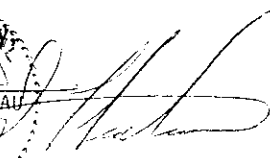
Results are expressed as milligrams per litre
except for pH and Conductivity (umhos/cm).
< = Less than the detection limit indicated

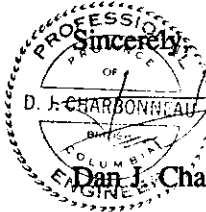
APPENDIX III

Statement of Qualifications

I, Dan Charbonneau, do certify that:

1. I am a mining engineer at #4 - 1038 West 7th Avenue, Vancouver, B.C. V6G 1B3.
2. I am a graduate of McGill University with a degree of B.Eng. (mining).
3. I have practised as a mining engineer for fifteen years.
4. I have been involved with the Cinola Gold Project since 1989, responsible for pit study, and supervised the monitoring work and the preparation of this report.

Sincerely,

Dan J. Charbonneau



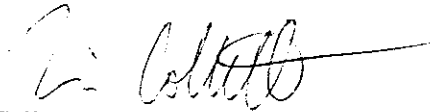
January 1992

STATEMENT OF QUALIFICATIONS

I, Tim F.V. Collett, do certify that:

1. I am a geotechnical engineer residing at 6-1012 Broughton Street, Vancouver, B.C. V6G 2A6
2. I am a graduate of the University of British Columbia with a degree of B.A.Sc in Geotechnical Engineering.
3. I have practised as a geotechnical engineer for five years.
4. I have been involved with the Cinola Gold Project since 1987, and performed the groundwater monitoring work described in this report on behalf of City Resources (Canada) Ltd.

Sincerely,



Tim F.V. Collett

January 1992

APPENDIX IV
Statement of Costs

STATEMENT OF COSTS

SALARIES

D. Charbonneau (Mining Engineer)	
5.8 hrs @ 99/hr	\$522.5
T. Collett (Geotechnical Engineer)	
September 22 to September 25	
34 hrs @ \$55/hr	<u>\$1,870.00</u>
	2,392.50

ROOM AND BOARD

3 days on location (1 man)	
Hotel: 138.00	
Meals: <u>68.97</u>	
206.97	\$206.97

TRANSPORTATION

Vancouver to Queen Charlottes, Return

Airfare:	540.00	
Truck Rental:	578.84	
Gas:	20.00	
Misc.: <u>102.13</u>		
1,240.97		\$1,240.97

ANALYTICAL

1 water quality test	\$179.00
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REPORT \$400.00

TOTAL EXPENDITURE \$4,419.44