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McADAM RESOURCES INC

PROSPECTUS

SPUD VALLEY PROJECT

APRIL 1988

PROSPECTUS

SPUD VALLEY PROJECT

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1.0 FACT SHEET

Mineral Reserves

Minerals	Gold bearing quartz vein
Reserves	224,000 tonnes
Average grade of ore	14.06 g Au/tonne

Mining

Mine Operation	Underground
Production Rate	90 - 185 tonnes/day
Mill Process	Gravity separation followed by flotation with cyanidation
Milling Rate	90 - 185 tonnes/day
Mine Life	3 - 4 years with excellent potential for extension
Work Period	Mine: 2 shifts/day - 5 to 7 days/week
	Mill: 3 shifts/day - 7 days/week

Transportation

Road Access	From Campbell River 160 km north on Highway 19 and then along gravel road to Zeballos and public right-of-way road to the mine.

Work Force

Total Operational	20 - 25
Housing	Zeballos
On Site Accommodation	None
Construction Workforce	15 - 20

Schedule

Underground Exploration	September 1987 - July 1988
Pilot Plant (purchase or construction)	August 1988
Pilot Plant Test	August 1988 - February 1989
Site Construction	March 1989
Full Production	Spring 1989

2.0 PROJECT DESCRIPTION

2.1 Introduction

Toronto-based McAdam Resources Inc. proposes to develop the Spud Valley Project, a gold deposit located on northern Vancouver Island approximately 80 km west of Campbell River (Figure 1). McAdam Resources Inc. is a mining and exploration company specializing in gold property exploration and development.

The project is a joint venture between McAdam Resources Inc. (75%) and Tashota-Nipigon Mines Ltd. (25%), with McAdam Resources undertaking exploration, predevelopment of the project, and mine operation once in production. The claims are held by McAdam Resources. Mining operations previously occurred on the property between 1938 and 1942. Other formerly operating mines in the project vicinity include the Privateer, Spud Valley, Mt. Zeballos, C.D., Rimy and Central Zeballos mines. Redevelopment work is currently in progress on some of these operations.

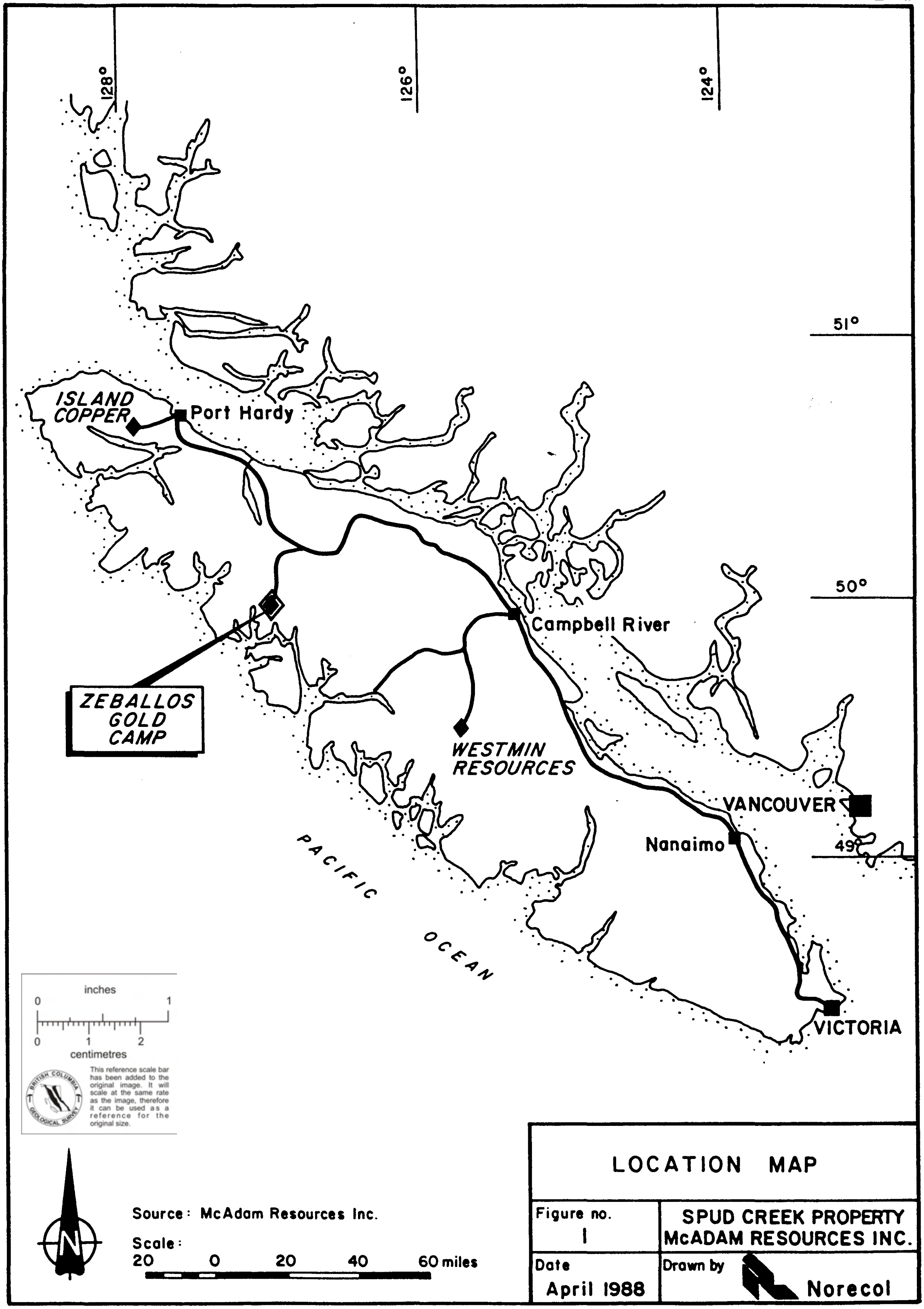
In June 1987, McAdam Resources Inc. obtained approval from the B.C. Government to obtain a bulk underground sample in early 1988. McAdam Resources will submit an application in May 1988 for operation of a pilot plant and tailings facility to process the bulk sample. Final project development engineering and environmental studies will be carried out concurrently with pilot mill purchase and/or construction and subsequent operation. Submission of the Stage I project application is planned for late October or early November, 1988.

2.2 Location and Access

The Spud Valley Project is located 4 km northeast of Zeballos, B.C., in the upper reaches of the Spud and Gold valleys. Spud and Goldvalley creeks drain into the Zeballos River, which in turn drains into the ocean at Zeballos.

The site is accessible by road north of Campbell River along Highway 19 for 160 km., then south 42 km on the gravel road to Zeballos, and then via public right-of-way road 10.4 km to the property.

Regular airline service is available at Campbell River and Port Hardy.


128°
126°
124°
51°
50°
49°
ISLAND COPPER
Port Hardy
ZEBALLOS GOLD CAMP
Campbell River
WESTMIN RESOURCES
VANCOUVER
Nanaimo
VICTORIA
PACIFIC OCEAN
inches
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centimetres
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BRITISH COLUMBIA GEOLOGICAL SURVEY
N
Source: McAdam Resources Inc.
Scale:
20 0 20 40 60 miles
LOCATION MAP
Figure no.
1
SPUD CREEK PROPERTY
McADAM RESOURCES INC.
Date
April 1988
Drawn by
Norecol

2.3 Claim Area Description

As indicated on Figure 2, the McAdam Resources property consists of 12 Crown Grants located in the Port Alberni Mining Division. Claims are located within mapsheet 92 L/2 and are as follows:

CLAIM NAME	CLAIM NO.	AREA (ha)
Goldfield	L1020	13.81
Last Chance	L1021	20.90
AT. No. 2 Fraction	L1022	7.86
Goldspring	L1023	9.33
Linton	L1024	12.25
Linton No. 2	L1025	0.02
A.T. Fraction	L1026	0.66
Anvil	L1027	16.60
Spud	L1028	16.97
A.T. No. 1	L1029	16.39
A.T. No. 6 Fraction	L1695	0.09
Rimy No. 4	L1903	16.53

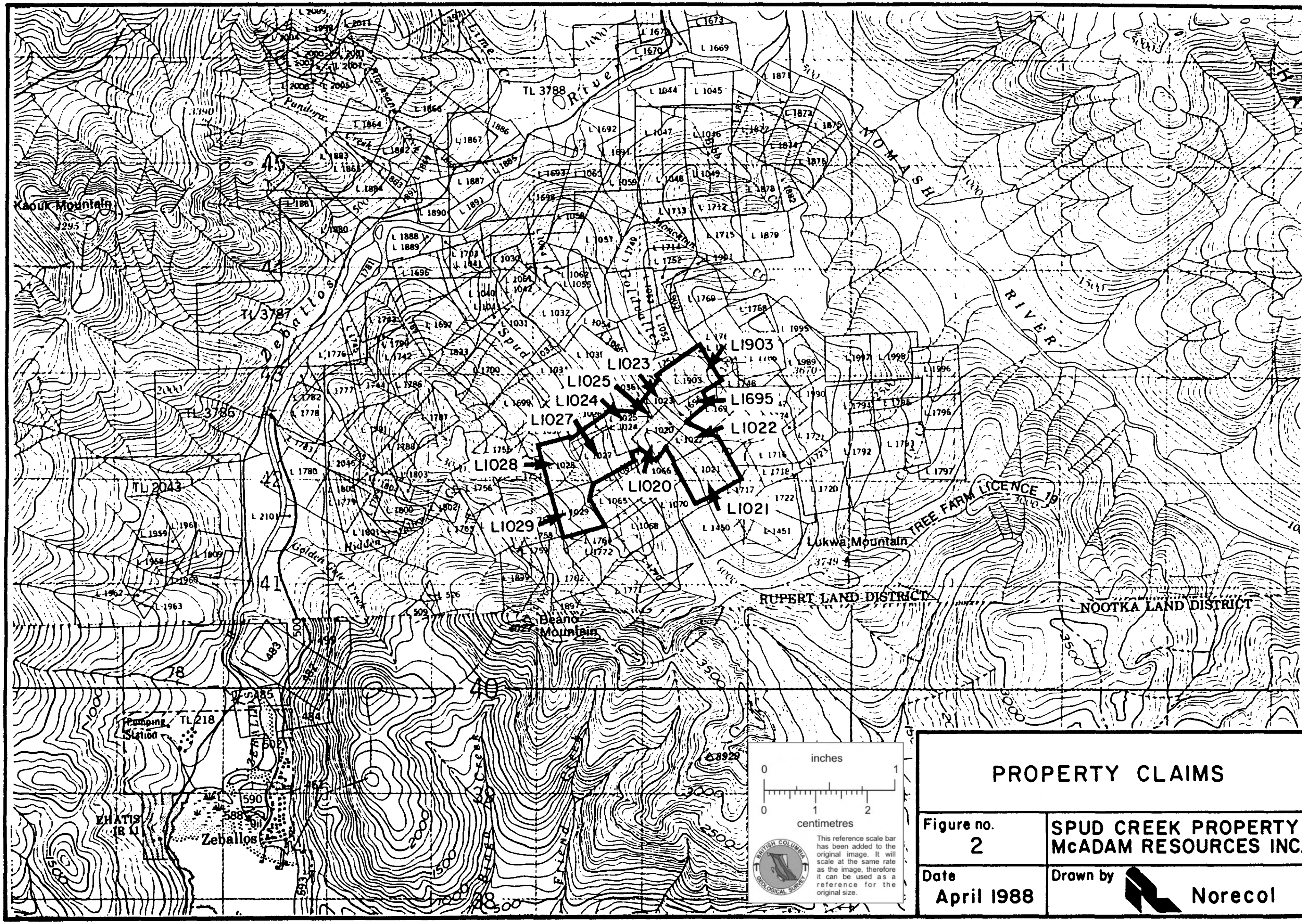
2.4 Existing Facilities

Existing mine workings consist of seven adits driven into a ridge between Spud Valley and Gold Valley. Levels 1 through 5 cut through the ridge, with portals in both valleys. Although all seven levels were once accessible from Spud Valley, only Levels 4 to 7 can currently be located. There is road access to No. 7 portal in Spud Valley and Levels 4 and 5 in Gold Valley. Some rehabilitation of No. 7 Level and Portal was carried out in late 1985. Further underground exploration took place in late 1987 and early 1988, which entailed driving 518 m of drift from the old No. 7 Level workings and 61 m of drift along the Linton North Vein.

Surface facilities were improved in 1987. Existing surface facilities include a small shop, first aid/lunch room, two 4500 L capacity fuel tanks, one 2250 L fuel tank, and one generator housed in a trailer.

2.5 Project Schedule

Figure 3 outlines the project schedule, including exploration, pilot plant operation, mine planning, government approvals, construction and production target dates.



PROPERTY CLAIMS

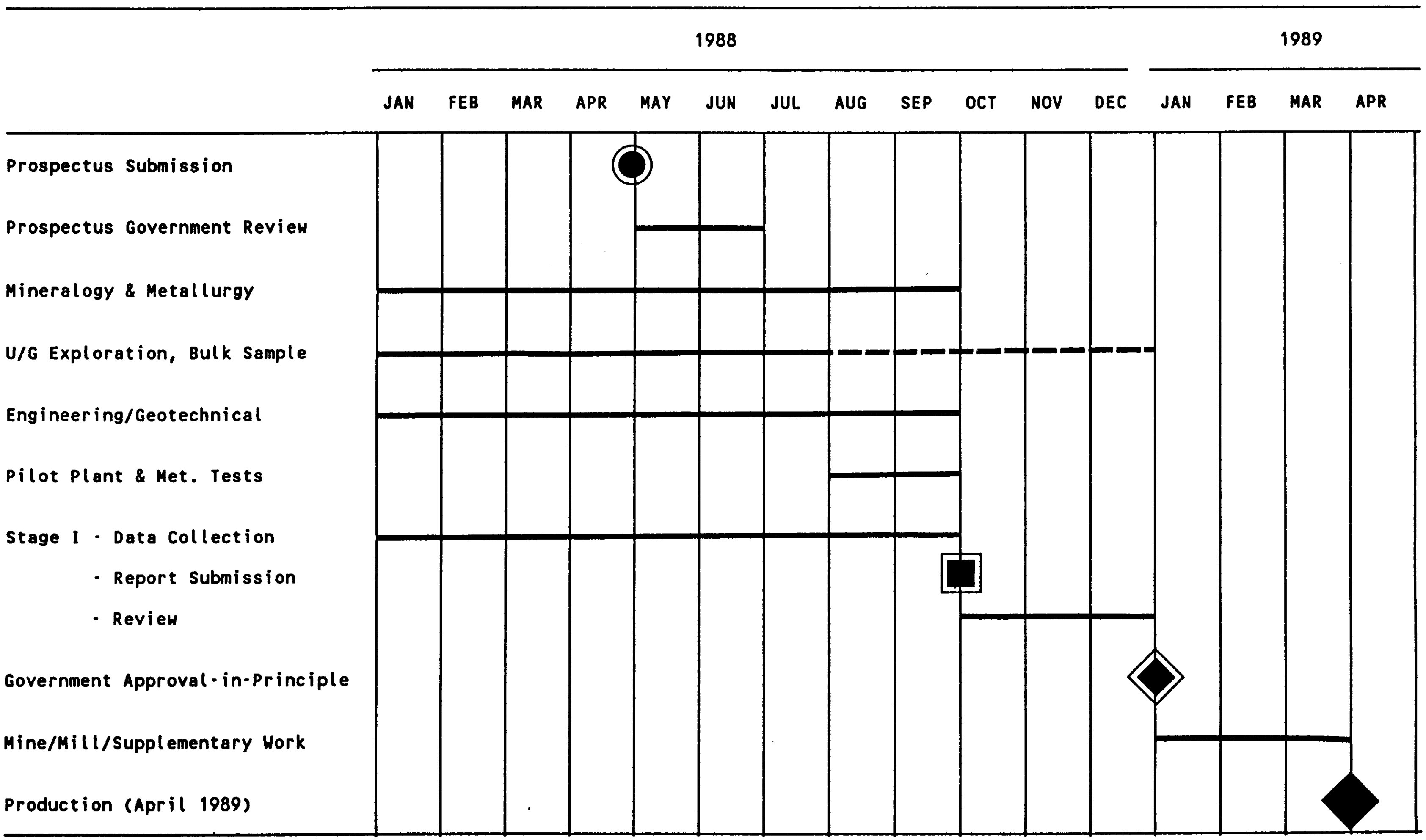
Figure no. 2

SPUD CREEK PROPERTY
McADAM RESOURCES INC.

Date April 1988

Drawn by Norecol

MCADAM RESOURCES SPUD VALLEY PROJECT: CRITICAL PATH SCHEDULE 1988-89



Norecol

Figure 3

3.0 GEOLOGY AND RESERVES

3.1 History

A number of narrow, rich gold-bearing quartz veins were discovered in the Zeballos gold camp in the mid-1930's. Following these discoveries, several properties were brought into production, including the Spud Valley Gold Mine, which later became the second largest producer in the camp. Production began in 1938 and continued until 1942, when a shortage of labour forced the mine to close.

No further work on the property took place until 1985, when McAdam Resources undertook rehabilitation of No. 7 Level and carried out 2340 m of diamond drilling. Three major structures were encountered: the AT Vein, the Linton Vein and the Linton North Vein. Old mine workings were confined primarily to the Goldfield Vein to the south and the adjacent Roper Vein. An assay carrying 83.64 g Au/tonne (2.439 oz. Au/ton) over 1 m was found in G6 on the AT Vein.

Diamond drilling continued in 1986 - 1987. The most significant assays from this program included G20, which carried 109.32 g Au/tonne (3.188 oz. Au/ton) over 0.24 m and G24, which carried 88.64 g Au/tonne (2.585 oz. Au/ton) over 0.21 m. Both assays were from the AT Vein in the Spud Valley area. Other anomalous results in the AT Vein were found from drilling in Gold Valley, the highest of which was G9, which carried 8.92 g Au/tonne (0.260 oz. Au/ton) over 1.36 m.

G24 carried 31.55 g Au/tonne (0.92 oz. Au/ton) over 0.27 m on the Linton North Vein in Spud Valley. In Gold Valley, anomalous gold was found in most holes. The most notable were G9, which carried 114.98 g Au/tonne (3.353 oz. Au/ton) over 0.34 m, and G18, which carried 223.52 g Au/tonne (6.518 oz. Au/ton) over 0.64 m.

The Linton Vein was more variable, although there were some good results. The most significant of these included G11, carrying 22.01 g Au/tonne (0.642 oz. Au/ton) over 0.18 m and G12, carrying 24.76 g Au/tonne (0.722 oz. Au/ton) over 0.31 m. Both assays came from Gold Valley.

Further drilling took place in the summer of 1987 to test the eastern extension of these veins in Gold Valley. Results were less promising, although the structure of the veins remained strong.

Between September and December 1987, 518 m of drifting was carried out from the old workings on No. 7 Level. The purposes of this drifting were to bulk sample the three main structures encountered in the drilling program and to enable further diamond drill testing of the extent along strike of these veins between Spud and Gold Valleys. To this end, a cross-cut was driven 91 m north from the old workings which follow the Goldfield Vein, then 244 m east parallel to the old No. 7 Level. A cross-cut 183 m long was then driven north to intersect the 3 major structures. Diamond drilling will take place from the drift parallel to the old No. 7 Level.

Of the three structures, the Linton North Vein appeared to be the most encouraging, both from existing drilling results, and from anomalous assays of the vein encountered in the drifting. The vein was followed for 61 m to the east with excellent results. The entire drift averaged 12.07 g Au/tonne (0.352 oz. Au/ton) over 1.2 m for a total length of 59.0 m. Because drifting stopped in good ore and drill results 30.5 m further east showed good assays, additional ore grade material is expected.

3.2 Regional Geology

The Spud Valley Mine lies on the western edge of the Zeballos pluton (Figure 4). This intrusive is composed mainly of quartz diorite and is one of the Tertiary Catface Group of Vancouver Island intrusives. The pluton is bounded to the south-west by the Lower Jurassic Bonanza Group of andesitic tuffs and rhyodacitic lavas.

The workings of the Spud Valley Mine are wholly in the quartz diorite, as are a number of other properties in the camp.

3.3 Property Geology

Mineralization on the property follows the same general pattern wherever it is encountered. Gold mineralization is in steeply dipping quartz veins contained within a distinct structure. These structures consist of one or more zones of strong argillic alteration, ranging in size from a few centimeters to a meter or more across. The diorite is bleached and altered with the mafic minerals altered to chlorite or, in some cases, completely obscured. The feldspars have generally been altered to clay minerals, with the quartz grains remaining as the only unaltered mineral.

These alteration zones are accompanied by chlorite alteration zones and weak chlorite alteration of the diorite several meters on either side of the structure, mainly on the hanging wall. The argillic alteration zones appear at times to grade into chlorite alteration zones and vice versa. However, the main structures can be traced for relatively long distances along strike.

The quartz veins within the structures are always contained within an argillic alteration zone. The veins are normally free walled, often with a thin plastic gouge seam along one or both walls. The veins range in width from 0.6 to 46 cm. They are normally banded with sulphides of iron, zinc, arsenic and occasionally, lead. A small amount of silver is usually present. The veins are often vuggy with infillings of calcite in the vugs. One or more veins can occupy a single argillic alteration zone.

3.4 Exploration Summary

Exploration by McAdam Resources commenced in late 1985 and still continues. Three major structures were encountered by diamond drilling. Two of these, the AT Vein and Linton North Vein, had been encountered previously on surface. Diamond drilling proved that these structures extend from Gold Valley through to Spud Valley, although information beneath the intervening ridge is scanty. Rugged topography in the area precluded surface drilling. The proposed underground drilling program should provide more information in this area. The AT and Linton North Veins are

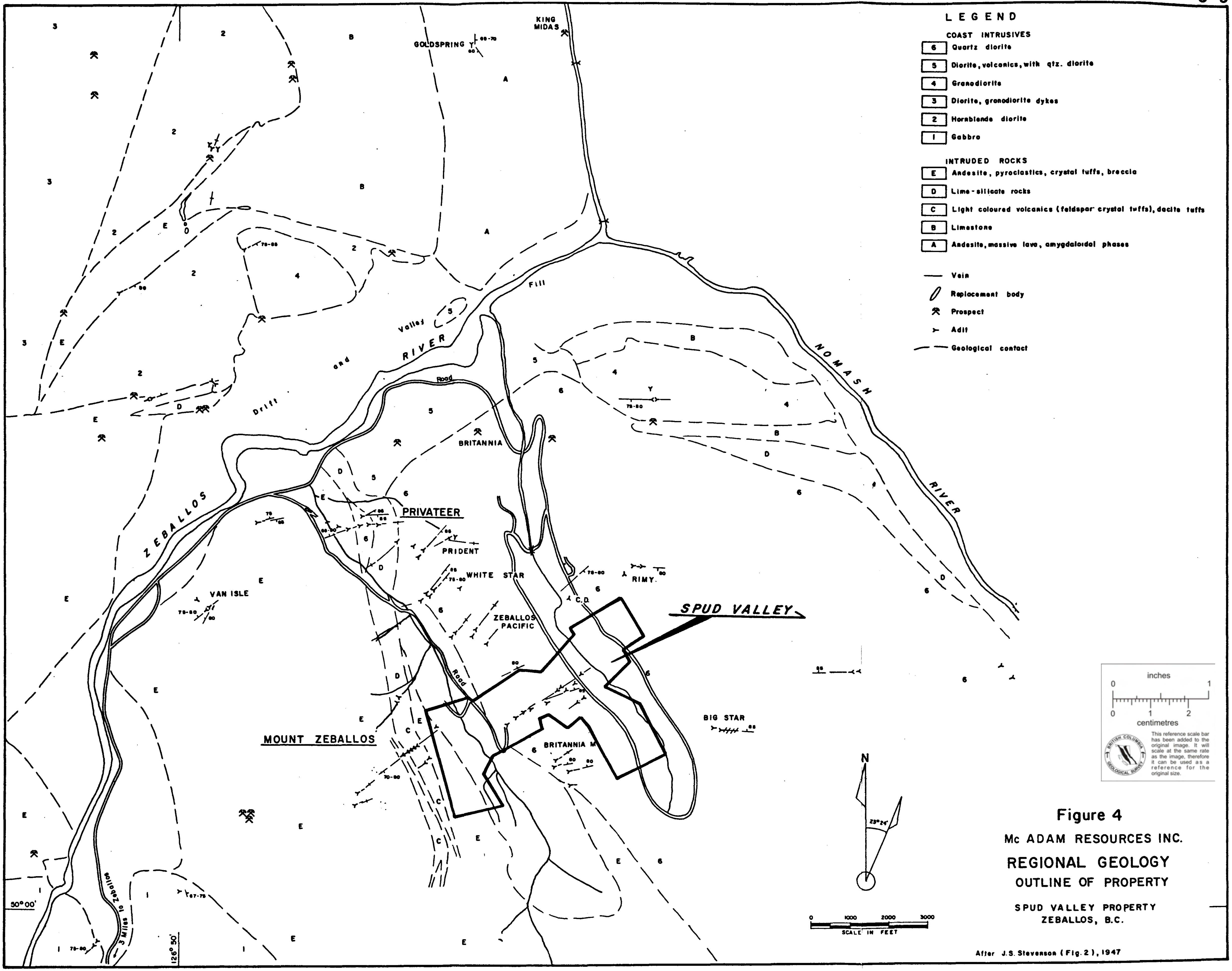


Figure 4

Mc ADAM RESOURCES INC.

REGIONAL GEOLOGY

OUTLINE OF PROPERTY

SPUD VALLEY PROPERTY
ZEBALLOS, B.C.

After J.S. Stevenson (Fig. 2), 1947

the most encouraging of these structures. Mineralization is open to the west in Spud Valley and at depth below existing drill holes.

Mineralization is associated with steeply dipping, north-easterly striking quartz veins. These veins are surrounded by distinct alteration zones. Generally, the larger the quartz vein, the greater the extent and intensity of alteration. This alteration varies from chlorite through to strong argillic alteration. The width of these zones ranges from a few centimeters to one or more meters.

3.5 Mineralization

The aim of the exploration program to date has been to test the structure and grade of several gold bearing quartz veins on the property (see Figure 5). These veins appear to be a result of a regional shear system which is present throughout the camp.

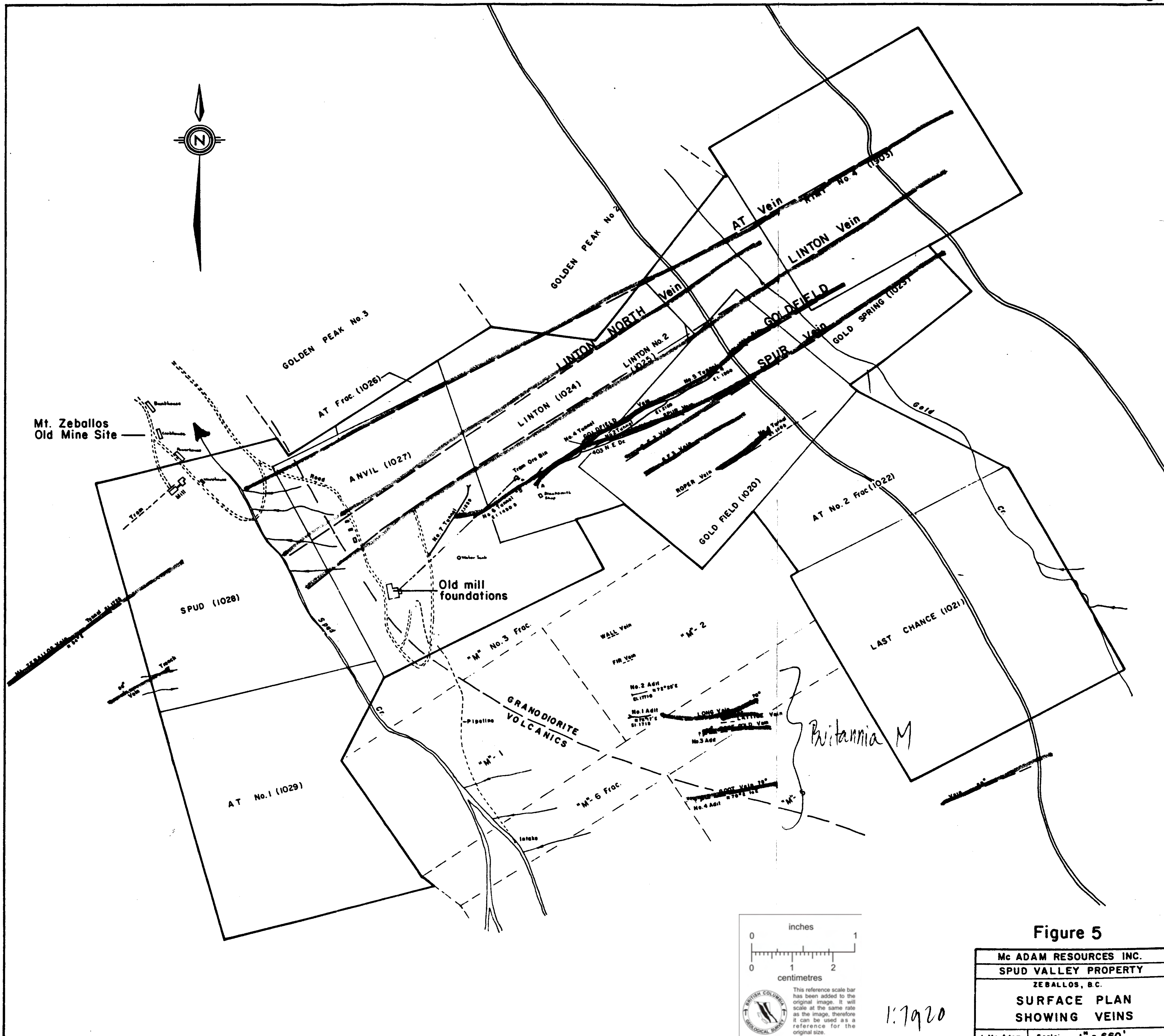
The gold bearing veins invariably contain quartz, and occasionally calcite, with traces of up to 15 percent pyrite, and several percent sphalerite, arsenopyrite, galena and occasional trace chalcopyrite. Higher assays are associated with wider quartz veins, and more intense argillic alteration. Higher gold values also occur when mineralization is very fine grained and well banded. Some visible gold has been encountered, but it is not common. Samples assaying several ounces of gold often contain no visible gold.

3.6 Mineral Reserves

Mineral reserves on the property are as follows:

	TONNES		GRADE (g of gold per tonne)
Proven and Probable	83,063	@	6.173
Drill Indicated	106,302	@	21.947
Possible	24,120	@	5.658
Pillar Reserves*	10,659	@	16.700
Total	224,144	@	5.793

* May be recoverable only in part.


N
Mt. Zeballos
Old Mine Site
GOLDEN PEAK No.3
GOLDEN PEAK No.2
AT Vein
LINTON Vein
LINTON NORTH Vein
GOLDFIELD
SPUR Vein
GOLD SPRING (1023)
LINTON No.2 (1025)
LINTON (1024)
AT Frac. (1026)
ANVIL (1027)
SPUD (1028)
GOLD FIELD (1020)
AT No.2 Frac (1022)
LAST CHANCE (1021)
AT No.1 (1029)
Old mill
foundations
"M" No.3 Frac.
"M"-2
"M"-1
"M"-6 Frac.
WALL Vein
ROPER Vein
GRANODIORITE
VOLCANICS
LONG Vein
Mill
Road
Pipeline
Intake
Spud
Cr.
Gold
Britannia M
1:7920
Figure 5
Mc ADAM RESOURCES INC.
SPUD VALLEY PROPERTY
ZEBALLOS, B.C.
SURFACE PLAN
SHOWING VEINS
J. Mc Adam
Scale: 1" = 660'
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GEOLOGICAL SURVEY

4.0 MINE PLANNING AND OPERATION

4.1 Conceptual Mine Plan

It is envisioned that mining and milling will take place at a rate of between 90 and 185 tonnes per day. The mine will be accessed by existing and new adits. The main portal will be the existing Level 7 adit at an elevation of 377 m in Spud Valley. Levels will be driven on the veins at about 46 m intervals. Mining of the ore could be a combination of shrinkage, open stoping, and cut and fill. Ore transport will be by underground railway to the portal and into a coarse ore bin. This bin would have a capacity of 1360 to 1815 tonnes. The mill would be fed directly from this bin.

4.2 Process Description

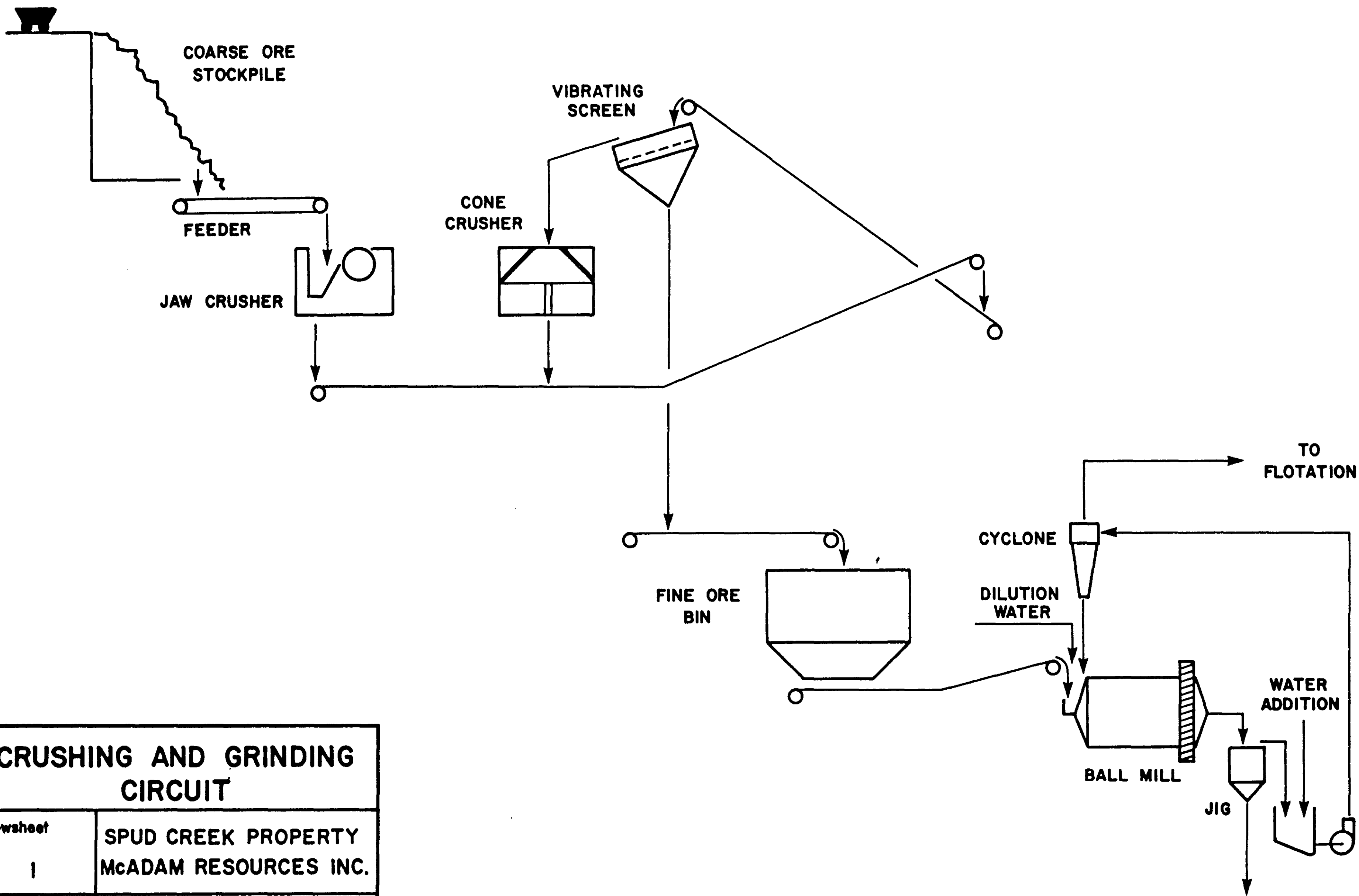
A pilot mill is scheduled to commence operation by fall, 1988, and will be used to verify the processing flowsheet and test ores from various levels of the mine development. As presently envisaged, the mill capacity will be in the order of 90 to 185 tonnes per day. The following description outlines the process that is to be used in the gold recovery circuit.

Ore from the mine will be trammed out on Level 7 and dumped onto the coarse ore stockpile. The ore will be withdrawn from the stockpile at a controlled rate using a pan feeder to feed the jaw crusher. Crushed ore from the jaw and cone crusher will be conveyed using two conveyors in series to feed the double deck screen. Screen oversize material will be returned to the cone crusher for recrushing. Undersize material from the screen will be distributed to the fine ore bin using a plough on the screen discharge conveyor.

A variable speed conveyor will be used to withdraw ore from the fine ore bin to feed the ball mill. The ball mill will be operated in a closed circuit with a cyclone to produce feed for the flotation circuit. A jig installed on the ball mill discharge will recover free gold from the mill discharge.

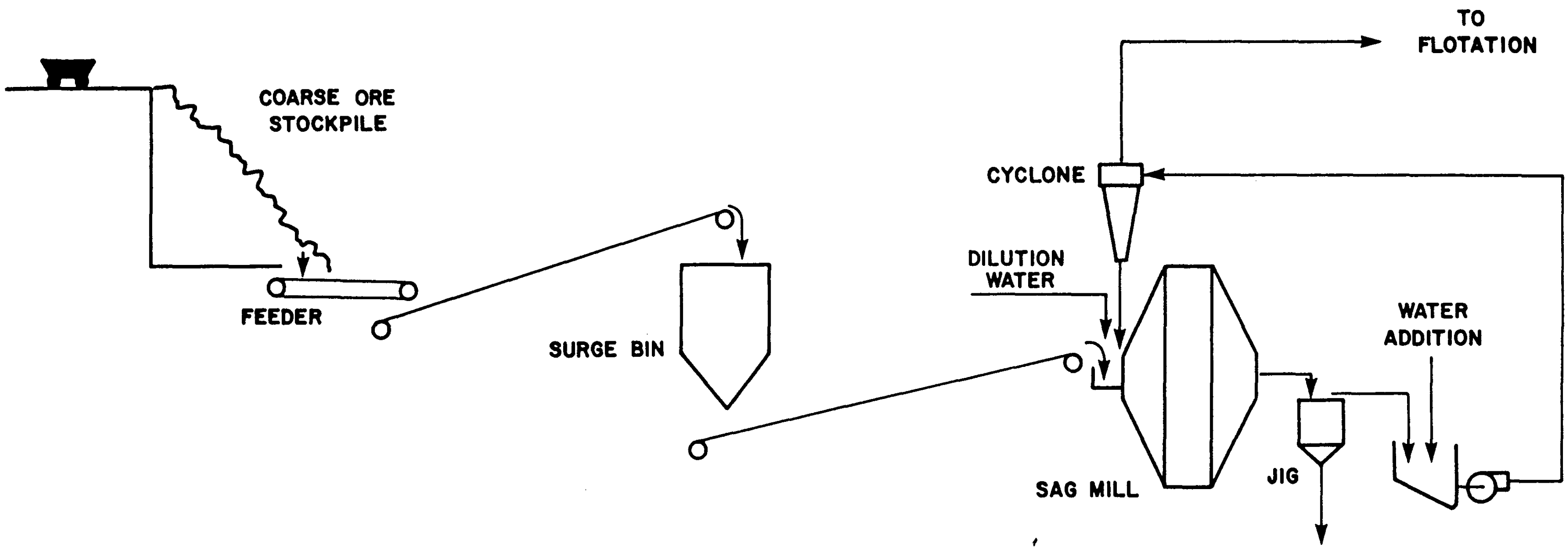
An alternate flowsheet using semi-autogenous grinding (SAG) to replace the conventional crushing and grinding circuit is under consideration. Ore from the coarse ore stockpile would be conveyed to a surge bin, from which it would be withdrawn at a controlled rate to feed the autogenous mill. The mill would operate in close circuit with the cyclone classifier. Free gold would be recovered in the mill discharge using a jig. The alternate plan would reduce the amount of equipment required and would reduce potential problems involved in handling sticky ore. Flowsheet 1 depicts the conventional crushing and grinding circuit, while Flowsheet 1A depicts the SAG milling concept.

Cyclone overflow from the grinding circuit will be conditioned with a xanthate collector prior to flotation in two banks of flotation cells. Rougher concentrate will be upgraded in a bank of cleaner flotation cells and then pumped to a thickener to remove excess water from the process. Tailings produced by the flotation process will be pumped to the tailings impoundment. Flotation is depicted in Flowsheet 2.



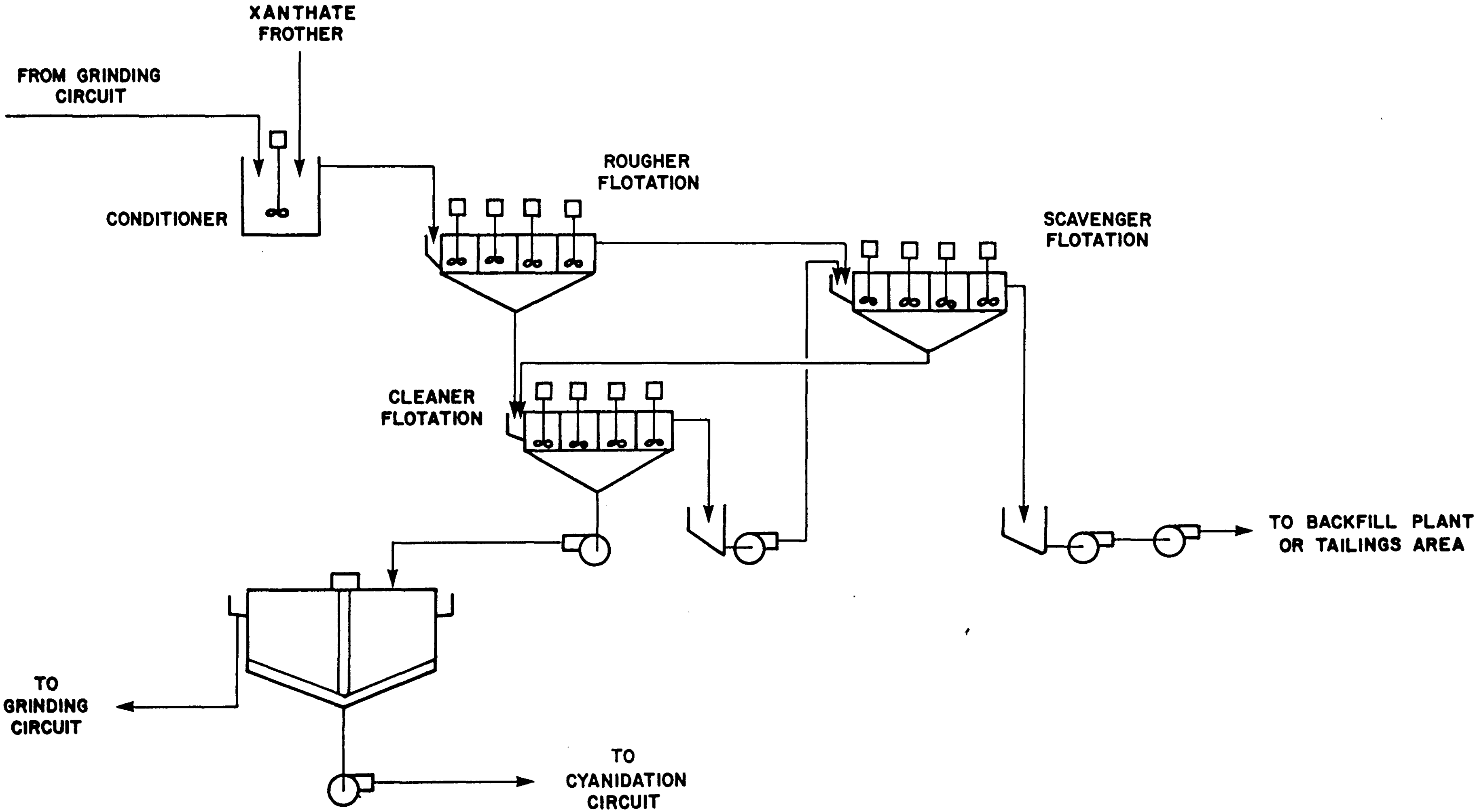
CRUSHING AND GRINDING CIRCUIT

Flowsheet 1	SPUD CREEK PROPERTY McADAM RESOURCES INC.
Date April 1988	Drawn by Norecol



GRINDING CIRCUIT

Flowsheet 1 A	SPUD CREEK PROPERTY McADAM RESOURCES INC.
Date April 1988	Drawn by Norecol



FLOTATION	
Flowsheet 2	SPUD CREEK PROPERTY McADAM RESOURCES INC.
Date April 1988	Drawn by Norecol

The thickener underflow can be sold as a final gold bearing product, treated at a custom cyanidation operation, or treated at an on-site cyanidation circuit.

An on-site cyanidation circuit will involve a lime addition to the thickener underflow and aeration of the pulp in two conditioning tanks. Upon completion of aeration, the pulp will be filtered and the solids repulped with barren solution from the Merrill-Crowe process. Following cyanide addition, the pulp will be leached for 48 hours in a series of four leach tanks. Two stages of filtration will be used to separate the final solid tailings from the pregnant solution containing the gold. Cyanidation is depicted in Flowsheet 3.

Gold will be recovered from the pregnant solution using the Merrill-Crowe process. The pregnant solution will be clarified, de-aerated, and the gold precipitate from the solution using zinc dust. The precipitated will be recovered in a filter press which will be emptied on a regular basis and sent to the refinery for conversion to dore metal containing gold.

Barren solution from the Merrill-Crowe process will be recycled to the feed of the cyanidation leach circuit or sent to the cyanide destruction circuit. The cyanide destruction circuit is an SO_2 air process conducted in a series of three tanks. Air and SO_2 will be introduced into tanks which, in the presence of a copper ion catalyst, will reduce the cyanide level to meet environmental standards.

4.3 Tailings Disposal

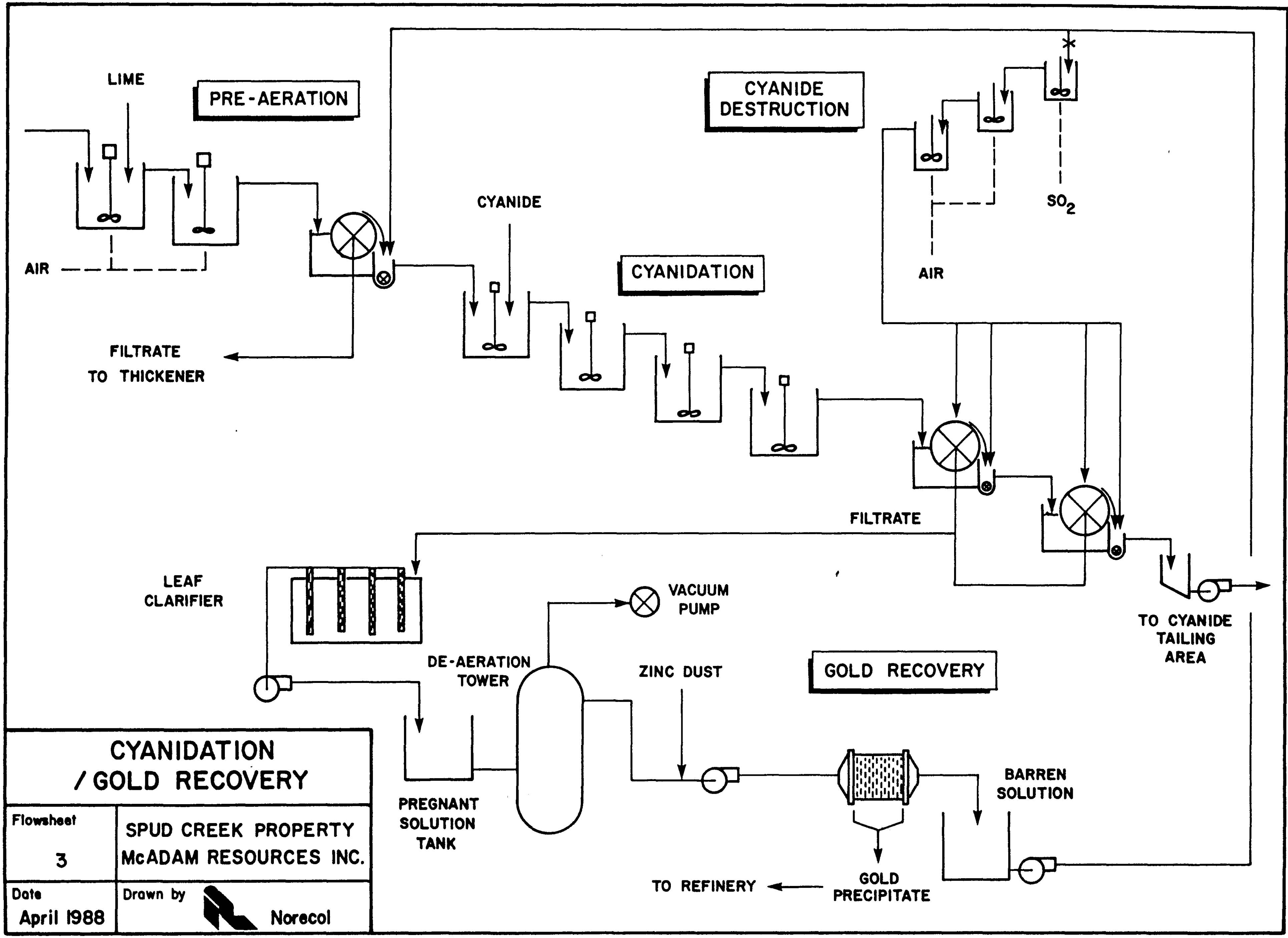
Solution from the cyanide destruction circuit will be used to repulp the cyanide tailings prior to discharge to the cyanide tailings dam.

Final tailings from the flotation circuit will be pumped through the Level 5 adit to the mine backfill plant. During periods in which backfill is required, tailings will be cycloned and the coarse fraction used as backfill. When backfill is not required, the tailings will be pumped to the disposal area located in Gold Valley.

Further environmental testing is planned as part of the continuing metallurgical program. As the details of the flowsheet are developed, the amenability of the effluents to cyanide destruction methods will be investigated as well as the acid generating potential of the tailings.

4.4 Surface Facilities

Surface facilities required for operation of the Spud Valley Project will include a mill and one small office trailer for the mine superintendant and an engineer. No camp will be installed, since workers will commute from Zeballos. All other facilities required for the mine will be located in Zeballos.



CYANIDATION / GOLD RECOVERY

Flowsheet 3	SPUD CREEK PROPERTY McADAM RESOURCES INC.
Date April 1988	Drawn by Norecol

4.5 Water Supply

Potable water will be required for domestic use, fire protection and the process plant. The anticipated required supply is 0.004 to 0.005 m^3/s. Potential water supply sources will be investigated during Stage I studies.

4.6 Power Supply

Any power required for mine operation will be supplied by an on-site diesel generator.

4.7 Transportation

A 10.4 km public right-of-way gravel road provides access to the project area from the village of Zeballos. The road was constructed in the 1930s for mine access and will be maintained by McAdam Resources Inc. during mine development and operation.

4.8 Water Management

Surface runoff from the mill site and portal service area will be collected in ditches. Groundwater discharged from the portals will be diverted into collection ditches. All ditches will be channelled into sedimentation control ponds which will be located upslope from Spud and Goldvalley creeks.

5.0 ENVIRONMENTAL ASPECTS

The following chapter discusses environmental aspects of the Spud Valley Project, including setting, potential concerns, and ongoing and proposed studies.

5.1 Environmental Setting

5.1.1 Climate

The climate of the Zeballos area is West Coast Marine dominated by the on-shore flow of Pacific air masses. Temperatures are generally moderate, while precipitation is heavy, averaging over 4000 mm a year at Zeballos. Temperatures rarely drop below -10°C or exceed 30°C. The mean annual temperature is approximately 9°C (Atmospheric Environment Service). Because the terrain is variable, the amount of rain and snow, as well as temperature, will vary from that described for the AES sites.

Lower temperatures than those recorded at Zeballos can be expected for the claims area because of their higher elevation. Records from the Zeballos Iron Mines indicate that much higher rainfall intensities can occur at higher elevations.

5.1.2 Topography

The Spud Valley Project area is located in a steep, V-shaped valley in the Vancouver Island Ranges. The valley floor is very narrow, with a valley flat of 10 to 15 m in the vicinity of the existing mine. Elevations within the claims area are variable, ranging from 580 to 850 m.

5.1.3 Drainages

The project area is drained by Spud Creek and Goldvalley Creek, which are tributaries of the Zeballos River. The western portion of the project area is located approximately 2.5 km up Spud Creek from its confluence with the Zeballos River, while Goldvalley Creek flows 3 km from the eastern portion of the project area to the Zeballos River. From the confluence of Spud Creek and the Zeballos River, the Zeballos River flows 6 km to its mouth at Zeballos Inlet. Goldvalley Creek meets the Zeballos River 2 km upstream from the Spud Creek and Zeballos River confluence.

5.1.4 Hydrology

The pattern of discharge in the Zeballos area is dominated throughout the fall and early winter months by intense rainstorms causing very high flows. Snowmelt in the spring produces only a slight rise in discharge, while summer flows decrease to a minimum in late August or early September. Mean maximum daily discharge on the Zeballos River is 360 m^3/s, while the mean minimum daily discharge is 5.0 m^3/s (Environment Canada, 1985).

5.1.5 Fisheries

The Zeballos River supports anadromous and resident fish populations. Anadromous species include a remnant stock of pink salmon, a few river run sockeye salmon (25-250), and substantial runs of coho salmon (300-500), chinook salmon (0-750) and chum salmon (Penny, pers. comm.). Escapement of chum and coho have been recorded as high as 15,000 and 7,500 respectively. A run of summer steelhead (100-200) and a few winter steelhead have been recorded in this system (Lirette, pers. comm.). Anadromous migration in the Zeballos River is primarily restricted to the lower 1.5 km due to a series of chutes and falls ranging from 3 to 5 m in height. The Fish and Wildlife Branch and Department of Fisheries and Oceans suspect that low numbers of fish may negotiate the falls during peak flows, but this has not been documented. Local anglers have reported catches of steelhead in the upper watershed. Norecol captured resident rainbow trout and Dolly Varden char above the falls during a preliminary fish survey in October, 1985.

Government agencies have investigated construction of fish passage facilities for the falls in the lower Zeballos River, but this was considered too costly. Partial removal of the falls is not appropriate since this could affect the hydrological characteristics of the lower river and cause flooding in the town of Zeballos. Steelhead fry may be placed in the upper Zeballos River, but this enhancement technique has not been approved to date (Lirette, pers. comm.).

The proposed mine area is drained by two small tributaries of the Zeballos River, Spud and Goldvalley creeks. Goldvalley Creek has limited fisheries potential due to steep gradients and, except for the lower 100 to 200 m, probably contains no fish. Spud Creek is a moderate gradient (6 to 8 percent) stream with areas of good fish habitat, but only the lower kilometer is accessible due to a 6 m falls. A resident population of Dolly Varden char occurs upstream of the falls. Downstream areas probably support Dolly Varden char and rainbow trout.

5.1.6 Wildlife

Spud and Gold valleys are mid-elevation narrow valleys in which no major wildlife concerns have been identified. Logging activities have occurred in both valleys. There are winter ranges for black-tailed deer in the main Zeballos River valley. No elk are found in the area (Morrison, pers. comm.).

Wolves substantially reduced the deer population in the main Zeballos River watershed. They may have moved out of the area however, as there have not been any recently reported sightings (Morrison, pers. comm.).

Coastal black-tailed deer is the most common ungulate in Spud and Gold valleys. Black bear, cougar, marten, mink, and blue and spruce grouse occur in Spud, Gold and Zeballos River valleys. A variety of small mammals, such as squirrels, also occur in the area (Morrison, pers. comm.).

5.1.7 Vegetation

Spud and Gold valleys are located in the Coastal Western Hemlock biogeoclimatic zone. Dominant vegetation species include western hemlock, Sitka spruce and western red cedar.

5.1.8 Soils

Surficial materials on the steep valley sides of the claims area consist of colluvial deposits that overlie glacial till and bedrock. These colluvial deposits are derived from bedrock by frost shattering and other weathering processes, and from the underlying unconsolidated glacial till. The local, medium to fine grained, volcanic bedrock gives the colluvial material and underlying till textures that range from gravelly silt loam to rubbly sandy loam. The colluvial deposits are poorly consolidated and very porous. Groundwater tends to flow laterally downslope along the contact with the underlying bedrock or till to collect in local depressions and valley bottoms. Soil development on these deposits is Podzolic, including Humo-Ferric and Ferro-Humic Podzols.

5.1.9 Land use

Logging and mining are the primary land uses in the claims area vicinity. The claims area is located within Tree Farm Licence (TFL) 19, held by CIP Inc. The claims area has been logged, as has much of Gold Valley.

A prospective and previously operating mine currently owned by New Privateer is located approximately 0.5 km from the mouth of Spud Creek.

5.1.10 Water use

For most of the year, the village of Zeballos draws its water from a dammed creek located in the Beano Mountain area near the town. During low flow, water is pumped from a well beside the Zeballos River up to the dam.

A fish farm is located approximately 2.2 km south of Zeballos along the east shore of Zeballos Inlet.

5.2 Potential Concerns

Environmental concerns for the project are primarily those associated with potential effects on water quality and fisheries resources. Tailings facilities siting and design will require detailed study as a result of topographical and climatic constraints.

Analyses of precipitation data from the Iron Mines indicate that October rainfalls for the area are high. Norecol could find no obvious reason for the high October readings. There did not appear to be tabulation errors. Unpredictably high rainfall intensities could occur at the headwaters of Spud and Goldvalley creeks.

Water management structure design will include considerations for high rainfall intensities, seasonal runoff fluctuations, and steep topography. Groundwater discharge from mine workings and surface water draining from the facilities area will meet government standards prior to discharge into Spud and Goldvalley creeks.

Potential effects on the Spud Creek and Zeballos River fisheries resource will be assessed through further studies. Preliminary studies indicate that mine development will not significantly affect the fish habitat or production of these streams.

Preliminary acid/base accounting studies indicate potential for acid generation from certain lithologic units. This will be investigated during Stage I studies.

As outlined in section 5.1.10, potential effects on the village of Zeballos' drinking water supply will be studied during Stage I. Potential effects on the Zeballos Inlet aquaculture industry will be examined.

Because of the absence of critical terrestrial wildlife habitat in the vicinity of the claims area and the small scale nature of the project, project effects on wildlife are expected to be minimal.

No conflicts with forestry resource use in the area are anticipated. The claims area has been previously logged by CIP Inc. CIP will cease maintenance of Spud Valley roads in 1988.

5.3 Ongoing and Proposed Studies

5.3.1 Climate

A wedge rain gauge (manual) was installed at the Spud Creek exploration camp April 5, 1988, and is being monitored regularly by McAdam Resources personnel.

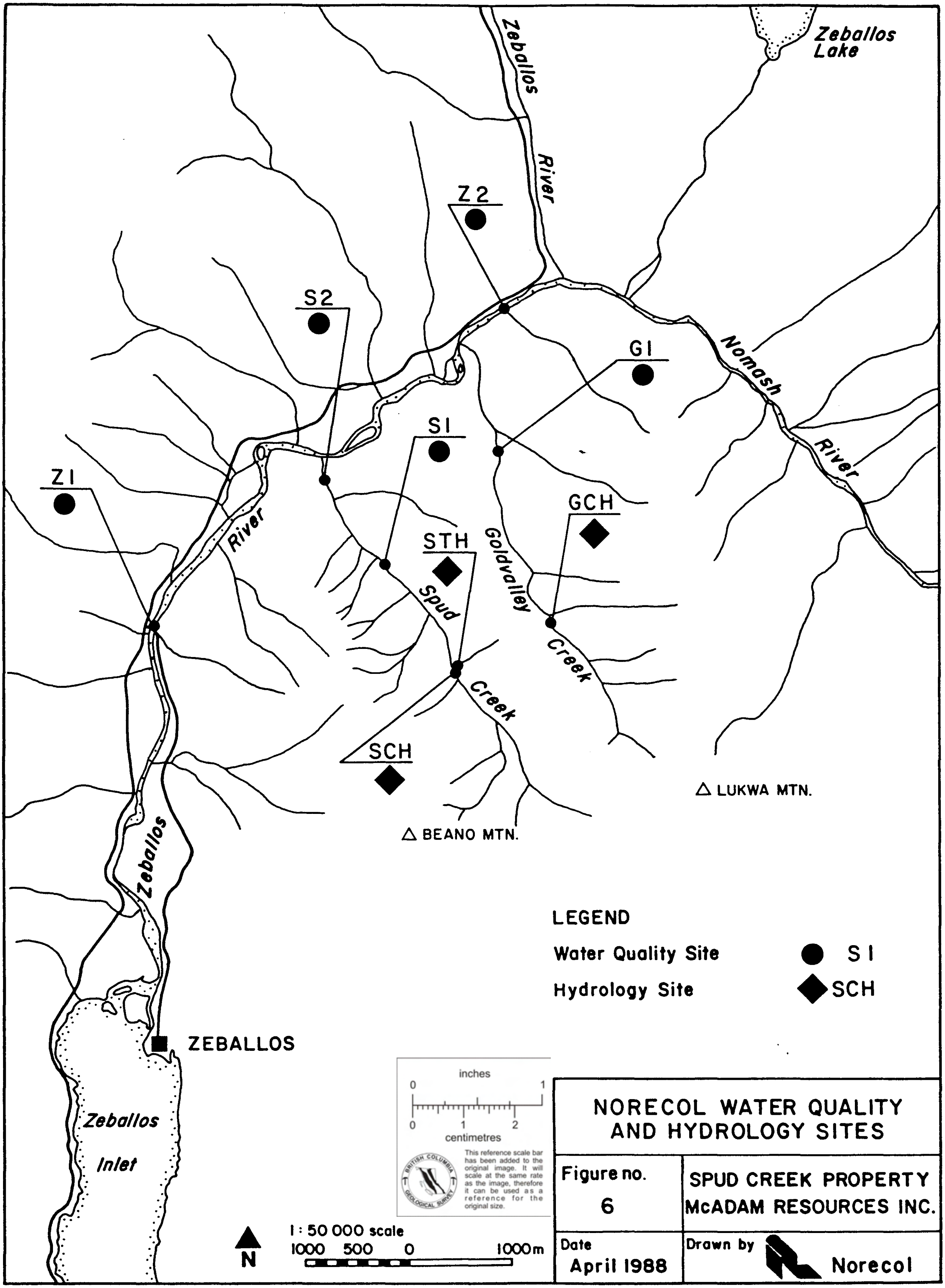
Copies of rainfall data for Zeballos have been collected from the Atmospheric Environment Service. Daily rainfall and snowfall records are available for the period from 1955 to 1960. Precipitation and temperature information was available for the Zeballos Iron Mines from 1964 to 1968. There were gaps in both sets of data.

Precipitation data gathered from the various sources will be used to estimate average annual precipitation and precipitation during storm events.

5.3.2 Hydrology

Hydrologic studies conducted by Norecol to date indicate that locally, the thin soils and small drainages of Spud Creek and Goldvalley Creek produce very flashy flows in response to rainfall. Flows in 1985 indicated by crest gauges were much higher than typically expected of similar drainages.

Hydrology field trips were conducted by Norecol Environmental Consultants Ltd. September 6 - 8, 1985, October 20 - 23, 1985 and February 5 - 7, 1986. Staff and crest gauges were installed at three sites on Spud and Goldvalley Creeks (Figure 6).


Zeballos River
Zeballos Lake
Nomash River
Z2
S2
G1
S1
Z1
GCH
STH
SCH
River
Goldvalley Creek
Spud Creek
Zeballos
Zeballos Inlet
ZEBALLOS
LUKWA MTN.
BEANO MTN.
LEGEND
Water Quality Site S1
Hydrology Site SCH
inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY
N
1 : 50 000 scale
1000 500 0 1000m
NORECOL WATER QUALITY AND HYDROLOGY SITES
Figure no. 6
SPUD CREEK PROPERTY
McADAM RESOURCES INC.
Date April 1988
Drawn by Norecol

Norecol will conduct additional hydrology studies during 1988 to monitor flows on Spud and Goldvalley creeks.

5.3.3 Groundwater

No groundwater information exists for the project area. Groundwater quantity and quality will be assessed during the Stage I environmental program. Studies will involve identification of aquifers and aquitards and water sample collection from adits and flowing boreholes, springs or seeps. Piezometers will be installed for groundwater characterization.

5.3.4 Water quality

Norecol established the following water quality collection sites in 1985: Goldvalley Creek at the lower road crossing (Site G1); Spud Creek near its mouth at the lower road crossing (Site S2); Spud Creek at the road crossing approximately 1.2 km below the McAdam licences (Site S1); Zeballos River at the road crossing a short distance above (Site Z2) and below (Site Z1) Spud and Goldvalley Creeks (Figure 6).

The Spud Creek sites were selected in part because of their locations upstream and downstream of New Privateer's property. A downstream site on the Zeballos River was selected because of potential effects on the the village of Zeballos' drinking water.

Water quality samples were collected from these sites during field trips conducted by Norecol October 20 to 23, 1985 and February 5 to 7, 1986. Samples were analyzed in the field for conductivity, dissolved oxygen, pH and temperature. Water samples were analyzed by ASL for pH, suspended solids, dissolved solids, turbidity, hardness, specific conductance, bicarbonate, sulphate, chloride, fluoride, nitrate, nitrite, ortho phosphate, total cyanide, total organic carbon, total Kjeldahl nitrogen, ammonia nitrogen, total and dissolved phosphorus, and dissolved and total metals (including aluminum, antimony, arsenic, barium, cadmium, copper, iron, lead, molybdenum, nickel, selenium and silver).

Water quality analysis results indicated that all waters were typical of west coast streams. They tended to be slightly acidic and contained low nutrients and low metals. All waters were safe for drinking water and for aquatic organisms. Results are included in Appendix 5.3-1.

Norecol will collect additional water quality samples at the same sites during 1988 field studies.

5.3.5 Acid generation

5.3.5.1 Completed studies

Acid-base accounting assays were obtained for six samples of ore and waste rock from the Spud Valley Mine. Results are detailed in Appendix 5.3-2. Two of the six samples were from the AT vein, two from the Linton North (LN) vein and two from waste rock adjacent to the LN samples. The LN vein is currently slated for mining, the AT vein is not. Ore samples were collected across a vein width of 0.3 m. Waste samples were also from a 0.3 m width.

The results indicate that AT vein rock has a very high net neutralization potential (192 to 348 kg calcium carbonate per tonne of rock). As the neutralizing potential of the rock is six to eight times greater than the maximum potential acidity, no acid would be produced from this rock. The net neutralization potentials of the LN vein samples were both negative (-43 and -12) and this ore has the potential to create acid if exposed to weathering. The waste rock adjacent to this vein material is acid consuming, however (net neutralizing potentials of 10.7 and 25.7). Waste rock results indicate that waste dumps, if composed entirely of this material, will not become acidic upon weathering. Sulphur content is low (0.009 and 0.043%) and neutralizing potential is 20 to 36 times greater than maximum potential acidity. The waste rock also has some capacity to neutralize acid that might be produced by LN vein material on exposed adit walls or in other situations where it is in close contact with vein material.

Paste pH results of the samples vary between 8.6 and 9.0. These pH values are in the alkaline range and indicate that none of the samples have the potential to immediately release acid, although samples LN-A and LN-B have the potential to release acid in time.

5.3.5.2 Proposed studies

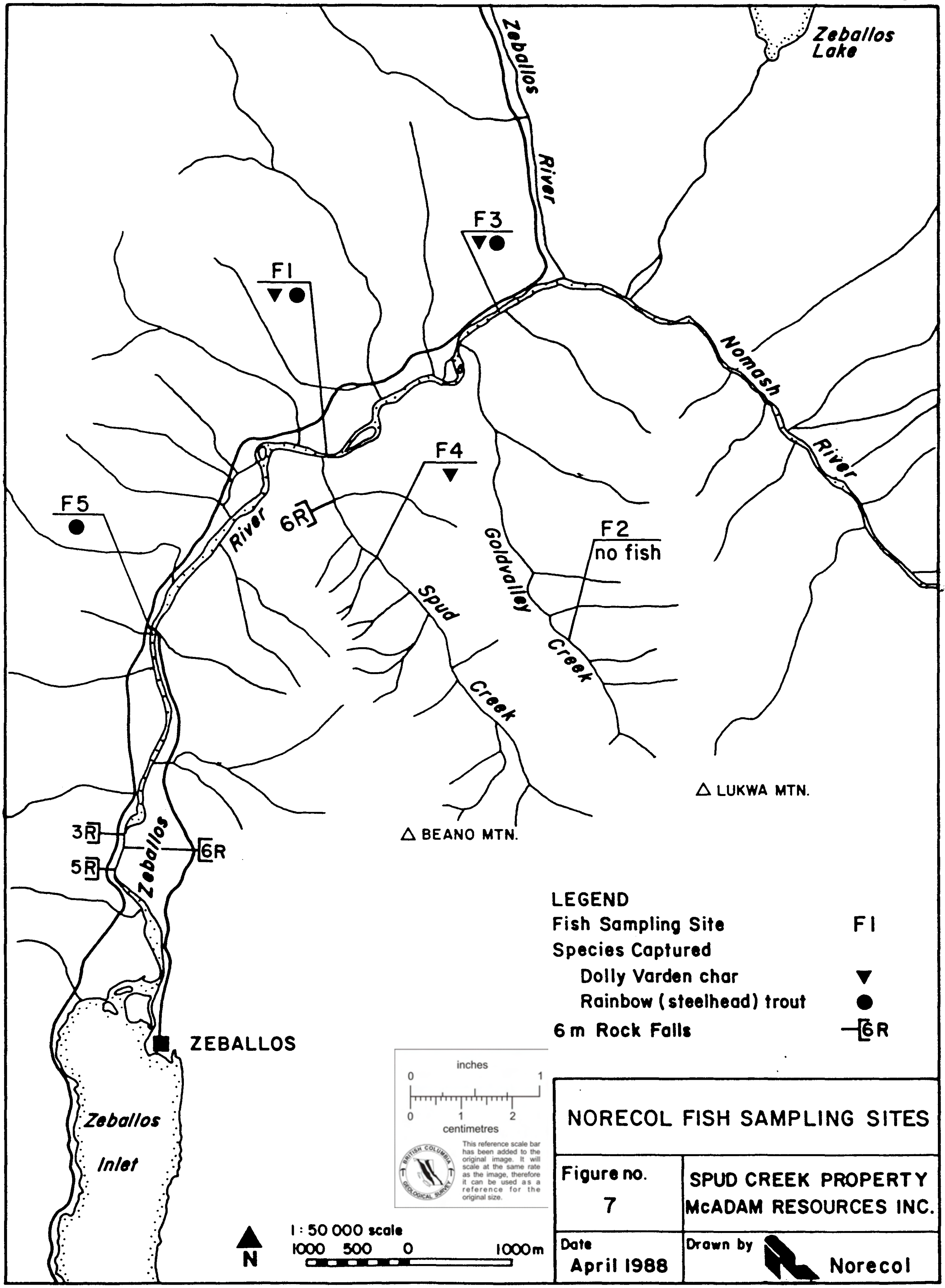
The pH of adit water, if present, will be monitored on a monthly basis to ascertain if any of the underground workings are producing acid. A triplicate set of samples from the LN zone and adjacent waste rock will be collected and assayed for acid-base accounting to verify results reported in section 5.3.5.1. As part of this study a metals scan will be run on representative samples of mill feed ore.

Once a mill process is decided upon, tailings will be characterized as to metals content, sulphur species and acid-producing potential at appropriate points in the mill process. If tests indicate tailings or waste rock may turn acidic, further tests will be undertaken.

5.3.6 Fisheries

Fisheries studies were conducted October 21 and 22, 1985 to document species distribution during the fall period. Sampling sites included the Zeballos River and Spud Creek. The Zeballos River was found to contain rainbow trout and Dolly Varden char, and a resident Dolly Varden population was found upstream of fish barriers in Spud Creek. Fish sampling in upper Goldvalley Creek yielded no fish.

Three beach seine hauls were conducted on the Zeballos River 50 m above Spud Creek. Young-of-the-year rainbow and steelhead trout were captured. Electroshocking at the same site captured young-of-the-year rainbow trout and Dolly Varden char. Electroshocking at Site 02 (Figure 7) in Goldvalley Creek opposite Portal 5 resulted in no captures. Rainbow trout and Dolly Varden char were captured by electroshocking at site 03 on the Zeballos River, below the Nomash River bridge (Figure 7).



Zeballos Lake
Zeballos River
Nomash River
F3
F1
F4
F5
F2
no fish
River
6R
Goldvalley Creek
Spud Creek
LUKWA MTN.
BEANO MTN.
3R
6R
5R
Zeballos
ZEBALLOS
Zeballos Inlet
LEGEND
Fish Sampling Site F1
Species Captured
Dolly Varden char
Rainbow (steelhead) trout
6 m Rock Falls 6R
inches
0
1
0
1
2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY
N
1 : 50 000 scale
1000 500 0 1000m
NORECOL FISH SAMPLING SITES
Figure no.
7
SPUD CREEK PROPERTY
McADAM RESOURCES INC.
Date
April 1988
Drawn by
Norecol

A spring fisheries survey will be conducted on Goldvalley Creek, Spud Creek and the Zeballos River to assess habitat potential of these streams. Additional work will be conducted on Goldvalley and Spud creeks to gather seasonal information on fish inhabiting these streams. Existing information will be gathered from appropriate government agencies and consultant reports.

5.3.7 Soils and surficial geology

Generalized 1:50 000 maps of soils, terrain and landforms in the project area have been produced by the Ministry of Environment and Parks. Field work will be conducted during 1988 to verify mapping units, describe on-site soils and document terrain hazards. Information obtained from these sources will be used to supplement background environmental data. It will also be considered during design and siting of mine facilities and during reclamation planning.

5.3.8 Vegetation

The Ministry of Environment and Parks has produced generalized maps of forest cover for the Zeballos area. Information from these maps will be supplemented with field work during 1988 to map basic habitat types. Vegetation mapping will be used for wildlife habitat interpretation of the area.

5.3.9 Wildlife

Wildlife studies will be conducted as part of the terrestrial reconnaissance studies of soil and vegetation.

5.3.10 Resource use

Heritage resource potential will be assessed from existing information at the "overview" level. Heritage potential will be identified in broad classes such as low, medium and high. Detailed heritage work will be conducted only if required and would depend on the findings of the overview study.

Information on land tenure, present land use, mineral resources, agriculture, forestry, aquaculture, recreation, hunting, angling and trapping will be compiled and assessed.

6.0 SOCIO-ECONOMIC ASPECTS

The following outline provides information on the socio-economic aspects of the project, with particular reference to the existing infrastructure, communities, populations, employment, and identification of potential impacts.

6.1 Setting

The project area is located in what is known as the North Island Region of Vancouver Island, and also within the Comox-Strathcona Regional District. This area has had a history of small mines with a few communities such as Zeballos beginning as mining towns. Other communities in the area were developed in response to the fishing and logging industries. Forestry remains the major industry in the area, followed by mining, fishing, tourism, and more recently, aquaculture.

6.2 Infrastructure and Services

The village of Zeballos is the closest community to the project area. The village was formed in response to the mining boom of the 1930's and 1940's. The population subsequently declined to the present level of 188. Access to the village is via 42 km of gravel road which begins 4 km south of Nimpkish on Highway 19.

Forestry is the major source of employment for village residents. There are also two resident fish buyers who provide seasonal employment, as well as increasing numbers of fish farms.

The village is serviced by a general store, hotel, and school. The school currently provides education for 30 students from kindergarten to grade 10 and has a 101 student capacity. In addition, there is a nursing station, volunteer fire department and ambulance service. Police services are provided by the R.C.M.P. at Port McNeill, 95 km to the northeast. Transportation services are provided by a daily limousine service and weekly heavy freight service.

The town of Port McNeill, located some 95 km to the north-east of the project area, is the next closest community. The major employer for this incorporated community of 2550 people is forestry. Educational facilities include schools for kindergarten students through to grade 12. It has medical and hospital facilities, in addition to an R.C.M.P. detachment. Freight services are mainly by truck along Highway 19.

Campbell River is the main supply centre for the project. This is a fully serviced community with a population of approximately 17,000 people, located on the east coast of Vancouver Island, 200 km southeast of the project. Access to the project from Campbell River is north on Highway 19 for 158 km, then south 42 km on a gravel forestry road. The main sources of employment for the community are forestry and mining, followed by tourism and service industries. The town has well developed services including medical, R.C.M.P. and airport facilities.

Transportation to service the project is mainly by road access. Light air service is available at Zeballos, as well as tide water for barge facilities.

6.3 Employment

Employment in the region is primarily in the resource-based industries of forestry, mining and fishing. Other sources of employment include the service industry, tourism, and more recently, aquaculture.

The economy of Zeballos is based on forestry, with CIP Inc. being the major employer. Fishing and aquaculture are also key sources of employment and tourism is increasing in importance.

Port McNeill's economy is also based primarily on forestry. Service industries provide some employment, with tourism being of secondary importance.

Campbell River is a forestry and mining town. Tourism and fishing are also major contributors to the economy. The town has a well developed service industry, since it is the major supply centre for the North Island region.

Zeballos and Port McNeill could provide several categories of workers to the project, including mechanics, heavy equipment operators, catering and camp services, and clerical personnel. In addition, Campbell River could provide skilled miners.

6.4 Potential Issues

Potential issues relate primarily to opportunities for services, housing, and employment for regional communities, with particular reference to Zeballos. Zeballos can accommodate many of the incoming workers' families, with ample room for village expansion.

6.5 Proposed Studies

A socio-economic assessment, as appropriate under the Mine Development Review Process, will be conducted as part of the Stage I Studies. The assessment will provide a description of regional communities, employment, available services, skills and housing, and ability to respond to project development.

REFERENCES

Atmospheric Environment Service. Annual Unpublished Data. Environment Canada, Pacific Regional Office, Vancouver, B.C.

Environment Canada. 1985. Historical Streamflow Summary for British Columbia. Inland Waters Directorate, Water Resources Water Survey of Canada. Ottawa, Canada.

Lirette, M. 1988. Personal Communication. Fish and Wildlife Branch, Ministry of Environment and Parks, Nanaimo, B.C.

Morrison, D. 1988. Personal Communication. Head, Habitat Protection Section, Fish and Wildlife Branch, Ministry of Environment and Parks, Nanaimo, B.C.

Penney, K. 1988. Personal Communication. Department of Fisheries and Oceans, Tahsis, B.C.

APPENDIX 5.3-1

WATER QUALITY RESULTS

ASL

August 30, 1985

File # 2095A

Report On: Analysis of Water Samples

Report To: Norecol Environmental Consultants Ltd.
Suite 100-1281 W. Georgia Str.
Vancouver, B.C.
V6E 3J7

Attn: Dr. J. Malick

RE: McAdam Project

We have analysed the water samples submitted by you staff on August 3, 1985 and report as follows:

SAMPLE INFORMATION

The samples were submitted in proper laboratory containers labelled as shown in "Results of Analysis." All were dated August 11, 1985 and were prefixed "McADAM."

METHODOLOGY

The analyses were carried out using procedures specified by the B.C. Ministry of the Environment. Further details can be provided upon request.

RESULTS

The results are summarized on the following four pages.

ASL ANALYTICAL SERVICE LABORATORIES LTD.

John M. Park, B.Sc.
Senior Partner

JMP:sls

analytical service laboratories
CONSULTING CHEMISTS & ANALYSTS
1650 Pandora Street
Vancouver, B.C. • V5L 1L6

ASL

RESULTS OF ANALYSIS

	SAMPLE IDENTIFICATION			
	SITE G1	SITE S1	SITE S2	SITE Z1
Physical Parameters				
pH	6.57	6.58	6.68	6.98
Suspended Solids	1.2	2.0	L1.0	1.6
Dissolved Solids	17.3	17.9	21.4	34.8
Turbidity (JTU)	L1.0	L1.0	L1.0	L1.0
Hardness $CaCO_3$	8.50	10.8	18.9	27.8
Specific Conductance (umhos/cm)	23.1	30.5	36.8	53.6
Dissolved Anions				
Bicarbonate HCO_3	7.92	8.45	8.45	23.5
Sulphate SO_4	3.5	4.0	5.0	L1.0
Chloride Cl	1.50	1.00	0.50	0.50
Fluoride F	L0.020	L0.020	L0.020	L0.020
Nitrate N	0.027	0.097	0.10	0.063
Nitrite N	L0.001	L0.001	L0.001	L0.001
Ortho Phosphate P	L0.001	L0.001	L0.001	L0.001
Other Parameters				
Total Cyanide CN	L0.005	L0.005	L0.005	L0.005
Ammonia Nitrogen N	L0.020	L0.020	L0.020	L0.020
Phosphorous (Dissolved) P	0.002	0.004	0.002	L0.001
Phosphorous (Total) P	0.002	0.004	0.002	L0.002

L = Less than

All results expressed as mg/L except pH, Turbidity and Hardness (and Conductivity)

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The following outline provides information on the socio-economic aspects of the project, with particular reference to the existing infrastructure, communities, populations, employment, and identification of potential impacts.

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A socio-economic assessment, as appropriate under the Mine Development Review Process, will be conducted as part of the Stage I Studies. The assessment will provide a description of regional communities, employment, available services, skills and housing, and ability to respond to project development.

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1650 Pandora Street
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ASL

RESULTS OF ANALYSIS

File No. 2095A

	SAMPLE IDENTIFICATION			
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Physical Parameters				
pH	6.57	6.58	6.68	6.98
Suspended Solids	1.2	2.0	L1.0	1.6
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Hardness $CaCO_3$	8.50	10.8	18.9	27.8
Specific Conductance (umhos/cm)	23.1	30.5	36.8	53.6
Dissolved Anions				
Bicarbonate HCO_3	7.92	8.45	8.45	23.5
Sulphate SO_4	3.5	4.0	5.0	L1.0
Chloride Cl	1.50	1.00	0.50	0.50
Fluoride F	L0.020	L0.020	L0.020	L0.020
Nitrate N	0.027	0.097	0.10	0.063
Nitrite N	L0.001	L0.001	L0.001	L0.001
Ortho Phosphate P	L0.001	L0.001	L0.001	L0.001
Other Parameters				
Total Cyanide CN	L0.005	L0.005	L0.005	L0.005
Ammonia Nitrogen N	L0.020	L0.020	L0.020	L0.020
Phosphorous (Dissolved) P	0.002	0.004	0.002	L0.001
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L = Less than

All results expressed as mg/L except pH, Turbidity and Hardness (and Conductivity)

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE G1	Site S1	SITE S2	SITE Z1
Dissolved Metals					
Aluminum	Al	0.11	0.044	0.50	0.25
Arsenic	As	0.0043	0.0029	0.0090	0.0004
Barium	Ba	0.006	L0.005	0.005	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	L0.001	L0.001	L0.001	L0.001
Iron	Fe	0.05	L0.03	L0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005
Total Metals					
Aluminum	Al	0.49	0.046	1.48	0.29
Arsenic	As	0.0044	0.0031	0.0096	0.0005
Barium	Ba	0.007	L0.005	0.006	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	0.001	L0.001	L0.001	L0.001
Iron	Fe	0.17	L0.03	L0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Mercury	Hg	L0.00005	L0.00005	L0.00005	L0.00005
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005

L = Less than
All results expressed as mg/L

ASL

RESULTS OF ANALYSIS

File No. 2095A

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Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	L0.001	L0.001	L0.001	L0.001
Iron	Fe	0.05	L0.03	L0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005
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Barium	Ba	0.007	L0.005	0.006	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	0.001	L0.001	L0.001	L0.001
Iron	Fe	0.17	L0.03	L0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Mercury	Hg	L0.00005	L0.00005	L0.00005	L0.00005
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005

L = Less than

All results expressed as mg/L

RESULTS OF ANALYSIS

ASL

	SAMPLE IDENTIFICATION			
	SITE Z2	TR. BLK		
Physical Parameters				
pH	7.00	4.47		
Suspended Solids	L1.0	L1.0		
Dissolved Solids	31.5	L1.0		
Turbidity (JTU)	L1.0	L1.0		
Hardness $CaCO_3$	18.8	L1.0		
Specific Conductance (umhos/cm)	43.1	5.3		
Dissolved Anions				
Bicarbonate HCO_3	20.6	L1.0		
Sulphate SO_4	3.1	L1.0		
Chloride Cl	0.50	L0.50		
Fluoride F	L0.020	L0.020		
Nitrate N	0.053	L0.001		
Nitrite N	L0.001	L0.001		
Ortho Phosphate P	L0.001	L0.001		
Other Parameters				
Total Cyanide CN	L0.005	---		
Ammonia Nitrogen N	L0.020	L0.020		
Phosphorous (Dissolved) P	L0.001	L0.001		
Phosphorous (Total) P	L0.001	L0.001		

L = Less than
All results expressed as mg/L except pH, Turbidity and Hardness (and Conductivity)

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE Z2	TR. BLK		
Dissolved Metals					
Aluminum	Al	0.038	L0.005		
Arsenic	As	0.0003	L0.0001		
Barium	Ba	L0.005	L0.005		
Cadmium	Cd	L0.0005	L0.0005		
Copper	Cu	L0.001	L0.001		
Iron	Fe	L0.03	L0.03		
Lead	Pb	L0.001	L0.001		
Molybdenum	Mo	L0.005	L0.005		
Nickel	Ni	L0.001	L0.001		
Silver	Ag	L0.0005	L0.0005		
Total Metals					
Aluminum	Al	0.060	L0.005		
~~Antimony~~	~~Sb~~				
Arsenic	As	0.0005	L0.0001		
Barium	Ba	L0.005	L0.005		
Cadmium	Cd	L0.0005	L0.0005		
Copper	Cu	L0.001	L0.001		
Iron	Fe	L0.03	L0.03		
Lead	Pb	L0.001	L0.001		
Mercury	Hg	L0.00005	L0.00005		
Molybdenum	Mo	L0.005	L0.005		
Nickel	Ni	L0.001	L0.001		
Silver	Ag	L0.0005	L0.0005		

L = Less than
All results expressed as mg/L except pH, Tubidity and Conductivity

ASL

Date November 20, 1985

File No. 2344A

Report On: Analysis of Water Samples   Re: McAdam Project

Report To: Norecol Environmental Consultants Ltd.
Suite 100 - 1281 West Georgia Street
Vancouver, B. C.
V6E 3J7

Attention: Dr. J. Malick

We have analysed the water samples submitted by your staff on October 23, 1985 and report as follows:-

SAMPLE INFORMATION

The samples were submitted in proper laboratory containers labelled as shown in "Results of Analysis". All were prefixed "McAdam".

METHODOLOGY

The analyses were carried out using procedures specified by the B. C. Ministry of the Environment. Further details can be provided upon request.

RESULTS

The results are summarized on the following four pages.

ASL ANALYTICAL SERVICE LABORATORIES LTD.

John M. Park, B.Sc.
Senior Partner

JMP/mm

analytical service laboratories
CONSULTING CHEMISTS & ANALYSTS
1650 Pandora Street
Vancouver, B.C. • V5L 1L6

ASL

RESULTS OF ANALYSIS

File No. 2344A

	SAMPLE IDENTIFICATION			
	SITE G1	SITE S1	SITE S2	SITE Z1
Physical Parameters				
pH	5.70	5.95	6.27	7.02
Suspended Solids	26.4	3.6	4.4	44.8
Dissolved Solids	7.9	8.6	18.3	22.6
Turbidity (JTU)	14.0	3.2	4.8	24.8
Hardness $CaCO_3$	2.85	4.26	5.76	15.3
Specific Conductance (umhos/cm)	13.1	13.2	25.0	39.4
Dissolved Anions				
Bicarbonate HCO_3	2.44	2.44	9.76	12.2
Sulphate SO_4	1.0	L1.0	2.2	1.0
Chloride Cl	L0.50	L0.50	L0.50	L0.50
Fluoride F	L0.020	L0.020	L0.020	L0.020
Nitrate N	L0.003	0.070	0.13	0.19
Nitrite N	L0.001	0.010	0.004	0.005
Ortho Phosphate P	0.008	0.002	0.005	L0.001
Other Parameters				
Total Cyanide CN	L0.005	L0.005	L0.005	L0.005
Total Organic Carbon TOC	-	-	-	-
Total Kjeldahl Nitrogen N	-	-	-	-
Ammonia Nitrogen N	L0.020	L0.020	L0.020	L0.020
Phosphorous (Dissolved) P	0.008	0.002	0.005	0.006
Phosphorous (Total) P	0.008	0.002	0.006	0.010

L = Less than
All results expressed as mg/L except pH, Turbidity and Hardness

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE G1	SITE S1	SITE S2	SITE Z1
Dissolved Metals					
Aluminum	Al	0.23	0.27	0.19	0.18
Antimony	Sb	-	-	-	-
Arsenic	As	0.0006	0.0022	0.0023	0.0004
Barium	Ba	L0.005	L0.005	L0.005	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	L0.001	L0.001	L0.001	L0.001
Iron	Fe	0.10	0.63	0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Selenium	Se	-	-	-	-
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005
Total Metals					
Aluminum	Al	1.73	0.47	3.86	0.52
Antimony	Sb	-	-	-	-
Arsenic	As	0.0064	0.0064	0.010	0.0008
Barium	Ba	0.012	L0.005	0.031	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	0.004	0.002	0.010	0.003
Iron	Fe	1.63	0.28	3.33	0.27
Lead	Pb	0.001	L0.001	L0.001	L0.001
Mercury	Mg	L0.00005	0.00016	L0.00005	L0.00005
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Selenium	Se	-	-	-	-
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005

L = Less than
All results expressed as mg/L except pH, Tubidity and Hardness

ASL

RESULTS OF ANALYSIS

File No. 2344A

	SAMPLE IDENTIFICATION			
	SITE Z2			
Physical Parameters				
pH	7.03			
Suspended Solids	L1.0			
Dissolved Solids	21.6			
Turbidity (JTU)	L1.0			
Hardness $CaCO_3$	14.5			
Specific Conductance (umhos/cm)	38.2			
Dissolved Anions				
Bicarbonate HCO_3	9.76			
Sulphate SO_4	L1.0			
Chloride Cl	L0.50			
Fluoride F	L0.020			
Nitrate N	0.11			
Nitrite N	0.004			
Ortho Phosphate P	L0.001			
Other Parameters				
Total Cyanide CN	L0.005			
Total Organic Carbon TOC	-			
Total Kjeldahl Nitrogen N	-			
Ammonia Nitrogen N	L0.020			
Phosphorous (Dissolved) P	0.002			
Phosphorous (Total) P	0.002			

L = Less than
All results expressed as mg/L except pH, Turbidity and Hardness

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE Z2			
Dissolved Metals					
Aluminum	Al	0.15			
Antimony	Sb	-			
Arsenic	As	L0.0001			
Barium	Ba	L0.005			
Cadmium	Cd	L0.0005			
Copper	Cu	L0.001			
Iron	Fe	L0.03			
Lead	Pb	L0.001			
Molybdenum	Mo	L0.005			
Nickel	Ni	L0.001			
Selenium	Se	-			
Silver	Ag	L0.0005			
Total Metals					
Aluminum	Al	0.29			
Antimony	Sb	-			
Arsenic	As	L0.0001			
Barium	Ba	L0.005			
Cadmium	Cd	L0.0005			
Copper	Cu	0.003			
Iron	Fe	0.17			
Lead	Pb	L0.001			
Mercury	Mg	L0.00005			
Molybdenum	Mo	L0.005			
Nickel	Ni	L0.001			
Selenium	Se	-			
Silver	Ag	L0.0005			

L = Less than
All results expressed as mg/L except pH, Tubidity and Hardness

ASL

Date: February 28,1986

File No. 2675A

Report On: Analysis of Water Samples Re: McAdam Project

Report To: Norecol Environmental Consultants Ltd.
Ste. 100 - 1281 West Georgia Street
Vancouver, B. C.
V6E 3J7

Attention: Dr. J. Malick

We have analysed the water samples submitted by your staff on February 10, 1986 and report as follows:

SAMPLE INFORMATION

The samples were submitted in proper laboratory containers labelled as shown in "Results of Analysis".

METHODOLOGY

The analyses were carried out using procedures specified by the B. C. Ministry of the Environment. Further details can be provided upon request.

RESULTS

The results are summarized on the following pages.

ASL ANALYTICAL SERVICE LABORATORIES LTD.

John M. Park, B.Sc.
Senior Partner

JMP/mm

analytical service laboratories
CONSULTING CHEMISTS & ANALYSTS
1650 Pandora Street
Vancouver, B.C. • V5L 1L6

ASL

RESULTS OF ANALYSIS

File No. 2675A

		SAMPLE IDENTIFICATION			
		SITE G1	SITE S1	SITE S2	SITE Z1
Physical Parameters					
pH		6.36	6.16	6.30	6.90
Suspended Solids		L1.0	L1.0	2.0	L1.0
Dissolved Solids		8.0	11.0	18.0	23.7
Turbidity (JTU)		L1.0	L1.0	L1.0	L1.0
Hardness	$CaCO_3$	2.98	6.81	7.93	19.2
Specific Conductance (umhos/cm)		10.8	16.2	21.6	43.2
Dissolved Anions					
Bicarbonate	HCO_3	12.8	2.55	5.10	15.3
Sulphate	SO_4	1.0	L1.0	1.0	L1.0
Chloride	Cl	L0.50	L0.50	L0.50	L0.50
Fluoride	F	L0.020	L0.020	L0.020	L0.020
Nitrate	N	0.013	0.019	0.058	0.077
Nitrite	N	L0.001	L0.001	L0.001	L0.001
Ortho Phosphate	P	L0.001	L0.001	L0.001	L0.001
Other Parameters					
Total Cyanide	CN	L0.005	L0.005	0.006	L0.005
Total Organic Carbon	TOC	6.3	2.0	2.0	2.9
Total Kjeldahl Nitrogen	N	0.098	0.044	0.074	0.13
Ammonia Nitrogen	N	L0.020	L0.020	L0.020	L0.020
Phosphorous (Dissolved)	P	L0.001	0.003	0.007	L0.001
Phosphorous (Total)	P	L0.001	0.068	0.068	L0.001

L = Less than

All results expressed as mg/L except pH, Turbidity and Hardness

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE G1	SITE S1	SITE S2	SITE Z1
Dissolved Metals					
Aluminum	Al	0.13	0.050	0.31	0.029
Antimony	Sb	-	-	-	-
Arsenic	As	0.0011	0.0020	0.0047	L0.0001
Barium	Ba	L0.005	L0.005	L0.005	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	L0.001	L0.001	L0.001	L0.001
Iron	Fe	0.04	L0.03	L0.03	L0.03
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Selenium	Se	L0.0005	L0.0005	L0.0005	L0.0005
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005
Total Metals					
Aluminum	Al	0.15	0.051	0.50	0.038
Antimony	Sb	-	-	-	-
Arsenic	As	0.0011	0.0020	0.0047	L0.0001
Barium	Ba	L0.005	L0.005	L0.005	L0.005
Cadmium	Cd	L0.0005	L0.0005	L0.0005	L0.0005
Copper	Cu	L0.001	L0.001	L0.001	L0.001
Iron	Fe	0.06	L0.03	0.09	0.04
Lead	Pb	L0.001	L0.001	L0.001	L0.001
Mercury	Hg	L0.00005	L0.00005	L0.00005	L0.00005
Molybdenum	Mo	L0.005	L0.005	L0.005	L0.005
Nickel	Ni	L0.001	L0.001	L0.001	L0.001
Selenium	Se	L0.0005	L0.0005	L0.0005	L0.0005
Silver	Ag	L0.0005	L0.0005	L0.0005	L0.0005

L = Less than

All results expressed as mg/L except pH, Tubidity and Hardness

ASL

RESULTS OF ANALYSIS

	SAMPLE IDENTIFICATION			
	SITE Z2			
Physical Parameters				
pH	6.76			
Suspended Solids	L1.0			
Dissolved Solids	22.6			
Turbidity (JTU)	L1.0			
Hardness $CaCO_3$	16.8			
Specific Conductance (umhos/cm)	32.4			
Dissolved Anions				
Bicarbonate HCO_3	15.3			
Sulphate SO_4	L1.0			
Chloride Cl	L0.50			
Fluoride F	L0.020			
Nitrate N	0.069			
Nitrite N	L0.001			
Ortho Phosphate P	L0.001			
Other Parameters				
Total Cyanide CN	L0.005			
Total Organic Carbon TOC	4.1			
Total Kjeldahl Nitrogen N	0.060			
Ammonia Nitrogen N	0.020			
Phosphorous (Dissolved) P	L0.003			
Phosphorous (Total) P	0.054			

L = Less than

All results expressed as mg/L except pH, Turbidity and Hardness

ASL

RESULTS OF ANALYSIS

		SAMPLE IDENTIFICATION			
		SITE Z2			
Dissolved Metals					
Aluminum	Al	0.031			
Antimony	Sb	-			
Arsenic	As	L0.0001			
Barium	Ba	-			
Cadmium	Cd	L0.0005			
Copper	Cu	L0.001			
Iron	Fe	L0.03			
Lead	Pb	L0.001			
Molybdenum	Mo	L0.005			
Nickel	Ni	L0.001			
Selenium	Se	L0.0005			
Silver	Ag	L0.0005			
Total Metals					
Aluminum	Al	0.039			
Antimony	Sb	-			
Arsenic	As	L0.0001			
Barium	Ba	-			
Cadmium	Cd	L0.0005			
Copper	Cu	L0.001			
Iron	Fe	L0.03			
Lead	Pb	L0.001			
Mercury	Hg	L0.00005			
Molybdenum	Mo	L0.005			
Nickel	Ni	L0.001			
Selenium	Se	L0.0005			
Silver	Ag	L0.0005			

L = Less than
All results expressed as mg/L except pH, Tubidity and Hardness

APPENDIX 5.3-2

ACID-BASE ACCOUNTING RESULTS

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
450 MATHESON BLVD., E., UNIT 54, MISSISSAUGA,
ONTARIO, CANADA L4Z-1R5
PHONE (416) 890-0310

To: McADAM RESOURCES INC.
1415 - 25 ADELAIDE ST., EAST
TORONTO, ON
M5C 1Y2
Project :
Comments:

Page No. : 1
Tot. Pages: 1
Date : 29-MAR-88
Invoice # : I-8813278
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8813278

SAMPLE DESCRIPTION	PREP CODE		S % (Leco)	MAX POT ACID **	Neutral Poten**	PASTE pH	Net Neutral Poten**
AT-A	208	--	0.883	27.6	220.00	8.8	192.4
AT-B	208	--	2.16	67.5	416.00	8.6	348.5
LN-A	208	--	1.930	60.3	17.00	8.6	-43.3
LN-B	208	--	1.280	40.0	28.00	8.8	-12.0
WASTE-A	208	--	0.009	0.3	11.00	9.0	10.7
WASTE-B	208	--	0.043	1.3	27.00	8.8	25.7

Note: ** Units = Tons of calcium carbonate equivalent per thousand tons material

ALL ASSAY DETERMINATIONS ARE PERFORMED OR SUPERVISED BY B.C. CERTIFIED ASSAYERS

CERTIFICATION : B Swatte