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**AVINO MINES AND RESOURCES LTD.
BRALORNE PROPERTY**

**A PRE-APPLICATION FOR A
MINE DEVELOPMENT CERTIFICATE
FOR THE
BRALORNE PROPERTY**

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July, 1992

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**AVINO MINES AND RESOURCES LTD
THE BRALORNE PROJECT**

EXECUTIVE SUMMARY

This Pre-Application is submitted by Avino Mines and Resources Ltd. (AVINO) as a first step towards obtaining approval for the reopening and redevelopment of the Bralorne Mine. AVINO has delineated ore reserves to warrant a 450 t/day operation. The feasibility study compiled in 1982 indicates that the project is economic. Thus, AVINO has decided to proceed with the redevelopment of the Bralorne Mine and the construction of a new mill at an estimated cost of \$5,000,000. It is estimated that the mill will require \$3,200,000 for the mill and the tailings disposal area, and \$1,800,000 for development and working capital.

The Bralorne area is a historic gold mining area known as the Bridge River Camp. The previous Bralorne and Pioneer Mines produced over 4.1 million ounces of gold between 1932 and 1971. Proven, Probable and Possible ore reserves in the Bralorne Mine above the 1,000 level total 322,000 st with an average grade of 0.35 oz/st (9 g/mt). Additional ore reserves are anticipated below the 1,000 level, subject to further exploration work. Also, new discoveries N/E of the Ferguson thrust will be developed, and exploration will continue.

New discoveries on the Peter vein that have the same geological properties as found at Bralorne site contained high values of gold. Drilling along the vein in 1989 encountered 215 feet grading 0.38 oz/st gold over an average width of 2.4 feet. This intersection included 105 feet grading 0.611 oz/st gold and terminated in mineralization averaging 0.58 oz/st gold. A surface trench on the zone produced an average grade of 2.90 oz/st gold over a width of 9.4 feet.

Early studies indicate that a portion of the old Bralorne workings intersected the Peter vein and also suggest that the Loco Property may host an undeveloped extension of the Bralorne's King mine. The King mine contained one of the company's richest veins, having an average grade of

**AVINO MINES AND RESOURCES LTD
THE BRALORNE PROJECT**

0.75 oz/st gold.

The proposed new mill will include semi-autogenous grinding, gravity separation and floatation. Spent tailings fines will be sent to a tailings impoundment and spent coarse tailings will be used as backfill in the mine. A detailed water balance has not been completed but the amount of recycle will be maximized wherever possible.

Environmental and socioeconomic concerns will be addressed in updated and additional studies to those completed in 1982 for the previous Stage I submission. Since the project was never developed at that time, a new Application For A Mine Development Certificate (Application) will be prepared and submitted later this year.

1.0 INTRODUCTION

The Bralorne area has been an active mining camp since placer gold was discovered in the Bridge River area in 1863. Most of the important placer deposits, particularly in the Cadwallader Creek area, had been discovered and exploited by 1897. No active developments were commenced on vein deposits until 1928, when the Pioneer Mine began operation. The Bralorne Mine was put into operation in 1932.

The Pioneer and Bralorne Mines operated independently until 1959, when their operations were merged. Following the merger, the Pioneer Mill was closed and ore from the Pioneer Mine was treated in the Bralorne Mill. The Bralorne operations ceased in 1971.

An unsuccessful attempt was made to reopen the Bralorne Mine in 1974 and 1975, but the project proved to be uneconomical. In 1975, the mine was shut down completely and much of the equipment was removed from the mine and mill site.

In July 1980, E & B Exploration Inc. and Geomex signed an option agreement with Bralorne Resources Ltd. to earn 50% interest in the property for an expenditure of \$5 million. At that time, E & B Exploration Inc. planned to reopen the mine and, as part of its application to do so, prepared a Stage I submission in 1982 to the Ministry of Energy, Mines and Petroleum Resources, Inspection and Engineering Division. The Stage I Report consisted of three volumes, plus an Addendum submitted in 1983 and 1988, respectively, have been utilized by AVINO in the process of permitting the property for production. The total Bralorne property, equipment, infrastructure, etc., was taken over by AVINO on November 30, 1991. Since 1980, the previous owner spent approximately \$15,000,000 on the Bralorne property. Underground evaluation, drill out reserves, geological and engineering reports, 50 man camp, mining equipment and offices consumed the majority of the dollars spent.

2.0 PROPERTY DESCRIPTION

2.1 LOCATION AND LAND TENURE

The Bralorne Mine is located in the Bridge River area of British Columbia (Figure 1) approximately 160 km (100 miles) due north of Vancouver at longitude 123°48.5' and latitude 50°46.5', and 65 km (40 miles) west of Lillooet, B.C.

Access to the Bralorne townsite is via the Trans-Canada Highway to Lytton, thence to Lillooet and continuing on a gravel highway to Gold Bridge and the mine site, a total distance of approximately 460 km (280 miles).

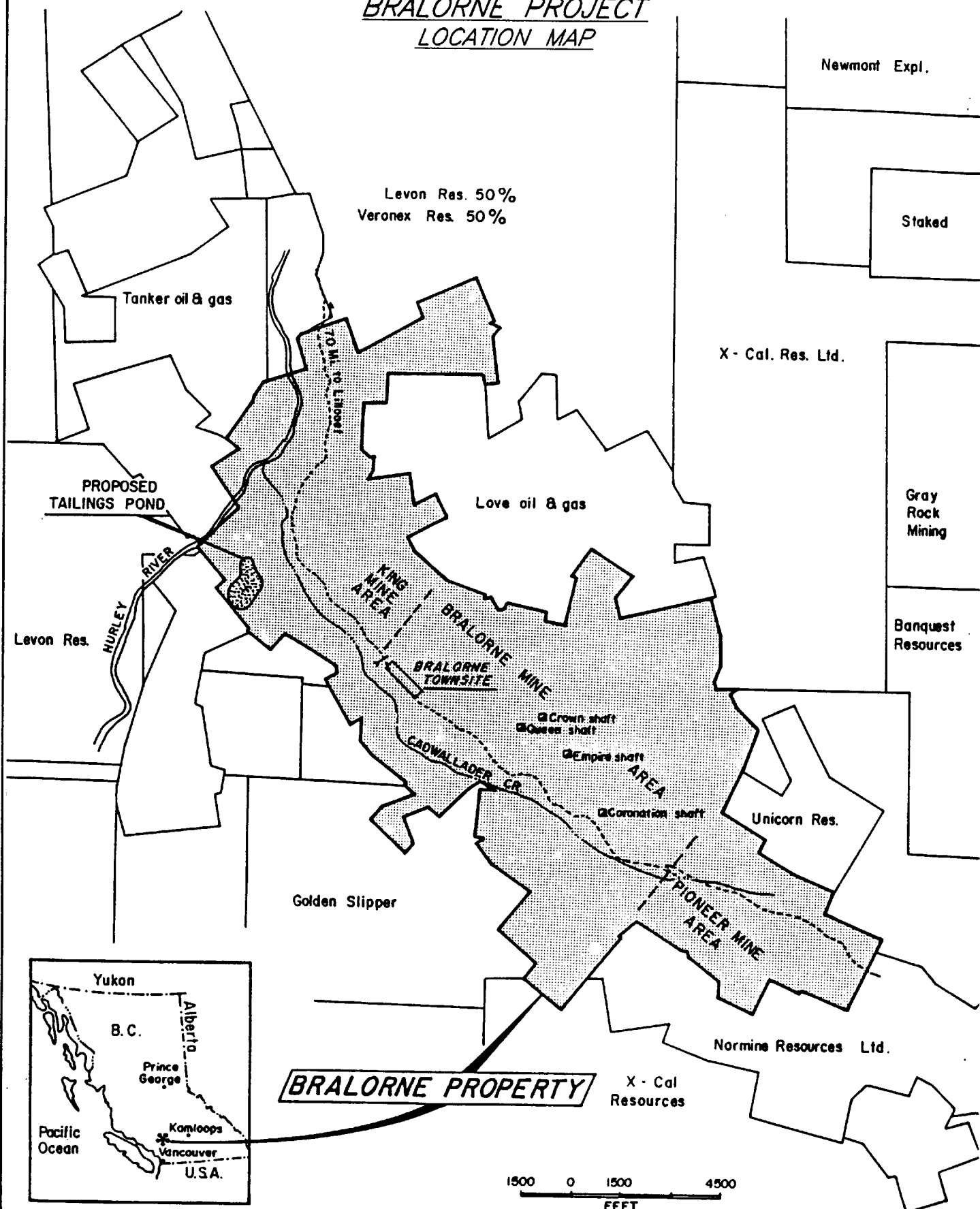
The Bralorne Mine can also be reached by travelling Highway #99 to Pemberton, and thence by logging road along the Hurley River to Gold Bridge and Bralorne, or by taking the Duffy Lake Road to Lillooet and then to Gold Bridge and the mine site.

The Bralorne property is comprised of 133 Crown granted mineral claims, five reverted Crown granted claims, one located mineral claim and two placer leases. Surface title to nine parcels, including most of the land required for the plant and tailings area, is also held. The Love Oil property is comprised of 21 Crown grants and one staked claim.

2.2 HISTORICAL OVERVIEW

Gold was discovered in the Bridge River area in 1863 when prospectors found small, but rich, placer deposits in the Hurley and Bridge Rivers. The important deposits in the Bridge River area, particularly the Cadwallader Creek area, were discovered by 1897. No active development was completed on the vein deposits until 1928. The Pioneer Mine commenced operation in 1928 and

AVINO MINES AND RESOURCES LTD.
BRALORNE PROJECT
LOCATION MAP



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FIGURE 1

CAD FILE: I:\CAD\HALLAM\FIG1.DWG Plot scale 1"=1'

the Bralorne Mine in 1932.

The capacity of the Bralorne Mill, which started in February 1932. was gradually increased to 550 tons per day. The Pioneer Mill, which commenced with an initial capacity of 100 tons per day in 1928, was increased to 400 tons per day in 1934. The combined operations produced over 4.1 million ounces of gold from 1932 to 1971.

Increasing costs of production resulted in the mine closure in 1971. An attempt was made to reopen the Bralorne Mine in 1974 and 1975. The low price of precious metals in 1975 and the provincial royalties on the gold price, made the project uneconomical. In 1975, the mine was shut down completely. The hoisting and pumping equipment were removed from the mine and some of the buildings, houses, and land lots were sold.

3.0 GEOLOGY AND MINERALIZATION

3.1 GEOLOGICAL SETTING

The Bralorne Deposit includes the veins of the former King, Lorne, Coronation, Bralorne and Pioneer Mines. The holdings of the Bralorne Project cover the majority of the producing veins in the area known as the "Bridge River Camp".

The rocks in the Cadwallader Creek area are made up of a series of cherty sediments and volcanics (Ferguson Series of Permian age), which are overlain by the Pioneer Greenstones and the Hurley and Noel Formations of Triassic age. The assemblage of sediments and volcanics has been folded and intruded by a series of perioditite (new serpentine) gabbro, diorite, quartz-diorite, quartz and feldspar porphyries, soda granite and albitite.

3.2 MINERALIZATION

Gold-bearing veins occur principally in the greenstones, to a lesser extent in the sediments, and in all of the intrusive rocks except the serpentine and the gabbro. The veins show a spatial relationship to the sodic intrusive rocks.

The veins have, in general, an east-west and north-south strike. The east-west veins dip to the north at angles of 60° to 80° and the north-south veins dip to the west at angles of 45° to 60°. The veins consist of quartz and contain minor amounts of sulphides, tellurides and usually fine gold. Thirty-five veins have been traced in the workings of the Bralorne Mine.

Stoping of the ore was carried out by the former operators of the Bralorne Mine on the veins from the surface to the 4,577 level, a slope distance of about 2.4 km (1.5 miles). There appears to be little change in the gold content of the veins in this distance. When the mine closed in 1971, the gold ore from the lower levels contained 0.57 ounces of gold per ton. The gold content of the ore from the Bralorne Mine over the previous 40 years of operation averaged 0.53 ounces of gold per ton.

3.3 PRELIMINARY GEOLOGICAL ORE RESERVES

The Bralorne Deposit has been delineated by drilling from the surface and underground. Based on the data from these drill holes, a preliminary ore reserve has been calculated:

	<u>PROVEN & PROBABLE</u>	<u>POSSIBLE</u>
Above 800 level	182,000 st @ 0.43*	74,000 st @ 0.34*
800 - 1,000 level	49,000 st @ 0.24*	17,000 st @ 0.25*
Total above 1,000 level	231,000 st @ 0.33	91,000 st @ 0.40
TOTAL	322,000 st @ 0.35*	

Exploration work is continuing on both surface and underground deposits and additional ore reserves are expected to be defined.

In addition, the following reserves are available below the 1000 level

	<u>PROVEN & PROBABLE</u>	<u>POSSIBLE</u>
1000-2600 level	688,000 st @ 0.24*	54,000 st @ 0.19*
Total below 1000 level	742,000 st @ 0.24*	

* Ounces/short ton. Cutoff grade 0.14 oz/st.

4.0 CONCEPTUAL DEVELOPMENT PLAN

4.1 CONCEPTUAL MINE PLAN

Of the total ore reserves above the 1,000 level (322,000 st), 80%, or 264,000 st, are located in the 51 Vein and the 51B FW Vein (Figure 2). These veins will therefore be developed first.

The 51 Vein has drifts driven on all levels. Some of these require rehabilitation or re-driving because of deterioration. The 51B FW Vein requires level drifting on all levels except the 400 and 800 levels. General access to both veins will be through surface adits at the 200 and 300 levels, and through the Empire Shaft for the other levels.

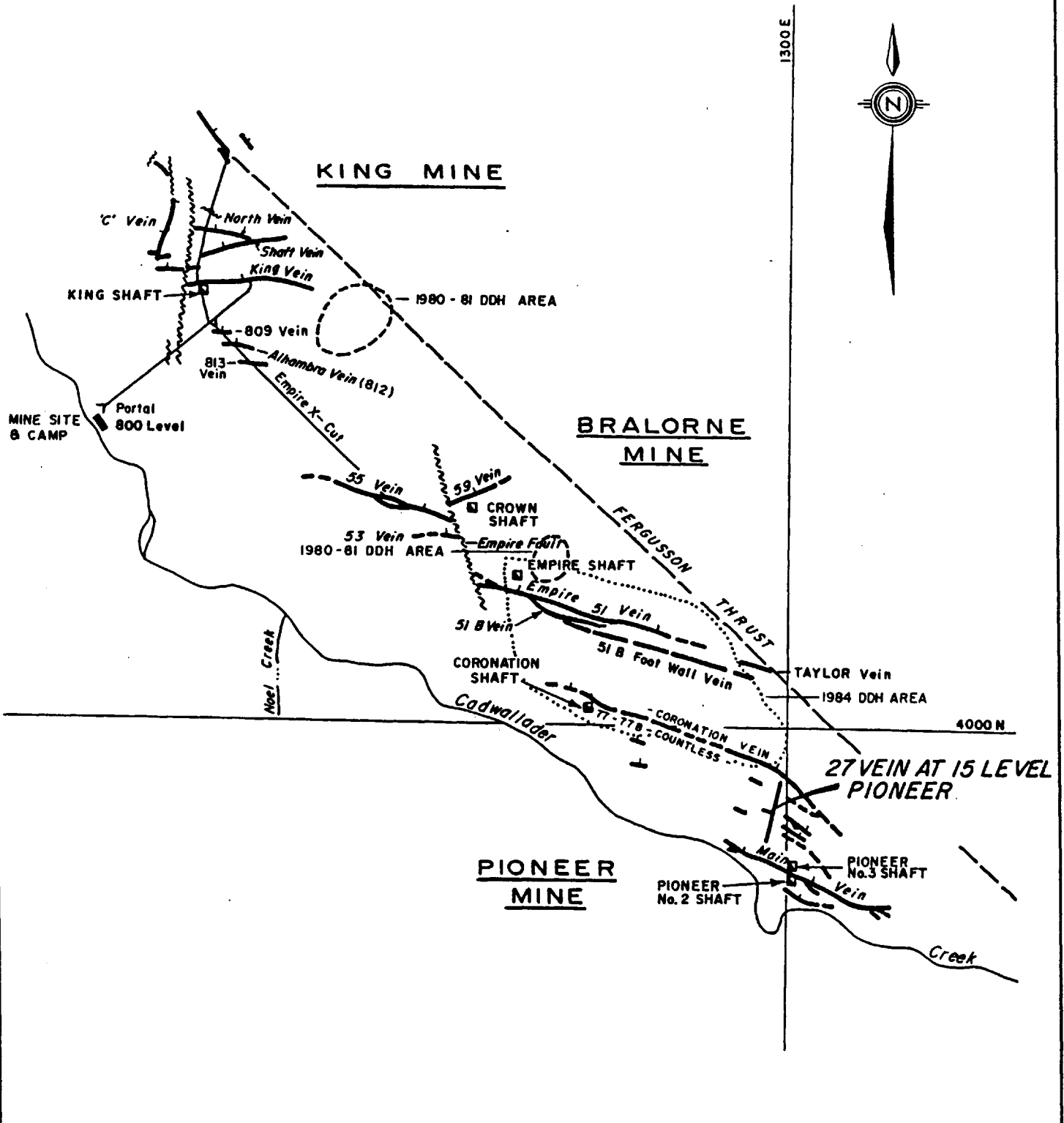
Concurrent with development of the 51 and 51B FW Veins, other areas of the mine will be rehabilitated for access to other veins.

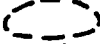

All blocked-out ore reserves will be recovered by shrinkage stope mining. Eleven shrinkage stopes plus development ore will be required to maintain the mill throughput of 450 st/day.

4.2 CONCEPTUAL MILLING PLAN

The proposed mill will be located close to the site of the old Bralorne Mill. Based on preliminary test work on ore samples reported in the Feasibility Study (E & B Explorations Inc., 1982), the milling operations are expected to comprise semi-autogenous grinding, gravity separation and floatation. Figure 3 presents the updated mill process flow sheet compiled by R.M. Samuels Consulting Inc. (1992) based on a milling rate of 450 st/d production level. Spent tailings fines will report to a tailings pond and coarse tailings will be returned to the mine workings. The updated milling plan does not include cyanidation or mercury amalgamation.

AVINO MINES AND RESOURCES LTD.
BRALORNE PROJECT
SURFACE PROJECTION OF VEINS



 1980 - 1981 AREA OF DRILLING
 1984 AREA OF DRILLING

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FIGURE 2

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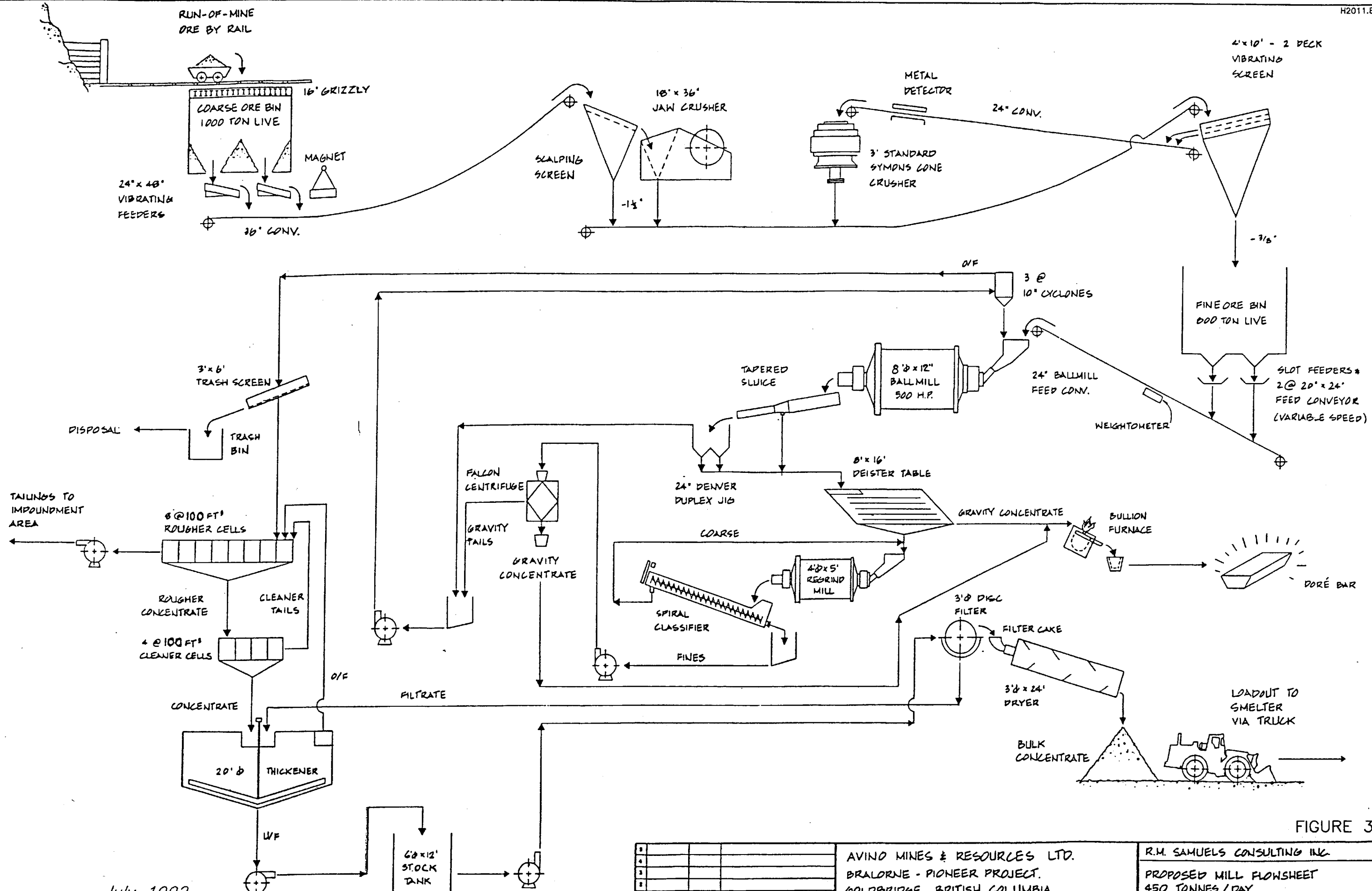


FIGURE 3

AVINDO MINES & RESOURCES LTD. BRALORNE - PIONEER PROJECT. GOLDBRIDGE, BRITISH COLUMBIA.		R.M. SAMUELS CONSULTING INC. PROPOSED MILL FLOWSHEET 450 TONNES / DAY											
NO.	DATE	MADE BY	DESCRIPTION	DATE	DESIGNED BY	DRAWN BY	CHECKED	APPROVED	SCALE	PROJECT NO.	DIVISION NO.	DRAWING NUMBER	REV.
1	JUN 92	M.S.		JUN 92	R.S.	M.S.			NONE			001	1
REVISIONS													

July 1992

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4.3 ANCILLARY FACILITIES

The proposed ancillary facilities will include a 50 man camp, administration facilities, change house, mine equipment maintenance shop, warehouse, laboratory, water supply system, electrical system, sewage system, and tailings disposal site.

Freshwater to the mill will be obtained from Cadwallader Creek or the Hurley River. Power for the project will be supplied from the B.C Hydro grid system.

All sewage will be treated in an approved manner to meet environmental and health standards.

4.4 CONCEPTUAL TAILINGS DISPOSAL PLAN

The conceptual tailings disposal plan is expected to be similar to that proposed in the 1982 Stage I Report. The concept of returning coarse tailings to the mine is currently being evaluated, and the final design of the tailings pond dams will be dependent on the decision regarding tailings disposition.

A tailings pond will be located about 1.25 km northwest of the proposed mill (Figure 4). Tailings supernatant will be recycled to the mill and no deliberate decant discharge to surface streams is planned. The pond will be equipped with an emergency spillway to cope with emergency storm conditions, but operating philosophy will be allow an adequate freeboard at all times to cope with storm water surges.

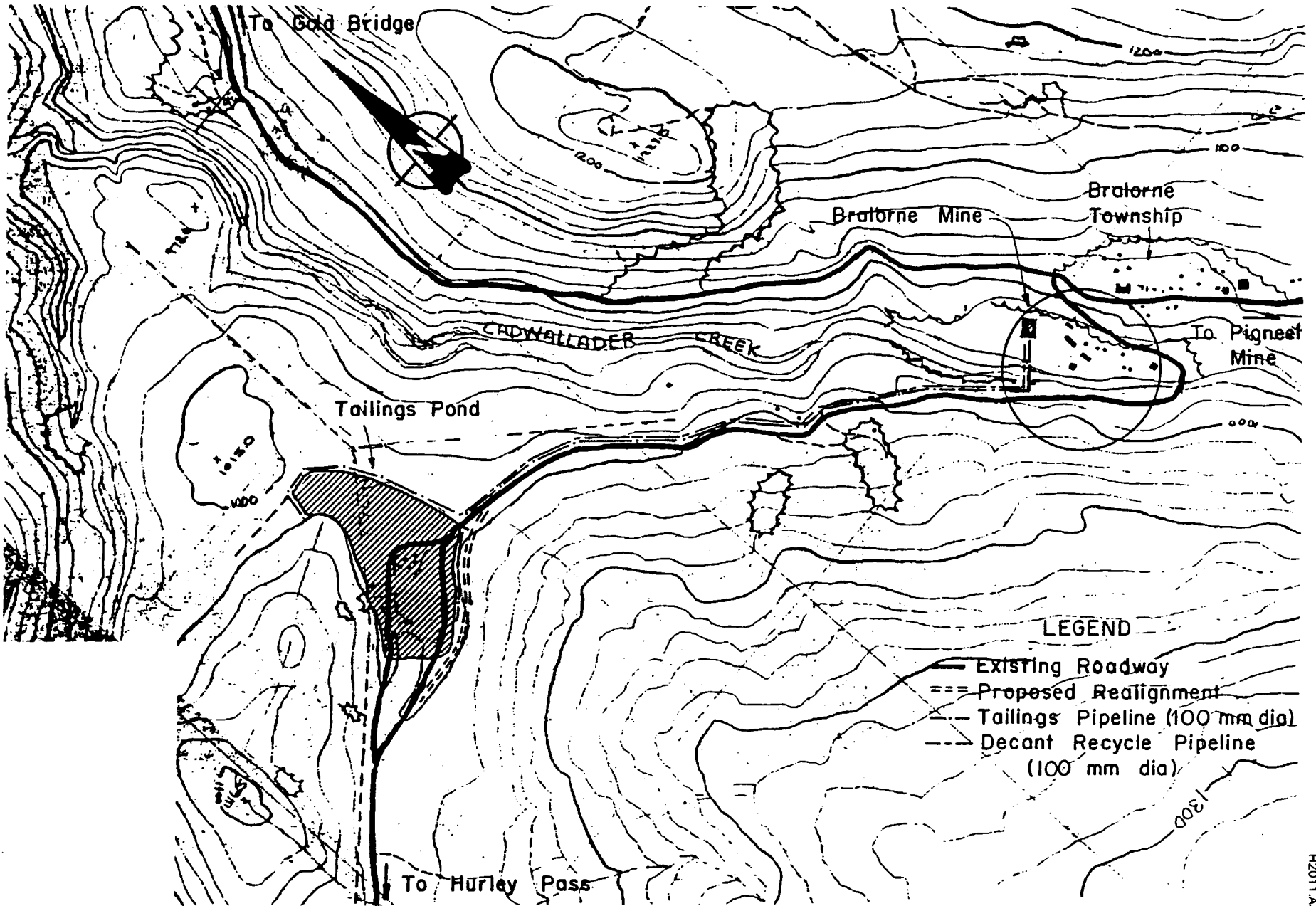
Water balances, tailings characteristics and acid-base accounting are also reported in the Feasibility Study (E & B Exploration Inc., 1982).

AVINO MINES AND RESOURCES LTD. BRALORNE PROJECT TAILINGS FACILITY LOCATION



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ENVIRONMENTAL CONSULTANTS

July 1992



LEGEND

- Existing Roadway
- === Proposed Realignment
- - - Tailings Pipeline (100 mm dia)
- - - Decant Recycle Pipeline (100 mm dia)

100 0 200 400 m

FIGURE 4

5.0 DEVELOPMENT SCHEDULE

AVINO anticipates sufficient reserves will be proven and engineering and design sufficiently advanced to purchase and install a 500 st/d mill by the fall of 1993.

6.0 AVAILABLE INFORMATION

6.1 ENVIRONMENTAL

6.1.1 Physiography and Soils

The site is located in the eastern section of the Coast Mountain Physiographic region. The mine site is located on the northern side of Cadwallader Creek, which discharges into the Hurley River 2.5 km (1.5 miles) below Bralorne. The mine site and proposed ancillary facilities occur at elevations varying between 1,000 m and 1,100 m (3,280 feet to 3,610 feet).

The valleys and peaks of the area have been strongly affected by glacial erosion and deposition. The morphological units include glaciated valley bottoms, alpine plateaus, cirques and aretes. Remnants of mountain glaciers still exist in north-facing depressions at some of the higher levels. More extensive glaciers occur at the head of the Bridge River Valley

6.1.2 Seismicity

The proposed operations are located in an area of high seismic activity; Peak Horizontal Acceleration Zone 3 and Peak Horizontal velocity Zone 3 (Basham, et al., 1985).

6.1.3 Climate

The Atmospheric Environment Service has records for the Bralorne meteorological station from 1951-1980 and has 17 years of records for the Bridge River station.

The Bralorne records show that mean annual precipitation is 633 mm, of which 57% falls in the period from October 1 to January 31 and 36% falls as snow.

Mean annual temperature is 4.3°C, with mean monthly maximum and minimum temperatures of 14.9°C (July) and -7.6°C (January), respectively.

6.1.4 Hydrology

The Bralorne mineral claims are drained by Cadwallader Creek, which flows westward to discharge into the Hurley River at the western extremity of the claims.

Surface and groundwater hydrology are reported in the Feasibility Study (E & B Exploration Inc., 1982). Water Survey of Canada operated gauging stations on the Hurley River near Bralorne (Station No. 08ME011) between 1926 and 1936, and on the Bridge River (five stations) between 1924 and 1986 (discontinuous). Water Survey of Canada records from gauging stations on numerous other streams in the Bralorne area provide an adequate data base to develop regionally based stream flow data and flood hydrographs for Cadwallader Creek and other streams that may be affected by the development.

6.1.5 Fisheries and Aquatic Resource

In the swift-flowing streams, such as Cadwallader Creek, small populations of rainbow trout, kokanee and Dolly Varden char are reported. The presence of rainbow trout in limited numbers was confirmed during a survey completed by the Aquatic Studies Branch of the Ministry of Environment. The survey should be considered as the only baseline inventory for local creek fisheries. Some trout, sculpin and members of the sucker family are expected to be found in the lakes and reservoirs of the Bridge River system.

The fish population in Cadwallader Creek represents the recovery of a stream that was essentially sterilized by early mining operations. Mine wastes and tailings were formerly discharged directly into streams. Since shutdown of the mines along the creek, aquatic life has been restored. The proposed mine rehabilitation is planned to maintain the creek as a viable fish habitat throughout the resumed mine operation. Sea-run salmon are prevented from reaching the study area to spawn by dams on the lower sections of Bridge River. The Ministry of Environment, Lands and Parks, Fish and Wildlife Branch have indicated their Ministry has no concerns and no further interest in the project (Mine Development Steering Committee correspondence, October 11, 1988)

6.1.6 Water Quality

Groundwater quality data are reported in the Stage I Report (E & B Exploration Inc., 1982) and updated in the Appendix to Stage I Report in 1983. Water samples have been collected and analyzed from three locations in Cadwallader Creek and from water being pumped from the old underground workings. Cadwallader Creek samples meet the Provincial water quality criteria for drinking water.

6.1.7 Vegetation/Forestry Resources

Descriptions of the vegetation communities found at the mine site are reported in the Stage I Report (E & B Exploration Inc., 1982). Because of the large variation in elevations throughout the study area, the Bralorne site displays characteristics of several biogeoclimatic zones. According to the biogeoclimatic classification system (Krajina, 1973), the Interior Douglas Fir biogeoclimatic zone occurs at lower elevations along the valley bottoms. This zone grades transitionally with elevation into the Sub-Alpine Engelmann Spruce/Sub-Alpine Fir Zone, and finally into the Alpine Tundra Zone. Plant species typical to all three zones are found in the study area.

Logging has been moderately intensive in all areas observed. Except for cut-lines and powerlines, clearcutting was not practised. Those areas that have been clearcut, now support dense to impenetrable, secondary growth of alder, aspen and fir.

6.1.8 Wildlife

Wildlife information is reported in the Stage I Report (E & B Exploration Inc., 1982). During a preliminary site reconnaissance, observations of animal species were limited to rabbits and squirrels. However, local residents report that deer, moose, black bear, wolf and cougar frequent the area. Less common are elk and grizzly bear. Mountain goats and big horn sheep occur at higher elevations. Most the larger species are seasonally migratory, traversing from the mountain slopes to lower valley bottoms according to availability and accessibility of food sources.

The smaller mammals remain within a restricted area. The small number of sightings made during site reconnaissance suggest that the animal population of the study area is small. Much of the wildlife is thought to have been driven out by human activity and by domestic animals (cats and dogs) belonging to residents of the area. The study area apparently does not provide winter habitat

for any of the larger animal species.

According to the Canada Land Inventory - Land Capability for Wildlife (Ungulates), 90% of the study area is Class 5 (moderately severe limitations) for deer and moose. Limitations in this area include excessive snow depth, which reduces mobility of ungulates, and the availability of food plants and soil depth. The remaining 10% of the area is Class 3 wintering area for mountain goat, sheep and deer, with limitations imposed by snow depth and soil depth. The valley bottom along Cadwallader Creek is Class 4 (moderate limitation) for deer and moose, with slight limitations due to snow depth.

6.1.9 Recreation

The valleys of Cadwallader Creek and the Bridge River are classified as lands that have moderate to moderately low capability for outdoor recreation (Canada Land Inventory, Classes 4 and 5)

6.1.0 Archaeological and Heritage Resources

A complete Socioeconomic Impact Study (E & B Explorations Inc., 1982) reported archaeological information and to date no archaeological sites have been found in the areas to be used for the mill or tailings pond. However, the Town of Bralorne is itself a valuable heritage resource. According to the Lillooet-Fraser Heritage Resource Study, "...Bralorne's significance lies in the fact that it is an entire 1930's mining town intact and in relatively good exterior condition. There are few examples of such complete company towns with vernacular buildings of the period..."

6.2 SOCIOECONOMIC

The Bralorne area is rural. Leading economic activities are forestry and cattle ranching, followed by recreation and tourism and mineral exploration. Tourism prospects will be enhanced by the completion of the Duffy Lake road upgrade between Pemberton and Lillooet.

1986 Census data indicate the population of Subdivision A of Squamish-Lillooet Regional District was about 4,450 with about 2,350 in and around Lillooet. The population of Bralorne itself is estimated to be about 60.

All year road access to Bralorne is via the Bridge River road from Lillooet. This is a two-lane public gravel road maintained by the Ministry of Highways. There are no air, rail or bus services to Bralorne, although B.C. Rail provides freight and passenger service to Lillooet from Vancouver and from the Interior.

Commercial services in Bralorne include a general store and a laundromat. There is a gas station and tire repair shop in Brexton. Gold Bridge has a hardware store, grocery store, two hotels, two gasoline outlets, community hall and an elementary school.

The nearest physicians are at Big Gun Lake (semi-retired G.P.'s) and at Lillooet. Specialists are available in Kamloops and Vancouver. One dentist practices in Lillooet.

People in the Bralorne/Gold Bridge area who require hospitalization must go to the Lillooet Hospital, or to Kamloops or Vancouver. The Lillooet Hospital has 34 acute care beds and three extended care beds. There is also an intermediate care facility in Lillooet with 22 beds.

The Nlaka'pamux Nation Tribal Council, Fraser Canyon Indian Administration, Lillooet District

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THE BRALORNE PROJECT**

Indian Council and the Lillooet Tribal Council were informed of the project during previous socioeconomic studies for the Stage I Report (E & B Explorations Inc., 1982). Although no concerns were identified by these groups, they asked to be kept informed of the progress of the project.

7.0 PROPOSED STUDIES

Proposed studies outlined in the following sections will be reported in an Addendum to all previous submissions and are designed to support an Application for Mine Development Certificate requirements. Investigations are designed recognizing both the need to fill data gaps revealed by a compilation of existing regional information, and the fact that a Stage I submission for the project was made in 1982. Studies are also important in the determination of mitigative measures necessary to minimize environmental impacts.

7.1 ENVIRONMENTAL STUDIES AND INVESTIGATIONS

7.1.1 Physiography and Surficial Geology

A generalized mapping of surficial geology of the study area will be undertaken at a scale of approximately 1:50,000 on NTS topographic base using the E.L.C. terrain classification system. General surficial features and soils resources will be identified and followed up by ground proofing. In view of the long history of Bralorne as a mining centre, this aspect of the study will require only limited effort.

7.1.2 Soils

Typical samples of local soil materials will be collected and returned to Vancouver for analyses.

Hallam Knight Piesold Ltd.

The Addendum will include a discussion of field collections, method of soil analyses, soil textures, interpretation of soil chemistry, and fertilizer and lime requirements. The report will include a map of sample locations and tabulated analyses. This information will be utilized in development of the Reclamation Plan.

7.1.3 Seismic Risk Analysis

Historical information on seismicity for the mine site area will be obtained from the Earth Physics Branch of the Pacific Geoscience Centre at Sidney, B.C., and an estimate of the following will be obtained from their computer program:

- percentage of gravity and Modified Mercalli Intensity Scale; and
- predictions on future events, including duration, horizontal displacements and intensity.

A summary analyses including tabulation of data and seismic zoning map will be provided for the Addendum Report. These data will be used in support of a tailings dam design and building design.

7.1.4 Acid Generation Potential Tests

Representative samples of ore, development muck, hanging wall and footwall rock will be collected and returned to a laboratory for Acid Generation Potential Testing. Samples of potential tailings from metallurgical test work will also be tested. An initial test and confirmation test (if necessary) will be undertaken. These data will be incorporated into the Addendum Report and used to support a tailings and waste rock disposal strategy (Waste Management Plan).

7.1.5 Meteorology and Air Quality

Over 30 years of records from Bralorne and 17 years of records from Bridge River (Lajoie Dam) will be utilized in developing a regional hydrology scenario and water management plan for the project.

7.1.6 Surface and Groundwater Quality

Baseline water quality data were collected in 1982/83 for the previous Stage I (1982) submission. A new sampling program is being initiated on a monthly basis until the scheduled submission of the Addendum Report. Analyses to be performed will include conductivity, turbidity, pH, alkalinity, suspended and dissolved solids, nutrients including nitrates, and phosphates, cyanide and a variety of total and dissolved metals.

Samples of groundwater will be obtained, where possible, from springs, producing drill holes or trenches, and submitted together with surface water samples for analyses.

7.1.7 Surface and Groundwater Hydrology

Water Survey of Canada operated hydrology stations on the Hurley River at Bralorne and on the Bridge River at Lajoie Falls, near Gold Bridge, below Tyaughton Creek and near Shalalth. Several other hydrology stations were operated by Water Survey of Canada in the region, including the Seton River and Cayoosh Creek. No records exist for Cadwallader Creek, except for limited measurements taken between 1981 and 1983.

The hydrology program will comprise an examination of regional data to derive long-term records for engineering and design in conjunction with water Licence Applications and facilities design in

the Water Management Plan. Data from previous B.C. Hydro studies on the Carpenter Lake hydro project will be incorporated in the examination.

A staff gauge will be installed on Cadwallader Creek. Stream flows will be metered during field studies in order to develop reliable rating curves.

Information from geotechnical and groundwater investigations, relating to tailings dam design, foundation investigations or piezometer installations, will be included in the Addendum Report. Depending on studies required, these may include results of falling head tests, permeability tests, borehole log data, pump tests, etc., that are used to estimate recharge and discharge zones and foundation conditions.

7.1.8 Vegetation and Forestry Resources

Major vegetation communities will be plotted on 1:50,000 NTS maps from stereo-examinations and interpretation made for wildlife habitat suitability, forestry capability and reclamation species. This mapping will incorporate information gathered by the B.C. Surveys and Resource Mapping Branch and the Canada Forestry Service.

A ground proofing survey and assessment will be conducted, consisting of transect documentation of understorey and ground cover species. Larger tree species will be identified and measured with DBH callipers to verify airphoto interpretation of forestry resources.

7.1.9 Wildlife Resources

A wildlife habitat survey will include an assessment of representative habitat units, available food vegetation mapping, wildlife observations, feces counts, and recording of game trails, dens, licks

and other important features. Wildlife habitat descriptions, obstruction of ungulate range, status of furbearers and predators, and location and description of particularly sensitive areas will be documented. This study will also incorporate existing data from various government information sources.

7.1.10 Fisheries and Aquatic Resources

Fish sampling and fish habitat assessments will be conducted on Cadwallader Creek and the Hurley River to identify areas of spawning, overwintering, rearing, obstructions and food production.

A survey of benthic macroinvertebrate organisms will be conducted during the summer survey. Population abundance and species composition will be determined and related to watershed productivity and water quality.

7.1.11 Land Capability and Historic Use

An assessment of the property's historic use and resource capability will be documented. This evaluation will include present land use and tenure, agriculture, forestry, recreation, hunting, fishing, guiding and trapping.

7.1.12 Archaeological and Heritage Resources

A review of archaeological and heritage resources will be initiated. Heritage potential will be rated based on field study, a literature review of existing archival information in government files, and other sources such as local museums.

7.2 SOCIOECONOMIC STUDIES

Recognizing the requirements of the Mine Development Assessment Process, the socioeconomic evaluation will address both positive and negative impacts of the proposed mine development on local communities. The socioeconomic study undertaken for the previous Stage I Report (1982) will be updated to reflect changes in economic and infrastructure conditions since 1982.

7.3 ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT PLANS

A section of the Addendum will be devoted to Environmental Protection and Waste Management Planning. These components of the Addendum Report will be prepared during the development of project plans and include sections dealing specifically with:

- **Waste Management Plans:** The disposal and management of tailings, waste rock, mine water, process effluents, sewage, industrial and municipal refuse during operations.
- **Water Management Plans:** The protection of natural surface flows transecting the property; segregation, collection and treatment of affected waters before return to the natural environment; and incorporation of recycling procedures, where appropriate.
- **Spill Contingency Plans:** Facilities and measures incorporated into the overall development plans for the isolation and containment of accidental losses of material.
- **Environmental Monitoring Plans:** Recommendations on a monitoring program to be incorporated into operating permits and implemented during the development and

operational stages of mine life.

- **Conceptual Reclamation Plan:** Conceptual plans for the decommissioning and final abandonment of the proposed development.

These components of the Addendum cannot be finalized until potential design and environmental resource conflicts are identified and resolved during environmental and preliminary engineering studies. Negative environmental impacts will be mitigated at an early planning stage.

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