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PEACE LIARD DISTRICT

RESOURCE PLANNING DIVISION

**ECSTALL TENURES ACCESS CORRIDOR STUDY,
BRITISH COLUMBIA**

Project No. 449042-0015

Ecstall Access Corridor Study CO2MKT003

FINAL REPORT

**KILBORN ENGINEERING PACIFIC LTD.
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OCTOBER 25, 2001

Mailing Address: PO Box 9426 Stn Prov Govt Victoria BC V8W 9V1

Ref: 27222

File: 31090-25-05

Date: December 21, 2001

To: Honourable Stan Hagen, Minister of Sustainable Resource Management
Honourable Richard Neufeld, Minister of Energy and Mines
Honourable Joyce Murray, Minister of Water, Land and Air Protection

Re: **Results of the Ecstall Tenures Access Corridor Study**

Background

In approving the Mackenzie Land and Resource Management Plan (LRMP) in October 2000, the former Cabinet recognized the need to address access requirements in the northeastern portion of the Braid Resource Management Zone (RMZ) including the Ecstall Mining Corporation mineral tenures located in that area, near the boundary of Dune Za Keyih (Frog-Gataga) Park. Accordingly, Cabinet directed that a thorough geo-technical, environmental and cost analysis be carried out of options providing surface access to the area (see map 1). The Cabinet-approved terms of reference indicated a preference for a practical and cost effective route outside of Dune Za Keyih (Frog-Gataga) Park. A study of the access situation and options was needed in order to determine if an additional *Environment and Land Use Act (ELUA)* corridor would be required through the new park.

Process

An advisory group was struck to carry out the study in accordance with the terms of reference. Membership included the President of Ecstall Mining Corporation and representatives of the Kwadacha Band, conservation groups, wilderness tourism operators, Ministry of Energy and Mines (MEM), the BC Parks Division of the Ministry of Water, Land and Air Protection (MWLAP), and the Ministry of Sustainable Resource Management (MSRM), (Chair). The study cost (~\$90,000) was split equally between MEM and the Muskwa-Kechika Trust Fund.

The advisory group developed a Request for Proposals, adjudicated the six proposals received, and selected the proposal of Kilborn Engineering Pacific Ltd. (affiliated with SNC Lavalin Group) - largely on the strength of its direct experience in mine road design and construction and mine development.

MSRM issued a contract to Kilborn. Kilborn compiled existing information from MSRM (maps, air photos), BC Parks (wildlife values), and other advisory groups members (mineral values, geology, wildlife values, wilderness tourism values, First Nations values), and conducted a helicopter reconnaissance of the study area. Kilborn ultimately identified three potentially viable route options and used its engineering skills and tools to carry out construction and operating cost and multiple accounts analyses of these routes. One of the three route options would have required amendment to the park boundary and the designation of an additional *ELUA* corridor. These options and Kilborn's methodology are described in the final report that was recently delivered to the advisory group. The study can be described as a reconnaissance level comparative analysis of alternative access routes into and within the study area. More detailed mapping and engineering assessment will have to be done before any roads are actually constructed in the area.

Recommendations and agreements

Kilborn's recommendation - Kilborn identified two routes that could provide practical and cost effective access to the northeastern Braid RMZ and the Ecstall tenures but would not require amending the park boundary. Kilborn recommended one route, the shortest of the three options (see map 2, option one is the recommended route). The estimated construction and operating costs of Kilborn's recommended route are less than for the route that would require amendment to the park boundary. While the recommended route is largely located in challenging terrain (which is reflected in its construction cost per kilometer), in Kilborn's professional opinion it has good construction viability and acceptable costs for construction and operations under the design parameters established by MEM. This route also has the least impact on environmental factors, First Nations values and wilderness aesthetics.

Advisory group agreement - After careful consideration of Kilborn's report and its recommended route, all members of the advisory group except one, the representative of Ecstall Mining Corporation, accepted Kilborn's report and recommended route. The Ecstall representative preferred option 3, a route outside the park that follows the Rocky Mountain Trench and Braid Creek to reach the Ecstall tenures. Thus, the advisory group does agree that two viable access route options exist outside the park.

Chair's recommendation - I recommend that government accept Kilborn's final report and the advisory group agreement that viable route options exist outside Dune Za Keyih (Frog-Gataga) Park. For clarity, I recommend that government not act to create a new *ELUA* corridor through this park at this time, since it is apparent that practical and cost effective alternative routes exist outside the park.

Further Considerations

Kilborn's report identifies several apparently practical access routes into the south eastern portion of the Braid RMZ that lie outside of the existing *ELUA* corridors. Should any of these routes ever be constructed, one or both of the *ELUA* corridors established in the south eastern portion of Dune Za Keyih (Frog-Gataga) Park (see corridors 3 and 4 in map 3) may not be needed. Government may wish to consider eliminating these *ELUA* corridors at that time. For clarity, the *ELUA* corridor that provides access to the Upper Gataga RMZ will be retained; only the need for the "branch" corridors identified as 3 and 4 in the attached map may be eliminated.

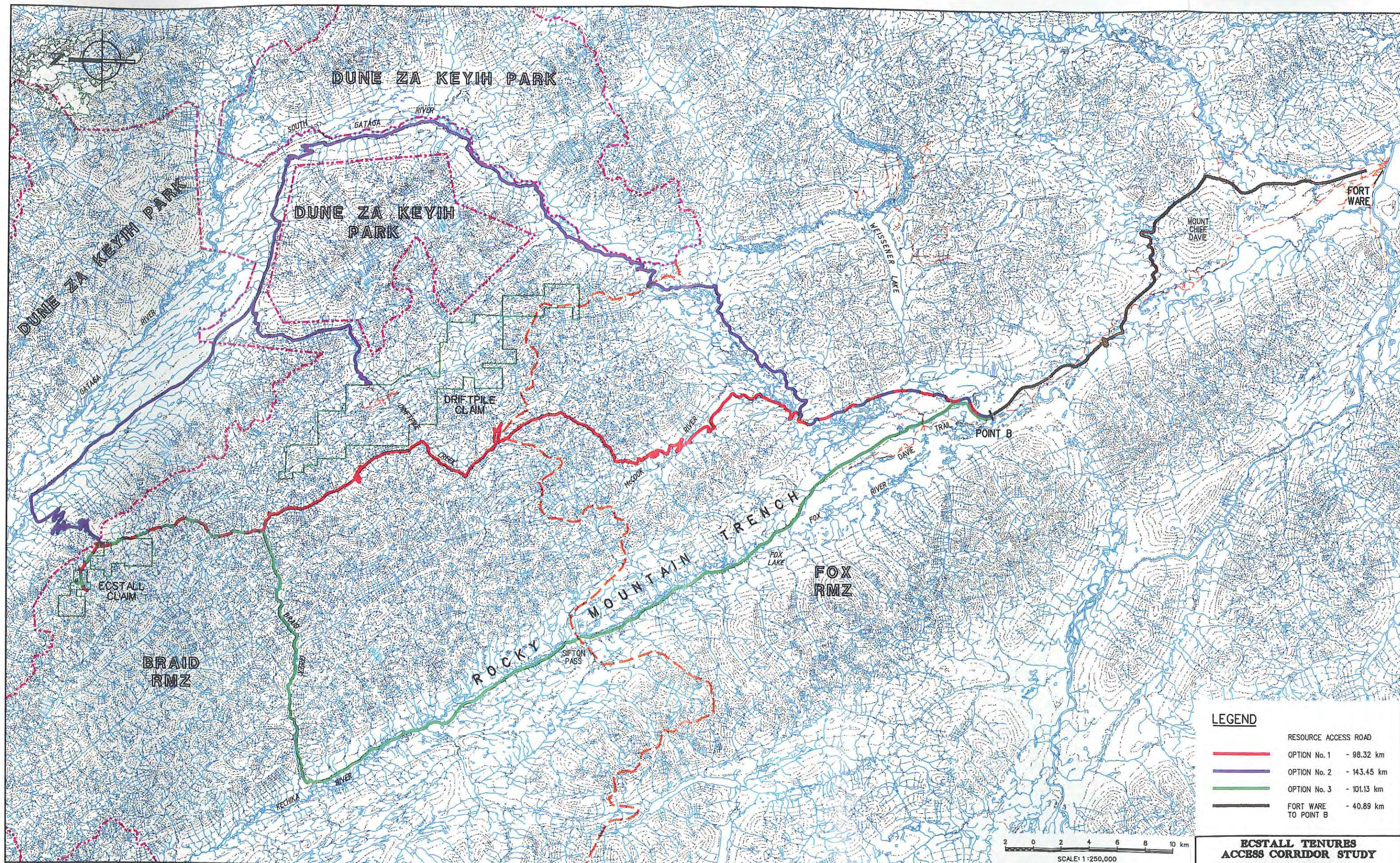
The Ecstall representative has correctly pointed out that this study has not addressed all aspects of infrastructure that will be required should a mine be developed within this area. Indeed, even road construction would require much more detailed planning and engineering work than was possible within the limited scope of the present study.

Kilborn's report contains information that will be vital to any future planning of infrastructure corridors in the Rocky Mountain Trench north of the existing road head. For this reason, a small number of copies of the report will be printed and distributed to the Muskwa-Kechika Advisory Board, government agencies, local governments, and First Nations in the Prince George region, as well as to the BC and Yukon Chamber of Mines and the Mining Association of BC.

ORIGINAL SIGNED BY

Michael Coon
Advisory Group Chair and Director, LRMP Office
Ministry of Sustainable Resource Management

pc: Advisory group members
 Phil Zacharatos, Regional Director, MSRM
 Ed Beswick, Regional Manager, MEM
 Don Roberts, District Manager, BC Parks, MWLAP
 Ray Schultz, Regional Manager, Ministry of Forests
 Chair, Muskwa-Kechika Advisory Board



LEGEND

	RESOURCE ACCESS ROAD
	OPTION No. 1 - 98.32 km
	OPTION No. 2 - 143.45 km
	OPTION No. 3 - 101.13 km
	FORT WARE TO POINT B - 40.89 km

SCALE: 1:250,000

ECSTALL TENURES ACCESS CORRIDOR STUDY RESOURCE ACCESS ROAD OVERALL SITE PLAN

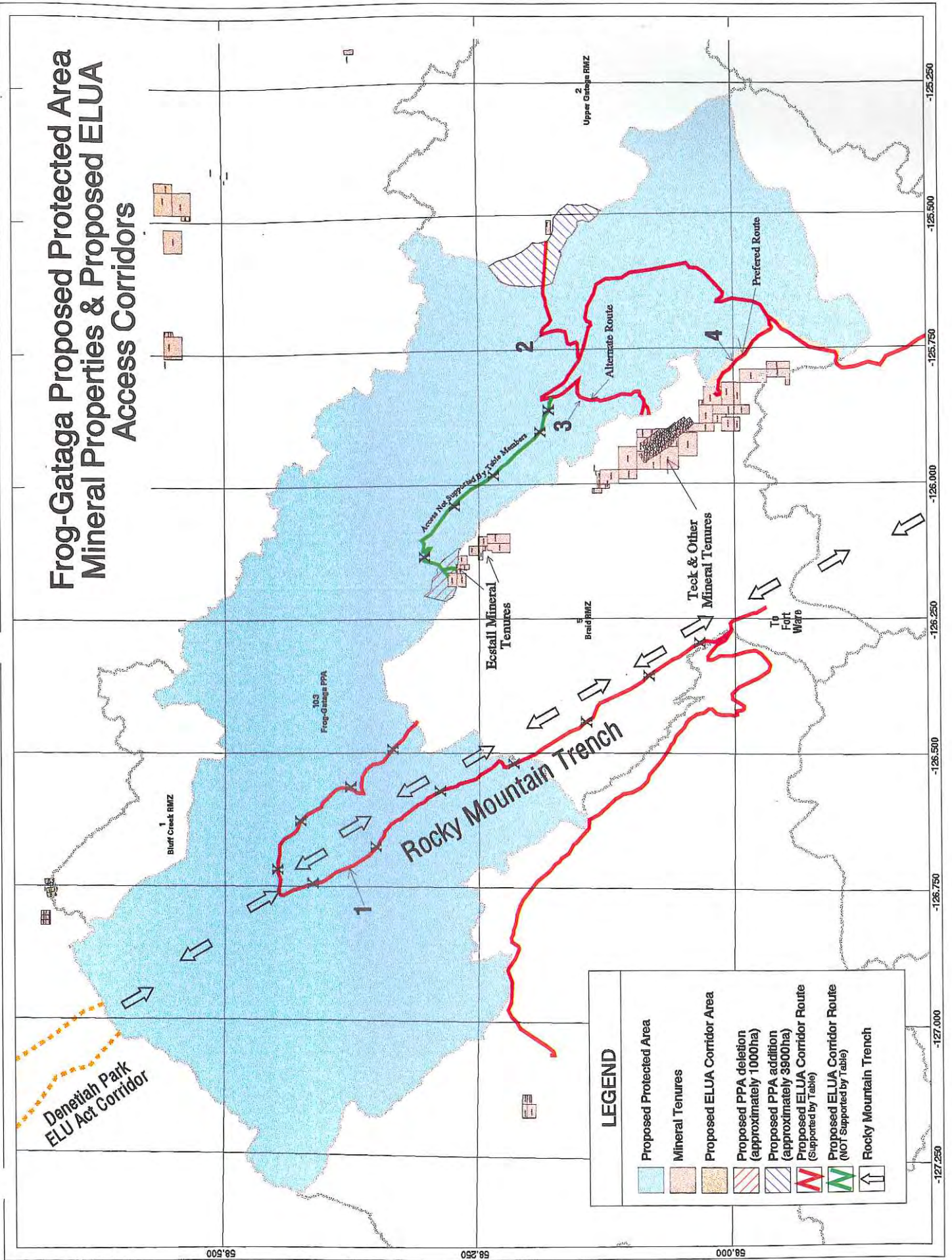


CLIENT PROVINCE OF BRITISH COLUMBIA
RESOURCE PLANNING DIVISION

PROJECT NUMBER 449042-15
DRAWING NUMBER 000-35-001
REV. C

NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR FINAL REPORT	28 OCT 2001	VAD	1	ISSUED FOR FINAL REPORT	28 OCT 2001	VAD
2	OPTION No. 3 ADDED	05 OCT 2001	VAD	2	OPTION No. 3 ADDED	05 OCT 2001	VAD
3	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD	3	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD
4	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD	4	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD

Frog-Gataga Proposed Protected Area Mineral Properties & Proposed ELUA Access Corridors



**RESOURCE PLANNING DIVISION
ECSTALL TENURES ACCESS CORRIDOR STUDY
BRITISH COLUMBIA**

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17. Drawing List

Drawing No.	Description	Rev. No.
000-35-001	Resource Access Road Overall Site Plan	C
000-35-002	Resource Access Road Typical Road Cross Sections	B
000-35-003	Resource Access Road Typical Fish Stream Crossing Plan, Sections & Details	B
000-35-004	Resource Access Road Typical Road Sections and Details	B
000-35-005	Resource Road Access Segmental Routing Key Plan	B

Drawing No.	Description	Rev. No.
300-35-003	Resource Access Road Option No. 3 Sheet 2 of 6	B
300-35-004	Resource Access Road Option No. 3 Sheet 3 of 6	B
300-35-005	Resource Access Road Option No. 3 Sheet 4 of 6	B
300-35-006	Resource Access Road Option No. 3 Sheet 5 of 6	B
300-35-007	Resource Access Road Option No. 3 Sheet 6 of 6	B
400-35-001	Resource Access Road Ft. Ware To Point B Key Plan	B
400-35-002	Resource Access Road Ft. Ware To Point B Sheet 1 of 3	B
400-35-003	Resource Access Road Ft. Ware To Point B Sheet 2 of 3	B
400-35-004	Resource Access Road Ft. Ware To Point B Sheet 3 of 3	B

1.0 EXECUTIVE SUMMARY

The corridor access study for the north eastern portion of the Braid Resource Management Zone and the Ecstall Mining Corporation mineral tenures is located in the area near the boundary of the Dune Za Keyih (Frog-Gataga) protected area. The purpose of the study is to determine if an access corridor will be required through the protected area.

The study considered the practicality of construction and costs, environmental factors, impacts on aesthetics for wilderness tourism and First Nations values. This was accomplished by the detailed examination of provided materials; documents, maps and air photos; and dialogue with members of the Advisory Group and other interested parties.

The study is a reconnaissance level comparative analysis of alternate access routes into the Ecstall tenures in the northeastern Braid Resource Management Zone.

The engineering parameters of the future road would be a year round, all weather road and will be of a standard that will service heavy haul road traffic. The topography in much of the study area is steep and mountainous with many stream crossings.

After exhaustive preliminary study of many different routes, Kilborn's findings showed three potential routes for multidisciplinary analysis. Based on comparative analysis of construction viability and costs, operating costs, impacts on the First Nations values, wildlife and wilderness integrity and visual quality, Kilborn has prepared a recommended route option.

Route Option Summaries

1. Option No. 1 - Starting at Point B following the McCook River and crossing the RMZ boundary to Driftpile creek it allows good access to the Driftpile claim area. It continues through rough terrain to Braid creek and then continues upstream and into the northern Ecstall claim area. See drawing 100-35-001 for Option No. 1 key plan. ✓
2. Option No. 2 – Starting at Point B following the McCook River then veering off toward and along the South Gataga River in the park corridor. Then turning down stream of the Gataga River until it starts climbing the slopes toward the Ecstall Claim area. See drawing 200-35-001 for Option No. 2 key plan.

3. Option No. 3 - Starting at Point B and continuing down the Rocky Mountain Trench until the road turns eastward up Braid Creek. At junction E the road turns north and into the northern Ecstall Claim area. See drawing 300-35-001 for Option No. 3 key plan.

The two acceptable routes, Option 1 and 3, into the north eastern Braid Resource Management Zone and the Ecstall Mining Corporation mineral tenures do not require a corridor through the Dune Za Keyih protected area. ✓

Option 2 is constrained partially by geological features; there would be difficulty to bring the road from the Gataga valley gaining 660 metres in elevation to the mining tenure. Option 2 is also constrained in that it is partially located in the Dune Za Keyih Park outside of the ELU corridor. The extension of Option 2 north along the Gataga so as to access the most northern part of the Ecstall Claims was not passable but the most northern part of the Ecstall Claims can be reached from the south by all options by going through the claim. ✓

Option 3 is constrained by First Nations values. The Davie Trail follows the route for approximately 60% of its length. There is anecdotal evidence of First Nations trapping cabins located in the Rocky Mountain Trench. There are high wildlife and fisheries values along this route. A route up the Trench follows a wide and relatively flat valley. ✓

Where Option 1 is located in challenging terrain, it has good construction viability and acceptable costs for the construction and operations under the given parameters. Option 1 has the least impact on the environmental factors, First Nations values and wilderness aesthetics.

None of the options are without mitigating conditions. ✓

The recommended route is Option 1. ✓

1.0 EXECUTIVE SUMMARY

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After exhaustive preliminary study of many different routes, Kilborn's findings showed three potential routes for multidisciplinary analysis. Based on comparative analysis of construction viability and costs, operating costs, impacts on the First Nations values, wildlife and wilderness integrity and visual quality, Kilborn has prepared a recommended route option.

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3. Option No. 3 - Starting at Point B and continuing down the Rocky Mountain Trench until the road turns eastward up Braid Creek. At junction E the road turns north and into the northern Ecstall Claim area. See drawing 300-35-001 for Option No. 3 key plan.

The two acceptable routes, Option 1 and 3, into the north eastern Braid Resource Management Zone and the Ecstall Mining Corporation mineral tenures do not require a corridor through the Dune Za Keyih protected area.

Option 2 is constrained partially by geological features; there would be difficulty to bring the road from the Gataga valley gaining 660 metres in elevation to the mining tenure. Option 2 is also constrained in that it is partially located in the Dune Za Keyih Park outside of the ELU corridor. The extension of Option 2 north along the Gataga so as to access the most northern part of the Ecstall Claims was not passable but the most northern part of the Ecstall Claims can be reached from the south by all options by going through the claim.

Option 3 is constrained by First Nations values. The Davie Trail follows the route for approximately 60% of its length. There is anecdotal evidence of First Nations trapping cabins located in the Rocky Mountain Trench. There are high wildlife and fisheries values along this route. A route up the Trench follows a wide and relatively flat valley.

Where Option 1 is located in challenging terrain, it has good construction viability and acceptable costs for the construction and operations under the given parameters. Option 1 has the least impact on the environmental factors, First Nations values and wilderness aesthetics.

None of the options are without mitigating conditions.

The recommended route is Option 1.

10.0 ENVIRONMENTAL

The project area is located in the Boreal White and Black (BWBSdk1) and Spruce Willow Birch (SWBb) Biogeoclimatic subzones.

The Stikine Boreal White and Black Spruce subzone is a lowland to Montane subzone occurring between 250 and 1100 m in elevation. The subzone is characterized by a northern continental climate, with frequent outbreaks of arctic air masses, long, very cold winters and short growing seasons. The mean annual temperature within the subzone is -2.9 to 2 degrees Celsius. The monthly average temperature remains below 0 degrees C for five to seven months of the year and above 10 degrees for only 2 at 4 months. Annual precipitation averages between 330 and 570 mm with 35 to 55% of this falling as snow. The ground freezes deeply for a large part of the year. White spruce, trembling aspen, Lodgepole pine, black spruce, balsam poplar, tamarack, subalpine fir and paper birch are the major tree species. Forest fires are frequent throughout the subzone.

The Spruce Willow Birch subzone is an interior subalpine type. The subzone occupies the mid elevations of the northern Rocky Mountains. Elevations range between 1000 and 1500 m. Mean annual temperature is about -0.7 to -3 degrees Celsius. Temperature averages above 10 degrees C. for probably just one month. Mean annual precipitation is 460 to 700 mm, with 35 to 60% as snowfall. Winters are long and cold, summers are brief and cool. Deciduous shrubs dominate upper elevations, mainly scrub birch and several willow species. Lower elevations are generally forested by white spruce and subalpine fir.

The abundance of water will intensify the need for sediment control during any future construction and the planting of indigenous plant species in disturbed areas for the control of erosion. Care will have to be taken with heavy equipment to ensure that oils and fuels do not enter the streams. Extreme weather conditions will limit construction windows.

11.0 ROAD ENGINEERING AND DESIGN

11.1 Mapping And Graphics Used For This Study

The corridor feasibility study was conducted using existing digital mapping with contour intervals of 20m. The digital mapping was supplied to Kilborn by RPD. A photo mosaic was produced using (1:70,000) photo imagery showing Options No. 1 and 2. Other maps and reports were studied to take into consideration other factors that could impact route selection. Input from the Advisory Group and stakeholders were also considered in the route selection.

12.2.2 OPTION NO. 1

Starting at point B, Option No. 1 is approximately 98km long.

Option No. 1 travels upstream on the east side of the McCook River on the same alignment as Option No. 2 for approximately 17 km until it reaches Point C. After point C the road would cross the McCook River and follows it up a wide treed valley on the east side until km 30. Here the road crosses the McCook River again and follows the river for approximately 8 km until it slowly turns northeast down a narrow treed valley. The valley turns northward and crosses the Fox / Braid RMZ at km 49. At km 54 the side slopes start to get steeper and avalanche hazards increase. The road continues on to Driftpile Creek and at this point (km 61) there is good access to the Driftpile claim area. From this point the road turns northeast toward Braid Creek along the valley bottom. At 15 km along the way there is a possible access point to the Ecstall claims at the north end of the Driftpile claim area. The road continues north for another 10 km until it reaches the Ecstall claim area. The road continues on for 12 km into the Ecstall claim area to a point where access to the most northern part of the claim is obtainable.

12.2.3 Option No. 2

Starting at point B, Option No. 2 is approximately 143km long.

Option No. 2 travels upstream on the east side of the McCook River in a wide treed valley all the way to the South Gataga Lakes. From here the road stays on the west side of the South Gataga River staying in the existing corridor of the protected area. Before the road reaches the Gataga River it turns in a northerly direction heading downstream in the Gataga River valley. At approximately km 90 along the way and near the Mayfield lakes the road travels into that portion of the protected area that does not have an existing corridor. The road travels northwest down the middle of the Gataga River valley approximately 22 km in the protected area without an existing corridor. To this point the road profile has been gentle with only a few sections of road at 8% maximum. The road turns west and crosses part of the Gataga valley and ascends up a wide treed slope toward the Ecstall Claim area. This is the beginning of the difficult terrain as the road climbs approx. 660 metres from the valley bottom crossing an avalanche area before it reaches the summit. The road in this section is a series of hairpin curves, which maintain a grade of 6% to 8% except in the curves. Once the road crosses the saddle at the ridge it is out of the protected area, leaving an additional 15 km of road behind in the protected area without an existing corridor. At this point the road is just below tree line and there are very few trees to help stabilize the ground. The ground is mostly composed of loose shale, so the road from here on in will be prone to avalanches and rock fall areas. Beyond this point the most northern part of the Ecstall claim area can be reached by going through the claim.

12.2.4 OPTION NO. 3

Starting at Point B, Option No. 3 is approximately 101km long. Starting at Point B, Option No. 3 continues down the Rocky Mountain Trench on the east side half way between McCook River and Fox River. The Rocky Mountain Trench is a very wide treed valley with a flat bottom. At Fox Lake the road moves to the middle of the trench and follows the Fox River upstream on the west side of the river. At approximately km 37 the road leaves the Fox RMZ and enters the Braid RMZ. This boundary in the Rocky Mountain Trench is called Sifton Pass. Once over Sifton Pass the road continues down stream on the west side of the Kechika River. At km 51 the road crosses the Kechika River until it meets Braid Creek. From here the road turns eastward up Braid Creek on the south side. Braid Creek is a V shaped valley with steep side slopes. Hazards like avalanches and unstable ground conditions begin. The road crosses the Braid Creek twice before reaching Junction Point E while attempting to avoid any hazardous areas. At junction E (km 81) the road turns north. As the road climbs toward the Ecstall Claim area the valley slopes flatten out and become less hazardous. From this point on the route is the same as Option 1 where access to the most northern part of the claim can be reached.

12.3 Capital Cost Estimate

Scoping Study Level – Plus 35%, Minus 10% - consists of the following parameters:

- Extensive site visit not essential
- Aerial/ground survey mapping at 1:20,000 with contour intervals of 3 metres or better is preferred.
- Some geo-technical evaluation (but not always) of selected routing
- Assumed soil conditions from works might be useful to the road engineer as a "what if" exercise
- The level of engineering design completed is typically 5%
- Drawings are conceptual only
- No equipment, materials and construction specifications
- Approximate costs (file) of temporary construction power, fuel, explosives, screening and crushing, etc.
- Major equipment and material costs from updated former quotations and/or telephone quotes
- Range of labour rates for remote areas and typical burden used for constructions and operational costs
- The capital cost estimates is typically used for comparison or rejection purposes

This is a preliminary capital cost estimate for all three options to construct a Resource Access Road to the Ecstall Tenures in the NE Braid Resource Management Zone.

Capital costing starts at Point B on Drawing 000-35-001.

See Figure 3, Capital Cost Estimates of Options for the details.

12.4 Annual Road Operating Costs

This estimate is for Options 1, 2 and 3. This estimate is approximate only, as it is based on the preliminary route selection study and dependent on weather conditions.

12.4.1 Equipment Needs

- 2 - Snow plows / Sanding trucks
- 2 - Cat 426C Hoes
- 1 - Snow Blower Truck
- 1 - Large Grader Cat 16H
- 3 - 1 Ton Pick-up trucks equipped for fuel delivery, equipment lubrication, and repair.

Cost for vehicles and equipment per year is approximately \$500,000 and is based on purchase price and amortisation over the normal operating life for each piece of equipment. Costing method considers cost per hour of use for: ownership, repairs, fuel, lubrication and oil changes, parts, tires and insurance.

12.4.2 MANPOWER

- 1 – Shop Mechanic (Heavy Duty)
- 4 – Operators multi trades
- 1 – Operator / Supervisor

Manpower costs include salaries and benefits at scale. Total cost per year approximately \$600,000.

Total Equipment and Manpower cost per year is approximately \$1,100,000.

SUMMARY MATRIX

IMPACTS ON	OPTION No. 1	OPTION No. 2	OPTION No. 3	COMMENTS
FIRST NATIONS	2	2	3	HUNTING AND TRAPPING
FISHERIES	2	4	3	
WILDLIFE	2	4	3	
TOURISM/VISUAL IMPACT	2	5	3	AREA USERS
GEOLOGICAL HAZARDS	4	1	4	ROCK FALLS AND AVALANCHES
SAFETY	3	2	3	DRIVING SAFETY ON THE ROAD
COST	3	3	3	
DAVIE TRAIL	3	3	5	IN THE ROCKY MOUNTAIN TRENCH
FUTURE POTENTIAL ACCESS	1	3	4	DIFFICULTY IN ACCESSING OTHER CLAIM AREAS
TOTAL	22	27	31	

LEGEND

VERY HIGH	5
HIGH	4
MEDIUM	3
LOW	2
VERY LOW	1

FIGURE 2

CAPITAL COST ESTIMATES OF OPTIONS			
COSTS	OPTION No. 1 98.32km	OPTION No. 2 143.56km *	OPTION No. 3 101.13km
ROAD	\$87,000,000	\$88,700,000	\$78,500,000
BRIDGES/MAJOR CULVERTS	\$13,700,000	\$16,100,000	\$17,000,000
SNOW SHEDS	\$1,200,000	\$1,700,000	\$2,300,000
MAJOR FISH STREAM CROSSINGS	\$700,000	\$900,000	\$700,000
WILDLIFE CROSSINGS	\$300,000	\$600,000	\$300,000
SUBTOTAL	\$102,900,000	\$108,000,000	\$98,800,000
AVERAGE COST PER KILOMETER	\$1,046,600	\$760,000	\$977,000
CONSTRUCTION INDIRECTS 12%	\$12,350,000	\$13,000,000	\$11,900,000
Engineering, Procurement, Construction Management 5%	\$5,100,000	\$5,400,000	\$4,900,000
CONTINGENCY 20%	\$20,550,000	\$21,600,000	\$19,800,000
TOTAL CAPITAL COST	\$140,900,000	\$148,000,000	\$135,400,000
ROAD OPERATING COST			
EQUIPMENT NEEDS	\$500,000	\$500,000	\$500,000
MANPOWER	\$600,000	\$600,000	\$600,000
ROAD MAINTENANCE			
REPAIRING WEARING SURFACE	\$720,000	\$1,050,000	\$740,000
SCALING AND SLOPE STABILIZATION	\$435,000	\$314,000	\$340,000
ADDITIONAL CAPITAL/OPERATIONAL COST	\$104,000	\$104,000	\$104,000
TOTAL ROAD OPERATING COST PER YEAR	\$2,359,000	\$2,568,000	\$2,284,000

*Option 2 - See Plans 000-35-005 and 200-35-001
This Option includes Leg K-H but does not include L-F.

CAPITAL COST ROAD INCLUDES:

Logging, clearing and grubbing, excavation and fills, ditching, diversion ditches, slope stabilization, safety barriers, sediment control, road base, road surfacing and signage.

FIGURE 3

12.4.3 Road Maintenance

Additional yearly cost to road for repairing wearing surface.

Option 1 - \$720,000 based on 98.32 kilometres of road

Option 2 - \$1,050,000 based on 143.56 kilometres of road

Option 3 - \$740,000 based on 101.13 kilometres of road

Additional yearly cost to road for scaling and slope stabilization:

Option 1 \$435,000

Option 2 \$314,000

Option 3 \$340,000

12.4.5 Additional Capital/Operational Costs (Optional)

This is common to all options.

Works Yard	\$80,000
Fuel Storage	\$80,000
Shop and shelter	\$180,000
Screening and crushing facility (portable)	\$700,000
Total	\$1,040,000

Amortised over 10 years or \$104,000 per year.

12.5 Evaluation Of Corridor Options

See Figures 4 and 5 for the pros and cons of the

12.6 Segmental Break Down of Routing

See Figure 6 for the details of the segmental break down.

PROS		
OPTION No. 1	OPTION No. 2	OPTION No. 3
Lower impact on the wildlife wintering grounds	Good winter traveling for most of the route	Good winter traveling for 60% of the route
Less animal mortality	High level of safety for vehicles on the road	High level of safety for vehicles on the road
Least impact on Rocky Mountain Trench and to the Gataga and South Gataga drainages	Low to medium avalanche hazard	No impact on the Gataga and South Gataga drainages
Avoids Protected Area	Low to medium rock fall hazard	Lower grade advantage over 60% of the route
Less visual impact for area users	Out cropping of shale slopes are gentler	Allows for multiple access to the Through Creek Watershed and other locales in the NE Braid RMZ.
Little impact on the Davie Trail		Provides partial future access to the Alaska Highway via the Rocky Mountain Trench
Provides good access to all Claim areas		Avoids Protected Area
Allows for access to Through Creek Watershed and other locales in the NE Broad RMZ		

FIGURE 4

CONS		
OPTION No. 1	OPTION No. 2	OPTION No. 3
Construction challenges in rock (shale)	Impacts on year round wildlife habitat	High impact on the wildlife wintering grounds
High snow removal probability	high opposition from table and stake holders	Impacts on First Nations trapping territory
High Rock fall hazard	Longer travel time (road length approx. 144km)	Impacts on the Davie Trail
Poor winter traveling	The route runs 63km through the protected area in existing corridors	High visual impact
High avalanche hazard	The route runs 37km through the protected area along the Gataga river - Additional corridor required	Limits access to Claims other than Ecstall Claims
High exposure to talus slopes	Impacts on trapping territory	High rock fall and Avalanche hazard along Braid Creek
Road construction will greatly impact and alter the untouched aspect of the wilderness	Road construction will greatly impact and alter the untouched aspect of the wilderness	Construction challenges in areas beyond the Rocky Mountain Trench
		Road construction will greatly impact and alter the untouched aspect of the wilderness

FIGURE 5

SEGMENTAL BREAK DOWN OF ROUTING

LEG	LENGTH (km)	COST \$	RISK OF AVALANCHE AND ROCK SLIDES	IMPACT ON WILDLIFE AND FISH HABITAT	THROUGH THE PROTECTED AREA	COMMENTS
A-B	40.89km	\$30,094,000	○	●	NO	COMMON CONNECTOR - ALL OPTIONS
B-C	16.46km	\$11,118,000	○	●	NO	
B-D	59.00km	\$50,447,000	○	●	NO	
C-G	44.53km	\$62,130,000	○ TO ■	○	NO	
G-M	15.56km	\$25,756,000	■	○	NO	
M-E	1.79km	\$1,844,000	●	○	NO	
E-L	12.36km	\$19,808,000	●	○	NO	
L-F	7.62km	\$20,243,000	■	○	NO	
D-E	22.15km	\$44,902,000	■	●	NO	
H-G	4.37km	\$7,261,000	●	○	NO	
J-H	23.67km	\$45,347,000	■	○	YES	PARTIALLY IN EXISTING CORRIDOR
N-J	5.38km	\$3,859,000	○	●	YES	PARTIALLY IN EXISTING CORRIDOR
C-N	23.15km	\$16,610,000	○	●	YES	PARTIALLY IN EXISTING CORRIDOR
J-K	39.91km	\$37,960,000	○	●	YES	IN EXISTING CORRIDOR
K-H	19.09km	\$25,670,000	○ TO ●	●	YES	PARTIALLY IN EXISTING CORRIDOR
K-L	42.13km	\$55,356,000	○ TO ●	●	YES	ADDITIONAL CORRIDOR REQUIRED
H-M	26.18km	\$39,237,000	■	○	NO	
N-P	6.57km	\$5,756,000	●	○	NO	

VERY HIGH



HIGH



MEDIUM



LOW



NOTE:

Access to the most northern Ecstall
Claim from the Gataga Valley was looked
at. Kilborn was unable to find a reasonable
passable route that would be within
Engineering Design Guidelines.

FIGURE 6

13.0 POWERLINE CORRIDOR, MINE DEVELOPMENT AND PROCESSING SITE

Power requirements for the mine development have not been fully defined. Without the details of the source of the power and how much power is required, it is difficult to assess the power line requirements. At present, power in the quantities that would be required for the operation of a processing plant, would have to come from a major transmission line. Unless the power requirements were small enough that a power line could follow the road right-of-way, a transmission line right-of-way would be a study unto itself. Other options for a power source could be either micro hydro, as the area is abundant in water, or diesel generators, as fuel will have to be brought in for mining equipment. A power line could be brought in from the Alaska Highway through the ELU Act corridor. A diesel generating station could be set up on the Alaska Highway making fuel easier to bring to the power plant and giving the option of selling excess power to other users.

In the northern portion of the Ecstall tenure, potential areas have been located large enough for a small footprint mine development and processing site. See plan 100-35-006 and 300-35-007 for the exact locations.

14.0 RECOMMENDATIONS

Kilborn recommends Option No. 1. The result of the comparative evaluation of the corridor options indicate that all the options have impacts upon one or more of the areas of concern used to evaluate each corridor. No single corridor option emerges without some impact.

Therefore, looking at the cost, length and impact on wildlife, First Nations values, visual quality and encroachment into Protected Areas, Option 1 has the least number of negative impacts and the greatest number of positive aspects. The distance that this option runs parallel to the Davie Trail is not as great as Option 3 and therefore a lower impact on wildlife, First Nations values and visual quality.

Option 1 and Option 3 are very similar except that Option 3 will have greater impact on the wildlife and the Davie Trail, First Nations values and visual quality.

Option 1 is outside of the Dune Za Keyih protected area and has the least impact on wildlife, trapping lines and visual quality. Option 2 is generally safer to travel over than the other two routes.

Kilborn recommends that a detailed geo-technical assessment be conducted before future construction.

It is recommended that power line requirements be studied further.

It is recommended that an appraisal of timber values be conducted before construction to ascertain if it is viable to offset cost of construction with timber sales.

Appendix A Advisory Group

ECSTALL TENURES ACCESS CORRIDOR STUDY

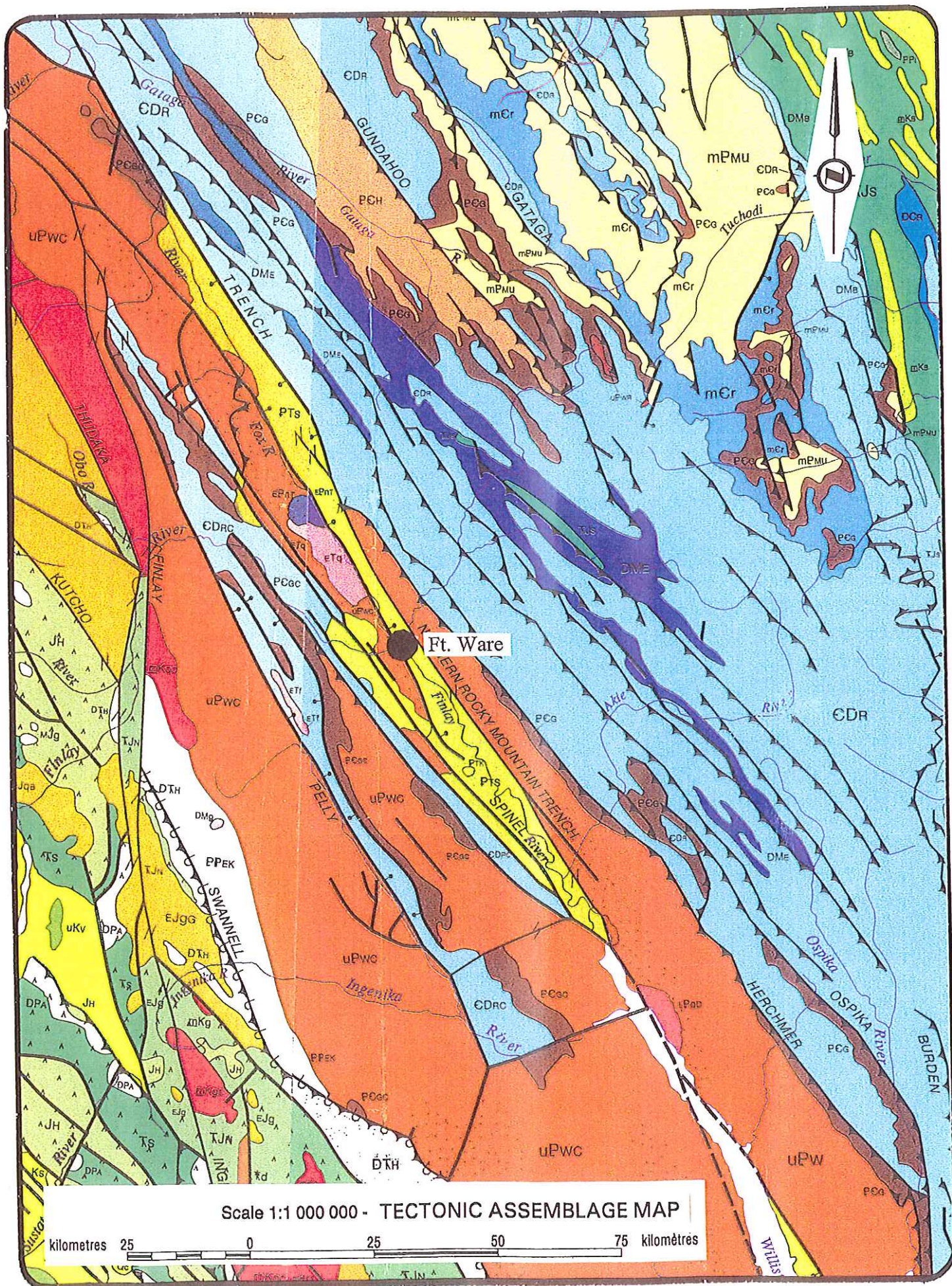
ADVISORY GROUP

NAME	AFFILIATION	CONTACT NUMBERS
Michael Coon	Resource Planning Division	Phone(250)953-4792 Fax(250)953-3481 Michael.coon@gems5.gov.bc.ca
*Dave Crampton	Kwadacha Band	Phone(250)427-6804 Fax (250)427-6805 Crampton@rockies.net
*Chris Graf	Ecstall Mining	Phone (604)681-4402
*Wayne Sawchuk	Chetwynd Environmental Society	Phone(250)788-2685 wsawchuk@pris.bc.ca
*Johnny Mikes	Canadian River Expeditions	Phone (604)932-3811 Johnny@whooshnet.com
Fred Hermann	Ministry of Energy and Mines	Phone(250)952-0494 Fax(250)952-0491 Fred.Hermann@gems9.gov.bc.ca
Bryan Webster	Peace Liard Parks District	Phone(250)787-3418 Fax(250)787-3490 Bryan.Webster@gems2.gov.bc.ca

Consulted		
*Randy Gee	Terminus Mountain Wilderness Adventures	Lodge(250)787-2663 Home(250)787-7986 propile@solarwinds.com

Appendix B

Geological Plan



LEGEND

TECTONIC ASSEMBLAGES

PALEOGENE

PTk

KAMLOOPS: transtensional arc volcanics; alkali-rich, calc-alkaline andesite, basaltic andesite, dacite, rhyolite and basalt flows, pyroclastics and epiclastic deposits. In south and southeast, highly alkaline rhomb-porphry flows and breccia; bimodal basalt-rhyolite along Tintina Fault; includes alkaline volcanics east of Foreland Belt; all nonmarine

PTs

SIFTON: nonmarine fault-trough clastics (locally includes upper Upper Cretaceous strata); shale, siltstone, sandstone, conglomerate, local lignite, marl and dacitic volcanics; nonmarine

DEVONIAN - MISSISSIPPIAN

DME

EARN: fault-trough clastic wedge; westerly derived, chert-pebble conglomerate, chert-quartz sandstone, pebbly mudstone, blue-black siliceous shale, locally containing barite, brown shale, alkaline trachyte and rhyolite flows, breccia, tuff, pillow basalt and breccia; chert, and limestone; marine and nonmarine

CAMBRIAN - DEVONIAN

CDR

ROCKY MOUNTAINS: passive continental margin sediments; CDR in Cassiar displaced passive margin terrane; resistant dolomite, limestone, and local sandstone interbedded with recessive red, green, and grey shale and detrital carbonate that together form several carbonate-shale grand cycles. These pass westward into offshore shale, siltstone and thin-bedded carbonate with minor alkalic tuff, breccia and amygdaloidal basalt of Cambrian, Cambro-Ordovician, Silurian, and Devonian ages but mainly of Ordovician age; marine

MIDDLE CAMBRIAN

mCr

Rift assemblage; conglomerate, block breccia, conglomerate, brick-red sandstone, limestone, siltstone, sandstone; marine and nonmarine

UPPER PROTEROZOIC - LOWER CAMBRIAN

PEH

HYLAND: mainly clastic offshore passive continental margin sediments; upper unit: blue-grey, apple-green and maroon slate with minor siltstone and sandstone; lower unit: interbedded graded sequence of sandstone, locally conglomeratic, and shale with limestone in upper part; marine

PGG

GOG: rifted and passive continental margin sediments; PGG in Cassiar Terrane; shallow-water crossbedded orthoquartzite, feldspathic quartzite, locally graded-bedded quartzite, quartz-pebble conglomerate, mafic flows, breccia and tuff overlain by interbedded quartzite, siltstone, shale, and limestone with archeocyathid reefs; metamorphic equivalents; marine

UPPER PROTEROZOIC

uPw

WINDERMERE: mainly clastic continental margin sediments; uPw in Cassiar Terrane; graded-bedded assemblage of interbedded quartz-feldspar grit, sandstone, siltstone and shale, commonly maroon and green; diamictite in Rocky Mountains, limestone in upper part, local greenstone flows, breccia and tuff, and metamorphic equivalents; marine

uPWR

RAPITAN: rift assemblage; Rapitan: upper tillite, hematite-jaspilite iron formation, silicic turbidite and red, maroon and green argillite, lower tillite; local tholeiite above calc-alkaline basalt and minor felsite; Toby: andesite flows and tuffs above diamictite and conglomerate; marine

MIDDLE PROTEROZOIC

mPmu

MUSKWA: passive continental margin sediments; silty, sandy, calcareous, dolomitic and chamositic mudstone, pebbly mudstone, slate, carbonaceous shale, crossbedded and turbiditic quartzite, argillaceous and stromatolitic dolomite; marine

PLUTONIC AND ULTRAMAFIC ROCKS

Plutonic Suite....Cassiar Pluton....(Deserters)

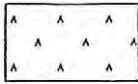
EARLY TERTIARY (40 - 64 Ma)

ET

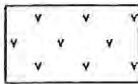
ETg - undivided granodiorite and quartz diorite; commonly has concordant U-Pb and K-Ar ages in Coast Plutonic Complex
ETq - undivided granite
ETf - undivided felsite, quartz feldspar porphyry

LEGEND

VOLCANIC ROCKS

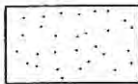


Calc-alkaline volcanic rocks



Tholeiitic volcanic rocks

METAMORPHIC ROCKS (protolith uncertain)



protolith metamorphosed to amphibolite facies

SYMBOLS

Geological contact (defined)

Thrust fault (teeth on upper plate)

Overtured thrust fault (teeth on upper plate, dip of fault overturned)

Extension fault (solid circle indicates downthrow side)

Right lateral transcurrent fault

Left lateral transcurrent fault

Fault of unknown displacement

Submerged faults and those buried by younger strata

ArborEcos Forest Management

**8740 Findlay Road,
Cranbrook, B.C.
VIC 7C8**

SNC-LAVALIN
RECEIVED

AUG 13 2001

VANCOUVER

Recipient: Geraldine Collins

Sent By: David Crampton

Company: SNC - LAVALIN

Company: ArborEcos Forest

Fax Number: 1-604-683-1672

Fax Number: 250-427-6805

Voice Number:

Voice Number: 250-427-6804

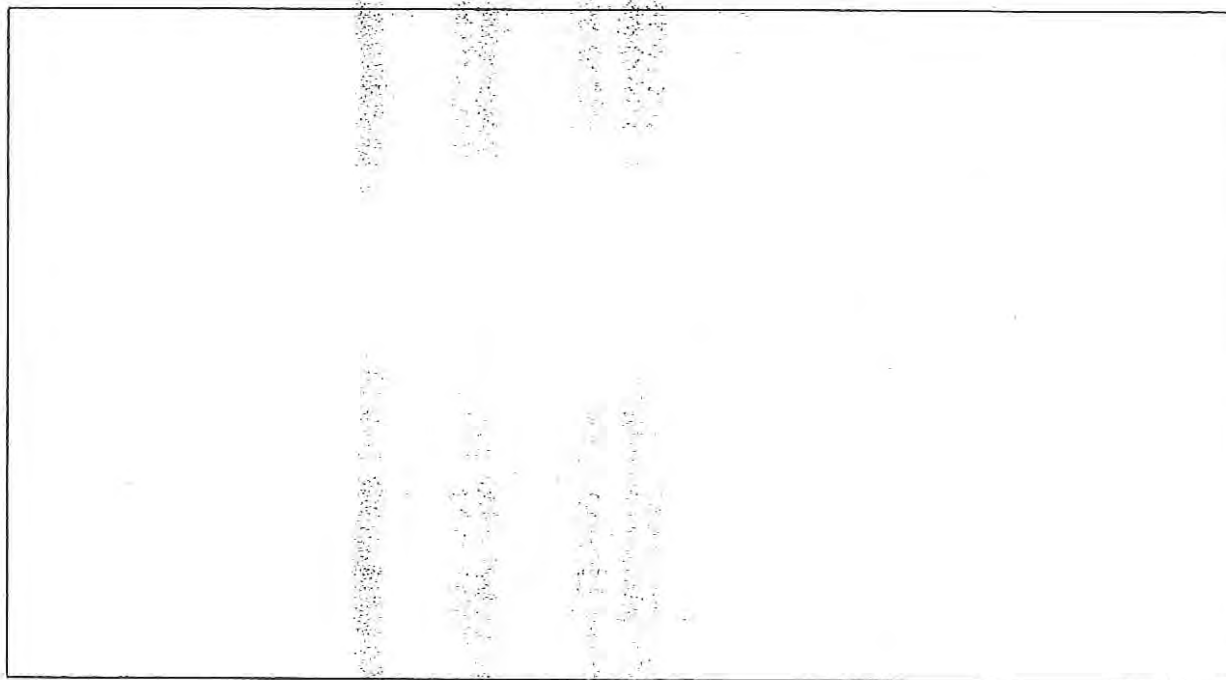
Date: 13/08/01

Time: 3:56:50 PM

Total No. Pages: 3

Subject: Kwadacha Band Access concerns

Message:



**KWADACHA BAND**

Administration Office
Suite 5 - 1237 4th Avenue, Prince George, B.C. V2L 5J5
Tel: (250) 563-4101 • Fax: (250) 568-2888
Post-Ward Office:
Tel: (250) 471-9303 • Fax: (250) 471-2701



August 13, 2001

Geraldine Collins
Suite 1200,
1075 W. Georgia,
Vancouver, B.C.
V6E 3C9

Geraldine,

I have "sketched" the proposed logging road that I have submitted to the Ministry of Forests for the logging activities of the Kwadacha Band on their Forest Licences. As you can see there will be a road - 12 metres wide - moving north on the east side of the trench. We have and will be taking a great deal of care not to interfere with the visual and physical attributes of the Aatse Dene Tunna Trail (Davie Trail). The road crosses the Kwadacha River to the east of the village approximately 1 kilometer north of the village. This road is a continuation of a present logging that travels on the east side of the Findlay River.

The greatest concern to the Kwadacha Band in development north of the community is the ability to retain the opportunities for tourism, guide outfitting, hunting, fishing and trapping. The Band believes these opportunities can be maintained in the context of resource development, and as a result, has formed the Kwadacha Natural Resources Agency. The responsibility of the Agency is to guide the development of the resources to ensure a wide range of economic opportunity for all members of the Band. Any access to the north would have to conform to the access development plans presently being developed by the Kwadacha Natural Resources Agency. On the east side the Agency is attempting to "hide" the road from the Aatse Dene Tunna Trail while finding opportunities for timber harvesting. Essentially the plans are to stay as far from the Trail as possible. The Agency also recognizes that the greatest present use and future economic opportunities other than forestry and mining are usually in the Trench or connected to Trench.

I hope this brings some clarity to the position the Kwadacha Band has with regards to access development in the Traditional Territory north of Fort Ware.

Sincerely,

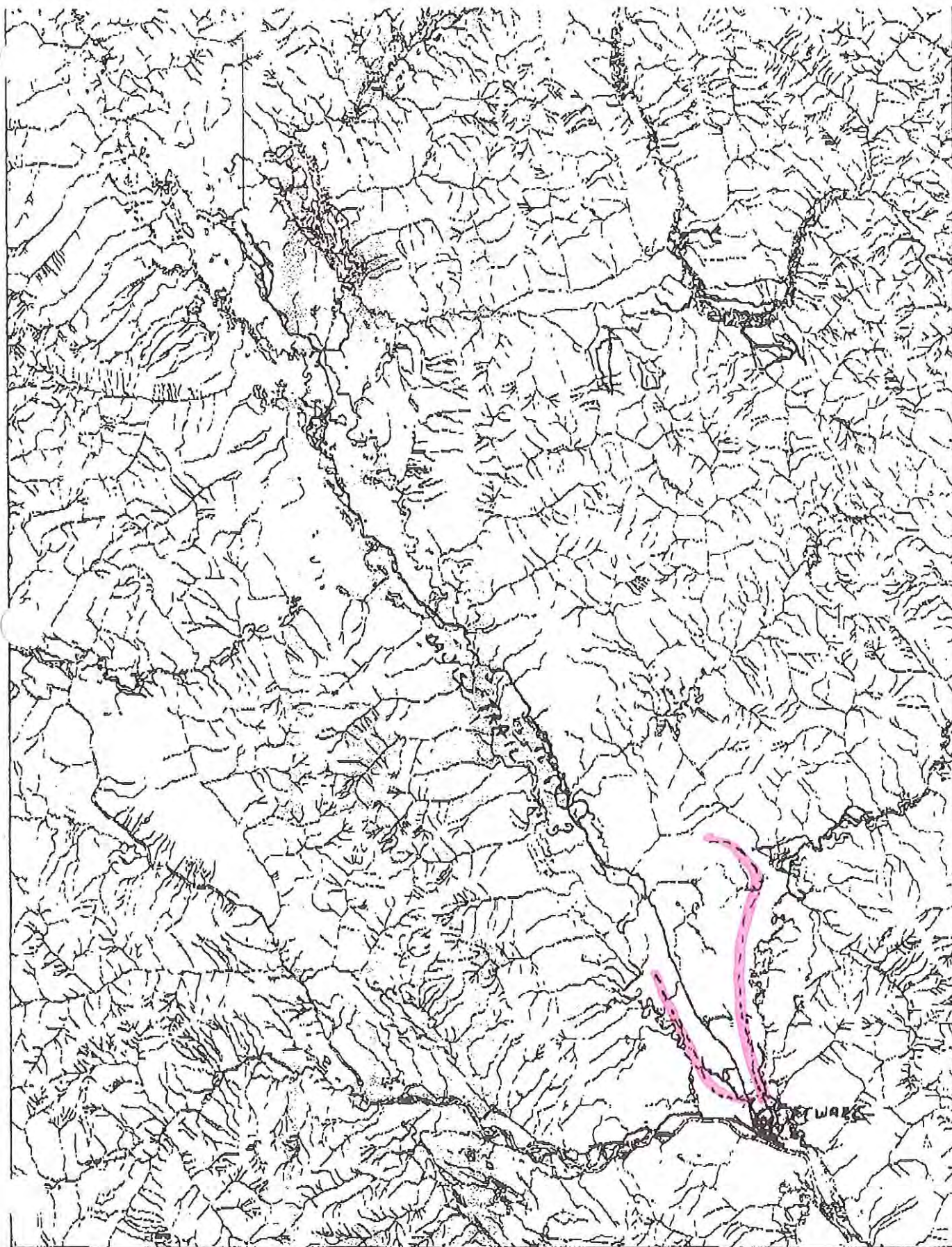

David Crampton

Chair, Kwadacha Natural Resources Agency

AUG. -13' 01 (MON) 11:36 SNC LAVALIN INC.

TEL:604 683 1672

P. 002



...44504211cadm\basefile.dgn Aug. 13, 2001 11:00:53

PROPOSED LOGGING ROADS

Appendix D
Letter and Map
of Wildlife Concerns

AUG - 72001

Chetwynd Environmental Society VANCOUVER

working for wilderness, a non-renewable resource

Box 2049, Chetwynd B.C. V0C 1J0 ph/fax (250) 788-2685

August 5, 2001

Geraldine Collins,
SNC Lavalin
By Fax- (604) 683-1672

RE: Ecstall Corridor Access Study Dear Ms. Collins: Please find below some of my concerns regarding access in the Frog-Gataga Park area. Please note that these concerns are not exhaustive, as there is little information or knowledge available for much of this area.

Most importantly, I am very concerned that access will destroy the wilderness quality of the area. Any road in the valley bottom will irrevocably damage the perception of pristine wilderness that people now have of the area.

The valley bottom contains high quality wintering areas for moose and caribou. Road access will have a detrimental effect on these values.

The slopes to the south of Mayfield Lakes are of prime importance for furbearers such as marten and wolverine.

There are specific sites that are of prime importance for mountain goat, as shown on the accompanying map. The corridors have been in use for centuries, and any roads that transect these corridors will fragment the high quality habitat that now exists, and will most likely lead to local extirpation of goat populations on the mountain to the south west of the Mayfield Lakes. The same is true for the two mineral licks, to which the goats travel long distances to obtain minerals vital to their diet.

An important viewpoint is located on the point of land between the two largest of the Mayfield Lakes. Any access into this area must protect the viewscape from this point as it has the greatest potential as a camp or campsite in the future.

Thank you,

Wayne Sawchuk.

Appendix E
Meeting Notes from
N. Kruckenberg

July 17, 2001

Meeting with Wayne Sawchuk,

We landed with the helicopter at Wayne's cabin approx. 4:00 pm and spoke with him regarding his concerns of a road going through the corridor of the protected area. He has a cabin on the Mayfield lakes and a trap line in the Gataga River valley.

He brought up two concerns in the area of Mayfield lakes.

1. The goat traffic that travels from the mountains down to the valley's to the licks in the Gataga river valley. He was unsure but said a road could disturb the movement of the goats traveling up and down the mountains. He also said there were some goat trails running across the corridor from peak to peak. Again the road could disturb the natural movement of the goats.
2. Rafting trips start at the Mayfield Lakes and run down the Gataga River and end at the Terminus Mountain Lodge. They run approx. 2 to 3 trips in summer. The concern would be the visual impact for the rafters at the viewpoints and other stops as the road would be running through the protected area.

These are not quotes from Wayne, just my notes summarizing our meeting.

Norm Kruckenberg
SNC-Lavalin

Appendix F
Report from Johnny Mikes

MEMO TO: Joe Cave
Memo from: Geraldine Collins
Date: August 14, 2001
Subject: Ecstall Tenures Access Corridor Study

RE: Telephone Conversation with Johnny Mikes

Johnny Mikes called me on August 10, 2001 to give a verbal submission in regards to the above study.

Johnny is the Proprietor of Canadian River Expeditions. He flies his clients into this area where they raft the local rivers. He uses low impact camping to maintain the wilderness conditions of the rivers. He does not hold any real estate or structures in the area. His clients are primarily interested in the remote wilderness and being surrounded by the awe of nature.

Johnny maintains that that having no roads in this territory is a major factor in selling his product of wilderness adventure. The ability to not cross one single road is a powerful experience. Often, he and his clients will hike up into the mountains to a height of over 3,000 feet where the vista is over a great expanse of the large majestic mountains in the study area. That there is no visible or audible sound of development is what draws his clients to this type of adventure.

The fact that there is no resource extraction is key to the development of the Gataga as a First Class Wilderness Tourism destination.

Appendix G
Report from Randy Gee

MEMO TO: Joe Cave
Memo from: Geraldine Collins
Date: August 14, 2001
Subject: Ecstall Tenures Access Corridor Study

RE: Telephone Conversation with Randy Gee

Randy Gee called me on August 13, 2001 to give a verbal submission in regards to the above study.

Randy is the Proprietor of Terminus Mountain Wilderness Adventures. He flies his clients into his hunting area with his own floatplanes to his lodge located on a remote lake in the study area. As a Class A Guide he takes his clients hunting with the use of horses. To date he has spent in excess of \$2.8 million for his hunting area, lodge and horses, and floatplanes and boats needed to provide his clients with a wilderness adventure.

Randy maintains that that having no roads in this territory is a major factor in selling his product of wilderness adventure. The ability to not cross one single road is a powerful experience. No matter where a road would be located in the study area it would impact on his hunting area. Once a road is established anyone can get into his area and there by diminish the value of his business. A road would virtually devastate his business. The pristine wilderness is key to the type of experience his clients are paying for.

The fact that there is no resource extraction is key to the development of the Gataga as a First Class Wilderness Tourism destination.

Appendix H
Report from Chris Graf

Cave, Joe

From: Chris Graf [cgraf@ecstall.com]
Sent: Monday, August 20, 2001 5:04 PM
To: joe.cave@snclavalin.com
Subject: Ecstall tenures Access Route

Joe, I have sent this message further to our conversation earlier today.

As I explained to you and to 2 of your associates on separate occasions, a very serious geotechnical complication to road/tunnel construction in the Braid, Driftpile and Through creeks valleys is the highly incompetent Gunsteel shale formation which more or less blankets these areas and hosts all of the mineral deposits/potential mines.

This monolithic mudstone unit is in the order of 500 meters thick but is repeated and thickened structurally by thrust faults and associated folds. It does not contain any massive competent beds of sandstone or limestone.

I suggest that at the very least you find a geological map to find its actual distribution and overlay this with any potential routes you may have in mind.

I mentioned to your associates who made the field visit to pay particular attention to this shale formation and note its large solifluction lobes on all hillsides it underlies.

About 100 kilometers further south a major sedex massive sulfide layer, known as the Cirque deposit, occurs within this Gunsteel shale and when a mining plan was developed it was found to dip at ~ 30 degrees and the shale was so incompetent that a large portion of the sulfide orebody had to be left unmined in order to hold up the shale roof of the tunnels and mine openings.

With respect to locating a route it must be economically and technically practicable. The eventual route to be chosen is to be the least costly +/- 10% and so at least one route through the Gataga-Frog Protected area has to be included to compare costs.

The \$2 million/kilometer estimated cost that you mentioned to me today for an ~ 75 kilometer long road (\$150 million) is just too high by almost an order of magnitude to be worth even putting on paper as it would only serve to forever preclude all mining companies from considering developing a mine or two in this area.

Tunnels are not a realistic option and I suggest that you somehow get more money to make another field trip to the area and take me along.

A 10 meter wide road is probably necessary because of the economics of large haulage containers (B-trains) and as well the route would also have to carry other infrastructure such as powerlines and pipelines etc. however these wide cuts will result in some considerable problems with sloughing of the Gunsteel shale which again needs to be field checked.

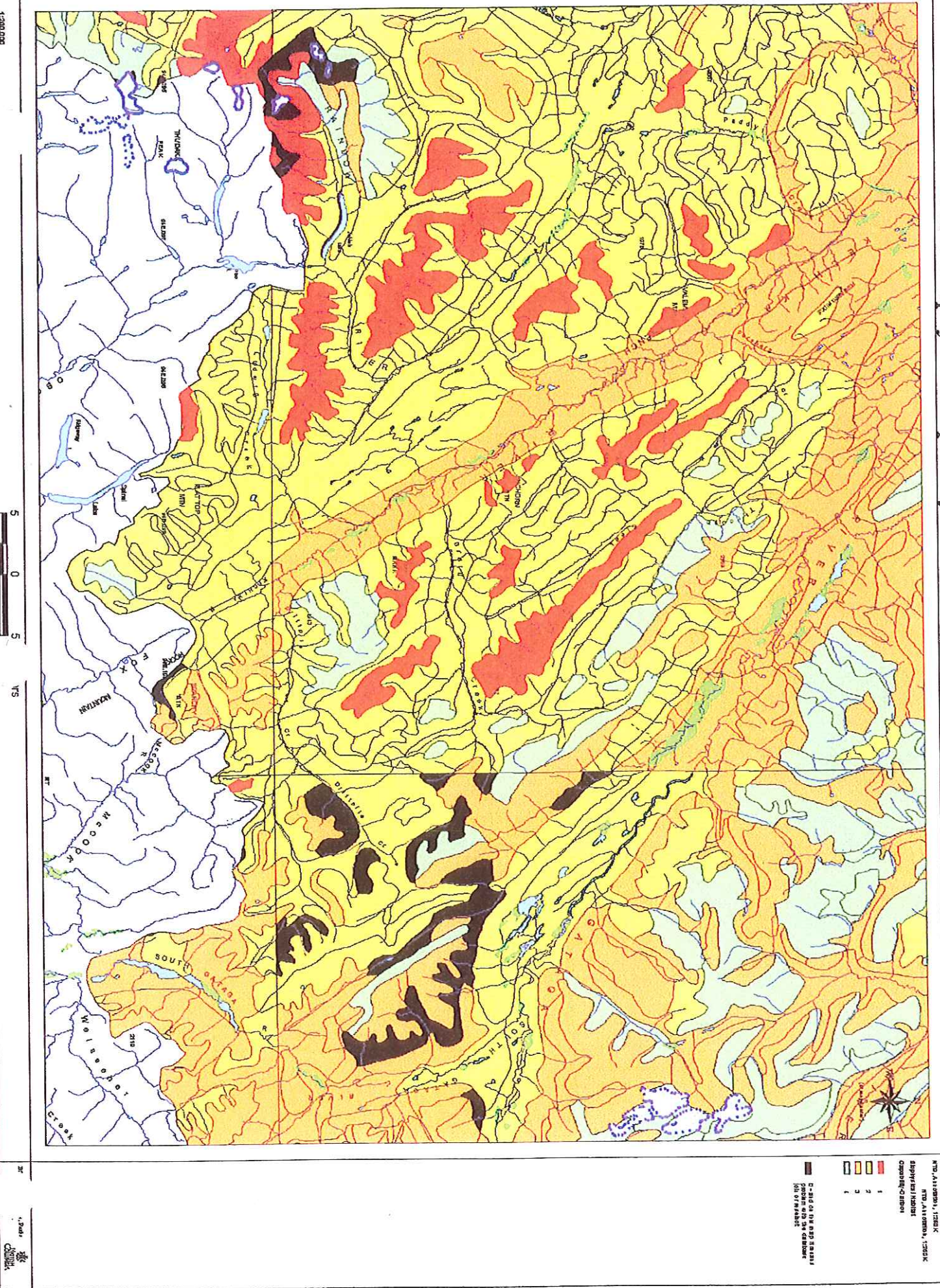
I have other comments but this is all I have time for right now.

Regards, Chris Graf

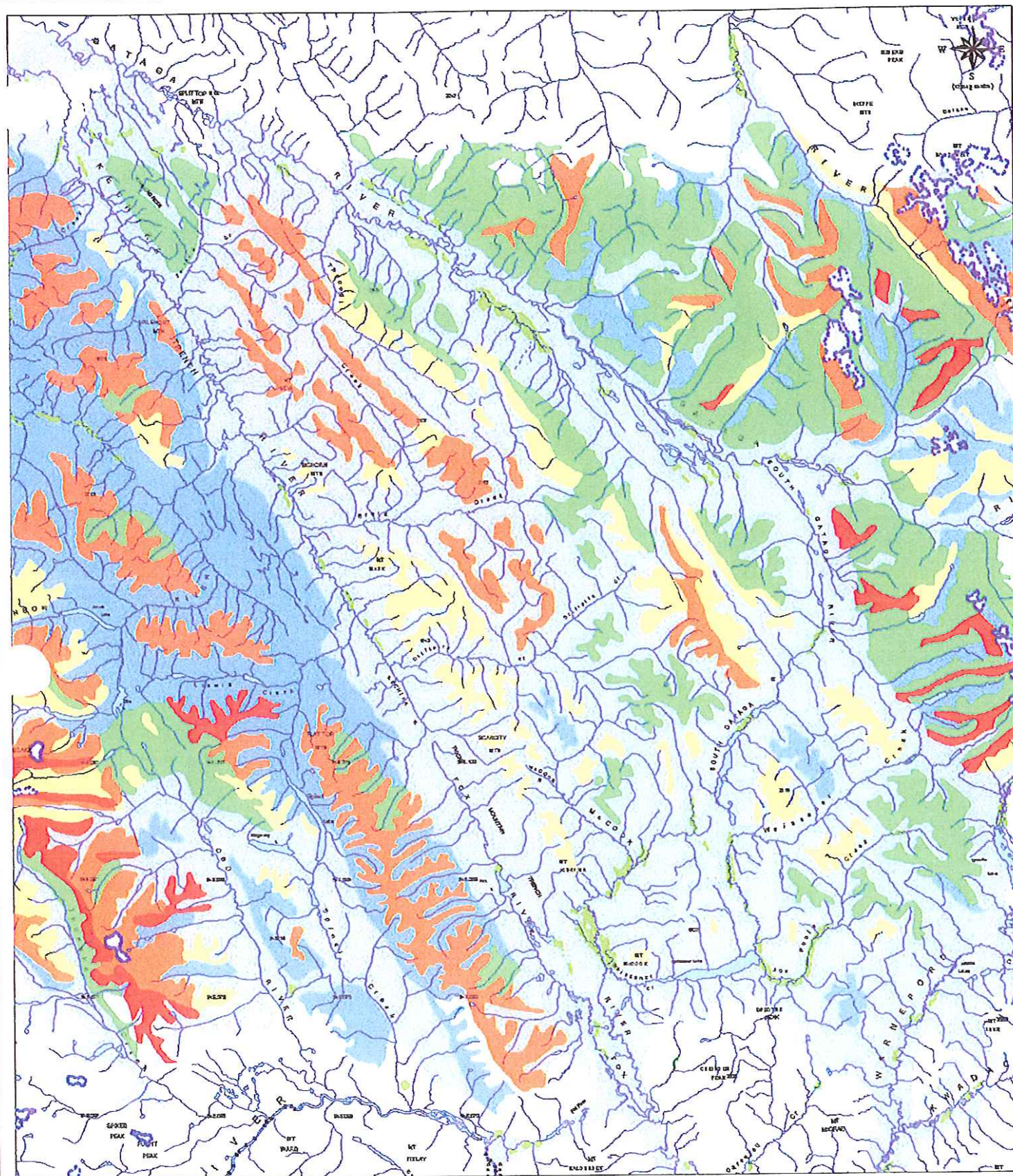
Appendix I

Wildlife Capacity Maps

Prov. Biophysical Capability - Caribou (From the 1:250K coverage)



Mountain Goat Winter Capability Map



5 0 5 Kilometers

1250 K
 1250 K
 1250 K
 1250 K

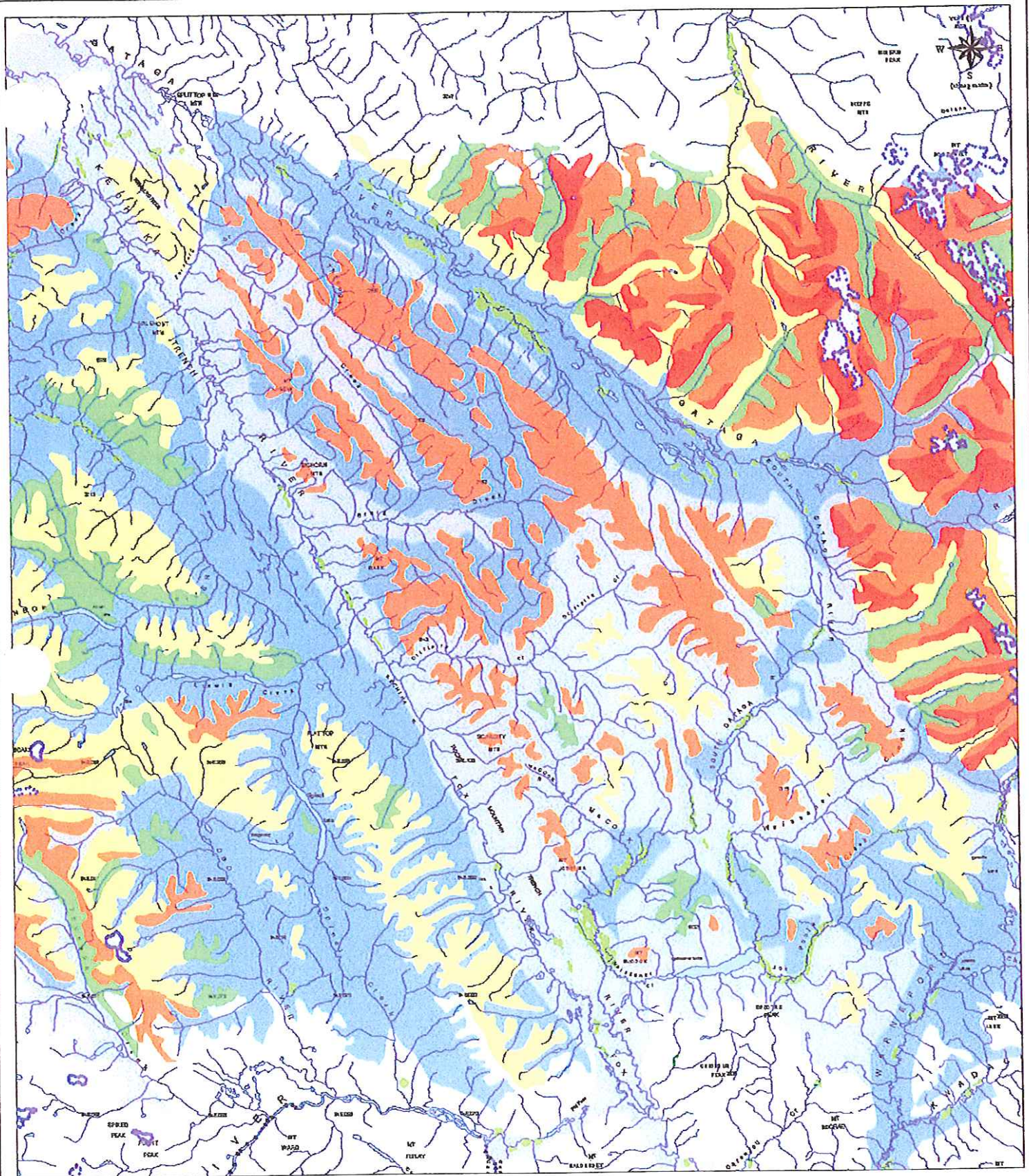
 Class 1 - Very High
 Class 2 - High
 Class 3 - Moderate
 Class 4 - Low

Class 5 - Very Low
Class 6 - Nil

PC MIA. Enx Leads, Pch
Fm 12/2/81
Fm 12/2/81



Mountain Goat Summer Capability Map



5 0 5 Kilometers

700

chr1_1295K chr5 - Very Low
chr1_1295K chr5 - HI

HIS, H1, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12, H13, H14, H15, H16, H17, H18, H19, H20, H21, H22, H23, H24, H25, H26, H27, H28, H29, H30, H31, H32, H33, H34, H35, H36, H37, H38, H39, H40, H41, H42, H43, H44, H45, H46, H47, H48, H49, H50, H51, H52, H53, H54, H55, H56, H57, H58, H59, H60, H61, H62, H63, H64, H65, H66, H67, H68, H69, H70, H71, H72, H73, H74, H75, H76, H77, H78, H79, H80, H81, H82, H83, H84, H85, H86, H87, H88, H89, H90, H91, H92, H93, H94, H95, H96, H97, H98, H99, H100

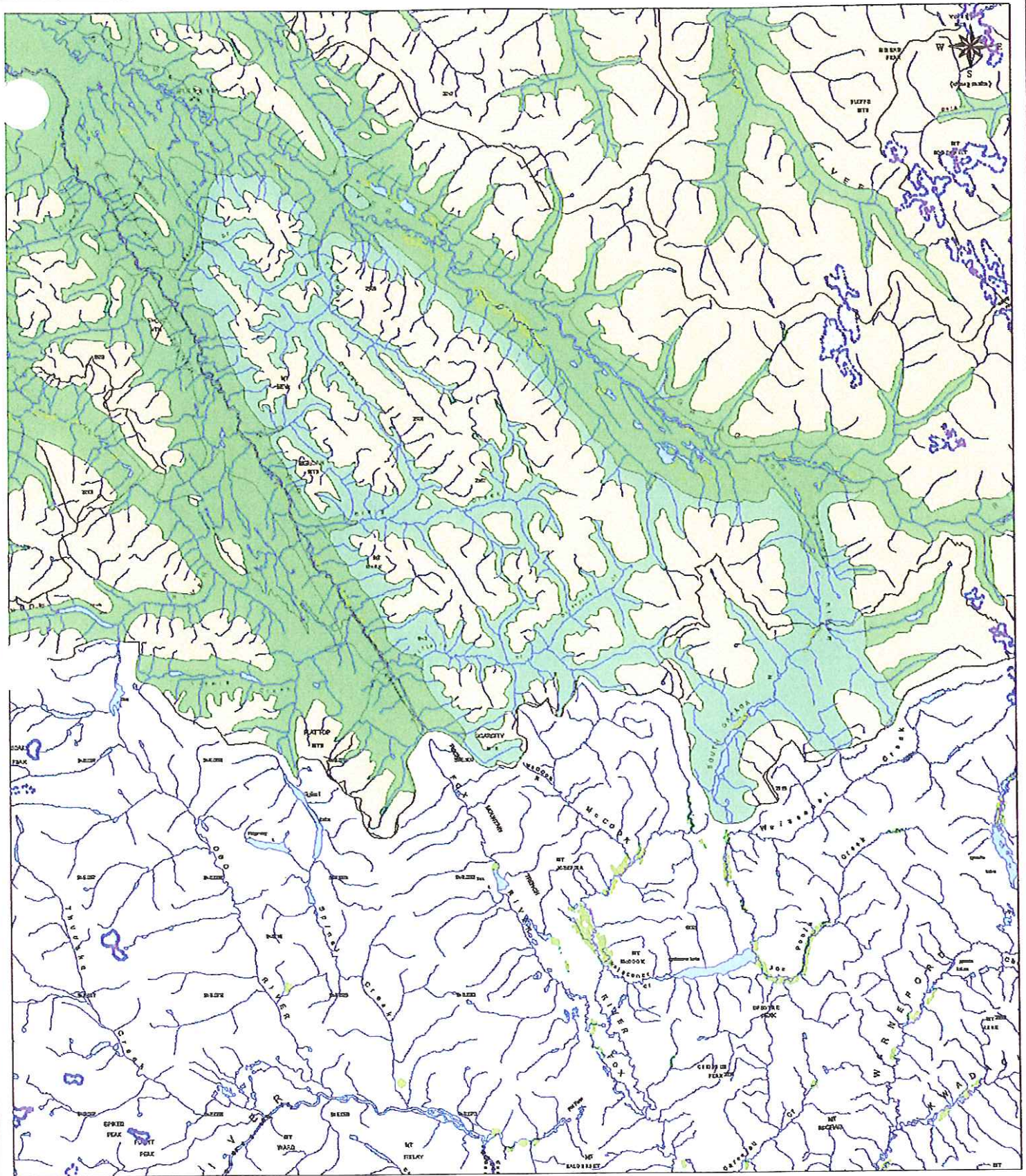
Capability-Weighted Average

Chr 1 - Very High
Chr 2 - High
Chr 3 - Moderate
Chr 4 - Low

PC HIA. Yim Lada, Fchi
Pam Lada
Jun 6, 1911



Grizzly Bear Capability



100

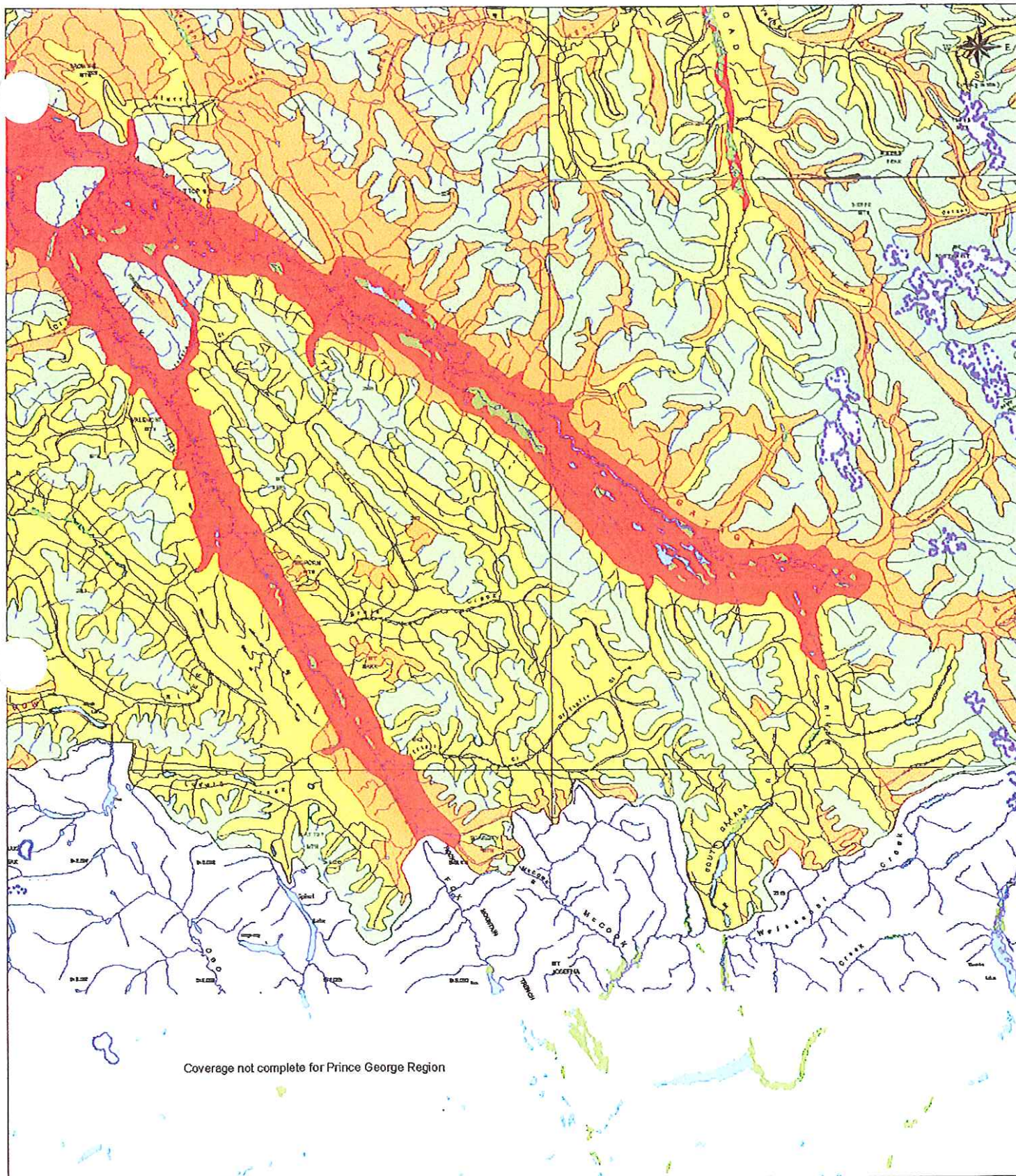
5 0 5 Kilometers

1:250,000
 W.B. 1:250,000
 Dark green high (3)
 Light Green Mid (4)
 Yellow Low (5)

BC Min. Trans. & Highways
 Forest & Range
 June 1, 1993



Grizzly Bear Capability - from Prov Bio 1:250000 coverage



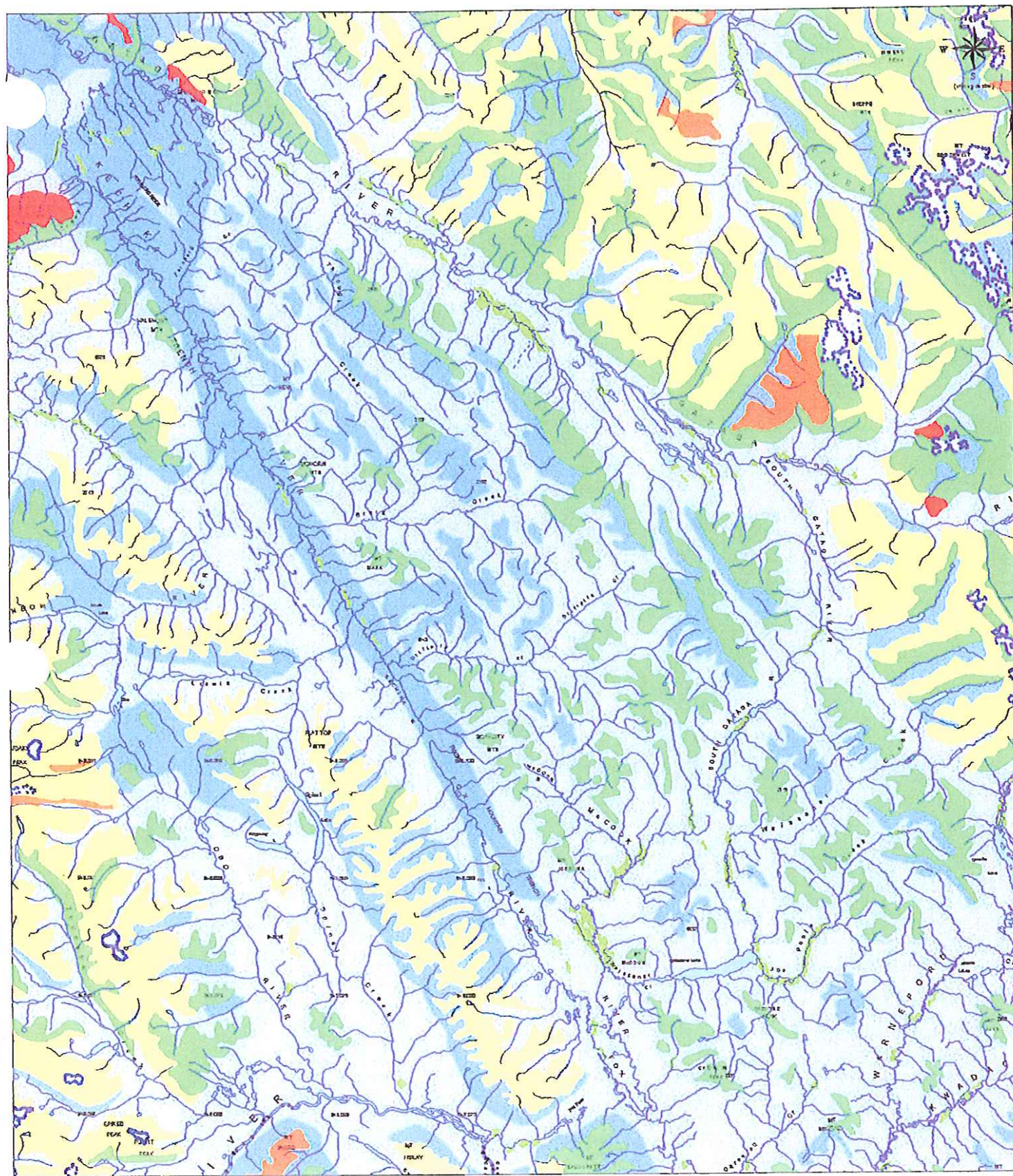
5 0 5 Kilometers

at 1:250 K
 WTD, A11 clutts, 1:250 K
 Dark green high (3)
 Light Green Mid (4)
 Yellow Low (5)

BC Mts. Eval. Unit, Volo
 Peter A. G. P.
 June 4, 1991



Stone Sheep Winter Capability



5 0 5 Kilometers

NTD, 1.250K
NTD, Assets, 1.250K
KING, 1816bit Sleep White
Capacity - Weighted Average

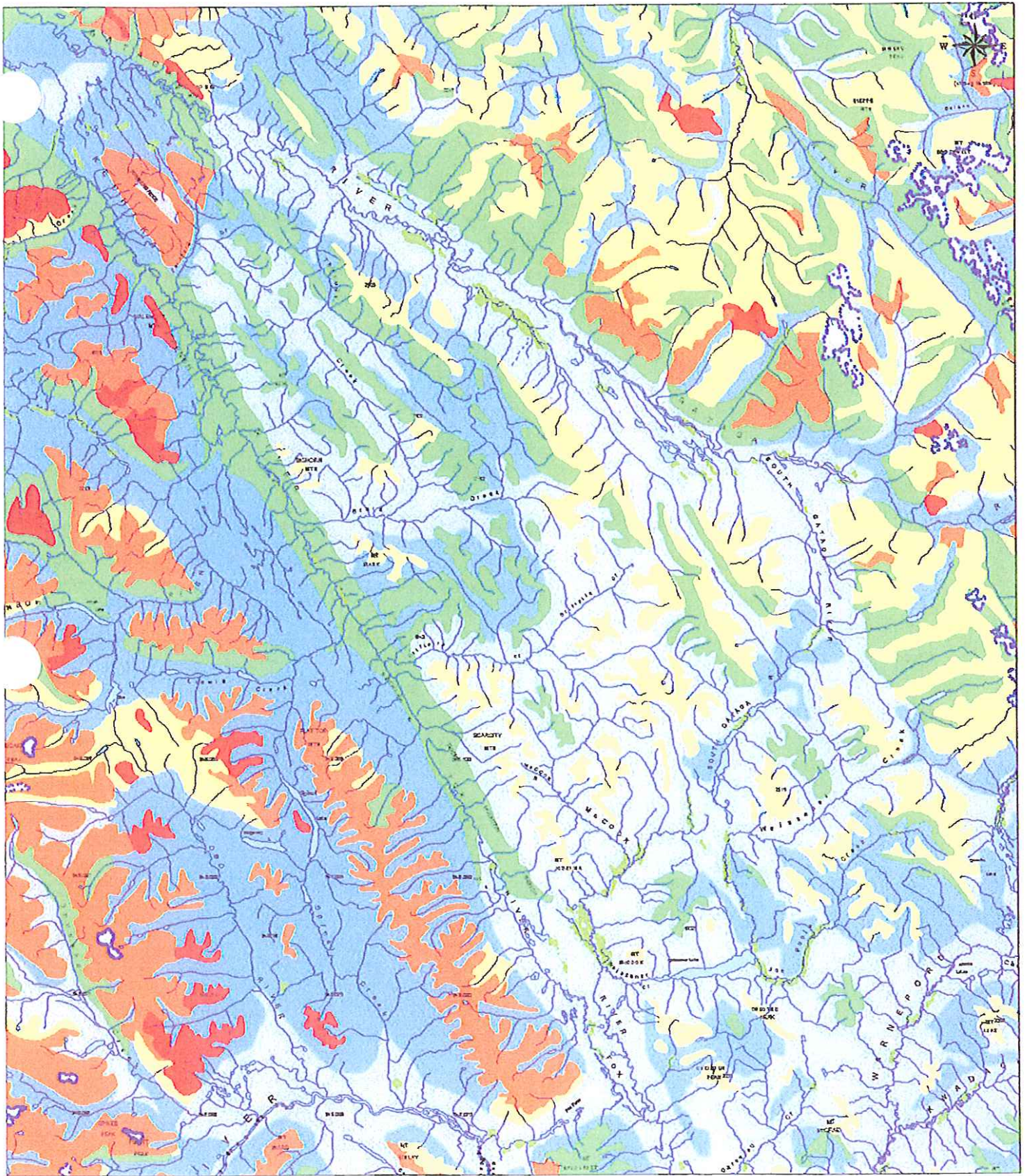
Class 5 - Very Low
Class 5 - NE

-  Class 1 - Very High
-  Class 2 - High
-  Class 3 - Moderate
-  Class 4 - Low

PC Hb. Ex Lib. Fed.
Post Office
June 1, 1911



Stone Sheep Summer Capability Map



100

5 0 5 Kilometers

2000, 1250K
MT9, 1250K
HAG, 8010K Sheep Summit
Copyright - Wildlife Services

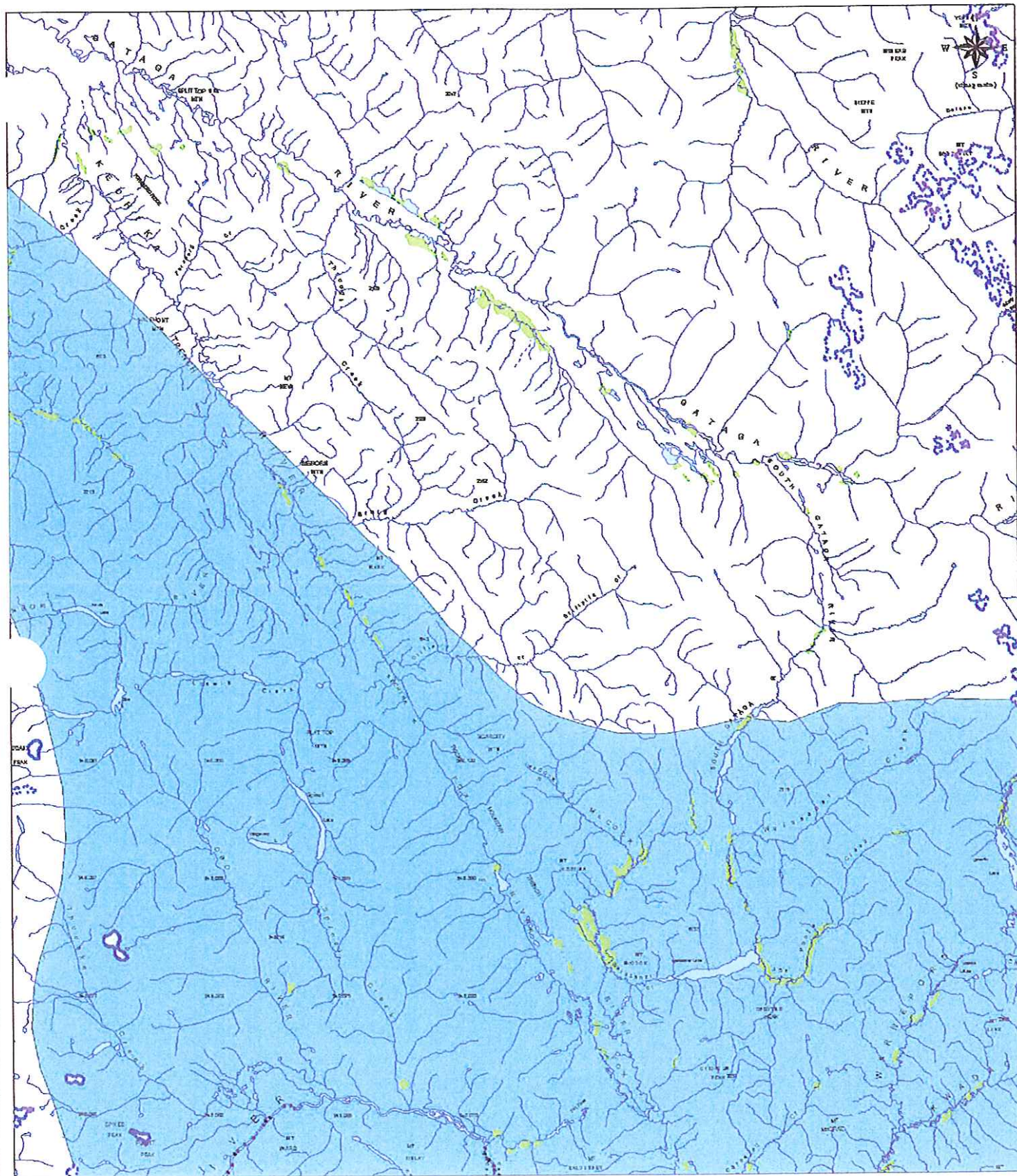
Class 1 - Very High
Class 2 - High
Class 3 - Moderate
Class 4 - Low

Class 5 - Very Low
Class 6 - Nil

20 Miles, 30 Kilometers, 1000 Feet
Scale 1:100,000
June 1, 1981



Rainbow Trout Distribution



5 0 5 Kilometers

1250 K
 NT9, A1250 K, 1250 K
 HMC, 1250 K
 Granger Capable - Weighted
 Average

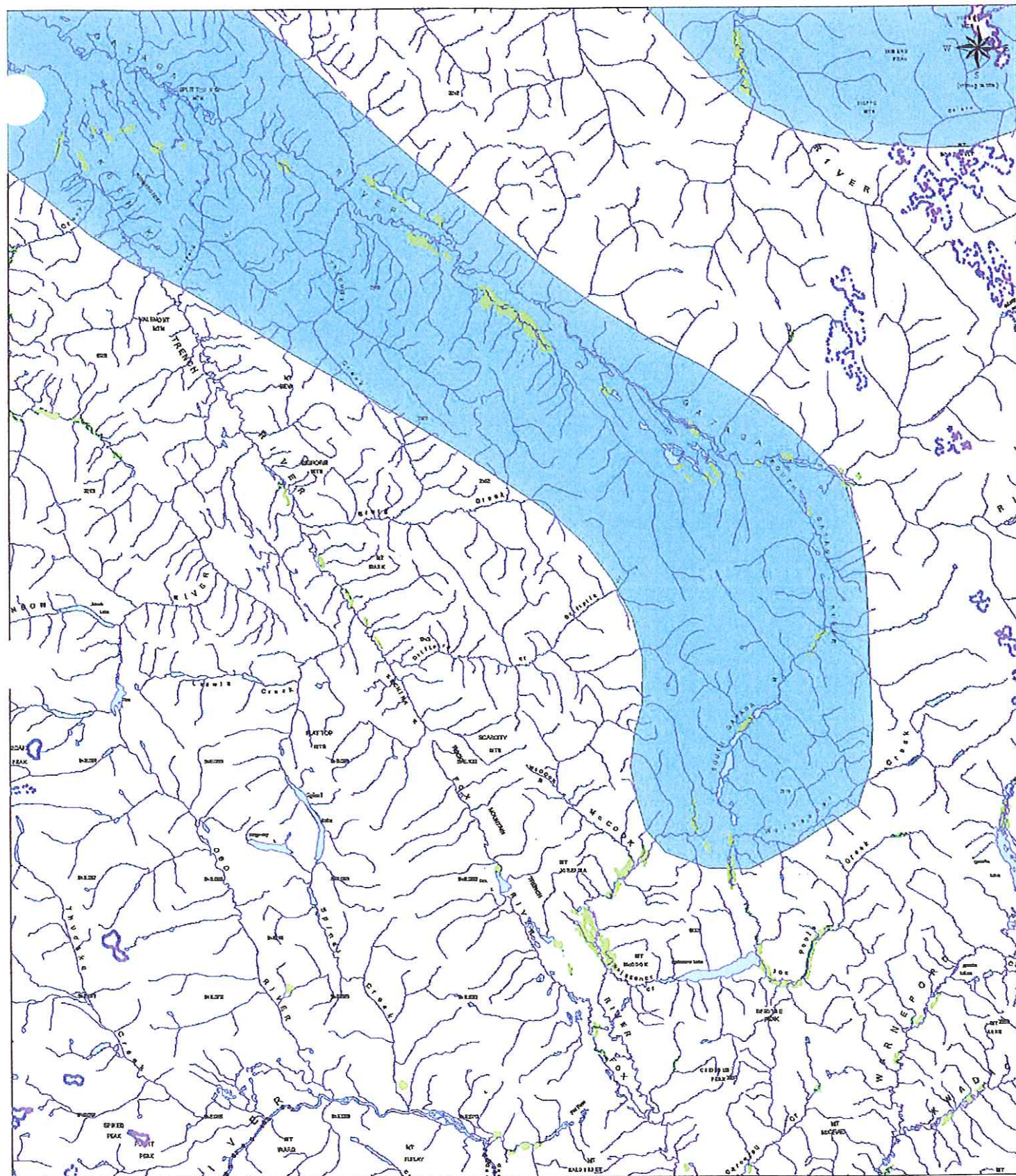
Class 4 - Low
Class 5 - Very Low
Class 6 - Nil

	Class 1 - Year High
	Class 2 - High
	Class 3 - Moderate

DC Min. Tax Unit, Fed.
Trans. Regs.
Page 6, 1981



Northern Pike Distribution



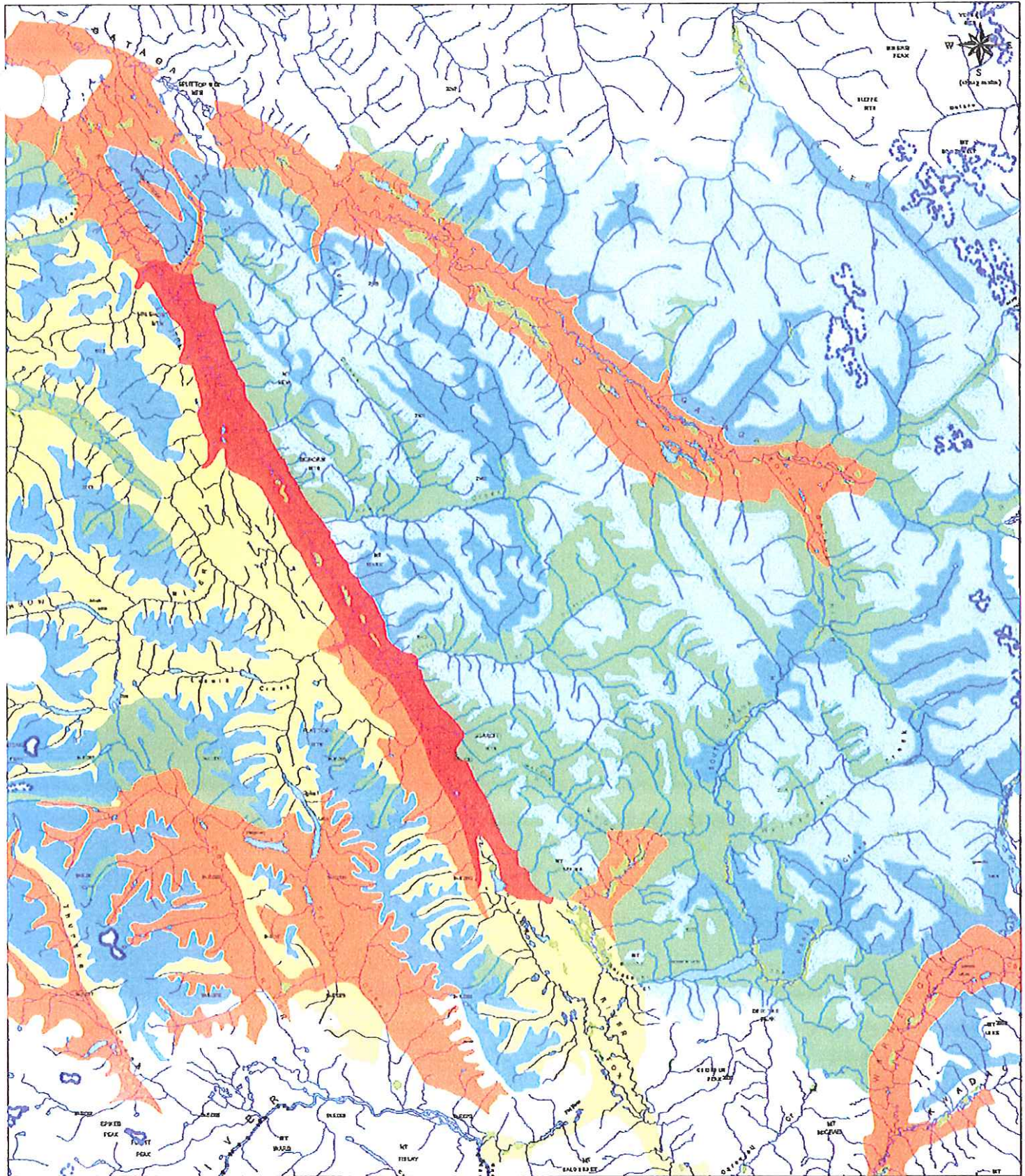
5 0 5 Kilometers

lib1, 1,260 K
MTS, Assembly, 1,260 K
Worden File
 Worden File

DC Hqs. East Coast, Field
Post Office
Post 6, 1941



Broad EI Moose Winter Capability Map



5 0 5 Kilometers

1250 K
 MTS, 1250 K
 HPG, 1250 K
 Winter Capability Map - Weighted
 Average
 Class 1 - Very High
 Class 2 - High
 Class 3 - Moderate
 Class 4 - Low
 Class 5 - Very Low
 Class 6 - Nil

BC Mts. Data, Publ.
 1991
 1991



Appendix J
E-Mails from B. Webster
BC Parks

Collins, Geraldine

From: "Webster, Bryan PRK:EX" <Bryan.Webster@gems2.gov.bc.ca>
[SLI.SMTPMTL."Bryan.Webster@gems2.gov.bc.ca"] on behalf of
SLI.SMTPMTL."Bryan.Webster@gems2.gov.bc.ca"
Sent: Tuesday, September 25, 2001 3:51 PM
To: Collins, Geraldine
Cc: Michael.Coon@gems5.gov.bc.ca
Subject: Frog-Gataga Caribou Surveys and related other information.



Header

I obtained the inventory data for the caribou count done in February, 2001 by Fish and Wildlife Branch which, together with the radio relocation data I gave you previously, will give you a bit of a picture of what their habitat use is for the area...however that which is still lacking is year-round habitat use information (niche). Beyond our perspective anyway for this purpose.

The number of caribou estimated from the count was 1034 with a confidence interval of 789.5 to 1278.2 at the 95% level. This was a capture-recapture count following the Resource Inventory Committee standard for such work. Unfortunately there was no formal report submitted on the work as in previous years due to staffing issues and workload at Fish and Wildlife Branch.

I do have however, the moose, and sheep counts and can send you a hard copy you need it.

A summary of that follows:

The moose population estimate for the area revealed a density of 0.0613 moose per square Kilometer, but ranged from .0066/Km² to 0.5972/Km² for the high density areas at a Confidence interval of 95%. This count was a stratified Randomized Block Count following the Resource Inventory Committee methods as adapted from Gasaway et al. The more southern portions of the area such as Gataga Lakes south to nearer Fort Ware in normal winters are restrictive to moose due to excessive snow accumulations and lateness of degree-growing day initiation each spring. There were several high density areas favoured by the natives at the easternmost Gataga Lake and in the Mayfield Lake area.

The wintering stone sheep for the area are as follows:

2+	ewes	total	yearlings	lambs	rams	total	sheep
40		12		19	30		101

The conditions observed the past three winters for the area can be categorized as having been exceedingly mild with little snow accumulations. The numbers of stone sheep for this area are significantly regulated by wolf predation, thus access to the Ecstall claims area if built will have an impact on the sheep by way of giving easy travel for the wolves to and from the area. During normal winters the climate in this area is severe and mining presence may exacerbate their survival if insufficient mitigativeasures were not undertaken. During the summer and fall months additionalone sheep move into the area from a variety of locations where winter ranges are milder and more productive over the longer term, and where this species is far more numerous. The effects of predation on summer range areas where wolves find easy access such as the Ecstall area is a potential

concern. The presence of mining access and a mine would impact less on this component directly, but their needs would have to be understood. At present we have no summer movement information for sheep.

a Mountain Goat inventory did not adequately overlap with the Braid unit and these data are not included.

The Bull Trout were not inventoried this year, but if you require detail as to presence or absence I can show that you you.

All for now, and hope this is useful to your purpose.

Bryan Webster
Resource Officer
Peace-Liard District
Tel: 250-787-3418
Cel: 250-261-8877

Collins, Geraldine

From: "Webster, Bryan PRK:EX" <Bryan.Webster@gems2.gov.bc.ca>
[SLI.SMTPMTL."Bryan.Webster@gems2.gov.bc.ca"] on behalf of
SLI.SMTPMTL."Bryan.Webster@gems2.gov.bc.ca"
Sent: Wednesday, September 26, 2001 4:03 PM
To: Collins, Geraldine
Subject: FW: Driftpile Caribou



cari bio 1250k
coverage.jpg



Header

Because there was no report done for the caribou work, I

figured perhaps you might find Dr. Elliott's comment below of some use. The issue John was trying to resolve was that of identifying caribou calving grounds from the telemetry information. We were able as you know, to relocate a large proportion of the collared caribou in June (the floppy disk I gave to you). The calving area he figured was critical was the long north-south ridge indicated on the BEI map in the jpg graphic file on the CDROM we sent you earlier. It is the one indicated in the attached graphic. You will note however from the dispersion of the radio collars from this June, that we might well not be correct. Both John Elliott and myself felt the route we discussed coming past the Tek-Cominco claims units is going to prove to be the better one from the point of view of many factors as we discussed in the meeting at your office.

<<cari bio 1250k coverage.jpg>>

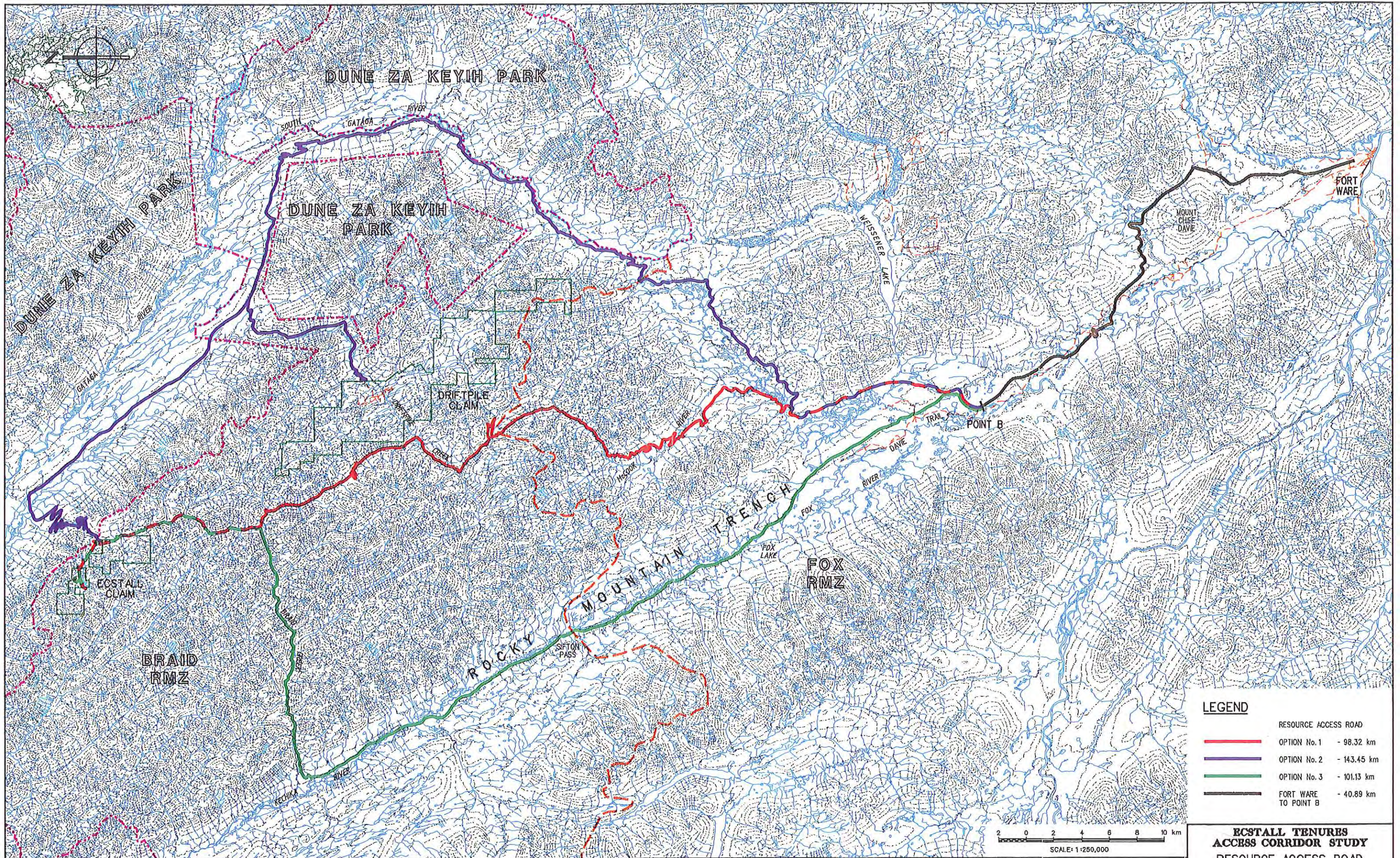
. -----Original Message-----

> From: Webster, Bryan PRK:EX
> Sent: Thursday, June 07, 2001 11:57 AM
> To: Elliott, John ELP:EX
> Subject: RE: Driftpile Caribou
>
> Thanks John. This kind of stuff will be useful.

> -----Original Message-----

> From: Elliott, John ELP:EX
> Sent: Thursday, June 07, 2001 11:44 AM
> To: Webster, Bryan PRK:EX
> Subject: Driftpile Caribou
>
> Still trying to dig myself out of the backlog but thought you might need a
> preview on the latest caribou locations.
>
> The snow just wasn't melting and the believed calving country was still
> snow packed 23 May. The caribou were in the: Kechika valley around the
> mouth of Braid, upper McCook valley, Rainbow, 'Islandlake Creek', and
> Mayfield flats.

DRAWINGS



LEGEND

RESOURCE ACCESS ROAD	
—	OPTION No. 1 - 98.32 km
—	OPTION No. 2 - 143.45 km
—	OPTION No. 3 - 101.13 km
—	FORT WARE TO POINT B - 40.89 km

**ECSTALL TENURES
ACCESS CORRIDOR STUDY
RESOURCE ACCESS ROAD
OVERALL SITE PLAN**

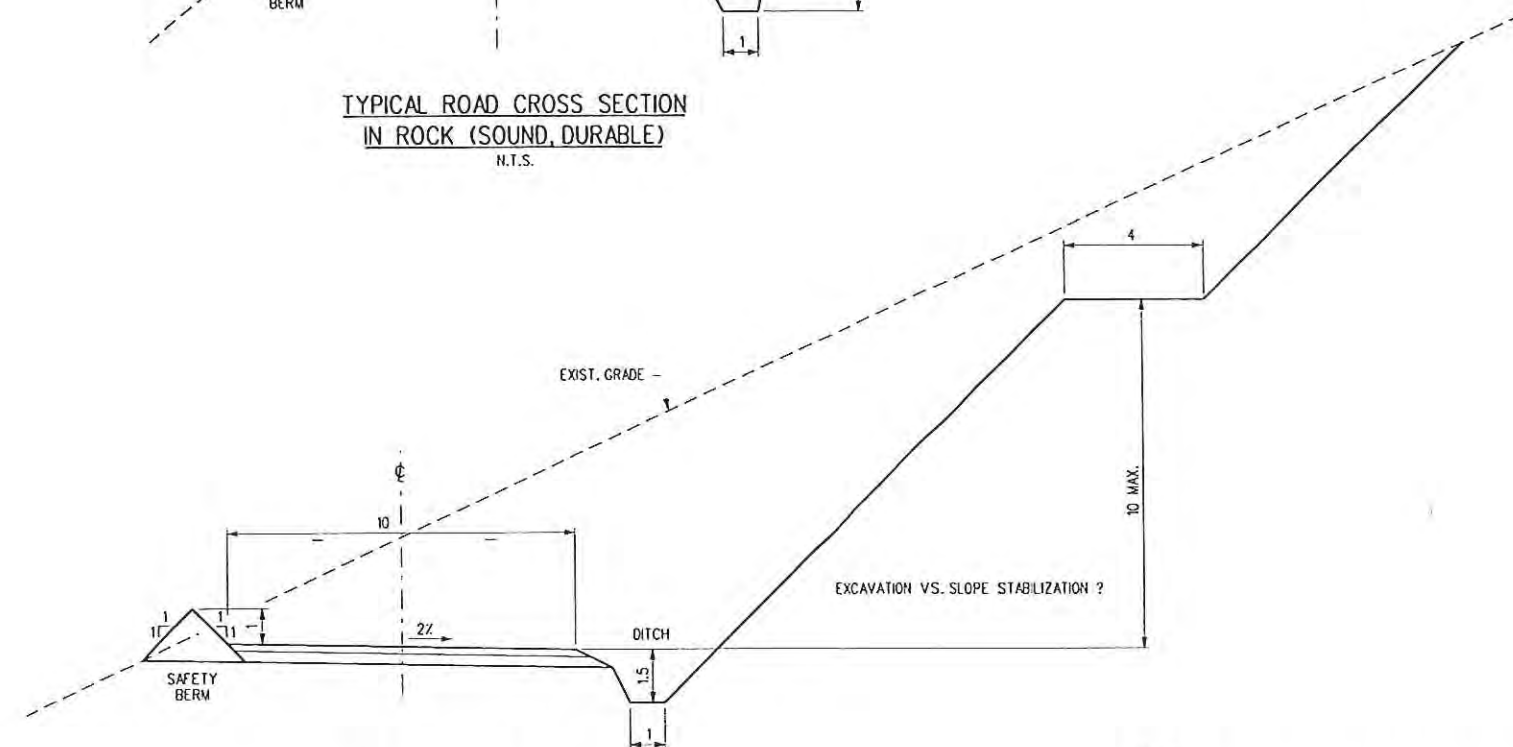
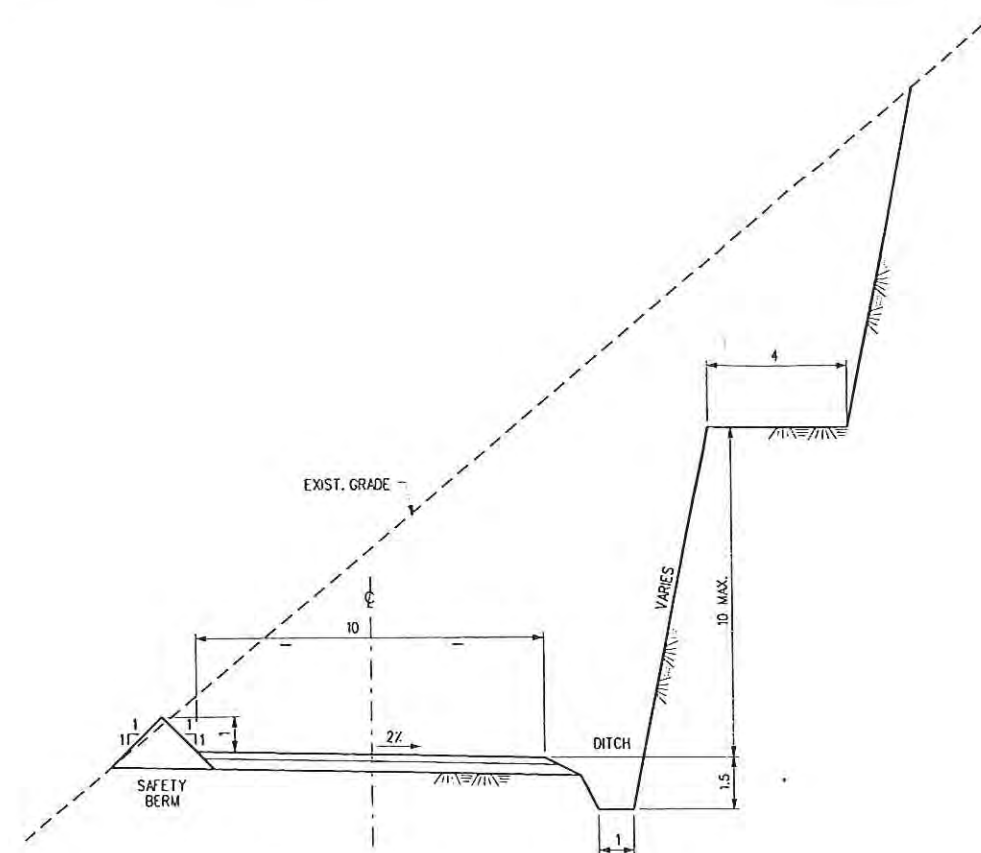
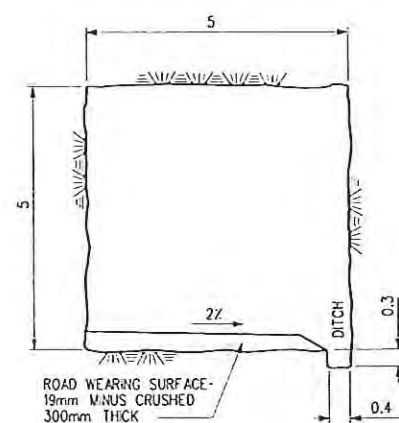
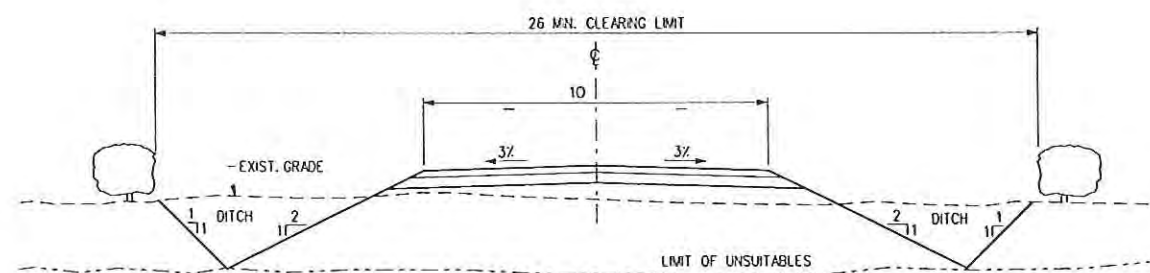
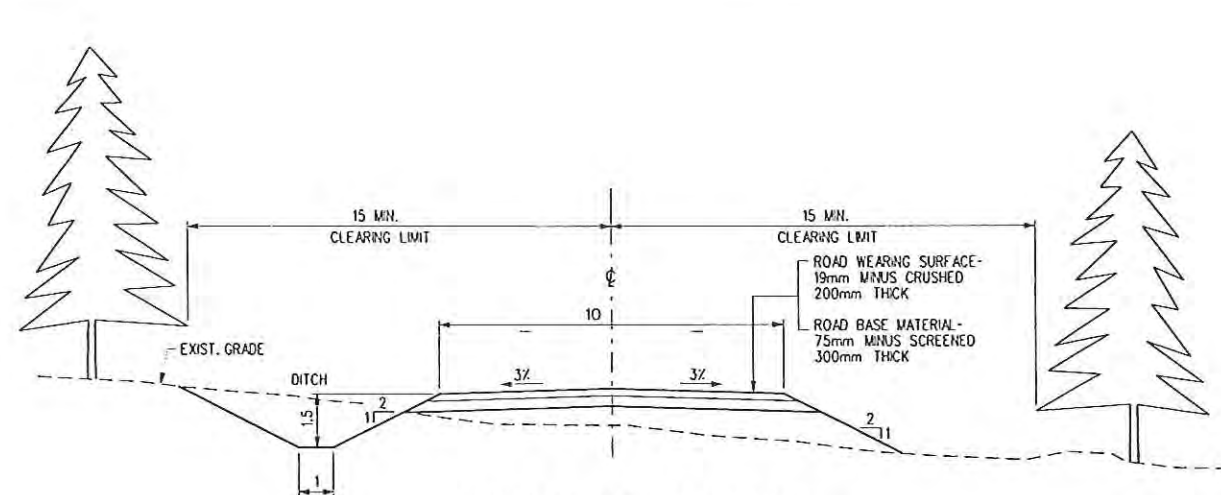
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2	OPTION No. 3 ADDED	05 OCT 2001	VAD
3	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD
4	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR FINAL REPORT	25 OCT 2001	VAD
2	OPTION No. 3 ADDED	05 OCT 2001	VAD
3	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD
4	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD

SECTION: CIVIL	DATE
SCALE: 1:250,000	AUG 2001
DESIGNED: JOA A. CAVE	AUG 2001
DRAWN: VAD	AUG 2001
CHECKED:	
APPROVED:	

 KILBORN SNC-LAVALIN	CLIENT: PROVINCE OF BRITISH COLUMBIA RESOURCE PLANNING DIVISION
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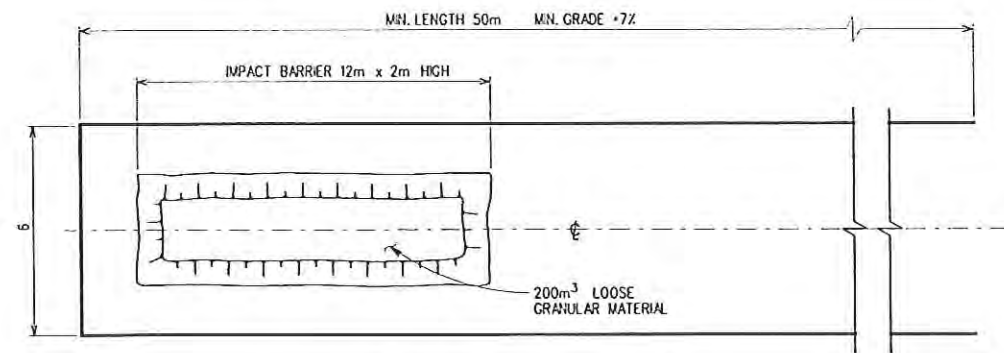
PROJECT NUMBER	DRAWING NUMBER	REV.
449042-15	000-35-001	C



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ROAD WIDTH INCLUDING SHOULDERS TO BE 10 METRES EXCEPT AT BRIDGES, FISH STREAM CROSSINGS, TUNNELS AND SNOW SHEDS.

[illegible]

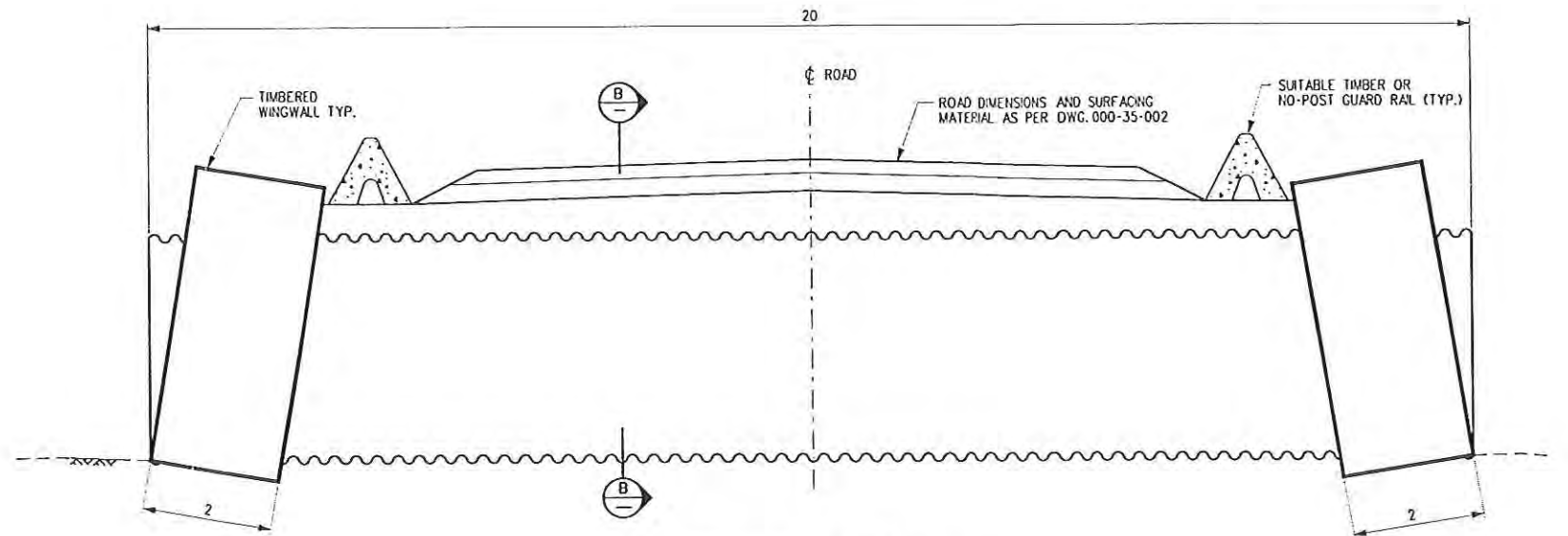


EMERGENCY RUN-OUT LANE

PLAN

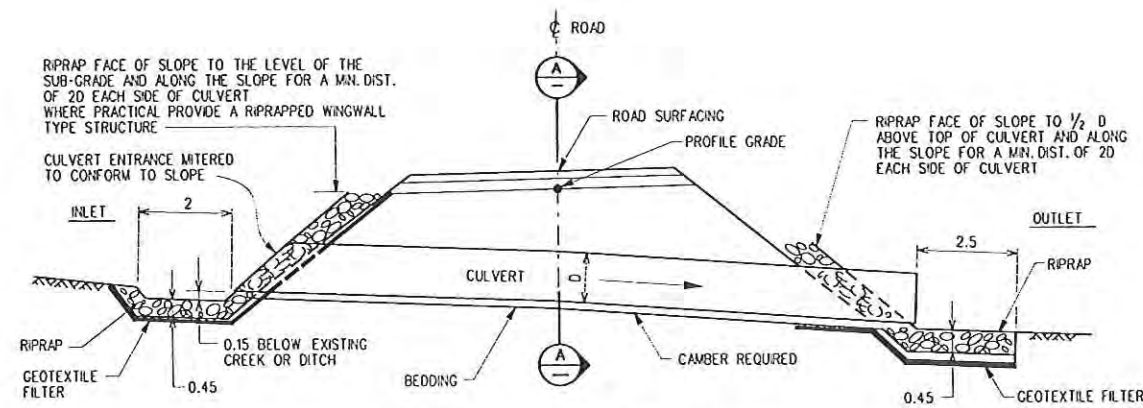
N.T.S.

EMERGENCY RUN-OUT LANES TO BE FIELD LOCATED BY THE ENGINEER



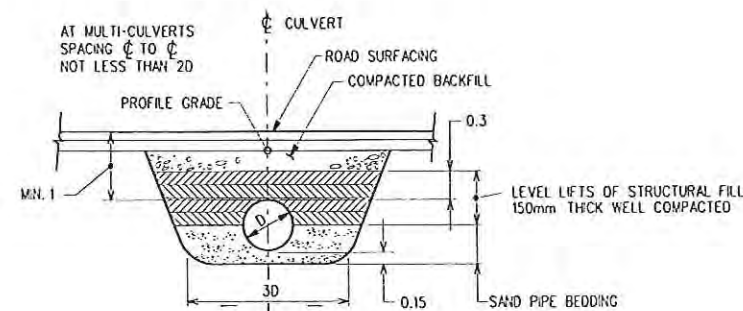
TYPICAL WILDLIFE CROSSING

N.T.S.



SECTION THROUGH CULVERT

N.T.S.

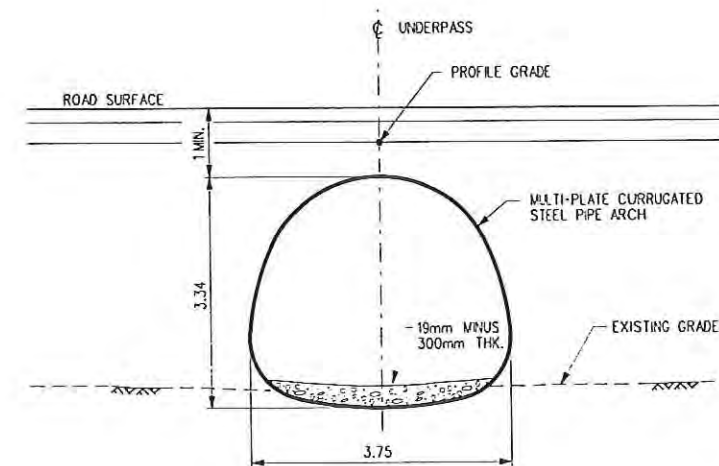


SECTION A-A

N.T.S.

TYPICAL CULVERT DETAIL

(UNLESS NOTED OTHERWISE)



SECTION B-B

N.T.S.

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ROAD WIDTH INCLUDING SHOULDERS TO BE 10 METRES EXCEPT AT BRIDGES, FISH STREAM CROSSINGS, TUNNELS AND SNOW SHEDS.

ECSTALL TENURES
ACCESS CORRIDOR STUDY
RESOURCE ACCESS ROAD
TYPICAL ROAD SECTIONS
AND DETAILS



PROVINCE OF BRITISH COLUMBIA
RESOURCE PLANNING DIVISION

PROJECT NUMBER 449042-15
DRAWING NUMBER 000-35-004

REV. B

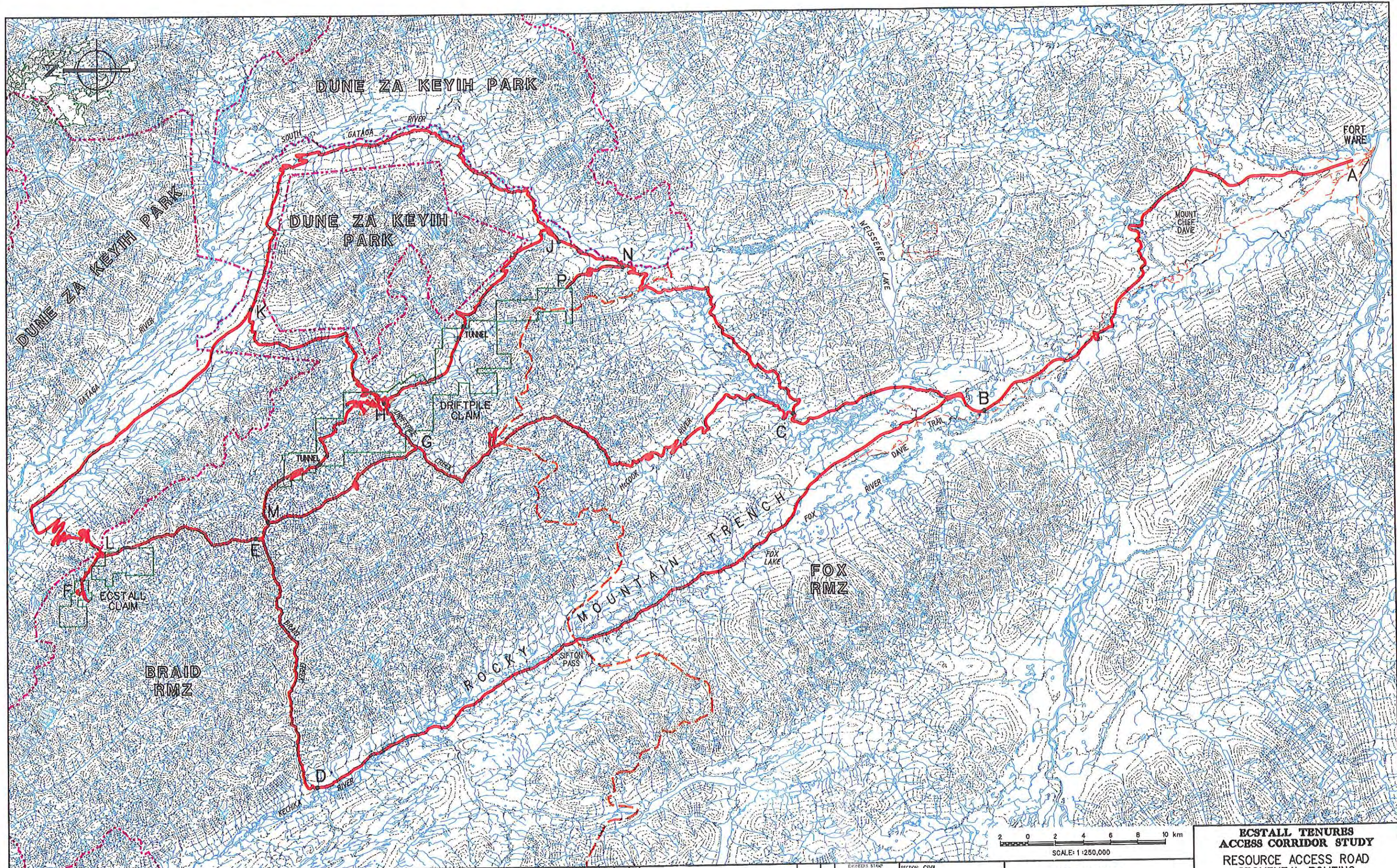
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2	ISSUED FOR DRAFT REPORT	05 SEP 2001	VAD

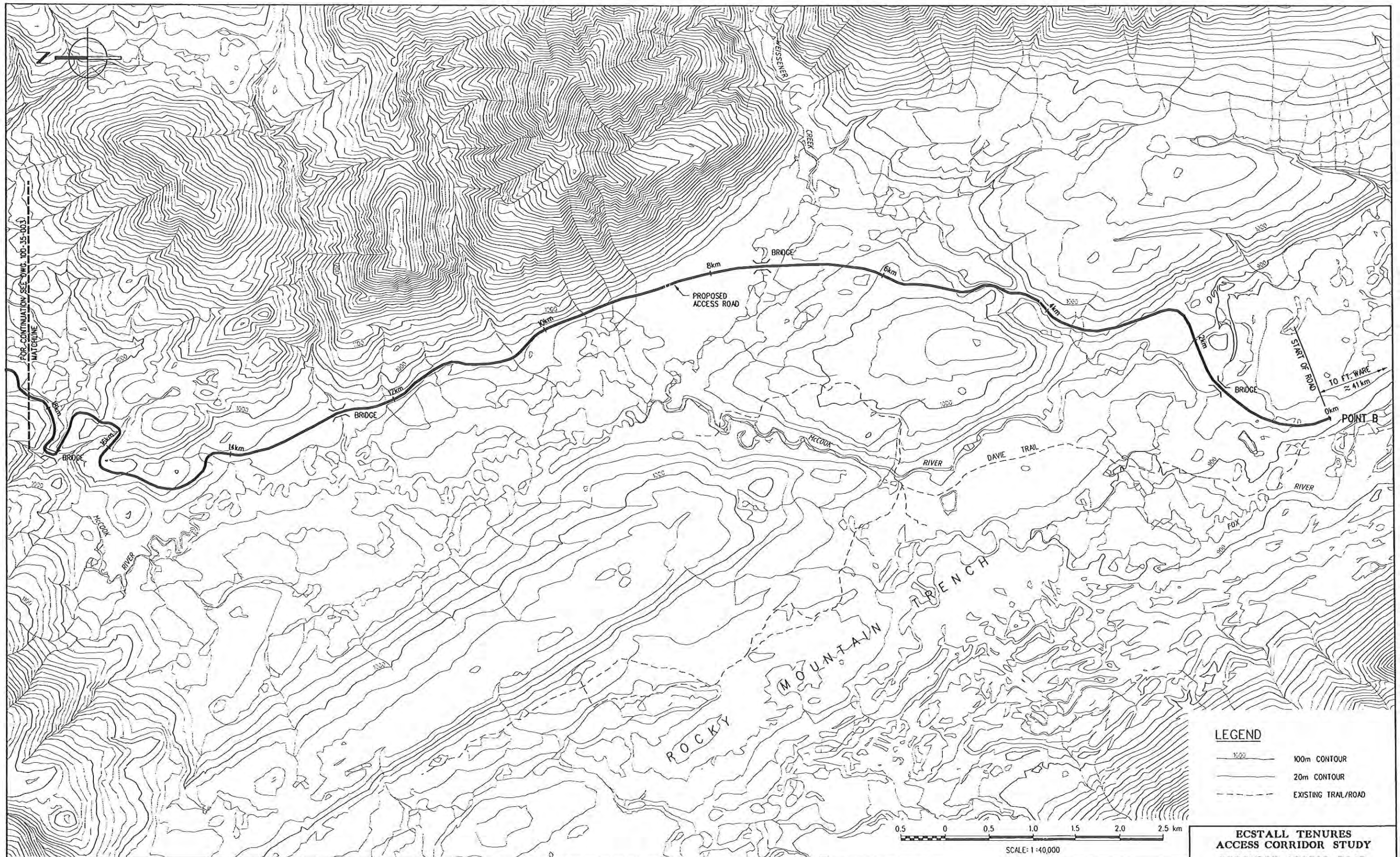
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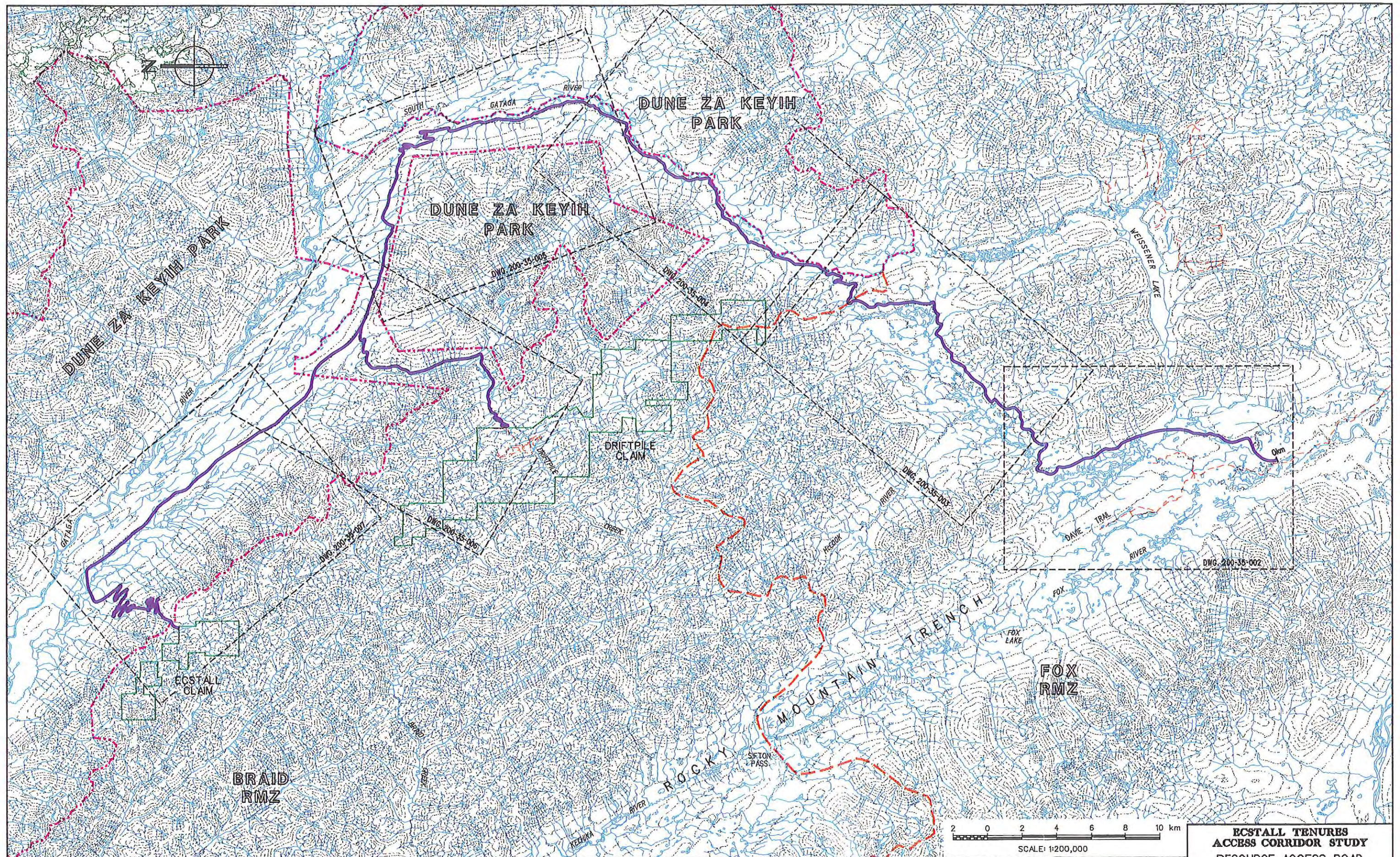
REVISIONS

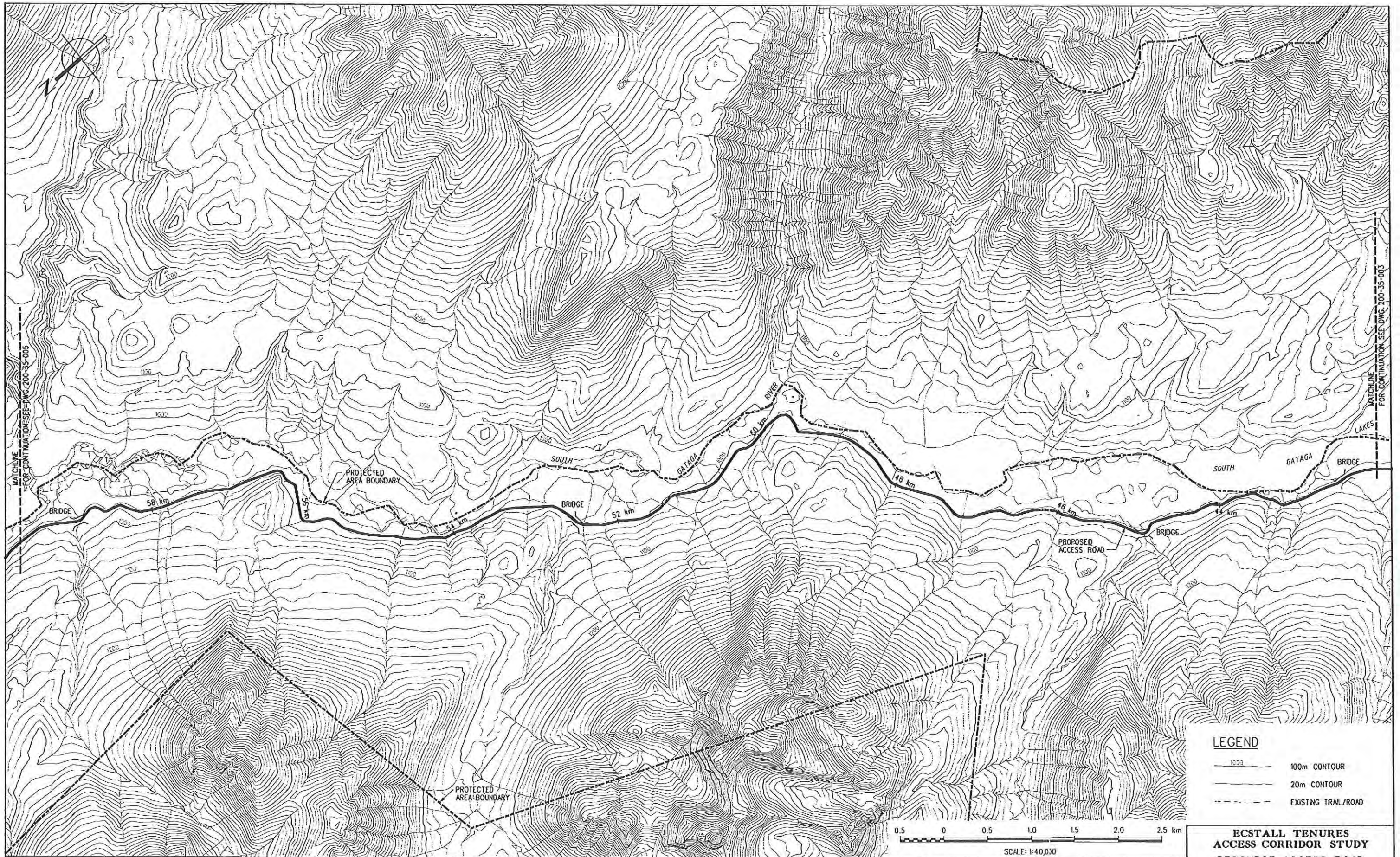
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1.17

[illegible]



[illegible]

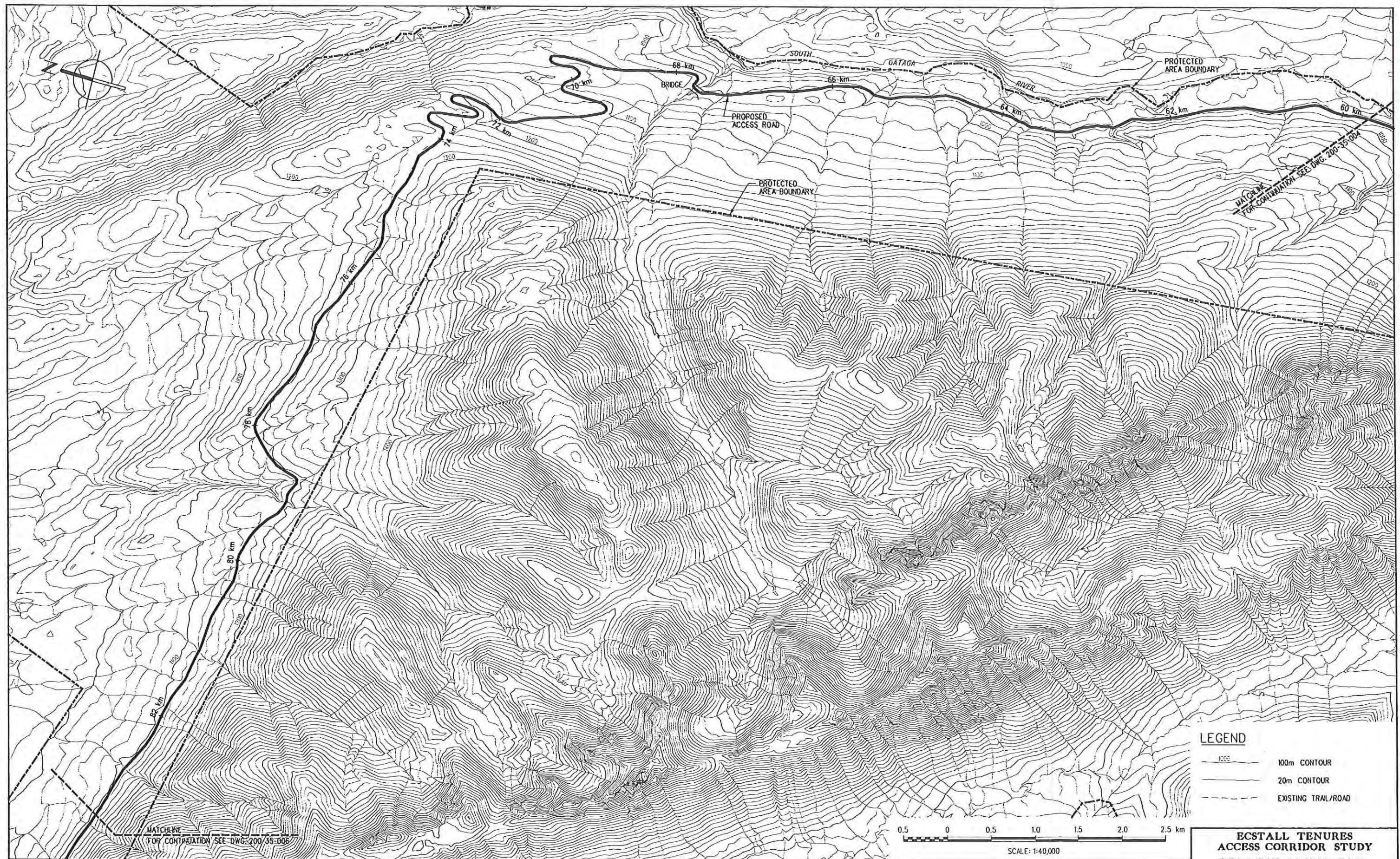


LEGEND

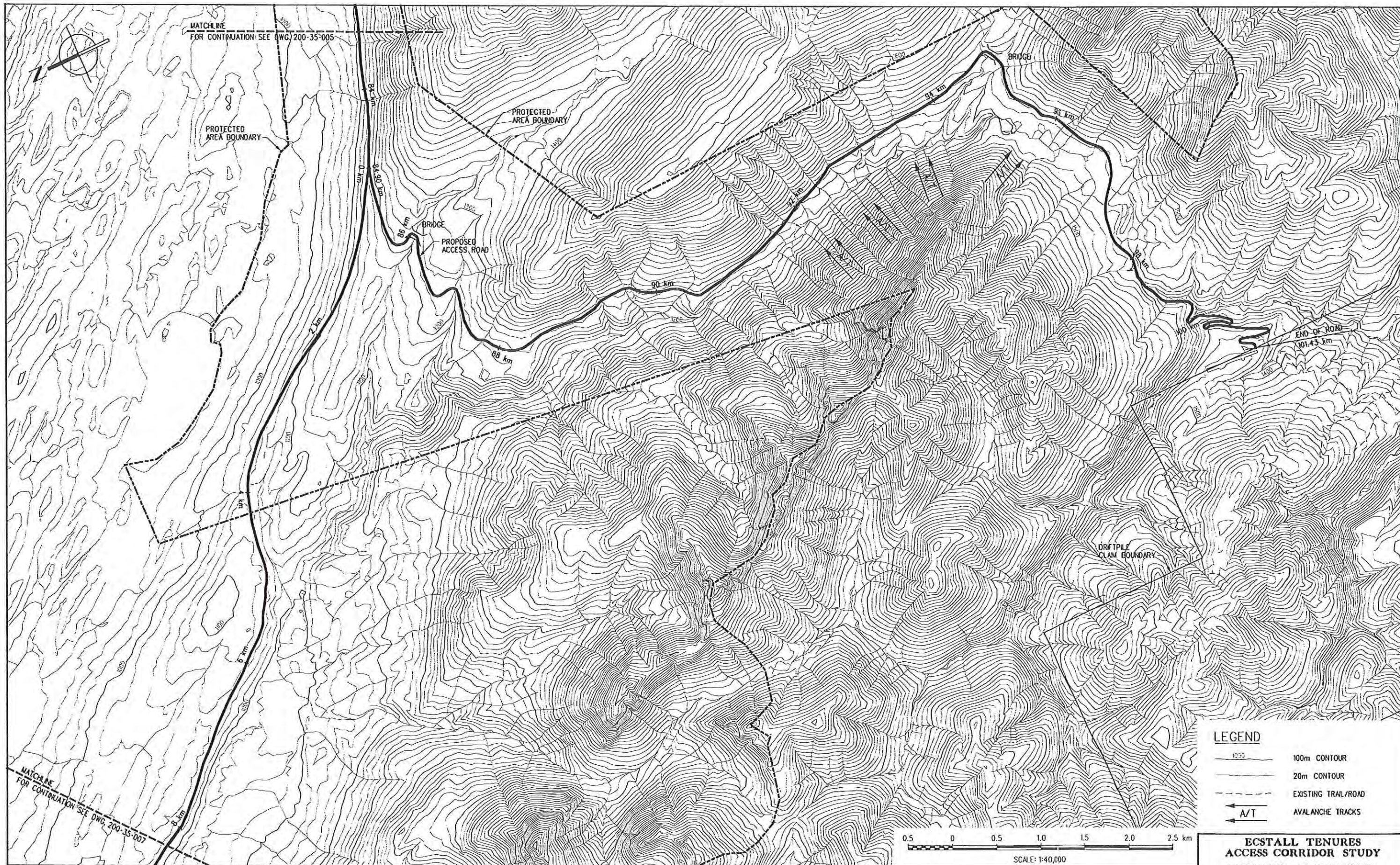
- 100m CONTOUR
- 20m CONTOUR
- EXISTING TRAIL/ROAD

**ECSTALL TENURES
ACCESS CORRIDOR STUDY**
RESOURCE ACCESS ROAD
OPTION No. 2
SHEET 3 OF 6

D-C NO.		DESCRIPTION		CLIENT	PROJECT CHAIRMAN	PROJECT MANAGER	DESIGNER	CHECKER	NO.	DESCRIPTION		DATE	BY	CLIENT	PROJECT CHAIRMAN	PROJECT MANAGER	DESIGNER	CHECKER	NO.	DESCRIPTION		DATE	BY	CLIENT	PROJECT CHAIRMAN	PROJECT MANAGER	DESIGNER	CHECKER	NO.	DESCRIPTION		DATE	BY
REFERENCE DRAWINGS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS	
B		ISSUED FOR FINAL REPORT		25 OCT 2001		VAD		A		ISSUED FOR DRAFT REPORT		05 SEP 2001		VAD		SECTION: CIVIL		SCALE: 1:40,000		DATE		DESIGNED: JOS A. CAVE		AUG 2001		DRAWN: VAD		AUG 2001		CHECKED:		APPROVED:	
KILBORN SNC-LAVALIN		PROVINCE OF BRITISH COLUMBIA		RESOURCE PLANNING DIVISION		PROJECT NUMBER		449042-15		DRAWING NUMBER		200-35-004		REV.		B																	



										SECTION: CIVIL SCALE: 1:40,000 DESIGNED: Jos A. CAVE DRAWN: VAD CHECKED: APPROVED:				RESOURCE ACCESS ROAD OPTION No. 2 SHEET 4 OF 6	
										CLIENT: PROVINCE OF BRITISH COLUMBIA RESOURCE PLANNING DIVISION		PROJECT NUMBER: 449042-15 DRAWING NUMBER: 200-35-005		REV: B	

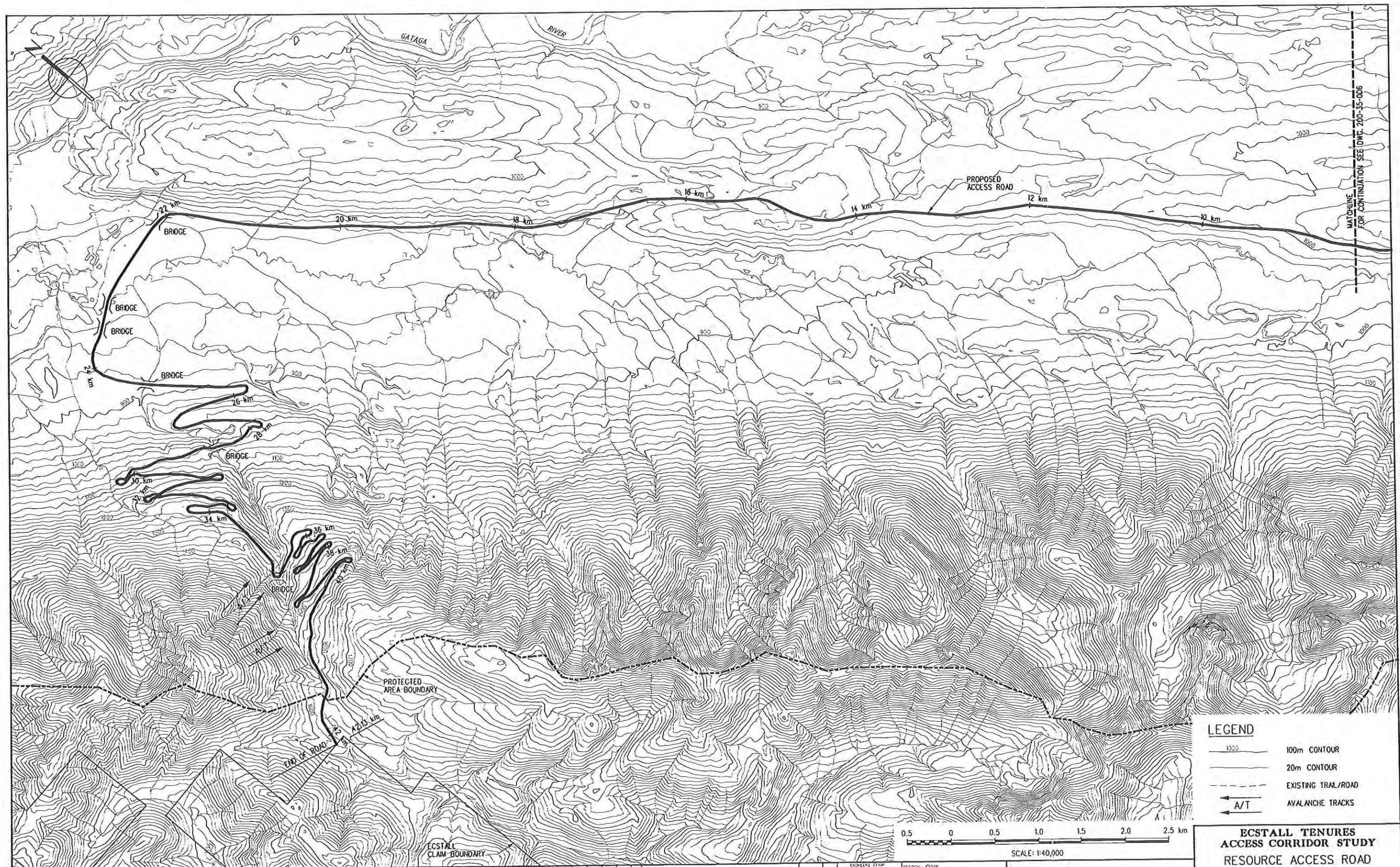


- LEGEND**
- 100m CONTOUR
 - 20m CONTOUR
 - EXISTING TRAIL/ROAD
 - A/T AVALANCHE TRACKS

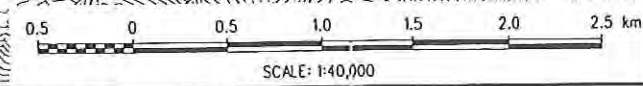
0.5 0 0.5 1.0 1.5 2.0 2.5 km
SCALE: 1:40,000

**ECSTALL TENURES
ACCESS CORRIDOR STUDY**
RESOURCE ACCESS ROAD
OPTION No. 2
SHEET 5 OF 6

												ENGINEER STAMP		SECTION: CIVIL		 KILBORN SNC-LAVALIN		RESOURCE ACCESS ROAD OPTION No. 2 SHEET 5 OF 6	
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												DESIGNER: Jos A. CAVE		AUG 2001					
												DATE: VAD		AUG 2001					
B ISSUED FOR FINAL REPORT												25 OCT 2001		VAD					
A ISSUED FOR DRAFT REPORT												05 SEP 2001		VAD					
NO																			
DESCRIPTION												DATE		BY					
REVISIONS																			



LEGEND	
	100m CONTOUR
	20m CONTOUR
	EXISTING TRAIL/ROAD
	AVAILANCE TRACKS



**ECSTALL TENURES
ACCESS CORRIDOR STUDY**
RESOURCE ACCESS ROAD
OPTION No. 2
SHEET 6 OF 6

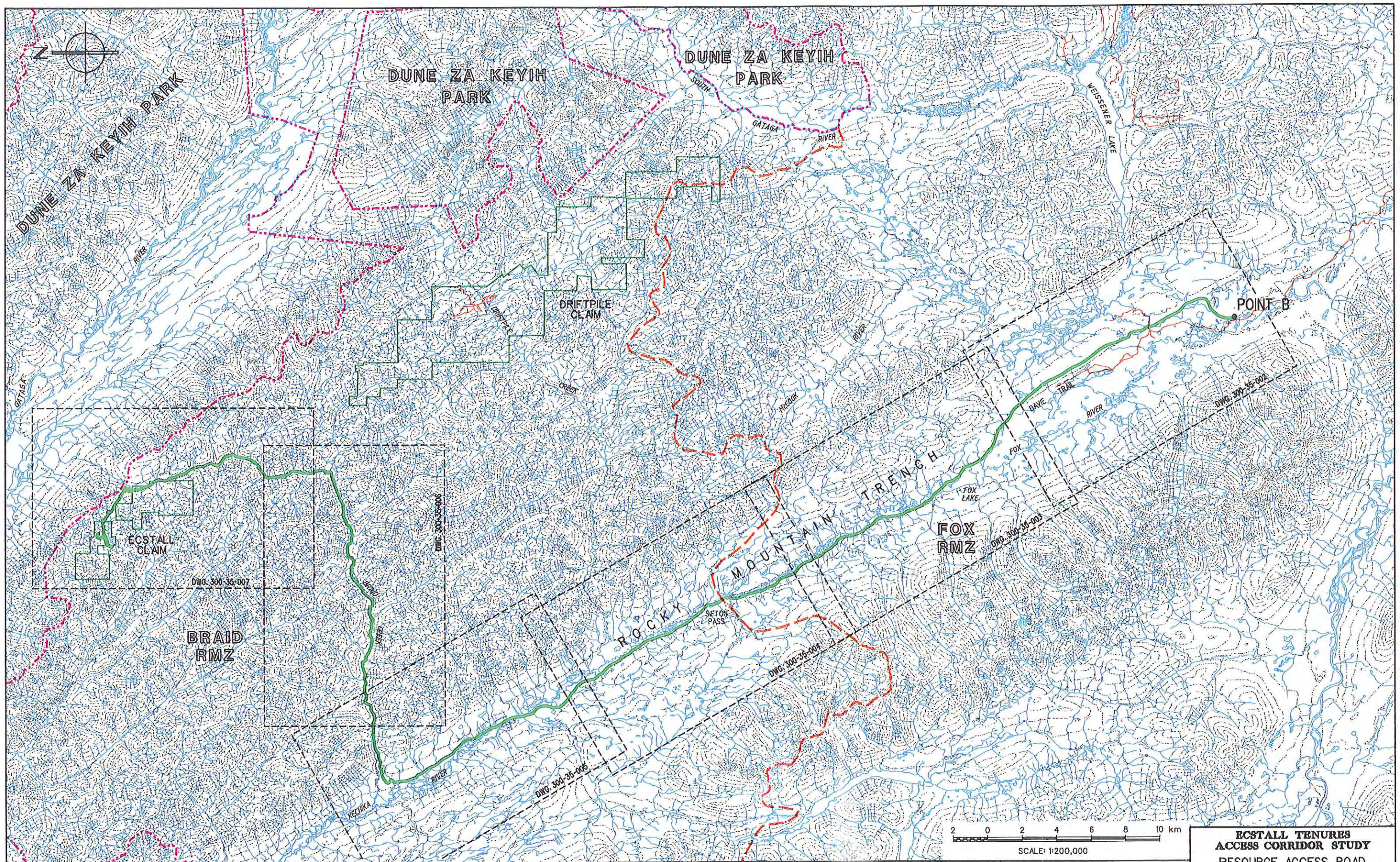


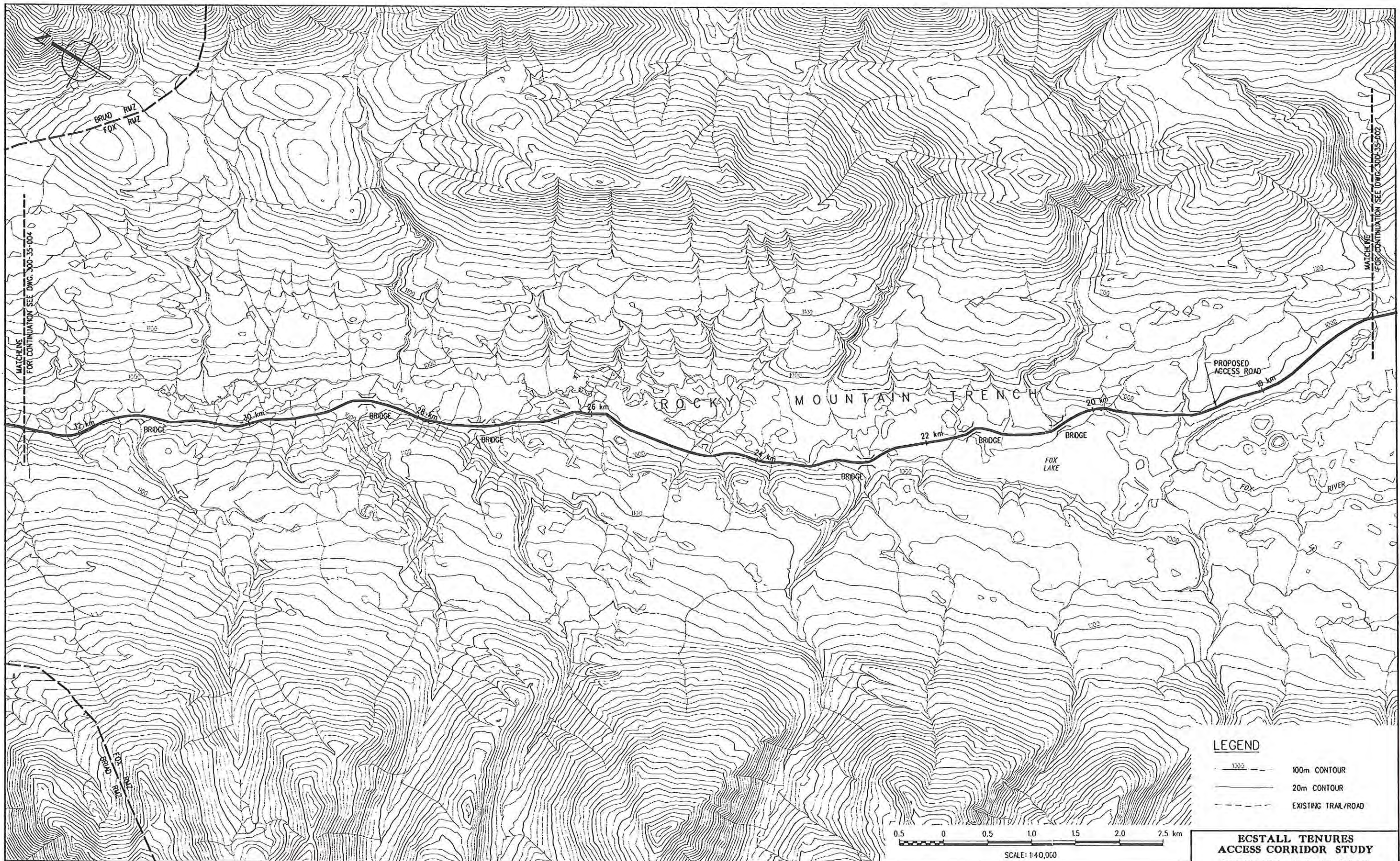
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APPROVED:	

CLIENT: PROVINCE OF BRITISH COLUMBIA
RESOURCE PLANNING DIVISION

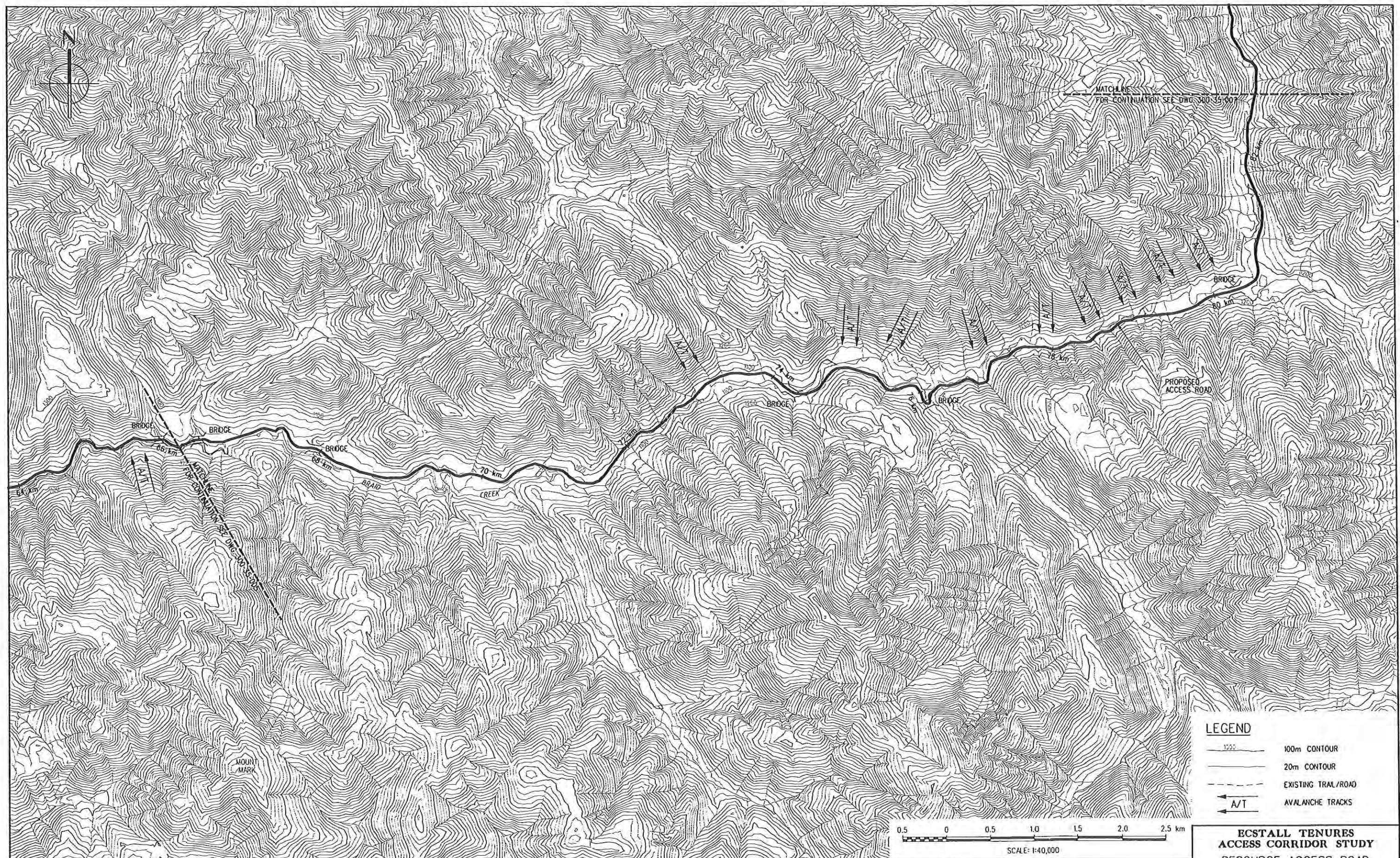
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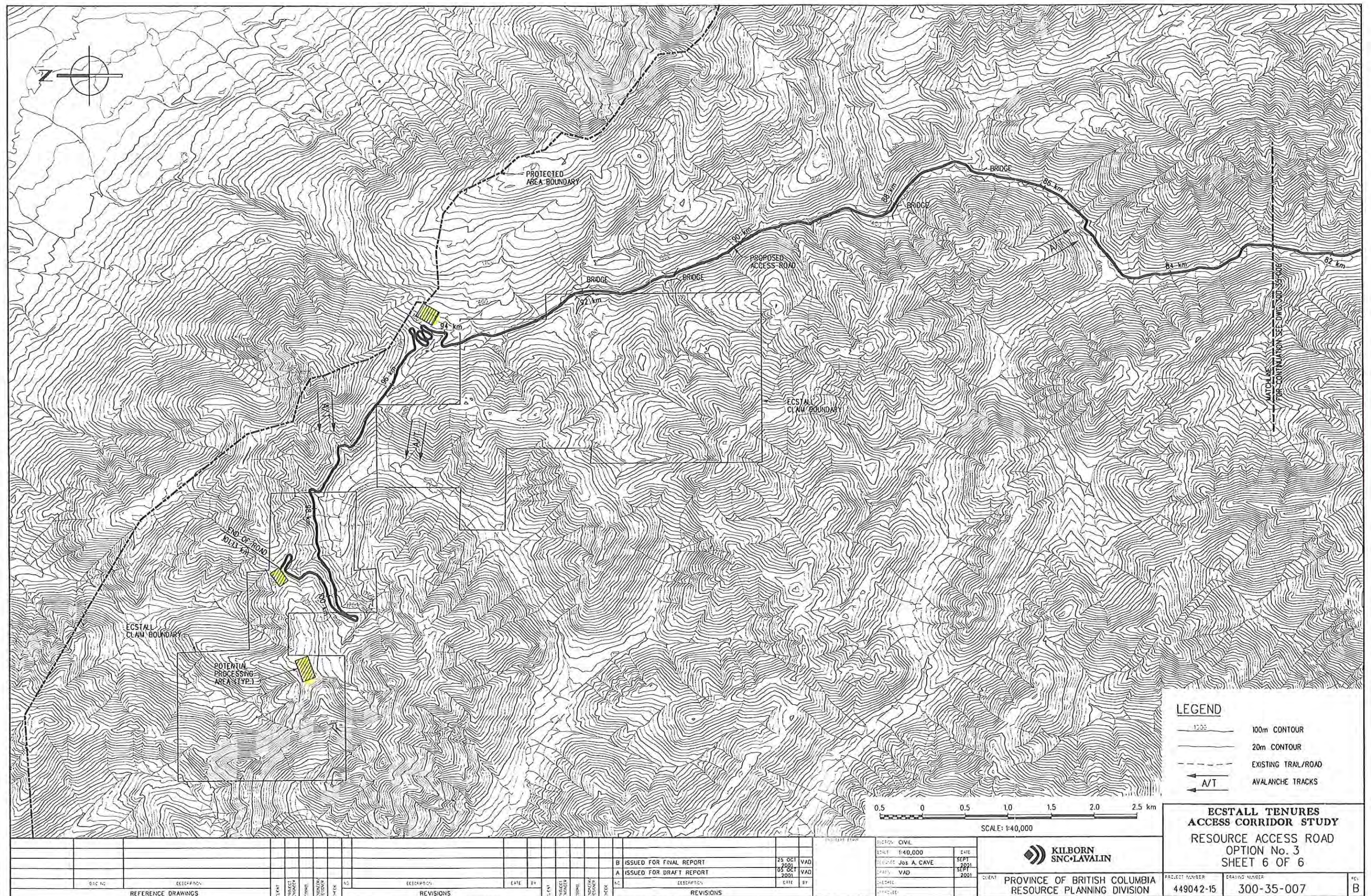
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REVISIONS							
CLIENT	PROJECT ENGINEER	DESIGNER	DRAWN	CHECKED	APPROVED	DATE	BY

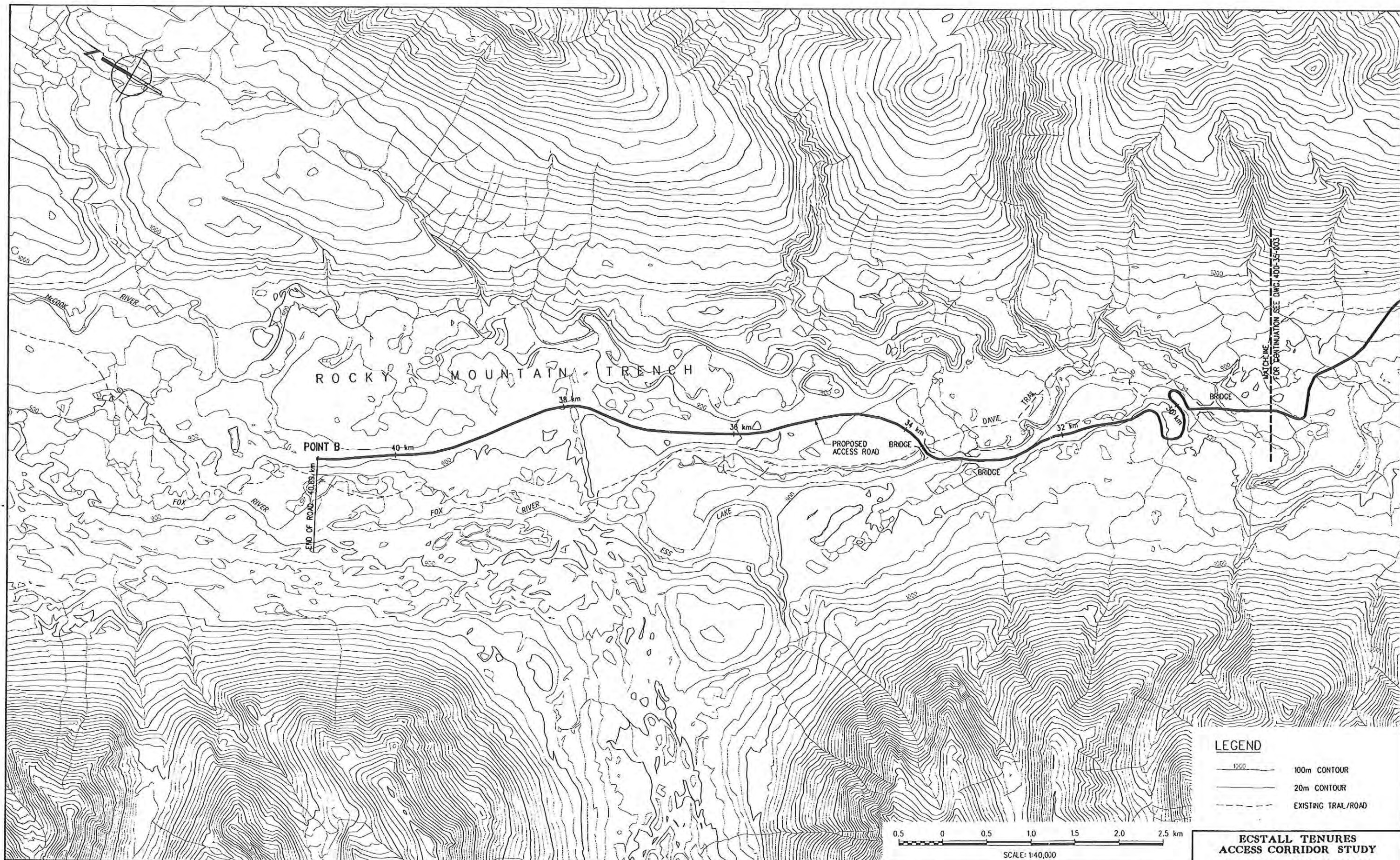
[illegible]



																				ENGINEER'S STAMP										SECTION: CIVIL										RESOURCE ACCESS ROAD OPTION No. 3 SHEET 2 OF 6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							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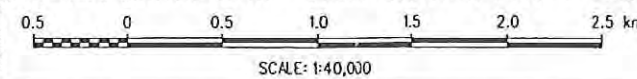
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LEGEND

- 100m CONTOUR
- 20m CONTOUR
- EXISTING TRAIL/ROAD



ECSTALL TENURES ACCESS CORRIDOR STUDY RESOURCE ACCESS ROAD FT. WARE TO POINT B SHEET 3 OF 3

REFERENCE DRAWINGS										REVISIONS									
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SECTION: CIVIL		 KILBORN SNC•LAVALIN		RESOURCE ACCESS ROAD FT. WARE TO POINT B SHEET 3 OF 3				
SCALE: 1:40,000	DATE			PROJECT NUMBER		DRAWING NUMBER		REV. B
DRAWN: JOS A. CAVE	SEPT 2001			449042-15		400-35-004		
DESIGN: VAD	SEPT 2001							
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		PROVINCE OF BRITISH COLUMBIA RESOURCE PLANNING DIVISION						

