

RECLAMATION OPERATIONS FOR 1976
CHAMBERLAIN AND BULLMOOSE PROPERTIES
SUKINAKA RIVER AREA, B. C.
by
J. R. S. VERZOSA, P. ENG.
for
BRAMEDA RESOURCES LIMITED

Vancouver, B. C.

March, 1977

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	1
2. Mining and Exploration Programme	2
3. Research and Investigations	2
4. Reclamation Operations	4
5. Summary of Proposed 1977 Programme	7

Photographs depicting the landscape and the general approach taken in the 1976 reclamation and environmental protection programme.

LIST OF ILLUSTRATIONS

- Plate 1: Map showing areas where reclamation measures have been performed.
- Plate 2: Map showing areas where reclamation measures are proposed for 1977.
- Plate 3: Index Map of aerial photography taken in 1976.

1. INTRODUCTION

The reclamation programme in the Bullmoose and Chamberlain properties in 1976 was aimed at stabilizing and revegetating areas disturbed during the year and in previous years. The revegetation part of the programme was largely experimental with the introduction of the method of hydro-seeding particularly in the alpine areas. Conventional seeding was carried out in other areas and, on the advice of consultants, other species of grass were added to the standard mixture prescribed by the various government agencies.

The stabilization of the disturbed areas consisted mostly of grading, ditching, pulling back of berms, installation of erosion bars, installation of culverts and dips and, where feasible, back-filling and recontouring.

In the construction of access roads through forested areas pre-logging of timber was adhered to.

In 1976 International Environmental Consultants were retained to carry out an on-going environmental impact study relating to the future mining development of the two properties.

The reclamation land-use objective of the company for the Bullmoose and Chamberlain properties is the eventual enhancement of the area as a browsing ground for wildlife. It is believed that the achievement of a self-sustaining vegetation cover on all disturbed areas can be realized and the company's current research and reclamation effort is being geared towards this end.

2. MINING AND EXPLORATION PROGRAMME

2.1 Land disturbed during the year resulted mainly from the construction of access roads and drill sites. Later in the programme two adits were driven for the purpose of obtaining bulk samples.

2.2. Area of Land Disturbed (Hectares)

	<u>Roads</u>	<u>Drill sites</u>	<u>Trenching</u>	<u>Stripping</u>	<u>Campsite</u>	<u>Waste Dump</u>
1976	8.6	1.07	nil	nil	0.5	0.18
pre-1976	24.69	0.53	0.10	0.52	0.2	nil

3. RESEARCH AND INVESTIGATIONS

3.1 Reclamation Research

Hydro-seeding was introduced during the year for experimental use in the alpine areas. In addition a test plot was made using the same species of grass and legumes that comprised the mixture used in the hydro-seeding.

Site preparation consisted simply of pulling back berms and side casts onto the roads and creating several track marks on the sites by making several passes with a bulldozer.

3.2 Plant Growth Potential of Disturbed Areas

Experimental seeding in the fall of 1975 using government-prescribed mixtures and rates of application was carried out on unprepared roads and drillsites in both alpine and subalpine areas. The experiment resulted in sparse although established stem and root growth the following year. This clearly indicates that there is a good potential for plant growth in the disturbed areas. Consequently, in 1976 the rate of seeding was doubled after limited preparation of the sites was carried out. Barring excessive spring run-off a successful growth of vegetation is anticipated and should be noticeable this year.

3.3. Environmental Studies

Environmental studies of both the Chamberlain and Bullmoose area is an on-going project that was started early in 1976. International Environmental Consultants of Richmond has been retained by Brameda to carry out the study.

3.4 Climatic Studies - Nil

(Note: A self-recording weather station was installed, presumably by E.L.U.C. on the adjoining Sukunka property in 1976.)

4. RECLAMATION OPERATIONS

4.1 Seed Collection of Trees and Shrubs - Nil

4.2 Plant Propagation - Nil

4.3 Site Preparation

In the alpine areas back filling of roads and recontouring of trenches where feasible was carried out. On all roads that were reclaimed the berms were pulled back and erosion bars were installed.

In the hydro-seeding mentioned earlier the mulch and binder used was a wood fibre called "Silva Fibre" manufactured by Weyerhaeuser of Canada Ltd.

4.4 Planting - Nil

4.5 Seeding

For hydro-seeding in the alpine areas a standard seed and fertilizer mixture and rate of application adopted by I.E.C. for experimentation on the Bullmoose and Chamberlain properties is as follows:

<u>Species</u>	<u>Rate of Application</u>
Vetch	13 Kg per hectare
Rambling Alfalfa	"
Sweet Clover	"
White Clover	"
Annual Rye	"
Canadian Blue	"
Crested Wheat Grass	22 Kg per hectare
Russian White Rye	"
Brown Grass	"
Timothy	"
Creeping Red Fescue	45 Kg per hectare

<u>Fertilizer</u>	<u>Rate of Application</u>
34-0-0	180 Kg per hectare
11-55-0	112 Kg per hectare
0-0-60	112 Kg per hectare

Other minor elements were added to the mixture at the rate of 2.5 Kg per hectare. The binder used for the mixture was a wood fibre product sold as "Silva Fibre" by Weyerhaeuser of Canada Ltd.

For the access roads and other disturbed areas below tree line a mixture of Creeping Red Fescue, Alsike Clover, Annual Rye and Crested Wheat Grass was applied by hand at the rate of 56 Kg per hectare.

4.6 Tending - Nil

4.7 Summary of 1976 Field Operations

Area treated	27.2 hectares
Area re-vegetated	20.0 hectares

Costs: Seeds & supplies	\$ 3,581.59
Labor	4,260.00
Bulldozer	12,427.50
Supervision	3,595.00
Transportation	2,679.98
Hydro-seeding	<u>27,215.74</u>
	53,759.81
Environmental Study (I.E.C.)	<u>30,825.95</u>
TOTAL	\$ 84,585.76

4.8 Assessment of Results - Nil

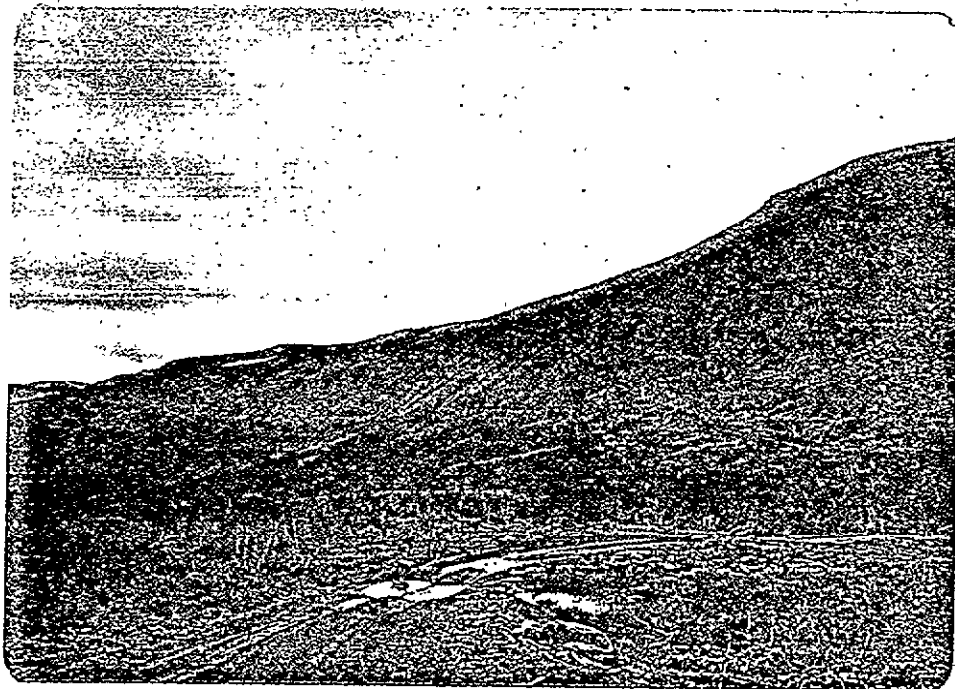
5. SUMMARY OF PROPOSED 1977 PROGRAMME

The reclamation programme in 1977 will largely be dependent on the results of seeding experiments carried out in 1976. A continuing programme of revegetation is planned to be carried out on sections of disturbed areas not completed in 1976 as well as the drill sites and access roads to be constructed this year.

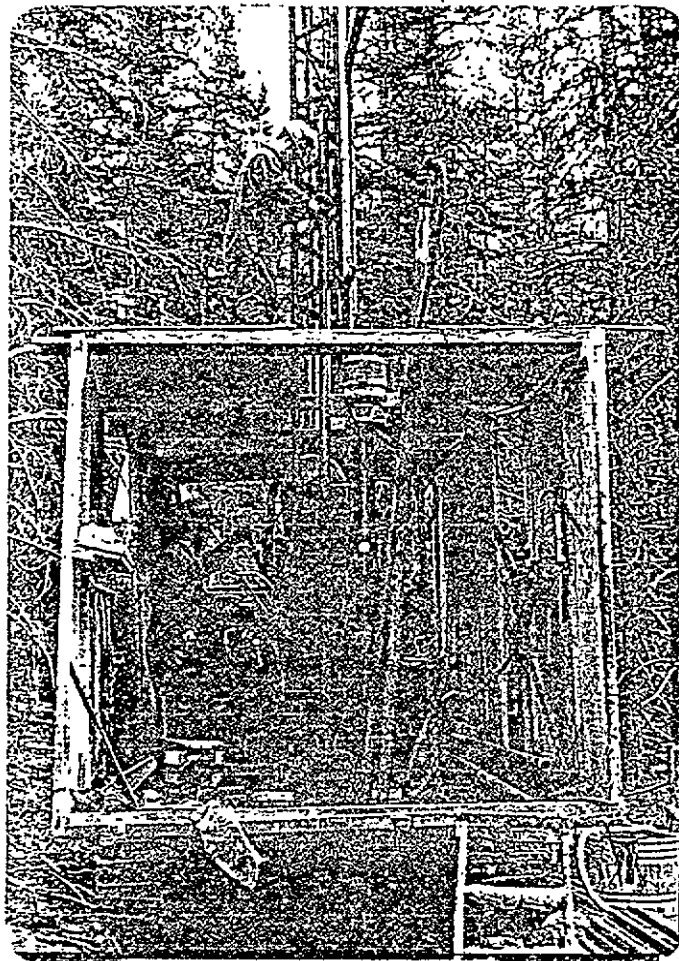
Respectfully submitted,

R. S. Verzosa, P.Eng.

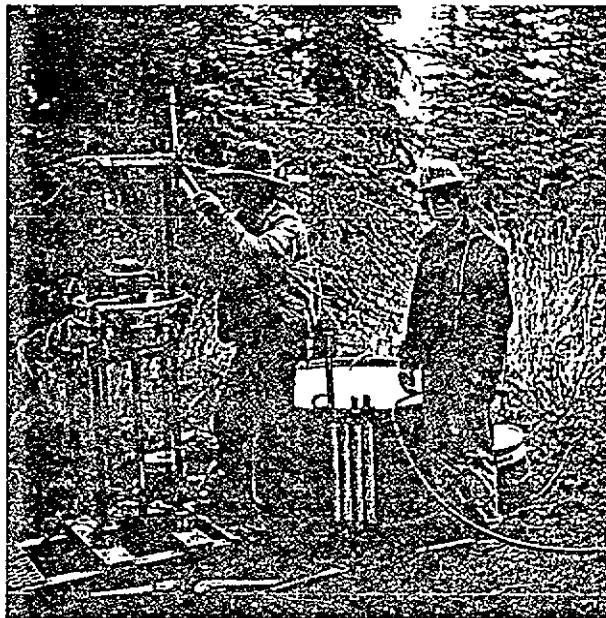
RSV:mjb



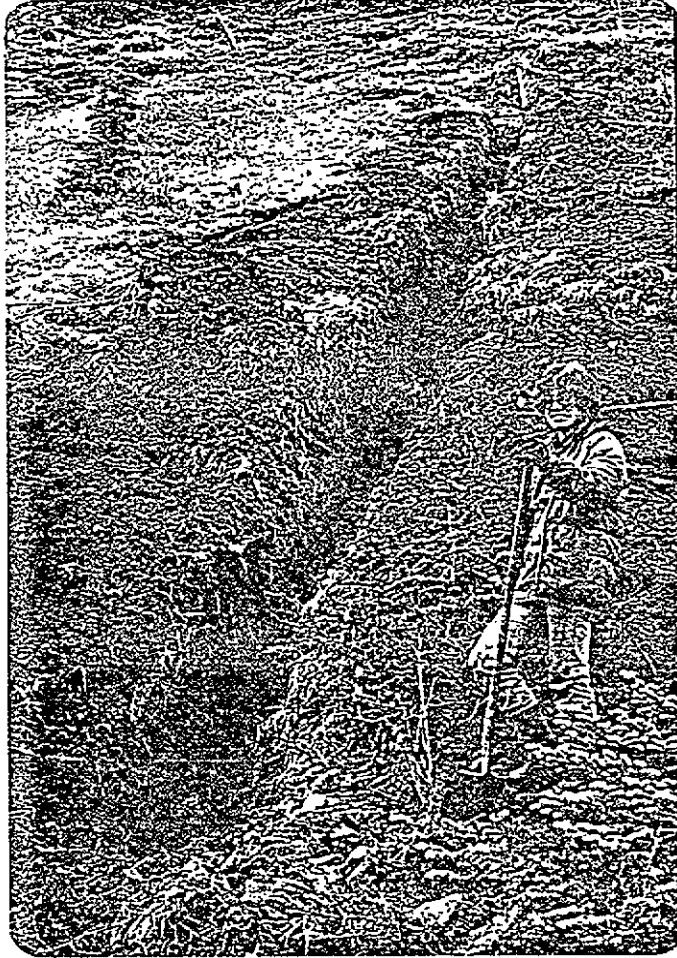
Typical landscape in the
Bullmoose area



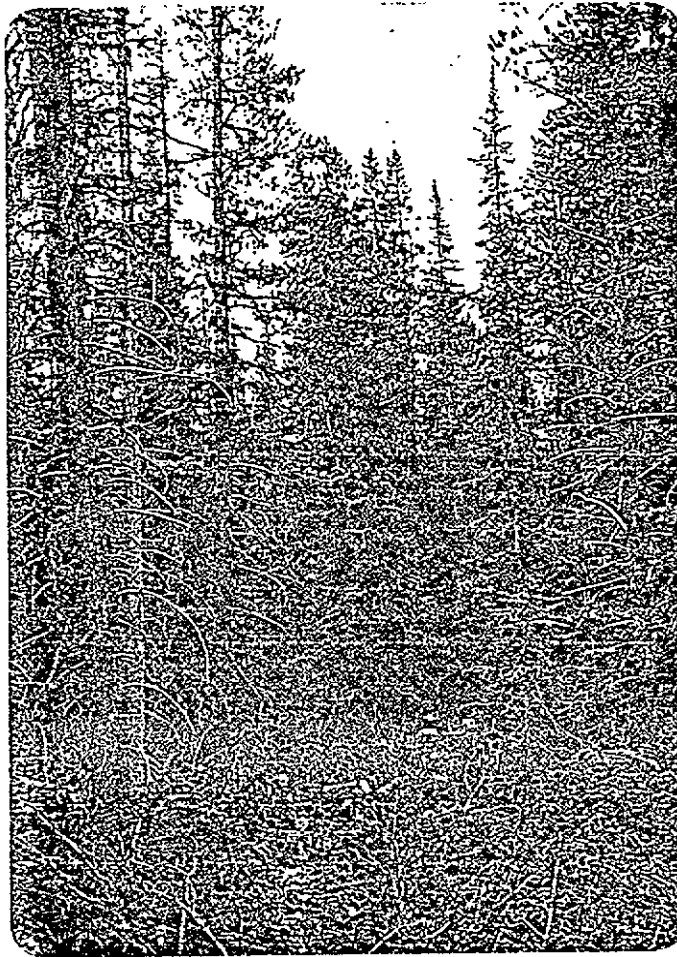
A track-mounted drill required a minimum of access and site preparation with consequently less land disturbance.



A highly portable drill rig proved adaptable in certain requirements. No access nor site preparation that involved land disturbance was necessary.



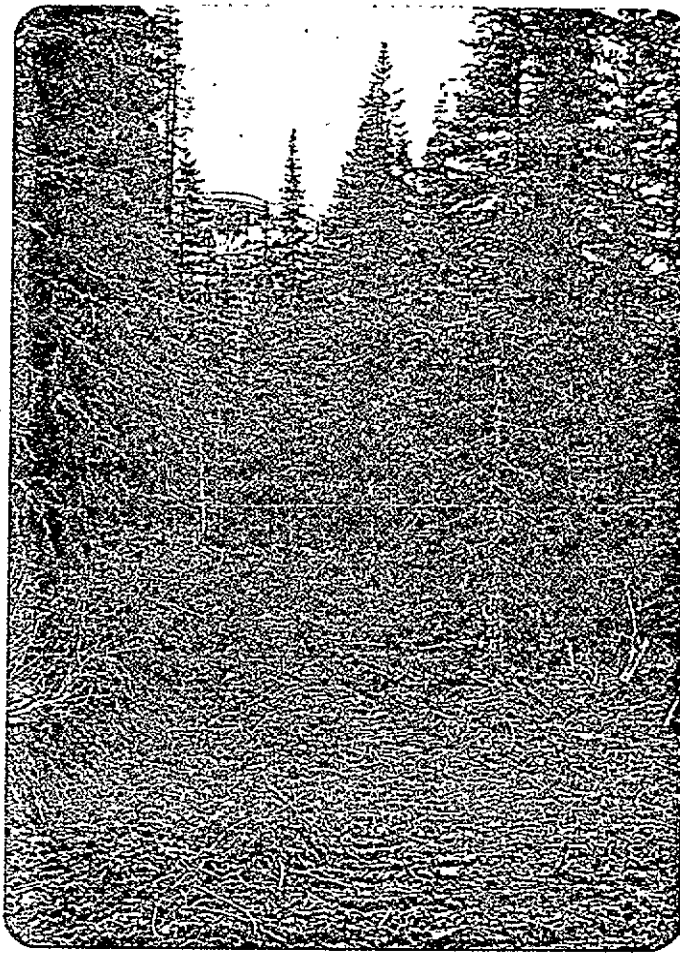
To further minimize land disturbance trenching was carried out by hand.



In the treed areas the stages of road construction was first; the timbers are felled onto the right-of-way and bucked.



Second; the trees are buried.



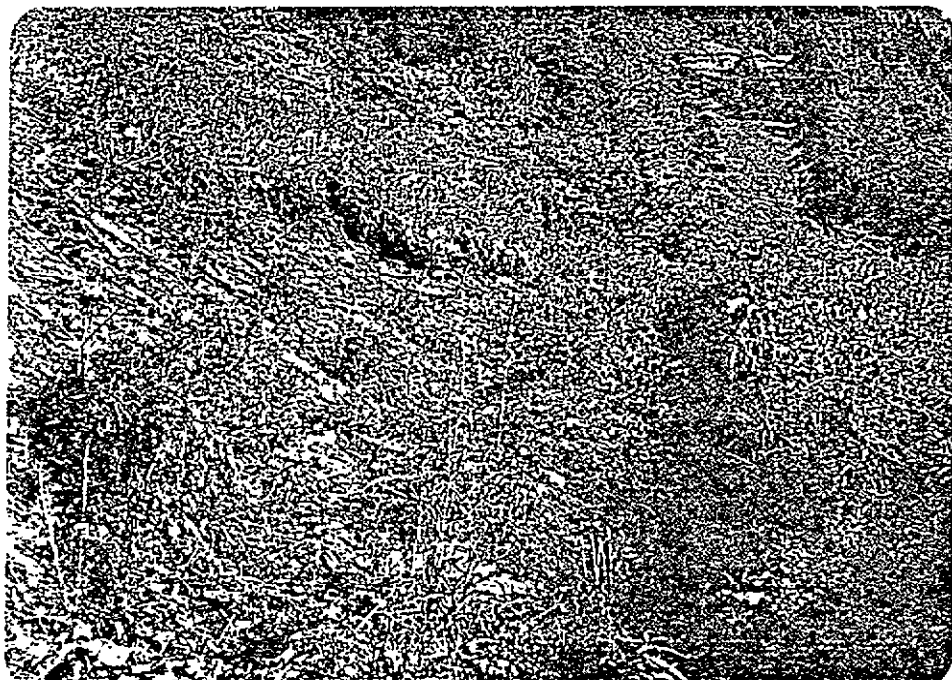
Third; the road is graded and ditched.



Culverts are installed where required.

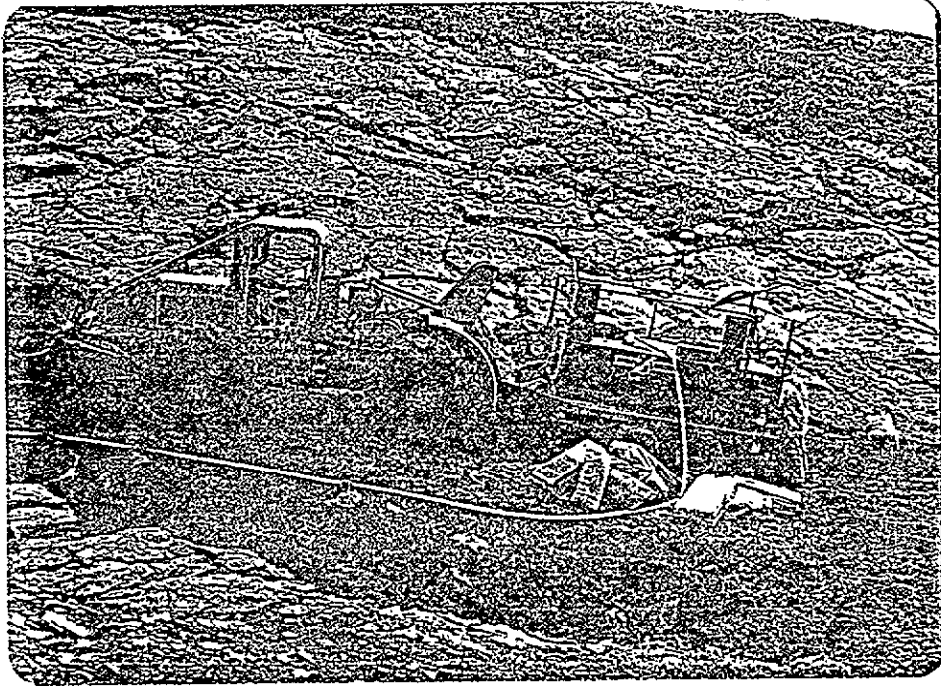


Land disturbed in 1971 with no previous reclamation. In 1976 erosion bars were installed and agronomic seeds applied in an experiment to augment the native growth already established.

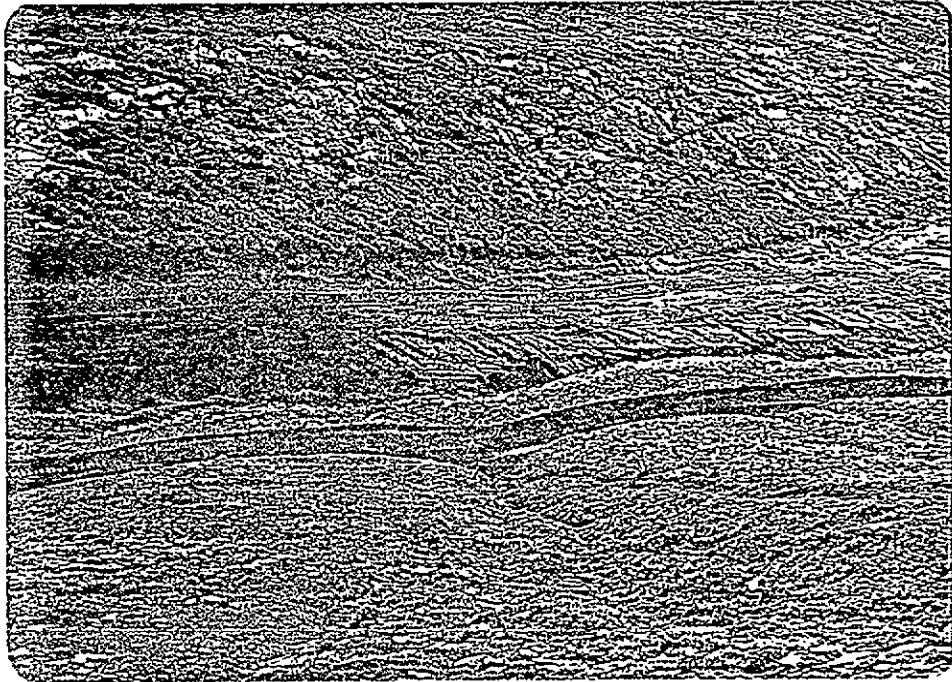


Land disturbed in 1971 that has been almost fully reclaimed by mother nature. Photo taken during summer of 1976.

Hydro-seeding in the alpine areas.



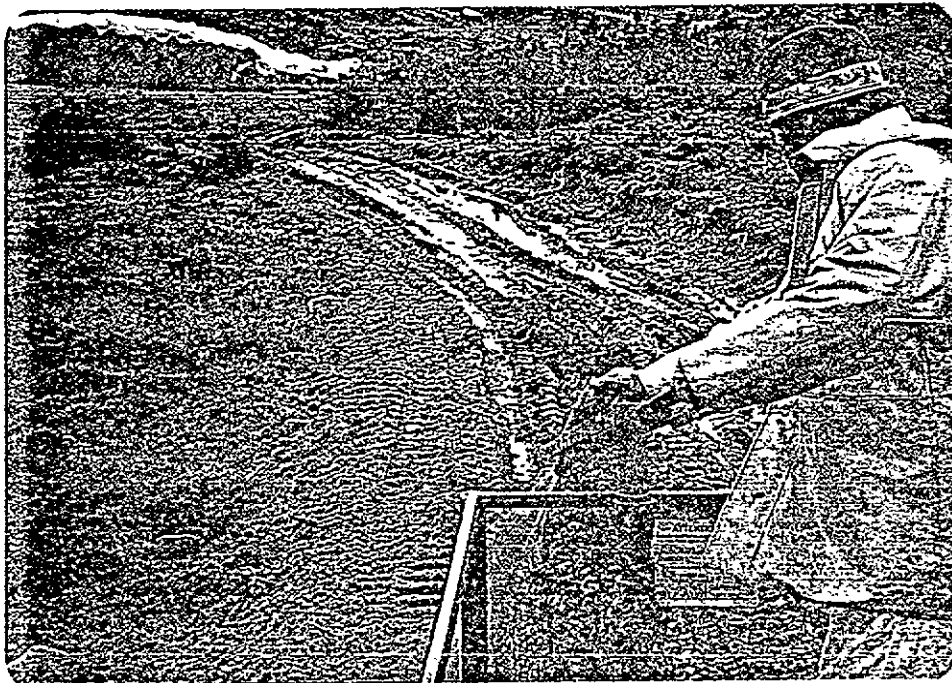
The hydro mixture is being prepared



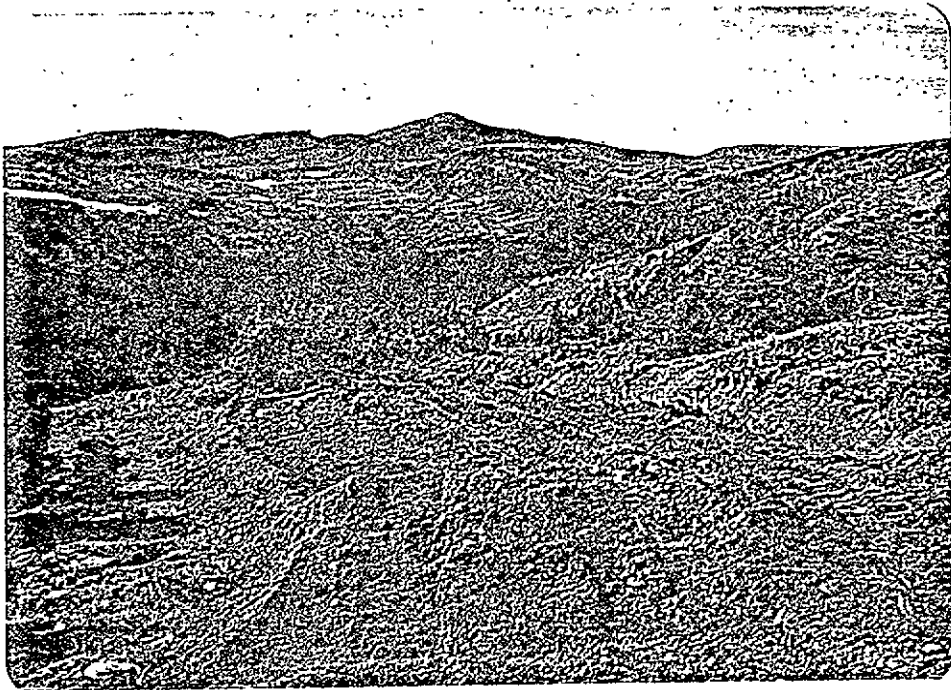
Hydro seed mixture immediately after application. The binder used is a wood fibre called "Silva Fibre". Its color is green.



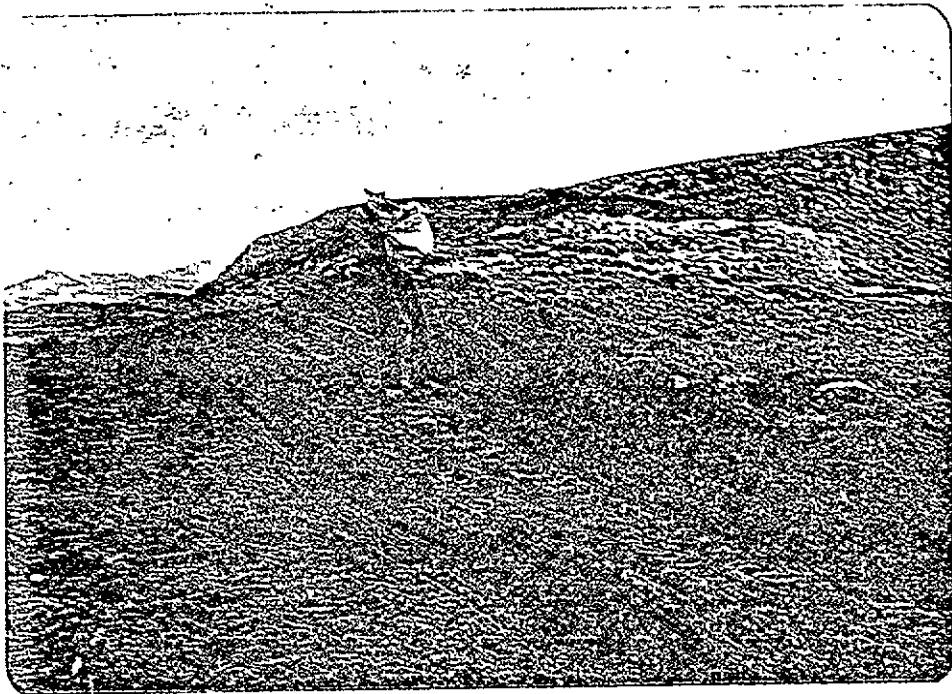
Hydro-seeding road cuts and side casts.



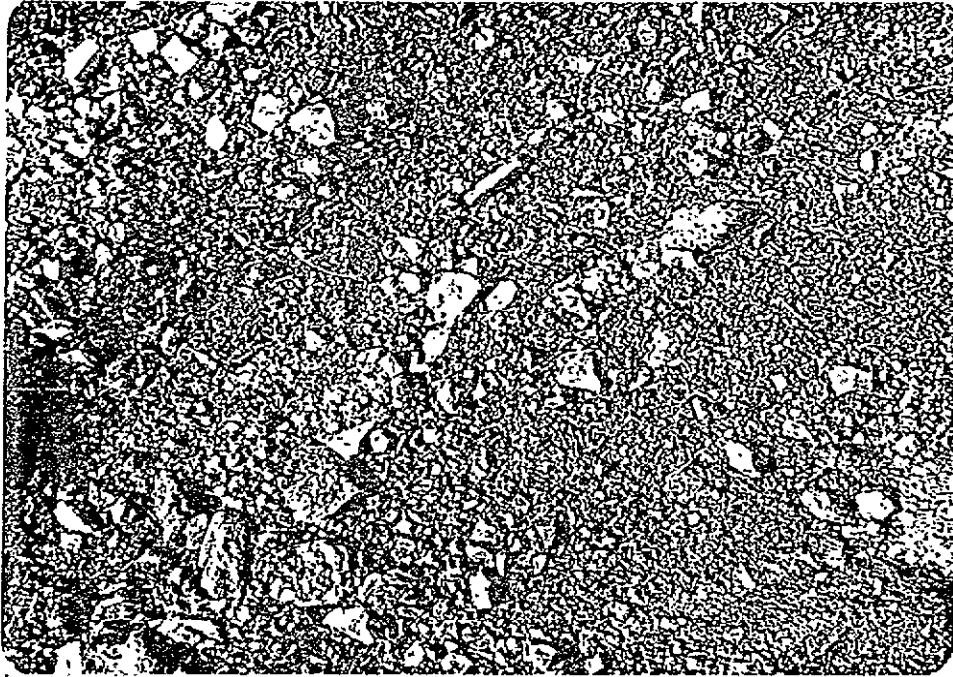
As well as road sides.



Erosion bars are installed, after which---



Seeding by hand is done---



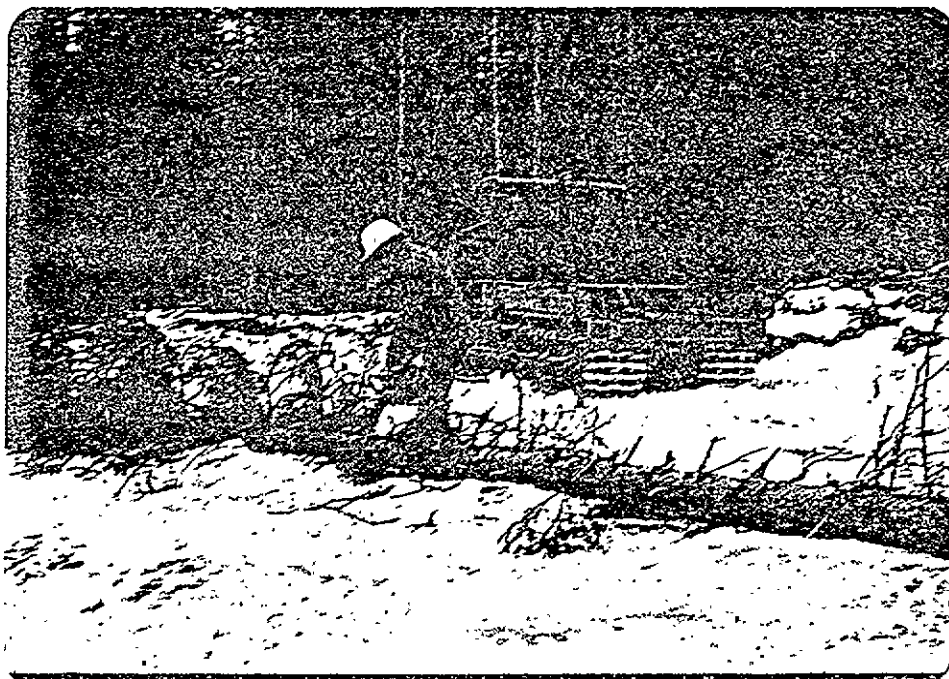
At the approximate rate of 56 Kg per hectare.



After seeding the top soil is floated and packed by dragging branches of trees repeatedly over the treated area.



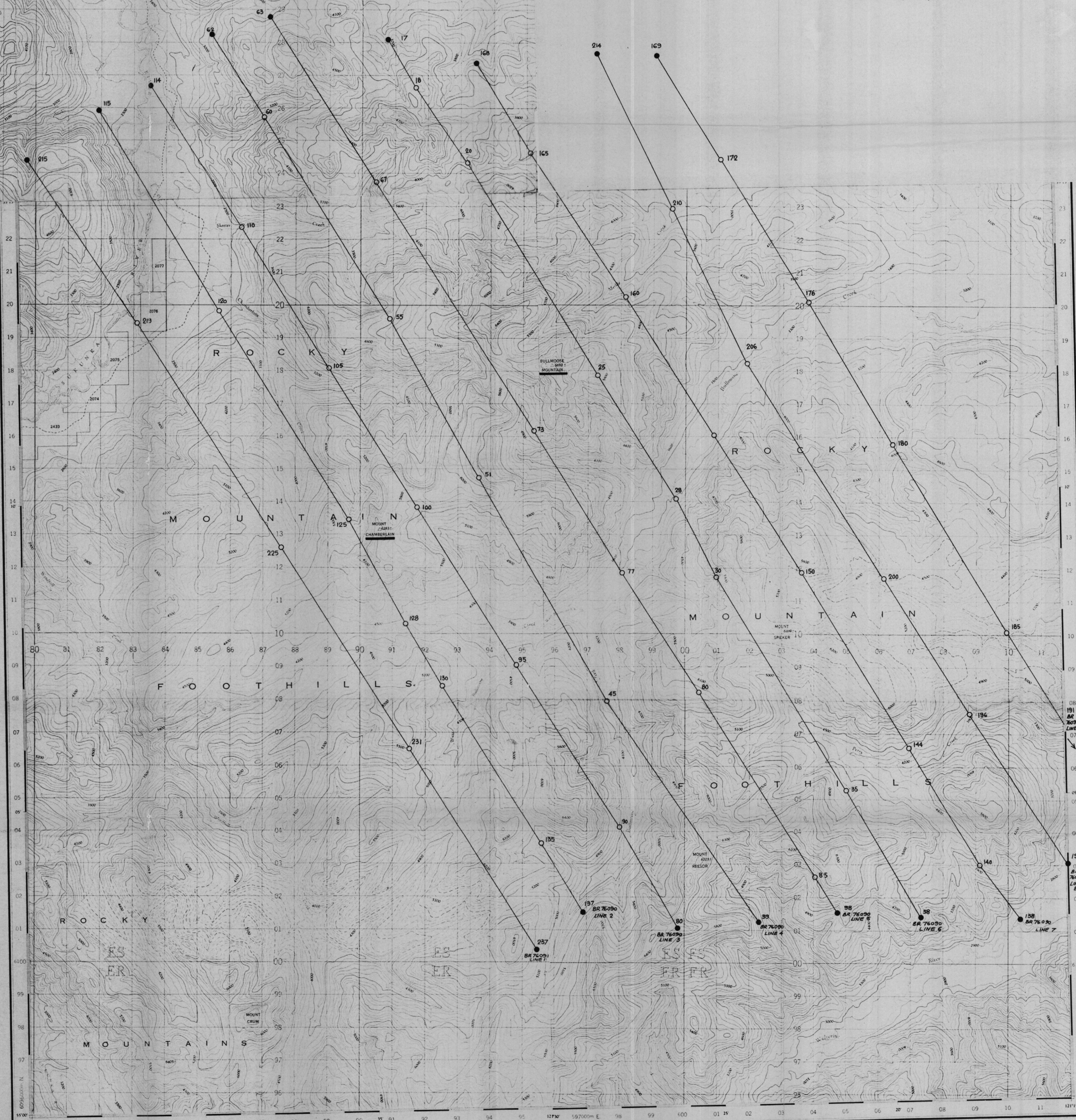
At the end of the exploration program barriers were installed at key points to close the area to 4 x 4 traffic.



Five hazard abatement measures were carried out thru the field season

AIRPHOTO INDEX: SUKUNKA, BULLMOOSE,
CHAMBERLAIN AREA

JOB N°: 76-1091
ROLL N°: BR 76090
BR 76091
DATE: SEPT. 18, 1976

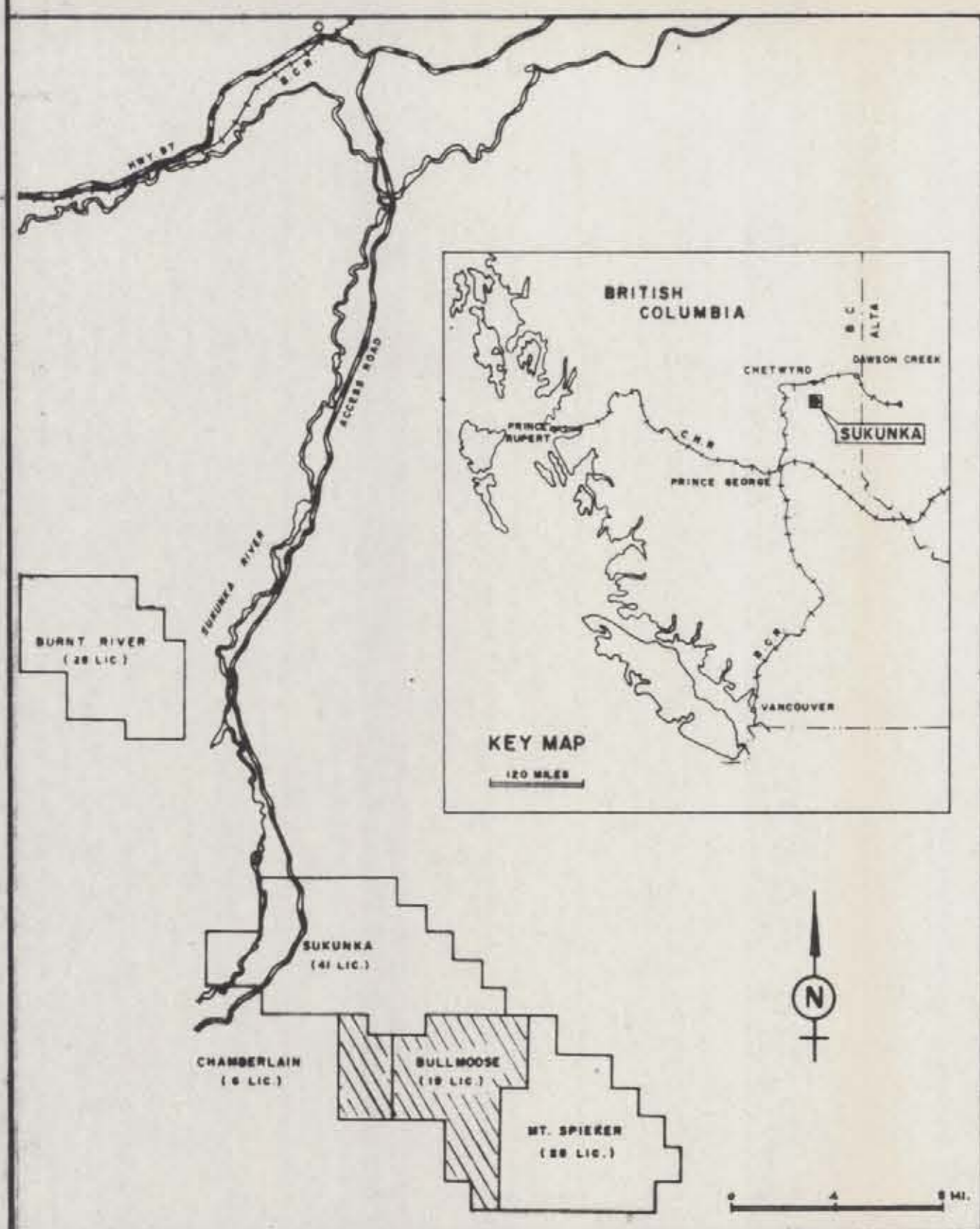
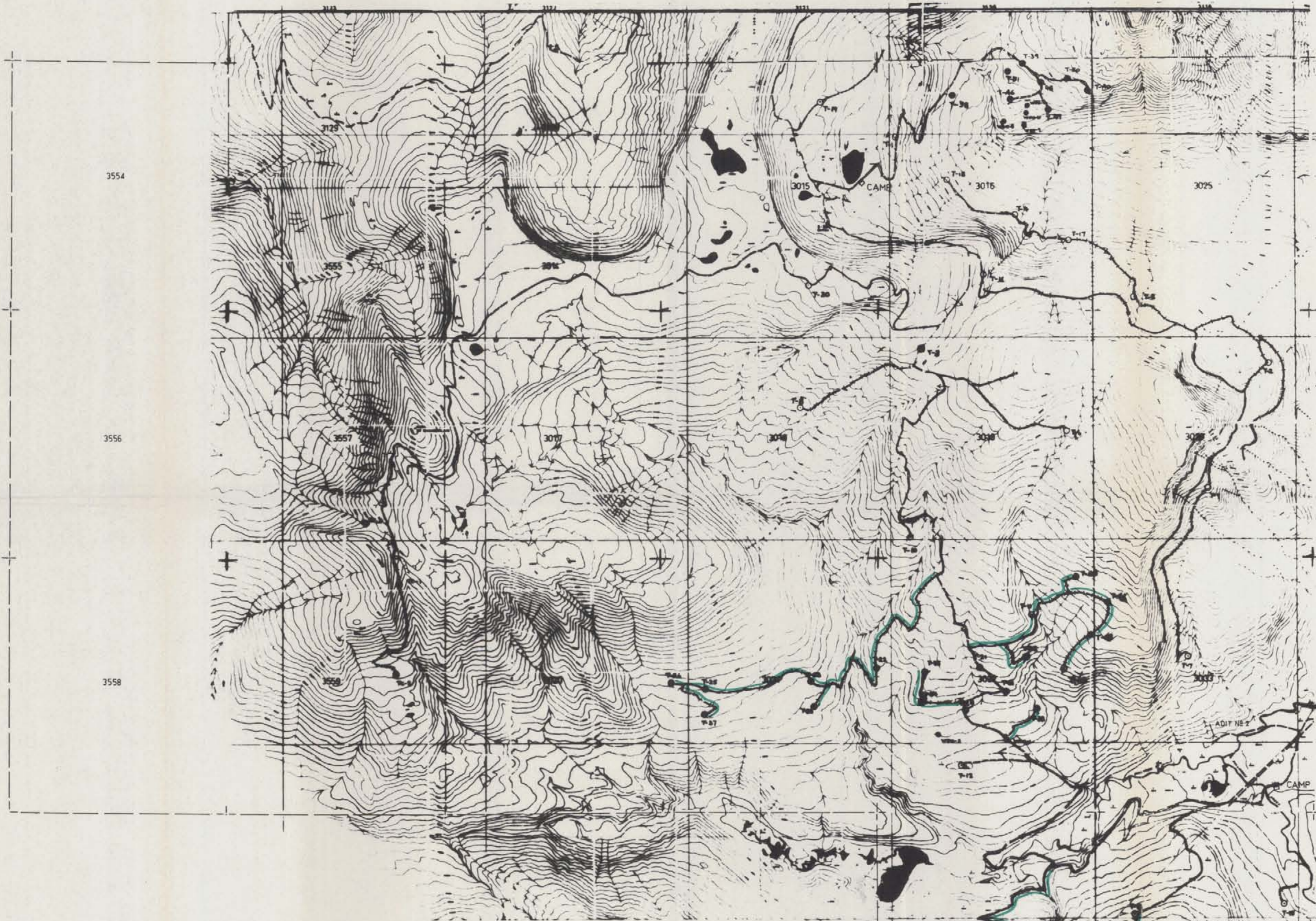


Surveyed and compiled by the SURVEYS AND MAPPING BRANCH,
BRITISH COLUMBIA. Produced by the MAPPING AND CHARTING
ESTABLISHMENT, DEPARTMENT OF NATIONAL DEFENCE.
Information current as of 1975. Printed 1976.
Copies may be obtained from the Map Distribution Office,
Department of Energy, Mines and Resources, Ottawa.


SUKUNKA RIVER
PEACE RIVER DISTRICT
BRITISH COLUMBIA
SCALE 1:50,000 ÉCHELLE

Levés et compilés par la DIRECTION DES LEVÉS ET DE LA
CARTOGRAPHIE, COLOMBIE-BRITANNIQUE. Produité par le SERVICE DE CARTOGRAPHIE, MINISTÈRE DE LA
DÉFENSE NATIONALE.
Renseignements à jour en 1975. Imprimé en 1976.
Ces cartes sont en vente au Bureau de distribution des cartes,
ministère de l'Énergie, des Mines et des Ressources, Ottawa.

BULLMOOSE CREEK 485
PEACE RIVER DISTRICT
BRITISH COLUMBIA
SCALE 1:50,000 ÉCHELLE
PLATE 3
RR-BULLMOOSE CHAMBERLAIN 76(2)-78



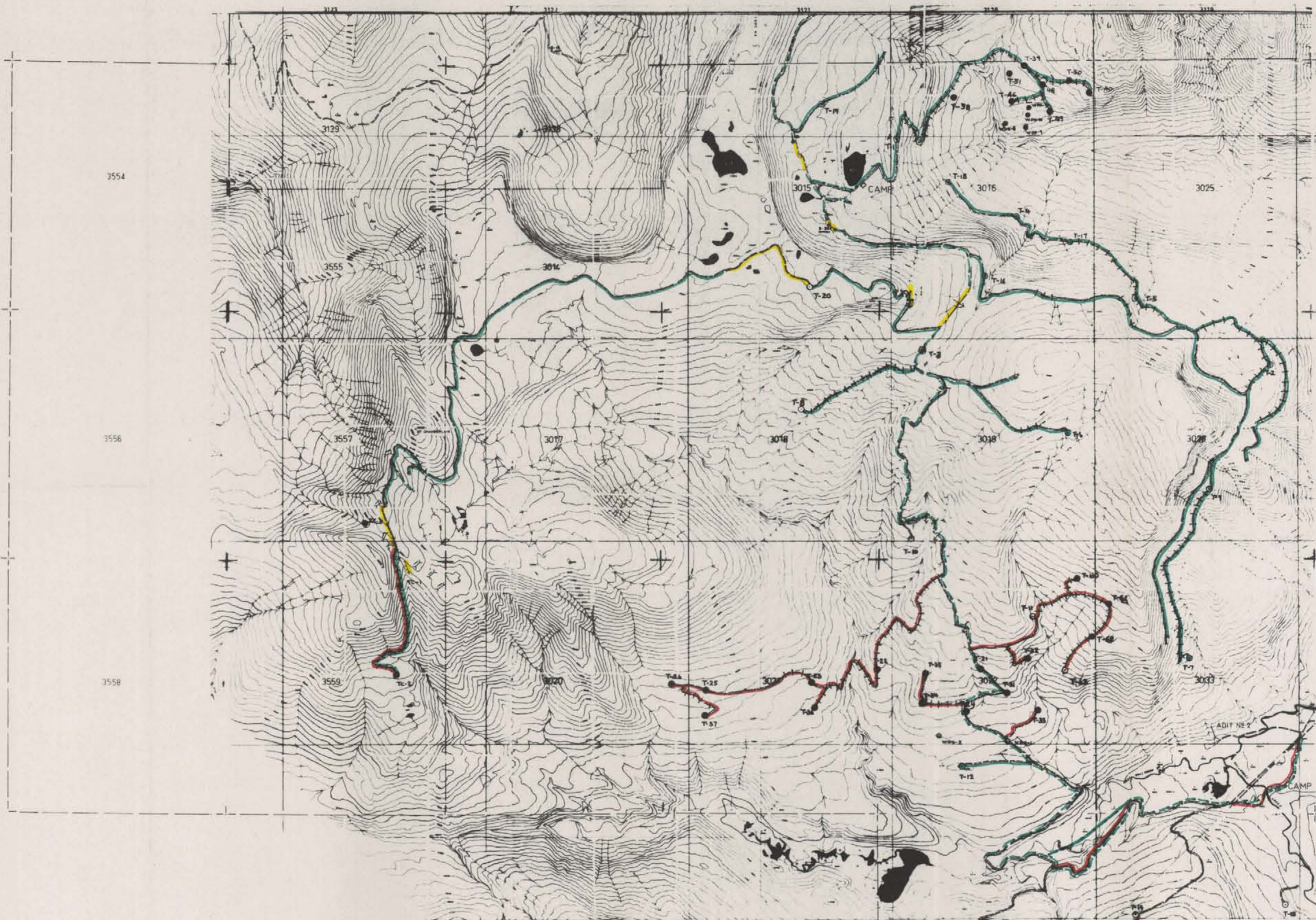
LEGEND

 ACCESS ROADS AND DRILL SITES TO BE SEED

PROPOSED **485**
RECLAMATION OPERATIONS FOR 1977

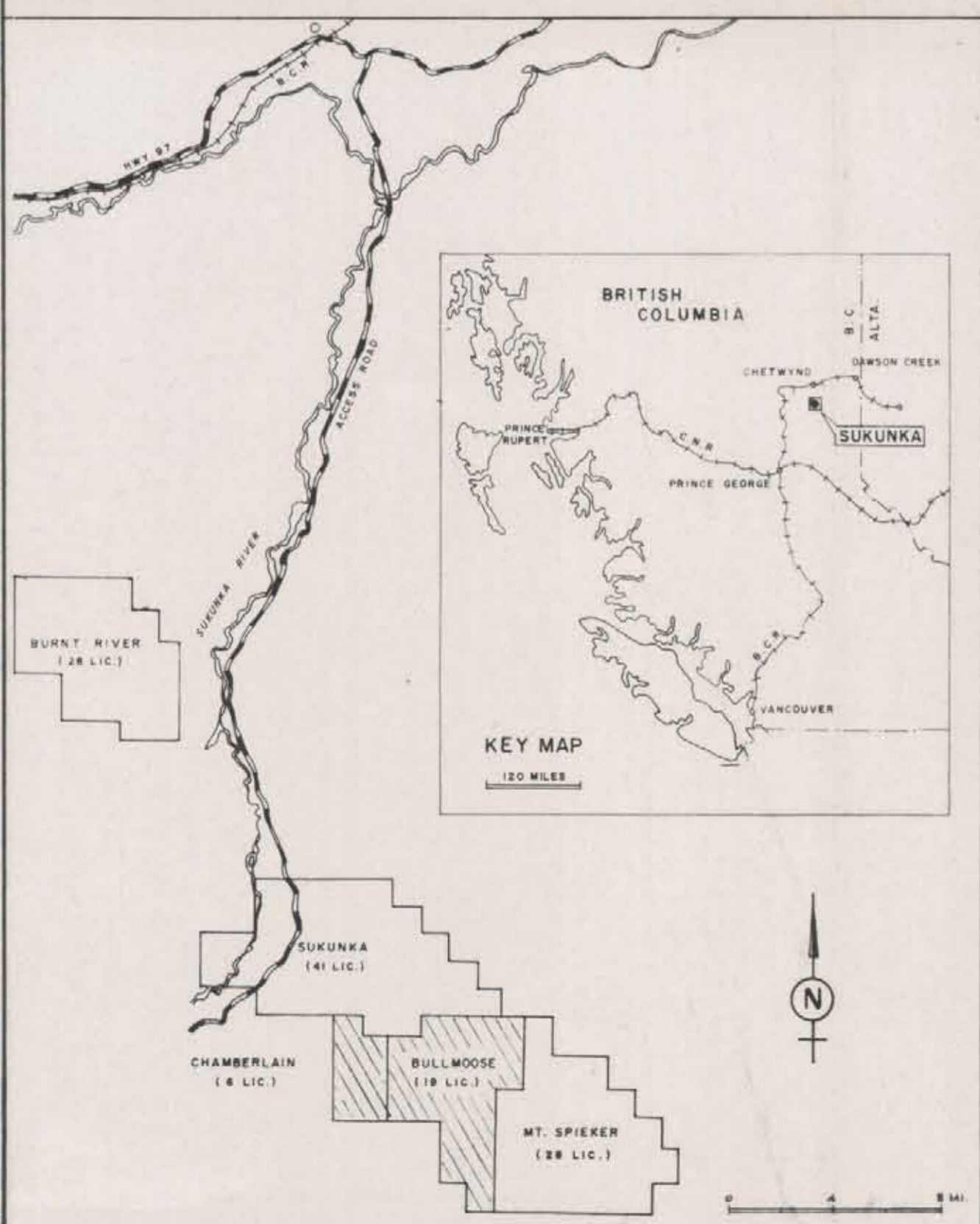
BULLMOOSE & CHAMBERLAIN PROPERTIES

SCALE: 1:20000



LEGEND

- ACCESS ROADS
- ROAD CONSTRUCTED IN 1976
- T-3 DRILL SITES FROM PREVIOUS DRILLING
- T-34 DRILL SITES - 1976 DRILLING
- WDH-3 WINKIE DRILL HOLES (NO ROAD ACCESS)
- SEAM TRACING (1975)
- TRENCHING (1975)
- ADIT (1976)
- SECTIONS OF ROAD WHERE EROSION BARS WERE INSTALLED
- AREAS WHERE HYDRO-SEEDING WAS APPLIED
- SECTIONS OF ROAD FULLY SEEDED
- SECTIONS OF ROAD WHERE ONLY BERMS WERE SEEDED
- CULVERT INDICATED BY ARROW



485

RECLAMATION OPERATIONS FOR 1976

BULLMOOSE & CHAMBERLAIN PROPERTIES

SCALE: 1:20000

PR - BULLMOOSE + CHAMBERLAIN PLATE 1
76 (2) B.