

**ASSESSMENT REPORT ON THE  
ALPO MINERAL CLAIMS  
LOCATED IN THE PINAUS LAKE AREA**

**-for-**

**OPAL RESOURCES CANADA INC.  
BOX 298,  
VERNON, B.C.**

**-location-**

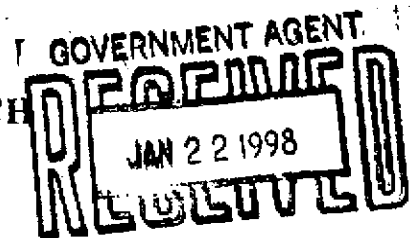
**N.T.S. MAP 82L/05E  
VERNON, KAMLOOPS & NICOLA  
MINING DIVISIONS  
Province of British Columbia**

**-prepared by-**

**Y-H Technical Services Ltd.,  
Written by Brian Callaghan, B.Sc.  
Box 298  
Vernon, B.C.  
V1T 6M2**

January 16, 1998

**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**



**25,409**

## TABLE OF CONTENTS

	Page No.
Introduction -----	1
Summary -----	1
Location and Access -----	2
Physiography and Vegetation -----	2 - 3
Property Description -----	3 - 4
Property History -----	5 - 6
Regional Geology -----	6 - 7
1996 Geological Mapping Program -----	7 - 8
Property Geology (1997) -----	8 - 11
Conclusions and Recommendations -----	12
Cost Statement -----	13
Bibliography -----	14
Certificates of Qualifications -----	15

## APPENDICES

Appendix I: Opal Description Table -----	after page 15
--	---------------

## LIST OF ILLUSTRATIONS:

Map No. 1 - Property Location Map -----	after Page 2
Map No. 2 - Alpo Mineral Claim Map -----	after Page 3
Map No. 3 - Regional Geology Map ---	after Page 6
Map No. 4 - Geology, Raods and Claim Boundaries ---	in back pocket
Map No. 5 - Geology Northwest Corner ---	in back pocket
Map No. 6 - Lowland Area (Possible Tertiary Lake Basin) ---	after Page 6

## **Introduction**

This report describes the results of the exploration work conducted on the Alpo claims. A programme of geological reconnaissance work and mapping was conducted in portions of the original grid and those areas recently staked to the north and west of the original claim block in the vicinity of Lady King Lake. The programme was conducted over a period of 6 days between October 19th to 27th 1997. The programme concentrated in areas that were considered to have the greatest potential for locating similar rocks that host precious opal on the Klinker/Ewer claims in which opal mineralization may be related to a large Mid-Miocene lake basin. The programme also included additional mapping to determine the northerly extent of Mid-Miocene rock units that include locally diatomaceous, opalized, ash tuffs, breccias and shales that appear to be laterally restricted on the western portion of the Alpo claims by a possible fault bounded northwesterly contact that may represent the edges of this basin. The occurrence of common opal and agate in these rock units is seen as a positive indication that precious opal may also be found

## **Summary**

New discoveries of common opal with a variety of base colours have been found in place and in float samples of clast and matrix supported lahars that form an extensive belt that is 2 kilometres in width and stretches from McGregor Creek in the south to Pinaus Lake in the north. They appear to be similar to and represent the northwest extension of those lahars that host precious opal on the nearby Klinker/Ewer deposit to the south. The areas of opal mineralization on the Alpo claims may be restricted to the margins or edges of a large Mid-Miocene lake basin that possibly covers a large portion of the Alpo claims.

A programme of continued prospecting and mapping is recommended to close off and further delineate the contact margins between Marron formation flows and breccias with the waterlain ash - tuff sediments, shales and lahars of the Tranquille formation in the western portion of the claim block and to determine the extent of the lahars on Alpo claims to the east of the claim block. These include the Alpo 47, 48 and 39 mineral claims and the areas to the south of Pinaus Lake. Additional prospecting and mapping is recommended in those areas with the greatest concentrations of agate and opal associated with the matrix and clast supported lahars. These include the areas west of McGregor road at the 21.5 kilometre marker and the discovery of common opal on the Alpo 72 and Alpo 60 mineral claim. It is also recommended that the fraction that has formed from the staking of the Alpo 61 should be staked to cover ground that has good potential for precious opal.

Sediment hosted precious opal may occur below exposures of opalized shales and diatomaceous earths. Removal of overburden and trenching is recommended along the west side of McGregor Road to further expose the loosely consolidated volcanic ash sediments exposed in roadcuts if significant amounts of common and precious opal are found. A programme of limited drilling is also recommended to determine if precious opal occurs in underlying sediments within this basin environment.

Further analysis of opal samples might help in understanding its formation on the Alpo claims and surrounding areas.

### **Location and Access**

The Alpo claims are located approximately 30 kilometres west-north-west of the City of Vernon, British Columbia. The property is accessible from the south via the McGregor Creek forestry access road that branches off the main Six Mile Creek Road. The turn off to the Six Mile Creek Road is approximately 13 kilometres to the south from where the northend of the Westside Road branches off Highway 97N approximately 12 kilometres by road from the city of Vernon. Access to the Alpo claims from the north via Westwold is a turn off onto the main logging roads that include the Ingram Creek and 505 forestry access logging roads that lead onto McGregor Creek Road. The claims extend in a northwesterly direction from the 18.5 km mark on McGregor to the 22 km mark that extends past the junction of McGregor and the 505 logging road. The claims are located in the Vernon, Kamloops and Nicola Mining Divisions - on map N.T.S. 82L/05E.

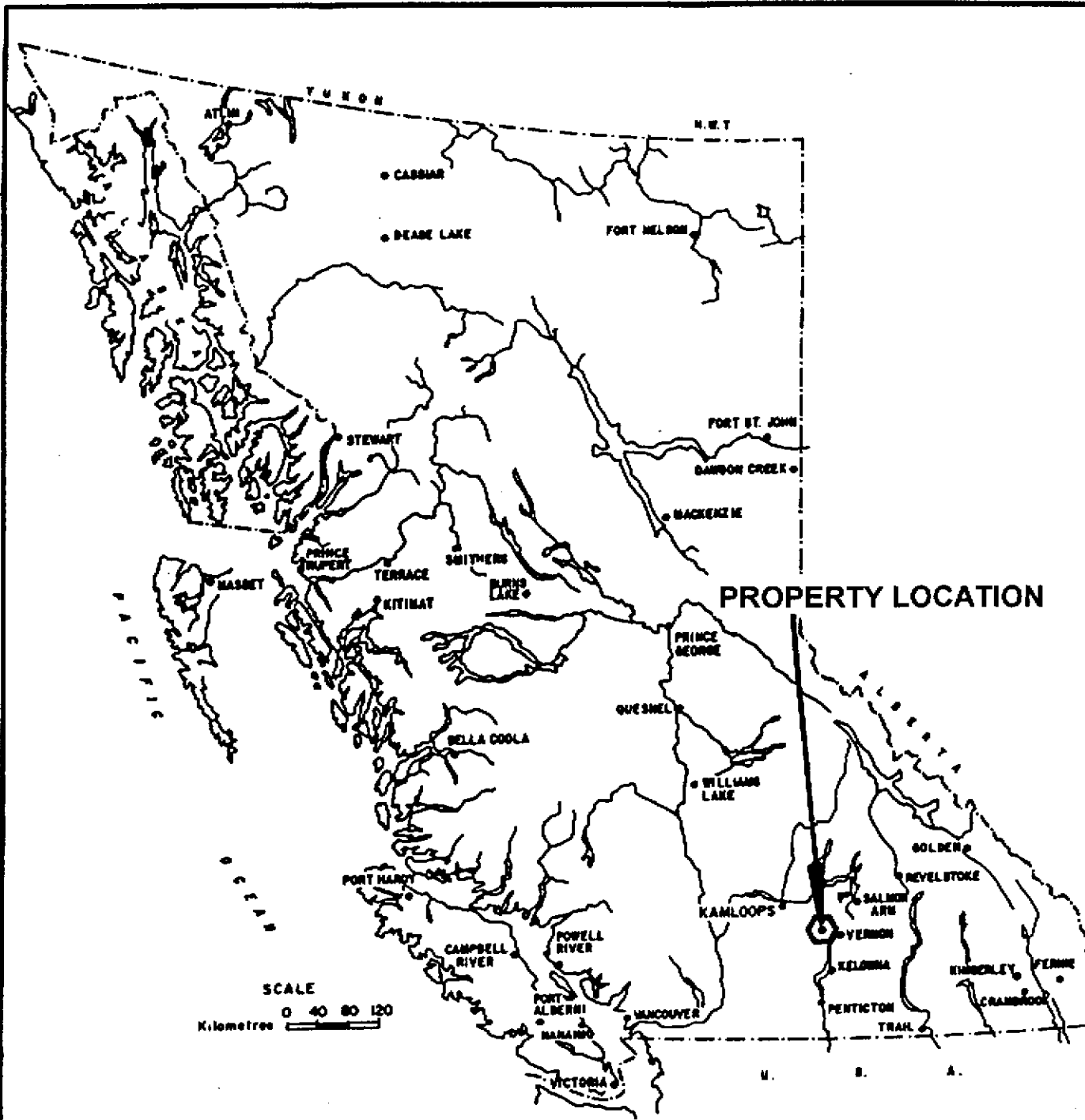
Access to the newly staked Alpo 70 to Alpo74 mineral claims is via the Ingram Creek Main logging road to the Pinaus Lodge. The claims extend to the east as far as Lady King Lake and Will Lake road. Access off the Ingram Main is via the Will Lake logging road as far as the 10 kilometre marker where a turn off to the east is taken which leads to a log landing on the Alpo 72 mineral claim approximately 1 kilometre from the turn off. The east boundary of the Alpo 64 mineral claim flanks the west side of Lady King Lake. The northern boundaries of the Alpo 61 and Alpo 62 mineral claims are situated in close proximity to the south side of Pinaus Lake. A portion of the Alpo 62 mineral claim covers the southern tip of Pinaus Lake.

The property is presently accessible via two wheel drive during the period from early June to mid October. Snow cover commences in mid October and lasts until May.

### **Physiography and Vegetation:**

The Alpo claims are centred within a possible fault bounded north westerly trending basin that is drained by Pinaus Creek to the northwest. The claims are bounded to the south by Ewer Creek Canyon whose headwaters drain to the southwest. To the *northeast, the edges of this basin slope steeply to Pinaus Lake in close proximity to the northern boundaries of the Alpo 61 and Alpo 62 mineral claims.* The claims are flanked to the east by a gentle sloping, northwest trending ridge top with elevations ranging from approximately 1400 to 1500 metres that runs sub-parallel to the claim block.

Elevations of approximately 1500 metres are reached on the western boundary of the claim block in the vicinity of the headwaters of Ingram Creek that drains into Cain Creek and eventually west into the Salmon River approximately 10 kilometres from Falkland. The recently staked single unit claims including the Alpo 70 to Alo 74 and Alpo 63 to Alpo 64 are situated directly to the west of Lady King Lake.



**PROPERTY LOCATION**

SCALE  
0 40 80 120  
Kilometres

**ALPO PROPERTY**  
Ewer Creek Area, B. C.  
Vernon Mining Division

**Property Location Map**

Y-H Technical Services Ltd.  
DATE SCALE MAP No.  
Nov. 1996 1: 8,000,000 1

UPDATED 1997

An area of lowland swamp that drains into Pinaus Creek is centred on the Alpo 32 and 57 mineral claims and crosses the McGregor Road access at the 21.5 km marker.

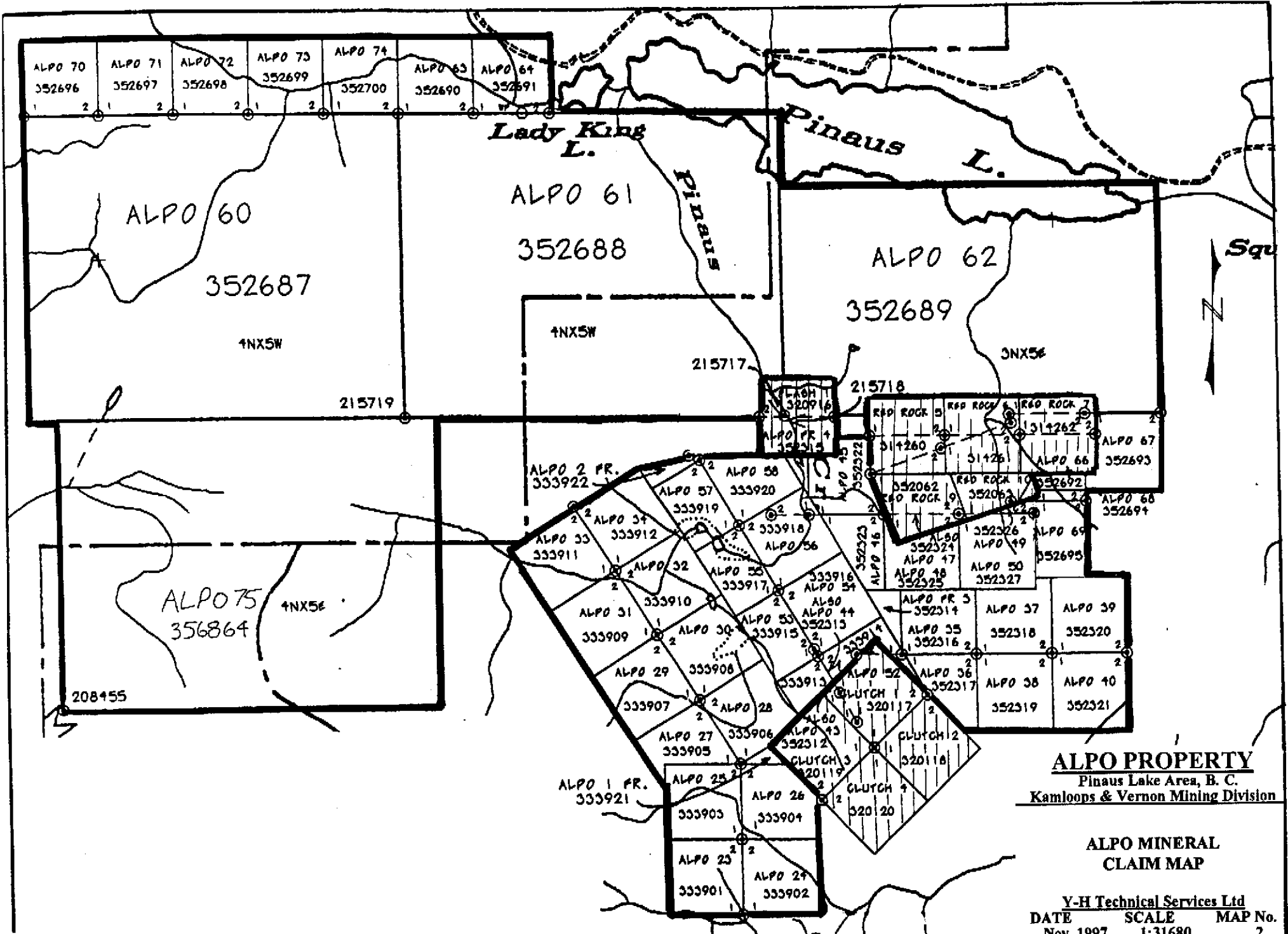
A powerline crosses the central portion of the property just north of the Alpo 34 mineral claim and passes on through the Flash and Red Rock mineral claims. The powerline which originates at the Mica Dam comes cross-country from the north-east past Enderby, passing south of Pinaus Lake enroute to the upper Salmon River Valley and Douglas Lake area between Westwold and Merritt B.C. then on to the B.C. lower mainland. The powerline right-of-way is clear cut for widths ranging from 80 to 120 metres. Outcrop exposures are mostly found along the powerline and in roadcuts along the west side of McGregor Creek Road, ridgetops and skid trails to old log landings. Numerous outcrops also occur along this powerline right-of-way.

Large portions of the property have been clear-cut logged and additional logging has taken place recently to the east of the property. Merchantable timber includes mainly Douglas Fir and Lodgepole Pine that occurs higher up and away from the valley bottoms. Merchantable timber also occurs in portions of the valley bottom in the central portion of the claim block and to the north and east towards the Red Rock claims. Most logging in the area is very recent. Stands of secondary growth timber occur on portions of the Alpo 61 and Alpo 60 mineral claims in the northwest portions of the claim block.

### Property Description

A list of the claims forming the Alpo property is provided below. See also the claim map (Map # 2) for further information.

Claim Name	Units	Record #	Current Expiry Date
Alpo # 23	1	333901	January 26, 1999
Alpo # 24	1	333902	January 26, 1999
Alpo # 25	1	333903	January 26, 1999
Alpo # 26	1	333904	January 26, 1999
Alpo # 27	1	333905	January 26, 1999
Alpo # 28	1	333906	January 26, 1999
Alpo # 29	1	333907	January 26, 1999
Alpo # 30	1	333908	January 26, 1999
Alpo # 31	1	333909	January 27, 1999
Alpo # 32	1	333910	January 27, 1999
Alpo # 33	1	333911	January 27, 1999
Alpo # 34	1	333912	January 27, 1999
Alpo # 35	1	352316	October 16, 1998
Alpo # 36	1	352317	October 16, 1998
Alpo # 37	1	352318	October 16, 1998
Alpo # 38	1	352319	October 16, 1998
Alpo # 39	1	352320	October 16, 1998
Alpo # 40	1	352321	October 16, 1998
Alpo # 43	1	352312	October 26, 1998
Alpo # 44	1	352313	October 26, 1998
Alpo # 45	1	352322	October 15, 1998
Alpo # 46	1	352323	October 15, 1998
Alpo # 47	1	352324	October 15, 1998



**ALPO PROPERTY**  
 Pinaus Lake Area, B. C.  
 Kamloops & Vernon Mining Division

**ALPO MINERAL  
 CLAIM MAP**

Y-H Technical Services Ltd  
 DATE SCALE MAP No.  
 Nov. 1997 1:31680 2

**Property Description** (cont'd)

<u>Claim Name</u>	<u>Units</u>	<u>Record#</u>	<u>Current Expiry Date</u>
Alpo # 48	1	352325	October 15, 1998
Alpo # 49	1	352326	October 15, 1998
Alpo # 50	1	352327	October 15, 1999
Alpo # 51	1	333913	January 28, 1999
Alpo # 52	1	333914	January 28, 1999
Alpo # 53	1	333915	January 28, 1999
Alpo # 54	1	333916	January 28, 1999
Alpo # 55	1	333917	January 27, 1999
Alpo # 56	1	333918	January 27, 1999
Alpo # 57	1	333919	January 27, 1999
Alpo # 58	1	333920	January 27, 1999
Alpo # 1 Fr	1	333921	January 26, 1999
Alpo # 2 Fr	1	333922	January 27, 1999
Alpo # 3 Fr.	1	352314	October 26, 1998
Alpo # 4 Fr.	1	352315	October 26, 1998
Alpo # 60	20	352687	November 13, 1998
Alpo # 61	20	352688	November 14, 1998
Alpo # 62	15	352689	November 14, 1998
Alpo # 63	1	352690	November 13, 1998
Alpo # 64	1	352691	November 13, 1998
Alpo # 66	1	352692	November 7, 1998
Alpo # 67	1	352693	November 7, 1998
Alpo # 68	1	352694	November 8, 1998
Alpo # 69	1	352695	November 8, 1998
Alpo # 70	1	352696	November 12, 1998
Alpo # 71	1	352697	November 12, 1998
Alpo # 72	1	352698	November 13, 1998
Alpo # 73	1	352699	November 13, 1998
Alpo # 74	1	352700	November 13, 1998
Alpo # 75	20	356864	June 11, 1998

The "owner of record" for the above listed Alpo claims is Okanagan Opal Inc. The expiry dates shown herein, reflect the recent application of work supported by the filing of this report describing the geological fieldwork conducted during the 1997 season. The claims are recorded in the Vernon, Kamloops and Nicola Mineral Divisions of British Columbia. All claims have been located in accordance with the requirements of the Mineral Act of the province of British Columbia.



### **Alpo Property History**

The original block of Alpo claims were located in 1995 as a result of prospecting work conducted by R. W. Yorke-Hardy who noted numerous outcroppings of fossiliferous waterlain rhyolitic ash/ tuff sediments along the McGregor forestry road access. It was thought that the geological setting and the exposure of these sediments might be a favourable environment for the formation of sediment hosted precious opal similar to precious opal hosted in Tertiary lake sediments in Nevada. The general proximity of these claims to the precious opal deposit located on the Klinker/Ewer property approximately 2.5 kilometres to the south-east and to reported occurrences of jelly opal on the adjacent Flash and Red Rock claims along the powerline to the north and east combined with generally similar geology and the discovery of common opal were also additional reasons for staking these claims.

Common opal (amber jelly to brown opaque) was noted by P. Read in 1994 during his mapping of rock outcrops under powerlines that traverse the area approximately 4.5 kilometres to the east of the Alpo claims. Read was at that time conducting work for the GSC which included fieldwork to investigate occurrences of industrial minerals within the Tertiary stratigraphy which included diatomaceous earths, swelling clays, zeolites, perlite, kaolinite, precious opal, gypsum and dimension stone. This preliminary work was released to the public at the Cordilleran Round-up in January 1995. Interest in this geological setting has also been directed towards the occurrence of palagonite which is recorded on the west flank of Tuktakamin Mountain, north of Pinaus Lake.

This entire region was heavily staked during a "staking rush" in 1988 which occurred as a result of gold discovered by Huntington Resources on the Brett property located to the south on Whiteman Creek. No other mineral exploration has been noted in the area except on the Way 1 mineral claim located to the south and adjacent to the Alpo 23 and 24 mineral claims. This area saw grassroots exploration for gold in 1988-89 because of its potential for the discovery of epithermal type gold mineralization in the underlying Eocene volcanics.

The initial work on the Alpo claims included general prospecting and a physical work programme on the Alpo 28 and Alpo31 mineral claims between August and November of 1995. Work consisted of excavator trenching along the inside edge of the west side of McGregor Creek Road to further expose the shallow dipping waterlain sediments. Samples were taken for mineralogical (SEM and X-Ray) and geochemical studies by G. Simandl of the Industrial Minerals Branch of the B.C. Geological Survey from a location at the 20 km marker on McGregor Creek road. Initial results from this analysis of these samples in 1996 has determined that the waterlain sediments are diatomaceous, part opalized and are of younger mid-Miocene age. Additional results are expected from this analysis.

In May 1996 a regional airphoto lineament study over the Alpo claims area was prepared by Mollard and Associates Ltd. of Regina, Saskatchewan which includes the outline on a 1:50,000 scale black-and-white airphoto of an interpreted low lying area which may represent the margins of a Tertiary lake basin.

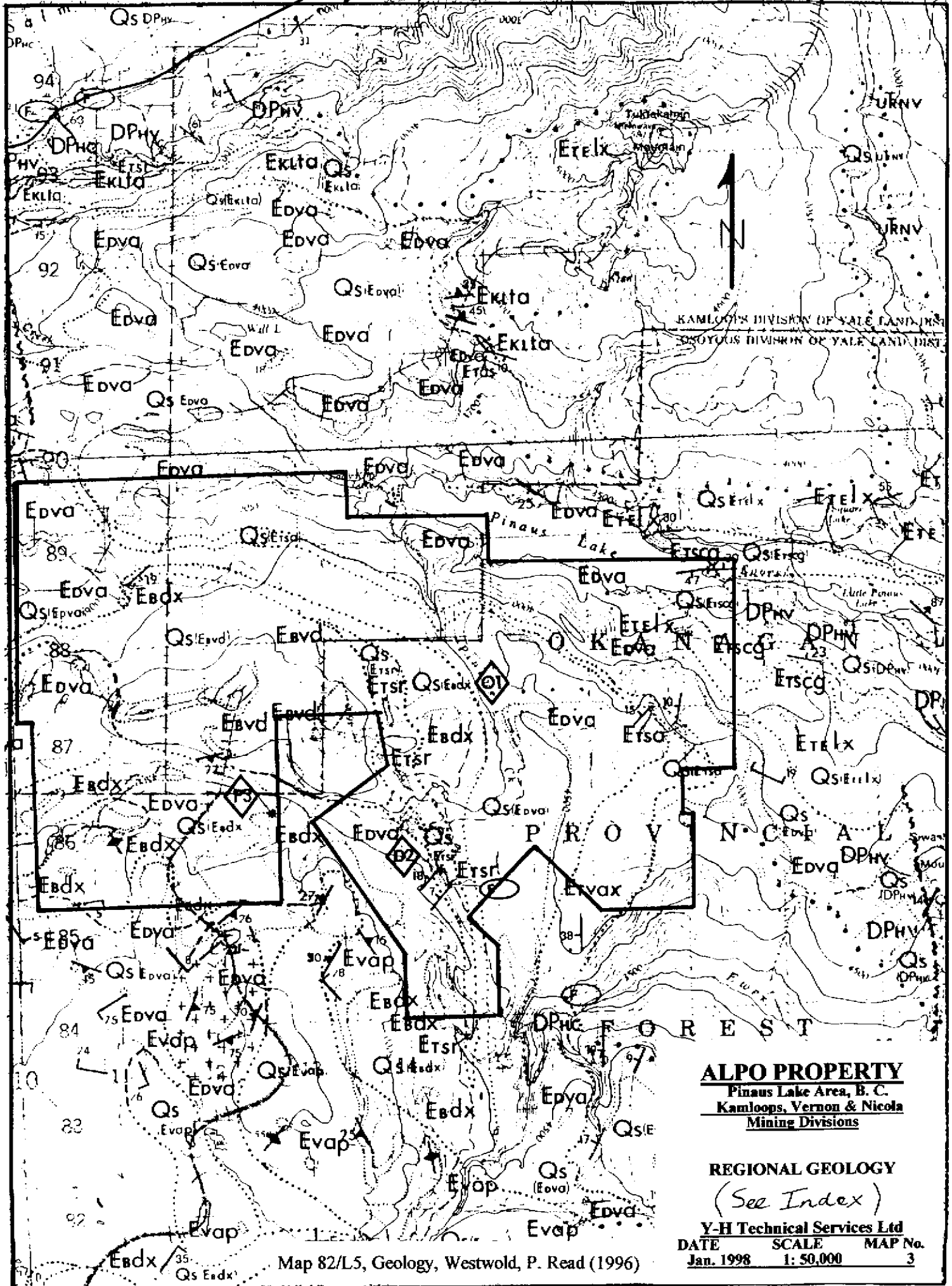
The Alpo claim block includes an additional 86 units after further staking in the fall of 1996 which has included the addition of the Alpo 60 to Alpo 64 and Alpo 66 to Alpo 74 mineral claims. The Alpo 75 was staked in the early part of 1997.

### **Regional Geology**

Recent regional mapping of the Alpo claims area has been conducted by P. Read while mapping the base of the Eocene volcanics on map sheet NTS 82L in 1994 and while assessing the perlite industrial mineral potential of the Eocene volcanic belt of rocks that extend from Vernon to Kamloops in 1995. More recently, Simandl and Paradis (1996) have conducted a detailed analysis of the opal occurrences on the Klinker claims with the assistance from B. Callaghan and R. Yorke-Hardy and is published in "Summary of Field Activities and Current Research - Paper 1997-1, Geological Fieldwork 1996".

The occurrences of common opal on the Alpo claims are found in predominantly volcanic rocks of the Eocene Kamloops Group that forms a basin(s) that extends 150 kilometres north-northwest from Trepanier on the west side of Okanagan Lake to locations near Cache Creek west of Kamloops. The width of this volcanic sheet is approximately 25 to 30 kilometres and according to Read (1995) has a thickness which in places may exceed 600 metres as seen north and south of Falkland at Estekwalan and Tuktakamin Mountains respectively. Regionally, Eocene rocks lie on a basement of Upper Triassic Nicola Group rocks consisting of crystal lithic andesites, basaltic tuffs, minor breccia and flows, interbedded greywackes and shales, and grey phyllitic limestones. They are underlain by older greenstone and marble rocks of the Harper Ranch group of Late Paleozoic age and consist of massive to foliated chloritized hornblende and augite porphyry, meta andesite tephra and flows that are chloritized to the greenschist facies. According to Read, the general structure of these Eocene rocks is that of an upright syncline. The Eocene rocks are vesicular, amygdaloidal and contain fillings of calcite, zeolites and silica in the form of agate, common opal and rare precious opal.

The Alpo claims are for the most part underlain by rocks of the Tranquille Formation (Read 1996) and include waterlain clast and matrix supported lahars and ash to lapilli tuffs that host common opal, agate and a variety of zeolite minerals. These waterlain volcanic rocks exhibit many lateral and vertical facies changes with quite a high westward primary dip to the beds according to Read (personal communication).



**ALPO PROPERTY**  
 Pinaus Lake Area, B. C.  
 Kamloops, Vernon & Nicola  
 Mining Divisions

REGIONAL GEOLOGY  
 (See Index)

Y-H Technical Services Ltd  
 DATE SCALE MAP No.  
 Jan. 1998 1: 50,000 3

Map 82/L5, Geology, Westwold, P. Read (1996)

QUATERNARY

PLEISTOCENE AND RECENT

**Qs(E1sr)** Unconsolidated sediments: glacial deposits, colluvium and alluvium; few if any outcrops; probable subcrop unit within parentheses

TERTIARY

EOCENE

KAMLOOPS GROUP

PENTICTON GROUP

MARRON FORMATION

**Bouleau rhyolite (Ebdx & Ebvd)**

**Ebdx** Grey vitrophyric (plagioclase) aquagene dacite breccia with white to buff palagonite matrix

**Ebvd** Grey vitrophyric (plagioclase) dacite flows

**Kitley Lake Member**

**Eklta** Porphyritic (feldspar) trachyandesite flows

**Whiteman Creek Stock**

**Ewg** Porphyritic pink granite

DEWDROP FLATS FORMATION

**Evap** Grey porphyritic (plagioclase) trachyandesite and dacite flows

**Edva** Grey aphanitic or porphyritic augite, olivine) trachyandesite flows and interflow breccia

**Eao** ATTENBOROUGH CREEK FORMATION  
Mainly thinly bedded andesite and dacite lava and breccia and some olivine basalt

**Edva** Grey aphanitic or porphyritic (augite±olivine) trachyandesite tephra

**Eia<sup>+</sup>** Grey aphanitic or porphyritic (augite, olivine) andesite and basalt sills and dikes

**Edvb** Dark grey porphyritic (olivine, augite) trachybasalt and basaltic trachyandesite flows and flow breccias

TRANQUILLE FORMATION

**Estekwan Breccia (Etelx)**

**Etelx** White, buff and brown partly vitrophyric (pyroxene) aquagene latite breccia

**Etsr** White rhyolite ash-tuff locally waterlain; minor shale with plant debris

**EtXR** Light grey vitrophyric rhyolite breccia

*Index tables for Regional  
Geology - Map 3*

**Evd** Grey vitrophyric (plagioclase) dacite flows

**Eklta** **Kitley Lake Member**  
Porphyritic (feldspar) trachyandesite flows

**Ewg** **Whiteman Creek Stock**  
Porphyritic pink granite

**Evap** **DEWDROP FLATS FORMATION**  
Grey porphyritic (plagioclase) trachyandesite and dacite flows

**Edva** Grey aphanitic or porphyritic (augite, olivine) trachyandesite flows and interflow breccia

**EAG** **ATTENBOROUGH CREEK FORMATION**  
Mainly thinly bedded andesite and dacite lava and breccia and some olivine basalt

**Edva** Grey aphanitic or porphyritic (augite+olivine) trachyandesite tephra

**Eia** Grey aphanitic or porphyritic (augite, olivine) andesite and basalt sills and dikes

**Edvb** Dark grey porphyritic (olivine, augite) trachybasalt and basaltic trachyandesite flows and flow breccias

**Etelx** **TRANQUILLE FORMATION**  
**Estekwan Breccia (Etelx)**  
White, buff and brown partly vitrophyric (pyroxene) aquagene latite breccia

**Etsr** White rhyolite ash-tuff locally waterlain; minor shale with plant debris

**Etxr** Light grey vitrophyric rhyolite breccia

**Etvr** Cream, porphyritic (feldspar, hornblende, biotite) rhyolite flows; rare red and black volcanic glass

**Eir** Cream, flow-layered, porphyritic (biotite, quartz, feldspar) rhyolite stocks

**Etvax** Cream to red-brown andesite/basalt clast mudflows with crude bedding

**Etsa** Grey bedded basalt/andesite lithic ash-tuff

**Etcg** Conglomerate, sandstone; rare shale

**Etx** Sedimentary breccia

*Index tables for  
REGIONAL GEOLOGY*

*- Map 3*

CRETACEOUS

EARLY CRETACEOUS

**EKnqm**

**NISCONLITH PLUTON**

Biotite hornblende leucoquartz monzonite

JURASSIC OR CRETACEOUS

**JKgd**

Chloritized biotite-hornblende granodiorite

JURASSIC

EARLY JURASSIC

**εJgd**

**WILD HORSE BATHOLITH**

Biotite granodiorite and leucogranodiorite

TRIASSIC

UPPER TRIASSIC

**URNV**

**NICOLA GROUP**

Crystal-lithic andesite and basalt tuff; minor breccia and flows

**URNS**

Interbedded greywacke and shale

**URncp**

Grey phyllitic limestone, limy phyllite, graphitic phyllite

EVONIAN TO PERMIAN

**DPhv**

**HARPER RANCH GROUP**

Meta-andesite flows and tephra; greenstone

**DPhc**

Grey massive limestone

PALEOZOIC

**us**

Serpentinite

PROTEROZOIC OR PALEOZOIC

**SILVER CREEK FORMATION**

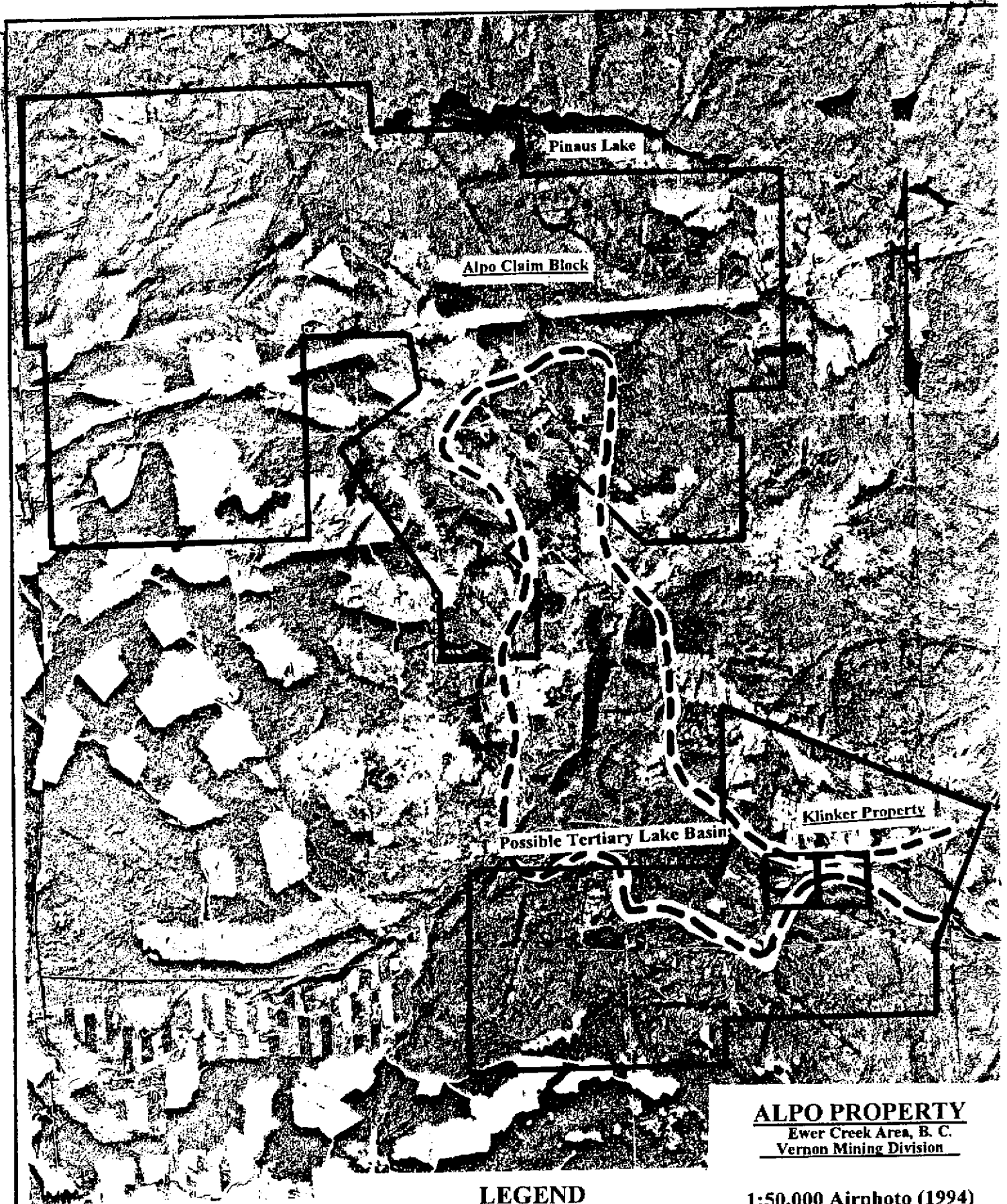
**Pscq**

Chase Member: White calcareous quartzite, micaceous quartzite, mica-quartz schist

**Pscsb**

Biotite, biotite-muscovite schist and micaceous amphibolite

*Index tables for  
Regional Geology  
- Map 3*



**LEGEND**

- Claim Boundary
- - - Boundary of Tertiary Lake Basin

**ALPO PROPERTY**

Ewer Creek Area, B. C.  
 Vernon Mining Division

1:50,000 Airphoto (1994)  
 Lowland Area  
 per J.D. Mollard & Assoc.

Y-H Technical Services Ltd  
 DATE SCALE MAP No.  
 Nov. 1997 1: 50,000 6

They are referred to as Unit Etvax (see Regional Geology - Map No 3). They trend in a northerly direction for approximately 5 kilometres. Recent mapping by B. Callaghan indicates that this belt extends 2 kilometres in width and appears to underlie a shallow west dipping sequence of waterlain sediments referred to as Unit Etsr. Simandl and Paradis (1996) have discovered from samples taken, that these sediments contain Mid-Miocene aged palynomorph assemblages that are derived from shoreline habitats that indicate a shallow stream or lake edge environment for their formation. They are comprised of a sequence of white weathering, locally diatomaceous and locally opalized tuffaceous shales consisting of ash to lapilli rhyolitic tuff, breccia flows and glass sands. According to Read, this unit has an approximate thickness of 150 metres.

Unit Etsr overlies Unit Ebdx which consists of a vitrophyric aquagene dacite breccia, south of Pinaus Creek. Unit Etsr underlies grey vitrophyric (plagioclase) dacite flows of the Marron formation referred to as Unit Ebvd and may be the source of the northerly trending dacite breccias that outcrop to the west of exposed waterlain sediments (Etsr) at the 20 Kilometre marker on the McGregor logging road. The dacite flows outcrop to the north of the 505 Road junction with the McGregor logging road. Massive to scoriaceous mafic dykes or sills of similar age occur within these sedimentary sequences of the Kamloops Group

The oldest rocks in the vicinity of the Alpo claims are exposed in Ewer Creek to the south and east of the Alpo Claim block. They consist of gently west dipping grey green brecciated andesitic/basaltic flows of the Harper Ranch Group of late Paleozoic age.

### **1997 Geological Mapping Programme Outline**

Mapping of portions of the Alpo claims using a Silva Ranger Compass and Topolite belt chain for control was carried out at a metric scale of 1:5000 over exposures of sediments on the west side of McGregor Road. Any rock exposures along roadcuts and the location of claim posts were plotted on a 1:15000 Forestry Cover Map Sheet enlarged to a metric scale of 1:5000 for the geological interpretation.

The geological mapping and prospecting on the Alpo claims was conducted by B. Callaghan. The exploration work conducted during the 6 days of field work also included chain and compass surveying of skid trails and roads in the immediate vicinity of the claim block. In addition, Legal Corner Posts were located in the field to determine the position of Alpo claims relative to the Flash and Red Rock claims. Geological mapping at a scale 1:5000 was also conducted during reconnaissance work in an area to the east of McGregor Creek over exposed matrix and clast supported lahars that underly the shallow west dipping sediments exposed along McGregor Road on the Alpo 28 & 30 mineral claims.

Exploration work during the 1997 field programme was centred mostly in the north west portion of the claim block and included 3 areas of examination, Geological mapping was carried out during reconnaissance traversing in an area to the west of the McGregor logging road immediately to the south of the 505 junction in the vicinity of extensive beaver ponds on the Alpo 32 mineral claim in which both common opal and bedded, partly unconsolidated sediments containing broad leaf fossils were also found.



A surveyed traverse to the north of the powerlines on the recently staked Alpo 62 mineral claim was mapped to tie a northerly trending vitrophyric (plagioclase ) dacite flow and related breccias that extend to the north from mapped exposures of breccia to the west of the kilometre 20 marker on the McGregor forestry logging road. The third area of mapping was conducted approximately 2 kilometres to the west of Lady King Lake on the recently staked Alpo 72 and Alpo 75 mineral claims in an area of coarse matrix and clast supported lahars with vesicle fillings of botryoidal agate, zeolite and unpreviously discovered common white, pink opaque opal. These additional areas of common opal on the Alpo claims are included on map Nos 4 and 5.

A classification of the different forms of opal are provided. See Appendix 1.

### **Property Geology 1997**

The area of the Alpo claims on the west side of the McGregor logging road are overlain by Unit Etsr, referred to as Unit-e which consists of a thin sequence of west shallow dipping locally waterlain ash - tuff sediments and shale with plant debris. An examination of these sediments in 1995 by G. Simandl of the Industrial Minerals Geological Survey Branch has confirmed the existence of diatoms and that the sediments indicate shallow stream or lake edge sediments (Simandl 1996). This unit is exposed in outcrop at the 17.5 kilometre marker on the Alpo 24 mineral claim and to the north at the 20 to 21 kilometre marker ( See Map 4).

An additional outcropping of this unit has been mapped approximately 400 metres to the west of the McGregor logging road on the Alpo 32 mineral claim. At this site, the unit occurs as thinly bedded 34 degree west dipping waterlain sediment layers that strike approximately 330 degrees and are exposed in outcrop up to approximately 5 metres in thickness from the west bank of the northerly arm of a large swamp that drains into Pinaus Creek.

The sediment layers consist of white to light brown diatomaceous and opalized ash to tuff lenses, pale green coloured, glass sands and grey to brown plant fossil bearing shales that extend north westerly for at least 500 metres from the 20 kilometre marker and may extend beyond, on to the recently staked Alpo 60 mineral claim to the north of an old log landing in the vicinity of mapped Unit - g.

Unit - g consists of a light cream, grey vitrophyric aquagene dacite breccia with white to buff palagonite matrix of the Marron formation referred to as Unit Ebdx by Read (1996). It extends approximately 2600 metres from the west side of the McGregor logging road in a north westerly direction to similar exposures on the Alpo 61. Examination of these exposures at the base of a subvertical cliff exhibit coarse matrix to clast supported high energy brecciated flows with subrounded clasts and boulders up to 1 metre and average 30 cms. Clasts are grey to black, appear siliceous and contain translucent, zeolites as fillings. This large outcrop appears to be one massive flow as there is no evidence of bedding or intermixing of debris flow material.

The source for these dacitic breccias may be vitrophyric dacite flows as mapped during the 1997 programme and are referred to by Read as Unit Ebdv of the Marron formation i.e. Unit - j (See map 4). They occur just to the north of the 505 logging road junction with McGregor in the vicinity of the powerlines and further north on a ridge top above an old landing on the Alpo 61 mineral claim.

According to Read unit Ebdx is overlain by Unit Etsr. The latter may be a source of silica fluids for the formation of opal and has been suggested as a possible source for the precious opal occurrences on the nearby Klinker/Ewer claims. Results of an analysis of honey to dark brown opalized rhyolite (dacite) ash breccia fragments using X-ray diffraction methods have determined that these fragments are common Opal-CT, according to Read (1996)

The breccias and ash - tuff waterlain sediments with minor shales as described above, are underlain by matrix and clast supported lahars referred to as Unit Etvax ie. Units - a and b. A fairly extensive sequence of clast and matrix supported lahars underly the ash tuff sediments and shales in the vicinity of the beaver ponds on the west side of the McGregor logging road at 21.5 Kilometre. These low to high energy lahars that are clast supported can contain coarse matrix material up to approximately 5 to 10%. Clasts are more weathered and altered with rusty red-brown oxidation of clasts and coarse matrix material. Noticeable banded agate and common opal occur as fracture fillings in float at the base of outcrop exposures on the banks of the beaver ponds. Agate is also abundant as vesicle fillings, in red oxidized basaltic clasts. The lahars trend approximately 290 degrees and dip 50 degrees to the southwest. Dominant fractures trend approximately 310 degrees and dip 40 degrees to the west.

This sequence of lahars is intermixed with discontinuous lenses of ash to lapilli tuff and warrants additional prospecting and mapping, as precious opal may occur at the intersection of cross cutting structures within these flows, that contain opal.

The 1997 mapping indicates that this belt of lahars may extend in width for approximately 2 kilometres to the east where similar lahars have been mapped on the Alpo 50 mineral claim on the east side of this large basin. They are also exposed along a road access that runs along the base of the powerlines which is sub parallel to the south of the Alpo 62 mineral claim boundary and are similar to the lahars that host precious opal on the nearby Klinker/Ewer claims to the south and lahars that contain common opal on the Flash claims to the east.

They occur at various elevations on the Alpo claims. Those Lahars occurring on the west side of McGregor road may represent the down dip continuation of shallow dipping beds on the east side of the claim block that occur at higher elevations, or they may reflect repeated successive layers of lahars and tuffaceous sediments. It has not been established if there are substantial thicknesses to these sediments and flows that are opal bearing. They possibly represent a continuation of the same lahars on the Klinker claims to the south and to the north on the adjacent Flash claims.

The lahars that extend across the centre of the powerline contain between 10 to 15 % rounded to sub-angular vesicular clasts that average 7 cms in size. Samples of float contain vesicle fillings of common white and minor jelly opal in close proximity to these small, flat lying outcrop exposures that extend for a few metres where other flat lying ash to lapilli tuff beds also occur in small exposures under these powerlines.

An outcrop situated approximately 500 metres to the north of lahar and ash - tuff sequences exposed on the powerlines as mentioned above consists of a well cemented coarse grit , (conglomerate) with 5% sub-angular and subrounded cobbles and boulders from 15 cms to 40 cms that are supported in a brecciated coarse matrix. Most of the clasts consist of vesicular and amygdaloidal basalt. Fracture densities vary between 5 to 10 per metre. Glacial striations trend at 270 degrees.

A single float sample of a clast on the east side of a northerly flowing creek in the vicinity of this outcrop contains minor vesicle fillings of translucent to opaque white opal that is lined with a thin coating of orange amber translucent opal. No open space fillings of common opal were seen in this outcrop.

Outcrop exposures in this area to the north of the powerline are minimal and confined to the steeper ridges. Further prospecting and mapping is recommended in this area towards the north and east on the Alpo 61 mineral claim towards the south side of Pinaus Lake. Common opal, agate and amethyst is reported to occur in cliffs south of Pinask Lake and in the vicinity of Lady King Lake.

The 1997 mapping on the Alpo 72 and Alpo 75 mineral claims indicate that this belt of basaltic lahars may extend in a north westerly direction from the powerline for approximately 6 kilometres. Both coarse matrix and clast supported lahars were identified in an area located off the Will Lake road leading to Pinaus Lake on the Alpo 72 mineral claim. They contain agate, zeolites and minor common opal.

Red oxidized coarse matrix supported lahars on the Alpo 72 mineral claim contain vesicle fillings of white zeolite (analcime) and a yellow, brown sugary zeolite. One discontinuous fracture filling through a basalt clast is 0.5 cm in width and contains agate. Other coarse matrix supported lahars are maroon to grey in colour, massive with no evidence of bedding. Open space fillings include vesicles, minor fractures and as a matrix cement. Fillings consist of mostly botryoidal agate up to 2% in patchy clusters. In some outcrops, fractures are closely spaced up to 20 per metre, are sub vertical and trend 360 degrees. White common to pinkish opaque common opal infills the coarse matrix material as seen in one outcrop.

Vesicle fillings of agate appear to be more abundant in exposures to the south on the Alpo 75 mineral claim in clast supported lahars in roadcuts and along the northern slopes above an old haul road situated to the south of an old log landing. Large green to grey chert nodules up to approximately 7 cms were found smashed in scattered piles amongst the clast supported lahars. No opal was found in these outcrops. Similar large dark green chert nodules were found as float on the Alpo 38 mineral claim close to amygdaloidal basaltic flow rocks with abundant amygdule fillings of agate and occasionally lined with white botryoidal zeolites. The formation of the chert nodules and the significance of its presence in these clast supported lahars with abundant agate

and minor common opal is not understood. The chert may have formed as an open space filling prior to the deposition of opal or may have formed from the alteration of opal .

### **Conclusions and Recommendations**

Additional discoveries of common opal with a variety of base colours have been found in place and in float samples of clast and matrix supported lahars.

Clast and matrix lahars that contain significant common opal with a variety of base colours extend in width for approximately 2 kilometres in a northwesterly direction over an extensive portion of the Alpo claims that stretches from McGregor Creek in the south to Pinaus Lake in the north. They appear to be similar to and may represent the north west extension of those lahars that host precious opal on the nearby Klinker/Ewer deposit to the south. Different varieties of common opal have been found on the Alpo72, Alpo 60, Alpo 32 mineral claims and along the southern boundary of the Alpo 61 mineral claim in close proximity to open ground.

The areas of opal mineralization on the Alpo claims may be restricted to the margins or edges of a large Mid-Miocene lake basin that possibly covers a large portion of the Alpo claims. Sequences of white rhyolitic (dacite) ash-tuff and shale containing plant fossils are diatomaceous and locally opalized and may represent the edges or bottom of this lake and the source of silica for the formation of opal.

The discovery of additional occurrences of these sediments indicates the broad extent of these sediments within this area.

A programme of continued geological reconnaissance work and mapping is recommended to close off and further delineate the contact margins between Marron formation flows and breccias with the waterlain ash - tuff sediments, shales and lahars of the Tranquille formation in the western portion of the claim block.

Additional geological reconnaissance work and mapping is recommended in those areas with the greatest concentrations of agate and opal associated with the matrix and clast supported lahars and includes the area to the west of McGregor road at the 21.5 kilometre marker and the area of the Alpo 72 and Alpo 60 mineral claim. The fraction that has formed from the staking of the Alpo 61 should be staked to cover ground that may have good potential for the formation of precious opal.

The area around the southern portion of Pinaus Lake in those areas with extensive outcrop should be mapped and prospected as well as ground to the south of the Red Rock 5 mineral claim where common opal was found in sub crop at surface in matrix supported lahar exposures, located just off the claims and north of the Alpo 47 mineral claim. Also, additional mapping and reconnaissance work is recommended in an area of common opaque white opal which was discovered to the east of an old log landing in amygdaloidal basalt on the Alpo 38 mineral claim. Outcrop exposures contain abundant amygdules infilled with agate and lined with white botryoidal zeolites.

This additional mapping will help in evaluating the key areas that need more detailed examination and at the same time will eliminate those areas less likely to host precious opal.

Sediment hosted precious opal may occur below exposures of opalized shales and diatomaceous earths. Removal of overburden and trenching is recommended along the west side of McGregor Road to further expose the loosely consolidated volcanic ash sediments exposed in roadcuts. This work should be expanded if significant amounts of common and/or precious opal are found in underlying volcanic flows and sediments. A programme of drilling is also recommended to determine if precious opal host rocks occur in these sediment sequences at lower horizons within this mid-Miocene basin

Further analysis of opal samples and their host rocks would help in understanding its formation on the Alpo claims and surrounding areas.

**COST STATEMENT****Management/Administration:**

R. W. Yorke-Hardy  
 2 man days at \$300.00 per day(field) \$ 600.00

**Geological Work:**

B. Callaghan  
 6 man days at \$300.00 per day \$ 1800.00

**Geological Field Assistant:**

J. Young  
 6 man days at \$250.00 per day \$ 1500.00

**Support Costs:**

Vehicle costs - 6 days at \$75.00/day \$ 450.00  
 Field Supplies - flagging, thread \$ 50.00  
 Room & Board - 6 man days at \$50.00 per day \$ 300.00  
 Misc. Field Equipment - \$ 25.00

**Report Preparation:**

Management and administration  
 R. W. Yorke-Hardy  
 2 man day at \$300.00 per day \$ 600.00

**Report writing and Drafting:**

B. Callaghan  
 9 man days at \$300.00 per day \$ 2700.00  
 J Young  
 1 man day at 250.00 per day \$ 250.00  
 Typing and printing costs \$ 200.00

**TOTAL** \_\_\_\_\_ **\$8,475.00**

**Bibliography**

- Read, Peter B. (1995) Industrial Mineral Potential of the Tertiary Rocks, Vernon(82L) and Adjacent Map Areas. Part of Geological Fieldwork 1995- A Summary of Field Activities and Current Research (Paper 1996-1).
- Penner, L. A. & Mollard J. D. Regional Airphoto Study Covering the Klinker Area and Surrounding Area (1996). Private Report
- G. Simandl, K. Hancock, B. Callaghan, S. Paradis & R. Yorke-Hardy (1997) Klinker Precious Opal Deposit, South Central B.C. Canada - Field Observations and Potential Deposit -Scale Controls.

**Statement of Qualifications**

I, Brian Callaghan reside at 989 Curtis Road, Kelowna, B.C..


I am presently self employed as a Geological Consultant and have practised my profession for eighteen years since graduation from Brandon University, Manitoba with a Bachelor of Science Degree in Geology.

Part of my experience has included geological mapping, prospecting and report preparation related to exploration for opal on various properties in the Pinaus Lake region of South Central British Columbia over the last five years.

I am presently under contract with Y-H Technical Services Ltd., of Vernon, B. C. and have been involved in the geological mapping and report preparation for the Alpo claims located in the Pinaus Lake area from 1995 to 1998. I have mapped the geology on the Alpo mineral claims during the period from October 19th 1997 to October 27th 1997.

I have no interest, direct or indirect, in the Alpo property or Y-H. Technical Services Ltd.; nor do I expect to receive any.

Sincerely,

  
Brian Callaghan, B.Sc., Geology

January 16, 1998

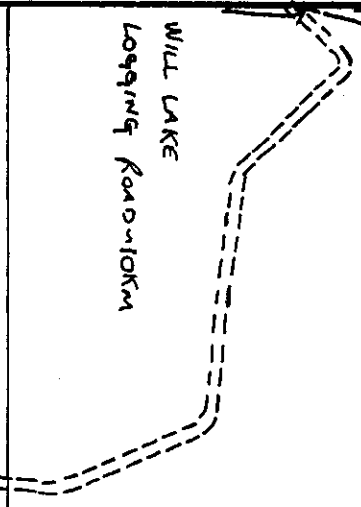


**APPENDIX I**

PRECIOUS OPAL					
DESCRIPTION		OPAQUE	TRANSLUCENT	TRANSPARENT	
BASE COLOR	CODE	1	2	3	
BLACK	A	n/a	faces up black with play of color	faces up black with play of color	
ORANGE	B	n/a	n/a	orange base color with play of color	
RED	C	n/a	n/a	n/a	
AMBER	D	n/a	amber with play of color	amber with play of color	
YELLOW	E	n/a	yellow with play of color	yellow base color with play of color	
CLEAR	F	n/a	semi-clear with play of color	clear with play of color	
WHITE	G	white base color with play of color	semi-white with play of color	n/a	
GREEN	H	n/a	n/a	n/a	
SALMON/PINK	I	pink base color with play of color	n/a	n/a	
CARAMEL	J	caramel with play of color	caramel with play of color	n/a	
BROWN	K	brown with play of color	brown with play of color	faces up brown with play of color	
BLUE	L	blue with play of color	blue with play of color	n/a	
COMMON OPAL (no play of color)					
DESCRIPTION		OPAQUE	TRANSLUCENT	TRANSPARENT	
BASE COLOR	CODE	4	5	6	
BLACK	A	black base color	black base color	faces up black	
ORANGE	B	orange base color	orange base color	orange base color	
RED	C	n/a	red base color	red base color	
AMBER	D	n/a	amber	amber	
YELLOW	E	n/a	yellow base color	yellow base color	
CLEAR	F	n/a	semi-clear	clear	
WHITE	G	white	semi-white	n/a	
GREEN	H	green	n/a	n/a	
SALMON/PINK	I	salmon/pink	n/a	n/a	
CARAMEL	J	caramel	caramel	n/a	
BROWN	K	brown	brown	n/a	
BLUE	L	blue	n/a	n/a	

To Pinaus Lodge

WILL LAKE  
Logging Road-10km



ALPO 60

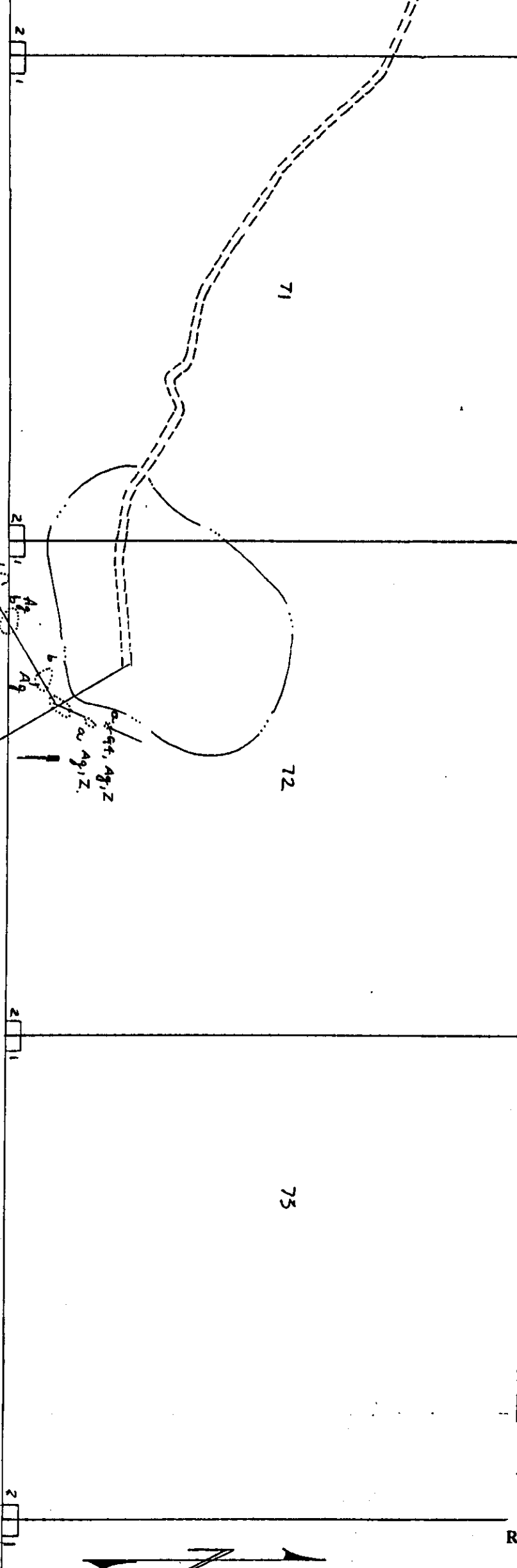
70

71

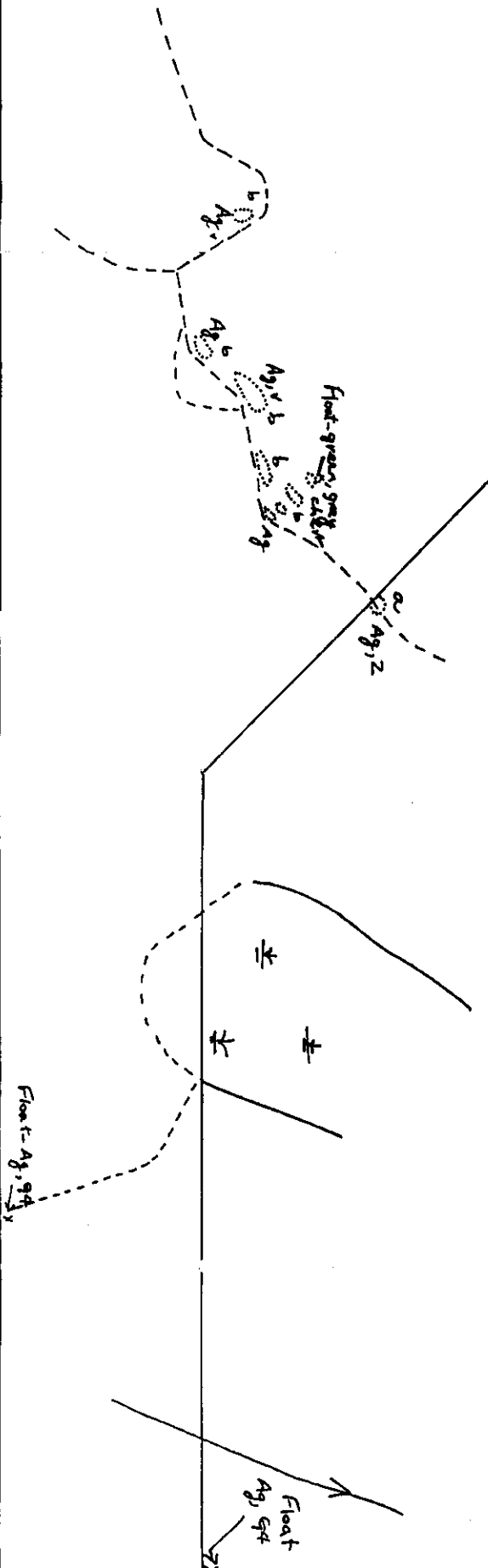
72

73

74



- Refer to Map 4 for legend



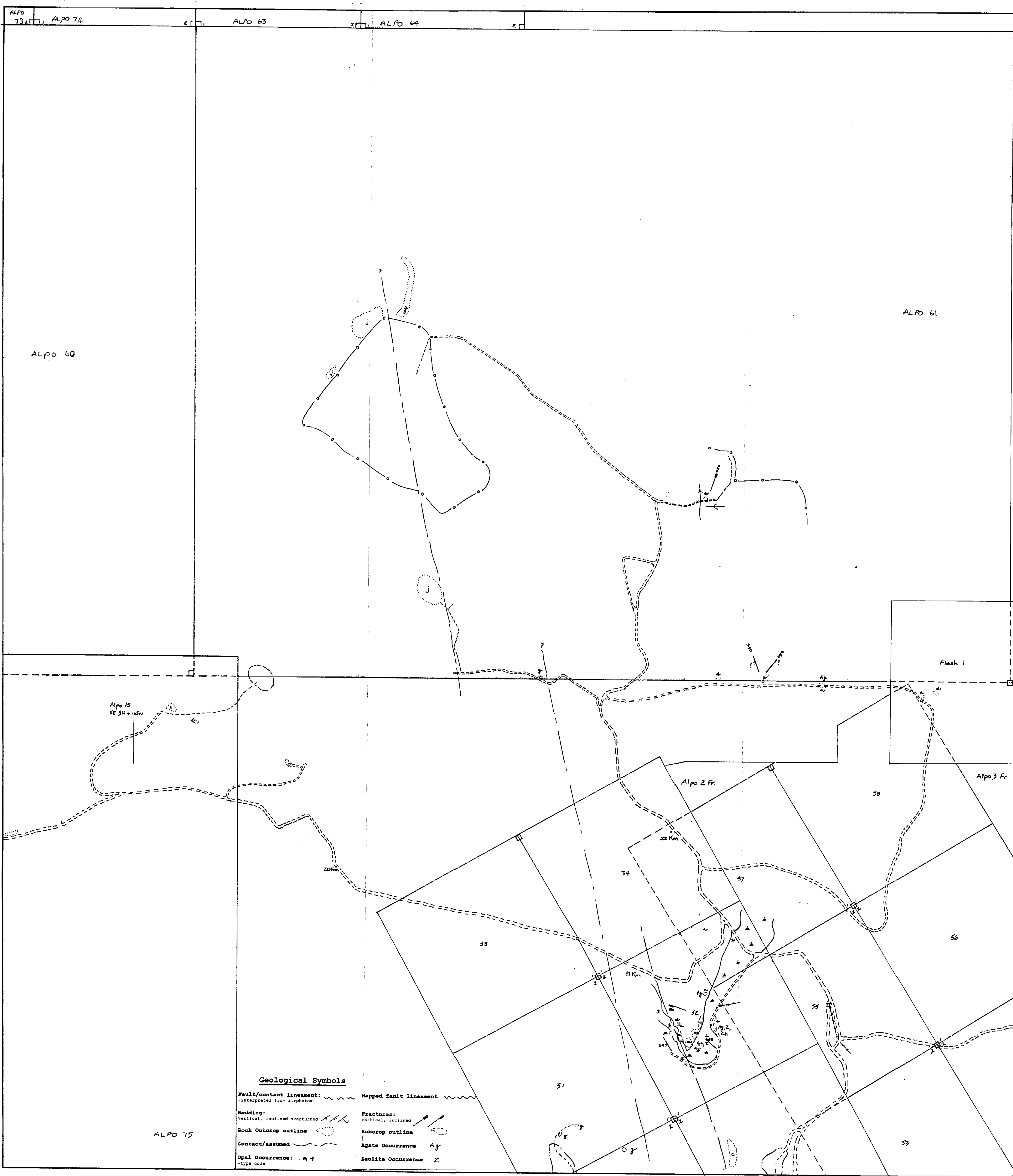
GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

25,409

**ALPO PROPERTY**  
Pinaus Lake Area, B. C.  
Kamloops & Vernon Mining Division

**GEOLOGY,**  
Roads & Claim Boundaries in Northwest  
corner of the Alpo claim block

Y-H Technical Services Ltd  
DATE Nov. 1997 SCALE 1:5000 MAP No. 5



**LEGEND - General**

- |                        |                          |
|------------------------|--------------------------|
| Roads - Access Road    | Trails - old skid trails |
| - logging road         | - old skid trails-foot   |
| Creek or Draw Definite | Swamps or Muskeg         |
| Lake/Pond              | Log Landing              |
| Fence Line             | Cattleguard              |
| Claim Boundaries       | Claim Post               |
| Towers                 | Powerline                |
| Edge of Cut Block      |                          |

**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

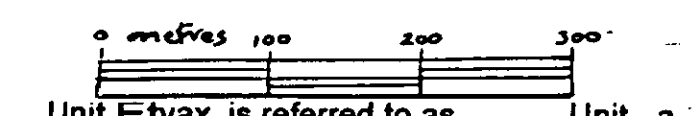
**25,409**

**Geological Legend**

**TERTIARY**

**Eocene or Mid-Miocene - Kamloops Group**

- a Low to high energy lahar, sandy tuffaceous matrix maybe coarse matrix supported, clasts weathered, andesitic/basaltic.
- b Low to high energy lahar, clast supported, clasts weathered, andesitic/basaltic.
- c Grey black basaltic/andesitic flows - may be dykes or sills, scoriaceous, massive, columnar jointed.
- d Ash to Lapilli Tuff, bedded
- e Diatomaceous earths, bentonite and shale with fossil plant debris locally opalized
- f Kaolinized clastic sedimentary breccia with plant fossils
- g Light grey, cream (kaolinized) glassy, rhyolitic breccia ?
- h Light grey, cream, buff (quartz, augite, hornblende) latite flow breccia or intrusive(?) matrix cream, white, cavities locally coated with rusty oxide
- i Light tan, brown volcanoclastic ash-tuff sediment
- j Rhyolite intrusion ? (Read 1995)



- Unit Etvax is referred to as -Unit - a
- Unit - b
- Unit - d
- Unit Eia is referred to as -Unit - c
- Unit Etsr is referred to as -Unit - e
- Unit - f
- Unit Ebdx is referred to as -Unit - g
- Unit - h
- Unit Edva is referred to as -Unit - i
- Unit - j

**Geological Symbols**

- |   |                                  |
|---|----------------------------------|
| Fault/contact lineament:<br>-interpreted from photographs | Mapped fault lineament           |
| Bedding:<br>vertical, inclined overturned                 | Fractures:<br>vertical, inclined |
| Rock Outcrop outline                                      | Subcrop outline                  |
| Contact/assumed   | Agate Occurrence Ag              |
| Opal Occurrence: - G f<br>-type code                      | Zeolite Occurrence Z             |

**ALPO CLAIMS**

Pinaus Lake Area, B. C.  
K: amloops & Vernon Mining Division

**GEOLOGY,  
Roads & Claim Boundaries**

**Y-FM TECHNICAL SERVICES LTD.**  
DATE SCALE MAP No.  
Nov 1997 1:5000 4