GEOLOGICAL REPORT

on the

CLUTCH 1 – 4 MINERAL CLAIMS

EWER CREEK AREA

VERNON MINING DIVISION, B.C.

NTS:	82L/5E
Latitude:	50°23.2'North
Longitude:	119°35.9' West
Owner:	D.H. Mitchell
Operator:	Discovery Consultants
Author:	K.L. Daughtry, P.Eng.
Date:	October 28, 1997

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INTRODUCTION

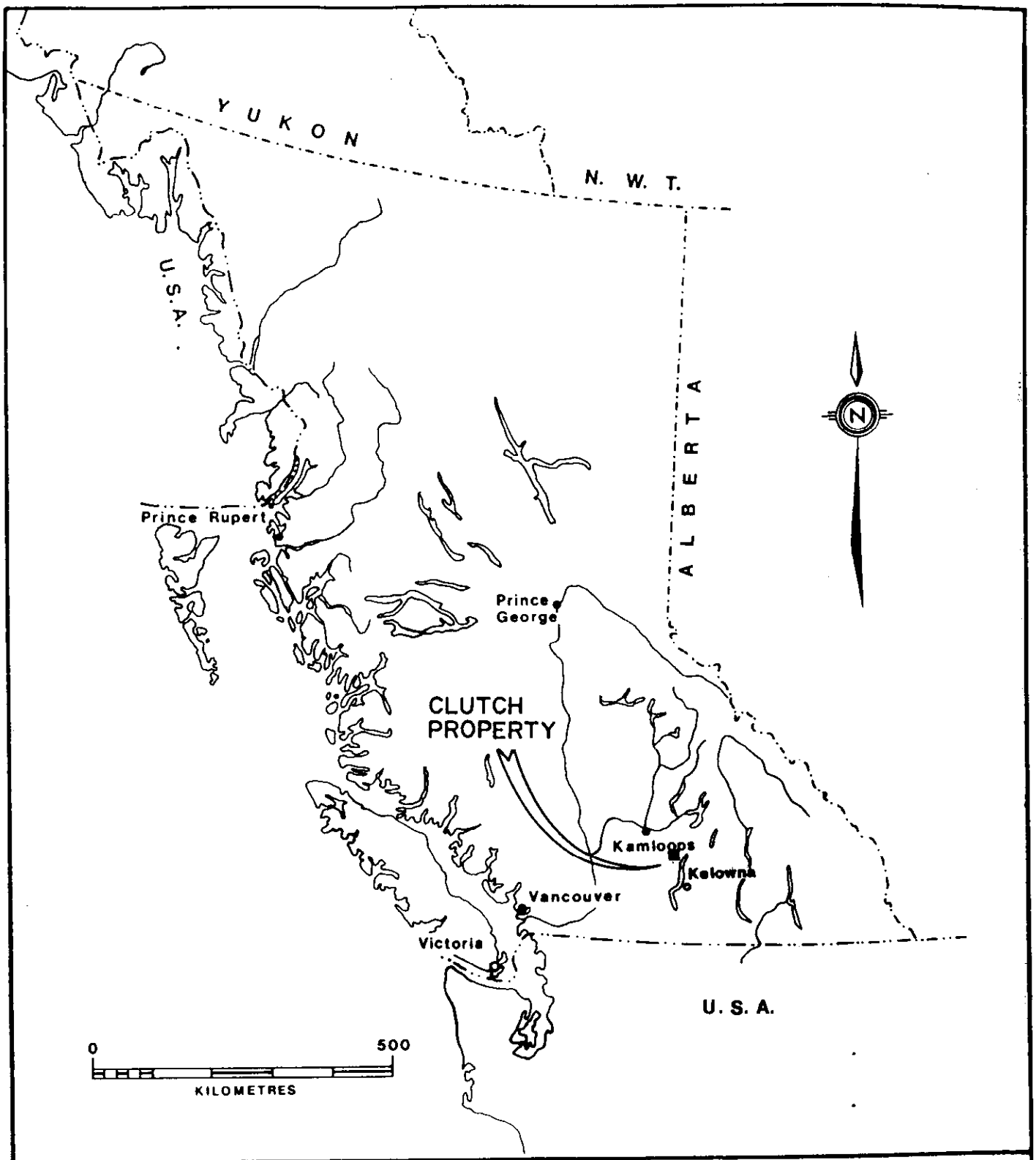
In the past few years, precious opal has been discovered at several localities between Pinaus Lake and McGregor Creek, northwest of Vernon, B.C. The opal occurs in association with agate mineralization in volcanic rocks of the Kamloops Group.

The Clutch 1-4 claims were staked to cover an area of abundant agate mineralization which was discovered in 1993. In August and October, 1997, several days were spent on geological studies and mapping on the Clutch property. Between 20 and 30 rock samples were examined with a binocular microscope. This report presents the results of that work.

LOCATION, ACCESS, TOPOGRAPHY

The Clutch property is 27 kilometres northwest of Vernon and 13 km south-southwest of Falkland in the Okanagan region of southern British Columbia (Figure 1). The claims are on the Thompson Plateau at the head of Ewer Creek, an eastward-flowing tributary of Equesis (Six-mile) Creek which flows into the north arm of Okanagan Lake. Pinaus Lake is 4.5 kilometres due north of the property (Figure 2). The co-ordinates of the centre of the claim block are 50°23.2′ North and 119°35.9′ West.

The principal access to the property is gained by driving south from Highway 97 on Westside Road for 13.6 km to the junction of Six-mile Road, up Six-mile Road for 10.3 km to the start of the McGregor Main logging road, then west on this road for 19.2 km. The centre of the claim block is 900 metres to the east of this point along an old logging road. Topographic relief is moderate on the plateau in the area of the claims, ranging up to 80 metres. The property is on the northwestern rim of Ewer Creek Canyon, which has been deeply incised into the plateau. On the eastern edge of the property the relief in the canyon is about 300 m. Elevations vary from 1060 m above sea level in Ewer Creek to about 1370 m a.s.l. at the McGregor Main road.



DISCOVERY Consultants	AUDAX ENTERPRISES LTD.
CLUTCH PROPERTY	LOCATION MAP

DATE: NOV. 4/1994	PROJECT: 357	SCALE: As Shown	N.T.S.: 82L/5E	M.D.: VERNON	FIGURE: 1

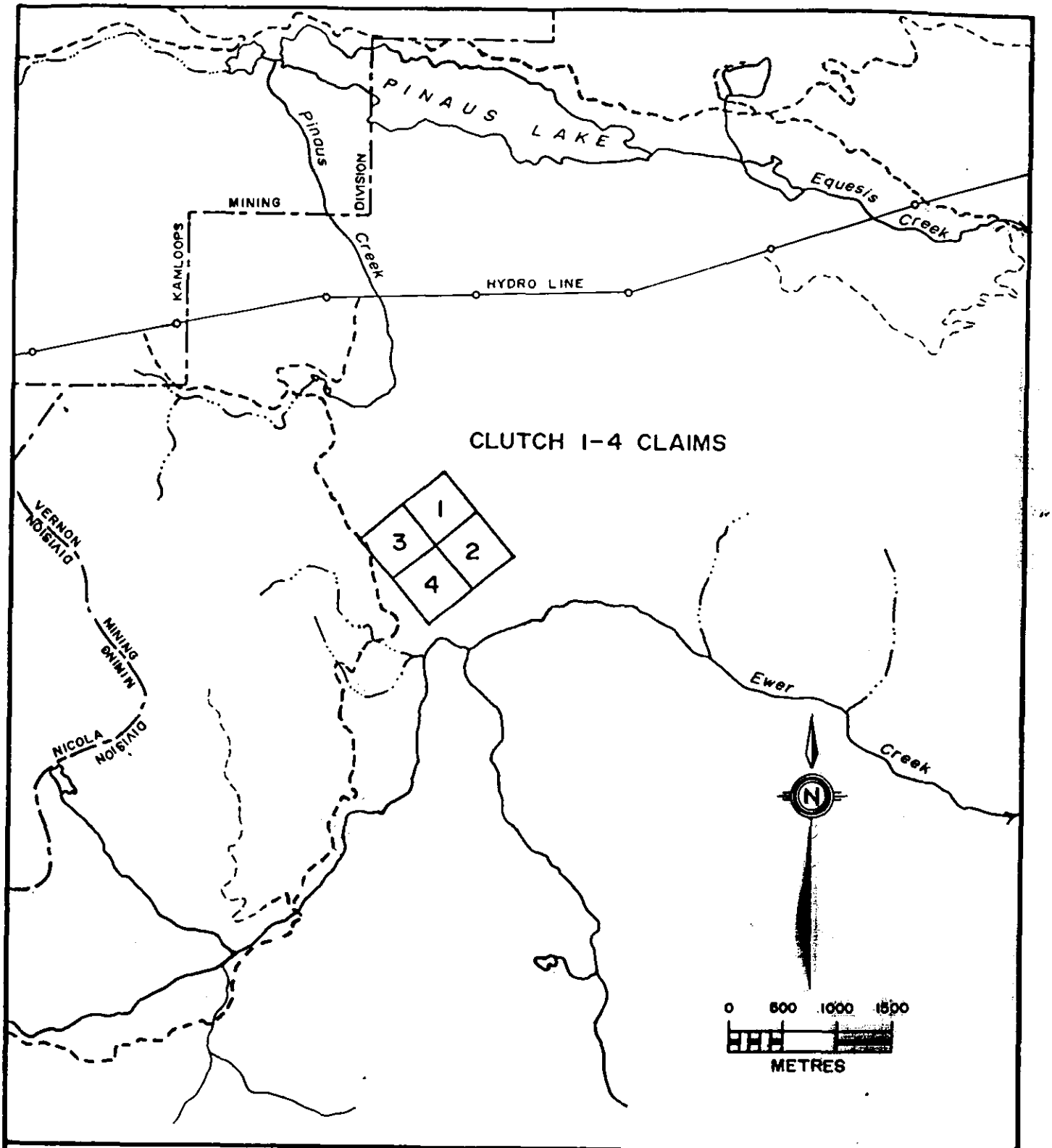
HISTORY

There is no record of any mineral occurrences or previous exploration activity in the area of the clutch property prior to the location of the Clutch claims. Prospecting for precious opal was conducted on the clutch property in 1993 and 1994.

PROPERTY

The property comprises the Clutch 1-4 mineral claims, Tenure numbers 320117 to 320120, in the Vernon Mining Division of British Columbia. The claims were located on August 6, 1993 and recorded on August 17, 1993. The owner of record is Mr. D.H. Mitchell of Vernon, B.C.

Assuming acceptance of this report, the expiry date of the Clutch 1-4 claims is August 6, 2001.



DISCOVERY Consultants	AUDAX ENTERPRISES LTD.
CLUTCH PROPERTY	CLAIM LOCATION MAP

DATE: NOV. 4/1994	PROJECT: 357	SCALE: 1:50,000	N.T.S.: 82L/5E	M.D.: VERNON	FIGURE: 2

REGIONAL GEOLOGY

The area of the Clutch claims is underlain by Eocene volcanic and minor volcaniclastic rocks of the Kamloops and Penticton groups. These rocks were deposited in the fault bounded Falkland-Trinity basin upon a sub-Eocene surface with moderate paleorelief (Read 1997).

Immediately east of the Clutch property, the Eocene volcanic rocks unconformably overlie Paleozoic and Triassic volcanic and sedimentary rocks in the canyon of Ewer Creek. The stratigraphic sequence of the basal Eocene units is shown in the following table.

TABLE OF FORMATIONS

(from Read 1997)

Eocene

Penticton Group

Marron Formation

*	Bouleau rhyolite:	Grey vitrophyric aquagene dacite breccia.
	Bouleau member:	White rhyolite ash-tuff, minor shale with plant debris.

Kamloops Group

*	Dewdrop Flats Formation:	Grey aphanitic to weakly porphyritic dacite, andesite and basaltic andesite flows and interflow breccia.
*	Tranquille Formation:	Mainly basaltic andesite, andesite and dacite lahars; includes well-bedded basalt/andesite tuffs and volcaniclastic grits and sandstone.

PALAEOZOIC

Harper Ranch Group: Meta-andesite flows and tephra, greenstone, massive limestone.

* Units with known occurrences of precious opal

Post-Eocene extensional normal faults have resulted in tilting and offsetting of the Eocene rocks. In the area of the Clutch property, the Eocene rocks generally strike north to northeasterly and dip from 10° to 30° westerly.

PROPERTY GEOLOGY

The Clutch property is underlain by the basal stratigraphic units of the Kamloops Group. These rocks form a gently westerly-dipping panel of lahar, volcanic flows and breccia, tuff and volcaniclastic sediments which unconformably overlies Palaeozoic basement rocks. Read (1997) assigns these rocks to a lower unit of basaltic/andesitic lahars and breccias with intercalated tuffaceous and volcaniclastic layers belonging to the Tranquille Formation, overlain by an upper unit of dacitic, andesitic and basaltic flows and breccia, part of the Dewdrop Flats Formation.

The stratigraphic sequence on the Clutch property is as follows, from oldest to youngest (see Figure 3).

Dewdrop Flats Formation

Unit 1: Brownish-weathering volcanic breccia or lahar. Predominantly a breccia comprising angular clasts <20 cm of brownish-black olivine and/or augite porphyritic amygdaloidal and vesicular basalt/andesite. Minor interlayered aphanitic to very fine grained basalt/andesite similar to Unit 3 occurs as well as minor beds of yellowish-brown interflow tuffaceous rock. The amygdules are commonly filled with white to pale brown zeolites. Neither opal nor agate have been observed in this unit.

Unit 2: Intercalated with Unit 1, and overlying it to the northwest, are beds of yellowish-brown to reddish tuff and tuffaceous wacke, arkose, and siltstone. This unit is generally poorly lithified and contains carbonaceous plant debris and rusty

oxidized layers. Only minor agate, and no opal, have been observed in this unit.

Unit 3: Yellowish to brown weathering flows of aphanitic amygdaloidal olivine-augite basalt/andesite occur intercalated with Units 1 and 4 and overlying Unit 2. This rock is lithologically similar to the clasts in the breccias and lahars of Unit 1. Agate and common opal have been observed in amygdules in this unit, and at one outcrop near the southwestern boundary of the Clutch 3 claim, a single very-fine grained amygdule of precious opal was tentatively identified.

Unit 4: The uppermost stratigraphic unit is pink to red and maroon weathering matrix supported lahar. The clasts (<22 cm) are heterolithic and comprise various volcanic lithologies, dominated by amygdaloidal basalt/andesite. The matrix is a fine-to-medium grained tuffaceous arkosic assemblage of similar composition. Abundant agate mineralization is common as amygdules fracture-filling and void-filling. In places this unit contains up to 50% agate. Common opal has been noted in several places, and facet-grade opal and precious opal have been observed near the centre of the claim block.

Glacial overburden is almost continuous, but where disturbed by logging activity is observed to be generally less than 1 metre thick.

MINERAL OCCURRENCES

The Clutch claims were located to cover an area of abundant agate mineralization thought to hold favourable exploration potential for precious opal. During the current geological survey, precious opal and facet-grade opal were discovered in a red lahar layer of Unit 4 at the centre of the Clutch property.

At the discovery outcrop, the opal occurs in an agate-rich zone within the lahar. Individual precious opal and facet-grade opal grains are generally fine-grained; the largest grain seen is about 1.5 cm long. A single large grain of dark bluish grey translucent opal with a diameter of 4 cm was observed in a piece of lahar rubble. No zeolites were observed in the opal-bearing zones. A yellowish-brown fine-grained sugary mineral was noted, which may be the mineral mentioned by Simandl et al (tridymite?) occurring with precious opal at the nearby Klinker deposit.

The precious opal is clear to greyish translucent with bright play of colours including green, blue, pink and orange. In the larger grains the play of colours appears to be related to planes within the grains, but on the finer grains the colour appears to be on the surface. Due to the small grain size, it is possible that some of the observed colour is iridescence on the grain surfaces.

The facet-grade opal shows pale salmon pink to orange to gold colour in whitish slightly translucent grains.

Common opal occurs as vesicle-filling throughout the agate-rich rocks in this locality.

CONCLUSIONS and RECOMMENDATIONS

Precious opal has been found in two locations on the Clutch property. The precious opal occurs in clasts of basaltic andesite and trachyandesite(?) in lahar, and in basaltic andesite flows. Accompanying minerals include common opal, abundant agate, jasper, and sugary yellow-brown tridymite(?).

It is recommended that the Clutch property should be carefully prospected for additional occurrences of precious opal, and that the occurrences be tested by bulldozer ripping or backhoe trenching.

Respectfully submitted,

K.L. Daughtry, P.Eng.

Vernon, B.C.
October 28, 1997

STATEMENT OF COSTS

1.	Professional Services		
	K.L. Daughtry (P.Eng.)		
	Field		
	1.3 days @ $450/day	$585.00	
	Field (Oct 21, 24)		
	2 days @ $450/day	900.00	
	Microscope study (Oct 26,31)		
	0.6 days @ $450/day	270.00	
	Report Writing		
	1.5 days @ $450/day	675.00	$2,430.00
2.	Office Personnel		
	Drafting	200.00	
	Office	55.00	
	Secretarial	110.00	365.00
3.	Expenses		
	Field Supplies	10.66	
	Office	30.00	40.66
		Total Exploration:	$2,835.66
4.	Transportation		
	4x4 truck 3.3 days @ $40/day	132.00	
	366 km @ 30¢/km	123.60	
	Fuel	42.00	
		$297.60	
		Total Costs:	**$3,133.26**

STATEMENT OF QUALIFICATIONS

I, KENNETH L. DAUGHTRY, of 7814 Tronson Road, Vernon, British Columbia, DO HEREBY CERTIFY that:

1. I am a Consulting Geologist in mineral exploration.

2. I have been practising my profession for thirty three years in Canada, the United States, South America and Ireland.

3. I am a graduate of Carleton University, Ottawa, with a Bachelor of Science degree in Geology and Chemistry.

4. I am a member of the Associations of Professional Engineers of British Columbia, Ontario, and Yukon Territory, and a Fellow of the Geological Association of Canada.

5. This report is based upon knowledge of the CLUTCH property gained from the geological studies described herein.

6. I hold a beneficial interest in the CLUTCH property.

K.L. Daughtry, P.Eng.

Vernon, B.C.
October 31, 1997

REFERENCES

Church, B.N. and Evans S.G.,.	1983	Basalts of the Kamloops Group in the Salmon River Area: in Geological Fieldwork 1982, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1983-1, pp 89-92.
Daughtry, K.L.,	1994	Prospecting Report on the Clutch 1-4 Mineral Claims, Ewer Creek Area, Vernon Mining Division, B.C., B.C. Assessment Report.
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Ewing, T.E.	1981	Regional Stratigraphy and Structural Setting of the Kamloops Group, South-central B.C., CJES, v 18, no 9, pp 1464-1477.
Read, P.B.	1996	Industrial Mineral Potential of the Tertiary Rocks, Vernon (82L) and Adjacent Map Areas; in Geological Fieldwork 1995, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1996-1, pp 207-218.
--	1997	Kamloops to Vernon: Tertiary Stratigraphy and Structure, Industrial Mineral and Precious Metal Potentials, Kamloops, Nicola and Vernon Mining Division, B.C. Assessment Report.
Simandl, G.J. et al.	1997	Klinker Precious Opal Deposit, South-Central B.C., Canada - Field Observations and Potential Deposit - scale Controls; in Geological Fieldwork 1996, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1997-1, pp 321-327.

315000E

316000E

5585000N

5584000N

McGregor Main

19km

To Vernon 56km

CLUTCH 1
T.N. 320117

CLUTCH 2
T.N. 320118

CLUTCH 3
T.N. 320119

CLUTCH 4
T.N. 320120

No outcrop observed

Top of canyon wall

Top of canyon wall

Creek

Ewer

500N 400N 300N 200N 100N B1000N 100S 200S 300S 400S 500S 000W 100W 200W 300W 400W 500W 600W 700W 800W 900W 1000W

4500 4000 3500

LEGEND

Geology

Eocene - Kamloops Group

Tranquille Formation

4 — Pink to red and maroon weathering matrix supported lahar. Commonly contains abundant agate; rare opal occurrences.

3 — Yellowish to brown weathering flows of aphanitic amygdaloidal olivine-augite basalt/andesite. May contain agate and rare opal.

2 — Yellowish-brown to reddish tuff and tuffaceous arkose, wacke, and siltstone. Poorly lithified. Contains plant debris. Contains minor agate.

1 — Brownish weathering volcanic breccia or lahar. Clasts predominantly of Unit 3 litholigies. Interlayered beds of basalt/andesite flows like Unit 3 and tuffs/ volcaniclastic sediments like Unit 2. No opal or agate.

Symbols

Geological boundary

Area of outcrop

× Spot outcrop

Limits of area of outcrop

a Abundant agate present

* Precious opal occurrence

45 Attitude of bedding

True North = 2°07'E
Topographic contour interval = 100 feet
N.A. Datum 1927

DRAWN:November 4/1994
Revised: Oct.30/1997

DWG - 357\357_97.DWG

METRES
0 100 200 300

SCALE 1:5000

DISCOVERY Consultants

AUDAX ENTERPRISES LTD.

CLUTCH PROPERTY map 1

GEOLOGICAL MAP

Date: Oct.31/1997	Scale: 1:5000
Project: 357	NTS: 82L/5E
M.D.: Vernon	Figure: 3