

PRECIOUS OPAL POTENTIAL

personal info

Agate¹ is widespread in the Eocene to Pliocene lavas of British Columbia, common opal² is sparsely scattered, and precious opal² occurs in very few localities. Only one or two chips of precious opal have been found in each of the three British Columbia localities reported by Leaming (1973). With staking of the Klinker claim in 1991 and the Ewer claim in 1992, R.W. Yorke-Hardy recorded the first significant discovery of precious opal in both British Columbia and Canada. The staking of other claims soon followed and covered an area of scattered opal showings which extends past a powerline 6.5 km northwest of the original discovery. Within the staked area, agate is widespread, and a nearby sequence of tuffaceous shale and waterlain rhyolite ash is locally altered to a grey vitreous "chert" composed of common opal. Similar widespread agate and waterlain rhyolite ash, with locally developed common opal "chert" lenses, lies between 800 and 1100 metres (2600' and 3600') on the south flank of Estekwalan Mountain. These features may indicate another suitable prospecting area for precious opal.

O1 **Klinker Property**
 STATUS: Producer
 TYPE: Volcanic

MINFILE: 082LSW **
 NTS: 082L/05E
 Lat./Long.: 50°21'49"; 119°33'48"
 UTM: LF0317680mE; LF5581500mN
 Elevation: 1490 m (4875 feet)

The Klinker Property, consisting of 24 units, covers several concentrations of precious opal developed in the basal 100 metres of the Middle Eocene Kamloops Group. The host rock is a volcanic breccia-lahar complex composed of angular to rounded clasts of andesite and basalt ranging from 0.2 to 0.6 metres in diameter in a lapilli tuff matrix. In the lahar, the tuff has bedding which swirls around the clasts. Lapilli tuff lenses up to 5 metres thick develop locally and indicate that the volcanic succession dips 20 to 30° to the west. Thin andesite or basalt flows and intrusions up to 4 metres thick are scattered throughout. On McGregor Creek Forestry Access road, about 500 metres east of the Discovery pit (Figure **), outcrops of grey-green meta-andesite flows and lapilli tuffs of probable Late Paleozoic age form the basement which dips gently westward and underlies the valley bottom of Ewer Creek north of the property.

On the property, precious opal, agate and common opal fill fractures in the Eocene rocks and permeate podiform rock masses which are up to 0.5 m in diameter in the lahars. The rock masses are smaller in the lapilli tuffs and absent in the flows or intrusions. Precious opal-filled fractures preferentially develop in sets with the following three preferred strikes: 1. 025±10°, 2. 070±10° and 3. 330±15°; all sets have steep dips. The podiform rock masses commonly form beside or across opal-filled

fractures. In the masses, precious opal fills voids developed during the formation of the host rock, and later openings apparently formed by local dissolution of the host. Here and there the precious opal, agate and common opal have layering which is subhorizontal even in subvertically oriented fracture fillings. The presence of this subhorizontal layering in these materials, which is not subparallel to the orientation of the gently west-dipping lapilli tuff, implies that the precious opal, agate and common opal precipitated after the beds were tilted.

Of the six shallow pits exposing the precious opal on the Klinker, the Discovery pit is the largest at 2100 square metres, and together with the smaller Bluebird pit, probably the richest because of subequally developed podiform masses and fracture fillings (Figure **). A right-lateral strike-slip fault dips 80°NW (slickensides trend/plunge 195/25S), passes along the eastern side of the pit, and offsets the lahars an indeterminate amount. In the other shallow pits, the Tripod, Red Rock, and the Caramel and its extension, podiform masses in the lahars developed at the expense of fracture fillings. A lapilli tuff underlies the eastern side of the Caramel Pit. Outside the pit areas, the primary openings of the rock are either mostly empty or less commonly filled with agate, common opal, chabazite - a highly hydrated zeolite ($\text{CaAl}_2\text{Si}_4\text{O}_{12}\cdot 6\text{H}_2\text{O}$), and other unidentified zeolites.

Footnotes:

¹ agate is microcrystalline quartz with a large number of micropores (Deer et al., 1963). It displays a colour variation arranged in planar or concentric zones. Refractive indices fall in the range 1.534 to 1.539.

² common opal is a hydrous cryptocrystalline or colloidal form of silica with a composition of $\text{SiO}_2 \cdot n\text{H}_2\text{O}$ with a water content around 6 to 10 per cent. Refractive indices fall in the range 1.44 to 1.47. In precious opal a play of delicate colours is observed. (Deer et al., 1963).