GEOLOGICAL SURVEY OF CANADA

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Lower Jurassic Volcanic Rocks of the West Half of Smithers Map-area, B.C. (93L)

by

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Geological study of the Smithers map-area continued during the summer of 1971 with particular emphasis on the stratigraphy of the Hazelton Group. Of primary interest were Lower Jurassic volcanic rocks exposed in the west half of the map-area, mainly south of McDonnell Lake (map-unit 6 of Armstrong 1944; map-unit 4 of Carter and Kirkham, 1969). Here the Lower Jurassic rocks have a threefold subdivision namely a) a red, well-stratified tuff unit. b) a volcanic unit with abundant red, maroon, and purple flows, breccias, and tuffs, and c) a green volcanic unit consisting mainly of fragmental rocks. During the course of mapping a number of occurrences of copper mineralization were noted. These, so far as the writer has been able to ascertain, are new but some may have been seen previously and possibly staked. These occurrences, together with other known deposits, have suggested that there may be some stratigraphic control to copper mineralization at certain horizons in two of the three Lower Jurassic units.

The "Red Tuff" unit

Bright red, brick red, and maroon stratified tuffs and fine breccias comprise the bulk of this unit. In places well-bedded sedimentary rocks, including thin grey limestone bands are interlayered. Fossils are rare but a late Early Jurassic to early Middle Jurassic age is possible. The

unit may rest disconformably on the underlying "Red Volcanic" unit. These rocks are generally unmetamorphosed and no copper mineral occurrences have been found by the writer in these rocks.

The "Red Volcanic" unit

This unit is made up of breccias, tuffs, ignimbrites, massive volcanic flows, vesicular and amygdaloidal flows of variable composition in shades of purple, red, and green. The unit varies in thickness and lithology from place to place but generally has more green volcanics near the base, reddish vesicular lavas, in places associated with fossiliferous limestone, near the top, and red tuffs at several horizons that may be confused with the "Red Tuff" unit. The thickness of the unit in places is in excess of 3000 feet. Copper minerals were found to occur in vesicles and in fractures associated with prehnite, laumontite, various zeolites, calcite, epidote, and quartz. A common occurrence is in red vesicular lavas that may be closely associated with mid-Lower Jurassic limestone lenses and reefs. However, lower in the unit, copper minerals have been found in breccias associated with epidote and calcite.

The "Lower Green Volcanic" unit

The unit consists of highly epidotized basic green volcanic breccias, stratified tuffs, and minor flows. The thickness of the unit is unknown. It has yielded no fossils but as it underlies the "Red Volcanic" unit may be Early Jurassic or Late Triassic. In a few places copper minerals have been noted associated with epidote, quartz, calcite, garnet, and tremolite.

Mineral Occurrences

The following mineral occurrences were noted during the course of routine geological mapping. In all cases the grade, extent, and economic potential are totally unassessed. In some instances the total obvious copper mineralization was removed as a specimen. The presence of all reported minerals is based on tentative field identifications. The locations have been calculated from preliminary 1:50,000 topographic maps (93 L/3, 93 L/4, 93 L/5, 93 L/6, 93 L/11, 93 L/12) and the 1:250,000 Smithers map (93L) published by British Columbia Department of Lands, Forests, and Water Resources.

1. Location: 1 1/2 Mi. North of Mt. Loring

   54°04'36"N, 127°40'53"W

   Mineralogy: Malachite Stain, minor Bornite & Chalcopyrite; minor copper stain in limestone with red vesicular lavas. "Red Volcanic" unit.

2. Location: 3/4 Mi. to WSW of Mt. Loring

   54°3'12"N, 127°41'30"W

   Mineralogy: Malachite stain, possibly on float. "Red Volcanic" unit (?)

3. Location: 1 Mi. up Loring Cr. from Morice Lk.

   54°02'30"N, 127°39'24"W.

   Mineralogy: Malachite stain, minor bornite with epidote, quartz, garnet and hematite in red volcanic breccias.

4. Location: In Saddle to SE of Corona Pk.

54°05'12"N, 127°49'00"W.

Mineralogy: Minor malachite stain in red breccias "Red Volcanic" unit.

5. Location: Hope Pk.

54°07'05"N, 127°54'12"W.

Mineralogy: Minor malachite and bornite in small calcite lenses in red breccias. "Red Volcanic" unit.

6. Location: Hope Pk.

54°07'42"N, 127°54'53"W.

Mineralogy: Malachite, bornite and chalcocite in shears in green volcanics. "Lower Green Volcanic" unit.

7. Location: Herd Dome (to SW).

54°12'45"N, 127°43'30"W.

Mineralogy: Very minor native copper in pods with quartz, calcite, prehnite (?) and laumontite, in red vesicular flows. "Red Volcanic" unit.

8. Location: Herd Dome (to WSW).

54°12'54"N, 127°43'34"W.

Mineralogy: Minor chalcocite with quartz and calcite associated with red vesicular volcanics; probably float. "Red Volcanic" unit.

9. Location: Herd Dome (to NE).

54°13'50"N, 127°39'49"W.

Mineralogy: Malachite, chalcopyrite and pyrite, disseminated in reddish-green volcanics. "Red Volcanic" unit.

10. Location: Herd Dome (to NE)

54°14'29"N, 127°39'15W.

Mineralogy: Malachite and bornite disseminated in a grey siliceous intrusion (?) associated with Red Volcanics. "Red Volcanic" unit.

11. Location: To west of Thautil River.

54°18'00N, 127°25'53W.

Mineralogy: Minor chalcopyrite with chlorite, epidote, and K-feldspar as amygduloidal fillings in grey-red flows. "Red Volcanic" unit.

12. Location: To west of Thautil River

54°18'18"N, 127°24'56"W.

Mineralogy: Very minor malachite with epidotized red-green volcanics. "Red Volcanic" unit.

13. Location: 2 Mi. upstream along second tributary of Thautil River at junction with Morice River

54°15'30"N, 127°20'5"W.

Mineralogy: Malachite and chalcocite in calcite veins in red vesicular flows; "Red Volcanic" unit.

14. Location: On north side of Morice River

54°12'00"N, 127°00'45"W.

Mineralogy: Very minor malachite with epidote in vesicles in red volcanics (flows); "Red Volcanic" unit.

15. Location: About the high point on the ridge running N-S to the west of Howson Peak.

54°24'15"N, 127°52'30"W

Mineralogy: Native copper with prehnite in red vesicular flows; "Red Volcanic" unit.

16. Location: 1 1/2 miles north-northwest of Eagle Peak

54°29'12"N, 127°36'08"W.

Mineralogy: Very minor malachite with calcite in red volcanics "Red Volcanic" unit.

17. Location: 4 miles along the mining road from Telkwa River to the west of Howson Creek.

54°17'48"N, 127°22'07"W.

Mineralogy: Minor chalcopyrite in green volcanics "Red Volcanic" unit.

18. Location: Head of the north fork of Serb Creek.

54°40'23"N, 127°48'27"W.

Mineralogy: Pods of bornite, chalcopyrite and minor chalcocite with epidote, tremolite, chlorite, magnetite, minor garnet and wollastonite in green volcanics; "Lower Green Volcanic" unit.

19. Location: 2 Mi. east of Zymoetz River.

54°39'30"N, 127°54'15"W.

Mineralogy: chalcocite, malachite and chrysocolla (?) with quartz, epidote, tremolite and garnet in green volcanics. "Lower Green Volcanic" unit.

20. Location: South-east of the mouth of Red Canyon Creek.

54°41'16"N, 127°54'33"W.

Mineralogy: bornite, chalcopyrite and malachite with quartz and epidote in the "Red Volcanic" unit.

References:

Armstrong, J.E., Smithers, British Columbia; Geol. Surv. Can., 1944 Prelim. map 44-23.

Carter, N.C. and Kirkham, R.V., Geological Compilation Map of 1969 the Smithers, Hazelton, and Terrace areas; British Columbia Dept. Mines and Petroleum Resources, Map 69-1.