

Revised stratigraphic framework of the Lower to Middle Jurassic Hazelton Group, north-western British Columbia

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Abstract

The Lower to Middle Jurassic Hazelton Group of northern British Columbia records the last phase of arc-related volcanism on the Stikine terrane, and the initiation of subsidence that was to result in the development of the Bowser Basin. The group hosts significant mineral deposits, and has also been proposed as a potential source for hydrocarbons in the overlying Bowser basin. However, numerous local stratigraphies hinder correlation within the upper part of the Hazelton Group. New stratigraphic sections of the Hazelton Group and overlying Middle to Late Jurassic Bowser Lake Group have been measured at several locations on the periphery of the Bowser basin. In the south, the Ashman, Quinlan, Texas Creek and Netalzul Mountain sections display a similar lithostratigraphic succession, which consists of four units in ascending order: 1) maroon crystal-lithic dust tuff; 2) fossiliferous and bioturbated tuffaceous sandstone and siltstone; 3) blocky, thinly-bedded grey to black siliceous mudstone and beige to pink dust tuff; 4) brown to white weathering conglomerate, sandstone, and finely laminated fissile siltstone. In the north, the Joan Lake, Mount Will and Oweegee Dome sections possess a lithologically equivalent four-part stratigraphic package, but the units there are slightly older. In the northwest, the stratigraphic succession at Eskay Creek and Table Mountain is significantly different. Thick bimodal volcanic flows occur in place of the sedimentary rocks seen elsewhere. Regional correlations of stratigraphic sections in the northern Stikine terrane indicate that the Hazelton Group can be divided into two distinct lithostratigraphic assemblages, the volcanic-dominated lower Hazelton Group and the sedimentary-dominated (although locally bimodal volcanic-rich)

upper Hazelton Group, which are separated by an unconformity in most places. Proposed changes in the formal nomenclature of the upper Hazelton Group are as follows: 1) distinctive interbedded siliceous mudstones and thin tuff beds, informally known as 'pyjama beds', throughout the basin, are included in the Quock Formation, which is elevated from its previous status as a member of the Spatsizi Formation; 2) underlying predominantly sedimentary successions in the north of the basin are included in a revised unit, the Spatsizi River Formation; 3) a new lithostratigraphic unit, the Iskut River Formation, is introduced to include interbedded volcanic and sedimentary successions of the upper Hazelton Group, laterally equivalent to the Spatsizi River and in part to the Quock Formations; 4) the Salmon River Formation is abandoned. These revisions, together with new paleontological and isotopic data, lead to a regional view of basin development that will assist with tectonic interpretations. Most of the new units are significantly diachronous, and record changes in tectonic environments that spread across the basin during the Early and Middle Jurassic.