

Aquifer Name: Glade Overburden Aquifer

Aquifer Number: 1117

Date of Mapping: February 2nd, 2023

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A. AQUIFER DESCRIPTION FOR AQUIFER 1117

A.1 CONCEPTUAL UNDERSTANDING OF HYDROSTRATIGRAPHY

A.1.1 AQUIFER EXTENTS

Aquifer 1117 is located along the Kootenay and Slocan rivers (see Figure 1; Lengyel et al. 2024). The aquifer boundary was delineated based on surficial geological mapping in the area and coincides with the extent of alluvial and glaciofluvial sediments (Fulton et al. 1984). The aquifer was separated from aquifer 1276 based on an inferred bedrock outcrop and groundwater divide resulting in two separate groundwater flow systems in the overburden deposits. Directly west from Siwash Mountain, there is a steep decline in topographic elevation suggesting there is unlikely a significant thickness of overburden present past the currently mapped extent. The aquifer is separated from aquifer 0501 based on inferred bedrock outcrops. Dashed lines indicate uncertainty in the mapped aquifer extents. The aquifer has been extended north to the confluence of the Slocan and Little Slocan rivers.

A.1.2 GEOLOGIC FORMATION (OVERLYING MATERIALS)

The aquifer materials are overlain by a mix of clay, silt, boulders, gravel and topsoil. Between 0.3 and 156 m of overlying materials were reported from well records with an average thickness of 21.4 m.

A.1.3 GEOLOGIC FORMATION (AQUIFER) – SUBTYPE: 4B – CONFINED GLACIOFLUVIAL

The aquifer materials are described as a mix of glaciofluvial deposits, ranging from fine or silty sand and gravel, to coarse-gravel by Fulton et al. (1984), consistent with well records.

A.1.4 VULNERABILITY - MODERATE

The aquifer is generally confined, however there are cases throughout the aquifer where the confining layer contains permeable windows. Additionally, there is a moderately shallow water table, with average water depth of 28.2 m. The aquifer is composed of coarse-grained aquifer material. The overall vulnerability of the aquifer has been assessed as moderate.

A.2 CONCEPTUAL UNDERSTANDING OF FLOW DYNAMICS

A.2.1 GROUNDWATER LEVELS AND FLOW DIRECTION

Static groundwater levels recorded in the provincial groundwater wells database (GWELLS) range from shallow (1.2 m) to deep (134 m). There are three wells with artesian groundwater conditions located in the aquifer. There are no provincial observation wells within the aquifer.

The groundwater surface is interpreted to be a subdued representation of the topography, based on regional interpolation of groundwater surface elevations.

Groundwater is interpreted to follow the topographic gradient and flow from high elevations near the edges of the aquifer to low elevations near the Kootenay and Slocan rivers and Goose Creek with a component of flow along the river valleys.

A.2.2 RECHARGE

Recharge to the aquifer is likely from direct infiltration of precipitation, snowmelt, and surface water features including the Kootenay and Slocan rivers and their minor tributaries. The infiltration of precipitation and snowmelt is expected to focus on areas where the overlying materials are thinner or coarse-grained. The aquifer may also be recharged by deep groundwater flow associated with mountain block recharge in adjacent mountain ranges via the underlying bedrock aquifers (0511 and 0513).

A.2.3 POTENTIAL FOR HYDRAULIC CONNECTION

Groundwater is inferred to be hydraulically connected to the Kootenay and Slocan rivers and minor tributaries. The aquifer may also be connected to the underlying bedrock aquifers (0511 and 0513). While inferred bedrock outcrops separate them, aquifers 0483, 0484, 0501, and 1117 are part of the same group of overburden aquifers along the Columbia and Kootenay Rivers.

A.3 WATER MANAGEMENT

A.3.1 ADDITIONAL INFORMATION ON WATER USE AND MANAGEMENT

Based on the water quality comments in the GWELLS database, five wells indicate elevated iron in the water while four wells indicate hard water as water quality concerns. Reported well yields for 394 of the 431 wells (excluding 37 wells that were dry or had no reported well yield) within the aquifer range from 0.002 L/s to 37.9 L/s with a geometric mean of 1.1 L/s, indicating an aquifer with moderate productivity with localized zones of both low and high productivity.

The wells are used for domestic purposes based on land use and well records.

A.3.2 ADDITIONAL ASSESSMENTS OR MANAGEMENT ACTIONS

No water availability or water budget studies have been completed in the area.

A.4 AQUIFER REFERENCES

Berardinucci J. and K. Ronneseth, 2002. Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater. BC Ministry of Water, Land and Air Protection, Water Air and Climate Change Branch, Water Protection Section.

Fulton, R.J., Shetsen, I., and Rutter, N.W., 1984. Surficial geology, Kootenay Lake, British Columbia-Alberta. Geological Survey of Canada, Open File 1084, 1:1,000,000 scale.

Geographic datasets from the BC Data Catalogue, accessed December 2022 <https://data.gov.bc.ca/>.

Lengyel, T., Verma, S., Déri-Takács, J., and Hinnell, A. 2024. Aquifer Mapping in the Kootenay/Boundary Region of British Columbia: Creston, Rossland, Castlegar, and Salmo. Water Science Series, WSS2024-05. Prov. B.C., Victoria B.C.

A.5 REVISION HISTORY

Date	Version	Revision Class	Comments	Author
20020321	1*	Major	Initial mapping of aquifer 0514	N/A
20020322	1*	Major	Initial mapping of aquifer 0515	N/A
20160416	1*	Major	Initial mapping of aquifer 1119	N/A
20160417	2*	Minor	Remapping of aquifer 0514	N/A
20160215	1	Major	Initial mapping of aquifer 1117	N/A
20221230	2	Major	Remapping and consolidation of aquifers	Tibor Lengyel, M.Sc., P.Geo., Simrat Verma, M.Sc., and Andrew Hinnell, Ph.D., P.Geo.

Notes: Author of first mapping not available

*denotes version for previous aquifers that have been consolidated