

Aquifer Name: Beaver Creek Overburden Aquifer

Aquifer Number: 1284

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A. AQUIFER DESCRIPTION FOR AQUIFER 1284

A.1 CONCEPTUAL UNDERSTANDING OF HYDROSTRATIGRAPHY

A.1.1 AQUIFER EXTENTS

Aquifer 1284 is defined in the valley bottom of Beaver Creek and its tributaries (see Figure 1; Lengyel et al. 2024). The aquifer boundary was delineated based on surficial geological mapping of alluvial sediments by Fulton et al. (1984) and an inferred surface water/groundwater divide to the east, separating it from aquifer 0496.

A.1.2 GEOLOGIC FORMATION (OVERLYING MATERIALS)

Forty-two out of 54 well records indicate that the aquifer is overlain by 1.2 to 49.3 m of clay, hardpan, boulders, silt, till, and loose gravel and rock, with an average thickness of 12.4 m. The other 12 well records indicate that the aquifer is exposed at surface. Surficial mapping (Fulton et al. 1984) indicates that aquifer 1284 is overlain by alluvium (thickness is not defined).

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

Borehole logs and surficial mapping indicate that aquifer 1284 is composed of glaciofluvial sand and gravel located in the valley bottom.

A.1.4 VULNERABILITY - HIGH

Well records indicate that aquifer 1284 is generally unconfined; however, there are areas that are confined by a thin layer of clay, till, or hardpan. Depth to groundwater is shallow to moderately deep with an average depth to water of 10.0 m. Due to limited thickness of the overlying deposits, which may be comprised of permeable materials, and the location and use of the aquifer, the aquifer has been assessed as highly vulnerability.

A.2 CONCEPTUAL UNDERSTANDING OF FLOW DYNAMICS

A.2.1 GROUNDWATER LEVELS AND FLOW DIRECTION

Static water levels recorded in the provincial groundwater wells database (GWELLS) range from shallow (0.6 m) to moderately deep (42.7 m).

The groundwater surface is interpreted to be a subdued representation of the topography, based on regional interpolation of groundwater surface elevations. Accordingly, groundwater is interpreted to flow primarily towards valley bottoms locally with a southwesterly component influenced by the slope of the valley. There are no wells with artesian groundwater conditions within the aquifer.

A.2.2 RECHARGE

Recharge to the aquifer is likely from direct infiltration of precipitation and/or surface water features including Beaver Creek and its tributaries. The aquifer may also be recharged by deep groundwater flow associated with mountain block recharge in adjacent mountain ranges via the underlying bedrock aquifers (0486, 0493, and 1282). However, the spatial and temporal understanding of recharge mechanisms is uncertain and further investigation is required to confirm hydraulic connections.

A.2.3 POTENTIAL FOR HYDRAULIC CONNECTION

There is likely hydraulic connection to Beaver Creek and its tributaries to the wells that are constructed in the respective floodplains. The aquifer may also be connected to the underlying bedrock aquifers (0486, 0493, and 1282).

A.3 WATER MANAGEMENT

A.3.1 ADDITIONAL INFORMATION ON WATER USE AND MANAGEMENT

Based on the water quality comments of the GWELLS database, two well records indicate the water is soft. Reported well yields for 53 out of 56 wells within the aquifer range between 0.3 L/s to 37.8 L/s, with a geometric mean of 1.6 L/s, indicating an aquifer with moderate productivity. No other water quality or quantity concerns were recorded in GWELLS.

The wells within the aquifer consist of primarily domestic wells 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 Management 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., Deri-Takacs, 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
20221230	1	Major	Initial mapping of aquifer	Tibor Lengyel, M.Sc., P.Geo., Simrat Verma, M.Sc., and Andrew Hinnell, Ph.D., P.Geo.