Aquifer Name: Kiskatinaw Buried Channel

Aquifer Number: 0594

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A. AQUIFER DESCRIPTION FOR AQUIFER 0594

A.1 CONCEPTUAL UNDERSTANDING OF HYDROSTRATIGRAPHY

A.1.1 AQUIFER EXTENTS

The aquifer is along the Kiskatinaw River. The boundaries in the north, west, and east were based on a combination of the Kiskatinaw paleovalley extent (Hickin and Best 2013) and the 15 m depth-to-bedrock contour line (Monahan et al. 2018) (Lengyel et al. 2023, Figure 1). The southern boundary is uncertain as the aquifer is likely continuous toward the south. The aquifer boundaries are uncertain in the north as the boundaries of the buried channel here are uncertain. The western boundary of the aquifer is uncertain due to lack of information on the hydraulic connection between aquifers 0590, 0594 and 0596. The coarse-grained sediments may not be continuous throughout the entire aquifer extent due to glacial erosion.

A.1.2 GEOLOGIC FORMATION (OVERLYING MATERIALS)

The aquifer is overlain by glaciolacustrine and glaciodeltaic sediments, till, and colluvial deposits. Glaciolacustrine sediments consist of silt and clay. Glaciodeltaic sediments consist of gravel, sand, and silt. Till mainly consists of poorly-sorted clasts in a clay to sand matrix. Fifteen out of the 16 wells associated with the aquifer reported low-permeability, fine-grained material (clay, silt) on the surface, one reported high-permeability, coarse-grained sediment (sand). The thickness of the overlying material is more than 100 meters.

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

The buried-channel sediments, interpreted to be of Middle-Wisconsinan fluvial origin, consist of gravel and sand. Based on the thickness and type of overlying sediments, the aquifer is interpreted to be likely confined.

A.1.4 VULNERABILITY

Depth to groundwater varies from shallow to moderately deep. The permeability of the aquifer has not been tested, but it is expected to be high based on the type of the dominant aquifer material (sand and gravel). Surficial mapping by Reimchen (1980) and borehole logs indicate that the buried-channel aquifer is primarily covered by fine-grained materials of variable thickness. The overall vulnerability of the aquifer to surface contamination has been qualitatively assessed to be low.

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) and the EERI research wells (Goetz 2021) range from shallow (2.1 m) to moderately deep (35.1 m). There are no active provincial observation wells in the aquifer extents, however there is one inactive provincial observation well (OW-113, Well Tag Number [WTN] 22906). There are no wells with artesian conditions within the aquifer extents.

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 flow primarily toward the Kiskatinaw River with a northerly component corresponding to the regional slope of the river valley.

A.2.2 RECHARGE

Recharge to the aquifer could occur via distributed infiltration of precipitation and snowmelt. The aquifer may also be recharged from surrounding weathered bedrock (Goetz 2021) (i.e., aquifers 0593, 0595, 0633, and 1275); however, the spatial and temporal understanding of these recharge pathways are uncertain and further investigation is required to confirm these hydraulic connections.

A.2.3 POTENTIAL FOR HYDRAULIC CONNECTION

Groundwater is inferred to be hydraulically connected with the underlying bedrock aquifers (0593, 0595, 0633, and 1275) where the aquifers are not separated by layers of fine-grained sediment. The aquifer may also be hydraulically connected to the overlying overburden aquifer (0596).

A.3 WATER MANAGEMENT

A.3.1 ADDITIONAL INFORMATION ON WATER USE AND MANAGEMENT

Baye et al. (2016) reported exceedances for arsenic, iron, manganese, and hardness in some of the overburden wells within the area of aquifer 0594. Stated yields in the well records range from 3.2 to 4.7 L/s, with a geometric mean of 3.8 L/s indicating high productivity. Groundwater is used for domestic, commercial, and monitoring purposes, based on the GWELLS database.

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

Baye, A., Rathfelder, K., Wei, M., and Yin, J., 2016. Hydrostratigraphic, hydraulic and hydrogeochemical descriptions of Dawson Creek-Groundbirch areas, Northeast BC. Victoria, Prov of B.C. Water Science Series 2016-04.

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A.5 REVISION HISTORY

Date	Version	Revision Class	Comments	Author
2011	1	Major	Initial mapping of aquifer	Lowen Hydrogeology Consulting Ltd. 2011
02/10/2023	2	Minor	Aquifer boundaries updated to reflect aquifer extent based on updated conceptual model	Tibor Lengyel, M.Sc., P.Geo., Judit Deri-Takacs, Ph.D., Andrew Hinnell, Ph.D., P.Geo.