A. AQUIFER DESCRIPTION FOR AQUIFER 50 – SOUTH OF HOPINGTON

A.1 CONCEPTUAL UNDERSTANDING OF HYDROSTRATIGRAPHY

A.1.1 AQUIFER EXTENTS

The South of Hopington Aquifer (#50) is comprised of two northwest oriented bodies of sand and gravel that are stacked above each other, each 5 to 20 m thick and located in the Township of Langley near the international border. The upper sand and gravel body corresponds to "Aquifer T" of Makepeace and Ricketts (2000). The South of Hopington Aquifer (#50) begins at the US-Canada border and extends up to 24th Ave, and spans from 208th St to 240th St. The eastern portion of the aquifer is not entirely defined as it extends beyond the Nicomekl-Serpentine watershed (Hatfield, 2020a).

A.1.2 GEOLOGIC FORMATION (OVERLYING MATERIALS)

The aquifer is part of a complex of intertill units, overlain by glacial till up to 20 meters thick.

A.1.3 GEOLOGIC FORMATION (AQUIFER)

The aquifer is characterized by sands and gravels of glaciofluvial or glaciomarine outwash origin, representative of the Fort Langley Formation (or possibly Vashon Drift).

A.1.4 VULNERABILITY

Low – the aquifer is confined by approximately 15 m to 40 m of low permeability till and silt material.

A.2 CONCEPTUAL UNDERSTANDING OF FLOW DYNAMICS

A.2.1 GROUNDWATER LEVELS AND FLOW DIRECTION

Moderately deep - groundwater occurrence in the shallower of the two sand and gravel bodies is variable, with some parts of the upper sand and gravel body characterized by unsaturated conditions, most commonly in the southern upland areas, closer to the border of the United States where groundwater levels are also deeper. Overall, the depth to groundwater is considered to be moderately deep (30-60 m below ground surface), with an average depth of 30-40 m. Groundwater flow from the north and central parts of the aquifer is inferred to be directed to the south, towards the Campbell River valley. Some higher elevation portions of the South of Hopington Aquifer (#50) have been noted to be unsaturated or dry in upland areas.

A.2.2 RECHARGE

Recharge presumably occurs from lower permeability materials located above and adjacent to the aquifer and through connection with the overlying Brookswood Aquifer (No. 41). The aquifer is inferred to have a minor lateral connection to the West of Aldergrove Aquifer (No. 33) along its northern perimeter.

A.2.3 POTENTIAL FOR HYDRAULIC CONNECTION

The aquifer subtype is 4b, Confined Glacio-fluvial sand and gravel aquifers underneath till, in between till layers, or underlying glacio-lacustrine deposits, with this aquifer subtype considered possibly connected to streams (Wei et al, 2009). The upper sand and gravel body of the aquifer may be hydraulically connected to Campbell River. Hatfield (2020) inferred high streamflow vulnerability to pumping in the aquifer.

A.3 WATER MANAGEMENT

A.3.1 ADDITIONAL INFORMATION ON WATER USE AND MANAGEMENT

Groundwater is used for private domestic water supply and irrigation. The groundwater demand is considered to be moderate.

Kreye and Wei (1994) report isolated occurrences of nitrate, high iron and sulphur are reported in some well logs in the BC WELLS database.

There are two Provincial Groundwater Observation Wells associated with the South of Hopington Aquifer (No. 50) (Hatfield, 2020b).

- PGOW #4 was monitored from March 1963 to March 2004 and is now inactive.
- PGOW #440 commenced monitoring groundwater levels as of November 2017 and remains active. Groundwater level trend analysis could not be conducted due to the short record length.

A.3.2 ADDITIONAL ASSESSMENTS OR MANAGEMENT ACTIONS

No groundwater characterization studies specific to the South of Hopington Aquifer (#50) have been identified.

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A.5 REVISION HISTORY

Date	Version	Revision Class	Comments	Author
1994	1	New	Initial aquifer mapping in Fraser Basin	Kreye and Wei
2000	2	Minor	Roughly corresponds to “Aquifer T”	Makepeace and Ricketts
2005	3	Major	Aquifer mapping exercise to support development of regional-scale numerical hydrogeological model for the Township of Langley	Golder Associates
2014	4	N/A	Update of the numerical model.	Golder Associates
2018	5	Major	Adoption of 2005 and 2014 aquifer mapping.	Golder Associates
2025	6	Minor	Revised as part of Hydrogeological Mapping and Analysis – Bertrand Creek and Fishtrap Creek Watersheds, Water Science Series, WSS2025-05.	WSP (Qin et al. 2025)