

Lowell Point preliminary aquifer investigation, Seward, Alaska

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The Lowell Point Community occupies the fan-delta of Spruce Creek south of Seward, Alaska, on the west shore of Resurrection Bay. The aquifer underlying Lowell Point supplies water to about 77 year-round residents with population swelling to 150 during the summer months. Population growth estimates indicate a 20-year population of 1100 residents. Most residents occupy one-half acre lots and are plumbed with individual well and on-site sewer systems. Water well data collection found information on 17 wells, including residential and community wells. Some existing wells provided no information for the database.

The Lowell Point Aquifer is a surficial, unconfined aquifer comprised of the unconsolidated soils of two landforms; the fluvial fan-delta gravels of Spruce Creek and the marine beach sands of Resurrection Bay. The marine beach sands overlie and may be interlayered at depth with the fan-delta gravels. The soils that comprise the aquifer have hydraulic conductivities that vary from 2500 ft/day to 6000 ft/day. The aquifer has an area above sea level of about 0.12 square miles and extends from the toe of the mountain slopes to the shoreline of Resurrection Bay.

The upper surface of the aquifer is the water table encountered in the wells and the excavated test pits. The water table is shallow, usually a few feet or tens of feet below the ground surface. The water table slopes from west to east at about 1 foot per 100 feet. The Spruce Creek drainage basin recharges the subsurface water within the Lowell Point Aquifer. The surface water observations and static water levels show lowering of the water table during the winter months and rising of the water table from May to October. Field observations confirm that the water table rises and lowers with the ebb and flow of the tide. The chemical composition of the groundwater can be characterized as dilute calcium-bicarbonate water. Salty water occurs in the nearshore portion of the aquifer.

The lower surface of the aquifer is the contact with the underlying slate bedrock. This metamorphic bedrock has been encountered in only a few wells near the toes of the mountain slopes. Bedrock doesn't produce significant amounts of water. Most wells do not encounter bedrock so the thickness of the aquifer is not known. Thus, transmissivity of the aquifer cannot be determined.

Well yield for 14 wells ranges from 8.8 gpm to 100 gpm with an average of 41.2 gpm. Most wells supply residences and produce from 6-inch diameter, 17 lbs/ft welded steel casing with an open end. Preliminary results show specific capacities of 8 gal/min/ft to 50 gal/min/ft. These results are probably limited by pumping rates available during well construction. No data exists to determine storativity of the aquifer.

Recommendations for future investigation include a time-drawdown pump test of an 8-inch diameter well to determine aquifer capacity and possible production rates, plus chemical sampling and analyses to insure suitability as a community water source.