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REPORT ON

GROUNDWATER POTENTIAL EVALUATION FOR THE HULLCAR AREA, TOWNSHIP OF SPALLUMCHEEN, B.C.

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1.0 INTRODUCTION

Golder Associates Ltd. ("Golder") is pleased to provide this report to the Township of Spallumcheen ("TOS") and Urban Systems Ltd. ("USL"), summarizing the results of an assessment of the potential for the development of groundwater municipal water supply wells for the TOS, specifically within the Hullcar Area (hereafter referred to as the "Hullcar Study Area"). In addition, Golder also conducted a preliminary assessment of a secondary groundwater development area, closer to the TOS, hereafter referred to as the Eagle Rock Study Area. The Hullcar Study Area is located in the northwest corner of the Spallumcheen District Municipal boundary, while the Eagle Rock Study Area is located in the southern portion of the Spallumcheen District Municipality, south of Armstrong (Figure 1).

The purpose of the Study is to provide an evaluation of the development potential of the aquifer within the two areas, specifically allowing for i) an assessment of subsurface conditions and the potential aquifer yield, and ii) the development of a Master Water Plan by USL for the TOS.

Authorization to proceed with this study was provided by Ms. Lynda Shykora of the TOS on February 22, 2006.

2.0 BACKGROUND

The Hullcar Study Area is located in the North Okanagan, approximately 5 km northwest of Armstrong, BC, and is within the Township of Spallumcheen's municipal boundaries. The Hullcar Study Area is defined as follows: the northern, eastern and western boundaries of the Hullcar Study Area generally follow those of the Spallumcheen District Municipal boundaries (Figure 1). The southern boundary is defined by a line of latitude at 50° 28′ N, roughly corresponding with the southern limit of the main aquifers in the Hullcar Study Area. The total land area covered by the Hullcar Study Area is approximately 5,500 hectares (ha).

The second area of investigation was the Eagle Rock Study Area, which is located in the southern portion of the Spallumcheen District Municipality, approximately 3 km south of Armstrong (Figure 1). The total land area covered by the Eagle Rock Study Area is approximately 2,700 ha.

Currently, the TOS manages four water utilities, and acts as the collector (tax notices) for 14 other Water Districts within the Township boundaries. The four water utilities managed by the TOS are as follows:

- Hankey Water Utility - water is provided by an artesian well to five users.

- Pleasant Valley Water Utility - services an area south of the City of Armstrong, extending to Pleasant Valley Cross Road. Water is collected from Fortune Creek and Silver Star Lakes reservoirs and distributed through the Armstrong's water treatment plant and distribution lines.

- Round Prairie Water Utility - services an area west of the City of Armstrong from the City boundary along Salmon River Road to Round Prairie Road. Water is collected from Fortune Creek and Silver Star Lakes reservoirs and distributed by the City of Armstrong.

- Stepping Stones Water Utility - water is supplied and distributed by Greater Vernon Services (City of Vernon) to the southern portion of Spallumcheen.

It is understood that the TOS wishes to develop an additional groundwater supply source within the Hullcar Study Area to service nearby residents, who are currently on individual, private water supply systems. In addition, should a sufficient groundwater supply be identified and eventually developed by the TOS, there is the potential that smaller water districts within the area may wish to be managed by the Township. As such, as part of this investigation, Golder also conducted a preliminary assessment of the nearby Eagle Rock Study Area.

3.0 SCOPE AND METHODOLOGY

In order to assess the groundwater development potential of the Hullcar area, Golder conducted a review of available geological and hydrogeological information, including information on existing wells in the area and climatic data. Information regarding existing wells was obtained either through the Ministry of Environment ("MoE") water well database (Appendices I and II), or from Ms. Trina Koch of the MoE, who recently completed a field reconnaissance of the area (Appendix III). It should be noted that the majority of available well logs reported well yields in gallons per minute without specifying U.S. or Imperial gallons. For the purposes of this report, well yields were assumed to be U.S. gallons per minute, and converted and reported in litres/sec (L/s).

In addition, geologic cross-sections for the Hullcar Study Area, recently prepared by Dr. Patrick Monahan, P.Geo. for the North Okanagan Aquifer Mapping Project, were examined and modified by Golder to include the recent information collected by Ms. Koch. Wells added to the geological interpretation provided by Dr. Monahan have been noted on the relevant figures.

The methodology used by Dr. Monahan to determine the thickness, depth and distribution of each aquifer are fully described in the North Okanagan Aquifer Mapping Project report. The main source of information used to produce the cross sections was the MoE water well database, including UTM coordinates and elevation.

Based on the results of this investigation, Golder has prepared this report, including the following information:

- A map of the assessed extent of each aquifer in the Study Area, identifying existing well locations, where possible.
- A map of the approximate extent of surface water catchments that collect and concentrate precipitation to the Hullcar Study Area, providing recharge to the aquifer.
- An evaluation of aquifer gradation, thickness, width, and flow gradients, along with estimates of hydraulic conductivity and transmissivity to develop an estimation of annual flow through the aquifer.
- An estimation of recharge to the Study Area using historical precipitation and evaporation data.
- A preliminary evaluation of the aquifer yield.

In addition, Golder conducted a preliminary review of an alternate aquifer in the south portion of the Municipal District of Spallumcheen (Eagle Rock Study Area).

4.0 RESULTS FOR THE HULLCAR STUDY AREA

4.1 Topography and Surface Water

The Hullcar Study Area is predominantly located within the base of a small east-west trending valley, located within a larger north-south trending valley. Valley elevations range from approximately 518 meters above sea level (masl) at the northern limits of the Study Area, to 400 masl at the southern limits, along Deep Creek. The steep upland areas in the northwest and southwest corners of the Hullcar Study Area rise from approximately 518 masl to over 1,000 masl.

The dominant water course through the area is Deep Creek, which enters the Hullcar Study Area from the north, traverses through the base of the Valley and the eastern portion of the Study Area, and exits in the southern portion of the Hullcar Study Area (Figure 1). Also present are Lyster Creek and Slack Creek, which flow from the highlands in the northwest corner of the Hullcar Study Area toward to the Valley centre. Parkinson Lake, a kettle lake approximately 4 ha in area, is the only lake in the Study Area, approximately 2.9 km west of Deep Creek. Major water bodies outside of the Study Area are Gardom Lake, located approximately 8.5 km to the north and the Shuswap River, located approximately 10 km to the northeast (Figure 1).

4.2 Surficial and Bedrock Geology

The surficial geology in Study Area is complex and consists of lacustrine, glacial and glacial-fluvial deposits of till, clay, silty sand, sand and gravel. According to Nasmith (1962), the predominant surficial deposits comprising the Hullcar Study Area are glacial lake sediments deposited by glacial Lake Penticton, along with outwash terraces deposited by meltwater streams. These glacial deposits were modified in recent times by the formation of gullies, stream channels, alluvial fans, and deltas.

Apart from providing a physical boundary within which the unconsolidated sediments of the Valley are situated, the bedrock in the Study Area is presumed to have little effect on the local groundwater flow regime. The bedrock geology is therefore only described briefly in the following.

According to the BC Geological Survey website, the region is underlain primarily by greenstone and greenschist metamorphic rocks of the Mount Ida assemblage from the Lower Paleozoic Period.

4.3 Aquifers in the Hullcar Area

According to the MoE Water Resource Atlas, there are six main aquifer units in the Hullcar Study Area (Figure 2), as follows:

- Aquifer No. 103 is a sand and gravel aquifer with a moderate productivity, high vulnerability and moderate demand.

- Aquifer 102 is a sand and gravel aquifer with a high productivity, low vulnerability and moderate demand.

- Aquifer No. 356 is a sand and gravel aquifer with a moderate productivity, moderate vulnerability and low demand.

- Aquifers No. 104, 106 and 355 are low-yielding bedrock aquifers.

Aquifer No. 102 and 103 were noted to be the most productive within the Study Area, with available well logs indicating well yields as high as 38 L/s (600 USgpm) and 13 L/s (200 US gpm), respectively. Due predominantly to these reported relatively high capacities, the main focus is on these two aquifers. Furthermore, as the bedrock aquifers in the Study Area indicate relatively low-yielding wells of less than 0.6 L/s (10 USgpm) (Figure 3), they are only briefly described in this report.

4.3.1 Aquifer No. 103

Based on a review of available information, 46 known water wells are completed within the unconfined aquifer (Aquifer No. 103), which covers an area of approximately 1,100 ha. A review of the available well logs indicates subsurface conditions generally consist of glaciofluvial sands and gravels overlying till. It is inferred that the till deposit is relatively continuous across the Study Area, varying in depth, as shown in Cross Section A-A' (Figure 4). This cross section profiles the base of the east-west trending valley (Figure 2).

The majority of the wells in the unconfined aquifer are located in the west-central portion of the Valley, in an area surrounding Parkinson Lake, extending approximately 1,500 m to the west of the lake. At this location in the unconfined aquifer, the sand and gravel deposits are the thickest (15 m to 46 m). Wells with known yields within this area of the unconfined aquifer have yields ranging from less than 3 L/s to 35 L/s (Figure 5).

Additional well information collected by Ms. Koch of the MoE identified additional wells at the west end of the aquifer (1500 m to 4300 m west of Parkinson Lake). These wells are reported to yield between 19 L/s (300 USgpm) and 126 L/s (2000 USgpm). Although no well log identifying subsurface conditions was available for the 126 L/s (2,000 USgpm) well, the total reported depth was approximately 21.3 m below ground surface ("bgs"). Based on the depth of the well, it was inferred that the well was completed within the unconfined aquifer. It is important to note that there are relatively few wells logs available for the wells at the west end of the aquifer, and Cross Section A-A' was produced by interpretation of this limited information.

There are fewer wells located in the area to the east of Deep Creek, where the unconfined aquifer appears to extend to a depth of up to 30.5 m. As shown on Figure 4, the unconfined aquifer is inferred to be relatively shallow near Deep Creek and in the central portion of the cross section. As discussed in the following section, the majority of the wells completed in this area are located in the deeper confined aquifer.

Cross Section B-B' is oriented in a northwest-southeast direction across the Valley (Figure 2), and infers that the unconfined aquifer is relatively shallow in the central portion of the cross-section, increasing in thickness towards the south. Well logs from the only two wells at the southern edge of this aquifer indicate that sand and gravel deposits are present to depths of up to 46 m deep, underlain by approximately 45 m of till, followed by a confined aquifer at depth below the till (Figure 6). The two wells in this area are inferred to be completed in the confined aquifer, and as such, the productivity of the unconfined aquifer at this location is unknown.

Based on a review of the well logs for wells completed in the unconfined aquifer, water levels range from 1 m to 24 m bgs.

4.3.2 Aquifer No. 102

The confined aquifer in the Hullcar Study Area is identified by the MoE as Aquifer No. 102 and covers an area of approximately 1,500 ha (Figure 2). A total of 54 wells exist in the MoE water well database within the confined aquifer.

The confined aquifer is present below a till layer in sands and gravels to depths of up to 59 m bgs. As shown on Cross Section A-A' (Figure 4), the confined aquifer is at least 23 m thick in the east central part of the Valley, extending from Deep Creek to approximately 2,600 m west of the creek. The aquifer hosts numerous wells with yields in the range of 3 L/s (50 USgpm) to 38 L/S (600 USgpm). As few wells completed within the confined aquifer were drilled deep enough to encounter clay, till or bedrock, the full thickness of the confined aquifer is unknown.

Two wells (12-9 and 12-10, as numbered during the MoE site reconnaissance) (Figure 5) located in the east central portion of the Valley were drilled to a depth of 67 m bgs and reportedly yield between 19 L/s (300 USgpm) and 13 L/s (200 USgpm), respectively. These wells were located during the recent MoE site reconnaissance and as such do not exist in the MoE water well database. Well logs were not available for these wells and total depth was inferred to be approximately 61 m, corresponding roughly to the depth at which submersible pumps were placed in both wells. However, it is unclear whether the confined aquifer extends to approximately 61 m deep at this location, or whether these two wells are completed in a second, deeper, previously unidentified confined aquifer.

As shown in Cross Section A-A' (Figure 4), there is evidence that the confined aquifer may be up to 49 m deep at the eastern end of the Valley, east of Deep Creek. However, the well logs for wells completed in this portion of the aquifer have identified well yields of 3 L/s (50 USgpm) or less.

Information for the southern portion of Cross Section B-B' (Figure 6) is limited. The well logs for two wells in this area, having MoE Well Tag Numbers 48180 and 9216 indicate a 46 m thick till deposit overlies the confined sand and gravel aquifer. The confined aquifer was encountered at a depth of approximately 100 m bgs. A well yield of approximately 32 L/s (500 USgpm) was reported for the well with Well Tag Number 48180, which is located near the southern boundary of the confined aquifer, indicating the potential for development of relatively high yield in this area.

Water levels within the confined aquifer are reported to range from ground surface to approximately 82 m bgs.

The confined aquifer is bounded by bedrock to the south and north, although both of these bedrock areas are reported to host fractured bedrock aquifers, as described in the following section.

4.3.3 Aquifer No. 356

According to the MoE Water Resource Atlas, Aquifer No. 356 is a small, poorly characterized sand and gravel aquifer located in the southern portion of the Hullcar Study Area, which lies between the two bedrock aquifers. There are approximately 10 wells known to be completed in the aquifer at this location, the majority of which are completed within confined sand and gravel aquifer. Based on the well records, this aquifer appears to be confined by layers of silt and/or clay, and is variable in depth, with the upper boundary varying in depth between 24 m bgs and 114 m bgs and the lower boundary varying between 65 m bgs and 118 m bgs. Well yields in this aquifer range from 0.5 L/s (8 USgpm) to 3 L/s (50 USgpm).

4.3.4 Aquifer Nos. 106 & 355

Three bedrock aquifers (Aquifer Nos. 104, 106 and 355) are present within the Hullcar Study Area. Aquifers 106 and 355 are predominantly located to the south of the unconfined and confined aquifers in the Study Area, and are described by the MoE water well database as having a low productivity, low vulnerability and low demand. Aquifer 104 is to the north and is described by the water well database as having a moderate productivity, moderate vulnerability and moderate demand. There are approximately 140 wells located in the bedrock aquifers; however, all but four of the wells have reported yields of less than 15 gpm.

4.4 Groundwater Flow Direction and Hydraulic Gradient

Based on the limited information regarding static water levels, estimates of groundwater flow direction and hydraulic gradient were made for both the confined and unconfined aquifers in the Hullcar Study Area. Static water levels used in this analysis were either measured by Ms. Koch of the MoE in the fall of 2005, or were taken from the well logs in the water well database. For water levels measured in different years, a correction was made based on changes in water levels noted in MoE Observation Well No. 117, located at Armstrong, BC (MoE 2006). Two estimates of groundwater flow direction and gradient were completed for each of the confined and unconfined aquifers. The data used in these calculations is presented in Table 1. As shown in Figure 2, groundwater flow in the confined aquifer is from NW to SE, and flow in the unconfined aquifer is from N/NW to S/SE. The estimated gradient in the confined aquifer ranged from 0.02 to 0.04, and was an order of magnitude higher than that of the unconfined aquifer, which was 0.004 to 0.005. It should be noted that groundwater flow directions and gradients were based on limited water levels within several wells. Bedrock located in the southern portion of the Study Area likely influences the groundwater flow direction to both the west and east, around the shallow bedrock.

4.5 Climate

The climate in the Hullcar Study Area consists of warm, dry summers and cool, moist winters. Golder reviewed available data from Environment Canada for the Armstrong Hullcar weather-reporting station, which is located at 50° 30′ N latitude and 119° 13′ W longitude and has an elevation of approximately 505 m (Figure 1). Table 2 summarizes the available data for this weather station, which has data available between the years 1971 and 1998 (Environment Canada, 2005). Based on the available information, it can be inferred that the mean annual total precipitation for the Study Area is 475.2 mm. The maximum annual precipitation measured was 677.6 mm in 1996, while the minimum annual precipitation was 347.9 mm and was recorded in 1987.

Daily mean temperatures for the Hullcar area are expected to range from a minimum of -4.75 °C in January to a maximum of 19.16 °C in July.

4.6 Water Balance

4.6.1 Annual Recharge Estimate

For the purpose of this investigation, estimates of recharge to the Hullcar sand and gravel aquifers (Aquifer Nos. 102 & 103) were based on i) estimating the volume of precipitation infiltrating the subsurface using climate data for the area, and ii) simple calculations based on Darcy's Law, which estimate recharge by assessing a cross-sectional area of the aquifer and evaluating the volume of water required to sustain groundwater flow through the aquifer.

Recharge Estimate Based on Climate Data

This analysis assumes that groundwater recharge within the Hullcar catchment is primarily via infiltration of precipitation and snow melt to the subsurface. The distribution of recharge between surrounding bedrock areas and areas infilled with alluvium is unclear; however, it is assumed that the majority of infiltration (approximately 80 %) is concentrated in the alluvium sediments within the base of the Valley. It is anticipated that the remaining 20% of precipitation recharges local bedrock systems. Based on a review of topographic maps, the approximate extent of the watershed area contributing recharge to the aquifers in the Hullcar Study Area is outlined in Figure 1. This area includes the Deep Creek catchment area upslope of Hullcar including a total catchment area of 15,000 ha.

For the purposes of this calculation, precipitation has been assumed to be greater in higher elevation areas within the catchment. Assuming that approximately 7% of the mean annual total precipitation, or 33.26 mm/yr, is available as recharge, a preliminary estimate of the annual groundwater recharge to the Hullcar aquifers from the Deep Creek watershed is approximately 4,300,000 m^3/yr. This recharge estimate is based on precipitation only, and assumes that only 80% of infiltration recharges to alluvium in the Valley. Furthermore, it does not account for other sources of recharge such as contributions from septic disposal to ground and irrigation return flow.

Recharge Estimate Based on Darcy's Law

Another method of estimating the amount of groundwater recharge is to calculate the approximate flow across the aquifer based on Darcy's Law. This provides an indication of the recharge required to sustain groundwater flow and the water levels in the aquifer. Darcy's Law is dependent on several aquifer characteristics, including hydraulic conductivity, aquifer width and thickness, and the hydraulic gradient, and is presented as follows:

$Q = K \times W \times T \times i$ where: K = Hydraulic Conductivity
W = Aquifer Width
T = Thickness
i = Hydraulic gradient

Based on Darcy's Law, groundwater flow in the unconfined aquifer is estimated to be approximately 3,100,000 m^3/yr. This is based on an estimated hydraulic conductivity of approximately 8.64 m/d, which is common for sand and gravel (Freeze and Cherry, 1979), an aquifer width of approximately 8,000 m, an average saturated aquifer thickness of approximately 25 m, and a hydraulic gradient of 0.005.

Groundwater flow in the confined aquifer is estimated to be approximately 11,500,000 m^3/yr. This is based on an estimated hydraulic conductivity of 8.64 m/d, an aquifer width of approximately 8,000 m, an average aquifer thickness of 15 m, and an average hydraulic gradient of 0.03. Flow through the confined aquifer may be greater than reported, as the thickness of the aquifer may be greater than the estimate used above, as bedrock or confining deposits were encountered in very few of the boreholes completed within the deeper aquifer system in this area.

The estimated total flow across both aquifers based on Darcy's Law is approximately 14,600,000 m^3/yr, which is greater than the recharge estimate based on climate data (4,300,000 m^3/yr). As the Darcy's Law calculations are based on aquifer characteristics measured in the field, it is likely that the recharge estimate based on Darcy's Law is more representative than that based on precipitation, watershed area, and infiltration percentages.

4.6.2 Estimate of Groundwater Extraction

Without local metering, or an accurate account depiction of how many water wells are in use in the Hullcar Study Area, it is difficult to quantify the total annual groundwater extraction for all wells in the area. However, a preliminary approximation of the annual extraction rate was estimated using 1) the well yields reported on the well logs and 2) an

estimate of water extractions based on typical irrigation application rates in British Columbia.

The yield for each well was estimated using one of the following methods:

- Estimated by driller and recorded in well log (Appendix I); or
- Recorded from flow meter reading or equal to pump capacity as noted during site survey carried out by the MoE (Appendix III).

A summary of the well yields in each of the Hullcar aquifers is presented in Figure 3.

The following outlines the assumptions used in developing aquifer discharge estimates:

- The main source of groundwater extraction was assumed to be irrigation from the sand and gravel aquifers. It has been assumed that withdrawals from the adjacent bedrock aquifers do not influence the sand and gravel aquifer, and were therefore not considered.
- Groundwater extraction estimates were calculated using each of the following methods:
    - All wells in the Study Area with known well yields were assumed to be pumping at a rate equal to their maximum reported yield for a period of 12 hours per day, for 8 months of the year (243 days), or
    - Estimates of groundwater extraction were calculated based on estimated volumes of water required to support irrigation of the approximately 3,000 ha of arable land (MAFF, 2001) in the study area

The method based on well yield estimates groundwater extraction to be approximately 6,200,000 m^3/yr for the unconfined aquifer and 4,000,000 m^3/yr for the confined aquifer, resulting in a total preliminary extraction estimate in the order of 10,200,000 m^3/yr. The method based on typical irrigation requirements estimates groundwater extraction in the Hullcar Study Area to be 10,300,000 m^3/yr.

Based on these methods of calculation, groundwater extraction in the Hullcar area is estimated to be in the order of 10,250,000 m^3/yr. In comparison with the estimated recharge based on Darcy's Law, it appears that the unconfined aquifer has an annual water deficit of 3,100,000 m^3/yr and the confined aquifer has a surplus of 7,500,000 m^3/yr.

5.0 RESULTS FOR THE EAGLE ROCK STUDY AREA

A preliminary assessment of the groundwater development potential for a secondary study area (the Eagle Rock Study Area) was also conducted. The Eagle Rock Study Area is located 10 km to the south of the Hullcar Study Area (Figure 1).

The following presents a brief description of the hydrogeological parameters of the Eagle Rock Study Area, information for which was predominantly gathered during a previous investigation carried out by Golder (2003).

5.1 Topography and Surface Water

The topography of the Eagle Rock Study Area is generally flat in the base of the north-south trending Okanagan Valley, with elevations ranging from approximately 350 masl to 400 masl in the northern portion of the Eagle Rock Study Area. Upland areas to the east are generally above 500 masl. Hutley and Main Creeks run through the Study Area and eventually discharge into Deep Creek, located to the southwest of the Eagle Rock Study Area (Figure 1).

5.2 Surficial and Bedrock Geology

The surficial geology consists primarily of lacustrine (valley fill) deposits along the centre of the valley, with glacio-fluvial (meltwater) fans and kame-terrace deposits along the eastern edge of the Valley. The valley fill deposits consist primarily of silt and clay near the ground surface with sand and limited gravel at depth. Some till is also present in the shallow valley fill deposits. The fan and terraced-kame deposits along the eastern edge of the Valley are associated with glacio-fluvial (post-glacial melt) along Hutley Creek and Maid Creek. The material associated with the fans is sand and gravel, with variable amounts of silt. It is apparent that sand and gravel dominate the proximal portion of the fan and kame deposits (eastern limits), while fine sand and silt become more prominent in the distal portion of the fan (towards the centre of the Valley). The fan deposit extends under the clay into the centre of the Valley.

According to the BC Geological Survey website, the region is underlain primarily by two bedrock units, which are exposed in the highland areas to the east and west of the Valley. To the east is the Shuswap Highlands Complex, which is comprised of orthogneiss metamorphic rocks and granite as well as alkali feldspar granite intrusive rocks from the Tertiary, Proterozoic and Paleozoic Periods. To the west are greenstone and greenschist metamorphic rocks of the Mount Ida assemblage from the Lower Paleozoic Period. A fault of unknown characteristics runs through the center axis of the valley oriented roughly from north to south.

5.3 Unconfined to Confined Aquifer (Aquifer No. 353)

According to the MoE Water Resources Atlas, Aquifer 353 is the only aquifer present in the Eagle Rock Study Area. This sand and gravel aquifer is described as having a high productivity, high vulnerability and high demand. This aquifer is bordered to the north, south and west by Aquifer No. 111, a moderately productive sand and gravel aquifer (Appendix II)

Golder previously conducted a previous investigation in the Eagle Rock Study Area, the results of which were presented in our 2003 report entitled "Phase I Aquifer Protection Planning, Eagle Rock Aquifer, Spallumcheen, BC". Based on the results of our previous investigation, it was determined that the hydraulic conductivity for the sand and gravel aquifer in the Eagle Rock Study Area ranges from 1×10^{-4} m/s to 1×10^{-3} m/s. This range of values is consistent with data found in the literature for clean sand. The thickness of the aquifer is indicated to range from 5 m to 50 m along the eastern limits of the valley to a maximum of 65 m in the centre of the Valley. The aquifer is overlain by sequences of till and clay and is therefore characterized as a semi- to fully-confined aquifer. Available information indicates the aquifer trends to unconfined along the east edge of the Valley where the kame-terrace deposits exist, and to confined towards the centre of the Valley where lacustrine clays exist at surface. The aquifer appears to be unconfined in the area of the Spallumcheen Industrial Park, which is located in the northwest corner of the Study Area, along Highway 97A.

Based on information available in 2003, wells yields for the aquifer ranged from 0.4 L/s (6 USgpm) to 50 L/s (800 USgpm). Recharge and extraction estimates also made in 2003 indicate a net surplus of water in the Eagle Rock aquifer, which exceeded 2,400,000 m^3/yr.

5.4 Groundwater Flow Direction and Gradient

Based on a review of static water levels in the area, the hydraulic gradient for the aquifer is in the range of 0.0020 to 0.0025 and the direction of flow is towards the north.

6.0 GROUNDWATER DEVELOPMENT POTENTIAL

Both the unconfined and confined aquifers in the Hullcar Study Area appear to be suitable to support the development of high yielding (greater than 6 L/s or 100 USgpm) water wells. This is supported based on a review of the driller's estimated well yields in the existing well logs. Additional evidence in support of this conclusion is based on the results of the MoE site reconnaissance, identifying high pump capacities and/or measured pumping rates for wells.

Although both the Hullcar confined and unconfined aquifers have the potential for high-yielding wells, the long term sustainability of these aquifers is unclear. Based on the preliminary estimates of groundwater extraction in the Hullcar Study Area, there is the potential that more water is being withdrawn from the unconfined aquifer on an annual basis than is recharging the aquifer. Should this be the case, there is the potential that groundwater levels within the unconfined aquifer will decline over time, which may cause some shallow wells to run dry.

When assessing which aquifer is more suitable for the development of a groundwater potential, the following considerations should be made:

- Unconfined aquifers used as a potable water source are generally more vulnerable to surface contamination than confined aquifers. Potential sources of contamination of the unconfined aquifer in the Hullcar area could include fertilizers used for agricultural purposes, nitrates associated with cattle and private septic fields.

- As water quality data for wells completed in the Hullcar Study Area was not available for review, Golder cannot comment on the suitability of the water quality within either the unconfined or confined aquifers. However, generally speaking, the mineral content in the groundwater is related to the depth of a well, with mineral content increasing with increasing well depth.

Based on the results of this assessment, a multiple criteria analysis was performed to aide in determining which aquifer within the Hullcar Study Area would be more suitable for development as a groundwater source for the TOS (Table 4). This analysis included an assessment of the following information regarding each target study area: i) the number of known wells, ii) the water balance of the primary aquifer, iii) the number of high-yielding wells (greater than 6 L/s (100 USgpm), iv) the number of buildings, and v) road access (based on aerial photo review). Table 4 includes information included in previous sections of this report and additional information contained in 2005 air photos of the Hullcar Area. Figure 7 shows a composite air photo of the Hullcar Area for 2005 overlain by locations of possible target areas for future investigations. Based on the susceptibility to contamination of unconfined aquifers, and the apparent deficit in groundwater recharge to the unconfined aquifer, the confined aquifer in Target Study Areas 1 and 3 are preferred over Target Study Area 2 (Figure 7). Although Target Study Area 1 has the fewest number of existing wells and is not as intensely developed as Target Study Area 3, there is also much less information available about the aquifer characteristics because there are fewer well logs in this area. In addition, a portion of Target Study Area 1 is not within the municipal boundaries of the Township of Spallumcheen. To gain more information about the aquifer characteristics in each of the

target study areas, it will be helpful to measure water levels in the area and carry out pumping tests on existing wells.

Due to low well yields for wells completed within the bedrock aquifers in the Hullcar Study Area, these aquifers are not considered to be suitable for development as a groundwater resource for the Township of Spallumcheen.

Based on a preliminary assessment of the Eagle Rock Study Area, it is also considered suitable for groundwater development purposes, with well yields in the order of 6 gpm to 800 gpm. However, this aquifer is unconfined along its eastern extent and as such, would be susceptible to surface contamination, specifically from the Spallumcheen Industrial Park, located in the northwest corner of the Study Area, along Highway 97A. However, should the TOS be considering providing potable water to residents closer to the main populated area of the Township, considerable savings regarding the water system infrastructure could be realized with the development of wells in this area. Wells located in the confined portion of the aquifer to the west of the Spallumcheen Town Hall could be acceptable, thus maximizing the distance from industrial area. Water quality may be higher in iron and manganese for this area, thus requiring treatment.

7.0 CONCLUSIONS

Based on the results of this assessment, the following conclusions are made:

- Two main aquifers are present in the Hullcar Study Area; an unconfined sand and gravel aquifer and a confined sand and gravel aquifer. The aquifers are separated by a relatively continuous till deposit.

- The unconfined aquifer is inferred to be approximately 25 m thick.

- The thickness of the confined aquifer is unknown, but is inferred to range from 9 m thick to at least 21 m thick.

- Both the unconfined and the confined aquifers in the Hullcar Study area host several wells with reported yields over 6 L/s (100 USgpm). Each of these aquifers also has at least two wells with an estimated yield of at least 32 L/s (500 USgpm). In addition, the unconfined aquifer contains two wells reported to yield in excess of 63 L/s (1,000 USgpm). These wells are located within the western portion of the unconfined aquifer.

- Based on the limited information available, groundwater flow in the confined aquifer is from northwest to southeast, with bedrock to the south likely influencing the groundwater flow to the west and east. The estimated gradient of the confined aquifer ranged from 0.02 to 0.04.

- Based on the limited information available, groundwater flow in the unconfined aquifer is from north-northwest to south-southeast, with bedrock to the south likely influencing the groundwater flow to the west and east. The estimated gradient of the unconfined aquifer ranged from 0.004 to 0.005.

- Annual recharge to the Hullcar aquifers is estimated to be in the order of 14,600,000 m^3/yr, based on Darcy's Law.

- A preliminary groundwater extraction estimate for the unconfined aquifer in the Hullcar Study Area is estimated to be in the order of approximately 6,200,000 m^3/yr, giving a recharge deficit of 3,100,000 m^3/yr. However, this estimate is based on limited information.

- A preliminary groundwater extraction estimate for the confined aquifer in the Hullcar Study Area is estimated to be in the order of approximately 4,000,000 m^3/yr, giving a recharge surplus of 7,500,000 m^3/yr. This estimate is also based on limited information.

- The Eagle Rock Study Area contains a confined to unconfined aquifer, with reported well yields of up to 50 L/s (800 USgpm).

- Wells located in the confined portion of the Eagle Rock aquifer to the west of the Spallumcheen Town Hall could be acceptable for groundwater development. Water quality may be higher in iron and manganese for this area, thus requiring treatment.

- Unconfined aquifers used as a potable water source are generally more vulnerable to surface contamination than confined aquifers. Potential sources of contamination of the unconfined aquifer in the Hullcar area could include the use of fertilizers for agricultural purposes, nitrates associated with cattle and private septic fields.

- As water quality data was not available for review, Golder cannot comment on the suitability of the water quality within either the unconfined or confined aquifers. However, generally speaking, the mineral content in the groundwater is related to the depth of the well, with mineral content increasing with increasing well completion depth

- Based on the susceptibility to contamination of unconfined aquifers, and the apparent deficit in groundwater recharge to the unconfined aquifer, Target Study Areas 1 and 3 (shown in Figure 7), within the confined aquifer are preferred target locations for possible future investigations.

8.0 RECOMMENDATIONS

The results of this assessment indicate that there may be potential for high capacity water supply wells in the Hullcar area. However, further work needs to be conducted in order to determine the long term sustainability and water quality of potential water supply wells in the Hullcar Study Area.

Based on the results of this preliminary assessment, the following recommendations are made with regards to the development of groundwater resources in the Hullcar Area for the Township of Spallumcheen:

- Complete a field reconnaissance within the Hullcar Study Area to measure static water levels, and to determine annual water extraction rates, water quality if available.

- Conduct a pumping test on several existing wells within the identified Target Study Areas 1 and 3 to assess aquifer characteristics.

Based on the results of the above, it is recommended that input from the Township of Spallumcheen regarding the influence of land use on drilling location aide in determining the most suitable location(s) and target yield for a test well. Once this has been completed, it is recommended that, if suitable, a test well(s) be constructed within the selected area to further assess the groundwater development potential for the Hullcar Study Area.

9.0 LIMITATIONS

This report was prepared for the exclusive use of the Township of Spallumcheen and Urban Systems Ltd. The purpose of the Study was to provide a preliminary evaluation of the aquifer yield to determine if there is further potential for development of groundwater resources in the Hullcar Study Area and if so, to provide recommendations for additional studies. The assessment was performed according to current professional standards and practices in the groundwater field and has been made using historical and technical data obtained from sources noted in the report. Golder has relied in good faith on information provided by third parties. We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omissions, misinterpretations or fraudulent acts of others.

The assessment is based on currently available information and does not account for mutual well interference created by additional wells which may be constructed in the future. It also does not consider the potential for other external factors which could affect the water balance for the Study Area, such as climate change and additional surface water development in upland areas to the east of the Study Area.

If new information is discovered during future work, Golder should be requested to provide amendments to this report as required.

Any use which third parties make of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Golder Associates Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

10.0 CLOSURE

We trust that this report provides you with the information you require at this time. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

GOLDER ASSOCIATES LTD.

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Hydrogeologist

Jacqueline Foley, M.Sc.
Hydrogeologist

Reviewed By: Remi Allard, P. Eng.
Associate, Senior Hydrogeologist

PVA/JF/RA/jc/cfh

N:\Active\2006\1440 - Kelowna\06-1440-064 Twp Spall GW Potential Hullcar\Final_WP\Hullcar Groundwater Potential 28 July 2006.doc

11.0 REFERENCES

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TABLE 1: GROUNDWATER LEVELS FOR UNCONFINED AND CONFINED AQUIFER, HULLCAR STUDY AREA

	Well Tag Number	Date	Depth to water (ft bgs)	Depth to water (m bgs)	Well Elevation (m)	Water level elevation (m)	Water level correction (m)	Corrected water level elevation (m)	Inferred Flow Direction	Gradient
Unconfined Aquifer	44170	1-Jan-80	27	8.2296	518	509.7704	0.35	510.1204	S	0.005
	28970	1-Oct-73	8	2.4384	530	527.5616	0	527.5616		
	41505	1-Jan-79	30	9.144	530	520.856	-0.2	520.656		
	53373	11-Mar-84	22	6.7056	514	507.2944	0	507.2944	SE	0.004
	21394	7-Apr-68	47	14.3256	518	503.6744	0	503.6744		
	57252	7-Dec-87	25	7.62	518	510.38	0	510.38		
Confined Aquifer	31280	28-Oct-05	12	3.6576	514	510.3424	0	510.3424	SE	0.015
	44872	28-Oct-05	31	9.4488	515	505.5512	0	505.5512		
	41474	28-Oct-05	48	14.6304	515	500.3696	0	500.3696		
	31279	18-Sep-74	12	3.6576	520	516.3424	0	516.3424	SE	0.041
	62401	4-Oct-85	108	32.9184	520	487.0816	0.7	487.7816		
	48180	4-Jun-81	270	82.296	513	430.704	0.5	431.204		

Note: For water levels measured in different years, a correction was made based on changes in water levels noted in MoE Observation Well No. 117, located at Armstrong, BC

TABLE 2: CLIMATE DATA FOR ARMSTRONG HULLCAR CLIMATE STATION SHOWING TOTAL MONTHLY PRECIPITATION, IN MILLIMETERS, FOR YEARS BETWEEN 1971 AND 1998

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
1971								28.2	22.1	43.7	36.6	145.8	276.4
1972	77.5	48.5	58.7	26.2	30.2								241.1
1986						83.6	43.8	9.6	51.6	13.6	52.5	48.7	303.4
1987	31.5	10.9	28.7	35.4	36.2	11.8	50	20.8	13.3	10.8	39.6	58.9	347.9
1988	22.7	28.5	23.1	58.3	47.4	59.8	34.8	37.8	62.4	36.6	56.3	44.4	512.1
1989	48	17.5	29.2	19.2	77	65.9	52.8	82.8	34	34.3	35.6	37.6	533.9
1990	59	19	24.4	21.2	101.4	80	33.4	25.7	10.6	44.6	90	79.2	588.5
1991	56	30	18.8	24.2	48	31	23	75	13.2	9.4	76.6	12.5	417.7
1992	60.2	23.2	12.4	28.2	33.6	46.1	46.6	16.6	73	22.8	99.6	106	568.3
1993	69.6	10.2	15.5	50.5	33.2	49.6	91.5	23.3	21.4	41.2	18.4	74.1	498.5
1994	41.6	66.6	15.4	38.6	22.7	56.4	21	44.2	12.4	37.2	77.1	43.2	476.4
1995	56.3	30.1	44	44.4	9	53	24	66.2	18	68.1	139	77.2	629.3
1996	50.7	41.8	15.5	38.4	103.6	22.4	26.8	20.6	76.6	66.6	108.6	106	677.6
1997	45	31.3	41.6	32.9	60.2	48.4	142.3	25.2	77.8	51.2	42.7	24.6	623.2
1998	80.1	20.2	45.6	28		29.3	9.8	2	27.8	38.8	71.1	80.9	433.6
Mean	53.7	29.1	28.7	34.3	50.2	49.0	46.1	34.1	36.7	37.1	67.4	67.1	475.2

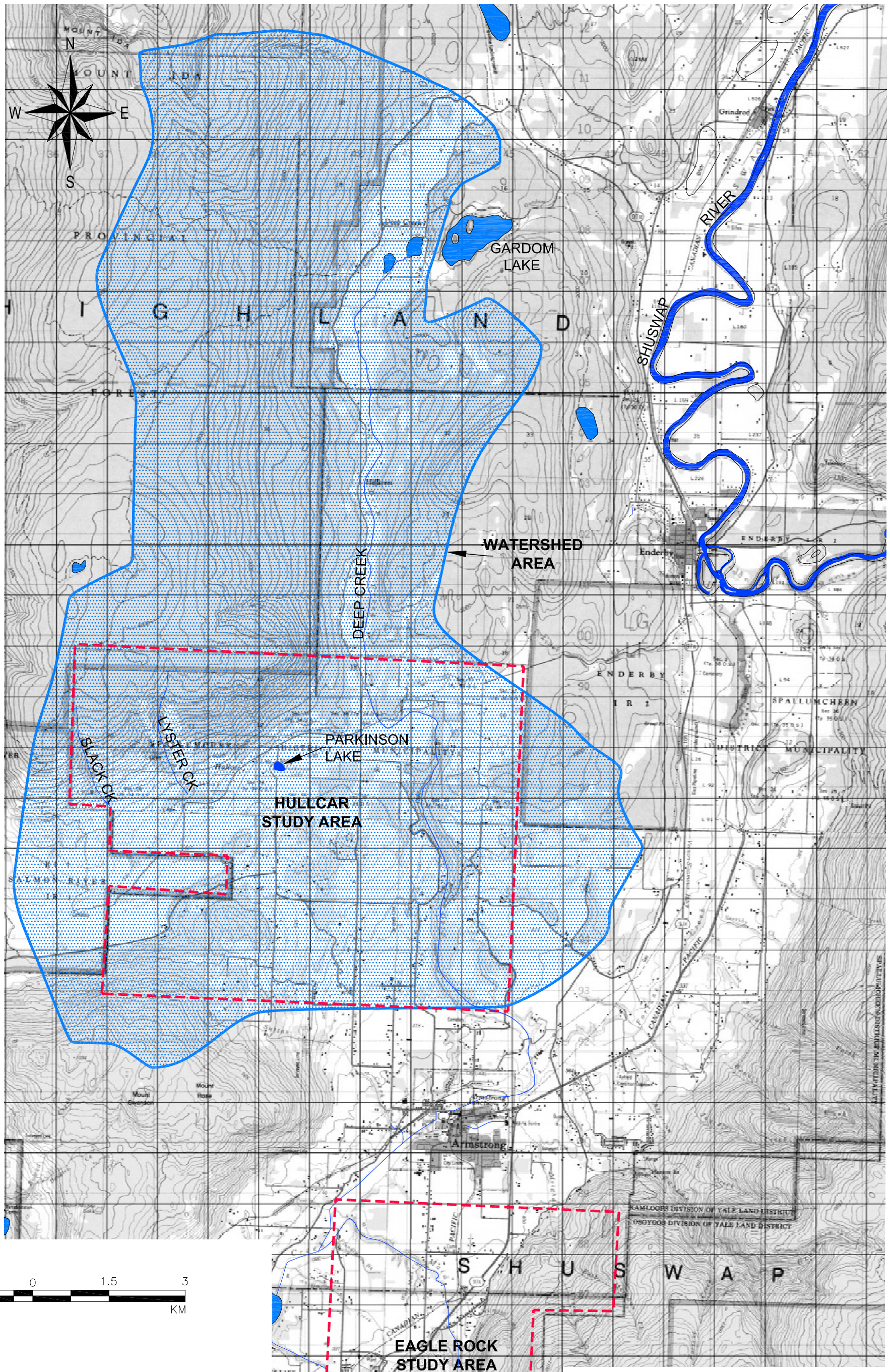
TABLE 3: ESTIMATE OF GROUNDWATER EXTRACTION IN HULLCAR STUDY AREA

	Confined Aquifer				Unconfined Aquifer				Both Aquifers			
	#	(L/s)	(US gpm)	(m^3/yr)	#	(L/s)	(US gpm)	(m^3/yr)	#	(L/s)	(US gpm)	(m^3/yr)
Wells with Known Yields	62				59				121			
Wells with No Yield Given	6				0				6			
Wells with Yield Reported as Zero	7				15				22			
Average Well Yield		5.84	93			10.01	159			15.85	159	
Total of Known Well Yields		385.26	6106	1.21E+07		590.47	9359	1.86E+07		975.73	9359	3.08E+07
Annual Use*				4.05E+06				6.21E+06				1.03E+07

Notes:
*Assuming pumping 12 hr/d for 8 months of the year

TABLE 4: DECISION-MAKING CRITERIA MATRIX FOR POSSIBLE FUTURE TARGET STUDY AREAS

Location	Type of Aquifer	Aquifer vulnerability	Aquifer thickness	Known wells in aquifer	Available well logs	Wells with yields > 6 L/s (100 USgpm)	Water Balance	Buildings in area	Road Access	WTN of possible wells for pumping test	Well Notes	Other Notes
1	Confined	Low	9 m - ?	11	9	1	Surplus	7	good at north, south and west ends, limited in centre	54651	nearby well at 101 m depth ran dry-no log avail	Wells 41506, 62395, 62396 had casings removed or were filled in
										34182	Yield est. 4 gpm	
										19524	Yield est. 0 gpm	
										41510	hole abandoned, unsure if filled in	
2	Unconfined	High	21 - 46 m	28	21	4	Deficit	17	good at north and west ends	44169		
										50316		
										67911		
										63176		
3	Confined	Low	21 m - ?	25	16	9	Surplus	28	good along centre, north and east	well 12-9	no logs available	
										well 12-10	no logs available	
										well 17-8	abandoned	
										well 17-5		
										44872		
										41474		
										46540		
										751		



LEGEND

- STUDY AREA
- WATERSHED AREA
- APPROXIMATE PROPERTY LINE

REFERENCES

1.) BASEMAP: Produced under licenses granted by Her Majesty the Queen in right of Canada, represented by the Department of Natural Resources, and by SoftMap Technologies Inc.

PROJECT
GROUNDWATER POTENTIAL EVALUATION FOR THE HULLCAR AREA, TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE
SITE PLAN & WATERSHED BOUNDARIES

Golder Associates
Kelowna, BC

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REVIEW				

FIGURE: 1

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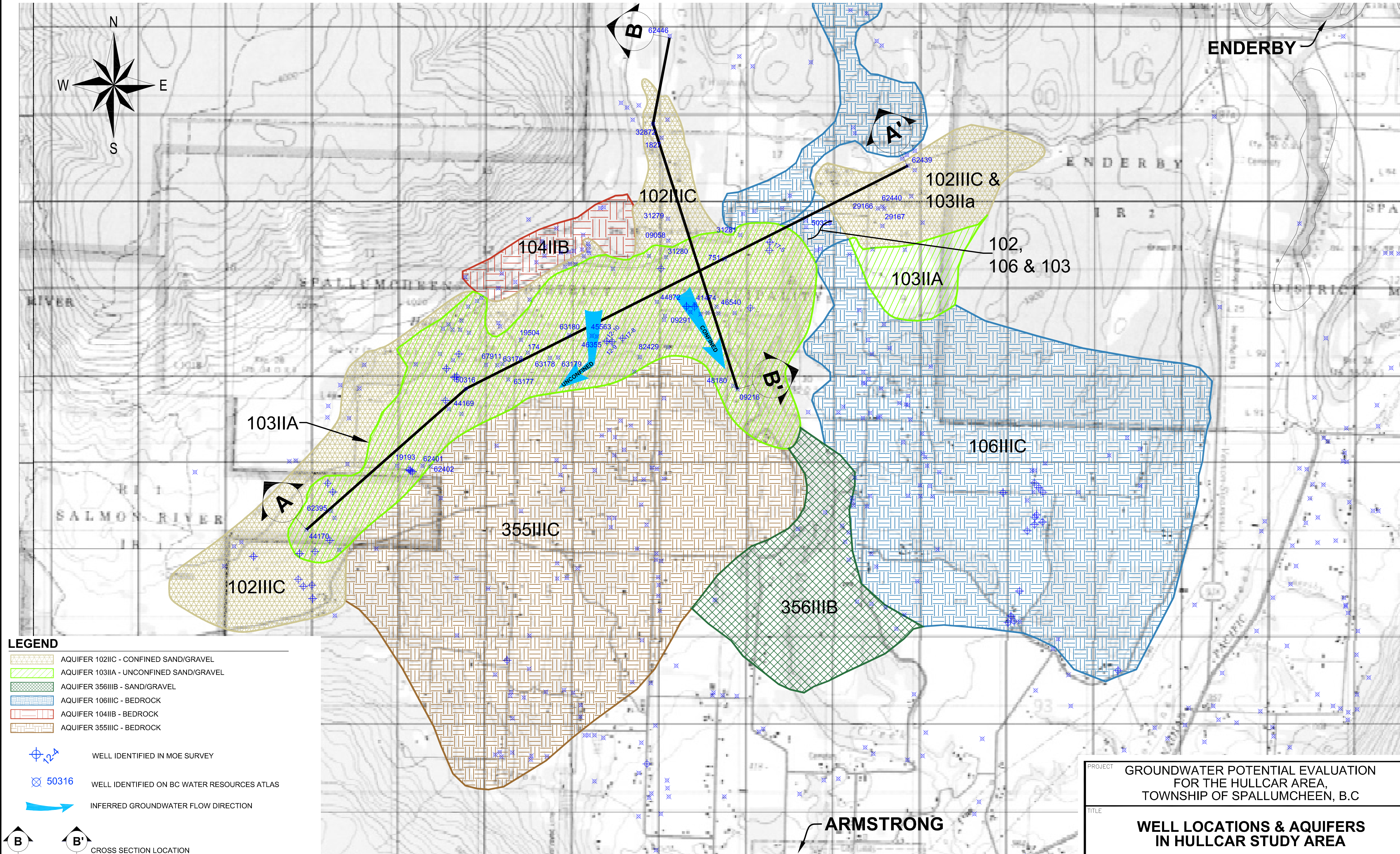

LEGEND

- AQUIFER 102IIC - CONFINED SAND/GRAVEL
- AQUIFER 103IIA - UNCONFINED SAND/GRAVEL
- AQUIFER 356IIIB - SAND/GRAVEL
- AQUIFER 106IIIC - BEDROCK
- AQUIFER 104IIB - BEDROCK
- AQUIFER 355IIIC - BEDROCK
- 124 WELL IDENTIFIED IN MOE SURVEY
- 50316 WELL IDENTIFIED ON BC WATER RESOURCES ATLAS
- INFERRED GROUNDWATER FLOW DIRECTION
- B B' CROSS SECTION LOCATION

REFERENCES

1.) Aquifers & well locations: BC WATER RESOURCES ATLAS: http://srmapps.gov.bc.ca/apps/wrbc/
2.) Basemap: Produced under licenses granted by Her Majesty the Queen in right of Canada, represented by the Department of Natural Resources, and by SoftMap Technologies Inc.

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PROJECT
GROUNDWATER POTENTIAL EVALUATION
FOR THE HULLCAR AREA,
TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE
WELL LOCATIONS & AQUIFERS IN HULLCAR STUDY AREA

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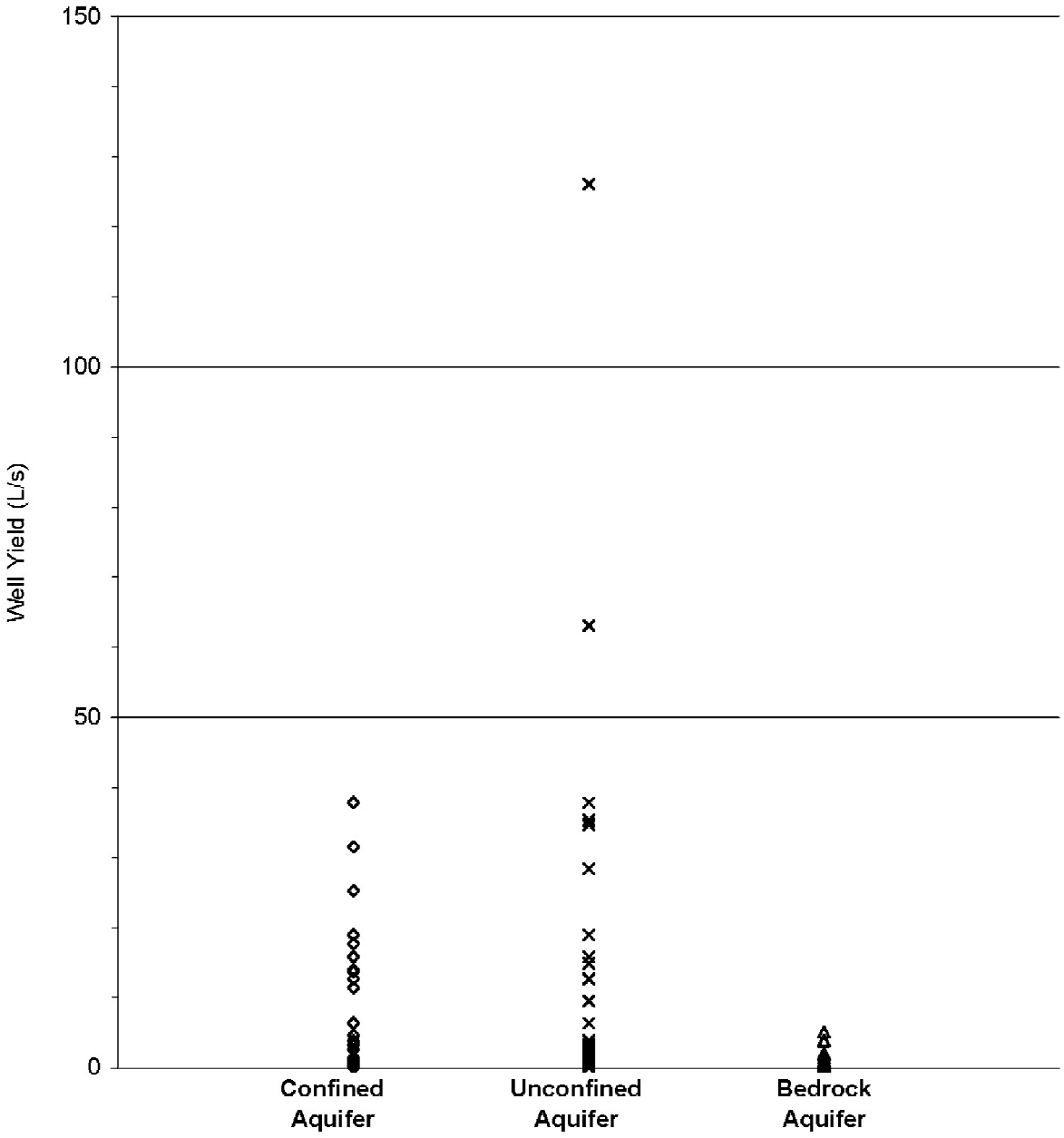
CHECK					
REVIEW					

Golder Associates
Kelowna, BC

FIGURE: 2



PROJECT
GROUNDWATER POTENTIAL EVALUATION
FOR THE HULLCAR AREA,
TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE
ESTIMATED WELL YIELDS BY AQUIFER TYPE FOR WELLS IN HULLCAR STUDY AREA

Golder Associates
Kelowna, BC

PROJECT No. 06-1440-064(2000)			FILE No. 061440064_2000_3.dwg	
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CADD	JG	22/MAY/06		
CHECK				
REVIEW				

FIGURE: 3

REFERENCES

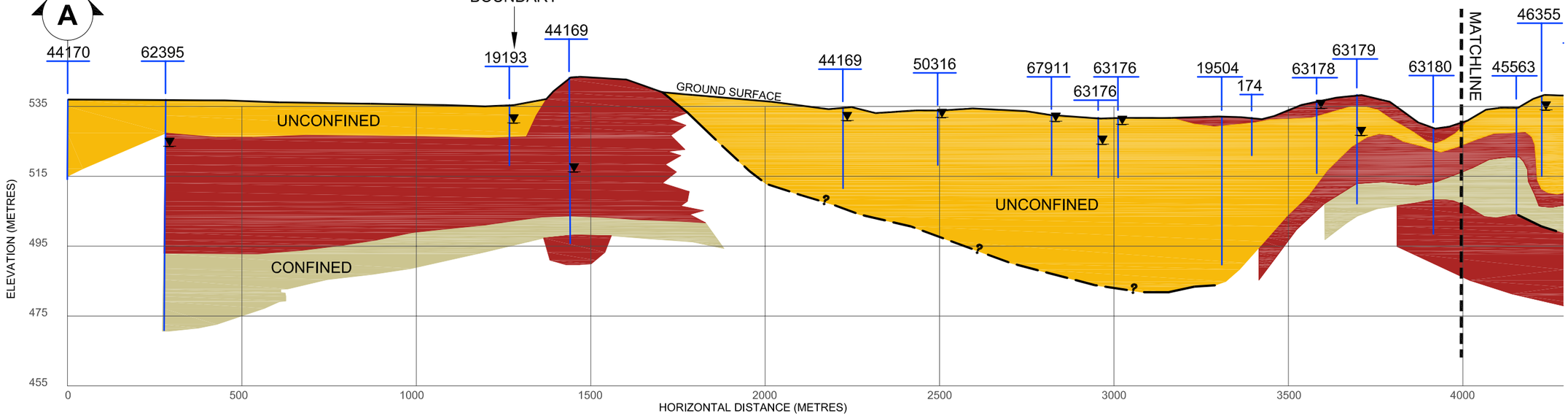
1.) BC WATER RESOURCES ATLAS: http://srmapps.gov.bc.ca/apps/wrbc/

WEST

A

STUDY AREA BOUNDARY

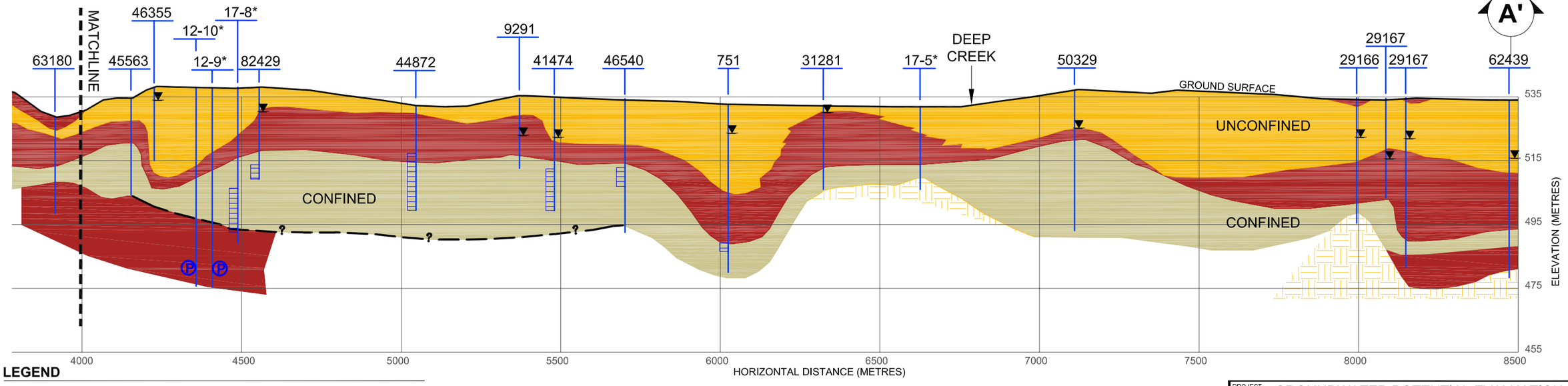
LOOKING NORTH



LOOKING NORTH

EAST

A'



LEGEND

- CONFINED AQUIFER - SAND/GRAVEL
- UNCONFINED AQUIFER - SAND/GRAVEL
- CONFINING LAYER - SILT, CLAY OR TILL
- BEDROCK
- ? INFERRED STATIGRAPHY CHANGE
- REPORTED STATIC WATER LEVEL
- SCREEN INTERVAL
- (P) PUMP LOCATION

NOTES

1.) THIS DIAGRAM IS AN INTERPRETATION OF VISUAL OBSERVATIONS, AVAILABLE WELL LOGS, REPORTED STATIC LEVELS AND AVAILABLE REPORTS.
2.) PAT MONOHAN, CROSS SECTION 15, HULLCAR, APRIL 06.
3.) GOLDER HAS INCLUDED WELLS 17-5*, 17-8*, 17-9* & 19-10* TO THE CROSS SECTION.

SCALE VERTICAL SCALE METRES: 25 0 25 50

SCALE HORIZONTAL SCALE METRES: 250 0 250 500

PROJECT: GROUNDWATER POTENTIAL EVALUATION FOR THE HULLCAR AREA, TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE: **CROSS SECTION A-A'**

Golder Associates Kelowna, BC

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CHECK					
REVIEW					

FIGURE: 4

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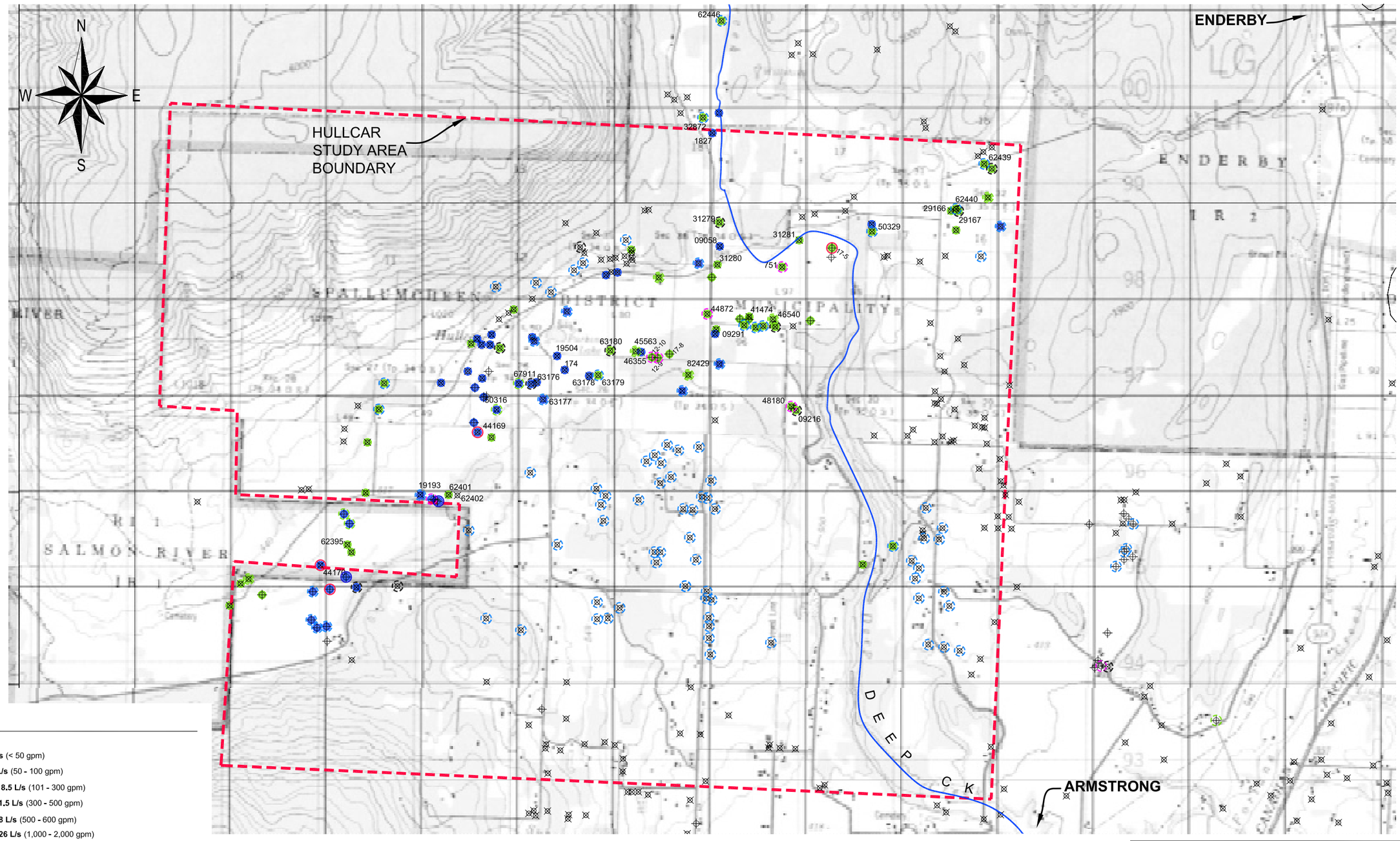

LEGEND

WELL YIELD

- **< 3 L/s** (< 50 gpm)
- **3 - 6 L/s** (50 - 100 gpm)
- **6.5 - 18.5 L/s** (101 - 300 gpm)
- **19 - 31.5 L/s** (300 - 500 gpm)
- **32 - 38 L/s** (500 - 600 gpm)
- **63 - 126 L/s** (1,000 - 2,000 gpm)

WELL CONTRIBUTING SOURCE

- WELLS IN UNCONFINED SAND / GRAVEL AQUIFER
- WELLS IN CONFINED SAND / GRAVEL AQUIFER

124 WELL IDENTIFIED IN MOE SURVEY

50316 WELL IDENTIFIED ON BC WATER RESOURCES ATLAS

REFERENCES

1.) Well locations: BC WATER RESOURCES ATLAS: http://srmapps.gov.bc.ca/apps/wrbc/
2.) Basemap: Produced under licenses granted by Her Majesty the Queen in right of Canada, represented by the Department of Natural Resources, and by SoftMap Technologies Inc.

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SCALE METRES

PROJECT: GROUNDWATER POTENTIAL EVALUATION FOR THE HULLCAR AREA, TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE: **AQUIFER TYPE & ESTIMATED YIELDS FOR WELLS IN HULLCAR STUDY AREA**

Golder Associates Kelowna, BC

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CHECK					
REVIEW					

FIGURE: 5

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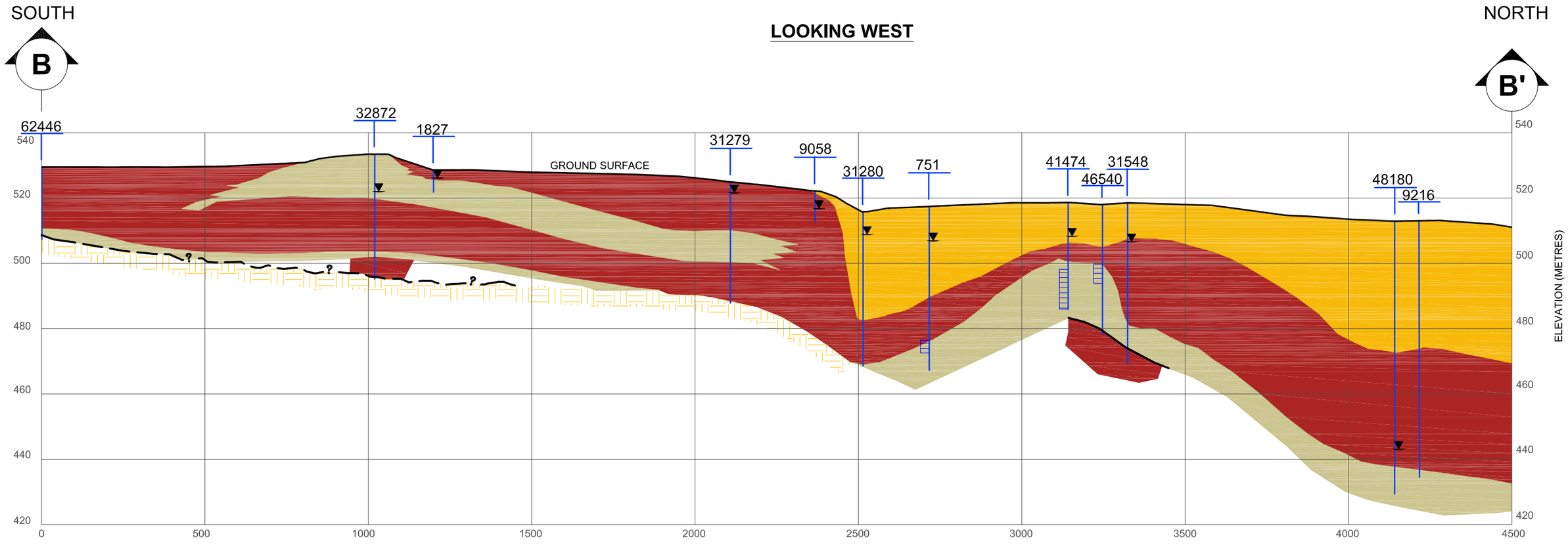
SOUTH

B

NORTH

B'

LOOKING WEST



LEGEND

- CONFINED AQUIFER - SAND/GRAVEL
- UNCONFINED AQUIFER - SAND/GRAVEL
- CONFINING LAYER - SILT, CLAY OR TILL
- BEDROCK
- ? INFERRED STATIGRAPHY CHANGE
- REPORTED STATIC WATER LEVEL
- SCREEN INTERVAL
- (P) PUMP LOCATION

NOTES

1.) THIS DIAGRAM IS AN INTERPRETATION OF VISUAL OBSERVATIONS, AVAILABLE WELL LOGS, REPORTED STATIC LEVELS AND AVAILABLE REPORTS.
2.) PAT MONOHAN, CROSS SECTION 15, HULLCAR, APRIL 06.
3.) GOLDER HAS INCLUDED WELLS 17-5*, 17-8*, 17-9* & 19-10* TO THE CROSS SECTION.

24 0 24 48
SCALE VERTICAL SCALE METRES

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SCALE HORIZONTAL SCALE METRES

PROJECT
GROUNDWATER POTENTIAL EVALUATION
FOR THE HULLCAR AREA,
TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE
CROSS SECTION B-B'

Golder Associates
Kelowna, BC

PROJECT No. 06-1440-064(2000)			FILE No. 061440064_2000_4,6.dwg		
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CADD	JG	21/MAY/06			
CHECK					
REVIEW					

FIGURE: 6

N:\Active\2006\1440 - Kelowna\06-1440-064 Twp Spall GW Potential Hullcar\Drafting\Task 2000\CAD\ Drawing file: 061440064_2000_4.6.dwg Jul 28, 2006 - 11:17am

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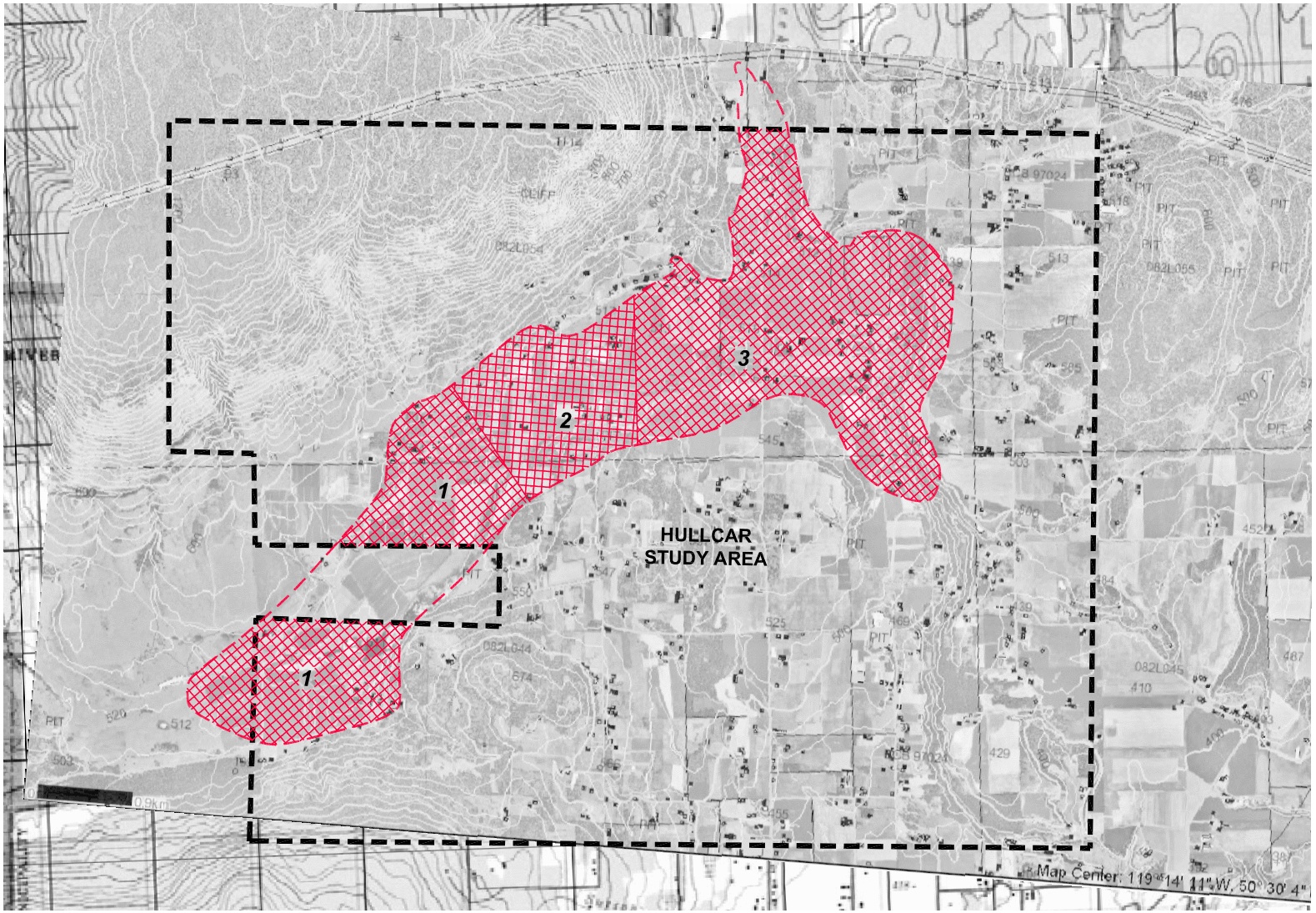

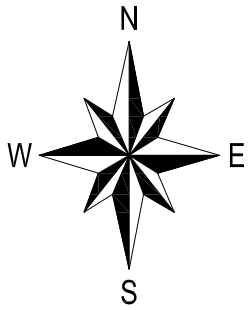

LEGEND

STUDY AREA

1 FUTURE STUDY AREAS

1.2 0 1.2
SCALE KM

REFERENCES

1.) AERIAL PHOTO: BC WATER RESOURCES ATLAS: http://srmapps.gov.bc.ca/apps/wrbc/, DATED: 2005
2.) MAP REFERENCE: PRODUCED UNDER LICENSES GRANTED BY HER MAJESTY THE QUEEN IN RIGHT OF CANADA, REPRESENTED BY THE DEPARTMENT OF NATURAL RESOURCES, AND BY SOFTMAP TECHNOLOGIES INC.

PROJECT
GROUNDWATER POTENTIAL EVALUATION
FOR THE HULLCAR AREA,
TOWNSHIP OF SPALLUMCHEEN, B.C

TITLE
2005 AERIALPHOTO OF HULLCAR SHOWING POSSIBLE LOCATIONS OF FUTURE TARGET STUDY AREAS

Golder Associates
Kelowna, BC

PROJECT No. 06-1440-064(2000)			FILE No. 061440064_2000_7.dwg	
DESIGN	PA	21/MAY/06	SCALE 1:60,000	REV. 0
CADD	JG	21/MAY/06		
CHECK				
REVIEW				

FIGURE: 7

APPENDIX I

WELL LOGS FOR WELLS USED IN CROSS SECTIONS

WELL LOGS FOR CONFINED AQUIFER

17-8
No WTN

DWR #8

TELEPHONE
(604) 853-2513

A&H Construction Ltd.

"Specializing in Water Wells, Soil Sampling, Exploration"

1681 SALTON RD.,
P.O. BOX 38,
ABBOTSFORD, B.C.
V2S 4N7

INVOICE No. 1119

#8

TO Mr. Doug Regier,

ADDRESS Armstrong, B.C.

WELL DRILLED AT Armstrong, B.C.

WELL COMPLETED April 25/86 INVOICE DATE April 28, 1986.

	Machine Hours at		per Hour	
	Feet of Drilling at		per Foot	
169	Feet of Drilling & Casing at	$34.00	per Foot	5,746.00
	Feet of Casing at		per Foot	
	Feet of Casing at		per Foot	
	Feet of Casing at		per Foot	
1. 10"	Drive Shoes at		each	225.00
20	Feet of Screen	@125.00	per ft	2,500.00
	Installation of Screen			
	Pump Testing Hours at		per Hour	
	Sampling and Bailing Hours at		per Hour	
	Other Charges:			
	Moving on Site and Setting Up	Mobilize & Dem.		200.00
	Blasting			
	Other 8hrs. developing well @ $80.00			640.00
	1. K, packer			235.00
				9,546.00
	Ream and Recal CREDIT 24' casing @ 8.00			272.00
	Travelling and Tolls			
	TOTAL INVOICE PRICE			$9,274.00

0' Top Soil
3'
Sand & Gravel
28'
Sand & Fine Gravel
47'
Silty Sand
75'
Course Sand
110'
Fine Sand Some Clay
138'
Gravel
169'
169

S. S. Screen: 5 ft 100 slot; 5 ft 40 slot; 5 ft 80 slot; 5 ft 100 slot

Notations: Set 20ft. Johnson S.S. screen. Bottom of well 154'6". Top of screen 123'1". Static water 30'2".

INVOICE

Account due on presentation of this invoice.
Interest at 1½% per Month (18% per Annum) on all accounts overdue 30 days.

Dog R #5

17-5 NoWTN

TELEPHONE (604) 853 2513

"Specializing in Water Wells, Soil Sampling, Exploration"

3681 SALTON RD.,
P.O. BOX 38,
ABBOTSFORD, B.C.
V2S 4N7

#5

INVOICE No. 1124

LOG OF WELL

Top Soil
7'

Sand & Gravel
21'

Till
45'

Sand
Clay
Dirty
69'

Gravel
H20
77'

Bed Rock
Granite
145'

Bottom of casing 80ft.

TO Mr. Doug Regier,

ADDRESS Armstrong, B.C.

WELL DRILLED AT Same

WELL COMPLETED May 23/86 INVOICE DATE May 26, 1986.

	Machine Hours at	per Hour	
	Feet of Drilling at	per Foot	
145	Feet of Drilling & Casing at $34.00	per Foot	4,930.00
	Feet of Casing at	per Foot	
	Feet of Casing at	per Foot	
	Feet of Casing at	per Foot	
1. 10"	Drive Shoes at	each	225.00
	Feet of Screen		
	Installation of Screen		
	Pump Testing Hours at	per Hour	
	Swabbing and Bailing Hours at	per Hour	
	Other Charges:		
	Moving on Site and Setting Up		
	Blasting		
	Other 5hrs. developing well @ $80.00		400.00
	Removal of Casing		
	Installing and Locking		
	TOTAL INVOICE PRICE		$5,555.00

Notations: Well producing approximately 750 gals. per minute. Static water level 33'2". Pumped at 600 G.P.M. with 30'-2" drawdown for 8 hrs.

INVOICE

Account due on presentation of this invoice.
Interest at 1½% per Month (18% per Annum) on all accounts overdue 30 days.

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 751	Construction Date:
Owner: DOUG REGHER	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: SCHUBERT RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 400 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 37 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 97 Plan: Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054224 Well: 8	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 10.0 inches Well Depth: 194.0 feet Elevation: 0 Bedrock Depth: feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
EXCL. PL 3221/ IN SPALLMUCHEEN

From	0 to	104 Ft.	SAND
From	104 to	161 Ft.	TILL
From	161 to	194 Ft.	WATER-BEARING GRAVEL

- Return to Main

Information Disclaimer

The Province disclaims all responsibility for the accuracy of information provided. Information provided should not be used as a basis for making financial or any other commitments.

WTN 751

#4

Province of British Columbia Ministry of Environment Water Investigations Branch

4

WATER WELL RECORD

Date

Legal Description & Address

Descriptive Location 5042 Shubert Rd

Owners Name & Address Doug Leyhr

NTS MAP 92 I 034 324 E 5598420 N ELEV WELL No 14

Date 19

1. TYPE OF WORK: 1 ☑ New Well 2 ☐ Reconditioned 3 ☐ Deepened 4 ☐ Abandoned

2. WORK METHOD: 1 ☑ Cable tool 2 ☐ Rotary 3 ☐ Jetted 4 ☐ Rotary a ☐ mud b ☐ air 5 ☐ Other 6 ☐ Reverse

3. WATER WELL USE: 1 ☐ Domestic 2 ☐ Municipal 3 ☐ Irrigation 4 ☐ Commercial & Industrial 5 ☐ Other

4. DRILLING ADDITIVES

5. MEASUREMENTS from 1 ☐ ground level 2 ☐ top of casing

FROM ft	TO ft	6. WELL LOG DESCRIPTION	SWL ft
0	104	Sand	
104	161	till	
161	195	Water Bearing Gravel	

9. CASING: Materials 1 ☐ Steel 2 ☐ Galvanized 3 ☐ Wood 4 ☐ Plastic 5 ☐ Concrete 6 ☐ Other

							units
Inside Diameter							ins
Diameter	10						ins
from							ft
to	161						ft
Thickness							ins
Weight							lb/ft

Pitless unit ft 1 ☐ above 2 ☐ below ground level

1 ☑ Welded 2 ☐ Cemented 3 ☐ Threaded 4 ☐ New 5 ☐ Used

Perforations

Shoe(s)

Open hole, from to ft Diameter ins

Grout

10. SCREEN: 1 ☑ Nominal 8' 2 ☐ Pipe Size

Type 1 ☐ Continuous Slot 2 ☐ Perforated 3 ☐ Louvre 4 ☐ Other

Material 1 ☐ Stainless Steel 2 ☐ Plastic 3 ☐ Other

Set from 164 to 174 ft below ground level

SCREEN & BLANKS							units
Length							ft
Diam. I.D.							ins
Slot Size							ins
from							ft
to							ft

Fittings, top 15 bottom

Gravel Pack 13

11. DEVELOPED BY: 1 ☑ Surging 2 ☐ Jetting 3 ☐ Air 4 ☐ Bailing 5 ☐ Pumping 6 ☐ Other

12. TEST 1 ☐ Pump 2 ☐ Bail Date

Rate 360 US gpm Temp °C SWL before test ft

ft after test of hrs mins

TIME in mins	WL	TIME in mins	WL	TIME in mins	WL	TIME in mins	WL

13.

14. WATER TYPE: 1 ☐ Fresh 2 ☐ Salty 3 ☐ Clear 4 ☐ Cloudy

Odour Smell gas 1 ☐ yes 2 ☐ no

15. WATER ANALYSIS: 1 ☐ Hardness mg/l

mg/l 3 ☐ Chloride mg/l

pH Date

Lab No Lab Date

WELL PRODUCTION DATA

Total Depth 198 ft Water Flowing USgpm

Static water level 37 ft Pressure Head ft

Date tested

Well yield rating Capped

17. DRILLER (CERTIFIED) SURNAME THOMAS FIRST NAME

Signature

18. CONTRACTOR Address Thomas Well Drilling

Member, BCWWA ☐ Yes ☐ No

DUPLICATE

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 9216	Construction Date: 1950-01-01 00:00:00.0
Owner: I J HOOLSEMA	Driller: Nor-West Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: SHUBERT RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 50 (Driller's Estimate) Ga Artesian Flow: Static Level: feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054222 Well: 5	Water Utility: Water Supply System Name: Water Supply System Well Name:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 0.0 inches Well Depth: 306.0 feet Elevation: 0 Bedrock Depth: UNK feet	Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	30	Ft. COARSE SILTY SAND
From	30	to	40	Ft. SAND & GRAVEL
From	40	to	125	Ft. FINE BROWN SAND
From	125	to	142	Ft. COARSE BROWN SAND
From	142	to	155	Ft. SILTY BROWN SAND & GRAVEL,SOME WATER
From	155	to	157	Ft. TILL WITH A LAYER OF SILTY WATER
From	157	to	195	Ft. VERY TIGHT TILL
From	195	to	260	Ft. LAYER OF HARD & LOOSE CONGLOMERATE
From	260	to	290	Ft. TILL WITH SOME WATER
From	290	to	302	Ft. COARSE BROKEN ROCK & GRAVEL
From	302	to	306	Ft. WATER-BEARING

- Return to Main

Information Disclaimer

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 9291	Construction Date: 1950-01-01 00:00:00.0
Owner: CARL F GOWING	Driller: Okanagan Rotary Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 11 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 44 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B1660 Lot: Township: 34 Section: 25Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054222 Well: 6	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 104.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	2 Ft.	SANDY TOPSOIL
From	2	to	18 Ft.	BROWN SAND WITH MICA,VERY RUSTY,MUD
From	0	to	0 Ft.	TURNED RUST RED.
From	18	to	21 Ft.	ROCKS IN BROWN SANDY CLAY,CLAY IS MORE
From	0	to	0 Ft.	OF RED RUST COLOUR.
From	21	to	42 Ft.	BROWN SANDY CLAY
From	42	to	68 Ft.	VERY HARD PACKED GRAY SILTY CLAY
From	68	to	80 Ft.	GRAYISH BEACH SAND,UNDER A MIC. THE SAND
From	0	to	0 Ft.	IS WHITE & BLACK SORT OF MIXED.

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 29166	Construction Date: 1973-11-01 00:00:00.0
Owner: R A MILNE	Driller: Okanagan Water Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area:	Well Yield: 5 (Driller's Estimate) Ga Artesian Flow: Static Level: 46 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B617 Lot: Township: 35 Section: 32Range: Indian Reserve: Meridian: Block: Quarter: NE Island BCGS Number (NAD 27): 082L055113 Well: 2	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 6.0 inches Well Depth: 146.0 feet Elevation: 0 Bedrock Depth: 134 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	12 Ft.	SANDY BROWN CL
From	12	to	46 Ft.	FINE SILTY BROWN SAND COMPACTED,DRY
From	46	to	72 Ft.	FINE SILTY BROWN SAND COMPACTED,
From	0	to	0 Ft.	SOME WATER.
From	72	to	94 Ft.	VERY FINE GRAY SILTY SAND WITH SAND
From	0	to	0 Ft.	PACKING.
From	94	to	124 Ft.	GRAY CLAYISH SILT
From	124	to	134 Ft.	SILTY VERY FINE BEACH SAND
From	134	to	146 Ft.	BEDROCK

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 29167	Construction Date: 1973-11-01 00:00:00.0
Owner: R A MILNE	Driller: Okanagan Water Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area:	Well Yield: 60 (Driller's Estimate) Ga Artesian Flow: Static Level: 52 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B617 Lot: Township: 35 Section: 32Range: Indian Reserve: Meridian: Block: Quarter: NE Island BCGS Number (NAD 27): 082L055113 Well: 3	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 6.0 inches Well Depth: 182.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	6 Ft.	SANDY BROWN CLAY
From	6	to	52 Ft.	FINE SILTY BROWN SAND,COMPACTED,DRY
From	52	to	68 Ft.	FINE SILTY BROWN SAND,SOME WATER
From	68	to	114 Ft.	GRAY SILT HARD VERY COMPACTED
From	114	to	116 Ft.	GREENISH BLUE CLAY
From	116	to	141 Ft.	ROCKY TILL
From	141	to	148 Ft.	SILTY GRAVLE
From	148	to	160 Ft.	ROCKY TILL,CLAY LIGHT GREENISH BLUE
From	0	to	0 Ft.	& SANDY.
From	160	to	165 Ft.	SORT OF GREENISH BLUE & SANDY
From	165	to	180 Ft.	CLEAN GRAVEL WITH SOME FINE BEACH SAND
From	180	to	196 Ft.	ROCKY TILL

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 31279	Construction Date: 1974-09-18 00:00:00.0
Owner: MERVYN LLOYD OLSON	Driller: Okanagan Water Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 52 (Driller's Estimate) Ga Artesian Flow: Static Level: 12 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 97 Plan: B1671 Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054223 Well: 3	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 6.0 inches Well Depth: 138.0 feet Elevation: 0 Bedrock Depth: 133 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	9 Ft.	SILTY WITH A LITTLE SAND,BROWN CLAY
From	9	to	57 Ft.	SILTY GRAYISH CLAY,ALMOST WHITE
From	57	to	92 Ft.	VERY FINE SILTY SAND,VERY LITTLE GRAVEL
From	92	to	119 Ft.	ROCK & GRAVEL IN SILTY FINE SAND
From	119	to	133 Ft.	ROCK & GRAVEL IN COMPACTED SILT,FINE
From	0	to	0 Ft.	SAND & CLAY.
From	133	to	138 Ft.	BEDROCK

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 31280	Construction Date: 1974-09-18 00:00:00.0
Owner: MERVYN LLOYD OLSON	Driller: Okanagan Water Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 0 (Driller's Estimate) Artesian Flow: Static Level: 25 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 97 Plan: B1671 Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054223 Well: 2	Water Utility: Water Supply System Name: Water Supply System Well Name:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 6.0 inches Well Depth: 182.0 feet Elevation: 0 Bedrock Depth: 180 feet	Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	4	Ft. SILTY BROWN CLAY
From	4	to	25	Ft. SILTY SAND
From	25	to	42	Ft. FINE SILTY CLAYISH SAND
From	42	to	76	Ft. VERY FINE SILTY SAND
From	76	to	130	Ft. SILT,SAND,GRAVEL
From	130	to	134	Ft. LIGHT GRAY CLAY
From	134	to	180	Ft. ROCK,GRAVEL & LAYERS OF CLAYISH SAND,
From	0	to	0	Ft. CEMENTED.
From	180	to	182	Ft. BEDROCK

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 31281	Construction Date: 1974-09-18 00:00:00.0
Owner: MERVYN LLYOD OLSON	Driller: Okanagan Water Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: HULLCAR RD.	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate) Artesian Flow: Static Level: 7 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 97 Plan: B1671 Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054224 Well: 5	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 6.0 inches Well Depth: 101.0 feet Elevation: 0 Bedrock Depth: 98 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	7 Ft.	SILTY SAND
From	7	to	28 Ft.	SAND & GRAVEL IN SILTY CLAY
From	28	to	58 Ft.	FINE SILTY WHITE CLAY
From	58	to	73 Ft.	GRAVEL IN FINE,SILTY SAND
From	73	to	91 Ft.	COMPACTED FINE SILTY SAND WITH SOME CLAY
From	91	to	98 Ft.	GRAVEL IN COMPACTED SILTY FINE SAND
From	98	to	101 Ft.	SOLID ROCK,BEDROCK

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 31548

Owner: CARL & GRACE GOWING

Address:

Area: ARMSTRONG

WELL LOCATION:
KAMLOOPS (KDYD) Land District
District Lot: 96 Plan: 1660 Lot: 1
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island
BCGS Number (NAD 27): 082L054222 Well: 8

Class of Well:
Subclass of Well:
Orientation of WEll:
Status of Well: New
Well Use: Unknown Well Use
Observation Well Number:
Observation Well Status:
Construction Method: Unknown Constru
Diameter: 4.0 inches
Well Depth: 162.0 feet
Elevation: 0
Bedrock Depth: UNK feet

Construction Date: 1974-10-29 00:00:00.0

Driller: Okanagan Water Well Drilling
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 60 (Driller's Estimate) Ga
Artesian Flow:
Static Level: 45 feet

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

Surface Seal Flag:
Surface Seal Material:
Surface Seal Method:
Surface Seal Depth:
Surface Seal Thickness:

Lithology Info Flag:
Pump Test Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):
Site Info Details:
Other Info Flag:
Other Info Details:

GENERAL REMARKS:

From	0	to	7 Ft.	SANDY CLAY
From	7	to	41 Ft.	DRY FINE SAND
From	41	to	137 Ft.	VERY FINE SILTY SAND WITH VERY LITTLE
From	0	to	0 Ft.	CLAY.
From	137	to	148 Ft.	SILT SAND & GRAVEL
From	148	to	159 Ft.	CLEAN GRAVEL
From	159	to	162 Ft.	SILT SAND & GRAVEL

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 32872	Construction Date: 1975-07-03 00:00:00.0
Owner: RIEMER	Driller: Stewart Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: DEEP CREEK	PRODUCTION DATA AT TIME OF DRILLING:
Area:	Well Yield: 12 (Driller's Estimate) Ga Artesian Flow: Static Level: 45 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054241 Well: 2	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 4.5 inches Well Depth: 150.0 feet Elevation: 0 Bedrock Depth: 150 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
DRAWDOWN AT 72 FEET.

From	0 to	55 Ft.	SAND & SILT
From	55 to	119 Ft.	BLUE CLAY
From	119 to	122 Ft.	SAND
From	122 to	150 Ft.	SILT WITH SOME SAND
From	150 to	0 Ft.	QUARTZITE ROCK

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 41474	Construction Date: 1979-01-01 00:00:00.0
Owner: DOUG REGEHR	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 250 (Driller's Estimate) Ga Artesian Flow: Static Level: 48 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 35 Section: 25Range: Indian Reserve: Meridian: Block: Quarter: NE Island BCGS Number (NAD 27): 082L054222 Well: 1	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 126.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	48 Ft.	DRY SAND GRAVEL
From	48	to	73 Ft.	SILT
From	73	to	126 Ft.	WATER-BEARING SAND

- Return to Main

WTN 41474

Province of British Columbia — Ministry of Environment — Water Investigations Branch

WATER WELL RECORD

Date 1801

Legal Description & Address: UTM Co-ordinates 11U 0312614 5483832

Descriptive Location: 5042 Schubert Road Armstrong, BC

Owners Name & Address: Doug Regehr Well #1

NTS MAP — ELEV 571m — WELL No. — Date 19__

1. TYPE OF WORK: 1 [X] New Well; 2 [ ] Reconditioned; 3 [ ] Deepened; 4 [ ] Abandoned

2. WORK METHOD: 1 [X] Cable tool; 2 [ ] Bored; 3 [ ] Jetted; 4 [ ] Rotary; 5 [ ] Dug; 6 [ ] Reverse; 7 [ ] Other

3. WATER WELL USE: 1 [ ] Domestic; 2 [ ] Municipal; 3 [ ] Irrigation; 4 [ ] Commercial & Industrial; 5 [ ] Other

4. DRILLING ADDITIVES

5. MEASUREMENTS from 1 [ ] ground level 2 [ ] top of casing

FROM ft	TO ft	6. WELL LOG DESCRIPTION	SWL ft
0	48	DRY SAND + GRAVEL	
48	73	SILT	
73	126	WATER BEARING SAND	

9. CASING: Materials 1 [X] Steel; 2 [ ] Galvanized; 3 [ ] Wood; 4 [ ] Plastic; 5 [ ] Concrete; 6 [ ] Other

		units
Diameter	8	ins
from	0	ft
to	93	ft
Thickness	.250	ins
Weight		lb/ft

Pitless unit ___ ft 1 [ ] above 2 [ ] below ground level

1 [X] Welded; 2 [ ] Cemented; 3 [ ] Threaded; 4 [ ] New; 5 [ ] Used

Perforations:

Shoe(s):

Open hole, from ___ to ___ ft Diameter ___ ins

Grout:

10. SCREEN: 1 [X] Nominal 2 [ ] Pipe Size

Type 1 [X] Continuous Slot 2 [ ] Perforated 3 [ ] Louvre 4 [ ] Other

Material 1 [X] Stainless Steel 2 [ ] Plastic 3 [ ] Other

Set from 83 to 126 ft below ground level

SCREEN & BLANKS		units
Length	33	ft
Diam. I.D.	7	ins
Slot Size		
from		ft
to		ft

Fittings, top ___ bottom ___

Gravel Pack

11. DEVELOPED BY: 1 [X] Surging 2 [ ] Jetting 3 [ ] Air 4 [ ] Bailing 5 [ ] Pumping 6 [ ] Other

12. TEST: 1 [X] Pump 2 [ ] Bail Date 80

250 gpm Temp ___ SWL before test ___ ft

ft after test of ___ hrs ___ mins

Time in mins & drawdown in ft — Time in mins & recovery in ft

14. WATER TYPE: 1 [ ] Fresh 2 [ ] Salty 3 [ ] Clear 4 [ ] Cloudy

15. WATER ANALYSIS:

16. FINAL WELL COMPLETION DATA

Total depth 126 ft — Water Flowing ___ gpm

48 ft — Pressure Head ___ ft

Capped

17. DRILLER (please print): Surname RAMSEY — First name SHANE

Signature

18. CONTRACTOR, Address: THOMAS WELL DRILLING LUMBY B.C.

Member B.C.W.W.D.A. [ ] yes [ ] no

Doug R

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 44872	Construction Date: 1980-04-25 00:00:00.0
Owner: DOUG REGEHR	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: SHUBERT RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 400 (Driller's Estimate) Ga Artesian Flow: Static Level: feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B4541 Lot: 13 Township: 35 Section: 25Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 1	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 121.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	10 Ft.	DRY GRAVEL
From	10	to	40 Ft.	TILL
From	40	to	66 Ft.	SILT
From	66	to	121 Ft.	WATER-BEARING SAND

- Return to Main

Information Disclaimer

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WTN 44872

Province of British Columbia — Ministry of Environment — Water Investigations Branch

WATER WELL RECORD

Date 80

Legal Description & Address: 5042 Schubert Road Armstrong, BC

Descriptive Location:

Owners Name & Address: Doug Regehr

N.T.S. MAP: 34246 4E 559775 9N — ELEV — WELL No. 3 — Date 1980

1. TYPE OF WORK: 1 ☑ New Well 2 ☐ Reconditioned 3 ☐ Deepened 4 ☐ Abandoned

2. WORK METHOD: 1 ☒ Cable tool 2 ☐ Bored 3 ☐ Jetted 4 ☐ Rotary 6 ☐ Jaed 5 ☐ ... 6 ☐ Reverse 5 ☐ Other

3. WATER WELL USE: 1 ☐ Domestic 2 ☐ Municipal 3 ☐ Irrigation 4 ☐ Commercial & Industrial 5 ☐ Other

4. DRILLING ADDITIVES

5. MEASUREMENTS from 1 ☐ ground level 2 ☐ top of casing

FROM ft	TO ft	6. WELL LOG DESCRIPTION	SWL ft
0	10	DRY GRAVEL	
12	40	TILL	
40	66	SILT	
66	121	WATER BEARING SAND	

9. CASING: Materials 1 ☑ Steel 2 ☐ Galvanized 3 ☐ Wood 4 ☐ Plastic 5 ☐ Concrete 6 ☐ Other

		units
Diameter	8	ins
from		ft
to	121	ft
Thickness	.250	ins
Weight		lb/ft

Pitless unit ___ ft 1 ☐ above 2 ☐ below ground level

1 ☐ Welded 2 ☐ Cemented 3 ☐ Threaded 4 ☐ New 5 ☐ Used

Perforations:

Shoe(s):

Open hole, from ___ to ___ ft Diameter ___ ins

Grout

10. SCREEN: 1 ☒ Nominal 2 ☐ Pipe Size

Type 1 ☒ Continuous Slot 2 ☐ Perforated 3 ☐ Louvre 4 ☐ Other

Material 1 ☐ Stainless Steel 2 ☐ Plastic 3 ☐ Other

Set from 81 to 121 ft below ground level

SCREEN & BLANKS

		units
Length		ft
Diam. I.D.		ins
Slot Size		ins
from	55	ft
to	121	ft

Fittings, top K bottom

Gravel Pack

11. DEVELOPED BY: 1 ☐ Surging 2 ☐ Jetting 3 ☐ Air 4 ☐ Bailing 5 ☐ Pumping 6 ☐ Other

12. TEST 1 ☐ Pump 2 ☐ Bail Date 80

Rate 400 USgpm Temp ___ °C SWL before Test ___ ft

24 ft after test of 8 hrs ___ mins

TIME in mins & DRAWDOWN in ft — TIME in mins & RECOVERY in ft

14. WATER TYPE: 1 ☐ Fresh 2 ☐ Salty 3 ☐ Odour 4 ☐ ...

15. WATER ANALYSIS: 1 ☐ Hardness 2 ☐ ... 3 ☐ Chloride

Field Test / Lab Test

FINAL WELL COMPLETION DATA

FINAL WELL COMPLETION DATA

Water Flowing ___ USgpm

28 ft Pressure Head ___ ft

Well Completion: capped

17. DRILLER (please print) Surname: RAMSAY First Name:

Signature

18. CONTRACTOR, Address

THOMAS WELL DRILLING LUMBY BC

Member BCWWDA Yes ☐ No ☐

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 45563	Construction Date: 1980-07-12 00:00:00.0
Owner: E SORENSEN	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: HULLCAR RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 200 (Driller's Estimate) Ga Artesian Flow: Static Level: 51 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: 12 Township: 35 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 5	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 112.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	23 Ft.	DRY SAND
From	23	to	50 Ft.	TILL
From	50	to	80 Ft.	TIGHT WATER-BEARING GRAVEL
From	80	to	112 Ft.	WATER-BEARING GRAVEL

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 46540	Construction Date: 1980-11-03 00:00:00.0
Owner: DOUG REGEHR	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: SCHUBERT ROAD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 250 (Driller's Estimate) Ga Artesian Flow: Static Level: feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 35 Section: 25Range: Indian Reserve: Meridian: Block: Quarter: NE Island BCGS Number (NAD 27): 082L054222 Well: 2	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 155.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
DRAWDOWN AT 35 FEET.

From	0	to	50 Ft.	SANDY TILL
From	50	to	72 Ft.	SILT
From	72	to	145 Ft.	WATER-BEARING SAND
From	145	to	155 Ft.	CLAY

- Return to Main

WTN 46540

Province of British Columbia Ministry of Environment Water Investigations Branch

WATER WELL RECORD

Date

Legal Description & Address: 5042 Schubert Road Armstrong, B C well #2

Description of Well Location: well #2

Owner's Name & Address: DOUG REGEHR

N.T.S. MAP | ELEV 1564 | WELL No. 2

3 1 2 0 1 4 E 5 4 8 3 8 3 2 N | Date 19

1. TYPE OF WORK: 1 ☑ New Well 2 ☐ Reconditioned 3 ☐ Deepened 4 ☐ Abandoned

2. WORK METHOD: 1 ☑ Cable Tool 2 ☐ Bored 3 ☐ Jetted 4 ☐ Rotary 5 ☐ Dug 6 ☐ Air 7 ☐ Driven 8 ☐ Other

3. WATER WELL USE: 1 ☐ Domestic 2 ☐ Municipal 3 ☐ Irrigation 4 ☐ Commercial & Industrial 5 ☐ Other

4. DRILLING ADDITIVES

5. MEASUREMENTS from 1 ☐ ground level 2 ☐ top of casing

FROM ft	TO ft	6. WELL LOG DESCRIPTION	SWL ft
0	50	SANDY TILL	
50	72	SILT	
72	140	SAND	
140	155	CLAY	

8 gal Draw Down

9. CASING: Materials 1 ☑ Steel 2 ☐ Galvanized 3 ☐ Wood 4 ☐ Plastic 5 ☐ Concrete 6 ☐ Other

							units
Diameter	8						ins
from	0						ft
to	155						ft
Thickness	.250						ins
Weight							lb/ft

Pitless unit ___ ft 1 ☐ above 2 ☐ below ground level

1 ☐ Welded 2 ☐ Cemented 3 ☐ Threaded 4 ☐ New 5 ☐ Used

Perforations:

Shoe (s): 1

Open hole, from ___ to ___ ft Diameter ___ ins

Grout

10. SCREEN: 1 ☑ Nominal 2 ☐ Pipe Size

Type 1 ☑ Continuous Slot 2 ☐ Perforated 3 ☐ Louvre 4 ☐ Other

Material 1 ☑ Stainless Steel 2 ☐ Plastic 3 ☐ Other

Set from 81 to 107 ft below ground level

SCREEN & BLANKS

							units
Length							
Diam. I.D.							ins
Slot Size							ins
from							ft
to							ft

Fittings, top ___ K ___ bottom ___

Gravel Pack

11. DEVELOPED BY: 1 ☑ Surging 2 ☐ Jetting 3 ☐ Air 4 ☐ Bailing 5 ☐ Pumping 6 ☐ Other

12. TEST 1 ☑ Pump 2 ☐ Bail Time 82

Rate 250 USgpm Temp. ___ °C SWL before test ___ ft

80 ft after test of 7 hrs 30 mins

13. WATER TYPE: 1 ☑ Fresh 2 ☐ Salty 3 ☐ Clear 4 ☐ Cloudy

14. WATER ANALYSIS

16. PRODUCTION DATA

17. DRILLER: RAMSAY SHANE

Signature

18. CONTRACTOR, Address: TOMAS WELL DRILLING.

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 48180	Construction Date: 1981-06-04 00:00:00.0
Owner: PETER STOBBE	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 500 (Driller's Estimate) Ga Artesian Flow: Static Level: 270 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 28066 Lot: 2 Township: 35 Section: 30Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054222 Well: 4	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 325.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	35 Ft.	SILTY SAND
From	35	to	50 Ft.	SAND & GRAVEL
From	50	to	130 Ft.	FINE BROWN SAND
From	130	to	145 Ft.	SAND & GRAVEL
From	145	to	160 Ft.	BROWN SAMD
From	160	to	190 Ft.	TILL
From	190	to	280 Ft.	TILL WITH SILTY WATER
From	280	to	295 Ft.	TILL
From	295	to	311 Ft.	FAIRLY CLEAN SAND & GRAVEL
From	311	to	314 Ft.	DIRTY GRAVEL WITH BALLS OF BROWN CLAY
From	314	to	322 Ft.	CLEAN GRAVEL WITH BROKEN ROCK
From	322	to	325 Ft.	DIRTY GRAVEL

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 50329	Construction Date: 1982-05-29 00:00:00.0
Owner: ADOLPH RUSCHEINSKI	Driller: H. Hadland Well Identification Plate Number:
Address: HULCAR AREA	Plate Attached By: Where Plate Attached:
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 20 (Driller's Estimate) Ga
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 4317D Lot: Township: 18 Section: 17Range: 9 Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054224 Well: 3	Artesian Flow: Static Level: 50 feet Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Unknown Constru Diameter: 5.5 inches Well Depth: 160.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	2 Ft.	TOPSOIL
From	2	to	8 Ft.	SANDY CLAY
From	8	to	15 Ft.	SANDY CLAY & GRAVEL
From	15	to	35 Ft.	DRY SAND
From	35	to	43 Ft.	SAND & GRAVEL
From	43	to	50 Ft.	CLAY & GRAVBEL
From	50	to	53 Ft.	SAND & GRAVEL SOME WATER
From	53	to	147 Ft.	FINE SAND WATER
From	147	to	160 Ft.	FINE SAND & COARSE SAND & BITS OF GRAVEL

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 62395	Construction Date: 1985-09-14 00:00:00.0
Owner: KEN ROGEHR	Driller: Stewart Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: HOLE #2, HULLCAR/MATHESON RDS	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 4 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 52 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 48 Plan: Lot: Township: 19 Section: 33Range: 9 Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L044433 Well: 5	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Abandoned Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 245.0 feet Elevation: 0 Bedrock Depth: feet	Lithology Info Flag: Pump Test Info Flag: Y File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
ABANDONED SILTY

From	0	to	35 Ft.	Coarse sand & gravel
From	35	to	71 Ft.	Silt, clay layers & sand
From	71	to	97 Ft.	Gravel & silt
From	97	to	162 Ft.	Silt, clay & sand
From	162	to	240 Ft.	Hard silty sand, gravel & clay

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 62401	Construction Date: 1985-10-04 00:00:00.0
Owner: KEN REGEHR	Driller: Stewart Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: HOLE #4, HULLCAR ROAD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 4 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 108 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 48 Plan: Lot: Township: 29 Section: 33Range: 9 Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L044434 Well: 6	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Abandoned Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 173.0 feet Elevation: 0 Bedrock Depth: feet	Lithology Info Flag: Pump Test Info Flag: Y File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
WELL ABANDONED, SILTY

From	0	to	68 Ft.	Gravel, boulders & clay
From	68	to	144 Ft.	Brown & blue clay
From	144	to	165 Ft.	Brown silty sand
From	165	to	173 Ft.	Clay

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 62439	Construction Date: 1975-01-29 00:00:00.0
Owner: RAY BROOK	Driller: Pacific Water Wells Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: CANYON ROAD, LOT N 1/3 - NE1/4	
Area: ENDERBY	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 20 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 70 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 35 Section: 32Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L055113 Well: 5	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 207.0 feet Elevation: 0 Bedrock Depth: 9 feet	Lithology Info Flag: Pump Test Info Flag: Y File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	68 Ft.	Dry sand w/ gravel layers
From	68	to	80 Ft.	null
From	80	to	85 Ft.	Silty sand
From	85	to	153 Ft.	Compacted gravel & clay
From	153	to	173 Ft.	Silty sand, water-bearing
From	173	to	183 Ft.	Till
From	183	to	185 Ft.	Water-bearing
From	185	to	198 Ft.	Till w/ sand layers
From	198	to	207 Ft.	Bedrock

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 62440	Construction Date: 1993-06-23 00:00:00.0
Owner: ALFRED J GIESBECHT	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: CANNON ROAD, LOT NW 1/4	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 20 (Driller's Estimate) Ga Artesian Flow: 0 Static Level: 69 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B617 Lot: Township: 35 Section: 32Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L055113 Well: 6	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 136.0 feet Elevation: 0 Bedrock Depth: feet	Lithology Info Flag: Pump Test Info Flag: Y File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	60 Ft.	Red sand
From	60	to	115 Ft.	Silty sand
From	115	to	136 Ft.	Sand

- Return to Main

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 62446	Construction Date: 1981-11-19 00:00:00.0
Owner: ERNIE BARTELL	Driller: Stewart Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: BARBER ROAD OFF DEEP CREEK RD	
Area: SALMON ARM	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 10 (Driller's Estimate) Gallons Artesian Flow: 0 Static Level: feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 18 Section: 19Range: 9 Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054243 Well: 6	Water Utility: N Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: N Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 82.0 feet Elevation: 0 Bedrock Depth: 2 feet	Lithology Info Flag: N Pump Test Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM): N Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
ARTESIAN WELL

From	0	to	68 Ft.	Soft clay
From	68	to	72 Ft.	Hardpan
From	72	to	80 Ft.	Sand & gravel
From	80	to	82 Ft.	Bedrock

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 63179

Owner: CURTIS FARMS

Address: 5058 PARKSINSON ROAD

Area: ARMSTRONG

WELL LOCATION:
KAMLOOPS (KDYD) Land District
District Lot: Plan: B1137 Lot:
Township: 34 Section: 26Range:
Indian Reserve: Meridian: Block:
Quarter:
Island
BCGS Number (NAD 27): 082L054221 Well: 11

Class of Well:
Subclass of Well:
Orientation of WEll:
Status of Well: New
Well Use: Other
Observation Well Number:
Observation Well Status:
Construction Method: Drilled
Diameter: 6.0 inches
Well Depth: 114.0 feet
Elevation: 0
Bedrock Depth: 0 feet

Construction Date: 1996-08-30 00:00:00.0

Driller: Dan Gare Drilling
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 15 (Driller's Estimate) U
Artesian Flow: 0
Static Level: 49 feet

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

Surface Seal Flag:
Surface Seal Material:
Surface Seal Method:
Surface Seal Depth:
Surface Seal Thickness:

Lithology Info Flag:
Pump Test Info Flag:
File Info Flag:
Sieve Info Flag:
Screen Info Flag:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):
Site Info Details:
Other Info Flag:
Other Info Details:

GENERAL REMARKS:

From	0	to	10 Ft.	Clay
From	10	to	50 Ft.	Sand
From	50	to	95 Ft.	Silt & Clay
From	95	to	114 Ft.	Sand (fine)
From	1114	to	0 Ft.	Gravel, Fine Sand, & Silt

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 63180	Construction Date: 1995-03-09 00:00:00.0
Owner: CURTIS FARMS	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: 5162 PARKINSON ROAD	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 100 (Driller's Estimate) U Artesian Flow: 0 Static Level: 0 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 50 Plan: B4541 Lot: PC11 Township: 34 Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 12	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Other Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 110.0 feet Elevation: 0 Bedrock Depth: 0 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
THIS LOG IS FOR A PUMP TEST

From	0	to	12 Ft.	CLAY WITH SMALL ROCKS
From	12	to	20 Ft.	RED SAND & GRAVEL
From	20	to	55 Ft.	BLUE FINE SAND & SILT
From	55	to	75 Ft.	COARSE SAND
From	75	to	105 Ft.	FINE SAND & SILT
From	105	to	110 Ft.	CLAY & ROCKS (TILL)

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 82429

Owner: KREBBERS

Address: KNOB HILL RD

Area: ARMSTRONG

WELL LOCATION:
KAMLOOPS (KDYD) Land District
District Lot: Plan: CG2419 Lot:
Township: 34 Section: 25Range:
Indian Reserve: Meridian: Block:
Quarter: SW
Island
BCGS Number (NAD 27): 082L054221 Well: 14

Class of Well:
Subclass of Well:
Orientation of WEll:
Status of Well: New
Well Use: Unknown Well Use
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Well Depth: 105 feet
Elevation:
Bedrock Depth: feet
Screen from 90 to 105 feet Slot Size 80

Construction Date: 1978-01-01 00:00:0(

Driller: Thomas Well Drilling
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 300 (Driller's Estimate
Artesian Flow:
Static Level: 30 feet

Water Utility: N
Water Supply System Name:
Water Supply System Well Name:

Surface Seal Flag: N
Surface Seal Material:
Surface Seal Method:
Surface Seal Depth:
Surface Seal Thickness:

Lithology Info Flag: Y
Pump Test Info Flag: N
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N
Site Info Details:
Other Info Flag:
Other Info Details:

GENERAL REMARKS:

From 0 to 25 Ft. DRY SAND
From 25 to 70 Ft. TILL
From 70 to 105 Ft. WATER BEARING GRAVEL

- Return to Main

WELL LOGS FOR UNCONFINED AQUIFER

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 174	Construction Date:
Owner: CURTIS	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: PARKINSON RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 60 (Driller's Estimate) Ga Artesian Flow: Static Level: 8 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: SE Island BCGS Number (NAD 27): 082L054221 Well: 9	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 7.0 inches Well Depth: 37.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	4 Ft.	TOPSOIL
From	4	to	37 Ft.	SAND & GRAVEL

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 1827 Owner: W KOERSEN Address: Area: ENDERBY WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 18 Section: 18Range: Indian Reserve: Meridian: Block: Quarter: SW Island BCGS Number (NAD 27): 082L054241 Well: 4 Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Dug Diameter: 0.0 inches Well Depth: 20.0 feet Elevation: 0 Bedrock Depth: UNK feet	Construction Date: 1937-01-01 00:00:00.0 Driller: Unknown Well Identification Plate Number: Plate Attached By: Where Plate Attached: PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate) Artesian Flow: Static Level: 17 feet Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	10 Ft.	CLAY
From	10	to	18 Ft.	GRAVEL
From	18	to	20 Ft.	WATER-BEARING SAND

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 9058 Owner: JOHN JONES Address: Area: ENDERBY WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 18 Section: 18Range: Indian Reserve: Meridian: Block: Quarter: SW Island BCGS Number (NAD 27): 082L054223 Well: 1 Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Dug Diameter: 0.0 inches Well Depth: 35.0 feet Elevation: 0 Bedrock Depth: UNK feet	Construction Date: 1950-01-01 00:00:00.0 Driller: Unknown Well Identification Plate Number: Plate Attached By: Where Plate Attached: PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate) Artesian Flow: Static Level: 30 feet Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:
GENERAL REMARKS: From 0 to 35 Ft. CLAY & HARDPAN	

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 19193	Construction Date: 1965-03-01 00:00:00.0
Owner: ERNIE WILLIAMS	Driller: Art Moore & Son Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: SALMON RIVER IR	
Area:	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 10 (Driller's Estimate) In Artesian Flow: Static Level: 15 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: 29 Township: Section: Range: Indian Reserve: 1 Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L044434 Well: 4	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Well Depth: 35.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
DRAWDOWN AT 39 INCHES,RECOVERY IN 1 MINUTE.

From	0	to	3 Ft.	TOPSOIL
From	3	to	25 Ft.	GRAVEL & CLAY
From	25	to	32 Ft.	COARSE SAND SOME SILT & CLAY
From	32	to	35 Ft.	GRAY CLAY

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 19504	Construction Date: 1965-10-01 00:00:00.0
Owner: GROUNDWATER DIVISION	Driller: Sedco Exploration Ltd. Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	PRODUCTION DATA AT TIME OF DRILLING:
Area:	Well Yield: 0 (Driller's Estimate) Artesian Flow: Static Level: feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 7	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 154.0 feet Elevation: 0 Bedrock Depth: 154 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	3 Ft.	SILT LAKE BEDS
From	3	to	6 Ft.	MIXTURE OF SAND & GRAVEL,SILTY MATERIAL
From	0	to	0 Ft.	FEW SHELLS.
From	6	to	20 Ft.	GRAVEL & SAND RUSTY WEATHERED LOOKING,
From	0	to	0 Ft.	CaCO3 COATING ON SOME PEBBLES.
From	20	to	154 Ft.	GRAVEL & SAND FEW CLAY CLASTS,ROCK

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 44169	Construction Date: 1980-01-01 00:00:00.0
Owner: KIRBY PAUL	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: OLD KAMLOOPS RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 560 (Driller's Estimate) Ga Artesian Flow: Static Level: 7 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: 35 Section: 23Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L044434 Well: 3	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 0.0 inches Well Depth: 70.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0 to	8 Ft.	TOPSOIL
From	8 to	12 Ft.	GRAVEL
From	12 to	14 Ft.	WATER-BEARING SAND & GRAVEL
From	14 to	25 Ft.	SILTY CLAY LIKE GRAVEL & SAND
From	25 to	70 Ft.	WATER-BEARING SAND & GRAVEL
From	70 to	75 Ft.	SILTY SAND

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 44170	Construction Date: 1980-01-01 00:00:00.0
Owner: KEN REGIER REGEHR	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: MATHESON RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 550 (Driller's Estimate) GPM Artesian Flow: Static Level: 27 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: Lot: Township: Section: Range: Indian Reserve: 1 Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L044433 Well: 2	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 12.0 inches Well Depth: 76.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	27 Ft.	DRY SAND & GRAVEL
From	27	to	76 Ft.	WATER-BEARING SAND & GRAVEL
From	76	to	78 Ft.	SILTY SAND & GRAVEL

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 46355	Construction Date: 1980-10-11 00:00:00.0
Owner: ERIC SORENSON	Driller: Thomas Well Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 235 (Driller's Estimate) Ga Artesian Flow: Static Level: 12 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: 50 Plan: B4541 Lot: Township: Section: Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 4	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 84.0 feet Elevation: 0 Bedrock Depth: UNK feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	3 Ft.	TOPSOIL
From	3	to	7 Ft.	DRY GRAVEL
From	7	to	27 Ft.	DRY SAND
From	27	to	84 Ft.	WATER-BEARING SAND,CLAY

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 50316	Construction Date: 1982-05-26 00:00:00.0
Owner: LORNE LONG	Driller: McHarg Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: PARKINSON RD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 300 (Driller's Estimate) G Artesian Flow: 0 Static Level: 9 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 6723 Lot: A Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054212 Well: 18	Water Utility: Water Supply System Name: Water Supply System Well Name:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Unknown Well Use Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 58.0 feet Elevation: 0 Bedrock Depth: UNK feet	Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0 to	4 Ft.	CLAY & ROCKS
From	4 to	40 Ft.	SAND
From	40 to	60 Ft.	SAND & GRAVEL

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 63176	Construction Date: 1995-01-31 00:00:00.0
Owner: PETE MILNER	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: 5071 PARKINSON ROAD	PRODUCTION DATA AT TIME OF DRILLING:
Area: ARMSTRONG	Well Yield: 250 (Driller's Estimate) U Artesian Flow: 0 Static Level: 8 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 18795 Lot: 1 Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054212 Well: 20	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Other Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.0 inches Well Depth: 60.0 feet Elevation: 0 Bedrock Depth: 0 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From 0 to 60 Ft. Clean Sand

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 63177	Construction Date: 1995-03-23 00:00:00.0
Owner: PETE MILNER	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: 5071 PARKINSON ROAD	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 60 (Driller's Estimate) U Artesian Flow: 0 Static Level: 23 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 18795 Lot: 1 Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054212 Well: 21	Water Utility: N Water Supply System Name: Water Supply System Well Name:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Other Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Well Depth: 58.0 feet Elevation: 0 Bedrock Depth: 0 feet	Surface Seal Flag: N Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: N Pump Test Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM): N Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From	0	to	25 Ft.	Red Sand
From	25	to	40 Ft.	Fine Sand
From	40	to	58 Ft.	Coarse Sand

- Return to Main

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 63178	Construction Date: 1995-02-06 00:00:00.0
Owner: GEORGE CURTIS	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address: 5058 PARKINSON ROAD	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 0 (Driller's Estimate) Artesian Flow: 0 Static Level: 9 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: B1137 Lot: Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054221 Well: 10	Water Utility: Water Supply System Name: Water Supply System Well Name: Surface Seal Flag: Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Irrigation Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 8.6 inches Well Depth: 76.0 feet Elevation: 0 Bedrock Depth: 0 feet	Lithology Info Flag: Pump Test Info Flag: File Info Flag: Sieve Info Flag: Screen Info Flag: Water Chemistry Info Flag: Field Chemistry Info Flag: Site Info (SEAM): Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:

From 0 to 15 Ft. Clay
From 15 to 76 Ft. Sand (Clean)

- Return to Main

Information Disclaimer

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BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 67911	Construction Date: 1995-01-31 00:00:00.0
Owner: PETE MILNER	Driller: Dan Gare Drilling Well Identification Plate Number: Plate Attached By: Where Plate Attached:
Address:	
Area: ARMSTRONG	PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 250 (Driller's Estimate) Artesian Flow: 0 Static Level: 8 feet
WELL LOCATION: KAMLOOPS (KDYD) Land District District Lot: Plan: 18795 Lot: 1 Township: 34 Section: 26Range: Indian Reserve: Meridian: Block: Quarter: Island BCGS Number (NAD 27): 082L054212 Well: 22	Water Utility: N Water Supply System Name: Water Supply System Well Name:
Class of Well: Subclass of Well: Orientation of WEll: Status of Well: New Well Use: Domestic Observation Well Number: Observation Well Status: Construction Method: Drilled Diameter: 6.0 inches Well Depth: 56.0 feet Elevation: 0 Bedrock Depth: feet	Surface Seal Flag: N Surface Seal Material: Surface Seal Method: Surface Seal Depth: Surface Seal Thickness: Lithology Info Flag: N Pump Test Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM): N Site Info Details: Other Info Flag: Other Info Details:

GENERAL REMARKS:
20 FT EAST OF WEST BORDER, STEEL CASING +2 TO 46 DRILLER: FRESH CLEAR WATER

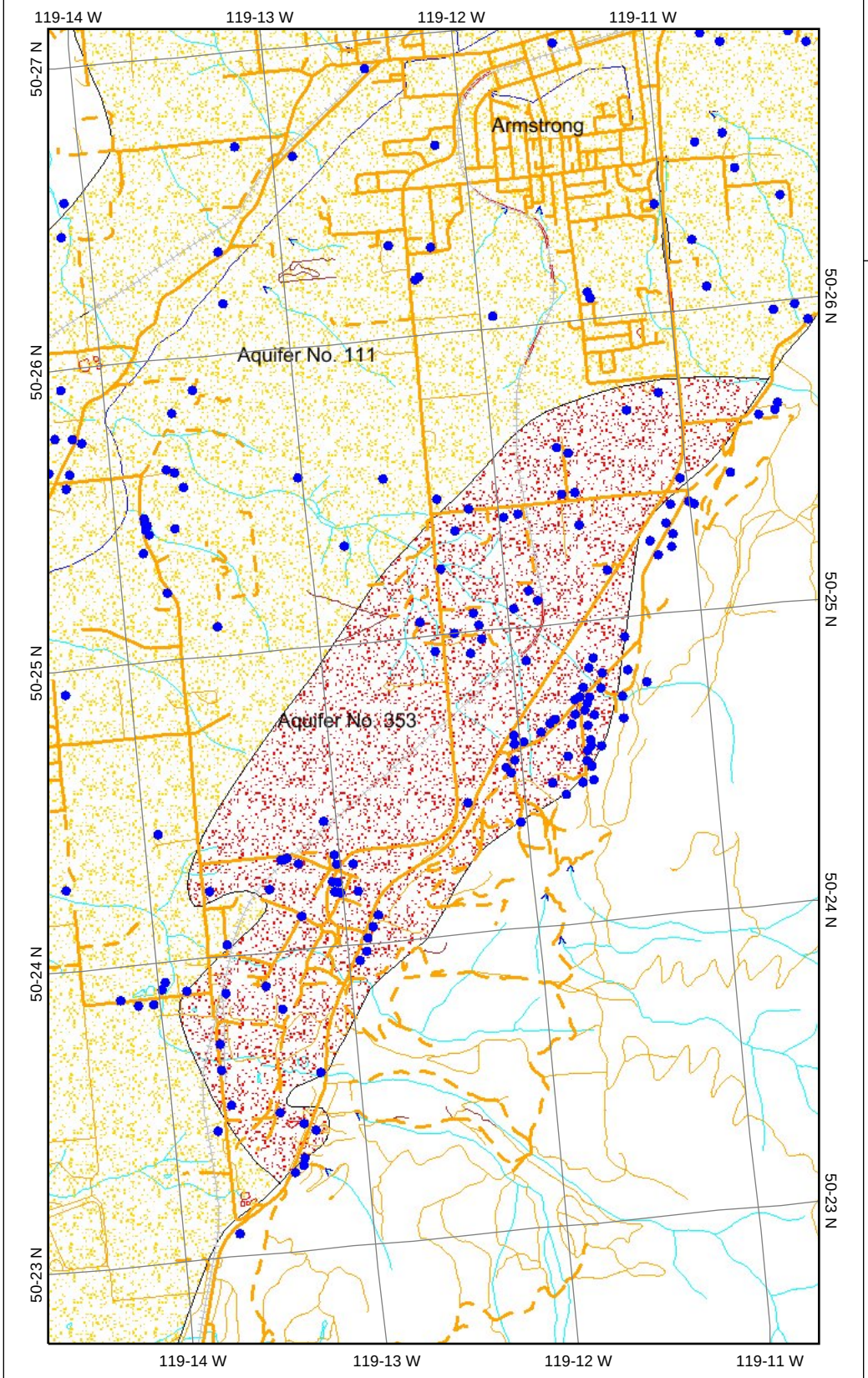
From 0 to 60 Ft. CLEAN SAND

- Return to Main

APPENDIX II

MAP OF WELLS AND AQUIFERS IN EAGLE ROCK STUDY AREA

Wells and Aquifers Near Eagle Rock Study Area



Map center: 50° 24' 50" N, 119° 12' 25" W

Legend

- WDIC - Waterbody Poly
- Water Wells

Aquifer Productivity

- Bedrock, High Productivity
- Bedrock, Moderate Productivity
- Bedrock, Low Productivity
- Unconsolidated, High Productivity
- Unconsolidated, Moderate Productivity
- Unconsolidated, Low Productivity

Transportation - Points (TRIM)

- Helipad

Transportation - Lines (TRIM)

- Airfield
- Airport
- Airstrip
- Airport.Abandoned
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U/C - 1 Lane
- Road (Gravel Undivided) - U/C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U/C - Not Elevated - 2 Lanes Each Way
- Road (Paved Undivided) - Not Elevated - 1 Lane
- Road (Paved Undivided) - Not Elevated - 2 Lanes
- Road (Paved Undivided) - Not Elevated - 4 Lanes
- Road (Paved Undivided) - U/C - Not Elevated - 4 Lanes
- Road (Unimproved)
- Cut (Roadway)
- Embankment/Fill (Roadway)
- Trail
- Bridge - Foot
- Bridge - Trestle
- Tunnel
- Bridge
- Rail Line (Double Track)
- Rail Line (Multiple Track)
- Rail Line (Single Track)
- Rail Line - Abandoned Track
- Spur

Water - Points (TRIM)

- Rapids
- Dam
- Flooded Land - Inundated
- Marsh
- Swamp

Scale: 1:39,054

APPENDIX III

WELL INFORMATION OBTAINED FROM MOE WATER WELL SURVEY

Location	Well No.	Well Tag No.	Easting	Northing	Elevation (m)	Well In Hullcar Study Area	Date of Visit	Info. Source	Well Type	Artesian	Springs nearby	Depth (feet)	SWL (feet)[1]	Time of year SWL taken	Screen depth (feet)	Pump depth (feet)
Location #1	1	none	339098	5595907	515	yes	22-Sep-05	2	drilled	no	yes	50	15	avg	unk.	unk.
Location #1	2	none	339116	5595909	513	yes	22-Sep-05	2	drilled	no	yes	50	15	avg	unk.	unk.
Location #1	3	none	339136	5595898	513	yes	22-Sep-05	2	drilled	no	yes	70	15	avg	unk.	unk.
Location #1	4	none	339155	5595888	513	yes	22-Sep-05	2	drilled	no	yes	70	15	avg	unk.	unk.
Location #1	5	none	339168	5595888	511	yes	22-Sep-05	2	drilled	no	yes	70	15	avg	unk.	unk.
Location #1	6	none	338188	5595753	518	yes	22-Sep-05	2	drilled	no	yes	70	15	avg	unk.	unk.
Location #1	7	none	338246	5595653	512	yes	22-Sep-05	2	drilled	no	yes	70	15	avg	unk.	unk.
Location #1	8	62395	338226	5595439	unk.	yes	22-Sep-05	3	drilled	no	yes	245	52	Sep	N/A	N/A
Location #1	9	62396	338269	5595356	unk.	yes	22-Sep-05	3	drilled	no	yes	184	64	Oct	N/A	N/A
Location #1	10	41506	338413	5595980	unk.	yes	22-Sep-05	3	drilled	no	yes	173	unk.	Jan	N/A	N/A
Location #1	11	19193	338982	5595949	unk.	yes	22-Sep-05	3	drilled	no	yes	35	15	Mar	N/A	N/A
Location #2	1	none	346017	5594232	370	yes	21-Sep-05	2	drilled	no	yes	400	dry	N/A	unk.	unk.
Location #2	2	none	346287	5595280	unk.	yes	21-Sep-05	2	drilled	yes	yes	85	+	unk.	unk.	unk.
Location #2	3	none	346204	5595208	320	yes	21-Sep-05	2	drilled	yes	yes	130	+2.5	avg	unk.	unk.
Location #2	4	none	346292	5595362	318	yes	21-Sep-05	2	drilled	yes	yes	130	+2.5	avg	unk.	unk.
Location #2	5	none	346311	5595391	412	yes	21-Sep-05	2	drilled	yes	yes	130	+1	avg	unk.	unk.
Location #2	6	63174	346116	5594518	unk.	yes	21-Sep-05	3	drilled	no	yes	190	10	Jun	unk.	unk.
Location #3	1	41502	337203	5584533	380	no	27-Sep-05	4	drilled	no	no	425	276.5	Jan	410	unk.
Location #3	2	45000	337578	5584521	307	no	27-Sep-05	4	drilled	no	no	108	70.32	May	95	unk.
Location #3	3	45688	337653	5584457	320	no	27-Sep-05	4	drilled	no	no	296	62.83	Jul	280	unk.
Location #3	4	none	337266	5584467	301	no	27-Sep-05	4	drilled	no	no	460	330	unk.	unk.	unk.
Location #4	1	52379	340003	5579968	372	no	27-Sep-05	2	drilled	no	5	225	unk.	unk.	unk.	unk.
Location #4	2	52341	339997	5579966	398	no	27-Sep-05	2	drilled	no	5	155	unk.	unk.	unk.	unk.
Location #4	3	52444	340055	5579674	unk.	no	27-Sep-05	2 and 3	drilled	no	5	210	unk.	July	unk.	unk.
Location #4	4	none			unk.	no	27-Sep-05	2	drilled	no	5	90	unk.	unk.	unk.	unk.
Location #4	5	none	339623	5581284	387	no	27-Sep-05	2	drilled	no	5	90	unk.	unk.	unk.	unk.
Location #5	1	none	338036	5581930	462	no	27-Sep-05	2	drilled	no	no	160	unk.	unk.	143	unk.
Location #6	1	none	340242	5593725	601	yes	7-Oct-05	2	drilled	no	no	207	160		no	unk.
Location #7	1	none	341846	5592538	423	yes	7-Oct-05	3	drilled	no	no	132	40	Dec	119	unkown
Location #8	1	none	339639	5596966	518	yes	7-Oct-05	2	drilled	no	yes	65	unk.	unk.	unk.	unk.
Location #8	2	none	339668	5596974	513	yes	7-Oct-05	2	drilled	no	yes	60	26	unk.	unk.	unk.
Location #8	3	none	339548	5597066	503	yes	7-Oct-05	2	drilled	no	yes	60	26	unk.	unk.	unk.
Location #8	4	none	339537	5596702	514	yes	7-Oct-05	2	drilled	no	yes	60	16	unk.	unk.	unk.
Location #8	5	none	339691	5597234	511	yes	7-Oct-05	2	dug	no	yes	50	16	unk.	no screen	unk.
Location #9	1	none	350859	5598363	386	no	13-Oct-05	2	drilled	no	no	520	85	avg	no	360
Location #9	2	none	350844	5598704	389	no	13-Oct-05	2	drilled	no	no	500	85	avg	no	480
Location #9	3	none	350794	5598707	383	no	13-Oct-05	2	drilled	no	no	160	85	avg	unk.	158
Location #9	4	none	350772	5598602	403	no	13-Oct-05	2	drilled	no	no	320	85	avg	unk.	300
Location #10	1	none	343765	5587528	401	no	13-Oct-05	3	drilled	yes	yes	265	+	avg	256	220
Location #10	2	none	343728	5587531	506	no	13-Oct-05	3	drilled	yes	yes	285	+	avg	269	unkown

Location	Well No.	Well dia. (inches)	Volume of extraction (gpm)	Volume of extraction determined by	Annual volume extracted (gal/yr)	Acres of crop irrigated	Days of year in use	Min per day used	Hours per day in use	Year constructed	Water use
Location #1	1	8	450	pump gage	648000.0	700	120	1440	24	1995	irrigation
Location #1	2	8	450	pump gage	648000.0	700	120	1440	24	1994	irrigation
Location #1	3	12	2000	pump gage	2880000.0	700	120	1440	24	1992	irrigation
Location #1	4	6	20	pump gage	2400.0	0	365	120	2	1992	domestic
Location #1	5	6	45	pump gage	5400.0	0	365	120	2	1998	domestic
Location #1	6	12	250	pump gage	180000.0	700	120	720	12	1980	irrigation
Location #1	7	12	200	pump gage	144000.0	700	120	720	12	1980	irrigation
Location #1	8	unk.	4	pump test at time of drilling	0.0	0	0	0	0	1985	not used
Location #1	9	unk.	5	pump test at time of drilling	0.0	0	0	0	0	1985	not used
Location #1	10	unk.	N/A	pump test at time of drilling	N/A	0	0	0	0	1979	not used
Location #1	11	unk.	10	pump test at time of drilling	0.0	0	0	0	0	1965	not used
Location #2	1	6	0	N/A	0.0	0	0	0	0	2002	N/A
Location #2	2	6	unk.	pump test at time of drilling		N/A	N/A	0	0	1980	N/A
Location #2	3	6	10	pump test at time of drilling	0.0	300	N/A	0	0	1980	N/A
Location #2	4	6	60	pump test at time of drilling	0.0	300	N/A	0	0	1990	N/A
Location #2	5	6	40	pump test at time of drilling	0.0	300	N/A	0	0	1980	N/A
Location #2	6	6	100	drillers estimate	24000.0	0	365	240	4	1995	domestic
Location #3	1	8	250		120000.0	14.8	120	480	8	1979	irrigation
Location #3	2	10	70	unk.	33600.0	14.8	120	480	8	1982	irrigation
Location #3	3	8	77	unk.	36960.0	14.8	120	480	8	1980	irrigation
Location #3	4	6	100	unk.	48000.0	14.8	120	480	8	2004	irrigation
Location #4	1	6	250	air pump test	360000.0	100	120	1440	24	1980	irrigation
Location #4	2	6	200	air pump test	288000.0	100	120	1440	24	1980	irrigation
Location #4	3	8.5	350	air pump test	0.0	100	120	0	0	1983	irrigation
Location #4	4	6	200	air pump test	0.0	100	120	0	0	before 1970	irrigation
Location #4	5	6	3	air pump test	0.0	100	120	0	0	before 1980	abandoned
Location #5	1	6	100	drillers estimate	12000.0	0	365	120	2	2005	domestic- cattle watering
Location #6	1	6	100	drillers estimate	30000.0	0	365	300	5	2002	domestic
Location #7	1	5	100	pump test at ime of drilling	138000.0	20	120	1380	23	1993	irrigation
Location #8	1	6	150	pump test at ime of drilling	36000.0	0	365	240	4	1995	domestic
Location #8	2	6	250	pump test at ime of drilling	0.0	N/A	120	0	0	2000	not in use
Location #8	3	6	250	pump test at ime of drilling	0.0	N/A	120	0	0	2000	not in use
Location #8	4	8	250	pump test at ime of drilling	150000.0	40	120	600	10	2005	irrigation
Location #8	5	3 ft	0	pump test at ime of drilling	0.0	0	0	0	0	about 1975	not in use
Location #9	1	6	60	drillers estimate	72000.0	N/A	120	1200	20	2004	domestic
Location #9	2	6	7	drillers estimate	0.0	N/A	0	0	0	1993	domestic, to be used in the future
Location #9	3	6	6	drillers estimate	0.0	N/A	0	0	0	1999	domestic, to be used in the future
Location #9	4	6	1	drillers estimate	0.0	N/A	0	0	0	unk.	emergency well (domestic)
Location #10	1	6	60	pump test at time of drilling		N/A	365		unk.	1984	commercial water sales
Location #10	2	6	110	pump test at time of drilling	0.0	N/A	365		unk.	1992	commercial water sales

Location	Well No.	Well housing	Height of stick-up (feet)	Stick up protection	Type of well cover	Vermin proof?	Flood proofing	Grading around well head
Location #1	1	pumphouse	3.5	pumphouse	drive head / discharge pipe bolted to well casing	yes	burm	yes
Location #1	2	pumphouse	4	pumphouse	drive head / discharge pipe bolted to well casing	yes	burm	yes
Location #1	3	pumphouse	8	pumphouse	vented well cap	yes	burm	yes
Location #1	4	pumphouse	2	pumphouse	drive head / discharge pipe bolted to well casing	yes	burm	yes
Location #1	5	pumphouse	2.5	pumphouse	drive head / discharge pipe bolted to well casing	yes	burm	yes
Location #1	6	pumphouse	5	pumphouse	vented well cap	yes	no	yes
Location #1	7	pumphouse	5	pumphouse	vented well cap	yes	no	yes
Location #1	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #1	9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #1	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #1	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #2	1	no	5	none	none	no	none	slight
Location #2	2	no	2	none	none	no	none	none
Location #2	3	no	2.5	none	none	no	none	none
Location #2	4	no	2.5	none	drive head / discharge pipe bolted to well casing	yes	none	slight
Location #2	5	no	9 feet	none	none	yes	none	none
Location #2	6	inside house	unk.	unk.	unk.	unk.	unk.	unk.
Location #3	1	pumphouse	1	Low stick up surrounded by cement base	drive head / discharge pipe bolted to well casing	yes	no	no
Location #3	2	pumphouse	2.5	no	Metal Cap off at time of visit - water visible about 4	yes, when	yes, on raised platform	yes
Location #3	3	no	1	no	Metal - rusty	no	no	no
Location #3	4	no	3	no	Metal	no	no	no
Location #4	1	no	2.5	no	drive head / discharge pipe bolted to well casing	yes	no	no
Location #4	2	no	2.5	no	drive head / discharge pipe bolted to well casing	yes	no	no
Location #4	3	no	3	no	metal cap	yes	no	no
Location #4	4	pump house	N/A	yes, pump house	drive head / discharge pipe bolted to well casing	yes	N/A	N/A
Location #4	5	no	1.3	none	none	no	no	no
Location #5	1	no	2.7	none	metal cap	yes	no	no
Location #6	1	no	2.6	none	drive head / discharge pipe bolted to well casing	yes	some	yes, about 3 feet
Location #7	1	pump house	3.6	yes, pump house	drive head / discharge pipe bolted to well casing	yes	yes, raised 1 foot	no
Location #8	1	none	2.2	in part by fence on one side	pvc plastic	yes	no	no
Location #8	2	pump house	2.6	yes, in pump house	none, covered with a board	no	no	no
Location #8	3	none	1.8	none	taped with plastic bag inserted into hole	maybe?	no	no
Location #8	4	none	1.4	yes, fence surrounding	pvc plastic	yes	no	no
Location #8	5	none	5.2	none	Wooden plank	no	no, but stick up is 5 feet	no
Location #9	1	wood box	3.2	yes, wooden box	unkown	yes	no	no, well in a
Location #9	2	none	2.5	none	metal	yes	no	no, well in a
Location #9	3	none	3.5	none	metal	yes	no	no, well in a
Location #9	4	none	2.7	none	metal	yes	no	no, well in a
Location #10	1	wood with door	1.3	well housing	drive head / discharge pipe bolted to well casing	yes	no	no
Location #10	2	wood with door	1.5	well housing	drive head / discharge pipe bolted to well casing	yes	no	no

Location	Well No.	Hole around well	Abandoned	Treatment	Place to sample water before treatment?	Analysis frequency	Chemically significant findings (anectodal) Indicate if from a report
Location #1	1	no	no	none	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	2	no	no	none	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	3	no	no	none	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	4	no	no	water softener	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	5	no	no	water softener	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	6	no	no	none	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	7	no	no	none	yes	random (IH has records)	high in calcium, sulfur taste
Location #1	8	N/A	hole filled in	N/A	N/A	N/A	N/A
Location #1	9	N/A	hole filled in	N/A	N/A	N/A	N/A
Location #1	10	N/A	hole filled in	N/A	N/A	N/A	N/A
Location #1	11	N/A	hole filled in	N/A	N/A	N/A	N/A
Location #2	1	no	yes	N/A	N/A	N/A	N/A
Location #2	2	no	yes	none	yes	random (once)	last ten years high sodium tastes
Location #2	3	no	yes	none	yes	random (once)	last ten years high sodium tastes
Location #2	4	no	yes	none	yes	random (once)	last ten years high sodium tastes
Location #2	5	no	yes	none	no	random (once)	last ten years high sodium tastes
Location #2	6	unk.	no	unk.	unk.	unk.	unk.
Location #3	1	no	no	none	yes	spring and fall	high in calcium
Location #3	2	no	no	none	yes	spring and fall	high in calcium
Location #3	3	no	yes	none	metal cap is	N/A	N/A
Location #3	4	no	no	none	no	spring and fall	high in calcium
Location #4	1	no	no	none	yes	at time of drilling	high in calcium
Location #4	2	no	no	none	yes	at time of drilling	high in calcium
Location #4	3	no	yes	none	no	at time of drilling	high in calcium
Location #4	4	no	no	none	yes	at time of drilling	high in calcium
Location #4	5	no	yes	none	no	at time of drilling	high in calcium
Location #5	1	no	no	none	yes	at time of drilling	none known
Location #6	1	no	no	none	yes	once	Hardness of 462 mg/L, 0.5 ppm iron
Location #7	1	no	no	none	yes	none	none known
Location #8	1	no	no	none	yes	once	iron and calcium build-up
Location #8	2	no	yes	none	N/A	none	N/A
Location #8	3	no	yes	none	N/A	none	N/A
Location #8	4	no	no	none	yes	none	N/A
Location #8	5	no	yes	none	N/A	none	N/A
Location #9	1	no	no	none	yes	at time of drilling	unk.
Location #9	2	yes, moist but no	no	none	yes	at time of drilling	unk.
Location #9	3	yes, about 3 cm of	no	none	yes	at time of drilling	unk.
Location #9	4	no	no	none	yes	at time of drilling	unk.
Location #10	1	yes	no	see note	yes	daily	
Location #10	2	no	no	see note	yes	daily	

Location	Well No.	Land use activities	Quality under the influence of other wells?[2]	Quantity under the influence of other wells?[2] (If yes, see notes)	Run dry?[2]	Deepened?[2]	Distance to closest water body (approx)
Location #1	1	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	no	no	no	500 m to lake (ground water fed)
Location #1	2	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	no	no	no	501 m to lake (ground water fed)
Location #1	3	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	no	no	no	502 m to lake (ground water fed)
Location #1	4	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	no	no	no	503 m to lake (ground water fed)
Location #1	5	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	no	no	no	504 m to lake (ground water fed)
Location #1	6	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	yes	no	no	1 km to lake (ground water fed)
Location #1	7	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	no	yes	no	no	2 km to lake (ground water fed)
Location #1	8	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	N/A	N/A	N/A	N/A	3 km to lake (ground water fed)
Location #1	9	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	N/A	N/A	N/A	N/A	4 km to lake (ground water fed)
Location #1	10	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	N/A	N/A	N/A	N/A	5 km to lake (ground water fed)
Location #1	11	hobby farms, hay fields, horse pasture, agriculture, res. housing, other wells	N/A	N/A	N/A	N/A	6 km to lake (ground water fed)
Location #2	1	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	N/A	N/A	N/A	no	1km to spring
Location #2	2	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	no	no	no	no	1km to spring
Location #2	3	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	no	no	no	no	1km to spring
Location #2	4	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	no	no	no	no	1km to spring
Location #2	5	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	no	no	no	no	1km to spring
Location #2	6	dairy and beef farms, hay fields, chem. storage, res. housing, other wells	no	no	no	no	no
Location #3	1	hay fields, chemical storage, agriculture, residential housing, other wells	no	no	no	no	5 km north of Okanagan Lake
Location #3	2	hay fields, chemical storage, agriculture, residential housing, other wells	no	no	no	no	5 km north of Okanagan Lake
Location #3	3	hay fields, chemical storage, agriculture, residential housing, other wells	no	no	no	no	6 km north of Okanagan Lake
Location #3	4	hay fields, chemical storage, agriculture, residential housing, other wells	no	no	no	no	6 km north of Okanagan Lake
Location #4	1	dairy and beef farms, hay fields, chem. storage, res. housing, highway	no	no	no	no	1 km north of Swan Lake
Location #4	2	dairy and beef farms, hay fields, chem. storage, res. housing, highway	no	no	no	no	1 km north of Swan Lake
Location #4	3	dairy and beef farms, hay fields, chem. storage, res. housing, highway	no	no	no	no	1 km north of Swan Lake
Location #4	4	dairy and beef farms, hay fields, chem. storage, res. housing, highway	yes, when well #2 is	no	yes	no	1 km north of Swan Lake
Location #4	5	dairy and beef farms, hay fields, chem. storage, res. housing, highway	no	no	no	no	1km north of Swan Lake
Location #5	1	cattle farm, hay fields, Okeefe Ranch (historical tourist attraction)	no	no	no	no	1 km from Okanagan Lake
Location #6	1	horse pasture, forest, hay fields, dirt road	no	no	no	no	7 km from Otter Lake
Location #7	1	horse pasture, forest, hay fields, paved road	no	no	no	no	5 km from Otter Lake
Location #8	1	horse pasture (75 horses), tree nursery, forest, residential housing, paved road	no	no	no	no	1 Km from Deep Creek
Location #8	2	horse pasture (75 horses), tree nursery, forest, residential housing, paved road	no	no	no	no	1 Km from Deep Creek
Location #8	3	horse pasture (75 horses), tree nursery, forest, residential housing, paved road	no	no	no	no	1 Km from Deep Creek
Location #8	4	horse pasture (75 horses), tree nursery, forest, residential housing, paved road	no	no	no	no	1 Km from Deep Creek
Location #8	5	horse pasture (75 horses), tree nursery, forest, residential housing, paved road	no	no	no	no	1 Km from Deep Creek
Location #9	1	cattle and dairy ranching, hay fields, prefabricated wooden frame manufacturing	no	no	no	no	2 km to Shuswap River
Location #9	2	cattle and dairy ranching, hay fields, prefabricated wooden frame manufacturing	no	no	no	no	2 km to Shuswap River
Location #9	3	cattle and dairy ranching, hay fields, prefabricated wooden frame manufacturing	no	no	no	no	2 km to Shuswap River
Location #9	4	cattle and dairy ranching, hay fields, prefabricated wooden frame manufacturing	no	no	no	future plans to	2 km to Shuswap River
Location #10	1	hay, cattle, highway, res. housing, railway, water bottling operation	no	no	no	no	20 meters to spring
Location #10	2	hay, cattle, highway, res. housing, railway, water bottling operation	no	no	no	no	30 meters to spring

Location	Well No.	Driller	Comments
Location #1	1	unk.	none
Location #1	2	unk.	none
Location #1	3	unk.	none
Location #1	4	unk.	6 houses + feedlot
Location #1	5	unk.	6 houses + feedlot
Location #1	6	unk.	Well interference between wells 6 and 7 at this location
Location #1	7	unk.	Well interference between wells 6 and 7 at this location
Location #1	8	Stewart Drilling	Casing removed
Location #1	9	Stewart Drilling	Casing removed
Location #1	10	Thomas Well Drilling	Casing removed
Location #1	11	Art Moor and Son	Casing removed
Location #2	1	unk.	Well never had water
Location #2	2	unk.	none
Location #2	3	unk.	Screen plugged
Location #2	4	unk.	none
Location #2	5	unk.	none
Location #2	6	no	found in database after the survey
Location #3	1	Thomas Well Drilling	none
Location #3	2	Thomas Well Drilling	none
Location #3	3	Thomas Well Drilling	none
Location #3	4	unk.	no
Location #4	1	McHarg Drilling	no
Location #4	2	McHarg Drilling	In 2004 owner could only get 150 gpm from well but can usually get 150 gpm. First time this has happened in 15
Location #4	3	McHarg Drilling	Larkin water district drilled and tested it. It has never been used.
Location #4	4	unk.	Could have been artestian in some years before 1970. The well (SWL) can drop down 150 feet when pump #2 is in
Location #4	5	unk.	Sandy lithology
Location #5	1	Corley Drilling	
Location #6	1		none
Location #7	1		none
Location #8	1	unk.	Owner has noticed a 16 foot in the SWL in all of his wells over the last 2 years. The wells used to be almost flush with the ground surface
Location #8	2	unk.	none
Location #8	3	unk.	none
Location #8	4	unk.	none
Location #8	5	unk.	Cement culvert well
Location #9	1	Stewart	Bedrock (anecdotal)
Location #9	2	Bud McHarg	Bedrock (anecdotal)
Location #9	3	Dan McGladderly	Sandy and silty (anecdotal)
Location #9	4	Stewart Drilling	May deepen in the future
Location #10	1	Capri Drilling	The water is ozonated after being in the tank with pherites that take out iron. It is then filtered through various sized media and run through a carbon filter. Then it is re-ozonated and stored in a tank before being bottled and sold. In comparing 3 reports from 2005, 1986 and 1990, the 2005 report showed no Hardness as CaCO3. In 1990 Iron was at .11 mg/L compared to .03 in 2005 and leass than .01 in 1986.
Location #10	2	Les Litwin	

Location	Well No.	Well Tag No.	Easting	Northing	Elevation (m)	Well In Hullcar Study Area	Date of Visit	Info. Source	Well Type	Artesian	Springs nearby	Depth (feet)	SWL (feet)[1]	Time of year SWL taken	Screen depth (feet)	Pump depth (feet)
Location #11	1	142	344450	5589236	392	no	13-Oct-05	[2]	drilled	no	no	280	unk.	N/A	260 mesh	unk.
Location #11	2	122	344438	5589276	395	no	13-Oct-05	[2]	drilled	no	no	280	unk.	unk.	260 mesh	unk.
Location #11	3	none	344873	5589657	366	no	13-Oct-05	[2]	dug	no	no	280	unk.	unk.	no screen	no pump
Location #12	1	none	337849	5594653	507	yes	14-Oct-05	[2]	drilled	no	yes	70	unk.	unk.	unk.	57
Location #12	2	none	338211	5595099	507	yes	14-Oct-05	[2]	drilled	no	yes	70	unk.	unk.	unk.	60
Location #12	3	none	338042	5594971	501	yes	14-Oct-05	[2]	drilled	no	yes	70	unk.	unk.	unk.	60
Location #12	4	none	337865	5594947	506	yes	14-Oct-05	[2]	drilled	no	yes	37	unk.	unk.	unk.	32
Location #12	5	none	337908	5594572	515	yes	14-Oct-05	[2]	drilled	no	yes	120	unk.	unk.	unk.	116
Location #12	6	none	338007	5594585	509	yes	14-Oct-05	[2]	drilled	no	yes	140	unk.	unk.	unk.	130
Location #12	7	none	337338	5594914	513	yes	14-Oct-05	[2]	drilled	no	yes	330	dry	unk.	unk.	N/A
Location #12	8	none	338014	5594432	513	yes	14-Oct-05	[2]	dug	no	yes	unk.	20	Oct	unk.	N/A
Location #12	9	none	341446	5597375	520	yes	14-Oct-05	[2]	drilled	no	yes	220	unk.	unk.	unk.	200
Location #12	10	none	341386	5597381	516	yes	14-Oct-05	[2]	drilled	no	yes	220	unk.	unk.	unk.	200
Location #13	1	none	346182	5591459	385	no	14-Oct-05	[2]	drilled	yes	no	205	+	avg	10	175
Location #14	1	none	346383	5595650	429	yes	20-Oct-05	[2]	drilled	no (see note)	yes	200	+	avg	unk.	80
Location #14	2	none	346337	5595702	427	yes	20-Oct-05	[2]	drilled	no	yes	200	unk.	unk.	unk.	80
Location #14	3	none	346285	5595757	N/A	yes	20-Oct-05	[2]	drilled	no, but was	yes	unk.	unk.	unk.	unk.	no pump
Location #14	Spring	N/A	345927	5595646	435	yes	20-Oct-05	N/A	spring	N/A	yes	N/A	N/A	N/A	N/A	N/A
Location #15	1	none	345983	5594157	unk.	yes	27-Oct-05	[2]	drilled	no	unk.	unk.	unk.	unk.	unk.	unk.
Location #15	2	none	347244	5593612	unk.	yes	27-Oct-05	[2]	drilled	no	unk.	unk.	unk.	unk.	unk.	unk.
Location #16	1	none	346051	5594174	410	yes	28-Oct-05	[2]	drilled	yes (see note)	unk.	212	27	avg	180	unk.
Location #17	1	41474	342642	5597771	622	yes	28-Oct-05	[3]	drilled	no	Steele	126	48	unk.	83	unk.
Location #17	2	46540	342391	5597775	564	yes	28-Oct-05	[3]	drilled	no	Steele	155	unk.	unk.	81	unk.
Location #17	3	none	342299	5597779	614	yes	28-Oct-05	[3]	drilled	no	Steele	121	31	unk.	74	unk.
Location #17	4	751	343248	5598420	499	yes	28-Oct-05	[3]	drilled	no	Steele	198	37	unk.	164	unk.
Location #17	5	none	343255	5598516	507	yes	28-Oct-05	[3]	drilled	no	Steele	145	33	may	unk.	90
Location #17	6	none	343031	5597761	500	yes	28-Oct-05	[3]	drilled	no	Steele Springs	137	40	Nov	125	115
Location #17	7	none	342007	5598212	492	yes	28-Oct-05	[3]	drilled	no	Steele	111	12	Sep	89	unk.
Location #17	8	none	341567	5597415	505	yes	28-Oct-05	[3]	drilled	no	Steele	169	30	Apr	123	N/A
Location #17	9	none	unk.	unk.	unk.	no	28-Oct-05	[3]	drilled	no	Steele Springs	270	unk.	N/A	no screen	N/A
Location #17	10	none	see notes	unk.	unk.	no	28-Oct-05	[3]	drilled	yes	Steele Springs	148	+	unk.	92	N/A
Location #18	1	9216	342883	5596832		yes		[3]	drilled	no	Steele	306	N/A	unk.	unk.	unk.
Location #18	2	48180	342835	5596863		yes		[3]	drilled	no	Steele	306	270	Jun	unk.	unk.

Location	Well No.	Well dia. (inches)	Volume of extraction (gpm)	Volume of extraction determined by	Annual volume extracted (gal/yr)	Acres of crop irrigated	Days of year in use	Min per day used	Hours per day in use	Year constructed	Water use
Location #11	1	6	250	pump capacity	37500.0	70	150	150	2.5	unk.	irrigation
Location #11	2	6	250	pump capacity	45000.0	70	150	180	3	unk.	irrigation
Location #11	3	4	0	N/A	0.0	0	0	0	0	unk.	former domestic
Location #12	1	12	600	pump capacity	432000.0	370	120	720	12	1975	irrigation
Location #12	2	12	1000	pump capacity	720000.0	370	120	720	12	1992	irrigation
Location #12	3	12	600	pump capacity	432000.0	370	120	720	12	1987	irrigation
Location #12	4	6	100	pump capacity	24000.0	0	365	240	4	2004	domestic
Location #12	5	6	40	pump capacity	9600.0	0	365	240	4	1986	domestic (cattle watering)
Location #12	6	8	40	pump capacity	0.0	0	0	0	0	1980	domestic (back-up)
Location #12	7	8	0.5	pump test at time of drilling	0.0	0	0	0	0	1992	abandoned
Location #12	8	36	0	N/A	0.0	0	0	0	0	1952	abandoned
Location #12	9	6	300	pump capacity	216000.0	80	120	720	12	1980	irrigation
Location #12	10	6	200	pump capacity	144000.0	80	120	720	12	1980	irrigation
Location #13	1	6	200	pump test at time of drilling	144000.0	50	120	720	12	1986 or 1987	irrigation
Location #14	1	4	12	pump test at time of drilling	8640.0	160	120	720	12	1984	irrigation
Location #14	2	6	unk.	unk.		0	365	360	6	1984	domestic
Location #14	3	4	unk.	unk.	N/A	0	0	0	0	unk.	abandoned
Location #14	Spring	N/A	0	N/A	0.0	N/A	0	0	0	N/A	N/A
Location #15	1	8	360	unk.	259200.0	50	120	720	12	unk.	irrigation
Location #15	2	8	180	unk.	140400.0	100	150	780	13	unk.	irrigation
Location #16	1	6	250	pump capacity	180000.0	80	120	720	12	1981	irrigation
Location #17	1	8	250	pump test at time of drilling	225000.0	400	120	900	15	1980	irrigation
Location #17	2	8	250	pump test at time of drilling	225000.0	400	120	900	15	1982	irrigation
Location #17	3	8	400	pump test at time of drilling	360000.0	400	120	900	15	1980	irrigation
Location #17	4	10	360	pump test at time of drilling	324000.0	400	120	900	15	1980	irrigation
Location #17	5	unk.	600	pump test at time of drilling	540000.0	400	120	900	15	1986	irrigation
Location #17	6	5	50	pump test at time of drilling	36000.0	400	0	720	12	1985	domestic
Location #17	7	6	52	pump test at time of drilling	37440.0	400	0	720	12	1974	domestic
Location #17	8	8	unk.	unk.		400	0	0	0	1986	abandoned
Location #17	9	10	0	N/A	0.0	0	0	0	0	1986	not developed
Location #17	10	unk.	0	unk.	0.0	0	0	0	0	unk.	abandoned
Location #18	1	unk.	50	estimated at time of drilling		unk.	unk.		unk.	1950	irrigation
Location #18	2	8	500	estimated at time of drilling		unk.	unk.		unk.	1981	irrigation

Location	Well No.	Well housing	Height of stick-up (feet)	Stick up protection	Type of well cover	Vermin proof?	Flood proofing	Grading around well head
Location #11	1	wood housing	unkown	well housing	unkown	yes	none	no
Location #11	2	wood	unkown	well housing	unkown	yes	none	no
Location #11	3	none	1.4	none	welded cap with 1 inch area along seal that has come open	no	none	no
Location #12	1	wood, no door	1.5	well housing	drive head / discharge pipe bolted to well casing	yes	no	no
Location #12	2	none	1.5	fencing and close proximity to pump house	drive head / discharge pipe bolted to well casing	yes	no	no
Location #12	3	none	2.9	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #12	4	none	2.8	none	metal	yes	no	no
Location #12	5	corrogated metal no roof	unk.	corrogated metal surrounding (but filled with garbage)	unk.	unk.	no	no
Location #12	6	corrogated metal, wood plank roof	2.5	well housing	drive head / discharge pipe bolted to well casing	yes	no	no
Location #12	7	none	2.7	none	welded metal cap	yes	yes	yes
Location #12	8	cement ring, wood plank roof	5	stick up itself is thick concrete but no other protection	wooden plank	no	no	no
Location #12	9	wooden housing, no door	1.2	well housing	drive head / discharge pipe bolted to well casing	yes	no	no
Location #12	10	none	1.2	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #13	1	none	0.7	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #14	1	wood with door	2.5	well housing	drive head / discharge pipe bolted to well casing	yes	yes	yes
Location #14	2	none	2.7	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #14	3	none	2.8	none	none	no	no	no
Location #14	Spring	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #15	1	unk.	unk.	unk.	unk.	unk.	unk.	unk.
Location #15	2	unk.	unk.	unk.	unk.	unk.	unk.	unk.
Location #16	1	none	unk.	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	1	none	2	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	2	none	1	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	3	large plank	1	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	4	large plank	2	none	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	5	none	0.8	large hose rapped around entire works	drive head / discharge pipe bolted to well casing	yes	no	no
Location #17	6	corregated metal with plywood cover	2.7	yes, well housing	drive head / discharge pipe bolted to well casing	yes	yes	no
Location #17	7	wood with door	2.6	yes, well housing	drive head / discharge pipe bolted to well casing	yes	yes	yes
Location #17	8	none	2.8	none	metal cap that has been duct taped at edges	no	no	no
Location #17	9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #17	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Location #18	1	unk.	unk.	unk.	unk.	unk.	unk.	unk.
Location #18	2	unk.	unk.	unk.	unk.	unk.	unk.	unk.

Location	Well No.	Hole around well	Abandoned	Treatment	Place to sample water before treatment?	Analysis frequency	Chemically significant findings (anectodal) Indicate if from a report
Location #11	1	no	no	none	yes	unk.	unk.
Location #11	2	no	no	none	yes	unk.	unk.
Location #11	3	no	yes	N/A	N/A	unk.	unk.
Location #12	1	no	no	none	yes	at time of drilling	unk.
Location #12	2	no	no	none	yes	at time of drilling	unk.
Location #12	3	yes, ditch dug to the	no	none	yes	at time of drilling	unk.
Location #12	4	no	no	none	yes	every two years	unk.
Location #12	5	no	no	none	yes	every two years	unk.
Location #12	6	no	no	none	yes	every two years	unk.
Location #12	7	no	yes	none	yes	at time of drilling	unk.
Location #12	8	no	yes	none	yes	unk.	unk.
Location #12	9	no	no	none	yes	at time of drilling	unk.
Location #12	10	no	no	none	yes	at time of drilling	unk.
Location #13	1	no	no	none	yes	at time of drilling (note)	high in mangense and calcium
Location #14	1	no	no	none	yes	at time of drilling	unk.
Location #14	2	no	no	none	yes	at time of drilling	unk.
Location #14	3	no	yes	none	unk.	unk.	unk.
Location #14	Spring	N/A	N/A	N/A	N/A	N/A	N/A
Location #15	1	unk.	no	none	yes	ubknown	ubknown
Location #15	2	unk.	no	none	yes	ubknown	unk.
Location #16	1	no	no	none	N/A	once last year	Very high selenium
Location #17	1	no	no	none	N/A	not sampled	unk.
Location #17	2	no	no	none	N/A	not sampled	unk.
Location #17	3	no	no	none	N/A	not sampled	unk.
Location #17	4	no	no	none	N/A	not sampled	unk.
Location #17	5	no	no	none	N/A	not sampled	unk.
Location #17	6	no	no	none	yes	random	Calcium 111 mg/L from report
Location #17	7	no	no	none	yes	random	unk.
Location #17	8	no	yes	none	N/A	not sampled	unk.
Location #17	9	N/A	yes	N/A	N/A	N/A	N/A
Location #17	10	N/A	yes	N/A	N/A	N/A	N/A
Location #18	1	unk.	no	unk.	unk.	unk.	unk.
Location #18	2	unk.	no	unk.	unk.	unk.	unk.

Location	Well No.	Land use activities	Quality under the influence of other wells?[2]	Quantity under the influence of other wells?[2] (If yes, see notes)	Run dry?[2]	Deepened?[2]	Distance to closest water body (approx)
Location #11	1	golf course, residential housing, highway	no	yes	no	no	Creek 50 meters away
Location #11	2	golf course, residential housing, highway	no	yes	no	no	Creek 50 meters away
Location #11	3	golf course, residential housing, highway	N/A	N/A	yes	no	Creek 30 meters away
Location #12	1	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	2	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	3	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	4	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	5	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	6	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	7	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	yes	no	within 1 km to pond
Location #12	8	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	9	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #12	10	cattle, hay, farm eqip. storage, fuel storage, low density homes, res. road	unk.	unk.	no	no	within 1 km to pond
Location #13	1	hay, corn, cattle, horse, highway, light residential volume	no	no	no	no	10 feet away from Fortune Creek
Location #14	1	cattle, horse, hay, corn, dirt road, light residential	no	yes	no	no	5 meters to pond
Location #14	2	cattle, horse, hay, corn, dirt road, light residential	no	yes	no	no	8 meters to pond
Location #14	3	cattle, horse, hay, corn, dirt road, light residential	no	yes	yes	no	50 meters to pond
Location #14	Spring	N/A	N/A	N/A	N/A	N/A	N/A
Location #15	1	hay, res. housing	no	no	no	no	unk.
Location #15	2	hay, res. housing	no	no	no	no	unk.
Location #16	1	cattle, storage facility, orchard grass, hay, farms, mod. res. housing, highway	unk.	yes	no	no	150 meters from fortune creek
Location #17	1	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	500 m
Location #17	2	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	510 m
Location #17	3	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	530 m
Location #17	4	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	510 m
Location #17	5	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	480 m
Location #17	6	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	400 m
Location #17	7	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	500 m
Location #17	8	cattle, hay, surrounding main road, irrigation, other wells, light housing	no	no	no	no	540 m
Location #17	9	cattle, hay, surrounding main road, irrigation, other wells, light housing	N/A	N/A	N/A	N/A	N/A
Location #17	10	cattle, hay, surrounding main road, irrigation, other wells, light housing	N/A	N/A	N/A	N/A	800 m
Location #18	1	cattle, hay, surrounding main road, irrigation, other wells, light housing	unk.	unk.	unk.	unk.	800 m
Location #18	2	cattle, hay, surrounding main road, irrigation, other wells, light housing	unk.	unk.	unk.	unk.	800 m

Location	Well No.	Driller	Comments
Location #11	1	MacHarg	Two wells (1 and 2) were put in because of fine silty material. Water is pumped into a retention pond during the day and used for irrigation at night. Decrease in capacity noted when well 1 and 2 are both pumped.
Location #11	2	MacHarg	
Location #11	3	MacHarg	This well was dug to the same depth as the other and initially had 5 gpm but ran dry. It was only used to water the garden for a few years.
Location #12	1	Thomas Drilling	none
Location #12	2	A and H Abbotsford	none
Location #12	3	unk.	none
Location #12	4	Stewart Drilling	none
Location #12	5	A and H Drilling	none
Location #12	6	unk.	none
Location #12	7	A and H Drilling	none
Location #12	8	unk.	has no pump and is never used except to look at water table level
Location #12	9		"nice clear water - no smell"
Location #12	10		"nice clear water - no smell"
Location #13	1	Stewart Drilling	check for water quality records from the City of Armstrong
Location #14	1	unk.	Water is pumped into the reservoir and then irrigatted from the reservoir. 4 neigboring wells have run dry. Artesian until neighbor's well developed.
Location #14	2	unk.	4 neigboring wells have run dry
Location #14	3	unk.	Was flowing at one time. There are mineral salts in a ring around the base of the well
Location #14	Spring	N/A	Pipe visible taking water from the spring
Location #15	1	Dan Gare	
Location #15	2	Dan Gare	none
Location #16	1	Spear Well Drilling	After irrigating in 2004 the well took a few months to flow again. First time this has occurred since it was drilled.
Location #17	1	Thomas Well Drilling	none
Location #17	2	Thomas Well Drilling	none
Location #17	3	Thomas Well Drilling	none
Location #17	4	Thomas Well Drilling	none
Location #17	5	A and H Construction Ltd.	none
Location #17	6	Okanagan Water Well Drilling	none
Location #17	7	Okanagan Water Well Drilling	none
Location #17	8	A and H Construction Ltd.	none
Location #17	9	A and H Construction Ltd.	Well not completed as a producing irrigation well. The ten inch casing was pulled.The end of the hole at 270 feet was very hard bedrock. Casing pulled after drilling
Location #17	10	A and H Construction Ltd.	300 m west of well #5. Began flowing at 1000 gpm but sealed itself off with fine sand. Hole was then back filled with pea gravel and 10 feet of screen was set from 92 feet to a 102 foot depth. The well continued to seal itself off.
Location #18	1	Nor-West Drilling	none
Location #18	2	Thomas Well Drilling	none

Notes:

1. Measured from ground level
2. Anecdotal
3. Well log
4. Well Report - Groundwater Supply Wells PRT Armstrong Nursery, Kala Ground Water March 25 2003
5. Ditch in field (about 10 meters across and 1 metre deep) fills each spring
6. + = water level above ground level
7. SWL = static water level
8. unk. = unknown
9. N/A = not applicable
10. res. = residential