

# Source Water Protection Plan: Modules 7 and 8 – Genelle Improvement District

*Prepared for:*

## **Genelle Improvement District**

611-16th Avenue, PO Box 82  
Genelle, BC  
V0G 1G0



*March 2017*

*Project: 16-062-01*

*Prepared by:*

**Western Water Associates Ltd.**  
**#106 - 5145 26<sup>th</sup> St**  
**Vernon BC V1T 8G4**

March 15, 2017

Genelle Improvement District  
611-16th Avenue, PO Box 82  
Genelle, B.C. V0G 1G0

**Re: Genelle Improvement District – Source Water Protection Plan Modules 7 and 8**

Western Water Associates Ltd. (WWAL) is pleased to provide this report that completes the Source Water Protection Plan (SWPP) for the Genelle Improvement District (GID). Initial steps in the SWPP process were completed by Golder Associates in 2008 and this report builds upon that work.

The GID is at present completely reliant on groundwater with wells completed in a relatively deep, unconfined sand and gravel aquifer system. The aquifer system in Genelle is an extremely valuable resource. Water quality from this aquifer is excellent, both chemically and bacteriologically. At present, groundwater does not require treatment prior to distribution and the aquifer is quite productive. Because of the good water quality and characteristics of the aquifer, production wells can have long lifespans and do not require frequent maintenance to retain their productivity. There are few aquifers in the province with all these characteristics, and the resource warrants protection to ensure it remains a high-quality water source.

Based on our assessment, we find that there are three primary risks to groundwater in Genelle:

1. The potential for a spill along one of the two major transportation corridors within the proposed protection area.
2. Activities occurring on the industrially-zoned properties, which are present in close proximity to the GID wells. At present, activities occurring on these properties are relatively low risk, but land uses could change.
3. Septic disposal to ground across the community. The effects of septic disposal to ground in the community are evident in water quality samples from the GID wells, where nitrate concentrations are typically measured in the 1 mg/L range.

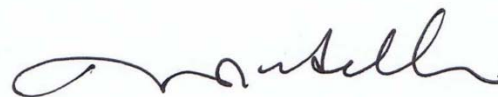
Several recommendations are provided at the end of the report which will help protect the groundwater sources into the future. We trust that the professional opinions and advice presented in this document are sufficient for your current requirements. Should you have any questions, or if we can be of further assistance in this matter, please contact the undersigned.

**WESTERN WATER ASSOCIATES LTD.**


**Ryan Rhodes, P.Ge., P. Geol**  
**Hydrogeologist**

Reviewed by:



**Douglas Geller, M.Sc., P.Ge.**  
**Senior Hydrogeologist**

## TABLE OF CONTENTS

<b>1. INTRODUCTION</b>	<b>3</b>
1.1 BACKGROUND	3
1.2 ASSESSMENT STRUCTURE AND GUIDING DOCUMENTS	3
1.3 SWPP SCOPE OF WORK	4
<b>2. GID WATER SYSETM BACKGORUND AND OPERATION</b>	<b>4</b>
<b>3. HYDROGEOLOGIC SETTING AND SOURCE PROTECTION AREA</b>	<b>6</b>
3.1 HYDROGEOLOGIC SETTING	6
3.2 CAPTURE ZONE DELINEATION AND SOURCE PROTECTION AREA	7
<b>4. SOURCE WATER QUALITY</b>	<b>8</b>
<b>5. CONTAMINANT SOURCE INVENTORY</b>	<b>9</b>
5.1 OBJECTIVES AND METHODS	9
5.2 CONTAMINATED SITE DATABASE SEARCHES	10
5.3 VISUAL SURVEY OF SOURCE PROTECTION AREA	10
5.4 PRIVATE WELLS IN THE SOURCE PROTECTION AREA	11
5.5 ZONING IN THE SOURCE PROTECTION AREA	12
5.6 WELL COMPLETION ISSUES	14
5.7 SUMMARY OF CONTAMINATION SOURCE INVENTORY	14
<b>6. MODULE #7: CHARACTERIZE RISKS FROM SOURCE TO TAP</b>	<b>17</b>
6.1 OBJECTIVE AND METHODOLOGY	17
6.2 RISK CHARACTERIZATION	18
6.3 STRENGTHS, WEAKNESS, OPPORTUNITIES AND THREATS	21
<b>7. MODULE #8 RECOMMENDED ACTIONS TO PROMOTE GROUNDWATER PROTECTION</b>	<b>22</b>
7.1 DISCUSSION	22
7.2 RECOMMENDATIONS	22

### List of Figures (Appendix A)

- Figure 1 Mapped Aquifers and Reported Wells in Genelle Area.
- Figure 2 Land Use and Points of Interest in the Genelle Area.
- Figure 3 GID Well Capture Zone Mapping (Golder 2008).
- Figure 4 Primary and Overall Source Protection Areas.
- Figure 5 Genelle Zoning with Source Protection Areas.

---

## List of Tables

Table 2.1	Selected Construction Details for GID Wells.....	5
Table 4.1	Summary of Recent GID Well Water Quality Testing .....	9
Table 5.1:	Abbreviated Potential Contaminant/Hazard Inventory for GID Proposed Source Protection Area .....	15
Table 6.1	Levels of Likelihood Description.....	17
Table 6.2	Relative Levels of Consequence Description.....	18
Table 6.3	Qualitative Risk Analysis Matrix.....	18
Table 6.4	Risk Characterization Summary for BEWD Groundwater Sources .....	19

## List of Appendices

Appendix A	Figures
Appendix B	GID Well Construction and Lithology Information
Appendix C	Contaminated Sites Database Search Results

## List of Acronyms

AO	Aesthetic Objectives
CP	Canadian Pacific
DPA	Development Permit Area
GARP	Groundwater at Risk of Containing Pathogens
GCDWQ	Guidelines for Canadian Drinking Water Quality
GID	Genelle Improvement District
GSC	Geological Survey of Canada
GUDI	Groundwater Under the Direct Influence of surface water
HC	Highway Commercial
I1	Industrial 1
I2	Industrial 2
MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
MOE	BC Ministry of the Environment
MYA	million years ago
ORP	Oxygen Reduction Potential
RDEK	Regional District of Kootenay Boundary
S2TAG	Comprehensive Drinking Water Source to Tap Assessment Guideline
SPA	Source Protection Area
SWPS	Source Water Protection Strategy
TAC	Technical Advisory Committee
WPT	Well Protection Toolkit
WTN	Well Tag Number
WWAL	Western Water Associates Ltd.

## I. INTRODUCTION

At the request of the Genelle Improvement District (GID), Western Water Associates Ltd. (WWAL) has completed the final steps in a Source Water Protection Plan for the GID's groundwater-based water system. This report documents the final steps of that plan, and includes several recommendations to promote the protection of groundwater resources.

### I.1 Background

In 2008, the GID commissioned Golder Associates to complete the initial phases of a Groundwater Protection Plan. For that project, Golder used the Well Protection Toolkit (MOE 2006), at the time, a widely-used guidance document developed by the Ministry of Environment and the Ministry of Health. Golder completed Steps 1, 2 and 3 of the Well Protection Toolkit (WPT), thoroughly characterized the hydrogeology in the Genelle area, delineated well capture zones and identified some threats to the water source existing at that time (Golder 2008).

In 2016, at the request of Interior Health, the GID retained WWAL to complete the Source Water Protection Plan (SWPP) process. Specifically, the GID was requested to complete Modules 7 and 8 of the Comprehensive Source-To-Tap Assessment Guideline (Ministry of Healthy Living and Sport, 2010). The prior Golder report addressed most of Modules 1 and 2 of that Guideline, while Modules 7 and 8 of the Comprehensive Source-To-Tap Assessment are aimed at characterizing risks to drinking water and developing a series of actions that can be implemented to protect and improve water quality. Modules 7 and 8 overlap to a large extent with Steps 4, 5 and 6 of the WPT document. For this project, WWAL reviewed and updated the information compiled by Golder and completed Modules 7 and 8 of the Comprehensive Drinking Water Source to Tap Assessment Guideline (S2TAG).

### I.2 Assessment Structure and Guiding Documents

The S2TAG provides a structured and consistent approach to evaluating risks to drinking water. It serves as a tool to develop a more comprehensive understanding of the risks to drinking water safety and availability, how to operate effectively, and how to produce the best possible water quality. The S2TAG consists of eight modules:

- Module #1 - Delineate and characterize drinking water sources
- Module #2 - Conduct contaminant source inventory
- Module #3 - Assess water supply elements
- Module #4 - Evaluate Waterworks District management, operation and maintenance practices
- Module #5 - Audit water quality and availability
- Module #6 - Review financial capacity and governance of the Waterworks District
- Module #7 - Characterize risks from source to tap
- Module #8 - Recommend actions to improve drinking water protection

As mentioned previously, WWAL's scope of work focused on Modules 7 and 8. In this report however, we summarize some of the initial steps in the process for context, including a description of the GID well sources and the area hydrogeology, and also touch upon aspects of Modules 4 and 5. For more detailed information on the initial stages in the SWPP, the reader is referred to the Golder 2008 report.

### **I.3 SWPP Scope of Work**

To complete the SWPP process, WWAL completed the following works:

1. Reviewed existing background information on the GID wells and background information on the hydrogeology of the Genelle area. This included well logs and well completion reports for GID wells, the results of recent water quality testing, the 2008 Golder report, a 1994 report prepared by Golder pertaining to septic disposal in Genelle, and aquifer mapping and well reports available in provincial databases.
2. Completed a search of the B.C. Site Registry Database, which contains information on reported contaminated sites in B.C.
3. Completed an initial site reconnaissance of the area in August of 2016. Met with the GID water system operator to discuss the current operation of the water system and obtained relevant background information from GID paper files.
4. Prepared for and attended a meeting of the TAC at GID offices on October 24, 2016 to discuss our initial assessment and obtain input from the TAC;
5. Generated a draft SWPP report for review by the TAC,
6. Compiled and reviewed comments on the draft report and prepared a final version.
7. Prepared an educational handout for the GID to distribute to water system customers to provide information on source protection initiatives and the outcomes of the SWPP process.

The SWPP received input from the following individuals, whether as formal members of the TAC or less formally by providing information:

- Rae Walker, Board Chair of the GID;
- Wendy Settle, GID Water System Operator;
- Ryan Rhodes, P.Geo., hydrogeologist with WWAL;
- Donna Dean, Manager of Planning and Development, Regional District of Kootenay Boundary;
- Pouria Mojtahedi, Specialist Environmental Health Officer with Interior Health;
- All other members of the GID Board of Trustees.

WWAL also contacted regional hydrogeologists with the B.C. Ministry of Forests, Lands and Natural Resource Operations (MFLNRO), who unfortunately were unable to participate in the process.

## **2. GID WATER SYSTEM BACKGROUND AND OPERATION**

The unincorporated community of Genelle is located within the Regional District of Kootenay Boundary (RDKB), Electoral Area "B". It is located approximately 12 km south of Castlegar and 20 km north of Trail, B.C. The community of Genelle has a population of approximately 770 residents (Statistics Canada 2016) with approximately 350 homes. Genelle is located on the western shore of the Columbia River,

and the bulk of development exists between the Columbia River in the east and Highway 22 to the west. All properties in Genelle utilize private onsite septic systems for sewage disposal.

The GID relies on three wells for its water supply. These wells are referred to as Wells #1, #2 and #3. Selected construction details for these wells are provided in Table 2.1. The location of these wells is shown on Figures 1 through 5, and well logs are provided as an attachment in Appendix B.

**Table 2.1 Selected Construction Details for GID Wells**

Parameter	Well 1 (WTN285)	Well 2 (WTN66691)	Well 3 (no tag number)
Date Drilled	1978	1990	2003
Diameter	8 inch (200 mm)	8 inch (200 mm)	8 inch (200 mm)
Elevation (approx..)	434 masl	433 masl	433 masl
Static Water Depth	22.8 m below ground (75 ft)	21.3 m below ground (70 ft)	20.6 m below ground (67.7 ft)
Total Depth	53 m (174 ft)	62.2 m (204 ft)	79.2 m (260 ft)
Depth to top of screen	48.5 m (159 ft)	59.1 m (194 ft)	74.7 m (245 ft)
Screen open length	4.6 m (15 ft)	3.1 m (10 ft)	4.6 m (15 ft)
Screen design	5 ft of 25 slot 10 ft of 20 slot	10 ft of 100 slot	15 ft of 60 slot
Driller-Estimated Yield	250 US gpm (15.8 L/s)	350 US gpm (22.1 L/s)	600 US gpm (37.8 L/s)
Lithology Comments	Little detail on log, all sand reported. Apparently Unconfined	Sand, gravel, or sand and gravel to total depth. Apparently unconfined.	Predominantly sand and gravel. Silt reported 102 – 192 ft. Semi-confined?

All three of the GID wells are routinely used as supply wells. Typical operation of the system sees Wells #2 and/or #3 operating as the main supply wells in the summer high demand period. These wells reportedly operate at 28.4 L/s (450 US gpm) individually, and can operate together when needed at a combined rate of 46 L/s (730 US gpm). Well 1 serves as the primary winter low demand season supply well, and has a typical operating rate of approximately 17.3 L/s (275 US gpm).

At present the GID does not employ any water treatment, and raw groundwater is distributed to connections while feeding a reservoir located west of Highway 22. The existing reservoir capacity is 378 m<sup>3</sup>, and a second 567 m<sup>3</sup> reservoir was completed in November 2016.

The GID reports no significant operational issues with their wells, and completes relatively frequent maintenance on their pumping systems. The pumps in Wells 2 and 3 have both been serviced since 2012, and we understand that the pump in Well 1 will be serviced in 2017. It is our understanding that none of the GID wells have been redeveloped, and despite this, remain productive.

In the past, the GID has distributed surface water from China Creek to customers, and maintains a surface water license. Surface water has not been used by the GID for many years, and the GID has no plans to resume using surface water. In the event of an emergency where the wells could not be used however, the connection to the China Creek source could theoretically be re-established.

### **3. HYDROGEOLOGIC SETTING AND SOURCE PROTECTION AREA**

In this section we provide a brief description of the physiographic and hydrogeologic setting as it pertains to the GID supply wells. For a detailed description of the surficial and bedrock geology of the Genelle area the reader is referred to the 2008 Golder report. In Section 3.2, we discuss the well capture zone delineations developed by Golder, and the derivation of the Source Protection Area proposed for this project. The capture zone analysis completed by Golder (2008) was thorough, and as little has changed in terms of water system demands or operation of the GID wells, new capture zone mapping was not completed for this project.

#### **3.1 Hydrogeologic Setting**

The community of Genelle occupies raised alluvial terraces emplaced by the Columbia River, consisting of alternating layers of sand and gravel. These sand and gravel deposits are up to 80 m thick or more based on a review of well logs in the area. The GID wells are located in what is referred to as “lower Genelle”, which is in the northern part of the community and as the name suggests, is located at lower elevation than development to the south. Lower Genelle is situated in an area where the historic alluvial terraces have been eroded away by China Creek. China Creek emerges from the mountainous area west of Genelle and discharges into the Columbia River. In the lower Genelle area, it is likely that alluvial fan deposits from China Creek are present overlying the older alluvial deposits emplaced by the Columbia River.

The Aquifer in which the GID wells are completed is mapped provincially as Aquifer 501-III A, which is classified as having a high productivity, moderate demand and high vulnerability to contamination. The high vulnerability to contamination rating suggests that the aquifer is unconfined. Lithology reported on the well driller logs for GID Wells #1 and #2 corroborate the unconfined classification of the aquifer, as only interbedded sequences of sand, sand and gravel and silty sand are reported. The driller-reported lithology on Well #3 (the deepest well) is somewhat different, as blue silt and sand or silt are reported above the water bearing sands in which the well is screened. Well #3 is located approximately 30 m from Well #2, and considering the proximity of these wells, the lithological differences reported can likely be attributed to lithological classification differences between the various well drillers. In summary, Aquifer 501-III A appears to be an unconfined aquifer in the lower Genelle area.

The direction of groundwater flow in Aquifer 501-III A was assessed in a 1994 report that evaluated sewage disposal issues in Genelle (Golder 1994). For that study, water level elevations were measured in seven wells, top of casing elevations were surveyed and a plot of the water levels was made. Based on this plot,



---

groundwater was found to flow southeasterly through the lower Genelle area, at a gradient of 0.00625 (Figure 2).

Primary sources of recharge to Aquifer 501-III A are believed to be the Columbia River and losses from China Creek. Direct infiltration of rainfall, snowmelt (and septic tank effluent) over the footprint of the aquifer are also probable sources of recharge.

Our conceptual model of groundwater occurrence and flow in the Lower Genelle area includes the following main components:

- Losses (recharge) from China Creek as it emerges from the mountains and travels across its alluvial fan creates a localized groundwater high point and is the primary driver of groundwater flow. This is consistent with the measured southeasterly flow direction in Lower Genelle.
- The Columbia River acts as the primary control on aquifer levels in Genelle. While no detailed analysis of water levels has been done, the GID water system operator reports that water levels in the wells closely mimic changes in the stage of the River. This suggests that the aquifer is in hydraulic connection with the River, which serves as a downgradient, positive recharge boundary.

### **3.2 Capture Zone Delineation and Source Protection Area**

Well capture zones can be delineated using a variety of methods depending on the amount of information available about the wells construction, pumping rates, and aquifer properties. Where little information is available, simple capture zone delineation methods are used such as the Arbitrary Fixed Radius (AFR) or Calculated Fixed Radius (CFR). Where more detailed information on aquifer parameters such as groundwater flow direction, gradient and transmissivity are available, more advanced capture zone methodologies can be used such as analytical equations and hydrogeologic mapping.

As part of the initial steps in the source protection planning process, Golder developed a two-dimensional groundwater flow model using MODFLOW (a computer groundwater modelling software package) to develop capture zones for each of the GID wells. This capture zone analysis was completed assuming that each well would be pumped at its typical operating rate continuously (which is conservative and resulted in larger than actual capture zones). The capture zone delineation also incorporated a range of aquifer transmissivity values derived from pumping tests on GID wells, as well as possible shifts of +/- 15 degrees in the measured groundwater flow direction.

In brief, the capture zone analysis completed by Golder involved development of a one-layer (2 dimensional) flow model that was not calibrated to field-measured water levels, and applied reasonable boundary conditions and assumed aquifer properties. The model incorporated well interference effects and is considered equivalent to an analytically derived solution to captures zones, which is more rigorous than a calculated fixed radius (CFR) approach that is typically used in projects of this nature. As water system demands and well pumping rates have not changed significantly since this capture zone delineation was completed, new capture zones were not derived for the wells and the 2008 capture zones were used to develop a source protection area for this project.

Figure 3 depicts the results of the Golder capture zone analysis for various pumping durations. Source Protection Areas are typically larger than individual well capture zones, are intended to account for

uncertainty or data limitations in well capture zone delineations. For this project, WWAL used the individual well capture zones derived in 2008 as a basis, and delineated expanded Source Protection Areas (SPA) for completing Modules 7 and 8 of the S2TAG.

Two SPAs were delineated as shown on Figure 4. The smaller, Primary SPA is an amalgamation of the 1 year capture zones delineated by Golder. The Primary SPA should be considered the area where land uses or activities have the most potential to impact the GID supply wells due to their proximity.

The larger, Overall SPA shown on Figure 4 depicts the extent of the area where landuses and accidental discharges of contaminants have the ability to potentially impact the GID source wells, and corresponds to what Golder termed the “Capture Zone Envelope”. The Overall SPA extends to the inferred western and upgradient edge of aquifer 500IIIA, and north as far as China Creek.

#### 4. SOURCE WATER QUALITY

As part of this project, WWAL compiled and reviewed recent water quality data provided by the GID. Water quality and changes in water quality over time is a useful tool to assess whether land use activities in the vicinity of a well is impacting groundwater quality. A summary of the water quality data reviewed is provided in Table 4.1.

Water quality from all three GID wells is very good and quite similar. Groundwater from all three wells displays a low level of mineralization. Iron and manganese, which are common aesthetic issues in groundwater supplies in the interior of the Province, are both found at low concentrations in all three wells. The low mineral content and low levels of iron and manganese in Aquifer 501-III A are likely a key factor in why the GID wells have remained productive since being put into service and have not required well redevelopment to help them maintain their productivity.

Sodium, chloride and nitrate can be considered parameters indicative of human activities at the surface. Road salting, septic disposal to ground, landfill leachate etc. can be sources of these parameters. Sodium and chloride are found at consistent and relatively low concentrations in all three wells. Nitrate is present in all three wells at concentrations of ~1 mg/L. While well below the Canadian Drinking Water Quality Guideline for Nitrate of 10 mg/L, the presence of nitrate at ~1 mg/L is indicative of an anthropogenic source of nitrate, as nitrate is typically absent or found at concentrations much lower than 1 mg/L in pristine aquifers. The likely source of the nitrate observed in the GID wells is septic disposal to ground within the community. We note that following its drilling in 2004, nitrate was not observed in Well #3 which is the deepest of the GID wells, but since being put into operation, nitrate concentrations have increased to ~1 mg/L. This suggests pumping has drawn water from shallower portions of the aquifer toward the well over time.

Based on discussions with the GID water system operator and Interior Health, we understand that bacteriological water quality in the GID wells is excellent.

**Table 4.1 Summary of Recent GID Well Water Quality Testing**

	Well 1	Well 1	Well 2	Well 2	Well 3	Well 3	Well 3
	Aug 2009	Dec 2015	Aug 2009	Apr 2013	March 2004 (post-drilling pumping test)	Aug 2009	May 2013
Turbidity (NTU)	0.1	0.2	0.2	<0.1	0.9	<0.1	<0.1
Conductivity (µS/cm)	267	280	248	212	271	259	251
TDS (mg/L)	115	149	142	115	155	155	133
Chloride (mg/L)	12.3	15.2	5.19	4.87	14.4	10.6	11.6
Sodium (mg/L)	3.8	3.8	3.05	3.1	8.58	2.99	3.1
Iron (mg/L)	<0.10	<0.10	<0.10	<0.1	0.21	<0.10	<0.1
Manganese (mg/L)	<0.002	<0.002	<0.002	<0.002	0.013	0.0027	<0.002
Nitrate (mg/L)	1.59	1.01	1.03	0.722	<0.05	0.94	0.894
Total Coliform (CFU/ 100 mL)	<1	na	<1	na	<1	<1	na
Fecal Coliform / E.Coli (CFU/ 100 mL)	<1	na	<1	na	<1	<1	na

## 5. CONTAMINANT SOURCE INVENTORY

As described within the S2TAG, Module #2 comprises a contaminant source inventory which identifies inherent risks to water quality as well as describing land uses, human activities and other potential contaminant sources that could affect source water quality. The term “contaminant source” is defined within the S2TAG to mean both actual/existing and potential sources of contamination.

### 5.1 Objectives and Methods

The objective of Module 2 is to inventory existing and known potential contamination sources in and around the proposed SPA and then to summarize what is known about these sites so that the potential risk to drinking water may be assessed further in Module 7.

We used the following methods in completing the contamination source survey:

- 1) A review of the 2008 Golder report;
- 2) A search of the B.C. Site Registry Database which contains information on reported contaminated sites and spills;
- 3) Discussions with TAC members on historic, current and future land uses;
- 4) A visual survey of the area in and around the Overall SPA conducted during August 2016. This was conducted partially on foot and partly by vehicle; and
- 5) A review of records on existing wells in the area.

The results of the contaminant source inventory are summarized in Table 5.1.

## 5.2 Contaminated Site Database Searches

A search of the B.C. Site Registry Database of reported contaminated sites was completed for an area within a radius of 5 km from the well sites. The addresses for the reported contaminated sites were reviewed and only two of the reported sites are located within the proposed Overall SPA.

Site ID#6442 pertains to a diesel spill that occurred along Highway 22 near China Creek in 1999. The detailed report for this file indicates that 200 L of diesel spilled from a ruptured semi-truck fuel tank, at a location approximately 10 m from China Creek. Hydrocarbon contaminated soil was excavated and removed from the site, as documented in several reports submitted to the Ministry of Environment. The current status of the file is Inactive – No Further Action.

Site ID#7943 pertains to the former Spir-O-Lok Industrial property in Lower Genelle, located approximately 200 m directly upgradient of GID Wells #2 and #3. In 2001, the GID notified the Ministry of Environment of their concerns related to a hydrocarbon spill at the property. An environmental investigation was initiated by the property owner and 46 m<sup>3</sup> of hydrocarbon and metals contaminated soils was subsequently removed or remediated on site. The current status of the file is Inactive – No Further Action.

## 5.3 Visual Survey of Source Protection Area

Ryan Rhodes P. Geo completed a visual survey of the proposed SPA twice in 2016. The area to the north and northwest of the GID wells is zoned Industrial, and several light industrial or commercial businesses currently operate in the area. The location of source protection concerns and land uses of note are shown on Figure 2. East of Highway 22, and within or partially within the Primary SPA:

- Genelle Marine boat repair. Located immediately (<30m) north of GID Wells #2 and #3.
- Pepsi Distributor Warehouse. Located ~75 m northwest of GID Wells #2 and #3.
- Home Goods Furniture Warehouse. Located ~90 m northwest of GID Wells #2 and #3. Immediately adjacent to GID Well #1.
- Canada Culvert. Culvert manufacturing (former Spir-O-Lok site), located ~170 m northwest of GID Wells #2 and #3.
- Columbia Warehouse. Currently vacant. Located approximately 340 m northwest of GID Wells #2 and #3.
- Star Transfer.
- Chinook Scaffolding storage yard and office.

---

West of Highway 22, outside the primary SPA but within the overall recharge source area for the GID wells:

- Roofing supply and RV storage facility. This facility has a large lined storage pond, which we understand is for stormwater runoff collection and used as an emergency fire suppression reservoir.
- Mini storage facility.
- Former China Creek Shell station. Not in operation for nearly a decade. TAC members report that underground fuel storage tanks likely still in place.
- Several residential properties with recently drilled wells (See Section 5.2).

Much of the primary and overall SPA is comprised of residential land uses, with onsite septic disposal to ground and of the potential for minor releases of household volumes of fuels, solvents, and fertilizer application.

Two major transportation corridors are present in the SPA and are potential threats to the aquifer. The first is the CP rail line, which traverses the entire primary SPA, and is located less than 30 m from both GID Wells #2 and #3. A major accident or derailment involving the transportation of possible contaminants such as fuels or chemicals has the potential to significantly impact the aquifer system, particularly GID Wells #2 and #3. The second transportation corridor is Highway 22. Spills along this corridor, which is located just outside the Primary SPA but within the overall source protection area also have the potential to impact the aquifer. Spills along this corridor have occurred in the past, as evidenced by the Site Registry ID#6442 spill of hydrocarbons near China Creek.

#### **5.4 Private Wells in the Source Protection Area**

Old or improperly constructed/maintained wells are potential direct pathways for contaminants to get into an aquifer. It is not uncommon for old wells to have been forgotten or buried as properties change hands, and changes in land use or drainage in the area can result in surface runoff draining into the old well. In terms of regulatory requirements for old and unused wells, the *B.C. Groundwater Protection Regulation* requires that unused wells (with no plans for future use) be closed by their owners within 10 years of being no longer used. Although this requirement has not been strongly enforced by the MFLNRO we can expect more attention paid to unused wells under the Water Sustainability Act and Regulations, which enable increased groundwater oversight and enforcement activities.

Figures 2 through 4 depict the location of reported wells in the Genelle area. In the Primary SPA, three wells other than the GID wells are reported. Two of these wells are active private domestic wells used by commercial or industrial operations, and one appears to be a residential domestic well that may or may not still be in use.

Further to the northwest, an additional nine wells are reported. Two of these wells are associated with commercial and industrial properties and are in use. Several residential properties are present west of Highway 22 and have recently drilled wells as water sources. These residential properties were formerly supplied with water from a separate community water system with an intake on China Creek. When faced with the requirement to upgrade treatment for their surface water source, the community water system

was abandoned and the property owners each drilled private domestic wells. These recently drilled wells are constructed to current standards, and would include surface seals and proper well head completions.

Two additional community supply wells are present and provide water to the Whispering Pines Mobile Home Park. Both these wells are outside the Primary SPA, and the wells are not in the Provincial well record database. We understand that the GID has had preliminary discussions with Whispering Pines with regards to providing GID water to the mobile home park, but at present, no plans are in place to implement this service.

It is our understanding the GID does not have a bylaw that prohibits property owners in the service area from drilling and using their own private wells.

## 5.5 Zoning in the Source Protection Area

There are a variety of zonings present in the proposed SPA, as shown on Figure 5. Land use is governed by RDKB Electoral Area 'B'/Lower Columbia–Old Glory Zoning Bylaw No. 1540 (2015).

The following zoning designations are located in the proposed SPA:

- Industrial 1 – 1 hectare minimum parcel size. Permitted uses include:
  - a) Auction mart;
  - b) Building and contracting supply establishment;
  - c) Contractor's shops and yards;
  - d) Distribution facility;
  - e) Eating and drinking establishment;
  - f) Freight terminal;
  - g) Light manufacturing;
  - h) Passenger terminal;
  - i) Rental, sales and associated service facilities for vehicles and light equipment;
  - j) Retail store;
  - k) Storage;
  - l) Tradesperson shop;
  - m) Wholesale establishment

Five parcels immediately northwest of GID Wells #2 and #3 are zoned Industrial 1 and are located within the Primary SPA.

- Industrial 2 – 1 hectare (10,000 m<sup>2</sup>) minimum parcel size when not connected to a community water system. 2,000 m<sup>2</sup> when connected to a community water system.

Permitted uses include:

- a) Auction mart;
- b) Building and contracting supply establishment;
- c) Contractor's shops and yard;
- d) Distribution facility;

- e) Eating and drinking establishment;
- f) Freight terminal;
- g) Light manufacturing;
- h) Log home manufacturing;
- i) Passenger terminal;
- j) Rental, sales and associated service facilities for vehicles and light equipment;
- k) Retail store;
- l) Storage;
- m) Tradesperson shop;
- n) Veterinary clinic;
- o) Wholesale establishment.

One parcel within the Primary SPA and five additional parcels within the Overall SPA have Industrial 2 zoning. We note that all six of these parcels are currently not serviced by the GID water system and have private wells or are not yet developed. Some of these parcels appear large enough in size to be subdivided, and if connected to the GID water system, could potentially be subdivided into several parcels.

- Commercial – 1 hectare (10,000 m<sup>2</sup>) minimum parcel size when not connected to a community water system. 2,000 m<sup>2</sup> when connected to a community water system.

Permitted uses include:

- a) Eating and drinking establishment;
- b) Hotel
- c) Motel;
- d) Office;
- e) Passenger terminal;
- f) Personal Service Establishment;
- g) Retail store;
- h) Service station.

One parcel within the Overall SPA has Commercial zoning, the former China Creek Shell Station.

Other zonings within the SPA include Residential 2, Rural Resource 1 (RUR1) and Agricultural Resource 2. Residential 2 has a minimum lot size of 2,000 m<sup>2</sup> (0.5 acres) when connected to a community water system, and there appears to be little if any potential for additional subdivision and residential densification in the SPA.

Several properties located west of Highway 22 are zoned RUR 1, which has the following permitted land uses:

- a) Campground;
- b) Cemetery;

- c) Portable shake, shingle, sawmill and lumber mill operations;
- d) Resource use;
- e) Single family dwelling.

Land uses of the most concern with respect to the protection of groundwater resources are the industrial-zoned parcels within the Overall SPA. At present, land uses on these parcels are relatively low risk, but permitted uses for parcels with this zoning could include higher risk activities such as light manufacturing involving chemicals or automotive repair.

### **5.6 Well Completion Issues**

GID Wells #1 and #2 are located within secure pump houses, while Well #3 is not located within a pump house but is within the GID's fenced compound which encloses Wells #2 and #3. All three wells have secure well caps, and no significant issues were noted with well head mechanical completions.

All three wells were completed prior to 2005 when the Groundwater Protection Regulation was enacted and are not completed with surface seals. The lack of a surface seal for Wells #1 and #2 is not considered to be an issue, as the wells are located in pump buildings with concrete floors. Well #3 however is not located inside a pump building and is located very near to the CP rail line. Addition of a surface seal to Well 3 would be beneficial.

### **5.7 Summary of Contamination Source Inventory**

The results of the contamination source inventory are presented in Table 5.1. Considering the SPA consists of industrial, residential and commercial land uses, 10 potential contamination sources were identified. Not all these sources are site – specific but rather relate to general land uses in the area.



**Table 5.1: Abbreviated Potential Contaminant/Hazard Inventory for GID Proposed Source Protection Area**

Hazard Reference No.	Contaminant Source type and Description	Location	Approx. Distance to Source	Possible Contaminants of Concern	Contaminant Transport Method	Associated Barriers
1	Industrial Land Uses near wells - East of Highway 22	Immediately adjacent to Wells, and extending directly up-gradient within SPA	20 m to 500 m	hydrocarbons, solvents, chemicals, industrial site stormwater	Infiltration through unsaturated soil then groundwater transport	Attenuation and retardation of transport through unsaturated soils overlying aquifer
2	Industrial Land Uses near wells - West of Highway 22	West of Highway 22, within SPA but outside likely 1 year capture zone	500 m +	hydrocarbons, solvents, chemicals, industrial site stormwater	Infiltration through unsaturated soil then groundwater transport	Attenuation and retardation of transport through unsaturated soils overlying aquifer
3	Storm water Infiltration	throughout SPA	20 m to 500 m+	hydrocarbons, chemicals	Infiltration through unsaturated soil then groundwater transport	Attenuation and retardation of transport through unsaturated soils overlying aquifer
4	Septic disposal to ground	throughout SPA	30 m to 500 m+	Nutrients, enteric viruses, bacteria, pharmaceuticals, chemicals	Infiltration through unsaturated soil or runoff	Attenuation and uptake in soils and by plants; Attenuation and retardation of transport through unsaturated soils overlying aquifer; die-off during transport
5	Accidental release of residential quantities of fuels or chemicals	Throughout Source Protection Area	30+ m	Hydrocarbons, solvents, fertilizers (nutrients), pesticides	Infiltration through unsaturated soil or runoff	Attenuation and uptake in soils and by plants
6	Contaminants introduced into existing unused wells, or well casings acting as preferential	Throughout Source Protection Area	30+ m	Fecal coliform, viruses,	Short-circuiting from surface to aquifer along well, then groundwater flow	none
				Nutrients (e.g. nitrate-nitrogen),		

Hazard Reference No.	Contaminant Source type and Description	Location	Approx. Distance to Source	Possible Contaminants of Concern	Contaminant Transport Method	Associated Barriers
	contamination pathways			Chloride (as an indicator)		
7	Transportation corridors - Highway 22	Highway 22 major corridor, located hydraulically upgradient within SPA	250 m to 600 m	Hydrocarbon release from vehicle accidents, chemicals	Infiltration through unsaturated soil then groundwater transport	Attenuation and retardation of transport through unsaturated soils overlying aquifer
8	Transportation Corridors - Rail Line	Rail corridor immediately adjacent to Wells 2 and 3	15 m to 100 m	Hydrocarbons, Chemicals	Infiltration through unsaturated soil then groundwater transport	Attenuation and retardation of transport through unsaturated soils overlying aquifer
9	GID well construction deficiencies	At wellheads	At source	All of the above	Short-circuiting from surface to aquifer along well, then groundwater flow	Pump houses over Wells 1 and 2
10	Future land use changes, new development	Primarily Industrial area adjacent to wells	30 m to 500 m	All of the above	Multiple potential pathways	GID input into development proposals and land use changes in SPA, appropriate site BMPs

## 6. MODULE #7: CHARACTERIZE RISKS FROM SOURCE TO TAP

Module #7 of the S2TAG probably forms the most important step in the source-to-tap assessment process. The purpose of the module is to synthesize all of the information on the GID Wells and aquifer system (strengths and vulnerabilities) into a comprehensive assessment of the major water supply elements and the system as a whole.

It is noted that both low probability / high magnitude and high probability / low magnitude risk events can result in adverse effects to human health and safety, and present risk management concerns to community water suppliers. The risk evaluation matrix discussed below is conservative in this respect and forces consideration of highly unlikely events that could have major consequences if they occur. Such events are normally dealt with by emergency response and/or contingency planning.

### 6.1 Objective and Methodology

The purpose of the risk assessment is to determine the level of risk posed by each identified drinking water hazard, and also considers the risk posed by the potential for future land use change in the area. A qualitative evaluation of risk typically involves an analysis of both the probability of a given risk event as well as the magnitude of the risk. This study has followed the structured approach to the assessment of risk as presented in the S2TAG as follows.

The likelihood of a given risk event has been assigned a value of ‘A’ to ‘E’ according to the S2TAG approach presented in Table 6.1.

**Table 6.1 Levels of Likelihood Description**

Level	Descriptor	Description	Probability of Occurrence in Next 10 Years
A	Almost certain	Is expected to occur in most circumstances	> 90%
B	Likely	Will probably occur in most circumstances	71-90%
C	Possible	Will probably occur at some time	31-70%
D	Unlikely	Could occur at some time	10-30%
E	Rare	May only occur in exceptional circumstances	< 10%

The relative consequences associated with the occurrence of a given risk event have been assigned a value of 1 to 5 according to the S2TAG approach presented in Table 6.2 while the resulting Qualitative Risk Analysis Matrix based on combining Likelihood and Consequence is provided in Table 6.3.

**Table 6.2 Relative Levels of Consequence Description**

Level	Descriptor	Description
1	Insignificant	Insignificant impact, no illness, little disruption to normal operation, little or no increase in normal operating costs.
2	Minor	Minor impact for small population, mild illness moderately likely, some manageable operation disruption, small increase in operating costs
3	Moderate	Minor impact for large population, mild to moderate illness probable, significant moderation to normal operation but manageable, operating costs increase, increased monitoring
4	Major	Major impact for small population, severe illness probable, systems significantly compromised and abnormal operation if at all, high level monitoring required
5	Catastrophic	Major impact for large population, severe illness probable, complete failure of systems

**Table 6.3 Qualitative Risk Analysis Matrix**

Likelihood	Consequences				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
A (almost certain)	Moderate	High	Very High	Very High	Very High
B (likely)	Moderate	High	High	Very High	Very High
C (possible)	Low	Moderate	High	Very High	Very High
D (unlikely)	Low	Low	Moderate	High	Very High
E (rare)	Low	Low	Moderate	High	High

## 6.2 Risk Characterization

Table 6.4 presents the Risk Evaluation Summary for the ten potential drinking water hazards identified for the proposed Source Protection Area. The level of risk for each hazard ranges from low to high.

**Table 6.4 Risk Characterization Summary for BEWD Groundwater Sources**

Hazard Reference No.	Drinking Water Hazard	Likelihood Level (from Table 6.1)	Consequence Level (from Table 6.2)	Risk Level (from Table 6.3)	Comments
1	Industrial Land Uses near wells - East of Highway 22. Spill, accidental release	C	2	Moderate	Moderate likelihood – low consequence event (with existing land uses). Land uses could change to higher risk activities which have the potential to increase the risk level.
2	Industrial Land Uses near wells - West of Highway 22. Spill, accidental release	C	2	Moderate	Moderate likelihood – low consequence event (with existing land uses). Land use activities could change and increase risk, but due to distance from wells, likely to remain moderate risk.
3	Storm water Infiltration	A	1	Moderate (WWAL revises to Low)	High likelihood – low consequence event. Low risk due to thick unsaturated zone above well intakes.
4	Septic Disposal to Ground	A	2	High (WWAL revises to moderate)	Septic disposal common and ongoing in SPA. Some indication of septic impact on aquifer already. Revised to moderate owing to depth to well intakes, stable population, and inferred high discharge of aquifer.
5	Accidental release of residential quantities of fuels or chemicals	D	2	Low	Low Likelihood – low consequence event. Relatively low risk for residential quantities of these substances.

6	Contaminants introduced into existing unused wells, or well casings acting as preferential contamination pathways	D	2	Low	Relatively few unused wells or wells in general in the DPA. Many of the reported wells are relatively recent (those located west of Highway 22) and would be constructed to current standards.
7	Transportation corridors - Highway 22	C	2 - 3	Moderate to High	Possible likelihood – moderate consequence event. Moderate to high risk due to location of corridor upgradient and unconfined nature of the aquifer.
8	Transportation Corridors - Rail Line	E	4	High	Low likelihood – major consequence event has the potential to impact or impair aquifer quality indefinitely. Wells 2 and 3 at greater risk due to proximity to rail line.
9	GID well construction deficiencies	D	2	Low	None of the GID wells have surface seals, but we assign this factor a low risk. Wells 1 and 2 are located in secure pump buildings with concrete floors. Well 3 could benefit from the addition of a surface seal.
10	Future land use changes, new development	C	2 - 3	Moderate to High	It is likely that land use changes will occur in the SPA, particularly in areas zoned industrial. If land uses in this area transition to higher risk activities it could pose a threat to the aquifer. The risk depends on the land use activity and its proximity to the wells.

---

### 6.3 Strengths, Weakness, Opportunities and Threats

The significant factors with potential to influence drinking water quality and availability now and into the future are discussed below in a Strengths, Opportunities, Weaknesses and Threats (SWOT) analysis.

#### System Strengths:

- The GID has redundancy in that three wells are available, any one of which can supply at least basic water demands (e.g. indoor domestic) for the entire community.
- Water quality from the wells is excellent, both chemically and bacteriologically.
- The excellent water quality results in long well lifespans, with wells that don't require rehabilitation to maintain yields.
- A preliminary assessment in Golder's 2008 hydrogeologic report suggests that the wells are not considered Groundwater Under the Direct Influence of Surface Water (GUDI).
- The GID also maintains its licence to the point of diversion on China Creek, and in an emergency could theoretically switch to that source (although a water quality or boil water advisory would likely be issued in this event).
- There is little potential for additional development to occur in the SPA.

#### System Weaknesses:

- The system does not have a dedicated mainline to the reservoir. In the event that water treatment is ever deemed necessary, it may prove difficult to maintain consistent chlorine concentrations in the distribution system.
- The GID is operated as a private utility and does not have access to grant funding for upgrades the same way local or regional government would.

#### System Opportunities:

- The GID system is located within Area "B" of the RDKB. The RDKB has been proactive at establishing and promoting source water protection in Genelle and other areas. The RDKB has been engaged in this project and has the ability to implement planning controls (e.g. Development Permit Areas) on development in the area.
- We understand that the GID may expand its service area to include a nearby mobile home park in the future, which could increase its customer base and bolster its financial position.

#### System Threats:

- Land use immediately adjacent to the supply wells are zoned Industrial. Current industrial land uses are primarily low risk, but this could change in the future.
- There are no mechanisms, other than the zoning bylaw, to control or have input into activities occurring on the industrial-zoned properties.
- Two major transportation corridors are located near to the well sites or within the SPA along which potential contaminants are likely routinely transported. The GID has no control over goods transported along these routes and is not notified when high-risk chemicals are transported through the community.
- The wells are located relatively close together, and completed in the same, unconfined aquifer system.

---

## 7. MODULE #8 RECOMMENDED ACTIONS TO PROMOTE GROUNDWATER PROTECTION

### 7.1 Discussion

Based on our assessment, we find that the three primary risks to groundwater in Genelle are:

1. The potential for a spill along one of the two major transportation corridors within the SPA.
2. Activities occurring on the Industrially-zoned properties which are present in close proximity to the GID wells. At present, activities occurring on these properties are relatively benign and constitute a moderate risk, but land uses could change to higher risk activities.
3. Septic disposal to ground across the community. The effects of septic disposal to ground in the community are evident in water quality samples from the GID wells, where nitrate concentrations are typically measured in the 1 mg/L range.

In Section 7.2 below we provide several recommendations to mitigate the effects of these primary risks as well as providing recommendations for initiatives that protect groundwater in general.

### 7.2 Recommendations

1. There is little the GID can do to prohibit or restrict the transport of goods on either Highway 22 or on the CP Rail line. As a result, mitigation strategies for the low probability but high risk scenario of a major spill in the SPA must focus on emergency preparedness and emergency response planning. We recommend that the GID engage CP Rail to initiate a communication protocol and to obtain the correct contact information for CP emergency response personnel in Genelle Area. This contact information should be confirmed yearly as part of the GID Emergency Response Plan and updated as needed. Provide CP Rail with the location of the GID water wells and if possible, work with CP Rail to have them recognize the GID Source Protection Area and update their emergency response plan in the event an incident occurs in the Source Protection Area.
2. Work with the RDKB to take advantage of planning mechanisms that RDKB can implement to protect groundwater in Genelle.
  - a. We recommend that the Groundwater Protection Development Permit Area already in place in Genelle be expanded to correspond with the Primary SPA developed for this report. The expanded DPA corresponds to the 1-year capture zones for the wells, and at least partially encompasses all of the Industrial-1 zoned properties east of Highway 22.
  - b. As written, the current Genelle Aquifer Development Permit Area seems only to pertain to septic systems. The RDKB has other development permit areas designed to protect groundwater resources (e.g. Industrial and Columba Gardens Aquifer DPA). We suggest modifying the Genelle Aquifer Development Permit Area to be more consistent with the Columbia Gardens DPA, which is stronger and contains more provisions to promote proper planning and aquifer protection.



3. A key limitation for the GID is their inability to have input into operations that occur on the industrially zoned parcels adjacent to their well sources. At present, industrial activities that are occurring are relatively benign, but under the existing Industrial 1 and 2 zonings, a range of activities are permitted and could potentially occur in the future. Consider working with the RDKB to more explicitly limit permitted land uses under these Industrial zonings.
4. Educate the residents of Genelle about this Source Protection Plan and what they can do to contribute to the protection of the resource. As part of our scope of services, we have prepared an educational handout that the GID can distribute.

One of the most important thing residents of Genelle can do to protect groundwater resources is to ensure their private septic systems are functioning properly and routinely maintained, including periodic pumping of septic tanks.

5. Consider installing a surface seal around Well #3. This a relatively low priority recommendation as the well is not located in a flood-prone area or in an area where ponding of water is likely to occur. Considering that Wells #1 and 2 are located in secure pump control buildings with concrete floors, retrofitting the wells to include surface seals would be challenging and would not result in a significant improvement to aquifer protection.
6. A typical recommendation in Source Water Protection Plans is to install signage indicating that drivers are entering a groundwater protection zone. These signs are already in place in the community of Genelle.

---

## REFERENCES

- British Columbia Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Water Resources Atlas accessed on-line at: [http://www.env.gov.bc.ca/wsd/data\\_searches/wrbc/](http://www.env.gov.bc.ca/wsd/data_searches/wrbc/)
- British Columbia Ministry of Environment. 2006. Well Protection Toolkit.  
[http://www.env.gov.bc.ca/wsd/plan\\_protect\\_sustain/groundwater/wells/well\\_protection/wellprotect.html](http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/well_protection/wellprotect.html)
- Golder Associates. 1994. Hydrogeological Assessment – Suitability for Septic Systems, Genelle, British Columbia. December 15, 1994.
- Golder Associates. 2008. Initial Phases in the Development of a Groundwater Protection Plan – Genelle Improvement District, Genelle, B.C. May 23, 2008.
- Ministry of Healthy Living and Sport. 2010. Comprehensive Drinking Water Source to Tap Assessment Guidelines. 45 p. <http://www.health.gov.bc.ca/protect/pdf/cs2ta-intro.pdf>

---

## **Western Water Associates Ltd. Standard Report Limitations**

1. This Document has been prepared for the particular purpose outlined in the work scope that has been mutually agreed to with the Client.
2. The scope and the period of service provided by Western Water Associates Ltd are subject to restrictions and limitations outlined in subsequent numbered limitations.
3. A complete assessment of all possible conditions or circumstances that may exist at the Site or within the Study Area referenced, has not been undertaken. Therefore, if a service is not expressly indicated, it has not been provided and if a matter is not addressed, no determination has been made by Western Water Associates Ltd. in regards to it.
4. Conditions may exist which were undetectable given the limited nature of the enquiry that Western Water Associates Ltd. was retained to undertake with respect to the assignment. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the Site, or Study Area, which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
5. In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Western Water Associates Ltd's opinions are based upon information that existed at the time of the production of the Document. It is understood that the Services provided allowed Western Water Associates Ltd to form no more than an opinion of the actual conditions of the Site, or Study Area, at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the Site, or Study Area, nor the surroundings, or any laws or regulations.
6. Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either expressed or implied, that the actual conditions will conform exactly to the assessments contained in this Document.
7. Where data supplied by the Client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated.
8. No responsibility is accepted by Western Water Associates Ltd for incomplete or inaccurate data supplied by others.
9. The Client acknowledges that Western Water Associates Ltd may have retained sub-consultants affiliated to provide Services. Western Water Associates Ltd will be fully responsible to the Client for the Services and work done by all of its sub-consultants and subcontractors. The Client agrees that it will only assert claims against and seek to recover losses, damages or other liabilities from Western Water Associates Ltd.
10. This Document is provided for sole use by the Client and is confidential to it and its professional advisers. No responsibility whatsoever for the contents of this Document will be accepted to any person other than the Client. Any use which a third party makes of this Document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. Western Water Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this Document.











**APPENDIX A**  
**Figures**

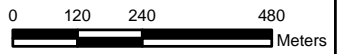
Genelle Improvement District Source Water Protection Plan  
WWAL Ref: 16-062-01



**Figure 1 - Mapped Aquifers and Reported Wells in Genelle Area.**

*Legend*

-  GID Production Wells
-  BC WELLS Database (WTN)
-  Streams
-  Gas Pipeline
-  Highway 22
-  Power Lines
-  Railroad
-  Bedrock Aquifer 500 IIIB
-  Sand and Gravel Aquifer 501 IIIA
-  Measured Groundwater Flow Direction in Aquifer 501 IIIA (1994)



Reference

Client: Genelle Improvement District  
 Project Number: 16-062-01  
 Date: January 20, 2017  
 Drawn by: Nathan Whiting  
 Checked by: Ryan Rhodes

Digital data and orthophotos provided by RDKB and MOE

Coordinate System: NAD 83 UTM Zone 11

Key Map

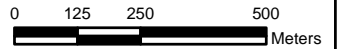




**Figure 2 - Land Use and Points of Interest in the Genelle Area.**

*Legend*

- BC WELLS Database (WTN)
- GID Production Wells
- Wells
- Streams
- Gas\_Pipeline
- Highway 22
- Power\_Lines
- Railroad
- Commercial Industrial Park



Reference

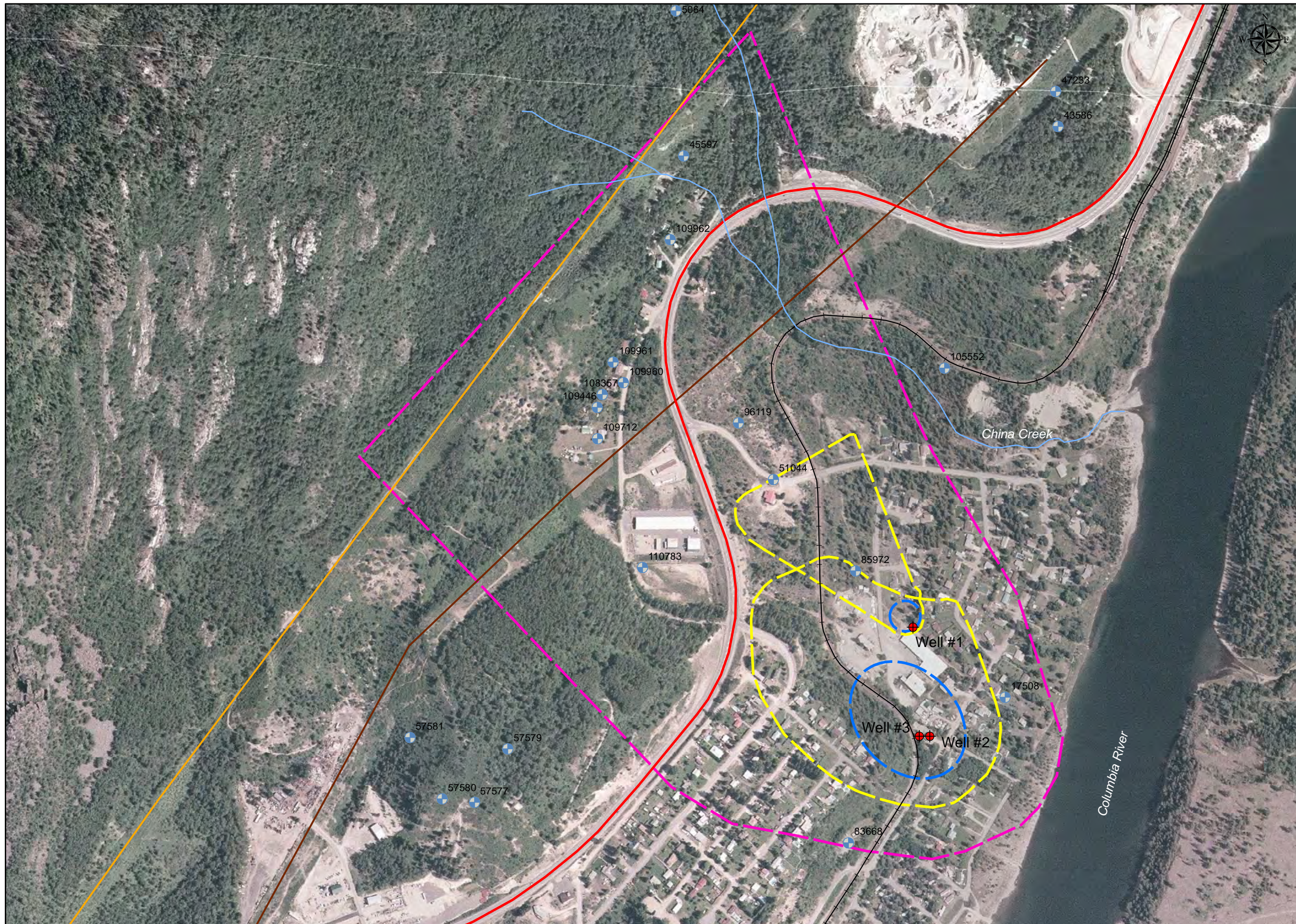
Client: Genelle Improvement District  
 Project Number: 16-062-01  
 Date: October 24, 2016  
 Drawn by: Nathan Whitting  
 Checked by: Ryan Rhodes

Digital data and orthophotos provided by RDKB and MOE

Coordinate System: NAD 83 UTM Zone 11

Key Map

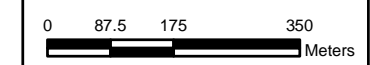




**Figure 3 - GID Well Capture Zone Mapping (Golder 2008).**

**Legend**

- GID Production Wells
- BC WELLS Database (WTN)
- Streams
- Gas\_Pipeline
- Highway\_22
- Power\_Lines
- Railroad
- 100-Day TOT Capture Zone 1
- Year TOT Capture Zone
- Overall Capture Zone



**Reference**

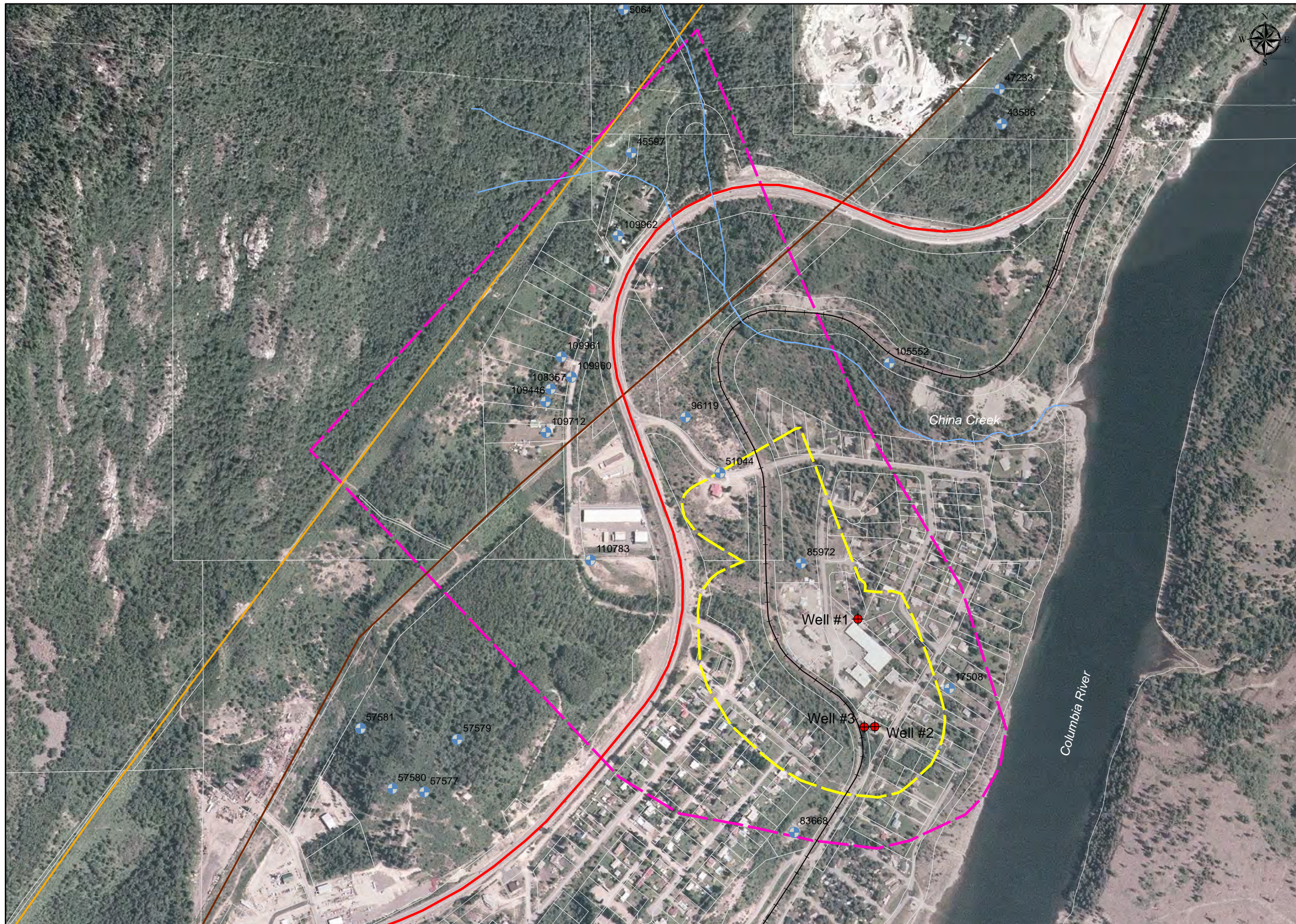
Client: Genelle Improvement District  
 Project Number: 16-062-01  
 Date: January 20, 2017  
 Drawn by: Nathan Whiting  
 Checked by: Ryan Rhodes

Digital data and orthophotos provided by RDKB and MOE

Coordinate System: NAD 83 UTM Zone 11

**Key Map**

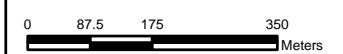




**Figure 4 - Primary and Overall Source Water Protection Area.**

**Legend**

- GID Production Wells
- BC WELLS Database (WTN)
- Streams
- Gas\_Pipeline
- Highway 22
- Power\_Lines
- Railroad
- Primary Source Protection Area
- Overall Source Protection Area
- Cadastral Fabric



**Reference**

Client: Genelle Improvement District  
 Project Number: 16-062-01  
 Date: January 20, 2017  
 Drawn by: Nathan Whiting  
 Checked by: Ryan Rhodes

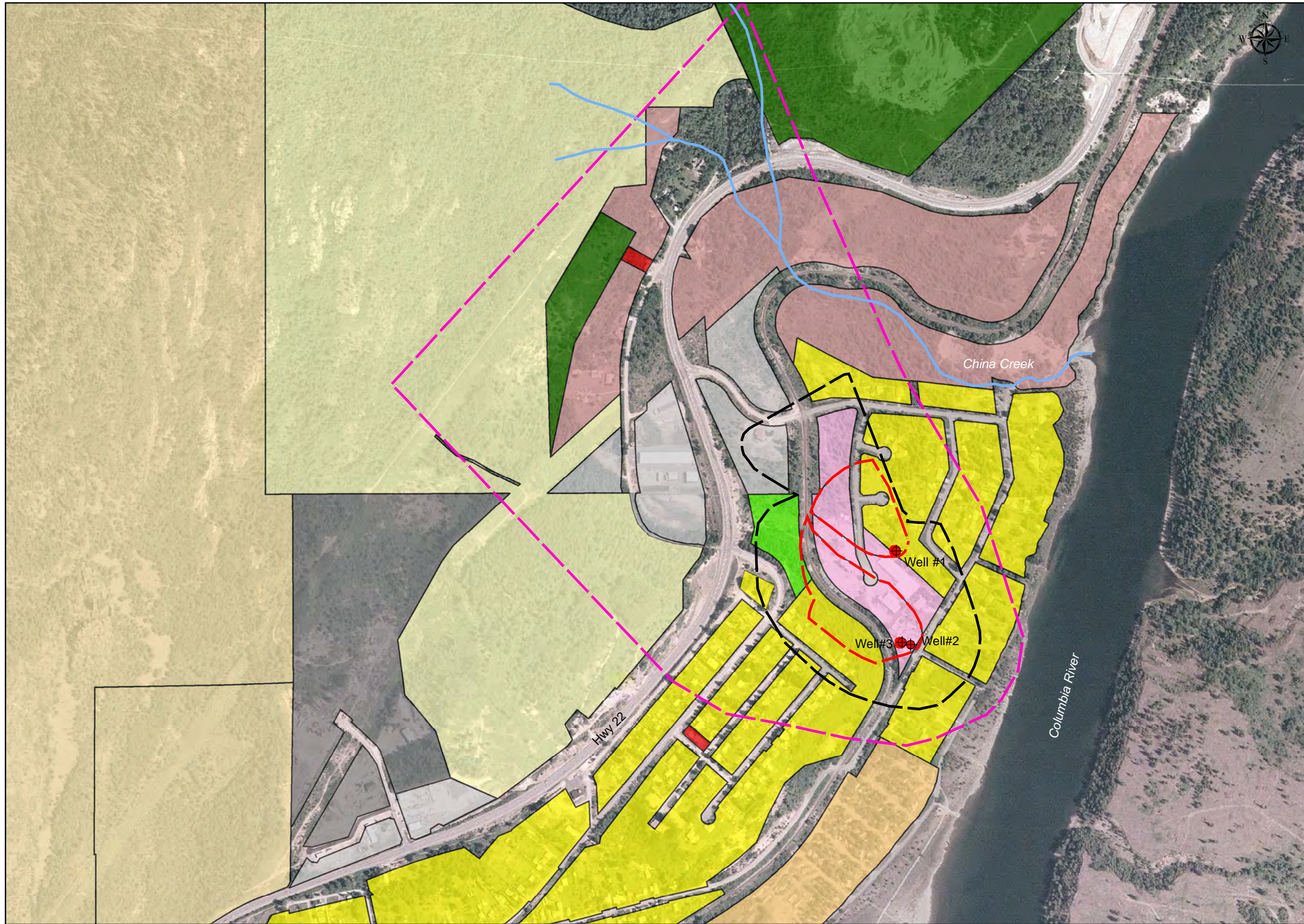
Digital data and orthophotos provided by RDKB and MOE

Coordinate System: NAD 83 UTM Zone 11

**Key Map**





















**Figure 5 - Genelle Zoning with Source Protection Areas.**

*Legend*

-  GID Production Well
-  Current Genelle Aquifer DPA
-  Primary Source Protection Area
-  Overall Source Protection Area
-  Commercial
-  Agricultural Resource 2
-  Industrial 1
-  Industrial 2
-  Industrial 3
-  Parks and Recreation
-  Rural Resource - 1
-  Rural Resource - 3
-  Genelle Residential
-  Manufactured Home Park



Reference

Client: Genelle Improvement District  
 Project Number: 16-062-01  
 Date: January 20, 2017  
 Drawn by: Nathan Whiting  
 Checked by: Ryan Rhodes

Digital data and orthophotos provided by RDKB and MOE

Coordinate System: NAD 83 UTM Zone 11

Key Map



**APPENDIX B**  
**GID Well Logs**

Genelle Improvement District Source Water Protection Plan  
WWAL Ref: 16-062-01



## Report 1 - Detailed Well Record

610 Production Well #1

<p>Well Tag Number: 285</p> <p>Owner: GENELLE IMPROVEMENT</p> <p>Address: DONSMITH WELL</p> <p>Area: GENELLE</p> <p>WELL LOCATION:          KOOTENAY Land District          District Lot: Plan: Lot:          Township: Section: Range:          Indian Reserve: Meridian: Block:          Quarter:          Island:          BCGS Number (NAD 27): 082F022213 Well: 5</p> <p>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 Constr          Diameter: 0.0 inches          Casing drive shoe:          Well Depth: 0 feet          Elevation: 0 feet (ASL)          Final Casing Stick Up: inches          Well Cap Type:          Bedrock Depth: feet          Lithology Info Flag:          File Info Flag:          Sieve Info Flag:          Screen Info Flag:</p> <p>Site Info Details:          Other Info Flag:          Other Info Details:</p>	<p>Construction Date:</p> <p>Driller: Unknown          Well Identification Plate Number:          Plate Attached By:          Where Plate Attached:</p> <p>PRODUCTION DATA AT TIME OF DRILLING:          Well Yield: 250 (Driller's Estimate) U.S. Gallon          Development Method:          Pump Test Info Flag:          Artesian Flow: UNKNOWN YIELD          Artesian Pressure (ft):          Static Level:</p> <p>WATER QUALITY:          Character:          Colour:          Odour:          Well Disinfected: N          EMS ID:          Water Chemistry Info Flag:          Field Chemistry Info Flag:          Site Info (SEAM):</p> <p>Water Utility:          Water Supply System Name:          Water Supply System Well Name:</p> <p>SURFACE SEAL:          Flag:          Material:          Method:          Depth (ft):          Thickness (in):</p> <p>WELL CLOSURE INFORMATION:          Reason For Closure:          Method of Closure:          Closure Sealant Material:          Closure Backfill Material:          Details of Closure:</p>																				
<table border="1"> <thead> <tr> <th>Screen from</th> <th>to feet</th> <th>Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="4">GENERAL REMARKS:</td> </tr> <tr> <td colspan="4">LITHOLOGY INFORMATION:</td> </tr> <tr> <td>From</td> <td>0 to</td> <td>0 Ft.</td> <td></td> </tr> <tr> <td>From</td> <td>0 to</td> <td>0 Ft.</td> <td>174 feet of sand</td> </tr> </tbody> </table>		Screen from	to feet	Type	Slot Size	GENERAL REMARKS:				LITHOLOGY INFORMATION:				From	0 to	0 Ft.		From	0 to	0 Ft.	174 feet of sand
Screen from	to feet	Type	Slot Size																		
GENERAL REMARKS:																					
LITHOLOGY INFORMATION:																					
From	0 to	0 Ft.																			
From	0 to	0 Ft.	174 feet of sand																		

- [Return to Main](#)

**Information Disclaimer**

The Province disclaims all responsibility for the accuracy of information provided. Information provided





BRITISH COLUMBIA

BC Environment Water Management Division WATER WELL RECORD

Date 03/10/29

N.T.S. MAP, WELL No., ELEV., Location Agency, Date 19, Well Type

Owners Name & Address: GENELLE IMPROVEMENT DISTRICT
Legal Description & Address: 611-16 AVE, PO BOX 82, GENELLE BC V0G 1G0
Descriptive Location: IMPROVEMENT YARD

1. TYPE OF WORK, 2. WORK METHOD, 3. WATER WELL USE, 4. DRILLING ADDITIVES, 5. MEASUREMENTS

9. CASING: Materials, Hole Diameter, Diameter from to, Thickness, Weight

6. WELL LOG DESCRIPTION table with columns FROM ft, TO ft, Description, SWL ft

Pitless unit, 10. SCREEN: Type, Material, Set from to

RISER, SCREEN & BLANKS table with columns Length, Diam. I.D., Slot Size, units

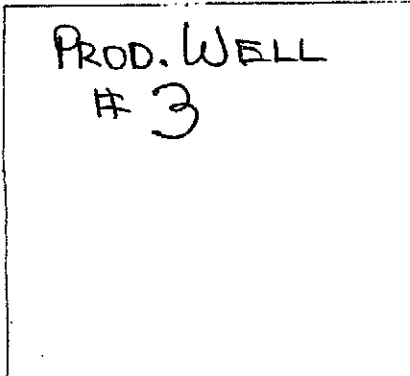
11. DEVELOPED BY, 12. TEST: Rate, Temp, SWL before test, Water Level

RECOVERY in ft table with columns mins, WL, mins, WL, mins, WL, mins, WL

13. RECOMMENDED PUMP TYPE, RECOMMENDED PUMP SETTINGS, RECOMMENDED PUMPING RATE

14. WATER TYPE, 15. WATER ANALYSIS: Hardness, Iron, Chloride, pH

7. CONSULTANT, 8. WELL LOCATION SKETCH



SITE I.D. No., Lab Date

16. FINAL WELL COMPLETION DATA: Well Depth, Well Yield, Static Water Level, Back filled, Well Head Completion

17. DRILLER: Signature, Surname, First Name

18. CONTRACTOR: Address, J.R. Drilling Ltd, 7062 HIDDEN VALLEY RD, CRANBROOK BC V0G 1X4

**APPENDIX C**  
**Site Registry Database Reports**

Genelle Improvement District Source Water Protection Plan  
WWAL Ref: 16-062-01

SiteRegSearchLat49Long117

As Of: JUL 31, 2016 BC Online: Site Registry 16/08/07  
 For: PA76904 WESTERN WATER ASSOCIATES LTD 16:31:40  
 Page 1

Folio: GENELLE

11 records selected for 5.0 km from latitude 49 deg, 12 min, 55.4 sec  
 and Longitude 117 deg, 41 min, 7.6 sec

Site Id	Lastupd	Address / City	
0004617	02JAN31	COLUMBIA ROAD CASTLEGAR	
0004858		4675 MINTO ROAD CASTLEGAR	
0005677	02SEP09	4500 MINTO ROAD CASTLEGAR	
0005964	01JUN06	4720 14TH AVENUE CASTLEGAR	
✓ 0006342	02SEP09	COURTESY ROAD GENELLE	
✓ 0006442	02JUN26	HWY 22 GENELLE	3 200 L diesel spill - Inactive - No Further Action - remediated
✓ 0006707	05APR28	4000 COLUMBIA AVENUE CASTLEGAR	
✓ 0007943	02AUG15	HOME GOODS ROAD GENELLE	} sp no - tok - 40m <sup>3</sup> of hydrocarbon Soil removed
✓ 0008075	03NOV21	PIPELINE PIT ROAD GENELLE	- remediation completed
New 0011963	10FEB25	END OF COURTESY ROAD GENELLE	- Inactive - No further Action
New 0017664		1010 COMMERCIAL WAY GENELLE	

11963 - Courtesy Road - Commercial development to the  
 South west - No risk  
 " " " "  
 0017664 - Commercial way - " "

As of: OCT 14, 2007 BC Online: Site Registry 07-10-25  
For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY) 11:21:29  
Folio: 07-1480-0065CR Page 1

Detail Report

SITE LOCATION

Site ID: 6442 Latitude: 49d 13m 24.4s  
Victoria File: Longitude: 117d 41m 23.2s  
Regional File: 26250-20/6442  
Region: NELSON, KOOTENAY

Site Address: HWY 22  
City: GENELLE Prov/State: BC  
Postal Code:

Registered: MAR 03, 2000 Updated: JUN 26, 2002 Detail Removed: JUN 17, 2002

Notations: 3 Participants: 5 Associated Sites: 0  
Documents: 2 Susp. Land Use: 1 Parcel Descriptions: 0

Location Description: ADJACENT TO HWY 22 WITHIN RIGHT-OF-WAY, APPROXIMATELY 15  
KM SOUTH OF CASTLEGAR. LAT/LONG OBTAINED BY BC ENVIRONMENT REFERENCING TRIM  
DATA (1:20,000)

Record Status: INACTIVE - NO FURTHER ACTION  
Fee category: SMALL SITE, COMPLEX CONTAMINATION

=====  
NOTATIONS

Notation Type: SITE INVESTIGATION REPORT SUBMITTED  
Notation Class: ADMINISTRATIVE  
Initiated: JAN 31, 2000 Approved: JAN 31, 2000

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants Notation Roles  
TROWELEX RENTALS (CASTLEGAR, B.C.) REQUESTED BY



STOCKERL, ED (NELSON)  
WESTERN BIORESOURCES CONSULTING LTD (TRAIL)

RECEIVED BY  
ISSUED BY

Note: REPORT SUMMARIZES RESULTS OF AN ENVIRONMENTAL ASSESSMENT AND REMEDIAL WORKS CONDUCTED ON JANUARY 19/00. THIS WAS FOLLOW-UP TO SITE ASSESSMENT AND REMEDIAL WORKS CONDUCTED ON DECEMBER 17, 1999. ADDITIONAL PETROLEUM HYDROCARBON CONTAMINATED SOIL WAS REMOVED FOR APPROPRIATE OFF-SITE DISPOSAL. REPORT WAS SUBMITTED FOR INFORMATION PURPOSES ONLY. NO REQUEST FOR REVIEW OR COMMENT.

Required Actions: RESULTS OF CONFIRMATION SAMPLING INDICATED CONTAMINANT LEVELS WERE WITHIN NUMERICAL STANDARDS AT THE LIMITS OF EXCAVATION.

-----  
Notation Type: SITE INVESTIGATION REPORT SUBMITTED

Notation Class: ADMINISTRATIVE

Initiated: JAN 13, 2000

Approved: JAN 13, 2000

Ministry Contact: STOCKERL, ED (NELSON)

As of: OCT 14, 2007

BC Online: Site Registry

07-10-25

For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY)

11:21:29

Folio: 07-1480-0065CR

Page 2

NOTATIONS

Notation Participants

TROWELEX RENTALS (CASTLEGAR, B.C.)

STOCKERL, ED (NELSON)

WESTERN BIORESOURCES CONSULTING LTD (TRAIL)

Notation Roles

REQUESTED BY

RECEIVED BY

ISSUED BY

Note: REPORT SUMMARIZES RESULTS OF ENVIRONMENTAL ASSESSMENT OF DIESEL SPILL. PETROLEUM HYDROCARBONS EXCEEDED SPECIAL WASTE NUMERICAL STANDARDS.

Required Actions: EXCAVATED SOIL WILL REQUIRE SUBMISSION OF A SPECIAL WASTE GENERATOR REGISTRATION. SOILS ARE TO BE DISPOSED TO A PERMITTED FACILITY. ADDITIONAL EXCAVATION IS REQUIRED TO REMOVE CONTAMINATED SOIL REMAINING AT THE SPILL SITE.

-----

Notation Type: SPILL REPORTED  
Notation Class: ADMINISTRATIVE  
Initiated: DEC 15, 1999 Approved: DEC 15, 1999

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants Notation Roles  
PROVINCIAL EMERGENCY PROGRAM RECEIVED BY

Note: DIESEL SPILL OF APPROXIMATELY 200 LITRES WAS REPORTED TO PEP BY THE RCMP TRAIL DETACHMENT (DANGEROUS GOODS INCIDENT 12491). SEMI TOW TRUCK WENT OFF ROAD RUPTURING FUEL TANK AND SPILLING DIESEL FUEL TO GROUND ON HWY 22 RIGHT OF WAY. SPILL OCCURRED WITHIN 10 METRES OF CHINA CREEK.

Required Actions: SOIL EXCAVATION TO OCCUR UNDER SUPERVISION OF QUALIFIED CONSULTANT.

=====

SITE PARTICIPANTS

Participant: PROVINCIAL EMERGENCY PROGRAM  
Role(s): ASSOCIATED PROVINCIAL GOVERNMENT CONTACT  
Start Date: DEC 15, 1999 End Date:

-----

Participant: STOCKERL, ED (NELSON)  
Role(s): MAIN MINISTRY CONTACT  
Start Date: DEC 15, 1999 End Date:

-----

Participant: TOM & MERRITT TOWING LTD.  
Role(s): RESPONSIBLE PERSON  
Start Date: JAN 15, 2000 End Date:  
Notes: SPILLER

-----

Participant: TROWELEX RENTALS (CASTLEGAR, B.C.)  
Role(s): TRANSPORTER/SUPPLIER/PRODUCER  
Start Date: JAN 13, 2000 End Date:

-----

Participant: WESTERN BIORESOURCES CONSULTING LTD (TRAIL)

Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR

As of: OCT 14, 2007 BC Online: Site Registry 07-10-25  
For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY) 11:21:29  
Folio: 07-1480-0065CR Page 3

SITE PARTICIPANTS

Start Date: JAN 13, 2000 End Date:

=====

DOCUMENTS

Title: UPDATED SPILL REMEDIATION REPORT FOR: HIGHWAY 22/CHINA CREEK  
Authored: JAN 31, 2000 Submitted: JAN 31, 2000

Participants	Role
WESTERN BIORESOURCES CONSULTING LTD (TRAIL)	AUTHOR
TROWELEX RENTALS (CASTLEGAR, B.C.)	COMMISSIONER
STOCKERL, ED (NELSON)	RECIPIENT

Notes: REPORT SUMMARIZES RESULTS OF PETROLEUM HYDROCARBONS ANALYSIS OF  
EXCAVATED SOILS AND IS AN UPDATE TO A REPORT RECEIVED ON JANUARY 17,  
2000. NO REPORT

-----

Title: SPILL REMEDIATION REPORT FOR: HIGHWAY 22/CHINA CREEK  
Authored: JAN 13, 2000 Submitted: JAN 17, 2000

Participants	Role
WESTERN BIORESOURCES CONSULTING LTD (TRAIL)	AUTHOR
TROWELEX RENTALS (CASTLEGAR, B.C.)	COMMISSIONER
STOCKERL, ED (NELSON)	RECIPIENT

Notes: REPORT SUMMARIZES SPILL INCIDENT AND RESULTS OF PETROLEUM HYDROCARBONS  
ANALYSIS OF EXCAVATED SOIL AND SURROUNDING AREA. NO REPORT REVIEW  
REQUESTED.

=====

SUSPECTED LAND USE

Description: MISCELLANOUS VACANT LAND

Notes: HIGHWAY RIGHT OF WAY

No activities were reported for this site

End of Detail Report

As of: OCT 14, 2007 BC Online: Site Registry 07-10-25  
For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY) 11:20:56  
Folio: 07-1480-0065CR Page 1

Detail Report

SITE LOCATION

Site ID: 7943 Latitude: 49d 12m 57.8s  
Victoria File: Longitude: 117d 41m 10.9s  
Regional File: 26250-20/7943  
Region: NELSON, KOOTENAY

Site Address: HOME GOODS ROAD  
City: GENELLE Prov/State: BC  
Postal Code: V0G 1G0

Registered: AUG 08, 2002 Updated: AUG 15, 2002 Detail Removed: AUG 12, 2002

Notations: 5 Participants: 6 Associated Sites: 0  
Documents: 3 Susp. Land Use: 1 Parcel Descriptions: 1

Location Description: CO-ORDINATES PROVIDED BY PROPERTY OWNER

Record Status: INACTIVE - NO FURTHER ACTION

Fee category: SMALL SITE, SIMPLE CONTAMINATION

=====  
NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED (WMA  
28(2))

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS

Initiated: AUG 09, 2002

Approved: AUG 09, 2002

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants

WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR  
(17TH STREET))

Notation Roles

SUBMITTED BY

Note: PROPERTY OWNER'S CONSULTANT PROVIDED WRITTEN CONFIRMATION ADVISING  
MANAGER OF REMEDIAL PROGRAM COMPLETION. REMEDIATION INVOLVED EXCAVATION OF  
HYDROCARBON AND METAL CONTAMINATED SOILS. INCLUDED WITH SUBMISSION WAS COPY  
OF A PRELIMINARY SITE INVESTIGATION AND REMEDIAL CLOSURE REPORT.

-----  
Notation Type: SITE INVESTIGATION REPORT SUBMITTED

Notation Class: ADMINISTRATIVE

Initiated: AUG 09, 2002

Approved: AUG 09, 2002

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants

WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR  
(17TH STREET))

STOCKERL, ED (NELSON)

Notation Roles

SUBMITTED BY

RECEIVED BY

Note: PRELIMINARY SITE INVESTIGATION REPORT AND REMEDIAL CONFIRMATION REPORT  
SUBMITTED IN SUPPORT OF NOTICE OF INDEPENDENT REMEDIATION COMPLETION.

As of: OCT 14, 2007

BC Online: Site Registry

07-10-25

For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY)

11:20:56

Folio: 07-1480-0065CR

Page 2

NOTATIONS

REMEDICATION WORKS INVOLVED EXCAVATION OF 46 CUBIC METRES OF HYDROCARBON AND  
METALS CONTAMINATED SOILS.

-----  
Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED (WMA  
28(2))

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS

Initiated: MAY 15, 2002

Approved: AUG 07, 2002

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants

WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR  
(17TH STREET))  
STOCKERL, ED (NELSON)  
EICHENBERGER, KATHY (KOOTENEY)  
SPIR-L-OK INDUSTRIES (GENELLE)

Notation Roles

SUBMITTED BY  
  
REVIEWED BY  
RECEIVED BY  
ISSUED BY

Note: VERBAL NOTIFICATION PROVIDED TO MINISTRY ON MAY 15, 2002. WRITTEN NOTIFICATION DATED MAY 15/02 RECEIVED BY MINISTRY ON AUGUST 7/02. NOTICE ADVISED THAT HYDROCARBON AND METAL CONTAMINATION IN SURFACE SOILS WILL BE REMEDIATED TO NUMERICAL STANDARDS APPLICABLE TO COMMERCIAL/INDUSTRIAL LAND USE. AN ESTIMATED 25 CUBIC METRES OF CONTAMINATED SOILS WILL BE EXCAVATED AND DISPOSED TO AN AUTHORIZED FACILITY. SPECIAL WASTE LEVEL CONTAMINATED SOILS MAY BE TREATED ON-SITE IN A BIO-CELL.

Required Actions: CONFIRMATION OF REMEDIAL WORKS IS TO BE PROVIDED TO THE MANAGER WITHIN 90 DAYS OF COMPLETING WORKS.

-----

Notation Type: INSPECTION / VISIT

Notation Class: ADMINISTRATIVE

Initiated: JUL 24, 2001

Approved: JUL 24, 2001

Ministry Contact: STOCKERL, ED (NELSON)

Notation Participants

SPIR-L-OK INDUSTRIES (GENELLE)

Notation Roles

RECEIVED BY

Note: SITE INSPECTION CONDUCTED BY MINISTRY STAFF IN RESPONSE TO REPORT OF OIL SPILL RECEIVED ON JULY 17, 2001. OBVIOUS HYDROCARBON STAINING OF SOILS OBSERVED ADJACENT TO ENTRANCE TO SHOP BUILDING.

Required Actions: SITE OPERATOR IS TO TAKE APPROPRIATE ACTIONS TO PREVENT SUBSEQUENT DISCHARGES OF OIL AND TO MITIGATE EXISTING IMPACTS TO SOIL.

-----

Notation Type: SPILL REPORTED

Notation Class: ADMINISTRATIVE

Initiated: JUL 17, 2001

Approved: JUL 17, 2001

Ministry Contact: WOOD, BARRY (MELP)





Participant: STOCKERL, ED (NELSON)

Role(s): MAIN MINISTRY CONTACT

Start Date: JUL 17, 2001

End Date:

-----  
Participant: WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR (17TH STREET))

Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR

Start Date: APR 24, 2002

End Date:

-----  
Participant: WOOD, BARRY (MELP)

Role(s): ALTERNATE MINISTRY CONTACT

Start Date: JUL 17, 2001

End Date: MAR 31, 2002

Notes: FORMER ASSISTANT REGIONAL WASTE MANAGER

=====

DOCUMENTS

Title: CONFIRMATION OF REMEDIATION REPORT FOR HOME GOODS ROAD, GENELLE, BC.

Authored: JUN 25, 2002

Submitted: AUG 09, 2002

Participants

WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR  
(17TH STREET))

Role

AUTHOR

SPIR-L-OK INDUSTRIES (GENELLE)

COMMISSIONER

STOCKERL, ED (NELSON)

RECIPIENT

Notes: REPORT SUMMARIZES REMEDIAL WORKS AND ANALYTICAL RESULTS FOR  
CONFIRMATION SOIL SAMPLES COLLECTED AT LIMITS OF EXCAVATIONS.

-----

As of: OCT 14, 2007

BC Online: Site Registry

07-10-25

For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY)

11:20:56

Folio: 07-1480-0065CR

Page 4

DOCUMENTS

Title: NOTIFICATION OF INDEPENDENT REMEDIATION

Authored: MAY 15, 2002

Submitted: AUG 07, 2002

Participants	Role
WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR (17TH STREET))	AUTHOR
SPIR-L-OK INDUSTRIES (GENELLE)	COMMISSIONER
STOCKERL, ED (NELSON)	REVIEWER

Notes: LETTER OF NOTIFICATION ADVISING OF PROPOSED REMEDIAL WORKS TO ADDRESS  
PETROLEUM HYDROCARBON CONTAMINATION IN SURFACE SOILS.

-----  
Title: PRELIMINARY INVESTIGATION AND REMEDIAL PLAN FOR HYDROCARBON SOIL AT  
SPIR-L-OK INDUSTRIES, GENELLE, BC

Authored: APR 24, 2002

Submitted: AUG 09, 2002

Participants	Role
WESTERN BIORESOURCES CONSULTING LTD (CASTLEGAR (17TH STREET))	AUTHOR
SPIR-L-OK INDUSTRIES (GENELLE)	COMMISSIONER
STOCKERL, ED (NELSON)	RECIPIENT

Notes: REPORT SUMMARIZES RESULTS OF EFFORTS TO ASSESS HYDROCARBON AND METAL  
CONTAMINATION IN SURFACE SOIL.

=====

SUSPECTED LAND USE

Description: WELDING OR MACHINE SHOPS (REPAIR OR FABRICATION)

Notes: SITE OPERATIONS INVOLVE FABRICATION OF CORRUGATED METAL PIPE

=====

PARCEL DESCRIPTIONS

Date Added: AUG 08, 2002

Crown Land PIN#:

LTO PID#: 024801470

Crown Land File#:

Land Desc: LOT A DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP66980

No activities were reported for this site

End of Detail Report

As Of: OCT 14, 2007

BC Online: Site Registry

07/10/24

For: PA59614 GOLDER ASSOCIATES LTD. (BURNABY)

09:26:33

Folio: 07-1480-0065CR

Page 1

9 records selected for 5.0 km from latitude 49 deg, 12 min, 50.4 sec  
and Longitude 117 deg, 41 min, 6.9 sec

Site Id	Lastupd	Address / City
0002314		CHAMPION NDB SITE/TC CASTLEGAR
0004858		4675 MINTO ROAD CASTLEGAR
0005677	02SEP09	4500 MINTO ROAD CASTLEGAR
0005964	01JUN06	4720 14TH AVENUE CASTLEGAR
0006342	02SEP09	COURTESY ROAD GENELLE
0006442	02JUN26	HWY 22 GENELLE
0006707	05APR28	4000 COLUMBIA AVENUE CASTLEGAR
0007943	02AUG15	HOME GOODS ROAD GENELLE
0008075	03NOV21	PIPELINE PIT ROAD GENELLE

49 12 50.4

117 41 7.6

SiteRegDetailSiteID11963Lat49Long117

As of: AUG 07, 2016 BC Online: Site Registry 16-08-07  
For: PA76904 WESTERN WATER ASSOCIATES LTD 20:38:18  
Folio: GENELLE Page 1

Detail Report

SITE LOCATION

Site ID: 11963 Latitude: 49d 12m 56.0s  
Victoria File: 26250-20/11963 Longitude: 117d 41m 46.0s  
Regional File:  
Region: NELSON, KOOTENAY

Site Address: END OF COURTESY ROAD  
City: GENELLE Prov/State: BC  
Postal Code:

Registered: NOV 30, 2009 Updated: FEB 25, 2010 Detail Removed: FEB 23, 2010

Notations: 7 Participants: 3 Associated Sites: 0  
Documents: 0 Susp. Land Use: 1 Parcel Descriptions: 20

Location Description: SITE CREATED BY SITE PROFILE, ENTERED 2009-11-19.  
LAT/LONG VERIFIED USING GOOGLE EARTH 2009-12-07.

Record Status: ACTIVE - UNDER REMEDIATION  
Fee category: UNRANKED

=====  
NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED  
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL  
Initiated: FEB 12, 2010 Approved: FEB 12, 2010

Ministry Contact: SAMWAYS, JENNIFER

Notation Participants Notation Roles  
SNC LAVALIN ENVIRONMENT SUBMITTED BY

Note: START: 2010-04-01

-----  
Notation Type: SITE PROFILE REVIEWED - FURTHER INVESTIGATION REQUIRED BY THE  
MINISTRY  
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL  
Initiated: DEC 07, 2009 Approved:

Ministry Contact: O'GRADY, TYLER

Note: INITIAL SITE PROFILE WAS FILLED OUT INCORRECTLY. SUBSEQUENT SITE PROFILE SUBMISSION INDICATED A SCHEDULE 2 ACTIVITY AND A "YES" ANSWER. RELEASE LETTER DATED FEBRUARY 12, 2010: IN THE OPINION OF THE DIRECTOR THE RELEASE OF THE DEVELOPMENT PERMIT WOULD NOT POSE SIGNIFICANT THREAT OR RISK

Required Actions: PRELIMINARY SITE INVESTIGATION REQUIRED. PERMIT RELEASED WITH CONDITIONS TO BE MET PRIOR TO OCCUPANCY - SEE LETTER FOR MORE DETAIL.

-----  
Notation Type: SITE PROFILE - FURTHER INVESTIGATION REQUIRED BY THE MINISTRY  
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS

As of: AUG 07, 2016

BC Online: Site Registry

16-08-07

For: PA76904 WESTERN WATER ASSOCIATES LTD

20:38:18

Folio: GENELLE

Page 2

NOTATIONS

Initiated: DEC 07, 2009

Approved:

Ministry Contact: O'GRADY, TYLER

Note: INITIAL SITE PROFILE WAS FILLED OUT INCORRECTLY. SUBSEQUENT SITE PROFILE SUBMISSION INDICATED A SCHEDULE 2 ACTIVITY AND A "YES" ANSWER. RELEASE LETTER DATED FEBRUARY 12, 2010: IN THE OPINION OF THE DIRECTOR THE RELEASE OF THE DEVELOPMENT PERMIT WOULD NOT POSE SIGNIFICANT THREAT OR RISK

Required Actions: PRELIMINARY SITE INVESTIGATION REQUIRED. PERMIT RELEASED WITH CONDITIONS TO BE MET PRIOR TO OCCUPANCY - SEE LETTER FOR MORE DETAIL.

-----  
Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY

Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL

Initiated: NOV 19, 2009

Approved:

Ministry Contact: WARD, JOHN E H

Note: ONE SCHEDULE 2 ACTIVITY AND NO "YES" ANSWERS NOTED ON INITIAL SITE

SiteRegDetailSiteID11963Lat49Long117

PROFILE SUBMISSION. REVISED SITE PROFILE SUBMITTED ON 2009-12-03 INDICATING A SCHEDULE 2 USE AND "YES" ANSWERS.

Required Actions: REFER TO SUBSEQUENT SITE PROFILE SUBMISSION FOR INVESTIGATION REQUIREMENTS.

-----  
Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS  
Initiated: NOV 19, 2009 Approved:

Ministry Contact: WARD, JOHN E H

Note: ONE SCHEDULE 2 ACTIVITY AND NO "YES" ANSWERS NOTED ON INITIAL SITE PROFILE SUBMISSION. REVISED SITE PROFILE SUBMITTED ON 2009-12-03 INDICATING A SCHEDULE 2 USE AND "YES" ANSWERS.

Required Actions: REFER TO SUBSEQUENT SITE PROFILE SUBMISSION FOR INVESTIGATION REQUIREMENTS.

-----  
Notation Type: SITE PROFILE RECEIVED

Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL  
Initiated: NOV 18, 2009 Approved:

Ministry Contact: WARD, JOHN E H

Notation Participants  
TRI GEN INVESTMENTS

TRI GEN INVESTMENTS

Notation Roles  
SITE PROFILE SUBMITTED  
BY  
SITE PROFILE SUBMITTED  
BY

As of: AUG 07, 2016 BC Online: Site Registry 16-08-07  
Folio: GENELLE For: PA76904 WESTERN WATER ASSOCIATES LTD 20:38:18  
NOTATIONS Page 3

-----  
Notation Type: SITE PROFILE RECEIVED

SiteRegDetailSiteID11963Lat49Long117

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS  
Initiated: NOV 18, 2009 Approved:

Ministry Contact: WARD, JOHN E H

Notation Participants  
TRI GEN INVESTMENTS

Notation Roles  
SITE PROFILE SUBMITTED  
BY  
SITE PROFILE SUBMITTED  
BY

TRI GEN INVESTMENTS

=====

SITE PARTICIPANTS

Participant: O'GRADY, TYLER  
Start Date: DEC 07, 2009 End Date:

Participant: TRI GEN INVESTMENTS  
Role(s): PROPERTY OWNER  
SITE PROFILE COMPLETOR  
SITE PROFILE CONTACT  
Start Date: NOV 18, 2009 End Date:

Participant: WARD, JOHN E H  
Role(s): MAIN MINISTRY CONTACT  
Start Date: NOV 18, 2009 End Date:

=====

SUSPECTED LAND USE

Description: METAL SALVAGE OPERATIONS  
Notes: INSERTED FOR SITE PROFILE DATED 2009-10-12(described on Site  
Profile dated 09-10-12)

=====

PARCEL DESCRIPTIONS

Date Added: FEB 12, 2010 Crown Land PIN#:  
LTO PID#: 009248633 Crown Land File#:  
Land Desc: THAT PART OF PARCEL A (SEE 16120I) DISTRICT LOT 2404 KOOTENAY  
DISTRICTLYING TO THE NORTHWEST OF THE RIGHT OF WAY SHOWN ON PLAN  
6600 EXCEPT (1)PART INCLUDED IN PLAN RW 12 AND (2) PARTS  
INCLUDED IN PLANS 15693, NEP22379AND PLAN NEP23103

-----  
Date Added: FEB 18, 2010 Crown Land PIN#:  
LTO PID#: 023129875 Crown Land File#:  
Land Desc: LOT 1 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP22379

-----  
Date Added: FEB 18, 2010 Crown Land PIN#:  
LTO PID#: 023129883 Crown Land File#:  
Land Desc: LOT 2 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP22379

As of: AUG 07, 2016 BC Online: Site Registry 16-08-07  
For: PA76904 WESTERN WATER ASSOCIATES LTD 20:38:18  
Folio: GENELLE Page 4  
PARCEL DESCRIPTIONS

Date Added: FEB 18, 2010 Crown Land PIN#:  
LTO PID#: 023129891 Crown Land File#:  
Land Desc: LOT 3 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP22379

Date Added: FEB 18, 2010 Crown Land PIN#:  
LTO PID#: 023129905 Crown Land File#:  
Land Desc: LOT 4 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP22379

Date Added: FEB 18, 2010 Crown Land PIN#:  
LTO PID#: 023440511 Crown Land File#:  
Land Desc: THAT PART OF PARCEL A (SEE 16120I) DISTRICT LOT 2404 KOOTENAY  
DISTRICT LYING TO THE NORTHWEST OF RW PLAN 6600 INCLUDED IN LOT  
A PLAN NEP23103

Date Added: FEB 25, 2010 Crown Land PIN#:  
LTO PID#: 023440546 Crown Land File#:  
Land Desc: LOT A DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP23103

Date Added: FEB 25, 2010 Crown Land PIN#:  
LTO PID#: 024851906 Crown Land File#:  
Land Desc: THAT PART OF LOT 2 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN  
NEP22379 CONTAINED IN LOT B PLAN NEP67502

Date Added: FEB 25, 2010 Crown Land PIN#:  
LTO PID#: 024852023 Crown Land File#:  
Land Desc: LOT A DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP67502

Date Added: FEB 25, 2010 Crown Land PIN#:  
LTO PID#: 024852031 Crown Land File#:  
Land Desc: LOT B DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP67502

Date Added: MAR 04, 2010 Crown Land PIN#:



SiteRegDetailSiteID11963Lat49Long117

LTO PID#: 025907476

Crown Land File#:

Land Desc: LOT 1 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907484

Crown Land File#:

Land Desc: LOT 2 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907492

Crown Land File#:

Land Desc: LOT 3 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907506

Crown Land File#:

Land Desc: LOT 4 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907514

Crown Land File#:

Land Desc: LOT 5 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

As of: AUG 07, 2016

BC Online: Site Registry

16-08-07

For: PA76904 WESTERN WATER ASSOCIATES LTD

20:38:18

Folio: GENELLE

Page 5

PARCEL DESCRIPTIONS

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907522

Crown Land File#:

Land Desc: LOT 6 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907531

Crown Land File#:

Land Desc: LOT 7 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907549

Crown Land File#:

Land Desc: LOT 8 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 027029514

Crown Land File#:

SiteRegDetailSiteID11963Lat49Long117

Land Desc: LOT 1 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP83588

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 027029522

Crown Land File#:

Land Desc: LOT 2 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP83588

CURRENT SITE PROFILE INFORMATION (Sec. III to X)

Site Profile Completion Date: OCT 12, 2009

Local Authority

Received: OCT 14, 2009

Ministry Regional Manager Received:

Decision: DEC 07, 2009

Decision: INVESTIGATION REQUIRED

Site Registrar

Received: NOV 18, 2009

Entry Date: NOV 19, 2009

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2

Reference

Description

C4

METAL SALVAGE OPERATIONS

AREAS OF POTENTIAL CONCERN

- Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO
- Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO
- Discarded barrels, drums or tanks?.....NO
- Contamination resulting from migration of substances from other properties?.....NO

FILL MATERIALS

- Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?.....NO
- Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO

Folio: GENELLE

Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL (QUESTIONS AS OF JANUARY 1 2009)

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO

Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....NO

Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO

Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO

Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); for from the cleaning or repair of parts of boats, ships, barges, automobiles or trucks, including sandblasting grit or paint scrapings?.....NO

TANKS OR CONTAINERS USED OR STORED, OTHER THAN TANKS USED FOR RESIDENTIAL HEATING FUEL

Underground fuel or chemical storage tanks other than storage tanks for compressed gases?.....NO

Above ground fuel or chemical storage tanks other than storage tanks for compressed gases?.....YES

HAZARDOUS WASTES OR HAZARDOUS SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO

Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO

Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

SiteRegDetailSiteID11963Lat49Long117

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

SiteRegDetailSiteID17664Lat49Long117

As of: AUG 07, 2016 BC Online: Site Registry 16-08-07  
Folio: GENELLE For: PA76904 WESTERN WATER ASSOCIATES LTD 20:40:24  
Page 1

Detail Report

SITE LOCATION

Site ID: 17664 Latitude: 49d 12m 38.2s  
Victoria File: 26250-20/17664 Longitude: 117d 42m 06.4s  
Regional File:  
Region: NELSON, KOOTENAY

Site Address: 1010 COMMERCIAL WAY  
City: GENELLE Prov/State: BC  
Postal Code: V0G 1G0

Registered: FEB 11, 2015 Updated: Detail Removed:

Notations: 4 Participants: 2 Associated Sites: 1  
Documents: 0 Susp. Land Use: 1 Parcel Descriptions: 1

Location Description: SITE CREATED BY SITE PROFILE, ENTERED 2015-02-11  
LATS/LONGS PROVIDED BY CONSULTANT

Record Status: INACTIVE - NO FURTHER ACTION  
Fee category: NOT APPLICABLE

=====

NOTATIONS

Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY  
THE MINISTRY  
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL  
Initiated: FEB 11, 2015 Approved:

Ministry Contact: HANEMAYER, VINCENT (SURREY) C

-----  
Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE  
MINISTRY  
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS  
Initiated: FEB 11, 2015 Approved:

Ministry Contact: HANEMAYER, VINCENT (SURREY) C

-----  
Notation Type: SITE PROFILE RECEIVED

Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL

Initiated: FEB 10, 2015

Approved:

Ministry Contact: HANEMAYER, VINCENT (SURREY) C

Notation Participants

CRAWFORD TRUCK

CRAWFORD TRUCK

Notation Roles

SITE PROFILE SUBMITTED

BY

SITE PROFILE SUBMITTED

BY

-----  
Notation Type: SITE PROFILE RECEIVED

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS

As of: AUG 07, 2016

BC Online: Site Registry

16-08-07

For: PA76904 WESTERN WATER ASSOCIATES LTD

20:40:24

Folio: GENELLE

Page 2

NOTATIONS

Initiated: FEB 10, 2015

Approved:

Ministry Contact: HANEMAYER, VINCENT (SURREY) C

Notation Participants

CRAWFORD TRUCK

CRAWFORD TRUCK

Notation Roles

SITE PROFILE SUBMITTED

BY

SITE PROFILE SUBMITTED

BY

=====

Participant: CRAWFORD TRUCK

Role(s): PROPERTY OWNER

SITE PROFILE COMPLETOR

SITE PROFILE CONTACT

Start Date: FEB 10, 2015

End Date:

-----  
Participant: HANEMAYER, VINCENT (SURREY) C

Role(s): MAIN MINISTRY CONTACT

Start Date: FEB 10, 2015

End Date:

=====

ASSOCIATED SITES

Site id: 11963

Date: FEB 11, 2015

Notes:

=====

SUSPECTED LAND USE

Description: AUTO/TRUCK/BUS/SUBWAY/OTHER VEHICLE REPAIR/SALVAGE/WRECKING

Notes: INSERTED FOR SITE PROFILE DATED 2014-12-02(described on Site Profile dated 14-12-02)

=====

PARCEL DESCRIPTIONS

Date Added: MAR 04, 2010

Crown Land PIN#:

LTO PID#: 025907522

Crown Land File#:

Land Desc: LOT 6 DISTRICT LOT 2404 KOOTENAY DISTRICT PLAN NEP75381

=====

CURRENT SITE PROFILE INFORMATION (Sec. III to X)

Site Profile Completion Date: DEC 02, 2014

Local Authority

Received: FEB 10, 2015

Ministry Regional Manager Received:

Decision: FEB 11, 2015

Decision: INVESTIGATION NOT REQUIRED

Site Registrar

Received: FEB 10, 2015

Entry Date: FEB 11, 2015

As of: AUG 07, 2016

BC Online: Site Registry

16-08-07

For: PA76904 WESTERN WATER ASSOCIATES LTD

20:40:24

Folio: GENELLE

Page 3

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2

Reference

Description

G2

AUTO/TRUCK/BUS/SUBWAY/OTHER VEHICLE REPAIR/SALVAGE/WRECKING

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO  
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO  
Discarded barrels, drums or tanks?.....NO  
Contamination resulting from migration of substances from other properties?.....NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?.....NO  
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO  
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL (QUESTIONS AS OF JANUARY 1 2009)

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO  
Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....NO  
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO  
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO  
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); for from the cleaning or repair of parts of boats, ships, barges, automobiles or trucks, including sandblasting grit or paint scrapings?.....NO

TANKS OR CONTAINERS USED OR STORED, OTHER THAN TANKS USED FOR RESIDENTIAL HEATING FUEL

Underground fuel or chemical storage tanks other than storage tanks for compressed gases?.....NO  
Above ground fuel or chemical storage tanks other than storage tanks for compressed gases?.....NO

HAZARDOUS WASTES OR HAZARDOUS SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO



Waste asbestos or asbestos containing materials such as pipe wrapping,

As of: AUG 07, 2016 BC Online: Site Registry 16-08-07  
For: PA76904 WESTERN WATER ASSOCIATES LTD 20:40:24  
Folio: GENELLE Page 4

blown-in insulation or panelling buried?.....NO  
Paints, solvents, mineral spirits or waste pest control products or pest  
control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental  
conditions or quality of soil, water, groundwater or other  
environmental media?.....NO  
Liens to recover costs, restrictive covenants on land use, or other  
charges or encumbrances, stemming from contaminants or wastes remaining  
onsite or from other environmental conditions?.....NO  
Government notifications relating to past or recurring environmental  
violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

SiteRegSearchLat49Long117

As Of: JUL 31, 2016

BC Online: Site Registry

16/08/07

For: PA76904 WESTERN WATER ASSOCIATES LTD

16:31:40

Folio: GENELLE

Page 1

11 records selected for 5.0 km from latitude 49 deg, 12 min, 55.4 sec  
and Longitude 117 deg, 41 min, 7.6 sec

Site Id	Lastupd	Address / City
0004617	02JAN31	COLUMBIA ROAD CASTLEGAR
0004858		4675 MINTO ROAD CASTLEGAR
0005677	02SEP09	4500 MINTO ROAD CASTLEGAR
0005964	01JUN06	4720 14TH AVENUE CASTLEGAR
0006342	02SEP09	COURTESY ROAD GENELLE
0006442	02JUN26	HWY 22 GENELLE
0006707	05APR28	4000 COLUMBIA AVENUE CASTLEGAR
0007943	02AUG15	HOME GOODS ROAD GENELLE
0008075	03NOV21	PIPELINE PIT ROAD GENELLE
0011963	10FEB25	END OF COURTESY ROAD GENELLE
0017664		1010 COMMERCIAL WAY GENELLE



Groundwater Supply Development and Management

Source Water Assessment and Protection

Well Monitoring & Maintenance

Environmental & Water Quality Monitoring

Storm & Wastewater Disposal to Ground

Groundwater Modeling

Aquifer Test Design and Analysis

Geothermal / Geoexchange Systems

Policy and Guideline Development

Applied Research

Rural Subdivision Services

Environmental Assessment & Permitting