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2014 ENVIRONMENTAL MONITORING REPORT GOLDEN REFUSE DISPOSAL FACILITY, GOLDEN, B.C.

Prepared for:

Columbia Shuswap Regional District
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Prepared by:

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Consultants in Hydrogeology and Environmental Science

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Columbia Shuswap Regional District
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P.O. Box 978
Golden, B.C., V1E 4P1

Dear Mr. Van Nostrand:

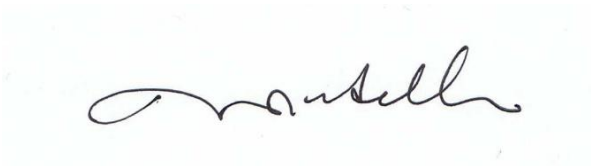
Re: 2014 Environmental Monitoring Report – Golden Landfill, Golden, B.C.

Western Water Associates Ltd. (WWAL) is pleased to provide this report which summarizes environmental monitoring at the Golden Refuse Disposal Facility (RDF) in 2014. For the 2014 reporting, time series plots were created from historic and current data. This temporal analysis helps us understand the degree of impact on groundwater over time. This report satisfies the requirements of the provincially issued Operational Certificate and is suitable for submission to the B.C. Ministry of Environment.

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.

Reviewed by:



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1. INTRODUCTION AND SITE BACKGROUND

Western Water Associates Limited (WWAL) was retained by the Columbia Shuswap Regional District (CSRD) to prepare the 2014 Annual Environmental Monitoring Report for the Golden Refuse Disposal Facility (RDF) (hereinafter called the "site") as part of a district-wide monitoring contract. This report presents the monitoring for the 2014 report period from January 1 to December 31, 2014. Summit Environmental Consultants Inc. (Summit) previously reported on the 2008 to 2013 monitoring programs. Prior to 2008, Sperling Hansen Associates (SHA) prepared the annual reports (SHA 2008). In 2014 WWAL was awarded the monitoring contract and we are pleased to provide the results of the environmental monitoring program at the Golden Landfill in this report.

The Golden RDF has operated as a natural attenuation site since the late 1970's when the permit was transferred to Columbia Shuswap Regional District (CSRD). The site operates under the now referenced Operational Certificate (OC) 17006, issued May 5, 2003 and most recently amended August 29, 2012, by the British Columbia Ministry of Environment (MoE). The Golden waste shed includes the municipality of Golden and CSRD Electoral Area A, which services approximately 7,000 residents (Summit, 2013). This report was prepared in accordance with the annual landfill reporting requirements outlined in Section 5.0 of the OC. A copy of the OC is included in Appendix A.

1.1 Objective and Scope

To meet the goal of assessing the long-term monitoring for groundwater impacts from landfill operations, the objectives of the program are to collect and analyze groundwater samples, and interpret analytical results in accordance with the OC (MoE 1996) and the consulting agreement between WWAL and the CSRD. The tasks undertaken were as follows:

- Collect and submit to the laboratory, water samples as scheduled for the year;
- Assess the condition of local on-site vegetation for potential stress;
- Analyze the data and prepare the final annual report (this document);
- summarizing water quality guideline exceedances from the 2014 results; and
- Review the results with the CSRD Project Manager at the end of each year and provide recommendations regarding well maintenance and to revise the program for future years, if warranted.

The following sections describing the site, background information and the overall hydrogeological setting; these introductory sections are summarized from the Summit (2013) report with permission from the CSRD.

2. SITE DESCRIPTION

This section describes geographic location, bedrock and surficial geology of the study area, historical climate data, hydrologic data, and hydrogeology data for Golden RDF. Further, a description of the monitoring network that was sampled in the 2014 monitoring program is provided.

2.1 Location

The Golden RDF is located approximately 2 km northeast of downtown Golden at 350 Golden-Donald Upper Road in Golden, BC (Figure 1). The legal description of the site is Subdivision 12 of Section 18, Township 27, Range 21, West of the fifth Meridian, Kootenay District. The site covers an area of about 17 ha with the waste foot print covering an area of approximately 4.4 ha. The property is bounded on all sides by forest with Golden-Donald Upper Road located just west of the site. The site is approximately 1 km north and approximately 127 m above the Kicking Horse River, which is a major surface water body in the area. The nearest privately owned residence is within 100 m of the landfill boundary and is located just east of the site. The landfill site is generally level at 925 m above sea level (m asl), however there is a northwest facing slope in the northeastern corner of the property. The site layout is provided on Figure 2.

2.2 Geology, Hydrology and Hydrogeology

The regional geology and hydrogeology of the area was summarized by Kala in 1995, SHA in 2008 and reviewed by WWAL in 2013.

Surficial deposits at the Golden RDF vary from dense gravely sand and silty ablation till along the eastern slopes, to well-sorted sand and gravel ice-contact and alluvial deposits in the south central and western sections, as well as in a trench at the southwest corner of the site. Silt with sand and gravel deposits were observed in a test pit (test hole 4) at the western edge of the landfill (Kala 1995). Based on well logs for TH-7 and MW-4D these unconsolidated deposits appear to be thicker in the southern sections of the site rather than towards the north. Deposits in exposures across from the landfill site on the west side of Golden-Donald Upper Road consist of dense, well-sorted sands and gravels with traces of silt and clay and occasional bedding planes.

The bedrock underlying the landfill site is mapped as limestone, limestone-conglomerate, shale, and associated meta-sedimentary rocks of the McKay Group (Balkwell et al. 1980). Bedrock outcrops were noted in the northeastern part of the site. No bedrock was encountered in the five test pits completed during the Kala 1995 hydrogeological investigation. However, based on the drill log for MW-6D, limestone bedrock was encountered at approximately 34 m (111 ft) below ground surface (bgs) at the central western boundary of the site.

Surface drainage is dependent on the local topography. A narrow ravine is located midway along the east side of the landfill site. During extreme rain events or periods of high run-off from snowmelt, this ravine collects the surface water from the east side of the site and diverts surface flow away from the landfill.

There are no surface water drainage courses leading away from the landfill itself. The permeability of the surficial deposits at the site ranges from low to moderate. Silty surficial deposits along the eastern side of the landfill limit groundwater recharge while the silty sand and gravel located in the south central section of the landfill is typical moderately (SHA 2008).

The Kicking Horse River is approximately 1 km southeast of the landfill and nearly 130 m lower in elevation. The river flows northwest through the western range of the Rocky Mountains and the lower Kicking Horse Canyon where it merges into the Columbia River at the Town of Golden. The Columbia River flows northwest and is approximately 3 km west of the site. Hospital Creek, located in a deeply incised valley northwest of the landfill site,flows southwest into the Columbia River.

The B.C. Water Resources Atlas shows MoE sand and gravel Aquifer 456 IIB approximately 60 m southwest of the Golden RDF boundary and is located at the confluence of the Columbia and Kicking Horse Rivers. This aquifer, which is classified as having a moderate demand, high productivity, and moderate vulnerability, covers an area of 10.2 km^2. Demand describes local reliance on the groundwater water source, productivity indicates relative well yields, and vulnerability describes the potential for contaminants to move from the surface into the aquifer. There are no MoE reported aquifers at the site location. Based on site topography and water level elevations from the three wells (MW-4d, TH-8 and DMW-2) completed in the local bedrock aquifer (Summit 2010), groundwater flow direction at the site is from northeast to southwest, moving from the uplands towards the Columbia and Kicking Horse Rivers. The groundwater flow direction should be confirmed once an accurate survey of the top of casing elevation of the wells is completed. Rain and snowmelt percolating through the landfill will likely migrate vertically down until reaching the water table.

2.3 Climate

The climate at the site is humid continental with relatively warm summers and a relatively short dry season, with Golden situated between two mountain ranges. The nearest climatic data available for the region is from the station at the Golden Airport (Climate STN ID 1173210). Climate averages for this station are available for 1981 to 2010. During this period, the recorded average annual temperature and total precipitation at Golden were 5.1°C and 466.8 mm/year, respectively (Environment Canada 2015). Recorded mean monthly temperatures ranged from – 7.9°C in January to 17.3°C in July. The recorded mean precipitation ranged from 24.1 mm/month in February to 51.1 mm/month in November. Table 1 summarizes the climate data from the Golden climate station.

Table 1: Monthly Average Climate Data (STN 1173210: 1981 - 2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg.
Temperature													
Daily Average (°C)	-7.9	-5.0	0.8	6.5	11.3	14.9	17.3	16.7	11.5	5.00	-2.0	-7.8	5.1
Precipitation													
Rainfall (mm)	6.4	5.5	14.1	21.9	33.3	49.7	50.6	45.3	38.0	32.3	21.6	6.4	325.2
Snowfall (cm)	45.3	20.7	12.1	2.5	1.1	0	0	0	0	2.8	31.8	42.5	158.7
Precipitation (mm)	45.9	24.1	24.4	24.4	34.5	49.7	50.6	45.3	38.0	34.9	51.1	43.9	466.8

Source: Canadian Climate Normals (Environment Canada, 2015)

2.4 2014 Monitoring Network

The 2014 monitoring network included six locations:

- two monitoring wells (TH-8 and MW-4s),
- two domestic wells (DMW-1b and DMW-4); and
- two Town supply wells (TW- #4 and TW-#6).

Monitoring Well TH-2 has been dry since 2007 and remained dry through 2014. Summit installed three onsite monitoring wells MW-6S (shallow), MW-6D (deep) and TH-7 in 2009 to replace decommissioned wells TH-4 and TH-3. Further, due to similar water chemistry at wells MW-6S and MW-6D, sampling of MW-6D was considered redundant and therefore discontinued in 2011. Landfill gas monitoring points GP-6S/GP-6D and GP-7S/GP-7D were also installed in 2009 and are currently being monitored by the CSRD personnel directly. Monitoring well TH-8 was installed approximately 150 m northwest of the site to assess potential offsite leachate migration.

Domestic well DMW-1b was added to the program in 2011 as a replacement to upgradient monitor location DMW-1 as all water outlets have filtration systems at this location. DMW-1 characterized background water quality, therefore DMW-1b and DMW-4 are now considered as new background wells. As per Summit's recommendations (Summit 2013), DMW-4 was added to the program in 2013, as one of the nearest available cross gradient receptors.

Town Well #4 is one of Golden's five municipal water supply wells located approximately 1.5 km west of the landfill site. Based on Summit's recommendations (Summit 2013), beginning in 2013, another supply well (Town Well #6) was targeted for sampling because the capture zone for this well is closer to the landfill than it is for Town Well #4 (Golder 2006). Table 2 summarizes the current monitoring locations and available well logs are provided in Appendix A.

Prior to 2011, sampling was conducted quarterly, with the exception of 2002 where three sampling events occurred. Beginning in 2011, the monitoring program went to tri-annual monitoring based on statistical analysis of variance (ANOVA) data provided by Summit (Summit 2010).The tri-annual monitoring at the site was approved by the MoE. Sampling at Golden RDF occurs three times annually with the 2014 sampling events occurring on June 2, August 18 and November 14.

Table 2: 2014 Monitoring Program

Sample Location	Depth of Well (m btoc)	Aquifer Type/ Primary Lithology	Approximate Ground Surface Elevation (masl)	Location Description
MW-6s	35.4	Unknown	920	Located along the western boundary of the landfill site and is the northern most on-site well.
TH-8	26.2	Unconfined (bedrock)	921	Located approximately 300 m northwest of the site along Golden Donald Upper Rd.
Town Well #4	Unknown	Unknown	790	Located approximately 1.5 km northwest of the site on a strata road north of 14th St N.
Town Well #6	Unknown	Unknown	Unknown	Located approximately 2 km northwest of the site the west side of 11th Ave. N.
DMW-1b	60	Unconfined (bedrock)	975	Located approximately 150 m east of the landfill site on Hietala Rd.
DMW-4	120	Unknown	Unknown	Located approximately 250 m east of the landfill site just off Hietala Rd.
TH-2	22.5	Unknown	915	Located along the south central boundary of the landfill.
TH-7	31.7	Unconfined (sand silt and gravel)	Unknown	Located along the western boundary of the landfill (south side) near Golden- Donald Upper Rd and Granite Dr.

Note: **masl** = metres above sea level; **mbtoc** = metres below top of casing; Ground surface elevations were measured by Summit, accurate to ±30 cm. Grey boxes indicate historically dry wells. Depth for both domestic wells are approximate and are known from personal communication with home owners.

3. METHODS

The following sections outline the program methods, including parameters sampled and field techniques used for the program.

3.1 Sampling Parameters

The program remained as per 2013. The 2014 laboratory assessed water quality parameters included the following:

- Total Alkalinity (total as $CaCO_3$);
- Total suspended solids (TSS)
- Turbidity;
- pH;
- Hardness (dissolved, as $CaCO_3$);
- Anions (chloride, fluoride and sulphate);
- Nutrients: (nitrate (as N), nitrite (as N) and ammonia (as N));
- Dissolved metals.

The groundwater monitoring program conducted in 2014 consisted of hydraulic (water level) monitoring, field measurements of pH, electrical conductivity (EC), temperature, and oxidation-reduction potential (ORP) and dissolved oxygen (DO) recorded during purging and immediately before sampling. All of the above-listed parameters were analyzed during each sample event. These parameters are in accordance with Test "B" as specified in the CSRD Environmental Monitoring Contract.

3.2 Sampling Methods and Protocols

In order to ensure that representative groundwater samples were obtained from the monitoring wells and that no contamination of the recovered samples occurred. Sampling protocols followed the second edition (draft) of the "Landfill Criteria for Municipal Solid Waste" (MoE 2013), "British Columbia Field Sampling Manual for Continuous Monitoring plus the Collection for, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples" (MoE 2003).

Prior to groundwater sample collection, each well was purged of the standing volume of stagnant water using a submersible well pump, dedicated bailers, peristaltic pump or Waterra tubing (as appropriate). The objective of purging is to pump groundwater from the well until a representative sample of the formation groundwater is obtained. This is typically achieved by removal of three to five times the volume of standing water in the well or purging the well dry and letting the well recover to at least half of its pre-pumping level. Purging was considered complete once sediment-free groundwater is obtained and/or the EC, temperature, ORP and pH of the groundwater stabilize. The pump was decontaminated between each sample location. Groundwater samples were collected in the appropriate laboratory-supplied clean, new sample containers and preserved as required. Groundwater samples designated for metals analysis were field filtered to 0.45 micron and preserved.

All samples were packaged in a cooler and delivered to the laboratory within a 24-hour period for analysis. Groundwater samples were submitted, under chain-of-custody protocol, to Caro Analytical Services (Kelowna, BC), for analysis. The laboratory results were sent directly from the laboratory to Wireless Water, our database manager. The field and laboratory data were then merged and the data were available in one database for analysis by WWAL.

During each monitoring event, the following field data were recorded:

- water level;
- field measured parameters [temperature, pH, ORP, DO, and EC];
- field notes on procedures (e.g. purging rates) and any unusual observations (e.g. well condition, odours, colours, etc.);

- evaluation of vegetation health in the area surround the wells that could be attributed to landfill leachate (luxuriant growth, discolouration, die-off, etc.); and
- signs of leachate breakout zones (e.g. presence of unusual bacteria or algae at all sites, signs of liquid flowing from the surface).

The quality assurance and quality control values for Sunnybrae are similar to past years RPD (relative percent difference) at less than 25%.

4. RESULTS AND DISCUSSION

The following section describes field observations and the results of the water quality sampled at the site in 2014. Annual water level elevations, water quality guideline exceedances in 2014, along with temporal and spatial trends for the Golden RDF monitoring program are discussed. The descriptive statistics (average, maximum, minimum and count) for select water quality results between 2002 and 2014 are summarized in Table 4 with the full water quality database for all historic and current results provided in Appendix C. The 2014 analytical reports provided by the laboratory can be found in Appendix D.

Our analysis of potential leachate impacts on the receiving environment employs two main approaches: 1) a direct comparison of monitoring results to guidelines (i.e. does a problem exist) and 2) trend analysis (i.e. is the situation changing over time or space, and if so, in what direction). The ensuing evaluation, elucidated in our discussion below, may then be used to inform decisions about future monitoring priorities as well as the overall program results. Water quality results were assessed both temporally and spatially.

Potential impacts to groundwater from landfill leachate are typically identified by assessing the concentrations of landfill leachate indicators relative to background groundwater concentrations. Typical leachate indicators may include, but are not limited to, ammonia, chloride, total alkalinity, sulphate, manganese, iron, calcium, and magnesium, and the heavy metals cadmium, chromium, copper, nickel, and zinc (Christensen et al. 2001).

Figures 3 through 6 depict the time series plots for 7 water quality parameters sampled at the six locations between 2002 and 2014. The landfill leachate associated parameters plotted include the following: chloride, electrical conductivity, sulphate, nitrate, dissolved sodium, dissolved Iron and dissolved manganese. Plotted results below the reportable detection limit are displayed as one-half the reportable detection limit.

- Chloride and Conductivity (Figure 3);
- Dissolved Sodium and Sulphate (Figure 4);
- Nitrate and Modified Nitrate (Figure 5); and
- Dissolved Iron and Dissolved Manganese (Figure 6).

4.1 Vegetation

WWAL's assessment continues to indicate that there is perceived stress to the trees just beyond the southern boundary of the Golden RDF and is an area of concern. To determine if the stress is related to landfill activities we continue to recommend assessment of the vegetative biomass and soils at the south property boundary (See Section 6.0). There were no signs of breakout zones at any of the monitored locations and no surface water ponding was evident at the landfill site during the 2014 sampling events.

4.2 Water Quality Exceedances

Assessing impact on the receiving environment from landfill leachate is the objective of the current monitoring program at Golden. Due to the proximity of domestic water wells and surface water bodies in the vicinity of the site the 2014 water quality results were compared to the following applicable guidelines and standards:

- Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentration (health-based guideline) (GCDWQ MAC) and Aesthetic Objective (based on aesthetic considerations) (GCDWQ AO) (Health Canada 2012);
- B.C. Approved Water Quality Guidelines for Drinking Water (BCAWQG DW) and Working Water Quality Guidelines for Drinking Water (BCWWQG DW) (MoE 2010); and
- British Columbia Approved Water Quality Guidelines for Aquatic Life (BCAWQG AL) and Working Water Quality Guidelines for Aquatic Life (BCWWQG AL) (MoE 2010).

Table 3 provides a list of exceedances in water quality guidelines relevant to landfill leachate impact. Exceedances in the Provincial freshwater aquatic life guidelines at the groundwater monitoring locations are listed on Table 3, however exceedances of these parameters are not relevant to the current water quality assessment as the BCAWQG AL and BCWWQG AL are intended to be applied to surface waters. It should be noted that BCAWQG DW guideline applies to drinking water that is treated with chlorine to address health issues related to production of haloforms (MoE 2001); since none of the monitoring wells are treated with chlorine this guideline does not apply to the well at the site.

Table 3: 2014 Water Quality Exceedances by Guideline

Sampling Location	Guideline	2014 Exceedances
DMW-1b	BCAWQG AL	Arsenic (dissolved), Dissolved oxygen [F], Iron (dissolved)
	GCDWQ MAC	Arsenic (dissolved)
	GCDWQ AO	Iron (dissolved)
	BCAWQG DW	Arsenic (dissolved)
DMW-4	BCAWQG AL	Copper (dissolved), Dissolved oxygen [F]
MW-6S	BCAWQG AL	Boron (dissolved), Chloride, Dissolved oxygen [F], Nitrate (as N), Sulphate
	GCDWQ MAC	Nitrate (as N)

	GCDWQ AO	Chloride, Manganese (dissolved), pH [F], Sodium (dissolved), Sulphate
	BCAWQG DW	Chloride, Nitrate (as N), pH [F], Sulphate
TH8	BCAWQG AL	Chloride
	GCDWQ AO	Chloride, pH [F], Sodium (dissolved)
	BCAWQG DW	Chloride, pH [F]
Town Well #4	BCAWQG AL	Dissolved oxygen [F]

[F] = Field Result(s)

Similar to previous years, a number of parameters were detected at concentrations above guidelines in 2014. Dissolved oxygen was a new exceedance in 2014, which exceeded BCAWQG AL of 5 mg/l at both DMW-1b, DMW-4 and MW-6s. Further, copper was also in exceedance of the BCAWQG AL at DMW-4. Chromium was not detected in 2014 at MW-6s and manganese was below GCDWQ AO at TH-8 in 2014.

Similar to 2013, chloride was detected at concentrations above the BCAWQG DW and GCDWQ AO (both 250 mg/l) and the BCAWQG AL (600 mg/L) in both TH-8 and MW-6s sampling locations. Nitrate and sulphate concentrations at MW-6s remain in exceedance of GCDWQ MAC (nitrate only), BCAWQG DW and GCDWQ AO (sulphate only). In 2014, exceedances of the applicable guidelines for dissolved metals included: arsenic, boron, copper, iron, manganese and sodium. Consistent with historical data, the highest arsenic concentrations were found at DMW-1b, where concentrations exceeded the BCAWQG AL of 0.005 mg/l, the GCDWQ MAC of 0.010 mg/l, and the BCAWQG DW of 0.025 mg/l during all sampling events in 2014. Boron concentrations remain an order of magnitude greater in MW-6s than in the other wells, and concentrations have increased steadily from below the BCAWQG AL of 1.2 mg/l in 2009 to above guidelines in one year (2010).

4.3 Water Quality Trend Analysis from 2002 to 2014

All sample locations were selected in order to monitor potential receptors surrounding the Golden RDF. Monitoring well TH-8 monitors potential impacts from the landfilling operations offsite, to the northwest (cross gradient). The Town wells (#4 and # 6) both monitor downgradient, off-site domestic receptors. The capture zone for Town Well #6 and Town Well #4 are both southwest of the landfill and include industrial, commercial, and residential areas, which could also contribute other contaminant sources. MW-6s (shallow) monitors the upper section of western boundary just prior to the water flowing off site. Domestic wells DMW-1b and DMW-4 aboth monitor potential off-site contamination directly east of the site (upgradient and cross gradient). Both TH-7 and TH-2 are intended to monitor on-site contamination near the southern boundary of the landfill site, however they have both been dry since at least 2007.

Table 4: Summary Statistics for Select Water Quality Parameters from 2002 to 2014

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Count	Number of Exceedances
Chloride	DMW-1b	mg/L	34.9	26.0	41.1	12	none
	DMW-4	mg/L	18.9	16.2	22.4	6	none
	MW6S	mg/L	633	491	732	17	17
	TH8	mg/L	767	523	988	16	16
	Town Well #4	mg/L	71	57.6	91.1	23	none
	Town Well #6	mg/L	26.8	22.9	34.5	4	none
Conductivity	DMW-1b	µS/cm	1053	750	1220	12	none
	DMW-4	µS/cm	1010	900	1130	6	none
	MW6S	µS/cm	4146	480	6600	17	none
	TH8	µS/cm	2687	340	3500	15	none
	Town Well #4	µS/cm	817	640	970	15	none
	Town Well #6	µS/cm	620	577	677	4	none
Nitrate (as N)	DMW-1b	mg/L	0.054	<0.010	0.397	12	none
	DMW-4	mg/L	0.335	<0.010	0.647	6	none
	MW6S	mg/L	54	2.99	66.9	17	16
	TH8	mg/L	0.40	<0.010	1.11	16	none
	Town Well #4	mg/L	1.2	0.755	1.63	23	none
	Town Well #6	mg/L	0.96	0.781	1.23	4	none
Sodium (dissolved)	DMW-1b	mg/L	27.5	23.5	30.4	12	none
	DMW-4	mg/L	36.8	20.2	51.0	6	none
	MW6S	mg/L	366	290	444	17	17
	TH8	mg/L	365	178	450	16	15
	Town Well #4	mg/L	41	34	48.5	22	none
	Town Well #6	mg/L	15.6	13.9	17.9	4	none
Sulphate	DMW-1b	mg/L	128	117	144	12	none
	DMW-4	mg/L	231	150	270	6	none
	MW6S	mg/L	806	606	925	17	17
	TH8	mg/L	47.9	36.5	72.9	16	none
	Town Well #4	mg/L	39	35.8	44.5	23	none
	Town Well #6	mg/L	23.1	20.4	24.3	4	none
Iron (dissolved)	DMW-1b	mg/L	0.29	0.11	0.404	12	6
	DMW-4	mg/L	0.015	0.011	0.021	6	none
	MW6S	mg/L	0.10	0.01	0.425	17	2
	TH8	mg/L	0.55	0.011	3.01	16	4
	Town Well #4	mg/L	0.06	<0.010	0.386	22	1
	Town Well #6	mg/L	0.014	<0.010	0.033	4	none
Manganese (dissolved)	DMW-1b	mg/L	0.0052	0.0037	0.0158	12	none
	DMW-4	mg/L	0.0052	0.0021	0.0127	6	none
	MW6S	mg/L	0.141	0.0683	0.518	17	17
	TH8	mg/L	0.144	0.0049	0.492	16	11
	Town Well #4	mg/L	0.001	<0.0002	0.0068	22	none
	Town Well #6	mg/L	0.0030	0.0009	0.0082	4	none

Arsenic (dissolved)	DMW-1b	mg/L	0.0354	0.0196	0.0436	12	12
	DMW-4	mg/L	0.0013	0.0012	0.0014	6	none
	MW6S	mg/L	0.0013	<0.0005	0.0057	17	1
	TH8	mg/L	0.0050	0.0016	0.0149	16	4
	Town Well #4	mg/L	0.0	<0.0005	0.0006	22	none
	Town Well #6	mg/L	none	none	none	4	none

Overall, MW-4s continues to exhibit the highest degree of landfill leachate impact, with elevated average conductivity and concentrations of chloride, nitrate, sodium and sulphate relative to other sampling locations. Leachate-associated parameters manganese and ammonia show increasing trends at this location. Monitored location TH-8 exhibits elevated concentrations of chloride, sodium and conductivity without associated nitrates and sulphates, which suggests road salts as a likely sources of contaminant.

4.3.1 Chloride

Historically, chloride concentrations were lower at DMW-1b (average 35 mg/l) and Town Well #6 (average 26.8 mg/l) than they were at TH-8 and MW-6s with averages over 600 mg/l (Table 4). Chloride concentrations at the recently added DMW-4 and to a lesser extent Town Well #4 were also low. Further, concentrations at DMW-1b and Town Well #4 have remained relatively steady over time. At both MW-6s and TH-8 chloride has been variable with no observed upward or downward trends. Chloride concentrations at TH-8 have the largest range, from 523 mg/l to 988 mg/l. The increases in chloride occurring at MW-4s may be related to the conservative (non-reactive) nature of this parameter and the vertical movement of groundwater. Because chloride is more conservative, it may travel farther than some other parameters, such as metals that undergo adsorption or retardation due to other processes.

4.3.2 Electrical Conductivity

Electrical conductivity is elevated at all monitored locations on-site as well as most locations off – site. Lowest levels are at both Town Well #4 and Town Well #6, which are around 800 µS/cm and 600 µS/cm. EC levels at MW-4s, TH-8 and both domestic wells remain elevated with averages exceeding 1000 µS/cm. EC at MW-4s are elevated above all other monitored locations (Figure 3) followed by TH-8 with average values of 4146 µS/cm and 2687 µS/cm (Figure 3). EC values at all locations are relatively stable with the exception of values in November 2012 at MW-6s and TH-8, which are anomalous with values increasing to average levels within the same year.

4.3.3 Sodium

Both TH-8 and MW-6s locations have elevated concentrations (greater than 350 mg/l) relative to the other wells (all below 50 mg/l). Concentrations of sodium (Figure 4) at MW-6s decreased from the initial sampling event in 2009 to late 2011, then increased in August 2013 and again in November 2014. Concentrations at TH-8 have typically increased over time, from 178 mg/l in November 2010 to 436 mg/l in November 2014. Concentrations showed a slight decrease from May 2013 to June 2014 but have since been around 400 mg/l. At TH-8, the trend observed for sodium concentration is similar to chloride suggesting that road salt could be contributing to the observed concentrations. In contrast, the trend for both sodium and chloride at MW-6s are different, suggesting other sources (likely landfill) may be

contributing to the elevated levels. Similar to chloride, sodium levels remained low and relatively consistent at Town Well #4, DMW-1b, and Town Well #6. As DMW-4 has only been sampled for one year, no trends are evident at this time.

4.3.4 Sulphate

Sulphate concentrations (Figure 4) at MW-6s remained elevated relative to all other wells, ranging from 784 mg/l to 879 mg/l in 2014. The next highest sulphate concentrations in 2014 were at DMW-4 with an average of 231 mg/l, followed by DMW-1b, with an average of 128 mg/l. The lowest values were found in the two town wells and at TH-8, which have all remained stable and below100 mg/l. Sulphate concentrations at MW-6s show a similar trend to sodium, with a general decrease up until late 2011, followed by a relatively steady increase until late 2012 and has remained relatively steady since. The source of the elevated sulphate in MW-6s is most likely the Golden RDF.

4.3.5 Nitrate

Nitrate concentrations (Figure 5) at MW-6s are elevated above background and all other monitored locations with an average of 54 mg/l. Concentrations show a decreasing trend at this location from 60 mg/l in November 2009 to 48 mg/l in November 2014. A drop in nitrate concentration in May 2012 was observed, which is likely anomalous as concentrations otherwise have consistently been above 40 mg/l. The high levels of nitrate found at MW-6s are not representative of natural groundwater quality, and the most likely source is the Golden RDF. The next highest nitrate concentrations in 2014 were at Town Well #4, which have been relatively stable and ranges from 1.75 mg/l to 1.63 mg/l. Concentrations at TH-8, DMW-4 and Town Well #6 show a variable yet increasing trend but all remain below 1.3 mg/l. Nitrate at DMW-1b remained relatively stable since its addition into the program in 2011 but showed a slight increase of 0.2 mg/l in August and again November 2014.

4.3.6 Dissolved Metals

There are some dissolved metals that are slightly elevated at MW-4s, TH-8 and DMW-1b compared to the other sampling locations (Town Wells and DMW-4), which may be related to landfill influence or potentially naturally occurring.

Iron concentrations (Figure 6) at DMW-1b. Historically, concentrations of iron (up to 3 mg/l) were recorded atTH-8 and to a lesser extent DMW-1b. Iron concentrations decreased dramatically in late 2011 and have remained below 0.12 mg/l since. Iron concentrations at DMW-1b were above guidelines throughout the 2014 sampling event at about 0.37 mg/l and have been increasing since 2011. Iron concentrations at all other sampling locations, including MW-6s, were lower than 0.04 mg/l in 2014, which suggests that the elevated iron in DMW-1b is not related to landfill activity and that the elevated iron concentrations are likely naturally occurring.

Manganese concentrations (Figure 6) at MW-6s and TH-8 are elevated and range from 0.0049 mg/l to 0.518 mg/l. Both stable trends and lower manganese values (< 0.0037 mg/l) were detected in all other wells. Manganese concentrations at MW6-s decreased from the first sampling event in 2009 to mid-2012, after which time they began to slightly increase; however, in 2013 and 2014, levels were lower than the historic maximum (2009). Monitoring well TH-8 has also shown a decrease in manganese over this same time period and continues to decrease in 2014.

Consistent with historical data, the highest arsenic concentrations were found in DMW-1b, where concentrations exceeded guidelines during all sampling events in 2014 and has done so since November 2010. However, arsenic concentrations remain below detection limits in MW-6s, which suggests that the presence of arsenic in DMW-1b is likely unrelated to landfill activity. All other sample locations remain relatively stable and low (≤ 0.006 mg/l) since August 2011.

The highest concentration of boron was recorded at MW-6s with concentrations remaining at or above 1.6 mg/l in 2014. The trend at this location has been increasing since 2009. In contrast, boron concentrations in the other wells remain low at less than 0.5 mg/l. Concentrations in the other wells are relatively steady over time, with the exception of DMW-4 which showed an increase 2013 but decreased slightly in 2014 at about 0.25 mg/l. Boron sources include coal combustion products, municipal sewage, leaching of landfill materials, and the production of fertilizers and pesticides. The maximum boron concentration at DMW-4 was 0.465 mg/l (November 2013), when compared to MW-6s it is far below concentrations that may be of concern at this time. However, continued monitoring is necessary to determine whether concentrations continue to rise.

5. CONCLUSIONS

From the analysis performed for the 2014 reporting the following conclusions are made:

C1 In 2014 (as in previous years), stressed vegetation was observed south of the Golden RDF. To evaluate the magnitude of the stress on the vegetation and to determine whether it is related to landfill activities, we recommend:

- Assessing the biomass of the vegetation for uptake of heavy metals; and
- Collecting soil samples from the root zones of the affected area to assess potential impacts from leachate-affected surface runoff.

C2 Similar to the 2013 program exceedances of aquatic life and drinking water guidelines were detected in locations at and beyond the landfill property boundary in 2014, with the following notable observations:

- Groundwater quality in well MW-6s, located near the landfill boundary, continues to show evidence of impacts. Elevated concentrations of chloride, nitrate, sodium, sulphate and dissolved metals including boron and manganese indicate anthropogenic impacts from landfill leachate;
- Monitoring well TH-8 continues to have concentrations of chloride, sodium, and manganese that are above guidelines. The relatively consistent ratio between chloride and sodium in this well suggests one possible source of the elevated levels is the application of road salt on the nearby road. Other parameters found at high concentrations in MW-6s (i.e. sulphate, nitrate, and boron) are relatively low in TH-8, which suggests that landfill activities may not be impacting water quality in TH-8 at this time. However, due to the

elevated presence of chloride, sodium, and manganese, impacts from the Golden RDF to TH-8 cannot be ruled out; and

- In DMW-1b, concentrations of arsenic and iron in 2014 were above the GCDWQ MAC and the GCDWQ AO, respectively. These exceedances are not likely related to landfill activity.

6. RECOMMENDATIONS

As per the WWAL 2013 hydrogeological review and based on the results of the monitoring program to-date, the following recommendations are provided:

R1) Off-Site Migration of Landfill Leachate

- After assessing the geochemical profile at the monitoring wells we believe surface contamination from road salting is likely the source of increasing levels of chloride and dissolved sodium at TH8 since its installation in 2010. We recommend decommissioning TH8;
- Drill a "sentry" monitoring well (a monitoring well between potential drinking water wells and a potential contaminant source) off-site at the junction of Granite Drive and Stoney Lane (approximate UTM coordinates U11, 502899, 568400, elevation 904 masl). Note that the landfill is approximately 340 m from the edge of the Golder-modeled 10-year capture zone for Town Well #6 (Golder 2006) and this edge of the modelled 10-year capture zone corresponds with the location of the recommend off-site monitoring well;
- If off-site migration of leachate is confirmed after off-site drilling and monitoring for at least one year, the CSRD should perform a cost benefit analysis of either acquiring land downgradient from the landfill or explore leachate management options for the site;
- Further, we believe both the Town of Golden's water supply well # 6 and Town #4 should be sampled for the next 5 years, with results to be evaluated in 2017 to assess if Town #4 sampling can be ended with just Town Well #6 being sampled; and
- As per Summit's recommendation (Summit 2013), perform a yearly survey to ensure any newly installed wells in the vicinity of the site, intended for domestic water are identified. The yearly survey update would include calling local drillers to assess if new wells were installed in the area, calling the Town of Golden to assess if new building permit applications have been received, and driving the major roads to see if new building activity is apparent.

R2) Monitoring at the southwest toe of the landfill site

- As mentioned above, attempts to drill at the southwest toe of the landfill have been unsuccessful due to refusal during drilling (TH3) and budget constraints (TH7). To enable monitoring at the southwest edge of the landfill, we recommend drilling another monitoring well at this location. The purpose of drilling this new well will be to reach the unconsolidated aquifer and bedrock interface, where we expect to find a groundwater table. Because the depth of the bedrock interface is unknown, in order to be successful at reaching the bedrock interface, budgeting for drilling this well should be done with an over-estimate of the drilling depth; we recommend estimating a 122 m (400 ft) deep well using an air rotary drilling rig.

3) Water quality exceedances at DMW-1b

- We know it has been challenging to find a representative "background" well to compare water quality downgradient of the Golden Landfill. Attempts have been made to drill a well, on-site and upgradient of the landfilled area without success; therefore, upgradient domestic wells (DMW-1 and DMW-1b) were located and permission received to sample the wells was granted. The water quality of these domestic wells has proved to be poor, with exceedances in drinking water guidelines of arsenic, magnesium, and iron occurring regularly. Arsenic is a common water quality parameter to exceed guidelines within some surficial and bedrock aquifers surrounding Golden and throughout B.C. We believe the water quality exceedances observed at DMW-1b are likely naturally occurring; however, to confirm this is the case, additional sampling of nearby DMW-2 and DMW-3 should be performed during the yearly monitoring to establish a sound understanding of the background bedrock water quality in the area of the landfill site. With this understanding, we will be able to rule out the possibility of landfill leachate affecting these wells and contributing to poor water quality. Further, as per Summit's recommendations in the 2012 Annual Monitoring Report, if it has not occurred already, residences at DMW-1b should be notified immediately of exceedances of the drinking water guidelines. These included arsenic (GCDWQ MAC) and iron (GCDWQ AO).

4) Stressed vegetation south of the landfill site

As noted by Summit (2013), in previous years, stressed vegetation has been observed to the south of the landfill site. To evaluate if the stress on the vegetation is related to landfill activities we recommend the following:

- Have a biologist bio-assay for heavy metals and assess the condition of the trees; and
- Soil samples be collected from the root zones of the affected area to assess potential impacts from leachate-affected surface runoff from the landfill.

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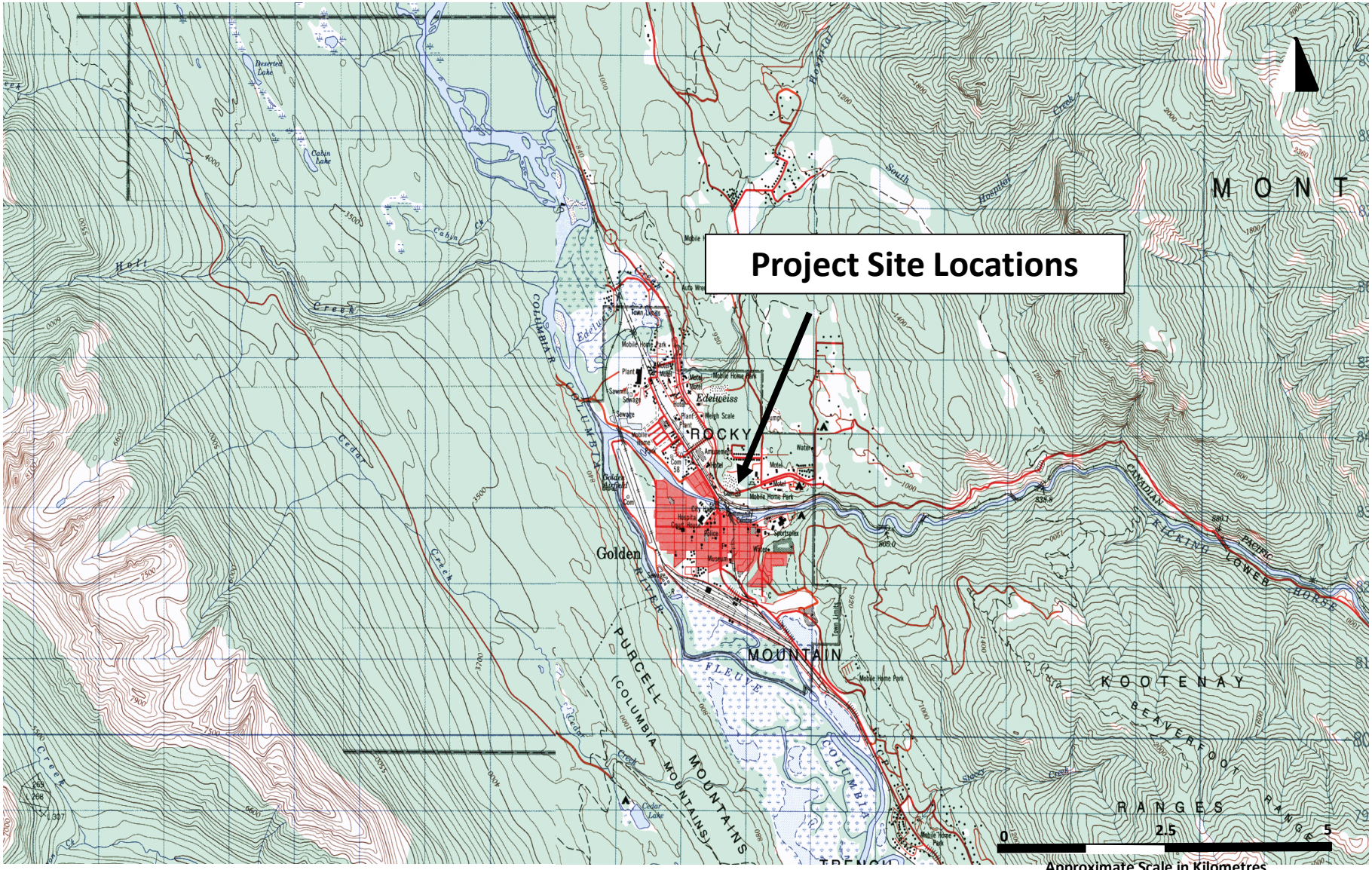
Figures



Columbia Shuswap Regional District

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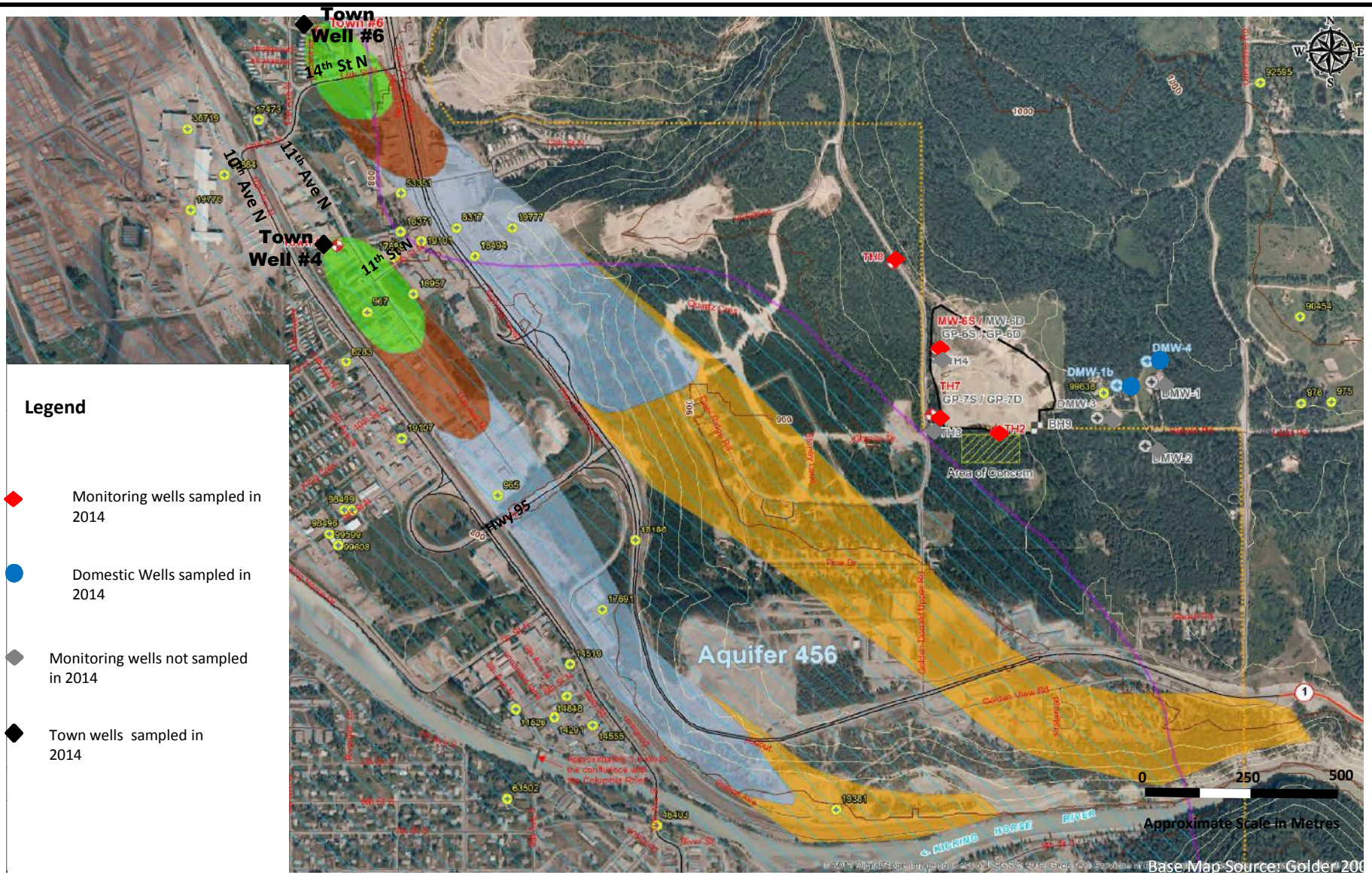
Figure 1: General Site Map

DRAWN		DATE	April 2015	PROJECT NO.	14-024-16
CHECKED	BRM	SCALE	See figure	DWG. NO.	n/a
REVIEWED	DG	FILE NO.		FIGURE VERSION NO.	



Columbia Shuswap Regional District

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Figure 2: Sampling Locations at Golden Refuse Disposal Facility

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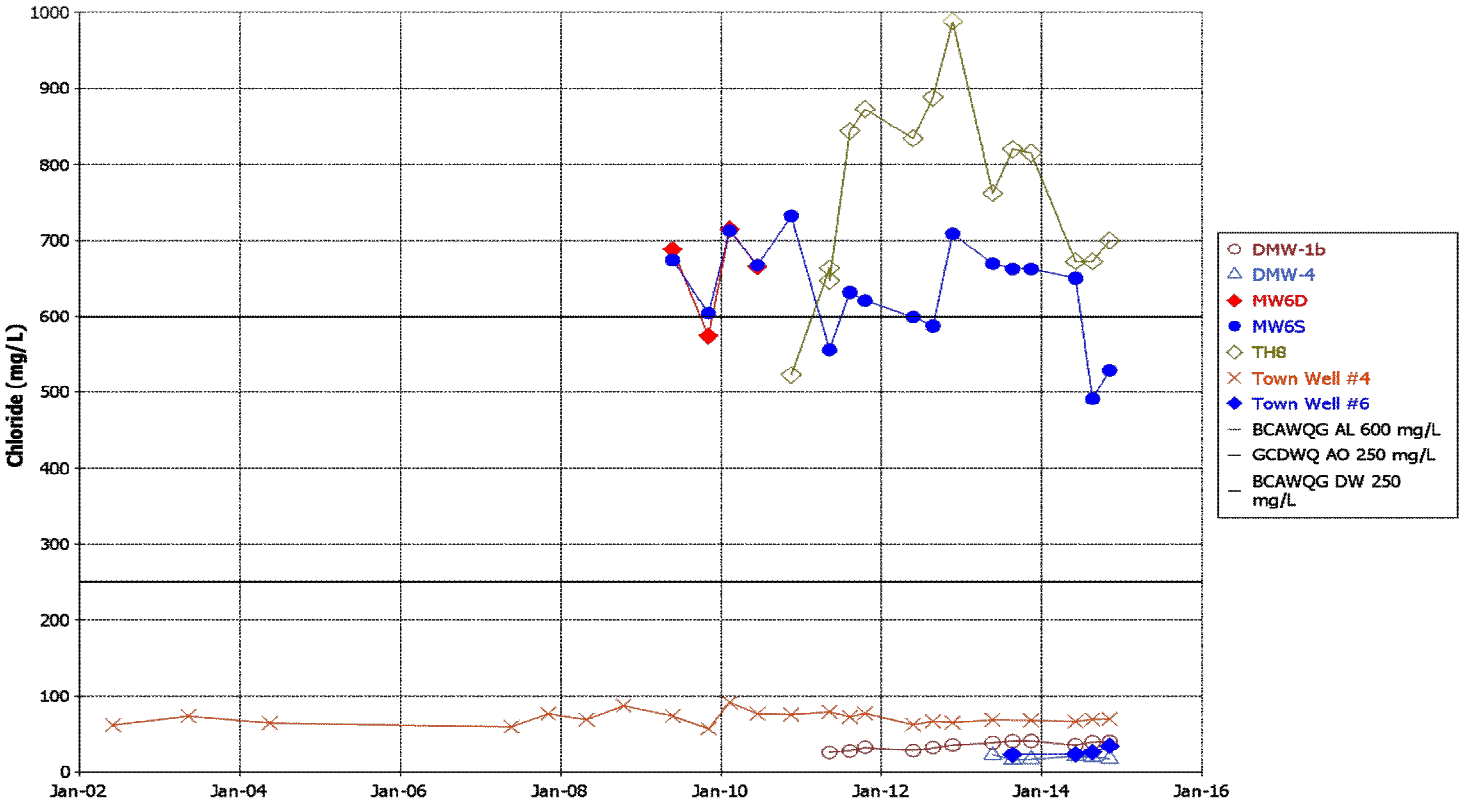
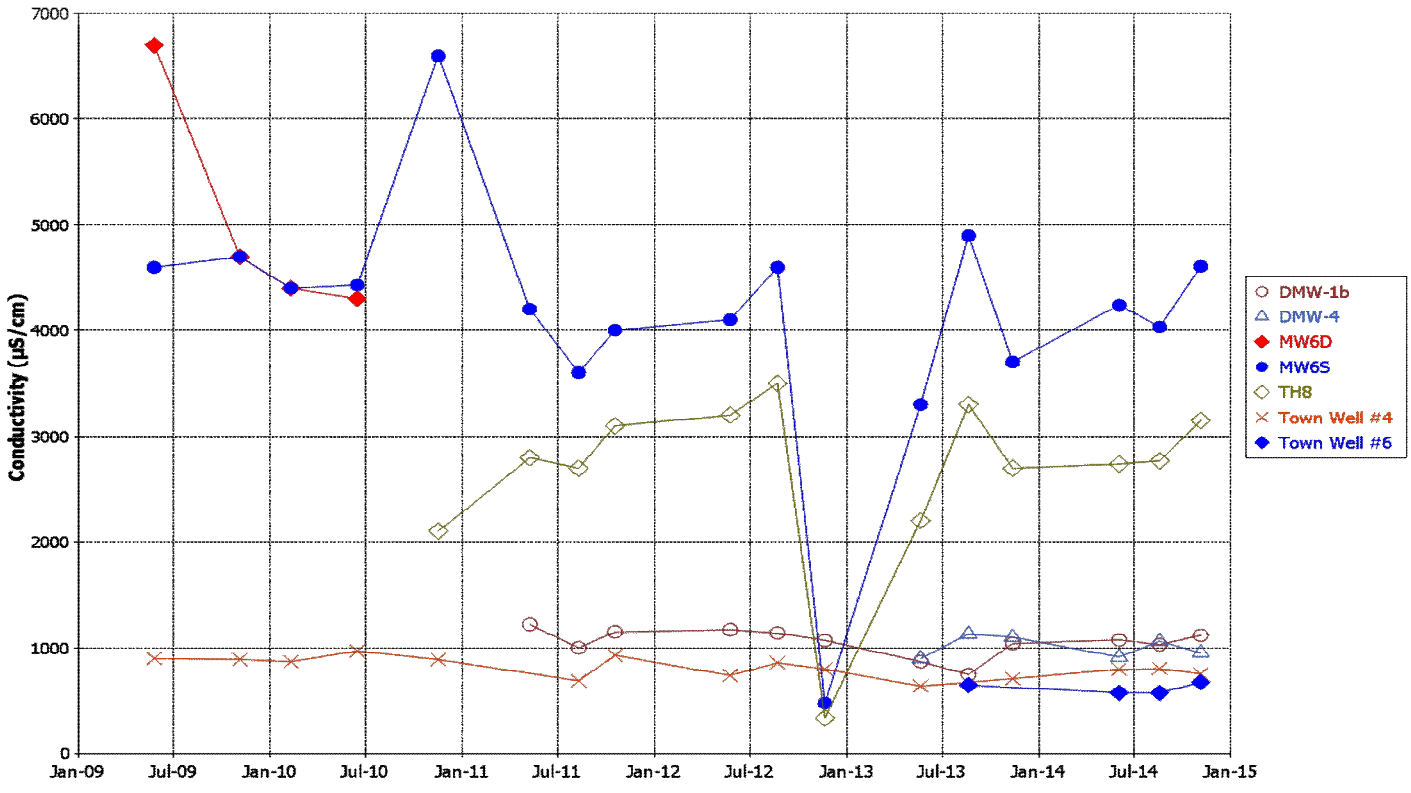
CHECKED	BRM	SCALE	See figure	DWG. NO.	n/a
REVIEWED	DG	FILE NO.		FIGURE VERSION NO.	





Columbia Shuswap Regional District

TITLE

Figure 3: Chloride (Top) and Conductivity (Bottom) Time Series Plots, Golden RDF

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DRAWN		DATE	March 2015	PROJECT NO.	14-024-16
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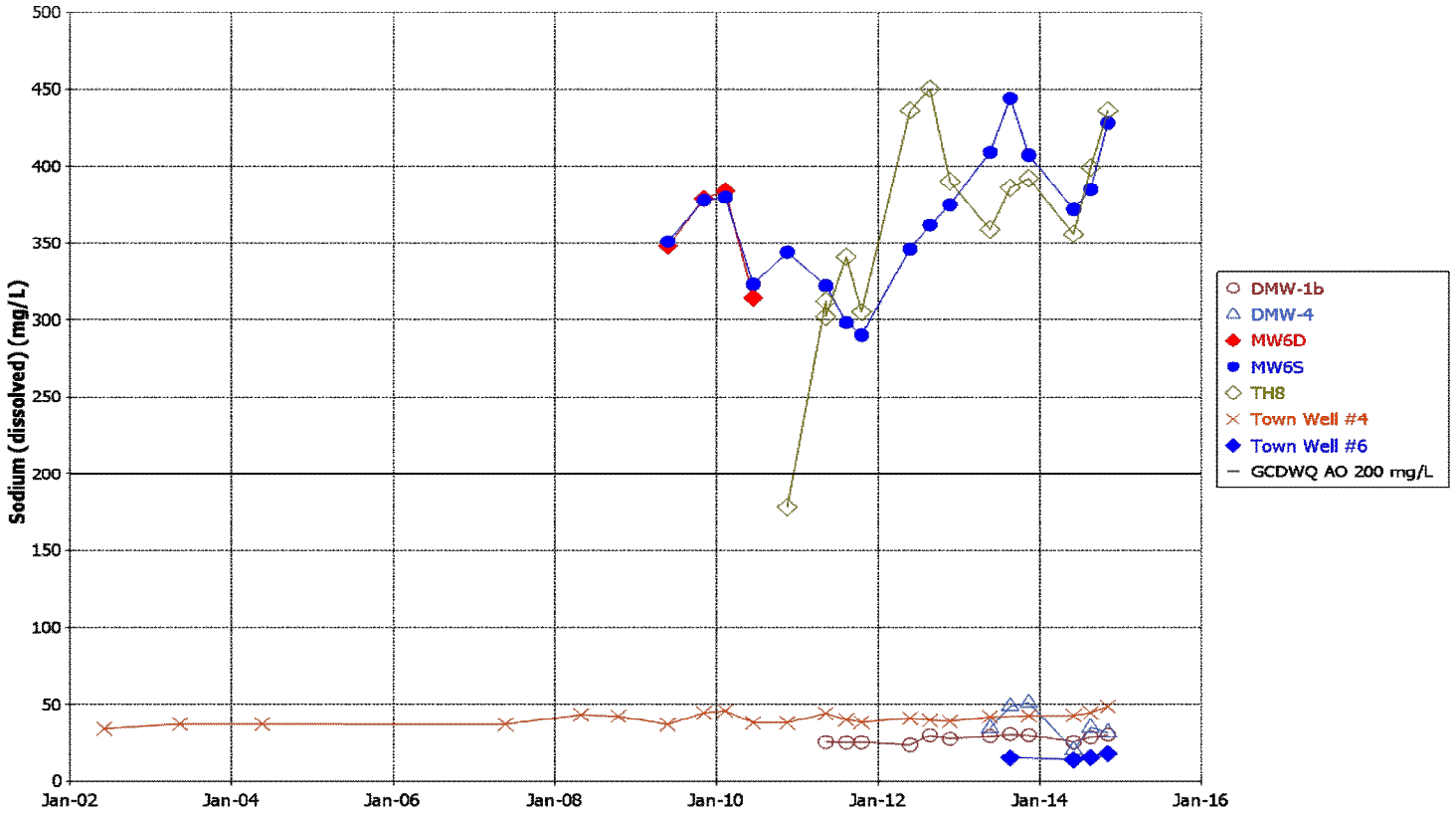

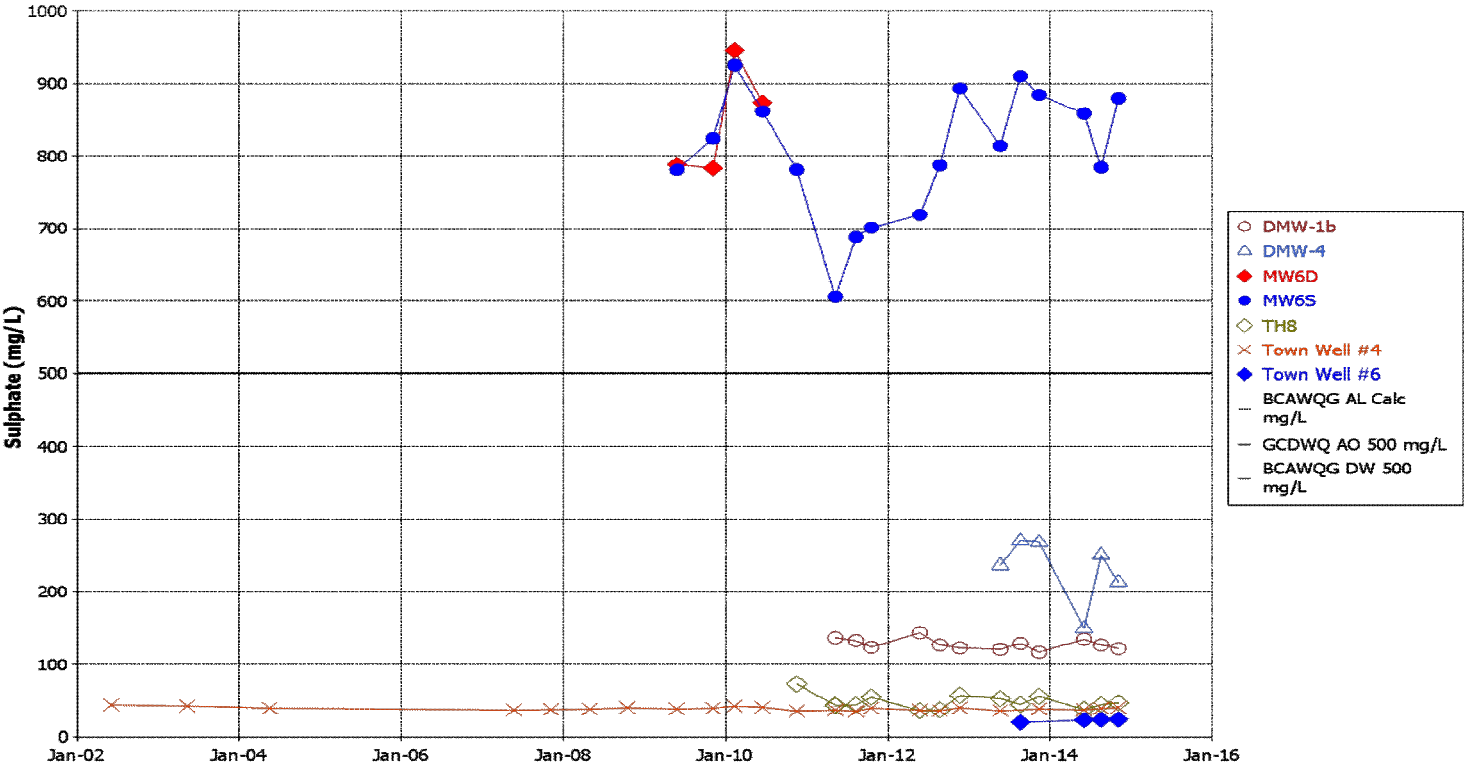

Columbia Shuswap Regional District

TITLE

Figure 4: Dissolved Sodium (Top) and Sulphate (Bottom) Time Series Plots, Golden RDF

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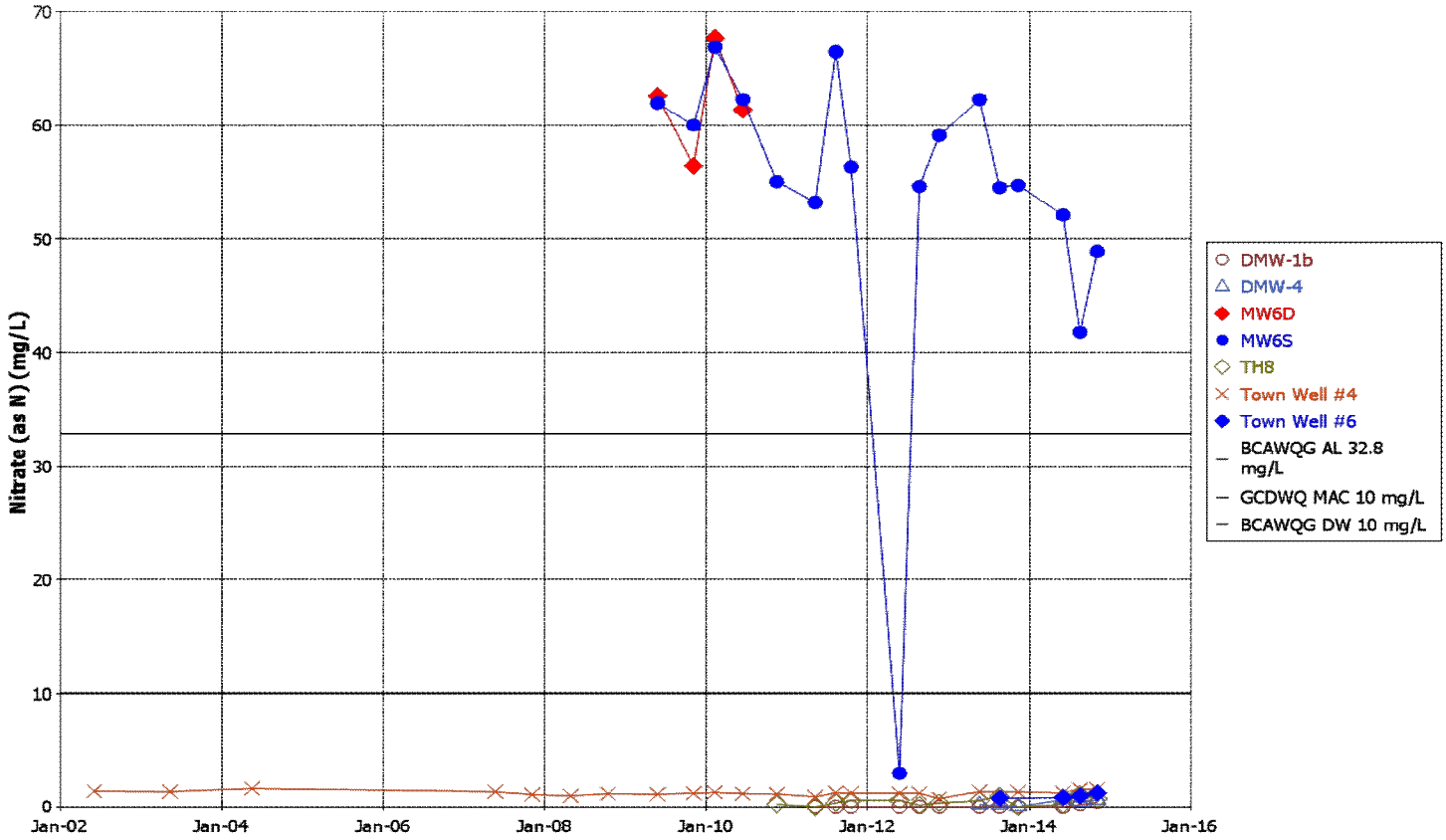

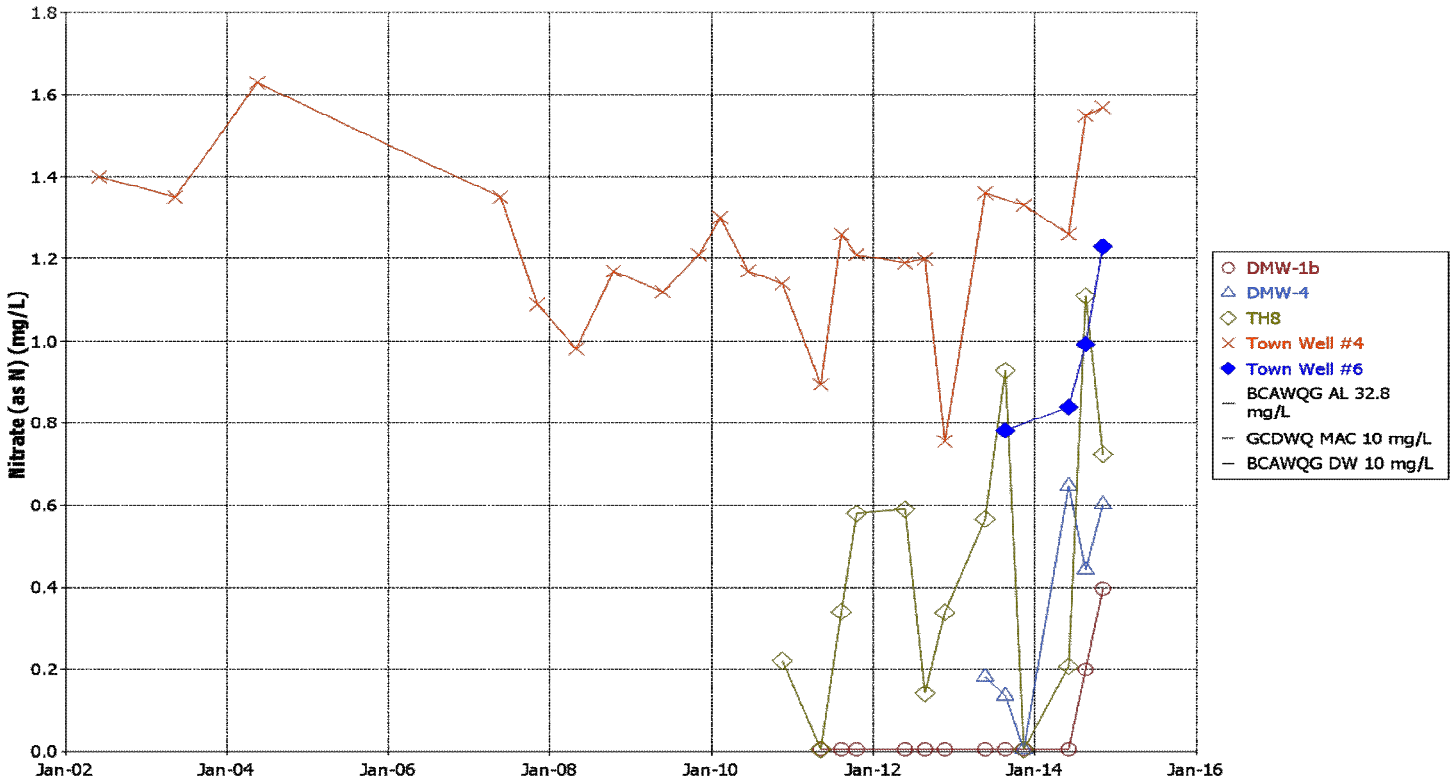

Columbia Shuswap Regional District

TITLE

Figure 5: Nitrate (Top) and Modified Nitrate (Bottom), Time Series Plots, Golden RDF

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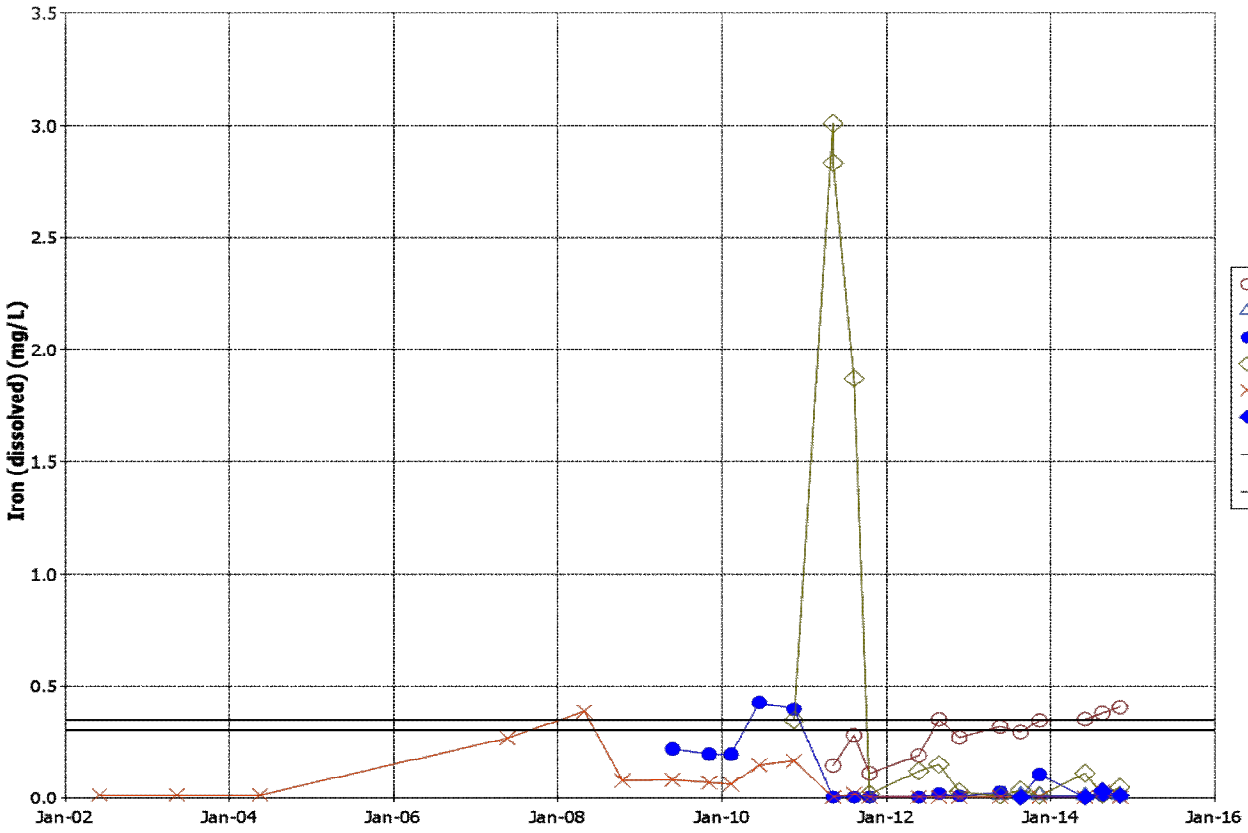

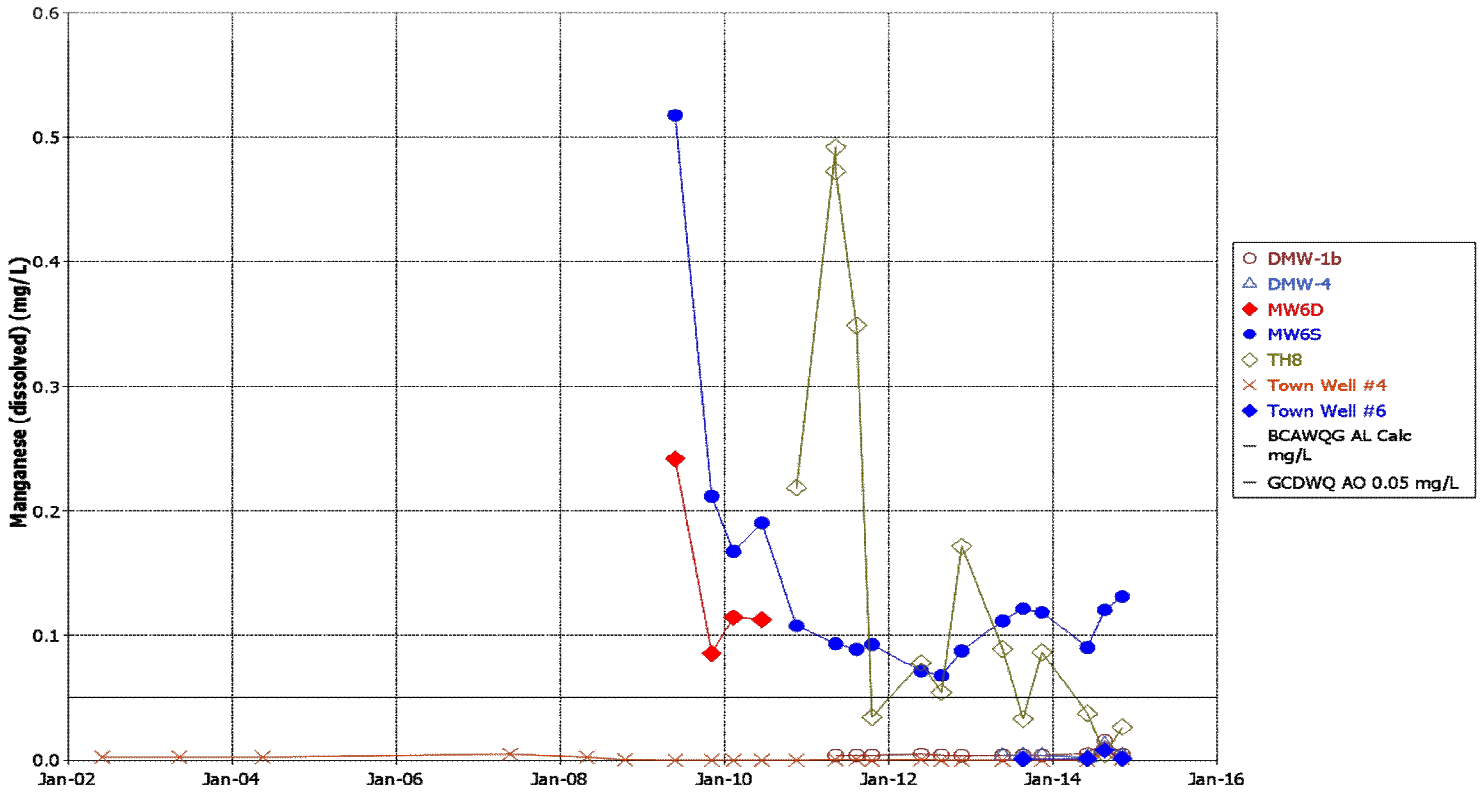

Columbia Shuswap Regional District

TITLE

Figure 6: Dissolved Iron (Top) and Dissolved Manganese (Bottom) Time Series Plots, Golden RDF

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REVIEWED	DG	FILE NO.		FIGURE REV. NO.	

Appendix A

Operational Certificate – OC 17006

August 29, 2012

Tracking Number: 243578
Authorization Number: 17006

REGISTERED MAIL

Columbia Shuswap Regional District
Box 978
781 Marine Park Drive NE
Salmon Arm, BC V1E 4P1

Dear Operational Certificate Holder:

Enclosed is Amended Operational Certificate 17006 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the operational certificate. An annual fee will be determined according to the Permit Fees Regulation.

This operational certificate does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the operational certificate holder. It is also the responsibility of the operational certificate holder to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

...2

Ministry of Environment
Environmental Protection Division
401 - 333 Victoria St.
Nelson, BC V1L 4K3
Southern Interior Region - Kootenay
Telephone: (250) 354-6333
Facsimile: (250) 354-6332

Administration of this operational certificate will be carried out by staff from the Southern Interior Region - Kootenay. Plans, data and reports pertinent to the operational certificate are to be submitted to the Regional Manager, Environmental Protection, at Ministry of Environment, Regional Operations, Southern Interior Region - Kootenay, 401 - 333 Victoria St., Nelson, BC V1L 4K3.

Yours truly,

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

Enclosure

cc: Environment Canada

MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

17006

Under the Provisions of the Environmental Management Act

Columbia Shuswap Regional District

Box 978
781 Marine Park Drive NE
Salmon Arm, BC V1E 4P1

is authorized to manage waste and recyclable material from the Columbia Shuswap Regional District and environs at the Columbia Shuswap Regional District in Golden landfill located near Golden, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

This Operational Certificate supersedes all previous versions of the Operational Certificate MR-17006 issued under the authority of the *Environmental Management Act.*

1. AUTHORIZED DISCHARGE

This section applies to the discharge of refuse from municipal, commercial and light industrial sources to a sanitary landfill known as the GOLDEN LANDFILL. The site reference number for this discharge is E246600.

1.1 The authorized works are a sanitary landfill and related appurtenances approximately located as shown on the attached location map.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

1.2 The maximum quantity of waste discharges must not exceed the design capacity of the landfill as specified in the approved Design and Operations Plan. The final footprint and profile of the discharged waste must be within that specified in the Design and Operations Plan, and approximately as shown on the attached location map.

1.3 The authorized discharge is municipal solid waste as defined in the *Environmental Management Act* and other waste as may be authorized by the Director.

1.4 The legal description of the location of the authorized landfill facility is Subdivision 12 of Section 18, Township 27, Range 21, West of the 5th Meridian, Kootenay District.

1.5 The site is located approximately 2 kilometres travelling northeast on Highway 1 as shown on the location map.

2. DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design and Operating Plan

The Operational Certificate holder must prepare and maintain a current Design and Operations Plan prepared by a qualified professional. The Plan must be reviewed and updated as needed at least once every five years. The next update must be undertaken and completed in 2013. The Plan must address, but not be limited to, each of the subsections in the Landfill Criteria for Municipal Solid Waste including performance, siting, design, operational, closure and post-closure criteria. The facilities must be developed, operated and closed in accordance with the Plan. Should there be any inconsistency between this Operational Certificate and the Plan, this Operational Certificate must take precedence.

Written authorization from the Director must be obtained prior to implementing any changes to the approved plans. Based on any information obtained in connection with this facility, the Director may require revision of, or addition to, the design, operating and closure plans.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

2.2 Qualified Professionals

All facilities and information, including works, plans, assessments, monitoring, investigations, surveys, programs and reports, must be certified by Qualified Professionals.

2.3 Maintenance of Works and Emergency Procedures

The authorized works must be inspected regularly and maintained in good working order. In the event of an emergency or condition beyond the control of the Columbia Shuswap Regional District including, but not limited to, unauthorized fires arising from spontaneous combustion or other causes, or detection of surfacing leachate on the property, the Columbia Shuswap Regional District must take appropriate remedial action and notify the Regional Office. The Director may reduce or suspend operations to protect the environment until the authorized works has been restored, and/or corrective steps taken to prevent unauthorized discharges.

2.4 Additional Facilities or Works

The Director may require investigations, surveys, and the construction of additional facilities or works. The Director may also amend any information requirements of this Operational Certificate including plans, programs, monitoring, assessments and reports.

2.5 Public Health, Safety and Nuisance

The landfill must be operated in a manner such that it will not create a public nuisance or become a significant threat to public health or safety with respect to landfill gas, unauthorized access, roads, traffic, airport activity, noise, dust, litter, vectors, or wildlife attraction.

2.6 Ground and Surface Water Quality Impairment

The landfill must be operated in a manner such that ground or surface water quality does not decrease beyond that specified by the British Columbia Water Quality Guidelines, or other appropriate criteria as may be specified by the Director, at or beyond the landfill property boundary.

The certificate holder must take all reasonable measures to ensure that BCWQG are met at or beyond the property boundary. These measures include but are not limited to:

a) Prohibiting the discharge of municipal solid waste into water.

b) Ensuring that no new waste is landfilled within 1.2 m of the highest groundwater level.

c) Ensuring that adequate surface water and groundwater diversion works are constructed and maintained to minimize surface water run-off and groundwater seepage from entering the landfill.

d) Ensuring that the management systems for surface water that has not come in contact with waste are hydraulically separate from those for managing impacted surface water.

e) Ensuring that the landfill is operated in a manner that prevents the exceedance in surface water and groundwater of anticipated leachate indicators or parameters distinctive of leachate or those specified by the Director at the landfill boundary.

f) Ensuring that the indicators in e) above, at specified groundwater monitoring wells within the property boundary are in accordance with those predicted by design and that suitable measures are taken to address the cause of any exceedances above the trigger levels identified in the most current Design and Operations Plan.

g) Ensuring that the landfill is operated in accordance with a Design & Operations Plan which specifies measures to prevent decreases in groundwater and surface water quality at and beyond the property boundary.

If exceedances to the specified water quality criteria occur as a result of landfill operations, the Director may require that leachate management control measures or works be undertaken. Terms of reference for any leachate management study and/or design work must be submitted to the Director for review prior to conducting the work.

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Date amended: August 29, 2012
(most recent)

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for Director, *Environmental Management Act*
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2.7 Landfill Gas Management

The Landfill must not cause combustible gas concentrations to exceed the lower explosive limit in soils at the property boundary or 25% of the lower explosive limit at or in on-site or off-site structures.

The Operational Certificate holder must ensure that the facility is in compliance with the requirements of the Landfill Gas Management Regulation under the *Greenhouse Gas Reduction (Emissions Standards) Statutes Amendment Act*, 2008 on or before applicable dates specified in the regulation. The requirements of the regulation and its guideline documents must be incorporated by the Operational Certificate holder into the Design and Operation Plan revisions as they come into effect and as applicable.

2.8 Buffer Zone

No material must be landfilled within 50 metres of the property boundary.

3. OPERATIONAL REQUIREMENTS

3.1 Waste Compaction and Coverage

The Operational Certificate holder must ensure that waste deposition and compaction meets or exceeds the requirements of the BC Landfill Criteria or its most current version for daily, intermediate and final cover. Control must be exercised to ensure keeping freshly deposited refuse in a well defined and small / manageable working face.

3.2 Prohibited Wastes

The disposal of the following types of wastes is strictly prohibited:

(a) Hazardous Wastes other than those specifically approved for disposal to authorized landfills in the Hazardous Waste Regulation under the *Environmental Management Act*.

(b) Biomedical wastes as defined in the Guidelines for the Management of Biomedical Wastes in Canada (Canadian Council of Ministers of the Environment, February 1992),

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(c) Bulk liquids and semi-solid wastes, which contain free liquids, as determined by US EPA Method 90954 Paint Filter Liquids Test, Test Methods for Evaluating Solid Wastes-Physical/Chemical Methods (EPA Publication No. Sw-846),

(d) Release of ozone depleting substances from the storage, handling and disposal of used appliances, equipment, or any material containing ozone depleting substances is prohibited in accordance with the requirements of the Ozone Depleting Substances Regulation. Onsite removal or evacuation of Ozone Depleting Substances (ODS) from appliances and the subsequent storage of appliances on site is permitted subject to both activities being in compliance with the Ozone Depleting Substances Regulation.

3.3 Waste Asbestos

Waste asbestos is authorized for disposal subject to compliance with the requirements of section 40 of the Hazardous Waste Regulation and the following conditions:

(a) The asbestos waste may not be mixed with any other hazardous waste.

(b) The Regional District must approve the disposal before disposal takes place.

(c) All other applicable requirements of the Hazardous Waste Regulation, including but not limited to manifesting and waste record keeping, must also be complied with.

3.4 Contaminated Soil

Soil that contains contaminants in concentrations less than "hazardous waste" as defined by the Hazardous Waste Regulation may be disposed of at the landfill site. Disposal includes monofilling, co-disposal with other wastes, use as a refuse cell berm material and use as a refuse cell cover material. Disposal does not include use as final cover material.

3.5 Wildlife and Vector Control

Vectors (carriers capable of transmitting a pathogen from one organism to another including, but not limited to flies and other insects, rodents, and birds) must be controlled by the application of cover material at the required frequency or by such additional methods as specified by the Director. Wildlife control fencing must be maintained around the perimeter of the landfill site and must be

electrified for at least the active bear season of each year.

This landfill must be operated so as to minimize the attraction of wildlife such as bears and birds by applying cover at required frequencies and instituting a good housekeeping program.

3.6 Site Access and Supervision

A landfill operator that has received BC Qualified Landfill Operator training, is familiar with the requirements of the Operational Certificate and the specifications of the Design and Operations Plan, must be present at all times during operating hours.

Locking gates must be maintained at all access routes to the landfill site. Gates, perimeter fencing and/or barriers must be installed where necessary to prevent unauthorized access to the site by vehicles. Gates must be locked during non-operating hours.

3.7 Dust Control

Dust created within the landfill property must be controlled, using methods and materials acceptable to the Director, such that it does not cause a public nuisance.

3.8 Litter Control

The best practical means must be used to prevent the scatter of litter. Any litter scattered into the neighbouring property, along access roads, in drainage ditches, along litter-control fences, into surrounding trees or elsewhere on the landfill site must be cleaned up. The frequency of clean up and other additional requirements for refuse scatter control must be determined by the Director.

3.9 Waste Reduction and Alternate Disposal

The Provincial Government has developed policies to promote the reduction, reuse and recycling of wastes. The Operational Certificate holder is encouraged to segregate for recycling and reuse, where possible, materials destined for disposal at this site.

Public scavenging must not be permitted at the landfill. The controlled salvaging of waste by the landfill operator or persons authorized by the

Operational Certificate holder is encouraged if areas or facilities for separation and storage of recyclable or reusable materials are provided.

In certain landfill environments, some construction and demolition debris or other wastes may create specific air and water quality concerns. If problems arise at this site that are attributable to specific wastes, the Director may require that alternate disposal/storage procedures be implemented.

3.10 Operations and Maintenance Manual

The Operational Certificate holder must prepare an Operations and Maintenance Manual to be reviewed and updated as necessary on at least an annual basis.

4. MONITORING AND REPORTING REQUIREMENTS

4.1 Landfill Monitoring

A monitoring program must be developed by a Qualified Professional and identify potential environmental impacts of the authorized facility and must address but not be limited to the Landfill Criteria for Municipal Solid Waste and Guidelines for Environmental Monitoring. The monitoring program must be updated every five years and submitted to the satisfaction of the Director. The next monitoring plan update is required to be undertaken and completed in 2013. Monitoring must be conducted in accordance with the monitoring program.

The program must be designed to assess and identify:

- The design performance of the landfill as per the Design & Operations Plan including but not limited to compliance with water quality performance standards at the landfill boundary.
- Landfill leachate as a contaminant source.
- Residential well water quality.
- Surface water quality.

The monitoring program must address, but not be limited to relevant sections of the Landfill Criteria for Municipal Solid Waste and the Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills. The Environmental Monitoring Program must take into consideration results from previous monitoring programs and any other investigations conducted at the site to ensure that early detection of potential impacts is possible.

4.2 Sampling Techniques

Sampling must be carried out in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples", or by suitable alternative procedures as authorized by the Director. A copy of the above manual may be purchased from the Queen's Printer Publications Centre, P.O. Box 9452, Stn. Prov. Gov't., Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or (250) 387-6409).

4.3 Analysis

Analyses must be carried out in accordance with procedures described in the most recent edition of the "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials", or by suitable alternative procedures as authorized by the Director. A copy of the above manual may be purchased from the Queen's Printer Publication Centre.

4.4 Quality Assurance

The Operational Certificate holder must produce, within 60 days on the request of the Regional Manager Environmental Protection, 'Field and Laboratory Quality Protocols and Quality Assurance Criteria' acceptable to the Director. The 'Laboratory Quality Protocols' must include the procedures used to assess precision, accuracy and blank quality, including frequency of application of those procedures, the procedures for sampling, handling (e.g. preservation, hold times) and corrective measures to be initiated when deficiencies are indicated. The 'Quality Assurance Criteria' must include the acceptance criteria for accuracy (based on recoveries for reference samples/spikes), for precision (based on deviation in field and lab duplicates) and method blanks (designed to indicate false positives).

5. LANDFILL REPORTING

5.1 Annual Report

The Operation Certificate Holder must submit an Annual Report to the Director on or before April 30th each year for the previous calendar year. The report must contain at least the following information:

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(a) an executive summary;

(b) the type and tonnage of waste received, recycled, stored on-site and discharged / landfilled for the year;

(c) Any proposed changes to the Design and Operations Plan and the environmental monitoring program (EMP), with rationale for the changes; a description of unanticipated occurrences and any changes to the closure or post-closure plans and funds;

(d) A review of the preceding year of operation or an operations update which summarizes landfill development work completed in the subject reporting year and work planned for the subsequent year. A summary of any new information or changes to the facilities and plans, assessments, surveys, programs and reports;

(e) Occurrences or observations of wildlife (medium and large carnivores) at the facility;

(f) A statement regarding the facility's progress in reducing the regional solid waste stream being landfilled and the objectives of the Regional Solid Waste Management Plan;

(g) An outline of the current Environmental Monitoring Program and a compendium of all environmental monitoring data in accordance with requirements specified in the most recent version of Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills and Landfill Criteria for Municipal Solid Waste. The annual report must document any effect of the discharge on the quality of the receiving environment using appropriate statistical and graphical analysis. Trend analyses, as well as an evaluation of the impacts of the discharges on the receiving environment must be included;

(h) A list of training programs completed for landfill operators during the previous year; and

(i) Any additional information requested by the Director.

All reports must be submitted, suitably formatted and tabulated in both print and electronic format (portable document format).

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

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5.2 Five Year Report

The Operation Certificate Holder must submit a Five Year Report to the Director on or before April 30th on the five year anniversary of the last submission. The next report is due by the end of 2013. The report must contain at least the following information:

(a) An executive summary;

(b) An updated Design and Operations Plan;

(c) A detailed hydrogeological assessment;

(d) The type and tonnage of waste received, recycled, stored on-site and discharged / landfilled for the year;

(e) A current topographic map detailing airspace consumption, on-site borrow pit changes and future developments;

(f) Volume and density analysis or an in-place material summary, updated estimates for the remaining capacity, site life, revised closure date for the current phase or sequence and revised closure date for the current landfill footprint;

(g) An outline of the current Environmental Monitoring Program and a compendium of all environmental monitoring data in accordance with requirements specified in the most recent version of Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills and Landfill Criteria for Municipal Solid Waste. The annual report must document any effect of the discharge on the quality of the receiving environment using appropriate statistical and graphical analysis. Trend analyses, as well as an evaluation of the impacts of the discharges on the receiving environment must be included;

(h) An update on the financial assurance mechanism including a statement of the current dollar value of the Closure Fund and the amount earmarked for the Landfill site; and

(i) Any additional information requested by the Director.

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Date amended: August 29, 2012
(most recent)

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6. LANDFILL CLOSURE PLAN

6.1 Closure Plan and Post Closure

The Operational Certificate holder must perform closure and post-closure care in accordance with all applicable requirements of the BC Landfill Criteria for Municipal Solid Waste. This Operational Certificate is issued on the condition that a Closure Plan and Final Cover Design that meets or exceeds the requirements of the criteria will be submitted to the Director during the operating life of the landfill. The Closure Plan must be reviewed every five years throughout the operating life of the landfill.

A certification by a Qualified Professional attesting that all closure works have been completed in accordance with the Closure Plan and Final Cover Design is to be submitted to the Director no later than 60 days after the implementation of the Final Cover Design.

The Operational Certificate Holder must submit a Post Closure or Aftercare Plan to the Ministry at least two years prior to the anticipated closure date of the landfill.

6.2 Closure Fund

The Operational Certificate holder must provide for the funding of progressive closure operations, final closure and operations beyond closure by maintaining a closure fund. The value of the closure fund must meet or exceed the estimated closure and post-closure costs as established in the approved Design and Operations Plan and updated in the annual report, plus a reasonable contingency for any remediation which may be required. Reported costs must be adjusted for inflation annually. Alternately, a closure and post-closure financial security acceptable to the Director may be built over time.

The Operational Certificate holder must determine and ensure that the closure fund is adequate by preparing annually a financial statement of the fund which must be made available to the Director upon request. The financial statement must report the accrued capital, interest and additions to the fund for the previous year and review the sufficiency of the fund and the rate of accrual in consideration of the projected costs of closure and post-closure obligations.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

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6.3 Site Decommissioning

In accordance with Section 40 of the *Environmental Management Act* and Part 2 of the Contaminated Sites Regulation, the Operational Certificate holder must submit a site profile to the manager at least ten days prior to decommissioning the facilities authorized in Section 1.

6.4 Declaration of Landfill

Landfills sited on titled land must register a covenant that the property was used for the purpose of waste disposal as a charge against the title to the property as provided for under Section 215.1 of the *Land Title Act.* Landfills located on crown land are to have a "notation on file" registered that the property was used for the purpose of waste disposal.

The Operational Certificate holder must, upon closure of the landfill, register a charge against the property title, or provide other legal notification acceptable to the Director that the property described in Section 1 was used for the purpose of waste disposal. The Director must be notified of the charge or legal notification.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

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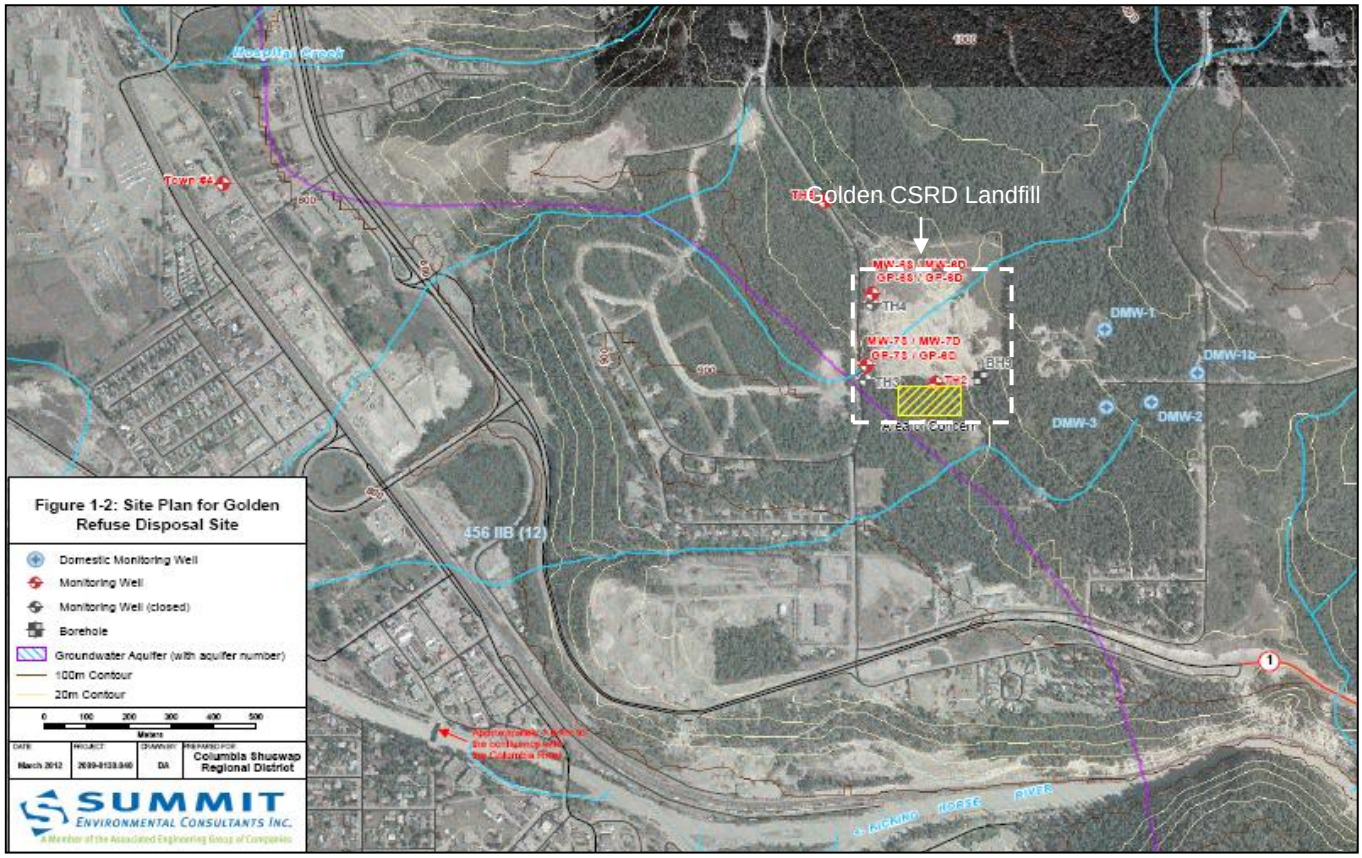
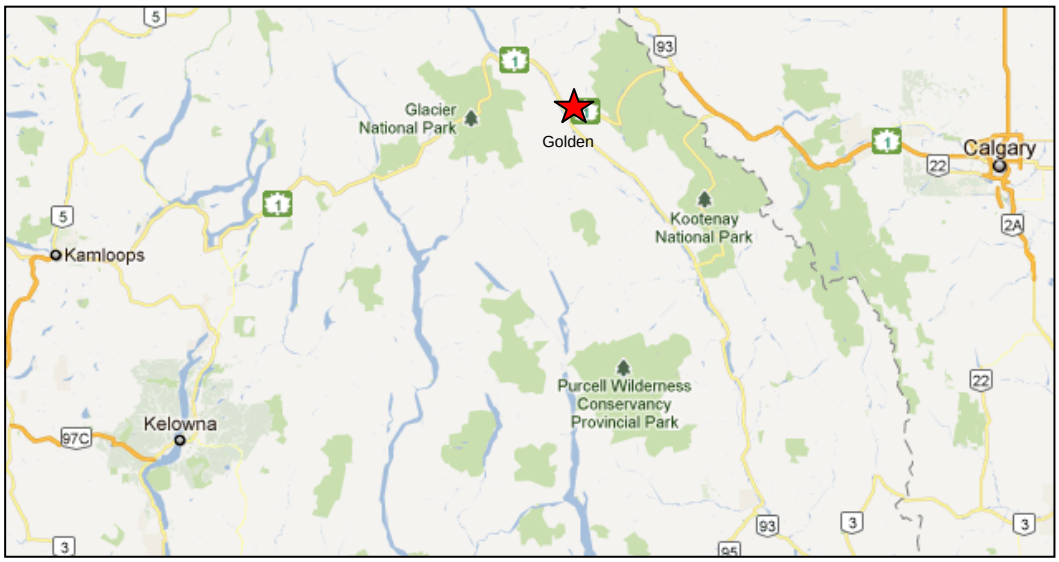
Location Map





Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

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Southern Interior Region - Kootenay

Appendix B

Well Logs

Symbol Legend

Common Symbols

 Sand

 Silty Sand

 Sandy Silt

 Clayey Sand

 Sand and Gravel

 Gravel

 Silt

 Clayey Silt

 Clay

 Silty Clay

 Sandy Silty Clay

 Silty Sand and Gravel

 Silty Gravel

 Silty Clay and Gravel

 Topsoil

 Peat

 Limestone

 Shale

Well Symbols

Pipe and Screen

NONE None

 Pipe

 Double Walled Pipe

 Sealed Pipe

 Fine Screen

 Coarse Screen

 Slotted Screen

 Slotted Screen

Top Fittings

NONE None

 Cap

 Flush-mounted Cap

 Above-ground Cap

 Connector

 Reducer

 Pipe Break

 Packer

Bottom Fittings

NONE None

 Cap

 Cone

 Screw-on Cap

 Connector

 Enlarger

 Pipe Break

 Packer

Packing and Backfill

NONE None

 Bentonite

 Clay

 Silt

 Cement

 Sand

 Sand and Gravel

 Gravel

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH-6 (6")

Well I.D.: **MW-6S, MW-6D, GP-6S, GP-6D**

Location on site: **near weight scale (replaces TH4)**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 ft		Light brown, GRAVEL, w. sand, loose, dry					
30 ft / 10 m		Light brown, SILT w/ sand, trace gravel, loose, dry					
40 ft		Grey, GRAVEL w/ sand and silt, loose, dry					
50 ft		Grey, GRAVEL w/ sand and silt, loose, dry					
60 ft / 20 m		Note: larger gravel than above					
70 ft		Light brown, (f.) SAND w/ silt and trace gravel, dense, moist					
80 ft		Grey, (m.) SAND, w/ silt and gravel, dense, moist					
90 ft		Grey, cemented GRAVEL, dense, dry					
100 ft / 30 m		Yellow, SILT w/ some angular gravel and m.-c. sand, dense, moist					
110 ft		Black, Limestone bedrock					
120 ft							
130 ft / 40 m							
140 ft							
150 ft							
160 ft / 50 m							
170 ft							
180 ft							
190 ft / 60 m							
200 ft							
210 ft							
220 ft		End of Borehole					

Configuration:

- Two groundwater monitoring wells (each 2" diameter)
- Two gas monitoring probes (each 1" diameter)
- Schedule 40 PVC
- Gas piezos. are threaded
- 20/40 sand pack around each monitoring well

Screen Assembly:

- No. 10 slot PVC

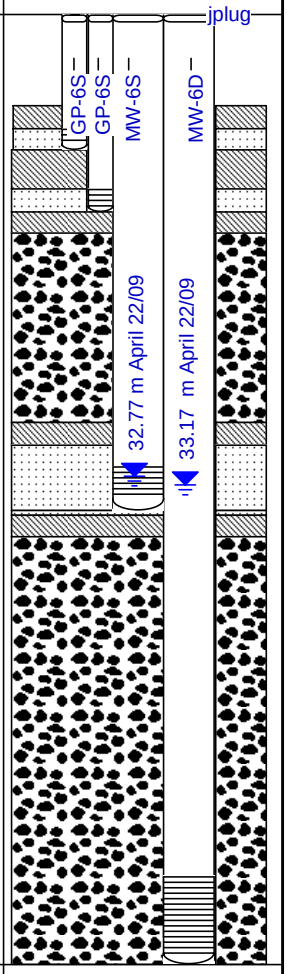
MW6D
-Screened in bedrock - Screened btw 59.76 m (196 ft) and 65.85 (216 ft) bgs

MW6S
-Screened in surficial deposits (overburden)
-Screened btw 31.40 m (103 ft) and 34.45 m (113 ft) bgs

GP6D
-Screened btw 12.20 m (40 ft) and 16.77 m (55 ft) bgs

GP6S
-Screened btw 7.93 m (26 ft) and 9.45 m (31 ft) bgs

Casing height =



SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling Central Ltd.
Operator(s): Jerry Opper
Drill Method: Dual Air Rotary
Ground conditions: bare

Date: April 20, 2009
Time:
Temperature: 10 degC
Sheet: 1 of 1

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

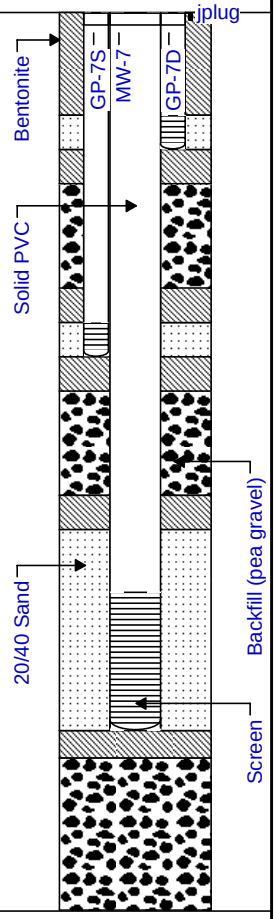
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH-7 (6")

Well I.D.: **MW-7, GP-7S, GP-7D (replaces TH3)**

Location on site: **Golden-Donald Upper Rd.**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
0–10 ft		Yellow/ brown, SILT, loose, damp				Configuration: ♦ One groundwater monitoring well (2" diameter) ♦ Two gas monitoring probes (each 1" diameter) ♦ Schedule 40 PVC ♦ Gas probes are threaded ♦ 20/40 sand pack around each monitoring well Screen Assembly: - No. 10 slot PVC **MW-7** -Screened in the surficial deposits (overburden) -Screened btw 25.6 m (84 ft) and 31.7 m (104 ft) bgs **GP-7D** -Screened btw 13.72 m (45 ft) and 15.24 m (50 ft) bgs **GP-7S** -Screened btw 4.5 m (15 ft) and 6.10 m (20 ft) bgs Casing Height: 1.2 m (3.9 ft)	
10–20 ft		Grey, SILTand clay, dense, moist					
		Grey, SILT, dense, moist					
20–30 ft		Light brown, SILT w/ (f.) sand and gravel, loose, moist, fining upwards					
30–40 ft		Grey, cemented GRAVEL w/ sand and silt, dense, damp					
40–50 ft		Grey, SILT trace sand, dense, moist					
50–60 ft		Grey, GRAVEL w/ (m.) sand and silt, dense, moist					
60–70 ft		Grey, (f.-m.) SAND w/ silt, dense, moist, coarsening upward					
70–80 ft		Grey, cemented GRAVEL, dense, dry					
80–90 ft		Grey, (f.) angular GRAVEL w/ sand and silt, dense, dry,					
90–100 ft							
100–110 ft							
110–120 ft							
120–130 ft							
130–140 ft		End of Borehole					

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling Central Ltd.

Operator(s): Jerry Opper

Drill Method: Dual Air Rotary

Ground conditions: bare

Date: April 23, 2009

Time:

Temperature: 7 deg C

Sheet: 1 of 1

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

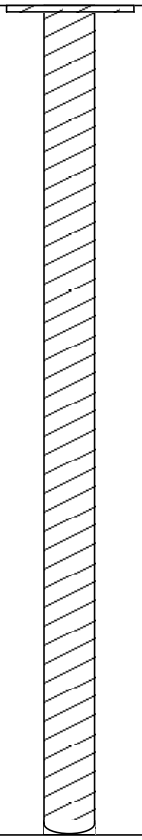
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH3

Well I.D.: **TH-3 (well closure)**

Location on site: **on Golden-Donald Upper Rd**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 ft / 10 m						TH-3 was replaced by MW-7. TH-3 was decommissioned according to the Groundwater Protection Regulation. The surface casing was removed, the 2" piezometer was cut approximately 4" below ground surface and bentonite chips were poured into the casing. Bentonite was poured around the outer annulus of the piezometer to bring the hole to ground surface.	
20 ft / 20 m							
30 ft / 10 m							
40 ft							
50 ft							
60 ft		End of Borehole					
70 ft / 20 m							

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling

Operator(s): Jerry

Drill Method:

Ground conditions: bare

Date: April 20, 2009

Time:

Temperature: 10 degC

Sheet: 1 of 1

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT:	RCP	PROJECT:	Hydrogeologial	TESTHOLE:	BH95-03
LOCATION:	Golden Landfill		Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG:	Becker Hammer	SURF ELV:	908.5m ASL.	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: METHANE %	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES		COMPLETION DETAILS
	0 5 10 15 20						
Gravel					Depth (m)	N	Stickup 1.2m
	0-8.54		**Silt**-some fine sand, some gravel, fine to coarse, iso. cobbles, non-plastic, red/brown, dense, damp		AR1 1.5		50mm dia. Solid pipe
2.0 906.5							Bentonite Grout
					AR2 3.0		
					D1 3.5/3.95	50	
4.0 904.5							
					AR3 4.5		
6.0 902.5							Top 6.0m
					AR4 6.0		
					D2 6.5/6.95	50	
8.0 900.2							
	8.54-11.3		**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist.		AR5 7.5		
10.0 898.2							Sand
					AR6 10.0		
	11.3-15.5		**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, grey/brown, hard, moist				
12.0 896.2							
					AR7 11.5		
14.0 894.2					AR8 13.0		0.010" slotted pipe
					D3 13.5/13.9	50	
					AR9 14.0		
16.0 892.2	15.5-18.3		**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp.		AR10 15.0		
					D4 16/16.45	75	
					AR11 16.5		
18.0 890.2					AR12 18.0		
							18.3m
20.0 888.2			*End of TH95-01 at 18.3m - No groundwater seepage Monitoring Well installed*				
22.0							

Prepared by: Paul Blackett	Reviewed by:	Figure: 3
Groundwater Depth: no groundwater	Borehole Depth: 18.3m below surface	Date: 10/9/95

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

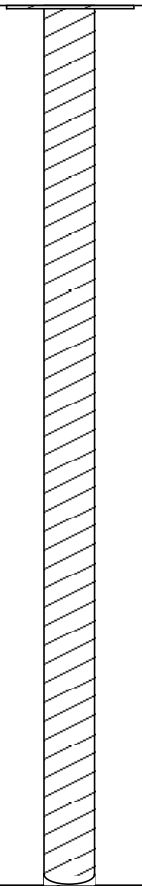
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH4

Well I.D.: **TH-4 (well closure)**

Location on site: **near weight scale**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 ft; 10 / 20 / 30 m						TH-4 was replaced by MW-6S. TH-4 was decommissioned according to the Groundwater Protection Regulation. The surface casing was removed, the 2" piezometer was cut approximately 4" below ground surface and bentonite chips were poured into the casing. Bentonite was poured around the outer annulus of the piezometer to bring the hole to ground surface.	
110 ft		End of Borehole					

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling

Operator(s): Jerry

Drill Method:

Ground conditions: bare

Date: April 20, 2009

Time:

Temperature: 10 degC

Sheet: 1 of 1

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT:	RCP	PROJECT:	Hydrogeologial	TESTHOLE:	BH95-04
LOCATION:	Golden Landfill		Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG:	Becker Hammer	SURF ELV:	916.9m ASL.	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: METHANE %	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES		COMPLETION DETAILS
	0 5 10 15 20				Depth (m)	N	Stickup 1.2m
Grass							
	0-3.35		**Silt**-and fine sand, trace gravel fine to coarse, occ. cobbles, non-plastic, dense, yellow/brown, damp.		AR1 1.5		50mm dia. Solid pipe
2.0 914.9							Bentonite Grout & backfill
					AR2 3.0		
					D! 3.5/3.95	35	
4.0 912.9	3.35-5.49		**Gravel**-fine to coarse, and silt, trace sand fine to coarse, occ. cobbles, light brown, moist.		AR3 4.5		
6.0 910.9	5.49-11.0		**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, grey/brown, hard, moist.		AR4 6.0		
					D2 6.5/6.95	50	
8.0 908.9					AR5 7.5		
10.0 906.9							Sand
					AR6 10.0		
	11.0-12.8		**Sand**-fine to medium, and gravel, fine to coarse, iso. cobbles, trace silt, dense, red/brown, moist.		D3 10/10.45	45	
12.0 904.9					AR7 11.5		
	12.8-17.7		**Sand**- fine to medium, and silt, little gravel fine to coarse, iso. cobbles, brown, hard, moist.		AR8 13.0		0.010" slotted pipe
14.0 902.9					D2 13.5/13.9	50	
					AR9 14.0		
16.0 900.2					AR10 15.0		
					D4 15/15.45	70	
					AR11 16.5		
18.0 898.2	17.7-30.48		**Sand** - fine and silt, trace gravel, fine to coarse, brown, hard, moist.		AR12 18.0		
					AR13 22.0		
20.0 896.2					AR 14 25.0		Top 20.0m
			End of TH95-01 at 30.48m - No groundwater seepage		AR15 27.5		
30.0 894.2			*Monitoring Well installed*		AR 16 30.0		Bot 30.5m

Prepared by: Paul Blackett	Reviewed by:	Figure:
Groundwater Depth: no groundwater	Borehole Depth: 30.5m below surface	Date: 10/9/95

MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

MAJOR DIVISION			GROUP SYMBOL	GRAPH SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 200 SIEVE)	GRAVELS MORE THAN HALF COARSE GRAINS LARGER THAN NO 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW		RED	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_U = \frac{D_{60}}{D_{10}} > 4 \quad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			GP		RED	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (WITH SOME FINES)	GM		YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS BELOW "A" LINE OR P.I. LESS THAN 4
			GC		YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
	SANDS MORE THAN HALF FINE GRAINS SMALLER THAN NO 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	SW		RED	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_U = \frac{D_{60}}{D_{10}} > 6 \quad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			SP		RED	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (WITH SOME FINES)	SM		YELLOW	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			SC		YELLOW	CLAYEY SANDS, SAND-CLAY MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES 200 SIEVE)	SILTS BELOW "A" LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 50\%$	ML		GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (see below)
		$W_L > 50\%$	MH		BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART NEGLIGIBLE ORGANIC CONTENT	$W_L < 30\%$	CL		GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	
		$30\% < W_L < 50\%$	CI		GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		$W_L > 50\%$	CH		BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SILTS & CLAYS BELOW "A" LINE ON CHART	$W_L < 50\%$	OL		GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY
		$W_L > 50\%$	OH		BLUE	ORGANIC CLAYS OF HIGH PLASTICITY	
HIGHLY ORGANIC SOILS			Pt		ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE

SPECIAL SYMBOLS

BEDROCK (Undifferentiated)

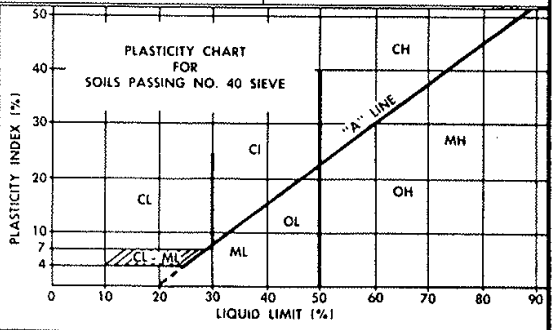
VOLCANIC ASH

SOIL COMPONENTS

FRACTION	U S STANDARD SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
	PASSING	RETAINED	PERCENT	DESCRIPTOR
GRAVEL			50 - 35	and
coarse	76 mm	19 mm		
fine	19 mm	No 4	35 - 20	some
SAND				
coarse	4.75 mm	2.00 mm	20 - 10	little
medium	2.00 mm	425 μm		
fine	425 μm	75 μm	10 - 1	trace
SILT (non plastic) or CLAY (plastic)	75 μm			

OVERSIZE MATERIAL

Rounded or subrounded	Not rounded
COBBLES 76 mm to 203 mm	ROCK FRAGMENTS > 76 mm
BOULDERS > 203 mm	ROCKS > 0·76 cubic metre in volume



1. ALL SIEVE SIZES MENTIONED ON THIS CHART ARE U.S. STANDARD, A.S.T.M. E.11.
2. BOUNDARY CLASSIFICATIONS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN COMBINED GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL SAND MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%.

Kala Groundwater Consulting Ltd.
Vernon Kamloops

Testhole Log - TH95-01	
Depth (m)	**Soil Description**
0-5.8	**Silt**-and fine sand, little gravel fine to coarse, iso. cobbles, non-plastic, dense, yellow/brown, moist.
5.8-6.71	**Silt**-and sand fine to medium, some gravel fine to coarse, non-plastic, hard, grey, moist.
6.71-8.54	**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, gre/brown, hard, moist.
8.54-11.3	**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist.
11.3-14.9	**Silt**-some fine sand, trace gravel, fine to coarse, occ. cobbles, non-plastic, red/brown, hard, damp.
14.9-18.9	**Clay**-and silt, trace fine sand, trace fine gravel, iso. cobbles, low to none plastic, grey, hard, moist.
	End of TH95-01 at 18.9m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-02	
Depth (m)	**Soil Description**
0-9.76	**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp. *Upper 0.3m fill*
9.76-12.8	**Sand**-afine and silt, some gravel fine to coarse, iso. cobbles, dense, red/brown, moist.
12.8-15.5	**Sand**-fine, some silt, some gravel fine to coarse, occ. cobbles. dense, red/brown, moist.
15.5-16.5	**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, iso. grey/brown, cobbles, stiff, moist.
16.5-20.1	**Silt**-little fine sand, trace clay, trace gravel, fine to coarse, occ. cobbles, non-plastic, red/brown, hard, damp.
20.1-22.9	**Silt** - some sand, fine to coarse, trace gravel fine to coasre, iso. cobbles, grey, very hard, non-plastic,
	End of TH95-02 at 22.9m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-03	
Depth (m)	**Soil Description**
0-8.54	**Silt**-some fine sand, some gravel, fine to coarse, iso. cobbles, non-plastic, red/brown, dense, damp
8.54-11.3	**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist
11.3-15.5	**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, grey/brown, hard, moist
15.5-18.3	**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp.
	End of TH95-03at 18.3m - No groundwater seepage -Monitoring Well installed

Testhole Log - TH95-04	
Depth (m)	**Soil Description**
0-3.35	**Silt**-and fine sand, trace gravel fine to coarse, occ. cobbles, non-plastic, dense, yellow/brown, damp.
3.35-5.49	**Gravel**-fine to coarse, and silt, trace sand fine to coarse, occ. cobbles, light brown, moist.
5.49-11.0	**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, gre/brown, hard, moist.
11.0-12.8	**Sand**-fine to medium, and gravel, fine to coarse, iso. cobbles, trace silt, dense, red/brown, moist.
12.8-17.7	**Sand**- fine to medium, and silt, little gravel fine to coarse, iso. cobbles, brown, hard, moist.
17.7-30.48	**Sand** - fine and silt, trace gravel, fine to coarse, brown, hard, moist.
	End of TH95-04 at 26.2m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-05	
Depth (m)	**Soil Description**
0-1.3	**Silt**-and fine sand, little gravel fine to coarse, iso. cobbles, non- plastic, dense, yellow/brown, moist.
1.3-3.1	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
3.1-3.4	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
3.4-5.1	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
5.1-5.4	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
5.4-6.2	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
6.2-7.1	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
	End of TH5 at 7.1m no groundwater-temporary installation

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT: RCP	PROJECT: Hydrogeologial	TESTHOLE:	BH95-02
LOCATION: Golden Landfill	Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG: Becker Hammer	SURF ELV: 914.0m ASL	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: 0 20 40 60 80 100 120 140	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES	N	COMPLETION DETAILS
Grass					Depth (m)		Stickup 1.2m
	0-9.76		**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp. *Upper 0.3m fill*		AR1 1.5		50mm dia. Solid pipe
2.0 912							Bentonite Grout
					AR2 3.0		
4.0 910							
					AR3 4.5		
6.0 908							Top 6.0m
					AR4 6.0		
					D1 6.5/6.95	50	
8.0 906							
					AR5 7.5		
	9.76-12.8		**Sand**-fine and silt, some gravel fine to coarse, iso. cobbles, dense, grey, moist.				Sand
10.0 904							
					AR6 10.0		
12.0 902							
					AR7 11.5		
	12.8-15.5		**Sand**-fine, some silt, some gravel fine to coarse, occ. cobbles. dense, red/brown, moist.		AR8 13.0		0.010"
14.0 900					D2 13.5/13.9	50	slotted pipe
					AR9 14.0		
	15.5-16.5		**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, iso. grey/brown, cobbles, stiff, moist.				
16.0 898					AR10 15.0		
	16.5-20.1		**Silt**-little fine sand, trace clay, trace gravel, fine to coarse, occ. cobbles,. non-plastic, red/brown, hard, damp		AR11 16.5		
18.0 896							
					AR12 18.0		
20.0 894							
	20.1-22.9		**Silt** - some sand, fine to coarse, trace gravel fine to coarse, iso.cobbles, grey, very hard, non-plastic, moist.		D3 20/20.45	80	
22.0 892			*End of TH95-01 at 18.9m - No groundwater seepage Well installed*				Well base 22.9m

Prepared by: Paul Blackett	Reviewed by:	Figure:
Groundwater Depth: no groundwater	Borehole Depth: 22.9m below surface	Date: 10/9/95

Project No: 2010-8835.010.006

Well I.D.: BH9

Client: CSRD

First Water: n/a

Ground Elevation: Approx. 928 m asl

Location: Golden Landfill

Stabilized Water Level: n/a

Top of Casing Elevation: 0

Location on site: 5 m SE of landfill

Reviewed by: Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth (ft / m)	Symbol	Description	Well Details and Notes	Well Construction
0 / 0		Ground Surface		
0 – 50 / 0 – 15		**SILT** Silt, occasional cobbles, dry to moist, yellowish-grey.	No well installed.	Natural slough
55		End of Borehole		

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Contractor: Target Drilling Inc.

Drill Method: Coring

Boring Diameter/ Depth: 6 in

Operator(s):

Date: Oct 8 2010

Project No: 2010-8835.010.006

Well I.D.: TH-8

Client: CSRD

First Water: n/a

Ground Elevation: Approx. 915 m asl

Location: Golden Landfill

Stabilized Water Level: 14 m btoc

Top of Casing Elevation: flush mount

Location on site: 150 m NW of landfill on Golden Donald Upper Road

Reviewed by: Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth (ft / m)	Symbol	Description	Well Details and Notes	Well Construction
-1		Ground Surface		
4 / 1		**SAND AND GRAVEL** Sand and gravel, trace fines, light brown.	Flush mount casing, well sealed with j-plug	Flush mount casing
14 / 5				Oct 7 2010
29 / 10				bentonite grout
49 / 15		**CLAYEY TILL** Clay matrix, some gravel, trace sand, dense, wet.		
54		**REGOLITH**		

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Contractor: Target Drilling Inc.

Drill Method: Coring

Boring Diameter/ Depth: 6 in / 27.3 m

Operator(s):

Date: Oct 5-7 2010

Project No: 2010-8835.010.006 ***Well I.D.: TH-8***

Client: CSRD ***First Water:*** n/a ***Ground Elevation:*** Approx. 915 m asl

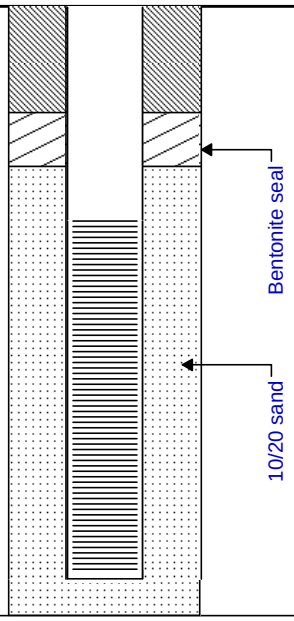
Location: Golden Landfill ***Stabilized Water Level:*** 14 m btoc ***Top of Casing Elevation:*** flush mount

Location on site: 150 m NW of landfill on Golden Donald Upper Road ***Reviewed by:*** Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth	Symbol	Description	Well Details and Notes	Well Construction
60		**SLATE BEDROCK** Slaty bedrock, in places phyllitic, grey, fractured, some fractures filled with clay.	1 m bentonite seal	
65		**QUARTZ BEDROCK** Quartz, likely a large vein. Fluid mixing with sedimentary deposits on either end.		
70	21	**SLATE BEDROCK** Slaty bedrock, as above.	Screen depth: 67-87 ft (20.4 - 26.5 m)	
75		**QUARTZ BEDROCK** Quartz, as above.	Screen details: -10 slot PVC, 2 inch diameter -10/20 sand pack	
80		**SLATE BEDROCK** Slaty bedrock, as above		
85	26			
90		End of Borehole		
95				
100	31			
105				
110				



Contractor: Target Drilling Inc. **Operator(s):**

Drill Method: Coring **Date:** Oct 5-7 2010

Boring Diameter/ Depth: 6 in / 27.3 m

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 99638 Owner: KATS CONTRACTING Address: 532 HIETALA ROAD Area: GOLDEN WELL LOCATION: KOOTENAY Land District District Lot: Plan: Lot: Township: 27 Section: 18 Range: 21 Indian Reserve: Meridian: W5M Block: A Quarter: Island: BCGS Number (NAD 27): 082N036121 Well: Class of Well: Water supply Subclass of Well: Domestic Orientation of Well: Vertical Status of Well: New Well Use: Private Domestic Observation Well Number: Observation Well Status: Construction Method: Diameter: inches Casing drive shoe: Y N Well Depth: 276 feet Elevation: feet (ASL) Final Casing Stick Up: 6 inches Well Cap Type: PLASTIC CAP Bedrock Depth: 18 feet Lithology Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N Site Info Details: Other Info Flag: Other Info Details:	Construction Date: 2000-10-25 00:00:00.0 Driller: Owen's Drilling Ltd. Well Identification Plate Number: Plate Attached By: Where Plate Attached: PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 6 (Driller's Estimate) U.S. Gallons per Minute Development Method: Air lifting Pump Test Info Flag: N Artesian Flow: Artesian Pressure (ft): Static Level: 50 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM): Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: N Material: Method: Depth (ft): Thickness (in): Liner from To: feet WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
0	36	6	Steel	Y
36	276	5.88	Open hole	N

GENERAL REMARKS:
260' OF PVC LINER. BOTTOM 40' PERFORATED. SHOE: 1X6" CARBIDE BOTTON. RECOMMENDED PUMP TYPE: SUB

LITHOLOGY INFORMATION:

From	0 to	18 Ft.	CLAY, GRAVEL, COBBLES	
From	18 to	36 Ft.	BEDROCK, BROKEN	
From	36 to	150 Ft.	2 Gallons per Minute (U.S./Imperial)	bedrock
From	150 to	257 Ft.	2 Gallons per Minute (U.S./Imperial)	bedrock
From	256 to	276 Ft.	1 Gallons per Minute (U.S./Imperial)	bedrock

- Return to Main
- Return to Search Options
- Return to Search Criteria

Appendix C

Water Quality Database

Legend for Reports for CSRD Refuse Disposal Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
A	Absent
BCAWQG AL	BC Approved Water Quality Guidelines for freshwater aquatic life
BCAWQG DW	BC Approved Water Quality Guidelines for drinking water
BCWWQG AL	Working Water Quality Guidelines for British Columbia for freshwater aquatic life
BCWWQG DW	Working Water Quality Guidelines for British Columbia for drinking water
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
BCAWQG AL	Highlighted value exceeds BCAWQG AL
BCAWQG DW	Highlighted value exceeds BCAWQG DW
BCWWQG AL	Highlighted value exceeds BCWWQG AL
BCWWQG DW	Highlighted value exceeds BCWWQG DW
GCDWQ AO	Highlighted value exceeds GCDWQ AO
GCDWQ MAC	Highlighted value exceeds GCDWQ MAC
SL Criteria Override	Highlighted value exceeds sampling location criteria override

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Guideline						Sampling Location	DMW-1	DMW-1	DMW-1	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b
								Date Sampled	09-Feb-10	15-Jun-10	16-Nov-10	09-May-11	10-Aug-11	18-Oct-11	24-May-12	22-Aug-12	20-Nov-12	21-May-13	20-Aug-13
								Lab Sample ID	K0B0397-04	K0F0788-01	K0K0729-04	K1E0403-05	K1H0536-03	K1J0685-03	2051369-01	2081484-03	2111131-03	3051354-03	3081378-03
								Sample Type							Normal	Normal	Normal	Normal	Normal
		BCAWQG AL	BCWWQG AL	**GCDWQ MAC**	**GCDWQ AO**	BCAWQG DW	BCWWQG DW												
Field Results																			
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG		1120	1220	1150	1220	1000	1150	1170	1140	1070	870	750
Depth to Water	m	NG	NG	NG	NG	NG	NG							9.89					
Dissolved oxygen	mg/L	min 5 [1.1]	NG	NG	NG	NG	NG												
Dissolved oxygen (percent)	%	NG	NG	NG	NG	NG	NG												
Oxidation reduction potential	mV	NG	NG	NG	NG	NG	NG			61	-18	-199	40	162	99	44	-12	124	8
pH		N [1.2]	NG	NG	6.5 - 8.5	6.5 - 8.5 [5.1]	NG		7.31	7.28	7.3	7.4	7.31	7.23	7.15	7.54	7.4	7.36	7.22
Temperature	°C	19 [1.3]	NG	NG	15	15 [5.2]	NG		6.5	9.9	6.2	8.8	9.5	6.1	8.2	10	8	8.7	7.7
Lab Results																			
General																			
Alkalinity (total, as CaCO3)	mg/L	NG	N [2.1]	NG	NG	NG	NG		444	453	475	509	509	495	486	480	512	497	463
Chemical Oxygen Demand	mg/L	NG	NG	NG	NG	NG	NG												
Chloride	mg/L	600 [1.4]	NG	NG	250	250 [5.3]	NG		26.8	23.3	30.1	26	27.7	32.7	28.4	32.2	35.7	38.9	40.9
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG		1130	1140	1090	1120	1090	1100	1150	1120	1120	1110	1140
Fluoride	mg/L	Calc [1.5]	NG	1.5	NG	1.5	NG								1.1	0.81	1.05	1.23	1.31
Hardness, total (dissolved as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG		583	558	611	655	590	550	654	618	590	629	644
pH		N [1.6]	NG	NG	6.5 - 8.5	6.5 - 8.5 [5.4]	NG		7.73	7.89	7.69	7.84	7.79	7.79	7.86	7.85	7.09	7.78	7.86
Sulphate	mg/L	Calc [1.7]	NG	NG	500 [4.1]	500	NG		208	213	91.7	137	133	124	144	127	123	121	129
Total suspended solids	mg/L	N [1.8]	NG	NG	NG	NG	NG		2	<1	<1	<1	<1	<1	1	17	12	4	<1
Turbidity	NTU	N [1.9]	NG	N [3.1]	NG	N [5.5]	NG		0.8	0.5	3.6	2	3.4	1.8	1.6	3	3.4	3	3.4
Metals																			
Aluminum (dissolved)	mg/L	Calc [1.10]	NG	NG	N [4.2]	0.2 [5.6]	NG		<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aluminum (total)	mg/L	NG	NG	NG	N [4.3]	NG	NG												
Antimony (dissolved)	mg/L	NG	0.020 [2.2]	0.006	NG	NG	NG		0.0002	0.0002	<0.0001	0.0002	0.0002	<0.0020	0.0001	0.0002	0.0004	0.0004	0.0004
Antimony (total)	mg/L	NG	0.02	0.006	NG	NG	NG												
Arsenic (dissolved)	mg/L	0.005 [1.11]	NG	0.010 [3.2]	NG	0.025 [5.7]	NG		0.0043	0.007	**0.0389**	**0.026**	**0.0362**	**0.0285**	**0.0196**	**0.0419**	**0.0392**	**0.0388**	**0.0397**
Arsenic (total)	mg/L	0.005	NG	0.010 [3.3]	NG	0.025 [5.8]	NG												
Barium (dissolved)	mg/L	NG	5 [2.3]	1	NG	NG	NG		0.0236	0.023	0.0269	0.0242	0.022	0.021	0.024	0.023	0.022	0.023	0.023
Barium (total)	mg/L	NG	5 [2.4]	1	NG	NG	NG												
Beryllium (dissolved)	mg/L	NG	0.0053 [2.5]	NG	NG	NG	0.004 [6.1]		<0.0001	<0.0001	0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001
Beryllium (total)	mg/L	NG	0.0053 [2.6]	NG	NG	NG	0.004 [6.2]												
Bismuth (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG												
Boron (dissolved)	mg/L	1.2 [1.12]	NG	5	NG	5 [5.9]	NG		0.171	0.233	0.174	0.143	0.135	0.104	0.138	0.137	0.133	0.145	0.166
Boron (total)	mg/L	1.2	NG	5	NG	5	NG												
Cadmium (dissolved)	mg/L	NG	Calc [2.7]	0.005	NG	NG	NG		0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00003	<0.00001	<0.00001	0.00001	<0.00001
Cadmium (total)	mg/L	NG	Calc [2.8]	0.005	NG	NG	NG												
Calcium (dissolved)	mg/L	NG	N [2.9]	NG	NG	NG	NG		73.9	70.9	73.5	71.9	63.2	65.9	61.2	63.9	64	68.7	71.8
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Chromium (dissolved)	mg/L	NG	0.001 [2.10]	0.05	NG	NG	NG		0.0146	0.0014	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chromium (total)	mg/L	NG	0.001 [2.11]	0.05	NG	NG	NG												
Cobalt (dissolved)	mg/L	0.110 [1.13]	NG	NG	NG	NG	NG		0.00063	0.00075	0.00012	0.00011	0.00009	<0.00005	0.00017	<0.00005	<0.00005	<0.00005	<0.00005
Cobalt (total)	mg/L	0.110 [1.14]	NG	NG	NG	NG	NG												
Copper (dissolved)	mg/L	Calc [1.15]	NG	NG	1	0.500 [5.10]	NG		0.0297	0.0392	0.0004	0.0006	0.0008	0.002	0.0002	0.0002	0.0014	0.0004	<0.0002
Copper (total)	mg/L	Calc [1.16]	NG	NG	1	0.500 [5.11]	NG												
Iron (dissolved)	mg/L	0.35	NG	NG	0.3	NG	NG		0.053	0.26	**0.418**	0.145	0.28	0.11	0.19	**0.35**	0.27	**0.318**	0.294
Iron (total)	mg/L	1	NG	NG	0.3	NG	NG												
Lead (dissolved)	mg/L	Calc [1.17]	NG	0.01	NG	0.050 [5.12]	NG		0.0001	0.0004	<0.0001	0.0002	0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Lead (total)	mg/L	Calc [1.18]	NG	0.01	NG	0.050 [5.13]	NG												
Lithium (dissolved)	mg/L	NG	0.870 [2.12]	NG	NG	NG	NG		0.0232	0.031	0.026	0.0238	0.0218	0.0209	0.0196	0.0228	0.0227	0.0251	0.0251
Lithium (total)	mg/L	NG	0.870 [2.13]	NG	NG	NG	NG												
Magnesium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		96.7	92.5	104	116	104	94.7	122	111	104	111	113
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Manganese (dissolved)	mg/L	Calc [1.19]	NG	NG	0.05	NG	NG		0.0022	0.0032	0.0042	0.0039	0.004	0.0039	0.005	0.0041	0.0037	0.004	0.0039
Manganese (total)	mg/L	Calc [1.20]	NG	NG	0.05	NG	NG												
Mercury (dissolved)	mg/L	0.000020 [1.21]	NG	0.001	NG	0.0010 [5.14]	NG		<0.00005	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	0.00033	<0.00002	<0.00002	<0.00002

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Guideline						Sampling Location	DMW-1	DMW-1	DMW-1	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b	DMW-1b
								Date Sampled	09-Feb-10	15-Jun-10	16-Nov-10	09-May-11	10-Aug-11	18-Oct-11	24-May-12	22-Aug-12	20-Nov-12	21-May-13	20-Aug-13
								Lab Sample ID	K0B0397-04	K0F0788-01	K0K0729-04	K1E0403-05	K1H0536-03	K1J0685-03	2051369-01	2081484-03	2111131-03	3051354-03	3081378-03
								Sample Type							Normal	Normal	Normal	Normal	Normal
		BCAWQG AL	BCWWQG AL	**GCDWQ MAC**	**GCDWQ AO**	BCAWQG DW	BCWWQG DW												
Mercury (total)	mg/L	0.000020 [1.22]	NG	0.001	NG	0.0010 [5.15]	NG												
Molybdenum (dissolved)	mg/L	2 [1.23]	NG	NG	NG	0.25 [5.16]	NG		0.0011	0.0008	0.0004	0.0003	0.0004	0.0017	0.0006	0.0004	0.0004	0.0004	0.0002
Molybdenum (total)	mg/L	2 [1.24]	NG	NG	NG	0.25 [5.17]	NG												
Nickel (dissolved)	mg/L	NG	Calc [2.14]	NG	NG	NG	NG		0.0034	0.0046	0.0036	0.0011	0.0014	0.0011	<0.0002	0.0014	0.0012	0.0014	0.0015
Nickel (total)	mg/L	NG	Calc [2.15]	NG	NG	NG	NG												
Selenium (dissolved)	mg/L	0.002 [1.25]	NG	0.05	NG	0.010 [5.18]	NG		0.0005	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L	0.002 [1.26]	NG	0.05	NG	0.010 [5.19]	NG												
Silicon (dissolved, as Si)	mg/L	NG	NG	NG	NG	NG	NG		10.4	6.09	4.55	7.93	8	7.3	7.6	7.9	8	7.9	8
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG												
Silver (dissolved)	mg/L	Calc [1.27]	NG	NG	NG	NG	NG		<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Silver (total)	mg/L	Calc [1.28]	NG	NG	NG	NG	NG												
Sodium (dissolved)	mg/L	NG	NG	NG	200	NG	NG		25.8	23.7	26.6	25.4	25.1	25.3	23.5	29.6	27.4	29.1	30.4
Sodium (total)	mg/L	NG	NG	NG	200	NG	NG												
Strontium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		3.07	3.89	1.88	1.8	1.69	1.62	1.69	1.72	1.67	1.76	1.74
Strontium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Sulphur (dissolved)	mg/L	NG	NG	NG	NG	NG	NG								55	50	46	46	45
Tellurium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Thallium (dissolved)	mg/L	NG	0.0003 [2.16]	NG	NG	NG	0.002 [6.3]		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00004	<0.00002	<0.00002
Thallium (total)	mg/L	NG	0.0003 [2.17]	NG	NG	NG	0.002 [6.4]												
Thorium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Tin (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG												
Titanium (dissolved)	mg/L	NG	2.000 [2.18]	NG	NG	NG	NG		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L	NG	2.000 [2.19]	NG	NG	NG	NG												
Uranium (dissolved)	mg/L	NG	0.300 [2.20]	0.02	NG	NG	NG		0.00173	0.00165	0.00008	0.00013	0.00011	0.00009	0.00014	0.00007	0.00009	0.00009	0.00007
Uranium (total)	mg/L	NG	0.300 [2.21]	0.02	NG	NG	NG												
Vanadium (dissolved)	mg/L	NG	0.006 [2.22]	NG	NG	NG	NG		0.0055	0.0028	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L	NG	0.006 [2.23]	NG	NG	NG	NG												
Zinc (dissolved)	mg/L	Calc [1.29]	NG	NG	5	5.0 [5.20]	NG		0.0096	0.0193	0.0097	0.0321	0.005	0.01	0.009	<0.004	0.005	<0.004	<0.004
Zinc (total)	mg/L	Calc [1.30]	NG	NG	5	5.0 [5.21]	NG												
Zirconium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG		0.0006	0.0004	0.002	0.0015	0.0013	0.0011	0.0011	0.0013	0.0014	0.0011	0.001
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG												
Nutrients																			
Ammonia (total, as N)	mg/L	Calc [1.31]	NG	NG	NG	NG	NG		0.65	0.76	0.29	0.2	0.26	0.26	0.155	0.263	0.031	0.274	0.274
Nitrate (as N)	mg/L	32.8 [1.32]	NG	10	NG	10 [5.22]	NG		<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	32.8 [1.33]	NG	10 [3.4]	NG	10 [5.23]	NG												
Nitrate + Nitrite (as N) (calculated)	mg/L	32.8 [1.34]	NG	10 [3.5]	NG	10 [5.24]	NG		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.014	<0.014	<0.014	<0.014	<0.014
Nitrite (as N)	mg/L	Calc [1.35]	NG	1	NG	1 [5.25]	NG		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L	NG	NG	NG	NG	NG	NG												
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	N [1.36]	NG	NG	NG	N [5.26]	NG		<0.020	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L	N [1.37]	NG	NG	NG	N [5.27]	NG												
Potassium (dissolved)	mg/L	NG	373 [2.24]	NG	NG	NG	NG		6.64	9.66	4.75	4.72	4.85	4.24	5.17	5.08	4.72	5.11	5.31
Potassium (total)	mg/L	NG	373 [2.25]	NG	NG	NG	NG												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 12-Nov-13 3110772-03 Normal	DMW-1b 02-Jun-14 4060249-03 Normal	DMW-1b 18-Aug-14 4081094-03 Normal	DMW-1b 04-Nov-14 4110161-03 Normal	DMW-4 21-May-13 3051354-05 Normal	DMW-4 20-Aug-13 3081378-04 Normal	DMW-4 12-Nov-13 3110772-04 Normal	DMW-4 02-Jun-14 4060249-04 Normal	DMW-4 18-Aug-14 4081094-04 Normal	DMW-4 04-Nov-14 4110161-04 Normal	MW6D 25-May-09 K9E0816-03	MW6D 04-Nov-09 K9K0184-01	MW6D 09-Feb-10 K0B0397-02	MW6D 15-Jun-10 K0F0788-04	MW6S 25-May-09 K9E0816-02	MW6S 04-Nov-09 K9K0184-02	MW6S 09-Feb-10 K0B0397-01
Field Results																		
Conductivity	µS/cm	1040	1075	1030	1118	900	1130	1100	914	1062	953	6700	4700	4400	4300	4600	4700	4400
Depth to Water	m											32.972	34	32.69	33.55	32.619	33	33.49
Dissolved oxygen	mg/L		0.29	0.59	1.98				2.33	0.3	3.22	0.83	1.92			2.21	1.07	
Dissolved oxygen (percent)	%		2.8	3.5	16.5				20	2.6	27.4							
Oxidation reduction potential	mV	19	-41	-86	-65	235	68	204	78	77	-8				73			
pH		7.16	7.3	7.3	7	7.25	7.16	7.11	7.3	7.1	7.1	6.78	6.86	6.76	7.01	6.87	6.84	6.79
Temperature	°C	8	7.8	9.1	8.2	8.7	7.8	7.2	7.9	8.6	8.2	10.8	9.4	9.4	11.3	12.5	10.5	10.9
Lab Results																		
General																		
Alkalinity (total, as CaCO3)	mg/L	479	499	479	478	437	427	435	392	399	416	1380	762	768	787	1590	780	794
Chemical Oxygen Demand	mg/L																	
Chloride	mg/L	41.1	35.8	39.7	40.1	22.4	16.2	16.9	20.6	19.7	17.4	**688**	**574**	**715**	**665**	**674**	**604**	**713**
Conductivity	µS/cm	1150	1160	1140	1160	1160	1220	1230	979	1170	1120	5110	4820	4790	4720	5090	4840	4780
Fluoride	mg/L	1.02	1.13	0.84	1.15	0.48	0.61	0.52	0.28	0.32	0.42							
Hardness, total (dissolved as CaCO3)	mg/L	641	692	650	606	619	641	643	571	635	584	1790	1770	1810	1550	1780	1770	1810
pH		7.86	7.89	7.66	7.81	7.76	7.84	7.77	7.9	7.64	7.81	7.4	7.28	7.32	7.55	7.4	7.29	7.49
Sulphate	mg/L	117	135	127	122	236	270	268	150	250	213	**788**	**783**	**945**	**873**	**781**	**824**	**925**
Total suspended solids	mg/L	1	<1	1	<1	<1	<1	1	<1	<1	<1	2640	34	1110	1690	2320	1720	751
Turbidity	NTU	3.2	4.3	3.7	4.3	0.2	0.2	0.3	5.5	0.2	0.2	>4000	9.1	1600	3500	2400	2900	830
Metals																		
Aluminum (dissolved)	mg/L	<0.005	0.006	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.23	<0.005	0.012	<0.005	0.009
Aluminum (total)	mg/L																	
Antimony (dissolved)	mg/L	0.0005	0.0003	0.0003	0.0002	0.0004	0.0005	0.0005	0.0004	0.0004	0.0003	0.0003	0.0003	0.0005	0.0005	0.0006	0.0002	0.0006
Antimony (total)	mg/L																	
Arsenic (dissolved)	mg/L	**0.0382**	**0.0351**	**0.0378**	**0.0436**	0.0013	0.0013	0.0014	0.0012	0.0014	0.0013	**0.0104**	0.0029	0.003	0.0048	0.0033	0.0028	0.0021
Arsenic (total)	mg/L																	
Barium (dissolved)	mg/L	0.023	0.024	0.024	0.026	0.015	0.014	0.015	0.015	0.017	0.017	0.101	0.0566	0.0822	0.062	0.087	0.0566	0.0831
Barium (total)	mg/L																	
Beryllium (dissolved)	mg/L	0.0001	0.0002	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L																	
Bismuth (dissolved)	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L																	
Boron (dissolved)	mg/L	0.158	0.153	0.138	0.134	0.263	0.415	0.465	0.07	0.286	0.218	1.12	1.05	1.28	1.08	1.09	0.921	1.24
Boron (total)	mg/L																	
Cadmium (dissolved)	mg/L	<0.00001	<0.00001	0.00001	0.00001	0.00002	0.00003	<0.00001	0.00002	0.00001	0.00002	0.00006	0.00001	0.00002	0.00002	0.00005	0.00003	0.00004
Cadmium (total)	mg/L																	
Calcium (dissolved)	mg/L	73.4	74	73.1	70.5	78.2	80.7	82.5	75.1	86.4	79.9	235	197	217	186	220	192	215
Calcium (total)	mg/L																	
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.006	0.0065	0.0342	0.0109	0.004	0.0082	0.0341
Chromium (total)	mg/L																	
Cobalt (dissolved)	mg/L	<0.00005	0.00013	0.00012	0.00008	0.00084	0.00075	0.00059	0.00126	0.00133	0.00106	0.00298	0.00108	0.00151	0.00142	0.00415	0.0022	0.00258
Cobalt (total)	mg/L																	
Copper (dissolved)	mg/L	<0.0002	0.0007	<0.0002	0.0004	0.0036	0.003	0.0024	0.0668	0.006	0.0065	0.008	0.0055	0.0143	0.0097	0.0091	0.0056	0.0157
Copper (total)	mg/L																	
Iron (dissolved)	mg/L	**0.345**	**0.351**	**0.378**	**0.404**	0.014	0.014	0.013	0.011	0.021	0.014	0.23	0.204	**0.402**	**0.396**	0.219	0.196	0.195
Iron (total)	mg/L																	
Lead (dissolved)	mg/L	<0.0001	0.0003	0.0002	<0.0001	0.0003	0.0004	0.0002	0.0003	0.0002	0.0003	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Lead (total)	mg/L																	
Lithium (dissolved)	mg/L	0.0259	0.0264	0.0252	0.0252	0.0347	0.0478	0.0516	0.0178	0.0385	0.0317	0.0341	0.0359	0.054	0.0477	0.0305	0.0278	0.0574
Lithium (total)	mg/L																	
Magnesium (dissolved)	mg/L	111	123	114	104	103	107	106	93	102	93.3	292	310	308	263	299	314	310
Magnesium (total)	mg/L																	
Manganese (dissolved)	mg/L	0.0039	0.0054	0.0158	0.0048	0.0039	0.0042	0.004	0.0021	0.0127	0.0043	**0.242**	**0.0862**	**0.115**	**0.113**	**0.518**	**0.212**	**0.168**
Manganese (total)	mg/L																	
Mercury (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 12-Nov-13 3110772-03 Normal	DMW-1b 02-Jun-14 4060249-03 Normal	DMW-1b 18-Aug-14 4081094-03 Normal	DMW-1b 04-Nov-14 4110161-03 Normal	DMW-4 21-May-13 3051354-05 Normal	DMW-4 20-Aug-13 3081378-04 Normal	DMW-4 12-Nov-13 3110772-04 Normal	DMW-4 02-Jun-14 4060249-04 Normal	DMW-4 18-Aug-14 4081094-04 Normal	DMW-4 04-Nov-14 4110161-04 Normal	MW6D 25-May-09 K9E0816-03	MW6D 04-Nov-09 K9K0184-01	MW6D 09-Feb-10 K0B0397-02	MW6D 15-Jun-10 K0F0788-04	MW6S 25-May-09 K9E0816-02	MW6S 04-Nov-09 K9K0184-02	MW6S 09-Feb-10 K0B0397-01
Mercury (total)	mg/L																	
Molybdenum (dissolved)	mg/L	0.0004	0.0003	0.0004	0.0004	0.0008	0.0004	0.0006	0.0014	0.0008	0.001	0.0006	0.0003	0.0003	0.0003	0.0023	0.0009	0.0004
Molybdenum (total)	mg/L																	
Nickel (dissolved)	mg/L	0.0016	0.0012	0.0021	0.0016	0.0018	0.0015	0.0012	0.0027	0.0026	0.0019	0.0163	0.0085	0.0112	0.0132	0.0148	0.0094	0.0115
Nickel (total)	mg/L																	
Selenium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0007	0.0007	<0.0003	<0.0003	<0.0003	0.0018	<0.0003	<0.0003	<0.0003
Selenium (total)	mg/L																	
Silicon (dissolved, as Si)	mg/L	7.4	7.4	8	8.4	7.2	7	6.6	7.4	7.3	7.9	10	10.1	22.4	8.42	9.21	9.1	17.6
Silicon (total, as Si)	mg/L																	
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005
Silver (total)	mg/L																	
Sodium (dissolved)	mg/L	29.7	25.4	28.4	30.1	34.2	48.8	51	20.2	34.8	31.6	**348**	**379**	**384**	**314**	**351**	**378**	**380**
Sodium (total)	mg/L																	
Strontium (dissolved)	mg/L	1.7	1.81	1.76	1.71	4.26	5.03	5.11	2.07	4.53	3.8	2.53	2.21	2.04	2.04	2.42	2.09	2.07
Strontium (total)	mg/L																	
Sulphur (dissolved)	mg/L	37	52	46	47	80	95	88	58	87	80							
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L																	
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00009	0.00006	0.00006	0.00007	0.00008	0.00006	0.00007
Thallium (total)	mg/L																	
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Thorium (total)	mg/L																	
Tin (dissolved)	mg/L	<0.0002	0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	<0.0002	<0.0002
Tin (total)	mg/L																	
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.017	0.008	<0.005	0.005	0.005
Titanium (total)	mg/L																	
Uranium (dissolved)	mg/L	0.00008	0.00014	0.00014	0.00009	0.00155	0.00115	0.001	0.00262	0.00152	0.00175	0.00761	0.00751	0.00639	0.00741	0.00886	0.00757	0.007
Uranium (total)	mg/L																	
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0019	0.002	0.016	0.0062	0.0014	0.0026	0.0134
Vanadium (total)	mg/L																	
Zinc (dissolved)	mg/L	<0.004	<0.004	<0.004	0.005	0.029	0.046	0.019	0.045	0.028	0.032	0.0063	0.0036	0.0086	0.0047	0.0063	0.0029	0.0103
Zinc (total)	mg/L																	
Zirconium (dissolved)	mg/L	0.0011	0.0012	0.0012	0.0015	0.0007	0.0007	0.0007	0.0004	0.0006	0.0006	0.0008	0.0002	0.0004	0.0002	0.001	0.0005	0.0003
Zirconium (total)	mg/L																	
Nutrients																		
Ammonia (total, as N)	mg/L	0.295	0.261	0.28	0.24	0.596	0.952	1.07	0.028	0.814	0.341	0.29	0.08	0.3	0.09	0.54	0.26	0.44
Nitrate (as N)	mg/L	<0.010	<0.010	0.199	0.397	0.181	0.135	<0.010	0.647	0.443	0.602	**62.6**	**56.4**	**67.7**	**61.4**	**62**	**60**	**66.9**
Nitrate + Nitrite (as N)	mg/L																	
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	<0.014	0.199	0.397	0.181	0.135	<0.014	0.647	0.443	0.602	**62.6**	**56.4**	**67.7**	**61.4**	**62**	**60**	**66.9**
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.02
Total kjeldahl nitrogen	mg/L																	
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.039	<0.020	0.03	<0.020	0.043	0.02	0.031
Phosphorus (total, by ICPMS/ICPOES)	mg/L																	
Potassium (dissolved)	mg/L	4.86	4.76	5.06	4.94	7.63	9.49	9.36	3.66	7.73	6.8	131	149	153	147	109	133	153
Potassium (total)	mg/L																	

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6S 15-Jun-10 K0F0788-03	MW6S 16-Nov-10 K0K0729-01	MW6S 09-May-11 K1E0403-03	MW6S 10-Aug-11 K1H0536-02	MW6S 18-Oct-11 K1J0685-01	MW6S 24-May-12 2051369-03 Normal	MW6S 22-Aug-12 2081484-01 Normal	MW6S 20-Nov-12 2111131-01 Normal	MW6S 21-May-13 3051354-01 Normal	MW6S 20-Aug-13 3081378-01 Normal	MW6S 12-Nov-13 3110772-01 Normal	MW6S 02-Jun-14 4060249-06 Normal	MW6S 18-Aug-14 4081094-06 Normal	MW6S 04-Nov-14 4110161-06 Normal	TH2 03-Jun-02	TH2 26-Aug-02	TH2 06-Nov-02
Field Results																		
Conductivity	µS/cm	4430	6600	4200	3600	4000	4100	4600	480	3300	4900	3700	4240	4030	4610			
Depth to Water	m	32.68	32.7	31.618	32.625	32.625	32.59	32.605	32.624	32.629	32.64	32.651	32.6	32.61	32.6	9999	9999	9999
Dissolved oxygen	mg/L												0.28	1.56	1.07			
Dissolved oxygen (percent)	%												2.8	14.08	10			
Oxidation reduction potential	mV	73	173	175	67	167	135	210	164	231	228	-24	96	116	44			
pH		6.86	6.91	6.75	6.87	6.73	6.86	6.97	6.9	6.87	6.63	6.64	**4.8**	7.3	6.7			
Temperature	°C	11.6	10	12.2	12.4	11.1	11.2	12.5	12.2	12.4	12.1	12.2	13	13	12.3			
Lab Results																		
General																		
Alkalinity (total, as CaCO3)	mg/L	778	757	801	800	784	805	813	790	902	771	798	818	802	832			
Chemical Oxygen Demand	mg/L																	
Chloride	mg/L	**667**	**732**	**556**	**632**	**621**	**599**	**587**	**709**	**669**	**662**	**662**	**650**	**491**	**529**			
Conductivity	µS/cm	4680	4640	4250	4230	4320	4380	4670	5040	5020	5150	5220	4840	4750	4850			
Fluoride	mg/L						0.11	0.31	0.14	0.12	0.14	<0.10	<0.10	0.11	0.25			
Hardness, total (dissolved as CaCO3)	mg/L	1580	1710	1660	1510	1460	1720	1720	1810	1980	2140	2010	1990	1920	1880			
pH		7.57	7.35	7.5	7.39	7.35	7.45	7.35	6.96	7.4	7.46	7.36	7.65	7.39	7.49			
Sulphate	mg/L	**861**	**781**	**606**	**688**	**701**	**719**	**787**	**893**	**814**	**910**	**884**	**858**	**784**	**879**			
Total suspended solids	mg/L	1090	1020	228	96	127	326	321	42	1080	176	140	19	66	292			
Turbidity	NTU	1500	730	188	79	155	437	267	32.2	448	163	84.6	3.7	47.2	196			
Metals																		
Aluminum (dissolved)	mg/L	0.006	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.005			
Aluminum (total)	mg/L																	
Antimony (dissolved)	mg/L	0.0004	0.001	0.0006	0.0004	<0.0020	0.0002	0.0009	0.0009	0.0009	0.0011	0.001	0.0003	0.0005	0.0003			
Antimony (total)	mg/L																	
Arsenic (dissolved)	mg/L	0.0044	0.0057	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			
Arsenic (total)	mg/L																	
Barium (dissolved)	mg/L	0.0676	0.074	0.0595	0.059	0.051	0.062	0.066	0.067	0.067	0.065	0.061	0.059	0.054	0.058			
Barium (total)	mg/L																	
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Beryllium (total)	mg/L																	
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Bismuth (total)	mg/L																	
Boron (dissolved)	mg/L	1.14	1.48	1.31	1.18	1.26	1.23	1.29	1.43	1.47	1.53	1.64	1.67	1.6	1.61			
Boron (total)	mg/L																	
Cadmium (dissolved)	mg/L	0.00002	0.00002	0.00018	0.00001	0.00002	<0.00001	<0.00001	0.00002	0.00002	0.00003	0.00001	<0.00001	<0.00001	0.00001			
Cadmium (total)	mg/L																	
Calcium (dissolved)	mg/L	191	212	194	177	177	180	182	193	218	235	231	218	217	209			
Calcium (total)	mg/L																	
Chromium (dissolved)	mg/L	0.0117	0.0019	<0.0005	<0.0005	<0.0005	<0.0005	0.0016	0.0006	0.0009	<0.0005	0.0066	<0.0005	<0.0005	<0.0005			
Chromium (total)	mg/L																	
Cobalt (dissolved)	mg/L	0.00228	0.0014	0.00124	0.00116	0.00093	0.00136	0.00114	0.00108	0.00148	0.00128	0.00127	0.001	0.00118	0.00133			
Cobalt (total)	mg/L																	
Copper (dissolved)	mg/L	0.0077	0.0048	0.0019	0.0015	0.017	0.0009	0.0018	0.0016	0.0014	0.0021	0.0013	0.0169	0.0017	0.0018			
Copper (total)	mg/L																	
Iron (dissolved)	mg/L	**0.425**	**0.396**	<0.010	<0.01	<0.01	<0.01	0.02	0.01	0.028	<0.010	0.105	<0.010	0.012	0.011			
Iron (total)	mg/L																	
Lead (dissolved)	mg/L	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001			
Lead (total)	mg/L																	
Lithium (dissolved)	mg/L	0.0488	0.042	0.0377	0.0364	0.0335	0.0361	0.0382	0.0395	0.045	0.0479	0.0486	0.052	0.0497	0.0501			
Lithium (total)	mg/L																	
Magnesium (dissolved)	mg/L	269	286	285	259	246	308	308	321	349	378	347	351	335	329			
Magnesium (total)	mg/L																	
Manganese (dissolved)	mg/L	**0.191**	**0.108**	**0.0937**	**0.0894**	**0.0932**	**0.072**	**0.0683**	**0.0882**	**0.112**	**0.122**	**0.119**	**0.0908**	**0.121**	**0.132**			
Manganese (total)	mg/L																	
Mercury (dissolved)	mg/L	<0.00005	<0.00005	<0.00002	<0.00002	0.00005	<0.00002	0.00008	0.00004	0.00002	0.00002	<0.00002	<0.00002	<0.00002	<0.00002			

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6S 15-Jun-10 K0F0788-03	MW6S 16-Nov-10 K0K0729-01	MW6S 09-May-11 K1E0403-03	MW6S 10-Aug-11 K1H0536-02	MW6S 18-Oct-11 K1J0685-01	MW6S 24-May-12 2051369-03 Normal	MW6S 22-Aug-12 2081484-01 Normal	MW6S 20-Nov-12 2111131-01 Normal	MW6S 21-May-13 3051354-01 Normal	MW6S 20-Aug-13 3081378-01 Normal	MW6S 12-Nov-13 3110772-01 Normal	MW6S 02-Jun-14 4060249-06 Normal	MW6S 18-Aug-14 4081094-06 Normal	MW6S 04-Nov-14 4110161-06 Normal	TH2 03-Jun-02	TH2 26-Aug-02	TH2 06-Nov-02
Mercury (total)	mg/L																	
Molybdenum (dissolved)	mg/L	0.0006	0.0005	0.0003	0.0003	0.0036	0.0003	0.0018	0.0005	0.0006	0.0003	0.0007	0.0003	0.0003	0.0003			
Molybdenum (total)	mg/L																	
Nickel (dissolved)	mg/L	0.0137	0.0154	0.007	0.0067	0.0067	0.0073	0.008	0.008	0.0155	0.0097	0.0176	0.0078	0.0097	0.0103			
Nickel (total)	mg/L																	
Selenium (dissolved)	mg/L	0.0006	0.0018	0.0006	0.0006	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	0.0006	0.0006			
Selenium (total)	mg/L																	
Silicon (dissolved, as Si)	mg/L	10.8	8.95	12.4	11.5	10.2	12.2	11.4	11.9	11.9	12.5	11.1	12	12.3	13.7			
Silicon (total, as Si)	mg/L																	
Silver (dissolved)	mg/L	0.00006	0.00014	<0.00005	0.00012	0.00009	<0.00005	<0.00005	0.00011	0.0001	<0.00005	0.00008	<0.00005	<0.00005	<0.00005			
Silver (total)	mg/L																	
Sodium (dissolved)	mg/L	**323**	**344**	**322**	**298**	**290**	**346**	**362**	**375**	**409**	**444**	**407**	**372**	**385**	**428**			
Sodium (total)	mg/L																	
Strontium (dissolved)	mg/L	2.12	2.25	1.95	1.88	1.74	1.91	2	2.11	2.18	2.28	2.1	2.15	2.06	2.04			
Strontium (total)	mg/L																	
Sulphur (dissolved)	mg/L						266	298	339	359	405	366	337	340	398			
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			
Tellurium (total)	mg/L																	
Thallium (dissolved)	mg/L	0.00007	0.00007	0.00006	0.00005	0.00006	0.00005	0.00005	0.00022	0.00005	0.00009	0.00007	0.00005	0.00007	0.00007			
Thallium (total)	mg/L																	
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Thorium (total)	mg/L																	
Tin (dissolved)	mg/L	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			
Tin (total)	mg/L																	
Titanium (dissolved)	mg/L	0.008	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
Titanium (total)	mg/L																	
Uranium (dissolved)	mg/L	0.00757	0.0079	0.00607	0.00602	0.00607	0.0058	0.00698	0.00686	0.00779	0.00823	0.00765	0.00721	0.00777	0.00802			
Uranium (total)	mg/L																	
Vanadium (dissolved)	mg/L	0.009	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Vanadium (total)	mg/L																	
Zinc (dissolved)	mg/L	0.005	0.0044	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.009	0.005	0.005			
Zinc (total)	mg/L																	
Zirconium (dissolved)	mg/L	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0002	0.0001	0.0001	0.0004	0.0004			
Zirconium (total)	mg/L																	
Nutrients																		
Ammonia (total, as N)	mg/L	0.26	0.13	0.2	0.18	0.16	0.133	0.274	0.406	0.432	0.462	0.518	0.39	0.588	0.408			
Nitrate (as N)	mg/L	**62.3**	**55**	**53.2**	**66.5**	**56.3**	2.99	**54.6**	**59.1**	**62.3**	**54.5**	**54.7**	**52.1**	**41.8**	**48.9**			
Nitrate + Nitrite (as N)	mg/L																	
Nitrate + Nitrite (as N) (calculated)	mg/L	**62.3**	**55**	**53.2**	**66.5**	**56.3**	2.99	**54.6**	**59.1**	**62.3**	**54.5**	**54.7**	**52.1**	**41.8**	**48.9**			
Nitrite (as N)	mg/L	0.03	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			
Total kjeldahl nitrogen	mg/L																	
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	0.024	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02			
Phosphorus (total, by ICPMS/ICPOES)	mg/L																	
Potassium (dissolved)	mg/L	146	157	167	160	148	170	161	178	202	228	210	222	232	246			
Potassium (total)	mg/L																	

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH2 07-Mar-03	TH2 12-May-03	TH2 03-Nov-03	TH2 17-May-04	TH2 08-Nov-04	TH2 25-Apr-05	TH2 02-Nov-05	TH2 17-Apr-06	TH2 05-Nov-06	TH2 22-May-07 K705752-01	TH4 17-May-04	TH8 16-Nov-10 K0K0729-02	TH8 09-May-11 K1E0403-01	TH8 09-May-11 K1E0403-04	TH8 10-Aug-11 K1H0536-01	TH8 18-Oct-11 K1J0685-02	TH8 24-May-12 2051369-04 Normal
Field Results																		
Conductivity	µS/cm												2100	2800		2700	3100	3200
Depth to Water	m	9999	21.25	21.25	21.3	21.82	21.28	9999	21.18	9999	21.27	26.6	14.14	13.903		13.945	13.78	13.59
Dissolved oxygen	mg/L																	
Dissolved oxygen (percent)	%																	
Oxidation reduction potential	mV												-138	2800		83	143	124
pH													8.44	7.85		7.51	7.33	7.43
Temperature	°C		11	11	13	11	12		10.3		10	13	5.9	8.7		8.1	6.9	7.9
Lab Results																		
General																		
Alkalinity (total, as CaCO3)	mg/L		2800	5600	1720	7040	4100		3500		3000	900	425	459	455	462	446	515
Chemical Oxygen Demand	mg/L		69	202	108	184	136		129		39	89						
Chloride	mg/L		57.5	63.8	72.5	75	128		159		90.5	**298**	**523**	**663**	**647**	**844**	**873**	**834**
Conductivity	µS/cm		1660	1620	1600	1900	2000		2200		1910	2810	2250	2850	2870	3150	3060	3340
Fluoride	mg/L																	0.12
Hardness, total (dissolved as CaCO3)	mg/L					920	1020		930		914		582	878	863	850	790	826
pH			7.1	6.8	6.9	7.1	7.2		7		6.8	7	7.97	7.84	7.95	7.76	7.78	7.85
Sulphate	mg/L		51	78	71	79	104		150		254	**640**	72.9	44.3	43.5	44.4	55.2	36.5
Total suspended solids	mg/L												117	2960	2800	7470	116	2870
Turbidity	NTU		>4000	>4000	>4000	>4000	>4000		>4000			680	87	641	535	>4000	71.1	>4000
Metals																		
Aluminum (dissolved)	mg/L		<0.2	<0.2	<0.2		<0.4		<0.02		<0.050	<0.2	0.007	<0.005	0.005	<0.005	<0.005	0.005
Aluminum (total)	mg/L										<0.10							
Antimony (dissolved)	mg/L		<0.2	<0.2	<0.2		<0.4		<0.02		<0.0050	<0.2	0.0008	0.0015	0.0006	0.001	<0.0020	0.0003
Antimony (total)	mg/L										<0.006							
Arsenic (dissolved)	mg/L		<0.2	<0.2	<0.2		<0.4		<0.02		<0.0050	<0.2	**0.0107**	**0.0149**	**0.0147**	0.0061	0.0031	0.0028
Arsenic (total)	mg/L										<0.010							
Barium (dissolved)	mg/L		0.2	0.19	0.19		0.21		0.15		0.124	0.12	0.125	0.257	0.245	0.246	0.195	0.255
Barium (total)	mg/L										0.114							
Beryllium (dissolved)	mg/L										<0.0010		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L										<0.005							
Bismuth (dissolved)	mg/L										<0.0010		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L										<0.001							
Boron (dissolved)	mg/L		0.6	0.58	0.59		0.6		0.6		0.632	0.65	0.093	0.034	0.034	0.028	0.027	0.031
Boron (total)	mg/L										0.608							
Cadmium (dissolved)	mg/L		<0.01	<0.01	<0.01		<0.02		<0.01		<0.00010	<0.01	0.00009	0.00002	<0.00001	<0.00001	0.00008	<0.00001
Cadmium (total)	mg/L										<0.00010							
Calcium (dissolved)	mg/L		174	177	175		210		210		215	165	73.8	87.6	90.6	103	100	102
Calcium (total)	mg/L										206							
Chromium (dissolved)	mg/L		<0.01	<0.01			<0.02		<0.01		0.0054	<0.01	0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chromium (total)	mg/L										<0.010							
Cobalt (dissolved)	mg/L										0.0037		0.00537	0.0198	0.0186	0.00674	0.00078	0.00219
Cobalt (total)	mg/L										0.0034							
Copper (dissolved)	mg/L		<0.01	<0.01			<0.02		<0.01		0.0057	<0.01	0.0031	<0.0002	<0.0002	<0.0002	0.0054	<0.0002
Copper (total)	mg/L										<0.010							
Iron (dissolved)	mg/L		<0.03	<0.03	<0.03		<0.06		<0.06		**0.655**	<0.03	**0.347**	**3.01**	**2.83**	**1.87**	0.02	0.12
Iron (total)	mg/L										**0.7**							
Lead (dissolved)	mg/L		<0.05	<0.05	<0.05		<0.1		<0.05		<0.0020	<0.05	0.0002	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Lead (total)	mg/L										<0.0020							
Lithium (dissolved)	mg/L										0.0185		0.02	0.0243	0.0248	0.0224	0.0193	0.0182
Lithium (total)	mg/L										0.0179							
Magnesium (dissolved)	mg/L		99.4	103	91.3		120		97		103	233	96.5	160	155	144	130	139
Magnesium (total)	mg/L										97.2							
Manganese (dissolved)	mg/L		0.009	**0.083**	0.02		0.04		0.007		**0.107**	0.009	**0.219**	**0.492**	**0.473**	**0.349**	0.035	**0.0785**
Manganese (total)	mg/L										**0.107**							
Mercury (dissolved)	mg/L										<0.00050		<0.00005	<0.00002	0.00002	0.00002	0.00008	0.00003

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Water Quality Results

Analyte	Unit	TH2 07-Mar-03	TH2 12-May-03	TH2 03-Nov-03	TH2 17-May-04	TH2 08-Nov-04	TH2 25-Apr-05	TH2 02-Nov-05	TH2 17-Apr-06	TH2 05-Nov-06	TH2 22-May-07 K705752-01	TH4 17-May-04	TH8 16-Nov-10 K0K0729-02	TH8 09-May-11 K1E0403-01	TH8 09-May-11 K1E0403-04	TH8 10-Aug-11 K1H0536-01	TH8 18-Oct-11 K1J0685-02	TH8 24-May-12 2051369-04 Normal
Mercury (total)	mg/L										<0.00050							
Molybdenum (dissolved)	mg/L		<0.03	<0.03	<0.03		<0.06		<0.03		<0.0020	<0.03	0.0149	0.0046	0.0042	0.0019	0.0046	0.0009
Molybdenum (total)	mg/L										<0.0050							
Nickel (dissolved)	mg/L		<0.05	<0.05	<0.05		<0.1		<0.05		0.037	<0.05	0.0175	0.0277	0.0259	0.0093	0.0099	0.006
Nickel (total)	mg/L										<0.020							
Selenium (dissolved)	mg/L		<0.2	<0.2	<0.2		<0.4		<0.2		<0.0100	<0.2	0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L										<0.010							
Silicon (dissolved, as Si)	mg/L										9.58		4.21	10.1	9.77	9	8.1	10.3
Silicon (total, as Si)	mg/L										7.5							
Silver (dissolved)	mg/L										<0.0004		<0.00005	0.00007	<0.00005	0.00016	0.00006	<0.00005
Silver (total)	mg/L										<0.00050							
Sodium (dissolved)	mg/L		68	73.8	74		120		130		107	**234**	178	**312**	**302**	**341**	**305**	**436**
Sodium (total)	mg/L										98							
Strontium (dissolved)	mg/L										1.12		1.03	1.66	1.62	1.6	1.49	1.53
Strontium (total)	mg/L										1.1							
Sulphur (dissolved)	mg/L																	19
Tellurium (dissolved)	mg/L										<0.0050		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L										<0.005							
Thallium (dissolved)	mg/L										<0.0010		<0.00002	<0.00002	<0.00002	<0.00002	0.00011	<0.00002
Thallium (total)	mg/L										<0.0010							
Thorium (dissolved)	mg/L										<0.0050		<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001
Thorium (total)	mg/L										<0.005							
Tin (dissolved)	mg/L										<0.0020		0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L										<0.001							
Titanium (dissolved)	mg/L										<0.0200		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L										<0.050							
Uranium (dissolved)	mg/L										0.0025		0.00216	0.00164	0.00166	0.00196	0.00205	0.00173
Uranium (total)	mg/L										0.0028							
Vanadium (dissolved)	mg/L										<0.0050		<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L										<0.010							
Zinc (dissolved)	mg/L		0.017	0.0197	0.02		0.01		0.028		<0.040	0.02	0.0037	<0.0040	<0.0040	<0.004	0.007	0.008
Zinc (total)	mg/L										<0.050							
Zirconium (dissolved)	mg/L										<0.010		0.0003	0.0002	0.0002	0.0001	0.0002	0.0001
Zirconium (total)	mg/L										<0.010							
Nutrients																		
Ammonia (total, as N)	mg/L					0.19	0.04		0.08		0.31		0.05	0.04	<0.02	0.04	0.05	<0.020
Nitrate (as N)	mg/L		**27.8**	**16.3**	**34.5**	**32.5**	**65**		**77**		**12.5**	**55.5**	0.22	<0.010	<0.010	0.341	0.58	0.59
Nitrate + Nitrite (as N)	mg/L										**14**							
Nitrate + Nitrite (as N) (calculated)	mg/L										**13.9**		0.22	<0.01	<0.01	0.341	0.58	0.59
Nitrite (as N)	mg/L		<0.01	0.16	<0.01	0.04	<0.01		<0.01		**1.44**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010
Total kjeldahl nitrogen	mg/L		2.92	13	3.7	4.7	5.12		5.1		7.12	0.84						
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L		<0.3	<0.3	<0.3		<0.6		<0.3		<0.500	<0.3	<0.020	<0.020	<0.020	<0.02	0.05	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L										<0.50							
Potassium (dissolved)	mg/L		54	53	50		50		57		59.5	52	8.58	6.79	6.6	6.33	6.51	7.89
Potassium (total)	mg/L										56.4							

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 22-Aug-12 2081484-02 Normal	TH8 22-Aug-12 2081484-05 Duplicate	TH8 20-Nov-12 2111131-02 Normal	TH8 21-May-13 3051354-02 Normal	TH8 21-May-13 3051354-06 Duplicate	TH8 20-Aug-13 3081378-05 Normal	TH8 12-Nov-13 3110772-05 Normal	TH8 02-Jun-14 4060249-05 Normal	TH8 18-Aug-14 4081094-05 Normal	TH8 04-Nov-14 4110161-05 Normal	Town Well #4 03-Jun-02	Town Well #4 12-May-03	Town Well #4 17-May-04	Town Well #4 22-May-07 K705752-02	Town Well #4 05-Nov-07 K7K0165-01	Town Well #4 28-Apr-08 K8E0035-01	Town Well #4 14-Oct-08 K8J0452-01
Field Results																		
Conductivity	µS/cm	3500	3500	340	2200	2200	3300	2700	2740	2770	3150							
Depth to Water	m	13.85	13.85	14.109	14.252	14.252	14.381	16.281	15.19	13.84	14.99	8						
Dissolved oxygen	mg/L								7.43	7.85	8.3							
Dissolved oxygen (percent)	%								67.1	71.7	71							
Oxidation reduction potential	mV	52	52	122	254	254	121	47	87	132	24							
pH		7.54	7.54	7.6	7.4	7.4	7.37	7.23	**3.1**	7.3	7.4							
Temperature	°C	8.4	8.4	7.1	8.9	8.9	8.6	7.5	8.1	9.5	7.5		10	12	7.5	5		
Lab Results																		
General																		
Alkalinity (total, as CaCO3)	mg/L	768	676	731	619	637	516	598	514	476	592	287	290	324	310	340	333	345
Chemical Oxygen Demand	mg/L											<5	5	10	<5	<5		
Chloride	mg/L	**888**	**888**	**988**	**762**	**679**	**820**	**815**	**672**	**672**	**700**	62.5	73.8	65	60.2	76.7	69.4	86.9
Conductivity	µS/cm	3410	3430	3500	3070	3110	3300	3380	2940	3180	3310	845	866	791	822	881	842	884
Fluoride	mg/L	0.13	0.19	0.12	0.23	0.24	0.24	0.25	0.27	0.13	0.26							
Hardness, total (dissolved as CaCO3)	mg/L	798	803	847	839	839	921	958	800	833	826				369	390	394	377
pH		7.74	7.75	6.95	7.78	7.78	7.86	7.86	7.94	7.74	7.82	7.1	7.2	7.3	7.1	7.4	7.4	6.9
Sulphate	mg/L	37.4	37.2	57.6	53.2	53.3	45.1	56.2	38.1	44.7	47.5	44.5	43	40	37.5	38	38.6	40.6
Total suspended solids	mg/L	2600	2200	1640	1020	1220	814	1230	300	284	1240						<1	<1
Turbidity	NTU	2350	2340	1910	620	800	664	1220	292	186	1180	0.4	2.5	0.6			0.2	0.1
Metals																		
Aluminum (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.01	<0.2	<0.2	<0.2	<0.050		<0.050	<0.010
Aluminum (total)	mg/L														<0.10			
Antimony (dissolved)	mg/L	0.0016	0.0015	0.0009	0.0007	0.0004	0.0004	0.0007	0.0003	0.0003	0.0013	<0.2	<0.2	<0.2	<0.0050		<0.0030	<0.0006
Antimony (total)	mg/L														<0.006			
Arsenic (dissolved)	mg/L	0.0039	0.004	0.0024	0.0024	0.0024	0.0029	0.0018	0.0024	0.0042	0.0016	<0.2	<0.2	<0.2	<0.0050		<0.0050	<0.0010
Arsenic (total)	mg/L														<0.010			
Barium (dissolved)	mg/L	0.271	0.272	0.25	0.227	0.223	0.239	0.257	0.192	0.235	0.242	0.2	0.2	0.21	0.191		0.191	0.211
Barium (total)	mg/L														0.19			
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0010		<0.0020	<0.0004
Beryllium (total)	mg/L														<0.005			
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0010		<0.0005	<0.0001
Bismuth (total)	mg/L														<0.001			
Boron (dissolved)	mg/L	0.017	0.02	0.024	0.025	0.028	0.051	0.041	0.031	0.035	0.024	<0.1	<0.1	<0.1	<0.020		<0.020	0.013
Boron (total)	mg/L														<0.020			
Cadmium (dissolved)	mg/L	<0.00001	<0.00001	0.00003	0.00004	0.00002	0.00001	0.00002	0.00002	0.00003	0.00001	<0.01	<0.01	<0.01	<0.00010		<0.00010	<0.00002
Cadmium (total)	mg/L														<0.00010			
Calcium (dissolved)	mg/L	107	105	110	107	107	120	128	103	116	116	90	104	88	84.6	88.4	91.2	87
Calcium (total)	mg/L														85.1			
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.01	<0.01	<0.01	<0.0050		0.006	0.006
Chromium (total)	mg/L														<0.010			
Cobalt (dissolved)	mg/L	0.00342	0.00355	0.00264	0.00126	0.00122	0.00127	0.00151	0.00111	0.00024	0.00096				<0.0010		<0.0005	<0.0001
Cobalt (total)	mg/L														<0.0010			
Copper (dissolved)	mg/L	0.001	0.001	0.001	0.0014	0.0013	<0.0002	0.0012	0.0011	0.004	0.0008	<0.01	<0.01	<0.01	<0.0050		<0.0030	0.0046
Copper (total)	mg/L														<0.010			
Iron (dissolved)	mg/L	0.15	0.13	0.03	0.011	0.014	0.038	0.012	0.111	0.015	0.049	<0.03	<0.03	<0.03	0.267		**0.386**	0.079
Iron (total)	mg/L														<0.30			
Lead (dissolved)	mg/L	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.05	<0.05	<0.0020		<0.0010	0.0002
Lead (total)	mg/L														<0.0020			
Lithium (dissolved)	mg/L	0.019	0.0187	0.019	0.0203	0.0204	0.022	0.0233	0.0223	0.0219	0.0212				0.0018		0.002	0.0015
Lithium (total)	mg/L														<0.0050			
Magnesium (dissolved)	mg/L	129	131	139	139	139	151	155	132	132	130	37	43.7	38.1	38.4	41.1	40.2	38.9
Magnesium (total)	mg/L														37.9			
Manganese (dissolved)	mg/L	**0.0546**	**0.0577**	**0.172**	**0.0896**	**0.0897**	0.0336	**0.0871**	0.038	0.0049	0.027	<0.005	<0.005	<0.005	<0.0100		<0.0050	<0.0010
Manganese (total)	mg/L														<0.010			
Mercury (dissolved)	mg/L	0.00006	0.00005	0.00003	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	0.00002				<0.00050		<0.00030	<0.00006

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 22-Aug-12 2081484-02 Normal	TH8 22-Aug-12 2081484-05 Duplicate	TH8 20-Nov-12 2111131-02 Normal	TH8 21-May-13 3051354-02 Normal	TH8 21-May-13 3051354-06 Duplicate	TH8 20-Aug-13 3081378-05 Normal	TH8 12-Nov-13 3110772-05 Normal	TH8 02-Jun-14 4060249-05 Normal	TH8 18-Aug-14 4081094-05 Normal	TH8 04-Nov-14 4110161-05 Normal	Town Well #4 03-Jun-02	Town Well #4 12-May-03	Town Well #4 17-May-04	Town Well #4 22-May-07 K705752-02	Town Well #4 05-Nov-07 K7K0165-01	Town Well #4 28-Apr-08 K8E0035-01	Town Well #4 14-Oct-08 K8J0452-01
Mercury (total)	mg/L														<0.00050			
Molybdenum (dissolved)	mg/L	0.0024	0.0023	0.0011	0.0007	0.0007	0.0004	0.0007	0.0006	0.0004	0.0007	<0.03	<0.03	<0.03	<0.0020		<0.0010	0.0002
Molybdenum (total)	mg/L														<0.0050			
Nickel (dissolved)	mg/L	0.0087	0.0088	0.0077	0.0053	0.0051	0.0048	0.006	0.0045	0.0032	0.0039	<0.05	<0.05	<0.05	<0.010		<0.005	0.001
Nickel (total)	mg/L														<0.020			
Selenium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.2	<0.2	<0.2	<0.0100		<0.0050	<0.0010
Selenium (total)	mg/L														<0.010			
Silicon (dissolved, as Si)	mg/L	9.6	9.4	9.7	9.4	9.4	9.6	9.1	9.2	9.9	10.4				3.88		5.01	5.35
Silicon (total, as Si)	mg/L														2.6			
Silver (dissolved)	mg/L	<0.00005	<0.00005	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005				<0.0004		<0.00040	<0.00008
Silver (total)	mg/L														<0.00050			
Sodium (dissolved)	mg/L	**450**	**444**	**390**	**359**	**358**	**386**	**392**	**356**	**399**	**436**	34	37	37	36.8		43.1	42.1
Sodium (total)	mg/L														34.8			
Strontium (dissolved)	mg/L	1.6	1.6	1.64	1.52	1.51	1.61	1.64	1.43	1.52	1.56				0.414		0.434	0.442
Strontium (total)	mg/L														0.405			
Sulphur (dissolved)	mg/L	17	20	23	21	22	20	18	18	17	20							
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				<0.0050		<0.0030	<0.0006
Tellurium (total)	mg/L														<0.005			
Thallium (dissolved)	mg/L	<0.00002	<0.00002	0.00003	0.00007	0.00006	<0.00002	0.00008	<0.00002	0.00004	<0.00002				<0.0010		<0.0005	<0.0001
Thallium (total)	mg/L														<0.0010			
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0050		<0.0030	<0.0006
Thorium (total)	mg/L														<0.005			
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				<0.0020		<0.0020	<0.0004
Tin (total)	mg/L														<0.001			
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				<0.0200		<0.100	<0.020
Titanium (total)	mg/L														<0.050			
Uranium (dissolved)	mg/L	0.00206	0.002	0.00206	0.00213	0.00214	0.00218	0.00223	0.00205	0.0021	0.00227				0.0011		0.0012	0.0014
Uranium (total)	mg/L														0.0012			
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				<0.0050		<0.010	<0.002
Vanadium (total)	mg/L														<0.010			
Zinc (dissolved)	mg/L	0.008	0.012	<0.004	0.011	0.011	<0.004	<0.004	<0.004	0.005	0.012	0.01	0.021	0.039	<0.040		<0.030	0.008
Zinc (total)	mg/L														<0.050			
Zirconium (dissolved)	mg/L	0.0002	0.0002	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0025				<0.010		<0.005	<0.001
Zirconium (total)	mg/L														<0.010			
Nutrients																		
Ammonia (total, as N)	mg/L	0.1	0.091	0.026	0.034	0.06	0.02	1.24	0.118	0.023	0.03				<0.02	<0.02	0.04	0.06
Nitrate (as N)	mg/L	0.141	0.128	0.339	0.566	0.544	0.929	<0.010	0.206	1.11	0.723	1.4	1.35	1.63	1.35	1.09	0.982	1.17
Nitrate + Nitrite (as N)	mg/L														1.35	1.09		
Nitrate + Nitrite (as N) (calculated)	mg/L	0.141	0.128	0.339	0.566	0.544	0.929	<0.014	0.206	1.11	0.723				1.35	1.09	0.982	1.17
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01
Total kjeldahl nitrogen	mg/L											0.05	<0.05	0.08	0.1	0.06		
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.3	<0.3	<0.3	<0.500		<0.200	<0.040
Phosphorus (total, by ICPMS/ICPOES)	mg/L														<0.50			
Potassium (dissolved)	mg/L	7.23	7.29	6.55	6.53	6.53	6.9	6.64	6.05	6.82	6.66	<2	<2	<2	1.66		2.17	1.82
Potassium (total)	mg/L														1.53			

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 25-May-09 K9E0816-01	Town Well #4 04-Nov-09 K9K0184-03	Town Well #4 09-Feb-10 K0B0397-03	Town Well #4 15-Jun-10 K0F0788-02	Town Well #4 16-Nov-10 K0K0729-03	Town Well #4 09-May-11 K1E0403-02	Town Well #4 10-Aug-11 K1H0536-04	Town Well #4 18-Oct-11 K1J0685-04	Town Well #4 24-May-12 2051369-02 Normal	Town Well #4 22-Aug-12 2081484-04 Normal	Town Well #4 20-Nov-12 2111131-04 Normal	Town Well #4 21-May-13 3051354-04 Normal	Town Well #4 12-Nov-13 3110772-02 Normal	Town Well #4 02-Jun-14 4060249-02 Normal	Town Well #4 18-Aug-14 4081094-01 Normal	Town Well #4 04-Nov-14 4110161-01 Normal	Town Well #6 20-Aug-13 3081378-02 Normal
Field Results																		
Conductivity	µS/cm	900	890	870	970	890		690	930	740	860	800	640	710	799	805	756	650
Depth to Water	m																	
Dissolved oxygen	mg/L	2.01	3.7												4.5	3.93	4.38	
Dissolved oxygen (percent)	%														38.2	33.8	37.6	
Oxidation reduction potential	mV				49	159		62	119	111	221	188	258	74	165	201	47	246
pH		6.85	7.48	7.2	7.41	7.49		7.35	7.39	7.43	7.59	7.6	7.36	7.2	7.5	7.5	7.2	7.15
Temperature	°C	8.4	8.4	7.4	12.2	8.2		9.4	7.6	8.2	8.8	8.1	8.4	8.1	7.9	8.5	8.4	7.9
Lab Results																		
General																		
Alkalinity (total, as CaCO3)	mg/L	337	330	325	328	313	331	332	327	304	313	332	326	314	319	320	319	268
Chemical Oxygen Demand	mg/L																	
Chloride	mg/L	74	57.6	91.1	76.7	75.7	79.2	72.9	77.2	63	67.2	65.6	69.1	68.5	67	69.7	70.2	22.9
Conductivity	µS/cm	899	902	905	874	854	869	835	873	825	836	838	833	859	857	880	900	620
Fluoride	mg/L									<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Hardness, total (dissolved as CaCO3)	mg/L	353	364	382	342	370	388	360	360	347	357	356	366	383	397	392	378	319
pH		7.7	7.76	7.81	7.93	7.79	7.85	7.81	7.82	7.87	7.8	6.94	7.86	7.82	7.92	7.65	7.85	7.94
Sulphate	mg/L	38.8	39.8	42.9	41.2	36.1	37.6	35.8	40	37.2	36.6	40.4	36.6	38.8	37.6	39.7	40.7	20.4
Total suspended solids	mg/L	<1	<1	4	<1	<1	<1	<1	<1	<1	6	2	<1	2	<1	<1	<1	<1
Turbidity	NTU	<0.1	0.3	0.2	<0.1	0.1	<0.1	0.11	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.6
Metals																		
Aluminum (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	0.021	<0.005	<0.005
Aluminum (total)	mg/L																	
Antimony (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0001	<0.0020	<0.0001	0.0007	0.0003	0.0003	0.0007	0.0004	0.0005	0.0002	0.0005
Antimony (total)	mg/L																	
Arsenic (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic (total)	mg/L																	
Barium (dissolved)	mg/L	0.227	0.173	0.244	0.216	0.217	0.189	0.195	0.184	0.189	0.193	0.191	0.195	0.2	0.192	0.195	0.21	0.133
Barium (total)	mg/L																	
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L																	
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L																	
Boron (dissolved)	mg/L	0.015	0.02	0.02	0.015	0.042	0.016	0.018	0.017	0.018	0.012	0.018	0.018	0.032	0.021	0.024	0.014	0.05
Boron (total)	mg/L																	
Cadmium (dissolved)	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00005	0.00009	<0.00001	0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	0.00003	0.00002	0.00002
Cadmium (total)	mg/L																	
Calcium (dissolved)	mg/L	83.8	80	87.4	79.1	81.3	90	83.8	84.7	74.7	80.7	82	82.5	88.6	90.2	92.1	88.7	81.5
Calcium (total)	mg/L																	
Chromium (dissolved)	mg/L	0.0033	0.0028	0.0116	0.0022	0.0007	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chromium (total)	mg/L																	
Cobalt (dissolved)	mg/L	0.00009	0.00006	0.00007	0.0001	0.00013	<0.00005	0.00018	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	0.00006	<0.00005
Cobalt (total)	mg/L																	
Copper (dissolved)	mg/L	0.0038	0.0016	0.0045	0.0025	0.0025	0.0008	0.0038	0.0016	0.0007	0.0013	0.001	0.0008	0.0006	0.0009	0.0014	0.0014	0.0008
Copper (total)	mg/L																	
Iron (dissolved)	mg/L	0.082	0.07	0.063	0.147	0.166	<0.010	0.02	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	0.031	<0.010	<0.010
Iron (total)	mg/L																	
Lead (dissolved)	mg/L	0.0001	<0.0001	0.0002	0.0002	0.0002	0.0001	0.0005	0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001
Lead (total)	mg/L																	
Lithium (dissolved)	mg/L	0.0021	0.0013	0.0017	0.0021	0.004	0.002	0.0017	0.0018	0.0017	0.0016	0.0018	0.0018	0.0018	0.002	0.0022	0.002	0.0013
Lithium (total)	mg/L																	
Magnesium (dissolved)	mg/L	34.9	39.8	39.7	35	40.5	39.7	37.3	34.9	39.1	37.7	36.8	38.9	39.3	41.8	39.4	38	28.1
Magnesium (total)	mg/L																	
Manganese (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	0.0008	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0068	0.0012	0.0009
Manganese (total)	mg/L																	
Mercury (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	0.00005	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 25-May-09 K9E0816-01	Town Well #4 04-Nov-09 K9K0184-03	Town Well #4 09-Feb-10 K0B0397-03	Town Well #4 15-Jun-10 K0F0788-02	Town Well #4 16-Nov-10 K0K0729-03	Town Well #4 09-May-11 K1E0403-02	Town Well #4 10-Aug-11 K1H0536-04	Town Well #4 18-Oct-11 K1J0685-04	Town Well #4 24-May-12 2051369-02 Normal	Town Well #4 22-Aug-12 2081484-04 Normal	Town Well #4 20-Nov-12 2111131-04 Normal	Town Well #4 21-May-13 3051354-04 Normal	Town Well #4 12-Nov-13 3110772-02 Normal	Town Well #4 02-Jun-14 4060249-02 Normal	Town Well #4 18-Aug-14 4081094-01 Normal	Town Well #4 04-Nov-14 4110161-01 Normal	Town Well #6 20-Aug-13 3081378-02 Normal
Mercury (total)	mg/L																	
Molybdenum (dissolved)	mg/L	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0012	0.0003	0.0005	0.0003	0.0002	0.0003	0.0003	0.0003	0.0002	0.0003
Molybdenum (total)	mg/L																	
Nickel (dissolved)	mg/L	0.0014	0.001	0.0012	0.0016	0.0037	0.0002	0.0011	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0002	<0.0002	0.0015	0.0004	0.0003
Nickel (total)	mg/L																	
Selenium (dissolved)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L																	
Silicon (dissolved, as Si)	mg/L	4.1	3.53	7.83	4	2.33	4.89	4.8	4.4	4.8	4.6	4.9	4.6	4.2	4.5	4.6	4.9	4.1
Silicon (total, as Si)	mg/L																	
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Silver (total)	mg/L																	
Sodium (dissolved)	mg/L	36.7	44.4	45.6	37.8	37.8	44	39.9	38.2	40.8	39.4	38.7	41.7	42.4	42.5	44.5	48.5	15.2
Sodium (total)	mg/L																	
Strontium (dissolved)	mg/L	0.481	0.409	0.409	0.451	0.628	0.423	0.436	0.37	0.441	0.405	0.399	0.432	0.4	0.421	0.457	0.438	0.282
Strontium (total)	mg/L																	
Sulphur (dissolved)	mg/L									16	17	15	13	9	16	12	13	8
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L																	
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Thallium (total)	mg/L																	
Thorium (dissolved)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L																	
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L																	
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L																	
Uranium (dissolved)	mg/L	0.00124	0.00114	0.00102	0.00115	0.00127	0.00113	0.00107	0.00104	0.00103	0.00109	0.00103	0.00112	0.00105	0.00114	0.00143	0.00123	0.00105
Uranium (total)	mg/L																	
Vanadium (dissolved)	mg/L	<0.0010	<0.0010	0.0046	0.0018	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L																	
Zinc (dissolved)	mg/L	0.0088	0.0021	0.0051	0.0058	0.0032	<0.0040	0.016	<0.004	<0.004	0.006	<0.004	<0.004	<0.004	<0.004	<0.004	0.005	<0.004
Zinc (total)	mg/L																	
Zirconium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zirconium (total)	mg/L																	
Nutrients																		
Ammonia (total, as N)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.020	0.03	0.025	0.024	0.029	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	1.12	1.21	1.3	1.17	1.14	0.895	1.26	1.21	1.19	1.2	0.755	1.36	1.33	1.26	1.55	1.57	0.781
Nitrate + Nitrite (as N)	mg/L																	
Nitrate + Nitrite (as N) (calculated)	mg/L	1.12	1.21	1.3	1.17	1.14	0.895	1.26	1.21	1.19	1.2	0.755	1.36	1.33	1.26	1.55	1.57	0.781
Nitrite (as N)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L																	
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L																	
Potassium (dissolved)	mg/L	2.08	1.48	1.93	2.33	1.95	1.74	1.75	1.5	2.04	1.62	1.61	1.69	1.67	1.7	1.84	1.9	1
Potassium (total)	mg/L																	

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #6 02-Jun-14 4060249-01 Normal	Town Well #6 18-Aug-14 4081094-02 Normal	Town Well #6 04-Nov-14 4110161-02 Normal
Field Results				
Conductivity	µS/cm	577	577	677
Depth to Water	m			
Dissolved oxygen	mg/L	8.14	7.68	7.38
Dissolved oxygen (percent)	%	68.1	65.3	64
Oxidation reduction potential	mV	183	172	66
pH		7.3	7.9	7.4
Temperature	°C	7.7	8.1	8.1
Lab Results				
General				
Alkalinity (total, as CaCO3)	mg/L	276	277	291
Chemical Oxygen Demand	mg/L			
Chloride	mg/L	23.7	26.2	34.5
Conductivity	µS/cm	621	634	679
Fluoride	mg/L	<0.10	<0.10	<0.10
Hardness, total (dissolved as CaCO3)	mg/L	324	325	322
pH		7.87	7.7	7.86
Sulphate	mg/L	23.5	24.1	24.3
Total suspended solids	mg/L	<1	<1	<1
Turbidity	NTU	<0.1	<0.1	0.1
Metals				
Aluminum (dissolved)	mg/L	<0.005	0.011	<0.005
Aluminum (total)	mg/L			
Antimony (dissolved)	mg/L	0.0005	0.0003	0.0002
Antimony (total)	mg/L			
Arsenic (dissolved)	mg/L	<0.0005	<0.0005	<0.0005
Arsenic (total)	mg/L			
Barium (dissolved)	mg/L	0.126	0.136	0.146
Barium (total)	mg/L			
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L			
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L			
Boron (dissolved)	mg/L	0.015	0.012	0.006
Boron (total)	mg/L			
Cadmium (dissolved)	mg/L	<0.00001	0.00002	<0.00001
Cadmium (total)	mg/L			
Calcium (dissolved)	mg/L	82.8	82.7	84.3
Calcium (total)	mg/L			
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005
Chromium (total)	mg/L			
Cobalt (dissolved)	mg/L	<0.00005	0.00007	0.00006
Cobalt (total)	mg/L			
Copper (dissolved)	mg/L	0.0013	0.0028	0.0024
Copper (total)	mg/L			
Iron (dissolved)	mg/L	<0.010	0.033	0.013
Iron (total)	mg/L			
Lead (dissolved)	mg/L	<0.0001	0.0002	<0.0001
Lead (total)	mg/L			
Lithium (dissolved)	mg/L	0.0013	0.0014	0.0013
Lithium (total)	mg/L			
Magnesium (dissolved)	mg/L	28.5	28.7	27.1
Magnesium (total)	mg/L			
Manganese (dissolved)	mg/L	0.0013	0.0082	0.0014
Manganese (total)	mg/L			
Mercury (dissolved)	mg/L	<0.00002	<0.00002	<0.00002

Golden Refuse Disposal Site
Water Quality Results

Analyte	Unit	Town Well #6 02-Jun-14 4060249-01 Normal	Town Well #6 18-Aug-14 4081094-02 Normal	Town Well #6 04-Nov-14 4110161-02 Normal
Mercury (total)	mg/L			
Molybdenum (dissolved)	mg/L	0.0004	0.0004	0.0004
Molybdenum (total)	mg/L			
Nickel (dissolved)	mg/L	<0.0002	0.0012	0.0004
Nickel (total)	mg/L			
Selenium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L			
Silicon (dissolved, as Si)	mg/L	4	4.4	4.5
Silicon (total, as Si)	mg/L			
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005
Silver (total)	mg/L			
Sodium (dissolved)	mg/L	13.9	15.4	17.9
Sodium (total)	mg/L			
Strontium (dissolved)	mg/L	0.269	0.301	0.29
Strontium (total)	mg/L			
Sulphur (dissolved)	mg/L	10	8	7
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L			
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002
Thallium (total)	mg/L			
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L			
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L			
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005
Titanium (total)	mg/L			
Uranium (dissolved)	mg/L	0.00103	0.00114	0.00114
Uranium (total)	mg/L			
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001
Vanadium (total)	mg/L			
Zinc (dissolved)	mg/L	<0.004	0.01	0.005
Zinc (total)	mg/L			
Zirconium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001
Zirconium (total)	mg/L			
Nutrients				
Ammonia (total, as N)	mg/L	0.024	<0.020	<0.020
Nitrate (as N)	mg/L	0.839	0.993	1.23
Nitrate + Nitrite (as N)	mg/L			
Nitrate + Nitrite (as N) (calculated)	mg/L	0.839	0.993	1.23
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L			
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	0.07	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L			
Potassium (dissolved)	mg/L	0.89	0.95	0.94
Potassium (total)	mg/L			

Guideline Notes for Reports for CSRD Refuse Disposal Sites Water Quality Results

1. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (BCAWQG AL)

General Notes:

The Water Quality Guidelines (Criteria) Reports by BC Ministry of Environment were used as references for the guidelines. (Internet address: http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html). Overview Reports (BC MOE) were used as the references for the guidelines unless the note for specific analyte indicates that the Technical Appendix (BC MOE) was used. / For some parameters, guidelines are specified as two values: the maximum value or the acute criterion, and the 30-day average value or the chronic criterion. The maximum value was used in this report for parameters that have both guideline values.

Note 1.1 for Dissolved oxygen:

The instantaneous minimum guideline for dissolved oxygen is 5 mg/L for all life stages other than buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in the water column is 9 mg/L for buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in interstitial water is 6 mg/L for buried embryo/alevin.
The 30-day mean guideline (minimum) for dissolved oxygen is 8 mg/L for all life stages other than buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in the water column is 11 mg/L for buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in interstitial water is 8 mg/L for buried embryo/alevin.

Note 1.2 for pH:

pH less than 6.5: No statistically significant decrease in pH from background.
pH from 6.5 to 9.0: Unrestricted change permitted within this range.
pH over 9.0: No statistically significant increase in pH from background.
See BC MOE Overview Report for additional details.

Note 1.3 for Temperature:

The maximum daily temperature of 19 degrees Celsius is for streams with unknown fish distribution. See BC MOE Overview Report for additional details for streams with unknown fish distribution, and specific guidelines for streams with known fish distribution, and guideline for lakes and impoundments.

Note 1.4 for Chloride:

To protect freshwater aquatic life from acute and lethal effects, the maximum concentration of chloride (mg/L as NaCl) at any time should not exceed 600 mg/L.
To protect freshwater aquatic life from chronic effects, the average (arithmetic mean computed from five weekly samples collected over a 30-day period) concentration of chloride (mg/L as NaCl) should not exceed 150 mg/L.

Note 1.5 for Fluoride:

Correction by BC MOE Sept. 2011: The criteria for Fluoride (total) in mg/L is 0.4 as a maximum where the water hardness (as CaCO3) is less than or equal to 10 mg/L. Otherwise use the equation:
LC50 fluoride = -51.73 + 92.57 log10 (Hardness) and multiply by 0.01.
Hardness is as CaCO3 in units mg/L.

Note 1.6 for pH:

pH less than 6.5: No statistically significant decrease in pH from background.
pH from 6.5 to 9.0: Unrestricted change permitted within this range.
pH over 9.0: No statistically significant increase in pH from background.
See BC MOE Overview Report for additional details.

Note 1.7 for Sulphate:

The approved 30-day average (minimum of 5 evenly-spaced samples collected in 30 days) water quality guidelines to protect aquatic life in BC for sulphate are:
128 mg/L at hardness of 0 to 30 mg/L as CaCO3
218 mg/L at hardness of 31 to 75 mg/L as CaCO3
309 mg/L at hardness of 76 to 180mg/L as CaCO3
429 mg/L at hardness 181 to 250 mg/L as CaCO3
Need to determine guideline based on site water for hardness greater than 250 mg/L as CaCO3.
For screening purposes in this report, exceedance were flagged for sulphate greater than 429 mg/L at hardness greater than 250 mg/L as CaCO3.

Note 1.8 for Total suspended solids:

Maximum Induced Suspended Sediments - mg/L or % of background:
- 25 mg/L in 24 hours when background is less than or equal to 25;
- Mean of 5 mg/L in 30 days when background is less than or equal to 25;
- 25 mg/L when background is between 25 and 250;
- 10% when background is greater than or equal to 250. / There are two refuse disposal sites (Revelstoke and Skimikin) where up gradient and down gradient samples have been collected in one water body; therefore, this guideline applies to Revelstoke and Skimikin only.

Note 1.9 for Turbidity:

When background is less than or equal to 8 NTU:
- Maximum Induced Turbidity of 8 NTU in 24 hours.
- For sediment inputs that last between 24 hours and 30 days (daily sampling preferred) the mean turbidity should not exceed background by more than 2 NTU.

Maximum Induced Turbidity of 5 NTU when background is between 8 and 50 NTU.
Maximum Induced Turbidity of 10% when background is greater than 50 NTU. / There are two refuse disposal sites (Revelstoke and Skimikin) where up gradient and down gradient samples have been collected in one water body; therefore, this guideline applies to Revelstoke and Skimikin only.

Note 1.10 for Aluminum (dissolved):
The maximum concentration of dissolved aluminum at any time should not exceed:
1. 0.10 mg/L when the pH is greater than or equal to 6.5
2. The value (in mg/L) determined by the following relationship if pH less than 6.5

Dissolved Aluminum = e (1.209-2.426 (pH) + 0.286 $(pH)^2$)

The 30-day average concentration of dissolved aluminum (based on a minimum of 5 approximately weekly samples) should not exceed:
1. 0.05 mg/L when the median pH over 30 days is greater than or equal to 6.5
2. the value determined by the following relationship at median pH less than 6.5

Dissolved Aluminum = e (1.6-3.327 (median pH) + 0.402 $(\text{median pH})^2$)

Note 1.11 for Arsenic (dissolved):
The recommended guideline is for total arsenic.

Note 1.12 for Boron (dissolved):
The recommended guideline is for total boron.

Note 1.13 for Cobalt (dissolved):
The interim maximum concentration for total cobalt is 110 µg/L to protect aquatic life in the freshwater environment from acute effects of cobalt.
The interim 30-day average concentration for total cobalt (based on five weekly samples) is 4 µg/L to protect aquatic life from chronic effects of cobalt.

Note 1.14 for Cobalt (total):
The interim maximum concentration for total cobalt is 110 µg/L to protect aquatic life in the freshwater environment from acute effects of cobalt.
The interim 30-day average concentration for total cobalt (based on five weekly samples) is 4 µg/L to protect aquatic life from chronic effects of cobalt.

Note 1.15 for Copper (dissolved):
The maximum concentration of total copper should not exceed at any time the numerical value (in µg/L) given by the formula "0.094(hardness)+2", where water hardness is reported as mg/L CaCO3.
The 30-day average concentration of total copper (based on a minimum of 5 approximately weekly samples) should not exceed 2 µg/L when average water hardness over the same period (expressed as mg/L CaCO3) is less than 50 mg/L.
When average water hardness is greater than 50 mg/L the 30-day average concentration should not exceed the numerical value (in µg/L) given by the formula "0.04(average hardness)", where water hardness is reported as mg/L CaCO3.

Note 1.16 for Copper (total):
The maximum concentration of total copper should not exceed at any time the numerical value (in µg/L) given by the formula "0.094(hardness)+2", where water hardness is reported as mg/L CaCO3.
The 30-day average concentration of total copper (based on a minimum of 5 approximately weekly samples) should not exceed 2 µg/L when average water hardness over the same period (expressed as mg/L CaCO3) is less than 50 mg/L.
When average water hardness is greater than 50 mg/L the 30-day average concentration should not exceed the numerical value (in µg/L) given by the formula "0.04(average hardness)", where water hardness is reported as mg/L CaCO3.

Note 1.17 for Lead (dissolved):
The maximum guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO3 is set at 3.0 µg/L. When water hardness exceeds 8.0 mg/L CaCO3 the maximum guideline for lead at any time is given by the following equation:
Maximum Criteria (µg/L) = exp (1.273 ln(hardness) - 1.460).
The 30-day average guideline for total lead in water, when water hardness exceeds 8 mg/L as CaCO3, is as follows:
30-Day Average (µg/L) is less than or equal to 3.31 + exp (1.273 ln (mean hardness) - 4.704).
For hardness less than or equal to 8.0 mg/L there is no 30-day average guideline; hence the maximum concentration of 3.0 µg/L is used.

Note 1.18 for Lead (total):
The maximum guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO3 is set at 3.0 µg/L. When water hardness exceeds 8.0 mg/L CaCO3 the maximum guideline for lead at any time is given by the following equation:
Maximum Criteria (µg/L) = exp (1.273 ln(hardness) - 1.460).
The 30-day average guideline for total lead in water, when water hardness exceeds 8 mg/L as CaCO3, is as follows:
30-Day Average (µg/L) is less than or equal to 3.31 + exp (1.273 ln (mean hardness) - 4.704).
For hardness less than or equal to 8.0 mg/L there is no 30-day average guideline; hence the maximum concentration of 3.0 µg/L is used.

Note 1.19 for Manganese (dissolved):

The maximum concentration of total manganese in mg/L at any time should not exceed the value as determined by the following relationship:
0.01102 hardness + 0.54
where water hardness is reported as mg/L of CaCO3.
The 30-day mean concentration of total manganese in mg/L should be less than or equal to the value as determined by the following relationship:
0.0044 hardness + 0.605
where water hardness is reported as mg/L of CaCO3.

Note 1.20 for Manganese (total):

The maximum concentration of total manganese in mg/L at any time should not exceed the value as determined by the following relationship:
0.01102 hardness + 0.54
where water hardness is reported as mg/L of CaCO3.
The 30-day mean concentration of total manganese in mg/L should be less than or equal to the value as determined by the following relationship:
0.0044 hardness + 0.605
where water hardness is reported as mg/L of CaCO3.

Note 1.21 for Mercury (dissolved):

The average concentration of total mercury in water as measured over a 30-day period (based on five weekly samples) should not exceed 0.02 µg/L when the methyl mercury (MeHg) constitutes less than or equal to 0.5% of the total mercury concentration. When the proportion of MeHg is greater than 0.5%, the guideline should be adjusted as indicated in the Table 1 and Table 4 of the BC MOE Overview Report - First Update, February 2001.
There is no guideline maximum for total mercury in water, for freshwater aquatic life.

Note 1.22 for Mercury (total):

The average concentration of total mercury in water as measured over a 30-day period (based on five weekly samples) should not exceed 0.02 µg/L when the methyl mercury (MeHg) constitutes less than or equal to 0.5% of the total mercury concentration. When the proportion of MeHg is greater than 0.5%, the guideline should be adjusted as indicated in the Table 1 and Table 4 of the BC MOE Overview Report - First Update, February 2001.
There is no guideline maximum for total mercury in water, for freshwater aquatic life.

Note 1.23 for Molybdenum (dissolved):

The maximum concentration for total molybdenum is 2 mg/L.
The 30-day average concentration for total molybdenum (based on at least five weekly samples in a period of 30 days) is less than or equal to 1 mg/L.

Note 1.24 for Molybdenum (total):

The maximum concentration for total molybdenum is 2 mg/L.
The 30-day average concentration for total molybdenum (based on at least five weekly samples in a period of 30 days) is less than or equal to 1 mg/L.

Note 1.25 for Selenium (dissolved):

The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.
The 30-day average alert concentration for the protection of aquatic life in sensitive ecosystems is 1 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.26 for Selenium (total):

The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.
The 30-day average alert concentration for the protection of aquatic life in sensitive ecosystems is 1 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.27 for Silver (dissolved):

The guideline maximum for total silver is:
0.1 µg/L maximum if hardness less than or equal to 100 mg/L
3.0 µg/L maximum if hardness greater than 100 mg/L.
The guideline 30-day average for total silver is:
0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L
1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.28 for Silver (total):

The guideline maximum for total silver is:
0.1 µg/L maximum if hardness less than or equal to 100 mg/L
3.0 µg/L maximum if hardness greater than 100 mg/L.
The guideline 30-day average for total silver is:
0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L
1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.29 for Zinc (dissolved):

The maximum concentration of total zinc (µg/L) at any time should not exceed 33 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
33 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.
The 30-day average concentration of total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
7.5 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.

Note 1.30 for Zinc (total):

The maximum concentration of total zinc (µg/L) at any time should not exceed 33 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
33 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.
The 30-day average concentration of total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
7.5 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.

Note 1.31 for Ammonia (total, as N):

The maximum guideline for ammonia varies as a function of pH and temperature. See Table 3 in Overview Report Update September 2009.
The 30-day average guideline for ammonia varies as a function of pH and temperature. See Table 4 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia for this report. If a lab pH result was not available then the field pH result was used.

Note 1.32 for Nitrate (as N):

The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.33 for Nitrate + Nitrite (as N):

The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.34 for Nitrate + Nitrite (as N) (calculated):

The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.35 for Nitrite (as N):

The guideline maximum for nitrite as N is:
0.06 mg/L if chloride less than 2 mg/L
0.12 mg/L if chloride is 2 to 4 mg/L
0.18 mg/L if chloride is 4 to 6 mg/L
0.24 mg/L if chloride is 6 to 8 mg/L
0.30 mg/L if chloride is 8 to 10 mg/L
0.60 mg/L if chloride is greater than 10 mg/L.
The guideline 30-day average for nitrite as N is:
0.02 mg/L if chloride less than 2 mg/L
0.04 mg/L if chloride is 2 to 4 mg/L
0.06 mg/L if chloride is 4 to 6 mg/L
0.08 mg/L if chloride is 6 to 8 mg/L
0.10 mg/L if chloride is 8 to 10 mg/L
0.20 mg/L if chloride is greater than 10 mg/L.

Note 1.36 for Phosphorus (dissolved, by ICPMS/ICPOES):

Streams: None proposed for streams.
Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.37 for Phosphorus (total, by ICPMS/ICPOES):

Streams: None proposed for streams.
Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

2. Notes for Working Water Quality Guidelines for British Columbia for freshwater aquatic life (BCWWQG AL)

General Notes:

For some parameters, guidelines are specified as two values: the maximum value or the acute criterion, and the 30-day average value or the chronic criterion. The maximum value was used in this report for parameters that have both guideline values.

Note 2.1 for Alkalinity (total, as CaCO3):

The working guideline for alkalinity, total (as CaCO3) in mg/L is as follows:
- Up to 10, highly sensitive to acid inputs
- 10 to 20, moderately sensitive
- Over 20 low sensitivity.

Refer to calcium regarding sensitivity to acid inputs, the more restrictive of calcium or alkalinity is applicable.

Note 2.2 for Antimony (dissolved):

The working guideline is for total antimony.

Note 2.3 for Barium (dissolved):

The working guideline is for total barium.
Under Ministry review
1 mg/L, 30-/day average
5 mg/L, maximum

Note 2.4 for Barium (total):

The working guideline is for total barium.
Under Ministry review
1 mg/L, 30-/day average
5 mg/L, maximum

Note 2.5 for Beryllium (dissolved):

Under Ministry review. The working guideline is for total beryllium.

Note 2.6 for Beryllium (total):

Under Ministry review. The working guideline is for total beryllium.

Note 2.7 for Cadmium (dissolved):

The guideline for total cadmium is determined on a site-specific basis according to the local water hardness. The guideline in µg/L is determined by the equation:
10 raised to the power of {0.86[log(hardness)] - 3.2}
where water hardness is reported as mg/L CaCO3.

Note 2.8 for Cadmium (total):

The guideline for total cadmium is determined on a site-specific basis according to the local water hardness. The guideline in µg/L is determined by the equation:
10 raised to the power of {0.86[log(hardness)] - 3.2}
where water hardness is reported as mg/L CaCO3.

Note 2.9 for Calcium (dissolved):

The working guideline for dissolved calcium in mg/L is as follows:
- up to 4, highly sensitive to acid inputs
- 4 to 8, moderately sensitive
- over 8, low sensitivity.

Refer to alkalinity. The more restrictive of calcium or alkalinity applies.

Note 2.10 for Chromium (dissolved):

The working guideline for total chromium is as follows:
Maximum 1 µg/L for Cr(VI)
Interim maximum 8.9 µg/L for Cr(III)
The working guideline maximum of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.11 for Chromium (total):

The working guideline for total chromium is as follows:
Maximum 1 µg/L for Cr(VI)
Interim maximum 8.9 µg/L for Cr(III)
The working guideline maximum of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.12 for Lithium (dissolved):

The working guideline for total lithium in mg/L is as follows:
0.014, secondary chronic value
0.096 Final chronic value
0.870 Aquatic maximum value

Note 2.13 for Lithium (total):

The working guideline for total lithium in mg/L is as follows:
0.014, secondary chronic value
0.096 Final chronic value
0.870 Aquatic maximum value

Note 2.14 for Nickel (dissolved):
The working guideline for total nickel is as follows:
25 µg/L maximum at hardness of 0 to 60 mg/L as CaCO3
65 µg/L maximum at hardness of 60 to 120 mg/L as CaCO3
110 µg/L maximum at hardness of 120 to 180mg/L as CaCO3
150 µg/L maximum at hardness greater than 180 mg/L as CaCO3

Note 2.15 for Nickel (total):
The working guideline for total nickel is as follows:
25 µg/L maximum at hardness of 0 to 60 mg/L as CaCO3
65 µg/L maximum at hardness of 60 to 120 mg/L as CaCO3
110 µg/L maximum at hardness of 120 to 180mg/L as CaCO3
150 µg/L maximum at hardness greater than 180 mg/L as CaCO3

Note 2.16 for Thallium (dissolved):
Working guideline for total thallium of 0.3 µg/L for water quality objective for Ontario. Table 1 in BCWWQG, 2006 also lists the following additional working guidelines for total thallium: 1.7 µg/L, human health, consumption of water + organism, and 6.3 µg/L, human health, consumption of organism only. (The CCME guideline is 0.8 µg/L.)

Note 2.17 for Thallium (total):
Working guideline for total thallium of 0.3 µg/L for water quality objective for Ontario. Table 1 in BCWWQG, 2006 also lists the following additional working guidelines for total thallium: 1.7 µg/L, human health, consumption of water + organism, and 6.3 µg/L, human health, consumption of organism only. (The CCME guideline is 0.8 µg/L.)

Note 2.18 for Titanium (dissolved):
Working guidelines for total titanium are:
2000 µg/L, median threshold level: Scenedesmus
4600 µg/L, median threshold level: Daphnia

Note 2.19 for Titanium (total):
Working guidelines for total titanium are:
2000 µg/L, median threshold level: Scenedesmus
4600 µg/L, median threshold level: Daphnia

Note 2.20 for Uranium (dissolved):
Working guidelines for total uranium are:
300 µg/L, maximum value
500 µg/L, Ontario's water quality objective

Note 2.21 for Uranium (total):
Working guidelines for total uranium are:
300 µg/L, maximum value
500 µg/L, Ontario's water quality objective

Note 2.22 for Vanadium (dissolved):
Working guidelines for total vanadium are:
6 µg/L, Ontario's water quality objective
20 µg/L, secondary chronic value

Note 2.23 for Vanadium (total):
Working guidelines for total vanadium are:
6 µg/L, Ontario's water quality objective
20 µg/L, secondary chronic value

Note 2.24 for Potassium (dissolved):
The working guideline for potassium as KCl is 373 – 432 mg/L, threshold for Daphnia magna immobilization.

Note 2.25 for Potassium (total):
The working guideline for potassium as KCl is 373 – 432 mg/L, threshold for Daphnia magna immobilization.

3. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)

Note 3.1 for Turbidity:
Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.
For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.
For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 3.2 for Arsenic (dissolved):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 3.3 for Arsenic (total):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 3.4 for Nitrate + Nitrite (as N):
The MAC for Nitrate (as N) is 10 mg/L
Note 3.5 for Nitrate + Nitrite (as N) (calculated):
The MAC for Nitrate (as N) is 10 mg/L
4. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)
Note 4.1 for Sulphate:
There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.
Note 4.2 for Aluminum (dissolved):
This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
Note 4.3 for Aluminum (total):
This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
5. Notes for BC Approved Water Quality Guidelines for drinking water (BCAWQG DW)
General Notes:
The Water Quality Guidelines (Criteria) Reports by BC Ministry of Environment were used as references for the guidelines. (Internet address: http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html). Overview Reports (BC MOE) were used as the references for the guidelines unless the note for specific analyte indicates that the Technical Appendix (BC MOE) was used. Drinking water guidelines are, in some cases, for raw water before treatment.
Note 5.1 for pH:
Designed to minimize solubilization of heavy metals and salts from water distribution pipes and the precipitation of carbonate salts in the distribution system, and maximize the effectiveness of chlorination. However, natural source water outside the guidelines may be safe to drink from a public health perspective.
Note 5.2 for Temperature:
The guideline for maximum temperature for drinking water is 15 degrees.
Note 5.3 for Chloride:
The guideline maximum for chloride in drinking water (for aesthetic reasons) is 250 mg/L.
Note 5.4 for pH:
Designed to minimize solubilization of heavy metals and salts from water distribution pipes and the precipitation of carbonate salts in the distribution system, and maximize the effectiveness of chlorination. However, natural source water outside the guidelines may be safe to drink from a public health perspective.
Note 5.5 for Turbidity:
Turbidity guidelines for raw drinking water follow;
• Drinking Water - raw untreated:
For raw waters of exceptional clarity (less than or equal to 5 NTU) which normally do not require treatment to reduce natural turbidity, induced turbidity should not exceed 1 NTU and the total turbidity should not exceed 5 NTU at any time.
• Drinking Water - raw treated:
For raw waters which normally require some form of treatment to reduce natural turbidity to a level that complies with the standard for finished water (5 NTU) in British Columbia, induced turbidity should not exceed 5 NTU when background turbidity is less than or equal to 50 NTU. When background is greater than 50 NTU, the induced turbidity should not be more than 10% of background.
Note 5.6 for Aluminum (dissolved):
The guideline maximum for dissolved aluminum is 0.2 mg/L (based on aesthetic considerations). This criterion would apply to both untreated raw water and raw water treated to remove suspended solids.
Note 5.7 for Arsenic (dissolved):
The interim guideline maximum for total arsenic in drinking water is 25 µg/L.
Note 5.8 for Arsenic (total):
The interim guideline maximum for total arsenic in drinking water is 25 µg/L.
Note 5.9 for Boron (dissolved):
The guideline maximum for total boron in drinking water is 5 mg/L.
Note 5.10 for Copper (dissolved):
In raw drinking water with or without treatment, total copper should not exceed 500 µg/L.
Note 5.11 for Copper (total):
In raw drinking water with or without treatment, total copper should not exceed 500 µg/L.
Note 5.12 for Lead (dissolved):
In raw drinking water, with and without treatment, the total lead concentration should not exceed 50 µg/L at any time.
Note 5.13 for Lead (total):
In raw drinking water, with and without treatment, the total lead concentration should not exceed 50 µg/L at any time.
Note 5.14 for Mercury (dissolved):
The concentration of total mercury in raw drinking water should not exceed 1.0 µg/L at any time.
Note 5.15 for Mercury (total):
The concentration of total mercury in raw drinking water should not exceed 1.0 µg/L at any time.
Note 5.16 for Molybdenum (dissolved):
The guideline maximum for total molybdenum in raw untreated drinking water is 0.25 mg/L.
Note 5.17 for Molybdenum (total):

The guideline maximum for total molybdenum in raw untreated drinking water is 0.25 mg/L.

Note 5.18 for Selenium (dissolved):
The guideline maximum for total selenium in drinking water is 10 µg/L.

Note 5.19 for Selenium (total):
The guideline maximum for total selenium in drinking water is 10 µg/L.

Note 5.20 for Zinc (dissolved):
The guideline maximum for total zinc in drinking water is 5.0 mg/L.

Note 5.21 for Zinc (total):
The guideline maximum for total zinc in drinking water is 5.0 mg/L.

Note 5.22 for Nitrate (as N):
Overview Report Update, September 2009

Note 5.23 for Nitrate + Nitrite (as N):
The guideline maximum for nitrate as nitrogen is 10 mg/l. Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed this value. Overview Report Update, September 2009

Note 5.24 for Nitrate + Nitrite (as N) (calculated):
The guideline maximum for nitrate as nitrogen is 10 mg/l. Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed this value. Overview Report Update, September 2009

Note 5.25 for Nitrite (as N):
Overview Report Update, September 2009

Note 5.26 for Phosphorus (dissolved, by ICPMS/ICPOES):
For lakes used as a source of drinking water, the total phosphorous concentration should not exceed 10 µg/L. No guideline is recommended for streams.

Note 5.27 for Phosphorus (total, by ICPMS/ICPOES):
For lakes used as a source of drinking water, the total phosphorous concentration should not exceed 10 µg/L. No guideline is recommended for streams.

6. Notes for Working Water Quality Guidelines for British Columbia for drinking water (BCWWQG DW)

Note 6.1 for Beryllium (dissolved):
The working guideline maximum for total beryllium in drinking water is 4 µg/L. (This is the USEPA drinking water maximum contaminant level for beryllium.)

Note 6.2 for Beryllium (total):
The working guideline maximum for total beryllium in drinking water is 4 µg/L. (This is the USEPA drinking water maximum contaminant level for beryllium.)

Note 6.3 for Thallium (dissolved):
The working guideline maximum for total thallium in drinking water is 2 µg/L. (This is the USEPA drinking water maximum contaminant level for thallium.)

Note 6.4 for Thallium (total):
The working guideline maximum for total thallium in drinking water is 2 µg/L. (This is the USEPA drinking water maximum contaminant level for thallium.)

Appendix D

Water Quality Reports

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	4060249
PO NUMBER		**RECEIVED / TEMP**	Jun-04-14 10:45 / 12°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14
PROJECT INFO		**COC NUMBER**	22894

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Issued By: **Karin Miyazaki For Jennifer Shanko, AScT**
Administration Coordinator

Please contact CARO if more information is needed or to provide feedback on our services.

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analysis Description	**Method Reference** (* = modified from) **Preparation**	**Analysis**	**Location**
Alkalinity, total	N/A	APHA 2320 B	Kelowna
Ammonia-N, total colorimetric	N/A	APHA 4500-NH3 G	Kelowna
Chloride in Water by IC	N/A	APHA 4110 B	Kelowna
Conductivity in Water	N/A	APHA 2510 B	Kelowna
Dissolved Metals	APHA 3030 B	APHA 3125 B	Richmond
Fluoride in Water by IC	N/A	APHA 4110 B	Kelowna
Hardness as CaCO3 (CALC)	N/A	APHA 2340 B	Richmond
Nitrate-N in Water by IC	N/A	APHA 4110 B	Kelowna
Nitrite-N in Water by IC	N/A	APHA 4110 B	Kelowna
pH in Water	N/A	APHA 4500-H+ B	Kelowna
Sulfate in Water by IC	N/A	APHA 4110 B	Kelowna
Total Suspended Solids	N/A	APHA 2540 D	Kelowna
Turbidity	N/A	APHA 2130 B	Kelowna

Note: The numbers in brackets represent the year that the method was published/approved

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
uS/cm	Microsiemens per centimeter

CARO ANALYTICAL SERVICES

SAMPLE ANALYTICAL DATA

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (4060249-01) [Waste Water] Sampled: Jun-02-14 10:10						
Anions						
Alkalinity, Total as CaCO3	**276**	1	mg/L	N/A	Jun-04-14	
Chloride	**23.7**	0.10	mg/L	N/A	Jun-06-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	**0.839**	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**23.5**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**621**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	**0.024**	0.020	mg/L	N/A	Jun-04-14	
pH	**7.87**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Jun-06-14	
Turbidity	< 0.1	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**324**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0005**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.126**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**0.015**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**82.8**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0013**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	< 0.010	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0013**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**28.5**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	**0.0013**	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**0.89**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**4.0**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**13.9**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**0.269**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**10**	1	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (4060249-01) [Waste Water] Sampled: Jun-02-14 10:10, Continued						
Dissolved Metals, Continued						
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00103**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4060249-02) [Waste Water] Sampled: Jun-02-14 10:35						
Anions						
Alkalinity, Total as CaCO3	**319**	1	mg/L	N/A	Jun-04-14	
Chloride	**67.0**	0.10	mg/L	N/A	Jun-05-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	**1.26**	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**37.6**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**857**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Jun-04-14	
pH	**7.92**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Jun-06-14	
Turbidity	**0.2**	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**397**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0004**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.192**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**0.021**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**90.2**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0009**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	< 0.010	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0020**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**41.8**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**1.70**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**4.5**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**42.5**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**0.421**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**16**	1	mg/L	N/A	Jun-07-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4060249-02) [Waste Water] Sampled: Jun-02-14 10:35, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00114**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (4060249-03) [Water] Sampled: Jun-02-14 11:30						
Anions						
Alkalinity, Total as CaCO3	**499**	1	mg/L	N/A	Jun-04-14	
Chloride	**35.8**	0.10	mg/L	N/A	Jun-05-14	
Fluoride	**1.13**	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**135**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**1160**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	**0.261**	0.020	mg/L	N/A	Jun-04-14	
pH	**7.89**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Jun-06-14	
Turbidity	**4.3**	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**692**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.006**	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	**0.0351**	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.024**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	**0.0002**	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**0.153**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**74.0**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	**0.00013**	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0007**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	**0.351**	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0264**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**123**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	**0.0054**	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	**0.0012**	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**4.76**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**7.4**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**25.4**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**1.81**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**52**	1	mg/L	N/A	Jun-07-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (4060249-03) [Water] Sampled: Jun-02-14 11:30, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	**0.0002**	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00014**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	**0.0012**	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (4060249-04) [Water] Sampled: Jun-02-14 12:00						
Anions						
Alkalinity, Total as CaCO3	**392**	1	mg/L	N/A	Jun-04-14	
Chloride	**20.6**	0.10	mg/L	N/A	Jun-05-14	
Fluoride	**0.28**	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	**0.647**	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**150**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**979**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	**0.028**	0.020	mg/L	N/A	Jun-04-14	
pH	**7.90**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Jun-06-14	
Turbidity	**5.5**	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**571**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0004**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	**0.0012**	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.015**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**0.070**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**75.1**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	**0.00126**	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0668**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	**0.011**	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0178**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**93.0**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	**0.0021**	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0014**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	**0.0027**	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**3.66**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	**0.0008**	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**7.4**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**20.2**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**2.07**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**58**	1	mg/L	N/A	Jun-07-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (4060249-04) [Water] Sampled: Jun-02-14 12:00, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00262**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	**0.045**	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	**0.0004**	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4060249-05) [Water] Sampled: Jun-02-14 13:15						
Anions						
Alkalinity, Total as CaCO3	**514**	1	mg/L	N/A	Jun-04-14	
Chloride	**672**	0.10	mg/L	N/A	Jun-05-14	
Fluoride	**0.27**	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	**0.206**	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**38.1**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**2940**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	**0.118**	0.020	mg/L	N/A	Jun-04-14	
pH	**7.94**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	**300**	1	mg/L	N/A	Jun-06-14	
Turbidity	**292**	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**800**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	**0.0024**	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.192**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**0.031**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**103**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	**0.00111**	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0011**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	**0.111**	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0223**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**132**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	**0.0380**	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0006**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	**0.0045**	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**6.05**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**9.2**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**356**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**1.43**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**18**	1	mg/L	N/A	Jun-07-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4060249-05) [Water] Sampled: Jun-02-14 13:15, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00205**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (4060249-06) [Waste Water] Sampled: Jun-02-14 14:30						
Anions						
Alkalinity, Total as CaCO3	**818**	1	mg/L	N/A	Jun-04-14	
Chloride	**650**	0.10	mg/L	N/A	Jun-05-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrate as N	**52.1**	0.010	mg/L	N/A	Jun-05-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Jun-05-14	
Sulfate	**858**	1.0	mg/L	N/A	Jun-05-14	
General Parameters						
Conductivity (EC)	**4840**	2	uS/cm	N/A	Jun-04-14	
Nitrogen, Ammonia as N, Total	**0.390**	0.020	mg/L	N/A	Jun-04-14	
pH	**7.65**	0.01	pH units	N/A	Jun-04-14	
Solids, Total Suspended	**19**	1	mg/L	N/A	Jun-06-14	
Turbidity	**3.7**	0.1	NTU	N/A	Jun-05-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1990**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Barium, dissolved	**0.059**	0.005	mg/L	N/A	Jun-07-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Boron, dissolved	**1.67**	0.004	mg/L	N/A	Jun-07-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Jun-07-14	
Calcium, dissolved	**218**	0.2	mg/L	N/A	Jun-07-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Cobalt, dissolved	**0.00100**	0.00005	mg/L	N/A	Jun-07-14	
Copper, dissolved	**0.0169**	0.0002	mg/L	N/A	Jun-07-14	
Iron, dissolved	< 0.010	0.010	mg/L	N/A	Jun-07-14	
Lead, dissolved	**0.0006**	0.0001	mg/L	N/A	Jun-07-14	
Lithium, dissolved	**0.0520**	0.0001	mg/L	N/A	Jun-07-14	
Magnesium, dissolved	**351**	0.01	mg/L	N/A	Jun-07-14	
Manganese, dissolved	**0.0908**	0.0002	mg/L	N/A	Jun-07-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Jun-07-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Jun-07-14	
Nickel, dissolved	**0.0078**	0.0002	mg/L	N/A	Jun-07-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-07-14	
Potassium, dissolved	**222**	0.02	mg/L	N/A	Jun-07-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-07-14	
Silicon, dissolved	**12.0**	0.5	mg/L	N/A	Jun-07-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-07-14	
Sodium, dissolved	**372**	0.02	mg/L	N/A	Jun-07-14	
Strontium, dissolved	**2.15**	0.001	mg/L	N/A	Jun-07-14	
Sulfur, dissolved	**337**	1	mg/L	N/A	Jun-07-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (4060249-06) [Waste Water] Sampled: Jun-02-14 14:30, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	**0.00005**	0.00002	mg/L	N/A	Jun-07-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-07-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-07-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-07-14	
Uranium, dissolved	**0.00721**	0.00002	mg/L	N/A	Jun-07-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-07-14	
Zinc, dissolved	**0.009**	0.004	mg/L	N/A	Jun-07-14	
Zirconium, dissolved	**0.0001**	0.0001	mg/L	N/A	Jun-07-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4060249
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-11-14

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Anions, Batch B4F0151										
Blank (B4F0151-BLK1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Blank (B4F0151-BLK2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Blank (B4F0151-BLK3)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
LCS (B4F0151-BS1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Alkalinity, Total as CaCO3	103	1	mg/L	100		103	96-108			
LCS (B4F0151-BS2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Alkalinity, Total as CaCO3	103	1	mg/L	100		103	96-108			
LCS (B4F0151-BS3)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Alkalinity, Total as CaCO3	106	1	mg/L	100		106	96-108			
Anions, Batch B4F0246										
Blank (B4F0246-BLK1)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B4F0246-BLK2)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Anions, Batch B4F0246, Continued										
Blank (B4F0246-BLK3)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B4F0246-BS1)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Chloride	15.6	0.10	mg/L	16.0		97	85-115			
Fluoride	3.91	0.10	mg/L	4.00		98	85-115			
Nitrogen, Nitrate as N	4.03	0.010	mg/L	4.00		101	85-115			
Nitrogen, Nitrite as N	1.98	0.010	mg/L	2.00		99	85-115			
Sulfate	16.2	1.0	mg/L	16.0		101	85-115			
LCS (B4F0246-BS2)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Chloride	15.6	0.10	mg/L	16.0		97	85-115			
Fluoride	3.87	0.10	mg/L	4.00		97	85-115			
Nitrogen, Nitrate as N	4.06	0.010	mg/L	4.00		101	85-115			
Nitrogen, Nitrite as N	1.98	0.010	mg/L	2.00		99	85-115			
Sulfate	16.1	1.0	mg/L	16.0		101	85-115			
LCS (B4F0246-BS3)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Chloride	15.6	0.10	mg/L	16.0		97	85-115			
Fluoride	4.08	0.10	mg/L	4.00		102	85-115			
Nitrogen, Nitrate as N	4.09	0.010	mg/L	4.00		102	85-115			
Nitrogen, Nitrite as N	1.99	0.010	mg/L	2.00		99	85-115			
Sulfate	16.1	1.0	mg/L	16.0		101	85-115			
Duplicate (B4F0246-DUP2)		**Source: 4060249-05**		Prepared: Jun-07-14, Analyzed: Jun-07-14						
Chloride	673	0.10	mg/L		672			< 1	10	
Fluoride	0.25	0.10	mg/L		0.27				10	
Nitrogen, Nitrate as N	0.204	0.010	mg/L		0.206			< 1	10	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L		< 0.010				10	
Sulfate	39.0	1.0	mg/L		38.1			2	10	
Dissolved Metals, Batch B4F0237										
Blank (B4F0237-BLK1)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4F0237, Continued										
Blank (B4F0237-BLK1), Continued				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Duplicate (B4F0237-DUP1)		**Source: 4060249-04**		Prepared: Jun-07-14, Analyzed: Jun-07-14						
Aluminum, dissolved	0.021	0.005	mg/L		< 0.005				11	
Antimony, dissolved	0.0003	0.0001	mg/L		0.0004				44	
Arsenic, dissolved	0.0012	0.0005	mg/L		0.0012				8	
Barium, dissolved	0.016	0.005	mg/L		0.015				7	
Beryllium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, dissolved	0.068	0.004	mg/L		0.070			4	13	
Cadmium, dissolved	0.00001	0.00001	mg/L		0.00002				27	
Calcium, dissolved	72.7	0.2	mg/L		75.1			3	8	
Chromium, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				14	
Cobalt, dissolved	0.00136	0.00005	mg/L		0.00126			8	10	
Copper, dissolved	0.0715	0.0002	mg/L		0.0668			7	28	
Iron, dissolved	0.012	0.010	mg/L		0.011				14	
Lead, dissolved	0.0003	0.0001	mg/L		0.0003				26	
Lithium, dissolved	0.0172	0.0001	mg/L		0.0178			3	14	
Magnesium, dissolved	98.4	0.01	mg/L		93.0			6	6	
Manganese, dissolved	0.0023	0.0002	mg/L		0.0021			7	9	
Molybdenum, dissolved	0.0016	0.0001	mg/L		0.0014			8	19	
Nickel, dissolved	0.0031	0.0002	mg/L		0.0027			14	21	
Phosphorus, dissolved	< 0.02	0.02	mg/L		< 0.02				14	
Potassium, dissolved	3.90	0.02	mg/L		3.66			6	8	
Selenium, dissolved	0.0016	0.0005	mg/L		0.0008				36	
Silicon, dissolved	7.8	0.5	mg/L		7.4			5	12	
Silver, dissolved	< 0.00005	0.00005	mg/L		< 0.00005				20	
Sodium, dissolved	21.4	0.02	mg/L		20.2			6	6	
Strontium, dissolved	2.20	0.001	mg/L		2.07			6	6	
Sulfur, dissolved	62	1	mg/L		58			6	26	
Tellurium, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, dissolved	< 0.00002	0.00002	mg/L		< 0.00002				13	
Thorium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				30	
Tin, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				6	
Titanium, dissolved	< 0.005	0.005	mg/L		< 0.005				20	
Uranium, dissolved	0.00253	0.00002	mg/L		0.00262			3	14	
Vanadium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Zinc, dissolved	0.045	0.004	mg/L		0.045			< 1	11	
Zirconium, dissolved	0.0004	0.0001	mg/L		0.0004				36	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4F0237, Continued										
Matrix Spike (B4F0237-MS1)		**Source: 4060249-05**		Prepared: Jun-07-14, Analyzed: Jun-07-14						
Antimony, dissolved	0.382	0.0001	mg/L	0.400	0.0003	95	76-114			
Arsenic, dissolved	0.192	0.0005	mg/L	0.200	0.0024	95	81-115			
Barium, dissolved	1.12	0.005	mg/L	1.00	0.192	93	80-113			
Beryllium, dissolved	0.105	0.0001	mg/L	0.100	< 0.0001	105	69-109			
Cadmium, dissolved	0.0923	0.00001	mg/L	0.100	0.00002	92	83-110			
Chromium, dissolved	0.385	0.0005	mg/L	0.400	< 0.0005	96	85-115			
Cobalt, dissolved	0.398	0.00005	mg/L	0.400	0.00111	99	86-114			
Copper, dissolved	0.385	0.0002	mg/L	0.400	0.0011	96	82-119			
Iron, dissolved	2.10	0.010	mg/L	2.00	0.111	100	80-116			
Lead, dissolved	0.177	0.0001	mg/L	0.200	< 0.0001	89	83-112			
Manganese, dissolved	0.413	0.0002	mg/L	0.400	0.0380	94	62-131			
Nickel, dissolved	0.375	0.0002	mg/L	0.400	0.0045	93	81-115			
Selenium, dissolved	0.0938	0.0005	mg/L	0.100	< 0.0005	94	79-115			
Silver, dissolved	0.0937	0.00005	mg/L	0.100	< 0.00005	94	69-121			
Thallium, dissolved	0.0922	0.00002	mg/L	0.100	0.00002	92	84-115			
Vanadium, dissolved	0.394	0.001	mg/L	0.400	< 0.001	98	83-113			
Zinc, dissolved	0.955	0.004	mg/L	1.00	< 0.004	95	82-115			
Reference (B4F0237-SRM1)				Prepared: Jun-07-14, Analyzed: Jun-07-14						
Aluminum, dissolved	0.233	0.005	mg/L	0.233		100	58-142			
Antimony, dissolved	0.0507	0.0001	mg/L	0.0430		118	75-125			
Arsenic, dissolved	0.427	0.0005	mg/L	0.438		98	81-119			
Barium, dissolved	3.41	0.005	mg/L	3.35		102	83-117			
Beryllium, dissolved	0.233	0.0001	mg/L	0.213		109	80-120			
Boron, dissolved	2.03	0.004	mg/L	1.74		117	74-117			
Cadmium, dissolved	0.217	0.00001	mg/L	0.224		97	83-117			
Calcium, dissolved	8.1	0.2	mg/L	7.69		105	76-124			
Chromium, dissolved	0.452	0.0005	mg/L	0.437		103	81-119			
Cobalt, dissolved	0.127	0.00005	mg/L	0.128		100	76-124			
Copper, dissolved	0.889	0.0002	mg/L	0.844		105	84-116			
Iron, dissolved	1.33	0.010	mg/L	1.29		103	74-126			
Lead, dissolved	0.106	0.0001	mg/L	0.112		95	72-128			
Lithium, dissolved	0.118	0.0001	mg/L	0.104		113	60-140			
Magnesium, dissolved	7.39	0.01	mg/L	6.92		107	81-119			
Manganese, dissolved	0.337	0.0002	mg/L	0.345		98	84-116			
Molybdenum, dissolved	0.422	0.0001	mg/L	0.426		99	83-117			
Nickel, dissolved	0.837	0.0002	mg/L	0.840		100	74-126			
Phosphorus, dissolved	0.53	0.02	mg/L	0.495		108	68-132			
Potassium, dissolved	3.05	0.02	mg/L	3.19		96	74-126			
Selenium, dissolved	0.0312	0.0005	mg/L	0.0331		94	70-130			
Sodium, dissolved	19.3	0.02	mg/L	19.1		101	72-128			
Strontium, dissolved	0.925	0.001	mg/L	0.916		101	84-113			
Thallium, dissolved	0.0369	0.00002	mg/L	0.0393		94	57-143			
Uranium, dissolved	0.267	0.00002	mg/L	0.266		100	85-115			
Vanadium, dissolved	0.872	0.001	mg/L	0.869		100	87-113			
Zinc, dissolved	0.871	0.004	mg/L	0.881		99	72-128			
General Parameters, Batch B4F0144										
Blank (B4F0144-BLK1)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Solids, Total Suspended	< 1	1	mg/L							
Blank (B4F0144-BLK2)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Solids, Total Suspended	< 1	1	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
General Parameters, Batch B4F0144, Continued										
LCS (B4F0144-BS1)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Solids, Total Suspended	49	1	mg/L	50.0		99	85-110			
LCS (B4F0144-BS2)				Prepared: Jun-06-14, Analyzed: Jun-06-14						
Solids, Total Suspended	47	1	mg/L	50.0		94	85-110			
General Parameters, Batch B4F0151										
Blank (B4F0151-BLK1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Conductivity (EC)	< 2	2	uS/cm							
Blank (B4F0151-BLK2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Conductivity (EC)	< 2	2	uS/cm							
Blank (B4F0151-BLK3)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Conductivity (EC)	< 2	2	uS/cm							
LCS (B4F0151-BS4)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Conductivity (EC)	1400	2	uS/cm	1410		99	93-104			
LCS (B4F0151-BS5)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Conductivity (EC)	1400	2	uS/cm	1410		99	93-104			
LCS (B4F0151-BS6)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Conductivity (EC)	1410	2	uS/cm	1410		100	93-104			
Reference (B4F0151-SRM1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
pH	6.99	0.01	pH units	7.00		100	98-102			
Reference (B4F0151-SRM2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
pH	7.00	0.01	pH units	7.00		100	98-102			
Reference (B4F0151-SRM3)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
pH	6.99	0.01	pH units	7.00		100	98-102			
General Parameters, Batch B4F0160										
Blank (B4F0160-BLK1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							
Blank (B4F0160-BLK2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							
LCS (B4F0160-BS1)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Nitrogen, Ammonia as N, Total	10.0	0.020	mg/L	10.0		100	86-111			
LCS (B4F0160-BS2)				Prepared: Jun-04-14, Analyzed: Jun-04-14						
Nitrogen, Ammonia as N, Total	9.99	0.020	mg/L	10.0		100	86-111			
Duplicate (B4F0160-DUP2)			**Source: 4060249-02**	Prepared: Jun-04-14, Analyzed: Jun-04-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L		< 0.020				15	
General Parameters, Batch B4F0175										
Blank (B4F0175-BLK1)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Turbidity	< 0.1	0.1	NTU							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4060249
REPORTED Jun-11-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
General Parameters, Batch B4F0175, Continued										
LCS (B4F0175-BS1)				Prepared: Jun-05-14, Analyzed: Jun-05-14						
Turbidity	42.0	0.1	NTU	40.0		105	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	4081094
PO NUMBER		**RECEIVED / TEMP**	Aug-19-14 08:05 / 3°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14
PROJECT INFO		**COC NUMBER**	B 19284

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Issued By: **Jennifer Shanko, AScT**
Administration Coordinator

Please contact CARO if more information is needed or to provide feedback on our services.

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www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analysis Description	**Method Reference** (* = modified from) **Preparation**	**Analysis**	**Location**
Alkalinity, total	N/A	APHA 2320 B	Kelowna
Ammonia-N, total colorimetric	N/A	APHA 4500-NH3 G	Kelowna
Chloride in Water by IC	N/A	APHA 4110 B	Kelowna
Conductivity in Water	N/A	APHA 2510 B	Kelowna
Dissolved Metals	APHA 3030 B	APHA 3125 B	Richmond
Fluoride in Water by IC	N/A	APHA 4110 B	Kelowna
Hardness as CaCO3 (CALC)	N/A	APHA 2340 B	Richmond
Nitrate-N in Water by IC	N/A	APHA 4110 B	Kelowna
Nitrite-N in Water by IC	N/A	APHA 4110 B	Kelowna
Orthophosphate as P by IC	N/A	APHA 4110 B	Kelowna
pH in Water	N/A	APHA 4500-H+ B	Kelowna
Sulfate in Water by IC	N/A	APHA 4110 B	Kelowna
Total Suspended Solids	N/A	APHA 2540 D	Kelowna
Turbidity	N/A	APHA 2130 B	Kelowna

Note: The numbers in brackets represent the year that the method was published/approved

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
uS/cm	Microsiemens per centimeter

SAMPLE ANALYTICAL DATA

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4081094-01) [Waste Water] Sampled: Aug-18-14 08:55						
Anions						
Alkalinity, Total as CaCO3	**320**	1	mg/L	N/A	Aug-19-14	
Chloride	**69.7**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**1.55**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**39.7**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**880**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Aug-20-14	
pH	**7.65**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Aug-20-14	
Turbidity	< 0.1	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**392**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.021**	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0005**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.195**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**0.024**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	**0.00003**	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**92.1**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00007**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	**0.0014**	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.031**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	**0.0001**	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0022**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**39.4**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.0068**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0015**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.11**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**1.84**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**4.6**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**44.5**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**0.457**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**12**	1	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4081094-01) [Waste Water] Sampled: Aug-18-14 08:55, Continued						
Dissolved Metals, Continued						
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00143**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (4081094-02) [Waste Water] Sampled: Aug-18-14 09:45						
Anions						
Alkalinity, Total as CaCO3	**277**	1	mg/L	N/A	Aug-19-14	
Chloride	**26.2**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**0.993**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**24.1**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**634**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Aug-20-14	
pH	**7.70**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Aug-20-14	
Turbidity	< 0.1	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**325**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.011**	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.136**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**0.012**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**82.7**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00007**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	**0.0028**	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.033**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	**0.0002**	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0014**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**28.7**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.0082**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0012**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.07**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**0.95**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**4.4**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**15.4**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**0.301**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**8**	1	mg/L	N/A	Aug-20-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (4081094-02) [Waste Water] Sampled: Aug-18-14 09:45, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00114**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	**0.010**	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (4081094-03) [Water] Sampled: Aug-18-14 10:55						
Anions						
Alkalinity, Total as CaCO3	**479**	1	mg/L	N/A	Aug-19-14	
Chloride	**39.7**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	**0.84**	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**0.199**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**127**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**1140**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	**0.280**	0.020	mg/L	N/A	Aug-20-14	
pH	**7.66**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	**1**	1	mg/L	N/A	Aug-20-14	
Turbidity	**3.7**	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**650**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.005**	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	**0.0378**	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.024**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	**0.0001**	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**0.138**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	**0.00001**	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**73.1**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00012**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.378**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	**0.0002**	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0252**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**114**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.0158**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0021**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.04**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**5.06**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**8.0**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**28.4**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**1.76**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**46**	1	mg/L	N/A	Aug-20-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (4081094-03) [Water] Sampled: Aug-18-14 10:55, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00014**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	< 0.004	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	**0.0012**	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (4081094-04) [Water] Sampled: Aug-18-14 11:25						
Anions						
Alkalinity, Total as CaCO3	**399**	1	mg/L	N/A	Aug-19-14	
Chloride	**19.7**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	**0.32**	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**0.443**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**250**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**1170**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	**0.814**	0.020	mg/L	N/A	Aug-20-14	
pH	**7.64**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Aug-20-14	
Turbidity	**0.2**	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**635**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	**0.0014**	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.017**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**0.286**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	**0.00001**	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**86.4**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00133**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	**0.0060**	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.021**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	**0.0002**	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0385**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**102**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.0127**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0008**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0026**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.02**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**7.73**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	**0.0007**	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**7.3**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**34.8**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**4.53**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**87**	1	mg/L	N/A	Aug-20-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (4081094-04) [Water] Sampled: Aug-18-14 11:25, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00152**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	**0.028**	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	**0.0006**	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4081094-05) [Water] Sampled: Aug-18-14 15:00						
Anions						
Alkalinity, Total as CaCO3	**476**	1	mg/L	N/A	Aug-19-14	
Chloride	**672**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	**0.13**	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**1.11**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**44.7**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**3180**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	**0.023**	0.020	mg/L	N/A	Aug-20-14	
pH	**7.74**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	**284**	1	mg/L	N/A	Aug-20-14	
Turbidity	**186**	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**833**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.006**	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	**0.0042**	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.235**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**0.035**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	**0.00003**	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**116**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00024**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	**0.0040**	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.015**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0219**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**132**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.0049**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	**0.00002**	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0032**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.02**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**6.82**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	**0.0006**	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**9.9**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**399**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**1.52**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**17**	1	mg/L	N/A	Aug-20-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4081094-05) [Water] Sampled: Aug-18-14 15:00, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	**0.00004**	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00210**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (4081094-06) [Waste Water] Sampled: Aug-18-14 13:05						
Anions						
Alkalinity, Total as CaCO3	**802**	1	mg/L	N/A	Aug-19-14	
Chloride	**491**	0.10	mg/L	N/A	Aug-19-14	
Fluoride	**0.11**	0.10	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrate as N	**41.8**	0.010	mg/L	N/A	Aug-19-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-19-14	
Sulfate	**784**	1.0	mg/L	N/A	Aug-19-14	
General Parameters						
Conductivity (EC)	**4750**	2	uS/cm	N/A	Aug-19-14	
Nitrogen, Ammonia as N, Total	**0.588**	0.020	mg/L	N/A	Aug-20-14	
pH	**7.39**	0.01	pH units	N/A	Aug-19-14	
Solids, Total Suspended	**66**	1	mg/L	N/A	Aug-20-14	
Turbidity	**47.2**	0.1	NTU	N/A	Aug-19-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1920**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Antimony, dissolved	**0.0005**	0.0001	mg/L	N/A	Aug-20-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Barium, dissolved	**0.054**	0.005	mg/L	N/A	Aug-20-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Boron, dissolved	**1.60**	0.004	mg/L	N/A	Aug-20-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Aug-20-14	
Calcium, dissolved	**217**	0.2	mg/L	N/A	Aug-20-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-20-14	
Cobalt, dissolved	**0.00118**	0.00005	mg/L	N/A	Aug-20-14	
Copper, dissolved	**0.0017**	0.0002	mg/L	N/A	Aug-20-14	
Iron, dissolved	**0.012**	0.010	mg/L	N/A	Aug-20-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Lithium, dissolved	**0.0497**	0.0001	mg/L	N/A	Aug-20-14	
Magnesium, dissolved	**335**	0.01	mg/L	N/A	Aug-20-14	
Manganese, dissolved	**0.121**	0.0002	mg/L	N/A	Aug-20-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Aug-20-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Aug-20-14	
Nickel, dissolved	**0.0097**	0.0002	mg/L	N/A	Aug-20-14	
Phosphorus, dissolved	**0.02**	0.02	mg/L	N/A	Aug-20-14	
Potassium, dissolved	**232**	0.02	mg/L	N/A	Aug-20-14	
Selenium, dissolved	**0.0006**	0.0005	mg/L	N/A	Aug-20-14	
Silicon, dissolved	**12.3**	0.5	mg/L	N/A	Aug-20-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-20-14	
Sodium, dissolved	**385**	0.02	mg/L	N/A	Aug-20-14	
Strontium, dissolved	**2.06**	0.001	mg/L	N/A	Aug-20-14	
Sulfur, dissolved	**340**	1	mg/L	N/A	Aug-20-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (4081094-06) [Waste Water] Sampled: Aug-18-14 13:05, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	**0.00007**	0.00002	mg/L	N/A	Aug-20-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-20-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Aug-20-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-20-14	
Uranium, dissolved	**0.00777**	0.00002	mg/L	N/A	Aug-20-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-20-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Aug-20-14	
Zirconium, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-20-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4081094
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Aug-26-14

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Anions, Batch B4H0790										
Blank (B4H0790-BLK1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B4H0790-BS1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Chloride	16.3	0.10	mg/L	16.0		102	85-115			
Fluoride	3.83	0.10	mg/L	4.00		96	85-115			
Nitrogen, Nitrate as N	4.21	0.010	mg/L	4.00		105	85-115			
Nitrogen, Nitrite as N	1.95	0.010	mg/L	2.00		98	85-115			
Sulfate	16.1	1.0	mg/L	16.0		101	85-115			
Duplicate (B4H0790-DUP1)		**Source: 4081094-01**		Prepared: Aug-19-14, Analyzed: Aug-19-14						
Chloride	69.0	0.10	mg/L		69.7			1	10	
Fluoride	< 0.10	0.10	mg/L		< 0.10				10	
Nitrogen, Nitrate as N	1.56	0.010	mg/L		1.55			< 1	10	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L		< 0.010				10	
Sulfate	39.5	1.0	mg/L		39.7			< 1	10	
Anions, Batch B4H0793										
Blank (B4H0793-BLK1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
LCS (B4H0793-BS1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Alkalinity, Total as CaCO3	101	1	mg/L	100		101	96-108			
Duplicate (B4H0793-DUP1)		**Source: 4081094-03**		Prepared: Aug-19-14, Analyzed: Aug-19-14						
Alkalinity, Total as CaCO3	485	1	mg/L		479			1	10	
Dissolved Metals, Batch B4H0851										

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4H0851, Continued										
Blank (B4H0851-BLK1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Reference (B4H0851-SRM1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Aluminum, dissolved	0.213	0.005	mg/L	0.233		92	58-142			
Antimony, dissolved	0.0513	0.0001	mg/L	0.0430		119	75-125			
Arsenic, dissolved	0.413	0.0005	mg/L	0.438		94	81-119			
Barium, dissolved	3.23	0.005	mg/L	3.35		96	83-117			
Beryllium, dissolved	0.211	0.0001	mg/L	0.213		99	80-120			
Boron, dissolved	1.80	0.004	mg/L	1.74		104	74-117			
Cadmium, dissolved	0.215	0.00001	mg/L	0.224		96	83-117			
Calcium, dissolved	7.9	0.2	mg/L	7.69		103	76-124			
Chromium, dissolved	0.431	0.0005	mg/L	0.437		99	81-119			
Cobalt, dissolved	0.131	0.00005	mg/L	0.128		102	76-124			
Copper, dissolved	0.857	0.0002	mg/L	0.844		102	84-116			
Iron, dissolved	1.27	0.010	mg/L	1.29		98	74-126			
Lead, dissolved	0.113	0.0001	mg/L	0.112		101	72-128			
Lithium, dissolved	0.112	0.0001	mg/L	0.104		107	60-140			
Magnesium, dissolved	6.60	0.01	mg/L	6.92		95	81-119			
Manganese, dissolved	0.344	0.0002	mg/L	0.345		100	84-116			
Molybdenum, dissolved	0.439	0.0001	mg/L	0.426		103	83-117			
Nickel, dissolved	0.854	0.0002	mg/L	0.840		102	74-126			
Phosphorus, dissolved	0.57	0.02	mg/L	0.495		116	68-132			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4H0851, Continued										
Reference (B4H0851-SRM1), Continued				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Potassium, dissolved	2.97	0.02	mg/L	3.19		93	74-126			
Selenium, dissolved	0.0312	0.0005	mg/L	0.0331		94	70-130			
Sodium, dissolved	18.2	0.02	mg/L	19.1		95	72-128			
Strontium, dissolved	0.865	0.001	mg/L	0.916		94	84-113			
Thallium, dissolved	0.0390	0.00002	mg/L	0.0393		99	57-143			
Uranium, dissolved	0.265	0.00002	mg/L	0.266		100	85-115			
Vanadium, dissolved	0.828	0.001	mg/L	0.869		95	87-113			
Zinc, dissolved	0.848	0.004	mg/L	0.881		96	72-128			
General Parameters, Batch B4H0766										
Blank (B4H0766-BLK1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Turbidity	< 0.1	0.1	NTU							
LCS (B4H0766-BS1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Turbidity	40.0	0.1	NTU	40.0		100	85-115			
Duplicate (B4H0766-DUP1)			**Source: 4081094-03**	Prepared: Aug-19-14, Analyzed: Aug-19-14						
Turbidity	3.8	0.1	NTU		3.7			4	15	
General Parameters, Batch B4H0793										
Blank (B4H0793-BLK1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Conductivity (EC)	< 2	2	uS/cm							
LCS (B4H0793-BS2)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
Conductivity (EC)	1410	2	uS/cm	1410		100	93-104			
Duplicate (B4H0793-DUP1)			**Source: 4081094-03**	Prepared: Aug-19-14, Analyzed: Aug-19-14						
Conductivity (EC)	1140	2	uS/cm		1140			< 1	5	
pH	7.68	0.01	pH units		7.66			< 1	5	
Reference (B4H0793-SRM1)				Prepared: Aug-19-14, Analyzed: Aug-19-14						
pH	6.99	0.01	pH units	7.00		100	98-102			
General Parameters, Batch B4H0816										
Blank (B4H0816-BLK1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Solids, Total Suspended	< 1	1	mg/L							
Blank (B4H0816-BLK2)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Solids, Total Suspended	< 1	1	mg/L							
LCS (B4H0816-BS1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Solids, Total Suspended	50	1	mg/L	50.0		101	85-110			
LCS (B4H0816-BS2)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Solids, Total Suspended	50	1	mg/L	50.0		100	85-110			
General Parameters, Batch B4H0845										
Blank (B4H0845-BLK1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							
Blank (B4H0845-BLK2)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4081094
REPORTED Aug-26-14

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
General Parameters, Batch B4H0845, Continued										
LCS (B4H0845-BS1)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Nitrogen, Ammonia as N, Total	10.0	0.020	mg/L	10.0		100	86-111			
LCS (B4H0845-BS2)				Prepared: Aug-20-14, Analyzed: Aug-20-14						
Nitrogen, Ammonia as N, Total	9.97	0.020	mg/L	10.0		100	86-111			

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	4110161
PO NUMBER	14-024-016	**RECEIVED / TEMP**	Nov-05-14 08:05 / 2°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14
PROJECT INFO	Golden	**COC NUMBER**	B 02264

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Issued By: **Karin Miyazaki For Jennifer Shanko, AScT**
Administration Coordinator

Please contact CARO if more information is needed or to provide feedback on our services.

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www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14

Analysis Description	Method Reference	Technique	Location
Alkalinity (Total)	APHA 2320 B	Titration with H2SO4 to pH 4.5	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3)	APHA 2340 B	Calculation	N/A
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Ammonia-N in Water	APHA 4500-NH3 G	Automated Colorimetry (Phenate)	Kelowna
Total Suspended Solids	APHA 2540 D	Gravimetry (Dried at 103-105C)	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre

SAMPLE ANALYTICAL DATA

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4110161
REPORTED Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4110161-01) [Waste Water] Sampled: Nov-04-14 08:45						
Anions						
Chloride	**70.2**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**1.57**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**40.7**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**319**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**900**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Nov-06-14	
pH	**7.85**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Nov-06-14	
Turbidity	< 0.1	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**378**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0002**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.210**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**0.014**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**88.7**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00006**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0014**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	< 0.010	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	**0.0001**	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0020**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**38.0**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.0012**	0.0002	mg/L	N/A	Nov-12-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0002**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0004**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**1.90**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**4.9**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**48.5**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**0.438**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**13**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4110161
REPORTED Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (4110161-01) [Waste Water] Sampled: Nov-04-14 08:45, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00123**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Sample ID: Town Well #6 (4110161-02) [Waste Water] Sampled: Nov-04-14 09:30						
Anions						
Chloride	**34.5**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	< 0.10	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**1.23**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**24.3**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**291**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**679**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Nov-06-14	
pH	**7.86**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Nov-06-14	
Turbidity	**0.1**	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**322**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0002**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.146**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**0.006**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**84.3**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00006**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0024**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	**0.013**	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0013**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**27.1**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.0014**	0.0002	mg/L	N/A	Nov-12-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4110161
REPORTED Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (4110161-02) [Waste Water] Sampled: Nov-04-14 09:30, Continued						
Dissolved Metals, Continued						
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0004**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**0.94**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**4.5**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**17.9**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**0.290**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**7**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00114**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Sample ID: DMW - 1b (4110161-03) [Water] Sampled: Nov-04-14 09:50						
Anions						
Chloride	**40.1**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	**1.15**	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**0.397**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**122**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**478**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**1160**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	**0.240**	0.020	mg/L	N/A	Nov-06-14	
pH	**7.81**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Nov-06-14	
Turbidity	**4.3**	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**606**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0002**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	**0.0436**	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.026**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	**0.0001**	0.0001	mg/L	N/A	Nov-12-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (4110161-03) [Water] Sampled: Nov-04-14 09:50, Continued						
Dissolved Metals, Continued						
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**0.134**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	**0.00001**	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**70.5**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00008**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0004**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	**0.404**	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0252**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**104**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.0048**	0.0002	mg/L	N/A	Nov-12-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0016**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**4.94**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**8.4**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**30.1**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**1.71**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**47**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	**0.0003**	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00009**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	**0.0015**	0.0001	mg/L	N/A	Nov-12-14	
Sample ID: DMW - 4 (4110161-04) [Water] Sampled: Nov-04-14 10:20						
Anions						
Chloride	**17.4**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	**0.42**	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**0.602**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**213**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**416**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**1120**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	**0.341**	0.020	mg/L	N/A	Nov-06-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (4110161-04) [Water] Sampled: Nov-04-14 10:20, Continued						
General Parameters, Continued						
pH	**7.81**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	< 1	1	mg/L	N/A	Nov-06-14	
Turbidity	**0.2**	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**584**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	**0.0013**	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.017**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**0.218**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**79.9**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00106**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0065**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	**0.014**	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	**0.0003**	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0317**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**93.3**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.0043**	0.0002	mg/L	N/A	Nov-12-14	
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0010**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0019**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**6.80**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	**0.0007**	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**7.9**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**31.6**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**3.80**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**80**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00175**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.032**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	**0.0006**	0.0001	mg/L	N/A	Nov-12-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4110161-05) [Water] Sampled: Nov-04-14 11:20						
Anions						
Chloride	**700**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	**0.26**	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**0.723**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**47.5**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**592**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**3310**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	**0.030**	0.020	mg/L	N/A	Nov-06-14	
pH	**7.82**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	**1240**	1	mg/L	N/A	Nov-06-14	
Turbidity	**1180**	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**826**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.010**	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0013**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	**0.0016**	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.242**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**0.024**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	**0.00001**	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**116**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00096**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0008**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	**0.049**	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0212**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**130**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.0270**	0.0002	mg/L	N/A	Nov-12-14	
Mercury, dissolved	**0.00002**	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0007**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0039**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**6.66**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**10.4**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**436**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**1.56**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**20**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 4110161
REPORTED Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (4110161-05) [Water] Sampled: Nov-04-14 11:20, Continued						
Dissolved Metals, Continued						
Thallium, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00227**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.012**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	**0.0025**	0.0001	mg/L	N/A	Nov-12-14	
Sample ID: MW-6s (4110161-06) [Waste Water] Sampled: Nov-04-14 12:20						
Anions						
Chloride	**529**	0.10	mg/L	N/A	Nov-06-14	
Fluoride	**0.25**	0.10	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrate as N	**48.9**	0.010	mg/L	N/A	Nov-06-14	
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-06-14	
Sulfate	**879**	1.0	mg/L	N/A	Nov-06-14	
General Parameters						
Alkalinity, Total as CaCO3	**832**	1	mg/L	N/A	Nov-05-14	
Conductivity (EC)	**4850**	2	µS/cm	N/A	Nov-05-14	
Nitrogen, Ammonia as N, Total	**0.408**	0.020	mg/L	N/A	Nov-06-14	
pH	**7.49**	0.01	pH units	N/A	Nov-05-14	
Solids, Total Suspended	**292**	1	mg/L	N/A	Nov-06-14	
Turbidity	**196**	0.1	NTU	N/A	Nov-06-14	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1880**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.005**	0.005	mg/L	N/A	Nov-12-14	
Antimony, dissolved	**0.0003**	0.0001	mg/L	N/A	Nov-12-14	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Barium, dissolved	**0.058**	0.005	mg/L	N/A	Nov-12-14	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Boron, dissolved	**1.61**	0.004	mg/L	N/A	Nov-12-14	
Cadmium, dissolved	**0.00001**	0.00001	mg/L	N/A	Nov-12-14	
Calcium, dissolved	**209**	0.2	mg/L	N/A	Nov-12-14	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-12-14	
Cobalt, dissolved	**0.00133**	0.00005	mg/L	N/A	Nov-12-14	
Copper, dissolved	**0.0018**	0.0002	mg/L	N/A	Nov-12-14	
Iron, dissolved	**0.011**	0.010	mg/L	N/A	Nov-12-14	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Lithium, dissolved	**0.0501**	0.0001	mg/L	N/A	Nov-12-14	
Magnesium, dissolved	**329**	0.01	mg/L	N/A	Nov-12-14	
Manganese, dissolved	**0.132**	0.0002	mg/L	N/A	Nov-12-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-13-14

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (4110161-06) [Waste Water] Sampled: Nov-04-14 12:20, Continued						
Dissolved Metals, Continued						
Mercury, dissolved	< 0.00002	0.00002	mg/L	N/A	Nov-12-14	
Molybdenum, dissolved	**0.0003**	0.0001	mg/L	N/A	Nov-12-14	
Nickel, dissolved	**0.0103**	0.0002	mg/L	N/A	Nov-12-14	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Nov-12-14	
Potassium, dissolved	**246**	0.02	mg/L	N/A	Nov-12-14	
Selenium, dissolved	**0.0006**	0.0005	mg/L	N/A	Nov-12-14	
Silicon, dissolved	**13.7**	0.5	mg/L	N/A	Nov-12-14	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-12-14	
Sodium, dissolved	**428**	0.02	mg/L	N/A	Nov-12-14	
Strontium, dissolved	**2.04**	0.001	mg/L	N/A	Nov-12-14	
Sulfur, dissolved	**398**	1	mg/L	N/A	Nov-12-14	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Thallium, dissolved	**0.00007**	0.00002	mg/L	N/A	Nov-12-14	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-12-14	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-12-14	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Nov-12-14	
Uranium, dissolved	**0.00802**	0.00002	mg/L	N/A	Nov-12-14	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Nov-12-14	
Zinc, dissolved	**0.005**	0.004	mg/L	N/A	Nov-12-14	
Zirconium, dissolved	**0.0004**	0.0001	mg/L	N/A	Nov-12-14	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	4110161
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Anions, Batch B4K0190										
Blank (B4K0190-BLK1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B4K0190-BLK2)				Prepared: Nov-07-14, Analyzed: Nov-07-14						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrogen, Nitrate as N	< 0.010	0.010	mg/L							
Nitrogen, Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B4K0190-BS1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Chloride	15.9	0.10	mg/L	16.0		100	85-115			
Fluoride	3.96	0.10	mg/L	4.00		99	85-115			
Nitrogen, Nitrate as N	4.02	0.010	mg/L	4.00		100	85-115			
Nitrogen, Nitrite as N	1.91	0.010	mg/L	2.00		95	85-115			
Sulfate	16.3	1.0	mg/L	16.0		102	85-115			
LCS (B4K0190-BS2)				Prepared: Nov-07-14, Analyzed: Nov-07-14						
Chloride	16.1	0.10	mg/L	16.0		100	85-115			
Fluoride	3.84	0.10	mg/L	4.00		96	85-115			
Nitrogen, Nitrate as N	3.98	0.010	mg/L	4.00		99	85-115			
Nitrogen, Nitrite as N	1.89	0.010	mg/L	2.00		95	85-115			
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			
Dissolved Metals, Batch B4K0353										
Blank (B4K0353-BLK1)				Prepared: Nov-12-14, Analyzed: Nov-12-14						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4K0353, Continued										
Blank (B4K0353-BLK1), Continued				Prepared: Nov-12-14, Analyzed: Nov-12-14						
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Mercury, dissolved	< 0.00002	0.00002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Duplicate (B4K0353-DUP1)		**Source: 4110161-04**		Prepared: Nov-12-14, Analyzed: Nov-12-14						
Aluminum, dissolved	< 0.005	0.005	mg/L		< 0.005				11	
Antimony, dissolved	0.0002	0.0001	mg/L		0.0003				44	
Arsenic, dissolved	0.0013	0.0005	mg/L		0.0013				8	
Barium, dissolved	0.017	0.005	mg/L		0.017				7	
Beryllium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, dissolved	0.210	0.004	mg/L		0.218			4	13	
Cadmium, dissolved	0.00002	0.00001	mg/L		0.00002				27	
Calcium, dissolved	78.2	0.2	mg/L		79.9			2	8	
Chromium, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				14	
Cobalt, dissolved	0.00102	0.00005	mg/L		0.00106			4	10	
Copper, dissolved	0.0064	0.0002	mg/L		0.0065			1	28	
Iron, dissolved	0.013	0.010	mg/L		0.014				14	
Lead, dissolved	0.0003	0.0001	mg/L		0.0003				26	
Lithium, dissolved	0.0311	0.0001	mg/L		0.0317			2	14	
Magnesium, dissolved	89.9	0.01	mg/L		93.3			4	6	
Manganese, dissolved	0.0043	0.0002	mg/L		0.0043			2	9	
Mercury, dissolved	< 0.00002	0.00002	mg/L		< 0.00002				19	
Molybdenum, dissolved	0.0010	0.0001	mg/L		0.0010			< 1	19	
Nickel, dissolved	0.0018	0.0002	mg/L		0.0019			5	21	

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4K0353, Continued										
Duplicate (B4K0353-DUP1), Continued		**Source: 4110161-04**		Prepared: Nov-12-14, Analyzed: Nov-12-14						
Phosphorus, dissolved	< 0.02	0.02	mg/L		< 0.02				14	
Potassium, dissolved	6.47	0.02	mg/L		6.80			5	8	
Selenium, dissolved	0.0007	0.0005	mg/L		0.0007				36	
Silicon, dissolved	7.5	0.5	mg/L		7.9			5	12	
Silver, dissolved	< 0.00005	0.00005	mg/L		< 0.00005				20	
Sodium, dissolved	30.6	0.02	mg/L		31.6			3	6	
Strontium, dissolved	3.66	0.001	mg/L		3.80			4	6	
Sulfur, dissolved	76	1	mg/L		80			6	26	
Tellurium, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, dissolved	< 0.00002	0.00002	mg/L		< 0.00002				13	
Thorium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				30	
Tin, dissolved	0.0002	0.0002	mg/L		0.0002				6	
Titanium, dissolved	< 0.005	0.005	mg/L		< 0.005				20	
Uranium, dissolved	0.00174	0.00002	mg/L		0.00175			< 1	14	
Vanadium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Zinc, dissolved	0.034	0.004	mg/L		0.032			8	11	
Zirconium, dissolved	0.0005	0.0001	mg/L		0.0006			12	36	
Matrix Spike (B4K0353-MS1)		**Source: 4110161-05**		Prepared: Nov-12-14, Analyzed: Nov-12-14						
Antimony, dissolved	0.424	0.0001	mg/L	0.400	0.0013	106	76-114			
Arsenic, dissolved	0.205	0.0005	mg/L	0.200	0.0016	102	81-115			
Barium, dissolved	1.25	0.005	mg/L	1.00	0.242	101	80-113			
Beryllium, dissolved	0.0968	0.0001	mg/L	0.100	< 0.0001	97	69-109			
Cadmium, dissolved	0.0932	0.00001	mg/L	0.100	0.00001	93	83-110			
Chromium, dissolved	0.430	0.0005	mg/L	0.400	< 0.0005	107	85-115			
Cobalt, dissolved	0.414	0.00005	mg/L	0.400	0.00096	103	86-114			
Copper, dissolved	0.409	0.0002	mg/L	0.400	0.0008	102	82-119			
Iron, dissolved	2.12	0.010	mg/L	2.00	0.049	104	80-116			
Lead, dissolved	0.195	0.0001	mg/L	0.200	< 0.0001	97	83-112			
Manganese, dissolved	0.445	0.0002	mg/L	0.400	0.0270	104	62-131			
Nickel, dissolved	0.399	0.0002	mg/L	0.400	0.0039	99	81-115			
Selenium, dissolved	0.100	0.0005	mg/L	0.100	< 0.0005	100	79-115			
Silver, dissolved	0.0995	0.00005	mg/L	0.100	< 0.00005	99	69-121			
Thallium, dissolved	0.0990	0.00002	mg/L	0.100	0.00002	99	84-115			
Vanadium, dissolved	0.438	0.001	mg/L	0.400	< 0.001	109	83-113			
Zinc, dissolved	0.977	0.004	mg/L	1.00	0.012	97	82-115			
Reference (B4K0353-SRM1)				Prepared: Nov-12-14, Analyzed: Nov-12-14						
Aluminum, dissolved	0.249	0.005	mg/L	0.233		107	58-142			
Antimony, dissolved	0.0482	0.0001	mg/L	0.0430		112	75-125			
Arsenic, dissolved	0.451	0.0005	mg/L	0.438		103	81-119			
Barium, dissolved	3.58	0.005	mg/L	3.35		107	83-117			
Beryllium, dissolved	0.205	0.0001	mg/L	0.213		96	80-120			
Boron, dissolved	1.69	0.004	mg/L	1.74		97	74-117			
Cadmium, dissolved	0.222	0.00001	mg/L	0.224		99	83-117			
Calcium, dissolved	7.6	0.2	mg/L	7.69		99	76-124			
Chromium, dissolved	0.471	0.0005	mg/L	0.437		108	81-119			
Cobalt, dissolved	0.142	0.00005	mg/L	0.128		111	76-124			
Copper, dissolved	0.927	0.0002	mg/L	0.844		110	84-116			
Iron, dissolved	1.37	0.010	mg/L	1.29		106	74-126			
Lead, dissolved	0.121	0.0001	mg/L	0.112		108	72-128			
Lithium, dissolved	0.103	0.0001	mg/L	0.104		99	60-140			
Magnesium, dissolved	6.50	0.01	mg/L	6.92		94	81-119			
Manganese, dissolved	0.379	0.0002	mg/L	0.345		110	84-116			
Molybdenum, dissolved	0.464	0.0001	mg/L	0.426		109	83-117			
Nickel, dissolved	0.917	0.0002	mg/L	0.840		109	74-126			
Phosphorus, dissolved	0.51	0.02	mg/L	0.495		103	68-132			

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Dissolved Metals, Batch B4K0353, Continued										
Reference (B4K0353-SRM1), Continued				Prepared: Nov-12-14, Analyzed: Nov-12-14						
Potassium, dissolved	3.15	0.02	mg/L	3.19		99	74-126			
Selenium, dissolved	0.0326	0.0005	mg/L	0.0331		98	70-130			
Sodium, dissolved	19.9	0.02	mg/L	19.1		104	72-128			
Strontium, dissolved	0.883	0.001	mg/L	0.916		96	84-113			
Thallium, dissolved	0.0406	0.00002	mg/L	0.0393		103	57-143			
Uranium, dissolved	0.285	0.00002	mg/L	0.266		107	85-115			
Vanadium, dissolved	0.912	0.001	mg/L	0.869		105	87-113			
Zinc, dissolved	0.894	0.004	mg/L	0.881		102	72-128			
General Parameters, Batch B4K0184										
Blank (B4K0184-BLK1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Solids, Total Suspended	< 1	1	mg/L							
Blank (B4K0184-BLK2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Solids, Total Suspended	< 1	1	mg/L							
LCS (B4K0184-BS1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Solids, Total Suspended	49	1	mg/L	50.0		97	85-110			
LCS (B4K0184-BS2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Solids, Total Suspended	51	1	mg/L	50.0		102	85-110			
General Parameters, Batch B4K0197										
Blank (B4K0197-BLK1)				Prepared: Nov-05-14, Analyzed: Nov-05-14						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B4K0197-BS1)				Prepared: Nov-05-14, Analyzed: Nov-05-14						
Alkalinity, Total as CaCO3	102	1	mg/L	100		102	96-108			
LCS (B4K0197-BS2)				Prepared: Nov-05-14, Analyzed: Nov-05-14						
Conductivity (EC)	1410	2	µS/cm	1410		100	93-104			
Reference (B4K0197-SRM1)				Prepared: Nov-05-14, Analyzed: Nov-05-14						
pH	6.96	0.01	pH units	7.00		99	98-102			
General Parameters, Batch B4K0216										
Blank (B4K0216-BLK1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Turbidity	< 0.1	0.1	NTU							
Blank (B4K0216-BLK2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Turbidity	< 0.1	0.1	NTU							
LCS (B4K0216-BS1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Turbidity	39.8	0.1	NTU	40.0		100	85-115			
LCS (B4K0216-BS2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Turbidity	39.6	0.1	NTU	40.0		99	85-115			
General Parameters, Batch B4K0220										
Blank (B4K0220-BLK1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
General Parameters, Batch B4K0220, Continued										
Blank (B4K0220-BLK2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Nitrogen, Ammonia as N, Total	< 0.020	0.020	mg/L							
LCS (B4K0220-BS1)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Nitrogen, Ammonia as N, Total	9.87	0.020	mg/L	10.0		99	86-111			
LCS (B4K0220-BS2)				Prepared: Nov-06-14, Analyzed: Nov-06-14						
Nitrogen, Ammonia as N, Total	9.66	0.020	mg/L	10.0		97	86-111			

Western Water Associates Ltd.
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