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Beaverlodge Watershed: Summary of Surface Water Quality Data, 1994-2018

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Table of Contents

Acknowledgements 6

1 Introduction 7

1.1 Scope and Objectives 7

1.2 Background 8

1.2.1 Geographic Location 8

1.2.2 Natural Regions and Climate 8

1.2.3 Land Use and Anthropogenic Disturbances 12

1.2.4 Hydrology 13

2 Methods 16

2.1 Sampling Locations 16

2.2 Field and Lab Methodology 16

2.2.1 Continuous Surface Water Temperature, 2009-2018 17

2.3 Data Evaluation 17

3 Results and Discussion 19

3.1 Temperature 19

3.1.1 Continuous Surface Water Temperature 20

3.2 Dissolved Oxygen 23

3.3 Field pH 25

3.4 Conductivity, Total Dissolved Solids, Hardness, and Major Ions 27

3.4.1 Specific Conductivity and Total Dissolved Solids 27

3.4.2 Hardness and Alkalinity 30

3.4.3 Magnesium and Calcium 33

3.4.4 Bicarbonate 37

3.4.5 Chloride and Sodium 37

3.4.6 Sulphate 42

3.4.7 Ionic Composition - Summary 44

3.5 Turbidity and Total Suspended Solids 45

3.6 Metals 49

3.6.1 Aluminum 50

3.6.2 Iron 50

3.7 Nutrients and Trophic State 52

3.7.1 Phosphorus 52

Classification: Public

3.7.2 Nitrogen 55
3.7.3 Chlorophyll_a 63
3.7.4 Nutrients and Trophic Summary 64
3.8 Organic Carbon 65
3.9 Priority Pollutants 67
3.10 Pesticides 68
4 Summary 69
5 Recommendations 74
6 Acronyms and Abbreviations 77
7 References 78
8 Appendices 82

Classification: Public

List of Figures

Figure 1. Geographic location of the Beaverlodge and Redwillow watersheds in Alberta 11
Figure 2. Land use of the Beaverlodge and Redwillow watersheds 11
Figure 3. Beaverlodge River near the town of Beaverlodge. Photo take on June 17, 2014. 12
Figure 4. Daily discharge rates for Beaverlodge River near Beaverlodge (AB07GD001) 14
Figure 5. Daily discharge rates for Redwillow River near Rio Grande (AB07GD004) 15
Figure 6. Map of water quality sampling sites. 18
Figure 7. Seasonal changes in water temperature (°C) 20
Figure 8. Daily mean water temperature summarized by month. 22
Figure 9. Daily maximum water temperature summarized by month from data loggers. 23
Figure 10. Boxplot of DO concentrations. Short-term PAL guideline is shown at 5 mg/L. 24
Figure 11. DO concentrations – seasonal distribution. 25
Figure 12. Boxplot of field pH levels. The long-term PAL guideline shown at >6.5 and <9.0. 26
Figure 13. Field pH levels – seasonal distribution. Long-term PAL guideline shown at >6.5 and <9.0. 27
Figure 14. Boxplot of specific conductivity levels. 28
Figure 15. Boxplot of TDS concentrations 29
Figure 16. TDS concentrations - seasonal distribution. 30
Figure 17. Boxplot of total hardness levels. 31
Figure 18. Boxplot of total alkalinity levels. 32
Figure 19. Total alkalinity levels - seasonal distribution. 33
Figure 20. Magnesium concentrations - seasonal distribution 34
Figure 21. Calcium concentrations - seasonal distribution. 35
Figure 22. Boxplot of magnesium concentrations. 36
Figure 23. Boxplot of calcium concentrations. 37
Figure 24. Boxplot of bicarbonate levels. 38
Figure 25. Boxplot of chloride concentrations 39
Figure 26. Boxplot of dissolved sodium concentrations. 40
Figure 27. Dissolved chloride – seasonal distribution. 41
Figure 28. Dissolved sodium - seasonal distribution. 42
Figure 29. Boxplot of sulphate concentrations 43
Figure 30. Sulphate - seasonal distribution. 44
Figure 31. Boxplot of turbidity levels. 45
Figure 32. Boxplot of TSS levels. 46
Figure 33. Turbidity levels - seasonal distribution. 48
Figure 34. TSS levels - seasonal distribution. 49
Figure 35. Boxplot of dissolved aluminum concentrations. 50
Figure 36. Boxplot of dissolved iron concentrations. 51
Figure 37. Dissolved iron concentrations – seasonal distribution. 52
Figure 38. Boxplot of TP concentrations. 54
Figure 39. TP concentrations – seasonal distribution 55
Figure 40. Boxplot of TN concentrations. 56
Figure 41. TN concentrations – seasonal distributions. 57
Figure 42. Boxplot of TKN concentrations. 58
Figure 43. TKN concentrations - seasonal distribution. 59

Classification: Public

Figure 44. Nitrate & Nitrite concentrations – seasonal concentrations. 60
Figure 45. Boxplot of nitrate & nitrite concentrations. 61
Figure 46. Boxplot of ammonia concentrations 62
Figure 48. Boxplot of chlorophyll_α levels. 64
Figure 49. Boxplot of TOC concentrations. 66
Figure 50. Boxplot of DOC concentrations 67

List of Tables

Table 1. Land cover of the Beaverlodge watershed 9
Table 2. Location and status of hydrometric stations on Beaverlodge and Redwillow River 13
Table 3. Hydrometric station – Effective and Gross drainage areas 14
Table 4. Locations of Water Quality Sampling Sites 16
Table 5. Number of days with maximum temperature above 25°C – continuous logger data. 21
Table 6. Pollutant export in tonnes/yr. in Beaverlodge, Beavertail Creek and Redwillow watersheds (Hutchinson 2018). 47
Table 7. Spatial Trends in Beaverlodge River Relative to Redwillow River – General Chemistry .... **Error! Bookmark not defined.**
Table 8. Spatial Trends in Beaverlodge River Relative to Redwillow River - Metals and Major Ions ..... **Error! Bookmark not defined.**
Table 9. Summary of Priority Pollutants and Pesticides Spatial Trends ..... **Error! Bookmark not defined.**

List of Appendices

Appendix 1 – Data Summary - General Chemistry
Appendix 2 – Data Summary - Metals and Major Ions
Appendix 3 – Data Summary - Pesticides
Appendix 4 – Data Summary - Priority Pollutants
Appendix 5 - Summary of sampling and chemical analysis completed by AEP

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- Dave Walty

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1 Introduction

The purpose of this report is to evaluate water quality in the Beaverlodge River and its tributaries based on the data collected by the Alberta Environment and Parks (AEP) and the Alberta Conservation Association (ACA) between 1994 and 2018. Data from multiple sites within the Beaverlodge watershed were evaluated to compare spatial and temporal changes in stream water quality.

From 1977 to 2007, deterioration of water quality was reported in the Beaverlodge River (AECOM 2009). In the 1970's, the Beaverlodge River's water was described as clear with a light brown tea colouration and limited algal occurrence. An increased algal presence was observed in the 1980's, and from the 1990's descriptions, included green coloured water and algal blooms. AECOM's report suggested that water quality issues stemmed from high nutrient inputs predominantly from agricultural and livestock operations. The upper and middle reaches of the river were effected by eutrophication.

The diversity of aquatic species in the Beaverlodge River has been negatively affected by the deterioration of water quality (REFERNCE?). The Beaverlodge River once supported a more diverse fish community including sportfish such as Arctic grayling. More recent fish community surveys (Hvenegaard 2001; Johnson and Burgess 2009) indicate that the predominate species are brook stickleback (*Culaea inconstans*), lake chub (*Couesius plumbeus*), and white sucker (*Catostomas commersoni*), species that are tolerant to poor water quality (REFERENCE?). Since 1994, Arctic grayling have not been found in the Beaverlodge watershed, and is presumed to be extirpated (Hvenegaard 2001; Tchir et al. 2002, 2004; Johnson and Burgess 2009; Cahill 2015). Multiple factors have lead to the loss of Arctic grayling, including degradation of fish habitat and riparian areas, altered stream flows, and reduced water quality (AECOM 2009). The restoration of Arctic grayling to the Beaverlodge River is a high priority to conservation agencies as well as municipal and provincial government. This will require improvements in water quality.

1.1 Scope and Objectives

The objectives of this report are to:

1. Summarize the available information on surface water quality in the Beaverlodge River and selected tributaries between 1994 and 2018;
2. Assess the surface water quality conditions of the Beaverlodge River watershed, including spatial patterns and temporal trends;
3. Record and evaluate exceedances of the Alberta Surface Water Guidelines (SWQG) for the Protection of Aquatic Life (PAL). If no Alberta PAL guidelines exist, the Canadian Council of Ministers of the Environment's (CCME) Water Quality Guidelines for PAL was used;
4. Compare water quality parameters in the Beaverlodge River and selected tributaries with the life history requirements of Arctic grayling.
5. Provide recommendations for future water quality assessment and monitoring work in the Beaverlodge and Red Willow watersheds.

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This report summarizes surface water quality data from the Beaverlodge River main-stem and its tributaries (Beavertail Creek, Steeprock Creek, and Windsor Creek) to its confluence with the Red Willow River. Data from the Wapiti River and Redwillow River upstream of the confluence with the Beaverlodge River were included for the comparison purposes as it is deemded that the upstream Wapiti and Redwillow river systems are less impacted than the Beaverlodge system.

1.2 Background

1.2.1 Geographic Location

The Beaverlodge River is located northwest of the city of Grande Prairie (Figure 1). The Beaverlodge watershed covers an area of ~1800 km^2 with 77% lying in Alberta (van der Giessen 1978); the remaining portion lies to the west in British Columbia (BC) (Figure 1). The Beaverlodge River joins the Redwillow River before flowing to the Wapiti River, and has several tributaries including Beavertail, Hay, Harold, Hegel, Sinclair, Spruce and other unnamed creeks. Steeprock Creek and Windsor Creek are tributaries of Beavertail Creek.

The Beaverlodge River originates in the uplands from several small lakes and streams in BC. The headwaters are relatively inaccessible as the area is largely composed of undulating till plain, and lacking deeply cut channels (AECOM 2009). Moss and sedge peat bogs are located in the area indicating a poor drainage network. The river flows east from its headwaters through farmlands, then through Preston and Horse Lake after which it runs southeast through a steep-sided valley to join the Redwillow River upstream of its confluence with the Wapiti River.

1.2.2 Natural Regions and Climate

The Beaverlodge River lies in two sub-regions of the Boreal Forest Natural Region: the dry mixed wood and the central mixedwood (Natural Regions Committee 2006). The dry mixedwood is characterised by aspen forests and cultivated landscapes; the central mixedwood is similar but has a greater presence of conifers and wetlands. The Beaverlodge uplands are heavily forested but the lowlands are extensively farmed (AECOM 2009) (Figure 2). GIS analysis of the area presented by AECOM (2009) indicated similar levels of disturbed (50.5%) and undisturbed cover (48.5%) (Table 1).

Approximately 65 lakes and waterbodies exist in the Beaverlodge watershed composing approximately 13% of the total land cover (Table 1; AECOM 2009). Waterbodies are generally shallow (< 3 m) with mud bottoms and aquatic vegetation. The Beaverlodge River runs through two lakes, Horse and Preston Lake. Permanent tributary streams connect the river to six lakes, while ephemeral streams supply the remaining lakes.

The Beaverlodge River is more sinuous and less steep than the nearby Redwillow River. Channel sinuosity ranges from 1.2 to 1.8 (see example in Figure 3), while the tributaries (Beavertail Creek and Steeprock Creek) ranged from 1.1 to 1.4 (AECOM 2009). Channel slope is between 0.1% and 1.3%, while the tributaries were from 0.14% to 0.42%. In 1954, the Beaverlodge River was described as low velocity and approximately 15 m wide. In 1969, measurements of the river upstream of its confluence with the Redwillow River found the wetted width from 6.1 to 9.1 m with an average velocity of 0.6 m/s. The

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wetted depth in riffle areas ranged from 0.3 to 0.6 m, while pools were an average 0.9 m to a maximum depth of 1.5 m. The riverbed substrate is largely silt and clay with some gravel. Gravel in the Beaverlodge River begins to move at stream flows of 11.3 m^3/s causing substantial bed instability during spring freshet and high flow events.

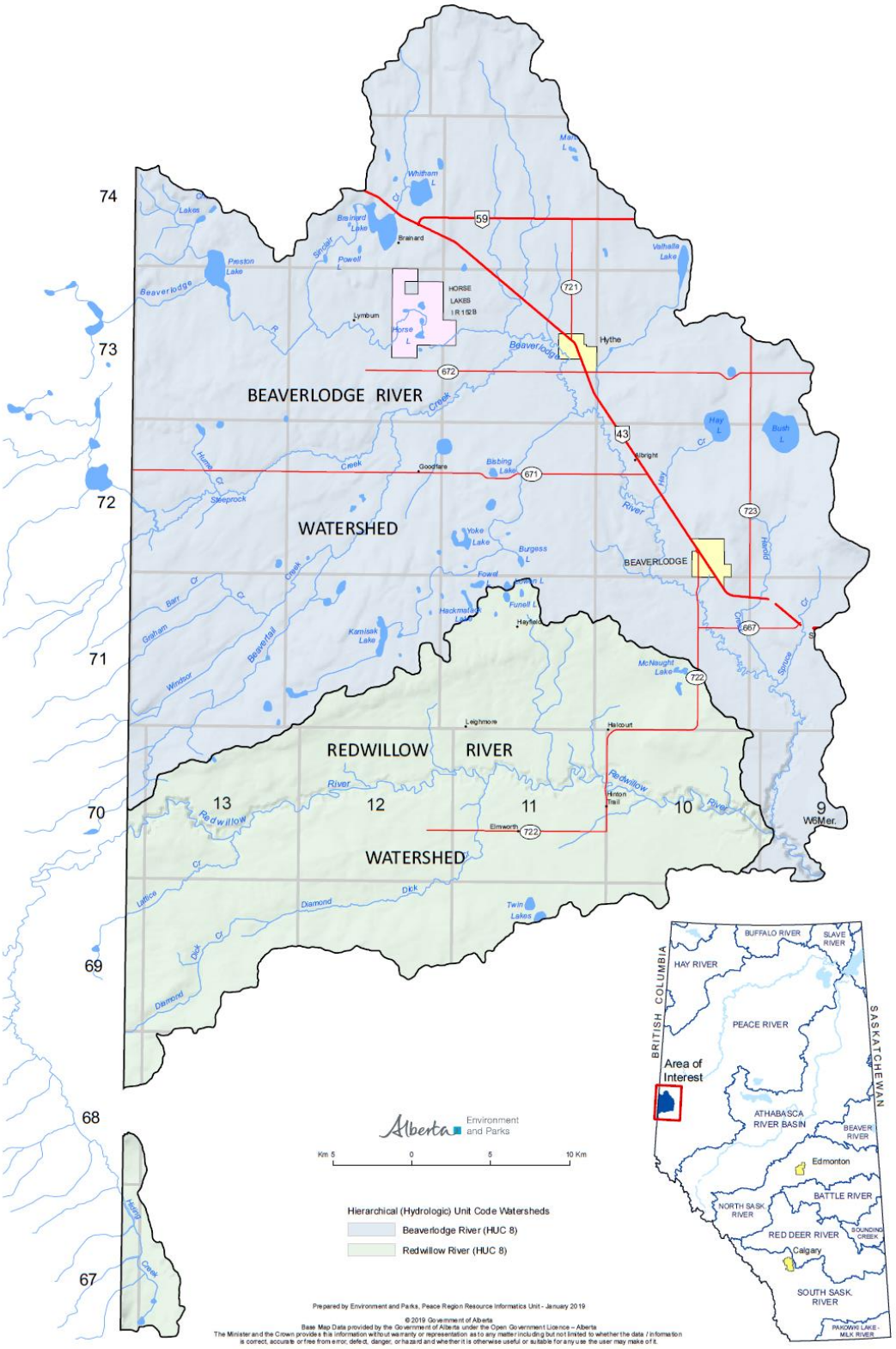
The region receives 70% of its annual precipitation during the April to August growing season (Natural Regions Committee 2006). Peak precipitation is associated with intense convection storm events in June and July. Mean annual precipitation is 461 mm and 478 mm for the dry mixedwood and central mixedwood sub-regions, respectively. The mean annual temperature in the dry mixedwood is 1.1°C and in central mixedwood is 0.2°C. The mean temperature of the warmest month (July) for both regions is 15.9°C and the mean temperature for the coldest month (February) was -16.8°C and -18.7°C for the dry mixedwood and central mixedwood sub-regions, respectively.

A climate change model specific to the Wapiti Basin was projected by Kerhoven (2014) using historical monthly temperature and precipitation data from the Environment Canada. Temperature and precipitation were projected to increase by 1.76 ± 0.73°C and 10.5 ± 15.1%, respectively, over the next 100 years.

Table 1. Land cover of the Beaverlodge watershed (AECOM 2009)

Cover Type	Watershed Area	Percentage of Watershed
Undisturbed	69,894	48.5%
Closed Spruce Forest	1,483	1.0%
Closed Aspen/Poplar/Birch Forest	34,872	24.2%
Closed Pine Forest	334	0.2%
Mixed Grassland	2,382	1.7%
Closed Upland Shrub	3,892	2.7%
Closed Undifferentiated Coniferous Forest	2,276	1.6%
Closed Coniferous/Deciduous Cover	1,997	1.4%
Open Pine Forest	28	0.0%
Open Aspen/Poplar/Birch Forest	3,870	2.7%
Wetlands (graminoid and shrubby) & Black Spruce Bog	14,196	9.8%
Water (lake, reservoir, river and stream)	4,564	3.2%
Disturbed	72,770	50.5%
Urban/Industrial (major roads, highways and railways)	2,957	2.1%
Undifferentiated Agriculture	69,813	48.4%
Unclassified (cloud, haze and shadow)	1,569	1.1%
Total	144,233	

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Figure 1. Geographic location of the Beaverlodge and Redwillow watersheds in Alberta

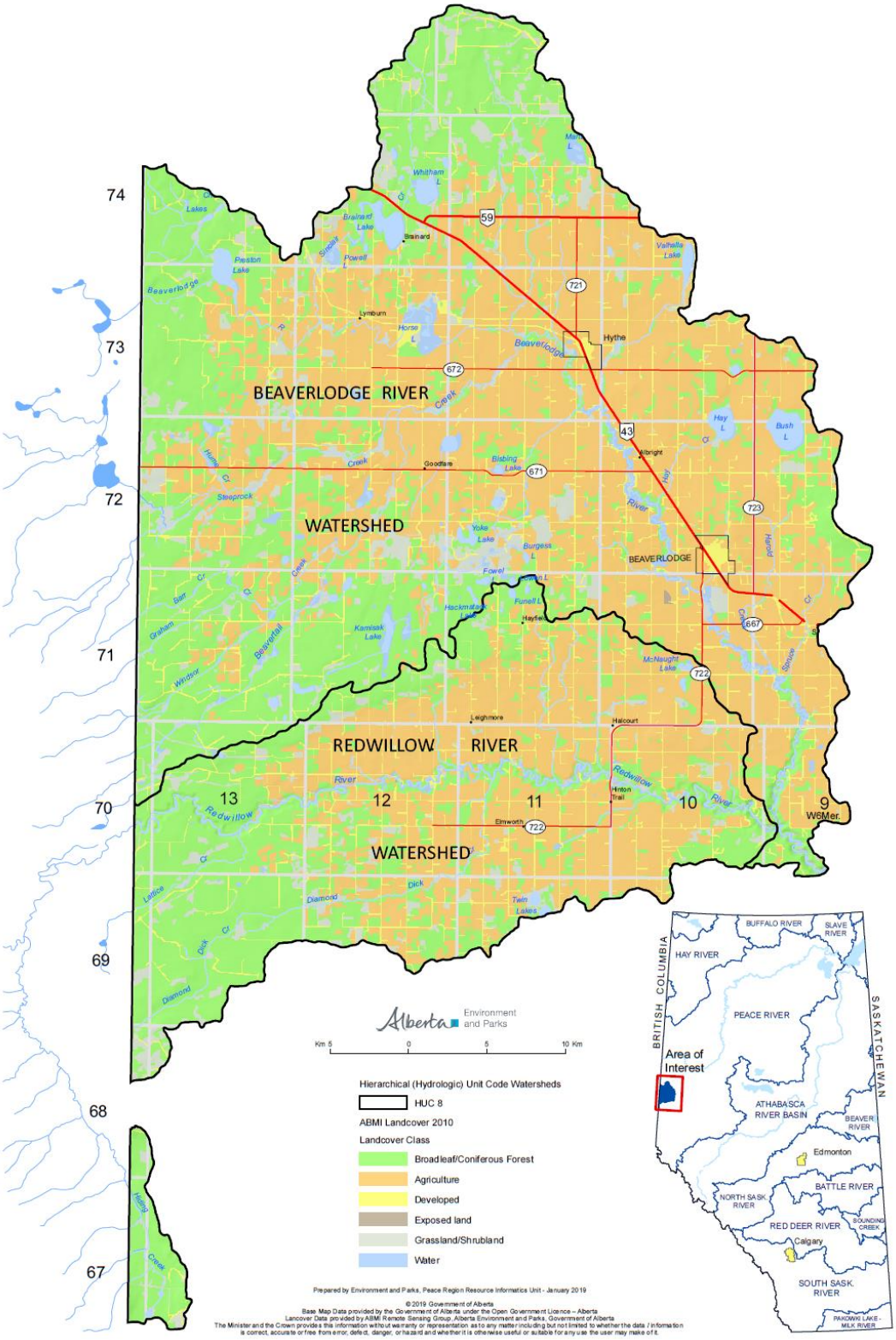

BEAVERLODGE RIVER
WATERSHED
REDWILLOW RIVER
WATERSHED
BEAVERLODGE
Hythe
Wembley
Grande Prairie
Clairmont
Sexsmith
Valhalla Lake
Bear Canyon
Kleskun Hill
Saskatoon Island
Provincial Park
Dunvegan
Provincial Park
Whitelaw
Brainard
Lymburn
Goodfare
Albright
Leighmore
Halcourt
Hayter
Elmworth
Hinton Trail
Redwillow River
Beaverlodge River
Kleskun Hill
Creek
Bear Canyon
Creek



Figure 3. Beaverlodge River near the town of Beaverlodge. Photo take on June 17, 2014.

1.2.3 Land Use and Anthropogenic Disturbances

Over the last century, the Beaverlodge River has experienced significant anthropogenic impacts (Figure 2). Surface waters are increasingly under pressure from forest clearing, agriculture, industrial activities, instream structures and water diversions (AECOM 2009) causing increased nutrient loading, pathogens, instream barriers, eutrophication, oxygen deficits, and water temperatures (Macaulay et al. 2011).

As early as 1951, forests were removed from the headwaters of the Beaverlodge River to use the land as arable and pasture (Ward 1951; Hallet 2003; AECOM 2009). The watershed has shifted from a predominantly forested landscape with some agriculture to a cleared, high intensity agriculture dominate landscape (CAESA 1998; Hutchinson Environmental Sciences Ltd. 2018). Loss of forest cover is a significant problem as it increases surface water runoff, silt, water temperatures, and changes the volumes and patterns of seasonal stream flows.

Poor agricultural practices linked to crop and livestock production have the potential to decrease water quality (Hallet 2003). Loss of riparian areas and the close proximity of farmland, livestock, and feedlots to surface waters are an issue in the Beaverlodge River watershed. An aerial survey revealed areas along the Beaverlodge River cleared to the water's edge with little to no riparian buffer (Tchir et al. 2002). Fields cultivated to the river's edge enables run off to carry sediment, fertilizers, pesticides, and herbicides into the surface waters (AECOM 2009). Livestock have unrestricted access to sections of the Beaverlodge River potentially causing fecal contamination (Larsen et al. 1995), erosion of stream banks, and resuspension of river sediments (Kauffman and Kueger 1984; Belsky et al. 1999). Feedlots established along the riverbank with insufficient riparian buffers have been observed to have runoff

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carrying manure and feed debris into the Beaverlodge River. In 2003, the Grande Prairie Riparian Action Team (GPRAT), formed between conservation agencies, nongovernmental organizations, municipal, provincial, and the federal government, began initial restoration work that continued until 2007. Various organizations have continued conservation and riparian projects to the present.

The majority of the population is located in the two municipalities: the town of Beaverlodge and the village of Hythe. In 2016, the population's of the town of Beaverlodge and the village of Hythe were 2,327 and 827, respectively (Statistics Canada 2017a; b). The Beaverlodge River receives effluent discharge from both Beaverlodge and Hythe as well as Horse Lake First Nation (AECOM 2009). A major fish kill event in 2006 prompted changes to municipal treatment facilities and wastewater release protocols. In 2007, Horse Lake First Nation upgraded their sewage treatment facility and relocated the discharge from Horse Lake to the Beaverlodge River. The town of Beaverlodge installed aeration and willow-bed irrigation systems.

1.2.4 Hydrology

The Beaverlodge River has one active hydrometric station (AB07GD001) located near the town of Beaverlodge (Table 2terns of seasonal stream flows.

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stations on Beavertail Creek (AB07GD002) and Redwillow (AB07GD003) were discontinued in 2009 and 1992, respectively. The timing of the average peak flow for the Beaverlodge (AB07GD001) and the Redwillow River (AB07GD004) were similar with peak average discharge occurring in the spring (Figure 4; Figure 5). Peak average discharge for the Beaverlodge River (15 m^3/s) is half the rate of the Redwillow River (~30 m^3/s). Average discharge for both sites is low during the fall and winter months.

Table 2. Location and status of hydrometric stations on Beaverlodge and Redwillow River

Waterbody	Station Name	Station Number	Latitude	Longitude	Status	Period of Record
Beaverlodge River	BLR near Beaverlodge	AB07GD001	55°11'21" N	119°26'14" W	Active	1968-present
Beavertail Creek	BTC near Hythe	AB07GD002	55°18'58" N	119°38'33" W	Discontinued	1982-2009
Redwillow River	RWR near Beaverlodge	AB07GD003	55°04'55" N	119°31'30" W	Discontinued	1983-1992
	RWR near Rio Grande	AB07GD004	55°04'43" N	119°42'05" W	Active	1993-present

*Sites are derived from AEP Water Data Systems (WDS) with the exceptions of AB07GD-WD01 and AB07GD-RW03

Table 3. Hydrometric station – Effective and Gross drainage areas

Waterbody	Station Name	Station Number	Effective Drainage Area (km^2)	Gross Drainage Area (km^2)
Beaverlodge River	BLR near Beaverlodge	AB07GD001	1610	1510
Beavertail Creek	BTC near Hythe	AB07GD002	666	596
Redwillow River	RWR near Beaverlodge	AB07GD003	1610	1580
	RWR near Rio Grande	AB07GD004	1250	NA

*Sites are derived from AEP Water Data Systems (WDS) with the exceptions of AB07GD-WD01 and AB07GD-RW03

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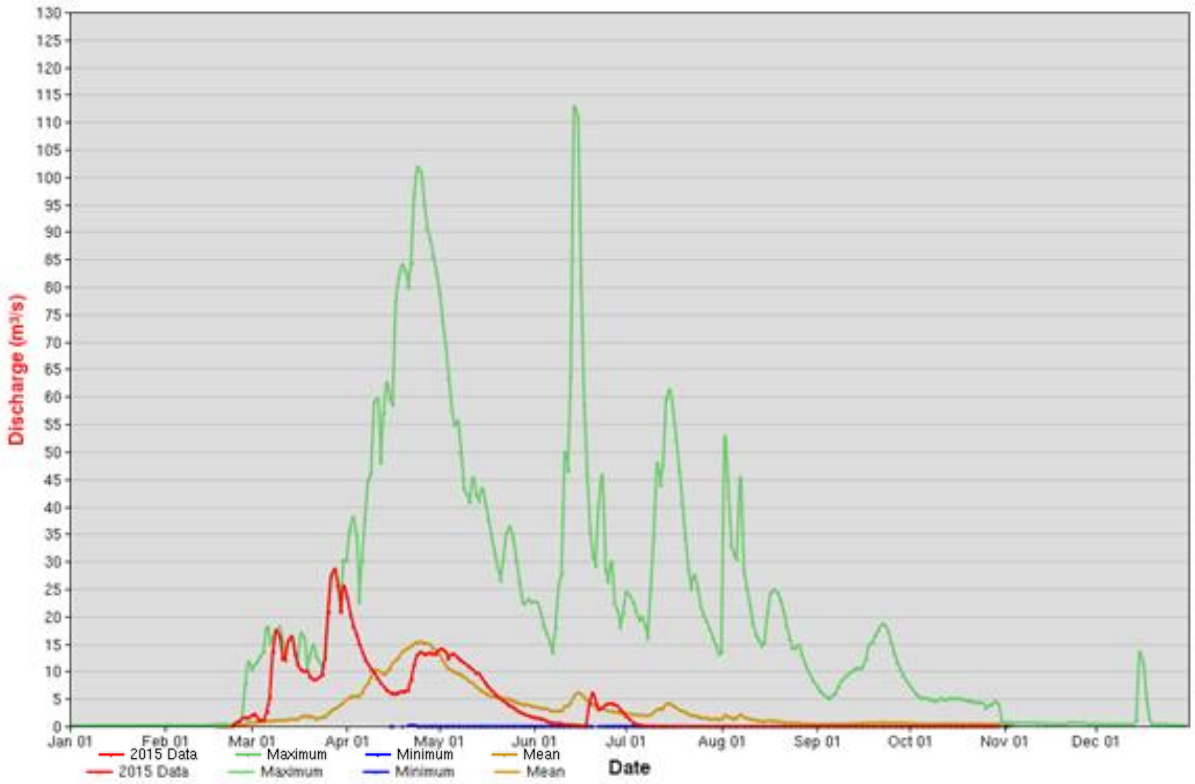


Figure 4. Daily discharge rates for Beaverlodge River near Beaverlodge (AB07GD001). Environment Canada hydrometric data.

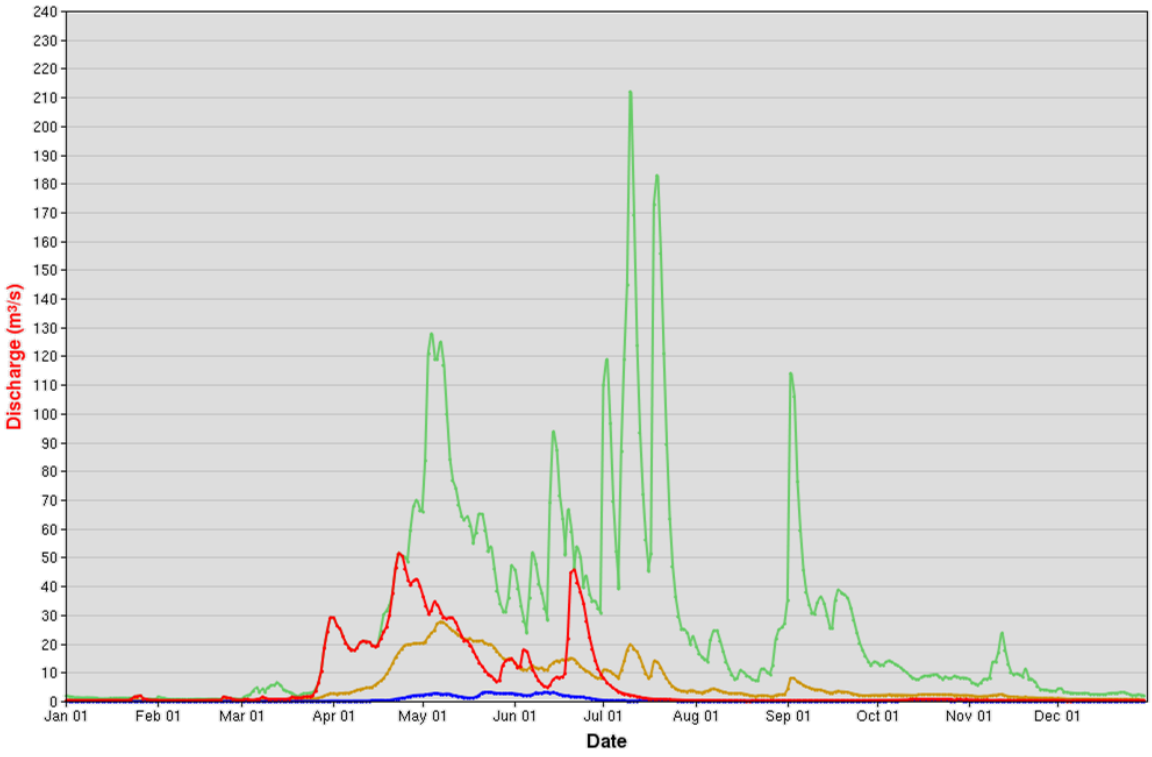


Figure 5. Daily discharge rates for Redwillow River near Rio Grande (AB07GD004). Environment Canada hydrometric data.

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2 Methods

2.1 Sampling Locations

This report presents data from 19 sampling locations (Table 4; Figure 6) on the Beaverlodge River and its tributaries. Nine sampling sites were located on the Beaverlodge River main stem. This report also presents sites outside of the Beaverlodge watershed for the purpose of comparison with less impacted systems; 3 sites located on the Redwillow River and one site on the Wapiti.

Table 4. Locations of Water Quality Sampling Sites

Watercourse	WDS Site*	Description	Latitude	Longitude
Beaverlodge River	AB07GD0005	BLR at TWP 734 and RR 132	55.34525 N	119.89581 W
	AB07GD0015	BLR upstream of Horse Lake	55.33000 N	119.74375 W
	AB07GD0020	BLR upstream of Beavertail Creek	55.33833 N	119.63972 W
	AB07GD0040	BLR upstream of Beaverlodge	55.20139 N	119.48167 W
	AB07GD0045	BLR upstream of Highway 722 Bridge	55.18929 N	119.43761 W
	AB07GD0050	BLR downstream of Beaverlodge	55.17111 N	119.42444 W
	AB07GD0060	BLR downstream of Hythe	55.32000 N	119.57083 W
	AB07GD0070	BLR at Gravel Pit	55.11306 N	119.33500 W
	AB07GD0080	BLR at the mouth	55.05583 N	119.36028 W
Beavertail Creek	AB07GD0022	BTC downstream of TWP Rd 720 Bridge	55.19972 N	119.81349 W
	AB07GD0030	BTC at the Mouth	55.31750 N	119.63500 W
Steeprock Creek	AB07GD0025	SRC upstream of confluence with Beavertail Creek	55.28083 N	119.75972 W
	AB07GD0027	STC upstream Hwy 671	55.22139 N	119.99028 W
Windsor Creek	AB07GD-WD01	Windsor Creek	55.12944 N	119.96165 W
Redwillow River	AB07GD0090	RWR upstream of Beaverlodge River	55.05472 N	119.37194 W
	AB07GD0095	RWR downstream of RR 121 Bridge	55.07879 N	119.70054 W
	AB07GE0005	RWR at mouth	55.03139 N	119.31139 W
	AB07GD-RW03	RWR at Mount Valley	55.06474 N	119.82998 W
Wapiti River	AB07GC0020	WR upstream of Redwillow River - Centre	55.00444 N	119.38810 W

*Sites are derived from AEP Water Data Systems (WDS) with the exceptions of AB07GD-WD01 and AB07GD-RW03

2.2 Field and Lab Methodology

The Beaverlodge River and its tributaries were sampled at various intervals from 1994 to 2018. Field measurements (e.g. water temperature, pH, conductivity, and dissolved oxygen) were recorded at approximately mid-depth of the water column at each site. Various YSI models were used to measure these parameters including, but not limited to, the ProODO Optical Dissolved Oxygen Otho288, 556 Handheld Multiparameter Instrument Otho 192, and Professional Plus Multiparameter Meter Otho 308 (personal communication, Lenore Seward, ACA). Surface water grab samples were sent to Maxxam Analytics for laboratory analysis where the samples were filtered as required for analysis. General chemistry and metal analyses were performed on all samples for all collection events (Table A1-6, Appendix 1). However, complete profiles for general chemistry and metal analyses were not performed for all samples. Pesticides, herbicides, and priority pollutants were analyzed in select years. Appendix 5 provides a detailed summary of survey sites, sampling frequency and chemical analyses.

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During the 1990's, two collection events took place on the Beaverlodge watershed. From 1994 to 1995, Alberta Environment and Alberta Sustainable Resource Development conducted seasonal surveys to characterize the Beaverlodge basin (AECOM 2009). The surveys were initiated due to concerns about the effects of treated effluent releases from sewage lagoons on fish populations. The release of treated effluent during low flows in the autumn and winter were suspected to cause water quality issues for fish. A second survey was conducted in the fall of 1997 and 1998, single water samples were collected from a new site at the mouth of the Redwillow River (AECOM 2009). The objectives of the survey were not recorded.

AEP conducted a survey from 2004 to 2007, with the goal to collect samples following runoff and storm events rather than the quarterly sampling undertaken in 1994-1995 (Charette 2004; AECOM 2009). AEP also conducted seasonal surveys between May 12, 2014 and February 12, 2015 to determine the loadings of contaminants to the Wapiti River (Table 7 & 8). In April 2010, ACA began water quality testing along the Beaverlodge River (ACA 2011). ACA collected samples in spring and fall, except in 2010 when low flows prevented the fall collection. The range of sampling sites and the range of analyses for this program vary from year to year.

2.2.1 Continuous Surface Water Temperature, 2009-2018

Temperature logger data were collected in 2009 and from 2012 to 2018 as a part of ACA's Riparian Conservation Program (personal communication, Lenore Seward, ACA). Temperature data were collected using the HOBO Water Temp Pro v2 sensors. The loggers were located at three sites, one each for the Beaverlodge River and its two major tributaries. The Beaverlodge River temperature logger was located upstream of the Highway 722 Bridge (AB07GD0045) near river flow station downstream of the town of Beaverlodge (Figure 1). The second logger was located at the mouth of Beavertail Creek (AB07GD0030) to measure the river temperature at its highest flow prior to joining the main stem of the Beaverlodge River. A third logger was located at the Redwillow River downstream of RR 121 Bridge (AB07GD0095).

2.3 Data Evaluation

Water quality data were tabulated (Appendix 1-5) and graphically presented on Figures 7-50 and Figures A2-1 – A2-5 (Appendix 2). For the graphical presentation, values less than analytical detection limits were replaced by values equal to half the detection limit. Box and whisker plots were used to summarize patterns across sites by displaying the maximum, minimum, median and 25-75 percentile of each variable.

For the purposes of this report, water quality data were compared to the Environmental Quality Guidelines for Alberta Surface Waters, specifically surface water quality guidelines for the protection of aquatic life (PAL). In the absence of Alberta PAL guidelines, the CCME's Canadian Water Quality Guidelines for the protection of aquatic life was used (Canadian Council of Ministers of the Environment 2014).

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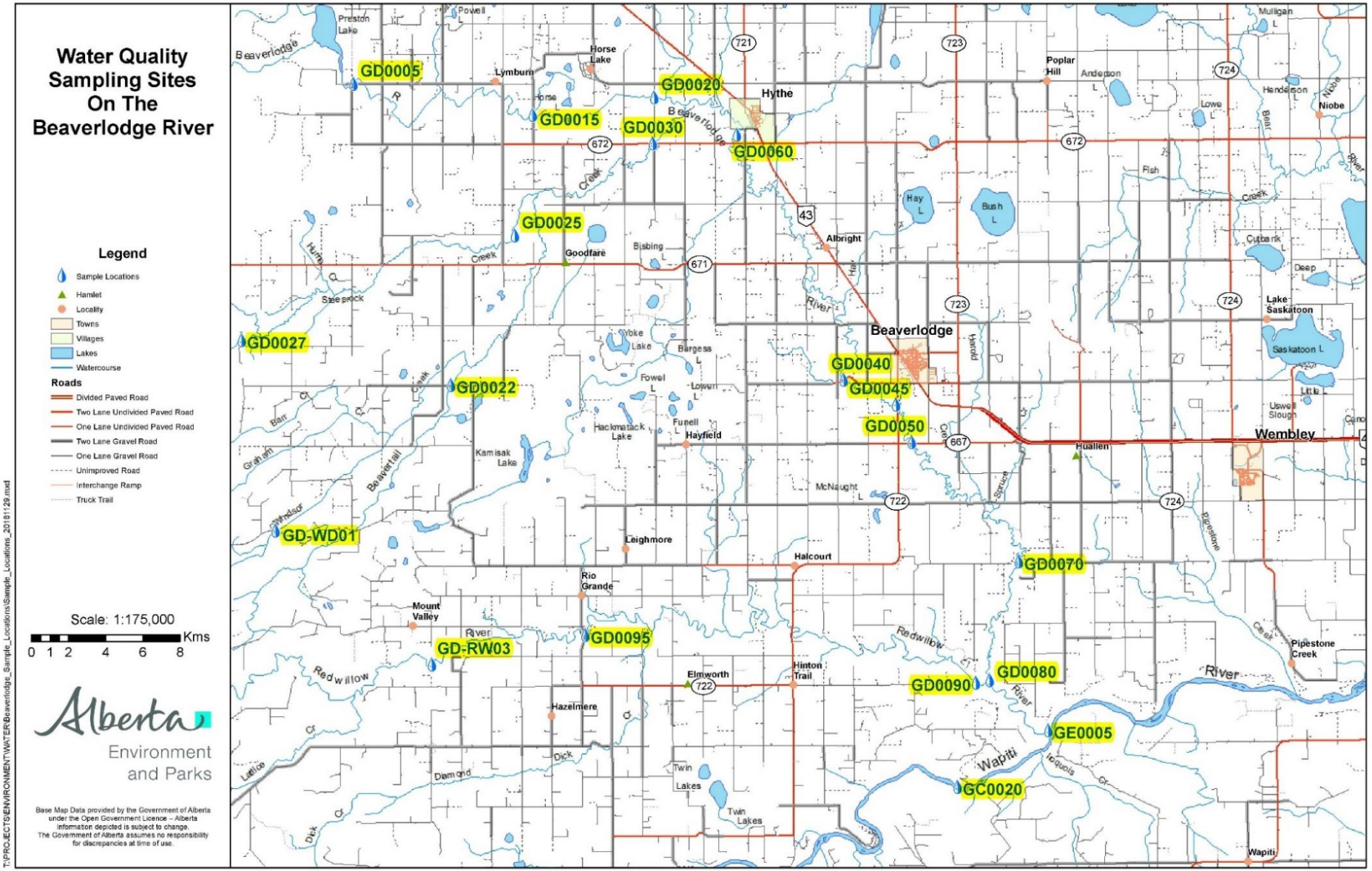


Figure 6. Map of water quality sampling sites.

Classification: Public

3 Results and Discussion

3.1 Temperature

Water temperature is important in aquatic ecosystem as it influences physical, chemical, and biological processes, oxygen concentration, and organism behaviour (Wetzel 2001). Water temperature is influenced by solar radiation, heat transfer from air and terrestrial sources, climate, seasonal variations, latitude, water outflow, and morphology of the river. Changes in natural patterns can be indicative of stream flow alterations due to either natural or anthropogenic factors (e.g. water withdrawals, effluent inputs, removal of vegetative cover). Stream temperatures are of particular interest to fishery resources and management due the effects on fish.

The loss of forest cover and changes to riparian areas of the Beaverlodge River have the potential to change surface water temperatures and influence thermal habitat for fish (Ward 1951; Hallet 2003; AECOM 2009). The Arctic grayling is among the least tolerant to high temperatures of any fish historically found in the Beaverlodge River. The distribution of Arctic grayling within a watershed is influenced by water temperature; Arctic grayling escape unfavourable temperatures by moving to cooler waters (Wojcik 1955). The optimal temperature for adult Arctic grayling is between 8 to 20°C. The upper incipient lethal temperature, the temperature at which 50% of the population survives an indefinitely long exposure, for Arctic grayling is 25°C. Observations of Arctic grayling in Alaska suggest that adult grayling are stressed when water temperatures exceeded 17.2°C and actively avoided 20°C (Wojcik 1955).

Results of temperature measurements are summarized in Appendix 1 and are graphically presented in Figure 7 below. Temperature in the Beaverlodge River and its tributaries ranged from -0.23 to 25.83°C with average temperatures for each site ranging from 6.42 to 10.41°C. In comparison, the Redwillow and Wapiti Rivers ranged from -0.04 to 24.5°C with site averages between 7.86 and 10.41°C.

In the Beaverlodge River, surface water temperatures exceeding the optimal upper limit for Arctic grayling of 20°C were measured at seven sites primarily in July of 2006 and 2014. Site GD0070 (Beaverlodge at gravel pit below the Town of Beaverlodge) exceeded the upper limit for Arctic Grayling of 25°C in July 2006 at 25.83°C. Overall, sites on the Beaverlodge River further downstream (near and below the town of Beaverlodge) had higher upper levels of water temperatures than sites located upstream. Upstream sites did not exceed 20°C (18.84-19.45°C), while the downstream sites recorded values between 21.60°C to 25.83°C.

Temperatures in Beavertail Creek and Steeprock Creek were similar to those in upstream sites on the Beaverlodge River. Temperature in the tributaries did not exceed the optimal upper limit for Arctic grayling (Figure 7). Limited temperature measurements were taken in the lower Redwillow River but available data suggests that summer temperatures can exceed 20°C (a maximum of 24.50°C was

Classification: Public

recorded upstream of the confluence with Beaverlodge River).Although the upper reaches of the stream are less frequently sampled they appeared to have lower summer temperatures than downstream sites (below the confluence with Beavertail Creek).



Figure 7. Seasonal changes in water temperature (°C)

3.1.1 Continuous Surface Water Temperature

The Beaverlodge River has had alteration in its riparian zone (AECOM 2009), a process linked to increased stream temperature extremes. Water temperatures can increase by 4-5°C in stream reaches following riparian deforestation (Beschta 1997; Kaushal et al. 2014). The increase in temperature with the downstream direction of the Beaverlodge River could be associated with riparian vegetation removal (AECOM 2009).

Classification: Public

Between 2009 and 2018, continuous surface water temperature was collected from three sites on the Beaverlodge River, Beavertail Creek, and Redwillow River. The loggers were installed at Beaverlodge River upstream of the Highway 722 Bridge (GD0045), Beavertail Creek at the mouth (GD0030), and Redwillow River downstream of RR121 Bridge (GD0095). Results are graphicallyt presented on Figures 8 and 9 in the form of boxplots. Boxplots indicate 25th and 75th percentails with wiskers representing minimum and maximum values. Outliers are indiated as indivisual dots. The line within the box denotes a median.

The mean daily water temperature for all sites is below the upper incipient lethal temperature for Arctic grayling of 25°C (Figure 8). During the summer months, daily averages for Beaverlodge River and Redwillow River were generally below the optimal upper limit for Arctic grayling of 20°C. July temperatures in 2012 (for both sites) and 2014 (in Redwillow River) had daily averages above the optimal upper limit but below the upper incipient lethal temperature for Arctic grayling. These high temperatures though not lethal, may make the habitat less desirable for Arctic grayling (Wojcik 1955).

The maximum temperatures were recorded during the summer months (Figure 9). Beaverlodge River, Beavertail Creek, and Redwillow River have all recorded a maximum water temperature exceeding 25°C. The median daily maximum temperature for Beaverlodge and Redwillow River in July of 2012 (for both sites) and 2014 (Redwillow River only) were between 20 to 25°C (Figure 9). Daily maximum temperatures in Redwillow River exceeding 25°C in the Redwillow River generally occurred between 2009 and 2014. Approximately 80% of maximum temperatures exceeding 25°C recorded in Beaverlodge occurred in 2017 (Appendix 1). Beavertail Creek experienced lower maximum water temperatures than Beaverlodge or Redwillow River. Temperature in Beavertail Creek exceeded 25°C in June of 2017 (Appendix 1)

Table 5. Number of days with maximum temperature above 25°C – continuous logger data.

Year	Beaverlodge River (GD0045)					Beavertail Creek (GD0030)					Redwillow River (GD0095)				
	May	June	July	Aug	Sept	May	June	July	Aug	Sept	May	June	July	Aug	Sept
2009	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
2012	0	0	12	1	0	0	0	0	0	0	0	0	4	0	0
2013	6	0	2	0	0	0	0	0	0	0	7	0	1	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
2015	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	3	17	23	23	3	0	3	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0

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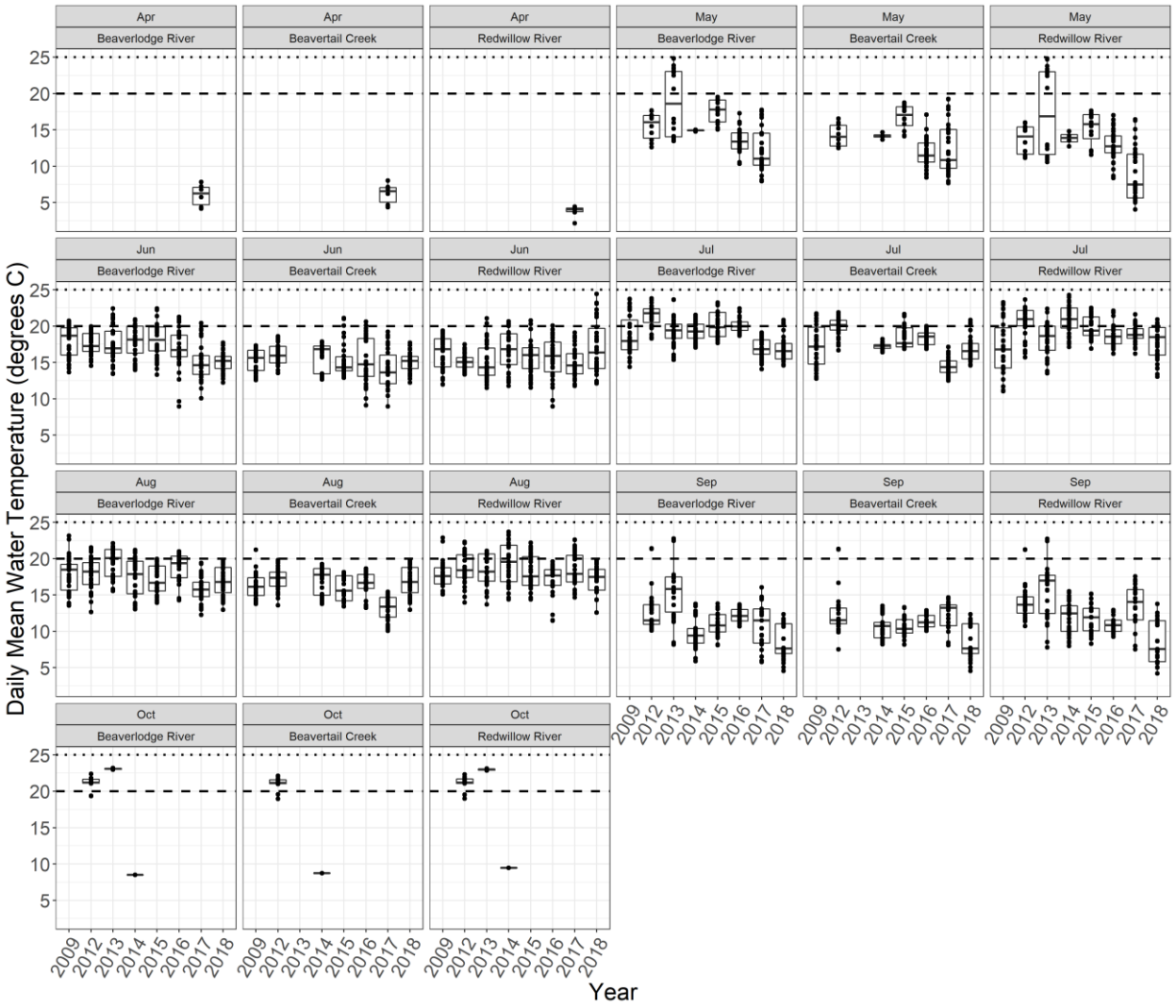


Figure 8. Daily mean water temperature summarized by month. Sites correspond to: Beaverlodge upstream of the Highway 722 Bridge (GD0045), Beavertail at the mouth (GD0030), and Redwillow River downstream of RR 121 Bridge (GD0095) Dashline represents upper limit of optimal temperature for grayling

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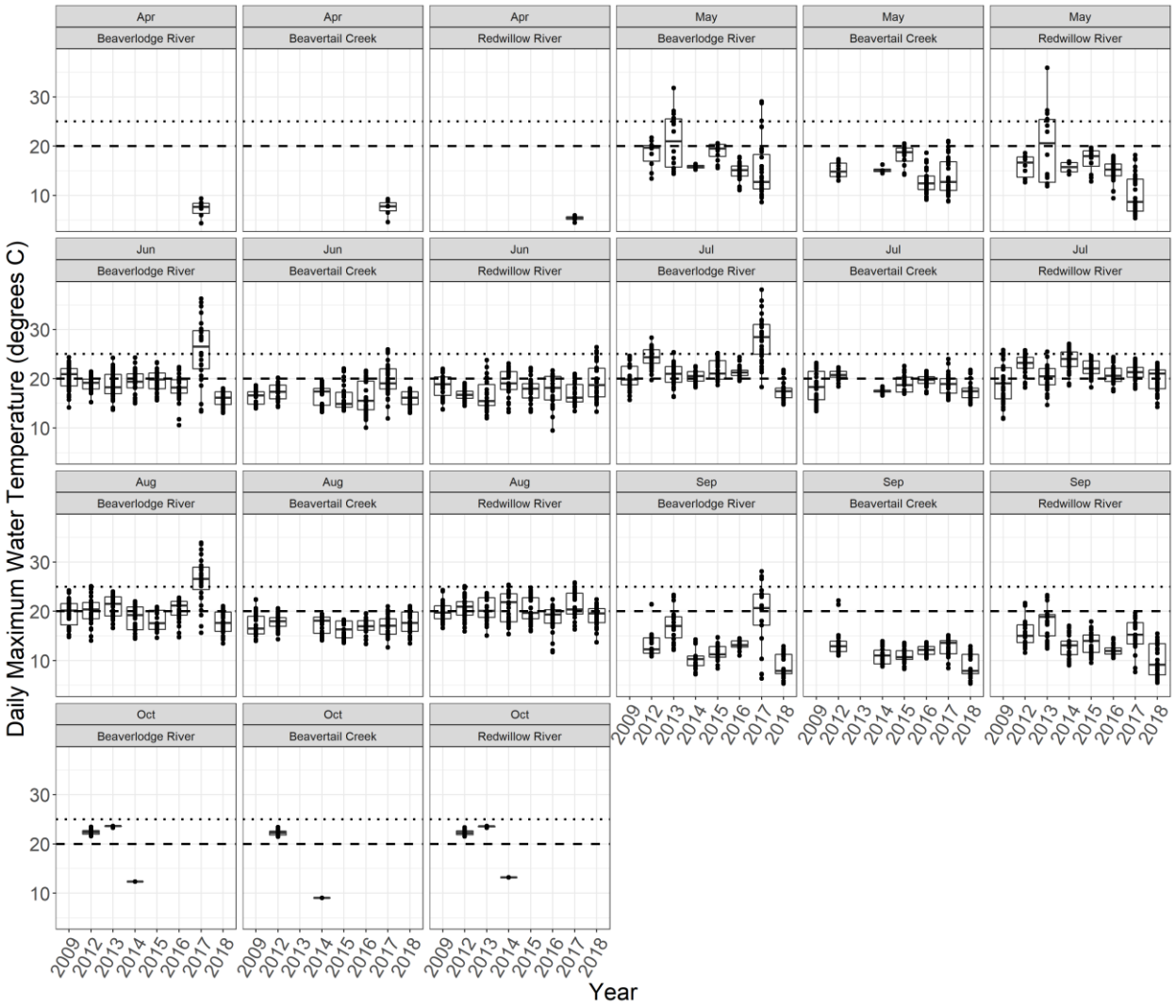


Figure 9. Daily maximum water temperature summarized by month from data loggers.

3.2 Dissolved Oxygen

Dissolved oxygen (DO) is an important parameter in aquatic ecosystems including understanding the distribution and behaviour of aquatic life (Wetzel 2001; CCME 1999). DO in surface waters is derived from the atmosphere and photosynthesis. The solubility of oxygen is correlated inversely to temperature and is also affected by pressure, atmospheric exchange, turbulence, salinity, photosynthesis and respiration. Low DO levels in surface waters can cause detrimental effects on aerobic-dependent organisms. SWQG for DO are minimum values that should be maintained. The short-term SWQG for DO uses an instantaneous recorded value of 5 mg/L. The long-term SWQG for DO uses a seven-day mean of 6.5 mg/L. The SWQG for DO during mid-May to the end of June is 8.3 mg/L for the protection of mayfly emergence. In areas and times when larval fish develop within gravel beds the SWQG for DO is 9.5 mg/L.

Classification: Public

Results of DO measurements are summarized in Appendix 1 and are graphically presented in Figure 10 and Figure 11 in the form of boxplots also showing individual records.

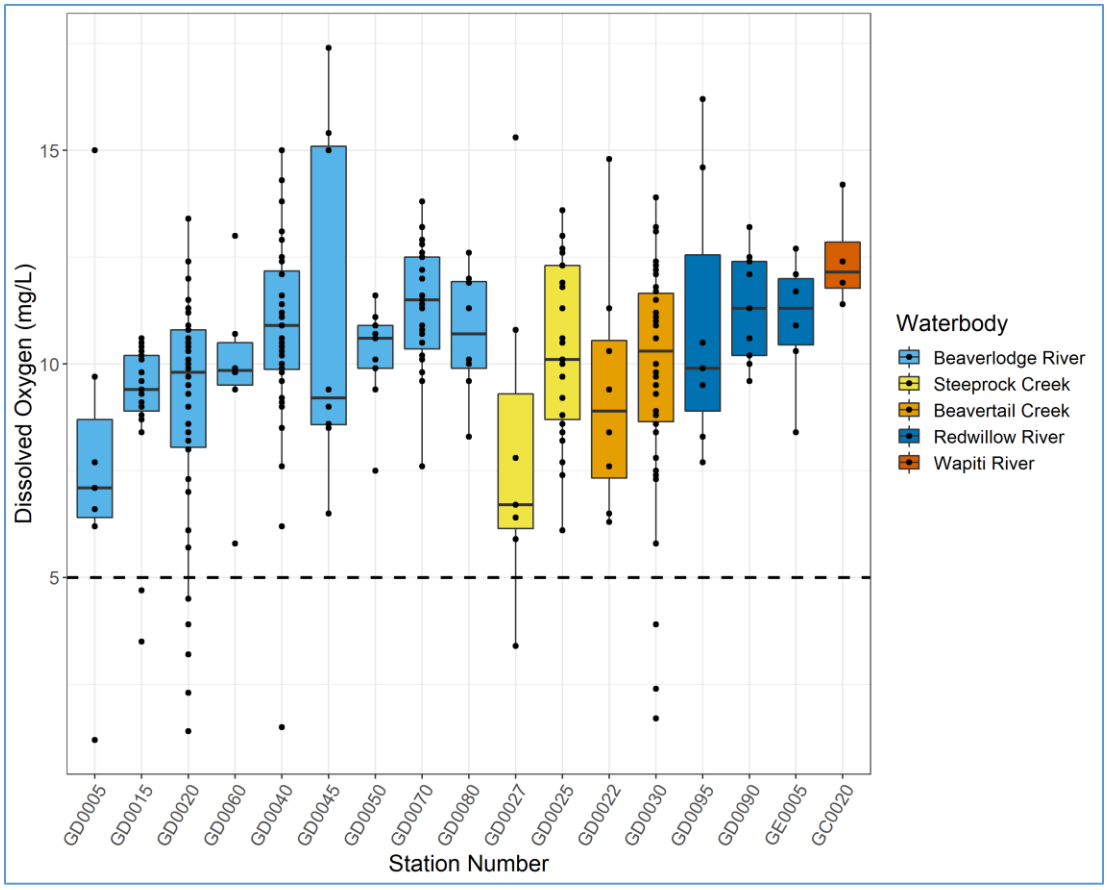


Figure 10. Boxplot of DO concentrations. Short-term PAL guideline is shown at 5 mg/L.

DO levels in the Beaverlodge River and its tributaries ranged between 1.2 and 17.4 mg/L with averages between 7.6 and 11.4 mg/L. DO levels increased with the downstream direction in Beaverlodge and its tributaries (Figure 10). The majority (54%) of DO values below 5 mg/L were measured in September (Figure 11). Decreases in oxygen concentrations during the late summer and early fall could be linked to increased consumption of DO by microorganisms and increased temperatures. The decline in oxygen concentrations especially in the upper reaches indicate that respiration exceeds photosynthesis in the late summer and early fall. Sites downstream of the Town of Beaverlodge had no DO measurements below PAL guidelines.

Classification: Public

Comparatively the DO values for the Redwillow and Wapiti Rivers were generally higher, ranging from 8.3 to 16.2 mg/L with median values from 11 to 12.5 mg/L. DO levels below SWQG of 5 mg/L were not recorded for either the Redwillow or Wapiti River.

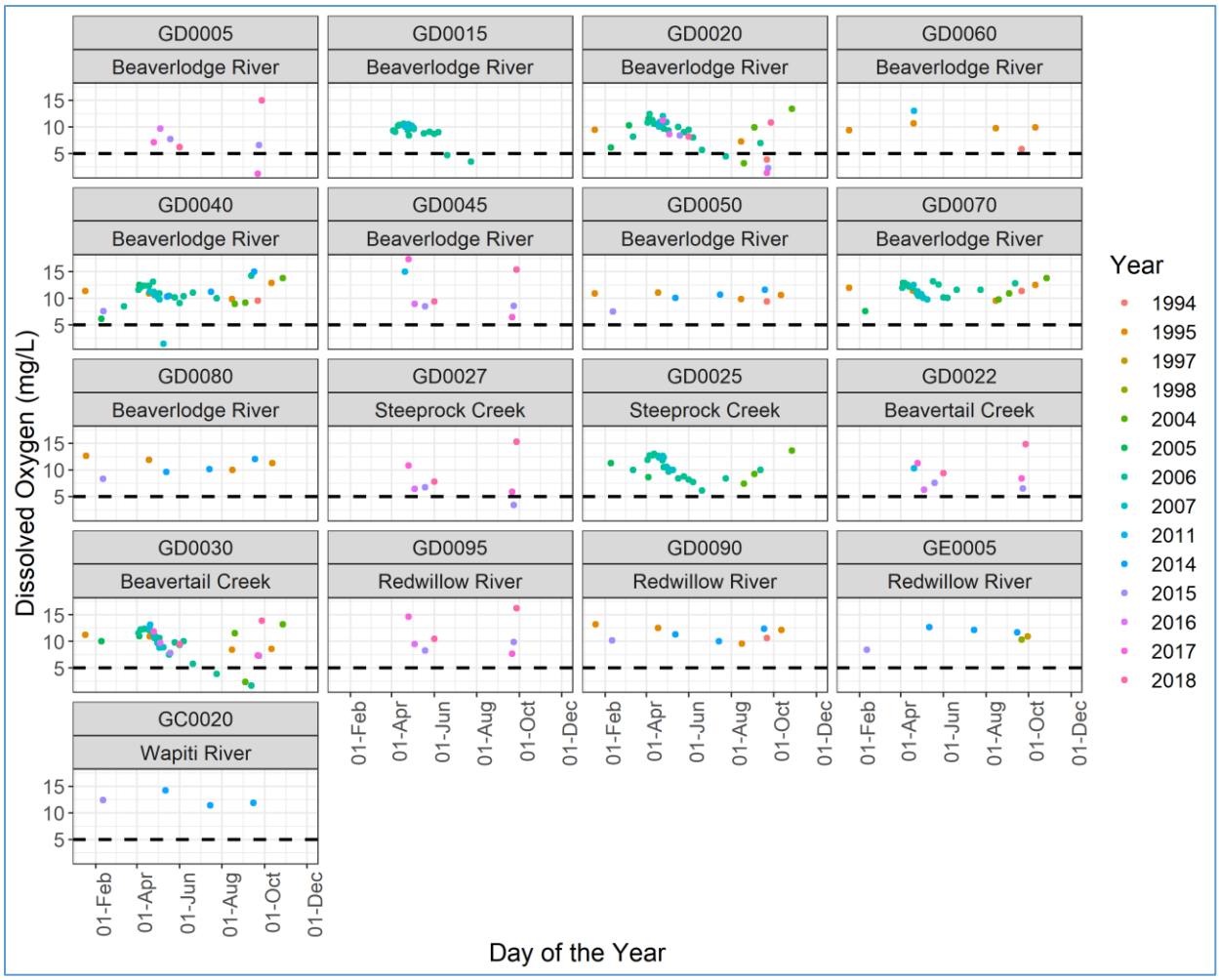


Figure 11. DO concentrations – seasonal distribution. The short-term PAL guideline is shown at 5 mg/L.

3.3 Field pH

pH is an important component in supporting aquatic life as the concentration of hydrogen ions influences dissolution and precipitation and the speciation of some chemicals. Results of pH measurements are summarized in Appendix 1 and are graphically presented on Figure 12 and Figure 13.

The pH ranged in all sites between 5.90 and 9.86. Values outside of PAL guidelines were occasionally observed on all waterbodies (Figure 12). Low pH values were observed largely in September 2015 (39%) and 2017 (39%), while the three high pH values were recorded in June and September of 2006 (Figure

Classification: Public

13). Surveys indicate that the average pH is slightly basic for the Beaverlodge (7.14 to 8.14), Redwillow (7.93), and Wapiti River (8.02).

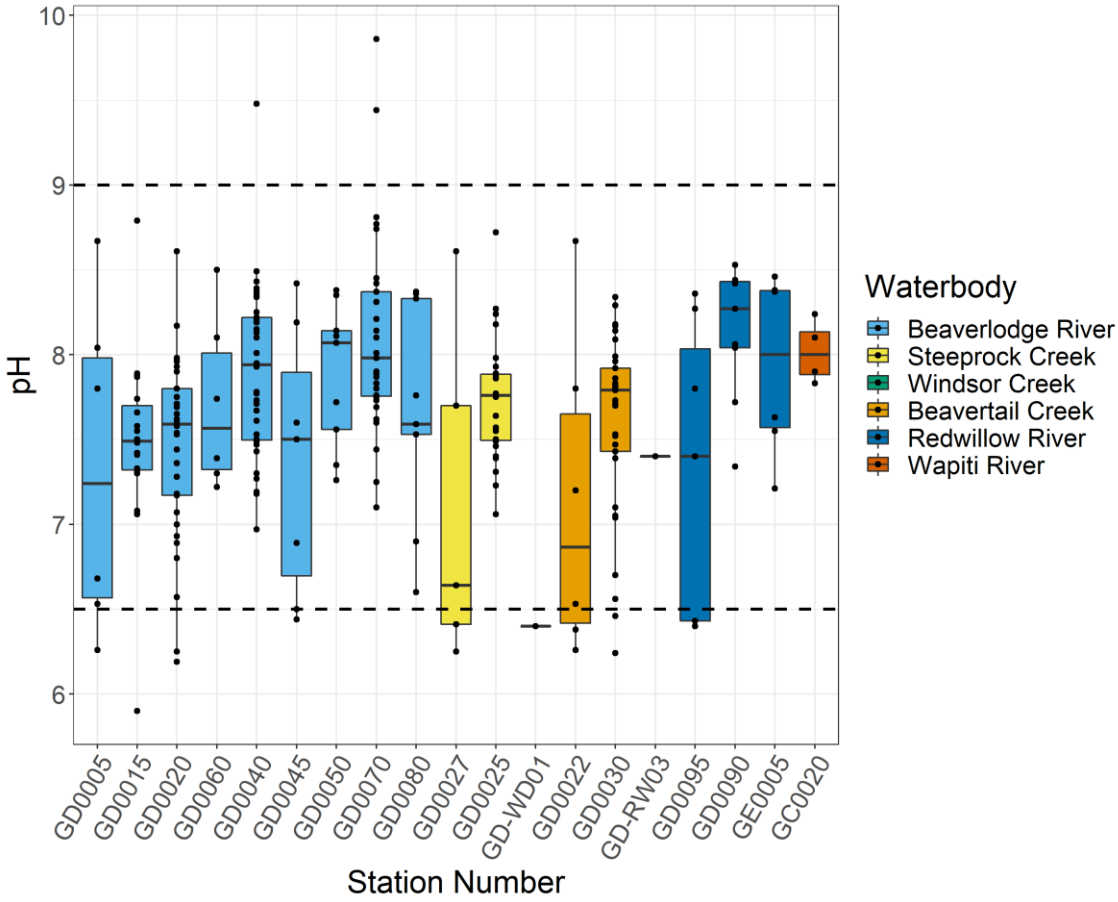


Figure 12. Boxplot of field pH levels. The long-term PAL guideline shown at >6.5 and <9.0.

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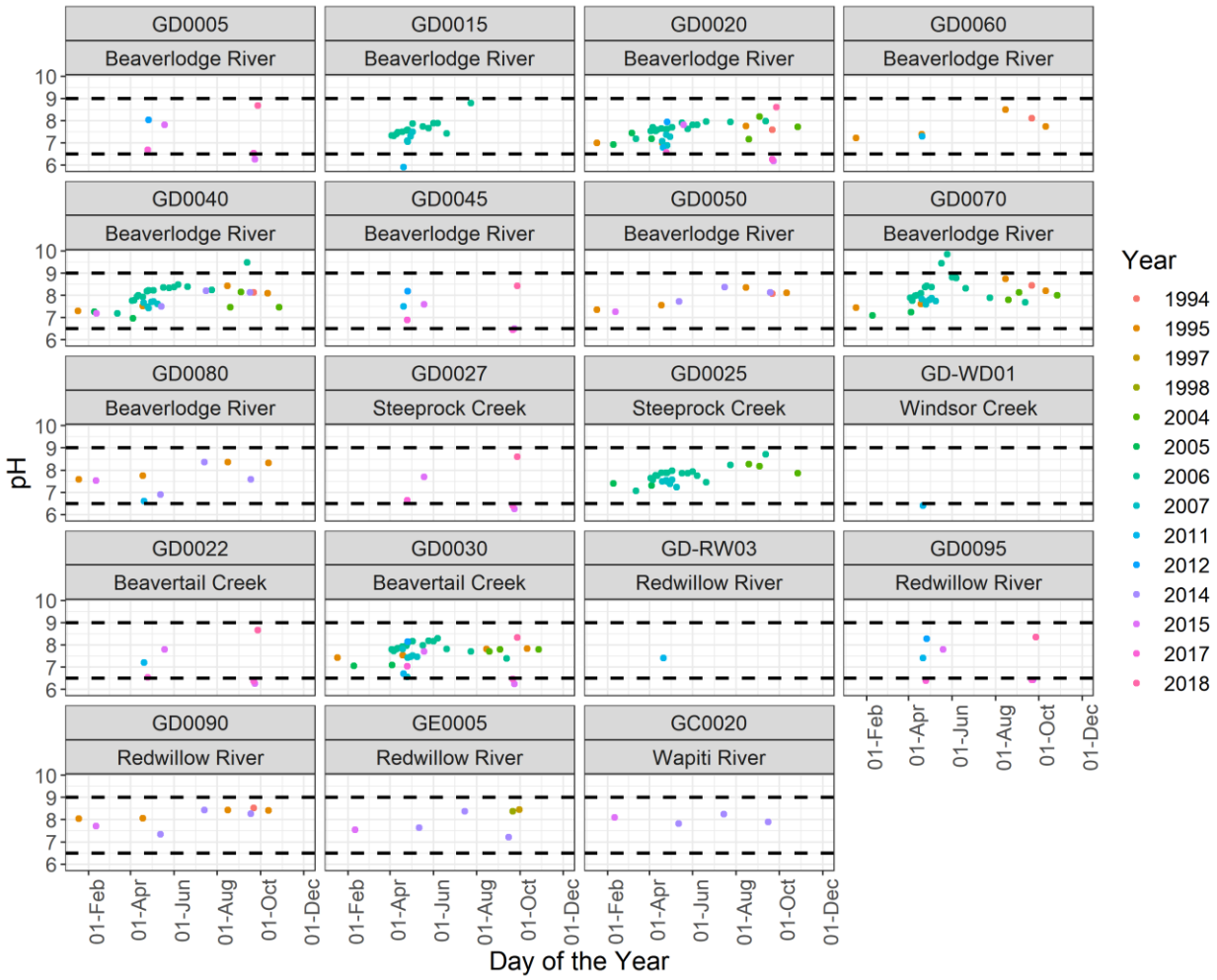


Figure 13. Field pH levels – seasonal distribution. Long-term PAL guideline shown at >6.5 and <9.0.

3.4 Conductivity, Total Dissolved Solids, Hardness, and Major Ions

Freshwater contains a mixture of cations and anions. Combinations of these ions are measured for various purposes including conductivity, hardness and for specific ions. Major ions enter surface waters through runoff, atmospheric deposition, ground water and anthropogenic sources.

3.4.1 Specific Conductivity and Total Dissolved Solids

Specific conductivity is a measure of a solution's resistance to electrical flow and is related to the total dissolved solids or ions in water. There are no PAL guidelines for specific conductivity. Total dissolved solids (TDS) in freshwaters are usually composed of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, chloride, sulphate, and nitrate. TDS enters waterways from a variety of sources including weathering of geological formations, biological sources, sewage, runoff, wastewater, and road salts. There are no Alberta PAL guidelines for TDS.

Classification: Public

Data for specific conductivity is presented in Figure 14. Specific conductivity in the Beaverlodge River ranged from 110 - 2202 µS/cm, while in the tributaries it ranged from 129-1414 µS/cm. Redwillow and Wapiti River had a smaller specific conductivity range of 172-702 µS/cm and 163-352 µS/cm, respectively. The highest recorded conductivity for Beaverlodge River, Beavertail Creek, and Steeprock Creek occurred in the fall on a single day, September 21, 2017. It is difficult to determine reasons for such high conductivity levels on that day but erroneous readings due to faulty equipment calibration cannot be ruled out. Specific conductivity measurement had a larger range on Beaverlodge River sites located downstream of the confluence with Beavertail Creek (upper limit <750 µS/cm) than above the Beavertail confluence (upper limit was >750 µS/cm to a maximum of 2202 µS/cm).

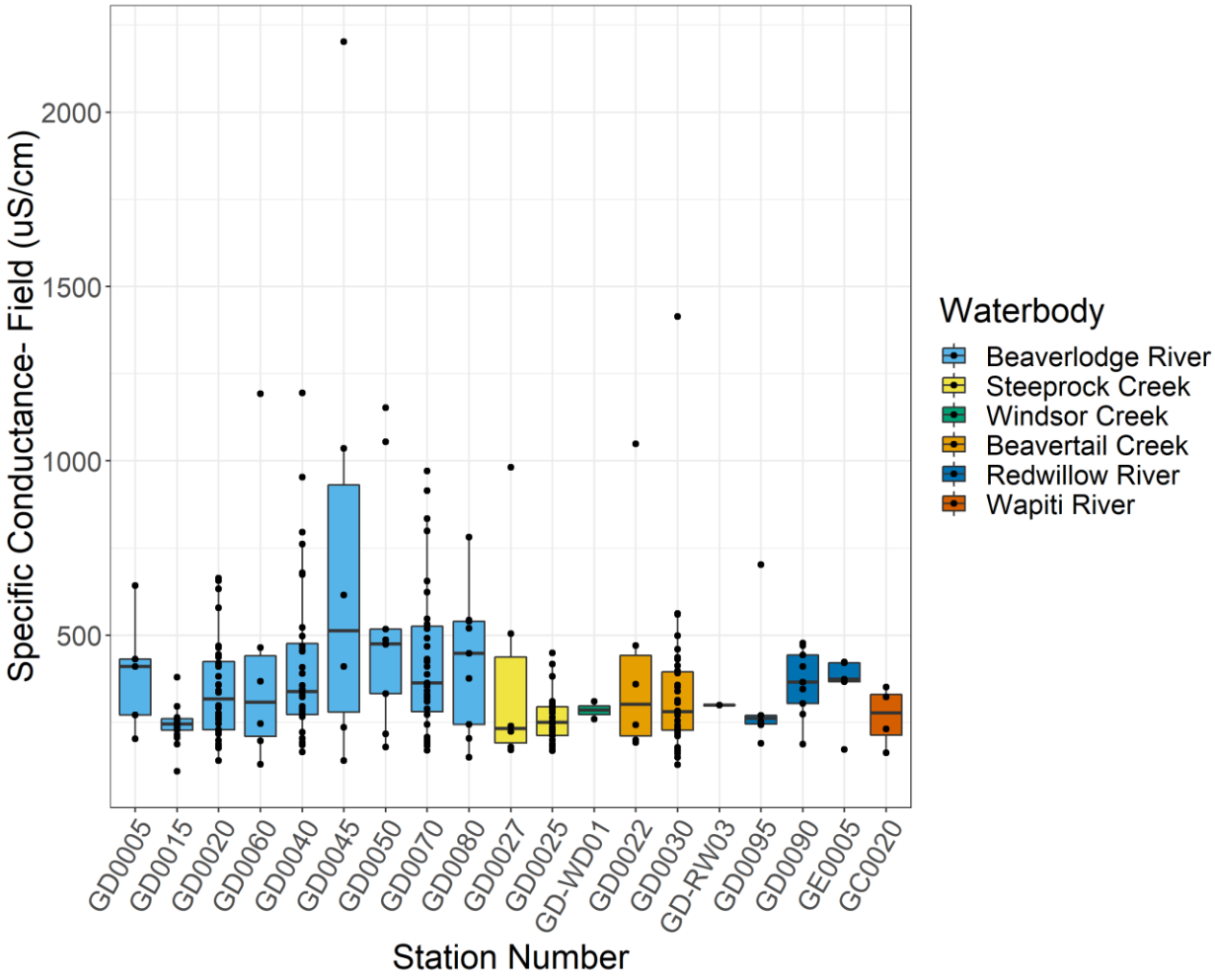


Figure 14. Boxplot of specific conductivity levels.

TDS in the Beaverlodge River and its tributaries ranged from 70 to 910 mg/L, while the Redwillow River varied from 120 to 270 mg/L (Figure 15). Concentrations of TDS were variable but displayed an

Classification: Public

increasing pattern downstream in the Beaverlodge mainstem but not its tributaries. TDS values were highest near the Town of Beaverlodge with levels above 500mg/L.

Seasonal fluctuations in conductivity and TDS are expected in surface waters. Generally, somewhat higher levels are often measured during winter season when streams are sustained by groundwater input. Reverse pattern can be observed at some sites that have sufficient number of sites permitting analysis of seasonal patterns. For example, the data for some Beaverlodge River sites showed increases in TDS in the spring and fall (Figure 16). This might be associated with runoff inputs of salts from the agricultural areas.

TDS levels on the Redwillow River and Beaverlodge River's tributaries were generally equal to or less than 250 mg/L and had smaller range of values. The Redwillow River site downstream of its confluence with Beaverlodge River was likely influenced by inputs from the Beaverlodge River.

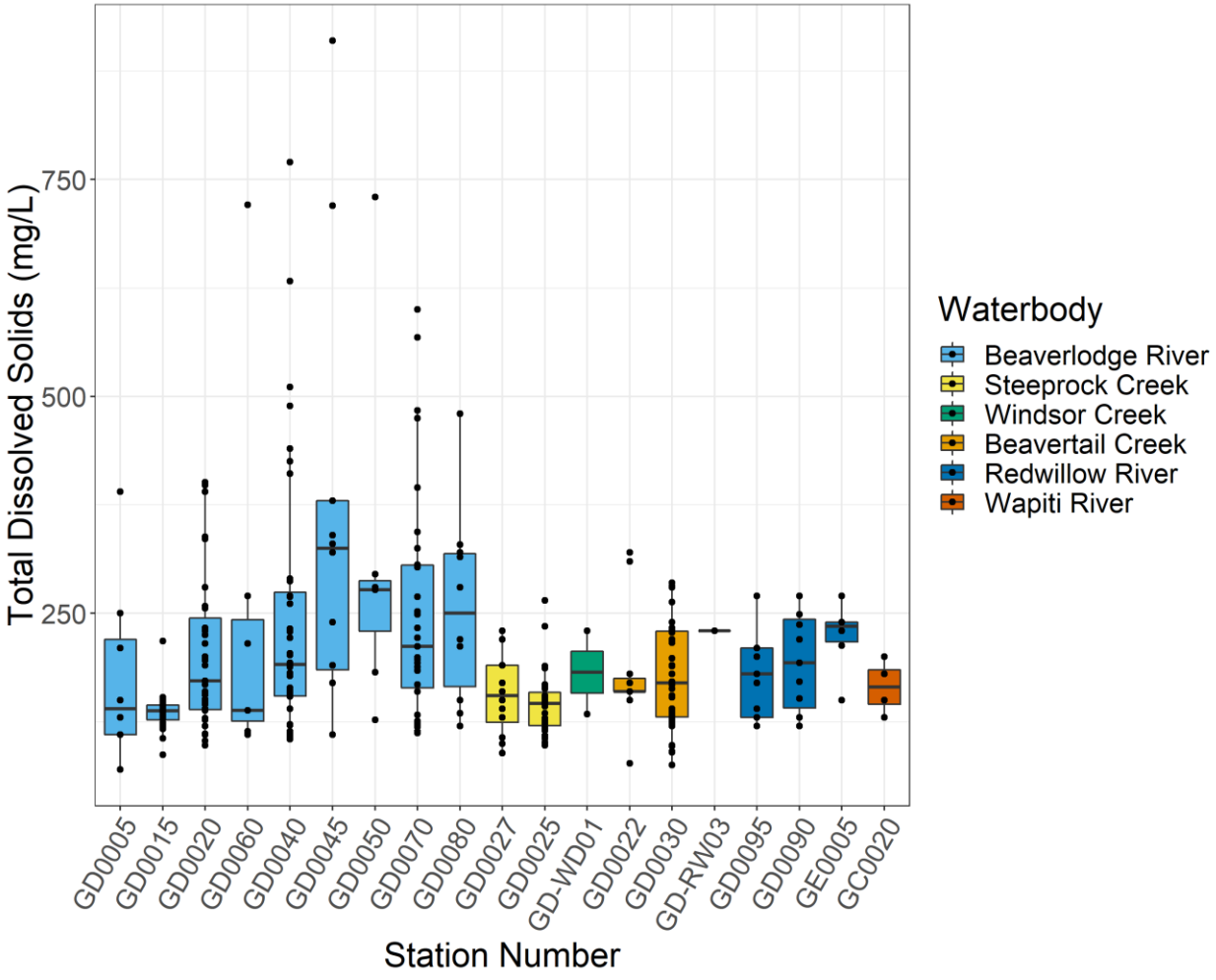


Figure 15. Boxplot of TDS concentrations.

Classification: Public



Figure 16. TDS concentrations - seasonal distribution.

3.4.2 Hardness and Alkalinity

In fresh water ecosystems, hardness is primarily a measure of calcium and magnesium concentrations (Health Canada 1979; Wetzel 2001). The main natural source of hardness in aquatic systems is sedimentary rocks, runoff from soils, and ground water. There is no PAL guidelines for hardness. Hardness is used to calculate the PAL guidelines for sulphates and certain metals (i.e. cadmium, cobalt, copper, lead, nickel).

Hardness in the Beaverlodge River and its tributaries ranged from 33 to 347 mg/L, while Redwillow River had a range of 86-230 mg/L (Figure 17). The median values for most sites on the Beaverlodge River, Redwillow River, and tributaries are in the moderately soft to hard range (76-180 mg/L) (Appendix 1). One site on the Redwillow River at Mount Valley (GD-RW03) was in the very hard range (181-250mg/L), but this was based on a single measurement. Water hardness on the Beaverlodge River increased at downstream sites with the highest values recorded near the town of Beaverlodge and plateauing downstream.

Classification: Public

Alkalinity is the measure of the buffering capacity of carbonate in aquatic systems (Wetzel 2001). Alkalinity is the total quantity of base such as hydroxyl, carbonate, and bicarbonate in water. The PAL guideline is a minimum value. Alkalinity should exceed 20 mg/L unless natural conditions are less. If natural conditions are below 20 mg/L, the guideline limit is 25% of the natural level. All samples on the Beaverlodge River, its tributaries and the Redwillow River were above the minimum PAL guideline.

Alkalinity in the Beaverlodge River and its tributaries varies from 45 to 430 mg/L, while the range for Redwillow River was 90 - 260 mg/L (Figure 18). Alkalinity in the Beaverlodge River was similar to the Redwillow River especially near the town of Beaverlodge. Alkalinity tends to vary with season and declines with increasing discharge (Moldan and Cerny, 1994). This phenomenon was exhibited in all sites as alkalinity decreased in the spring (Figure 19), when increased flows have a dilution effect.

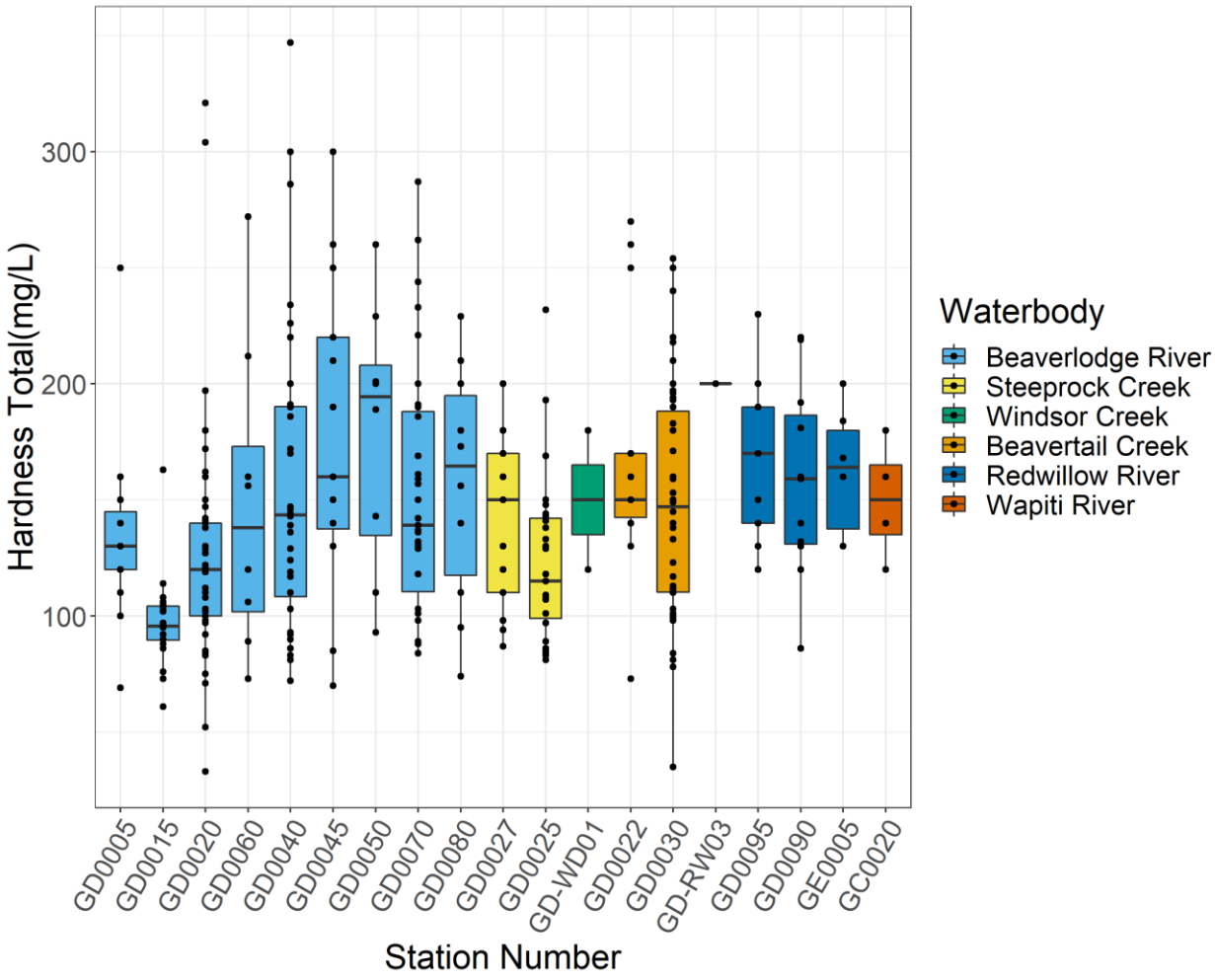


Figure 17. Boxplot of total hardness levels.

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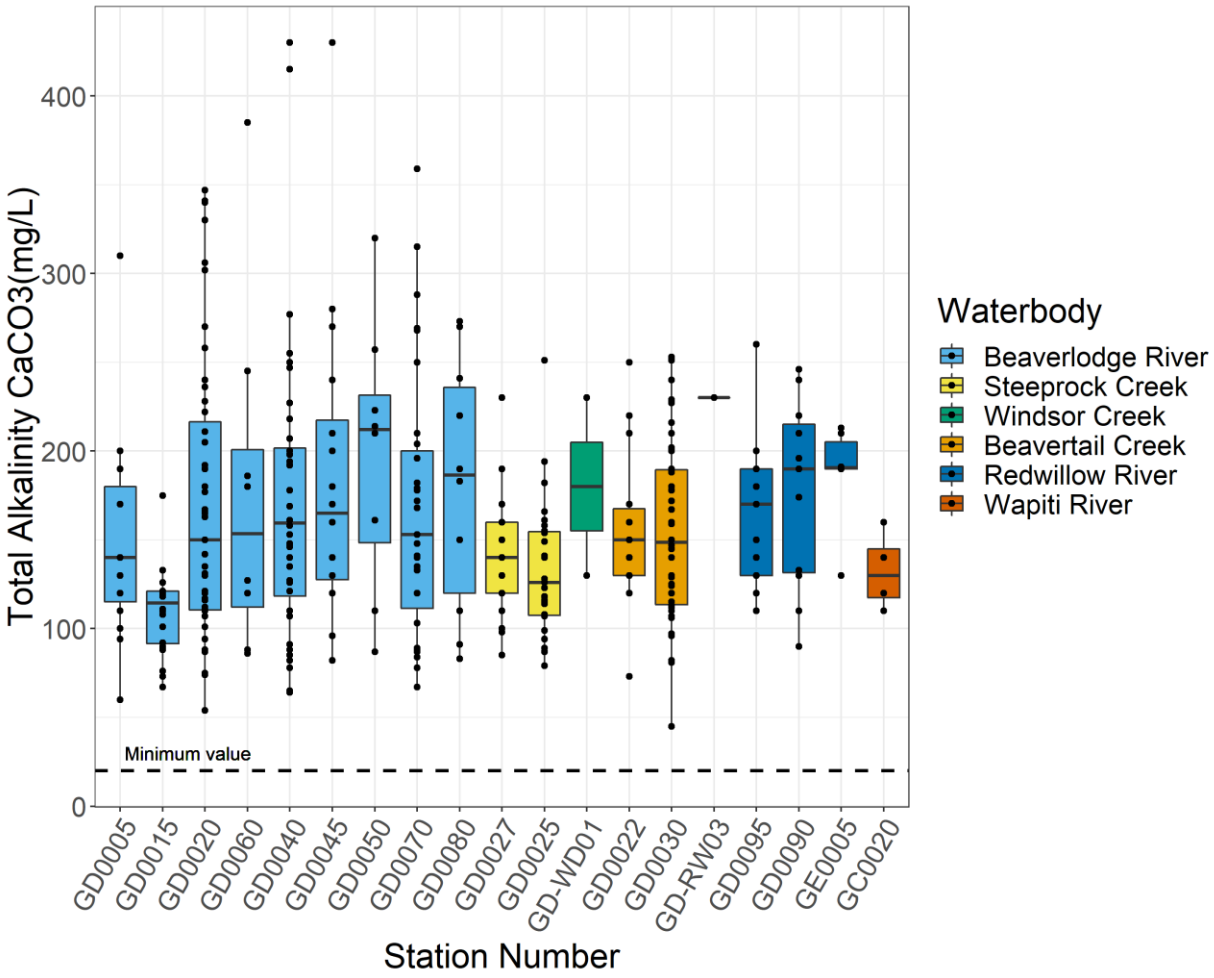


Figure 18. Boxplot of total alkalinity levels.

Classification: Public

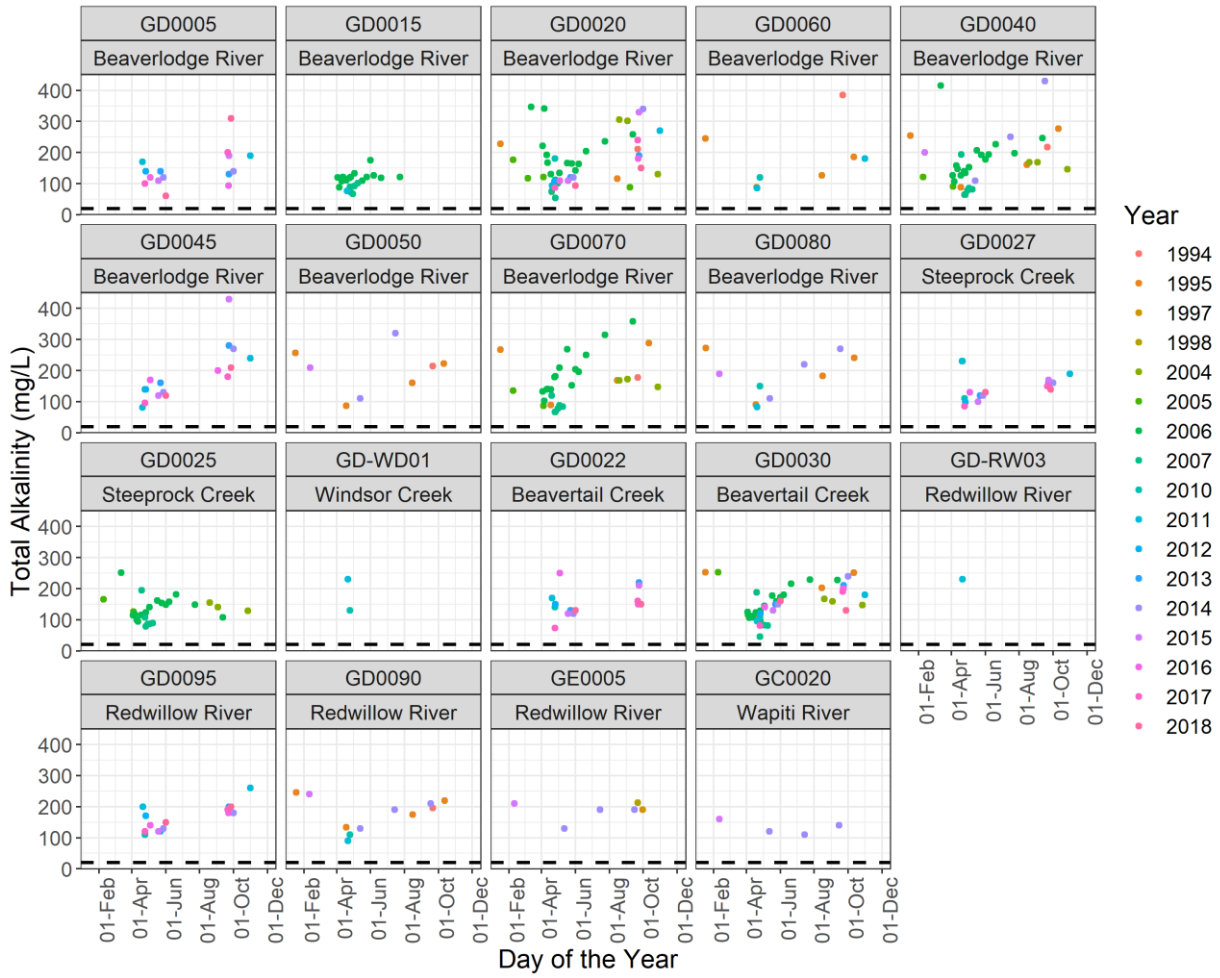


Figure 19. Total alkalinity levels - seasonal distribution.

3.4.3 Magnesium and Calcium

Magnesium and calcium data were collected in two forms: dissolved and extractable. The distribution of extractable and dissolved forms was sufficiently similar to be used interchangeably for the purposes of this report (Figure 20; Figure 21). Magnesium and calcium do not have PAL guidelines.

Magnesium concentrations along the Beaverlodge River and tributaries ranged from 2.66 to 29.0 mg/L, while the Redwillow River ranged from 6.70 to 15.0 mg/L (Figure 22). Calcium concentrations along the Beaverlodge River and tributaries ranged from 8.94 to 93.2 mg/L while in the Redwillow River it ranged from 24.0 to 68.0 mg/L (Figure 23).

Both ions displayed a similar spatial pattern to that of hardness in downstream sites in the tributaries, and the Redwillow River.

Both calcium and magnesium declined in the spring (Figure 20; Figure 21) likely associated with increased river flow (Figure 4) (Moldan and Cerny 1994).

Classification: Public

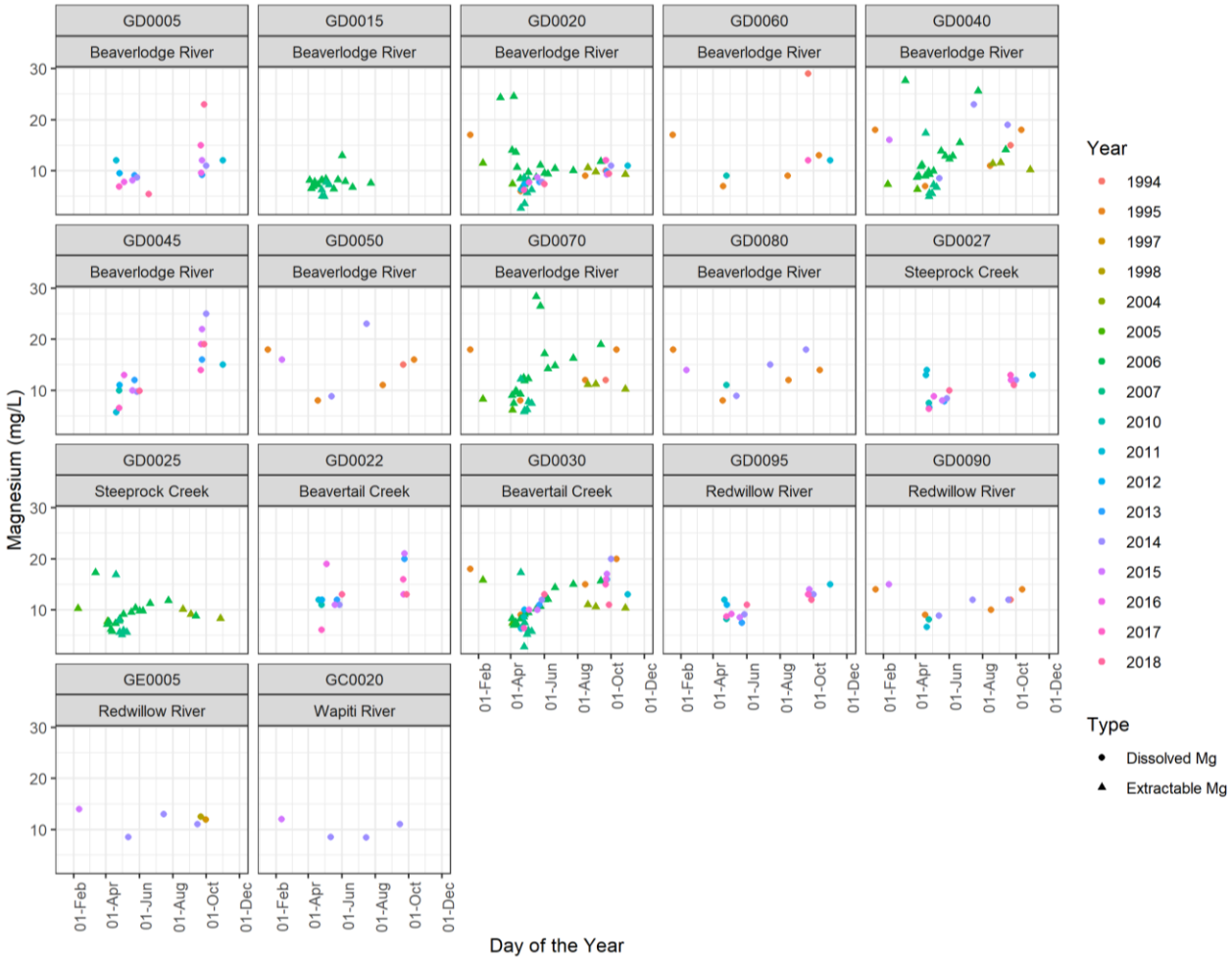


Figure 20. Magnesium concentrations - seasonal distribution.

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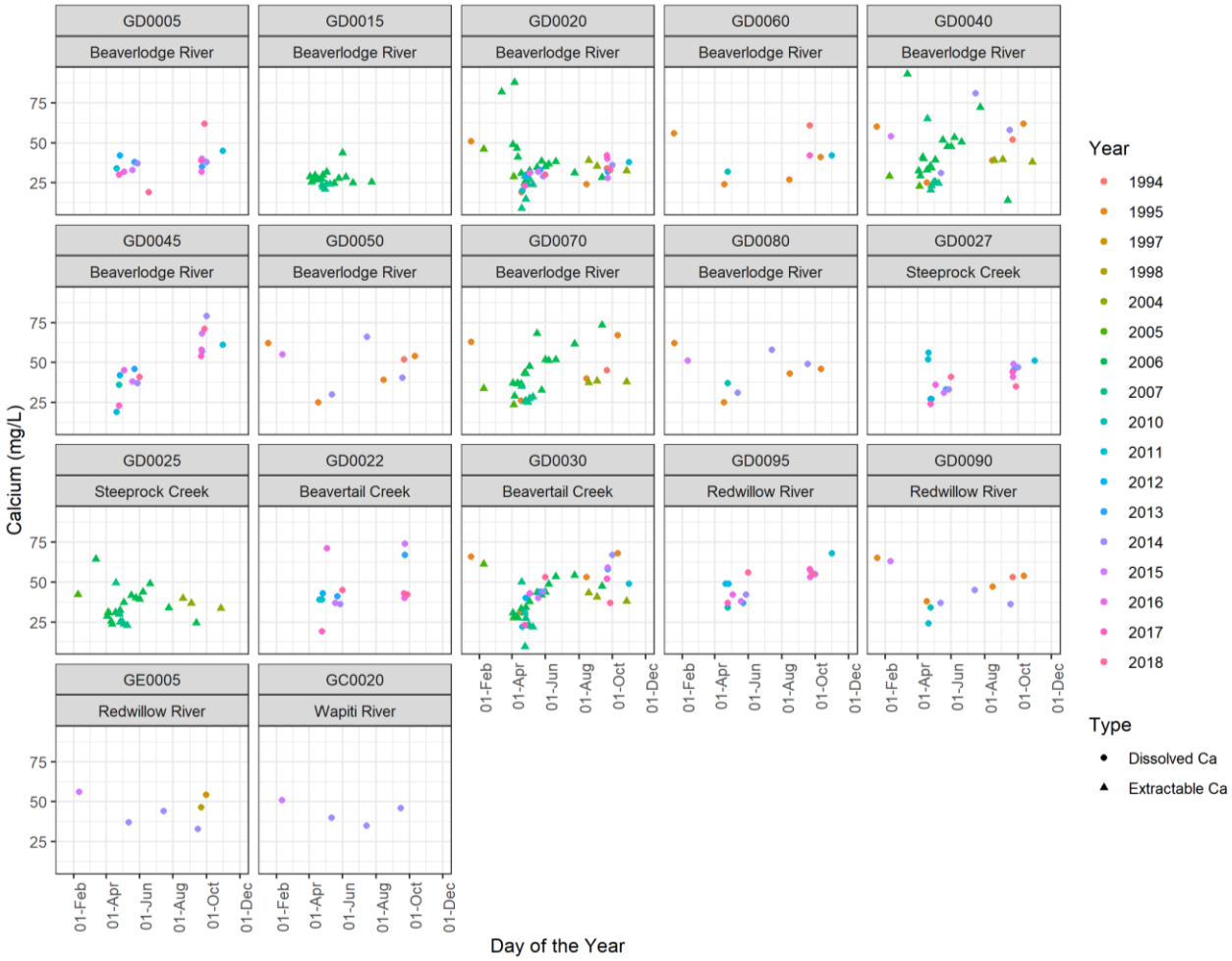


Figure 21. Calcium concentrations - seasonal distribution.

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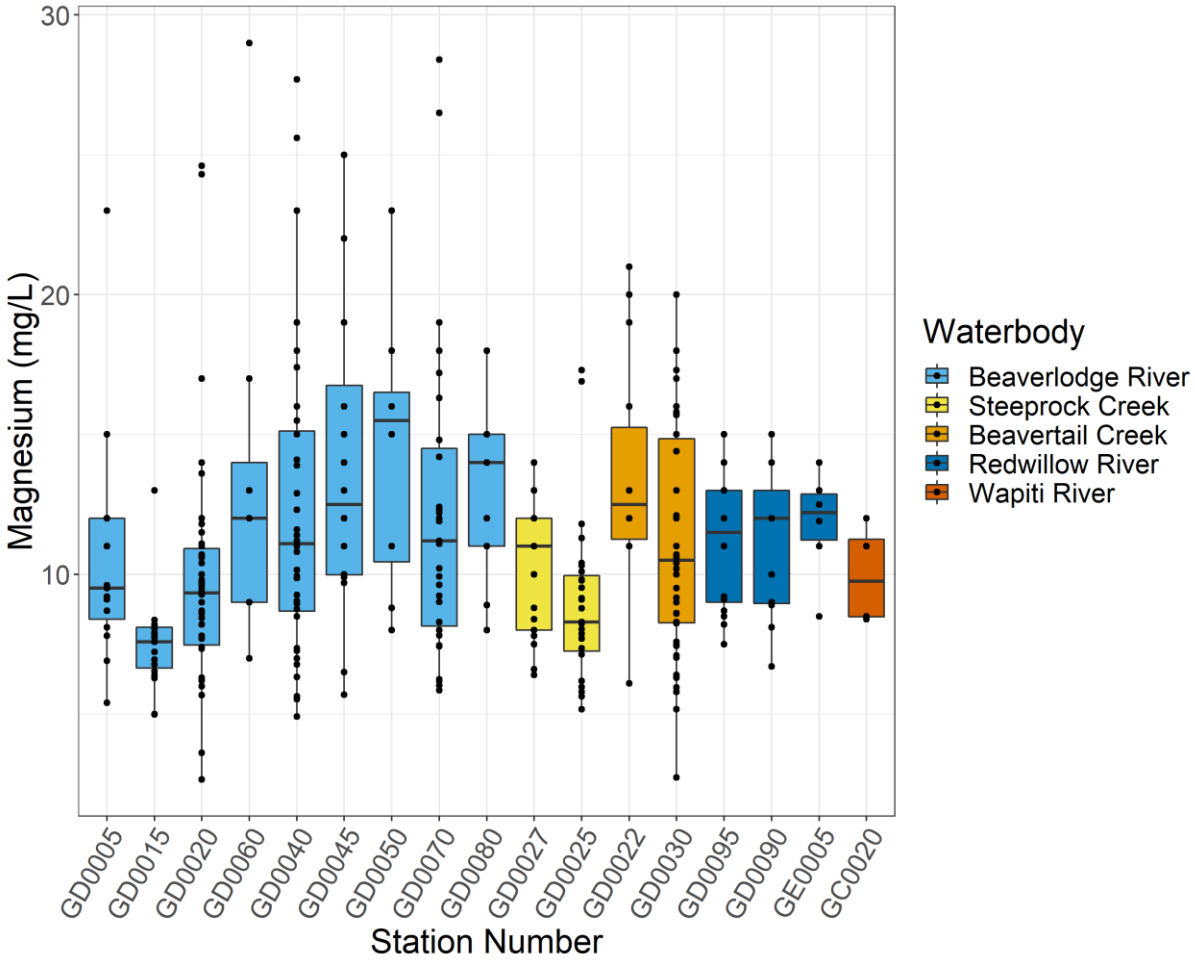


Figure 22. Boxplot of magnesium concentrations.

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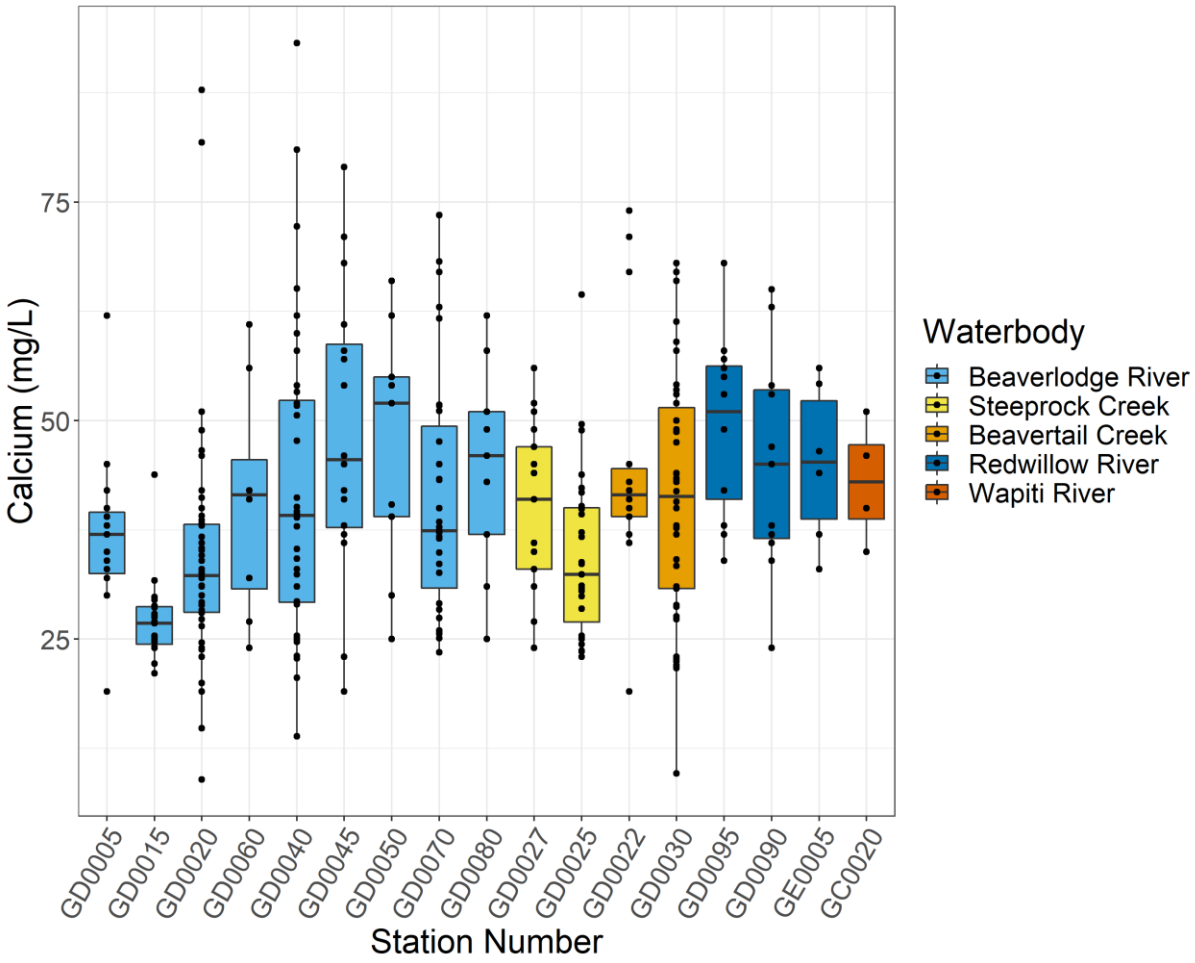


Figure 23. Boxplot of calcium concentrations.

3.4.4 Bicarbonate

There is no bicarbonate PAL guideline in Alberta. Bicarbonate concentrations in the Beaverlodge River and its tributaries ranged from 55 to 530 mg/L (Figure 24). Bicarbonate in the Redwillow River ranged from 110 to 300 mg/L.

Median concentrations of bicarbonate in the Redwillow River are between 210 to 230 mg/L. Sites downstream of the Town of Beaverlodge had similar concentrations (205-255 mg/L) while upstream reaches, including the tributaries, had lower levels of bicarbonate. Windsor Creek is the exception with elevated bicarbonate, but this was based on a single measurement.

3.4.5 Chloride and Sodium

The Alberta long term PAL guideline for chloride is 120 mg/L and the short term is 640 mg/L. There is no PAL guideline for sodium. No value recorded in the Beaverlodge River, its tributaries, or the Redwillow River exceeded the chloride guidelines.

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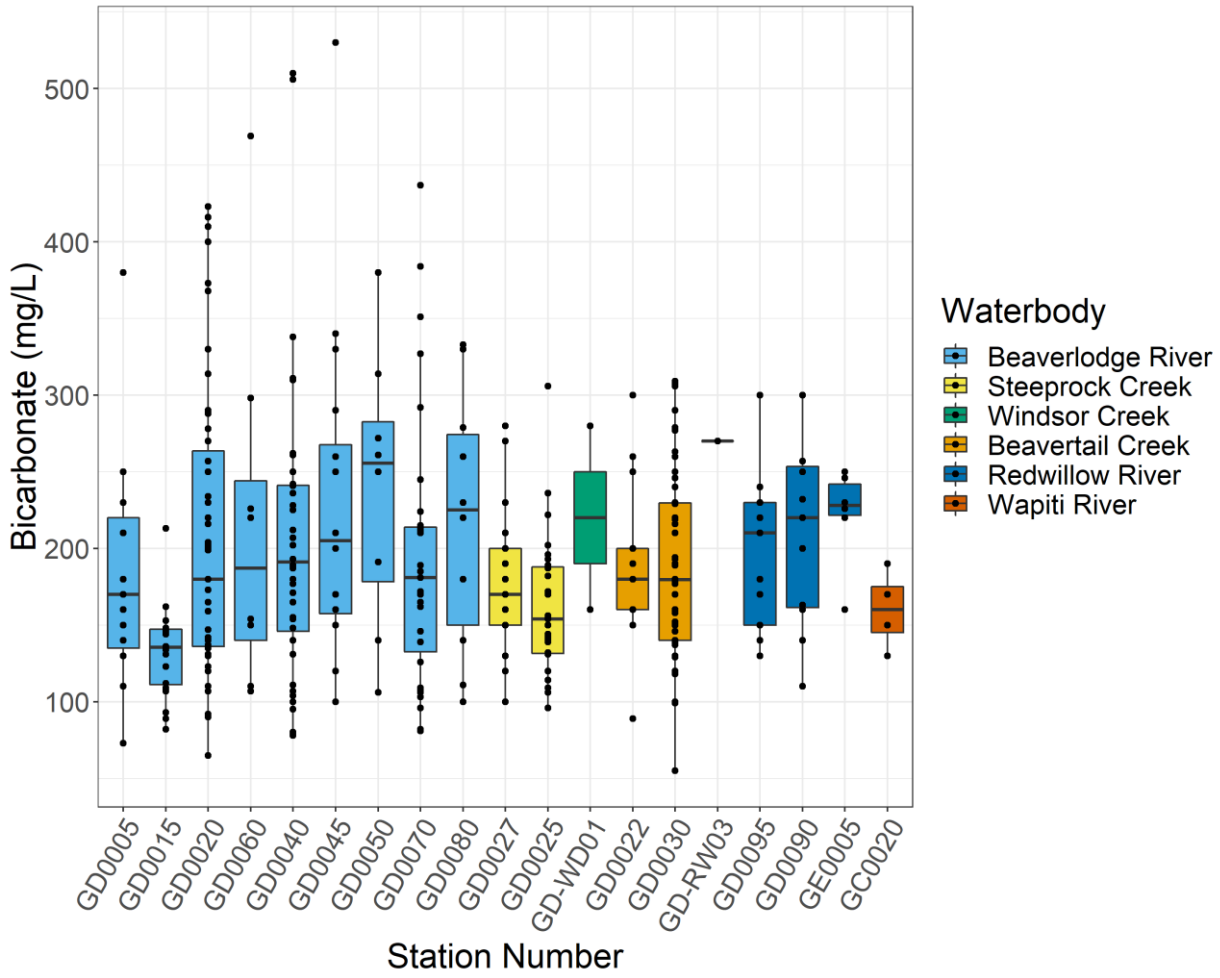


Figure 24. Boxplot of bicarbonate levels.

Chloride levels ranged from 0.15 to 85.6 mg/L in the Beaverlodge River and tributaries. The Redwillow River had a lower range of chloride (0.6-3.25 mg/L, Figure 25). Sodium concentrations in the Beaverlodge River and tributaries ranged from 2.5 to 240 mg/L (Figure 26). The Redwillow River had much lower range of dissolved sodium (3.8-49.0 mg/L). Chloride peaked in the spring and fall (Figure 27), while sodium decreased in in spring. Sodium concentrations increased in the summer and fall (Figure 28) coinciding with lower flows (Figure 4).

The median dissolved chloride values on the Beaverlodge River were greater than its tributaries and the Redwillow River (Figure 25). Median chloride and sodium levels increased along the Beaverlodge River. Peak values were recorded near the Town of Beaverlodge (GD0045). Overall chloride levels in the Beaverlodge River were higher than those recorded in the Redwillow River.

The median levels of sodium and chloride in the Redwillow were similar to those in the Beaverlodge tributaries (except GE0005). The Redwillow River site downstream of the confluence with Beaverlodge River had the highest level of chloride (3.25 mg/L) compared with upstream sites (0.25-2.00 mg/L). This

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site also had median levels of sodium double those found in upstream sites and more similar concentrations in the Beaverlodge mainstem. Increased levels of chloride and sodium at the Redwillow River site downstream of the confluence with Beaverlodge River likely stem from mixing with the Beaverlodge River.

The Beaverlodge tributaries had lower median concentrations of chloride and sodium than the mainstem. Chloride in the tributaries ranged 0.50 to 2.90 mg/L, while sodium ranged from 6.20 to 10.20 mg/L. Steeprock Creek had the lowest chloride levels that displayed an increasing pattern along the length. Both Windsor and Beavertail Creek had chloride levels above Steeprock Creek. The highest level of chloride was recorded in the upstream site located on the Beavertail Creek (GD0022). Sodium levels increased in downstream sites in all tributaries with the highest level downstream of the Steeprock and Beavertail confluence (GD0030).

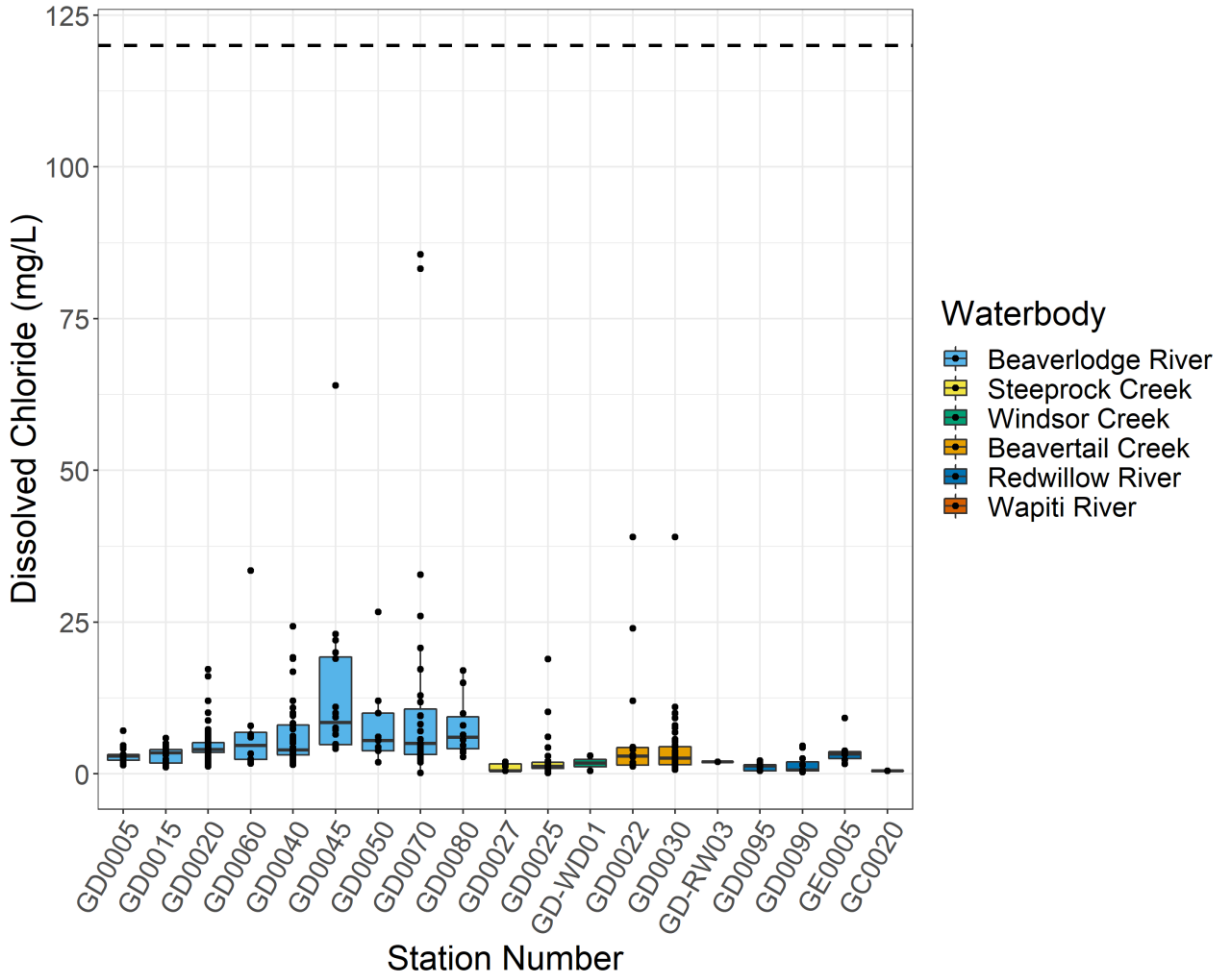


Figure 25. Boxplot of chloride concentrations.

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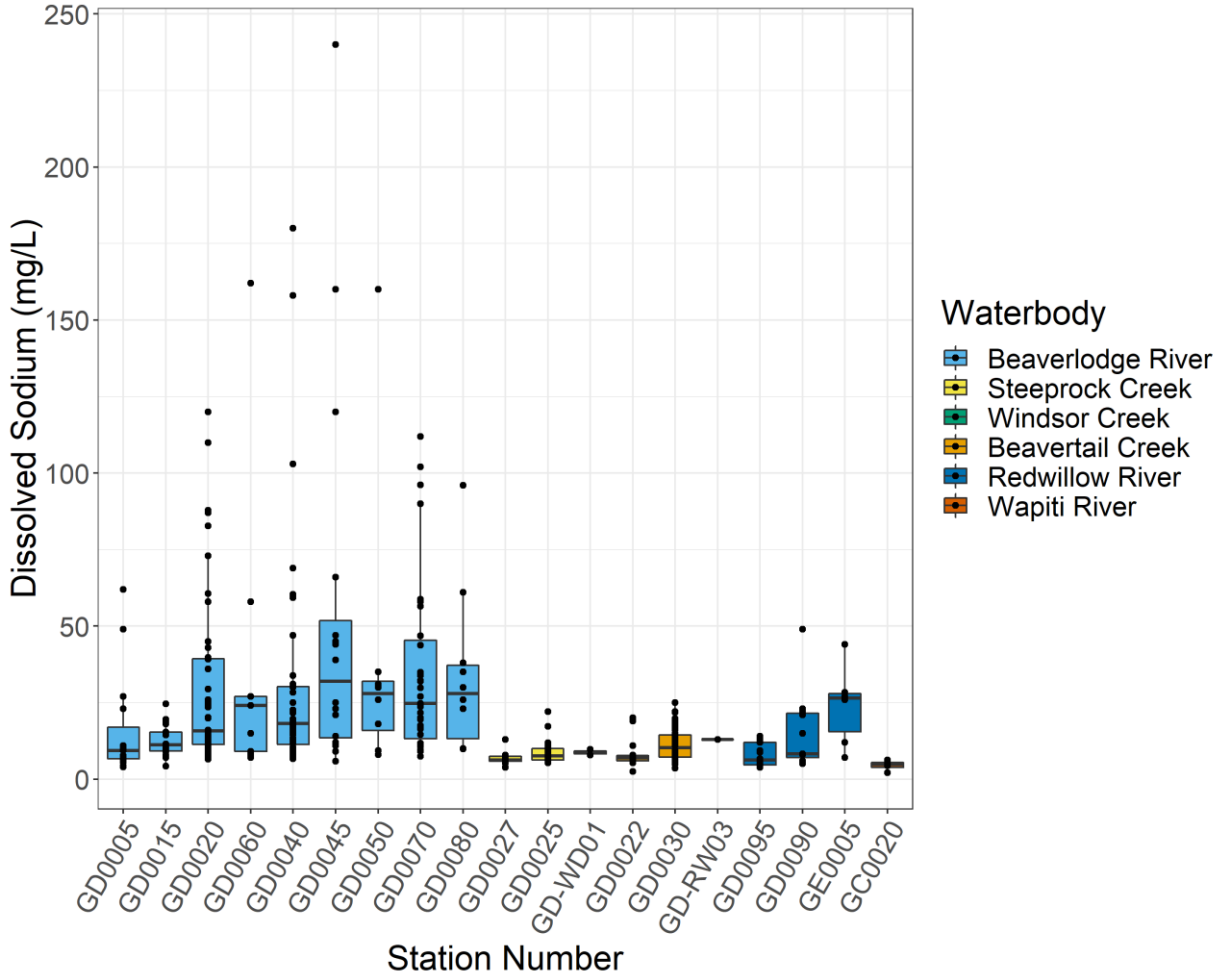


Figure 26. Boxplot of dissolved sodium concentrations.

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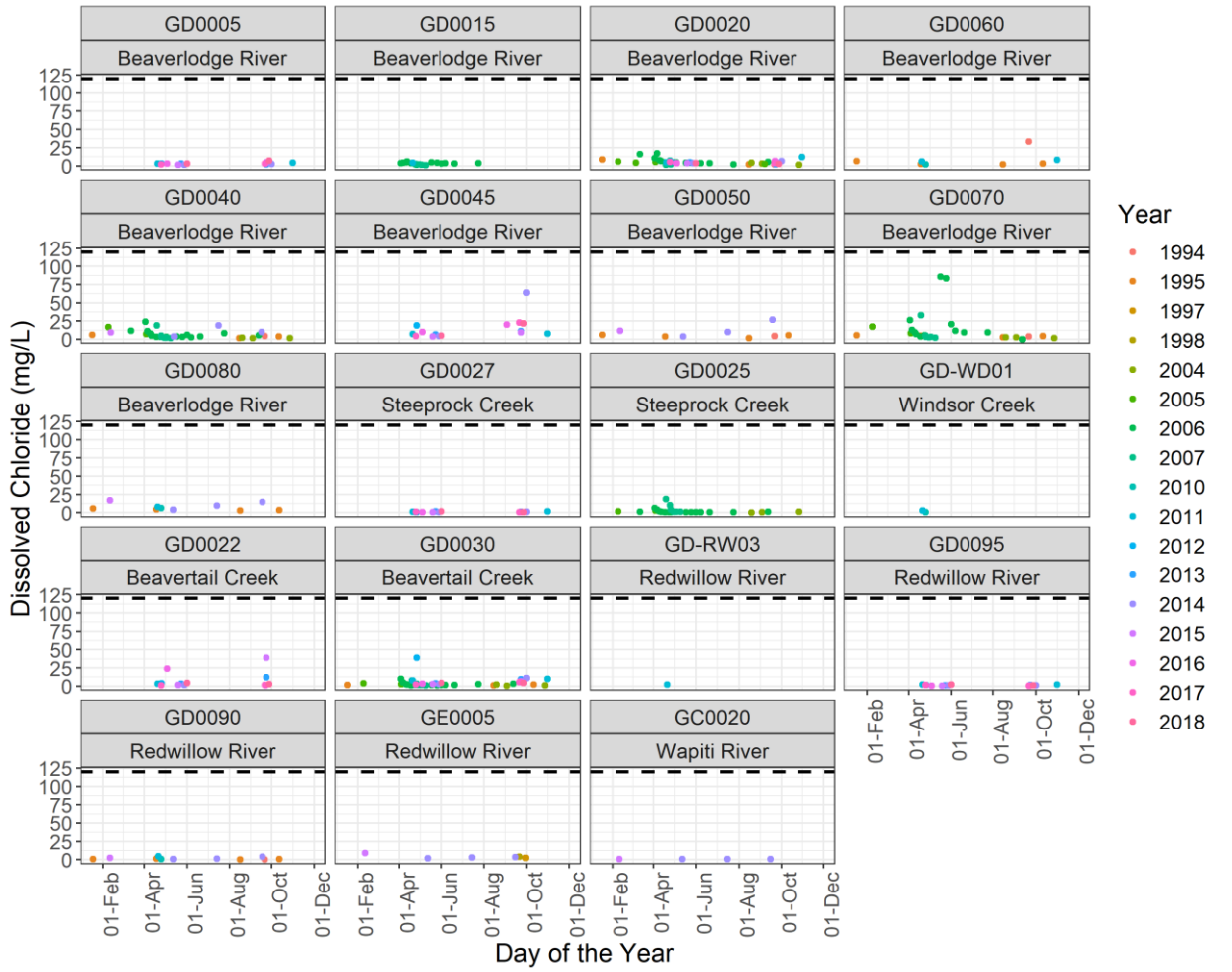


Figure 27. Dissolved chloride – seasonal distribution. Long-term guideline for PAL guideline is shown as dashlines.

Classification: Public

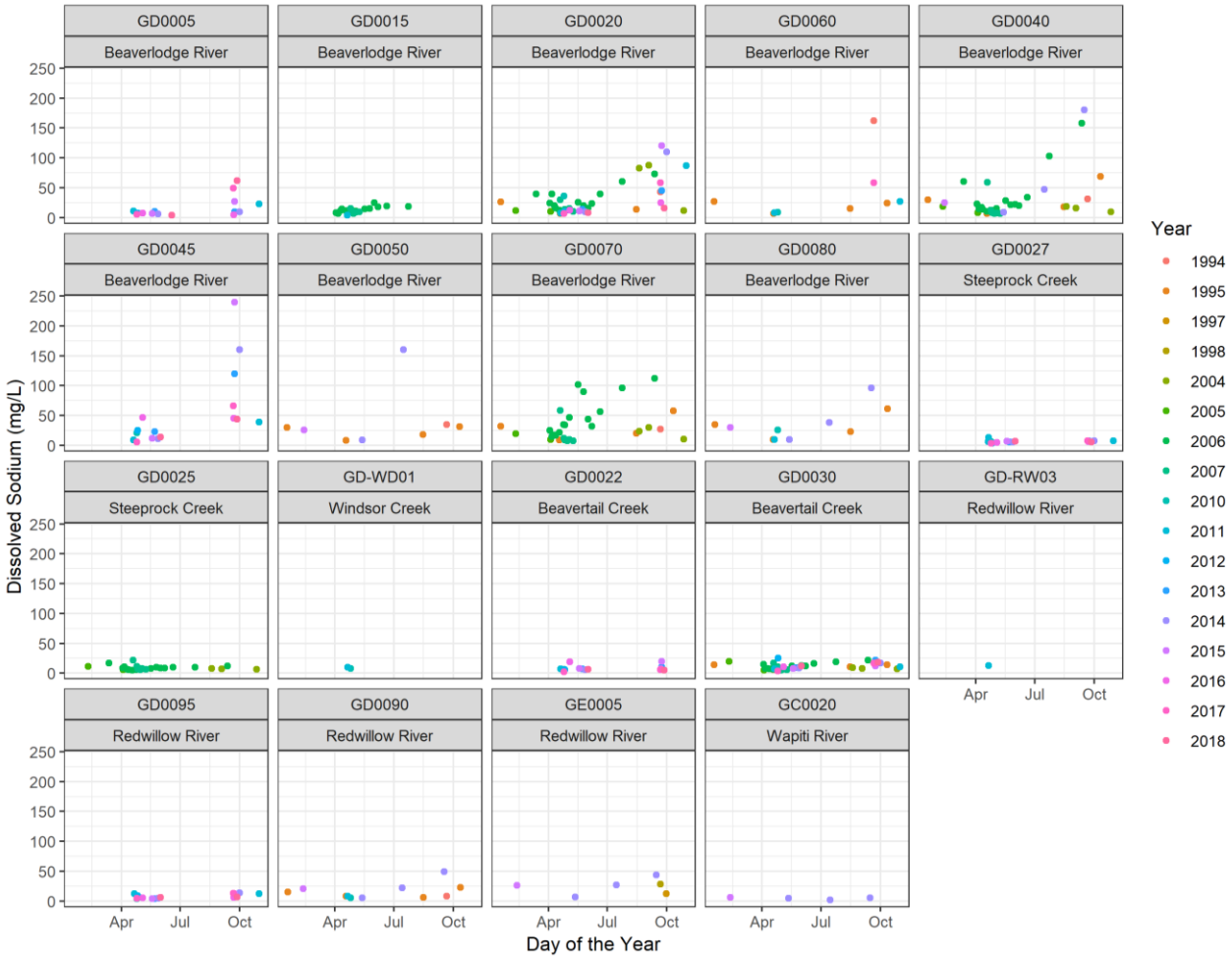


Figure 28. Dissolved sodium - seasonal distribution.

3.4.6 Sulphate

The PAL guideline for sulphate is dependent on water hardness. No site on the Beaverlodge River, its tributaries, the Redwillow River, or the Wapiti River exceeded guideline levels. Sulphate concentrations on the Beaverlodge River and its tributaries ranged from 0.5 to 310 mg/L. Sulphate in the Redwillow and Wapiti River ranged from 0.5 to 32 mg/L (Figure 29).

Sulphate concentrations increase in downstream sites on the Beaverlodge River. The highest levels of sulphates were recorded near the town of Beaverlodge (GD0040, GD0045, and GD0050). Sites upstream of the town of Beaverlodge had a median value of 0.5 to 13 mg/L, while those downstream ranged from 20 to 51 mg/L. The Redwillow River exhibited increasing levels of sulphate in downstream sites. The highest level of sulphate in the Redwillow River was measured downstream of the confluence with Beaverlodge, potentially indicating an influence by the Beaverlodge River. The largest spikes in sulphate concentrations occur in the late summer and early fall (Figure 30).

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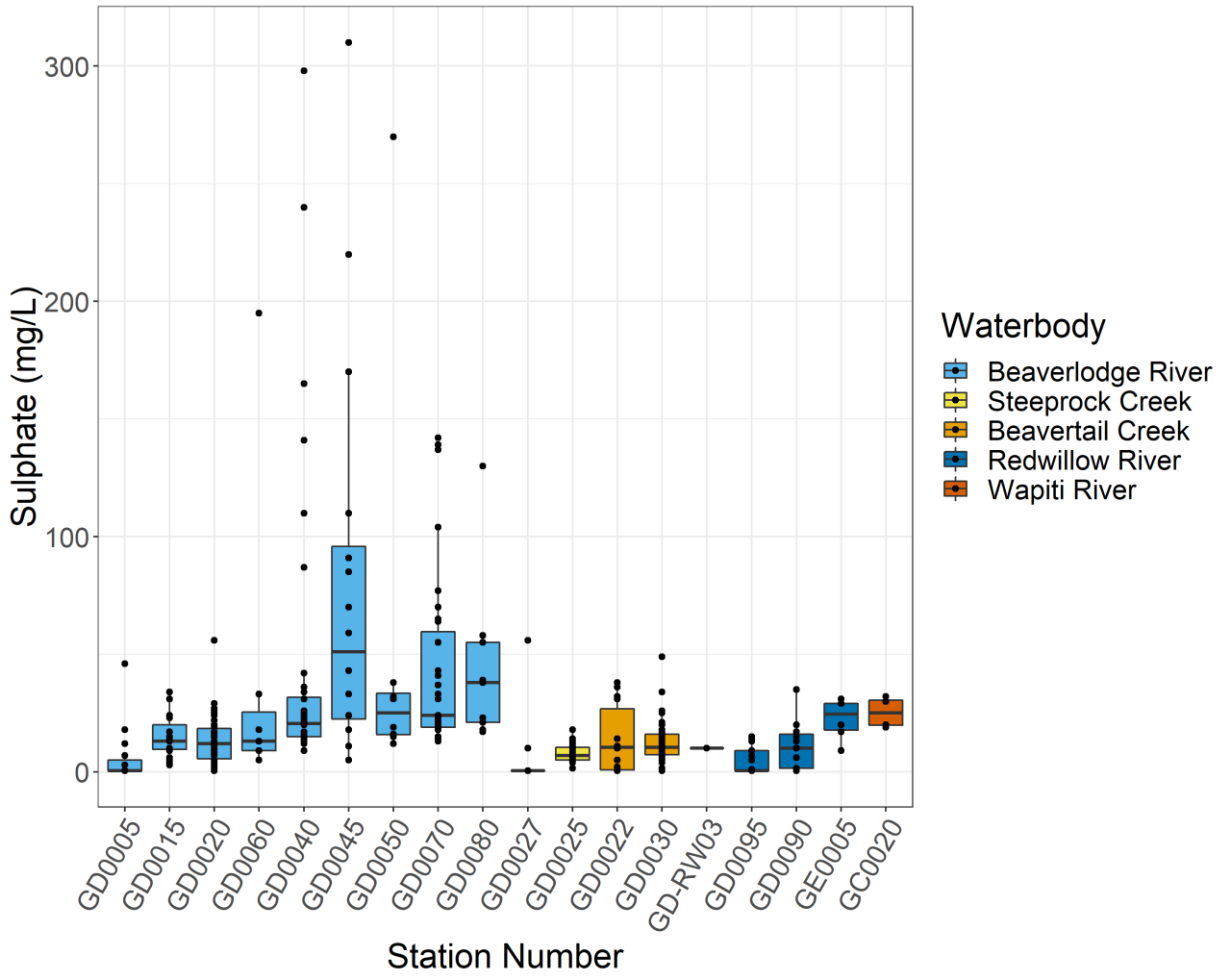


Figure 29. Boxplot of sulphate concentrations . PAL guideline not shown as it varies with hardness.

Classification: Public



Figure 30. Sulphate - seasonal distribution.

3.4.7 Ionic Composition - Summary

The Beaverlodge River is dominated by bicarbonate at all sites. Alkalinity, hardness, and major ions had similar spatial patterns across Beaverlodge, its tributaries, and Redwillow River. The similarity is likely due to the underlying geology. However, upstream sites on the Beaverlodge River had lower levels of alkalinity, water hardness and associated ions compared to the lower reaches.

Sites downstream had relatively high levels of sodium, chloride and sulphates with the highest levels occurring near the Town of Beaverlodge. TDS and specific conductivity also increased in downstream sites likely linked to the increases in sodium, chloride, and sulphates.

Seasonal concentrations of dissolved solids are expected to decrease with increases flows, however, TDS levels below the Town of Beaverlodge do not consistently adhere to this pattern. Some surveys indicate that TDS and sodium below the Town of Beaverlodge have increased values during spring, summer and fall. This could be due to agricultural runoff and municipal effluent discharges.

Classification: Public

3.5 Turbidity and Total Suspended Solids

Turbidity and total suspended solids (TSS) are measures of water clarity. Turbidity and TSS in aquatic systems generally originates from the erosion of rock formations, but can also be derived from scouring of streambeds and anthropogenic activates (e.g. construction, dredging, mining, agriculture). The PAL guidelines for both clear water and high flow conditions require a knowledge of the background levels of turbidity and TSS.

Turbidity is an optical characteristic of water clarity caused by biotic and abiotic particles suspended in the water column (CCME 1999; Wetzel 2001). Increases in the concentration of suspended or dissolved substances increase the turbidity. Turbidity in the Beaverlodge River ranged from 1.0 to 430 NTU, while in its tributaries ranged from 0.8 to 520 NTU (Figure 31). The Redwillow River had a narrower turbidity range of 0.7 to 100 NTU. The median values for turbidity on the Beaverlodge River were generally higher than in its tributaries and the Redwillow River.

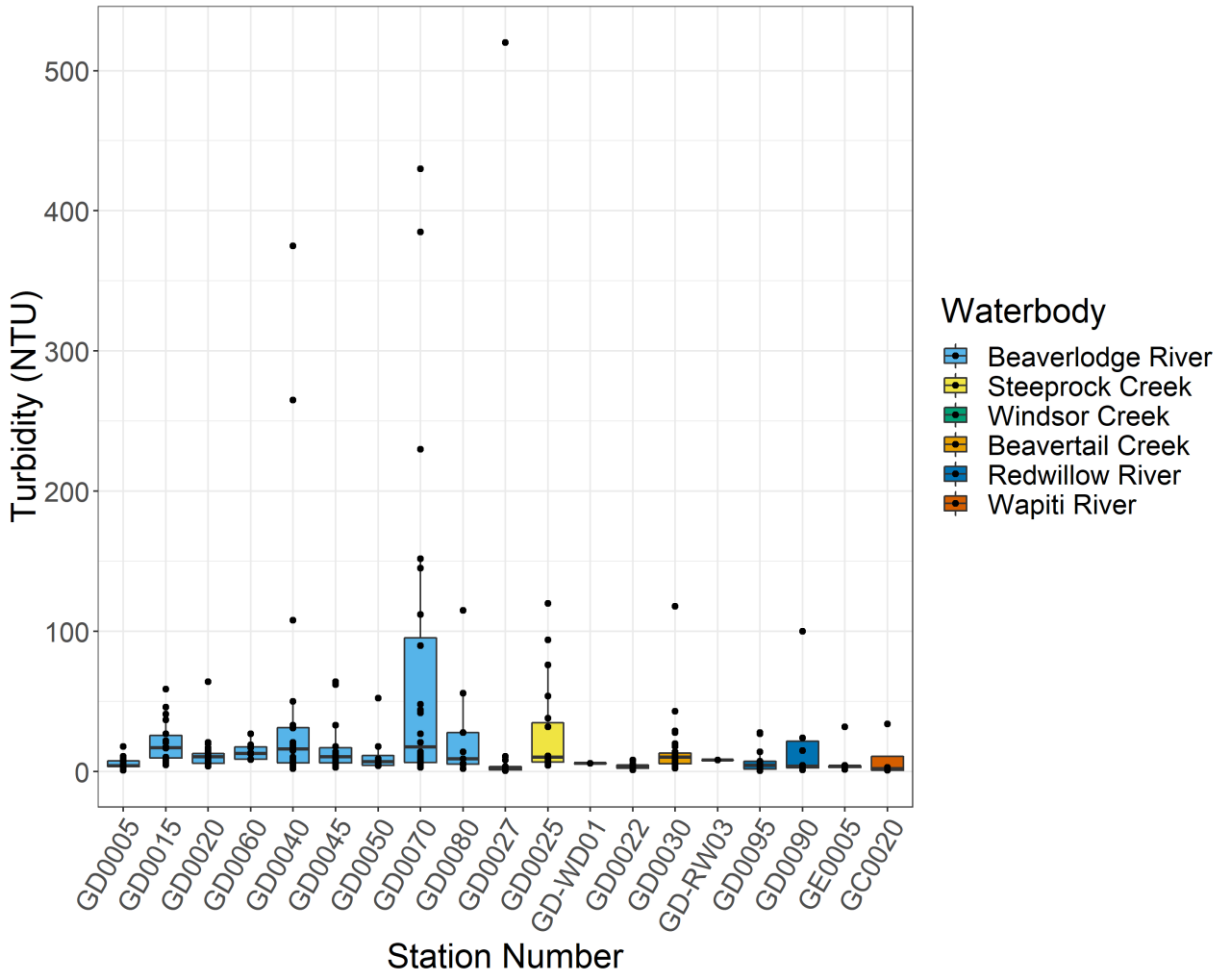


Figure 31. Boxplot of turbidity levels.

Classification: Public

Total suspended solids (TSS) are the measure of silt, clay, fine organic and inorganic particles, plankton, microscopic organisms, and other organic compounds (CCME 1999). Excess TSS in an aquatic ecosystem can lead to changes in physical, chemical, and biological properties of the waterbody. Increases in TSS can have negative effects on aquatic organisms by decreasing light penetration, infilling channels, altering habitat, and or clogging gills on fish (Biolotta and Brazier 2008). TSS in the Beaverlodge River ranged from 0.5 to 550 mg/L while in tributaries TSS ranged from 0.5 to 2000 mg/L (Figure 32). TSS in the Redwillow River ranged between 0.5 to 123 mg/L. Elevated TSS in the Beaverlodge River is expected as a previous study by Hutchinson (2018) found the lower Beaverlodge River (between Horse Lake Reserve and the village of Hythe) was classified with high export coefficients and annual exports of TSS (TSS and turbidity displayed similar seasonal pattern with the spring peaks primarily at two sites on the Beaverlodge: upstream of the town of Beaverlodge (GD0040) and at the gravel pit (GD0070) (Figure 33, Figure 34). Tributary reaches closer to the confluence with Beaverlodge River had elevated spring levels of turbidity and TSS. Increased TSS may be due to the absence of vegetation on riparian areas as severe riverbank erosion has been reported on the Beaverlodge River (AECOM 2009; Macaulay et al. 2011).

Table 6).

Classification: Public

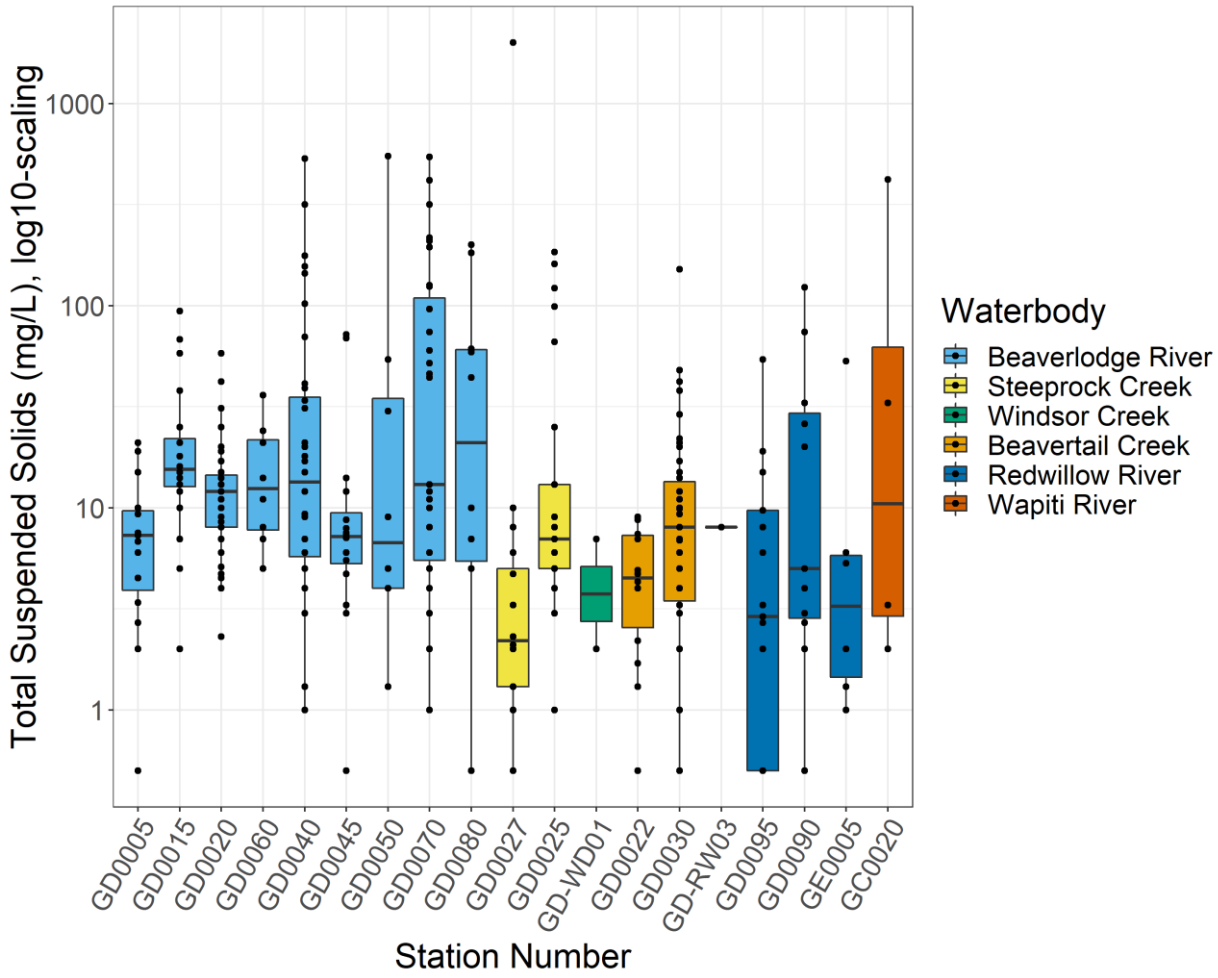


Figure 32. Boxplot of TSS levels.

TSS and turbidity displayed similar seasonal pattern with the spring peaks primarily at two sites on the Beaverlodge: upstream of the town of Beaverlodge (GD0040) and at the gravel pit (GD0070) (Figure 33, Figure 34). Tributary reaches closer to the confluence with Beaverlodge River had elevated spring levels of turbidity and TSS. Increased TSS may be due to the absence of vegetation on riparian areas as severe riverbank erosion has been reported on the Beaverlodge River (AECOM 2009; Macaulay et al. 2011).

Table 6. Pollutant export in tonnes/yr. in Beaverlodge, Beavertail Creek and Redwillow watersheds (Hutchinson 2018).

Watershed	Nitrogen	Classification for Nitrogen	Phosphorus	Classification for Phosphorus	Solids	Classification for Solids

Classification: Public

Upper Beaverlodge	188.45	Moderate	29.69	High	15 936	Moderate
Lower Beaverlodge	486.74	High	75.16	High	21 660	High
Beavertail Creek	190.80	High	29.88	High	15 869	Moderate
Lower Redwillow	186.82	Moderate	28.84	Moderate	9 300	Moderate
Upper Redwillow	86.86	Moderate	13.59	Moderate	9 487	Moderate



Figure 33. Turbidity levels - seasonal distribution.

Classification: Public

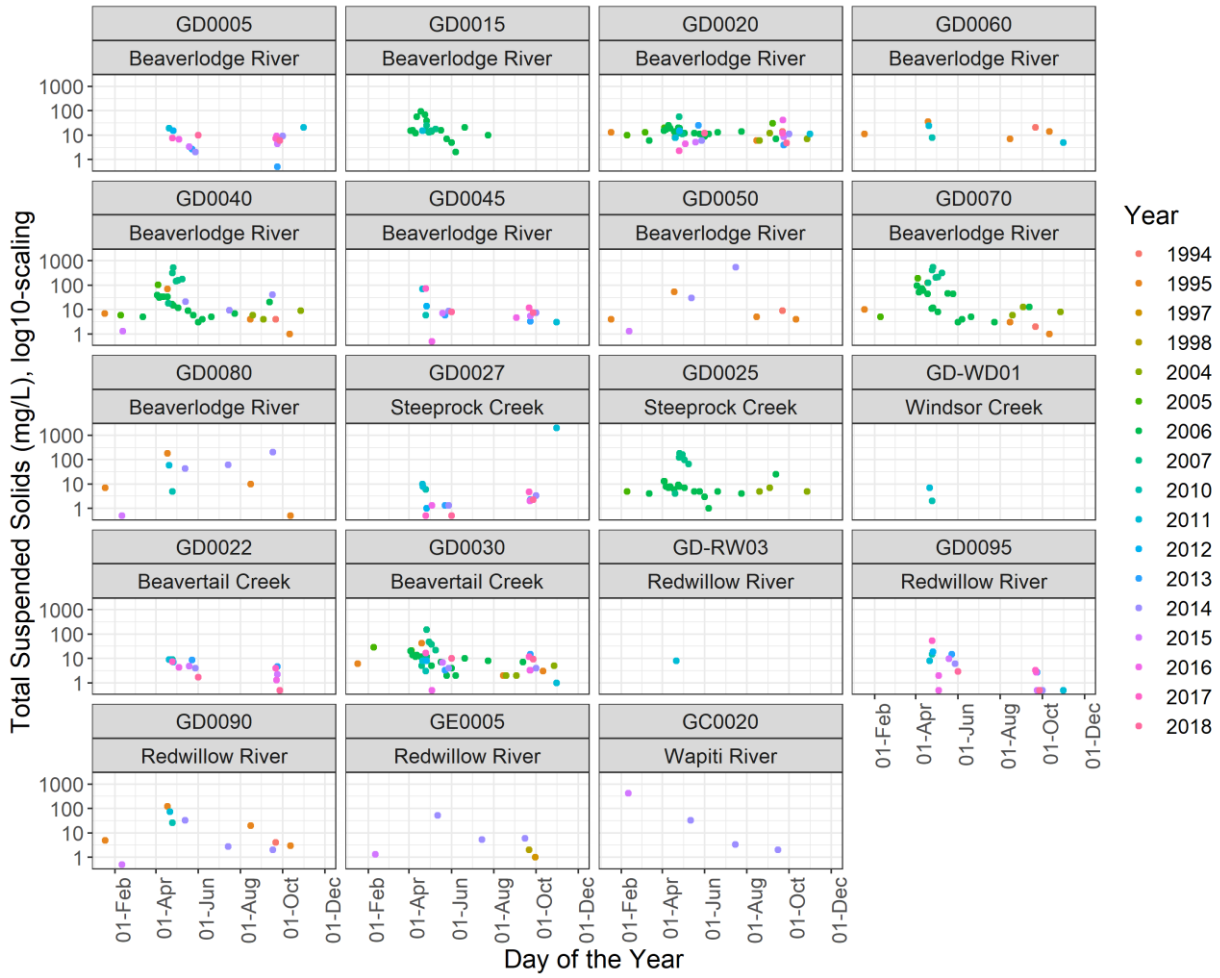


Figure 34. TSS levels - seasonal distribution.

3.6 Metals

Natural processes such as erosion of rocks and soil can deposit metals in freshwater ecosystems. Metals can also be deposited into freshwater systems from anthropogenic sources including wastewater discharges and agricultural lands. In surface waters, metals can be toxic at higher concentrations. Bioaccumulating metals (e.g. arsenic, cadmium, chromium, lead, mercury) are especially harmful to the aquatic organisms at higher trophic levels causing toxic effects.

Metals were sampled in 1994-1995, 2004 -2007, and 2010-2018. Samples were taken from all sites on the Beaverlodge River, Beavertail Creek, Steeprock Creek, Redwillow River, and Wapiti River. However, metal analyses varied across sites and years. Results are summarized in the Appendix 2.

The determination of guideline exceedances is difficult for metals as many metals were frequently measured for their dissolved form while PAL guidelines are established mainly for total metals. Overall, with the exception of dissolved aluminum and iron, levels of metals were measured below the PAL guideline values. Results for these two metals that exceeded the PAL guidelines are discussed below.

Classification: Public

3.6.1 Aluminum

The Alberta SWQG for dissolved aluminum is pH dependent. For waters with a pH ≥ 6.5, the long-term guideline is 50 µg/L and the short-term guideline is 100 µg/L. If the pH is <6.5 then an equation must be used to calculate the limit. A single value recorded in 2016 was above the long-term guideline for dissolved aluminum in the most upstream site of the Beaverlodge River (GD005).

Dissolved aluminum along the Beaverlodge River and tributaries ranged from below detection limits to 57 µg/L, which was similar to concentrations on the Redwillow River (1.29-46.0 µg/L) (Figure 35).

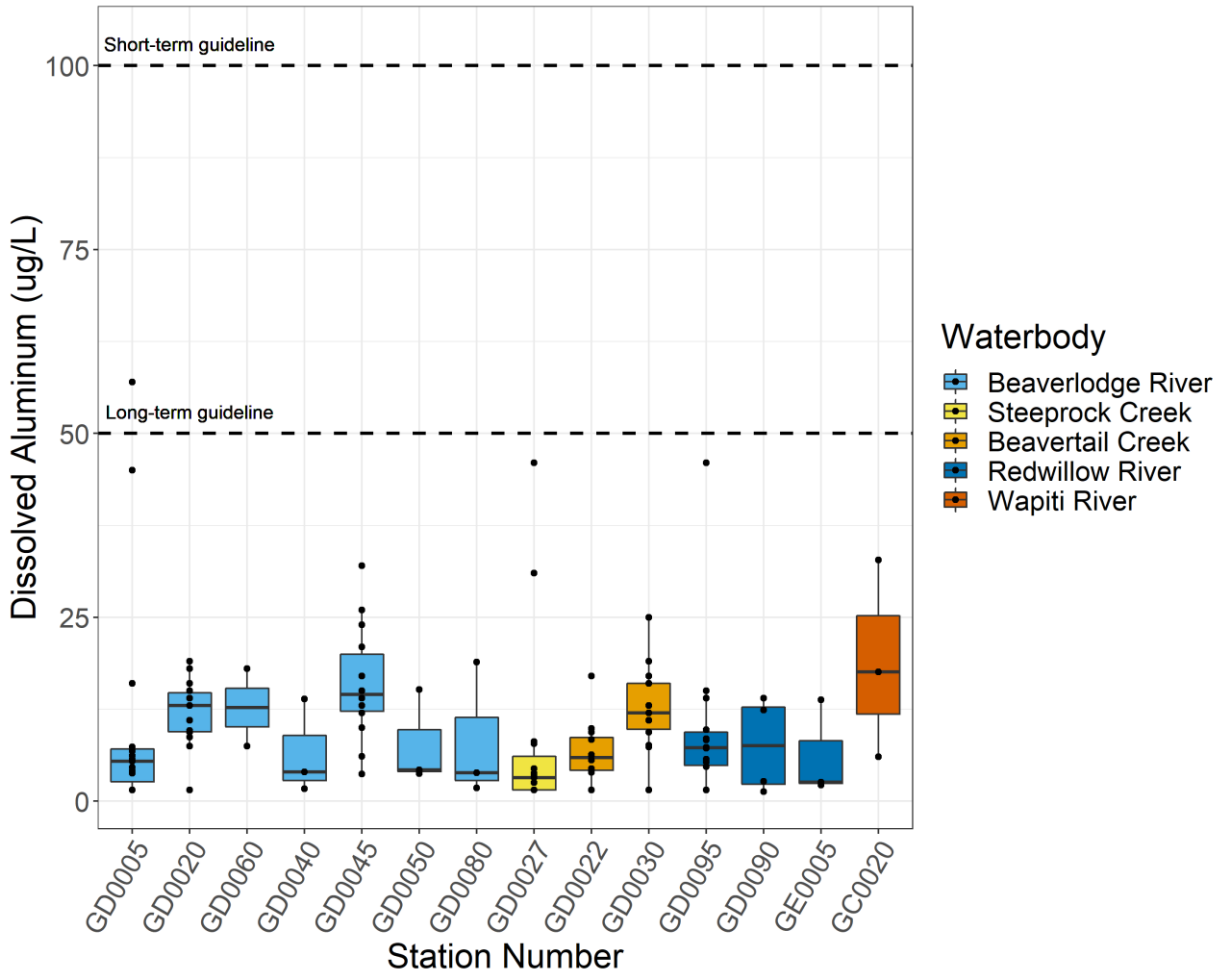


Figure 35. Boxplot of dissolved aluminum concentrations.

3.6.2 Iron

The long-term CCME and Alberta SWQG for dissolved iron is 300 µg/L. Four sites had median concentrations of dissolved iron that exceeded the long-term PAL guideline. Three sites located adjacent to (GD0060) and upstream of the village of Hythe on the Beaverlodge River (GD0020) and

Classification: Public

Beavertail Creek (GD0030) had levels between 350 to 830 µg/L. One site located adjacent to the town of Beaverlodge (GD0045) had a median concentration of 350 µg/L.

Dissolved iron concentrations on the Beaverlodge River and tributaries ranged from 17.8 and 2900 µg/L. The range of iron concentrations on the Redwillow River was much lower, ranging from 23.4 to 239 µg/L. The median for dissolved iron on the Redwillow River was between 30-77 µg/L. All sites on the Beaverlodge River and its tributaries were elevated (between 133 to 830 µg/L) when compared to the Redwillow River (Figure 36). Dissolved iron has only been measured since 2010, when samples were collected in either the spring or fall. No seasonal trends can be discerned due to scarcity of data (Figure 37).

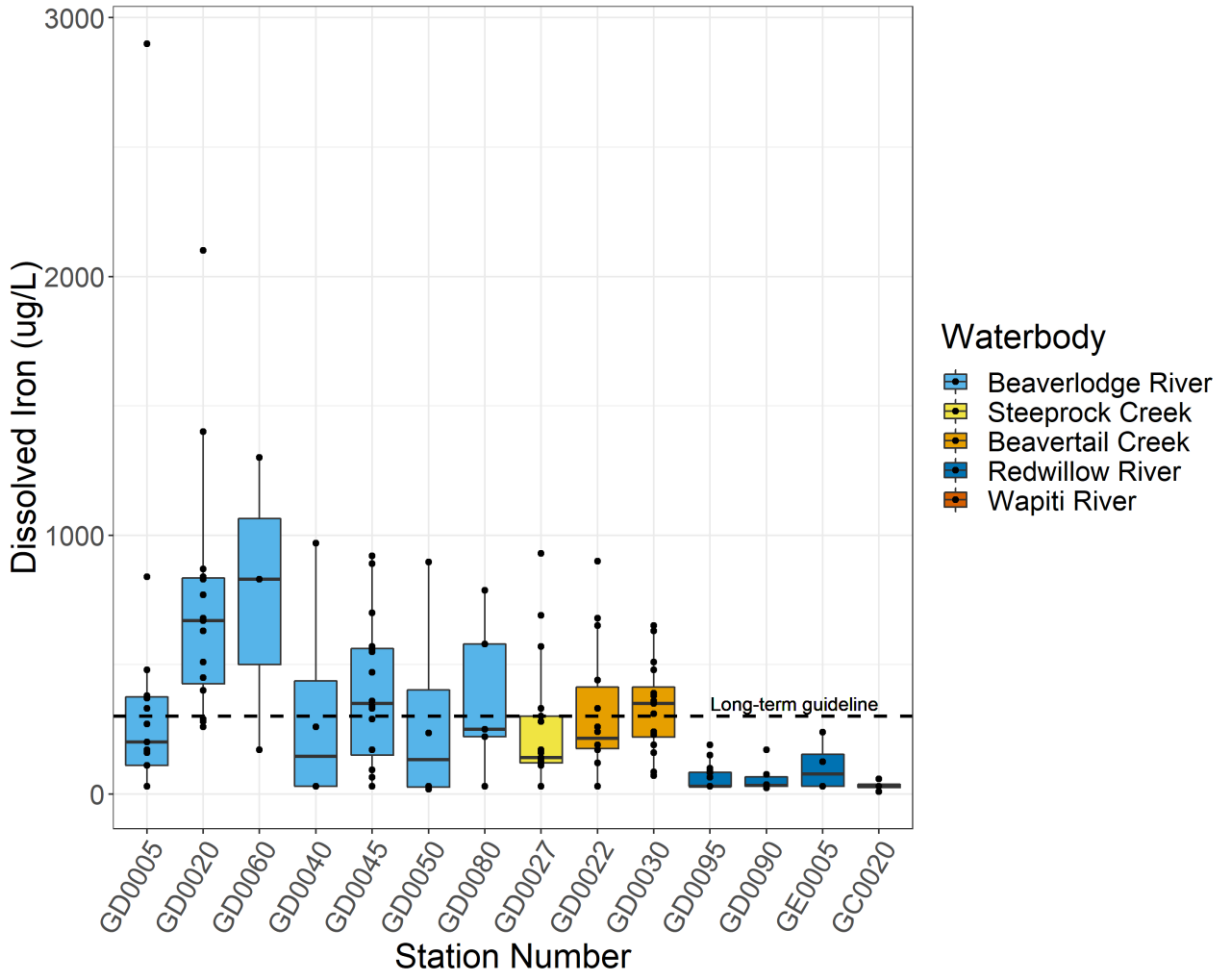


Figure 36. Boxplot of dissolved iron concentrations.

Classification: Public

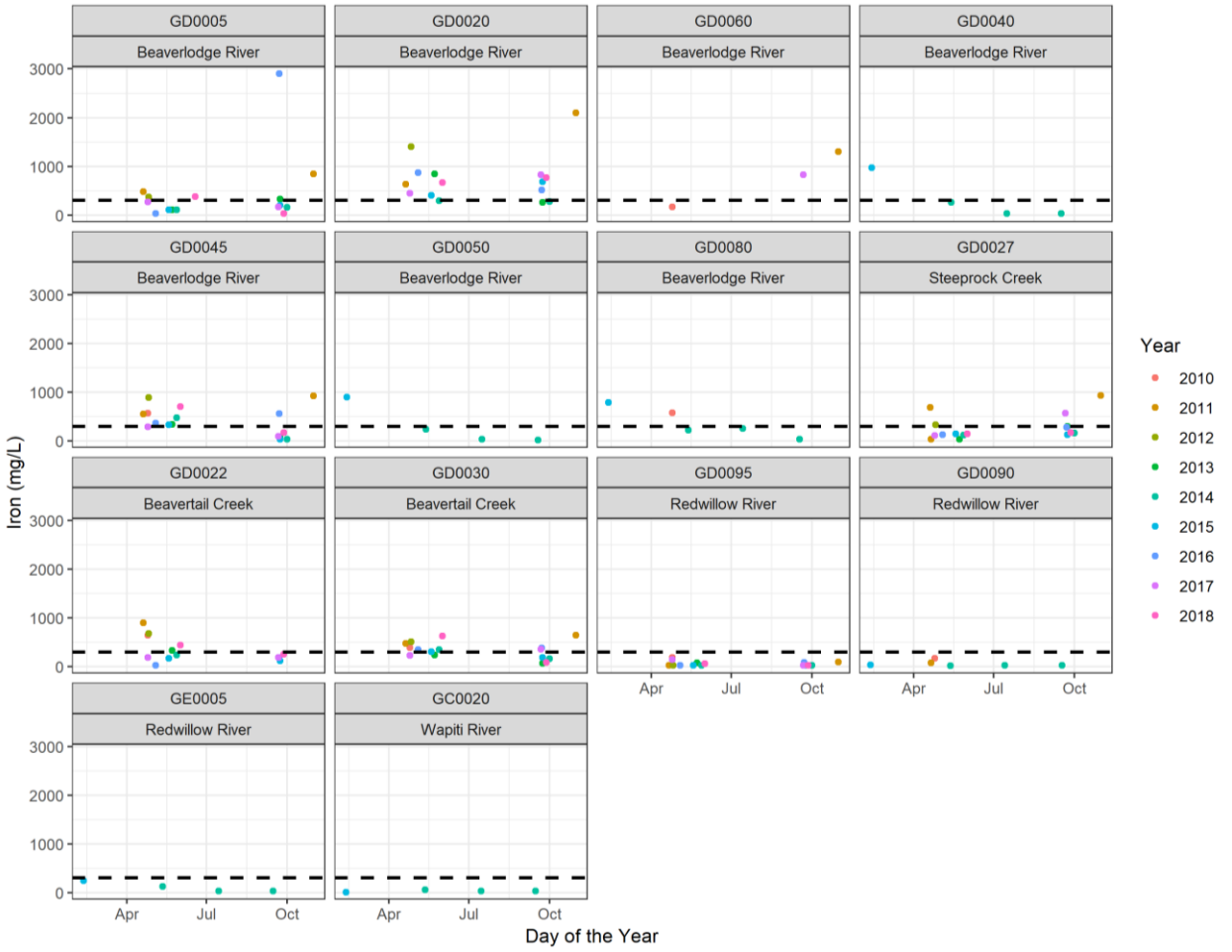


Figure 37. Dissolved iron concentrations – seasonal distribution.

3.7 Nutrients and Trophic State

Nutrient enrichment is an important issue to Alberta's freshwater resources. The addition of nutrients to surface waters can have deleterious effects causing increased eutrophication and toxic cyanobacteria blooms, shifts in species assemblages, and reduced biodiversity and dissolved oxygen levels. Some nutrients (e.g. ammonia) can have direct toxic effects to freshwater life.

With the exception on ammonia and nitrites, PAL nutrient guidelines do have numerical values. This section of the report will therefore use the less impacted Redwillow River as a baseline system to compare the Beaverlodge and its tributaries.

3.7.1 Phosphorus

Phosphorus is typically the limiting nutrient in freshwater systems and small additions can cause eutrophic effects. Phosphorus exists mainly in dissolved and particulate forms, which can internally cycle in aquatic ecosystems through microbial activities and interactions in the water and sediment interface. In most natural or pristine surface waters, total phosphorus (TP) concentrations range

Classification: Public

between 10 to 50 µg/L, but can have high variation in concentrations due to regional geology. Inputs of phosphorus into freshwater systems occur through a variety of mechanisms including soil erosion, runoff, atmospheric deposition, organic waste, industrial wastewater, ground water inflow, and fertilizers. The present Alberta PAL guidelines for TP is a qualitative statements: "for a major river total phosphorus concentrations should be maintained so as to prevent detrimental changes to algal and aquatic plant communities, aquatic biodiversity, oxygen levels, and recreational quality." Measures for algal and plant communities were not sampled to allow fully determine potential impacts of nutrients in the Beaverlodge watershed.

The highest levels of TP were recorded in the Beaverlodge River main stem ranging from below detection limits to 1.63 mg/L. Sites upstream in the Beaverlodge River had the highest median TP concentrations (0.260 and 0.225 mg/L at GD0015 and GD0020, respectively) with median concentrations declining at downstream sites to a low of 0.07 mg/L (Figure 38). The Beaverlodge River site near the gravel pit (GD0070) is an exception to the declining TP concentration in downstream sites; however, this site has not been measured for TP since 2007. In contrast, TP concentrations in the Beaverlodge tributaries increase in the downstream direction. Levels as high as 0.80 mg/L were recorded at the downstream site on Beavertail Creek (GD0030).

In the Beaverlodge River, the highest concentrations of TP were measured in the spring (Figure 39). This seasonal variation is also displayed on the furthest downstream sites on Beavertail Creek (at its mouth) and Steeprock Creek (upstream of its confluence with Beavertail Creek).

The TP concentrations in the Redwillow and the Wapiti River were generally lower than in the Beaverlodge River and its tributaries ranging from below detection limits to 0.18 mg/L. The increased concentrations of TP in the Beaverlodge River does not appear to be extending below the confluence with the Redwillow River. Similar median levels of TP were measured in the Redwillow upstream and below the confluence.

Overall, TP measurements appear to decline with time; higher levels were measured in 2004-2007 than in 2010-2018 (Figure 39). However, TP levels recorded in 2004-2007 were higher than those recorded 1994-1995 and 2010-2018. This increased level of TP recorded from 2004 to 2007 is likely due to the nature of the study when surveys were conducted on the weekly basis in spring.

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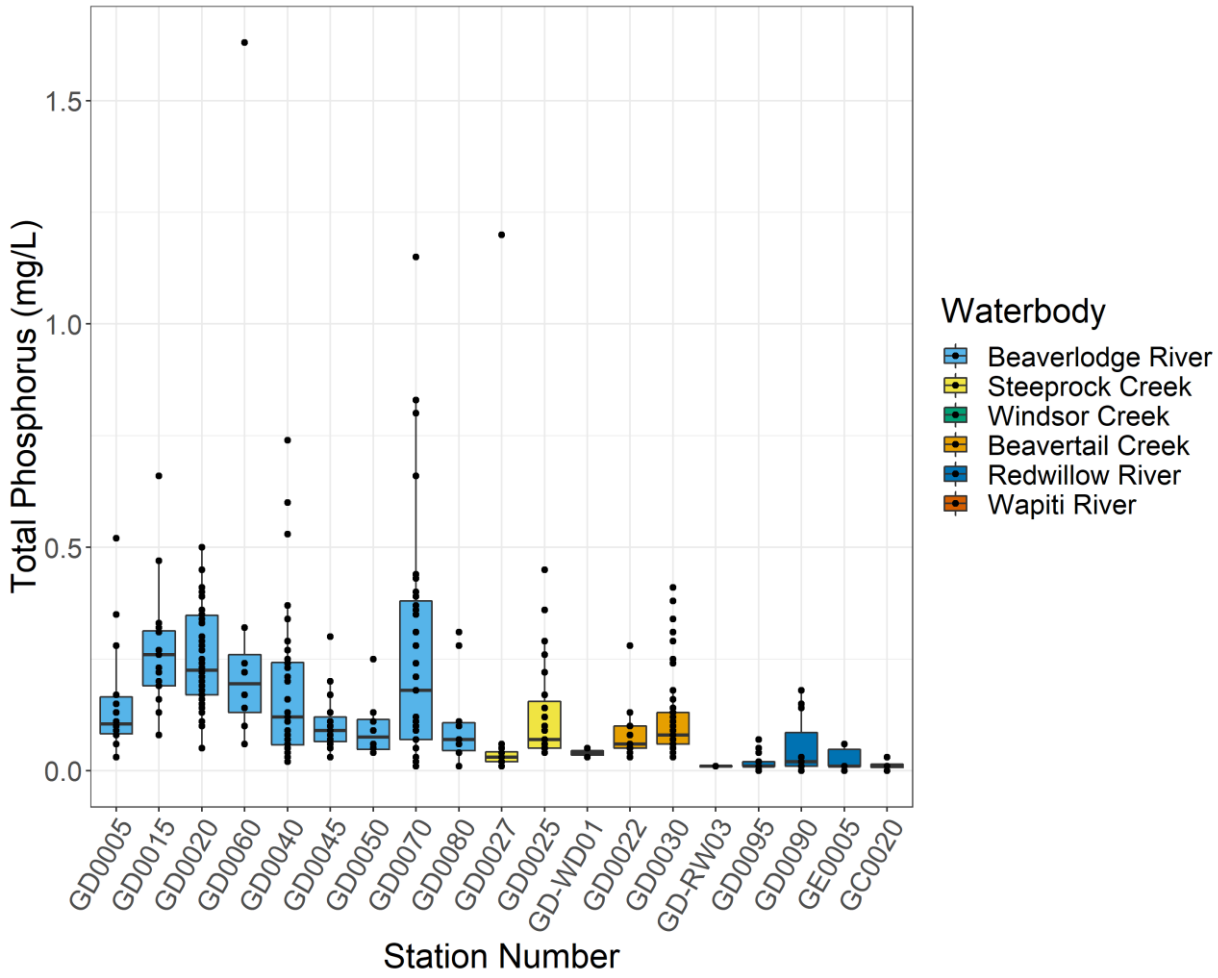


Figure 38. Boxplot of TP concentrations.

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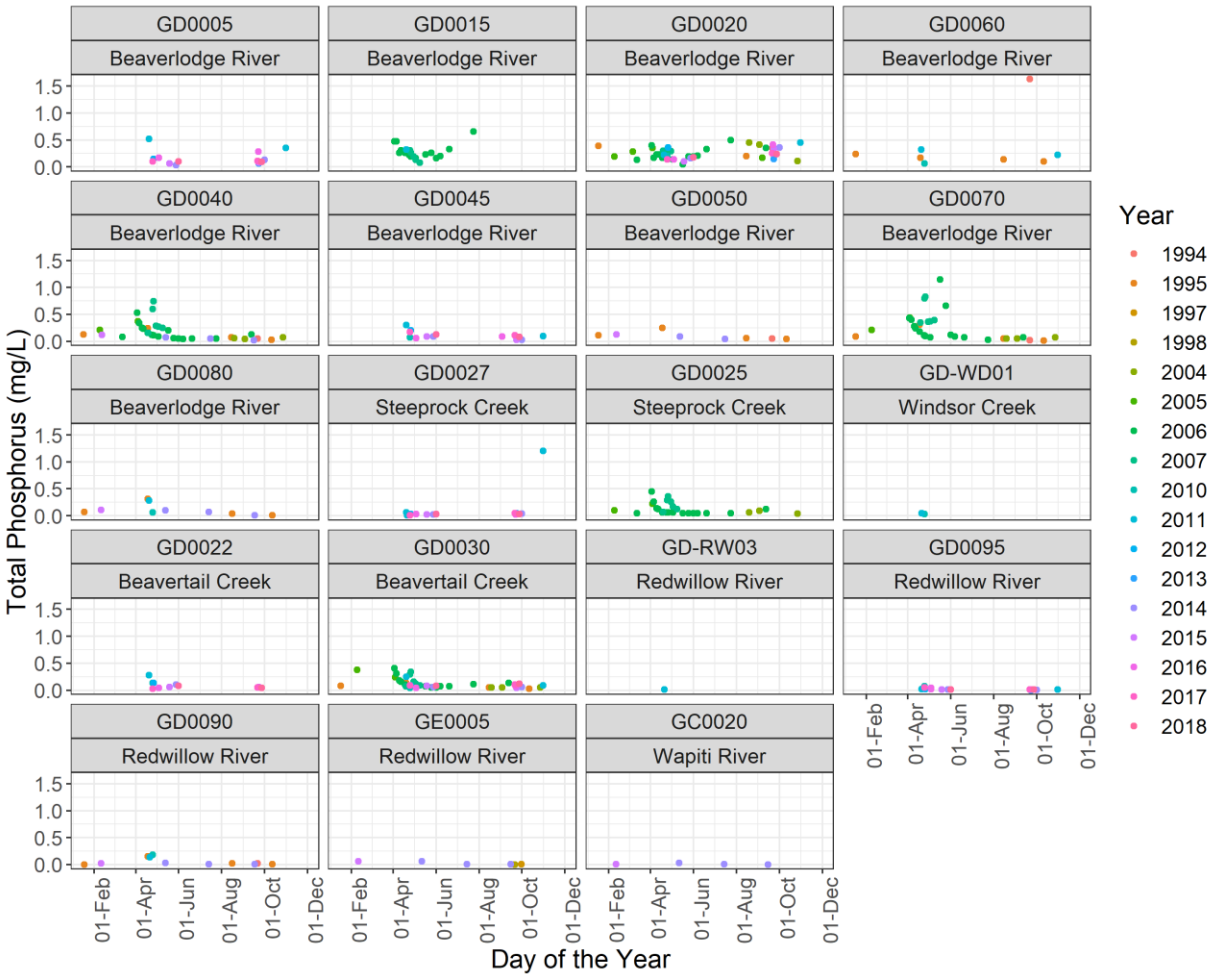


Figure 39. TP concentrations – seasonal distribution.

3.7.2 Nitrogen

Nitrogen is an important nutrient, necessary for the growth of aquatic life. Nitrogen occurs in aquatic ecosystems in inorganic (e.g., nitrate, nitrite, ammonia), organic (e.g. amino acids, proteins), and oxidized states. Nitrogen can enter surface waters through a variety of mechanisms including atmospheric deposition, nitrogen fixation, and catchment drainage. Certain forms of nitrogen can cause harmful and toxic effects. Nitrite and un-ionized ammonia can be toxic to aquatic life, while nitrate can be harmful to infants and livestock.

Nitrogen can be measured for a variety of forms including total nitrogen and inorganic and organic forms including total Kjeldahl nitrogen (TKN – sum of organic and ammonia nitrogen), nitrate and nitrite. Total nitrogen is the sum of organic and inorganic forms.

Total Nitrogen

The PAL guideline for total nitrogen (TN) states: “for a major river total nitrogen concentrations should be maintained to prevent detrimental changes to algal and aquatic plant communities, aquatic

Classification: Public

biodiversity, oxygen levels, and recreational quality." Measures for algal and plant communities were not sampled to allow fully determine potential impacts of nutrients in the Beaverlodge watershed. TN concentrations on the Beaverlodge River and its tributaries ranged from 0.4525 to 9.646 mg/L, while the less impacted Redwillow River ranged from 0.615 to 1.574 mg/L. The Beaverlodge mainstem site downstream of its confluence with Beavertail Creek had the highest median TN concentration. In general, most tributaries tended to have higher levels of TN in the upstream reaches compared to the downstream reaches (Figure 40). Beavertail Creek recorded the highest TN value above the confluence with Steeprock Creek. Steeprock Creek TN values increased along its length. The Beaverlodge River and its tributaries exhibited pulses of increased TN in the spring similar to those exhibited by TP (Figure 41).

Temporal patterns of TN levels are difficult to discern and evaluate (Figure 41). Although levels recorded in 2004-2007 were higher than those recorded in 1994-1995 and 2010-2018, this is likely due to the high frequency of spring sampling. The weekly surveys recorded influxes of TN occurring in late March and early April. TN values recorded at the same time of year appears to be consistent between years indicating that there has been no temporal change in TN.

Compared to the Redwillow River concentrations of TN were 2-4 times greater in the Beaverlodge River and its tributaries. TN increased in concentrations downstream of its confluence with the Beaverlodge.

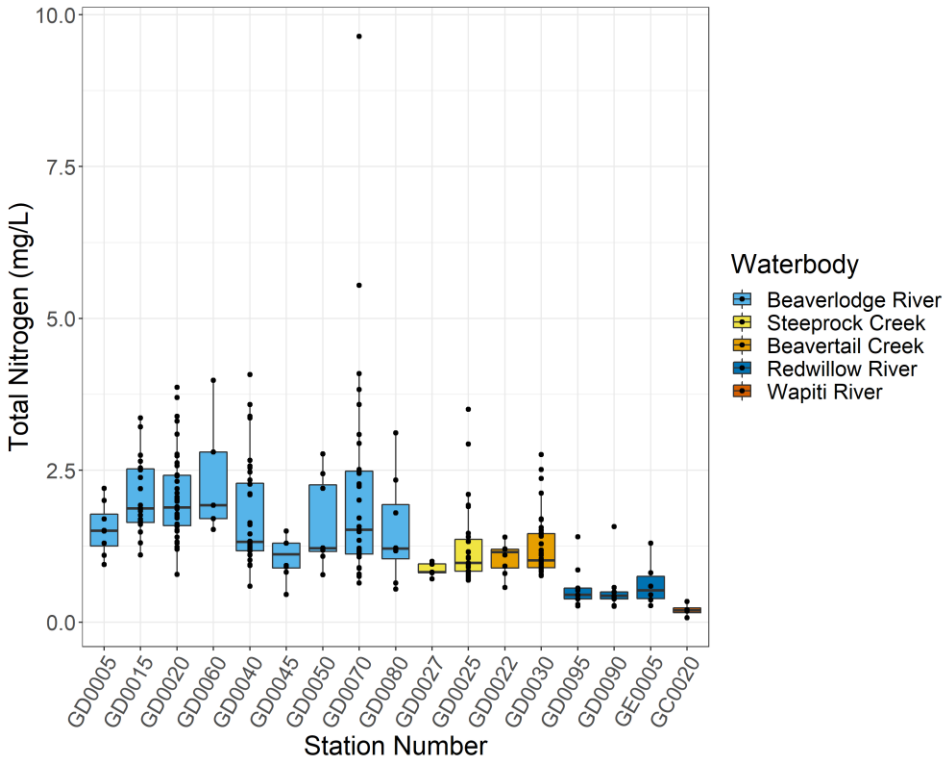


Figure 40. Boxplot of TN concentrations.

Classification: Public



Figure 41. TN concentrations – seasonal distributions.

Total Kjeldahl Nitroten

Total Kjeldahl Nitrogen (TKN) depicts the quantity of nitrogen in organic and ammonia forms. There is no PAL guideline for TKN.

TKN concentration in the Beaverlodge River and its tributaries ranged from 0.45 to 9.50 mg/L (Appendix 1). TKN values were highest in upstream sites (GD0015, GD0020) adjacent to Horse Lake and upstream of the confluence with Beavertail Creek. TKN levels were lower near and downstream of the town of Beaverlodge. Median values on the Beaverlodge were 2-4 times higher than median values on the less impacted Redwillow River (Figure 42). The Beaverlodge tributaries had median values 2 times those recorded on the Redwillow River. The highest median value on the tributaries was recorded upstream of Beavertail Creek (GD0022). Maximum concentrations of TKN primarily occur in the spring with a small increases in the fall (Figure 43).

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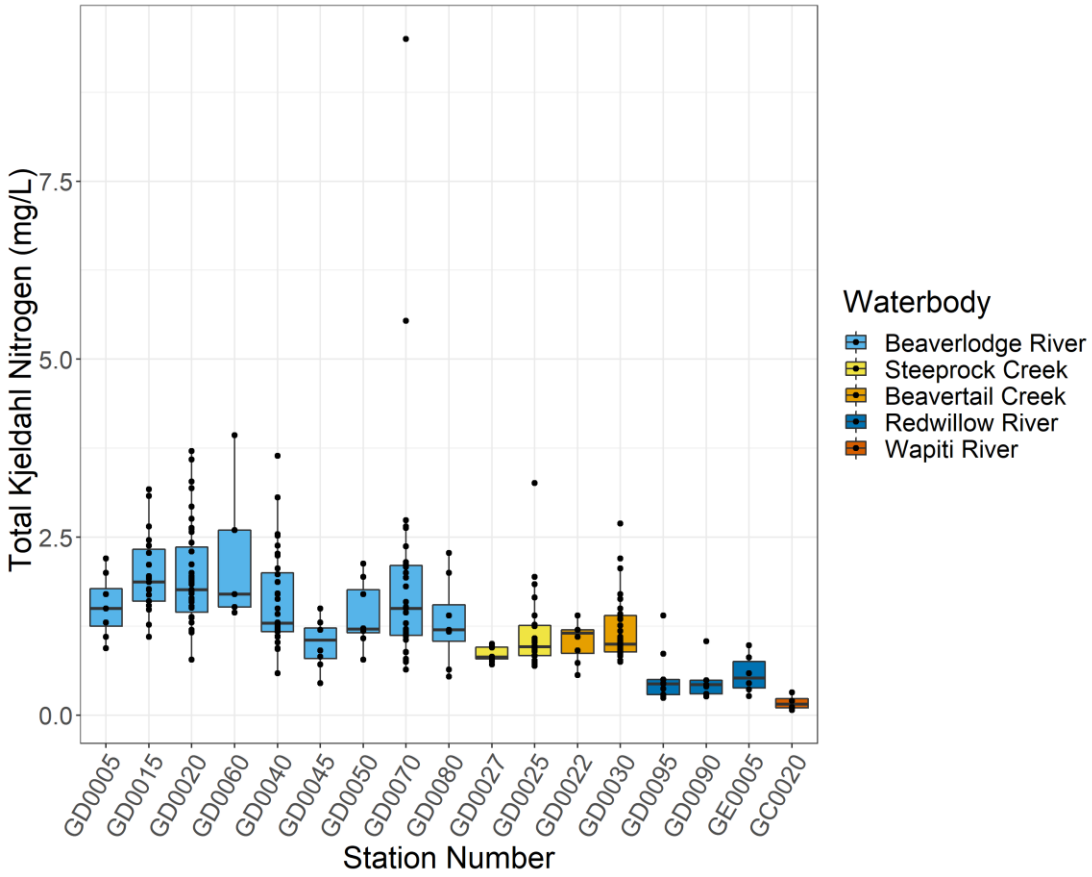


Figure 42. Boxplot of TKN concentrations.

As is the case of TP and TN, TKN levels recorded in 2004-2007 are higher than those recorded in either 1994-1995 or 2010-2018 (Figure 43). The overall increased levels of TKN in 2004-2007 are likely due to frequency of surveys which recorded large influxes of TKN in March and early April. TN values recorded at the same time of year appears to be consistent between years suggesting that there has been no temporal change in TKN.

The TKN values in the Redwillow River were relatively low, increasing at the site receiving input from the Beaverlodge River.

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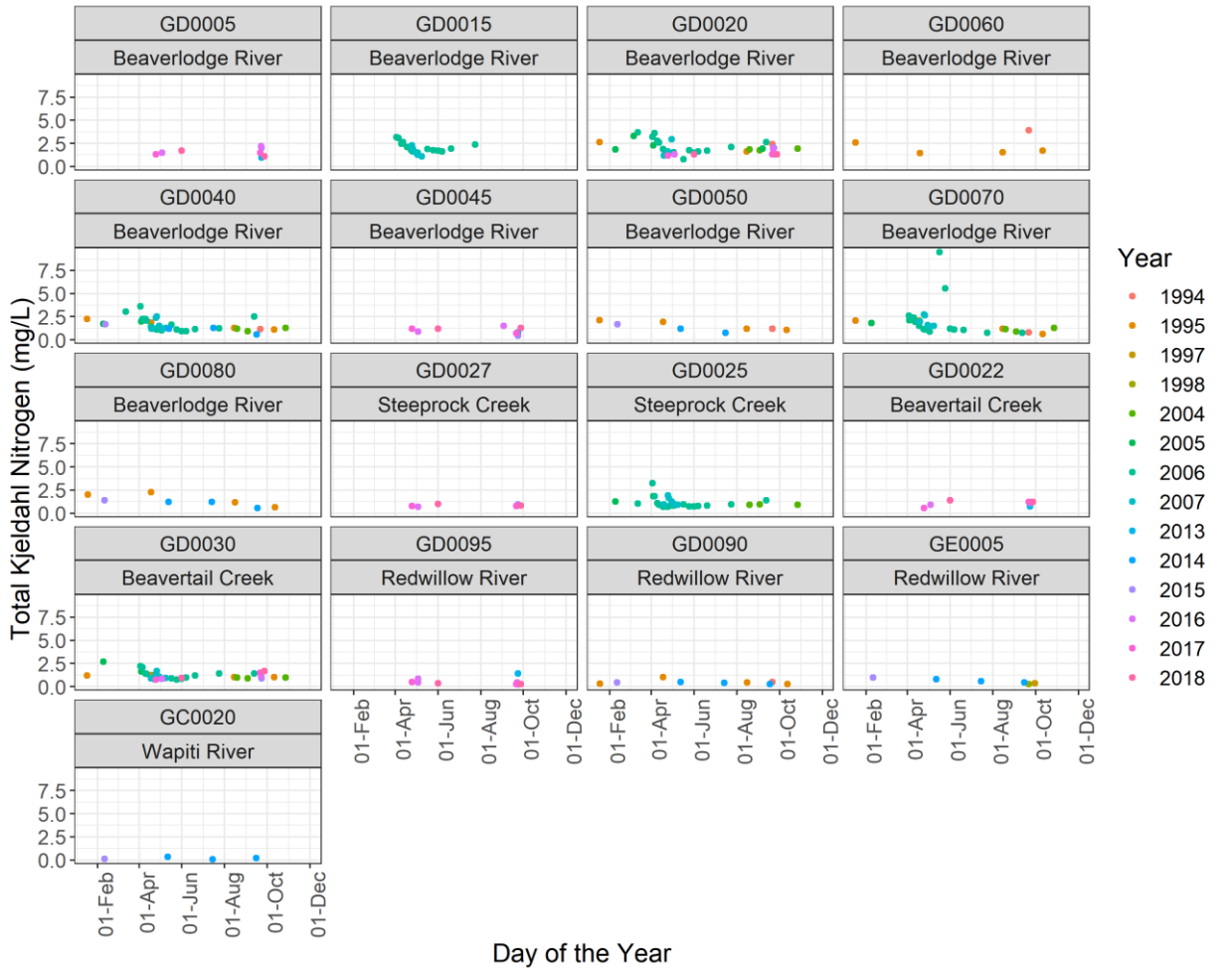


Figure 43. TKN concentrations - seasonal distribution.

Nitrate and Nitrite

Analytically, nitrates and nitrates were measured together and the results are expressed as nitrite+nitrate nitrogen (NO3+NO2-N). The PAL guidelines for nitrates and nitrites are separate values. The levels measured in the Beaverlodge River did not exceed either the long-term (3.0 mg/L) or the short-term (124 mg/L) guidelines for nitrates

NO3+NO2-N exhibited similar trends on the Beaverlodge mainstem as TKN and TN. NO3+NO2-N concentrations ranged from <MDL to 2.090 mg/L on the Beaverlodge River and its tributaries, while the Redwillow River ranged from <MDL to 0.7 mg/L (Figure 45). NO3+NO2-N was detected more frequently in the Beaverlodge River mainstem than in the tributaries) and Redwillow River.

The highest levels of NO3+NO2-N were recorded in the spring on sites located on the Beaverlodge River and its tributaries (Figure 44). All site on the tributaries and Redwillow River (except GD-RW03, which had a single observation) had median nitrite and nitrate concentration between 0.0125 to 0.009 mg/L.

Classification: Public



Figure 44. Nitrate & Nitrite concentrations – seasonal concentrations.

Classification: Public

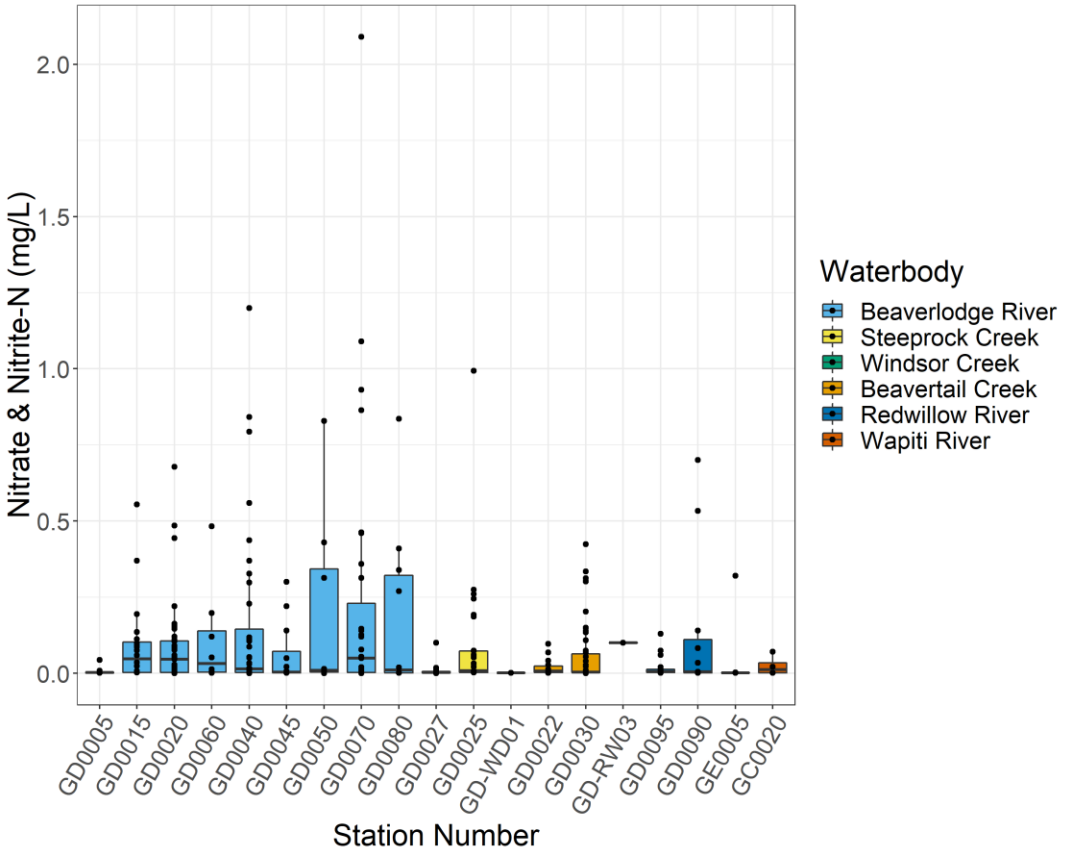


Figure 45. Boxplot of nitrate & nitrite concentrations.

Ammonia

Ammonia exhibited similar trends on the Beaverlodge mainstem as TKN and TN. Ammonia concentrations ranged from <MDL to 4.04 mg/L in the Beaverlodge River and its tributaries, while the Redwillow River levels ranged from <MDL to 0.09 mg/L (Figure 46). In the Beaverlodge River, ammonia concentrations declined with the downstream directions. Beaverlodge sites adjacent to the village of Hythe or upstream had the highest ammonia concentrations. Increased ammonia concentrations primarily occurred in the spring (Figure).

Ammonia levels since 2010 are generally lower than those recorded between 1994-1995 and 2004-2007 (Figure 47; Appendix 1). The largest increases in ammonia occurred in sites surveyed in late March and early April, a time period that has not been surveyed since 2010. Ammonia values recorded at the same time of year appear to be consistent between years indicating that there has been no temporal change in ammonia.

PAL guideline for total ammonia depends on pH and temperature. Total ammonia guideline was exceeded for six samples. The majority of exceedances occurred in the Beaverlodge River mainstem between 1999 and 2007 (GD0015, GD0020, GD0060, GD0070) (Appendix 1). One sample collected from Windsor Creek in 2011 exceeded the guideline level.

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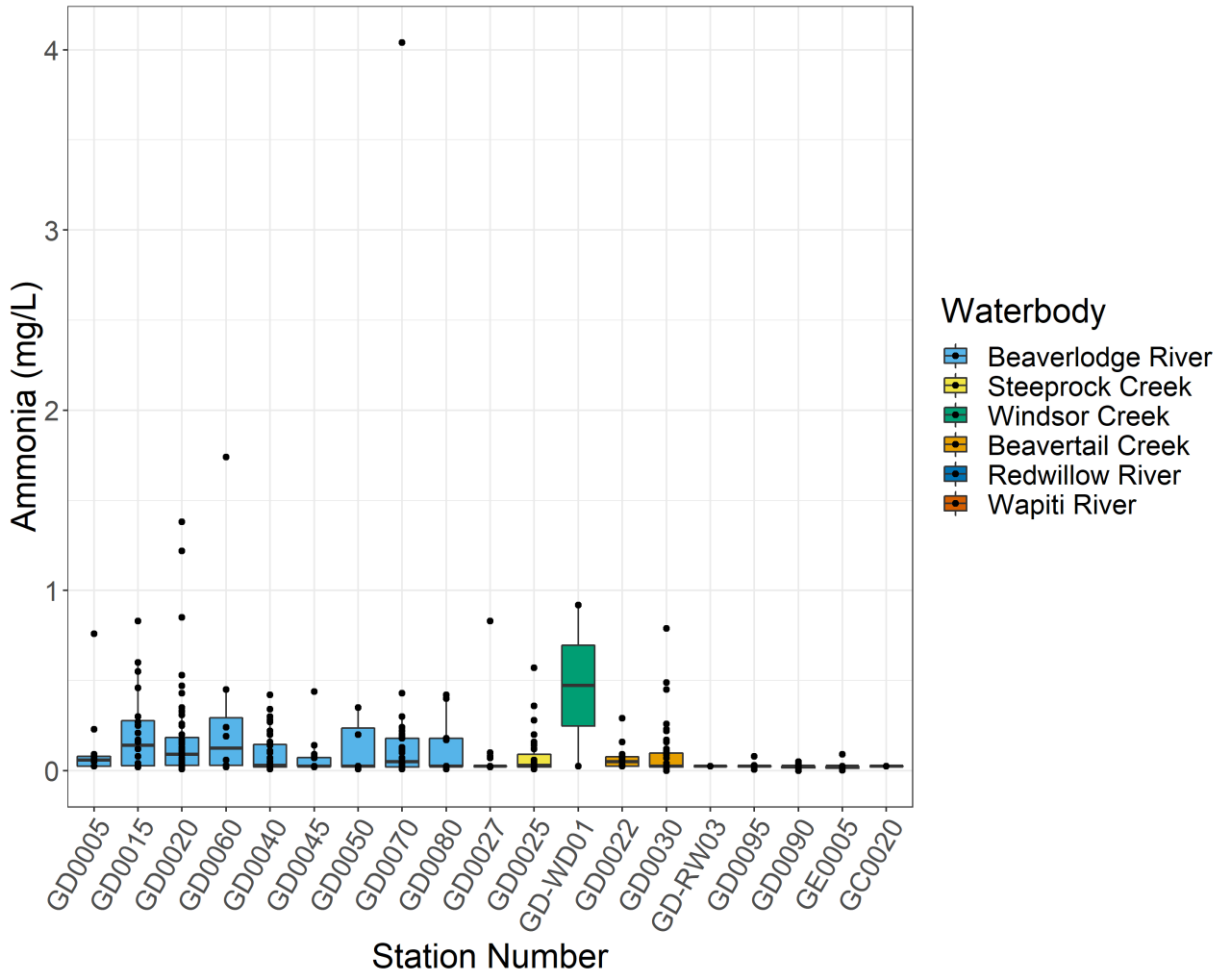


Figure 46. Boxplot of ammonia concentrations.

Classification: Public



Figure 47. Ammonia concentrations - seasonal distribution.

3.7.3 Chlorophyll_a

Chlorophyll_a is a photosynthetic pigment used to estimate phytoplankton biomass in an aquatic system (Wetzel 2001). Chlorophyll_a can be used to classify trophic conditions. There is no PAL guideline for chlorophyll_a. In this study, sestonic/planktonic chlorophyll_a was measured.

Chlorophyll_a in the Beaverlodge River and its tributary ranged from 0.25 to 216 µg/L (Figure 47). The Redwillow River and the Wapiti River had lower concentrations of chlorophyll_a, ranging between 0.1 to 3.2 µg/L. Chlorophyll_a had a similar spatial pattern to phosphorus and nitrogen.

The median concentrations for most sites were below the oligotrophic-mesotrophic boundary (10 µg/L) for sestonic chlorophyll_a proposed by Dodds (1998). Two sites upstream of the village of Hythe (AB07GD005 and AB07GD0020) had median concentrations above the oligotrophic-mesotrophic boundary but not exceeding the mesotrophic-eutrophic boundary (30 mg/L). However, these sites had a high proportion of measurements in the mesotrophic and eutrophic range. The tributaries had up to 36% measurements above the oligotrophic-mesotrophic boundary. Majority (93%) of chlorophyll_a measurements above the oligotrophic-mesotrophic boundary were recorded between 2011 and 2018.

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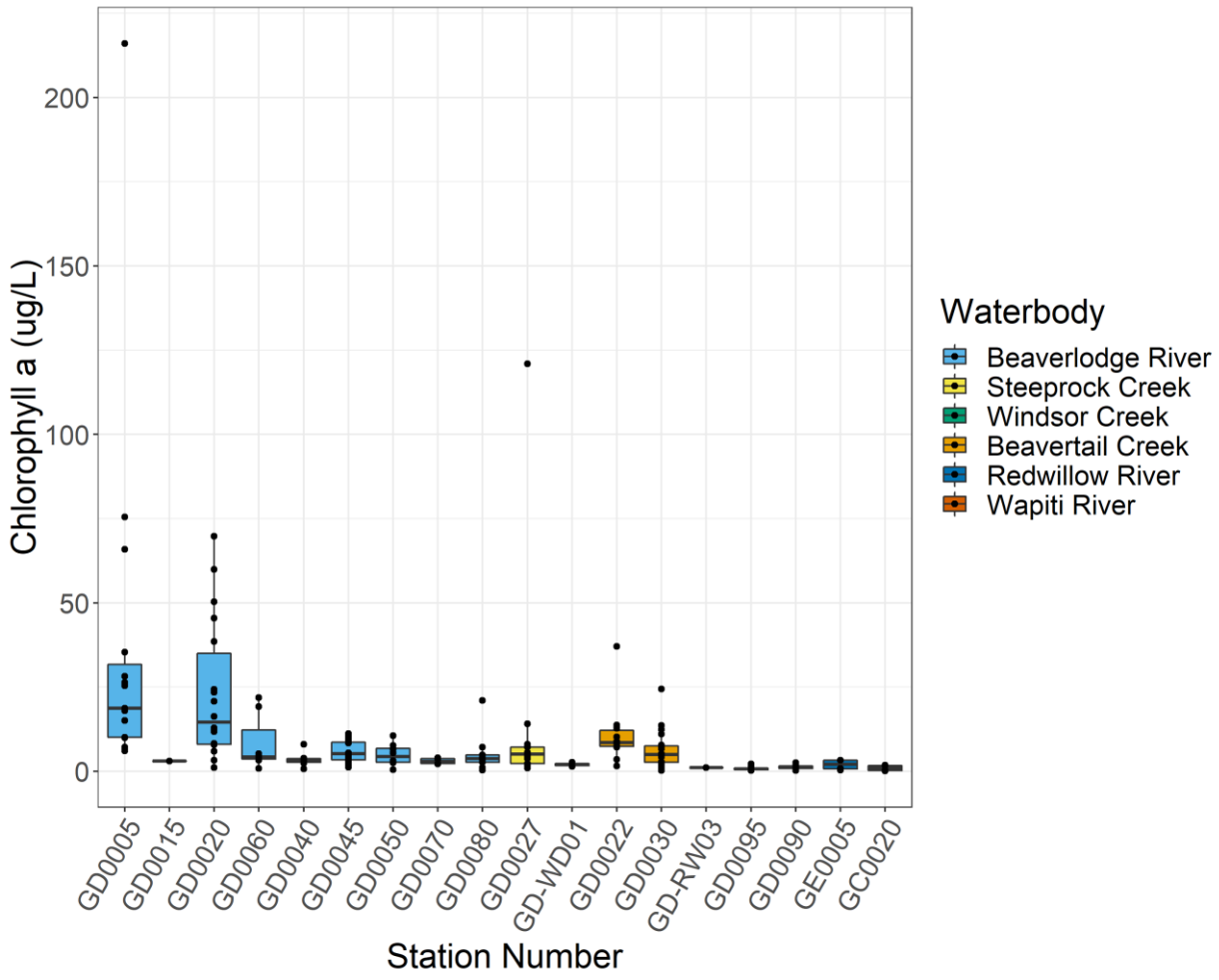


Figure 47. Boxplot of chlorophyll_a levels.

3.7.4 Nutrients and Trophic Summary

Nutrients (total phosphorus, total nitrogen, TKN, nitrite and nitrate, and ammonia) concentrations on the Beaverlodge River, near and upstream of the village of Hythe, were above those recorded in the Redwillow River. Elevated nutrient concentrations were recorded in the spring and are likely associated with spring runoff and storm events. The Beaverlodge watershed between Horse Lake Reserve and the village of Hythe is classified as having high export coefficients and annual export of nitrogen and phosphorus (TSS and turbidity displayed similar seasonal pattern with the spring peaks primarily at two sites on the Beaverlodge: upstream of the town of Beaverlodge (GD0040) and at the gravel pit (GD0070) (Figure 33, Figure 34). Tributary reaches closer to the confluence with Beaverlodge River had elevated spring levels of turbidity and TSS. Increased TSS may be due to the absence of vegetation on riparian areas as severe riverbank erosion has been reported on the Beaverlodge River (AECOM 2009; Macaulay et al. 2011).

Classification: Public

Table 6). The upper Beaverlodge River and Beavertail Creek are on the high end of the moderate category.

Chlorophyll_α had a similar spatial pattern to phosphorus and nitrogen. The upper reaches of the Beaverlodge River and tributaries had chlorophyll_α measurements above the oligotrophic-mesotrophic boundary. Sites upstream of the village of Hythe had median concentrations in the mesotrophic range indicating increased primary productivity.

The decline in nutrient levels downstream suggests a mechanism removing nutrients from downstream sites. TN and TP could be selectively removed from the stream by epilimnetic algal in stretches of the river with reduced flow. Nutrient removal is correlated to water residence time (Weyhenmeyer and Conley 2017). The above is speculative as there is no available information on flow regimes for each site to compare upstream and downstream flows. In addition, epilimnetic algal has not been assessed to evaluate that nutrient uptake and removal for surface waters.

Exceedances of PAL guidelines were observed for ammonia. Ammonia exceedances occurred prior to 2012 primarily on the Beaverlodge River.

3.8 Organic Carbon

Organic carbon is present in water in particulate or dissolved forms. Carbon can enter surface waters through internal (photosynthesis and microbial fixation) and external processes (terrestrial vegetation and decomposing organic matter). Carbon can also enter surface waters from anthropogenic sources including municipal and industrial effluent, and agricultural runoff. Elevated organic carbon levels can be associated with highly productive systems or organic pollution. There are no PAL guidelines for total organic carbon (TOC) or dissolved organic carbon (DOC).

TOC and DOC displayed similar concentrations in the Beaverlodge River and its tributaries. TOC and DOC on the Beaverlodge River and its tributaries ranged from 7.0 to 64 mg/L and 0.25 to 65.0 mg/L, respectively (Figure 48; Figure 49). Redwillow River's TOC and DOC ranged from 4.3 to 15 mg/L and 4.0 to 15 mg/L, respectively.

The Redwillow River had lower median values of DOC and TOC at all sites than the Beaverlodge River and its tributaries. Median levels in the Redwillow for DOC was 9-11 mg/L and for TOC was 8 to 11.25 mg/L (Figure 48; Figure 49). DOC and TOC levels in Beaverlodge River and its tributaries were higher than in Redwillow or Wapiti rivers - their medial levels exceeding 15 mg/L (Figure 48; Figure 49).

Classification: Public

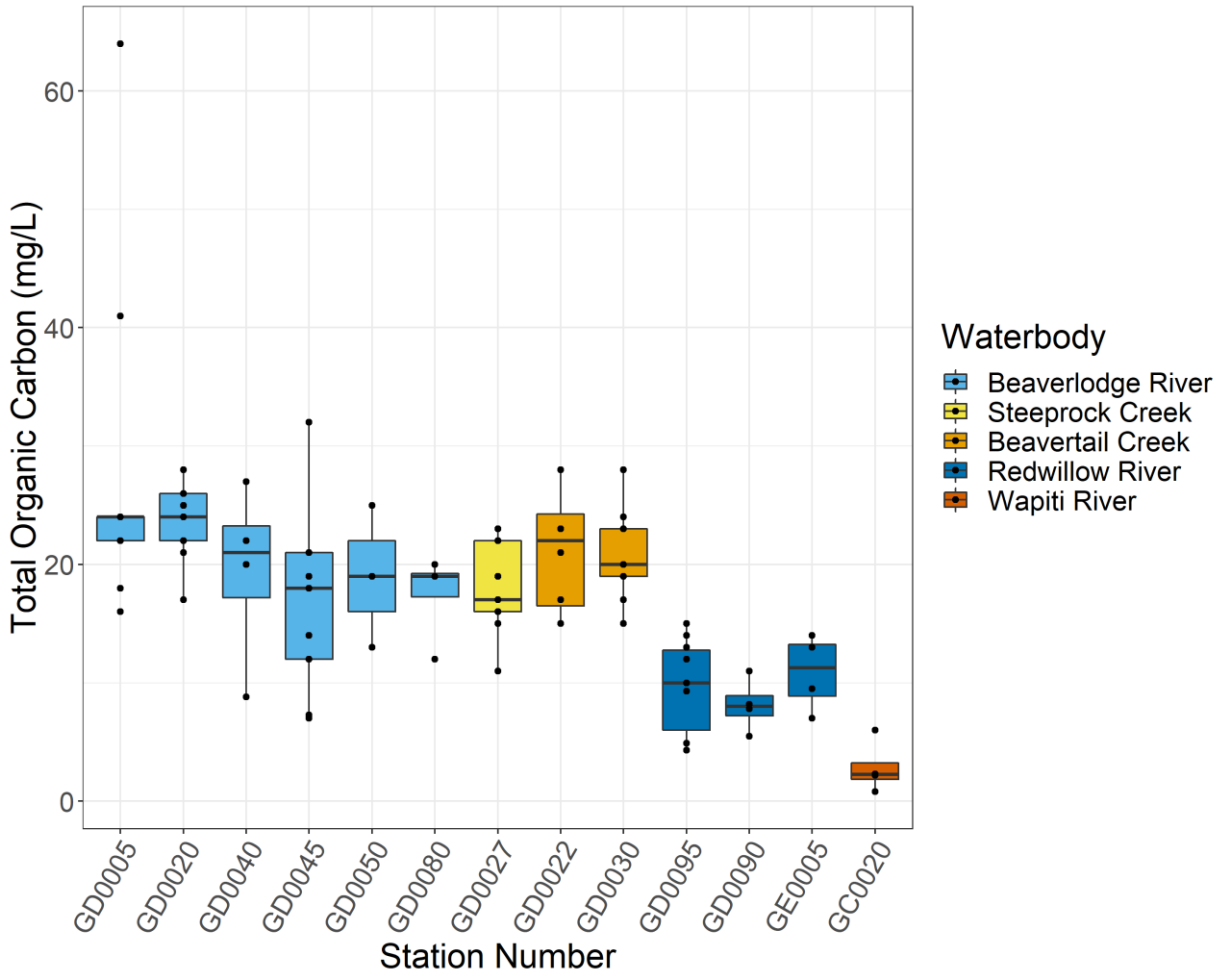


Figure 48. Boxplot of TOC concentrations.

Increased organic carbon in the Beaverlodge River compared to the Redwillow river is due to the extent of agricultural land and loss of riparian buffer (Stanley et al. 2012). Agricultural streams are likely to differ from historic conditions with significant changes in the transfer of organic carbon (e.g. DOC) to aquatic environment following removal or modification of riparian habitats within a catchment.

Classification: Public

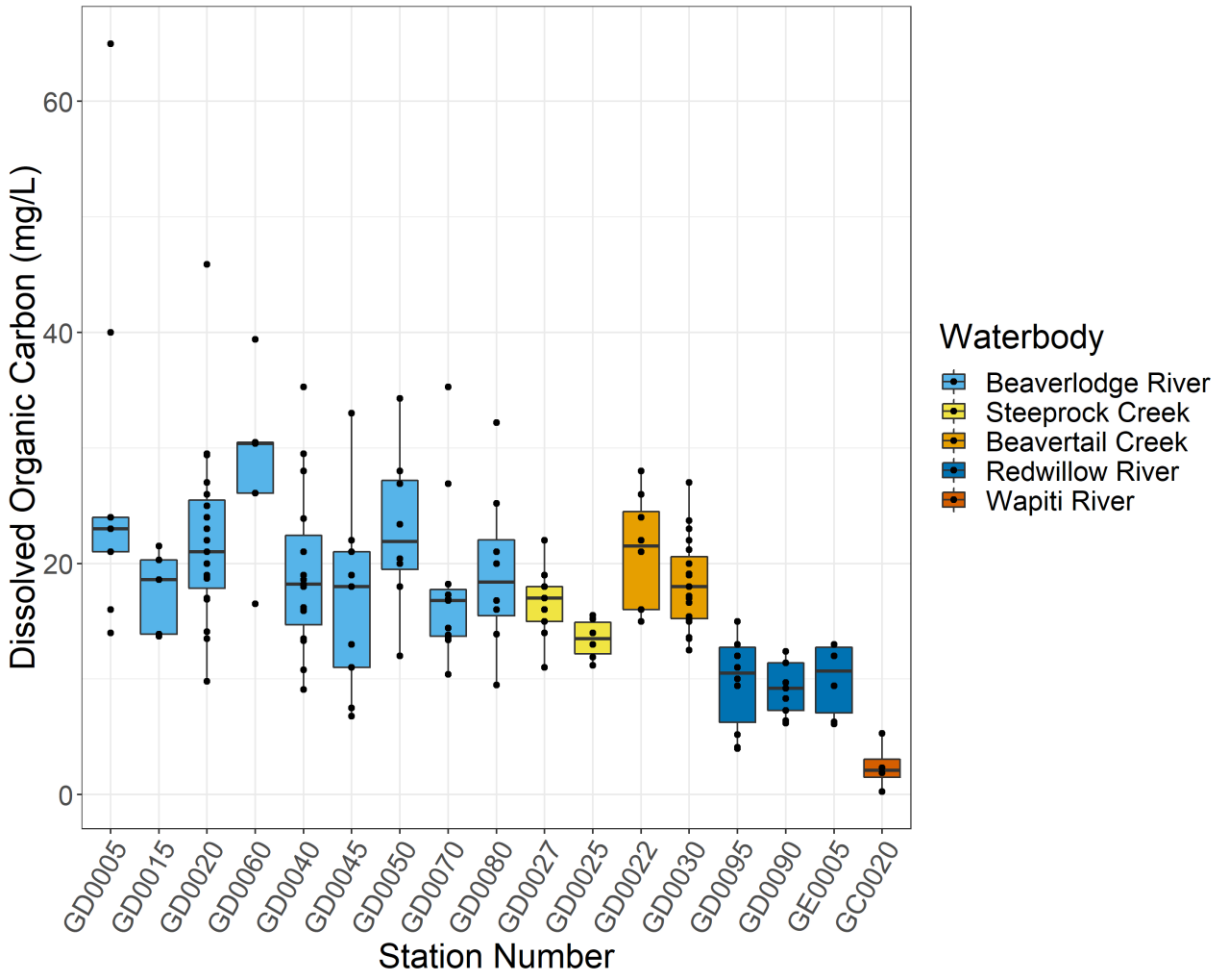


Figure 49. Boxplot of DOC concentrations.

3.9 Priority Pollutants

Organic priority pollutants measured in the Beaverlodge watershed include those on the priority pollutant list by the EPA (EPA 2014). Organic priority pollutants present at elevated concentrations are considered toxic to aquatic and human life.

Priority pollutants were surveyed at six sites on the Beaverlodge River and its tributaries and two sites on the Redwillow River (Appendix 3). These sites were sampled in 1994, 1995, 2005, and 2014. All organic priority pollutants measured were below the detection limits with the exception of Hexadecanoic acid and Adsorbable organic halide (AOX). There are no surface water quality PAL guideline for Hexadecanoic acid or AOX. Hexadecanoic acid or palmic acid is the most common saturated fatty acid found in and produced by animals, plants and microorganisms. It's present at low concentrations in surface waters can be of natural origin. AOX depicts a group of halogenated organic substances that are able to adsorb onto activated carbon. In surface waters, elevalted levels of AOX are most often associated with contaminations from landfills and certain wastewaters. However, AOX are ubiquitous in surface water and groundwater and various studies have shown that the widespread

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occurrence of organohalogens must to a large extent be explained by natural halogenation of organic matter.

3.10 Pesticides

Pesticides are a group of chemicals used to control pests. They include insecticides, herbicides and fungicides. The most common of these are herbicides, which account for approximately 80% of all pesticide use. Pesticides enter surface waterbodies through runoff, groundwater, and atmospheric deposition. Introduction of pesticides in aquatic ecosystems can have negative impacts on aquatic organisms.

Pesticides were sampled in 1994-1995, 2004-2007, and 2014 at twelve sites: 9 sites on the Beaverlodge River and its tributaries, 2 sites on the Redwillow River, and 1 site on the Wapiti River (Appendix 3). Seven herbicides were measured above the laboratory detection limits: Dicamba banvel, MCPA, MCPP, 4-Dichlorophenoxy acetic acid, Clopyralid lontrel, Imazamethabenz-methyl and Triclopyr. Detected levels were however below the available PAL guidelines. However Clopyralid lontrel, Imazamethabenz-methyl, and Triclopyr presently do not presently have PAL guidelines therefore, the significance of their detection is not known.

The most frequently detected herbicide was 2,4-Dichlorophenoxy acetic acid (10 detections) followed by MCPA (7 detections). The remaining herbicides were detected on 4 or less occasions. Pesticide surveys were conducted in April, May, July, September and October. The majority of detections occurred in April. Some herbicides were detected July and one in May. Herbicides were not detected during surveys conducted in September and October.

Although herbicides were found throughout the Beaverlodge watershed, more frequently concentrations were detected in intensively farmed upper watershed areas. In the Beaverlodge River a high number of herbicide detections were upstream of the Town of Beaverlodge.

Classification: Public

4 Summary

This report summarizes surface water quality data collected between 1994 and 2018 from the Beaverlodge River main-stem and its tributaries (Beavertail Creek, Steeprock Creek, and Windsor Creek, Redwillow River). Water quality data for the Redwillow River that has a less developed watershed were used to compare and assess the Beaverlodge River water quality conditions. In total, 19 sites were included, 9 of which were located on the main-stem of the Beaverlodge River.

A large portion of water quality information was collected by ACA as part of the projects aimed at restoring Arctic grayling population in the Beaverlodge watershed. Grayling once populated streams in the upper and lower Beaverlodge watershed but due to the decline in physical habitat and water quality their population practically expired. Due to their sensitivity to water quality, grayling are often considered indicator species. Declining grayling populations are closely correlated with and often signal the existence of water quality issues. The data presented in this report suggest that water quality issues potentially impacting Arctic grayling relate to low dissolved oxygen levels, increased summer water temperatures and increased levels of suspended sediments. Results of the monitoring efforts indicate that these water quality issues are the result of anthropogenic (mainly agricultural) activities in the Beaverlodge watershed.

Water quality parameters that did not comply with the available PAL guidelines in the Beaverlodge watershed were DO, pH, ammonia, aluminum, and iron (Table 7 and 8). The upper reaches of Beaverlodge River and Beavertail Creek occasionally had DO concentrations below the minimum, short-term guideline of 5 mg/L generally in late summer and early fall. The pH values outside of guideline range (6.5-9.0) can occur on all waterbodies but those values are sporadic. Total ammonia guidelines were exceeded in six samples. The majority of exceedances occurred in the Beaverlodge River mainstem between 1999 and 2007. One sample collected from Windsor Creek in 2011 exceeded the guideline level. In the Beaverlodge River, ammonia concentrations declined with the downstream directions. Beaverlodge sites adjacent to the village of Hythe or upstream had the highest ammonia concentrations.

Water temperature and DO levels are important parameters to consider in the Beaverlodge watershed since the Arctic grayling restoration efforts have been undertaken. While scientific studies indicate that Arctic Grayling might have a high tolerance to acute hypoxia short-term exposure they exhibit a physiological and behavioral stress response to DO concentrations ≤ 4.0 mg/L (Davis et al. 2019). Temperature preference of juvenile Arctic grayling is approximately 16-17°C (Hawkshaw 2011) although observations of Arctic grayling in Alaska suggest that adult grayling are stressed when water temperatures exceeded 17.2°C and actively avoided 20°C (Wojcik 1955). Incipient lethal temperatures to Arctic grayling is considered to be 25°C.

Discrete sampling did not indicate water temperatures in exceedance of the upper tolerance limit for Arctic grayling of 20°C. However, temperature data loggers measured temperatures exceeding 20°C in

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Beaverlodge River, Beavertail Creek, and Redwillow River. In May-September 2017, temperature data loggers at the Beaverlodge station upstream of HWY 722 Bridge, recorded 69 days with temperature above 25°C (Table 5). No similarly high temperature levels were measured in the Redwillow River during the same period of time. In the subsequent 2018 survey, data loggers did not record temperatures above 25°C. Although the upper reaches of the stream are less frequently sampled they appeared to have lower summer temperatures than downstream sites (below the confluence with Beavertail Creek). The increase in temperature with the downstream direction could be associated with riparian vegetation removal (AECOM 2009). Limited temperature measurements taken in the lower Redwillow River suggest that summer temperatures can exceed 20°C (a maximum of 24.50°C was recorded upstream of the confluence with Beaverlodge River).

The DO values below 5 mg/L were occasionally measured in Beaverlodge River, Steeprock and Beavertail creeks. These low levels occurred mainly in areas upstream of the Town of Beaverlodge. However, the median DO levels at all streams remained well above 5 mg/L and in the Beaverlodge River were comparable to those in the Redwillow River. Seasonal data suggest a decline in DO levels in the summer and recovery in the late fall. Decreases in oxygen concentrations during the late summer could be linked to increased consumption of DO by microorganisms and increased temperatures. The decline in oxygen concentrations especially in the upper reaches indicate that respiration exceeds photosynthesis in the late summer and early fall. Declining levels of DO can also be linked to increased eutrophication, primary production and organic matter loadings. Small streams in agricultural areas can be significantly impacted by the runoff from agricultural lands. Wastewater discharges from the lagoon systems could also contribute to increased nutrient levels and stream productivity resulting in the reduction in oxygen levels.

TSS, turbidity, organic carbon (TOC and DOC), iron and nutrient levels were higher in the Beaverlodge River than in the Redwillow River. Agricultural lands dominating the upper Beaverlodge River watershed landscape may be elevating the levels of iron in the stream as agricultural catchments have been shown to contribute more iron-rich particles and TOC than other types of covers (Temnerud and Hytteborn 2014). Turbidity may also be affected by elevated iron and DOC as iron and DOC can form stable complexes that can darkly colour the water and affect light absorbance measures (Weyhenmeyer et al. 2014).

Streams are of calcium bicarbonate type, typical of surface waters. In general, streams in the upper Beaverlodge watershed had lower levels of alkalinity, water hardness, magnesium, calcium, and bicarbonate. Concentrations of these ions in the Beaverlodge mainstem were lower above the village of Hythe than below. Generally, compared to the upstream reaches, lower reaches also had higher levels of sodium and chloride with the highest levels measured near the town of Beaverlodge. Sulphates had the similar pattern to chlorides and sodium. Increases in TDS and specific conductivity downstream can be linked to the increases in these ionic compounds. Changes to local geology in upstream and downstream reaches as well as cumulative impacts of agriculture and lagoon discharges could potentially explain these patterns.

Beaverlodge River upstream of the Beavertail Creek confluence had increased levels of phosphorus and nitrogen, potentially causing changes in trophic status at these sites. Total phosphorus (TP) and total

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nitrogen (TN) in the less impacted Redwillow River ranged from below detection limits to 0.18 mg/L and 0.62 to 1.57 mg/L, respectively. TP and TN in the Beaverlodge River ranged from below detection limits to 1.63 mg/L and 0.45 to 9.65 mg/L, respectively. Upstream sites (specifically, Beaverlodge River sites upstream of Horse Lake and Beavertail Creek) have high levels of TP and TN compared to those recorded in the Redwillow River. The relationship between nutrients and primary production suggests that sites with increased phosphorus and nitrogen concentrations would support increased primary production and have increased chlorophyll_α value. All sites measured for chlorophyll_α had median values below the stream oligotrophic and mesotrophic boundary (20 µg/L); however, sites with increased TP and TN had an increased proportion of chlorophyll_α above the oligotrophic and mesotrophic boundary (Dodds et al. 1998). Increased TP, TN, and chlorophyll_α indicate eutrophic effects in upstream sites that can be extending downstream. High levels of nutrients in the upper regions of the Beaverlodge River is likely caused by inputs of nutrients from runoff from the catchment, while the lower levels of nutrients at downstream sites suggests nutrient uptake.

Seven herbicides were measured above the laboratory detection limits: Dicamba banvel, MCPA, MCPP, 4-Dichlorophenoxy acetic acid, Clopyralid lontrel, Imazamethabenz-methyl and Triclopyr. The most frequently detected herbicide was 2,4-Dichlorophenoxy acetic acid) followed by MCPA. Detected levels were however below the available PAL guidelines. However, some of the herbicides detected in the Beaverlodge watershed surface waters do not have official guidelines; therefore, the significance of their detection is not known. The majority of detections occurred in April and July. Although herbicides were found throughout the Beaverlodge watershed, more frequently concentrations were detedted in intensively farmed upper watershed areas. In the Beaverlodge River a high number of herbicide detections were upstream of the Town of Beaverlodge.

Data presented in this report are compiled from multiple surface water quality surveys conducted for over 20 years in the Beaverlodge watershed. These surveys had variable purposes, duration and geographic extent. Compilation and interpretation of the data posed challenges due to variability in temporal and spatial design and parameter selection. However, a number of valuable observations and conclusions can be made. Overall, streams areas above the village of Hythe as well as the main stem of the Beaverlodge River exhibited decreased water quality manifested by periodically low concentrations of DO and increased nutrients levels. Water temperatures in the Beaverlodge River increased in the downstream direction and in the mainstem and the tributaries can occasionally exceedance the upper tolerance limit for Arctic grayling of 20°C. Levels of turbidity, TSS, DOC, iron and nutrients can be above those in the less impacted Redwillow River. Concentrations of dissolved solids increased in downstream sites primarily near settlements, which is likely associated with human impacts. Herbicides have been detected in the upper Beaverlodge watershed relatively frequently during surface runoff in spring. The results presented in this report clearly suggests water quality impacts due to surface runoff from the surrounding agricultural lands and the removal of riparian vegetation.

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Table 7. Spatial Trends in Beaverlodge River Relative to Redwillow River – General Chemistry

Variable	Comments on Trend	PAL Guideline Exceedances
Temperature	↑ in d/s sites on BLR compared to RWR	NA
Specific Conductivity	↑ occurs d/s of the Beaverlodge River and Beavertail Creek confluence	NA
TDS	↑ also in RWR d/s of BLR confluence	NA
Dissolved Oxygen	↓ u/s BLR sites compared to RWR sites	upper reaches of BLR and Beavertail Creek < 5 mg/L generally in the late summer and early fall
Hardness	↓ u/s BLR sites compared to RWR sites	NA
Alkalinity	↓ u/s BLR sites compared to RWR sites Begins d/s of the town of Beaverlodge	None
Phosphorus	↑ in u/s BLR sites compared to RWR Furthest u/s site had reduced concentrations ↑ in d/s sites in the tributaries ↑ in spring	NA
Ammonia	↑ in u/s tributaries (WC and BTC)	BLR had exceedances primarily from1999 to 2007 (GD0015, GD0020, GD0060, GD0070). One exceedance on WC in 2011
Nitrate &Nitrite Nitrogen	↑ in BLR mainstem sites compared to RWR ↑ in 77% sites ↑ in spring	None
TKN	↑ in u/s BLR sites compared to RWR ↑ in the fall	NA
Total Nitrogen	↑ in u/s BLR sites compared to RWR ↑ in spring	NA
Chlorophyll_a	↑ in u/s BLR sites compared to RWR ↑ furthest u/s site on BTC	NA
Turbidity	↑ in BLR mainstem sites compared to RWR ↑ in spring	NA
TSS	↑ in BLR mainstem sites compared to RWR ↑ in spring	NA
Organic Carbon (DOC &TOC)	↑ in BLR mainstem sites compared to RWR ↑ in tributaries	NA
pH	pH values outside of normal range (6.5-9.0) can occur on all waterbodies	• <6.5 generally in September 2015 and 2017 • >9 in 2006

N/A – no applicable guidelines
↑ - higher/increased

Classification: Public

Table 8. Spatial Trends in Beaverlodge River Relative to Redwillow River - Metals and Major Ions

General Description of Trend	Variable	Additional Description of Trend	Guideline Exceedances
↓ u/s BLR sites compared to RWR sites	**Magnesium**	↓ u/s of the village of Hythe	NA
	Calcium	↓ u/s of the village of Hythe ↓ in spring	NA
↑ in d/s BLR sites	**Chloride**	highest levels near the town of Beaverlodge ↑ in RWR at site downstream of BLR confluence ↓ in spring	None
	Sodium	highest near the town of Beaverlodge ↑ in RWR d/s of BLR confluence ↓ in spring	NA
	Sulphate	Highest levels near the town of Beaverlodge ↑ in late summer and early fall	None
↑ near settlements	**Aluminum**	↑ near village of Hythe & town of Beaverlodge	A single value in 2016 exceeded the long-term SWQG in the furthest u/s site on BLR (GD005).
↑ in BLR mainstem sites compared to RWR	**Iron**	↑ in BLR mainstem sites compared to RWR	Median concentrations at four sites exceeded the long-term SWQG located adjacent and u/s of the settlements Hythe (GD0060; GD0020; GD0030) and Beaverlodge (GD0045)
No observable trends	**Zinc**	No observable trends	None

N/A – no applicable guidelines
↑ - higher/increased

Table 9. Summary of Priority Pollutants and Pesticides Spatial Trends

Variable	Description of trend	Guideline Exceedances
Priority Pollutants	Below the detection limits except Hexadecanoic acid & AOX	None
Pesticides	Below the detection limit, except for seven herbicides: Dicamba banvel, MCPA, MCPP, 2,4-Dichlorophenoxy acetic acid, Clopyralid lontrel, Imazamethabenz-methyl, and Triclopyr.	None

Classification: Public

5 Recommendations

Majority of water quality data presented in this report were collected to determine temporal and seasonal water quality in the Beaverlodge River in support of fisheries (specifically Arctic grayling) management in the watershed. Though numerous factors may have contributed to the grayling's demise in the Beaverlodge watershed, declining surface water quality throughout the watershed is considered primarily to blame.

Water quality issues are invariably the result of habitat degradation throughout the grayling's former range. Many organization have worked on habitat conservation and restoration and supporting agricultural producers in implementing more sustainable practices that reduce their impacts on water resources in the Beaverlodge watershed. Mighty Peace Watershed Alliance (MPWA) with partners such as ACA, Cows and Fish and others lead the development and implementation of program "*Bring Back the Grayling! 2015-2040*" Redwillow Watershed Restoration Plan (MPWA 2021). This report collated the existing information on the water quality in the watershed setting the stage for a long term focused monitoring program to measure positive improvements of water quality leading to restoration of arctic grayling to their former range. To ensure that the aquatic habitat has improved to restore Arctic grayling to its historical range in accordance with the goals of AEP and ACA, continued assessment is required.

The following are considerations for future aquatic surveys conducted as part of the Arctic grayling habitat restoration projects:

- A long-term (e.g. 15 years) water quality and bio-indicator monitoring program for the Beaverlodge watershed is required to document the effects of the restoration efforts and provide guidance moving forward. Considering the overall goals of restoration of Arctic grayling habitat, the future surface water quality monitoring programs should provide insight into the current and future water quality trends and impacts due to agricultural activities. Careful planning for the future long-term survey and identification of clear goals and objectives should be considered for the effective monitoring program.
- Accordingly, AEP and organizations active in the area should continue their effort by undertaking a collaborative approach to designing and executing a monitoring program that supports the priorities and needs identified by organizations leading the restoration efforts and committed to maintaining or improving water quality in the Beaverlodge/Redwillow watersheds.
- Optimization of the sampling program is recommended, including the selection of
    - Key variables:
      Sampling should focus on parameters known to significantly impact the Arctic grayling populations such as DO and temperature. In addition, sampling should include parameters most likely to respond to changes in impacts and those known indicators of agricultural runoff. Based on those criteria and the results presented in this report, it is recommended to continue monitoring for the following parameters: nutrients (TP, TN, TKN, NO3+NO2, ammonia), suspended solids, fecal coliform bacteria indicators, a suite of commonly used pesticides (mostly herbicides), TSS, TDS, TOC, DOC, sodium, chloride, sulphate and chlorophyll_a.

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- Key water quality monitoring sites:
  It is proposed to continue sampling sites GD0010, GD0020, GD0025, GD0030, GD0040, GD0060, GD0070, GD0080, GD0090 and GE005. Sampling locations could be reassessed based on restoration efforts. Identifying areas of focus for riparian restoration and using those locations to prioritize sampling of surface water sites might enable surveys to capture potential changes in adjacent and downstream sites. Sampling of Redwillow River upstream of the confluence with Beaverlodge River should continue. This site can be considered a benchmarks for comparison of water quality conditions and determining impacts on Beaverlodge.
- Sampling frequency:
  The long-term strategy design could encompasses a short-term monitoring and reporting cycles (e.g. every 2-3 years), incorporating continuous feedback and refinement. Consequently, the program could be adapted to meet new monitoring needs as changes occur in available resources, technology, priorities and requirements. Sampling frequency and temporal sampling patterns are important. Seasonal trends have not been assessed in the decade since seasonal data were collected in 2004-2007. Seasonal sampling would enable comparison of changes in high and low flow conditions. Due to a relatively small catchment size of the Beaverlodge River, concentrations of nutrients and ions are greatly influenced by precipitation and runoff events. Sampling events following these events would capture information when the influx of nutrients and ions may be elevated. Inclusion of hydrological data (e.g. precipitation, water flow, river levels) on the date of sampling would allow for better interpretation of seasonal water quality changes. Where possible, water quality stations near a flow gauging station and near the mouth of the stream should be considered in planning of the monitoring program.

- Results presented in this report suggest impacts of nutrient loadings especially in upstream reaches. To understand the contribution and impacts of non-point versus point source pollution, it is recommended to inventory all point-source pollution such as industrial and municipal effluents and evaluate their characteristics and quantity of nutrients entering the river system. This information will potentially allow for assessing the load capacity of the river system.
- Bio-indicators integrate water quality information about pollution and changes in ecosystem health over their life span. It is recommended to collect and assess a bio-indicator such as periphyton at selected key locations. Monitoring abundance, richness, diversity, and community composition of periphyton can aid in determining natural and human-caused influences on water quality that may not be captured in discrete sampling efforts.
- Deployments of temperature and DO dataloggers in key locations would provide in-situ information of seasonal and daily temperature and DO fluctuations hence much more accurate information on the levels of these key parameters compared to discrete measurements. The upper reaches of the watershed appeared to have lower summer temperatures than downstream sites. However, this difference could be an artifact of sampling frequency; the upper reaches were less frequently sampled. Sampling frequency should be standardized among sampling locations to avoid uneven temporal and spatial data distribution.
- Water quality information is typically complex because it consists of many data points for a large number of variables. Regular updates of monitoring results should be shared publicly. Water quality

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should be assessed on an on-going basis and this technical and highly complex information reported on to a non-technical audience. Monitoring programs and sharing of the information would provide feedback on the significant restoration efforts in the Beaverlodge watershed.

Classification: Public

6 Acronyms and Abbreviations

AB	Alberta
ACA	Alberta Conservation Association
AECOM	AECOM Canada Limited
AEP	Alberta Environment and Parks
ASRD	Alberta Sustainable Resource Development
AWES	Agroforestry and Woodlot Extension Society
BC	British Columbia
BLR	Beaverlodge River
BTC	Beavertail Creek
CCME	Canadian Council of Ministers of the Environment
d/s	downstream
DIC	dissolved inorganic carbon
DL	detection limit
DO	dissolved oxygen
L	litre
GOA	Government of Alberta
µg	micrograms
MPWA	Mighty Peace Watershed Alliance
mg	milligrams
PAL	Protection of Freshwater Aquatic Life
RWR	Redwillow River
SWQG	surface water quality guidelines
TCU	total colour units
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
u/s	upstream
WR	Wapiti River

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8 Appendices

APPENDIX 1 – GENERAL CHEMISTRY

Table A1-1 General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alk. Phenolphthalein CaCO3	Alk. Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	L0.5	170	210	2.8					130	*0.76*		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	L0.5	190	230	4.1					160	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	L0.5	140	170	2.9					140	*0.08*		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	L0.5	140	170	3.1					130	*0.05*		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	L0.5	130	160	1.9					130	*0.06*	0.94	0.009	0.005	0.004	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	L0.5	120	140	1.4					130	*0.05*		L0.01	L0.01	L0.01	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	L0.5	140	180	2.6					140	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	L0.5	110	130	1.5					120	L0.05		L0.003	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	L0.5	190	230	4.7				0.11	150	0.09	2.00	L0.005	L0.003	L0.003	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	L0.5	120	150	3.2					110	L0.05	1.50	L0.005	0.003	L0.003	1.50
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	L0.5	94	110	3.1					120	0.07	2.20	L0.005	L0.003	L0.003	2.20
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	L0.5	100	130	1.9					100	L0.05	1.30	0.004	L0.003	0.004	1.30
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	L0.5	200	250	2.8					160	0.07	1.50	L0.014		L0.033	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Jun-18	L1	60	73	2.9					69	0.23	1.70	0.044	0.028	0.017	1.70
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	L1	310	380	7.1					250	0.08	1.10	L0.0042	0.004	L0.003	1.10
Average					148	181	3.1					136	0.11	1.53	0.006	0.004	0.004	1.56
STD					59	73	1.5					39	0.19	0.43	0.011	0.007	0.005	0.42
Median				L0.5	140	170	2.9					130	0.06	1.50	0.003	0.002	0.002	1.50
Number of Samples (N)				15	15	15	14				1	15	15	8	15	14	15	5
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	L1	120	147	3.6				0.07	105	0.46	3.17	0.194		0.014	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06	L1	88	107	4.0				0.04	90	0.30	3.08	0.136		0.017	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06	L1	108	131	5.0				0.04	96	0.21	2.46	0.076		0.007	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	L1	121	147	5.9				0.06	106	0.27	2.65	0.099		0.006	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	L1	111	135	3.7				0.06	97	0.25	2.11	0.088		0.005	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06	L1	118	144	1.7				0.08	102	0.16	1.77	0.059		0.006	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	L1	121	148	1.5				0.09	108	0.08	1.60	0.024		0.005	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	L1	133	162	1.4				0.09	114	0.02	1.48	L0.005		0.002	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	L1	110	134	4.9				0.09	88	0.02	1.87	L0.005		0.003	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06	L1	121	148	4.4				0.10	103	0.02	1.76	L0.005		0.002	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06	L1	175	213	3.1				0.11	163	0.02	1.69	L0.005		0.002	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06	L1	126	153	3.8				0.12	104	0.03	1.60	0.008		0.002	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06	L1	119	146	3.3				0.11	90	0.03	1.92	L0.005		0.003	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	4.6	121	136	3.6				0.16	95	0.12	2.38	L0.005		0.004	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07	L1	90	109	2.4				0.07	86	0.83	2.28	0.370		0.019	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07	L1	73	89	2.1				0.06	76	0.60	1.95	0.555		0.017	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07	L1	67	82	1.8				0.06	73	0.17	1.54	0.112		0.008	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07	L1	92	112	1.4				0.06	92	0.04	1.27	0.036		0.005	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07	L1	101	123	1.1				0.07	90	*0.02*	1.10	0.007		0.002	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11		76	93	4.0					61	0.55		0.093	0.093	*L0.003*	
Average					110	133	3.1				0.08	97	0.21	1.98	0.094		0.007	
STD					25	30	1.4				0.03	20	0.23	0.57	0.141		0.006	
Median				L1	115	136	3.5				0.07	95	0.14	1.87	0.048		0.005	
Number of Samples (N)				19	20	20	20				19	20	20	19	20	1	20	
Alberta SWQG		Short-Term (Acute)					640			0.022			Equation			124	Varies	
		Long-Term (Chronic)			20		120		↑ 20%	0.005						3		
CCME		Guideline Value																

*units in mg/L unless otherwise state; ** Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-1 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	DO (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/m	Sulphate Diss.	Sulphide
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11			0.30	0.52		7.61		240				320	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11			0.12	0.35		8.05						360	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12			0.11	0.15	8.04	8.04						300	12	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13			L0.1			8.03		180				290	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13			L0.1	0.06		7.52						270	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14			L0.1	0.03		8.23						240	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14			L0.1	0.13		8.05		200				290	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15		7.7	L0.1	0.06	7.80	8.08		160			203	230	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15		6.6	L0.1	0.08	6.26	8.11		240			271	390	7	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16		9.7	L0.1	0.17		8.06		180				270	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16			0.24	0.28		7.50						200	3	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17		7.1	L0.1	0.10	6.68	7.82					643	220	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17		1.2	L0.1	0.11	6.53	8.08					410		18	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Jun-18		6.2	L0.1	0.10		7.64		230				130	L1	
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18		15.0	L0.1	0.09	8.67	8.29		340			431	660	46	
Average					7.6	0.09	0.16	7.33	7.94		221			392	298	9	
STD					4.2	0.08	0.14	0.97	0.26		57			170	123	17	
Median					7.1	0.05	0.11	7.24	8.05		215			410	280	1	
Number of Samples (N)					7	15	14	6	15		8			5	14	15	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06		9.3	0.32	0.47	7.33	7.19				4.8	264	279	17	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06		9.1	0.27	0.47	7.31	7.21				4.2	228	236	24	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06		10.2	0.12	0.26	7.41	7.40				3.7	235	245	14	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06		10.4	0.12	0.31	7.48	7.49				3.4	260	268	13	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06		10.6	0.08	0.26	7.50	7.78				3.2	228	240	9	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06		9.4	0.07	0.22	7.55	7.84				3.2	235	244	5	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06		8.4	0.07	0.19	7.58	7.68				2.2	253	247	4	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06		9.8	0.06	0.16	7.87	7.97				0.8	255	261	3	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06		8.8	0.09	0.23	7.74	7.78				0.3	250	239	15	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06		9.1	0.16	0.26	7.66	7.81				0.9	264	243	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06		8.7	0.09	0.16	7.89	7.85				0.3	380	381	23	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06		9.0	0.14	0.20	7.88	7.91				0.5	296	250	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06		4.7	0.16	0.33	7.42	7.92				0.6	262	256	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06		3.5	0.44	0.66	8.79	8.66				1.2	240	249	6	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07		10.5	0.18	0.31	7.08	7.59				5.3	245	258	34	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07		10.3	0.15	0.27	7.06	7.53				5.0	215	227	31	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07		10.2	0.13	0.19	7.30	7.68				5.2	188	186	23	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07		9.6	0.06	0.13	7.49	7.59				5.0	206	216	17	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07			0.04	0.08		7.59				5.6		186	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11		10.1		*0.32*	5.90	7.58					110	170		
Average					9.0	0.14	0.27	7.49	7.70				2.9	243	244	15	
STD					1.9	0.10	0.13	0.54	0.31				2.0	51	43	9	
Median					9.4	0.12	0.26	7.49	7.68				3.2	245	245	13	
Number of Samples (N)					19	19	20	19	20				19	19	20	19	
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												0.002
CCME	Guideline Value																

*units in mg/L unless otherwise stated; **Minimum Value; ***Averaged values only; ****L refers to below the detection limit

Classification: Public

Table A1-1 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11					19.00	11.00			G2400		440	18
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11					21.00	18.00			2400		4	216*
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12					15.00	7.70			520		L1	66
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13					2.70	1.30			870		9	15
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13					L1	1.00			1700		17	6
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14					2.00	1.60			310		23	7
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	150.0		24.00	23.00	9.30				770		2	76
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15			22.00	21.00	3.40		16.900					10
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	210.0		24.00	24.00	4.50	3.80	9.050		170	1.0		19
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	130.0		18.00	16.00	6.80	5.50	15.500		1600	7.5	17	25
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	110.0	230.0	64.00	65.00	9.30	6.40	8.600		G2400	10.0	20	10
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	110.0	150.0	22.00	21.00	7.50	3.50	2.790		57	3.1	3	35
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	250.0	260.0	24.00	24.00	7.30	4.10	7.140		G2400	26.0	22	26
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Jun-18	70.0		41.00	40.00	10.00	10.00	12.100		4400	20.0	20	7
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	390.0		16.00	14.00	6.00	3.60	7.500		1700		70	28
Average				177.5	213.3	28.33	27.56	8.29	5.96	9.948		>1318	11.3	50	38
STD				103.6	56.9	15.12	15.84	6.01	4.79	4.653		>1246	9.8	119	54
Median				140	230.0	24.00	23.00	7.30	4.10	8.825		>870	8.8	17	19
Number of Samples (N)				8	3	9	9	15	13	8		14	6	13	15
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	153.0				15.00		-0.200			180.0	180	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06	134.0				16.00		-0.120			150.0	150	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06	138.0				12.00	9.80	0.080			20.0	20	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	152.0				58.00	41.00	1.210			10.0	L10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	133.0				94.00	59.00	1.880			10.0	L10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06	128.0				68.00	46.00	7.380			20.0	20	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	131.0				38.00	27.00	9.150			20.0	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	140.0				14.00	17.30	7.860			20.0	L10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	137.0				16.00	17.60	13.840			10.0	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06	144.0				7.00	9.00	13.200			70.0	40	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06	218.0				5.00	5.90	16.190			40.0	L10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06	148.0				2.00	4.90	15.440			40.0	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06	141.0				21.00	37.00	15.970		180		180	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	138.0				10.00	7.80	18.840			60.0	50	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07	145.0			13.90	16.00	16.80	-0.080			60.0	60	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07	124.0			13.70	25.00	22.00	0.300			50.0	40	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07	106.0			21.50	13.00	10.00	5.460			20.0	L10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07	120.0			20.30	15.00	10.40	6.880			20.0	10	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07	117.0			18.60	18.00	10.40				20.0	20	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11	87.0	130.0			15.00	21.00	0.100		2400		2	3
Average				136.7	130.0		17.60	23.90	20.72	7.020		1290	45.6	41	
STD				24.9			3.62	23.36	15.49	6.759		1569.77705	47.6	58	
Median				137.5	130.0		18.60	15.50	17.05	6.880		1290	20.0	15	
Number of Samples (N)				20.0	1		5	20	18	19		2	18	20	1
Alberta SWQG	Short-Term (Acute)							Narrative	Narrative	Narrative					
	Long-Term (Chronic)														
CCME	Guideline Value														

*units in mg/L unless otherwise stated

Classification: Public

Table A1-2 Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alk. Phenolphthalein CaCO3	Alk. Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour TCU	Cyanide	Fluoride Diss.	Hardness Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-94		211	257	1.8		83	0.004	0.22	127	0.03	2.42	0.001		0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-Jan-95		228	278	8.8		118	0.006	0.12	197	0.47	2.63	0.106		0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-95		74	90	2.6		103	0.004	0.06	71	0.26	1.75	0.444		0.027
AB07GD0020	Beaverlodge River	BLR u/s of BTC	15-Aug-95		116	141	1.7		65	0.002	0.11	98	0.07	1.63	0.153		0.017
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Aug-04	L1	306	373	4.1				0.32	141	0.03	1.86	0.006		0.002
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04	L1	302	368	3.2				0.29	129	0.03	1.75	L0.005		0.001
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Oct-04	L1	130	159	1.2				0.10	119	0.15	1.91	0.152		0.007
AB07GD0020	Beaverlodge River	BLR u/s of BTC	9-Feb-05	L1	177	216	5.7				0.06	162	0.33	1.84	0.146		0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	L1	121	147	5.2				0.07	103	0.17	2.30	0.106		0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	13-Mar-06	L1	347	423	16.1				0.15	304	0.31	3.71	0.158		0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	L1	222	270	10.1				0.10	180	0.16	3.19	0.120		0.009
AB07GD0020	Beaverlodge River	BLR u/s of BTC	6-Apr-06	L1	341	416	17.2				0.13	321	0.12	3.59	0.105		0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	10-Apr-06	L1	192	234	7.3				0.07	172	0.06	2.76	L0.005		0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	L1	167	204	6.3				0.07	147	0.05	2.57	L0.005		0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	L1	131	159	5.0				0.06	112	0.05	1.87	L0.005		0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Apr-06	L1	107	131	3.9				0.07	92	0.05	1.59	0.015		0.004
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	L1	112	137	3.8				0.07	97	0.20	1.37	0.029		0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	L1	135	165	4.7				0.09	121	0.06	1.53	0.049		0.007
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	L1	166	202	4.3				0.12	122	0.01	0.78	L0.005		0.004
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-May-06	L1	165	201	4.0				0.12	142	0.02	1.76	L0.005		0.002
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-06	L1	142	173	3.6				0.12	127	0.02	1.51	L0.005		0.002
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Jun-06	L1	163	199	3.7				0.14	130	0.03	1.61	L0.005		0.002
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Jun-06	L1	205	250	3.5				0.17	138	0.04	1.71	L0.005		0.002
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	L1	236	288	2.1				0.23	119	0.05	2.12	L0.005		L0.001
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L1	258	314	5.1				0.13	119	0.02	2.62	L0.005		L0.001
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-07	L1	75	92	1.4				0.07	33	0.12	1.16	0.077		0.007
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-07	L1	111	135	3.6				0.08	108	0.35	1.64	0.678		0.012
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-07	L1	54	65	2.0				0.06	52	0.25	1.38	0.485		0.017
AB07GD0020	Beaverlodge River	BLR u/s of BTC	30-Apr-07	L1	101	123	4.6				0.09	83	1.22	2.93	0.163		0.014
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Mar-05	L1	117	142	4.1				0.08	102	1.38	3.28	0.106		0.014
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Sep-05	L1	88	107	2.7				0.07	85	*0.15*	1.95	0.091		0.012
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-10		180	220	7.0					130	*L0.05*		L0.003	L0.003	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Apr-11	L0.5	94	120	4.5					75	0.53		0.052	0.052	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	31-Oct-11	L0.5	270	330	12.0					140	*0.11*		0.110	0.097	0.008
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-12	L0.5	110	140	5.1					100	*0.43*		0.087	0.087	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-May-13	L0.5	120	140	4.5					120	*0.13*		0.082	0.072	0.010
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-13	L0.5	190	230	1.9					120	*0.11*	1.30	0.019	0.012	0.007
AB07GD0020	Beaverlodge River	BLR u/s of BTC	28-May-14	L0.5	120	140	3.6					100	*0.09*		0.059	0.059	L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Oct-14	L0.5	340	410	6.6					140	*L0.05*		L0.003	L0.003	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-May-15	L0.5	110	130	3.9					120	L0.05		0.046	0.037	0.008
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-15	L0.5	330	400	3.7				0.29	110	0.85	2.00	L0.005	L0.003	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-16	L0.5	110	130	3.7					110	L0.05	1.30	L0.005	L0.003	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-16	L0.5	180	220	6.2					150	0.07	1.90	L0.005	L0.003	L0.003
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-17	L0.5	87	110	5.1					84	0.17	1.20	0.080	0.074	0.006
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-17	L0.5	240	290	3.9					160	0.03	1.30	L0.044	L0.010	L0.033
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-18	L1	94	120	3.5					100	0.16	1.30	0.220	0.190	0.029
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Sep-18	L1	150	180	2.7					120	0.06	1.30	L0.0042	0.004	L0.003
Average					171	208	4.9		92	0.004	0.12	126	0.19	1.96	0.085	0.044	0.007
STD					79	96	3.3		23	0.002	0.07	50	0.29	0.70	0.135	0.052	0.006
Median				L1	150	180	4.0		93	0.004	0.10	120	0.09	1.76	0.046	0.025	0.005
Number of Samples (N)				42	47	47	47		4	4	32	47	47	39	47	16	47
Alberta SWQG	Short-Term (Acute)						640			0.022			Equation			124	Equation
	Long-Term (Chronic)				20		120		↑ 20%	0.005						3	
CCME	Guideline Value																

*units in mg/L unless otherwise stated; **Minimum Value; ***L refers to below the detection limit

Classification: Public

Table A1-2 continued Beaverlodge Main Stem Sites (AB07GD020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TN Calcd	BOD	DO (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-94		8.4	3.9	0.18	0.35	7.58	7.50	0.012		332	5.6	410	416
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-Jan-95		1.8	9.5	0.31	0.39	7.00	7.35	0.023		374	5.5	445	467
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-95		2.2	10.4	0.13	0.20	7.00	7.22	0.019		154	4.7	183	186
AB07GD0020	Beaverlodge River	BLR u/s of BTC	15-Aug-95		2.1	7.3	0.15	0.20	7.75	7.81	0.013		202	1.5	229	229
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Aug-04			3.2	0.27	0.45	7.17	7.94				3.0	579	576
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04			9.9	0.22	0.41	8.17	7.94				2.5	293	550
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Oct-04			13.4	0.04	0.11	7.71	8.00				5.1	265	263
AB07GD0020	Beaverlodge River	BLR u/s of BTC	9-Feb-05		3.6	6.1	0.13	0.19	6.93	7.86				5.9	336	361
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05			11.5	0.18	0.35	7.18	7.65				6.2	247	260
AB07GD0020	Beaverlodge River	BLR u/s of BTC	13-Mar-06			8.2	0.05	0.13	7.18	7.60				4.9	664	694
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06			10.8	0.23	0.40	7.53	7.67				4.5	441	462
AB07GD0020	Beaverlodge River	BLR u/s of BTC	6-Apr-06			12.4	0.05	0.17	7.69	7.91				5.6	657	674
AB07GD0020	Beaverlodge River	BLR u/s of BTC	10-Apr-06			11.3	0.07	0.23	7.54	7.61				4.1	382	395
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06			10.6	0.08	0.23	7.59	7.61				3.6	339	345
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06			10.5	0.07	0.17	7.65	7.89				2.0	273	283
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Apr-06			10.5	0.07	0.17	7.61	7.80				0.9	221	231
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06			9.7	0.12	0.15	7.62	8.01				0.8	227	238
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06			9.3	0.11	0.14	7.70	7.84				0.9	276	281
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06			10.0	0.07	0.05	7.90	8.01				0.8	357	337
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-May-06			9.0	0.09	0.19	7.62	7.87				2.5	359	330
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-06			9.5	0.10	0.19	7.80	7.76				1.9	298	301
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Jun-06			8.0	0.11	0.21	7.80	7.79				2.4	341	318
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Jun-06			5.7	0.22	0.33	7.96	8.27				2.2	420	410
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06			4.5	0.34	0.50	7.93	7.95				0.9	438	449
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06			7.0	0.16	0.35	7.98	8.02				L0.1	465	486
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-07			10.1	0.25	0.30	7.07	7.93				4.8	187	202
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-07			12.0	0.09	0.27	7.36	7.93				7.0	247	258
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-07			10.8	0.17	0.27	6.89	7.40				5.4	177	185
AB07GD0020	Beaverlodge River	BLR u/s of BTC	30-Apr-07			10.9	0.13	0.29	7.28	7.78				4.0	228	227
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Mar-05			10.3	0.15	0.28	7.44	7.51				4.1	258	273
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Sep-05				0.05	0.17		7.64				4.5		207
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-10				0.08	0.20		7.90					410	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Apr-11			10.9		0.22	6.80	7.64		140			140	200
AB07GD0020	Beaverlodge River	BLR u/s of BTC	31-Oct-11				0.43	0.45		8.25						610
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-12				0.31	0.36	7.93	7.93						260
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-May-13				0.21			8.10		180				300
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-13				0.19	0.15		7.74						400
AB07GD0020	Beaverlodge River	BLR u/s of BTC	28-May-14				L0.1	0.16		8.23						240
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Oct-14				L0.1	0.36		8.23		490				690
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-May-15			8.4	0.11	0.10	7.80	8.19		180			217	250
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-15			2.3	0.39	0.34	6.19	8.10		430			469	670
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-16	1.30		8.6	L0.1	0.14		7.97		160				260
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-16	1.90			0.11	0.41		7.72						370
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-17	1.20		11.2	0.19	0.14	6.57	7.94					633	210
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-17			1.4	L0.1	0.25	6.25	7.96						470
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-18	1.50		8.2	0.17	0.18		7.97		170				210
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Sep-18	1.30		10.8	0.15	0.24	8.61	8.00		200			198	300
Average				1.44	3.6	8.9	0.15	0.25	7.45	7.85	0.017	244	266	3.5	342	355
STD				0.28	2.8	2.8	0.10	0.11	0.51	0.24	0.005	136	104	1.9	139	148
Median				1.30	2.2	9.8	0.13	0.23	7.59	7.90	0.016	180	267	4.0	317	301
Number of Samples (N)				5	5	38	46	46	37	47	4	8	4	31	36	46
Alberta SWQG	Short-Term (Acute)					5 **		Narrative	6.5-9.0	6.5-9.0						
	Long-Term (Chronic)					6.5/8.3/9.5***										
CCME	Guideline Value															

*units in mg/L unless otherwise stated; **Minimum value; *** Averaged values; ****L refers to below the detection limit

Classification: Public

Table A1-2 continued Beaverlodge Main Stem Sites (AB07GD020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sulphate Diss.	Sulphide	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp ° C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-94	9	0.002	230	319		29.4	14.0	10.6	8.56	1.00	4300	80		69.8
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-Jan-95	7	0.008	256	361		45.9	13.0	3.8	0.21	1.94	1300	24		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-95	10	0.005	98	145		16.9	9.0	5.5	0.76	1.93	9	6		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	15-Aug-95	5	0.002	127	196		29.5	6.0	4.6	16.29	1.52	500	20		3.3
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Aug-04	12		338				6.0		15.71			270	100	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04	13		336				12.0		12.44					
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Oct-04	13		150				7.0		0.65			40	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	9-Feb-05	22		215				10.0		0.08					
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	11		145				20.0		3.33			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	13-Mar-06	16		398				6.0		-0.23					
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	13		256				15.0		-0.06			50	50	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	6-Apr-06	15		401				17.0		0.01			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	10-Apr-06	12		225				25.0	17.1	0.15			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	12		196				19.0	13.1	4.39			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	12		156				14.0	9.2	5.04			20	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Apr-06	3		120				20.0	13.0	7.64			50	50	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	25		147				19.0	15.9	8.22			30	30	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	24		172				12.0	11.5	7.55			10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	19		198				12.0	13.8	14.84			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-May-06	20		199				11.0	12.3	13.58			60	60	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-06	12		168				9.0	7.8	16.51			20	20	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Jun-06	13		190				11.0	12.1	16.13			20	20	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Jun-06	13		233				13.0	5.0	16.62			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	8		258				14.0	13.7	19.45			20	20	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L3		280				7.0	5.2	8.70			10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-07	20		111			9.8	8.0	11.8	-0.26			680	170	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-07	12		138			14.1	58.0	64.0	1.63			1800	570	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-07	29		103			13.5	12.0	21.0	2.68			110	30	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	30-Apr-07	12		127			19.0	11.0	9.2	3.76			10	10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Mar-05	17		151			20.0	13.0	7.4	4.27			L10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Sep-05	26		129			18.7	31.0	13.5				10	L10	
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-10			232	270			14.0	11.1						1.1
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Apr-11	L1		110	140			8.0	9.3	0.10		1100		2	3.3
AB07GD0020	Beaverlodge River	BLR u/s of BTC	31-Oct-11	56						11.0	13.0			550		6	45.5
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-12	4		140				15.0	13.0			57		4	16.3
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-May-13	24		160				25.0	11.0			G2400		140	59.9
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-13	2						4.0	4.3			G2400		5	12.5
AB07GD0020	Beaverlodge River	BLR u/s of BTC	28-May-14	L1						6.0	4.4			650		82	8.2
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Oct-14	27		400		25.0	23.0	11.0				690		16	50.3
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-May-15	5				24.0	24.0	5.1		16.50					11.8
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-15	25		390		26.0	25.0	8.5	9.0	8.25		200	3	6	24.3
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-16	13		140		17.0	17.0	4.5	4.1	14.30		1300	2	2	12.9
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-16	4		200	180	28.0	26.0	42.0	20.0	9.40		L2400	L2	4	20.8
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-17	3		110	140	21.0	21.0	2.3	5.6	3.11		19	1	1	23.4
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-17	9		280	300	28.0	27.0	12.0	7.3	7.88		2400	140	62	38.5
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-18	1		110		22.0	22.0	12.0	5.9	14.60		L2400	29	13	5.9
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Sep-18	5		160		22.0	20.0	4.7	7.1	7.90		550		1	7.9
Average				13	0.004	202	228	23.7	22.2	13.6	11.5	7.45	1.60	1002	104	40	23.1
STD				10	0.003	88	86	3.6	7.8	9.9	9.9	6.29	0.44	1064	324	97	20.9
Median				12	0.004	172	196	24.0	21.0	12.0	10.6	7.64	1.73	670	20	6	14.6
Number of Samples (N)				46	4	43	9	9	19	47	37	39	4	18	34	38	18
Alberta SWQG	Short-Term (Acute)									Narrative	Narrative	Narrative					
	Long-Term (Chronic)				0.002												
CCME	Guideline Value																

*units in mg/L unless otherwise stated

Classification: Public

Table A1-3 General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94		218	261	4.3		67	0.003	0.15	191	0.02	1.17	0.001		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95		255	311	6.2		80	0.004	0.13	226	0.22	2.27	0.298		0.006	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95		88	107	3.3		96	0.005	0.07	92	0.30	1.87	0.793		0.041	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95		161	189	1.8		71	0.002	0.12	143	0.02	1.28	0.002		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95		277	338	4.0		40	0.003	0.16	226	0.02	1.10	0.004		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04	5	169	193	2.0				0.17	144	0.02	1.18	0.008		0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04	L1	169	207	1.5				0.13	147	0.02	0.93	L0.005		L0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04	L1	146	177	1.5				0.08	136	0.04	1.28	0.053		0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05	L1	121	148	16.8				0.07	103	0.11	1.71	0.559		0.009	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	L1	91	111	7.4				0.07	83	0.16	1.98	0.118		0.005	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06	L1	415	506	12.0				0.19	347	0.34	3.06	0.328		0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	L1	126	154	24.3				0.08	117	0.42	3.64	0.437		0.021	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06	L1	107	131	10.9				0.06	110	0.14	2.24	0.229		0.009	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06	L1	158	193	8.0				0.06	147	0.07	2.25	0.088		0.005	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	L1	148	180	5.1				0.07	146	0.05	2.06	0.051		0.004	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	L1	127	155	3.1				0.07	119	0.04	1.42	0.033		0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06	L1	140	171	3.1				0.09	129	0.02	1.21	L0.005		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	L1	135	165	3.1				0.09	124	0.02	1.11	L0.005		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	L1	153	187	3.6				0.11	139	0.01	1.02	L0.005		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	4.8	207	241	3.9				0.10	186	0.02	1.63	L0.005		0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06	2.6	192	228	3.4				0.12	172	0.01	1.11	L0.005		L0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06	6.1	178	202	6.1				0.13	170	0.01	0.94	L0.005		0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06	4.7	194	225	2.8				0.11	186	0.02	0.94	L0.005		0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06	6.3	227	262	3.9				0.14	190	0.02	1.17	0.007		0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	L1	198	242	8.3				0.17	286	0.02	1.24	L0.005		L0.001	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	36.5	247	212	5.6				0.27	93	0.03	2.54	L0.005		0.002	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	L1	194	236	19.2				0.09	234	0.28	1.21	0.115		0.007	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07	L1	65	80	5.1				0.09	72	0.27	2.38	1.200		0.021	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07	L1	64	78	3.5				0.10	81	0.20	2.52	0.842		0.018	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07	L1	78	95	2.3				0.07	86	0.10	1.50	0.106		0.009	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07	L1	85	104	2.0				0.06	93	0.07	1.18	0.031		0.007	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07	L1	82	100	1.9				0.06	90	0.03	1.30	0.017		0.004	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	L0.5	110	140	3.7	86		L0.002	0.07	110	L0.05	1.20	0.012	0.012	L0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L0.5	250	310	19.0	49		0.005	0.15	300	L0.05	1.30	L0.003	L0.003	L0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	2	430	510	10.0	18		L0.002	0.21	220	L0.05	0.59	L0.003	L0.003	L0.003	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	L0.5	200	250	9.6	77		L0.002	0.10	200	0.42	1.70	0.370	0.370	L0.003	2.10
Average				2.5	172	206	6.5	58	71	0.003	0.11	157	0.10	1.59	0.159	0.096	0.006	
STD				6.6	84	99	5.6	31	21	0.002	0.05	66	0.12	0.67	0.283	0.183	0.008	
Median				L1	160	191	4.0	63	71	0.003	0.10	144	0.03	1.29	0.015	0.007	0.003	
Number of Samples (N)				31	36	36	36	4	5	9	36	36	36	36	36	4	36	1
Alberta SWQG	Short-Term (Acute)						640			0.022			Equation			124	Varies	
	Long-Term (Chronic)				20 **		120		↑ 20%	0.005						3.000		
CCME	Guideline Value																	

*units in mg/L unless otherwise stated; **Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-3 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	DO (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94	1.7	9.6	0.02	0.05	8.13	8.36	0.008		360	0.7	469	482	31	0.001
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95	0.7	11.4	0.09	0.13	7.30	7.64	0.017		406	6.5	497	520	15	0.004
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95	3.2	10.9	0.13	0.24	7.53	7.60	0.022		258	5.9	222	225	15	0.006
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95	1.5	9.9	0.04	0.07	8.43	8.39	0.012		254	0.3	328	321	12	0.002
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95	1.3	12.9	0.02	0.03	8.10	8.24	0.007		472	0.5	675	667	87	0.001
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04		9.0	0.02	0.06	7.47	8.48				0.8	339	335	12	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04		9.2	0.02	0.04	8.15	8.24				0.7	338	332	15	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04		13.8	0.04	0.07	7.47	8.09				4.5	280	281	14	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05	7.7	6.2	0.13	0.21	7.27	7.72				5.3	296	301	20	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05		12.5	0.20	0.37	6.97	7.64				5.6	191	219	12	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06		8.5	0.04	0.08	7.19	7.58				8.2	761	828	36	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06		11.6	0.31	0.53	7.77	7.34				4.5	356	374	24	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06		12.1	0.18	0.34	7.78	7.49				4.6	274	286	21	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06		12.4	0.09	0.25	7.95	8.00				4.7	344	353	20	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06		12.4	0.08	0.23	8.01	7.89				4.5	325	335	25	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06		12.4	0.05	0.16	7.93	8.11				4.1	267	280	17	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06		13.1	0.04	0.12	8.19	8.19				2.7	287	298	9	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06		10.9	0.04	0.11	8.22	8.25				1.9	279	289	9	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06		10.9	0.03	0.09	8.22	8.23				0.8	323	326	15	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06		10.5	0.02	0.20	8.36	8.36				0.6	457	428	34	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06		10.2	0.02	0.06	8.34	8.33				0.4	408	374	23	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06		9.1	0.02	0.05	8.38	8.43				0.2	390	390	24	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06		10.4	0.02	0.04	8.49	8.43				0.7	408	377	23	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06		11.1	0.02	0.05	8.39	8.45				0.9	522	499	42	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06		10.0	0.02	0.05	8.25	8.22				0.6	954	959	298	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06		14.3	0.03	0.13	9.48	9.50				0.2	796	804	165	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07		11.2	0.03	0.16	7.67	7.86				5.2	679	709	141	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07		11.2	0.14	0.60	7.49	7.68				5.8	192	205	22	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07		10.6	0.10	0.74	7.43	7.60				5.7	165	181	17	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07		10.3	0.09	0.29	7.71	7.94				5.9	190	188	16	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07		9.8	0.08	0.27	7.73	7.73				5.7	190	201	15	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07		1.5	0.05	0.25	7.61	7.72				5.9	204	164	13	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14		10.3	0.05	0.07	7.50	7.99	0.004	180		2.2	185	250	13	0.006
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14		11.2	0.03	0.05	8.21	8.28	0.006	450		2.7	674	690	110	0.002
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14		15.0	0.01	0.02	8.13	8.33	0.004	770		1.5	1195	1200	240	L0.0019
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15		7.6	0.09	0.12	7.18	7.61	0.003	260		6.8	454	450	26	0.009
Average				2.7	10.7	0.07	0.18	7.90	8.05	0.009	415	350	3.3	414	420	45	0.003
STD				2.6	2.4	0.06	0.17	0.50	0.41	0.007	262	95	2.5	236	238	66	0.003
Median				1.6	10.9	0.04	0.12	7.94	8.10	0.007	355	360	3.4	339	335	21	0.002
Number of Samples (N)				6	36	36	36	36	36	9	4	5	36	36	36	36	9
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												0.002
CCME	Guideline Value																

*units in mg/L unless otherwise stated; **Minimum value; ***Averaged values only; ***L refers to below the detection limit

Classification: Public

Table A1-3 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94	269	357		23.9	4.0	6.4	10.75	1.56				3.2
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95	290	399		35.3	7.0	10.2	0.18	1.91	9	L4		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95	122	188		18.0	70.0	50.0	4.98	1.79	40	16		3.6
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95	181	250		29.5	4.0	4.5	17.84	1.59	60	10		2.8
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95	411	471		18.6	1.0	2.1	6.14	2.89	33	L4		2.4
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04	188				6.0		20.64			40	40	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04	189				4.0		12.90					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04	164				9.0		0.00			50	50	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05	178				6.0		0.09					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	121				102.0		0.34			30	20	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06	489				5.0		-0.23					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	204				39.0		-0.08			160	130	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06	162				31.0		0.05			120	70	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06	202				34.0	31.0	-0.04			10	10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	193				34.0	31.0	-0.08			L10	L10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	155				34.0	33.0	1.42			20	L10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06	159				17.0	17.8	9.65			L10	L10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	154				15.0	17.9	10.79			20	20	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	180				12.0	15.1	10.78			L10	L10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	261				9.0	8.8	18.46			120	50	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06	229				6.0	8.4	15.96			160	160	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06	222				3.0	4.7	18.84			40	40	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06	232				4.0	5.3	19.10			90	90	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06	287				5.0	6.3	20.24			100	100	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	633				7.0	5.5	21.60			60	40	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	511				20.0	19.5	15.81			L10	L10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	425			10.8	18.0	21.0	-0.12			50	10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07	114			13.5	316.0	265.0	3.35			160	160	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07	105			13.3	533.0	375.0	3.44			230	150	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07	109			15.9	144.0	108.0	6.98			110	110	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07	113			16.2	156.0	108.0	7.70			190	150	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07	107			18.2	176.0	108.0	9.11			20	10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	140		20.0	19.0	21.0	17.0	13.35			9	L10	3.9
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	440		22.0	21.0	9.3	4.4	23.59			70	20	8.0
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	770		8.8	9.1	41.0	10.0	13.31			10	10	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	270		27.0	28.0	1.3	3.4	-0.07			L10	L10	0.7
Average				249	333	19.5	19.4	52.9	46.3	8.80	1.95	36	60	53	3.5
STD				156	114	7.7	7.2	104.8	84.7	7.92	0.55	21	64	55	2.2
Median				191	357	21.0	18.2	13.5	16.1	8.41	1.79	37	35	30	3.2
Number of Samples (N)				36	5	4	15	36	28	36	5	4	32	28	7
Alberta SWQG	Short-Term (Acute)							Narrative	Narrative	Narrative					
	Long-Term (Chronic)														
CCME	Guideline Value														

*units in mg/L unless otherwise stated

Classification: Public

Table A1-4 General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD045, AB07GD050, AB07GD060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10	L0.5	140	170	4.4					130	L0.05		L0.003	L0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11	L0.5	82	100	7.2					70	0.44		0.300	0.300	0.004	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	L0.5	240	290	7.6					220	*L0.05*		0.003	0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	L0.5	140	170	19.0					150	*0.09*		0.220	0.220	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	L0.5	160	200	6.5					160	*0.14*		L0.003	L0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	L0.5	280	340	11.0					210	*L0.05*	0.82	L0.003	L0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	L0.5	130	160	4.4					130	*L0.05*		L0.01	L0.01	L0.01	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	L0.5	270	330	64.0					300	*L0.05*		0.008	0.008	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	L0.5	120	150	4.1					140	L0.05		L0.003	L0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	0.83	430	530	9.3				0.37	260	L0.05	0.45	L0.005	L0.003	L0.003	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	L0.5	170	210	10.0					160	L0.05	0.91	L0.005	L0.003	L0.003	0.91
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	2-Sep-16	L0.5	200	250	20.0					220	L0.05	1.50	L0.003	L0.003	L0.003	1.50
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	L0.5	96	120	4.6					85	L0.05	1.20	0.050	0.041	0.009	1.30
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	L0.5	180	210	23.0					190	0.02	0.71	0.220		L0.033	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	L1	120	150	4.9					140	0.08	1.20	0.140	0.120	0.025	1.30
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	L1	210	260	22.0					250	0.07	1.30	0.022	0.022	L0.003	1.30
Average				0.3	186	228	13.9					176	0.07	1.01	0.061	0.049	0.005	1.26
STD				0.2	88	107	14.9					64	0.10	0.35	0.100	0.092	0.007	0.21
Median				L0.5	165	205	8.5					160	0.03	1.06	0.004	0.003	0.002	1.30
Number of Samples (N)				16	16	16	16				1	16	16	8	16	15	16	5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94		214	261	4.4		64	0.003	0.15	189	0.02	1.18	0.006		0.004	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95		257	314	6.1		78	0.004	0.14	229	0.20	2.13	0.314		0.006	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95		87	106	3.8		95	0.005	0.07	93	0.35	1.94	0.829		0.041	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95		161	191	1.9		74	0.002	0.12	143	0.02	1.22	L0.001		0.001	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95		223	272	5.5		42	0.003	0.14	201	0.01	1.08	0.005		0.002	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	L0.5	110	140	3.8	88		L0.001	0.07	110	L0.05	1.20	0.014	0.014	L0.003	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14	4.1	320	380	10.0	33		0.005	0.25	260	L0.05	0.78	L0.003	L0.003	L0.003	0.78
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14				26.7											
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	L0.5	210	250	12.0	85		L0.002	0.09	200	0.35	1.70	0.430	0.430	L0.003	2.20
Average				1.5	198	239	8.2	69	71	0.003	0.13	178	0.12	1.40	0.200	0.149	0.007	1.49
STD				2.2	76	90	7.6	31	20	0.002	0.06	58	0.15	0.47	0.305	0.244	0.014	1.00
Median				L0.5	212	256	5.5	85	74	0.003	0.13	195	0.03	1.21	0.010	0.014	0.002	1.49
Number of Samples (N)				3	8	8	9	3	5	8	8	8	8	8	8	3	8	2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94		385	469	33.5		88	0.005	0.70	272	1.74	3.93	0.052		0.027	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95		245	298	6.5		105	0.005	0.13	212	0.24	2.60	0.198		0.006	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95		88	107	2.4		77	0.004	0.07	89	0.19	1.44	0.483		0.017	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95		127	154	1.7		72	0.002	0.12	106	0.03	1.52	0.005		0.003	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95		186	226	3.3		56	0.003	0.16	156	0.02	1.70	0.002		0.002	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10	L0.5	120	150	2.2					120	*0.06*		0.003	0.003	L0.003	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11		86	110	6.0					73	0.45		0.120	0.120	L0.003	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	L0.5	180	220	7.9					160	*L0.05*		0.013	0.007	0.006	
Average				0.25	177	217	7.9		80	0.004	0.24	149	0.34	2.24	0.110	0.043	0.008	
STD				0	100	121	10.6		18	0.001	0.26	67	0.58	1.05	0.166	0.066	0.009	
Median				0.25	154	187	4.7		77	0.004	0.13	138	0.13	1.70	0.033	0.007	0.005	
Number of Samples (N)				2	8	8	8		5	5	5	8	8	5	8	3	8	
Alberta SWQG		Short-Term (Acute)					640			0.022			Equation			124	Varies	
		Long-Term (Chronic)			20 **		120		↑ 20%	0.005						3.000		
CCME		Guideline Value																

*units in mg/L unless otherwise stated; **Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-4 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD045, AB07GD050, AB07GD060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material L	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10			0.02	0.07		8.12		210				340	33	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11		15.0		0.30	7.50	7.92		150			140	210	11	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11			L0.1	0.10		8.24						530	59	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12			0.17	0.20	8.19	8.19						410	43	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13			L0.1			8.21		250				410	43	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13			L0.1	0.05		8.11						910	170	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14			L0.1	0.09		8.31						300	18	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14			L0.1	0.03		8.25		740				1200	220	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15		8.5	L0.1	0.09	7.60	8.18		190			236	290	18	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15		8.6	L0.1	0.03	6.50	8.33		970			1036	1500	310	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16		9.0	0.10	0.06		8.26		330				550	91	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	2-Sep-16			L0.1	0.09		8.21						570	70	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17		17.4	L0.1	0.17	6.89	8.07					615	200	5	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17		6.5	L0.1	0.11	6.44	8.12					2202	620	110	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18		9.4	0.11	0.13		8.20		250				290	24	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18		15.4	L0.1	0.08	8.42	8.24		410			410	620	85	
Average					11.2	0.06	0.10	7.36	8.19		389			773	559	82	
STD					9.2	0.04	0.07	7.50	0.10		281			513	364	85	
Median					4.1	0.05	0.09	0.78	8.21		250			769	470	51	
Number of Samples (N)					8	15	15	7	16		9			6	16	16	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94	2.1	9.4	0.02	0.05	8.07	8.21	0.008		350	0.3	475	496	38	0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95	0.9	10.9	0.08	0.11	7.35	7.72	0.016		392	6.4	518	524	16	0.004
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95	4.0	11.1	0.13	0.25	7.56	7.66	0.022		242	5.8	217	230	19	0.007
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95	1.3	9.9	0.03	0.06	8.35	8.34	0.011		254	0.2	332	324	12	0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95	2.0	10.6	0.02	0.04	8.11	8.03	0.009		352	0.4	487	483	32	L0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14		10.1	0.05	0.09	7.72	8.17	0.003	180		2.6	180	250	15	0.006
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14		10.7	0.02	0.04	8.38	8.42	0.005	740		3.3	1055	1100	270	L0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14		11.6			8.14						1152			
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15		7.5	0.10	0.13	7.26	7.73	0.003	300		6.8	474	460	31	0.009
Average				2.1	10.2	0.06	0.10	7.88	8.04	0.010	407	318	3.2	543	483	54	0.004
STD				1.2	1.2	0.04	0.07	0.42	0.30	0.007	295	66	2.8	341	274	88	0.003
Median				2.0	10.6	0.04	0.07	8.07	8.10	0.009	300	350	3.0	475	472	25	0.003
Number of Samples (N)				5	9	8	8	9	8	8	3	5	8	9	8	8	8
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94	3.9	5.8	1.42	1.63	8.10	8.10	0.012		842	5.4	1192	1151	195	0.002
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95	1.0	9.4	0.19	0.24	7.22	7.54	0.019		374	7.0	465	490	9	0.006
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95	1.5	10.7	0.09	0.17	7.39	7.35	0.016		208		197	214	13	0.004
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	1.9	9.8	0.09	0.14	8.50	8.26	0.013		220	0.5	247	244	5	0.002
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95	3.5	9.9	0.04	0.10	7.74	7.82	0.010		284	0.6	368	369	18	0.002
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10			0.03	0.06		8.02		150				250	9	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11		13.0		0.32	7.30	7.78					130	200		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11			0.17	0.22		8.03						380	33	
Average				2.4	9.7	0.29	0.36	7.71	7.86	0.014		386	3.4	433	412	40	0.003
STD				1.3	2.3	0.50	0.52	0.51	0.30	0.004		263	3.3	391	315	69	0.002
Median				1.9	9.8	0.09	0.20	7.57	7.92	0.013		284	3.0	308	310	13	0.002
Number of Samples (N)				5	6	7	8	6	8	5	1	5	4	6	8	7	5
Alberta SWQG		Short-Term (Acute)			5**		Narrative	6.5-9.0	6.5-9.0								
		Long-Term (Chronic)			6.5/8.3/9.5***												0.002
CCME		Guideline Value															

*units in mg/L unless otherwise stated; **Minimum value; *** Averaged over seven days; ****L refers to below the detection limit

Classification: Public

Table A1-4 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD045, AB07GD050, AB07GD060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10	190	210			6.0	13.2						1.2
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11	110	150			69.0	62.0	1.80		1600		23	4.1
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	330				3.0	11.0			290		5	10.2
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	240				14.0	18.0			73		6	11.2
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13					6.0	8.7			410		59	5.5
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13					3.3	5.7			520		6	2.2
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14					8.7	10.0			820		28	8.4
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	720		7.3	7.5	7.3				G2400		37	8.4
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15			21.0	22.0	7.1		13.90					8.5
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	910		7.0	6.8	5.5	4.8	7.69		260	2	6	2.7
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	320		14.0	13.0	L1	2.9	14.10		410	7	16	3.6
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	2-Sep-16	340	380	32.0	33.0	4.7	5.1	4.60		870	6	9	4.7
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	110	130	18.0	19.0	72.0	33.0	3.71		150	29	35	9.7
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	380	400	12.0	11.0	12.0	64.0	7.65		L2400	L400	440	2.9
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	170		21.0	21.0	7.9	7.8	13.40		650	55	55	9.1
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	380		19.0	18.0	7.5	14.0	8.10		520		1	5.0
Average				350	254	16.8	16.8	14.7	18.6	8.33		598	50	52	6.1
STD				241	128	7.8	8.3	22.0	20.3	7.69		447	76	113	3.2
Median				325	210	18.0	18.0	7.2	10.5	4.59		520	18	20	5.2
Number of Samples (N)				12	5	9	9	16	14	9		14	6	14	16
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94	277	341		23.4	9.0	8.6	10.57	1.05	180	15		10.6
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95	295	388		34.3	4.0	9.2	0.13	1.80	6	L4		
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95	127	188		18.0	54.0	52.5	4.60	1.81	100	80		3.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95	182	249		26.9	5.0	4.2	17.48	1.35	100	10		2.5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95	277	348		20.4	4.0	4.6	5.37	2.03	75	33		6.5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14			19.0	20.0	30.0	18.0	11.53			40	30	2.7
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14	730		13.0	12.0	550.0	5.7	22.20			40	20	5.5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14							11.20			40	30	7.6
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	280		25.0	28.0	1.3	4.3	-0.01			L10	L10	0.5
Average				310	303	19.0	22.9	82.2	13.4	9.23	1.61	92	29	21	4.9
STD				196	82	6.0	6.9	189.9	16.5	7.51	0.40	62	25	12	3.3
Median				277	341	19.0	21.9	7.0	7.2	10.57	1.80	100	33	25	4.3
Number of Samples (N)				7	5	3	8	8	8	9	5	5	9	4	8
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94	721	821		30.5	21.0	13.5	11.42	2.11	200	110		5.2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95	270	364		39.4	11.0	8.5	0.33	1.94	310	12		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95	114	172		16.5	36.0	27.0	3.43	1.59	50	12		4.0
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	138	213		30.4	7.0	8.9	15.95	1.51	2900	2100		3.2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95	215	270		26.1	14.0	17.2	6.34	1.34	9	8		19.2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10	138	150			8.0	12.7						0.8
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11	110	140			24.0	19.0	1.20		1000		4	4.2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11					5.0	8.9			350		3	21.8
Average				244	304		28.6	15.8	14.5	6.45	1.70	688	448	4	8.3
STD				218	241		8.3	10.6	6.4	6.15	0.32	1029	924	1	8.5
Median				138	213		30.4	12.5	13.1	4.89	1.59	310	12	4	4.2
Number of Samples (N)				7	7		5	8	8	6	5	7	5	2	7
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													
CCME		Guideline Value													

*units in mg/L unless otherwise stated

Classification: Public

Table A1-5 General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alk. Phenolphthalein CaCO3	Alk Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94		178	213	3.7		52	0.003	0.14	161	0.01	0.79	0.001		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95		268	327	5.7		70	0.004	0.13	233	0.18	2.09	0.359		0.007	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95		89	109	4.8		81	0.005	0.07	98	0.43	2.08	0.864		0.047	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95		168	185	2.5		64	0.002	0.15	150	0.02	1.21	0.006		0.003	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95		288	351	4.5		24	0.002	0.16	244	0.01	0.64	0.003		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04	7	168	189	2.7				0.17	139	0.02	1.14	0.007		0.001	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04	L1	172	210	2.8				0.14	142	0.02	0.89	L0.005		L0.001	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04	L1	148	181	1.9				0.08	136	0.03	1.29	0.054		0.003	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05	L1	135	165	17.2				0.07	118	0.13	1.81	0.463		0.009	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	L1	87	106	8.2				0.07	84	0.20	2.11	0.121		0.007	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	L1	133	162	26.0				0.10	130	0.22	2.63	0.461		0.013	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06	L1	140	171	9.5				0.06	132	0.10	2.37	0.140		0.006	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06	L1	103	126	12.9				0.06	103	0.11	2.15	0.314		0.013	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	L1	141	172	7.0				0.07	131	0.07	1.93	0.078		0.004	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	L1	140	170	3.7				0.08	129	0.03	1.52	0.052		0.003	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06	3.4	179	210	5.7				0.11	159	0.02	1.16	L0.005		0.001	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	4.4	182	212	4.0				0.11	157	0.02	1.11	L0.005		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	4.7	210	245	3.5				0.16	169	0.01	0.88	L0.005		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	42.7	269	224	85.6				0.14	287	4.04	9.50	0.146		0.066	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06	19.4	153	139	83.2				0.14	191	0.04	5.54	L0.005		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06	15.2	204	211	20.7				0.15	200	0.02	1.19	L0.005		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06	9.9	196	215	11.8				0.14	186	0.03	1.13	L0.005		0.002	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06	5.4	250	292	9.6				0.17	190	0.05	1.06	0.012		0.003	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	L1	315	384	9.6				0.26	221	0.02	0.75	L0.005		L0.001	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	L1	359	437	L0.3				0.25	262	0.01	0.78	0.009		L0.001	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	L1	120	146	32.8				0.12	137	0.30	2.00	2.090		0.028	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07	L1	67	81	5.0				0.10	88	0.24	2.74	1.090		0.021	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07	L1	67	82	3.2				0.10	89	0.18	2.65	0.931		0.019	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07	L1	78	96	2.9				0.08	88	0.12	1.59	0.126		0.009	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07	L1	88	108	3.2				0.07	101	0.19	1.44	0.050		0.009	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07	L1	84	103	2.3				0.07	101	0.10	1.50	0.021		0.005	
Average				4.6	167	194	12.8		58	0.003	0.12	153	0.22	1.92	0.239		0.009	
STD				9.2	75	88	20.5		22	0.001	0.05	54	0.72	1.69	0.452		0.014	
Median				L1	153	181	5.0		64	0.003	0.11	139	0.05	1.50	0.050		0.003	
Number of Samples (N)				26	31	31	31		5	5	31	31	31	31	31		31	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95		273	333	5.6		68	0.004	0.14	229	0.17	2.00	0.339		0.006	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95		91	111	4.7		82	0.005	0.08	95	0.42	2.28	0.836		0.044	
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95		183	220	2.8		59	0.002	0.14	156	0.02	1.17	0.002		0.001	
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95		241	279	3.5		24	0.002	0.17	173	0.01	0.64	0.003		0.001	
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10	L0.5	150	180	6.4					140	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11		83	100	8.0					74	0.40		0.270	0.270	0.006	
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	L0.5	110	140	3.9	84		L0.002	0.09	110	L0.05	1.20	0.019	0.014	0.005	
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	2.8	220	260	9.9	44		L0.002	0.15	210		1.20	L0.003	L0.003	L0.003	
AB07GD0080	Beaverlodge River	BLR at the Mouth	29-Jul-14															
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	0.91	270	330	15.0	21		L0.001	0.19	200	L0.05	0.54	L0.003	L0.003	L0.003	
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	L0.5	190	230	17.0	97		L0.002	0.10	180	0.18	1.40	0.410	0.410	L0.003	1.80
Average				0.9	181	218	7.7	62	58	0.002	0.13	157	0.14	1.30	0.188	0.116	0.007	1.80
STD				1.1	71	85	4.9	35	25	0.002	0.04	51	0.17	0.60	0.279	0.179	0.013	#DIV/0!
Median				L0.5	187	225	6.0	64	64	0.002	0.14	165	0.03	1.20	0.011	0.008	0.002	1.80
Number of Samples (N)				5	10	10	10	4	4	8	8	10	9	8	10	6	10	1
Alberta SWQG	Short-Term (Acute)						640			0.022			*Equation			124	Varies	
	Long-Term (Chronic)				20 **		120		↑ 20%	0.005						3		
CCME	Guideline Value																	

*units in mg/L unless otherwise stated; **Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-5 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP mg/L	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94	1.7	11.4	0.01	0.02	8.45	8.35	0.006		312	1.1	410	421	33	L0.001
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95	0.9	12.0	0.06	0.09	7.44	7.79	0.016		408	5.8	532	550	18	0.003
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95	4.4	11.5	0.14	0.31	7.62	7.66	0.020		320	6.1	244	244	20	0.006
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95	1.7	9.6	0.02	0.05	8.74	8.69	0.010		268	0.3	341	337	19	L0.001
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95	1.2	12.5	0.01	0.01	8.21	8.25	0.004		450	3.9	655	649	70	L0.001
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04		9.8	0.02	0.05	7.80	8.59				1.1	354	351	19	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04		10.9	0.02	0.05	8.14	8.25				1.2	388	380	33	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04		13.8	0.03	0.07	8.01	8.22				4.4	289	286	15	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05	6.2	7.6	0.14	0.21	7.10	7.79				5.6	329	333	24	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05		12.9	0.18	0.44	7.25	7.72				5.8	200	217	14	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06		12.0	0.19	0.43	7.89	7.71				4.6	363	384	23	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06		12.6	0.11	0.28	7.98	8.04				4.4	321	331	21	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06		12.9	0.23	0.40	7.76	7.56				4.4	272	286	22	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06		12.2	0.08	0.24	8.01	7.94				4.1	310	320	21	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06		12.0	0.05	0.18	8.10	8.20				3.8	327	339	31	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06		10.9	0.03	0.11	8.37	8.38				3.6	432	441	43	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06		10.5	0.03	0.10	8.42	8.43				2.5	425	436	41	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06		10.1	0.02	0.07	8.37	8.42				1.3	519	519	65	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06		13.2	0.47	1.15	9.44	9.22				6.1	971	907	137	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06		12.6	0.09	0.66	9.86	9.18				6.3	834	759	139	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06		10.2	0.06	0.12	8.81	8.83				0.2	547	548	64	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06		10.1	0.06	0.09	8.77	8.70				0.7	468	435	37	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06		11.6	0.02	0.07	8.31	8.40				3.7	624	590	55	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06		11.6	0.01	0.03	7.90	8.08				6.4	799	796	104	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06		12.8	0.01	0.07	7.69	8.16				6.5	915	901	142	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07		12.5	0.09	0.35	7.83	7.82				5.7	492	521	77	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07		11.3	0.09	0.80	7.60	7.77				6.1	183	197	20	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07		10.7	0.11	0.83	7.73	7.74				5.8	170	190	18	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07		10.8	0.09	0.36	7.80	7.87				5.9	194	192	18	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07		10.2	0.08	0.37	7.87	7.80				5.8	208	222	19	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07		9.8	0.06	0.39	7.75	7.83				5.7	186	172	13	
Average				2.7	11.4	0.08	0.27	8.10	8.17	0.011		352	4.2	429	428	44	0.002
STD				2.1	1.3	0.09	0.28	0.59	0.44	0.007		75	2.1	219	206	38	0.002
Median				1.7	11.5	0.06	0.18	7.98	8.16	0.010		320	4.4	363	380	24	0.001
Number of Samples (N)				6	31	31	31	31	31	5		5	31	31	31	31	5
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95	1.4	12.6	0.04	0.07	7.59	7.87	0.016		394	5.7	540	564	23	0.003
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	4.2	11.9	0.12	0.31	7.76	7.83	0.021		378	5.9	244	249	21	0.007
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	1.5	10.0	0.02	0.04	8.37	8.30	0.009		292	0.3	376	381	18	0.002
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95	1.0	11.3	0.01	0.01	8.33	8.46	0.004		374	1.9	543	545	55	0.001
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10			0.02	0.06		8.16		230				380	39	
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11				0.28	6.60	7.97					150	220		
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14		9.6	0.04	0.10	6.90	8.23	0.005	190		2.8	204	260	17	0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14		10.1	0.01	0.07	8.36	8.39	0.005	360		1.5	520	540	58	0.004
AB07GD0080	Beaverlodge River	BLR at the Mouth	29-Jul-14														
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14		12.0	0.01	0.01	7.59	8.32	0.007	490		1.5	782	760	130	0.007
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15		8.3	0.09	0.11	7.53	7.79	0.004	330		6.0	448	470	38	0.009
Average				2.0	10.7	0.04	0.11	7.67	8.13	0.009	320	360	3.2	423	437	44	0.005
STD				1.5	1.5	0.04	0.11	0.63	0.25	0.006	118	46	2.3	201	171	36	0.003
Median				1.5	10.7	0.02	0.07	7.59	8.20	0.006	330	376	2.4	448	426	38	0.005
Number of Samples (N)				4	8	9	10	9	10	8	5	4	8	9	10	9	8
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												0.002
CCME	Guideline Value																

*units in mg/L unless otherwise stated; **Minimum value; *** Averaged values; ****L refers to below the detection limit

Classification: Public

Table A1-5 continued General Chemistry Water Quality at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94	233	310		14.4	2.0	6.5	13.43	1.12	120	12		2.1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95	305	399		35.3	10.0	11.1	0.16	1.86	6	6		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95	133	196		17.3	124.0	90.0	4.71	1.69	84	84		3.6
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95	198	265		26.9	3.0	4.2	19.04	1.46	140	140		4.0
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95	395	449		13.6	1.0	3.1	6.29	2.51	24	15		2.3
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04	199				6.0		20.03			170	170	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04	222				13.0		12.26					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04	168				8.0		0.01			10	L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05	197				5.0		0.01					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	122				195.0		0.48			20	10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	212				96.0		-0.16			130	130	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06	188				74.0	44.0	-0.20			10	L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06	160				52.0		-0.12			54	54	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	184				60.0	48.0	0.31			L10	L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	193				44.0	42.0	3.12			L10	L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06	252				11.0	13.3	11.31			50	50	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	249				12.0	14.0	11.21			10	10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	306				8.0	10.1	13.05			30	30	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	600				46.0	21.0	21.07			10	10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06	475				44.0	27.0	16.80			100	100	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06	325				3.0	4.2	19.97			20	10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06	269				4.0	4.2	21.72			70	50	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06	344				5.0	5.2	18.85			270	270	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	484				3.0	6.7	25.83			130	90	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	568				13.0	8.5	14.42		L10		L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	303			10.4	126.0	112.0	0.27			50	L10	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07	119			13.8	416.0	385.0	3.94			350	350	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07	112			13.4	544.0	430.0	4.76			150	70	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07	114			16.9	209.0	145.0	6.69			80	50	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07	126			16.8	217.0	152.0	7.72			230	190	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07	114			18.2	316.0	230.0	9.09			90	90	
Average				254	324		17.9	86.1	75.7	9.23	1.73	63	82	74	3.0
STD				133	102		7.1	132.5	118.2	8.17	0.52	60	88	91	0.9
Median				212	310		16.8	13.0	17.5	7.72	1.69	54	52	50	3.0
Number of Samples (N)				31	5		11	31	24	31	5	6	28	24	4
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95	315	387		32.2	7.0	9.2	0.16	0.39	21	4		
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	135	196		16.8	182.0	115.0	4.53	1.61	400	84		3.8
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	212	282		25.2	10.0	14.1	11.89	1.39	120	96		3.9
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95	329	374		13.9	L1	2.1	0.88	1.06				3.5
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10	220	230			5.0							1.1
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11	120	160			59.0	56.0	5.60		730		35	2.7
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	150		19.0	20.0	44.0	28.0	15.29			10	L10	4.8
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	320		19.0	16.0	61.0	5.9	21.00					7.1
AB07GD0080	Beaverlodge River	BLR at the Mouth	29-Jul-14										64	50	
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	480		12.0	9.5	200.0	5.5	9.32			10	L10	21.0
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	280		20.0	21.0	L1	5.0	-0.07			L10	L10	0.3
Average				256	272	17.5	19.3	56.9	26.8	7.62	1.11	318	39	20	5.4
STD				111	94	3.7	7.0	74.6	37.2	7.36	0.53	318	41	21	6.2
Median				250	256	19.0	18.4	27.0	9.2	5.60	1.23	260	10	5	3.8
Number of Samples (N)				10	6	4	8	10	9	9	4	4	7	5	9
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													
CCME		Guideline Value													

*units in mg/L unless otherwise stated

Classification: Public

Table A1-6 General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alk. Phenolphthalein CaCO3	Alk. Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-10	L0.5	140	180	1.3					140	*0.06*		L0.003	L0.003	L0.003	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	20-Apr-11	L0.5	170	200	3.0					150	0.29		0.007	0.007	L0.003	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-12	L0.5	150	180	4.0					150	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-May-13	L0.5	130	160	3.1					150	*0.09*		0.028	0.022	0.005	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-13	L0.5	220	260	12.0					250	*0.07*	0.73	0.069	0.063	0.006	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	28-May-14	L0.5	120	150	1.8					130	*0.16*		0.097	0.082	0.015	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	19-May-15	L0.5	120	150	1.4					140	L0.05		0.010	0.010	L0.003	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-15	L0.5	210	250	39.0				0.09	270	0.08	1.10	0.006	0.006	L0.003	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	3-May-16	L0.5	250	300	24.0					260	L0.05	0.91	0.007	0.007	L0.003	0.92
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-16	L0.5	150	190	1.2					150	L0.05	1.20	L0.005	L0.003	L0.003	1.20
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-17	L0.5	73	89	1.2					73	L0.05	0.56	0.013	0.007	0.005	0.57
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-17	L0.5	160	200	1.4					170	0.03	1.20	L0.014		L0.010	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	1-Jun-18	L1	130	160	4.4					170	0.05	1.40	0.042	0.029	0.013	1.40
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	27-Sep-18	L1	150	180	2.8					160	0.05	1.20	L0.0042	L0.003	L0.003	1.20
Average					155	189	7.6					169	0.07	1.04	0.021	0.018	0.004	1.06
STD					46	53	11.4					55	0.07	0.28	0.029	0.026	0.004	0.32
Median				L0.5	150	180	3.0					150	0.05	1.15	0.007	0.007	0.002	1.20
Number of Samples (N)				14	14	14	13				1	14	14	8	14	13	14	5
Alberta SWQG	Short-Term (Acute)						640			0.022			Equation			124	Equation	
	Long-Term (Chronic)				20 **		120		↑ 20%	0.005						3		
CCME	Guideline Value																	

*units in mg/L unless otherwise stated; **Minimum value; ***L refers to below the detection limit

Table A1-6 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-10			0.06	0.13		7.97		200				300	10	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	20-Apr-11		10.3		0.28	7.20	7.80		230			200	340	11	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-12			0.12	0.13		8.04						320	5	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-May-13			0.12			8.04		230				320	32	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-13			L0.1	0.05		7.87						520	38	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	28-May-14			L0.1	0.10		8.26						270	11	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	19-May-15		7.6	L0.1	0.06	7.80	8.09		180			243	280	14	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-15		6.5	L0.1	0.06	6.26	8.02		320			360	570	31	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	3-May-16		6.3	L0.1	0.04		8.01		340				580	36	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-16			L0.1	0.05		8.14						300	2	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-17		11.3	0.13	0.03	6.53	7.84					470	160	L1	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-17		8.4	L0.1	0.05	6.38	7.97					1049	300	L1	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	1-Jun-18		9.4	L0.1	0.08		8.20		240				280	L1	
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	27-Sep-18		14.8	L0.1	0.04	8.67	8.09		200			192	300	L1	
Average					9.3	0.07	0.08	7.14	8.02		243			419	346	14	
STD					2.8	0.03	0.07	0.95	0.13		58			327	122	14	
Median					8.9	0.05	0.06	6.87	8.03		230			302	300	10	
Number of Samples (N)					8	13	13	6	14		8	0		6	14	14	
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												0.002
CCME	Guideline Value																

*units in mg/L unless otherwise stated; **Minimum value; ***Averaged values only; ***L refers to below the detection limit

Classification: Public

Table A1-6 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-10	160	200			9.0	5.7						1.5
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	20-Apr-11	180	230			9.0	5.2	0.10		1400		2	7.4
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-12	170				7.0	4.7			210		L1	37.0
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-May-13					8.7	3.0			G2400		5	8.2
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-13					4.7	8.2			280		L1	7.8
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	28-May-14					4.0	4.1			490		1	10.2
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	19-May-15	150		23.0	22.0	4.9		16.80					12.7
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	23-Sep-15	310		15.0	15.0	2.2	3.5	5.40		180	2	1	13.2
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	3-May-16	320		15.0	16.0	4.3	2.8	9.30		240	1	2	7.2
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-16	160	170	28.0	26.0	1.3	1.3	8.80		980	16	8	8.8
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	25-Apr-17	77	110	17.0	16.0	7.4	3.4	2.21		42	2	4	3.5
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	21-Sep-17	170	200	28.0	28.0	4.0	2.5	7.36		G2400	160	240	10.2
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	1-Jun-18	160		21.0	21.0	1.7	2.4	10.10		1300	15	9	13.7
AB07GD0022	Beavertail Creek	BTC d/s of TWP Rd 720 Bridge	27-Sep-18	160		23.0	24.0	L1	1.2	6.90		330		3	7.5
Average				183	182	21.3	21.0	4.9	3.7	7.44		>545	33	23	10.6
STD				70	45	5.3	4.9	2.9	1.9	4.82		>495	63	68	8.3
Median				160	200	22.0	21.5	4.5	3.4	7.36		>305	9	3	8.5
Number of Samples (N)				11	5	8	8	14	13	9		12	6	12	14
Alberta SWQG	Short-Term (Acute)							Narrative	Narrative	Narrative					
	Long-Term (Chronic)														
CCME	Guideline Value														

*units in mg/L unless otherwise stated

Classification: Public

Table A1-7 General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95		253	309	1.4		57	0.002	0.12	240	0.09	1.18	0.109		0.006	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95		113	138	1.5		66	0.004	0.06	113	0.17	1.26	0.203		0.010	
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95		202	246	1.2		47	0.002	0.12	194	0.01	1.04	0.001		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95		251	306	2.2		39	0.002	0.14	254	0.02	1.00	0.002		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04	6	167	189	2.0				0.16	153	0.02	0.98	0.005		0.004	
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04	L1	159	193	0.7				0.12	145	0.02	0.89	L0.005		L0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04	L1	147	179	1.2				0.07	138	0.02	0.99	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05	L1	253	308	3.6				0.10	218	0.49	2.69	0.067		0.004	
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05	L1	115	140	2.9				0.06	100	0.10	1.63	0.055		0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05															
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	L1	125	152	9.9				0.07	111	0.26	2.20	0.312		0.018	
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06	L1	106	129	4.7				0.04	101	0.22	2.06	0.302		0.014	
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06	L1	112	137	2.6				0.05	103	0.11	1.42	0.134		0.006	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	L1	107	130	2.2				0.05	98	0.16	1.36	0.075		0.005	
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	L1	124	151	1.2				0.06	117	0.04	0.89	0.023		0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06	L1	120	146	1.4				0.07	112	0.02	0.76	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	L1	129	158	1.6				0.09	123	0.02	0.89	L0.005		0.002	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	L1	145	177	1.5				0.09	133	0.01	0.84	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	L1	178	216	1.4				0.09	150	0.02	0.87	0.007		0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06	L1	159	194	1.1				0.10	149	0.01	0.77	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06	L1	172	210	1.8				0.11	159	0.00	0.86	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06	L1	180	219	1.5				0.10	171	0.02	0.97	L0.005		0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06	L1	216	263	1.8				0.13	193	0.02	1.18	L0.005		0.002	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	L1	229	279	2.6				0.14	197	0.03	1.42	L0.005		L0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	L1	227	277	3.4				0.16	183	0.02	1.41	L0.005		L0.001	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07	L1	188	229	7.6				0.09	196	0.10	0.89	0.139		0.005	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07	L1	45	55	1.5				0.08	35	0.12	1.35	0.335		0.013	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07	L1	97	118	3.2				0.07	99	0.23	1.70	0.424		0.011	
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07	L1	82	100	1.4				0.06	78	0.02	1.07	0.068		0.005	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07	L1	82	100	1.6				0.06	81	0.02	0.86	0.025		0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07	L1	81	99	1.3				0.06	78	0.01	0.91	L0.005		0.002	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10	L0.5	110	140	2.6					110	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11	L0.5	96	120	8.0					81	0.45		0.150	0.150	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	L0.5	180	220	10.0					180	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	L0.5	120	150	39.0					140	*L0.05*		0.041	0.041	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	L0.5	150	180	3.7					150	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	L0.5	210	260	9.2					210	*L0.05*	0.92	0.003	L0.003	0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	L0.5	150	180	2.9					160	*L0.05*		L0.01	L0.01	L0.01	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	L0.5	240	290	11.0					250	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	L0.5	130	160	2.8					140	L0.05		0.007	0.007	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	L0.5	200	250	6.8				0.14	220	0.79	0.89	L0.005	L0.003	L0.003	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	L0.5	140	170	3.3					150	L0.05	0.83	L0.005	L0.003	L0.003	0.83
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	L0.5	200	240	5.7					200	L0.05	1.10	L0.005	L0.003	L0.003	1.10
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	L0.5	81	99	2.4					84	L0.05	0.75	0.028	0.022	0.006	0.78
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	L0.5	190	230	5.3					190	0.03	1.50	L0.014		L0.033	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	L1	160	190	4.4					180	0.03	0.95	0.010	0.003	0.007	0.96
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	L1	130	160	4.5					140	0.07	1.70	L0.0042	0.004	L0.003	1.70
Average				0.55	153	187	4.2		52	0.003	0.09	148	0.09	1.18	0.056	0.016	0.004	1.07
STD				0.5	149	180	2.6		52	0.002	0.09	147	0.03	1.00	0.004	0.002	0.002	0.96
Median				0.87	52	63	5.9		12	0.001	0.03	51	0.15	0.44	0.102	0.039	0.004	0.37
Number of Samples (N)				42	46	46	46		4	4	31	46	46	38	46	15	46	5
Alberta SWQG	Short-Term (Acute)						640			0.022			Equation			124	Varies	
	Long-Term (Chronic)				20 **		120		↑ 20%	0.005						3		
CCME	Guideline Value																	

Classification: Public

*units in mg/L unless otherwise stated; **Minimum value; ***L refers to below the detection limit

Table A1-7 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95	0.6	11.2	0.03	0.08	7.43	7.80	0.013		342	11.2	460	484	7	0.002
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95	1.2	10.9	0.08	0.14	7.53	7.51	0.012		216	6.3	240	248	10	0.004
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95	1.9	8.4	0.02	0.05	7.81	8.03	0.009		278	1.2	392	389	11	L0.001
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95	1.4	8.6	0.02	0.03	7.83	7.94	0.007		342	0.6	499	493	21	L0.001
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04		11.5	0.03	0.05	7.70	8.52				0.8	314	311	L3	
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04		2.4	0.03	0.05	7.79	8.19				2.2	562	291	5	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04		13.2	0.04	0.05	7.80	7.97				3.8	271	271	8	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05	4.3	10.0	0.19	0.38	7.05	7.84				10.7		462	25	
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05		11.0	0.16	0.24	7.10	7.76				6.3	225	239	8	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05														
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06		11.5	0.27	0.41	7.80	7.39				5.0	283	309	17	
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06		12.2	0.18	0.31	7.73	7.52				4.9	235	248	15	
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06		12.3	0.09	0.18	7.81	7.73				4.7	237	244	14	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06		12.4	0.09	0.16	7.86	7.76				4.5	218	227	11	
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06		12.1	0.04	0.10	7.92	8.05				4.9	234	247	6	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06		11.7	0.03	0.08	7.96	8.12				3.4	230	240	L3	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06		10.6	0.03	0.09	8.09	8.17				2.7	255	266	6	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06		10.6	0.03	0.07	8.17	8.21				0.9	281	285	5	
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06		7.5	0.02	0.07	7.99	8.10				0.7	353	333	11	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06		9.8	0.03	0.05	8.18	8.23				2.1	311	285	8	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06		9.3	0.04	0.05	8.17	8.21				2.3	340	341	12	
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06		10.0	0.04	0.07	8.29	8.27				1.6	357	333	12	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06		5.8	0.03	0.07	7.82	8.18				0.9	431	422	13	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06		3.9	0.05	0.11	7.71	7.87				3.7	436	443	8	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06		1.7	0.05	0.13	7.39	7.91				0.9	413	428	L3	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07		12.3	0.03	0.07	7.81	8.23				9.0	397	422	18	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07		11.0	0.21	0.29	6.56	7.41				5.5	129	136	16	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07		11.1	0.06	0.34	7.43	7.78				6.3	215	226	11	
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07		9.7	0.06	0.16	7.47	7.93				5.9	178	181	9	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07		8.8	0.06	0.12	7.52	7.59				5.7	169	181	8	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07		8.9	0.05	0.09	7.47	7.60				5.7	162	151	4	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10			0.03	0.04		8.03		150				240	6	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11		13.1		0.25	6.70	7.94		160			150	230	6	
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11			L0.1	0.09		8.14						390	26	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12			L0.1	0.09	8.14	8.14						410	26	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13			L0.1			8.25		200				320	14	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13			L0.1	0.06		7.90						480	17	
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14			L0.1	0.06		8.03						320	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14			L0.1	0.06		8.19		280				500	16	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15		7.8	L0.1	0.08	7.70	8.17		190			242	280	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15		7.3	L0.1	0.04	6.24	8.16		250			307	420	9	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16		9.7	L0.1	0.04		8.20		190				320	20	
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16			L0.1	0.07		8.17						400	9	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17		11.8	0.16	0.09	7.04	8.04					560	180	L1	
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17		7.4	L0.1	0.10	6.46	8.08					1414	400	18	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18		9.5	L0.1	0.08		8.26		180				340	49	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18		13.9	L0.1	0.12	8.34	7.98		200			211	320	34	
Average				1.9	9.8	0.06	0.12	7.62	7.99	0.010	200	295	4.1	335	319	12	0.002
STD				1.4	10.3	0.05	0.08	7.79	8.04	0.011	190	310	4.2	281	316	11	0.001
Median				1.4	2.8	0.05	0.10	0.51	0.25	0.003	41	60.406953	2.9	219	97	9	0.002
Number of Samples (N)				5	38	45	45	37	46	4	9	4	30	35	46	46	4
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												0.002

Classification: Public

CCME	Guideline Value														

*units in mg/L unless otherwise stated; **Minimum value; ***Averaged over a 7 day period; ****L refers to below the detection limit

Table A1-7 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95	263	337		23.7	6.0	9.5	0.33	1.56	4	4		
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95	132	174		16.6	42.0	18.0	2.12	1.25	40	9		5.0
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95	216	276		21.2	2.0	4.4	15.72	1.35	90	50		4.8
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95	281	339		19.1	3.0	3.4	5.70	0.41	12	6		1.6
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04	171				2.0		19.23			60	40	
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04	163				2.0		11.73					
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04	155				5.0		-0.02			10	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05	285				29.0		0.05					
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05	129				21.0		0.15			20	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05												
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	168				20.0		-0.15			440	440	
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06	140				14.0		-0.03			60	60	
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06	137				12.0	12.6	-0.02			30	30	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	126				14.0	13.6	-0.19			20	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	134				12.0	14.1	0.42			L10	L10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06	124				11.0	12.0	6.15			10	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	140				12.0	11.5	8.31			20	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	153				5.0	9.9	8.96			L10	L10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	189				7.0	13.4	15.52			30	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06	169				2.0	3.8	14.15			40	30	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06	189				4.0	4.2	17.08			60	30	
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06	198				2.0	4.4	17.01			40	20	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06	233				10.0	9.1	17.01			20	20	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	240				8.0	10.2	21.49			10	L10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	231				7.0	7.1	10.90			L10	L10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07	228			12.5	5.0	6.6	-0.18			10	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07	75			13.6	12.0	28.0	3.09			30	30	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07	124			13.5	151.0	118.0	1.66			20	20	
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07	97			15.1	48.0	43.0	6.03			30	30	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07	98			15.4	38.0	29.0	7.72			50	50	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07	91			17.2	22.0	19.6	8.30			10	10	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10	130	150			3.0	12.2						0.8
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11	120	160			8.0	11.0	1.70		460		7	L0.5
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	230				1.0	6.3			180		1	6.7
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	220				8.0	12.0			350		8	11.0
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13					3.3	4.2			1600		42	13.6
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13					15.0	20.0			G2400		15	7.7
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14					4.0	7.2			440		45	5.0
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	280		19.0	18.0	4.0				550		13	4.2
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15			20.0	20.0	6.9		15.70					4.4
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	230		19.0	19.0	3.3	5.8	9.02		51	1		5.2
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	180		15.0	15.0	L1	2.3	16.00		340	2	4	1.6
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	220	210	24.0	22.0	3.3	3.0	10.20		1600	1	6	2.4
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	90	120	17.0	17.0	17.0	10.0	2.88		49	5	2	2.8
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	230	260	28.0	27.0	12.0	11.0	7.54		G2400	250	280	12.4
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	230		20.0	20.0	9.9	12.0	14.40		550	6	22	7.3
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	190		23.0	23.0	9.3	5.7	8.00		G2400		4	24.4
Average				177	225	20.6	18.4	13.8	14.3	7.79	1.14	>421	40	36	6.4
STD				170	210	20.0	18.0	8.0	10.2	7.72	1.30	>340	20	10	5.0
Median				57	81	3.9	3.9	23.2	19.4	6.71	0.51	>497	83	82	5.8
Number of Samples (N)				42	9	9	19	46	37	39	4	18	34	37	19
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													

Classification: Public

CCME	Guideline Value													

* Units in mg/L unless otherwise stated; **L refers to below the detection limit

Table A1-8 General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04	L1	155	189	L0.3				0.16	141	0.02	0.91	0.009		0.002	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04	L1	140	170	0.9				0.11	129	0.03	0.95	0.022		0.002	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04	L1	128	156	1.1				0.08	118	0.01	0.90	0.007		0.002	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05	L1	166	202	1.7				0.10	148	0.12	1.27	0.192		0.004	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05	L1	126	154	2.9				0.05	109	0.20	1.84	0.061		0.005	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06	L1	251	306	1.5				0.12	232	0.06	1.06	0.008		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06	L1	114	139	6.1				0.06	101	0.57	3.26	0.245		0.015	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06	L1	118	144	4.3				0.07	108	0.14	1.84	0.260		0.009	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06	L1	99	120	2.1				0.04	89	0.05	1.08	0.074		0.004	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06	L1	94	114	1.6				0.05	83	0.04	0.91	0.052		0.003	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06	L1	116	142	0.9				0.06	107	0.05	0.69	0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06	L1	115	141	1.0				0.07	107	0.02	0.69	L0.005		0.003	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06	L1	123	150	0.9				0.08	115	0.02	0.73	L0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06	L1	141	172	1.1				0.09	130	0.01	0.83	L0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06	L1	161	196	1.0				0.09	144	0.01	0.97	L0.005		0.002	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06	L1	154	187	0.9				0.09	143	0.01	0.74	0.055		0.002	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06	L1	149	182	0.9				0.10	138	0.01	0.75	L0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06	L1	158	193	0.8				0.10	150	0.01	0.77	L0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06	L1	182	222	0.9				0.11	169	0.02	0.84	L0.005		0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06	L1	149	182	0.5				0.12	133	0.02	0.96	L0.005		L0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06	L1	108	132	1.2				0.13	97	0.05	1.40	L0.005		L0.001	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07	L1	194	236	18.9				0.09	193	0.28	0.97	0.186		0.006	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07	L1	107	131	10.2				0.07	109	0.36	1.94	0.993		0.010	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07	L1	79	96	4.3				0.06	86	0.16	1.65	0.275		0.008	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07	L1	87	106	1.3				0.06	85	0.04	1.25	0.073		0.003	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07	L1	87	106	1.6				0.07	84	0.03	1.02	0.032		0.003	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07	L1	89	109	1.3				0.07	81	0.02	0.91	0.007		0.002	
Average				L1	133	162	2.6				0.09	123	0.09	1.15	0.096		0.003	
STD					39	47	3.9				0.03	36	0.13	0.56	0.200		0.003	
Median				L1	126	154	1.2				0.08	115	0.03	0.96	0.009		0.002	
Number of Samples (N)				27	27	27	27				27	27	27	27	27		27	
Alberta SWQG		Short-Term (Acute)					640			0.022			Equation			124	Equation	
		Long-Term (Chronic)			20 **		120		↑ 20%	0.005						3		
CCME		Guideline Value																

* Units in mg/L unless otherwise stated; ** Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-8 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04		7.4	0.04	0.06	8.27	8.25				5.6	289	287	L3	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04		9.2	0.06	0.09	8.18	8.13				4.1	264	261	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04		13.6	0.02	0.04	7.86	8.00				3.9	235	234	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05	2.8	11.3	0.07	0.10	7.40	8.07				7.2	309	317	18	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05		8.6	0.14	0.22	7.31	7.95				7.6		259	11	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06		10.0	0.02	0.05	7.06	7.52				8.7	449	476	12	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06		11.9	0.30	0.45	7.64	7.21				4.9	248	262	10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06		12.7	0.16	0.26	7.56	7.57				5.5	247	259	11	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06		12.7	0.08	0.14	7.77	7.65				6.2	200	210	9	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06		13.0	0.06	0.12	7.76	7.79				4.3	183	193	8	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06		12.6	0.04	0.06	7.88	8.07				4.7	212	225	6	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06		11.8	0.02	0.06	7.89	8.15				3.3	214	227	L3	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06		10.5	0.03	0.06	7.88	8.14				2.8	229	241	L3	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06		9.7	0.02	0.06	7.98	8.13				0.8	264	270	L3	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06		8.4	0.02	0.05	7.87	8.06				1.3	310	300	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06		8.8	0.03	0.05	7.87	8.04				2.5	297	273	6	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06		8.2	0.03	0.05	7.93	7.85				2.2	282	285	5	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06		7.7	0.03	0.05	7.75	7.88				1.8	304	286	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06		6.1	0.02	0.05	7.46	7.89				1.7	382	346	4	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06		8.4	0.02	0.05	8.24	8.22				0.1	277	286	4	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06		10.0	0.03	0.12	8.72	8.33				0.2	224	240	14	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07		12.3	0.03	0.07	7.50	8.03				9.9	417	441	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07		12.6	0.06	0.29	7.55	7.88				5.5	253	267	11	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07		12.3	0.07	0.36	7.49	7.65				4.9	188	202	13	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07		10.6	0.04	0.26	7.39	7.94				5.4	172	193	5	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07		10.1	0.04	0.17	7.57	7.65				5.4	171	181	7	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07		10.0	0.03	0.12	7.23	7.68				5.2	169	160	5	
Average					10.4	0.06	0.13	7.74	7.92				4.3	261	266	7	
STD					2.0	0.06	0.11	0.36	0.26				2.5	73	70	4	
Median					10.1	0.03	0.07	7.76	7.95				4.7	250	261	7	
Number of Samples (N)				1	27	27	27	27	27				27	26	27	27	
Alberta SWQG		Short-Term (Acute)			5 **		Narrative	6.5-9.0	6.5-9.0								
		Long-Term (Chronic)			6.5/8.3/9.5***												0.002
CCME		Guideline Value															

* Units in mg/L unless otherwise stated; ** Minimum value; *** Averaged over a seven day period

Classification: Public

Table A1-8 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04	155				5.0		18.56			130	40	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04	147				7.0		12.34					
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04	135				5.0		0.11			10	10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05	189				5.0		0.07					
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05	143				13.0		5.02			20	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06	265				4.0		-0.11					
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06	147				13.0		-0.15			150	150	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06	148				8.0		-0.13			50	45	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06	115				7.0	7.7	-0.16			20	20	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06	106				8.0	10.8	-0.13			10	10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06	123				6.0	10.4	-0.10			10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06	118				9.0	11.1	3.06			L10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06	126				8.0	9.3	5.96			L10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06	144				7.0	10.6	8.39			L10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06	167				5.0	7.2	13.71			30	30	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06	163				5.0	8.8	13.72			20	10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06	155				3.0	5.1	15.22			60	60	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06	168				1.0	6.0	15.10			80	40	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06	187				5.0	6.3	16.07			L10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06	152				4.0	4.6	19.55			10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06	129				25.0	32.0	9.07			10	10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07	235			11.2	4.0	6.2	-0.14			L10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07	146			11.9	122.0	76.0	-0.01			70	60	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07	109			13.0	184.0	120.0	0.41			80	80	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07	98			14.0	161.0	94.0	4.83			10	L10	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07	101			15.5	99.0	54.0	6.51			170	170	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07	98			15.2	66.0	38.0	6.68			50	20	
Average				147			13.5	29.2	27.3	6.42			42	33	
STD				39			1.7	50.9	34.3	6.77			49	45	
Median				146			13.5	7.0	10.4	5.02			20	10	
Number of Samples (N)				27			6	27	19	27			24	24	
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													
CCME		Guideline Value													

* Units in mg/L unless otherwise stated

Classification: Public

Table A1-9 General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0027, WD-01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10	L0.5	110	130	L1					98	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11	L0.5	230	280	1.6					180	*0.83*		L0.003	L0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	1.9	230	270	1.6					200	*L0.05*		0.100	0.100	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	L0.5	190	230	2.0					180	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	L0.5	98	120	L1					94	*L0.05*		0.018	0.018	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	L0.5	120	150	1.7					110	*L0.05*		0.006	0.006	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	L0.5	160	200	1.4					160	*L0.05*	0.96	L0.003	L0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	L0.5	120	150	L1					120	*L0.05*		L0.01	L0.01	L0.01	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	L0.5	160	200	1.2					170	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	L0.5	100	120	L1					110	L0.05		0.004	0.004	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	L0.5	170	210	L1				0.11	170	0.08	0.95	L0.005	0.003	L0.003	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	L0.5	130	160	L1					130	L0.05	0.71	L0.005	L0.003	L0.003	0.71
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	L0.5	150	180	L1					150	L0.05	0.82	L0.005	0.004	L0.003	0.82
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	L0.5	85	100	1.2					87	L0.05	0.80	0.001	0.008	0.005	0.81
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	L0.5	150	190	L1					160	0.02	0.76	L0.014		L0.033	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	L1	130	150	1.9					150	0.10	1.00	0.011	0.005	0.006	1.00
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	L1	140	170	L1					130	0.07	0.81	0.004	0.004	L0.003	0.81
Average				0.4	145	177	1.0					141	0.08	0.85	0.010	0.010	0.003	0.83
STD				0.4	42	51	0.6					34	0.19	0.11	0.024	0.024	0.004	0.11
Median				L0.5	140	170	0.9					150	0.03	0.82	0.003	0.004	0.002	0.81
Number of Samples (N)				17	17	17	16				1	17	17	8	17	16	17	5
AB07GD-WD01	Windsor Creek	WC	25-Apr-10		130	160	L1					120	*L0.05*		L0.003	L0.003	L0.003	
AB07GD-WD01	Windsor Creek	WC	21-Apr-11		230	280	3.0					180	0.92		L0.003	L0.003	L0.003	
Average					180	220	1.8					150	0.47		0.002	0.002	0.002	
STD					71	85	1.8					42	0.63		0.000	0.000	0.000	
Median					180	220	1.8					150	0.47		0.002	0.002	0.002	
Number of Samples (N)					2	2	2					2	2		2	2	2	
Alberta SWQG	Short-Term (Acute)						640			0.022			Equation			124	Equation	
	Long-Term (Chronic)				20 **		120		↑20%	0.005						3		
CCME	Guideline Value																	

* Units in mg/L unless otherwise stated; ** Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-9 contiued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0027, WD-01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10			0.01	0.02		7.94		130				210	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11				0.06		7.66		250			240	420	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11			0.14	0.01		8.33		240				420	10	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11			L0.1	1.20		8.16						340	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12			L0.1	0.03		7.96						190	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13			L0.1			8.05		140				230	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13			L0.1	0.05		7.67						330	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14			L0.1	0.02		8.24						240	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14			L0.1	0.04		8.06		240				320	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15		6.7	L0.1	0.02	7.70	8.05		140			180	210	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15		3.4	L0.1	0.03	6.25	7.98		210			224	330	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16		6.4	L0.1	0.03		7.89		160				260	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16			L0.1	0.02		7.96						280	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17		10.8	0.12	0.01	6.64	7.98					504	180	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17		5.9	L0.1	0.05	6.41	7.82					982	280	L1	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18		7.8	L0.1	0.03		8.20		150				250	56	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18		15.3	L0.1	0.03	8.61	7.98		140			171	260	L1	
Average					8.0	0.06	0.10	7.12	8.00		180			384	279	4	
STD					3.9	0.03	0.29	1.01	0.18		49			318	72	14	
Median					6.7	0.05	0.03	6.64	7.98		155			232	260	1	
Number of Samples (N)					7	16	16	5	17		10			6	17	17	
AB07GD-WD01	Windsor Creek	WC	25-Apr-10			0.02	0.03		8.01					260			
AB07GD-WD01	Windsor Creek	WC	21-Apr-11				0.05	6.40	7.76					310	430		
Average							0.04		7.89					285			
STD							0.02		0.18					35			
Median							0.04		7.89					285			
Number of Samples (N)						1	2	1	2					2	1		
Alberta SWQG	Short-Term (Acute)				5**		Narrative	6.5-9.0	6.5-9.0								
	Long-Term (Chronic)				6.5/8.3/9.5***												
CCME	Guideline Value																0.002

* Units in mg/L unless otherwise stated; ** Minimum value; *** Averaged over a seven day period; ****L refers to below the detection limit

Classification: Public

Table A1-9 continued General Chemistry Water Quality at Beaverlodge Tributary Sites (AB07GD0027, WD-01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10	107	130			6.0	1.0						1.0
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11	220	250			10.0	11.0			770		770	2.0
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	230				8.0	8.3			57		L1	1.1
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	190				2000.0	520.0			200		140	121.0
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	100				1.0	3.0			120		4	2.3
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13					1.3	1.2			820		14	5.2
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13					2.3	3.0			290		3	4.7
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14					1.3	0.8			290		4	5.1
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	170		16.0	15.0	3.3				440		15	14.1
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15			17.0	16.0			15.62					7.2
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15			17.0	17.0	2.1	3.4	6.69		55	L1	2	4.8
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	130		11.0	11.0	1.3	2.8	11.50		280	1	2	8.0
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	150	140	22.0	18.0	2.0	1.3	9.00		870	L1	20	5.2
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	89	110	15.0	14.0	L1	1.5	0.80		29	L1	2	1.0
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	160	190	23.0	18.0	4.7	3.7	7.16		G2400	6	22	7.2
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	190		23.0	22.0	L1	1.2	12.60		610	4	9	5.6
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	140		19.0	19.0	2.3	1.4	7.30		390		6	3.7
Average				156	164	18.1	16.7	127.9	37.6	8.83		>373	2	68	11.7
STD				46	56	4.0	3.2	499.2	133.5	4.50		>297	2	197	28.3
Median				155	140	17.0	17.0	2.2	2.8	8.15		>290	1	6	5.1
Number of Samples (N)				12	5	9	9	16	15	8		15	6	15	17
AB07GD-WD01	Windsor Creek	WC	25-Apr-10	134	150			2.0							1.4
AB07GD-WD01	Windsor Creek	WC	21-Apr-11	230	280			7.0	6.0	2.40		870		200	2.6
Average				182	215			4.5							2.0
STD				68	92			3.5							0.8
Median				182	215			4.5							2.0
Number of Samples (N)				2	2			2	1	1		1		1	2
Alberta SWQG	Short-Term (Acute)							Narrative	Narrative	Narrative					
	Long-Term (Chronic)														
CCME	Guideline Value														

* Units in mg/L unless otherwise stated

Classification: Public

Table A1-10 General Chemistry Water Quality at Redwillow Sites (AB07GD0090 & AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94		196	232	L0.5		87	0.002	0.09	181	0.01	0.49	0.005		0.001	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95		246	300	0.6		13	0.001	0.08	219	0.02	0.30	0.083		0.002	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95		133	163	1.4		63	0.003	0.07	132	0.04	1.04	0.534		0.008	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95		174	200	L0.5		35	L0.000	0.09	159	0.01	0.43	0.003		L0.001	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95		220	257	0.6		10	0.001	0.11	192	L0.001	0.27	0.002		L0.001	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10	L0.5	110	140	L1					120	*L0.05*		0.034	0.034	L0.003	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	L0.5	90	110	4.6					86	*L0.05*		0.700	0.700	L0.003	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	L0.5	130	160	L1	42		L0.002	0.07	130	L0.05	0.49	L0.003	L0.003	L0.003	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14	3	190	220	1.5	16		L0.002	0.11	160	L0.05	0.40	L0.003	L0.003	L0.003	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	29-Jul-14															
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	2.5	210	250	4.3	12		L0.002	0.14	140	L0.05	0.26	L0.003	L0.003	L0.003	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	L0.5	240	300	2.5	34		L0.002	0.09	220	0.05	0.43	0.140	0.140	L0.003	0.56
Average				1	176	212	1.5	26	42	0.001	0.09	158	0.02	0.46	0.137	0.146	0.002	
STD				1.3	53	63	1.6	14	33	0.001	0.02	42	0.01	0.24	0.244	0.276	0.002	
Median				L0.5	190	220	0.6	25	35	0.001	0.09	159	0.03	0.43	0.005	0.018	0.002	
Number of Samples (N)				6	11	11	11	4	5	9	9	11	11	9	11	6	11	1
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10	L0.5	110	130	1.5					120	*L0.05*		0.004	0.004	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11	2.2	200	240	1.9					170	0.08		0.130	0.130	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	3.9	260	300	2.2					230	*L0.05*		0.074	0.074	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	L0.5	170	210	1.5					170	*L0.05*		0.061	0.061	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	L0.5	120	150	1.3					120	*L0.05*		0.005	0.005	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	L0.5	200	240	1.7					200	*L0.05*	1.40	L0.003	L0.003	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	1.9	130	150	1.1					140	*L0.05*		L0.01	L0.01	L0.01	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	2.9	180	210	1.2					190	*L0.05*		L0.003	L0.003	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	L0.5	120	140	L1					130	L0.05		0.005	0.005	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	2.2	190	230	1.3				0.09	200	L0.05	0.24	L0.005	L0.003	L0.003	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	0.73	140	170	L1					140	L0.05	0.44	L0.005	L0.003	L0.003	0.44
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	L0.5	140	180	L1					150	*L0.05*	0.86	L0.005	L0.003	L0.003	0.86
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	L0.5	180	220	L1					190	L0.05	0.45	L0.005	L0.003	L0.003	0.45
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	L0.5	120	150	1.5					130	L0.05	0.50	0.021	0.017	0.004	0.52
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	1.3	190	230	L1.0					200	L0.015	0.26	L0.014		L0.033	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	1.6	150	180	1.9					190	0.03	0.37	0.013	0.006	0.007	0.38
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	2.1	200	240	1.1					190	0.02	0.29	0.005	0.005	L0.003	0.29
Average				1.2	165	198	1.2					168	0.03	0.53	0.020	0.020	0.003	0.49
STD				0.73	170	210	1.3					170	0.03	0.44	0.005	0.005	0.002	0.45
Median				1.1	40	47	0.6					34	0.01	0.37	0.035	0.037	0.004	0.20
Number of Samples (N)				17	17	17	17				1	17	17	9	17	16	17	6
Alberta SWQG		Short-Term (Acute)					640			0.022			*Equation			124	Equation	
		Long-Term (Chronic)			20 **		120		↑ 20%	0.005						3		
CCME		Guideline Value																

* Units in mg/L unless otherwise stated; ** Minimum value; ***L refers to below the detection limit

Classification: Public

Table A1-10 continued General Chemistry Water Quality at Redwillow Sites (AB07GD0090 & AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94	1.4	10.6	0.00	0.02	8.53	8.43	0.004		248	3.8	345	359	L3	L0.001
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95	1.1	13.2	0.00	0.00	8.04	8.17	0.003		282	5.2	443	458	6	L0.001
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95	1.9	12.5	0.00	0.15	8.06	8.23	0.013		336	5.5	274	279	10	0.003
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95	1.0	9.6	0.00	0.02	8.43	8.46	0.005		232	3.1	304	313	L3	0.001
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95	1.2	12.1	0.00	0.01	8.42	8.37	0.002		264	1.7	410	413	13	L0.001
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10			0.01	0.18		8.09		150				220	1	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11			0.11	0.14		8.14		160				220	15	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14		11.3	0.00	0.03	7.34	8.28	0.004	160		3.0	188	260	L1	0.006
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14		10.0	0.01	0.01	8.44	8.43	0.004	230		3.1	366	400	20	L0.002
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	29-Jul-14														
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14		12.4	0.01	0.01	8.27	8.42	0.004	260		0.8	470	450	35	0.002
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15		10.2	0.02	0.02	7.72	7.96	0.003	280		5.7	477	470	17	0.004
Average				1.3	11.3	0.01	0.05	8.14	8.27	0.005	207	272.4	3.5	364	349	11	0.002
STD				0.4	1.3	0.03	0.07	0.40	0.17	0.003	57	40	1.7	97	95	11	0.002
Median				1.2	11.3	0.00	0.02	8.27	8.28	0.004	195	264	3.1	366	359	10	0.001
Number of Samples (N)				5	9	11	11	9	11	9	6	5	9	9	11	11	9
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10			0.01	0.07		8.08		130				220	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11				0.02	7.40	8.35		230			270	390	13	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11			L0.1	0.01		8.37						450	15	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12			L0.1	0.02	8.27	8.27						330	7	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13			L0.1			8.21		150				230	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13			L0.1	0.00		8.27						390	5	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14			L0.1	0.01		8.45						260	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14			L0.1	L0.003		8.47		160				360	15	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15		8.3	L0.1	0.01	7.80	8.26		150			190	240	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15		9.9	L0.1	0.01	6.43	8.39		210			270	390	9	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16		9.5	L0.1	0.02		8.36		170				280	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16			L0.1	0.04		8.36		190				320	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16			L0.1	0.01		8.34						330	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17		14.6	L0.1	0.05	6.40	8.29					702	250	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17		7.7	L0.1	0.01	6.43	8.33					253	370	14	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18		10.5	L0.1	0.01		8.39		170				310	L1	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18		16.2	L0.1	0.01	8.36	8.36		190			243	360	1	
Average					11.0	0.05	0.02	7.30	8.33		175			321	322	5	
STD					9.9	0.05	0.01	7.40	8.35		170			262	330	1	
Median					3.2	0.01	0.02	0.88	0.09		30			189	67	6	
Number of Samples (N)					7	16	16	7	17		10			6	17	17	
Alberta SWQG		Short-Term (Acute)			5**		Narrative	6.5-9.0	6.5-9.0								
		Long-Term (Chronic)			6.5/8.3/9.5***												
CCME		Guideline Value															0.002

* Units in mg/L unless otherwise stated; ** Minimum value; *** Averaged over a seven day period; ****L refers to below the detection limit

Classification: Public

Table A1-10 continued General Chemistry Water Quality at Redwillow Sites (AB07GD0090 & AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94	193	244		11.4	4.0	4.6	10.68	1.09	66	54		1.0
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95	249	277		8.3	5.0	3.1	0.19	0.75	24	6		
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95	152	213		12.4	123.0	100.0	3.08	1.01	G99999	12		1.1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95	171	212		11.4	20.0	15.0	13.36	0.89	160	160		1.2
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95	237	262		6.4	3.0	2.6	3.29	1.94	27	10		1.1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10	120				26.0							L0.5
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	120				74.0	100.0			1100		88	2.5
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	130		11.0	9.7	33.0	24.0	12.84			10	10	0.4
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14	220		7.8	7.3	2.7	1.2	24.50					1.8
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	29-Jul-14										45	30	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	270		5.5	6.2	2.0	1.4	12.54			L10	L10	1.7
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	270		8.2	9.2	L1	2.8	0.05			L10	L10	0.8
Average				194	242	8.1	9.1	26.7	25.5	8.95	1.14	>275	42	43	1.2
STD				59	29	2.3	2.3	38.8	39.9	8.02	0.47	>430	51	37	0.7
Median				193	244	8.0	9.2	5.0	3.9	10.68	1.01	>66	12	30	1.1
Number of Samples (N)				11	5	4	9	11	10	9	5	6	9	5	10
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10	120				15.0							L0.5
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11	210	230			8.0	7.4	3.00		36		L1	1.2
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	270				L1	1.6			170		3	L0.5
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	180				19.0	28.0			55		2	1.0
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	120				15.0	14.0			230		56	0.6
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	200				2.7	1.9			240		15	1.3
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	130				6.0	7.0			260		22	0.7
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	210		4.3	4.1	L1				330		21	0.5
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	120		12.0	12.0	9.7		12.80					0.8
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	210		4.9	5.2	L1	0.7	8.42		63	21	20	L0.5
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	140		10.0	11.0	2.0	5.3	13.30		100	12	10	0.7
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	180		15.0	15.0	L1	5.3			390	L1	10	1.6
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	180	180	14.0	15.0	2.7	1.8	7.80		340	4	5	0.8
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	130	150	13.0	13.0	54.0	27.0	0.01		36	3	3	2.1
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	210	200	4.9	4.0	3.3	2.8	6.73		2400	92	110	0.9
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	170		10.0	10.0	2.9	3.6	10.80		130	28	40	0.7
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	200		9.3	9.4	L1	1.9	7.90		130		9	L0.5
Average				175	190	9.7	9.9	8.4	7.7	7.86		327	23	22	0.8
STD				180	190	10.0	10.5	2.9	4.5	7.90		170	12	10	0.7
Median				43	34	3.9	4.2	13.1	9.1	4.32		585	32	29	0.5
Number of Samples (N)				17	4	10	10	17	14	9		15	7	15	17
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													
CCME		Guideline Value													

* Units in mg/L unless otherwise stated; **L refers to below the detection limit

Classification: Public

Table A1-11 General Chemistry Water Quality at Redwillow & Wapiti Sites (AB07GE0005 & AB07GD-RW03 & AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alkalinity Phenolphthalein CaCO3	Alkalinity Total CaCO3	Bicarbonate Calcd	Chloride Diss.	Colour TRU	Colour True TCU	Cyanide	Fluoride Diss.	Hardness Total Calcd CACO3	NH3-N	TKN	Nitrate & Nitrite-N	Nitrate-N	Nitrite-N	TN Calcd
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97		191	226	2.3	30			0.12	184	L0.005	0.36	L0.006			
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98	6	213	246	3.8		5			168	0.01	0.27	L0.005			
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	L0.5	130	160	1.6	61		L0.002	0.08	130	L0.05	0.81	L0.003	L0.003	L0.003	0.81
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14	1.9	190	220	3.2	20		0.004	0.12	160	L0.05	0.59	L0.003	L0.003	L0.003	
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.5	190	230	3.3	11		L0.002	0.12	130	L0.05	0.45	L0.003	L0.003	L0.003	
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	L0.5	210	250	9.2	66		L0.002	0.10	200	0.09	0.98	0.320	0.320	0.003	1.30
Average				1.7	187	222	3.9	38		0.002	0.11	162	0.03	0.58	0.055	0.081	0.002	1.06
STD				2.49	30	33	2.7	25		0.002	0.02	28	0.03	0.27	0.130	0.159	0.001	0.35
Median				L0.5	191	228	3.3	30		0.001	0.12	164	0.03	0.52	0.002	0.002	0.002	1.06
Number of Samples (N)				5	6	6	6	5	1	4	5	6	6	6	6	4	4	2
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11		230	270	2.0					200	L0.05		0.100	0.100	L0.003	
Average																		
STD																		
Median																		
Number of Samples (N)					1	1	1					1	1		1	1	1	
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	L0.5	120	150	L1	35		L0.002	0.09	140	L0.05	0.32	0.022	0.022	L0.003	0.34
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L0.5	110	130	L1	6		0.005	0.07	120	L0.05	0.07	L0.003	L0.003	L0.003	0.07
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.5	140	170	L1	5		L0.002	0.08	160	L0.05	0.20	L0.003	L0.003	L0.003	0.20
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	L0.5	160	190	L1	8		L0.002	0.08	180	L0.05	0.11	0.071	0.071	L0.003	0.18
Average					133	160	0.5	13		0.002	0.08	150	0.03	0.18	0.024	0.024	0.002	0.20
STD					22	26	0.0	14		0.002	0.01	26	0.00	0.11	0.033	0.033	0.000	0.11
Median				L0.5	130	160	0.5	7		0.001	0.08	150	0.03	0.16	0.012	0.012	0.002	0.19
Number of Samples (N)				4	4	4	4	4		4	4	4	4	4	4	4	4	4
Alberta SWQG		Short-Term (Acute)					640			0.022			Equation			124	Equation	
		Long-Term (Chronic)			20 **		120		↑20%	0.005						3		
CCME		Guideline Value																

* Units in mg/L unless otherwise stated; ** Minimum value; *** Averaged over a seven day period; **** L refers to below the detection limit

Classification: Public

Table A1-11 continued General Chemistry Water Quality at Redwillow & Wapiti Sites (AB07GE0005 & AB07GD-RW03 & AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	BOD mg/L	Oxygen Diss. (Field)	P Diss.	TP	pH (Field)	pH (Lab)	Phenolic Material	Residue Filterable	Residue Total	SiO_2 Reactive	Specific Conductivity Field uS/cm	Specific Conductivity Lab uS/cm	Sulphate Diss.	Sulphide
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97	3.0	10.9	0.01	0.01	8.46	8.50			240	2.7	367	389	17	
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98	0.8	10.3	L0.001	0.00	8.37	8.48			276	1.9	423	418	20	
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	L2	12.7	0.02	0.06	7.63	8.24	0.005	180		3.2	172	260	9	
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14	L2	12.1	0.01	0.01	8.38	8.38	0.005	230		2.0	374	400	29	0.005
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L2	11.7	0.00	0.01	7.21	8.28	0.005	230		0.6	421	410	31	0.004
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	L2	8.4	0.04	0.06	7.55	7.95	0.006	300		5.3		470	29	0.005
Average				1.3	11.0	0.01	0.02	7.93	8.31	0.005	235	258	2.6	351	391	23	0.005
STD				0.8	1.5	0.02	0.03	0.53	0.20	0.000	49	25	1.6	104	70	9	0.001
Median				L2	11.3	0.01	0.01	8.00	8.33	0.005	230	258	2.4	374	405	25	0.005
Number of Samples (N)				6	6	6	6	6	6	4	4	2	6	5	6	6	3
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11				0.01	7.40	8.33					300	420	10	
Average																	
STD																	
Median																	
Number of Samples (N)							1	1	1					1	1	1	0
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14		14.2	0.01	0.03	7.83	8.22	0.004	170		2.9	163	260	19	0.008
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14		11.4	0.01	0.01	8.24	8.22	0.005	140		1.6	231	230	20	0.008
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14		11.9	L0.003	0.00	7.90	8.27	0.005	160		2.3	323	320	30	L0.0019
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15		12.4	0.01	0.01	8.10	8.09	0.003	210		3.4	352	350	32	0.003
Average					12.5	0.00	0.01	8.02	8.20	0.004	170		2.6	267	290	25	0.005
STD					1.2	0.00	0.01	0.19	0.08	0.001	29		0.8	87	55	7	0.004
Median					12.1	0.01	0.01	8.00	8.22	0.004	165		2.6	277	290	25	0.006
Number of Samples (N)					4	4	4	4	4	4	4		4	4	4	4	4
Alberta SWQG		Short-Term (Acute)			5**		Narrative	6.5-9.0	6.5-9.0								
		Long-Term (Chronic)			6.5/8.3/9.5***												0.002
CCME		Guideline Value															

* Units in mg/L unless otherwise stated; ** Minimum value; *** Averaged over a seven day period; ****L refers to below the detection limit

Classification: Public

Table A1-11 continued General Chemistry Water Quality at Redwillow & Wapiti Sites (AB07GE0005 & AB07GD-RW03 & AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	TDS Calcd	TDS Measured	TOC	DOC	TSS	Turbidity NTU	Water Temp °C	Tannin and Lignin	Total Coliforms MPN per 100 mL	Coliforms Fecal MPN per 100 mL	E. Coli MPN per 100 mL	Chlorophyll-a ug/L
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97	213			12.0	L2	2.6	9.11			20	4	
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98	240	274		6.1	2.0	1.7	10.91			L10	L10	
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	150		14.0	13.0	53.0	32.0	9.44			10	10	3.2
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14	230		9.5	9.4	5.3	3.9	23.20					3.2
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	240		7.0	6.3	6.0	3.8	9.85			10	L10	0.8
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	270		13.0	13.0	1.3	4.4	-0.08			L10	L10	0.3
Average				224		10.9	10.0	11.4	8.1	10.41			10	6	1.9
STD				41		3.2	3.2	20.5	11.8	7.44			6	2	1.5
Median				235		11.3	10.7	3.7	3.9	9.65			10	5	2.0
Number of Samples (N)				6	1	4	6	6	6	6			5	5	4
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11	230	240			8.0	8.3	2.40		57		L1	1.1
Average															
STD															
Median															
Number of Samples (N)				1	1			1	1	1		1		1	1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	150		6.0	5.3	33.0	34.0	7.24			L10	L10	1.7
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	130		0.8	L0.5	3.3	0.9	18.50					0.3
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	180		2.2	1.9	2.0	1.0	12.03			L10	L10	0.1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	200		2.3	2.3	420.0	3.1	-0.04			10	L10	1.8
Average				165		2.8	2.4	114.6	9.8	9.43			7	5	1.0
STD				31		2.2	2.1	204.1	16.2	7.82			3	0	0.9
Median				165		2.3	2.1	18.2	2.1	9.64			5	5	1.0
Number of Samples (N)				4		4	4	4	4	4			3	3	4
Alberta SWQG		Short-Term (Acute)						Narrative	Narrative	Narrative					
		Long-Term (Chronic)													
CCME		Guideline Value													

* Units in mg/L unless otherwise stated; **L refers to below the detection limit

Classification: Public

APPENDIX 2 – METALS AND MAJOR IONS

TABLE A2-1 Metals and Major Ions at Beaverlodge Main Stem Sites (AB07GD0005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	L0.1		5.7			0.30			21		54		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	L0.1		16			0.80			27		68		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	L0.1		6.8			0.50			L20		61		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	L0.1		L3			0.80			25		59		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	L0.1		L3			0.40			23		51		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	L0.1		4.1			0.20			24		52		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	L0.1		4.6			0.60			22		58		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	L0.1		3.8			0.30			23		50		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	L0.1		6.2			0.80			35		59		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	L0.1		L3			0.50			40		60		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	L0.1		57			2.20			22		68		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	L0.1		5.4			0.29			28		43		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	L0.1		7.4			0.75			L20		57		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	18-Jun-18	L0.1		45			0.60			L20		35		L1				
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	L0.1		L3			0.50			56		66		L1				
Average				L0.1		11.2			0.64			25		56						
Median				L0.1		5.4			0.50			23		58		L1				
STD						16.7			0.48			12		9						
Number of Samples (N)				15		15			15.00			15		15		15				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07																	
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11																	
Average																				
Median																				
STD																				
Number of Samples (N)																				
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Classification: Public

TABLE A2-1 continued Metals and Major Ions at Beaverlodge Main Stem Sites (AB07GD0005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	34			L0.005			L0.3			L1			1.1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	45			L0.005			L0.3			L1			0.8		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	42			0.0056			L0.3			L1			0.5		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	38			0.005			L0.3			L1			0.5		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	35			L0.005			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	37			0.0054			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	38			L0.02			L0.3			L1			0.5		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	33			L0.02			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	40			L0.02			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	32			L0.02			L0.3			L1			0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	32			L0.02			0.43			L1			1.4		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	30			L0.02			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	39			L0.02			L0.3			L1			L0.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	18-Jun-18	19			L0.02			L0.3			L1			0.7		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	62			L0.02			L0.3			L1			1.7		
Average				37			0.008			0.2						0.5		
Median				37			L0.02			L0.3			L1			0.5		
STD				9			0.003			0.1						0.5		
Number of Samples (N)				15			15			15			15			15		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06		28.8													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06		25.4													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06		26.8													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06		29.5													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06		27.0													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06		27.5													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06		29.8													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06		31.7													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06		24.7													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06		27.9													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06		43.8													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06		28.6													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06		25.0													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06		25.4													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07		24.0													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07		22.2													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07		21.1													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07		24.1													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07		24.1													
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11			16												
Average					27.2													
Median					26.8													
STD					4.8													
Number of Samples (N)					19	1												
Alberta SWQG		Short-term (Acute)																7
		Long-term (Chronic)							Equation			Equation						Equation
CCME		Guideline Value																

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

TABLE A2-1 continued Metals and Major Ions at Beaverlodge Main Stem Sites (AB07GD0005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	480						14000	L20		12			230			0.3			11
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	840						3800	L20		12			240			0.4			23
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	370						6300	L20		9.5			100			0.4			7.7
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	110						5000	L20		9.1			L4			0.6			10
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	330						2400	L20		9.2			30			L0.2			9.3
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	110						2800	L20		8.7			7.1			L0.2			6.3
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	160					5.4		L20		11			L4			0.3			9.8
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	110						3300	L20		8.1			5.5			L0.2			6.9
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	200						4200	L20		12			L4			0.9			27
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	L60					9.1		L20		7.8			L4			0.6			7.7
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	2900					3.1		L20		9.6			270			0.31			4.4
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	270					4.9		L20		6.9			L4			L0.2			5.6
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	170					3.5		L20		15			5.5			0.66			49
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	18-Jun-18	380					1.9		L20		5.4			43			0.2			4
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	L60					4.1		L20		23			53			0.6			62
Average				433					4.6	5225			10.6			66.3			0.38			16.0
Median				200					4.1	4000	L20		9.5			7.1			0.31			9.3
STD				714					2.3	3758			4.2			97.5			0.25			17.4
Number of Samples (N)				15					7	8	15		15			15			15			15
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06		694				13.6					8.15								7800
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06		562				13.3					6.53								7000
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06		861				9.3					6.95								11300
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06		1460				8.9					7.84								14600
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06		2150				7.5					7.23								11500
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06		1570				5					8.06								10000
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06		1470				4.9					8.18								9600
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06		1210				4.5					8.36								11000
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06		1000				6					6.39								14400
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06		1170				5.6					8.21								15400
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06		699				5.9					13								24600
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06		523				4.9					7.9								18100
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06		1870				4.9					6.77								19500
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06		1030				4.9					7.58								18500
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07		1470				6.8					6.29								15300
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07		1250				6.4					5								10400
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07		791				6.7					4.99								7000
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07		664				5.4					7.73								9100
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07		589				4.1					7.23								9300
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11			780				9900					4.8			120				4200
Average					1107				6.8					7.49								12430
Median					1030				5.9					7.58								11150
STD					467				2.7					1.67								5047
Number of Samples (N)					19	1			19	1				19	1			1				20
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

TABLE A2-1 continued Metals and Major Ions at Beaverlodge Main Stem Sites (AB07GD0005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	1.1			L0.2			L0.2		0.8			2600		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	1.5			L0.2			L0.6		L0.2			1200		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	1			L0.2			L0.6		L0.2			1000		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	1.1			L0.2			L0.6		L0.2			390		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	1.1			L0.2			L0.6		L0.2			1300		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	0.8			L0.2			L0.6		L0.2			1300		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	0.8			L0.2			L0.6		L0.2			190		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	0.6			L0.2			L0.6		L0.2			860		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	1.1			L0.2			L0.6		L0.2			160		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	1.2			L0.2			L0.6		L0.2			1300		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	0.31			0.23			L0.6		L0.2			3200		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	0.64			L0.2			L0.6		L0.2			2000		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	1.3			L0.2			L0.6		L0.2			660		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	18-Jun-18	0.6			0.2			L0.6		L0.2			1100		L1		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	1.2			L0.2			L0.6		L0.2			100		L1		
Average				0.96			0.12					0.1			1157		<L1		
Median				1.10			L0.2			<L0.6		L0.2			1100		<L1		
STD				0.32			0.04					0.2			888				
Number of Samples (N)				15			15			15		15			15		15		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07																
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11																
Average																			
Median																			
STD																			
Number of Samples (N)																			
Alberta SWQG	Short-term (Acute)					Equation								1 **					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

TABLE A2-1 continued Metals and Major Ions at Beaverlodge Main Stem Sites (AB07GD0005, AB07GD0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	20-Apr-11	180					L1			L0.2			0.2			L1			5.4		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	31-Oct-11	260					L1			L0.2			0.5			L1			8.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-12	200					L1			L0.2			0.3			L1			4.9		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-May-13	220					L1			L0.2			0.4			L1			7.6		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-13	190					L1			L0.2			L0.1			L1					
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	28-May-14	180					L1			L0.2			0.1			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	1-Oct-14	210					L1			L0.2			0.3			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	19-May-15	160					L1			L0.2			L0.1			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	23-Sep-15	260					L1			L0.2			0.5			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	3-May-16	180					L1			L0.2			0.3			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-16	170					1.9			L0.2			0.18			1.2			3.6		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	25-Apr-17	140											0.11			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	21-Sep-17	270					L1			L0.2			0.66			L1			L3		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	18-Jun-18	93					1.5			L0.2			0.1			L1			3.2		
AB07GD0005	Beaverlodge River	BLR at TWP 734 and RR 132	27-Sep-18	540					L1			L0.2			1			L1			L3		
Average				217					0.7			<L0.2			0.32						3.2		
Median				190					L1			<L0.2			0.30			<L1			1.5		
STD				101					0.4						0.26						2.4		
Number of Samples (N)				15					14			14			15			15			14		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	6-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	10-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-May-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	1-Jun-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	7-Jun-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Jun-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	25-Apr-07																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-07																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	30-Apr-07																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-07																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	9-May-07																				
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	20-Apr-11																				
Average																							
Median																							
STD																							
Number of Samples (N)																							
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)											0.8				15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-2 Metals at Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-94				51				2.00				48	L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-Jan-95				L5				0.80				81	L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-95				52				0.50				35	L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	15-Aug-95				8				1.00				39	L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Aug-04																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	2-Sep-04																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Oct-04																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-Feb-05																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	4-Apr-05																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Oct-05																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	13-Mar-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	6-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	10-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-May-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-May-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-May-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	7-Jun-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Jun-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Jul-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Sep-06																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	30-Apr-07																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-10																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Apr-11																	
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	31-Oct-11	L0.1		15			1.20			61		56		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-12	L0.1		19			0.70			L20		45		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-May-13	L0.1		9.6			1.10			48		52		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-13	L0.1		9.4			1.40			34		37		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	28-May-14	L0.1		13			0.60			L20		46		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Oct-14	L0.1		14			2.00			40		44		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-May-15	L0.1		8.7			0.60			24		48		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-15	L0.1		11			3.00			52		44		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-16	L0.1		13			0.90			40		48		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-16	L0.1		13			1.50			38		61		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-17	L0.1		16			0.45			27		35		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-17	L0.1		7.5			1.60			28		54		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-18	L0.1		18			0.70			39		48		L1				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Sep-18	L0.1		L3			1.00			37		40		L1				
Average				<L0.1		12.1	28.4		1.20		1.08	35		47	50.8	<L1				
Median				<L0.1		13	29.5		1.05		0.90	38		47	43.5	<L1				
STD						4.6	26.8		0.68		0.65	14		7	20.9					
Number of Samples (N)				14		14	4		14		4	14		14	4	18				
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Classification: Public

Table A2-2 continued Metals at Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-94	34					L1			1		1				L1
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-Jan-95	51					L1			L1		L1				L1
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-95	19					L1			L1		L1				1
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	15-Aug-95	24					L1			L1		1				5
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Aug-04		39.1													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	2-Sep-04		35.4													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Oct-04		32.5													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-Feb-05		46													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	4-Apr-05		28.9													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Oct-05															
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	13-Mar-06		81.8													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-Apr-06		48.9													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	6-Apr-06		87.8													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	10-Apr-06		46.6													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Apr-06		41.2													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Apr-06		31													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Apr-06		24.6													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-06		32.6													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-07		27.3													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-May-07		23.9													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-06		26.5													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-May-06		34.6													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-May-06		38.6													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-06		35.2													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	7-Jun-06		36.7													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Jun-06		38.2													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Jul-06		31.1													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Sep-06		28.3													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-07		8.94													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-07		29.2													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-07		14.8													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	30-Apr-07		23.8													
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-10			36												
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Apr-11	20														
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	31-Oct-11	38			L0.005			0.5			L1			0.5		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-12	29			0.014			0.3			L1			0.5		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-May-13	33			L0.005			L0.3			L1			0.8		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-13	32			L0.005			L0.3			L1			L0.2		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	28-May-14	29			L0.005			L0.3			L1			L0.2		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Oct-14	36			L0.02			0.3			L1			0.5		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-May-15	32			L0.02			L0.3			L1			L0.2		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-15	28			L0.02			L0.3			L1			L0.2		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-16	31			L0.02			L0.3			L1			0.6		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-16	40			L0.02			L0.3			L1			0.45		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-17	23			L0.02			L0.3			L1			0.5		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-17	42			L0.02			0.31			L1			L0.2		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-18	30			L0.02			L0.3			L1			0.4		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Sep-18	33			L0.02			0.3			L1			2		
Average				32	36057.0				<L1	0.22		<L1	<L1	<L1		0.48		1.8
Median				32	32600.0		L0.02		<L1	0.15		<L1	<L1	<L1		0.48		0.8
STD				8	16655.9					0.11						0.49		2.2
Number of Samples (N)				19	27	1	14		4	14		4	14	4		14		4
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								Equation			Equation						Equation
CCME	Guideline Value																	

* Values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-2 continued Metals at Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-94			1400		L0.04		5900			10					365			L1	43000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-Jan-95			2940		L0.04		7700			17					469			L1	26000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-95			832		L0.04		7400			6					68			L1	7000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	15-Aug-95			730		L0.04		3500			9					47			L1	14000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Aug-04		L20				6.4					10.6								82700
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04		L20				6.1					9.78								87800
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Oct-04		325				3.7					9.27								11500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	9-Feb-05		1290				10.5					11.5								11700
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05		1440				9.3					7.38								10000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05																			
AB07GD0020	Beaverlodge River	BLR u/s of BTC	13-Mar-06		1710				10.8					24.3								39700
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06		1170				11.9					14								24300
AB07GD0020	Beaverlodge River	BLR u/s of BTC	6-Apr-06		1860				11.2					24.6								39500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	10-Apr-06		1500				10.1					13.6								20200
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06		1410				9.8					10.7								15800
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06		1000				9.1					8.44								12600
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Apr-06		921				6.2					7.34								10500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06		1080				6.7					9.66								13500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-07		1430				6.9					8.21								15100
AB07GD0020	Beaverlodge River	BLR u/s of BTC	9-May-07		929				7.2					6.24								10100
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06		960				5.9					7.38								11200
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06		1460				6.7					8.7								25500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-May-06		990				6.2					11.1								19900
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-06		1100				6.5					9.55								15800
AB07GD0020	Beaverlodge River	BLR u/s of BTC	7-Jun-06		853				6.1					9.36								23500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Jun-06		1250				5.6					10.4								39200
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06		1040				4.7					10								60600
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06		1090				5.2					11.8								72900
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-Apr-07		537				3.3					2.66								29400
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-07		1710				5.7					8.6								8900
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-07		1290				5.3					3.61								13500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	30-Apr-07		1160				6.2					5.68								12500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-10			570				11000					12			70				36000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	20-Apr-11	630						8600			6.3			130						7600
AB07GD0020	Beaverlodge River	BLR u/s of BTC	31-Oct-11	2100						5300	L20		11			220			0.7			87000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-12	1400						8100	L20		7.4			180			0.4			10000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-May-13	840						7500	L20		7.8			13			0.7			14000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-13	260						4700	L20		9.8			94			0.4			45000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	28-May-14	290						4600	L20		7.8			17			0.3			9700
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Oct-14	280					4.2		L20		11			220			1			110000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	19-May-15	400						5600	L20		8.7			16			L0.2			11000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	23-Sep-15	680						4600	L20		9.3			160			1.2			120000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-16	870					6.5		L20		7.7			29			0.6			12000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-16	510					7.1		L20		12			200			1.9			25000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	25-Apr-17	450					8.6		L20		6.2			13			0.4			6500
AB07GD0020	Beaverlodge River	BLR u/s of BTC	21-Sep-17	830					6.1		L20		12			370			0.38			58000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	1-Jun-18	670					5.4		L20		7.4			49			0.3			8000
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Sep-18	770					4.1		L20		9.4			93			0.5			16000
Average				732	1094	1294		<L0.04	6.9	6500	<L20		9.3	10.17		120		204	0.63		<L1	29866
Median				670	1100	832		<L0.04	6.3	5900	<L20		9.0	9.55		94		70	0.45		<L1	15800
STD				481	460	972			2.2	2092			2.6	4.85		105		198	0.47			28424
Number of Samples (N)				15	27	5		4	34	13	14		19	27	1	15		5	14		4	47
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-2 continued Metals at Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-94			4		L2						0.1					
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-Jan-95			L1		L2						L0.1					
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-95			2		3						0.1					
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	15-Aug-95			4		L2						L0.1					
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Aug-04																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	2-Sep-04																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Oct-04																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-Feb-05																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	4-Apr-05																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Oct-05							0.0179									
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	13-Mar-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	6-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	10-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-May-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-May-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-May-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	7-Jun-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Jun-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Jul-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Sep-06																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	30-Apr-07																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-10																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Apr-11																
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	31-Oct-11	2.3			L0.2			L0.6		L0.2			2700		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-12	1.4			L0.2			L0.6		L0.2			1600		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-May-13	1.9			L0.2			L0.6		L0.2			390		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-13	1.6			L0.2			L0.6		L0.2			970		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	28-May-14	0.8			L0.2			L0.6		L0.2			290		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Oct-14	2			L0.2			L0.6		L0.2			1000		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-May-15	1.1			L0.2			L0.6		L0.2			290		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-15	1.9			0.2			L0.6		L0.2			760		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-16	1.7			L0.2			L0.6		L0.2			690		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-16	1.9			L0.2			L0.6		L0.2			4400		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-17	1.4			L0.2			L0.6		L0.2			2000		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-17	1.6			L0.2			L0.6		L0.2			1700		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-18	1.9			L0.2			L0.6		L0.2			1500		L1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Sep-18	2.4			L0.2			L0.6		L0.2			2100		L1		
Average				1.7		2.6	<L0.2	1.5		0.2812		<L0.2		<L0.1	1456		<L1		
Median				1.8		3	<L0.2	1.0		0.3000		<L0.2		<L0.1	1250		<L1		
STD				0.4		1.7		1.0		0.0728					1122				
Number of Samples (N)				14		4	14	4		15		14		4	14		14		
Alberta SWQG	Short-term (Acute)					Equation								1**					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

Table A2-2 continued Metals at Beaverlodge Main Stem Sites (AB07GD0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-94																	L2			2
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-Jan-95																	L2			2
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-95																	L2			3
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	15-Aug-95																	4			2
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Aug-04																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	2-Sep-04																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Oct-04																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-Feb-05																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	4-Apr-05																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Oct-05																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	13-Mar-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	6-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	10-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	9-May-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-May-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-May-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	7-Jun-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Jun-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Jul-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Sep-06																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-Apr-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	30-Apr-07																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-10																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	20-Apr-11																				
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	31-Oct-11	210					L1			L0.2			0.6			L1			7.3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-12	140					L1			L0.2			0.2			L1			3.1		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-May-13	170					L1			L0.2			0.3			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-13	190					L1			L0.2			0.2			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	28-May-14	150					L1			L0.2			0.2			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Oct-14	180					L1			L0.2			0.8			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	19-May-15	160					L1			L0.2			0.2			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	23-Sep-15	160					1.5			L0.2			0.8			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-16	150					L1			L0.2			0.2			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-16	240					L1			L0.2			0.22			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	25-Apr-17	120											0.22			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	21-Sep-17	230					L1			L0.2			0.34			L1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	1-Jun-18	140					L1			L0.2			0.2			1			L3		
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Sep-18	170					L1			L0.2			0.3			L1			L3		
Average				172					0.6			<L0.2			0.34			<L1		1.8	2.0		2.3
Median				165					0.5			<L0.2			0.22			<L1		1.0	1.5		2
STD				35					0.28						0.22					1.5	1.6		0.5
Number of Samples (N)				14					13			13			14			14		4	14		4
Alberta SWQG	**Short-term (Acute)**																**33**						
	Long-term (Chronic)													**0.8**			**15**						**30**
CCME	**Guideline Value**																			**120**			

* Values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-3 Metals at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94				22				1.00				95	L1				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95				L5				0.80				87	L1				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95				307				1.30				66	L1				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95				L5				1.10				56	L1				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95				L5				0.50				79	L1				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07																	
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	0.004	0.011	13.9		1400	0.68		1.13	21.4	24.2	44.4	63.9	L0.009		0.032	0.008	0.015
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14		0.003			251			2.00		42.1		98.8			0.013		L0.001
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L0.001	L0.002	1.7		227	0.70		1.01	87.7	104	59.8	79.9	L0.009		0.00906	0.004	0.00652
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	0.004	0.005	3.96		84.3	0.88		0.94	31.1	31.5	74.6	75.5	0.01		0.01	L0.003	0.004
Average				0.003	0.005	6.52	67.3	490.6	0.75		1.09	46.7	50.5	59.6	77.9	0.315		0.01602	0.005	0.00651
Median				0.004	0.004	3.96	2.5	239	0.70		1.01	31.1	36.8	59.8	79	0.5		0.0115	0.004	0.00526
STD				0.002	0.004	6.490	134.3	610.7	0.11		0.41	35.8	36.4	15.1	14.3	0.256		0.01079	0.003	0.00618
Number of Samples (N)				3	4	3	5	4	3		9	3	4	3	9	8		4	3	4
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Classification: Public

Table A2-3 continued Metals at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94	52					L1			L1		L1				2
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95	60					L1			L1		L1				1
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95	25					L1			1		2				3
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95	39					L1			L1		1				6
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95	62					L1			L1		1	L1			1
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04		38.9													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04		39.6													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04		37.9													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05		29													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05		22.8													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06		93.2													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06		32.4													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06		29.3													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06		41.2													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06		40.1													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06		39.3													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06		33													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06		35.3													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06		34.2													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06		51.7													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06		47.7													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06		47.7													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06		53.3													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06		50.6													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06		72.2													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07		65.1													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06		13.9													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07		20.6													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07		23.1													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07		25.2													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07		25.4													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07		24.7													
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	31		27.8	0.008		0.025	0.153		0.386	0.9	1.96	L1	1.42		1.72
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	81		69.3			0.014			0.385		0.47	L1			1.8
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	58		63.7	0.007		0.0118	0.029		0.149	0.2	0.432	L1	1.03		1.04
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	54		51.2	0.014		0.017	0.111		0.127	0.1	0.19	L1	1.39		1.49
Average				51	39.5	53.0	0.010		0.2853	0.098		0.450	0.4	0.895	<L1	1.28		2.12
Median				54	37.9	57.5	0.008		0.5	0.111		0.5	0.2	0.5	<L1	1.39		1.72
STD				17	17.3	18.4	0.004		0.2546	0.063		0.254	0.4	0.669		0.22		1.59
Number of Samples (N)				9	27	4	3		9	3		9	3	9	5	3		9
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								Equation			Equation						Equation
CCME	Guideline Value																	

*values are reported in ug/L unless otherwise reported

Classification: Public

Table A2-3 continued Metals at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94			638		L0.04		6200			15					73			L1	31000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95			1400		L0.04		6100			18					61			L1	30000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95			2400		L0.04		7900			7					93			L1	7000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95			604		L0.04		3800			11					34			L1	18000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95			239		L0.04		6300			18					27			1	69000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04		L20				3.6					11.4								18400
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04		L2				3.5					11.6								16100
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04		512				3.3					10.15								9700
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05		1090				10.9					7.36								18700
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05		1820				8.7					6.33								8000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06		1010				9					27.7								60400
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06		965				13.5					8.75								22600
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06		867				11.3					9.05								14500
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06		1340				9.8					10.8								17200
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06		1290				9.3					11.2								13400
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06		927				4.7					9.94								15400
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06		1170				6.6					8.94								10400
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06		1060				5.5					9.87								12300
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06		956				5.2					9.26								12300
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06		330				4.7					13.9								28300
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06		326				5.1					12.9								21600
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06		315				3.9					12.3								21900
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06		219				4.2					12.9								19700
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06		402				5.3					15.5								33800
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06		391				6.2					25.6								103000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07		2070				6					17.4								59300
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06		691				6.8					14.1								158000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07		3160				5.8					4.92								11600
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07		4580				5.2					5.64								8300
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07		1910				5.8					5.53								6600
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07		2550				5.1					7.27								7600
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07		2320				4.6					6.78								7000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	260		1030				5700	1.63	2.01	8.5			11.6		52.5	0.317		0.375	8800
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L60		368		0.00171		6800		8.4	23			44		152			0.989	47000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L60		230		0.0018		3900	10.8	13	19			0.4		94.6	1.7		2.01	180000
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	969		1530		0.00198	9.8		4.1	4.14	16			14.4		16.8	0.293		0.298	25000
Average				322	1196	938		0.01319	6.6	5838	5.51	6.89	15.1	11.37		17.6		67.1	0.770		0.741	31997
Median				145	965	638		0.02	5.7	6150	4.1	6.27	16	10.15		13		61	0.317		0.500	18200
STD				445	1047	727		0.00940	2.7	1390	4.74	4.86	5.3	5.40		18.6		42.1	0.805		0.536	39557
Number of Samples (N)				4	27	9		8	28	8	3	4	9	27		4		9	3		9	36
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-3 continued Metals at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94			4		L2						0.2					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95			3		L2						0.1					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95			4		2						0.1					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95			3		L2						0.1					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95			4		L2						0.1					
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07																
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	1.05		1.81	0.07		0.401	0.123	0.124	0.12		0.22			0.038		0.039
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14			2.01			0.111		0.161			0.47					0.059
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	0.612		0.88	0.017		0.126	0.086	0.0872	0.16		0.213			0.033		0.042
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	1.56		1.58	0.053		0.118	0.08	0.081	0.14		0.14			0.017		0.018
Average				1.074		2.70	0.047	1.2	0.189	0.096	0.1133	0.14		0.183			0.029		0.040
Median				1.05		3	0.053	1.0	0.122	0.086	0.1056	0.14		0.140			0.033		0.041
STD				0.474		1.18	0.027	0.4	0.141	0.023	0.0370	0.02		0.120			0.011		0.017
Number of Samples (N)				3		9	3	5	4	3	4	3		9			3		4
Alberta SWQG	Short-term (Acute)					Equation								1**					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value

Classification: Public

Table A2-3 continued Metals at Beaverlodge Main Stem Sites (AB07GD0040), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	21-Sep-94																	L2			1
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-Jan-95																	L2			3
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-95																	5			12
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	15-Aug-95																	L2			2
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	11-Oct-95																	L2			L1
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Aug-04																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Oct-04																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-Feb-05																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	13-Mar-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	6-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	10-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-May-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	1-Jun-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	7-Jun-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	20-Jun-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	25-Apr-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	30-Apr-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	9-May-07																				
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	124		137	0.0447	0.143	1.41		22.8	0.0038		0.0132	0.236		0.311	0.43		2.87	1.22		3.6
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14			348		0.0025			4.73			0.0083			1.17			1.1			2.2
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	394		479	0.0373	0.0496	0.29		3.37	0.0046		0.00618	2.1		2.52	0.17		0.842	0.92		1.25
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Feb-15	221		224	0.0482	0.0488	1.38			0.0042		0.0056	0.45		0.455	230		0.45	2.4		2.9
Average				246		297	0.0434	0.0610	1.03		10.3	0.0042		0.00832	0.929		1.114	76.87		1.585	1.51		3.16
Median				221		286	0.0447	0.0492	1.38		4.73	0.0042		0.00724	0.450		0.813	0.43		1.000	1.22		2.20
STD				137		149	0.0056	0.0589	0.64		10.8	0.0004		0.00345	1.020		1.010	132.62		1.447	0.78		3.47
Number of Samples (N)				3		4	3	4	3		3	3		4	3		4	3		9	3		9
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)												0.8			15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported

Classification: Public

Table A2-4 Metals at Beaverlodge Main Stem Sites (AB07GD0045, AB07GD0050, AB07GD0060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10																	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11																	
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	L0.1		13			0.80			41		75		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	L0.1		13			0.80			22		59		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	L0.1		17			1.10			20		59		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	L0.1		14			1.00			69		57		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	L0.1		24			0.90			20		52		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	L0.1		6.1			0.50			73		75						
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	L0.1		12			0.90			22		55		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	L0.1		3.7			0.80			130		46		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	L0.1		10			0.90			54		57		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-16	L0.1		21			1.40			46		82		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	L0.1		32			0.57			21		39		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	L0.1		26			0.77			46		62		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	L0.1		15			1.00			46		61		L1				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	L0.1		17			0.60			41		87		L1				
Average				<L0.1		16.0			0.86			47		62		<L1				
Median				<L0.1		14.5			0.85			44		59		<L1				
STD						7.7			0.23			30		13						
Number of Samples (N)				14		14			14.00			14		14		13				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94				45				1.00				93	L1				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95				5				0.80				88	L1				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95				297				1.30				66	L1				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95				L5				1.00				57	L1				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95				L5				0.50				81	L1				
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	0.002	0.012	15.2		1940	0.69		1.09	22.5	23.5	43.8	68.7	0.011		0.056	L0.003	0.006
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14		0.005			391			1.72		88.2		81.6			0.016		L0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14	L0.001	0.00222	3.78		492	0.86		1.28	75.96	76.8	70.5	84.1	L0.009		0.0208	L0.003	L0.001
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	0.002	0.004	4.28		157	0.91		1.03	32.6	33	79.9	80.1	L0.009		0.015	0.005	0.008
Average				0.002	0.00581	7.75	70	745	0.82		1.08	43.69	55.4	64.7	77.7	0.315		0.0270	0.003	0.004
Median				0.002	0.0045	4.28	5	442	0.86		1.03	32.6	54.9	70.5	81	0.5		0.0184	0.002	0.003
STD				0.001	0.00429	6.45	128	809	0.11		0.34	28.40	31.9	18.7	11.5	0.255		0.0195	0.002	0.004
Number of Samples (N)				3	4	3	5	4	3.00		9.00	3	4	3	9	8		4	3	4
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94				97				2.70				71	L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95				L5				0.80				84	L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95				243				0.90				51	L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95				25				1.20				42	L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95				70				0.90				70	L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10																	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11																	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	L0.1		18			0.90			43		61		L1				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-17	L0.1		7.5			1.60			28		54		L1				
Average				<L0.1		12.8	88		1.25		1.30	36		58	64	<L1				
Median				<L0.1		12.8	70		1.25		0.90	36		58	70	<L1				
STD						7.42	94		0.49		0.80	11		5	17					
Number of Samples (N)				2		2	5		2.00		5.00	2		2	5	7				
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

*units in µg/L unless otherwise stated; **equation if pH <6.5; ***L refers to below the detection limit

Classification: Public

Table A2-4 continued Metals at Beaverlodge Main Stem Sites (AB07GD0045, AB07GD0050, AB07GD0060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10	36														
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11	19														
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	61			0.0096			L0.3			L1			1.3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	42			0.017			L0.3			L1			1.5		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	46			0.03			L0.3			L1			1.5		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	57						L0.3			L1			0.9		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	37						L0.3			L1			L0.2		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	79			L0.02			L0.3			L1			1.2		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	38						L0.3			L1			0.4		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	68			L0.02			L0.3			L1			L0.2		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	45			L0.02			L0.3			L1			1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-16	58			L0.02			L0.3			L1			1.6		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	23			L0.02			L0.3			L1			0.74		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	54			0.02			L0.3			L1			1.5		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	41			L0.02			L0.3			L1			1.5		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	71			L0.02			L0.3			L1			2.9		
Average				48			0.0133			<L0.3			<L1			1.16		
Median				46			0.01			<L0.3			<L1			1.25		
STD				17			0.0065									0.72		
Number of Samples (N)				16			11			14			14			14		
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94	52					L1			L1		L1				1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95	62					L1			L1		L1				2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95	25					L1			1		2				4
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95	39					L1			L1		1				6
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95	54					L1			L1		1	L1			2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	30		28.4	0.014		0.028	0.195		0.514	0.5	1.87	L1	1.72		1.74
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14	66		56.6			0.017			0.186		0.58	L1			2.13
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14	40.4		41.6	0.006		0.0175	0.069		0.332	0.3	0.93		1.95		2.36
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	55		54.5	0.014		0.019	0.097		0.141	0.1	0.3	L1	1.71		1.88
Average				47.0		45.3	0.011		0.2868	0.120		0.464	0.3	0.96	<L1	1.79		2.57
Median				52		48.1	0.014		0.5	0.097		0.5	0.3	0.93	<L1	1.72		2
STD				14.2		13.1	0.005		0.2528	0.066		0.248	0.2	0.60		0.14		1.51
Number of Samples (N)				9		4	3		9	3		9	3	9	4	3		9
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94	61					L1			L1		1				2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95	56					L1			L1		1				1
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95	24					L1			1		1				2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	27					L1			L1		2				5
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95	41					L1			L1		1	L1			1
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10	32														
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11			19												
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	42			0.013			L0.3			L1			1.9		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-17	42			L0.020			0.31			L1			L0.2		
Average				41			0.012		<L1	0.23		<L1	<L1	1.2		1.0		2.2
Median				42			0.012		<L1	0.23		<L1	<L1	1		1.0		2.0
STD				13			0.002			0.11				0.4		1.3		1.6
Number of Samples (N)				8		1	2		5	2		5	2	5	1	2		5
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								*Equation			*Equation						*Equation
CCME	Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-4 continued Metals at Beaverlodge Main Stem Sites (AB07GD0045, AB07GD0050, AB07GD0060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10	570						5200			10			18						21000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11	550						8900			5.7			100						9000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	920						4900	L20		15			94			0.6			39000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	890						10000	L20		11			52			0.6			25000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	340						5400	L20		12			4.6			0.8			23000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	65						4300	L20		16			4.6			1.6			120000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	470						4800	L20		9.7			23			0.5			11000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	L60					5.3		25		25			4.2			1.5			160000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	330						5600	L20		10			21			0.3			12000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	L60						3100	36		22			4.6			4.1			240000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	360					7.5		L20		13			L4			1			47000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-16	560					6.8		L20		19			7.5			0.85			45000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	290					7.1		L20		6.5			20			0.35			5800
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	93					4.3		L20		14			30			1.9			66000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	700					5.9		L20		9.9			38			0.5			14000
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	170					7.4		L20		19			18			0.6			44000
Average				398					6.3	5800	13		13.6			27.6			1.09			55113
Median				350					6.8	5200	10		12.5			19.0			0.70			32000
STD				287					1.2	2212	8		5.4			30.4			1.00			64920
Number of Samples (N)				16					7	9	14		16			16			14			16
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94			688		L0.04		5300			15					52			2	35000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95			1220		L0.04		6000			18					34			1	30000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95			2390		L0.04		7900			8					91			1	8000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95			566		L0.04		3500			11					28			L1	18000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95			311		L0.04		4700			16					46			L1	31000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	236		1300				6000	2.13	2.15	8.8			9.43		58.9	0.328		0.368	9300
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14	L60		338		0.00158	4.5			24.5	23			4.3		53.9			2.08	160000
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14	17.8		687		0.0029			24.7	24.7				0.57		89.1	1.859		1.88	
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	897		1550		0.0022	10		4.35	4.4	16			7.21		12.5	0.33		0.334	26000
Average				295.2		1006		0.01334	7.3	5567	10.39	13.94	14.5			5.38		51.7	0.839		1.074	39663
Median				133		688		0.02	7.3	5650	4.35	14.45	15.5			5.76		52	0.33		1	28000
STD				413.5		677		0.00921	3.9	1477	12.44	12.35	5.0			3.83		26.1	0.883		0.728	49644
Number of Samples (N)				4		9		8	2	6	3	4	8			4		9	3		9	8
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94			996		L0.04		7400			29					144			1	162000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95			2180		L0.04		6700			17					142			L1	27000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95			1500				6200			7					80			2	7000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95			759		L0.04		3400			9					39			2	15000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95			841		L0.04		4900			13					109			L1	24000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10	170						3800			9			25						9000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11			580				8800					6			110				8000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	1300						6600	L20		12			96			0.4			27000
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-17	830					6.1		L20		12			370			0.38			58000
Average				767		1143		<L0.04		5975	<L20		14			164		104	0.39		1.2	37444
Median				830		919		<L0.04		6400	<L20		12			96		110	0.39		1	24000
STD				568		597				1832			7			182		40	0.01		0.8	49298
Number of Samples (N)				3		6		4	1	8	2		8		1	3		6	2		5	9
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-4 continue Metals at Beaverlodge Main Stem Sites (AB07GD0045, AB07GD0050, AB07GD0060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10																
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11																
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	2.5			L0.2			L0.6		L0.2			2100		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	2.1			L0.2			L0.6		L0.2			2000		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	2.4			L0.2			L0.6		L0.2			1200		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	1.6			L0.2			L0.6		0.5			1800		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	1.9			L0.2			L0.6		L0.2			390		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	1.3			L0.2			L0.6		L0.2			630		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	1.6			L0.2			L0.6		L0.2			440		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	0.7			L0.2			L0.6		0.3			2200		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	1.9			L0.2			L0.6		L0.2			1100		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-16	3.1			L0.2			L0.6		L0.2			2000		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	1.5			L0.2			L0.6		L0.2			2300		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	1.7			L0.2			L0.6		0.36			1700		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	1.7			L0.2			L0.6		L0.2			1400		L1		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	2.5			L0.2			L0.6		L0.2			1700		L1		
Average				1.9			<L0.2			<L0.6		0.16			1497		<L1		
Median				1.8			<L0.2			<L0.6		0.10			1700		<L1		
STD				0.6								0.13			652				
Number of Samples (N)				14			14			14		14			14		14		
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94			3		L2						0.2					
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95			3		L2						0.1					
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95			5		L2						0.2					
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95			L1		L2						0.1					
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95			4		6						0.1					
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	1.2		2.16	0.073		0.564	0.134	0.135	0.12		0.13			0.032		0.046
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14			1.07			0.174		0.218			1.58					0.028
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14	1.36		1.89	0.035		0.354	0.198	0.2	0.36		0.592			0.008		0.0176
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	1.76		1.81	0.083		0.173	0.085	0.086	0.15		0.15			0.006		0.03
Average				1.44		2.49	0.064	2	0.316	0.139	0.160	0.21		0.350			0.015		0.0304
Median				1.36		2.16	0.073	1	0.264	0.134	0.168	0.15		0.15			0.008		0.029
STD				0.29		1.41	0.025	2	0.186	0.057	0.061	0.13		0.486			0.014		0.0117
Number of Samples (N)				3		9	3	5	4	3	4	3		9			3		4
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94			4		L2						0.3					
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95			2		L2						L0.3					
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95			2		2						0.1					
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95			3		L2						0.1					
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95			3		L2						0.2					
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	2.8			0.2			L0.6		L0.2			2100		L1		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-17	1.6			L0.2			L0.6		L0.2			1700		L1		
Average				2.2		2.8	<L0.2	<L2		<L0.6		<L0.2		0.17	1900		<L1		
Median				2.2		3	<L0.2	<L2		<L0.6		<L0.2		0.15	1900		<L1		
STD				0.8		0.8								0.08	283				
Number of Samples (N)				2		5	2	5		2		2		5	2		2		
Alberta SWQG	Short-term (Acute)					Equation								1**					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

Table A2-4 continued Metals at Beaverlodge Main Stem Sites (AB07GD0045, AB07GD0050, AB07GD0060), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-10																				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	20-Apr-11																				
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	31-Oct-11	290					L1			L0.2			0.9			L1			3.9		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-12	190					L1			L0.2			0.6			L1			5.2		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-May-13	210					1.2			L0.2			0.6			L1			4.4		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-13	470					1			L0.2			1.3			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	28-May-14	170					2.2			L0.2			0.4			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Oct-14	530					L1			L0.2			1.5			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	19-May-15	170					1.5			L0.2			0.3			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	23-Sep-15	780					L1			L0.2			2.5			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	3-May-16	290					1.8			L0.2			0.8			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-16	360					2.2			L0.2			0.9			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	25-Apr-17	97											0.21			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	21-Sep-17	300					3.5			L0.2			1			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	1-Jun-18	180					1.2			L0.2			0.4			L1			L3		
AB07GD0045	Beaverlodge River	BLR u/s Hwy 722 Bridge	27-Sep-18	330					1			L0.2			1.1			L1			L3		
Average				312					1.4			<L0.2			0.89			<L1			2.1		
Median				290					1.2			<L0.2			0.85			<L1			1.5		
STD				181					0.9						0.60						1.3		
Number of Samples (N)				14					13			13			14			14			14		
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	21-Sep-94																	L2			2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	17-Jan-95																	L2			7
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Apr-95																	5			11
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	15-Aug-95																	L2			2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	11-Oct-95																	L2			2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	13-May-14	132		140	0.0424	0.186	1.98		30.2	0.0066		0.0204	0.271		0.369	0.34		3.88	1.74		4.7
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	16-Jul-14			575		0.0323						0.0068			2.52			1.53			2.3
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	18-Sep-14	351		365	0.0376	0.127	0.45		8.43	0.0044		0.00836	1.88		1.96	0.24		1.77	1.14		3.36
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	12-Feb-15	227		230	0.0799	0.0809	1.39			0.0069		0.0071	0.518		0.524	250		0.67	2.39		3.3
Average				237		328	0.0533	0.1066	1.27		19.32	0.0060		0.01067	0.890		1.343	83.53		1.87	1.76		4.18
Median				227		298	0.0424	0.1040	1.39		19.32	0.0066		0.00773	0.518		1.242	0.34		1.0	1.74		3.30
STD				110		189	0.0232	0.0656	0.77		15.39	0.0014		0.00653	0.867		1.062	144.17		1.52	0.63		3.04
Number of Samples (N)				3		4	3	4	3		2	3		4	3		4	3		9	3		9
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94																	2			4
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95																	L2			6
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95																	2			7
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95																	4			3
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	11-Oct-95																	3			2
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	25-Apr-10																				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	20-Apr-11																				
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	31-Oct-11	190					L1			L0.2			0.5			L1			6.6		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-17	230					L1			L0.2			0.34			L1			L3		
Average				210					<L1			<L0.2			0.42			<L1		2.4	4.1		4.4
Median				210					<L1			<L0.2			0.42			<L1		2	4.1		4
STD				28											0.11					1.1	3.6		2.07
Number of Samples (N)				2					2			2			2			2		5	2		5
Alberta SWQG		**Short-term (Acute)**															**33**						
		Long-term (Chronic)												**0.8**			**15**						**30**
CCME		**Guideline Value**																		**120**			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-5 Metals at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94				33				1.00				80	L1				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95				L5				0.80				96	L1				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95				494				2.00				87	L1				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95				L5				1.40				60	L1				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95				L5				1.20				94	L1				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Nov-05																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07																	
Average							107				1.28				83	<L1				
Median							3				1.20				87	<L1				
STD							217				0.46				15					
Number of Samples (N)							5				5.00				5	5				
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95				57				0.80				101	L1				
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95				614				2.40				107	L1				
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95				90				1.30				85	L1				
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95				6				0.80				92	L1				
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10																	
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11	L0.5				24			1.00		20		40			L5		
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	0.002	0.015	18.9		2820	0.78		1.32	22.3	23.2	47.5	78	L0.009		0.07	L0.003	0.008
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14		L0.002			828			2.25		44		101			0.026		L0.001
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L0.001	L0.002	1.8		1120	0.98		1.47	54.8	55.7	91.6	119	L0.009		0.0391	L0.003	L0.001
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	0.003	0.005	3.86		131	0.91		1.20	31.7	37.5	73.6	88	0.012		0.014	L0.003	0.002
Average				0.064	0.006	8.19	191.8	985	0.89		1.39	36.3	36.1	70.9	90	0.289		0.5298	<L0.003	0.003
Median				0.003	0.003	3.86	73.5	828	0.91		1.30	31.7	37.5	73.6	92	0.5		0.0391	<L0.003	0.001
STD				0.124	0.007	9.34	283.6	1125	0.10		0.58	16.7	14.8	22.2	22	0.264		1.1016		0.004
Number of Samples (N)				4	4	3	4	5	3.00		9.00	3	5	3	9	7		5	3	4
Alberta SWQG		Short-term (Acute)				50 **							2900							
		Long-term (Chronic)			0.25	100 **					5.00		1500							
CCME		Guideline Value																		

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Classification: Public

Table A2-5 continued Metals at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94	45					L1			L1		L1				1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95	63					L1			L1		L1				2
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95	26					L1			2		4				5
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95	40					L1			1		2				5
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95	67					L1			L1		L1	L1			L1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04		37.4													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04		38.4													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04		37.8													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05		33.6													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05		23.5													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Nov-05															
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06		37.2													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06		29.1													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06		36.5													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06		36.7													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06		36.5													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06		43.3													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06		43.2													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06		47.6													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06		68.2													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06		32.6													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06		51.8													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06		51.1													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06		51.7													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06		61.7													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06		73.5													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07		34.9													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07		25.6													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07		25.8													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07		25.1													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07		27.4													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07		28.4													
Average				48	39.9				<L1			0.9		1.5				3
Median				45	37.0				<L1			0.5		0.5				2
STD				17	13.2							0.7		1.5				2
Number of Samples (N)				5	26				5			5		5	1			5
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95	62					L1			L1		L1				1
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	25					L1			2		4				6
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	43					L1			1		L1				5
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95	46					L1			1		L1	L1			L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10	37														
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11			19			0.03			L2		L5				2
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	31		29.5	0.01		0.037	0.165		0.658	0.5	2.54	L1	2.14		2.52
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	58		51.9			0.024			0.438		0.87	L1			2.16
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	49		47.9	0.004		0.0209	0.084		0.454	0.2	1.53	L1	1.07		2
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	51		52.7	0.016		0.026	0.101		0.143	0.2	0.25	L1	1.98		2.4
Average				45		40.2	0.01		0.2375	0.117		0.799	0.3	1.47	<L1	1.73		2.62
Median				46		47.9	0.01		0.037	0.101		0.658	0.2	0.87	<L1	1.98		2.16
STD				12		15.1	0.006		0.2490	0.043		0.542	0.2	1.29		0.58		1.78
Number of Samples (N)				9		5	3		9	3		9	3	9	5	3		9
Alberta SWQG		Short-term (Acute)																7
		Long-term (Chronic)							*Equation			*Equation						*Equation
CCME		Guideline Value																

*values are reported in ug/L unless otherwise reported

Classification: Public

Table A2-5 continued Metals at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94			564		L0.04		5400			12					46			1	27000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95			1070		L0.04		5900			18					55			L1	32000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95			3810		L0.04		7900			8					116			2	9000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95			485		L0.04		3800			12					35			2	20000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95			326		L0.04		4500			18					91			2	58000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04		L20				4.2					11.1								23600
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04		L2				3.8					11.2								29800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04		557				3.4					10.21								10700
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05		910				11.2					8.29								19500
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05		3130				8.3					6.18								9400
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Nov-05																			
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06		1650				10.9					9.01								24800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06		1060				10.6					7.46								14500
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06		1430				9.6					9.92								17500
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06		1440				8.5					9.62								16400
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06		1380				6.8					9.23								21600
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06		822				6					12.4								34900
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06		744				5.8					11.9								33900
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06		607				4.9					12.3								46800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06		358				12.2					28.4								102000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06		415				11.7					26.5								90000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06		133				6					17.2								43800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06		164				4.9					14.2								32300
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06		600				6.2					14.8								56500
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06		201				7.1					16.3								96200
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06		349				6.5					19								112000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07		2940				5.3					12.2								58800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07		5000				5.7					5.86								11800
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07		5090				5.5					6.03								9000
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07		2390				5.8					6.25								7500
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07		3380				4.9					7.82								9400
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07		4090				4.8					7.42								7400
Average					1494	1251		<L0.04	6.9	5500			14	11.95				68.6			1.5	35035
Median					866	564		<L0.04	6	5400			12	10.66				55			2	24800
STD					1531	1457			2.6	1567			4	5.77				33.81272			0.7	29627
Number of Samples (N)					26	5		5	26	5			5	26				5			5	31
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95			895		L0.04		5700			18					41			L1	35000
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95			4510		L0.04		7800			8					122			L1	10000
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95			683		L0.04		3900			12					33			4	23000
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95			132		L0.04		4800			14					59			L1	61000
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10	580						6000			11			19						26000
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11			300				9500		L0.02			6.3			84			L1	10000
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	221		1650				5900	2.02	2.4	8.9			5.29		56.2	0.386		0.402	9800
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	250		496		0.002		5800		8.69	15			20		84.6			1.24	38000
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L60		774		0.00118		6500	15.8	16.9	18			1.71		89.2	1.44		1.49	96000
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	787		1570		0.00407	10		4.87	5.57	14			6.36		8.93	0.521		0.57	30000
Average				374		1223		0.01246		6211	7.56	6.71	13			10.47		64.2	0.782		1.078	33880
Median				250		774		0.02		5900	4.87	5.57	14			6.36		59	0.521		0.5	28000
STD				304		1336		0.00944		1633	7.27	6.57	4			8.43		34.3	0.574		1.161	26933
Number of Samples (N)				5		9		7	1	9	3	5	9		1	5		9	3		9	10
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-5 continued Metals at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94			2		L2						0.1					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95			2		L2						0.1					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95			6		L2						0.1					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95			L1		L2						0.2					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95			2		3						L0.1					
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Nov-05							0.02									
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07																
Average						2.5		1.4						0.1					
Median						2		1						0.1					
STD						2.1		0.9						0.05					
Number of Samples (N)						5		5		1				5					
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95			3		L2						0.1					
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95			7		L2						0.2					
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95			7		L2						0.2					
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95			4		2						L0.1					
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10																
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11			L3					L0.001			L1		2000			L5
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	1.39		2.76	0.28		0.871	0.101	0.102	0.13		0.18			0.074		0.075
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14			2.92			0.312		0.171			0.44					0.049
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	1.95		2.82	0.006		0.452	0.109	0.11	0.2		0.248			0.016		0.0431
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	1.87		2.16	0.095		0.229	0.093	0.109	0.18		0.2			0.022		0.022
Average				1.74		3.68	0.127	<L2	0.466	0.101	0.099	0.17		0.235			0.037		0.5378
Median				1.87		2.92	0.095	<L2	0.382	0.101	0.109	0.18		0.2			0.022		0.049
STD				0.30		1.99	0.1397748		0.285	0.008	0.061	0.04		0.146			0.032		1.0971
Number of Samples (N)				3		9	3	4	4	3	5	3		9		1	3		5
Alberta SWQG		Short-term (Acute)				Equation								1**					
		Long-term (Chronic)				Equation			Equation					2***					
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

Table A2-5 continued Metals at Beaverlodge Main Stem Sites (AB07GD0070, AB07GD0080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94																	L2			L1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-Jan-95																	L2			3
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-95																	7			17
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	15-Aug-95																	L2			2
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	11-Oct-95																	2			L1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Aug-04																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Oct-04																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-Feb-05																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Nov-05																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	6-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	10-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-May-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	1-Jun-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	7-Jun-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	20-Jun-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	25-Apr-07																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-07																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	30-Apr-07																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-07																				
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	9-May-07																				
Average																				2.4			4.6
Median																				1			2
STD																				2.6			7.0
Number of Samples (N)																				5			5
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95																	L2			
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95																	8			20
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95																	4			3
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																	L2			L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	25-Apr-10																				
AB07GD0080	Beaverlodge River	BLR at the Mouth	20-Apr-11			90					L5			L1			L0.5			L5			L20
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	139		145	0.0471	0.284	2.29		43.7	0.0049		0.0314	0.328		0.448	0.43		5.1	2.56		6.2
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14			308		0.0075			16.2			0.0127			0.822			1.83			2.4
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	349		384	0.0202	0.181	0.3		13.5	0.0107		0.0202	0.841		0.97	0.19		2.75	0.76		3.5
AB07GD0080	Beaverlodge River	BLR at the Mouth	11-Feb-15	222		242	0.0471	0.0477	1.27			0.0072		0.0097	0.581		0.649	280		0.67	1.85		2.9
Average				237		234	0.0381	0.1301	1.29		19.0	0.0076		0.1148	0.583		0.628	93.54		2.98	1.72		6.1
Median				222		242	0.0471	0.1144	1.27		14.9	0.0072		0.0202	0.581		0.649	0.43		2.5	1.85		3.3
STD				106		119	0.0155	0.12662	1.00		17.5	0.0029		0.2155	0.257		0.287	161.48		2.39	0.91		6.3
Number of Samples (N)				3		5	3	4	3		4	3		5	3		5	3		9	3		8
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)												0.8			15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-6 Metals at Beaverlodge Tributary Sites (AB07GD0022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-10																	
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	20-Apr-11																	
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-12	L0.1		4.1			0.70			L20		52		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-May-13	L0.1		8.4			0.80			L20		51		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-13	L0.1		9.9			0.50			L20		99		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	28-May-14	L0.1		9.4			0.60			L20		43		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	19-May-15	L0.1		4.2			0.50			L20		45		L1			28	
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-15	L0.1		4.4			0.40			L20		94		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	3-May-16	L0.1		3.9			0.40			L20		110		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-16	L0.1		6.2			0.59			L20		50		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-17	L0.1		17			0.27			L20		24		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-17	L0.1		6.3			0.61			L20		50		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	1-Jun-18	L0.1		5.6			0.60			33		55		L1				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	27-Sep-18	L0.1		L3			0.50			25		50		L1				
Average				L0.1		6.7			0.54			13		60		<L1				
Median				L0.1		5.9			0.55			10		51		<L1				
STD						4.1			0.14			8		26						
Number of Samples (N)				12		12			12.00			12		12		12			1	
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-10	39														
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	20-Apr-11	39														
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-12	43			0.0065			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-May-13	41			0.0069			L0.3			L1			0.7		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-13	67			L0.005			L0.3			L1			0.5		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	28-May-14	36			0.0098			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	19-May-15	37			190			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-15	74			L0.02			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	3-May-16	71			L0.02			L0.3			L1			0.8		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-16	40			L0.02			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-17	19					L0.02	L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-17	43			L0.02			L0.3			L1			L0.2		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	1-Jun-18	45			L0.02			L0.3			L1			0.4		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	27-Sep-18	42			L0.02			L0.3			L1			1.1		
Average				45			17.2805			<L0.3			<L1			0.4		
Median				42			0.01			<L0.3			<L1			0.1		
STD				15			57.2846									0.4		
Number of Samples (N)				14			11		1	12			12			12		
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								Equation			Equation						Equation
CCME	Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-6 continued Metals at Beaverlodge Tributary Sites (AB07GD0022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-10	650						6900			11			44						6800
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	20-Apr-11	900						7700			12			290						6900
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-12	680						6600	L20		12			28			0.2			5900
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-May-13	330						6700	L20		12			11			0.5			7100
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-13	120						4900	L20		20			73			0.5			11000
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	28-May-14	240						3600	L20		11			35			0.3			5500
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	19-May-15	170						4800	L20		11			L4			L0.2			7800
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-15	120						5400	L20		21			43			0.9			20000
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	3-May-16	L60					5.6		L20		19			11			0.4			19000
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-16	190					4.2		L20		13			L4			L0.2			7500
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-17	190					4.2		L20		6.1			5.4			0.29			2500
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-17	190					3.9		L20		16			7			L0.2			6000
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	1-Jun-18	440					4.9		L20		13			12			0.3			6800
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	27-Sep-18	260					2.1		L20		13			4.4			0.3			5300
Average				322					4.2	5825	<L20		13.6			40.6			0.33			8436
Median				215					4.2	6000	<L20		12.5			11.5			0.3			6850
STD				254					1.2	1367			4.1			74.8			0.23			5029
Number of Samples (N)				14					6	8	12		14			14			12			14
Alberta SWQG		**Short-term (Acute)**						**0.013**														
		Long-term (Chronic)		**300**				**0.005**													**73**	
CCME		**Guideline Value**																				

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-10																
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	20-Apr-11																
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-12	1			L0.2			L0.6		L0.2			2100		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-May-13	1.4			L0.2			L0.6		L0.2			1400		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-13	1.9			L0.2			L0.6		L0.2			1500		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	28-May-14	0.9			L0.2			L0.6		L0.2			320		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	19-May-15	1			L0.2			L0.6		L0.2			830		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-15	1.1			L0.2			L0.6		L0.2			1600		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	3-May-16	1.7			L0.2			L0.6		L0.2			1900		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-16	0.57			L0.2			L0.6		L0.2			860		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-17	0.82			L0.2			L0.6		L0.2			2000		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-17	0.6			L0.2			L0.6		L0.2			640		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	1-Jun-18	1			L0.2			L0.6		L0.2			1100		L1		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	27-Sep-18	1.3			L0.2			L0.6		L0.2			230		L1		
Average				1.11			<L0.2			<L0.6		<L0.2			1207		<L1		
Median				1			<L0.2			<L0.6		<L0.2			1250		<L1		
STD				0.41											641				
Number of Samples (N)				12			12			12		12			12		12		
Alberta SWQG		Short-term (Acute)				Equation								1**					
		Long-term (Chronic)				Equation			Equation					2***					
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

Table A2-6 continued Metals at Beaverlodge Tributary Sites (AB07GD0022), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-10																				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	20-Apr-11																				
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-12	150					L1			L0.2			0.3			L1			3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-May-13	160					L1			L0.2			0.4			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-13	240					L1			L0.2			1			L1			12		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	28-May-14	140					L1			L0.2			0.4			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	19-May-15	140					L1			L0.2			0.2			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	23-Sep-15	260					L1			L0.2			1.5			L1			8.8		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	3-May-16	270					L1			L0.2			1.9			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-16	160					L1			L0.2			0.31			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	25-Apr-17	71											0.11			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	21-Sep-17	170					L1			L0.2			0.26			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	1-Jun-18	160					L1			L0.2			0.4			L1			L3		
AB07GD0022	Beavertail Creek	BTC d/s of TWP RD 720 Bridge	27-Sep-18	160					L1			L0.2			0.6			L1			L3		
Average				173					<L1			<L0.2			0.62			<L1			3.1		
Median				160					<L1			<L0.2			0.4			<L1			1.5		
STD				57											0.56						3.5		
Number of Samples (N)				12					11			11			12			12			12		
Alberta SWQG	Short-term (Acute)																33						
	Long-term (Chronic)													0.8			15						30
CCME	Guideline Value																			120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-7 Metals at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95				L5				0.80				95	L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95				169				0.70				56	L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95				L5				0.80				80	L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95				L5				0.60				87	L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	L0.1		11			0.70			32		68		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	L0.1		16			0.70			L20		63		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	L0.1		12			0.80			L20		66		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	L0.1		13			1.10			L20		91		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	L0.1		19			0.80			L20		61		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	L0.1		25			1.20			L20		100						
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	L0.1		9.4			0.80			L20		61		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	L0.1		7.6			1.10			L20		97		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	L0.1		7.4			0.80			L20		64		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	L0.1		12			1.00			L20		76		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	L0.1		16			0.36			L20		36		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	L0.1		11			1.40			31		92		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	L0.1		17			1.00			22		82		L1				
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	L0.1		L3			0.70			27		61		L1				
Average				<L0.1		12.7	44		0.89		0.73	15		73	80	0.5				
Median				<L0.1		12	3		0.80		0.75	10		67	84	0.5				
STD						5.7	83		0.26		0.10	9		18	17	0				
Number of Samples (N)				14		14	4		14.00		4.00	14		14	4	17				
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; *** L refers to below the detection limit

Classification: Public

Table A2-7 continued Metals at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95	66					L1			L1		L1				1
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95	31					L1			1		1				2
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95	53					L1			L1		L1				5
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95	68					L1			1		2	L1			L1
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04		43.3													
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04		40.7													
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04		38													
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05		61.3													
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05		27.6													
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05															
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06		30.8													
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06		28.9													
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06		28.7													
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06		27.6													
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06		33.4													
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06		30.8													
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06		34.1													
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06		37.7													
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06		43.4													
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06		41.9													
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06		43.9													
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06		48.7													
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06		53.5													
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06		54.1													
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06		47.5													
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07		50													
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07		9.65													
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07		27.3													
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07		22.6													
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07		22.5													
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07		21.7													
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10	31														
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11	22														
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	49			0.0097			L0.3			L1			1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	40			0.02			L0.3			L1			1.1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	44			0.014			L0.3			L1			1.2		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	58			0.0062			L0.3			L1			0.8		
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	44			0.009			L0.3			L1			L0.2		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	67			L0.02			0.4			L1			0.9		
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	40			L0.02			L0.3			L1			0.2		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	59			L0.02			L0.3			L1			L0.2		
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	43			L0.02			L0.3			L1			0.7		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	52			L0.02			L0.3			L1			0.67		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	23			L0.02			L0.3			L1			0.54		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	52			L0.02			0.33			L1			1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	53			L0.02			0.3			L1			1.2		
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	37			L0.02			L0.3			L1			2.2		
Average				46.6	36.525		0.0106		<L1	0.19		<L1	<L1	1		0.84		2.1
Median				46.5	35.9		0.01		<L1	0.15		<L1	<L1	0.75		0.85		1.5
STD				13.639725	12.06011		0.0031			0.08				0.7		0.55		2.0
Number of Samples (N)				20	26		14		4	14		4	14	4	1	14		4
Alberta SWQG	**Short-term (Acute)**																	**7**
	Long-term (Chronic)								***Equation**			***Equation**						***Equation**
CCME	**Guideline Value**																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-7 continued Metals at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95			1440		L0.04		3800			18					60			L1	14000
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95			1300		L0.04		5900			9					102			L1	6000
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95			476		L0.04		4000			15					106			L1	11000
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95			362		L0.04		4700			20					49			L1	14000
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04		L20				2.9					11								9400
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04		L2				2.5					10.6								8100
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04		318				2.7					10.4								7000
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05		4010				6.8					15.8								19800
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05		793				8.5					7.44								4900
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05																			
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06		1020				11.3					8.29								14600
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06		963				11.3					7.02								8000
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06		966				7.8					7.58								8100
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06		1030				6.8					7.1								6900
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06		861				4					8.25								6300
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06		751				2.9					8.61								6700
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06		796				3.6					9.16								7900
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06		628				3.2					9.5								8700
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06		511				3.4					10.2								12300
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06		266				2.7					10.7								9000
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06		355				3.4					12								12900
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06		296				3.9					12.1								12100
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06		604				4.8					14.4								16100
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06		243				4.9					15								18700
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06		838				4.9					15.7								21800
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07		509				4.2					17.3								17200
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07		1370				4.8					2.74								11000
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07		2540				7.1					7.49								7000
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07		1160				4.6					5.18								5000
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07		969				4					5.96								6600
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07		777				3.5					5.79								5600
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10	390						3200			8.6			18						7100
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11	480						9700			6.3			53						7200
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	650						9800	L20		13			67			0.4			11000
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	510						7600	L20		10			34			0.6			25000
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	240						3900	L20		11			29			0.4			9000
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	71						4200	L20		16			31			0.8			22000
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	350						3800	L20		12			52			0.4			8800
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	160					5.2		L20		20			320			0.8			17000
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	310						4000	L20		10			14			0.3			8000
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	190						3900	L20		17			91			0.9			12000
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	350					5.1		L20		10			34			0.6			11000
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	380					5.9		L20		16			14			0.47			15000
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	230					5.4		L20		6.4			13			0.37			3500
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	360					9.7		L20		15			200			0.69			17000
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	630					4.8		L20		13			74			0.6			12000
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	85					7.9		L20		11			L4			0.7			18000
Average				337	869	895		<L0.04	5.3	5269	<L20		12.9	9.82		65		79	0.57		<L1	11311
Median				350	785	888		<L0.04	4.8	4000	<L20		12.5	9.33		34		81	0.6		<L1	10200
STD				173	816	554			2.4	2292			4.1	3.62		83		29	0.19			5151
Number of Samples (N)				16	26	4		4	33	13	14		20	26		16		4	14		4	46
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Classification: Public

Table A2-7 continued Metals at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95			3		L2						0.1					
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95			2		L2						L0.1					
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95			5		L2						0.1					
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95			1		3						0.1					
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04																
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04																
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04																
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05																
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05																
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05							0.0209									
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06																
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07																
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10																
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11																
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	2.1			L0.2			L0.6		L0.2			950		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	1.8			L0.2			L0.6		L0.2			2100		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	1.8			L0.2			L0.6		L0.2			1900		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	2.6			L0.2			L0.6		L0.2			640		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	1.4			L0.2			L0.6		L0.2			690		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	2.3			L0.2			L0.6		L0.2			540		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	1.6			L0.2			L0.6		L0.2			920		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	1.7			L0.2			L0.6		L0.2			340		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	1.7			L0.2			L0.6		L0.2			2200		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	1.8			L0.2			L0.6		L0.2			3100		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	0.96			L0.2			L0.6		L0.2			2300		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	3.2			L0.2			L0.6		L0.2			550		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	2.3			0.2			L0.6		L0.2			1400		L1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	2.4			L0.2			L0.6		L0.2			550		L1		
Average				1.98		2.8	<L0.2	1.5		0.28		<L0.2		0.09	1299		<L1		
Median				1.8		2.5	<L0.2	1		0.3		<L0.2		0.1	935		<L1		
STD				0.56		1.7		1		0.07				0.03	866				
Number of Samples (N)				14		4	14	4		15		14		4	14		14		
Alberta SWQG	Short-term (Acute)					Equation								1**					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Classification: Public

Table A2-7 continued Metals at Beaverlodge Tributary Sites (AB07GD0030), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-Jan-95																	L2			4
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-95																	L2			5
AB07GD0030	Beavertail Creek	BTC at the Mouth	15-Aug-95																	3			2
AB07GD0030	Beavertail Creek	BTC at the Mouth	11-Oct-95																	L2			L1
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Aug-04																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Oct-04																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-Feb-05																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	4-Apr-05																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	6-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	10-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-May-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	7-Jun-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Jun-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-Apr-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	30-Apr-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	9-May-07																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-10																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	20-Apr-11																				
AB07GD0030	Beavertail Creek	BTC at the Mouth	31-Oct-11	160					L1			L0.2			0.4			L1			5.1		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-12	140					L1			L0.2			0.4			L1			5.3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-May-13	160					L1			L0.2			0.3			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-13	220					3			L0.2			0.5			L1			5.5		
AB07GD0030	Beavertail Creek	BTC at the Mouth	28-May-14	170					2			L0.2			0.3			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Oct-14	250					L1			L0.2			0.6			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	19-May-15	150					L1			L0.2			0.2			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	23-Sep-15	220					L1			L0.2			0.6			L1			6.4		
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-16	150					L1			L0.2			0.3			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-16	220					L1			L0.2			0.36			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	25-Apr-17	84											0.21			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	21-Sep-17	180					L1.6			L0.2			0.56			L1			L3		
AB07GD0030	Beavertail Creek	BTC at the Mouth	1-Jun-18	180					2.8			L0.2			0.5			L1			7.9		
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Sep-18	140					1			L0.2			0.5			L1			L3		
Average				173.14286					1.0			<L0.2			0.41			<L1		1.5	3.1		2.9
Median				165					0.5			<L0.2			0.4			<L1		1	1.5		3
STD				43.107838					0.9						0.14					1	2.3		2
Number of Samples (N)				14					13			13			14			14		4	14		4
Alberta SWQG	Short-term (Acute)																33						
	Long-term (Chronic)													0.8			15						30
CCME	Guideline Value																			120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-8 Metals at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07																	
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07																	
Average																				
Median																				
STD																				
Number of Samples (N)																				
Alberta SWQG		Short-term (Acute)				50 **							2900							
		Long-term (Chronic)			0.25	100 **					5.00		1500							
CCME		Guideline Value																		

* Units in µg/L unless otherwise stated; ** equation if pH <6.5

Table A2-8 continued Metals at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04		39.9													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04		36.7													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04		33.6													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05		42.3													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05		31.1													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06		64.4													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06		28.5													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06		30.6													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06		25.4													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06		23.7													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06		30.9													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06		29.9													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06		32.4													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06		37.2													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06		41.8													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06		40.2													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06		39.3													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06		43.8													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06		48.9													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06		33.8													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06		24.4													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07		49.6													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07		30.5													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07		25													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07		25.3													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07		23.6													
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07		23													
Average					34.7													
Median					32.4													
STD					9.8													
Number of Samples (N)					27													
Alberta SWQG		Short-term (Acute)																7
		Long-term (Chronic)							*Equation			*Equation						*Equation
CCME		Guideline Value																

*values are reported in ug/L unless otherwise reported

Table A2-8 continued Metals at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04		L20				2					10.1								7600
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04		L2				2.9					9.14								7300
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04		424				1.7					8.29								6200
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05		1190				5.3					10.32								11300
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05		648				8.6					7.71								5500
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06		1280				2.6					17.3								17200
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06		865				16.1					7.14								8800
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06		852				10.6					7.7								11000
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06		626				6.1					6.19								6700
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06		623				4.9					5.79								5800
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06		619				2.6					7.36								5300
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06		633				2.4					7.87								5700
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06		593				2.4					8.23								6200
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06		678				2.5					9.1								7500
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06		475				2.5					9.52								7900
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06		542				2.3					10.4								10000
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06		534				2.3					9.78								8700
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06		348				2.5					9.81								8800
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06		257				3					11.3								9900
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06		92.5				2.8					11.8								10000
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06		1190				3.4					8.78								11900
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07		833				3.7					16.9								22000
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07		2540				5.7					8.03								11200
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07		3410				5.3					5.64								7400
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07		2250				3.2					5.17								5500
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07		1810				3.1					5.97								7600
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07		1330				2.4					5.63								6300
Average					913.1				4.2					8.92								8863
Median					633.0				2.9					8.29								7600
STD					791.5				3.2					2.96								3730
Number of Samples (N)					27				27					27								27
Alberta SWQG		Short-term (Acute)						0.013														
		Long-term (Chronic)		300				0.005													73	
CCME		Guideline Value																				

*values are reported in ug/L unless otherwise reported

Table A2-8 continued Metals at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07																
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07																
Average																			
Median																			
STD																			
Number of Samples (N)																			
Alberta SWQG		Short-term (Acute)				*Equation								1* Alert Concentration					
		Long-term (Chronic)				*Equation			*Equation					2* Guideline					
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value

Table A2-8 continued Metals at Beaverlodge Tributary Sites (AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Aug-04																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	2-Sep-04																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Oct-04																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-Feb-05																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	4-Apr-05																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	13-Mar-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	6-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	10-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	18-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	17-May-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-May-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	1-Jun-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	7-Jun-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	20-Jun-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	24-Jul-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	12-Sep-06																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	19-Apr-07																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	25-Apr-07																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	26-Apr-07																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	30-Apr-07																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	3-May-07																				
AB07GD0025	Steeprock Creek	SRC u/s of confluence with Beavertail Creek	9-May-07																				
Average																							
Median																							
STD																							
Number of Samples (N)																							
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)												0.8			15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported

Table A2-9 Metals at Beaverlodge Tributary Sites (AB07GD0027, AB07GD-WD01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10																	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11																	
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	L0.1		2.5			L0.2			L20		150		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	L0.1		46			0.80			L20		90		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	L0.1		31			0.50			L20		45		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	L0.1		3.6			0.50			L20		49		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	L0.1		L3			0.80			L20		76		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	L0.1		L3			0.40			L20		47		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	L0.1		7.8			0.70			L20		72		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	L0.1		4.4			0.40			L20		54		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	L0.1		3.2			0.60			L20		64		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	L0.1		L3			0.40			L20		61		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	L0.1		L3			0.57			L20		80		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	L0.1		8.1			0.25			L20		38		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	L0.1		3.8			0.69			L20		75		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	L0.1		L3			0.60			L20		58		L1				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	L0.1		L3			0.60			L20		52		L1				
Average				<L0.1		8.0			0.53			<L20		67		<L1				
Median				<L0.1		3.2			0.57			<L20		61		<L1				
STD						12.9			0.19					27						
Number of Samples (N)				15		15			15.00			15		15		15				
AB07GD-WD01	Windsor Creek	WC	25-Apr-10																	
AB07GD-WD01	Windsor Creek	WC	21-Apr-11																	
Average																				
Median																				
STD																				
Number of Samples (N)																				
Alberta SWQG	Short-term (Acute)					50 **							2900							
	Long-term (Chronic)				0.25	100 **					5.00		1500							
CCME	Guideline Value																			

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Table A2-9 continued Metals at Beaverlodge Tributary Sites (AB07GD0027, AB07GD-WD01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10	27														
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11	52														
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	56			0.0054			L0.3			L1			2.5		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	51			0.0094			0.7			L1			0.9		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	27			0.005			L0.3			L1			0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	33			0.022			L0.3			L1			0.4		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	45			L0.005			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	33			L0.005			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	47			L0.02			L0.3			L1			0.5		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	31			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	49			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	36			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	41			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	24			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	44			L0.02			L0.3			L1			L0.2		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	41			L0.02			L0.3			L1			0.4		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	35			L0.02			L0.3			L1			1		
Average				40			0.0091			0.19			<L1			0.4466667		
Median				41			0.01			0.15			<L1			0.1		
STD				10			0.0046			0.14						0.6412785		
Number of Samples (N)				17			15			15			15			15		
AB07GD-WD01	Windsor Creek	WC	25-Apr-10			35												
AB07GD-WD01	Windsor Creek	WC	21-Apr-11			50												
Average						42.5												
Median						42.5												
STD						10.6												
Number of Samples (N)						2												
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								*Equation			*Equation						*Equation
CCME	Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-9 continued Metals at Beaverlodge Tributary Sites (AB07GD0027, AB07GD-WD01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10	110						2100			7.5			9.7						6100
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11	690						3400			13			1400						6200
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	L60						1500	L20		14			7.1			0.5			13000
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	930						1900	L20		13			310			0.3			7800
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	330						3000	L20		6.6			19			0.4			3800
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	L60						1900	L20		7.8			L4			0.6			5900
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	300						1600	L20		12			92			L0.2			7500
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	120						1600	L20		8.4			L4			0.5			5900
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	160					2.2		L20		12			100			L0.2			7700
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	140						2000	L20		8			L4			0.2			6900
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	130						1600	L20		12			65			0.3			7100
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	130					1.9		L20		8.8			L4			0.2			5200
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	280					2.1		L20		12			20			L0.2			6200
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	110					2.3		L20		6.4			L4			0.29			3800
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	570					2.4		L20		13			110			L0.2			7900
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	140					1.6		L20		10			9.7			0.4			7000
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	170					0.96		L20		11			6.7			0.2			5400
Average				257.05882					1.9	2060	<L20		10.3			127.01			0.29			6671
Median				140					2.1	1900	<L20		11			9.7			0.29			6200
STD				248.4644					0.5	640			2.5			337.06			0.16			2049
Number of Samples (N)				17					7	10	15		17			17			15			17
AB07GD-WD01	Windsor Creek	WC	25-Apr-10			200				2400					9			22				7800
AB07GD-WD01	Windsor Creek	WC	21-Apr-11			2100				7900					13			780				9700
Average						1150				5150					11			401				8750
Median						1150				5150					11			401				8750
STD						1344				3889					2.8			536				1344
Number of Samples (N)						2				2					2			2				2
Alberta SWQG	Short-term (Acute)							0.013														
	Long-term (Chronic)			300				0.005													73	
CCME	Guideline Value																					

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-9 continued Metals at Beaverlodge Tributary Sites (AB07GD0027, AB07GD-WD01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10																
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11																
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	1			L0.2			L0.2		L0.2			2300		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	1.8			0.4			L0.6		L0.2			4100		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	0.6			L0.2			L0.6		L0.2			1500		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	0.9			L0.2			L0.6		L0.2			840		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	0.8			L0.2			L0.6		L0.2			5900		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	0.6			L0.2			L0.6		L0.2			810		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	0.7			L0.2			L0.6		L0.2			7500		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	0.7			L0.2			L0.6		L0.2			940		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	0.5			L0.2			L0.6		L0.2			6100		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	0.6			L0.2			L0.6		L0.2			2900		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	L0.5			L0.2			L0.6		L0.2			3000		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	L0.5			L0.2			L0.6		L0.2			2300		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	0.78			L0.2			L0.6		L0.2			9500		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	0.7			L0.2			L0.6		L0.2			810		L1		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	0.8			L0.2			L0.6		L0.2			2000		L1		
Average				0.73			0.12			<L0.6		<L0.2			3367		<L1		
Median				0.7			0.1			<L0.6		<L0.2			2300		<L1		
STD				0.36			0.08								2705				
Number of Samples (N)				15			15			15		15			15		15		
AB07GD-WD01	Windsor Creek	WC	25-Apr-10																
AB07GD-WD01	Windsor Creek	WC	21-Apr-11																
Average																			
Median																			
STD																			
Number of Samples (N)																			
Alberta SWQG		**Short-term (Acute)**	**Equation**		**Equation**									**1****					
		Long-term (Chronic)	**Equation**		**Equation**			**Equation**						**2*****					
CCME		**Guideline Value**																	

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Table A2-9 continued Metals at Beaverlodge Tributary Sites (AB07GD0027, AB07GD-WD01), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-10																				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	20-Apr-11																				
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Apr-11	170					L1			L0.2			0.3			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	31-Oct-11	160					L1			L0.2			0.6			L1			4.9		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-12	78					2.4			L0.2			0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-May-13	100					L1			L0.2			0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-13	160					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	28-May-14	100					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Oct-14	150					L1			L0.2			0.2			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	19-May-15	100					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	23-Sep-15	150					L1			L0.2			0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	3-May-16	120					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-16	160					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	25-Apr-17	76											L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	21-Sep-17	150					L1			L0.2			L0.1			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	1-Jun-18	130					L1			L0.2			0.2			L1			L3		
AB07GD0027	Steeprock Creek	SRC u/s Hwy 671	27-Sep-18	130					L1			L0.2			0.1			L1			L3		
Average				129					0.6			<L0.2			0.14			<L1			1.7		
Median				130					0.5			<L0.2			0.1			<L1			1.5		
STD				32					0.5						0.15						0.9		
Number of Samples (N)				15					14			14			15			15			15		
AB07GD-WD01	Windsor Creek	WC	25-Apr-10																				
AB07GD-WD01	Windsor Creek	WC	21-Apr-11																				
Average																							
Median																							
STD																							
Number of Samples (N)																							
Alberta SWQG		**Short-term (Acute)**															**33**						
		Long-term (Chronic)												**0.8**			**15**						**30**
CCME		**Guideline Value**																		**120**			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-10 Metals at Redwillow and Wapiti River Sites (AB07GD0090, AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94				22				0.40				169	L1				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95				18				0.30					L1				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95				489				1.80				141	L1				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95				101				0.50				155	L1				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95				L5				0.40				176	L1				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10																	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	L0.5		14			L1			L20		59		L5				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	0.001	L0.001	12.4		2630	0.30		0.71	5.78	8.3	92.1	130	L0.009		0.073	L0.003	0.006
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14		L0.002			173			0.92		21.6		170			L0.008		L0.001
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	L0.001	L0.002	2.67		162	0.51		0.56	31.55	31.9	164	176	L0.009		L0.008	0.021	0.0208
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	0.004	0.004	1.29		233	0.43		0.51	13.3	18.6	163	171	L0.009		0.008	0.005	0.005
Average				0.064	0.004	7.59	127	800	0.44		0.68	15.16	20.1	119.5	161	0.557		0.022	0.009	0.0081
Median				0.003	0.003	7.54	22	203	0.46		0.51	11.65	20.1	127.6	170	0.5		0.006	0.005	0.0055
STD				0.124	0.004	6.54	206	1221	0.10		0.46	11.35	9.7	52.5	17	0.767		0.034	0.010	0.0088
Number of Samples (N)				4	4	4	5	4	4		9	4	4	4	8	9		4	3	4
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10																	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11																	
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	L0.1		46			0.20			L20		180		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	L0.1		9.7			0.20			L20		130		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	L0.1		15			0.30			L20		92		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	L0.1		L3			0.30			L20		190		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	L0.1		8.5			L0.2			L20		110		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	L0.1		5.7			0.30			L20		160		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	L0.1		8.3			0.20			L20		100		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	L0.1		7.3			0.30			L20		170		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	L0.1		7.2			0.30			L20		120		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	L0.1		5.3			0.26			L20		160		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	L0.1		14			0.21			L20		84		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	L0.1		4.7			0.24			L20		170		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	L0.1		4.7			0.20			L20		140		L1				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	L0.1		L3			0.20			L20		150		L1				
Average				<L0.1		9.96			0.24			<L20		140		<L1				
Median				<L0.1		7.25			0.23			<L20		145		<L1				
STD						11.09			0.06					34						
Number of Samples (N)				14		14			14.00			14		14		14				
Alberta SWQG		Short-term (Acute)				50 **							2900							
		Long-term (Chronic)			0.25	100 **					5.00		1500							
CCME		Guideline Value																		

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Table A2-10 continued Metals at Redwillow and Wapiti River Sites (AB07GD0090, AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94	53					L1			1		L1				2
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95	65					L1			1		L1				1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95	38					L1			2		4				6
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95	47					L1			2		1				5
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95	54					L1			1		L1	L1			3
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10	34														
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	24			L0.025			L1.5			L5			8.6		
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	37		33.7	0.008		0.031	0.059		0.477	0.4	2.21	L1	0.93		1.84
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14	45		40.5			0.01			0.093		0.28	L1			1.76
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	36		36.3	0.003		0.00753	0.024		0.0638	0.1	0.285	L1	1.25		1.44
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	63		57.9	0.012		0.016	0.059		0.078	L0.1	0.33	L1	1.5		1.61
Average				45		42.1	0.009		0.28495	0.223		0.8569	0.76	1.067	<L1	3.07		2.63
Median				45		38.4	0.01		0.5	0.059		1	0.25	0.5	<L1	1.38		1.84
STD				13		10.9	0.004		0.25510	0.352		0.7614	1.17	1.258		3.69		1.73
Number of Samples (N)				11		4	4		9	4		9	4	9	5	4		9
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10	34														
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11	49														
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	68			L0.005			L0.3			L1			0.7		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	49			0.0093			L0.3			L1			0.7		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	37			0.04			L0.3			L1			1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	57			L0.005			L0.3			L1			0.6		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	42			0.0073			L0.3			L1			L0.2		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	55			L0.02			L0.3			L1			0.7		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	38			L0.02			L0.3			L1			L0.2		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	57			L0.02			L0.3			L1			L0.2		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	42			L0.02			L0.3			L1			0.5		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	53			L0.02			L0.3			L1			0.65		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	37			L0.02			L0.3			L1			0.51		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	58			L0.02			L0.3			L1			0.68		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	56			L0.02			L0.3			L1			0.9		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	55			L0.02			L0.3			L1			1.4		
Average				49			0.0108			<L0.3			<L1			0.62		
Median				51			0.01			<L0.3			<L1			0.67		
STD				10			0.0088									0.36		
Number of Samples (N)				16			14			14			14			14		
Alberta SWQG	Short-term (Acute)																	7
	Long-term (Chronic)								Equation			Equation						Equation
CCME	Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-10 continued Metals at Redwillow and Wapiti River Sites (AB07GD0090, AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94			164		L0.04		700			12					7			L1	8000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95			156		L0.04		900			14					6			L1	15000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95			3680		L0.04		3700			9					68			1	8000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95			586		L0.04		600			10					15			L1	6000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95			83		L0.04		1300			14					6			L1	23000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10	170						1000			8.1			25						5000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	75						7200	L20		6.7			7.6			L1			8300
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	23.4		1190				1100	1.43	1.71	8.9			1.83		20.1	0.298		0.321	5600
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14	L60		67.2		0.0013		1600		6.7	12			L4		10.4			1.07	22000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	L60		81		0.00084		1800	9.44	9.73	12			0.24		6.77	1.18		1.21	49000
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	36.3		168		0.00292	3.1		3.58	4.23	15			3.12		4.66	0.633		0.634	21000
Average				60.78		686.1		0.0131325		1990	6.11	5.59	11.1			6.63		15.99	0.653		0.693	15536
Median				33.15		164		0.02		1200	6.51	5.47	12			2.56		7	0.567		0.5	8300
STD				56.61		1181.2		0.009496026		2035	4.26	3.43	2.7			9.34		20.15	0.378		0.315	13092
Number of Samples (N)				6		9		8	1	10	4	4	11			6		9	4		9	11
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10	190						880			8.2			25						4200
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11	L60						2000			12			14						12000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	100						860	L20		15			8.9			0.8			12000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	L60						740	L20		11			6.2			0.5			8800
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	82						530	L20		7.5			L4			0.3			3800
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	L60						840	L20		13			4.9			0.7			9300
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	L60						550	L20		9.1			L4			0.3			4700
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	L60					0.85		L20		13			L4			0.7			14000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	L60						590	L20		8.5			4.3			0.3			4000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	L60						830	L20		14			4.3			0.7			12000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	L60					0.53		L20		9.2			L4			0.4			5500
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	89					0.51		L20		13			L4			0.36			5800
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	150					1.5		L20		8.7			11			0.27			4700
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	L60					1.1		L20		13			9.7			0.72			13000
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	64					0.72		L20		11			4.4			0.5			5700
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	L60					0.61		L20		12			L4			0.6			6600
Average				61					0.83	869	<L20		11.1			6.5			0.51			7881
Median				30					0.72	830	<L20		11.5			4.4			0.5			6200
STD				50					0.36	446			2.3			6.2			0.19			3645
Number of Samples (N)				16					7	9	14		16			16			14			16
Alberta SWQG		Short-term (Acute)						0.013														
		Long-term (Chronic)		300				0.005													73	
CCME		Guideline Value																				

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-10 continued Metals at Redwillow and Wapiti River Sites (AB07GD0090, AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94			3		L2						0.1					
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95			3		L2						0.1					
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95			7		L2						0.2					
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95			2		L2						0.1					
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95			4		3						L0.1					
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10																
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	L2.5			L0.1					L0.1			2000		L5		
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	0.48		1.71	0.029		0.732	0.086	0.087	L0.04		0.12			0.04		0.054
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14			0.719			0.088		0.182			0.21					0.02
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	0.786		0.902	0.01		0.0929	0.143	0.145	0.15		0.158			0.012		0.0118
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	1.22		1.28	0.028		0.119	0.08	0.08	0.14		0.21			0.044		0.045
Average				0.934		2.623	0.029	1.4	0.2580	0.103	0.124	0.09		0.139			0.649		0.0327
Median				1.003		2	0.029	1	0.1060	0.086	0.116	0.10		0.12			0.042		0.0325
STD				0.370		1.967	0.016	0.9	0.3163	0.035	0.049	0.06		0.058			1.234		0.0200
Number of Samples (N)				4		9	4	5	4	3	4	4		9	1		4		4
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10																
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11																
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	0.9			L0.2			L0.6		L0.2			2000		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	0.7			L0.2			L0.6		L0.2			1700		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	0.8			L0.2			L0.6		L0.2			1700		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	0.9			L0.2			L0.6		L0.2			1400		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	0.5			L0.2			L0.6		L0.2			1200		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	L0.5			L0.2			L0.6		L0.2			1500		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	0.8			L0.2			L0.6		L0.2			1400		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	L0.5			L0.2			L0.6		L0.2			1500		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	0.8			L0.2			L0.6		L0.2			1300		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	0.72			L0.2			L0.6		L0.2			2100		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	0.69			L0.2			L0.6		L0.2			2400		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	0.73			L0.2			L0.6		L0.2			1600		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	0.6			L0.2			L0.6		L0.2			2000		L1		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	1			L0.2			L0.6		L0.2			1900		L1		
Average				0.69			<L0.2			<L0.6		<L0.2			1693		<L1		
Median				0.73			<L0.2			<L0.6		<L0.2			1650		<L1		
STD				0.22											345				
Number of Samples (N)				14			14			14		14			14		14		
Alberta SWQG	Short-term (Acute)					Equation								1**					
	Long-term (Chronic)					Equation			Equation					2***					
CCME	Guideline Value																		

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Table A2-10 continued Metals at Redwillow and Wapiti River Sites (AB07GD0090, AB07GD0095), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94																	L2			1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95																	L2			1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95																	8			16
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95																	4			3
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	12-Oct-95																	L2			1
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	25-Apr-10																				
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Apr-11	97					L5			L0.1			L0.5			5.4			L15		
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	101		110	0.022	0.211	1.31		36.1	0.0028		0.0306	0.13		0.209	0.15		4.44	0.6		5.5
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14			208		L0.0009			2.41			0.0039			0.415			0.68			0.9
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	230		236	0.0701	0.0709	0.25		2.76	0.0105		0.0124	0.487		0.494	0.16		0.491	0.86		0.873
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	11-Feb-15	215		220	0.0439	0.0444	0.96			0.0083		0.0128	0.471		0.491	180		0.56	1.24		1.8
Average				161		194	0.0453	0.0817	1.26		13.76	0.0179		0.0149	0.335		0.402	46.43		2.352	2.55		3.453
Median				158		214	0.0439	0.0577	1.14		2.76	0.0094		0.0126	0.361		0.453	2.78		1	1.05		1
STD				72		57	0.0241	0.0910	0.94		19.35	0.0216		0.0112	0.174		0.134	89.08		2.596	3.31		4.947
Number of Samples (N)				4		4	3	4	4		3	4		4	4		4	4		9	4		9
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-10																				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Apr-11																				
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	31-Oct-11	220					2.3			L0.2			0.6			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-12	140					L1			L0.2			0.3			L1			4.3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-May-13	92					2.1			L0.2			0.1			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-13	180					L1			L0.2			0.3			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	28-May-14	110					L1			L0.2			0.1			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Oct-14	180					L1			L0.2			0.4			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	19-May-15	94					L1			L0.2			L0.1			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	23-Sep-15	190					L1			L0.2			0.4			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	3-May-16	120					2			L0.2			0.1			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-16	160					L1			L0.2			0.13			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	25-Apr-17	110											0.16			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	21-Sep-17	170					L1			L0.2			0.35			L1			4.3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	1-Jun-18	140					L1			L0.2			0.2			L1			L3		
AB07GD0095	Redwillow River	RWR d/s of RR 121 Bridge	27-Sep-18	150					L1			L0.2			0.3			L1			L3		
Average				147					0.9			<L0.2			0.25			<L1			1.9		
Median				145					0.5			<L0.2			0.25			<L1			1.5		
STD				39					0.7						0.16						1.02		
Number of Samples (N)				14					13			13			14			14			14		
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)												0.8			15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-11 Metals at Redwillow and Wapiti River Sites (AB07GE0005, AB07GD-RW03, AB07GC0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ag Diss.	Ag Total	Al Diss.	Al Extr.	Al Total	As Diss.	As Extr.	As Total	B Diss.	B Total	Ba Diss.	Ba Total	Be Diss.	Be Extr.	Be Total	Bi Diss.	Bi Total
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97				0.0133			L0.4		L20					L0.5			
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98		L0.005			190			0.45		21.1		187			L0.04		0.005
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	0.002	0.016	13.8		2980	0.52		1.06	12.5	14.4	75.8	113	L0.009		0.078	0.003	0.011
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14		0.003			281			1.28		28.5		152			0.01		L0.001
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.001	L0.002	2.58		356	0.48		0.62	26	26.1	127	146	L0.009		0.011	L0.003	L0.001
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	0.002	0.004	2.21		246	0.73		0.89	23.7	24.7	124	139	L0.009		0.019	L0.003	0.003
Average				0.0015	0.005	6.20		811	0.58		0.86	18.1	23.0	108.9	147	<L0.009		0.028	<L0.003	0.004
Median				0.002	0.003	2.58		281	0.52		0.89	18.1	24.7	124	146	<L0.009		0.019	<L0.003	0.003
STD				0.0009	0.006	6.59		1214	0.13		0.33	8.0	5.5	28.7	27			0.029		0.004
Number of Samples (N)				3	5	3	1	5	3.00	1.00	5.00	4	5	3	5	3	1	5	3	5
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11	L0.1				2			L0.2		L20		150			L1		
Average																				
Median																				
STD																				
Number of Samples (N)				1				1			1		1					1		
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	0.002	0.021	32.8		3150	0.20		0.66	6.91	10.3	78.8	119	L0.009		0.076	0.007	0.009
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14		L0.002			103			0.14		8.3		82.2			L0.008		L0.001
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.001	L0.002	17.6		96.9	0.11		0.14	8.67	8.8	92.9	105	L0.009		L0.008	L0.003	L0.001
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	0.001	0.004	6.05		458	0.11		0.21	7.49	9.4	91.9	110	L0.009		0.017	L0.003	L0.001
Average				0.001	0.007	18.82		952.0	0.14		0.29	7.69	9.2	87.9	104.1	<L0.009		0.025	0.003	0.003
Median				0.001	0.003	17.6		280.5	0.11		0.18	7.49	9.1	91.9	107.5	<L0.009		0.011	0.002	0.001
STD				0.0008	0.0096	13.4		1475	0.05		0.25	0.90	0.9	7.9	15.7			0.034	0.003	0.004
Number of Samples (N)				3	4	3		4	3.00		4.00	3	4	3	4	3		4	3	4
Alberta SWQG		**Short-term (Acute)**				**50 ****							**2900**							
		Long-term (Chronic)			**0.25**	**100 ****					**5.00**		**1500**							
CCME		**Guideline Value**																		

* Units in µg/L unless otherwise stated; ** equation if pH <6.5; ***L refers to below the detection limit

Table A2-11 continued Metals at Redwillow and Wapiti River Sites (AB07GE0005, AB07GD-RW03, AB07GC0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ca Diss. (mg/L)	Ca Extr. (mg/L)	Ca Total (mg/L)	Cd Diss.	Cd Extr.	Cd Total	Co Diss.	Co Extr.	Co Total	Cr Diss.	Cr Total	Cr Hexavalent Diss.	Cu Diss.	Cu Extr.	Cu Total
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97	54.2				L0.1			0.6						0.9	
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98	46.5					L0.02			0.08		0.37				1.58
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	37		32.1	0.009		0.042	0.128		0.64	0.1	2.33	L1	1.39		2.47
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14	44		39.9			0.011			0.174		0.34	L1			2.07
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	33		32.8	L0.002		0.005	0.008		0.093	L0.1	0.51	L1	1.36		1.49
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	56		55.1	0.013		0.023	0.084		0.121	0.1	0.32	L1	2		2.44
Average				45.1		40.0	0.008		0.018	0.073		0.222	<L0.1	0.77	<L1	1.58		2.01
Median				45.3		36.4	0.009		0.011	0.084		0.121	<L0.1	0.37	<L1	1.39		2.07
STD				9.1		10.7	0.006		0.015	0.061		0.237		0.87		0.36		0.46
Number of Samples (N)				6		4	3	1	5	3	1	5	3	5	4	3	1	5
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11			5.6			0.005			L0.3		L1				2.5
Average																		
Median																		
STD																		
Number of Samples (N)						1			1			1		1				1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	40		35.6	0.011		0.037	0.107		0.493	0.1	3.04	L1	1.46		2.18
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	35		32.7			0.011			0.036		0.26	L1			0.52
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	46		45.5	0.004		0.008	L0.002		0.012	L0.1	0.24	L1	0.64		0.64
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	51		51.5	0.008		0.02	0.008		0.086	L0.1	0.37	L1	0.56		1.05
Average				43		41.3	0.008		0.019	0.039		0.157	<L0.1	0.98	<L1	0.89		1.10
Median				43		40.6	0.008		0.016	0.008		0.061	<L0.1	0.32	<L1	0.64		0.85
STD				7		8720.2	0.004		0.013	0.059		0.226		1.38		0.50		0.76
Number of Samples (N)				4		4	3	0	4	3	0	4	3	4	4	3	0	4
Alberta SWQG		Short-term (Acute)																7
		Long-term (Chronic)							Equation			Equation						Equation
CCME		Guideline Value																

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-11 continued Metals at Redwillow and Wapiti River Sites (AB07GE0005, AB07GD-RW03, AB07GC0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Fe Diss.	Fe Extr.	Fe Total	Hg Extr.	Hg Total	K Diss. Filtered (mg/L)	K Total	Li Diss.	Li Total	Mg Diss. (mg/L)	Mg Extr. (mg/L)	Mg Total (mg/L)	Mn Diss.	Mn Extr.	Mn Total	Mo Diss.	Mo Extr.	Mo Total	Na Diss. Filtered (mg/L)
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97		L10		L0.2	0.02	1.2				11.9				0.5			L0.05		12000
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98			96		L0.04	1.9			7.8	12.5					10.8			1.3	28300
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	124		1580			3		2.12	2.42	8.5			4.35		34.7	0.368		0.372	7000
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14	L60		176		0.00158		2900		7.36	13			L4		30.9			1.28	27000
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L60		170		0.00107		1900	9.21	9.61	11			0.13		14.5	1.21		1.31	44000
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	239		854		0.00411	6.8		4.76	5.28	14			4.46		6.73	0.674		0.701	26000
Average				106		575		0.00935	3.2	2400	5.36	6.49	11.8			2.74		19.5	0.751		0.993	24050
Median				77		176		0.00411	2.5	2400	4.76	7.36	12.2			3.18		14.5	0.674		1.28	26500
STD				99		640		0.00979	2.5	707	3.58	2.75	1.9			2.07		12.5	0.426		0.432	13149
Number of Samples (N)				4	1	5	1	5	4	2	3	5	6			4	1	5	3	1	5	6
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11			60				1500		L0.02			14			7			0.5	13000
Average																						
Median																						
STD																						
Number of Samples (N)						1				1		1			1			1			1	1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	57.6		1290			0.56		3.06	3.6	8.5			1.57		13.2	0.539		0.57	4400
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L60		81.7		0.00085	0.4			2.78	8.4			L4		3.06			0.663	2100
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L60		43.3		0.00053	0.48		4.3	4.61	11			0.29		1.92	0.638		0.683	5100
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	8.7		230		0.00321	0.45		3.91	3.96	12			0.28		4.64	0.647		0.698	6300
Average				31.6		411.3		0.00153	0.47		3.76	3.74	10.0			1.04		5.71	0.608		0.654	4475
Median				30		155.9		0.00085	0.47		3.91	3.78	9.8			0.93		3.85	0.638		0.673	4750
STD				20.0		591.3		0.00146	0.07		0.63	0.76	1.8			0.88		5.12	0.060		0.057	1767
Number of Samples (N)				4		4		3	4		3	4	4			4		4	3		4	4
Alberta SWQG		Short-term (Acute)						0.013														
		Long-term (Chronic)		300				0.005													73	
CCME		Guideline Value																				

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A2-11 continued Metals at Redwillow and Wapiti River Sites (AB07GE0005, AB07GD-RW03, AB07GC0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Ni Diss.	Ni Extr.	Ni Total	Pb Diss.	Pb Extr.	Pb Total	Sb Diss.	Sb Total	Se Diss.	Se Extr.	Se Total	Si Diss.	Si Total	Sn Diss.	Sn Extr.	Sn Total
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97		0.4			0.32					L0.4		1300			0.2	
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98			1.04			0.088					L0.5					L0.1
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	0.71		2.13	0.077		0.996	0.116	0.117	0.16		0.19			0.005		0.035
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14			1.53			0.171		0.2			0.24					0.033
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	0.951		1.18	0.013		0.123	0.138	0.14	L0.04		0.15			0.003		0.033
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	1.63		1.91	0.076		0.218	0.101	0.102	0.24		0.24			0.009		0.024
Average				1.097		1.56	0.055		0.319	0.118	0.140	0.14		0.21			0.006		0.035
Median				0.951		1.53	0.076		0.171	0.116	0.129	0.16		0.24			0.005		0.033
STD				0.477		0.46	0.037		0.382	0.019	0.043	0.11		0.04			0.003		0.009
Number of Samples (N)				3	1	5	3	1	5	3	4	3	1	5	1		3	1	5
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11			1					L0.0002			L0.2		2300			L1
Average																			
Median																			
STD																			
Number of Samples (N)						1					1			1		1			1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	0.416		1.79	0.037		0.884	0.114	0.115	0.28		0.35			0.017		0.083
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14			0.025			0.075		0.054			0.53					0.01
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	0.053		0.198	0.012		0.04	0.052	0.052	0.28		0.28			0.006		0.006
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	0.301		0.576	L0.004		0.163	0.052	0.058	0.39		0.45			L0.003		0.011
Average				0.257		0.647	0.017		0.291	0.073	0.070	0.32		0.40			0.008		0.028
Median				0.301		0.387	0.012		0.119	0.052	0.056	0.28		0.4			0.006		0.011
STD				0.186		0.796	0.018		0.399	0.036	0.030	0.06		0.11			0.008		0.037
Number of Samples (N)				3		4	3		4	3	4	3		4			3		4
Alberta SWQG		Short-term (Acute)		Equation		Equation								1**					
		Long-term (Chronic)		Equation		Equation			Equation					2***					
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **Alert Concentration; ***Guideline Value; ****L refers to below the detection limit

Table A2-11 continued Metals at Redwillow and Wapiti River Sites (AB07GE0005, AB07GD-RW03, AB07GC0015), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Sr Diss.	Sr Extr.	Sr Total	Th Diss.	Th Total	Ti Diss.	Ti Extr.	Ti Total	Tl Diss.	Tl Extr.	Tl Total	U Diss.	U Extr.	U Total	V Diss.	V Extr.	V Total	Zn Diss.	Zn Extr.	Zn Total
AB07GE0005	Redwillow River	RWR at Mouth	30-Sep-97		0.31					L0.3			L0.05			L0.05			L0.1			8	
AB07GE0005	Redwillow River	RWR at Mouth	21-Sep-98			260		0.004			3.6			0.01			0.64			0.52			1.32
AB07GE0005	Redwillow River	RWR at Mouth	12-May-14	122		123	0.0199	0.338	1.94			0.0037		0.0393	0.232		0.335	260		5.15	0.81		7.1
AB07GE0005	Redwillow River	RWR at Mouth	15-Jul-14			230		L0.0009			5.2			0.015			0.504			0.93			1.5
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	186		206	0.0058	0.0188	0.16		5.49	0.008		0.0108	0.397		0.475	0.12		0.77	1.13		1.2
AB07GE0005	Redwillow River	RWR at Mouth	11-Feb-15	220		236	0.0347	0.0428	1.09			0.0097		0.0139	0.55		0.589	200		0.69	1.11		2.1
Average				176		211	0.0201	0.0808	1.06		4.76	0.0071		0.0178	0.393		0.509	153.37		1.61	1.02		2.64
Median				186		230	0.0199	0.0188	1.09		5.2	0.008		0.0139	0.397		0.504	200		0.77	1.11		1.5
STD				50		53	0.0145	0.1447	0.89		1.02	0.0031		0.0122	0.159		0.117	136.07		1.98	0.18		2.51
Number of Samples (N)				3	1	5	3	5	3	1	3	3	1	5	3	1	5	3	1	5	3	1	5
AB07GD-RW03	Redwillow River	RWR at Mount Valley	21-Apr-11			170					L1			L0.2			0.3			L1			L3
Average																							
Median																							
STD																							
Number of Samples (N)						1					1			1			1			1			1
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	150		151	0.0536	0.27	1.64			0.0055		0.0442	0.265		0.338	180		6.61	0.88		6.8
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14			135		L0.0009						0.0044			0.248			0.36			2.7
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	182		202	L0.0008	L0.0009	0.19			L0.0004		0.0018	0.291		0.338	70		0.24	0.72		0.8
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	11-Feb-15	203		225	0.0116	0.0182	0.42			0.0033		0.008	0.325		0.373	60		0.83	0.54		3.8
Average				178		178	0.0219	0.0723	0.75			0.0030		0.0146	0.294		0.324	103		2.01	0.71		3.5
Median				182		177	0.0116	0.0093	0.42			0.0033		0.0062	0.291		0.338	70		0.60	0.72		3.3
STD				27		42	0.0280	0.1321	0.78			0.0027		0.0199	0.030		0.053	67		3.08	0.17		2.5
Number of Samples (N)				3		4	3	4	3			3		4	3		4	3		4	3		4
Alberta SWQG		Short-term (Acute)															33						
		Long-term (Chronic)												0.8			15						30
CCME		Guideline Value																		120			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

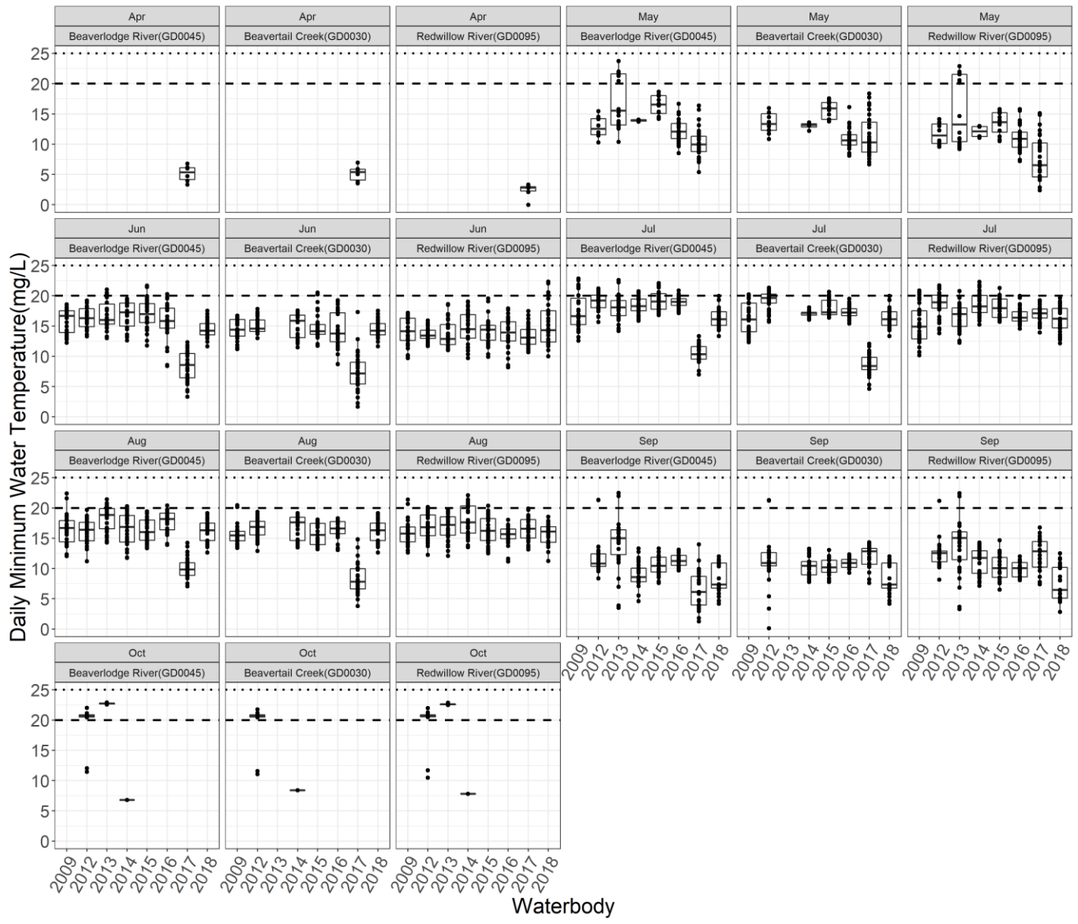


Figure A2-1. Minimum water temperature recorded for each day summarized by month. Logger data was collected in 2009, 2012-2018.



Figure A2-2. Total phosphorus (mg/L) from ACA and AEP surveys conducted from 1995 to 2018.

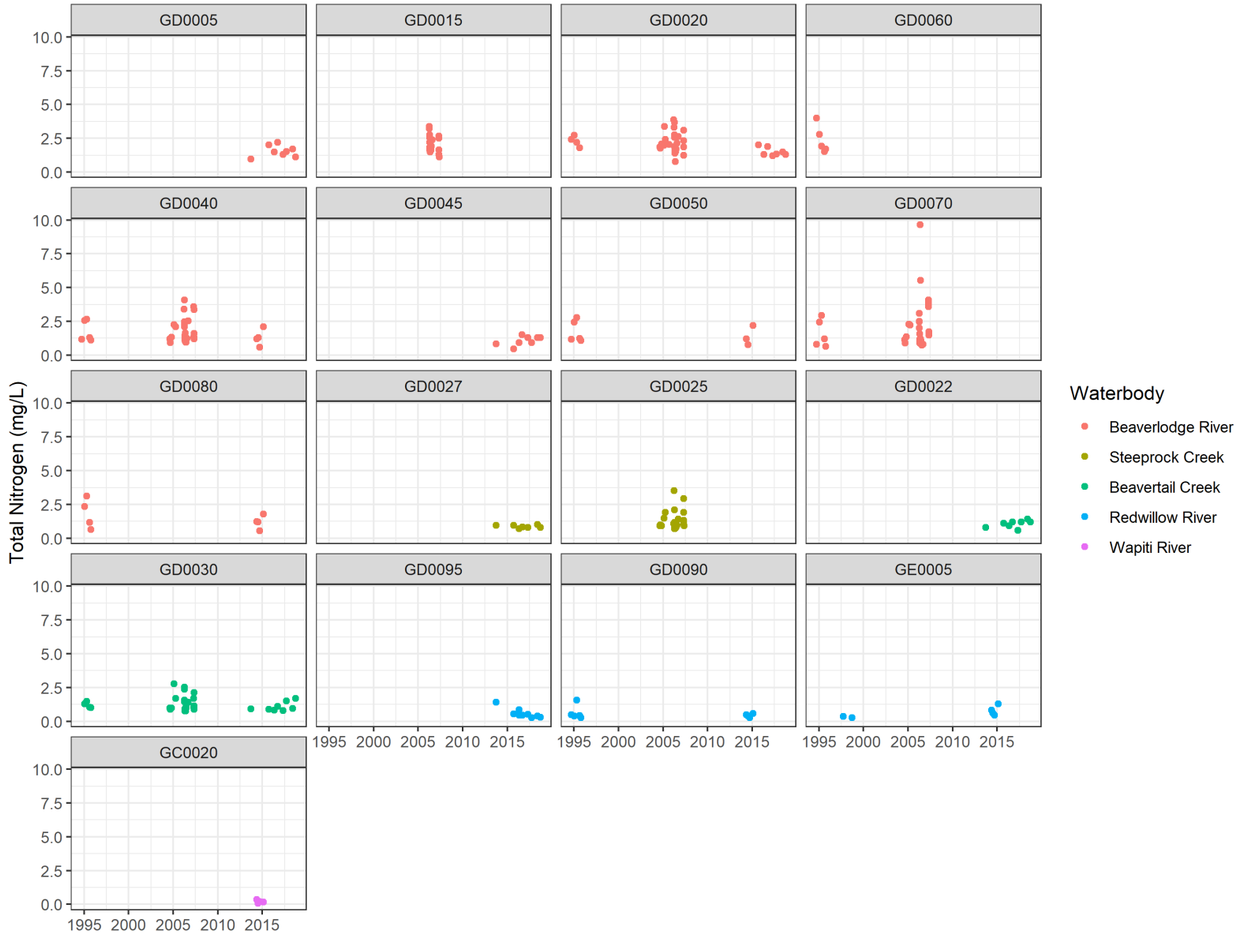


Figure A2-3 Total nitrogen (mg/L) from ACA and AEP surveys conducted from 1995 to 2018.



Figure A2-4. Total Kjeldahl Nitrogen (mg/L) from ACA and AEP surveys conducted from 1995 to 2018.



Figure A2-5. Ammonia (mg/L) from ACA and AEP surveys conducted from 1995 to 2018.

APPENDIX 3 - PESTICIDES

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0015, AB07GD0020, AB07GD0040, AB07GD0050), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alachor	Aldicarb	Aldrin	Atrazine	Bromacil	Bromoxynil	Chlorothalonil	alpha-Endosulfan	beta-Endosulfan	Chlorpyrifos ethyl dursban	Cyanazine	Diazinon	Dicamba banvel	Diclofop methyl hoegrass	Dieldrin	Dimethoate cygon
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
Number of Samples (N)					7	7	7		7	1	7	0	7	7	7	7	7	7	7
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	2-Sep-04		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	4-Apr-05		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	27-Oct-05	L0.005	L0.1	L0.005	L0.005		L0.005	L0.005	L0.005	L0.005	L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	24-Jul-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of Beavertail Creek	12-Sep-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
Number of Samples (N)				1	11	11	11		11	2	11	1	11	11	11	11	11	11	11
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	0.028	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
Number of Samples (N)					14	14	14		14	5	14		14	14	14	14	14	14	14
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95																
Number of Samples (N)																			
Alberta SWQG		Short-term (Acute)									0.06	0.06	0.02						
		Long-term (Chronic)			1	-	1.8	5	5	0.18	0.003	0.003	0.002	2	0.17	10	6.1		6.2
CCME		Guideline Value				-													

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0015, AB07GD0020, AB07GD0040, AB07GD0050), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	gamma-benzene hexachloride (Lindane)	gamma-Chlordane	Guthion (Azinphos-methyl)	Heptachlor epoxide	Linuron	Malathion	MCPA	MCPB	MCPP	Methoxychlor	Metolachlor	Metribuzin	O,P'-DDT	Parathion	Picloram tordan	Simazine	Triallate (Avadex BW)
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
Number of Samples (N)				7		7		1	7	7	7	7	7	1	1		1	7	7	7
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.005	L0.005	L0.2	L0.005	L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01	L0.005	L0.01	L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	L0.005		L0.2			L0.05	L0.005	L0.02	0.007	L0.03					L0.005	L0.01	L0.005
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
Number of Samples (N)				11	1	11	1	2	11	11	11	11	11	2	2	1	2	11	11	11
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	L0.005		L0.2		L0.02	L0.05	0.019	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	L0.005		L0.2			L0.05	L0.005	L0.02	0.017	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L0.005		L0.2		L0.02	L0.05	0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
Number of Samples (N)				14		14		5	14	14	14	14	14	5	5		5	14	14	14
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95																	
Number of Samples (N)																				
Alberta SWQG		Short-term (Acute)										10000					0.065			
		Long-term (Chronic)		0.01		0.01	*0.01	7	0.1	2.6		13	0.03	7.8	1	-	0.013	29	10	0.24
CCME		Guideline Value														-				

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0015, AB07GD0020, AB07GD0040, AB07GD0050), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Trifluralin (Treflan)	2,4-Dichlorophenoxy acetic acid	2,4-DB	2,4-Dichlorophenol	Amino-pyralid	Bentazon	alpha-Benzene-hexachloride	Bromo-methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Carbathiin carboxin	cis-1,3-Dichloropropene	Clodinafop acid metabolite	Clodinafop propargyl	Clopyralid lontrel	Desethyl atrazine
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	L0.005	L0.005	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	0.063	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
Number of Samples (N)				7	7	7	7		1	7				7		1	1	7	7
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	L0.005	0.011	L0.005	L0.01			L0.005				L0.1				0.056	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.005	L0.005	L0.005	L0.01		L0.005	L0.005	L0.1	L2	L2	L0.1	L0.3	L0.02	L0.04	L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	L0.005	0.048	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	L0.005	0.016	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
Number of Samples (N)				11	11	11	11		2	11	1	1	1	11	1	2	2	11	11
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	L0.005	0.007	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	L0.005	0.058	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	L0.005	0.041	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	L0.005	L0.005	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	L0.005	L0.005	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L0.005	0.007	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L0.005	L0.005	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
Number of Samples (N)				14	14	14	14	4	5	14				14		5	5	14	14
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95				L1					L1	L1						
Number of Samples (N)							1					1	1						
Alberta SWQG		Short-term (Acute)				560													
		Long-term (Chronic)		0.2	4	25	0.2												
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0015, AB07GD0020, AB07GD0040, AB07GD0050), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Desiso-propyl atrazine	2,4-Dichlor-prop	Disulfoton (Di-Syston)	Diuron	Ethafluralin (Edge)	Ethion	Etho-fumesate	Fenoxaprop-P-ethyl	Fluazifop	Fluroxypyr	Hexacon-azole	Imaza-methabenz-methyl	Imazamox	Imazethapyr	Iprodione	Metalaxyl-M
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	0.66	L0.02	L0.02	L0.02	L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
Number of Samples (N)				7	7	7	7	7	7	1	7	1	1	1	7	7	7	1	1
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
Number of Samples (N)				11	11	11	11	11	11	2	11	2	2	2	11	11	11	2	2
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				0.208	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
Number of Samples (N)				14	14	14	14	14	14	5	14	5	5	5	14	14	14	5	5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95																
Number of Samples (N)																			
Alberta SWQG		Short-term (Acute)																	
		Long-term (Chronic)																	
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0015, AB07GD0020, AB07GD0040, AB07GD0050), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Methomyl	Napro-pamide	O,P'-DDE	Oxy-carboxin	Penta-chloro-phenol	Phorate thimet	Propi-conazole	Pyridaben	Quinclorac	Quizalofop	Terbufos	Thia-methoxam	Trans 1,3-Dichloro-propene	Triclopyr	Vin-clozolin	1,1-Dichloro-propylene	1,2-Dibromo-ethane	4-Chloro-2-methyl-phenol
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	24-Jul-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0015	Beaverlodge River	BLR u/s Horse Lake	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
Number of Samples (N)				7	7		7		7	1	7	7	1	7	1		7	7			7
AB07GD0020	Beaverlodge River	BLR u/s of BTC	2-Sep-04		L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	4-Apr-05	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.1	L0.02	L0.005	L0.05	L2	L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05	L0.3	L0.01	L0.01	L0.1	L0.1	L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	24-Jul-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0020	Beaverlodge River	BLR u/s of BTC	12-Sep-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
Number of Samples (N)				10	11	1	11	1	11	2	11	11	2	11	2	1	11	11	1	1	11
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	2-Sep-04		L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	4-Apr-05	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		0.086	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	24-Jul-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	12-Sep-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	19-Apr-07	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	14-May-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Jul-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0040	Beaverlodge River	BLR u/s of Beaverlodge	16-Sep-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
Number of Samples (N)				13	14		14		14	5	14	14	5	14	5		14	14			14
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95					L1													
Number of Samples (N)								1													
Alberta SWQG		Short-term (Acute)																			
		Long-term (Chronic)																			
CCME		Guideline Value																			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0060, AB07GD0070, AB07GD080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alachor	Aldicarb	Aldrin	Atrazine	Bromacil	Bromoxynil	Chlorothalonil	alpha-Endosulfan	beta-Endosulfan	Chlorpyrifos ethyl dursban	Cyanazine	Diazinon	Dicamba banvel	Diclofop methyl hoegrass	Dieldrin	Dimethoate cygon
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95				L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.02	L0.02		
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95				L0.005	L0.03	L0.005		L0.005		L0.005	L0.05	L0.005	L0.02	L0.02		
Number of Samples (N)							2	1	2		2		2	2	2	2	2		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	0.017	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
Number of Samples (N)					11	11	11		11	2	11		11	11	11	11	11	11	11
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95																
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95				L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	0.009	L0.02		
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95				L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.02	L0.02		
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
Number of Samples (N)					3	3	5		5	3	5		5	5	5	5	5	3	3
Alberta SWQG	Short-term (Acute)										0.06	0.06	0.02						
	Long-term (Chronic)				1	-	1.8	5	5	0.18	0.003	0.003	0.002	2	0.17	10	6.1		6.2
CCME	Guideline Value					-													

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0060, AB07GD0070, AB07GD080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	gamma-benzene hexachloride (Lindane)	gamma-Chlordane	Guthion (Azinphos-methyl)	Heptachlor epoxide	Linuron	Malathion	MCPA	MCPB	MCPP	Methoxychlor	Metolachlor	Metribuzin	O,P'-DDT	Parathion	Picloram tordan	Simazine	Triallate (Avadex BW)
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94																	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95																	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005		L0.005
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005		L0.005
Number of Samples (N)				2		2			2	2	2	2	2					2		2
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94																	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	L0.005		L0.2			L0.05	0.006	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	L0.005		L0.2		L0.02	L0.05	0.04	L0.02	0.01	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	L0.005		L0.2			L0.05	0.066	L0.02	0.045	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	L0.005		L0.2		L0.02	L0.05	0.004	L0.02	0.007	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
Number of Samples (N)				11		11		2	11	11	11	11	11	2	2		2	11	11	11
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95																	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	L0.005		L0.2			L0.05	0.004	L0.02	L0.005	L0.03					L0.005		L0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	L0.005		L0.2				L0.005	L0.02	L0.005	L0.03					L0.005		L0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	L0.005		L0.2		L0.02	L0.05	0.028	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
Number of Samples (N)				5		5		3	4	5	5	5	5	3	3		3	5	3	5
Alberta SWQG		Short-term (Acute)										10000					0.065			
		Long-term (Chronic)		0.01	-	0.01	*0.01	7	0.1	2.6		13	0.03	7.8	1	-	0.013	29	10	0.24
CCME		Guideline Value			-											-				

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0060, AB07GD0070, AB07GD080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Trifluralin (Treflan)	2,4-Dichlorophenoxy acetic acid	2,4-DB	2,4-Dichlorophenol	Amino-pyralid	Bentazon	alpha-Benzene-hexachloride	Bromo-methane	Bis(2-chloroethyl) ether	Bis(2-chloro-isopropyl) ether	Carbathiin carboxin	cis-1,3-Dichloro-propene	Clodinafop acid metabolite	Clodinafop propargyl	Clopyralid lontrel	Desethyl atrazine
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94				L1					L1	L1						
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95				L1					L1	L1						
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95	L0.005	L0.005	L0.005				L0.005				L0.1				L0.02	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	L0.005	L0.005	L0.005	L1			L0.005		L1	L1	L0.1				L0.02	
Number of Samples (N)				2	2	2	3			2		3	3	2				2	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94				L1					L1	L1						
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	L0.005	0.015	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	L0.005	0.029	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	L0.005	0.018	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05

Number of Samples (N)				11	11	11	12	1	2	11		1	1	11		2	2	11	11
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95				L1					L1	L1						
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	L0.005	L0.005	L0.005	L1			L0.005		L1	L1	L0.1				L0.02	
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	L0.005	L0.005	L0.005	L1			L0.005		L1	L1	L0.1				L0.02	
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	L0.005	L0.005	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	L0.005	L0.005	L0.005	L0	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L0.005	L0.005	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
Number of Samples (N)				5	5	5	6	3	3	5		3	3	5		3	3	5	3
Alberta SWQG		Short-term (Acute)				560													
		Long-term (Chronic)		0.2	4	25	0.2												
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0060, AB07GD0070, AB07GD080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Desiso-propyl atrazine	2,4-Dichlorprop	Disulfoton (Di-Syston)	Diuron	Ethafluralin (Edge)	Ethion	Etho-fumesate	Fenoxaprop-P-ethyl	Fluazifop	Fluroxypyr	Hexa-conazole	Imaza-methabenz-methyl	Imazamox	Imazethapyr	Iprodione	Metalaxyl-M
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95																
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95		L0.005	L0.2	L0.2	L0.005	L0.1										
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95		L0.005	L0.2	L0.2	L0.005	L0.1										
Number of Samples (N)					2	2	2	2	2										
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94																
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				0.174	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
Number of Samples (N)				11	11	11	11	11	11	2	11	2	2	2	11	11	11	2	2
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95																
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95		L0.005	L0.2	L0.2	L0.005	L0.1										
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95		L0.005	L0.2	L0.2	L0.005	L0.1										
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
Number of Samples (N)				3	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3
Alberta SWQG		Short-term (Acute)																	
		Long-term (Chronic)																	
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Main Stem Sites (AB07GD0060, AB07GD0070, AB07GD080), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Methomyl	Naprop-amide	O,P'-DDE	Oxy-carboxin	Penta-chloro-phenol	Phorate thimet	Propi-conazole	Pyridaben	Quinclorac	Quizalofop	Terbufos	Thia-methoxam	Trans 1,3-Dichloro-propene	Triclopyr	Vin-clozolin	1,1-Dichloro-propylene	1,2-Dibromo-ethane	4-Chloro-2-methyl-phenol
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94					L1													
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95					L1													
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	19-Apr-95						L0.005					L0.03							
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95					L1	L0.005												
Number of Samples (N)								3	2					1							
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94					L1													
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	2-Sep-04		L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	4-Apr-05	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		0.055	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	24-Jul-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	12-Sep-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	19-Apr-07	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
Number of Samples (N)				10	11		11	1	11	2	11	11	2	11	2		11	11			11
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95					L1													
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95					L1	L0.005					L0.03							
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95					L1	L0.005					L0.03							
AB07GD0080	Beaverlodge River	BLR at the Mouth	13-May-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0080	Beaverlodge River	BLR at the Mouth	14-Jul-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0080	Beaverlodge River	BLR at the Mouth	17-Sep-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
Number of Samples (N)				3	3	0	3	3	5	3	3	3	3	5	3		3	3			3
Alberta SWQG	Short-term (Acute)																				
	Long-term (Chronic)																				
CCME	Guideline Value																				

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Tributary Sites (AB07GD0030, AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alachor	Aldicarb	Aldrin	Atrazine	Bromacil	Brom-oxynil	Chloro-thalonil	alpha-Endosulfan	beta-Endosulfan	Chlorpyrifos ethyl dursban	Cyanazine	Diazinon	Dicamba banvel	Diclofop methyl hoegrass	Dieldrin	Dimethoate cygon
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.005	L0.1	L0.005	L0.005		L0.005	L0.005	L0.005	L0.005	L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
Number of Samples (N)				1	10	10	10		10	2	10	1	10	10	10	10	10	10	10
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	2-Sep-04		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-Apr-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	18-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	26-Apr-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	17-May-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	24-Jul-06		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Sep-06		L0.1	L0.005	L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
Number of Samples (N)					9	9	9		9	2	9		9	9	9	9	9	9	9
Alberta SWQG		Short-term (Acute)									0.06	0.06	0.02						
		Long-term (Chronic)			1	-	1.8	5	5	0.18	0.003	0.003	0.002	2	0.17	10	6.1		6.2
CCME		Guideline Value				-													

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Tributary Sites (AB07GD0030, AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	gamma-benzene hexachloride (Lindane)	gamma-Chlordane	Guthion (Azinphos-methyl)	Heptachlor epoxide	Linuron	Malathion	MCPA	MCPB	MCPP	Meth-oxychlor	Metolachlor	Metribuzin	O,P'-DDT	Parathion	Picloram tordan	Simazine	Triallate (Avadex BW)
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.005	L0.005	L0.2	L0.005	L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01	L0.005	L0.01	L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
Number of Samples (N)				10	1	10	1	2	10	10	10	10	10	2	2	1	2	10	10	10
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	2-Sep-04	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-Apr-06	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	18-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	26-Apr-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	17-May-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	24-Jul-06	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Sep-06	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005	L0.01	L0.005
Number of Samples (N)				9		9		2	9	9	9	9	9	2	2		2	9	9	9
Alberta SWQG		Short-term (Acute)										10000					0.065			
		Long-term (Chronic)		0.01	-	0.01	*0.01	7	0.1	2.6		13	0.03	7.8	1	-	0.013	29	10	0.24
CCME		Guideline Value			-											-				

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Table A3. Pesticides at Beaverlodge Tributary Sites (AB07GD0030, AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Trifluralin (Treflan)	2,4-Dichloro-phenoxy acetic acid	2,4-DB	2,4-Dichloro-phenol	Amino-pyralid	Bentazon	alpha-Benzenehexa-chloride	Bromo-methane	Bis(2-chloro-ethyl) ether	Bis(2-chloro-isopropyl) ether	Carbathiin carboxin	cis-1,3-Dichloro-propene	Clodinafop acid metabolite	Clodinafop propargyl	Clopyralid lontrel	Desethyl atrazine
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.005	L0.005	L0.005	L0.01		L0.005	L0.005	L0.1	L2	L2	L0.1	L0.3	L0.02	L0.04	L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	L0.005	0.016	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	L0.005	0.007	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
Number of Samples (N)				10	10	10	10		2	10	1	1	1	10	1	2	2	10	10
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	2-Sep-04	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-Apr-06	L0.005	L0.005	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	18-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	26-Apr-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	17-May-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	24-Jul-06	L0.005	L0.005	L0.005	L0.01		L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Sep-06	L0.005	L0.005	L0.005	L0.01			L0.005				L0.1				L0.02	L0.05
Number of Samples (N)				9	9	9	9		2	9				9		2	2	9	9
Alberta SWQG		Short-term (Acute)				560													
		Long-term (Chronic)		0.2	4	25	0.2												
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Tributary Sites (AB07GD0030, AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Desiso-propyl atrazine	2,4-Dichlorprop	Disulfoton (Di-Syston)	Diuron	Ethafluralin (Edge)	Ethion	Etho-fumesate	Fenoxaprop-P-ethyl	Fluazifop	Fluroxypyr	Hexa-conazole	Imaza-methabenz-methyl	Imazamox	Imazethapyr	Iprodione	Metalaxyl-M
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	0.1	L0.02	L0.02	L0.02	L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
Number of Samples (N)				10	10	10	10	10	10	2	10	2	2	2	10	10	10	2	2
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	2-Sep-04	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	18-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	26-Apr-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	17-May-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	24-Jul-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Sep-06	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1		L0.04				L0.05	L0.02	L0.02		
Number of Samples (N)				9	9	9	9	9	9	2	9	2	2	2	9	9	9	2	2
Alberta SWQG		Short-term (Acute)																	
		Long-term (Chronic)																	
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Beaverlodge Tributary Sites (AB07GD0030, AB07GD0025), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Methomyl	Naprop-amide	O,P'-DDE	Oxy-carboxin	Penta-chloro-phenol	Phorate thimet	Prop-iconazole	Pyridaben	Quinclorac	Quiza-lofop	Terbufos	Thia-methoxam	Trans 1,3-Dichloro-propene	Tri-clopyr	Vin-clozolin	1,1-Dichloro-propylene	1,2-Dibromo-ethane	4-Chloro-2-methyl-phenol
AB07GD0030	Beavertail Creek	BTC at the Mouth	2-Sep-04		L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.1	L0.02	L0.005	L0.05	L2	L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05	L0.3	L0.01	L0.01	L0.1	L0.1	L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		0.168	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	24-Jul-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0030	Beavertail Creek	BTC at the Mouth	12-Sep-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
Number of Samples (N)				9	10	1	10	1	10	2	10	10	2	10	2	1	10	10	1	1	10
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	2-Sep-04		L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-Apr-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		0.097	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	18-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	26-Apr-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	3-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	17-May-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	24-Jul-06	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0025	Steeprock Creek	SRC u/s of confluence with BTC	12-Sep-06	L0.1	L0.02		L0.05		L0.005		L0.02	L0.005		L0.03			L0.01	L0.01			L0.01
Number of Samples (N)				8	9		9		9	2	9	9	2	9	2		9	9			9
Alberta SWQG		Short-term (Acute)																			
		Long-term (Chronic)																			
CCME		Guideline Value																			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Redwillow and Wapiti River Sites (AB07GD0090, AB07GE0005, AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Alachor	Aldicarb	Aldrin	Atrazine	Bromacil	Bromoxynil	Chloro-thalonil	alpha-Endosulfan	beta-Endosulfan	Chlorpyrifos ethyl dursban	Cyanazine	Diazinon	Dicamba banvel	Diclofop methyl hoegrass	Dieldrin	Dimethoate cygon
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94																
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95																
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95				L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.02	L0.02		
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95				L0.005		L0.005		L0.005		L0.005	L0.05	L0.005	L0.02	L0.02		
AB07GD0090	Redwillow River	RWR u/s of BLR	13-May-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GD0090	Redwillow River	RWR u/s of BLR	14-Jul-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
AB07GD0090	Redwillow River	RWR u/s of BLR	17-Sep-14		L0.1	L0.005	L0.005		L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
Number of Samples (N)					3	3	5		5	3	5		5	5	5	5	5	3	3
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14																
Number of Samples (N)																			
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14		L0.1	L0.005	L0.005	L0.03	L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.05
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14		L0.1	L0.005	L0.005	L0.03	L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14		L0.1	L0.005	L0.005	L0.03	L0.005	L0.005	L0.005		L0.005	L0.05	L0.005	L0.005	L0.02	L0.005	L0.005
Number of Samples (N)					3	3	3	3	3	3	3		3	3	3	3	3	3	3
Alberta SWQG		**Short-term (Acute)**									0.06	0.06	**0.02**						
		Long-term (Chronic)			**1**	**-**	**1.8**	**5**	**5**	**0.18**	**0.003**	**0.003**	**0.002**	**2**	**0.17**	**10**	**6.1**		**6.2**
CCME		**Guideline Value**				**-**													

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A3. Pesticides at Redwillow and Wapiti River Sites (AB07GD0090, AB07GE0005, AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	gamma-benzene hexachloride (Lindane)	gamma-Chlordane	Guthion (Azinphos-methyl)	Heptachlor epoxide	Linuron	Malathion	MCPA	MCPB	MCPP	Meth-oxychlor	Metolachlor	Metribuzin	O,P'-DDT	Parathion	Picloram tordan	Simazine	Triallate (Avadex BW)
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	21-Sep-94																	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Jan-95																	
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	18-Apr-95	L0.005		L0.2			L0.05	L0.005	L0.02	L0.005	L0.03					L0.005		L0.005
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	16-Aug-95	L0.005		L0.2				L0.005	L0.02	L0.005	L0.03					L0.005		L0.005
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	13-May-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	14-Jul-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GD0090	Redwillow River	RWR u/s of Beaverlodge River	17-Sep-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
Number of Samples (N)				5		5		3	4	5	5	5	5	3	3		3	5	3	5
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14																	
Number of Samples (N)																				
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.005		L0.2		L0.02	L0.05	L0.005	L0.02	L0.005	L0.03	L0.005	L0.01		L0.01	L0.005	L0.01	L0.005
Number of Samples (N)				3		3		3	3	3	3	3	3	3	3		3	3	3	3
Alberta SWQG		Short-term (Acute)										10000					0.065			
		Long-term (Chronic)		0.01	-	0.01	*0.01	7	0.1	2.6		13	0.03	7.8	1	-	0.013	29	10	0.24
CCME		Guideline Value			-											-				

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Table A3. Pesticides at Redwillow and Wapiti River Sites (AB07GD0090, AB07GE0005, AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Trifluralin (Treflan)	2,4-Dichlorophenoxy acetic acid	2,4-DB	2,4-Dichloro-phenol	Amino-pyralid	Bentazon	alpha-Benzenehexa-chloride	Bromo-methane	Bis(2-chloroethyl) ether	Bis(2-chloro-isopropyl) ether	Carbathiin carboxin	cis-1,3-Dichloro-propene	Clodinafop acid metabolite	Clodinafop propargyl	Clopyralid Iontrel	Desethyl atrazine
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94				L1					L1	L1						
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95				L1					L1	L1						
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95	L0.005	L0.005	L0.005	L1			L0.005		L1	L1	L0.1				L0.02	
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95	L0.005	L0.005	L0.005	L1			L0.005		L1	L1	L0.1				L0.02	
AB07GD0090	Redwillow River	RWR u/s of BLR	13-May-14	L0.005	L0.005	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0090	Redwillow River	RWR u/s of BLR	14-Jul-14	L0.005	L0.005	L0.005	L0	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GD0090	Redwillow River	RWR u/s of BLR	17-Sep-14	L0.005	L0.005	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
Number of Samples (N)				5	5	5	7	3	3	5		4	4	5		3	3	5	3
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14				L0.1				L0.3	L0.1	L0.1		L0.3				
Number of Samples (N)							1				1	1	1		1				
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	L0.005	L0.005	L0.005	L0.01	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L0.005	L0.005	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.005	L0.005	L0.005	L0.005	L0.01	L0.005	L0.005				L0.1		L0.02	L0.04	L0.02	L0.05
Number of Samples (N)				3	3	3	3	3	3	3				3		3	3	3	3
Alberta SWQG		Short-term (Acute)				560													
		Long-term (Chronic)		0.2	4	25	0.2												
CCME		Guideline Value																	

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Table A3. Pesticides at Redwillow and Wapiti River Sites (AB07GD0090, AB07GE0005, AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Desisopropyl atrazine	2,4-Dichlorprop	Disulfoton (Di-Syston)	Diuron	Ethafluralin (Edge)	Ethion	Etho-fumesate	Fenoxaprop-P-ethyl	Fluazifop	Fluroxypyr	Hexa-conazole	Imaza-methabenz-methyl	Imazamox	Imazethapyr	Iprodione	Metalaxyl-M
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94																
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95																
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95		L0.005	L0.2	L0.2	L0.005	L0.1										
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95		L0.005	L0.2	L0.2	L0.005	L0.1										
AB07GD0090	Redwillow River	RWR u/s of BLR	13-May-14	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GD0090	Redwillow River	RWR u/s of BLR	14-Jul-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
AB07GD0090	Redwillow River	RWR u/s of BLR	17-Sep-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
Number of Samples (N)				3	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14																
Number of Samples (N)																			
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	L0.05	L0.005	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.05	L0.05	L0.02	L0.02	L0.02	L0.01
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.05	L0.01	L0.2	L0.2	L0.005	L0.1	L0.005	L0.04	L0.01	L0.01	L0.005	L0.05	L0.005	L0.02	L0.02	L0.01
Number of Samples (N)				3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Alberta SWQG		Short-term (Acute)																	
		Long-term (Chronic)																	
CCME		Guideline Value																	

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Table A3. Pesticides at Redwillow and Wapiti River Sites (AB07GD0090, AB07GE0005, AB07GC0020), 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Methomyl	Naprop-amide	O,P'-DDE	Oxy-carboxin	Penta-chloro-phenol	Phorate thimet	Prop-iconazole	Pyridaben	Quinclorac	Quizalofop	Terbufos	Thia-methoxam	Trans 1,3-Dichloro-propene	Triclopyr	Vinclozolin	1,1-Dichloro-propylene	1,2-Dibromo-ethane	4-Chloro-2-methyl-phenol
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94					L1													
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95					L1													
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95					L1	L0.005					L0.03							
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95					L1	L0.005					L0.03							
AB07GD0090	Redwillow River	RWR u/s of BLR	13-May-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0090	Redwillow River	RWR u/s of BLR	14-Jul-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GD0090	Redwillow River	RWR u/s of BLR	17-Sep-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
Number of Samples (N)				3	3		3	4	5	3	3	3	3	5	3		3	3			3
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14					L0.1								L0.1			L0.1	L0.1	
Number of Samples (N)								1								1			1	1	
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	12-May-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Jul-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
AB07GC0020	Wapiti River	WR u/s of RWR - Centre	15-Sep-14	L0.1	L0.02		L0.05		L0.005	L0.05	L0.02	L0.005	L0.03	L0.03	L0.05		L0.01	L0.01			L0.01
Number of Samples (N)				3	3		3		3	3	3	3	3	3	3		3	3			3
Alberta SWQG		Short-term (Acute)																			
		Long-term (Chronic)																			
CCME		Guideline Value																			

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

APPENDIX 4 – PRIORITY POLLUTANTS

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Acenaphthene	Anthracene	Benz(a)-anthracene	Benzene	Benzo(a)-pyrene	Carbon tetra-chloride	Chloro-benzene	1,2-Di-chloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene	1,2,3-Trichloro-benzene	1,2-Dichloro-ethane	Cis-1,2-Dichloro-ethane	trans-1,2-Dichloro-ethene	Tri-chloro-ethylene	Tetra-chloro-ethylene	Chloroform
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L2	L2	L2	L0.1	L2	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.3	L0.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95		L1	L1		L1												
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94	L1	L1	L1		L1												
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95	L1	L1	L1		L1												
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	L1	L1	L1		L1												
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94		L1	L1		L1												
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95	L1	L1	L1		L1												
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	L1	L1	L1		L1												
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	L1	L1	L1		L1												
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L2	L2	L2	L0.1	L2	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.3	L0.1
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94	L1	L1	L1		L1												
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95		L1	L1		L1												
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95	L1	L1	L1		L1												
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95		L1	L1		L1												
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.4	L0.1	L0.1	L0.3	L0.1	L0.1	L0.1
Alberta SWQG		Short-Term (Acute)																		
		Long-Term (Chronic)		5.8	0.012	0.018	40	0.015	13.3	1.3	0.7	150	26	8	100	100	100	21	110	1.8
CCME		Guideline Value																		

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Dichloro-methane (Methylene chloride)	o,p'-DDT	Di-n-butyl phthalate	Ethyl-benzene	Fluorene	Fluor-anthene	Methyl tertiary butyl ether	Naphthalene	Phenol	Phen-anthrene	Pyrene	Styrene	Toluene	2-Chloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L2	L0.005	L2	L0.1	L2	L2	L0.1	L2	L2	L2	L2	L0.1	L0.1	L4		L2
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95			L1		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94			0		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95			0		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95					L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94			L1		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95			L1		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95			L1		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95			0		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L2	L0.005	L2	L0.1	L2	L2	L0.1	L2	L2	L2	L2	L0.1	L0.1	L4		L2
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94					L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95			L1		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95			0		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95			0		L1	L1		L1	L1	L1	L1			L2	L1	L1
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.4		L0.1	L0.1	L0.1	L0.1	L0.1	L0.3	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1		L0.1
Alberta SWQG		Short-Term (Acute)									1								
		Long-Term (Chronic)		98.1	0.001	19	90	3	0.04	10		4	0.4	0.025	72	0.5	7	18	18
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	2,3,4,6-Tetrachloro-phenol	Xylene	Acena-phthylene	Adsorbable organic halide (AOX) mg/L	Benzidine	Benzo(b)-fluoranthene	Benzo-(g,h,i)-perylene	Benzo(k)-fluoranthene	Benzoic acid	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Bromo-benzene
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L2	L0.1	L2		L4	L2	L4	L2		L2	L2	L2	L2	L0.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94			L1	0.003	L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95			L1	0.016	L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95				0.006										
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L2	L0.1	L2		L4	L2	L4	L2		L2	L2	L2	L2	L0.1
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94			L1	0.005	L2	L1	L2	L1	L2	L1	L1	L1	L1	
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95			L1		L2	L1	L2	L1	L2	L1	L1	L1	L1	
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95			L1	0.01	L2	L1	L2	L1	L2	L1	L1	L1	0	
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.1		L0.1		L0.1	L0.1	L0.1	L0.1		L0.1	L0.1	L0.1	L0.1	L0.1
Alberta SWQG		Short-Term (Acute)															
		Long-Term (Chronic)		1	30												
CCME		Guideline Value															

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Bromo-form	Butyl benzyl phthalate	Chloro-ethane	Chloro-methane	Chrysene	Di-n-octyl phthalate	Dibenzo[a,h]-anthracene	Dibromo-chloro-methane	Dibromo-methane	Dichloro-bromo-methane	Diethyl phthalate	Dimethyl phthalate	Hexachloro-benzene	Hexachloro-butadiene	Hexa-chlorocyclo-pentadiene	Hexachloro-ethane
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.5	L2	L0.1		L2	L2	L5	L0.1	L0.1	L0.1	L2	L2	L2	L0.3	L2	L5
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95		L1					L5				L1	L1	L1	L5	L1	L5
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.5	L2	L0.1		L2	L2	L5	L0.1	L0.1	L0.1	L2	L2	L2	L0.3	L2	L5
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94		L1			L1	L1	L5				L1	L1	L1	L5	L5	L5
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95		L1			L1	L1	L5				L1	L1	L1	L5	L1	L5
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.1	L0.1	L0.2	L0.2	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.2	L0.1	L0.1
Alberta SWQG		Short-Term (Acute)															1.3		
		Long-Term (Chronic)																	
CCME		Guideline Value														0/1		50	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Hexa-decanoic acid	Indeno(1,2,3-CD)-pyrene	Iso-phorone	Isopropyl-benzene	m,p-Xylene	n-Butyl-benzene	n-Nitroso-di-n-propylamine	n-Nitro-sodiphenyl-amine	n-Propyl-benzene	Nitro-benzene	o,p'-DDD	o,p'-DDE	p-Isopropyl-toluene	Perylene	sec-Butyl-benzene	4-Bromophenyl phenyl ether	Tert-butyl-benzene
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05		L2	L2	L0.1	L0.1	L0.1	L4	L2	L0.1	L2	L0.005	L0.005	L0.1		L0.1	L2	L0.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95	5	L1	L1				L2	L1		L1				L1		L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94	L3	L1	L1				L2	L1		L1				L1		L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95	2	L1	L1				L2	L1		L1				L1		L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95	0	L1	L1				L2	L1		L1				L1		L1	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94	L3	L1	L1				L2	L1		L1				L1		L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95	L3	L1	L1				L2	L1		L1				L1		L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95	16	L1	L1				L2	L1		L1				L1		L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95	0	L1	L1				L2	L1		L1				L1		L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																	
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05		L2	L2	L0.1	L0.1	L0.1	L4	L2	L0.1	L2	L0.005	L0.005	L0.1		L0.1	L2	L0.1
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94	L3	L1	L1				L2	L1		L1				L1		L1	
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95	L3	L1	L1				L2	L2		L1				L1		L1	
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95	0	L1	L1				L2	L1		L1				L1		L1	
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95	0	L1	L1				L2	L1		L1				L1		L1	
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14		L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1			L0.1		L0.1	L0.1	L0.1
Alberta SWQG		Short-Term (Acute)																		
		Long-Term (Chronic)																		
CCME		Guideline Value																		

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	Trichloro-fluoro-methane	Trihalo-methanes	Vinyl chloride	1,2,4-Trichloro-benzene	1,1-Dichloro-ethane	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	1,1,1,2-Tetrachloro-ethane	1,1,2,2-Tetrachloro-ethane	1,1-Dichloro-ethylene	2-Chloroethyl vinyl ether (2-Chloroeth-oxyethylene)	2-Chloro-naphthalene	4-Chlorophenyl phenyl ether	1,2-Dichloro-propane	1,3-Dichloro-propane	2,2-Dichloro-propane
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.1	L0.1	L0.5	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.4	L2	L2	L0.1	L0.1	L0.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95				L1								L1	L1			
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94				L1								L1	L1			
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95				L1								L1	L1			
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95				L1								L1	L1			
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94				L1								L1	L1			
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95				L1								L1	L1			
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95				L1								L1	L1			
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95				L1								L1	L1			
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.1	L0.1	L0.5	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.4	L2	L2	L0.1	L0.1	L0.1
AB07GD0090	Redwillow River	RWR u/s of BLR	21-Sep-94												L1	L1			
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Jan-95				L1								L1	L1			
AB07GD0090	Redwillow River	RWR u/s of BLR	18-Apr-95				L1								L1	L1			
AB07GD0090	Redwillow River	RWR u/s of BLR	16-Aug-95				L1								L1	L1			
AB07GE0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.1		L0.2	L0.3	L0.1	L0.1	L0.1	L0.1	L0.1	L0.3	L0.3	L0.1	L0.1	L0.1	L0.1	L0.2
Alberta SWQG		Short-Term (Acute)					24												
		Long-Term (Chronic)																	
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

Table A4. Priority Pollutants, 1994-2018

Station No.	Waterbody	Site Description	Sample Date	1,2,3-Trichloropropane	1,2-Dibromo-3-chloropropane	2-Chlorotoluene	4-Chlorotoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	4-Chloro-3-methylphenol	2,4-Dimethylphenol	2-Nitrophenol	4-Nitrophenol	2-Methyl-4,6-dinitrophenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	1,2-Diphenylhydrazine	o-Xylene
AB07GD0020	Beaverlodge River	BLR u/s of BTC	27-Oct-05	L0.1	L0.3	L0.1	L0.1	L0.1	L0.1	L2	L4	L2	L2	L2	L2	L2	L2	L2	L0.1
AB07GD0050	Beaverlodge River	BLR d/s of Beaverlodge	19-Apr-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	21-Sep-94							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	17-Jan-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0060	Beaverlodge River	BLR d/s of Hythe	15-Aug-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0070	Beaverlodge River	BLR at Gravel Pit	21-Sep-94							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Jan-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	18-Apr-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	16-Aug-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD0080	Beaverlodge River	BLR at the Mouth	12-Oct-95																
AB07GD0030	Beavertail Creek	BTC at the Mouth	27-Oct-05	L0.1	L0.3	L0.1	L0.1	L0.1	L0.1		L4	L2	L2	L2	L2	L2	L2	L2	L0.1

AB07GD 0090	Redwillow River	RWR u/s of BLR	21-Sep-94								L2	L1	L1	L1	L1	L1	L1		
AB07GD 0090	Redwillow River	RWR u/s of BLR	18-Jan-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD 0090	Redwillow River	RWR u/s of BLR	18-Apr-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GD 0090	Redwillow River	RWR u/s of BLR	16-Aug-95							L1	L2	L1	L1	L1	L1	L1	L1	L1	
AB07GE 0005	Redwillow River	RWR at Mouth	15-Sep-14	L0.2	L0.2	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1	L0.1
Alberta SWQG		Short-Term (Acute)																	
		Long-Term (Chronic)																	
CCME		Guideline Value																	

*values are reported in ug/L unless otherwise reported; **L refers to below the detection limit

APPENDIX 5

Summary of sampling and chemical analysis completed by ACA and AEP.

Year	Waterbody	WDS sites	General Chemistry	Metals & Major Ions	Pesticides	Priority Pollutants
1994	Beaverlodge River	AB07GD0020	✓	✓		
		AB07GD0040	✓	✓		
		AB07GD0050	✓	✓		
		AB07GD0060	✓	✓	✓	✓
		AB07GD0070	✓	✓	✓	✓
	Redwillow River	AB07GD0090	✓	✓	✓	✓
1995	Beaverlodge River	AB07GD0020	✓	✓		
		AB07GD0040	✓	✓		
		AB07GD0050	✓	✓	✓	✓
		AB07GD0060	✓	✓	✓	✓
		AB07GD0070	✓	✓		
		AB07GD0080	✓	✓	✓	✓
	Beavertail Creek	AB07GD0030	✓	✓		
	Redwillow River	AB07GD0090	✓	✓	✓	✓
1997	Redwillow River	AB07GE0005	✓	✓		
1998	Redwillow River	AB07GE0005	✓	✓		
2004	Beaverlodge River	AB07GD0020	✓	✓	✓	
		AB07GD0040	✓	✓	✓	
		AB07GD0070	✓	✓	✓	
	Beavertail Creek	AB07GD0030	✓	✓	✓	
	Steeprock Creek	AB07GD0025	✓	✓	✓	
2005	Beaverlodge River	AB07GD0020	✓	✓	✓	✓
		AB07GD0040	✓	✓	✓	
		AB07GD0070	✓	✓	✓	
	Beavertail Creek	AB07GD0030	✓	✓	✓	✓
	Steeprock Creek	AB07GD0025	✓	✓		
2006	Beaverlodge River	AB07GD0015	✓	✓	✓	
		AB07GD0020	✓	✓	✓	
		AB07GD0040	✓	✓	✓	
		AB07GD0070	✓	✓	✓	
	Beavertail Creek	AB07GD0030	✓	✓	✓	
	Steeprock Creek	AB07GD0025	✓	✓	✓	
2007	Beaverlodge River	AB07GD0015	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0040	✓	✓	✓	
		AB07GD0070	✓	✓	✓	
	Beavertail Creek	AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0025	✓	✓		

Year	Waterbody	WDS sites	General Chemistry	Metals & Major Ions	Pesticides	Priority Pollutants
2010	Beaverlodge River	AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
		AB07GD0060	✓	✓		
		AB07GD0080	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Windsor Creek	AB07GD-WD01	✓	✓		
	Redwillow River	AB07GD0090	✓	✓		
		AB07GD0095	✓	✓		
2011	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0015	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
		AB07GD0060	✓	✓		
		AB07GD0080	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Windsor Creek	AB07GD-WD01	✓	✓		
	Redwillow River	AB07GD0090	✓	✓		
		AB07GD0095	✓	✓		
		AB07GD-RW03	✓	✓		
2012	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Redwillow River	AB07GD0095	✓	✓		
2013	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0095	✓	✓		

Year	Waterbody	Sites surveyed	General Chemistry	Metals & Major Ions	Pesticides	Priority Pollutants
2014	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0040	✓	✓	✓	
		AB07GD0045	✓	✓		
		AB07GD0050	✓	✓		
		AB07GD0080	✓	✓	✓	
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0090	✓	✓	✓	
		AB07GD0095	✓	✓		
		AB07GE0005	✓	✓	✓	✓
	Wapiti River	AB07GC0020	✓	✓	✓	
2015	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0040	✓	✓		
		AB07GD0045	✓	✓		
		AB07GD0050	✓	✓		
		AB07GD0080	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0090	✓	✓		
		AB07GD0095	✓	✓		
		AB07GE0005	✓	✓		
	Wapiti River	AB07GC0020	✓	✓		
2016	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0095	✓	✓		
2017	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
		AB07GD0060	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0095	✓	✓		
2018	Beaverlodge River	AB07GD0005	✓	✓		
		AB07GD0020	✓	✓		
		AB07GD0045	✓	✓		
	Beavertail Creek	AB07GD0022	✓	✓		
		AB07GD0030	✓	✓		
	Steeprock Creek	AB07GD0027	✓	✓		
	Redwillow River	AB07GD0095	✓	✓		