

## Appendix B – Data Compilation and Preparation

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## B.1.0 DATA SOURCES

One of the objectives of the SOE report was to compile all available datasets for surface water quality and quantity in the Oil Sands Region (OSR) for rivers and streams. As described in Section 2.4 of the main body of the SOE report, several monitoring programs were combined to form a comprehensive dataset. Although data from these programs is publicly accessible, it is not currently available from a unified data source. In particular, surface water quality monitoring data from the various monitoring programs is hosted in different locations, including Alberta Environment and Protected Areas (EPA) Oil Sands Monitoring (OSM) Catalogue, EPA's Water Quality Data (WQD) portal, Environment and Climate Change Canada's (ECCC) data portal and Indigenous Community Based Monitoring (ICBM) portals such as Mackenzie Datastream. The approach to compiling data from these sources is outlined below with Table B1 illustrating how the historical and current data was accessed for the SOE water quality dataset.

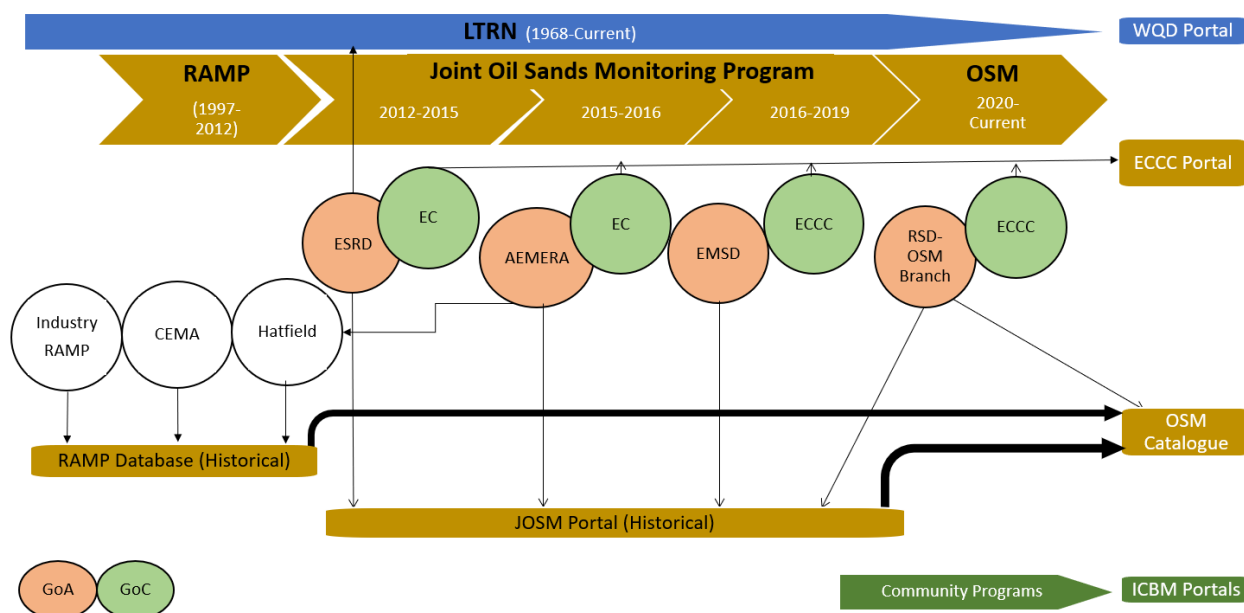


Figure B1: Surface Water quality data sources used to generate the SOE dataset.

Acronyms in the figure include: Long-Term River Network (LTRN), Water Quality Data (WQD), Regional Aquatic Monitoring Program (RAMP), Environment and Sustainable Resource Development (ESRD), Environment Canada (EC), Alberta Environmental Monitoring, Evaluation, and Reporting (AEMERA), Environmental Monitoring and Science Division (EMSD), Environment and Climate Change Canada (ECCC), Resource and Sustainable Development (RSD), (CEMA), Joint Oil Sands Monitoring Program (JOSM), Cumulative Effects Management Association (CEMA)

### Surface Water Quality

EPA's OSM Surface water data, derived from field-gathered samples, was downloaded from the [OSM WQ Data Portal](#), including:

- Historical data from a 1998-2015 focus study on the Muskeg River watershed (ABS058),
- OSM tributary data (excluding Muskeg River watershed) from 2011 to 2015 (ABS191),
- OSM tributary data collected by Alberta Environment and Parks/Environment and Protected Areas from 2015 to present (active)(ABS240),
- Enhanced Lower Athabasca River monitoring data from a 2018 to present (active) (ABS264).
- RAMP: Historical data collected as part of the Regional Aquatics Monitoring Program from 2003 to 2015

Data from acid sensitive lakes provided with this dataset was not included owing to the focus of this SOE report on rivers and streams, with lakes being a consideration for future iterations of the OSM Program's SOE reporting initiatives. Data for rivers and streams in the Kearl Oil Sands: Ambient Monitoring Response dataset ([link](#)) was also included with care taken not to have duplication of data that is included in both the Kearl Oil Sands and the their EPA OSM Program Surface Water Quality Discrete datasets. In total 52 comma separated value (CSV) files with the same

long format data structure were downloaded and merged together for inclusion into the SOE water quality data environment. Data up to October 31, 2023 was included for all data sources where available.

ECCC's surface water data from field samples was downloaded from the ECCC Data Catalogue ([link](#)), including

- Mainstem water quality (6 CSV files)
- Tributary water quality (5 CSV files)
- Expanded geographic extent (9 CSV files)

Code was developed in the R programming language to harmonize the ECCC datasets into a long-format format to facilitate the SOE analyses. To facilitate the long-format transition, some column names and symbols had to be manually modified to separate the English and French names and characters (e.g., changing “è” and “é” into “e” in Microsoft Excel). Other modifications to select column names and formats, as described below, were performed to ensure these CSV were combinable prior to converting them into a long format to be merged with the other datasets. Additional information was provided by ECCC via personal communication, including data files with VMV codes where they were not listed in the online data portal csv files.

Data was also obtained from EPA's Long Term River Network (LTRN) and Tributary Monitoring Network (TMN), downloaded from Alberta's Water Quality Data Portal ([link](#)) in one long-format that was combined with the other datasets.

The approach to integrating Indigenous community-based monitoring data is outlined in Appendix A. Data from Athabasca Chipewyan First Nation (ACFN) was primarily obtained from Mackenzie DataStream ([link](#)) in two separate csv files with an additional file for 2023 provided by personal communication. Data from ACFN was converted into a long-format and combined with the other datasets as outlined below.

In total, 76 separate CSV were compiled into one long-format data file with harmonized parameter and site names, units (e.g. “mg/l”, “µg/l” and “ng/l” all converted to “ng/l”), detection limit structure, data formats, and removal of duplicates. Multiple QA/QC cross-checks were also completed throughout this process. In addition, lakes and sites upstream of the oil sands region (OSR) with the exception of the Athabasca at the town of the Athabasca (ATR1) were removed from the dataset. Site ATR1 serves as a reference point for the Athabasca River upstream of the OSR. The preliminary dataset for surface water quality, including all parameters, QC data and all sites considered in the initial scoping of this SOE report included over 2.5 million unique values.

## Surface Water Quantity

Surface water quantity data was obtained by using the tidyhydat: Extract and Tidy Canadian 'Hydrometric' Data function (Albers, 2017) in the R Programming Language initially for all Northern Alberta sites with operational gauging stations for the initial scoping, including over 2.5 million unique values. Additional RAMP water quantity data was included based on the approach outlined in the code provided by the National Hydrological Service ([link](#)) used to generate Summary of Hydrologic Conditions in the Alberta Oil Sands Area reports for the OSM Region (e.g., OSM, 2018; OSM, 2019).

*Table B1: Source Descriptions of the Surface Water Quality and Quantity Data*

Source	Description
<b>OSM Catalogue</b> <b>ABS058</b> ( <a href="#">link</a> )	Historical surface water quality data from a 1998-2015 focus study on the Muskeg River watershed. Further description provided in Section 2.5.1 – Muskeg River Study.
<b>OSM Catalogue</b> <b>RAMP</b> ( <a href="#">link</a> )	Historical surface water quality data collected as part of RAMP from 2003 to 2012 and additional data collected as part of JOSM and AMERA from 2012 to 2015. Further description provided in Section 2.5.1 – RAMP and OSM Program Core Surface Water Projects.
<b>OSM Catalogue</b> <b>ABS191</b> ( <a href="#">link</a> )	Historical surface water quality data collected in tributaries (excluding Muskeg River watershed and outside of the RAMP network) from 2011 to 2015 as part of JOSM and AMERA. Further description provided in Section 2.5.1 – OSM Program Core Surface Water Projects.
<b>OSM Catalogue</b>	Surface water quality data collected in tributaries by Alberta Environment and Parks/Environment and Protected Areas from 2015 to present (active). This monitoring is completed as part of the OSM core monitoring described in Section 2.5.1 – OSM Program Core Surface Water Projects.

Source	Description
<b>ABS240 (active)</b> ( <a href="#">link</a> )	
<b>OSM Catalogue</b>  <b>ABS264</b> ( <a href="#">link</a> )	Surface water quality data collected from 2018 to 2022 at specific sites along the Lower Athabasca River as part of the Enhanced Lower Athabasca River monitoring (W-RC-1). Further details are provided in Section 2.5–1 - OSM Program – Focused Study on Enhanced Lower Athabasca River Monitoring (W-RC-1).
<b>Kearl Oil Sands: Ambient Monitoring Response</b> ( <a href="#">link</a> )	<p>The Kearl Oil Sands: Ambient Monitoring Response includes a Compilation of recent surface water chemistry data from surface waterbodies (lakes, rivers and streams) potentially affected by seepage and release of tailings-affected water from the Imperial Oil Kearl oil sands mine. These waterbodies are located downstream or downgradient of the area in which the seepage and release was reported.</p> <p>This dataset includes some samples taken as part of the EPA's core monitoring program (i.e., ABS240 above) which were removed to avoid duplication.</p>
<b>EPA</b>  <b>LTRN and TMN</b> ( <a href="#">LTRN link</a> , <a href="#">TMN link</a> )	Surface water quality data collected as part of the EPA's LTRN and TMN programs from 1987 to 2024 for the Peace River and Athabasca River is publicly available through the government of Alberta's Water Quality data portal. Section 2.5–1 - EPA – Long Term River Network provides further description of the program in relation to the SOE.
<b>ECCC Mainstem Water Quality</b> ( <a href="#">link</a> )	Surface water quality data collected from the lower Athabasca River (M2 to M7) between 2011 and 2023 by ECCC as part of the OSM program. Section 2.5.1 - OSM Program – Core Surface Water Projects provides additional details.
<b>ECCC Expanded Geographic Extent</b> ( <a href="#">link</a> )	Surface water quality chemistry data for sites in the lower Athabasca River (LAR), the Peace and Slave rivers, and their tributaries from as early as 1989 to as recent as 2023. Section 2.5.1 - OSM Program – Core Surface Water Projects provides additional details.
<b>ECCC Tributary Water Quality</b> ( <a href="#">link</a> )	Water quality chemistry data for sites on the tributaries of the Peace and Athabasca Rivers (Ells River, Mackay River, Steepbank River, Firebag River, Muskeg River, and High Hills River) between 2012 and 2015. Section 2.5.1 - OSM Program – Core Surface Water Projects provides additional details.
<b>Water Survey of Canada</b> ( <a href="#">link</a> , <a href="#">link</a> )	Surface water quantity data collected as part of the OSM program is incorporated in the water survey of Canada hydrometric station (HyDat) dataset. Section 2.5.1 - OSM Program Core - Surface Water Quantity Monitoring – Water Levels (W-LTM-S-1-2324) provides additional details.
<b>Mackenzie Data stream</b>  <b>Athabasca Chipewyan First Nation CBM Data</b> ( <a href="#">link</a> )	<p>The AFCN ICBM project includes monitoring both surface water quality and quality within the PAD and adjacent streams. Section 2.5.1 and 2.6.1 - Ni ho ghe di Athabasca Chipewyan First Nation Community Based Monitoring (B-CM-08) provides additional details.</p> <p>Water quality data is publicly available through the MacKenzie Datastream platform. Data from AFCN for 2023 was provided by personal communication as it was not yet available on Mackenzie Datastream.</p>

## B.2.0 DATA PREPARATION

### B.2.1 Parameter Selection

The harmonization of the various parameter names used across the different data sources and program iterations over time is fundamental to preparing the dataset for analysis. The surface water quantity dataset was generally harmonized and ready for evaluation. For surface water quality, the initial dataset included parameters that were analyzed in multiple different ways over the analysis period, which is reflected in the dataset by parameters having different names and, or different Variable Method Value (VMV) codes. VMV codes are a standardized library, representing lab methodologies for samples analyses. These were used to combine parameters with different names while maintaining the record of varying analytical method during the interpretation of results. When combining the dataset, the VMV codes were used to guide the parameter name harmonization based on the analytical methods used, best practices, and expert opinion. Combining different analytical approaches to a parameter presents the potential of introducing bias for trend assessments however, the assessment herein is limited to screening level assessments and this potential bias is retained as gap in the interpretation of results.

The initial dataset included over 3500 distinct parameter name and VMV Code combinations that were harmonized into one data environment. More information on the water quality parameters selected for the screening assessment are identified in Appendix C – Technical Methods.

### B.2.2 Site Selection

OSM Program governance directed that, all mainstem (Athabasca and Peace River) and tributary water quantity sites that have watersheds in the OSR, and all sites downstream of the OSR within Alberta should be included in the SOE report. The spatial scope for surface water quality was determined to include the mainstem site on the Athabasca River at the town of Athabasca along with all mainstem sites downstream on the Athabasca River, all Peace River mainstem sites in the OSR and downstream of the OSR, all mainstem and tributary sites that have watersheds in the OSR, and all sites downstream of the OSR within Alberta along with two additional sites on the Slave River in the Northwest Territories. The inclusion of additional upstream sites for surface water quantity was determined based on the potential ability to demonstrate consistency of trends from the headwaters through the OSR whereas changes over such a spatial scale for surface water quality may be influenced by a greater variety of landscape stressors.

For surface water quantity, the sites directed by the governance structure were included in the dataset moving forward with no modifications to the naming conventions provided by the Water Survey of Canada that were downloaded with the tidyhydat function in R. Each independent surface water quantity monitoring location is included in Table B3 below. For screening water quality parameters against various metrics, all sites were included in initial assessments as described in the main body of the text and presented in Appendix E. However, the site selection process for temporal assessments for trend and change point assessment are described in Section 2.5.4.

Owing to the multiple iterations of past and even present surface water quality monitoring programs in the OSR (e.g., Figure B1) there have been numerous site naming conventions used, with numerous organizations sampling the same sites, and at times, simultaneously. As the goal of this report is to provide a broad scale screening of all of the water quality data in the selected spatial scope outlined above, all sites were included in this assessment. To facilitate this site harmonization, all sites sampled within 1 km of each other were combined into one SOE site except for locations where a distinct tributary confluence exists between sampling locations.

In addition, a standardized SOE site naming convention was developed for each site that indicates the waterbody and the site number for the SOE with numbering beginning with the most upstream sites (i.e., Muskeg River Sampling Location 1 (MUR\_1)). Waterbody codes are presented in Table B2. Where the waterbody codes would be identical between waterbodies, an additional letter was added for clarity (i.e., Jackfish Creek [JAFK] and Jackpine Creek [JAPK]). Again, distinct sampling locations were assigned if locations were greater than 1 km from each other or were collected from different positions upstream or downstream of the mouth of a tributary.

Each independent SOE water quality monitoring location is provided in Table B3 along with historical naming conventions, location, sampling period, and number of samples. Table B5 provides detailed description of each of the surface water quality sampling site areas. Current sampling locations are highlighted in green. Table B4 provides surface water quantity sampling locations. A total of 157 independent surface water quality and 84 surface water quantity sites were identified with 35 of the surface water quality sites being co-located with surface water quantity monitoring stations.

Table B2: Waterbody Names

Waterbody	Code	Waterbody	Code	Waterbody	Code
Athabasca River	ATR	Grayling Creek	GRC	Muskeg River	MUR
Beaver Creek	BEC	Gregoire River	GRR	North Steepbank River	NSR
Beaver River	BVR	Hangingstone River	HAR	Peace River	PER
Big Creek	BIGC	High Hills River	HHR	Pierre River	PIR
Birch Creek	BIRC	Horse River	HOR	Poplar Creek	POC
Birch River	BIR	Iyininin Creek	IYC	Quatre Fourches Channel (PAD)	QFC
Buckton Creek	BUC	Jackfish Creek	JAFK	Redclay Creek	REC
Calumet River	CAR	Jackpine Creek	JAPC	Richardson River	RIR
Christina River	CHR	Jackfish River	JAR	Sawbones Creek	SAC
Clearwater River	CLR	Keane Creek	KEC	Shelley Creek	SHC
Dover River	DOR	Lesser Slave River	LSR	Slave River	SLR
Dunkirk River	DUR	Maybelle Creek	MAC	Smoky River	SMR
Ells River	ELR	Mackay River	MAR	Stanley Creek	STAC
Embarras River	EMR	McClelland Creek	MCCC	Steepbank River	STR
Eymundson Creek	EYC	McIvor River	MCIR	Sunday Creek	SUC
Fisherman's Creek	FIC	McLean Creek	MCLC	Tar River	TAR
Firebag River	FIR	Mills Creek	MIC	Upper Fletcher Creek (PAD)	UFC
Flett Creek	FLC	Moose Creek	MOC	Unnamed Creek	UNC
Fort Creek	FOC	Muskeg River Tributary	MRT	Unnamed Tributary	UNT
Goose Island Channel (PAD)	GIC	Muskeg Creek	MUC	Wapasu Creek	WAC

Table B3: SOE Water Quality Sites, green shaded sites indicate those that are currently sampled

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
ATR_1	Athabasca River Mainstem	EPA_LTRN_T MN	AB07BE0010	N/A	54.72222	-113.28611	505	1987	2023
ATR_2	Athabasca River Mainstem	EPA_OSM	AB07CB0520	N/A	54.9625	-112.84694	92	2017	2023
ATR_3	Athabasca River Mainstem	EPA_OSM	AB07CC0130	N/A	56.31	-112.59139	3	2017	2017
ATR_4	Athabasca River Mainstem	ECCC	AL07DD0002/M 2	Thalweg	56.71952778	-111.4044722	77	2012	2023
		ECCC	AL07DD0002/M 2	Panel 1 of 10	56.72061111	-111.4058056	2	2016	2016
		ECCC	AL07DD0002/M 2	Panel 10 of 10	56.71813889	-111.4028333	2	2016	2016
		ECCC	AL07DD0002/M 2	Panel 2 of 10	56.72038889	-111.4053611	7	2012	2016
		ECCC	AL07DD0002/M 2	Panel 3 of 10	56.72008333	-111.405	8	2012	2022
		ECCC	AL07DD0002/M 2	Panel 4 of 10	56.71977778	-111.4046667	14	2015	2016
		ECCC	AL07DD0002/M 2	Panel 5 of 10	56.72008333	-111.405	1	2023	2023
		ECCC	AL07DD0002/M 2	Panel 6 of 10	56.72008333	-111.405	1	2023	2023
		ECCC	AL07DD0002/M 2	Panel 7 of 10	56.71897222	-111.4038333	6	2012	2016
		ECCC	AL07DD0002/M 2	Shore sampling location	56.72061111	-111.4058056	5	2012	2012
		EPA_LTRN_T MN	AB07CC0030	Near Shore Grab	56.72028	-111.40556	651	1960	2023
		EPA_OSM	AB07CC0030	Near Shore Grab	56.72028	-111.40556	27	2019	2021
ATR_5	Athabasca River Mainstem	EPA_OSM	AB07DA0062	N/A	56.78033	-111.4024	60	2019	2020

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
ATR_6	Athabasca River Mainstem	ECCC	AL07DD0008/M3	Thalweg	56.8388	-111.41548	34	2012	2014
		ECCC	AL07DD0008/M3	Panel 1 of 10	56.8383	-111.41835	64	2012	2023
		ECCC	AL07DD0008/M3	Panel 10 of 10	56.8383	-111.41835	1	2023	2023
		ECCC	AL07DD0008/M3	Panel 10 of 10	56.83878	-111.41164	44	2012	2021
		ECCC	AL07DD0008/M3	Panel 2 of 10	56.8383	-111.41835	8	2023	2023
		ECCC	AL07DD0008/M3	Panel 2 of 10	56.83851	-111.41779	37	2012	2022
		ECCC	AL07DD0008/M3	Panel 3 of 10	56.83849	-111.41702	32	2012	2022
		ECCC	AL07DD0008/M3	Panel 4 of 10	56.83861	-111.41628	14	2012	2019
		ECCC	AL07DD0008/M3	Panel 5 of 10	56.8388	-111.41548	28	2012	2023
		ECCC	AL07DD0008/M3	Panel 6 of 10	56.83862	-111.41478	21	2012	2018
		ECCC	AL07DD0008/M3	Panel 7 of 10	56.83919	-111.41404	4	2012	2013
		ECCC	AL07DD0008/M3	Panel 8 of 10	56.83888	-111.41328	8	2012	2014
		ECCC	AL07DD0008/M3	Panel 9 of 10	56.8393	-111.41261	7	2023	2023
		ECCC	AL07DD0008/M3	Panel 9 of 10	56.83991	-111.41234	88	2012	2023
		EPA_OSM	RAMP_ATR-DC-CC	Centre of River	56.826557	-111.409307	6	2003	2007
		EPA_OSM	RAMP_ATR-DC-E	East Shore	56.826562	-111.407668	12	2003	2014
		EPA_OSM	RAMP_ATR-DC-W	West Shore	56.82654	-111.407957	13	2003	2014
ATR_7	Athabasca River Mainstem	EPA_OSM	AB07DA3024	N/A	56.940291	-111.439454	14	2018	2021
ATR_8	Athabasca River Mainstem	EPA_OSM	AB07DA3023	N/A	57.007818	-111.462064	22	2018	2021



SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
ATR_9	Athabasca River Mainstem	EPA_OSM	RAMP_ATR-SR-E	East Shore	57.019199	-111.478675	12	2003	2013
		EPA_OSM	RAMP_ATR-SR-W	West Shore	57.015363	-111.481123	12	2003	2013
ATR_10	Athabasca River Mainstem	EPA_OSM	AB07DA3022	500 m upstream	57.030041	-111.502088	22	2018	2021
		EPA_OSM	AB07DA3019	East Shore	57.035504	-111.501486	18	2018	2021
		EPA_OSM	AB07DA3020	West Shore	57.034967	-111.504514	34	2018	2021
		EPA_OSM	AB07DA3021	500 m downstream	57.034435	-111.504043	14	2018	2021
		EPA_OSM	AB07DA3017	East Channel	57.039686	-111.504488	14	2018	2021
		EPA_OSM	AB07DA3018	West Channel	57.038053	-111.510107	11	2018	2021
ATR_11	Athabasca River Mainstem	EPA_OSM	AB07DA3015	East Channel	57.049622	-111.504956	18	2018	2021
		EPA_OSM	AB07DA3016	West Channel	57.048655	-111.511194	11	2018	2021
ATR_12	Athabasca River Mainstem	EPA_OSM	AB07DA3009	N/A	57.071098	-111.530605	18	2018	2021
ATR_13	Athabasca River Mainstem	ECCC	AL07DD0004/M 4	Thalweg	57.12697222	-111.6024167	65	2011	2017
		ECCC	AL07DD0004/M 4	Panel 1 of 10	57.12622222	-111.6040278	12	2011	2016
		ECCC	AL07DD0004/M 4	Panel 10 of 10	57.12763889	-111.6000278	28	2011	2016
		ECCC	AL07DD0004/M 4	Panel 2 of 10	57.12633333	-111.6036111	11	2011	2015
		ECCC	AL07DD0004/M 4	Panel 3 of 10	57.12669444	-111.6035278	12	2011	2013
		ECCC	AL07DD0004/M 4	Panel 4 of 10	57.12694444	-111.6030833	22	2011	2016
		ECCC	AL07DD0004/M 4	Panel 5 of 10	57.12697222	-111.6024167	23	2011	2016
		ECCC	AL07DD0004/M 4	Panel 6 of 10	57.12708333	-111.6020556	5	2011	2013
		ECCC	AL07DD0004/M 4	Panel 7 of 10	57.12725	-111.6014722	7	2011	2013
		ECCC	AL07DD0004/M 4	Panel 8 of 10	57.12733333	-111.6010556	8	2011	2014
		ECCC	AL07DD0004/M 4	Panel 9 of 10	57.12761111	-111.6001389	26	2011	2014

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
		EPA_OSM	AB07DA0400	Near shore grab sample	57.13028	-111.605	1	2016	2016
		EPA_OSM	AB07DA3008	Thalweg	57.127898	-111.600994	22	2018	2021
		EPA_OSM	RAMP_ATR-MR-E	East Shore	57.131901	-111.602917	11	2003	2013
		EPA_OSM	RAMP_ATR-MR-W	West Shore	57.130189	-111.607862	11	2003	2013
ATR_14	Athabasca River Mainstem	ECCC	AL07DD0005/M 5	Thalweg	57.15680556	-111.6270528	64	2011	2014
		ECCC	AL07DD0005/M 5	Panel 1 of 10	57.15605556	-111.63	5	2011	2013
		ECCC	AL07DD0005/M 5	Panel 10 of 10	57.15758333	-111.6239444	22	2011	2014
		ECCC	AL07DD0005/M 5	Panel 2 of 10	57.15633333	-111.6294167	14	2011	2014
		ECCC	AL07DD0005/M 5	Panel 3 of 10	57.15655556	-111.6286944	7	2011	2014
		ECCC	AL07DD0005/M 5	Panel 4 of 10	57.15669444	-111.62825	8	2011	2015
		ECCC	AL07DD0005/M 5	Panel 5 of 10	57.15680556	-111.6275	27	2011	2014
		ECCC	AL07DD0005/M 5	Panel 6 of 10	57.15683333	-111.6265278	16	2011	2015
		ECCC	AL07DD0005/M 5	Panel 7 of 10	57.15686111	-111.6257222	8	2011	2015
		ECCC	AL07DD0005/M 5	Panel 8 of 10	57.15705556	-111.6250278	15	2011	2015
		ECCC	AL07DD0005/M 5	Panel 9 of 10	57.15747222	-111.6246944	22	2011	2014
		EPA_OSM	AB07DA0679	Near shore grab sample	57.156802	-111.627045	1	2016	2016
ATR_15	Athabasca River Mainstem	ECCC	AL07DD0009/M 6	Thalweg	57.21505	-111.6115	31	2012	2017
		ECCC	AL07DD0009/M 6	Panel 1 of 10	57.21513	-111.61512	26	2012	2016
		ECCC	AL07DD0009/M 6	Panel 10 of 10	57.21518	-111.60727	8	2012	2016
		ECCC	AL07DD0009/M 6	Panel 2 of 10	57.2151	-111.61433	5	2012	2013
		ECCC	AL07DD0009/M 6	Panel 3 of 10	57.21512	-111.61345	4	2012	2013

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
		ECCC	AL07DD0009/M 6	Panel 4 of 10	57.21516	-111.61577	6	2012	2014
		ECCC	AL07DD0009/M 6	Panel 5 of 10	57.21505	-111.6115	12	2012	2016
		ECCC	AL07DD0009/M 6	Panel 6 of 10	57.21502	-111.61068	5	2012	2013
		ECCC	AL07DD0009/M 6	Panel 7 of 10	57.2152	-111.6098	4	2012	2013
		ECCC	AL07DD0009/M 6	Panel 8 of 10	57.2153	-111.60903	6	2012	2014
		ECCC	AL07DD0009/M 6	Panel 9 of 10	57.21523	-111.60808	11	2012	2014
		EPA_OSM	AB07DA0683	Near shore grab	57.215046	-111.611508	1	2016	2016
ATR_16	Athabasca River Mainstem	ECCC	AL07DD0007/M 7	Thalweg	57.31373	-111.67183	33	2012	2017
		ECCC	AL07DD0007/M 7	Panel 1 of 10	57.31332	-111.67533	101	2012	2023
		ECCC	AL07DD0007/M 7	Panel 10 of 10	57.31395	-111.66737	52	2012	2022
		ECCC	AL07DD0007/M 7	Panel 10 of 10	57.31398	-111.67023	6	2023	2023
		ECCC	AL07DD0007/M 7	Panel 2 of 10	57.31337	-111.67458	5	2012	2015
		ECCC	AL07DD0007/M 7	Panel 3 of 10	57.31335	-111.6735	12	2012	2015
		ECCC	AL07DD0007/M 7	Panel 4 of 10	57.31365	-111.67278	23	2012	2023
		ECCC	AL07DD0007/M 7	Panel 5 of 10	57.31373	-111.67183	19	2012	2022
		ECCC	AL07DD0007/M 7	Panel 6 of 10	57.31373	-111.67093	10	2012	2014
		ECCC	AL07DD0007/M 7	Panel 7 of 10	57.3138	-111.66997	5	2012	2014
		ECCC	AL07DD0007/M 7	Panel 8 of 10	57.31392	-111.66925	9	2012	2017
		ECCC	AL07DD0007/M 7	Panel 9 of 10	57.3139	-111.66835	15	2012	2018
		EPA_OSM	AB07DA0800	Near shore grab	57.31361	-111.67167	30	2019	2020

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
ATR_17	Athabasca River Mainstem	EPA_OSM	RAMP_ATR-FC-E	East Shore	57.407625	-111.640348	2	2003	2003
		EPA_OSM	RAMP_ATR-FC-W	West Shore	57.407621	-111.649866	2	2003	2003
ATR_18	Athabasca River Mainstem	EPA_OSM	AB07DA0860	Near shore grab	57.43139	-111.6422	6	2003	2005
ATR_19	Athabasca River Mainstem	EPA_OSM	RAMP_ATR-DD-C	Centre of River	57.452166	-111.611744	3	2014	2016
		EPA_OSM	RAMP_ATR-DD-E	East Shore	57.452778	-111.602322	11	2005	2015
		EPA_OSM	RAMP_ATR-DD-W	West Shore	57.455284	-111.609813	11	2005	2015
ATR_20	Athabasca River Mainstem	ACFN	Kearl WI on AR (KL2)	Athabasca River by Kearl Water Intake	57.55983	-111.505134	2	2023	2023
		ACFN	Kearl WI on AR downstream (KL3)	downstream of the Water Intake	57.55983	-111.505134	2	2023	2023
		ACFN	Kearl WI on AR upstream (KL1)	Upstream of the Water Intake	57.565516	-111.506035	2	2023	2023
ATR_21	Athabasca River Mainstem	ECCC, M8	AB07DA0980	LTRN sampling location	57.72361	-111.37917	189	1989	2019
		EPA_OSM_KE ARL	AB07DA0980	Sampled once at an increased frequency as part of the Kearl response	57.72361	-111.37917	1	2023	2023
ATR_22	Athabasca River Mainstem	EPA_OSM	RAMP_ATR-FR-CC	N/A	57.740747	-111.368418	8	2003	2010
ATR_23	Athabasca River Mainstem	ACFN-MDS	ACFN-19	N/A	57.87495133	-111.3942933	14	2020	2022
ATR_24	Athabasca River Mainstem	ECCC	AL07DD0001	Current sampling location.	58.1725	-111.3702778	144	2011	2023

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
		ECCC	AL07DD0001	Old sampling location.	58.1725	111.3703	183	1989	2010
<b>ATR_25</b>	Athabasca River Mainstem	EPA_OSM	AB07DD0040	N/A	58.205	-111.39	7	2019	2020
<b>ATR_26</b>	Athabasca River Mainstem	EPA_OSM	RAMP_ATR-ER	N/A	58.353316	-111.541848	1	2004	2004
<b>ATR_27</b>	Athabasca River Mainstem	EPA_LTRN_T MN	AB07DD0010	N/A	58.38278	-111.51778	375	1987	2023
<b>ATR_28</b>	Athabasca River Mainstem	ACFN-MDS	ACFN-1	N/A	58.39711258	-111.5273329	36	2016	2022
<b>ATR_29</b>	Athabasca River Mainstem	EPA_LTRN_T MN	AB07DD0105	N/A	58.44722	-111.18583	125	1997	2023
<b>ATR_30</b>	Athabasca River Mainstem	EPA_OSM	RAMP_ARD-1	N/A	58.590791	-110.795243	3	2003	2004
<b>BEC_1</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1420	N/A	56.943803	-111.566232	34	2008	2023
<b>BEC_2</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1450	N/A	57.11917	-111.60556	14	2003	2016
<b>BEAR_1</b>	Cold Lake Region	EPA_LTRN_T MN	AB06AC0100	N/A	54.43044	-110.48254	204	1983	2023
<b>BEAR_2</b>	Cold Lake Region	EPA_LTRN_T MN	AB06AD0060	N/A	54.355	-110.21444	246	1983	2023
<b>BEAR_3</b>	Cold Lake Region	EPA_LTRN_T MN	AB06AD0130	N/A	54.25139	-110.02972	144	1983	2023
<b>BIGC_1</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1275	N/A	57.6333	-111.7919	17	2018	2019
<b>BIGC_2</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1270	N/A	57.6306	-111.4741	27	2011	2020
<b>BIRC_1</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0010	N/A	55.614752	-111.124391	5	2013	2017

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
<b>BIR_1</b>	Peace Athabasca Delta and Tributaries	ECCC	AL07KE0001	N/A	58.31542611	-113.0685081	63	2011	2022
<b>BUC_1</b>	Peace Athabasca Delta and Tributaries	ECCC	AL07KF0007	N/A	57.97889139	-111.7722239	54	2013	2022
<b>BUC_2</b>	Peace Athabasca Delta and Tributaries	ECCC	AL07KF0005	N/A	58.12688778	-111.8892875	55	2013	2022
<b>CAR_1</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1345	N/A	57.443381	-111.764825	11	2005	2014
<b>CAR_2</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA1360	At mouth	57.403755	-111.68415	80	2003	2023
		EPA_OSM	AB07DA1350	Upstream of mouth	57.40333	-111.6825	14	2003	2016
<b>CHR_1</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0001	N/A	55.88836	-111.543	88	2013	2023
<b>CHR_2</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0005	N/A	55.7191	-111.2196	5	2013	2017
<b>CHR_3</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0030	N/A	55.8858	-110.8024	99	2003	2023
<b>CHR_4</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0041	N/A	56.270733	-110.479144	1	2007	2007
<b>CHR_5</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0050	N/A	56.65833	-111.04167	97	2003	2023
<b>CLR_1</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0050	N/A	56.6633	-110.9286	82	2017	2023
<b>CLR_2</b>	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0060	N/A	56.666591	-111.043613	14	2003	2015

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
CLR_3	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0090	N/A	56.67381	-111.10355	14	2011	2012
CLR_4	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0200	N/A	56.68485	-111.255549	88	2016	2023
CLR_5	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0210	N/A	56.68871	-111.31751	68	2003	2015
DOR_1	Tributaries of the Athabasca River	EPA_OSM	AB07DB0005	N/A	57.1214	-112.0133	2	2016	2017
DUR_1	Tributaries of the Athabasca River	EPA_OSM	RAMP_DUR-1	N/A	56.846856	-112.701425	1	2009	2009
ELR_1	Ells River and Tributaries	ECCC	ELLS RIFF 5B	CABIN monitoring location	57.22094	-111.98817	60	2013	2014
		EPA_OSM	RAMP_ELR-3	Near shore grab	57.220751	-111.988135	3	2013	2015
ELR_2	Ells River and Tributaries	ECCC	ELLS RIFF 5	Initial CABIN monitoring location	57.22775	-111.9589	1	2012	2012
		ECCC	ELLS RIFF 5A	Updated CABIN monitoring location	57.22775	-111.9589	29	2012	2015
		EPA_OSM	AB07DA2999	Near shore grab	57.227778	-111.958889	90	2016	2023
ELR_3	Ells River and Tributaries	EPA_OSM	AB07DA3005	Near shore grab	57.23222	-111.74361	12	2011	2013
		EPA_OSM	RAMP_ELR-2A	Near shore grab, 500 m upstream	57.232706	-111.754081	3	2010	2012
ELR_4	Ells River and Tributaries	ECCC	ELLS RIFF 2	CABIN Biomonitoring Location	57.24456	-111.73656	85	2012	2015
		EPA_OSM	AB07DA3007	Near shore grab	57.244444	-111.736389	94	2004	2023
ELR_5	Ells River and Tributaries	EPA_OSM	AB07DA0700	N/A	57.29634	-111.6911	323	2017	2023

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
ELR_6	Ells River and Tributaries	ECCC	EL1		57.30488	-111.67642	114	NA	NA
		ECCC	Ells	500 m upstream	57.306777	-111.67973	1	2012	2012
		EPA_OSM	AB07DA0750	Near shore grab	57.30444	-111.67583	64	2003	2017
EMR_1	Tributaries of the Athabasca River	EPA_OSM	RAMP_EMR-1	N/A	58.358268	-111.550145	1	2003	2003
EMR_2	Tributaries of the Athabasca River	ACFN-MDS	ACFN-28	N/A	58.56886	-111.09	8	2021	2021
EMR_3	Tributaries of the Athabasca River	ACFN-MDS	ACFN-7	N/A	58.68562669	-111.053044	38	2014	2022
EYC_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA1320	N/A	57.491499	-111.568444	4	2011	2014
FIC_1	Peace Athabasca Delta and Tributaries	ACFN-MDS	ACFN-8	Fisherman's Channel	58.661893	-110.771681	1	2014	2014
		ACFN-MDS	ACFN-22	Steamboat Channel	58.66194	-110.771	8	2020	2020
FIR_1	Firebag River and Tributaries	EPA_OSM	AB07DC0010	Near shore grab	57.33466	-110.47335	107	2003	2023
		EPA_OSM_KE ARL	AB07DC0010	Increased sample frequency for Kearl response	57.33466	-110.47335	1	2023	2023
		EPA_OSM	RAMP_FI2	RAMP sampling location	57.33466	-110.47335	2	2016	2017
FIR_2	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0050	N/A	57.43604	-110.89294	32	2023	2023
FIR_3	Firebag River and Tributaries	ACFN-MDS	Firebag River 01 (upstream)	N/A	57.4707	-111.04098	1	2023	2023
FIR_4	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0055	N/A	57.4754	-111.09055	26	2023	2023
FIR_5	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0057	N/A	57.5407	-111.07931	28	2023	2023



SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
FIR_6	Firebag River and Tributaries	ECCC	FI WSC	ECCC sampling location	57.65075	-111.2019167	1	2012	2012
		ECCC	FI WSC	Updated ECCC sampling location	57.65075	-111.2019167	129	2012	2015
		EPA_OSM	AB07DC0060	EPA sampling location	57.65	-111.20417	112	2011	2023
FIR_7	Firebag River and Tributaries	ECCC	FI1B	Details not available	57.7431	-111.35254	83	2012	2015
		ECCC	FI1A	Details not available	57.7431	-111.35254	13	2012	2013
		EPA_OSM	AB07DC0110	EPA sampling location	57.74306	-111.35083	59	2003	2017
		EPA_OSM	AB07DC0090	Details not available	57.75	-111.35667	1	2011	2011
		ECCC	Firebag	Details not available	57.743116	-111.352683	1	2012	2012
		ACFN-MDS	Firebag River at AR	ACFN sampling location	57.733614	-111.34413	3	2023	2023
FLC_1	Slave River and Tributaries	ACFN-MDS	ACFN-9	N/A	58.9237651	-111.1675215	37	2016	2022
FOC_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA2760	N/A	57.409078	-111.640005	11	2003	2016
GIC_1	Peace Athabasca Delta and Tributaries	ACFN-MDS	ACFN-11	N/A	58.669596	-110.870285	1	2014	2014
GRC_1	Tributaries of the Athabasca River	ACFN-MDS	ACFN-24	N/A	57.914412	-111.423779	2	2021	2021
GRR_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0100	N/A	56.484155	-110.835157	4	2014	2017
HAR_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0010	N/A	56.6321	-111.3498	93	2004	2023

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
HAR_2	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0040	N/A	56.71	-111.3525	85	2013	2023
HHR_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CD0300	N/A	56.761802	-110.467229	90	2011	2023
HHR_2	Clearwater-Christina River and Tributaries	ECCC	HIHI1	N/A	56.7425	-110.51083	81	2013	2015
HOR_1	Tributaries of the Athabasca River	EPA_OSM	RAMP_HOR-1	N/A	56.361689	-112.175464	1	2009	2009
HOR_2	Tributaries of the Athabasca River	EPA_OSM	AB07CC0050	N/A	56.71	-111.39722	85	2016	2023
IYC_1	Muskeg River and Tributaries	EPA_OSM	RAMP_IYC-1	N/A	57.24957	-111.175222	7	2007	2014
JAPC_1	Muskeg River and Tributaries	EPA_OSM	AB07DA1225	N/A	57.068138	-111.329454	7	2008	2014
JAPC_2	Muskeg River and Tributaries	EPA_OSM	AB07DA1100	N/A	57.2059	-111.39038	51	2012	2017
JAPC_3	Muskeg River and Tributaries	EPA_OSM	AB07DA1090	N/A	57.23833	-111.41528	12	2006	2017
JAPC_4	Muskeg River and Tributaries	EPA_OSM	AB07DA0600	Current EPA sampling location	57.25944	-111.46472	212	1998	2023
		EPA_OSM	AB07DA0605	Details not available	57.25944	-111.46472	23	1998	2002
JAFC_1	Tributaries of the PAD	ACFN-MDS	ACFN-12	N/A	58.4185149	-110.918688	34	2014	2022
JAFC_2	Tributaries of the PAD	ACFN-MDS	ACFN-13	N/A	58.39794	-110.963	48	2019	2021
JAR_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0019	N/A	55.672428	-111.097958	6	2012	2017
KEC_1	Tributaries of the PAD	ACFN-MDS	ACFN-14	N/A	58.4746929	-110.8225329	1	2014	2014
LSR_1	Tributaries of the Athabasca River	EPA_LTRN_T MN	AB07BK0125	N/A	55.20667	-114.1225	227	1996	2023

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
<b>MAC_1</b>	Tributaries of the PAD	ACFN-MDS	ACFN-17	N/A	58.39587044	-110.9708348	70	2012	2014
<b>MAR_1</b>	Mackay River	ECCC	MA2	250 m upstream	56.9665	-111.91222	81	2013	2015
		EPA_OSM	AB07DB0350	Near shore grab	56.9666	-111.90813	248	2003	2023
<b>MAR_2</b>	Mackay River	EPA_OSM	RAMP MAR-2A	N/A	57.021161	-111.827819	6	2009	2014
<b>MAR_3</b>	Mackay River	EPA_OSM	AB07DB0030	N/A	57.1527	-111.7607	77	2017	2023
<b>MAR_4</b>	Mackay River	ECCC	MA1D	Details not available	57.21572	-111.695	67	2013	2015
		EPA_OSM	AB07DB0300	Near shore grab	57.21056	-111.69333	267	2017	2023
<b>MAR_5</b>	Mackay River	ECCC	MA1C	Details not available	57.17286	-111.65514	7	2013	2013
		ECCC	MA1A	Details not available	57.16811	-111.64064	21	2012	2012
		ECCC	MA1B	Details not available	57.16916	-111.64223	16	2012	2012
		ECCC	MacKay	Details not available	57.16896666	-111.6421167	1	2012	2012
		EPA_OSM	AB07DB0060	Near shore grab	57.16833	-111.64	66	2003	2017
<b>MCCC_1</b>	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0102	N/A	57.56419	-111.17656	2	2023	2023
<b>MCCC_2</b>	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0105	N/A	57.609722	-111.148889	26	2023	2023
<b>MCIR_1</b>	Peace Athabasca Delta and Tributaries	ECCC	AL07KF0006	N/A	58.05889139	-111.9041686	48	2013	2022
<b>MCLC_1</b>	Tributaries of the Athabasca River	EPA_OSM	AB07DA0071	N/A	56.897479	-111.41637	13	2003	2016
<b>MIC_1</b>	Tributaries of the Athabasca River	EPA_OSM	RAMP_MIC-1	N/A	57.245033	-111.600372	5	2010	2014
<b>MOC_1</b>	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0075	N/A	57.509659	-111.16404	24	2023	2023
<b>MUC_1</b>	Muskeg River and Tributaries	EPA_OSM	RAMP_MUC-1	N/A	57.283802	-111.314658	11	2003	2014

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
MUC_2	Muskeg River and Tributaries	EPA_OSM	AB07DA2755	N/A	57.3075	-111.38917	69	1998	2014
MUR_1	Muskeg River and Tributaries	EPA_OSM	AB07DA0430	Upstream site	57.33158	-111.12036	276	2012	2023
		EPA_OSM	AB07DA0420	Near shore grab	57.34472	-111.13056	2	2013	2014
		EPA_OSM	RAMP_MUR-6	RAMP site	57.343927	-111.131375	10	2003	2012
MUR_2	Muskeg River and Tributaries	EPA_OSM	AB07DA0440	N/A	57.417439	-111.22387	96	2008	2017
MUR_3	Muskeg River and Tributaries	ECCC	MU7	Same site	57.40681	-111.26476	21	2012	2012
		ECCC	MU7	Same site	57.406816	-111.264766	1	2012	2012
MUR_4	Muskeg River and Tributaries	EPA_OSM	AB07DA1125	N/A	57.38417	-111.29583	3	1998	1999
MUR_5	Muskeg River and Tributaries	ECCC	MU6	Biodiversity monitoring location	57.35138	-111.33537	90	2012	2015
		EPA_OSM	AB07DA0475	Near shore grab	57.35306	-111.33583	229	2003	2023
MUR_6	Muskeg River and Tributaries	EPA_OSM	AB07DA2750	N/A	57.33111	-111.37389	29	1998	2002
MUR_7	Muskeg River and Tributaries	EPA_OSM	AB07DA2754	N/A	57.30722	-111.39389	75	2010	2017
MUR_8	Muskeg River and Tributaries	EPA_OSM	AB07DA0595	N/A	57.26389	-111.4725	260	1998	2023
MUR_9	Muskeg River and Tributaries	ECCC	MU1	50 m upstream	57.19246667	-111.5729167	1	2012	2012
		ECCC	MU1A	ECCC sampling location	57.19233	-111.57188	44	2012	2013
		ECCC	MU1B	100 m downstream	57.19139	-111.57017	80	2013	2015
		EPA_OSM	AB07DA0610	Near shore grab	57.19167	-111.56806	483	1998	2023
MUR_10	Muskeg River and Tributaries	EPA_OSM	AB07DA0620	N/A	57.13472	-111.60222	43	1998	2017
MRT_1	Muskeg River and Tributaries	EPA_OSM	AB07DA0606	N/A	57.25306	-111.49833	3	1998	1999
NSR_1	Steepbank River and Tributaries	EPA_OSM	RAMP_NSR-1	Details not available	57.064342	-111.043204	12	2003	2014
		EPA_OSM	RAMP_STR-2	Details not available	57.064342	-111.043204	13	2003	2015
PER_1	Peace River Region	EPA_LTRN_T MN	AB07FD0135	N/A	56.09319	-117.56608	204	2006	2023

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
PER_2	Peace River Region	EPA_LTRN_T MN	AB07HA0230	N/A	56.65639	-117.14667	145	1988	2023
PER_3	Peace River Region	EPA_LTRN_T MN	AB07HF0010	N/A	58.40444	-116.12806	442	1988	2023
PER_4	Peace River Region	ECCC	AL07KC0001	N/A	59.11389	-112.42639	126	2011	2023
PIR_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA1340	N/A	57.448221	-111.628474	4	2011	2014
POC_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA0110	N/A	56.9133	-111.4603	90	2003	2023
QFC_1	Peace Athabasca Delta and Tributaries	ECCC	AL07KF0004	N/A	58.63158306	-111.3343061	87	2012	2023
REC_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA1570	N/A	57.7361	-111.7765	18	2018	2019
REC_2	Tributaries of the Athabasca River	EPA_OSM	AB07DA1560	N/A	57.7423	-111.4215	21	2018	2020
REC_3	Tributaries of the Athabasca River	EPA_OSM	AB07DA1295	N/A	57.696829	-111.404796	4	2011	2014
RIR_1	Tributaries of the Athabasca River	ECCC	AL07DD0006	N/A	58.36015306	-111.2410039	79	2012	2022
RIR_2	Tributaries of the Athabasca River	ACFN-MDS	ACFN-21	N/A	58.42410075	-111.2429624	1	2014	2014
SAC_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0060	N/A	55.650479	-110.818003	6	2012	2017
SHC_1	Muskeg River and Tributaries	EPA_OSM	AB07DA2756	EPA sampling location	57.285	-111.4125	2	1998	1999
	Muskeg River and Tributaries	EPA_OSM	RAMP_SHC-1	RAMP sampling location	57.284889	-111.408348	3	2006	2009
SLR_1	Slave River and Tributaries	ACFN-MDS	ACFN-5	N/A	58.9155907	-111.1800398	7	2015	2015

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
SLR_2	Slave River and Tributaries	ECCC	AL07NA0001	N/A	58.92216694	-111.18311	92	2012	2023
SLR_3	Slave River and Tributaries	ECCC	AL07NB0001	N/A	59.86917	-111.58583	175	2011	2023
SLR_4	Slave River and Tributaries	ECCC	NW07NC0003	N/A	61.26039778	-113.4585647	87	2012	2023
SLR_5	Slave River and Tributaries	ECCC	NW07NC0004	N/A	61.32130389	-113.6105519	28	2012	2016
SMR_1	Peace River Region	EPA_LTRN_T MN	AB07GJ0010	N/A	55.71556	-117.62194	498	1987	2023
STAC_1	Muskeg River and Tributaries	EPA_OSM	AB07DA0490	N/A	57.35222	-111.37889	14	1998	2016
STR_1	Steepbank River and Tributaries	EPA_OSM	RAMP_STR-3	N/A	56.843885	-111.080719	11	2004	2014
STR_2	Steepbank River and Tributaries	ECCC	STB RIFF 10	CABIN Biomonitoring location	56.86881	-111.14247	81	2012	2015
		EPA_OSM	AB07DA2720	Near shore grab	56.87	-111.14556	226	2016	2023
STR_3	Steepbank River and Tributaries	ECCC	STB RIFF 7	CABIN Biomonitoring location	56.978528	-111.297333	1	2012	2012
		ECCC	STB RIFF 7	CABIN Biomonitoring location, updated location	56.97953	-111.29865	119	2012	2015
		EPA_OSM	AB07DA1010	Near shore grab	56.979444	-111.298611	2	2016	2017
STR_4	Steepbank River and Tributaries	ECCC	STB RIFF WSC	CABIN Biomonitoring location	56.99945	-111.4065833	1	2012	2012
		ECCC	STB RIFF WSC	CABIN Biomonitoring location	56.99945	-111.40658	122	2012	2015
		EPA_OSM	AB07DA1000	Near shore grab	56.9995	-111.4066	291	2016	2023
STR_5	Steepbank River and Tributaries	EPA_OSM	AB07DA0300	N/A	57.01703	-111.43762	11	2011	2012

SOE Code	Watershed	Source	Station	Sub-Site/Sampling Approach	Latitude	Longitude	Samples	Min Year	Max Year
STR_6	Steepbank River and Tributaries	ECCC	STB RIFF 1	CABIN Biomonitoring site	57.02242	-111.47672	1	2012	2012
		ECCC	STB RIFF 1	CABIN Biomonitoring site, updated location	57.02318	-111.47572	97	2012	2015
		EPA_OSM	AB07DA0260	Near shore grab	57.0232	-111.4757	156	2003	2023
SUC_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0032	N/A	55.5529	-111.095	5	2013	2017
SUC_2	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0021	N/A	55.5842	-110.8935	6	2012	2017
TAR_1	Tributaries of the Athabasca River	EPA_OSM	AB07DA1365	Near shore grab	57.393056	-111.986389	219	2004	2023
		EPA_OSM	RAMP_TAR-2A	350 m upstream	57.393832	-111.992339	1	2016	2016
TAR_2	Tributaries of the Athabasca River	EPA_OSM	AB07DA1380	N/A	57.32156	-111.69072	186	2017	2023
UFC_1	Peace Athabasca Delta and Tributaries	ACFN-MDS	ACFN-27	N/A	58.5677536	-111.0587876	8	2021	2021
UNC_1	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0023	N/A	55.619	-110.7171	5	2013	2017
UNC_2	Clearwater-Christina River and Tributaries	EPA_OSM	AB07CE0022	N/A	55.5849	-110.823	5	2013	2017
UNT_1	Firebag River and Tributaries	EPA_OSM_KE ARL	AB07DC0053	N/A	57.47525	-111.08984	2	2023	2023
WAC_1	Muskeg River and Tributaries	EPA_OSM	RAMP_WAC-1	N/A	57.344397	-111.160504	11	2004	2014
WAC_2	Muskeg River and Tributaries	EPA_OSM	AB07DA1126	N/A	57.37833	-111.29167	24	1998	2016

Table B4: Water Quantity Sites

SITE Code	Source	LATITUDE	LONGITUDE	REGION	Number of Records	Minimum Year	Maximum Year
05ED002	WSC	53.88880157	-110.9210968	Atimoswe Creek Near Elk Point	48	1975	2022
05EE002	WSC	53.65100098	-110.3450012	Vermilion River At Lea Park	7	1964	1970
06AA001	WSC	54.43605042	-111.3674469	Beaver River Near Goodridge	56	1967	2022
06AA002	WSC	54.47454071	-112.0143509	Amisk River At Highway No. 36	52	1971	2022
06AB001	WSC	54.46749115	-111.1875916	Sand River Near the Mouth	56	1967	2022
06AB002	WSC	54.71279907	-111.0022736	Wolf River At Outlet of Wolf Lake	56	1968	2023
06AC001	WSC	54.4419899	-110.6866989	Jackfish Creek Near La Corey	51	1972	2022
06AD006	WSC	54.35515976	-110.2172775	Beaver River At Cold Lake Reserve	69	1955	2023
07AA002	WSC	52.91019058	-118.0587006	Athabasca River Near Jasper	73	1913	2023
07AD002	WSC	53.4242897	-117.5694199	Athabasca River At Hinton	62	1961	2022
07AE001	WSC	54.20753098	-116.0632095	Athabasca River Near Windfall	63	1960	2022
07BE001	WSC	54.72203064	-113.2879562	Athabasca River At Athabasca	104	1913	2022
07BF009	WSC	55.60820007	-116.1027374	Salt Creek Near Grouard	37	1986	2022
07BF010	WSC	55.81917191	-116.3897171	South Heart River Near Peavine	24	2000	2023
07BF905	WSC	55.57978058	-116.295639	South Heart River Near Big Prairie Settlement	19	2005	2023
07BK001	WSC	55.30487061	-114.7562103	Lesser Slave River at Slave Lake	62	1915	2023
07BK007	WSC	55.25547028	-114.2307892	Driftwood River Near the Mouth	55	1968	2022
07CA006	WSC	55.19929886	-112.4665985	Wandering River Near Wandering River	53	1971	2023
07CA012	WSC	55.17238998	-111.7247009	Logan River Near the Mouth	40	1984	2023
07CA013	WSC	55.01087189	-111.8563995	Owl River Below Piche River	40	1984	2023
07CB002	WSC	55.64247131	-112.1528091	House River At Highway No. 63	42	1982	2023
07CD001	WSC	56.68524933	-111.2552185	Clearwater River At Draper	70	1930	2023
07CD004	WSC	56.70893097	-111.3563004	Hangingstone River At Fort McMurray	59	1965	2023
07CD005	WSC	56.6634903	-110.9287033	Clearwater River Above Christina River	58	1966	2023
07CD008	WSC	56.26871872	-111.4871979	Hangingstone River At North Star Road	6	2017	2022
07CD009	WSC	56.76369095	-110.4610596	High Hill River Near the Mouth	6	2017	2022
07CE002	WSC	55.83710861	-110.8691025	Christina River Near Chard	42	1982	2023
07CE003	WSC	55.86968994	-110.9173584	Pony Creek Near Chard	41	1982	2022
07CE005	WSC	55.67292023	-111.0994034	Jackfish River Below Christina Lake	21	1982	2023
07CE007	WSC	56.5929718	-110.9178009	Christina River Near the Mouth	7	2017	2023
07CE008	WSC	56.48443985	-110.8351135	Gregoire River Near the Mouth	7	2017	2023
07CE010	WSC	55.57191849	-110.9012833	Sunday Creek Above Christina Lake	7	2017	2023
07CE013	WSC	55.88895035	-111.5401001	Christina River Above Statoi Leismer	7	2017	2023
07DA001	WSC	56.78089142	-111.4025803	Athabasca River Below Fort McMurray	67	1957	2023
07DA006	WSC	56.99934006	-111.4069977	Steepbank River Near Fort McMurray	52	1972	2023
07DA007	WSC	56.91334915	-111.4599991	Poplar Creek Near Fort McMurray	21	1972	2022
07DA008	WSC	57.19128036	-111.5699997	Muskeg River Near Fort Mackay	49	1974	2022
07DA018	WSC	56.94532013	-111.5662003	Beaver River Above Syncrude	49	1975	2023
07DA026	WSC	57.23933029	-111.4150009	Jackpine Creek At Canterra Road	7	2017	2023



SITE Code	Source	LATITUDE	LONGITUDE	REGION	Number of Records	Minimum Year	Maximum Year
07DA027	WSC	57.24964142	-111.1750336	Iyinin Creek Above Kearn Lake	6	2017	2022
07DA028	WSC	57.35319138	-111.3363037	Muskeg River Above Stanley Creek	6	2017	2022
07DA029	WSC	57.30849838	-111.3976974	Muskeg River Above Muskeg Creek	6	2017	2022
07DA032	WSC	57.24552917	-111.7332001	Ells River At Canadian Natural Resources Limited Bridge	7	2017	2023
07DA033	WSC	57.4031105	-111.6924973	Calumet River Near the Mouth	6	2017	2022
07DA034	WSC	57.33763885	-111.1294174	Muskeg River Upland	6	2017	2022
07DA035	WSC	57.28416824	-111.3155289	Muskeg Creek Near the Mouth	7	2017	2023
07DA037	WSC	57.39393997	-111.9859238	Tar River Above Canadian Natural Resources Limited Lake	6	2017	2022
07DA038	WSC	57.07184982	-111.2003937	East Jackpine Creek Near The 1300 Ft Contour	6	2017	2022
07DA039	WSC	57.22092819	-111.987999	Ells River Above Joslyn Creek Diversion	7	2017	2023
07DA040	WSC	57.64337921	-111.4887009	Big Creek Near the Mouth	7	2017	2023
07DA041	WSC	57.49571991	-111.5762787	Eymundson Creek Near the Mouth	7	2017	2023
07DA042	WSC	57.74324036	-111.4213028	Red Clay Creek Near the Mouth	6	2018	2023
07DA044	WSC	56.86737823	-111.139801	Steepbank River Below North Steepbank River	7	2017	2023
07DA045	WSC	57.32152176	-111.6908035	Tar River Near the Mouth	6	2017	2022
07DB001	WSC	57.2104187	-111.6949997	Mackay River Near Fort Mackay	51	1972	2022
07DB002	WSC	57.17380142	-111.8029022	Dover River Near the Mouth	10	1975	2023
07DB003	WSC	56.85074997	-112.708313	Dunkirk River Near Fort Mackay	12	1975	2023
07DB006	WSC	56.96755981	-111.9055023	Mackay River At Petro-Canada Bridge	6	2017	2022
07DC001	WSC	57.65116882	-111.2025299	Firebag River Near the Mouth	52	1971	2022
07DC003	WSC	57.33496857	-110.4736404	Firebag River Upstream of Suncor Firebag	6	2017	2022
07DD001	WSC	58.31264114	-111.5150986	Athabasca River At Embarras Airport	24	1971	2023
07DD002	WSC	58.36043167	-111.2405014	Richardson River Near the Mouth	54	1970	2023
07DD003	WSC	58.42985916	-111.547081	Embarras River Below Divergence	34	1987	2022
07FD003	WSC	55.91907883	-118.6066437	Peace River At Dunvegan Bridge	59	1960	2022
07FD908	WSC	56.16667175	-117.5999985	Grimshaw Drainage Near Grimshaw	21	1991	2011
07GJ001	WSC	55.71459961	-117.6230774	Smoky River at Watino	76	1915	2022
07HA001	WSC	56.24494171	-117.3143311	Peace River At Peace River	83	1915	2022
07HA003	WSC	56.05564117	-117.1298904	Heart River Near Nampa	61	1963	2023
07HA005	WSC	56.51094055	-117.6609573	Whitemud River Near Dixonville	53	1971	2023
07HA914	WSC	56.0141716	-117.1455612	Nampa (South) Drainage Near Nampa	21	1991	2011
07HB001	WSC	56.48749924	-116.4334869	Cadotte River At Outlet Cadotte Lake	39	1984	2022
07HC001	WSC	56.92004013	-117.6184235	Notikewin River At Manning	62	1961	2022
07HC002	WSC	56.89501953	-117.4885406	Buchanan Creek Near Manning	38	1985	2022
07HC907	WSC	56.82860947	-117.5688934	North Star Drainage Near North Star	21	1991	2011
07HD001	WSC	57.74227905	-117.0326538	Peace River Near Carcajou	8	1960	1967
07HF001	WSC	58.38777924	-116.0286484	Peace River At Fort Vermilion	43	1915	2022
07JA003	WSC	55.91667175	-113.9213028	Willow River Near Wabasca	38	1985	2022
07JC001	WSC	57.07305145	-115.0966797	Lafond Creek Near Red Earth Creek	48	1975	2022

SITE Code	Source	LATITUDE	LONGITUDE	REGION	Number of Records	Minimum Year	Maximum Year
<b>07JC003</b>	WSC	57.07781982	-115.0761337	Loon River Near the Mouth	17	2006	2022
<b>07JD002</b>	WSC	57.87462997	-115.3891373	Wabasca River At Highway No. 88	53	1970	2022
<b>07KC001</b>	WSC	59.11806107	-112.4369431	Peace River At Peace Point (Alberta)	64	1959	2022
<b>07KE001</b>	WSC	58.32492065	-113.0651093	Birch River Below Alice Creek	57	1967	2023
<b>07KF015</b>	WSC	58.48168945	-111.4851913	Embarras River Breakthrough to Mamawi Lake	33	1987	2022
<b>07NB001</b>	WSC	59.86333084	-111.5908279	Slave River at Fitzgerald (Alberta)	73	1921	2021

Table B5: Site Details, green sites are currently sampled

SOE Code	Latitude	Longitude	Associated WSC Site	Description
ATR_1	54.72222	-113.28611	07BE001	LTRN site within the Athabasca River at Town of Athabasca sampled by EPA by near shore grab. Sampled between 1987 and 2023.
ATR_2	54.9625	-112.84694		Sampling location on the Athabasca River downstream of the AIPAC DIFF Centre. Samples were collected by the EPA as near shore grab from 2017 to 2024.
ATR_3	56.31	-112.59139		Sampling location on the Athabasca River above grand rapids. Samples were collected by EPA by near shore grab in 2017 during the 2016-17 wildfire.
ATR_4	56.72061111	-111.4058056		Sampling site on the Athabasca River upstream of the confluence with Horse River. Various sampling regimes have been completed at this site between 2012 and 2023 by both ECCC and EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling.
ATR_5	56.78033	-111.4024	07DA001	Samples have been collected downstream of fort McMurray near the WSC gauge. Samples were collected by the EPA by near shore grab between 2019 and 2020.
ATR_6	56.83849	-111.41702		Sampling site on the Athabasca River downstream of the WSC gauge. Various sampling regimes have been completed at this site between 2003 and 2023 by both ECCC and EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling.
ATR_7	56.940291	-111.439454		Sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2018 and 2021.
ATR_8	57.007818	-111.462064		Sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2018 and 2021.
ATR_9	57.015363	-111.481123		Former RAMP sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2003 and 2021.
ATR_10	57.034435	-111.504043		Sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2018 and 2021.
ATR_11	57.048655	-111.511194		Sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2018 and 2021.
ATR_12	57.071098	-111.530605		Sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2018 and 2021.
ATR_13	57.12622222	-111.6040278		Sampling site on the Athabasca River upstream of the confluence with the Muskeg River. Various sampling regimes have been completed at this site between 2003 and 2021 by both ECCC and EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling.
ATR_14	57.15605556	-111.63		Sampling site on the Athabasca River upstream of the confluence with the Mackay River. Various sampling regimes have been completed at this site between 2011 and 2016 by both ECCC and EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling.
ATR_15	57.21513	-111.61512		Sampling site on the Athabasca River downstream of the confluence with the Mackay River. Various sampling regimes have been completed at this site between 2012 and 2017 by both ECCC and EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling.
ATR_16	57.31332	-111.67533		Sampling site on the Athabasca River downstream of the confluence with the Ellis River. Various sampling regimes have been completed at this site between 2012 and 2023 by both ECCC and

SOE Code	Latitude	Longitude	Associated WSC Site	Description
				EPA, this includes panel sampling, sampling of the thalweg and near shore grab sampling. Athabasca River M7, below Ells River
ATR_17	57.407621	-111.649866		Former RAMP sampling location on the Athabasca River. Samples were collected by EPA by near shore grab in 2003.
ATR_18	57.43139	-111.6422		EPA sampling site on the Athabasca River 5 km downstream of Bitumount. Samples were collected by near shore grab between 2003 and 2005.
ATR_19	57.452166	-111.611744		Former RAMP sampling location on the Athabasca River. Samples were collected by EPA by near shore grab between 2005 and 2016.
ATR_20	57.55983	-111.505134		Sampling location on the Athabasca River near the Kearl water intake. Sampled by ACFN.
ATR_21	57.72361	-111.37917		Sampling location on the Athabasca River upstream of the Firebag River. Sampled primarily by ECCC between 1989 and 2019 but also by EPA in response to the Kearl release.
ATR_22	57.740747	-111.368418		Former RAMP sampling station downstream of Firebag River sampled between 2003 and 2010.
ATR_23	57.87495133	-111.3942933		ACFN sampling location on the Athabasca River at Poplar Point, samples were collected between 2020 and 2022.
ATR_24	58.1725	-111.3702778		Long term ECCC sampling location on the Athabasca River at 27 Baseline. Samples have been collected between 1989 and 2023.
ATR_25	58.205	-111.39		Sampling location on the Athabasca River near the Embarras airport. Sampled by EPA by near shore grab between 2019 and 2020.
ATR_26	58.353316	-111.541848		Former RAMP Sampling locations on the Athabasca River upstream of the Embarras River, sampled by EPA in 2004.
ATR_27	58.38278	-111.51778		Long term sampling site on the Athabasca River at Old Fort, sampled have been collected by the EPA between 1987 and 2023.
ATR_28	58.39711258	-111.5273329		ACFN sampling location on the Athabasca River near the Embarras Portage and WSC gauge. Samples have been collected between 2016 and 2022.
ATR_29	58.44722	-111.18583		Long term sampling site on the Athabasca River located downstream, of the Devil's Elbow at the winter road crossing. Sampling has been completed by the EPA between 1997 and 2023.
ATR_30	58.590791	-110.795243		Former RAMP sampling station monitored between 2003 and 2004.
BEC_1	56.943803	-111.566232		Sampling site on Beaver Creek upstream of Syncrude mine and downstream of the confluence with Cache Creek. Sampled by EPA between 2008 and 2023.
BEC_2	57.11917	-111.60556		Sampling site on Beaver Creek upstream of the confluence with Athabasca River. Sampled by EPA between 2003 and 2016.
BEAR_1	54.43044	-110.48254		TMN sampling site on the Beaver River, at highway 892 bridge north of Ardmore. Samples have been collected by EPA between 1983 and 2023.
BEAR_2	54.355	-110.21444		TMN sampling site on the Beaver River, at HWY 28 bridge near beaver crossing. Samples have been collected by EPA between 1983 and 2023.
BEAR_3	54.25139	-110.02972		TMN sampling site on the Beaver River, 6 km upstream of the Alberta-Saskatchewan border. Samples have been collected by EPA between 1983 and 2023.
BIGC_1	57.6333	-111.7919		Sampling site on Big Creek approximately 25 km upstream of the Athabasca River. Sampled by EPA between 2018 and 2019.
BIGC_2	57.6306	-111.4741	07DA040	Sampling site on Big Creek at the upstream of the confluence with Athabasca River. Sampled by EPA between 2011 and 2020.
BIRC_1	55.614752	-111.124391		Sampling site on Birch Creek near Highway 881. Sampled by EPA between 2013 and 2017.

SOE Code	Latitude	Longitude	Associated WSC Site	Description
BIR_1	58.31542611	-113.0685081	07KE001	Sampling site on Birch River downstream of the confluence with Alice Creek. Sampled by ECCC between 2011 and 2022.
BUC_1	57.97889139	-111.7722239		Sampling site on the upstream segment of Buckton Creek. Sampled by ECCC between 2013 and 2022.
BUC_2	58.12688778	-111.8892875		Sampling site on the downstream segment of Buckton Creek. Sampled by ECCC between 2013 and 2022.
CAR_1	57.443381	-111.764825		Sampling site on the Calumet River north of Calumet Lake. Sampled by EPA between 2005 and 2014.
CAR_2	57.403755	-111.68415	07DA033	Sampling site on the Calumet River upstream of the confluence with the Athabasca River. Sampled by EPA between 2003 and 2024.
CHR_1	55.88836	-111.543	07CE013	Sampling site on the Christina River 70 km upstream of the May River. Sampled by EPA between 2013 and 2024.
CHR_2	55.7191	-111.2196		Sampling site on the Christina River 25 km downstream of the confluence with May River. Sampled by EPA between 2013 and 2017.
CHR_3	55.8858	-110.8024		Sampling site on the Christina River 11.5 km downstream of the confluence with Pony Creek. Sampled by EPA between 2003 and 2024.
CHR_4	56.270733	-110.479144		Sampling site on the Christina River 2 km downstream of Christina crossing. Sampled by EPA in 2007.
CHR_5	56.65833	-111.04167		Sampling site on the Christina River upstream of the confluence with clearwater River. Sampled by EPA between 2003 and 2024.
CLR_1	56.6633	-110.9286	07CD005	Sampling site on the Clearwater River near the WSC gauge. Sampled by EPA between 2017 and 2024.
CLR_2	56.666591	-111.043613		Sampling site on the Clearwater River upstream of the confluence with Christina River. Sampled by EPA between 2003 and 2015.
CLR_3	56.67381	-111.10355		Sampling site on the Clearwater River 2km downstream of the confluence with Christina River. Sampled by EPA between 2011 and 2012.
CLR_4	56.68485	-111.255549	07CD001	Sampling site on the Clearwater River at the WSC gauge near Draper. Sampled by EPA between 2016 and 2024.
CLR_5	56.68871	-111.31751		Sampling site on the Clearwater River near Waterways, upstream of the confluence with Athabasca River. Sampled by EPA between 2003 and 2015.
DOR_1	57.1214	-112.0133		Sampling site on Dover River approximately 40 km upstream of the confluence with MacKay River. Sampled by EPA between 2016 and 2017.
DUR_1	56.846856	-112.701425	07DB003	Former RAMP station on Dunkirk River near the WSC gauge. Sampled by EPA in 2009.
ELR_1	57.22094	-111.98817	07DA039	Upstream sampling location on the Ells River, biomonitoring is also completed in this area. Sampling has been completed by both EPA and ECCC between 2013 and 2015.
ELR_2	57.22775	-111.9589		Sampling location on the Ells River approximately 35 km upstream of the Town of Fort McKay Water Pump Station. Biomonitoring is also completed in this area. Sampling has been completed by both EPA and ECCC between 2015 and 2024.
ELR_3	57.23222	-111.74361		Sampling location on the Ells River upstream of the Town of Fort McKay Water Pump Station. Sampling has been completed by both EPA between 2011 and 2013.

SOE Code	Latitude	Longitude	Associated WSC Site	Description
ELR_4	57.24456	-111.73656	07DA032	Sampling location on the Ells River, near the Town of Fort McKay Water Pump Station. Biomonitoring is also completed in this area. Sampling has been completed by both EPA and ECCC between 2004 and 2024.
ELR_5	57.29634	-111.6911		Sampling location on the Ells River, 5 km downstream of the Town of Fort McKay Water Pump Station. Sampling has been completed by EPA between 2017 and 2024.
ELR_6	57.30488	-111.67642		Sampling location on the Ells River, upstream of the confluence with Athabasca River. Sampling has been completed by EPA and ECCC between 2003 and 2012.
EMR_1	58.358268	-111.550145		Sampling site on the Embarras River at the confluence with the Athabasca River. Sampled by EPA in 2003.
EMR_2	58.5688572	-111.0898032		Sampling site on the Embarras River near Fletcher. Sampled by ACFN in 2021.
EMR_3	58.68562669	-111.053044		Sampling site on the Embarras River towards Lake Athabasca. Sampled by ACFN between 2014 and 2022.
EYC_1	57.491499	-111.568444		Sampling site on Eymundson Creek upstream of the confluence with the Athabasca River. Sampled by AOSERP between 2011 and 2014 AT MOUTH - AOSERP
FIC_1	58.661893	-110.771681		Sampling site in Fisherman's Channel. Sampled by ACFN between 2014 and 2020.
FIR_1	57.33466	-110.47335	07DC003	Upstream sampling site on the Firebag River at the WSC gauge. Sampled by EPA from 2003 to 2024 by near shore grab.
FIR_2	57.43604	-110.89294		Sampling site on the Firebag River collected by Imperial Oil Ltd. as part of the Kearl Response in 2023.
FIR_3	57.4707	-111.04098		Sampling site at an upstream location on the Firebag River collected by ACFN.
FIR_4	57.4754	-111.09055		Sampling site on the Firebag River collected by Imperial Oil Limited as part of the Kearl Response in 2023.
FIR_5	57.5407	-111.07931		Sampling site on the Firebag River collected by Imperial Oil Limited as part of the Kearl Response in 2023.
FIR_6	57.65	-111.20417	07DC001	Sampling site on the Firebag River at the WSC gauge. Sampled by EPA from 2011 to 2024 by near shore grab.
FIR_7	57.74306	-111.35083		Sampling site on the Firebag River at the confluence with the Athabasca River. Sampled by EPA from 2003 to 2017 by near shore grab.
FLC_1	58.9237651	-111.1675215		Sampling site on Flett creek upstream of the confluence with the Slave River. Sampled by ACFN between 2016 and 2022.
FOC_1	57.409078	-111.640005		Sampling site on Fort Creek upstream of the confluence with the Athabasca River. Sampled by EPA between 2003 and 2016.
GIC_1	58.669596	-110.870285		Sampling site from the Goose Island Channel. Sampled by ACFN in 2014.
GRC_1	57.914412	-111.423779		Sampling site on Grayling Creek upstream of the confluence with the Athabasca River. Sampled by ACFN in 2021.
GRR_1	56.484155	-110.835157	07CE008	Sampling site on Gregoire River 2 km upstream of the confluence with Christina River. Sampled by EPA between 2014 and 2017.
HAR_1	56.6321	-111.3498		Sampling site on Hangingstone River 5 km upstream of Prairie Creek. Sampled by EPA between 2004 and 2024.
HAR_2	56.71	-111.3525	07CD004	Sampling site on Hangingstone River at the WSC station at Fort McMurray. Sampled by EPA between 2013 and 2024.
HHR_1	56.761802	-110.467229	07CD009	Sampling site on High Hills River at WSC gauge. Sampled by EPA between 2011 and 2024.



SOE Code	Latitude	Longitude	Associated WSC Site	Description
HHR_2	56.7425	-110.51083		Sampling site on High Hills River upstream of the confluence with Clearwater River. Sampled by ECCC between 2013 and 2015.
HOR_1	56.361689	-112.175464		Former RAMP sampling site on the Horse River, sampled in 2009.
HOR_2	56.71	-111.39722		Sampling site on the Horse River upstream of the confluence with the Athabasca River. Sampled by EPA between 2016 and 2024.
IYC_1	57.24957	-111.175222	07DA027	Former RAMP site on Iyininim Creek at the WSC gauge, sampled between 2007 and 2024.
JAFC_1	58.4185149	-110.918688		Sampling site on Jackfish Creek at the confluence with Athabasca River. Sampled by ACFN between 2013 and 2022.
JAFC_2	58.3979437	-110.9633253		Sampling site on Jackfish Creek at the confluence with Richardson Lake. Sampled by ACFN between 2019 and 2021.
JAPC_1	57.068138	-111.329454		Sampling site on Jackpine Creek near the East Athabasca Highway. Sampled by EPA between 2008 and 2014.
JAPC_2	57.2059	-111.39038		Sampling site on Jackpine Creek approximately 16.5 km upstream of the confluence with the Muskeg River. Sampled by EPA between 2012 and 2017.
JAPC_3	57.23833	-111.41528	07DA026	Sampling site on Jackpine Creek approximately 3.2 km upstream of the confluence with the Muskeg River. Sampled by EPA between 2006 and 2017.
JAPC_4	57.25944	-111.46472		Sampling site on Jackpine Creek approximately 0.4 km upstream of the confluence with the Muskeg River. Sampled by EPA between 1998 and 2024.
JAR_1	55.672428	-111.097958	07CE005	Sampling site on Jackfish River, 8 km downstream of Christina Lake. Sampled by EPA between 2012 and 2017.
KEC_1	58.4746929	-110.8225329		Sampling site on Keane Creek at confluence with Athabasca River. Sampled by ACFN in 2014.
LSR_1	55.20667	-114.1225		Sampling site on Lesser Slave River 9.5 km upstream of the confluence with Athabasca River. TMN site sampled by EPA between 1996 and 2023.
MAC_1	58.39587044	-110.9708348		Sampling site on Maybelle Creek. Sampled by ACFN from 2012 to 2014.
MAR_1	56.9665	-111.91222	07DB006	Upstream sampling site on MacKay River 35 km downstream of Birchwood Creek. Sampled by ECCC and EPA between 2003 and 2024.
MAR_2	57.021161	-111.827819		Former RAMP station on MacKay River, sampled between 2008 and 2014.
MAR_3	57.1527	-111.7607		Sampling site on MacKay River upstream of the confluence with Dover River. Sampled by EPA between 2017 and 2024.
MAR_4	57.21056	-111.69333		Sampling site on MacKay River at the WSC gauge. Sampled by ECCC and EPA between 2013 and 2024.
MAR_5	57.16811	-111.64064		Sampling site on MacKay River at the confluence with the Athabasca River. Sampled by ECCC and EPA between 2003 and 2017.
MCCC_1	57.56419	-111.17656		Upstream sampling site on McClelland Creek 1 km upstream of the confluence with Moose Creek. Sampled as part of the Kearl response in 2023.
MCCC_2	57.609722	-111.148889		Sampling site on McClelland Creek upstream of the confluence with Firebag River Sampled as part of the Kearl response in 2023.
MCIR_1	58.05889139	-111.9041686		Upstream sampling site on the Mclvor River. Sampled by ECCC between 2013 and 2022.
MCLC_1	56.897479	-111.41637		Sampling site on McLeod Creek at the confluence with the Athabasca River. Sampled by EPA between 2003 and 2016.

SOE Code	Latitude	Longitude	Associated WSC Site	Description
MIC_1	57.245033	-111.600372		Former RAMP station on Mills Creek, sampled between 2010 and 2014.
MOC_1	57.509659	-111.16404		Sampling site on Moose Creek upstream of the confluence with McClelland Creek. Sampled as part of the Kearl response in 2023.
MUC_1	57.283802	-111.314658	07DA035	Former RAMP station on Muskeg Creek and the WSC gauge, sampled between 2003 and 2014.
MUC_2	57.3075	-111.38917		Sampling site on Muskeg Creek at the confluence of an unnamed pond and historically the Muskeg River. Sampled between 1998 and 2014.
MUR_1	57.33158	-111.12036	07DA034	Sampling sites on the Muskeg River approximately 25 km upstream of the confluence with Stanley Creek. Sampled by EPA between 2003 and 2024.
MUR_2	57.417439	-111.22387		Sampling site on the Muskeg River approximately 11 km upstream of the confluence with Stanley Creek. Sampled by EPA between 2008 and 2017.
MUR_3	57.40681	-111.26476		Sampling site on the Muskeg River approximately 5 km upstream of the confluence with Stanley Creek. Sampled by EPA in 2012.
MUR_4	57.38417	-111.29583		Sampling site on the Muskeg River approximately upstream of the confluence with Wapasu Creek. Sampled by EPA between 1998 and 1999.
MUR_5	57.35138	-111.33537	07DA028	Sampling site on the Muskeg River upstream of the confluence with Stanley Creek. Biomonitoring is also completed in this area. Sampled by EPA and ECCC between 2003 and 2024.
MUR_6	57.33111	-111.37389		Sampling site on the Muskeg River downstream of the confluence with Stanley Creek. Sampled by EPA between 1998 and 2002.
MUR_7	57.30722	-111.39389	07DA029	Sampling site on the Muskeg River upstream of the confluence with Muskeg Creek. Sampled by EPA between 2010 and 2017.
MUR_8	57.26389	-111.4725		Sampling site on the Muskeg River upstream of the confluence with Jackpine Creek. Sampled by EPA between 1998 and 2024.
MUR_9	57.19233	-111.57188	07DA008	Sampling site on the Muskeg River at the WSC gauge. Sampled by EPA and ECCC between 1998 and 2024.
MUR_10	57.13472	-111.60222		Sampling site on the Muskeg River at the confluence with Athabasca River. Sampled by EPA between 1998 and 2017.
MRT_1	57.25306	-111.49833		Sampling site at a tributary of the Muskeg River at the confluence with the Muskeg River. Sampled by EPA between 1998 and 1999.
NSR_1	57.064342	-111.043204		Sampling site on the North Steepbank River approximately 25 km north of the confluence with the Steepbank river. Sampling was completed by EPA between 2003 and 2015.
PER_1	56.09319	-117.56608		Sampling site on the Peace River, upstream of the confluence with the Smoky River at the Shaftbury Ferry. Sampling completed by EPA as part of the LTRN from 2006 to 2023.
PER_2	56.65639	-117.14667		Sampling site on the Peace River, upstream of the confluence with the Whitemud River. Sampling completed by EPA as part of the LTRN from 1988 to 2023.
PER_3	58.40444	-116.12806	07HF001	Sampling site on the Peace River at Fort Vermillion. Sampling completed by EPA as part of the LTRN from 1988 to 2023.
PER_4	59.11389	-112.42639	07KC001	Sampling site on the Peace River at Peace Point. Sampling completed by ECCC from 2011 to 2023.
PIR_1	57.448221	-111.628474		Sampling site on the Pierre River at the confluence with Athabasca River. Sampling was completed by AOSERP from 2011 to 2014.



SOE Code	Latitude	Longitude	Associated WSC Site	Description
POC_1	56.9133	-111.4603	07DA007	Sampling Site on Poplar Creek near Highway 63, 21.6 km north of Fort McMurray. Sampling was completed by EPA between 2003 and 2023.
QFC_1	58.63158306	-111.3343061		Sampling site in the southernmost of the Quatre Fourches Channels upstream of Mamawi Lake. Sampling was completed by ECCC between 2012 and 2023.
REC_1	57.7361	-111.7765		Upstream sampling site on Redclay Creek 30 km upstream of the confluence with Athabasca River. Sampling was done by EPA between 2018 and 2019.
REC_2	57.7423	-111.4215	07DA042	Sampling site on Redclay Creek 5 km upstream of the confluence with Athabasca River. Sampling was done by EPA between 2018 and 2020.
REC_3	57.696829	-111.404796		Sampling site on Redclay Creek at the confluence with the Athabasca River. Sampling was done by EPA between 2011 and 2014.
RIR_1	58.36015306	-111.2410039	07DD002	Sampling site on the Richardson River at the WSC gauge. Sampled by ECCC from 2012 to 2022.
RIR_2	58.42410075	-111.2429624		Sampling site on the Richardson River at the confluence with the Athabasca River. Sampled by ACFN in 2014.
SAC_1	55.650479	-110.818003		Sampling site on Sawbones Creek 2 km north of Christina Lake. Sampled by EPA from 2012 to 2017.
SHC_1	57.285	-111.4125		Sampling Site on Shelley Creek 4000 m upstream of the confluence with the Muskeg River. Sampled by EPA between 1998 to 2009.
SLR_1	58.9155907	-111.1800398		Sampling Site on the Slave River (Rivière des Roches) upstream of the confluence with Flett Creek. Sampled by ACFN in 2015.
SLR_2	58.92216694	-111.18311		Sampling Site on the Slave River (Rivière des Roches) downstream of the confluence with Flett Creek. Sampled by ECCC between 2012 and 2023.
SLR_3	59.86917	-111.58583	07NB001	Sampling Site on the Slave River at Fitzgerald at WSC gauge. Sampled by ECCC between 2011 and 2023.
SLR_4	61.26039778	-113.4585647		Sampling Site on the Slave River 10 km upstream of Slave Lake. Sampled by ECCC between 2012 and 2023.
SLR_5	61.32130389	-113.6105519		Sampling Site on the Slave River at the mouth to Slave Lake. Sampled by ECCC between 2012 and 2016.
SMR_1	55.71556	-117.62194		Sampling site on the Smoky River upstream of the confluence with the Peace River at the WSC gauge at Watino. Sampled by EPA as part of the LTRN from 1987 to 2023.
STAC_1	57.35222	-111.37889		Sampling Site on Stanley Creek 2.4 km upstream of the confluence with the Muskeg River. Sampled by EPA between 1998 and 2016.
STR_1	56.843885	-111.080719		Former RAMP upstream sampling site on the Steepbank River upstream of the confluence with the North Steepbank River, sampled between 2004 and 2014.
STR_2	56.86881	-111.14247	07DA044	Sampling site on the Steepbank River downstream of the confluence with the North Steepbank River at the WSC gauge. Biomonitoring is also conducted at this location. Sampling conducted by ECCC and EPA between 2012 and 2024.
STR_3	56.97953	-111.29865		Sampling site on the Steepbank River. Biomonitoring is also conducted at this location. Sampling conducted by ECCC and EPA between 2012 and 2017.
STR_4	56.99945	-111.40658	07DA006	Sampling site on the Steepbank River at the WSC gauge. Biomonitoring is also conducted at this location. Sampling conducted by ECCC and EPA between 2012 and 2024.

SOE Code	Latitude	Longitude	Associated WSC Site	Description
STR_5	57.01703	-111.43762		Sampling site on the Steepbank River 5 km upstream of the confluence with the Athabasca River. Sampling conducted by EPA between 2011 and 2012.
STR_6	57.02318	-111.47572		Sampling site on the Steepbank River at the confluence with the Athabasca River. Biomonitoring is also conducted at this location. Sampling conducted by ECCC and EPA between 2012 and 2024.
SUC_1	55.5529	-111.095		Sampling location on Sunday Creek near Highway 881. Sampled by EPA from 2013 to 2017.
SUC_2	55.5842	-110.8935		Sampling location on Sunday Creek 10km upstream of the Christina Lake. Sampled by EPA from 2012 to 2017.
TAR_1	57.393832	-111.992339	07DA037	Sampling site on Tar River near the WSC gauge 32 km upstream of the confluence with Athabasca River. Sampled by EPA and formerly through RAMP between 2004 and 2024.
TAR_2	57.32156	-111.69072	07DA045	Sampling site on Tar River at the WSC gauge near the confluence with Athabasca River. Sampled by EPA between 2017 and 2023.
UFC_1	58.5677536	-111.0587876		Site on Upper Fletcher Creek sampled by ACFN in 2021.
UNC_1	55.619	-110.7171		Sampling site on an unnamed creek 6km east of Christina Lake. Sampled by EPA from 2013 to 2017.
UNC_2	55.5849	-110.823		Sampling site on an unnamed creek 6km south of Christina Lake. Sampled by EPA from 2013 to 2017.
UNT_1	57.47525	-111.08984		Sampling site on an unnamed tributary of the Firebag River at the confluence with the Firebag River. Sampled in 2023 as part of the Kearl response.
WAC_1	57.344397	-111.160504		Former upstream RAMP sampling site on Wapasu Creek, sampled from 2004 to 2014.
WAC_2	57.37833	-111.29167		Sampling site on Wapasu Creek 100 m upstream of the confluence with the Muskeg River. Sampled by EPA from 1998 to 2016.

### B.3.0 REFERENCES

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