WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION

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Wood Buffalo Environmental Association

ANNUAL REPORT – VOLUME 2

2018 INTEGRATED DATA

March 2019

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS

Passive Measurements:	Maxxam Analytics Ltd Edmonton, Alberta
Volatile Organic Compounds:	InnoTech Alberta, Inc. Vegreville, Alberta
Particulate Matter:	Atmospheric Research & Analysis, Inc. Morrisville, NC
	Desert Research Institute Reno, NV
Elemental Carbon and Organic Carbon:	Desert Research Institute Reno, NV
Polycyclic Aromatic Hydrocarbons:	Airzone One Incorporated Mississauga, Ontario
	Wisconsin State Laboratory of Hygiene Madison, WI
Precipitation:	Central Analytical Laboratory Champaign, IL
	InnoTech Alberta, Inc. Vegreville, Alberta

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Integrated Monitoring Summaries

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

HNO_3, NH_3, NO_2, O_3 AND SO_2 PASSIVE MEASUREMENTS DATA SUMMARY 2018

Prepared
March 2019

SAMPLE COLLECTIONAND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS

Passive Measurements: Maxxam Analytics Ltd
Edmonton, Alberta

FILE CONTENTS DESCRIPTION	Passive Measurements of SO_2, NO_2, O_3, NH_3 and HNO_3	
SAMPLING INTERVAL	Monthly	
SAMPLING FREQUENCY OF DATA	Monthly	
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection	
UNITS	ppbv or $\mu g/m^3$	
OBSERVATION TYPE	Gas	
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Diffusion	
MEDIUM	Filter	
ANALYTICALMETHODS	IONS by Ion Chromatography (IC)	
SAMPLE PREPARATION	DI water extraction	
ANALYTICAL LABORATORY	MAXXAM Analytics Inc	
USER NOTE 1	Data are blank corrected for SO_2, NO_2 and O_3. Data are not blank corrected for NH_3 and HNO_3.	
USER NOTE 2	Concentrations are calculated by equations developed by lab	
SAMPLING INSTRUMENT TYPE	SO_2	all-season SO_2 passive sampling system
	NO_2	all-season NO_2 passive sampling system
	O_3	all-season O_3 passive sampling system
	NH_3	Ogawa passive sampler
	HNO_3	Ogawa passive sampler
FLAGS USED		
V0	Valid value	
V1	Valid value but comprised wholly or partially of below detection limit data	
V4	Valid value despite failing to meet some QC or statistical criteria	
V5	Valid value but qualified because of possible contamination	
V6	Valid value but qualified due to non-standard sampling conditions (30 ±5 days)	
M1	Missing value because no value is available	
M2	Missing value because invalidated by Data Originator	
NA	Not available	

October 31, 2018

Wood Buffalo Environmental Association

Attention: Yu-Mei Hzu & the WBEA Team

Re: Data Reissue for NH3 by Passive Sampler

Dear Dr. Hsu:

Thank you for bringing the ammonia (NH_3) by Passive Sampler template calculation issue to Maxxam's attention. Maxxam takes great pride in our quality management system and recognizes the importance of reporting high quality defensible data to our customers. As an ISO 17025 accredited laboratory, when an error occurs we investigate, determine the root cause and implement corrective actions. A Corrective Action Report (CAR) has been completed (PTC CAR-00040) and included the involvement of our quality assurance department and our senior management team. Our investigation and corrective actions are summarized below.

There was a calculation error resulting in original sample results being reported high by a factor of two. The calculation for the passive sampler is provided in the manufacturer's instructions however the sampler alpha (uptake rate) was incorrectly specified in the original protocol (1.0 Sept 2005) since it did not state the alpha rate was based on two pads extracted simultaneously. A revised manufacturer's protocol (2.0 Oct 2010) did correctly state the alpha rate was based on both pads extracted together however this was not implemented within the Maxxam SOP. Maxxam validated this method originally in 2009 using the original 2005 protocol and unfortunately missed the 2010 reference method update.

Both our quality system and our ISO 17025 accreditation provider requires the analysis and submission of proficiency testing (PT) samples for all accredited parameters, which includes ammonia. Normally these single blind samples would help identify calculation errors during initial method validation however due to limitations on the types of commercially available matrices, the PT sample was not an Ogawa passive sampler and therefore did not require the same calculation. The initial and subsequent PT results did not flag the issue with the method.

Maxxam's investigation into this matter is now complete. Corrective actions are noted below:

1) Annual internal review of the manufacturer's reference method going forward.
2) The calculation in our standard operating procedure has been updated.
3) Previously reported customer data will be reissued with an explanation of the issue.

We would like to apologize for any inconvenience this data excursion may have caused. You are a valued customer and we are continually striving to ensure we provide analytical results and services that meet your expectations.

The Maxxam team is available to meet in person or via conference call to discuss any aspect of this issue. Please call if you have any questions or concerns.

Sincerely,

Carmen Toker
Passive Air Monitoring Laboratory Manager
Maxxam Analytics
780-378-8529

Paul Fewer
Vice President – Quality & EHS
Maxxam Analytics
902-877-3297

Wood Buffalo Environmental Association

Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
400	Jun-13-18	Jul-10-18	1.7	0.1	V0	64	292	130
400	Jun-13-18	Jul-10-18	2.3	0.1	V0	64	292	130
400	Jul-10-18	Aug-03-18	1.7	0.1	V6	69	291	76.8
400	Jul-10-18	Aug-03-18	1.7	0.1	V6	69	291	76.8
400	Aug-03-18	Sep-05-18	1.2	0.1	V0	66	286	80.2
400	Aug-03-18	Sep-05-18	1.1	0.1	V0	66	286	80.2
400	Sep-05-18	Oct-17-18	0.7	0.1	V6	70	275	69.9
400	Sep-05-18	Oct-17-18	0.6	0.1	V6	70	275	69.9
400	Oct-17-18	Dec-05-18	0.4	0.1	V6	81	268	63.4
400	Oct-17-18	Dec-05-18	0.4	0.1	V6	81	268	63.4
400	Dec-05-18	Jan-05-19	0.6	0.1	V0	81	263	74.7
400	Dec-05-18	Jan-05-19	0.6	0.1	V0	81	263	74.7
401	Jun-11-18	Jul-07-18	2.7	0.1	V0	69	291	130
401	Jun-11-18	Jul-07-18	2.9	0.1	V0	69	291	130
401	Jul-07-18	Jul-30-18	2.1	0.1	V6	67	292	130
401	Jul-07-18	Jul-30-18	2	0.1	V6	67	292	130
401	Jul-30-18	Sep-10-18	0.8	0.1	V6	68	288	130
401	Jul-30-18	Sep-10-18	0.8	0.1	V6	68	288	130
401	Sep-16-18	Oct-16-18	1	0.1	V0	69	274	129
401	Sep-16-18	Oct-16-18	1	0.1	V0	69	274	129
401	Oct-16-18	Dec-03-18	0.4	0.1	V6	78	268	130
401	Oct-16-18	Dec-03-18	0.4	0.1	V6	78	268	130
401	Dec-03-18	Jan-02-19	0.6	0.1	V0	80	260	130
401	Dec-03-18	Jan-02-19	0.6	0.1	V0	80	260	130
402	Jul-04-18	Aug-02-18	1.2	0.1	V0	65	292	45.3
402	Jul-04-18	Aug-02-18	1.3	0.1	V0	65	292	45.3
402	Aug-02-18	Sep-05-18	1.5	0.1	V0	69	287	130
402	Aug-02-18	Sep-05-18	1.3	0.1	V0	69	287	130
402	Sep-05-18	Oct-16-18	0.6	0.1	V6	72	273	130
402	Sep-05-18	Oct-16-18	0.6	0.1	V6	72	273	130
402	Oct-16-18	Dec-04-18	0.4	0.1	V6	82	267	130
402	Oct-16-18	Dec-04-18	0.4	0.1	V6	82	267	130
402	Dec-04-18	Jan-03-19	0.6	0.1	V0	82	261	130
402	Dec-04-18	Jan-03-19	1.2	0.1	V0	82	261	130
403	Jun-12-18	Jul-10-18	1.8	0.1	V0	65	292	130
403	Jun-12-18	Jul-10-18	1.7	0.1	V0	65	292	130
403	Jul-10-18	Aug-03-18	1.9	0.1	V6	69	292	130
403	Jul-10-18	Aug-03-18	1.1	0.1	V6	69	292	130
403	Aug-03-18	Sep-07-18	1.1	0.1	V0	68	289	130
403	Aug-03-18	Sep-07-18	1.1	0.1	V0	68	289	130
403	Sep-07-18	Oct-17-18	0.8	0.1	V6	70	275	130
403	Sep-07-18	Oct-17-18	0.8	0.1	V6	70	275	130
403	Oct-17-18	Dec-07-18	0.3	0.1	V6	79	269	130
403	Oct-17-18	Dec-07-18	0.4	0.1	V6	79	269	130
403	Dec-07-18	Jan-03-19	0.7	0.1	V0	78	260	130
403	Dec-07-18	Jan-03-19	0.4	0.1	V0	78	260	130
404	Jun-11-18	Jul-04-18	-9999	0.1	M1	37	298	15.5
404	Jun-11-18	Jul-04-18	2.3	0.1	V6	37	298	15.5
404	Jul-04-18	Jul-30-18	0.9	0.1	V0	63	291	68.5
404	Jul-04-18	Jul-30-18	1.5	0.1	V0	63	291	68.5
404	Jul-30-18	Sep-02-18	1.2	0.1	V0	65	288	63.6
404	Jul-30-18	Sep-02-18	1.2	0.1	V0	65	288	63.6
404	Sep-02-18	Oct-16-18	0.7	0.1	V6	67	276	60.2
404	Sep-02-18	Oct-16-18	0.5	0.1	V6	67	276	60.2
404	Oct-16-18	Dec-03-18	0.5	0.1	V6	78	268	56.8
404	Oct-16-18	Dec-03-18	0.4	0.1	V6	78	268	56.8
404	Dec-03-18	Jan-02-19	1	0.1	V0	81	262	56.5
404	Dec-03-18	Jan-02-19	0.9	0.1	V0	81	262	56.5
414	Jun-12-18	Jul-10-18	1.7	0.1	V0	65	289	130
414	Jun-12-18	Jul-10-18	1.8	0.1	V0	65	289	130

Wood Buffalo Environmental Association

Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
414	Jul-10-18	Aug-03-18	2.2	0.1	V6	69	290	130
414	Jul-10-18	Aug-03-18	1.9	0.1	V6	69	290	130
414	Aug-03-18	Sep-05-18	1.5	0.1	V0	68	287	130
414	Aug-03-18	Sep-05-18	1.2	0.1	V0	68	287	130
414	Sep-05-18	Oct-15-18	0.8	0.1	V6	70	274	130
414	Sep-05-18	Oct-15-18	0.7	0.1	V6	70	274	130
414	Oct-15-18	Dec-05-18	0.5	0.1	V6	79	268	130
414	Oct-15-18	Dec-05-18	0.5	0.1	V6	79	268	130
414	Dec-05-18	Jan-05-19	0.4	0.1	V0	78	263	130
414	Dec-05-18	Jan-05-19	0.4	0.1	V0	78	263	130
AS103	Dec-06-17	Feb-04-18	0.3	0.1	V0	80	257	130
AS103	Dec-06-17	Feb-04-18	0.4	0.1	V0	80	257	130
AS103	Feb-04-18	Apr-04-18	0.3	0.1	V0	68	263	130
AS103	Feb-04-18	Apr-04-18	0.2	0.1	V0	68	263	130
AS103	Apr-04-18	May-08-18	1	0.1	V0	53	278	130
AS103	Apr-04-18	May-08-18	0.9	0.1	V0	53	278	130
AS103	May-08-18	Jun-06-18	1.6	0.1	V0	52	287	130
AS103	May-08-18	Jun-06-18	1.7	0.1	V0	52	287	130
AS103	Jun-06-18	Jul-07-18	1.6	0.1	V0	65	292	130
AS103	Jun-06-18	Jul-07-18	2	0.1	V0	65	292	130
AS103	Jul-07-18	Aug-01-18	1.6	0.1	V0	67	292	130
AS103	Jul-07-18	Aug-01-18	2.4	0.1	V0	67	292	130
AS103	Aug-01-18	Sep-05-18	2	0.1	V0	66	294	130
AS103	Aug-01-18	Sep-05-18	1.7	0.1	V0	66	294	130
AS103	Sep-05-18	Oct-03-18	0.9	0.1	V0	70	277	130
AS103	Sep-05-18	Oct-03-18	0.9	0.1	V0	70	277	130
AS103	Oct-03-18	Nov-01-18	0.7	0.1	V0	70	275	130
AS103	Oct-03-18	Nov-01-18	0.9	0.1	V0	70	275	130
AS103	Nov-01-18	Dec-07-18	0.4	0.1	V6	83	265	130
AS103	Nov-01-18	Dec-07-18	0.4	0.1	V6	83	265	130
AS103	Dec-07-18	Jan-03-19	0.7	0.1	V0	78	260	130
AS103	Dec-07-18	Jan-03-19	0.7	0.1	V0	78	260	130
AS107	Dec-07-17	Feb-01-18	0.4	0.1	V0	80	257	130
AS107	Dec-07-17	Feb-01-18	0.4	0.1	V0	80	257	130
AS107	Feb-01-18	Apr-06-18	0.2	0.1	V0	68	263	130
AS107	Feb-01-18	Apr-06-18	0.2	0.1	V0	68	263	130
AS107	Apr-06-18	May-10-18	0.9	0.1	V0	51	279	130
AS107	Apr-06-18	May-10-18	1.7	0.1	V0	51	279	130
AS107	May-10-18	Jun-06-18	1.8	0.1	V0	54	288	130
AS107	May-10-18	Jun-06-18	1.5	0.1	V0	54	288	130
AS107	Jun-06-18	Jul-07-18	1.6	0.1	V0	92	288	55.5
AS107	Jun-06-18	Jul-07-18	1.9	0.1	V0	92	288	55.5
AS107	Jul-07-18	Aug-01-18	2.5	0.1	V0	64	291	67.4
AS107	Jul-07-18	Aug-01-18	2	0.1	V0	64	291	67.4
AS107	Aug-01-18	Sep-07-18	1.7	0.1	V6	65	288	63.5
AS107	Aug-01-18	Sep-07-18	1.7	0.1	V6	65	288	63.5
AS107	Sep-07-18	Oct-05-18	1.2	0.1	V0	67	276	60.6
AS107	Sep-07-18	Oct-05-18	1.1	0.1	V0	67	276	60.6
AS107	Oct-05-18	Nov-02-18	0.7	0.1	V0	68	275	59.6
AS107	Oct-05-18	Nov-02-18	1	0.1	V0	68	275	59.6
AS107	Nov-02-18	Dec-07-18	0.5	0.1	V0	83	264	55.3
AS107	Nov-02-18	Dec-07-18	0.4	0.1	V0	83	264	55.3
AS107	Dec-07-18	Jan-08-19	0.6	0.1	V0	80	262	56.2
AS107	Dec-07-18	Jan-08-19	0.4	0.1	V0	80	262	56.2
BM07	Dec-05-17	Feb-04-18	0.4	0.1	V0	79	253	130
BM07	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
BM07	Apr-04-18	May-06-18	0.8	0.1	V0	65	274	130
BM07	May-07-18	Jul-05-18	0.6	0.1	V6	75	290	105
BM07	Jul-05-18	Sep-05-18	0.7	0.1	V6	64	289	80.7
BM07	Sep-05-18	Oct-05-18	1.1	0.1	V0	66	276	84

Wood Buffalo Environmental Association

Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
BM07	Oct-03-18	Nov-06-18	0.3	0.1	V0	69	273	85.2
BM07	Nov-06-18	Jan-03-19	0.3	0.1	V6	81	262	80.3
BM10	Dec-07-17	Feb-01-18	0.4	0.1	V0	76	257	130
BM10	Feb-01-18	Apr-03-18	0.2	0.1	V0	65	262	130
BM10	Apr-03-18	May-06-18	0.8	0.1	V0	54	277	130
BM10	May-06-18	Jun-02-18	1.4	0.1	V0	44	289	130
BM10	Jun-02-18	Jul-03-18	-9999	0.1	M1	72	287	117
BM10	Jul-03-18	Aug-01-18	1.5	0.1	V0	68	289	120
BM10	Aug-01-18	Sep-04-18	1.2	0.1	V0	71	286	115
BM10	Sep-04-18	Oct-02-18	0.9	0.1	V0	72	274	115
BM10	Oct-02-18	Nov-02-18	0.5	0.1	V0	76	272	87.7
BM10	Nov-02-18	Dec-06-18	0.3	0.1	V0	86	263	96.8
BM10	Dec-06-18	Jan-04-19	0.8	0.1	V0	86	259	81.8
BM11	Dec-05-17	Feb-04-18	0.3	0.1	V0	79	253	130
BM11	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
BM11	Apr-04-18	May-07-18	1.1	0.1	V0	64	274	130
BM11	May-07-18	Jul-05-18	0.6	0.1	V6	75	290	105
BM11	Jul-05-18	Sep-05-18	0.8	0.1	V6	64	289	80.7
BM11	Sep-05-18	Oct-03-18	1.3	0.1	V0	66	276	84
BM11	Oct-03-18	Nov-05-18	0.4	0.1	V0	69	273	85.7
BM11	Nov-05-18	Jan-03-19	0.2	0.1	V6	81	262	80.1
JE306	Dec-05-17	Feb-04-18	0.4	0.1	V0	79	253	130
JE306	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
JE306	Apr-04-18	May-07-18	0.7	0.1	V0	64	274	130
JE306	May-07-18	Jun-05-18	1.2	0.1	V0	60	285	130
JE306	Jun-05-18	Jul-05-18	1.4	0.1	V0	70	290	127
JE306	Jul-05-18	Jul-31-18	1.2	0.1	V0	69	290	128
JE306	Jul-31-18	Sep-05-18	1.4	0.1	V6	71	287	127
JE306	Sep-05-18	Oct-11-18	1	0.1	V6	71	274	121
JE306	Oct-11-18	Nov-05-18	0.9	0.1	V0	74	273	130
JE306	Nov-05-18	Dec-04-18	0.6	0.1	V0	82	263	130
JE306	Dec-04-18	Jan-03-19	0.4	0.1	V0	81	261	129
JE308	Dec-07-17	Feb-01-18	0.4	0.1	V0	76	257	130
JE308	Feb-01-18	Apr-03-18	0.1	0.1	V0	65	262	130
JE308	Apr-03-18	May-06-18	0.8	0.1	V0	54	277	130
JE308	May-06-18	Jun-02-18	1.2	0.1	V0	44	289	130
JE308	Jun-02-18	Jul-03-18	-9999	0.1	M1	72	287	117
JE308	Jul-03-18	Aug-01-18	1.1	0.1	V0	68	289	120
JE308	Aug-01-18	Sep-04-18	1.8	0.1	V0	71	286	115
JE308	Sep-04-18	Oct-02-18	1.1	0.1	V0	72	274	115
JE308	Oct-02-18	Nov-02-18	0.6	0.1	V0	76	272	87.7
JE308	Nov-02-18	Dec-06-18	0.4	0.1	V0	86	263	96.8
JE308	Dec-06-18	Jan-04-19	0.6	0.1	V0	86	259	81.8
JE312	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
JE312	Feb-05-18	Apr-05-18	0.3	0.1	V0	68	264	130
JE312	Apr-05-18	May-08-18	1.2	0.1	V0	51	278	130
JE312	May-08-18	Jun-07-18	1.2	0.1	V0	53	287	128
JE312	Jun-07-18	Jul-06-18	1.8	0.1	V0	66	290	121
JE312	Jul-06-18	Aug-02-18	1.7	0.1	V0	68	290	125
JE312	Aug-02-18	Sep-06-18	1.7	0.1	V0	68	287	122
JE312	Sep-06-18	Oct-04-18	1.4	0.1	V0	71	274	119
JE312	Oct-04-18	Nov-01-18	0.7	0.1	V0	73	272	96.4
JE312	Nov-01-18	Dec-05-18	0.3	0.1	V0	85	263	107
JE312	Dec-05-18	Jan-05-19	0.5	0.1	V0	81	260	84.5
JE316	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
JE316	Feb-05-18	Apr-05-18	0.3	0.1	V0	68	264	130
JE316	Apr-05-18	May-08-18	0.9	0.1	V0	51	278	130
JE316	May-08-18	Jun-04-18	1.6	0.1	V0	51	287	129
JE316	Jun-04-18	Jul-06-18	4.1	0.1	V0	73	289	129
JE316	Jul-06-18	Aug-03-18	1.2	0.1	V0	72	290	130

Wood Buffalo Environmental Association

Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
JE316	Aug-03-18	Sep-06-18	1.8	0.1	V0	42	293	130
JE316	Sep-06-18	Oct-04-18	0.9	0.1	V0	75	275	129
JE316	Oct-04-18	Nov-01-18	0.8	0.1	V0	72	274	124
JE316	Nov-01-18	Dec-05-18	0.4	0.1	V0	86	264	130
JE316	Dec-05-18	Jan-05-19	0.8	0.1	V0	83	260	128
JE323	Dec-08-17	Feb-01-18	0.4	0.1	V0	80	257	130
JE323	Feb-01-18	Apr-05-18	0.3	0.1	V0	68	263	130
JE323	Apr-05-18	May-09-18	1	0.1	V0	52	278	130
JE323	May-09-18	Jun-06-18	1.4	0.1	V0	53	288	130
JE323	Jun-06-18	Jul-07-18	2.9	0.1	V0	60	293	118
JE323	Jul-07-18	Aug-01-18	1.5	0.1	V0	74	289	111
JE323	Aug-01-18	Sep-05-18	1.9	0.1	V0	70	286	112
JE323	Sep-05-18	Oct-05-18	1	0.1	V0	71	275	130
JE323	Oct-05-18	Nov-01-18	0.8	0.1	V0	72	273	110
JE323	Nov-01-18	Dec-06-18	0.4	0.1	V0	82	263	47.7
JE323	Dec-06-18	Jan-04-19	0.5	0.1	V0	77	259	98.1
JP101	Dec-04-17	Feb-06-18	0.3	0.1	V0	80	258	130
JP101	Dec-04-17	Feb-06-18	0.3	0.1	V0	80	258	130
JP101	Feb-06-18	Apr-06-18	0.2	0.1	V0	68	263	130
JP101	Feb-06-18	Apr-06-18	0.2	0.1	V0	68	263	130
JP101	Apr-06-18	May-05-18	1.1	0.1	V0	54	277	130
JP101	Apr-06-18	May-05-18	1.3	0.1	V0	54	277	130
JP101	May-05-18	Jun-08-18	1.3	0.1	V0	51	288	130
JP101	May-05-18	Jun-08-18	1.1	0.1	V0	51	288	130
JP101	Jun-08-18	Jul-07-18	1.9	0.1	V0	67	291	130
JP101	Jun-08-18	Jul-07-18	2.5	0.1	V0	67	291	130
JP101	Jul-07-18	Aug-07-18	0.6	0.1	V0	67	291	82.7
JP101	Jul-07-18	Aug-07-18	1.3	0.1	V0	67	291	82.7
JP101	Aug-07-18	Sep-07-18	1.9	0.1	V0	67	285	79
JP101	Aug-07-18	Sep-07-18	1.8	0.1	V0	67	285	79
JP101	Sep-07-18	Oct-10-18	0.9	0.1	V0	71	274	67
JP101	Sep-07-18	Oct-10-18	0.9	0.1	V0	71	274	67
JP101	Oct-10-18	Nov-02-18	1	0.1	V6	68	276	74.3
JP101	Oct-10-18	Nov-02-18	0.8	0.1	V6	68	276	74.3
JP101	Nov-02-18	Dec-07-18	0.4	0.1	V0	87	264	61.8
JP101	Nov-02-18	Dec-07-18	0.5	0.1	V0	87	264	61.8
JP101	Dec-07-18	Jan-08-19	0.6	0.1	V0	80	262	74.3
JP101	Dec-07-18	Jan-08-19	0.7	0.1	V0	80	262	74.3
JP102	Dec-07-17	Feb-01-18	0.4	0.1	V0	79	255	130
JP102	Dec-07-17	Feb-01-18	0.4	0.1	V0	79	255	130
JP102	Feb-01-18	Apr-06-18	0.2	0.1	V0	67	261	130
JP102	Feb-01-18	Apr-06-18	0.2	0.1	V0	67	261	130
JP102	Apr-06-18	May-10-18	1.2	0.1	V0	54	279	130
JP102	Apr-06-18	May-10-18	1.2	0.1	V0	54	279	130
JP102	May-10-18	Jun-06-18	1.5	0.1	V0	51	289	130
JP102	May-10-18	Jun-06-18	1.6	0.1	V0	51	289	130
JP102	Jun-06-18	Jul-07-18	2.6	0.1	V0	92	288	55.5
JP102	Jun-06-18	Jul-07-18	1.7	0.1	V0	92	288	55.5
JP102	Jul-07-18	Aug-01-18	1.8	0.1	V0	64	291	67.4
JP102	Jul-07-18	Aug-01-18	1.8	0.1	V0	64	291	67.4
JP102	Aug-01-18	Sep-07-18	2	0.1	V6	65	288	63.5
JP102	Aug-01-18	Sep-07-18	1.7	0.1	V6	65	288	63.5
JP102	Sep-07-18	Oct-05-18	1.2	0.1	V0	67	276	60.6
JP102	Sep-07-18	Oct-05-18	1.2	0.1	V0	67	276	60.6
JP102	Oct-05-18	Nov-02-18	0.9	0.1	V0	68	275	59.6
JP102	Oct-05-18	Nov-02-18	0.8	0.1	V0	68	275	59.6
JP102	Nov-02-18	Dec-07-18	0.6	0.1	V0	83	264	55.3
JP102	Nov-02-18	Dec-07-18	0.5	0.1	V0	83	264	55.3
JP102	Dec-07-18	Jan-08-19	0.6	0.1	V0	80	262	56.2
JP102	Dec-07-18	Jan-08-19	0.6	0.1	V0	80	262	56.2

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Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
JP104	Dec-02-17	Feb-04-18	0.5	0.1	V0	79	256	130
JP104	Dec-02-17	Feb-04-18	0.5	0.1	V0	79	256	130
JP104	Feb-04-18	Apr-07-18	0.2	0.1	V0	67	261	130
JP104	Feb-04-18	Apr-07-18	0.2	0.1	V0	67	261	130
JP104	Apr-07-18	May-08-18	1.1	0.1	V0	54	279	130
JP104	Apr-07-18	May-08-18	1.4	0.1	V0	54	279	130
JP104	May-08-18	Jun-01-18	2.3	0.1	V6	44	289	130
JP104	May-08-18	Jun-01-18	2.3	0.1	V6	44	289	130
JP104	Jun-01-18	Jul-04-18	2	0.1	V0	55	295	82.7
JP104	Jun-01-18	Jul-04-18	2.1	0.1	V0	55	295	82.7
JP104	Jul-04-18	Jul-30-18	1.9	0.1	V0	63	291	68.5
JP104	Jul-04-18	Jul-30-18	2	0.1	V0	63	291	68.5
JP104	Jul-30-18	Sep-02-18	2.1	0.1	V0	65	288	63.6
JP104	Jul-30-18	Sep-02-18	2.3	0.1	V0	65	288	63.6
JP104	Sep-02-18	Oct-01-18	1.3	0.1	V0	66	278	61.1
JP104	Sep-02-18	Oct-01-18	1.3	0.1	V0	66	278	61.1
JP104	Oct-01-18	Oct-31-18	1.1	0.1	V0	68	274	60.2
JP104	Oct-01-18	Oct-31-18	1	0.1	V0	68	274	60.2
JP104	Oct-31-18	Dec-03-18	0.6	0.1	V0	83	265	54.4
JP104	Oct-31-18	Dec-03-18	0.7	0.1	V0	83	265	54.4
JP104	Dec-03-18	Jan-02-19	1.2	0.1	V0	81	262	56.5
JP104	Dec-03-18	Jan-02-19	1.1	0.1	V0	81	262	56.5
JP107	Dec-05-17	Feb-04-18	0.3	0.1	V0	79	253	130
JP107	Dec-05-17	Feb-04-18	0.4	0.1	V0	79	253	130
JP107	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
JP107	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
JP107	Apr-04-18	May-07-18	1	0.1	V0	64	274	130
JP107	Apr-04-18	May-07-18	1	0.1	V0	64	274	130
JP107	May-07-18	Jun-05-18	1.6	0.1	V0	60	285	130
JP107	May-07-18	Jun-05-18	1.8	0.1	V0	60	285	130
JP107	Jul-05-18	Jul-31-18	1.2	0.1	V0	63	291	91.4
JP107	Jul-05-18	Jul-31-18	1.1	0.1	V0	63	291	91.4
JP107	Jul-31-18	Sep-05-18	1.7	0.1	V6	65	288	72.9
JP107	Jul-31-18	Sep-05-18	2.1	0.1	V6	65	288	72.9
JP107	Sep-05-18	Oct-03-18	1.2	0.1	V0	66	276	84
JP107	Sep-05-18	Oct-03-18	1.1	0.1	V0	66	276	84
JP107	Oct-03-18	Nov-05-18	0.8	0.1	V0	69	273	85.7
JP107	Oct-03-18	Nov-05-18	0.6	0.1	V0	69	273	85.7
JP107	Nov-05-18	Dec-04-18	0.7	0.1	V0	82	264	84.5
JP107	Nov-05-18	Dec-04-18	0.6	0.1	V0	82	264	84.5
JP107	Dec-04-18	Jan-03-19	0.6	0.1	V0	80	261	75.8
JP107	Dec-04-18	Jan-03-19	0.6	0.1	V0	80	261	75.8
JP108	Dec-06-17	Feb-05-18	0.4	0.1	V0	76	255	130
JP108	Dec-06-17	Feb-05-18	0.4	0.1	V0	76	255	130
JP108	Feb-05-18	Apr-01-18	0.2	0.1	V0	70	259	130
JP108	Feb-05-18	Apr-01-18	0.2	0.1	V0	70	259	130
JP108	Apr-05-18	May-08-18	1	0.1	V0	64	275	130
JP108	Apr-05-18	May-08-18	1	0.1	V0	64	275	130
JP108	May-08-18	Jun-07-18	1.2	0.1	V0	62	285	130
JP108	May-08-18	Jun-07-18	1.2	0.1	V0	62	285	130
JP108	Jun-07-18	Jul-06-18	1.8	0.1	V0	67	290	130
JP108	Jun-07-18	Jul-06-18	0.9	0.1	V0	67	290	130
JP108	Jul-06-18	Aug-03-18	2.3	0.1	V0	68	292	72.3
JP108	Jul-06-18	Aug-03-18	2.1	0.1	V0	68	292	72.3
JP108	Aug-03-18	Sep-06-18	1.5	0.1	V0	68	286	92.8
JP108	Aug-03-18	Sep-06-18	1.5	0.1	V0	68	286	92.8
JP108	Sep-05-18	Oct-04-18	1.3	0.1	V0	72	274	94.5
JP108	Sep-05-18	Oct-04-18	1.1	0.1	V0	72	274	94.5
JP108	Oct-04-18	Nov-01-18	0.7	0.1	V0	74	273	87.7
JP108	Oct-04-18	Nov-01-18	0.7	0.1	V0	74	273	87.7

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Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
JP108	Nov-01-18	Dec-05-18	0.4	0.1	V0	88	261	92.7
JP108	Nov-01-18	Dec-05-18	0.5	0.1	V0	88	261	92.7
JP108	Dec-05-18	Jan-05-19	0.6	0.1	V0	83	260	77.3
JP108	Dec-05-18	Jan-05-19	0.7	0.1	V0	83	260	77.3
JP201	Dec-07-17	Feb-01-18	0.4	0.1	V0	76	257	130
JP201	Dec-07-17	Feb-01-18	0.5	0.1	V0	76	257	130
JP201	Feb-01-18	Apr-03-18	0.2	0.1	V0	65	262	130
JP201	Feb-01-18	Apr-03-18	0.2	0.1	V0	65	262	130
JP201	Apr-03-18	May-06-18	0.9	0.1	V0	54	277	130
JP201	Apr-03-18	May-06-18	0.7	0.1	V0	54	277	130
JP201	May-06-18	Jun-01-18	1.8	0.1	V0	43	289	130
JP201	May-06-18	Jun-01-18	1.5	0.1	V0	43	289	130
JP201	Jun-02-18	Jul-03-18	1.7	0.1	V0	75	287	67.5
JP201	Jun-02-18	Jul-03-18	1.4	0.1	V0	75	287	67.5
JP201	Jul-03-18	Aug-01-18	0.7	0.1	V0	68	290	64.3
JP201	Jul-03-18	Aug-01-18	0.7	0.1	V0	68	290	64.3
JP201	Aug-01-18	Sep-04-18	1.7	0.1	V0	71	287	60.4
JP201	Aug-01-18	Sep-04-18	1.8	0.1	V0	71	287	60.4
JP201	Sep-04-18	Oct-02-18	1.1	0.1	V0	69	275	61.5
JP201	Sep-04-18	Oct-02-18	1	0.1	V0	69	275	61.5
JP201	Oct-02-18	Nov-02-18	0.7	0.1	V0	71	273	58.9
JP201	Oct-02-18	Nov-02-18	0.7	0.1	V0	71	273	58.9
JP201	Nov-02-18	Dec-06-18	0.4	0.1	V0	87	263	42.6
JP201	Nov-02-18	Dec-06-18	0.4	0.1	V0	87	263	42.6
JP201	Dec-06-18	Jan-04-19	0.6	0.1	V0	83	262	52
JP201	Dec-06-18	Jan-04-19	0.6	0.1	V0	83	262	52
JP205	Dec-05-17	Feb-04-18	0.4	0.1	V0	79	253	130
JP205	Dec-05-17	Feb-04-18	0.4	0.1	V0	79	253	130
JP205	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
JP205	Feb-04-18	Apr-04-18	0.2	0.1	V0	70	258	130
JP205	Apr-04-18	May-08-18	0.8	0.1	V0	64	274	130
JP205	Apr-04-18	May-08-18	0.9	0.1	V0	64	274	130
JP205	May-09-18	Jun-05-18	1.4	0.1	V0	61	285	130
JP205	May-09-18	Jun-05-18	1.5	0.1	V0	61	285	130
JP205	Jun-05-18	Jul-05-18	1.5	0.1	V0	66	291	77
JP205	Jun-05-18	Jul-05-18	3.3	0.1	V0	66	291	77
JP205	Jul-05-18	Jul-31-18	0.9	0.1	V0	63	291	91.4
JP205	Jul-05-18	Jul-31-18	1	0.1	V0	63	291	91.4
JP205	Jul-31-18	Sep-05-18	1.6	0.1	V6	65	288	72.9
JP205	Jul-31-18	Sep-05-18	2	0.1	V6	65	288	72.9
JP205	Sep-05-18	Oct-11-18	0.7	0.1	V6	66	275	80
JP205	Sep-05-18	Oct-11-18	0.7	0.1	V6	66	275	80
JP205	Oct-11-18	Nov-05-18	0.6	0.1	V0	71	274	92
JP205	Oct-11-18	Nov-05-18	0.7	0.1	V0	71	274	92
JP205	Nov-05-18	Dec-04-18	0.6	0.1	V0	82	264	84.5
JP205	Nov-05-18	Dec-04-18	0.8	0.1	V0	82	264	84.5
JP205	Dec-04-18	Jan-03-19	0.5	0.1	V0	80	261	75.8
JP205	Dec-04-18	Jan-03-19	0.6	0.1	V0	80	261	75.8
JP210	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
JP210	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
JP210	Feb-05-18	Apr-05-18	0.2	0.1	V0	68	264	130
JP210	Feb-05-18	Apr-05-18	0.3	0.1	V0	68	264	130
JP210	Apr-05-18	May-11-18	0.8	0.1	V6	51	278	130
JP210	Apr-05-18	May-11-18	0.7	0.1	V6	51	278	130
JP210	May-11-18	Jun-04-18	1.4	0.1	V6	52	288	129
JP210	May-11-18	Jun-04-18	1.7	0.1	V6	52	288	129
JP210	Jun-04-18	Jul-06-18	3.7	0.1	V0	67	289	130
JP210	Jun-04-18	Jul-06-18	3.8	0.1	V0	67	289	130
JP210	Jul-06-18	Aug-03-18	1.1	0.1	V0	68	292	72.3
JP210	Jul-06-18	Aug-03-18	1.1	0.1	V0	68	292	72.3

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			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
JP210	Aug-03-18	Sep-06-18	1.9	0.1	V0	68	286	92.8
JP210	Aug-03-18	Sep-06-18	1.5	0.1	V0	68	286	92.8
JP210	Sep-06-18	Oct-04-18	0.9	0.1	V0	72	274	94.5
JP210	Sep-06-18	Oct-04-18	0.9	0.1	V0	72	274	94.5
JP210	Oct-04-18	Nov-01-18	0.7	0.1	V0	74	273	87.7
JP210	Oct-04-18	Nov-01-18	0.6	0.1	V0	74	273	87.7
JP210	Nov-01-18	Dec-05-18	0.7	0.1	V0	88	261	92.7
JP210	Nov-01-18	Dec-05-18	0.6	0.1	V0	88	261	92.7
JP210	Dec-05-18	Jan-05-19	0.6	0.1	V0	83	260	77.3
JP210	Dec-05-18	Jan-05-19	0.6	0.1	V0	83	260	77.3
JP212	Dec-07-17	Feb-05-18	0.4	0.1	V0	78	255	130
JP212	Feb-05-18	Apr-03-18	0.3	0.1	V0	67	262	130
JP212	Apr-03-18	May-10-18	0.9	0.1	V6	55	277	130
JP212	May-10-18	Jun-06-18	1.7	0.1	V0	51	289	130
JP212	Jun-06-18	Jul-07-18	1.8	0.1	V0	92	288	55.5
JP212	Jul-07-18	Aug-02-18	1.6	0.1	V0	64	291	67.2
JP212	Aug-02-18	Sep-04-18	2.4	0.1	V0	65	288	63.6
JP212	Sep-04-18	Oct-05-18	1	0.1	V0	66	276	60.8
JP212	Oct-05-18	Nov-05-18	0.7	0.1	V0	70	274	61.6
JP212	Nov-05-18	Dec-06-18	0.5	0.1	V0	83	264	52.5
JP212	Dec-05-18	Jan-04-19	0.5	0.1	V0	81	262	56.9
JP213	Dec-06-17	Feb-05-18	0.6	0.1	V0	76	255	130
JP213	Dec-06-17	Feb-05-18	0.7	0.1	V0	76	255	130
JP213	Feb-05-18	Apr-05-18	0.2	0.1	V0	70	259	130
JP213	Feb-05-18	Apr-05-18	0.3	0.1	V0	70	259	130
JP213	Apr-05-18	May-08-18	1.3	0.1	V0	64	275	130
JP213	Apr-05-18	May-08-18	1.1	0.1	V0	64	275	130
JP213	May-08-18	Jun-07-18	1.4	0.1	V0	62	285	130
JP213	May-08-18	Jun-07-18	1.4	0.1	V0	62	285	130
JP213	Jun-07-18	Jul-06-18	1.6	0.1	V0	67	290	130
JP213	Jun-07-18	Jul-06-18	1.5	0.1	V0	67	290	130
JP213	Jul-06-18	Aug-02-18	1.1	0.1	V0	68	292	72.8
JP213	Jul-06-18	Aug-02-18	1.1	0.1	V0	68	292	72.8
JP213	Aug-02-18	Sep-06-18	2.3	0.1	V0	68	287	91.8
JP213	Aug-02-18	Sep-06-18	2.2	0.1	V0	68	287	91.8
JP213	Sep-06-18	Oct-04-18	1.2	0.1	V0	72	274	94.5
JP213	Sep-06-18	Oct-04-18	1.3	0.1	V0	72	274	94.5
JP213	Oct-04-18	Nov-01-18	1	0.1	V0	74	273	87.7
JP213	Oct-04-18	Nov-01-18	0.6	0.1	V0	74	273	87.7
JP213	Nov-01-18	Dec-05-18	0.5	0.1	V0	88	261	92.7
JP213	Nov-01-18	Dec-05-18	0.3	0.1	V0	88	261	92.7
JP213	Dec-05-18	Jan-05-19	0.7	0.1	V0	83	260	77.3
JP213	Dec-05-18	Jan-05-19	0.6	0.1	V0	83	260	77.3
JP309	Dec-04-17	Feb-01-18	0.3	0.1	V0	79	256	130
JP309	Dec-04-17	Feb-01-18	0.4	0.1	V0	79	256	130
JP309	Feb-01-18	Apr-02-18	0.2	0.1	V0	67	261	130
JP309	Feb-01-18	Apr-02-18	0.3	0.1	V0	67	261	130
JP309	Apr-02-18	May-06-18	0.8	0.1	V0	57	276	130
JP309	Apr-02-18	May-06-18	0.6	0.1	V0	57	276	130
JP309	May-06-18	Jun-02-18	2.3	0.1	V0	45	289	130
JP309	May-06-18	Jun-02-18	2.6	0.1	V0	45	289	130
JP309	Jun-02-18	Jul-03-18	2.8	0.1	V0	68	295	34.4
JP309	Jun-02-18	Jul-03-18	4.2	0.1	V0	68	295	34.4
JP309	Jul-03-18	Aug-01-18	1	0.1	V0	64	291	67.7
JP309	Jul-03-18	Aug-01-18	1	0.1	V0	64	291	67.7
JP309	Aug-01-18	Sep-04-18	1.7	0.1	V0	65	288	63.4
JP309	Aug-01-18	Sep-04-18	1.9	0.1	V0	65	288	63.4
JP309	Sep-04-18	Oct-02-18	1.3	0.1	V0	66	277	61.1
JP309	Sep-04-18	Oct-02-18	1.2	0.1	V0	66	277	61.1
JP309	Oct-02-18	Nov-02-18	0.5	0.1	V0	68	274	59.5

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			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
JP309	Oct-02-18	Nov-02-18	0.4	0.1	V0	68	274	59.5
JP309	Nov-02-18	Dec-06-18	0.6	0.1	V0	83	264	55
JP309	Nov-02-18	Dec-06-18	0.5	0.1	V0	83	264	55
JP309	Dec-06-18	Jan-04-19	0.9	0.1	V0	81	262	56.8
JP309	Dec-06-18	Jan-04-19	0.7	0.1	V0	81	262	56.8
JP311	Dec-04-17	Feb-06-18	0.3	0.1	V0	80	258	130
JP311	Dec-04-17	Feb-06-18	0.3	0.1	V0	80	258	130
JP311	Feb-06-18	Apr-06-18	0.3	0.1	V0	68	263	130
JP311	Feb-06-18	Apr-06-18	0.3	0.1	V0	68	263	130
JP311	Apr-06-18	May-05-18	0.9	0.1	V0	54	277	130
JP311	Apr-06-18	May-05-18	0.6	0.1	V0	54	277	130
JP311	May-05-18	Jun-08-18	1	0.1	V0	51	288	130
JP311	May-05-18	Jun-08-18	1.1	0.1	V0	51	288	130
JP311	Jun-08-18	Jul-07-18	1.3	0.1	V0	67	291	130
JP311	Jun-08-18	Jul-07-18	2.6	0.1	V0	67	291	130
JP311	Jul-07-18	Aug-07-18	1	0.1	V0	67	291	83.6
JP311	Jul-07-18	Aug-07-18	1.3	0.1	V0	67	291	83.6
JP311	Aug-07-18	Sep-07-18	2.7	0.1	V0	67	285	79
JP311	Aug-07-18	Sep-07-18	3	0.1	V0	67	285	79
JP311	Sep-07-18	Oct-10-18	0.9	0.1	V0	71	274	67
JP311	Sep-07-18	Oct-10-18	0.9	0.1	V0	71	274	67
JP311	Oct-10-18	Nov-02-18	0.7	0.1	V6	68	276	74.3
JP311	Oct-10-18	Nov-02-18	0.9	0.1	V6	68	276	74.3
JP311	Nov-02-18	Dec-07-18	0.4	0.1	V0	87	264	61.8
JP311	Nov-02-18	Dec-07-18	0.4	0.1	V0	87	264	61.8
JP311	Dec-07-18	Jan-08-19	0.3	0.1	V0	80	262	74.3
JP311	Dec-07-18	Jan-08-19	0.5	0.1	V0	80	262	74.3
JP316	Dec-06-17	Feb-05-18	0.3	0.1	V0	81	258	130
JP316	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
JP316	Feb-05-18	Apr-05-18	0.4	0.1	V0	68	264	130
JP316	Feb-05-18	Apr-05-18	0.3	0.1	V0	68	264	130
JP316	Apr-05-18	May-08-18	0.8	0.1	V0	51	278	130
JP316	Apr-05-18	May-08-18	0.7	0.1	V0	51	278	130
JP316	May-08-18	Jun-04-18	1.4	0.1	V0	51	287	129
JP316	May-08-18	Jun-04-18	0.9	0.1	V0	51	287	129
JP316	Jun-04-18	Jul-06-18	3.3	0.1	V0	66	289	130
JP316	Jun-04-18	Jul-06-18	3.5	0.1	V0	66	289	130
JP316	Jul-06-18	Aug-03-18	-9999	0.1	M1	47	296	130
JP316	Jul-06-18	Aug-03-18	0.5	0.1	V0	47	296	130
JP316	Aug-03-18	Sep-06-18	1.8	0.1	V0	39	294	130
JP316	Aug-03-18	Sep-06-18	2	0.1	V0	39	294	130
JP316	Sep-06-18	Oct-09-18	0.9	0.1	V0	34	283	74.6
JP316	Sep-06-18	Oct-09-18	1.1	0.1	V0	34	283	74.6
JP316	Oct-09-18	Nov-01-18	1.1	0.1	V6	68	276	82.8
JP316	Oct-09-18	Nov-01-18	1.3	0.1	V6	68	276	82.8
JP316	Nov-01-18	Dec-05-18	0.4	0.1	V0	86	263	71.7
JP316	Nov-01-18	Dec-05-18	0.5	0.1	V0	86	263	71.7
JP316	Dec-05-18	Jan-05-19	1.4	0.1	V0	82	261	73.4
JP316	Dec-05-18	Jan-05-19	0.7	0.1	V0	82	261	73.4
NE07	Dec-08-17	Feb-04-18	0.4	0.1	V0	78	255	130
NE07	Feb-04-18	Apr-04-18	0.3	0.1	V0	67	261	130
NE07	Apr-04-18	May-09-18	0.6	0.1	V0	55	278	130
NE07	May-09-18	Jun-06-18	1	0.1	V0	50	289	130
NE07	Jun-06-18	Jul-10-18	2.5	0.1	V0	92	288	57.6
NE07	Jul-10-18	Aug-02-18	1.5	0.1	V6	65	291	66.6
NE07	Aug-02-18	Sep-05-18	1.8	0.1	V0	65	288	63.6
NE07	Sep-05-18	Oct-03-18	1.2	0.1	V0	66	277	60.8
NE07	Oct-03-18	Nov-05-18	0.6	0.1	V0	70	274	61.4
NE07	Nov-05-18	Dec-06-18	0.4	0.1	V0	83	264	52.5
NE07	Dec-06-18	Jan-04-19	0.5	0.1	V0	81	262	56.8

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Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
NE10	Dec-06-17	Feb-05-18	0.4	0.1	V0	81	258	130
NE10	Feb-05-18	Apr-05-18	0.3	0.1	V0	68	264	130
NE10	Apr-05-18	May-08-18	0.7	0.1	V0	51	278	130
NE10	May-08-18	Jun-07-18	1.2	0.1	V0	53	287	128
NE10	Jun-07-18	Jul-06-18	1.4	0.1	V0	73	290	130
NE10	Jul-06-18	Aug-03-18	1	0.1	V0	72	290	130
NE10	Aug-03-18	Sep-06-18	1.8	0.1	V0	42	293	130
NE10	Sep-06-18	Oct-04-18	1.1	0.1	V0	75	275	129
NE10	Oct-04-18	Nov-01-18	1.1	0.1	V0	72	274	124
NE10	Nov-01-18	Dec-05-18	-9999	0.1	M1	86	264	130
NE10	Dec-05-18	Jan-05-19	0.8	0.1	V0	83	260	128
NE11	Dec-08-17	Feb-04-18	0.4	0.1	V0	78	255	130
NE11	Feb-04-18	Apr-04-18	0.3	0.1	V0	67	261	130
NE11	Apr-04-18	May-09-18	0.6	0.1	V0	55	278	130
NE11	May-09-18	Jun-06-18	1.2	0.1	V0	50	289	130
NE11	Jun-06-18	Jul-07-18	2.3	0.1	V0	92	288	55.5
NE11	Jul-07-18	Aug-02-18	1.1	0.1	V0	64	291	67.2
NE11	Aug-02-18	Sep-05-18	1.7	0.1	V0	65	288	63.6
NE11	Sep-05-18	Oct-03-18	1.2	0.1	V0	66	277	60.8
NE11	Oct-03-18	Nov-05-18	0.6	0.1	V0	70	274	61.4
NE11	Nov-05-18	Dec-04-18	0.6	0.1	V0	83	264	52.6
NE11	Dec-04-18	Jan-03-19	0.4	0.1	V0	81	262	56.6
R2	Dec-02-17	Feb-04-18	0.5	0.1	V0	79	256	130
R2	Feb-04-18	Apr-07-18	0.3	0.1	V0	67	261	130
R2	Apr-07-18	May-08-18	0.9	0.1	V0	54	279	130
R2	May-08-18	Jun-01-18	1.5	0.1	V6	44	289	130
R2	Jun-01-18	Jul-04-18	1.3	0.1	V0	68	289	79.4
R2	Jul-04-18	Jul-30-18	1.3	0.1	V0	67	291	85.4
R2	Jul-30-18	Sep-02-18	2	0.1	V0	68	288	73.9
R2	Sep-02-18	Oct-01-18	1.2	0.1	V0	66	278	61.3
R2	Oct-01-18	Oct-31-18	1	0.1	V0	69	274	67.5
R2	Oct-31-18	Dec-03-18	0.6	0.1	V0	83	265	56
R2	Dec-03-18	Jan-02-19	1	0.1	V0	81	262	56.5
SM07	Dec-04-17	Feb-06-18	0.3	0.1	V0	80	258	130
SM07	Feb-06-18	Apr-06-18	0.4	0.1	V0	68	263	130
SM07	Apr-06-18	May-11-18	0.9	0.1	V0	51	279	130
SM07	May-11-18	Jun-04-18	1.7	0.1	V6	52	288	130
SM07	Jun-04-18	Jul-10-18	1.5	0.1	V6	68	289	129
SM07	Jul-10-18	Aug-03-18	1.6	0.1	V6	76	290	129
SM07	Aug-03-18	Sep-06-18	2.2	0.1	V0	72	286	130
SM07	Sep-06-18	Oct-09-18	1	0.1	V0	75	274	130
SM07	Oct-09-18	Nov-06-18	1	0.1	V0	69	274	130
SM07	Nov-06-18	Dec-07-18	0.6	0.1	V0	85	265	128
SM07	Dec-07-18	Jan-08-19	0.6	0.1	V0	76	263	130
SM08	Dec-04-17	Feb-06-18	0.4	0.1	V0	80	258	130
SM08	Feb-06-18	Apr-06-18	0.2	0.1	V0	68	263	130
SM08	Apr-06-18	May-11-18	0.9	0.1	V0	51	279	130
SM08	May-11-18	Jun-04-18	1.1	0.1	V6	52	288	130
SM08	Jun-04-18	Jul-10-18	2.2	0.1	V6	64	285	130
SM08	Jul-10-18	Aug-03-18	1.8	0.1	V6	69	291	76.8
SM08	Aug-03-18	Sep-06-18	1.8	0.1	V0	66	286	80.2
SM08	Sep-06-18	Oct-09-18	1	0.1	V0	71	274	67.6
SM08	Oct-09-18	Nov-01-18	1.2	0.1	V6	67	276	73.7
SM08	Nov-01-18	Dec-05-18	0.5	0.1	V0	87	264	60.4
SM08	Dec-05-18	Jan-08-19	1.4	0.1	V0	81	262	74.9
WF04	Dec-04-17	Feb-01-18	0.3	0.1	V0	79	256	130
WF04	Feb-01-18	Apr-03-18	0.3	0.1	V0	67	261	130
WF04	Apr-03-18	May-06-18	0.7	0.1	V0	57	276	130
WF04	May-06-18	Jun-02-18	1.4	0.1	V0	45	289	130
WF04	Jun-02-18	Jul-03-18	1.2	0.1	V0	70	290	130

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Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
WF04	Jul-03-18	Aug-01-18	1.2	0.1	V0	67	291	130
WF04	Aug-01-18	Sep-04-18	-9999	0.1	M1	67	288	130
WF04	Sep-04-18	Oct-02-18	1	0.1	V0	68	277	130
WF04	Oct-02-18	Nov-02-18	0.6	0.1	V0	71	274	129
WF04	Nov-02-18	Dec-06-18	0.5	0.1	V0	81	264	129
WF04	Dec-06-18	Jan-04-19	0.7	0.1	V0	80	260	130
BLANK-R	Dec-01-17	Jan-31-18	0.5	0.1	V0	80	257	130
BLANK-R	Dec-01-17	Jan-31-18	0.5	0.1	V0	80	257	130
BLANK-R	Dec-01-17	Jan-31-18	0.5	0.1	V0	80	257	130
BLANK-R	Feb-01-18	Mar-31-18	0.5	0.1	V0	68	263	130
BLANK-R	Feb-01-18	Mar-31-18	0.6	0.1	V0	68	263	130
BLANK-R	Feb-01-18	Mar-31-18	0.6	0.1	V0	68	263	130
BLANK-R	Apr-01-18	Apr-30-18	1.4	0.1	V5	53	277	130
BLANK-R	Apr-01-18	Apr-30-18	1.7	0.1	V5	53	277	130
BLANK-R	Apr-01-18	Apr-30-18	1.2	0.1	V5	53	277	130
JP311 - Blank	May-05-18	Jun-08-18	4.5	0.1	V5	51	288	130
JE308 - Blank	May-06-18	Jun-02-18	2	0.1	V5	44	289	130
JE306 - Blank	May-07-18	Jun-05-18	2.4	0.1	V5	51	287	130
JP316 - Blank	May-08-18	Jun-04-18	4.2	0.1	V5	51	288	130
JE323 - Blank	May-09-18	Jun-06-18	3.6	0.1	V5	53	288	130
JE308 - Blank	Jun-02-18	Jul-03-18	3.9	0.1	V5	72	287	117
JP316 - Blank	Jun-04-18	Jul-06-18	5.2	0.1	V5	66	289	130
JE306 - Blank	Jun-05-18	Jul-05-18	2.5	0.1	V5	70	290	127
JE323 - Blank	Jun-06-18	Jul-07-18	9.9	0.1	V5	60	293	118
JP311 - Blank	Jun-08-18	Jul-07-18	2.9	0.1	V5	67	291	130
404 - Blank	Jun-11-18	Jul-04-18	3.3	0.1	V5	37	298	15.5
414 - Blank	Jun-12-18	Jul-10-18	3.6	0.1	V5	65	289	130
JE308 - Blank	Jul-03-18	Aug-01-18	3.5	0.1	V5	68	289	120
404 - Blank	Jul-04-18	Jul-30-18	2.9	0.1	V5	63	291	68.5
JE306 - Blank	Jul-05-18	Jul-31-18	2.7	0.1	V5	69	290	128
JP316 - Blank	Jul-06-18	Aug-03-18	3.8	0.1	V5	47	295	130
JP311 - Blank	Jul-07-18	Aug-07-18	2.5	0.1	V5	67	291	83.6
JE323 - Blank	Jul-07-18	Aug-01-18	2.4	0.1	V5	74	289	111
414 - Blank	Jul-10-18	Aug-03-18	3.6	0.1	V6	69	290	130
404 - Blank	Jul-30-18	Sep-02-18	2.2	0.1	V5	65	288	63.6
404 - Blank	Jul-30-18	Sep-02-18	3.7	0.1	V5	65	288	63.6
JE306 - Blank	Jul-31-18	Sep-05-18	2.8	0.1	V5	71	287	127
JE306 - Blank	Jul-31-18	Sep-05-18	3.8	0.1	V5	71	287	127
JE308 - Blank	Aug-01-18	Sep-04-18	3	0.1	V5	71	286	115
JE308 - Blank	Aug-01-18	Sep-04-18	5.6	0.1	V5	71	286	115
JE323 - Blank	Aug-01-18	Sep-05-18	1.8	0.1	V5	70	286	112
JE323 - Blank	Aug-01-18	Sep-05-18	5.5	0.1	V5	70	286	112
414 - Blank	Aug-03-18	Sep-05-18	2.1	0.1	V5	68	287	130
JP316 - Blank	Aug-03-18	Sep-06-18	2.5	0.1	V5	39	294	130
JP316 - Blank	Aug-03-18	Sep-06-18	6.5	0.1	V5	39	294	130
JP311 - Blank	Aug-07-18	Sep-07-18	2.3	0.1	V5	67	285	79
JP311 - Blank	Aug-07-18	Sep-07-18	13	0.1	V5	67	285	79
404 - Blank	Sep-02-18	Oct-16-18	0.9	0.1	V6	67	276	60.2
JE308 - Blank	Sep-04-18	Oct-02-18	1.8	0.1	V5	72	274	115
414 - Blank	Sep-05-18	Oct-15-18	1	0.1	V5	70	274	130
JE306 - Blank	Sep-05-18	Oct-11-18	1.3	0.1	V5	71	274	121
JE323 - Blank	Sep-05-18	Oct-05-18	1.2	0.1	V5	71	275	130
JP316 - Blank	Sep-06-18	Oct-09-18	1.4	0.1	V5	34	283	74.6
JP311 - Blank	Sep-07-18	Oct-10-18	1.1	0.1	V5	71	274	67
JE308 - Blank	Oct-02-18	Nov-02-18	1.4	0.1	V5	76	272	87.7
JE323 - Blank	Oct-05-18	Nov-01-18	1.1	0.1	V5	72	273	110
JP316 - Blank	Oct-09-18	Nov-01-18	1.4	0.1	V5	68	276	82.8
JP311 - Blank	Oct-10-18	Nov-02-18	1.3	0.1	V5	68	276	74.3
JE306 - Blank	Oct-11-18	Nov-05-18	1.5	0.1	V5	74	273	130
414 - Blank	Oct-15-18	Dec-05-18	0.8	0.1	V5	79	268	130

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Passive Measurements Remote Sites

			Ammonia			RH	Temp	Wind Speed
Site ID	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
404 - Blank	Oct-16-18	Dec-03-18	0.6	0.1	V6	78	268	56.8
JP316 - Blank	Nov-01-18	Dec-05-18	0.8	0.1	V5	86	263	71.7
JE323 - Blank	Nov-01-18	Dec-06-18	0.8	0.1	V5	82	263	47.7
JP311 - Blank	Nov-02-18	Dec-07-18	0.6	0.1	V0	87	264	61.8
JE308 - Blank	Nov-02-18	Dec-06-18	0.7	0.1	V5	86	263	96.8
JE306 - Blank	Nov-05-18	Dec-04-18	0.7	0.1	V5	82	263	130
404 - Blank	Dec-03-18	Jan-02-19	1.2	0.1	V5	81	262	56.5
JE306 - Blank	Dec-04-18	Jan-03-19	0.7	0.1	V5	81	261	129
JP316 - Blank	Dec-05-18	Jan-05-19	1.5	0.1	V5	82	261	73.4
414 - Blank	Dec-05-18	Jan-05-19	0.6	0.1	V5	78	263	130
JE308 - Blank	Dec-06-18	Jan-04-19	0.9	0.1	V5	86	259	81.8
JE323 - Blank	Dec-06-18	Jan-04-19	0.7	0.1	V5	77	259	98.1
JP311 - Blank	Dec-07-18	Jan-08-19	1.1	0.1	V5	80	262	74.3

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Passive Measurements Local Sites

				Ammonia			RH	Temp	Wind Speed
Site ID	Site Name	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
AMS01	Bertha Ganter	Nov-29-17	Feb-04-18	0.4	0.1	V0	80	258	130
AMS01	Bertha Ganter	Nov-29-17	Feb-04-18	0.4	0.1	V0	80	258	130
AMS01	Bertha Ganter	Nov-29-17	Feb-04-18	0.4	0.1	V0	80	258	130
			Average	0.4					
			Std Dev	0.0					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Feb-04-18	Apr-07-18	0.2	0.1	V0	69	262	130
AMS01	Bertha Ganter	Feb-04-18	Apr-07-18	0.3	0.1	V0	69	262	130
AMS01	Bertha Ganter	Feb-04-18	Apr-07-18	0.2	0.1	V0	69	262	130
			Average	0.2					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Apr-07-18	May-07-18	1.1	0.1	V0	53	279	130
AMS01	Bertha Ganter	Apr-07-18	May-07-18	1.1	0.1	V0	53	279	130
AMS01	Bertha Ganter	Apr-07-18	May-07-18	1	0.1	V0	53	279	130
			Average	1.1					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	May-07-18	Jun-01-18	1.7	0.1	V0	47	288	130
AMS01	Bertha Ganter	May-07-18	Jun-01-18	1.9	0.1	V0	47	288	130
AMS01	Bertha Ganter	May-07-18	Jun-01-18	1.9	0.1	V0	47	288	130
			Average	1.8					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Jun-01-18	Jul-03-18	1.8	0.1	V0	70	290	130
AMS01	Bertha Ganter	Jun-01-18	Jul-03-18	2.1	0.1	V0	70	290	130
AMS01	Bertha Ganter	Jun-01-18	Jul-03-18	1.9	0.1	V0	70	290	130
			Average	1.9					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Jul-03-18	Aug-01-18	1.9	0.1	V0	67	291	130
AMS01	Bertha Ganter	Jul-03-18	Aug-01-18	1.7	0.1	V0	67	291	130
AMS01	Bertha Ganter	Jul-03-18	Aug-01-18	1.9	0.1	V0	67	291	130
			Average	1.8					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Aug-01-18	Sep-04-18	2.1	0.1	V0	67	288	130
AMS01	Bertha Ganter	Aug-01-18	Sep-04-18	2.2	0.1	V0	67	288	130
AMS01	Bertha Ganter	Aug-01-18	Sep-04-18	1.8	0.1	V0	67	288	130
			Average	2.0					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Sep-04-18	Oct-01-18	1.2	0.1	V0	69	277	130
AMS01	Bertha Ganter	Sep-04-18	Oct-01-18	1.1	0.1	V0	69	277	130
AMS01	Bertha Ganter	Sep-04-18	Oct-01-18	0.6	0.1	V0	69	277	130
			Average	1.0					
			Std Dev	0.3					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Oct-01-18	Nov-02-18	0.9	0.1	V0	70	274	130
AMS01	Bertha Ganter	Oct-01-18	Nov-02-18	0.8	0.1	V0	70	274	130
AMS01	Bertha Ganter	Oct-01-18	Nov-02-18	0.9	0.1	V0	70	274	130
			Average	0.9					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					

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Passive Measurements Local Sites

				Ammonia			RH	Temp	Wind Speed
Site ID	Site Name	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
AMS01	Bertha Ganter	Nov-02-18	Dec-03-18	0.6	0.1	V0	81	264	129
AMS01	Bertha Ganter	Nov-02-18	Dec-03-18	0.7	0.1	V0	81	264	129
AMS01	Bertha Ganter	Nov-02-18	Dec-03-18	0.7	0.1	V0	81	264	129
			Average	0.7					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS01	Bertha Ganter	Dec-03-18	Jan-02-19	1.2	0.1	V0	80	260	130
AMS01	Bertha Ganter	Dec-03-18	Jan-02-19	0.8	0.1	V0	80	260	130
AMS01	Bertha Ganter	Dec-03-18	Jan-02-19	0.7	0.1	V0	80	260	130
			Average	0.9					
			Std Dev	0.3					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Nov-29-17	Feb-04-18	1	0.1	V0	80	258	130
AMS02	Mildred Lake	Nov-29-17	Feb-04-18	1	0.1	V0	80	258	130
AMS02	Mildred Lake	Nov-29-17	Feb-04-18	0.8	0.1	V0	80	258	130
			Average	0.9					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Feb-04-18	Apr-07-18	0.7	0.1	V0	69	262	130
AMS02	Mildred Lake	Feb-04-18	Apr-07-18	0.7	0.1	V0	69	262	130
AMS02	Mildred Lake	Feb-04-18	Apr-07-18	0.7	0.1	V0	69	262	130
			Average	0.7					
			Std Dev	0.0					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Apr-07-18	May-07-18	1.7	0.1	V0	53	279	130
AMS02	Mildred Lake	Apr-07-18	May-07-18	2.2	0.1	V0	53	279	130
AMS02	Mildred Lake	Apr-07-18	May-07-18	1.7	0.1	V0	53	279	130
			Average	1.9					
			Std Dev	0.3					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	May-07-18	Jun-07-18	3.4	0.1	V0	47	288	130
AMS02	Mildred Lake	May-07-18	Jun-07-18	3.4	0.1	V0	47	288	130
AMS02	Mildred Lake	May-07-18	Jun-07-18	3.8	0.1	V0	47	288	130
			Average	3.5					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Jun-07-18	Jul-03-18	6.1	0.1	V0	56	295	130
AMS02	Mildred Lake	Jun-07-18	Jul-03-18	3.9	0.1	V0	56	295	130
AMS02	Mildred Lake	Jun-07-18	Jul-03-18	4.3	0.1	V0	56	295	130
			Average	4.8					
			Std Dev	1.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Jul-03-18	Aug-01-18	3	0.1	V0	57	295	130
AMS02	Mildred Lake	Jul-03-18	Aug-01-18	3.2	0.1	V0	57	295	130
AMS02	Mildred Lake	Jul-03-18	Aug-01-18	3.3	0.1	V0	57	295	130
			Average	3.2					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Aug-01-18	Sep-04-18	4.7	0.1	V0	57	295	130
AMS02	Mildred Lake	Aug-01-18	Sep-04-18	4.9	0.1	V0	57	295	130
AMS02	Mildred Lake	Aug-01-18	Sep-04-18	4.6	0.1	V0	57	295	130
			Average	4.7					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					

Wood Buffalo Environmental Association

Passive Measurements Local Sites

				Ammonia			RH	Temp	Wind Speed
Site ID	Site Name	Start Date	End Date	ppb	MDL	Flag	%	K	cm/sec
AMS02	Mildred Lake	Sep-04-18	Oct-01-18	2.2	0.1	V0	71	277	130
AMS02	Mildred Lake	Sep-04-18	Oct-01-18	2.2	0.1	V0	71	277	130
AMS02	Mildred Lake	Sep-04-18	Oct-01-18	1.8	0.1	V0	71	277	130
			Average	2.1					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Oct-01-18	Nov-02-18	1.8	0.1	V0	71	275	130
AMS02	Mildred Lake	Oct-01-18	Nov-02-18	1.9	0.1	V0	71	275	130
AMS02	Mildred Lake	Oct-01-18	Nov-02-18	1.6	0.1	V0	71	275	130
			Average	1.8					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Nov-02-18	Dec-03-18	0.9	0.1	V0	83	264	130
AMS02	Mildred Lake	Nov-02-18	Dec-03-18	1.3	0.1	V0	83	264	130
AMS02	Mildred Lake	Nov-02-18	Dec-03-18	1.1	0.1	V0	83	264	130
			Average	1.1					
			Std Dev	0.2					
			Continuous	-					
			Diff (%)	-					
AMS02	Mildred Lake	Dec-03-18	Jan-03-19	1.3	0.1	V0	78	262	130
AMS02	Mildred Lake	Dec-03-18	Jan-03-19	1.4	0.1	V0	78	262	130
AMS02	Mildred Lake	Dec-03-18	Jan-03-19	1.4	0.1	V0	78	262	130
			Average	1.4					
			Std Dev	0.1					
			Continuous	-					
			Diff (%)	-					
BLANK-L	Field Blank Local	Dec-01-17	Jan-31-18	0.7	0.1	V0	80	258	130
BLANK-L	Field Blank Local	Feb-01-18	Mar-31-18	0.6	0.1	V0	69	262	130
BLANK-L	Field Blank Local	Apr-01-18	Apr-30-18	1.7	0.1	V5	53	279	130

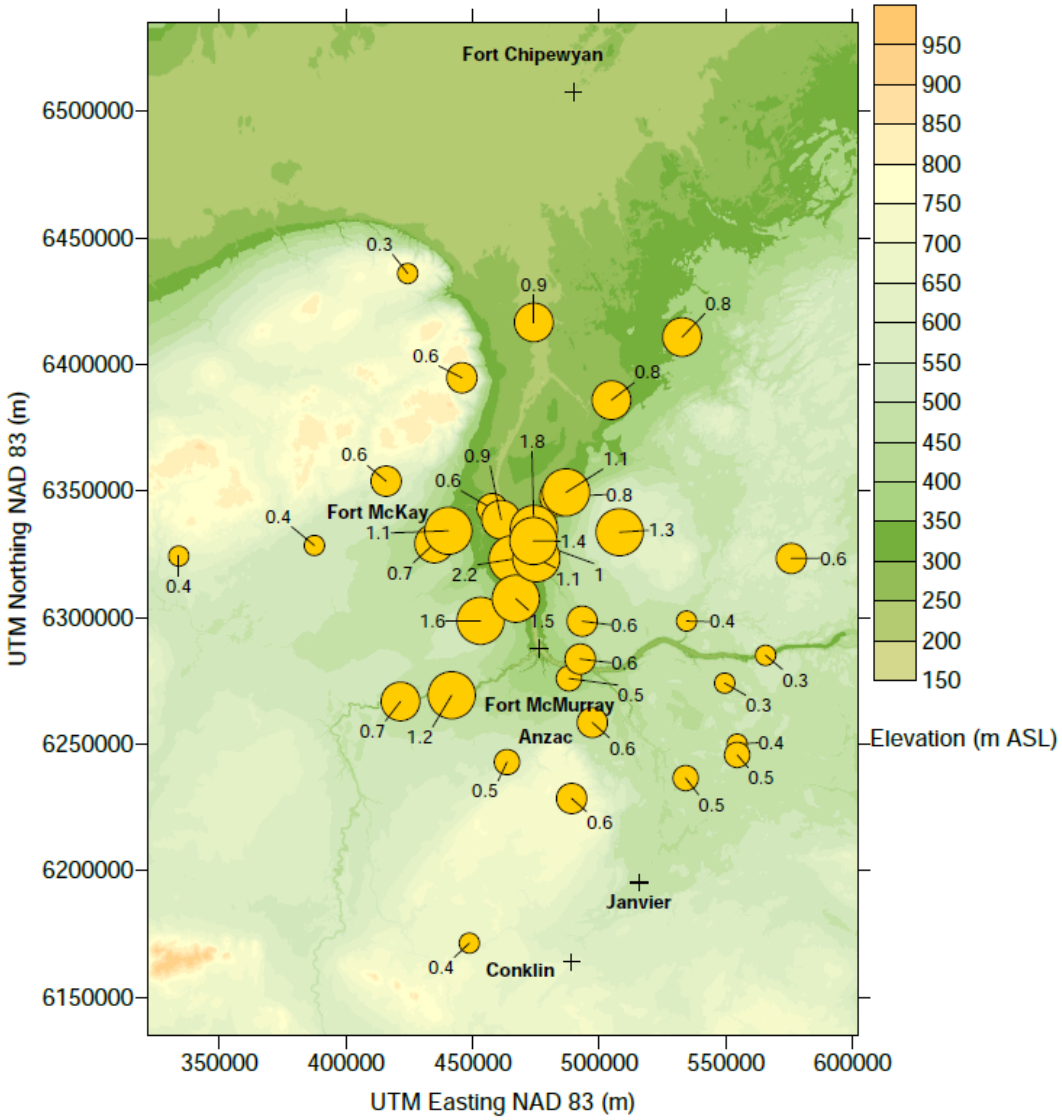
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2018**

Passives - Annual Averages

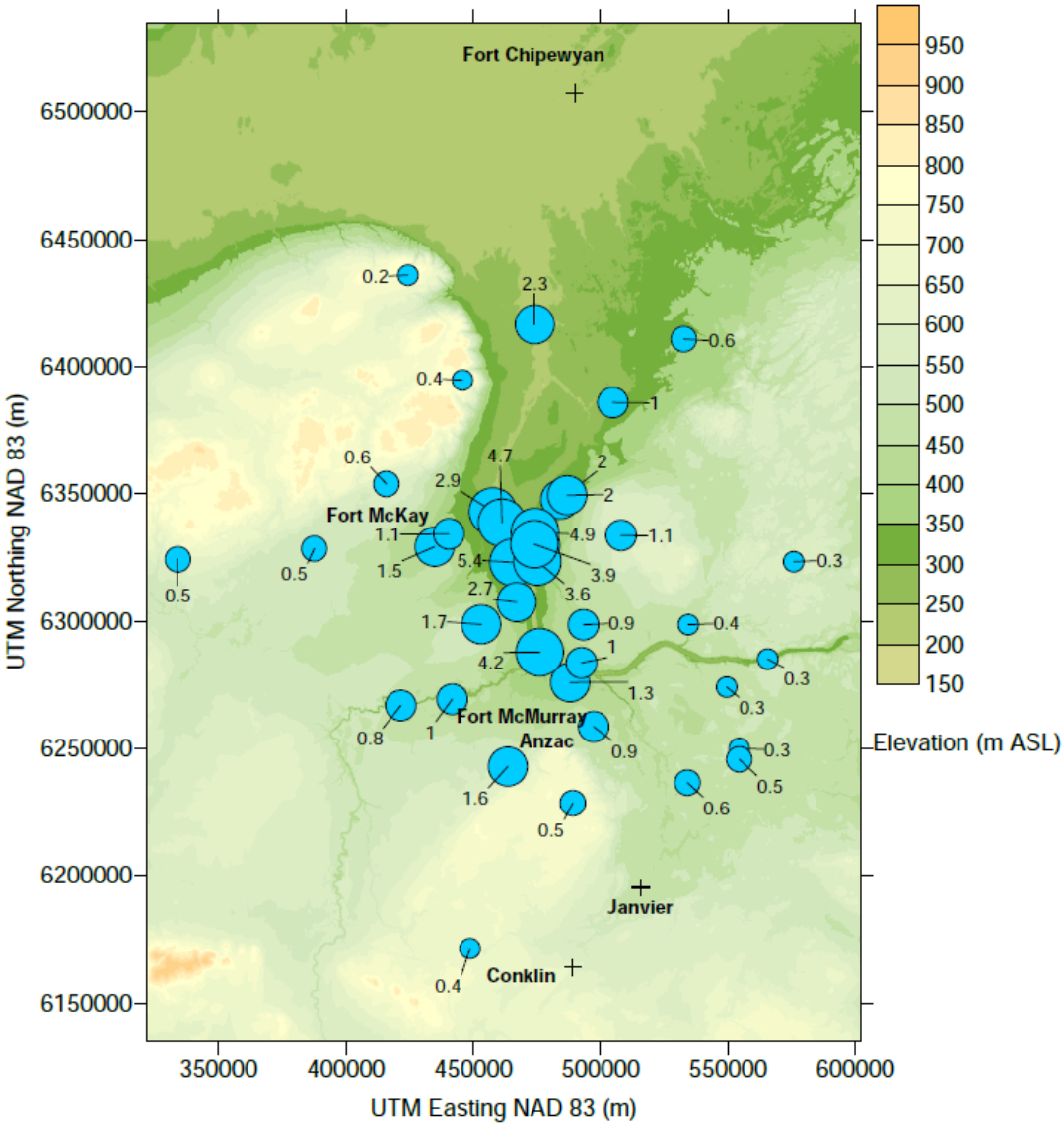
Species Column Contains:
Concentration,SC = Samples Collected, VP = Valid Periods

	Start	End			SO2			NO2			O3			HNO3			NH3		
Site	Date	Date	Lat.	Long.	ppb	SC	VP	ppb	SC	VP	ppb	SC	VP	ppb	SC	VP	ppb	SC	VP
400	2018/06/13	2019/01/05	56.329442	-111.588619	0.5	12	6	1.6	12	6	-	-	-	0.3	12	6	1.0	12	6
401	2018/06/11	2019/01/02	57.228355	-111.699922	0.6	12	6	2.9	12	6	-	-	-	0.4	12	6	1.1	12	6
402	2018/07/04	2019/01/03	57.272539	-111.261758	0.8	10	5	2.0	10	5	-	-	-	0.3	10	5	0.8	10	5
403	2018/06/12	2019/01/03	56.627549	-111.194622	0.5	8	5	1.3	9	5	-	-	-	0.3	12	6	0.9	12	6
404	2018/06/11	2019/01/02	57.110828	-111.417987	1.0	12	6	3.0	12	6	-	-	-	0.4	9	5	1.0	11	6
414	2018/06/12	2019/01/05	56.471364	-111.044156	0.6	12	6	0.9	11	6	-	-	-	0.4	12	6	1.0	12	6
AMS01	2017/11/29	2019/01/02	57.189428	-111.640583	0.9	33	11	4.7	33	11	23.8	33	11	0.4	33	11	1.0	33	11
AMS02	2017/11/29	2019/01/03	57.050006	-111.564147	2.2	33	11	5.4	33	11	24.7	33	11	0.4	33	11	2.1	33	11
AMS07	2018/06/04	2019/01/04	56.733628	-111.390431	-	-	-	4.2	14		-	-	-	-	-	-	-	-	-
AS103	2017/12/06	2019/01/03	56.696417	-111.122283	0.6	22	11	1.0	22	11	33.4	22	11	0.3	22	11	0.9	22	11
AS107	2017/12/07	2019/01/08	56.829833	-111.768167	1.6	22	11	1.7	22	11	37.3	22	11	0.4	22	11	1.0	22	11
BM07	2017/12/05	2019/01/03	58.058133	-112.281967	0.3	8	8	0.2	8	8	36.5	8	8	0.4	8	8	0.5	8	8
BM10	2017/12/07	2019/01/04	57.320050	-112.396967	0.6	9	9	0.6	10	10	23.8	9	9	0.4	10	10	0.7	10	10
BM11	2017/12/05	2019/01/03	57.691150	-111.909400	0.6	8	8	0.4	8	8	29.3	8	8	0.3	8	8	0.5	8	8
JE306	2017/12/05	2019/01/03	57.618833	-110.918117	0.8	11	11	1.0	11	11	26.9	11	11	0.4	11	11	0.8	11	11
JE308	2017/12/07	2019/01/04	57.085917	-112.855550	0.4	11	11	0.5	10	10	30.1	11	11	0.3	11	11	0.7	10	10
JE312	2017/12/06	2019/01/05	56.829950	-110.434767	0.4	11	11	0.4	11	11	30.3	11	11	0.4	11	11	0.9	11	11
JE316	2017/12/06	2019/01/05	56.353250	-110.118833	0.4	11	11	0.3	11	11	32.8	11	11	0.3	11	11	1.1	11	11
JE323	2017/12/08	2019/01/04	56.833167	-111.109133	0.6	11	11	0.9	11	11	28.0	11	11	0.4	11	11	1.0	11	11
JP101	2017/12/04	2019/01/08	56.539867	-112.276583	0.7	21	11	0.8	22	11	35.3	22	11	0.4	22	11	0.9	22	11
JP102	2017/12/07	2019/01/08	56.910317	-111.538267	1.5	22	11	2.7	22	11	36.4	22	11	0.4	21	11	1.0	22	11
JP104	2017/12/02	2019/01/02	57.120867	-111.424217	1.8	22	11	4.9	22	11	32.3	22	11	0.4	22	11	1.2	22	11
JP107	2017/12/05	2019/01/03	57.889483	-111.433700	0.9	22	11	2.3	22	11	34.2	22	11	0.4	22	11	0.8	20	10
JP108	2017/12/06	2019/01/05	56.709267	-109.927283	0.3	22	11	0.3	22	11	30.5	22	11	0.3	22	11	0.9	22	11
JP201	2017/12/07	2019/01/04	57.032217	-113.733217	0.4	22	11	0.5	22	11	37.5	22	11	0.3	22	11	0.8	22	11
JP205	2017/12/05	2019/01/03	57.840200	-110.446433	0.8	22	11	0.6	21	11	37.9	22	11	0.4	22	11	0.9	22	11
JP210	2017/12/06	2019/01/05	56.276083	-110.452000	0.5	22	11	0.6	22	11	34.4	22	11	0.4	22	11	1.0	22	11
JP212	2017/12/07	2019/01/04	57.053633	-111.406567	1.1	11	11	3.6	11	11	23.8	11	11	0.4	11	11	1.0	11	11
JP213	2017/12/06	2019/01/05	57.046467	-109.748767	0.6	22	11	0.3	21	11	38.6	22	11	0.4	22	11	1.0	22	11
JP309	2017/12/04	2019/01/04	57.101800	-112.072517	0.7	22	11	1.5	22	11	33.8	22	11	0.3	22	11	1.0	22	11
JP311	2017/12/04	2019/01/08	56.565750	-111.947417	1.2	22	11	1.0	21	11	36.2	22	11	0.4	22	11	0.9	22	11
JP316	2017/12/06	2019/01/05	56.353250	-110.118833	0.5	22	11	0.5	22	11	37.4	22	11	0.4	21	11	1.0	21	11
NE07	2017/12/08	2019/01/04	57.146783	-110.866050	1.3	11	11	1.1	11	11	32.3	11	11	0.4	11	11	0.9	11	11
NE10	2017/12/06	2019/01/05	56.608433	-110.192883	0.3	11	11	0.3	11	11	28.1	11	11	0.4	11	11	0.9	10	10
NE11	2017/12/08	2019/01/03	57.288033	-111.216950	1.1	11	11	2.0	11	11	26.6	11	11	0.4	10	10	0.9	11	11
R2	2017/12/02	2019/01/02	57.114450	-111.428967	1.4	11	11	3.9	11	11	23.0	11	11	0.4	11	11	0.9	11	11
SM07	2017/12/04	2019/01/08	55.685533	-111.815367	0.4	10	10	0.4	10	10	32.6	10	10	0.4	11	11	1.0	11	11
SM08	2017/12/04	2019/01/08	56.201617	-111.175283	0.6	11	11	0.5	11	11	33.5	11	11	0.3	11	11	1.0	11	11
WF04	2017/12/04	2019/01/04	57.147867	-111.984033	1.1	10	10	1.1	9	9	23.3	10	10	0.3	10	10	0.7	10	10

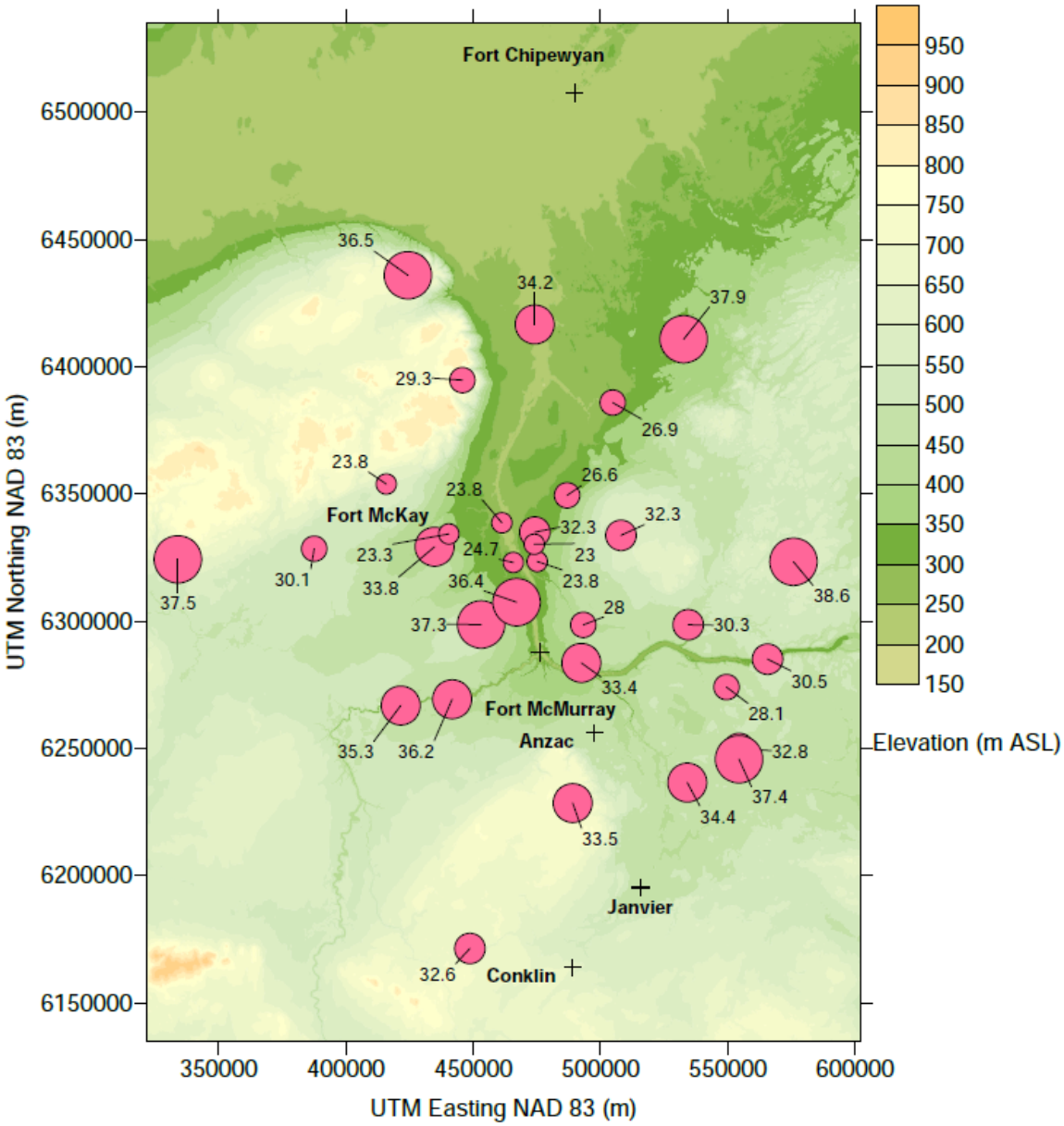
SPATIAL PLOT OF SO_2 CONCENTRATION



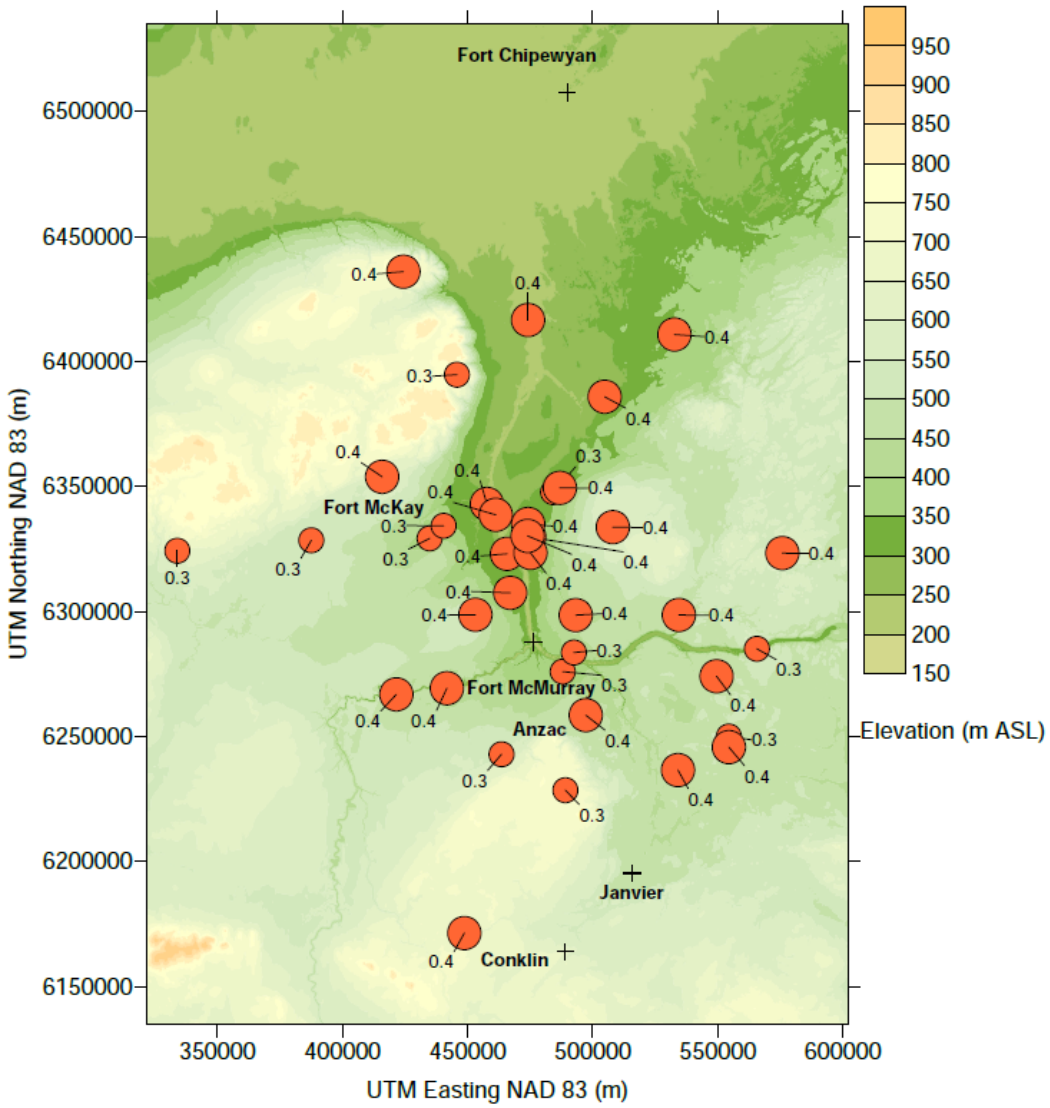
SPATIAL PLOT OF NO_2 CONCENTRATION



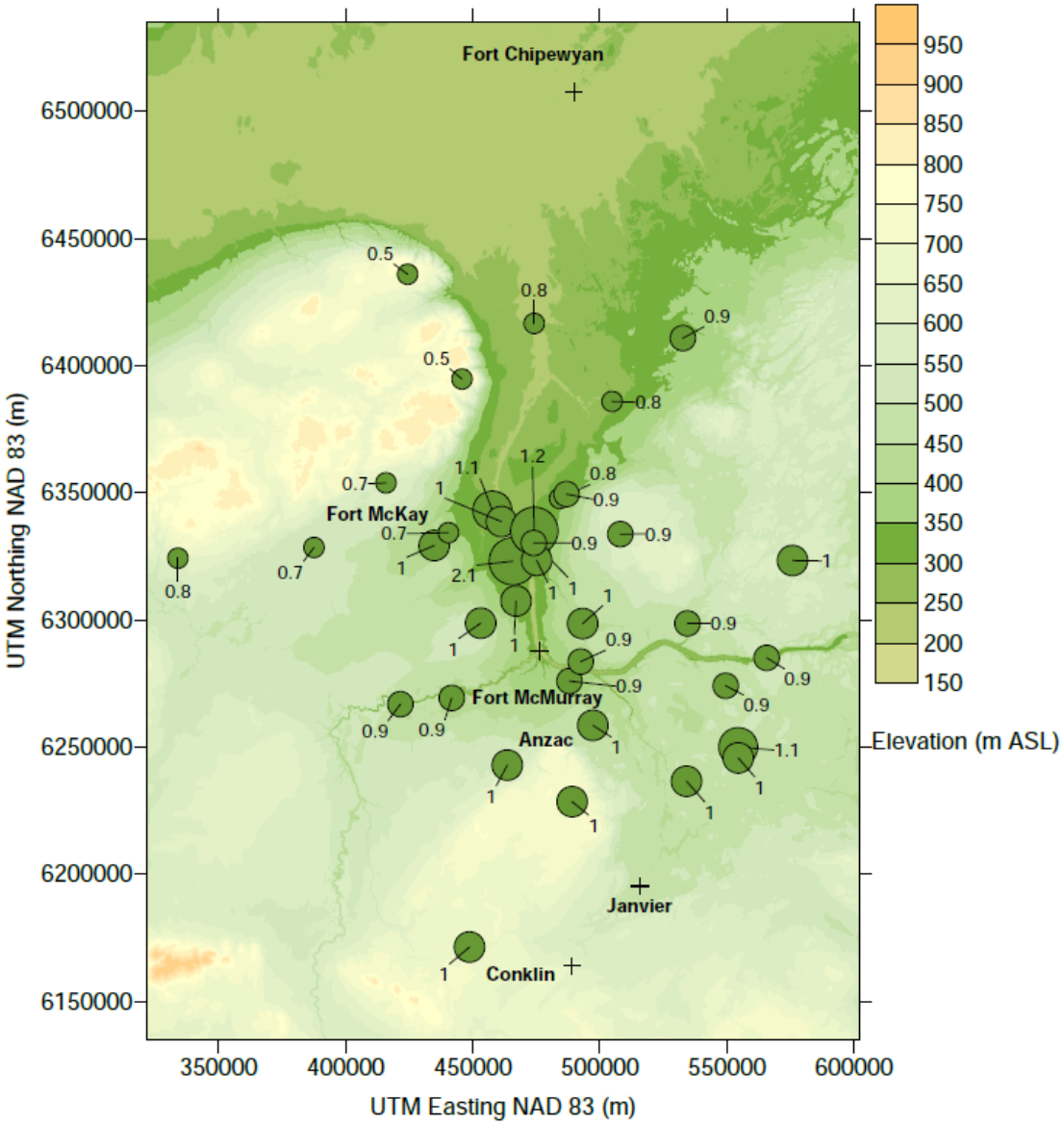
SPATIAL PLOT OF O_3 CONCENTRATION



SPATIAL PLOT OF HNO_3 CONCENTRATION



SPATIAL PLOT OF NH_3 CONCENTRATION



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

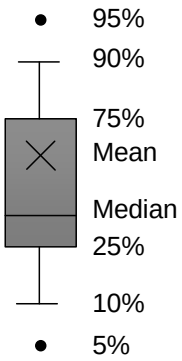
Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

VOCs: InnoTech Alberta, Inc.
Vegreville, Alberta

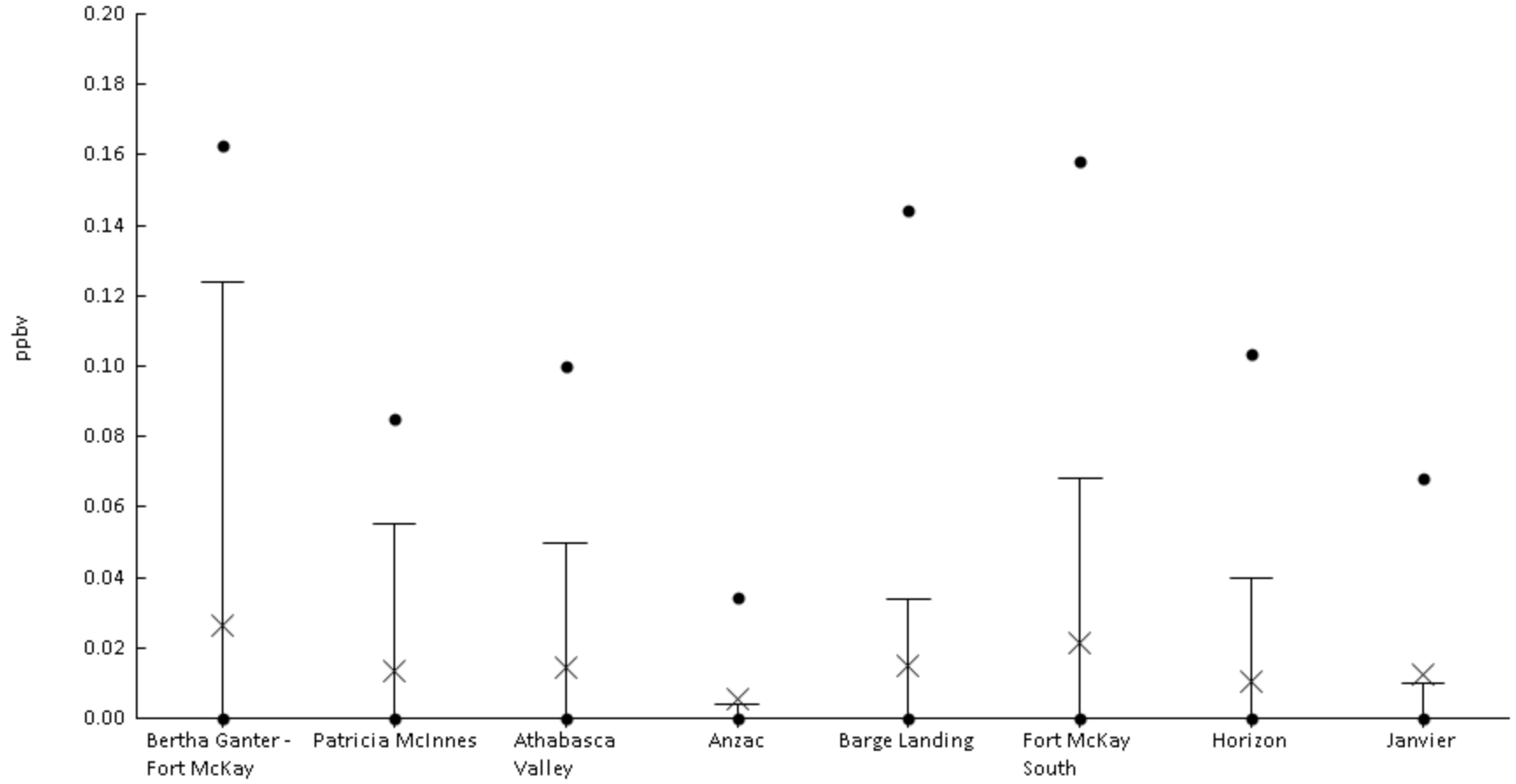
FILE CONTENTS DESCRIPTION	VOC - Speciated Volatile Organic Compounds
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	ppbv (parts per billion volume)
OBSERVATION TYPE	Gas
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Evacuated canister
ANALYTICAL METHODS	GC/MS - Gas chromatography/mass spectrometer
ANALYTICAL LABORATORY	InnoTech Alberta Inc
USER NOTE 1	Data are not blank corrected MDLs for many parameters were updated on February 13.
USER NOTE 2	Average is calculated using the reported lab value. If the lab value provided is <MDL and is not a number, then the value 0 will be used.
SAMPLING INSTRUMENT TYPE	Tisch TE123
FLOW RATE	10.0 cc/min (cubic centimeters per minute)
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



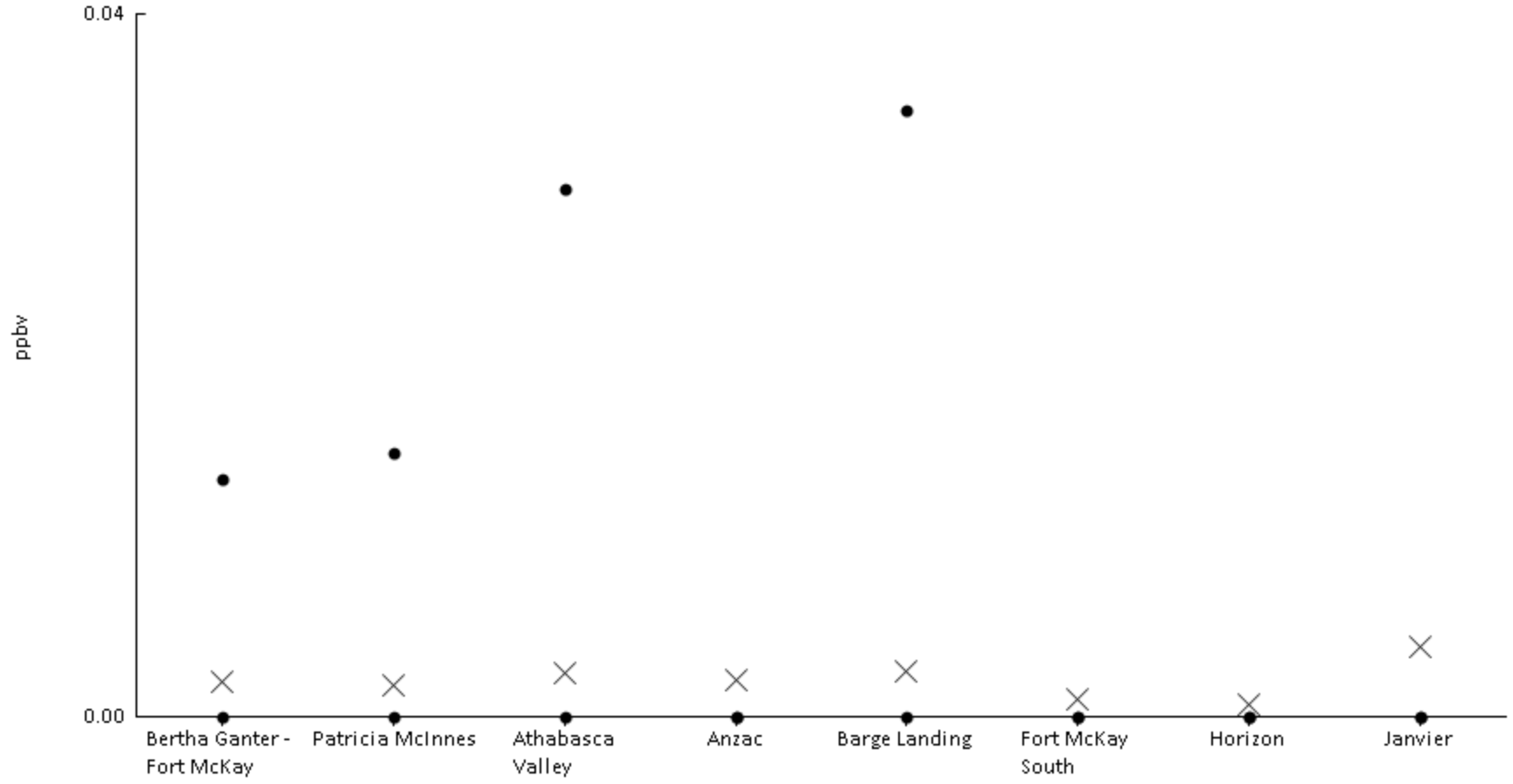
Volatile Organic Compounds - 1,2,4-Trimethylbenzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	23%	0	0	0	0	0	0	0.12	0.16	0.3	0.027	0.063
AMS06	Patricia McInnes	60	22%	0	0	0	0	0	0	0.055	0.085	0.19	0.014	0.036
AMS07	Athabasca Valley	60	22%	0	0	0	0	0	0	0.05	0.1	0.23	0.015	0.042
AMS14	Anzac	61	10%	0	0	0	0	0	0	4E-3	0.035	0.12	5.4E-3	0.022
AMS09	Barge Landing	61	16%	0	0	0	0	0	0	0.034	0.14	0.27	0.015	0.048
AMS13	Fort McKay South	61	23%	0	0	0	0	0	0	0.068	0.16	0.27	0.021	0.053
AMS15	Horizon	61	16%	0	0	0	0	0	0	0.04	0.1	0.13	0.01	0.03
AMS22	Janvier	58	12%	0	0	0	0	0	0	0.01	0.068	0.39	0.012	0.056



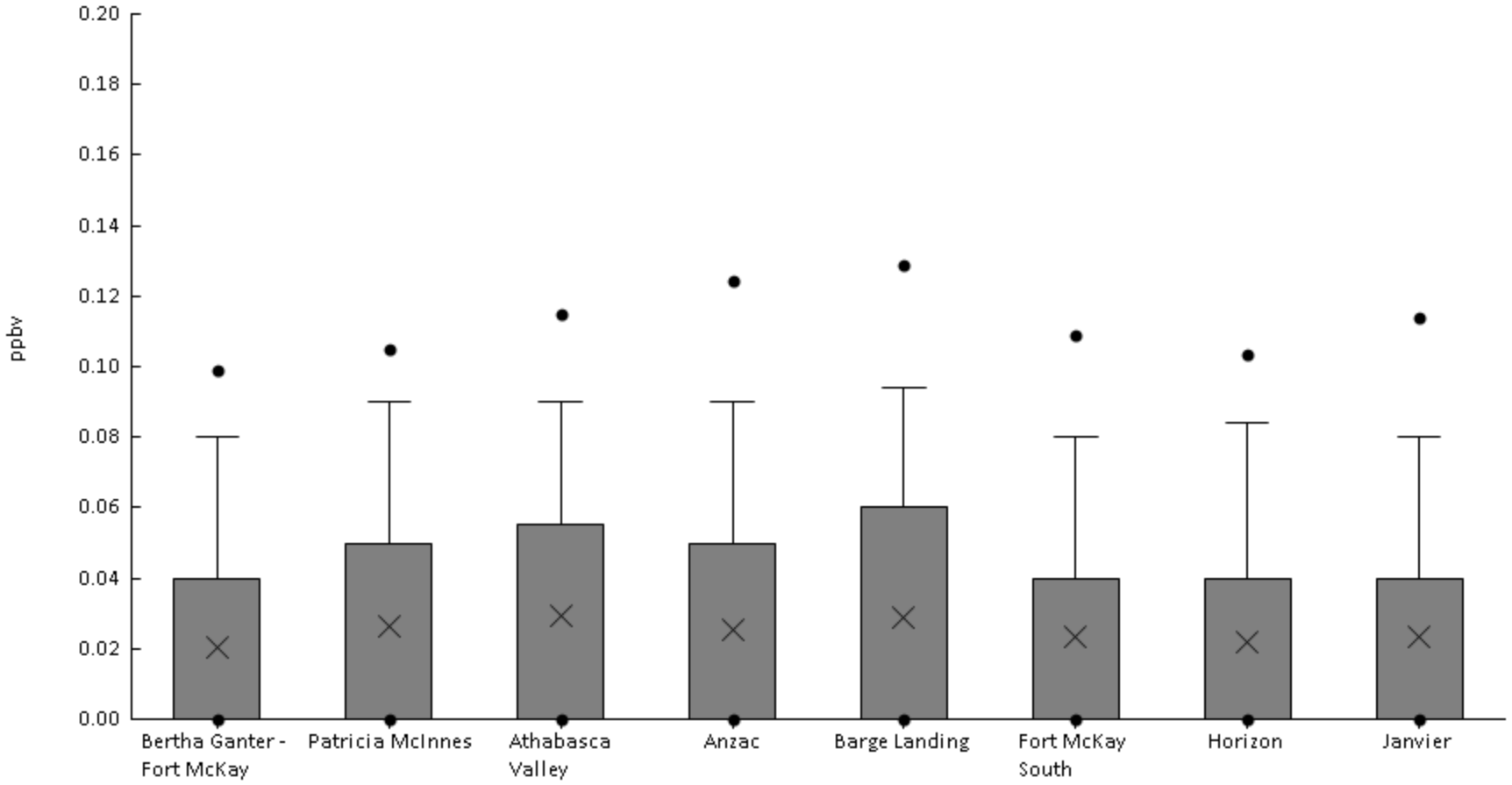
Volatile Organic Compounds - 1,3,5-Trimethylbenzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	5%	0	0	0	0	0	0	0	0.013	0.05	2E-3	8.9E-3
AMS06	Patricia McInnes	60	5%	0	0	0	0	0	0	0	0.015	0.04	1.8E-3	8.1E-3
AMS07	Athabasca Valley	60	7%	0	0	0	0	0	0	0	0.03	0.05	2.5E-3	9.7E-3
AMS14	Anzac	61	2%	0	0	0	0	0	0	0	0	0.13	2.1E-3	0.017
AMS09	Barge Landing	61	7%	0	0	0	0	0	0	0	0.035	0.05	2.6E-3	0.01
AMS13	Fort McKay South	61	3%	0	0	0	0	0	0	0	0	0.03	9.8E-4	5.4E-3
AMS15	Horizon	61	2%	0	0	0	0	0	0	0	0	0.04	6.6E-4	5.1E-3
AMS22	Janvier	58	3%	0	0	0	0	0	0	0	0	0.16	4E-3	0.023



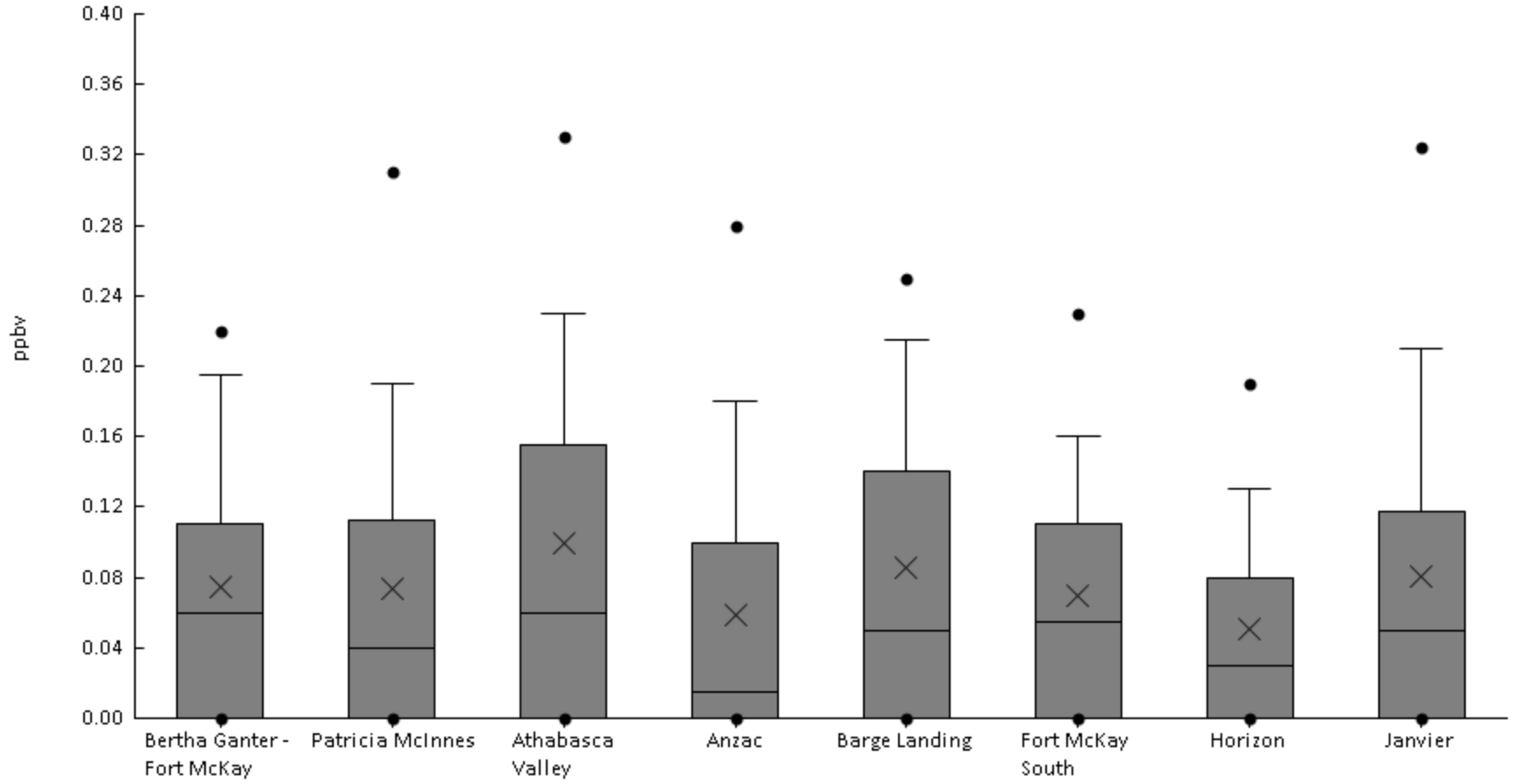
Volatile Organic Compounds - 1,3-Butadiene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	30%	0	0	0	0	0	0.04	0.08	0.099	0.14	0.02	0.037
AMS06	Patricia McInnes	60	38%	0	0	0	0	0	0.05	0.09	0.11	0.15	0.027	0.04
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.055	0.09	0.12	0.15	0.029	0.04
AMS14	Anzac	61	31%	0	0	0	0	0	0.05	0.09	0.12	0.21	0.025	0.045
AMS09	Barge Landing	61	36%	0	0	0	0	0	0.06	0.094	0.13	0.16	0.029	0.045
AMS13	Fort McKay South	61	34%	0	0	0	0	0	0.04	0.08	0.11	0.14	0.023	0.037
AMS15	Horizon	61	33%	0	0	0	0	0	0.04	0.084	0.1	0.13	0.022	0.036
AMS22	Janvier	58	33%	0	0	0	0	0	0.04	0.08	0.11	0.18	0.023	0.041



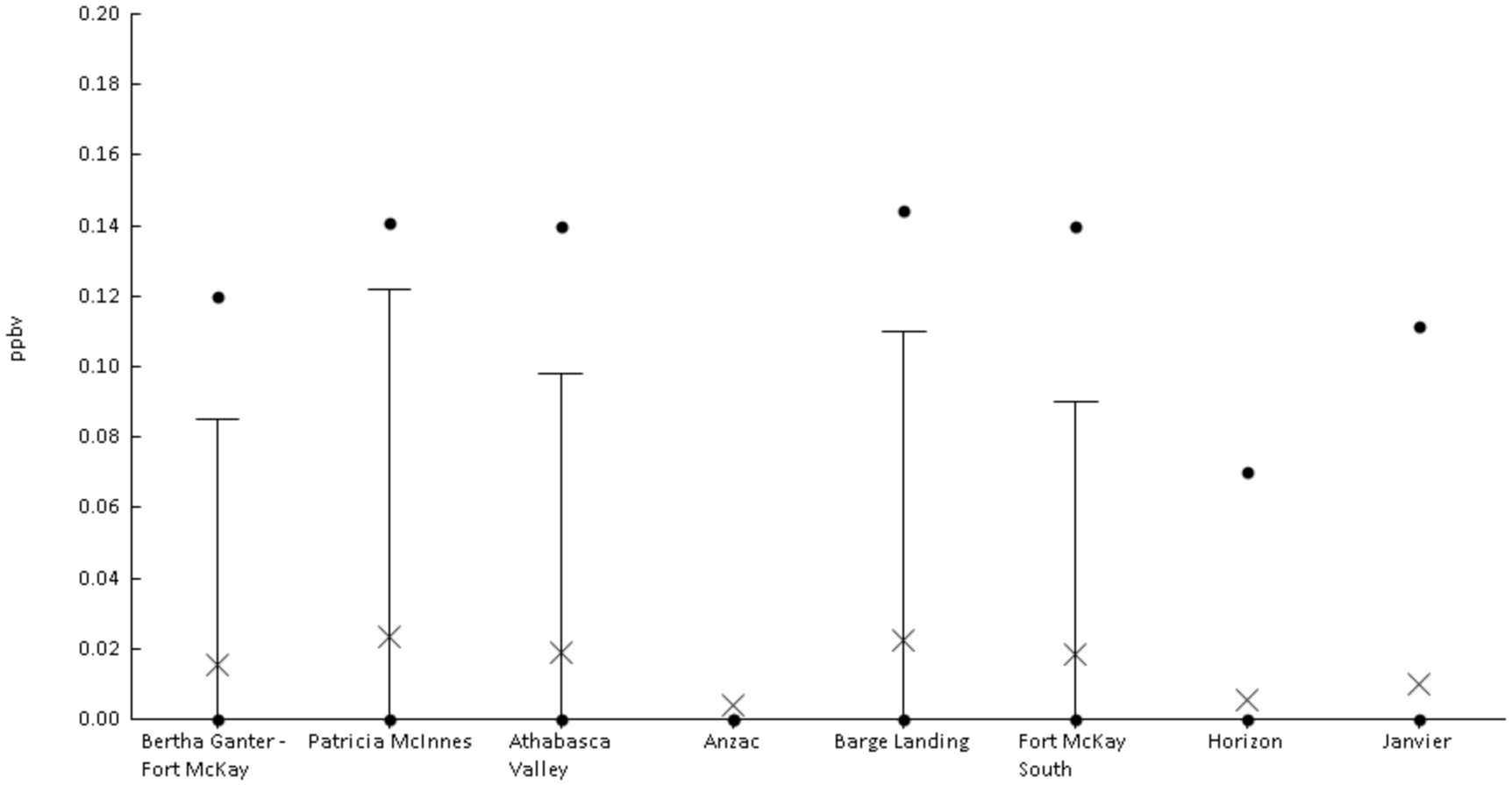
Volatile Organic Compounds - 1-Butene/Isobutylene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	50	66%	0	0	0	0	0.06	0.11	0.2	0.22	0.32	0.075	0.081
AMS06	Patricia McInnes	49	59%	0	0	0	0	0.04	0.11	0.19	0.31	0.39	0.073	0.094
AMS07	Athabasca Valley	49	65%	0	0	0	0	0.06	0.16	0.23	0.33	0.74	0.1	0.13
AMS14	Anzac	50	50%	0	0	0	0	0.015	0.1	0.18	0.28	0.31	0.059	0.084
AMS09	Barge Landing	50	60%	0	0	0	0	0.05	0.14	0.22	0.25	0.77	0.086	0.13
AMS13	Fort McKay South	50	66%	0	0	0	0	0.055	0.11	0.16	0.23	0.32	0.07	0.077
AMS15	Horizon	50	52%	0	0	0	0	0.03	0.08	0.13	0.19	0.31	0.051	0.073
AMS22	Janvier	47	60%	0	0	0	0	0.05	0.12	0.21	0.32	0.37	0.081	0.1



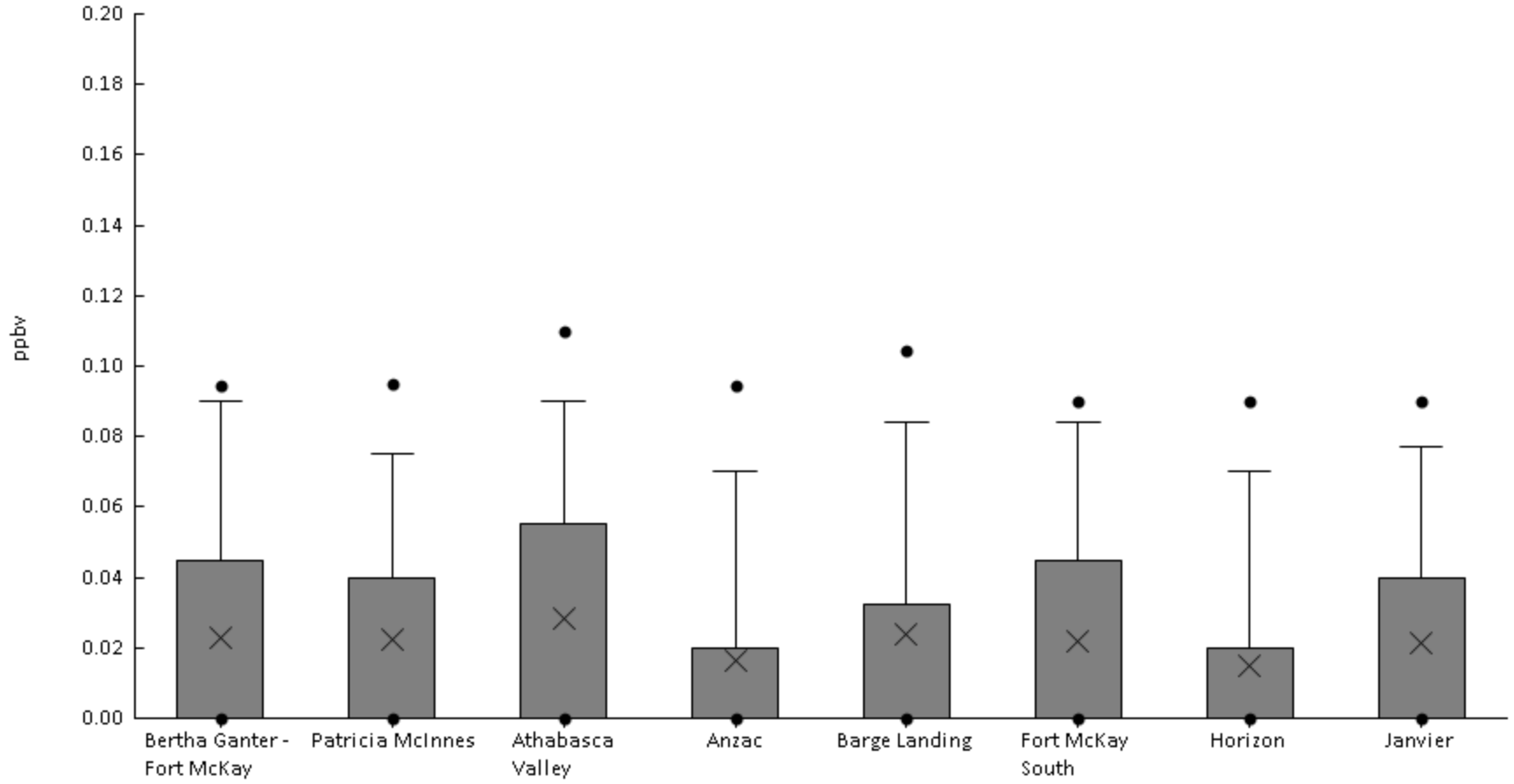
Volatile Organic Compounds - 1-Hexene/2-Methyl-1-pentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	50	14%	0	0	0	0	0	0	0.085	0.12	0.17	0.016	0.041
AMS06	Patricia McInnes	49	20%	0	0	0	0	0	0	0.12	0.14	0.17	0.023	0.05
AMS07	Athabasca Valley	49	16%	0	0	0	0	0	0	0.098	0.14	0.17	0.019	0.045
AMS14	Anzac	50	4%	0	0	0	0	0	0	0	0	0.14	4.2E-3	0.022
AMS09	Barge Landing	49	16%	0	0	0	0	0	0	0.11	0.14	0.29	0.022	0.061
AMS13	Fort McKay South	50	14%	0	0	0	0	0	0	0.09	0.14	0.23	0.019	0.051
AMS15	Horizon	50	6%	0	0	0	0	0	0	0	0.07	0.13	5.4E-3	0.023
AMS22	Janvier	47	9%	0	0	0	0	0	0	0	0.11	0.16	0.01	0.034



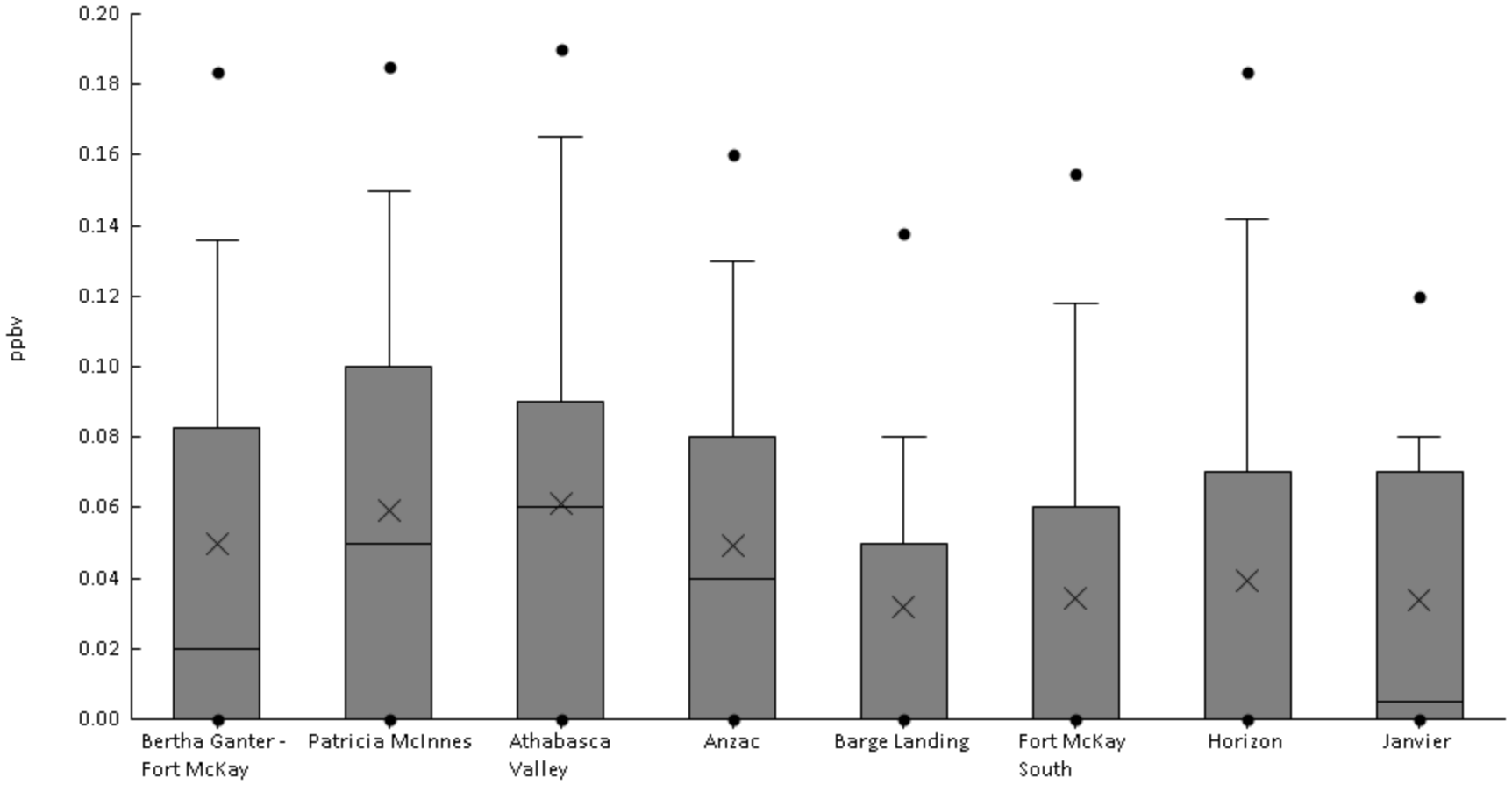
Volatile Organic Compounds - 1-Pentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	34%	0	0	0	0	0	0.045	0.09	0.095	0.14	0.023	0.037
AMS06	Patricia McInnes	60	42%	0	0	0	0	0	0.04	0.075	0.095	0.11	0.023	0.034
AMS07	Athabasca Valley	60	48%	0	0	0	0	0	0.055	0.09	0.11	0.17	0.029	0.041
AMS14	Anzac	61	26%	0	0	0	0	0	0.02	0.07	0.095	0.15	0.016	0.033
AMS09	Barge Landing	61	36%	0	0	0	0	0	0.033	0.084	0.1	0.17	0.024	0.041
AMS13	Fort McKay South	61	38%	0	0	0	0	0	0.045	0.084	0.09	0.13	0.022	0.035
AMS15	Horizon	61	28%	0	0	0	0	0	0.02	0.07	0.09	0.1	0.015	0.029
AMS22	Janvier	58	36%	0	0	0	0	0	0.04	0.077	0.09	0.13	0.021	0.034



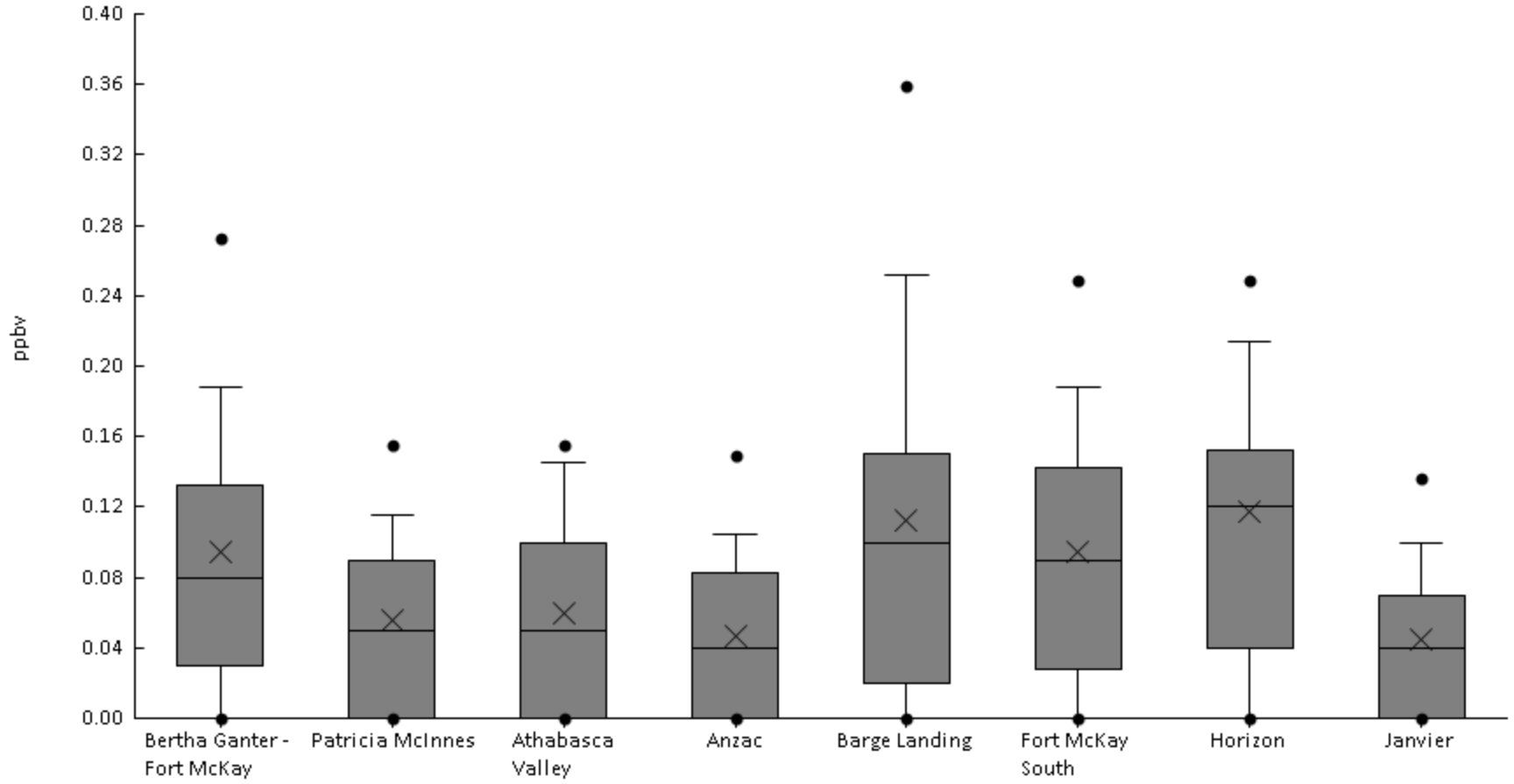
Volatile Organic Compounds - 2,2,4-Trimethylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	52%	0	0	0	0	0.02	0.083	0.14	0.18	0.31	0.05	0.067
AMS06	Patricia McInnes	60	72%	0	0	0	0	0.05	0.1	0.15	0.19	0.2	0.059	0.059
AMS07	Athabasca Valley	60	70%	0	0	0	0	0.06	0.09	0.17	0.19	0.21	0.061	0.061
AMS14	Anzac	61	61%	0	0	0	0	0.04	0.08	0.13	0.16	0.31	0.049	0.061
AMS09	Barge Landing	61	41%	0	0	0	0	0	0.05	0.08	0.14	0.3	0.032	0.055
AMS13	Fort McKay South	61	38%	0	0	0	0	0	0.06	0.12	0.15	0.25	0.034	0.058
AMS15	Horizon	61	44%	0	0	0	0	0	0.07	0.14	0.18	0.2	0.039	0.059
AMS22	Janvier	58	50%	0	0	0	0	5E-3	0.07	0.08	0.12	0.14	0.034	0.041



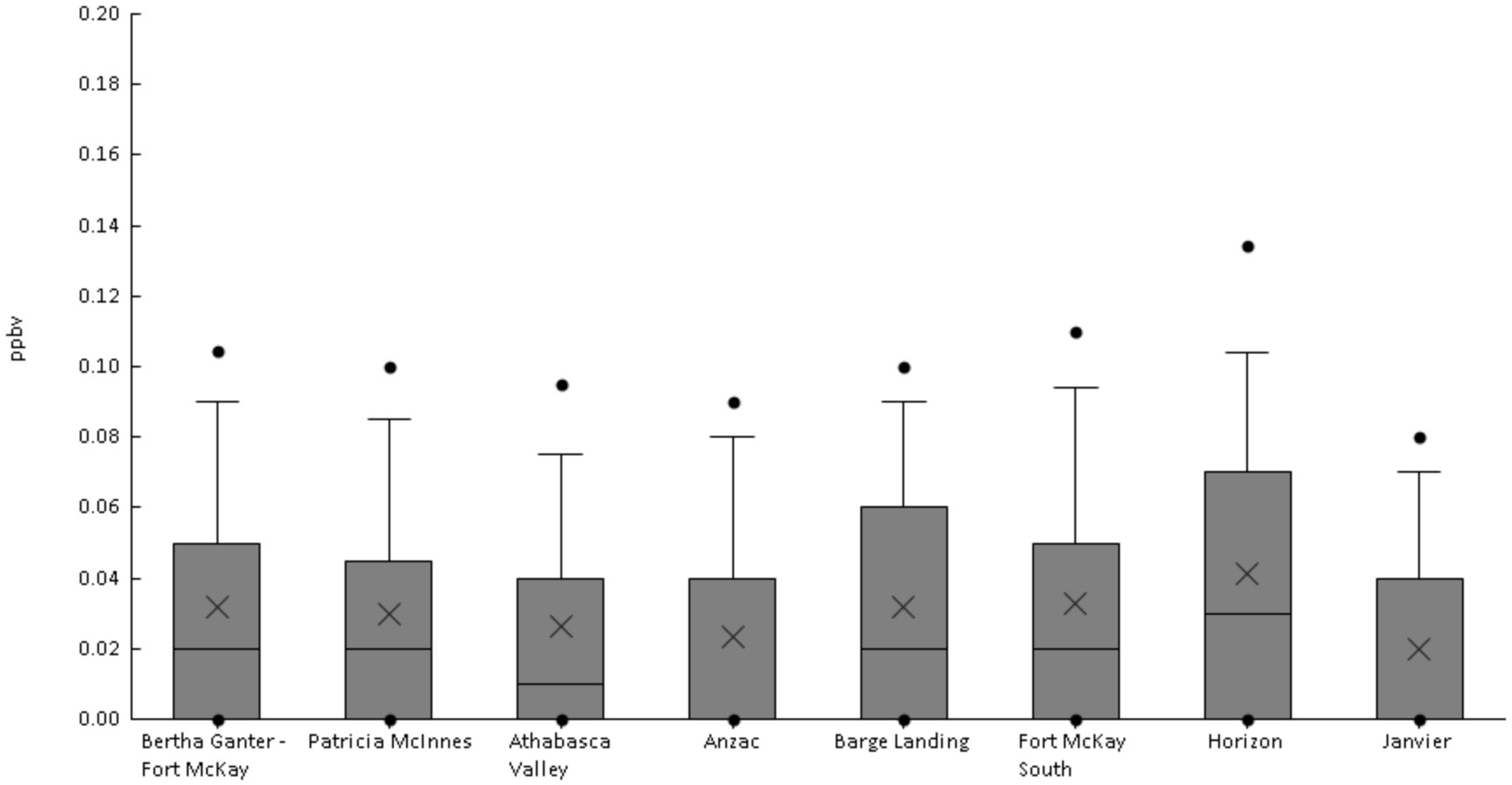
Volatile Organic Compounds - 2,2-Dimethylbutane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	80%	0	0	0	0.03	0.08	0.13	0.19	0.27	0.4	0.094	0.085
AMS06	Patricia McInnes	60	70%	0	0	0	0	0.05	0.09	0.12	0.16	0.26	0.056	0.056
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.05	0.1	0.15	0.16	0.21	0.06	0.056
AMS14	Anzac	61	64%	0	0	0	0	0.04	0.083	0.1	0.15	0.19	0.047	0.05
AMS09	Barge Landing	61	84%	0	0	0	0.02	0.1	0.15	0.25	0.36	0.44	0.11	0.11
AMS13	Fort McKay South	61	84%	0	0	0	0.028	0.09	0.14	0.19	0.25	0.37	0.094	0.081
AMS15	Horizon	61	82%	0	0	0	0.04	0.12	0.15	0.21	0.25	0.73	0.12	0.11
AMS22	Janvier	58	64%	0	0	0	0	0.04	0.07	0.1	0.14	0.19	0.045	0.047



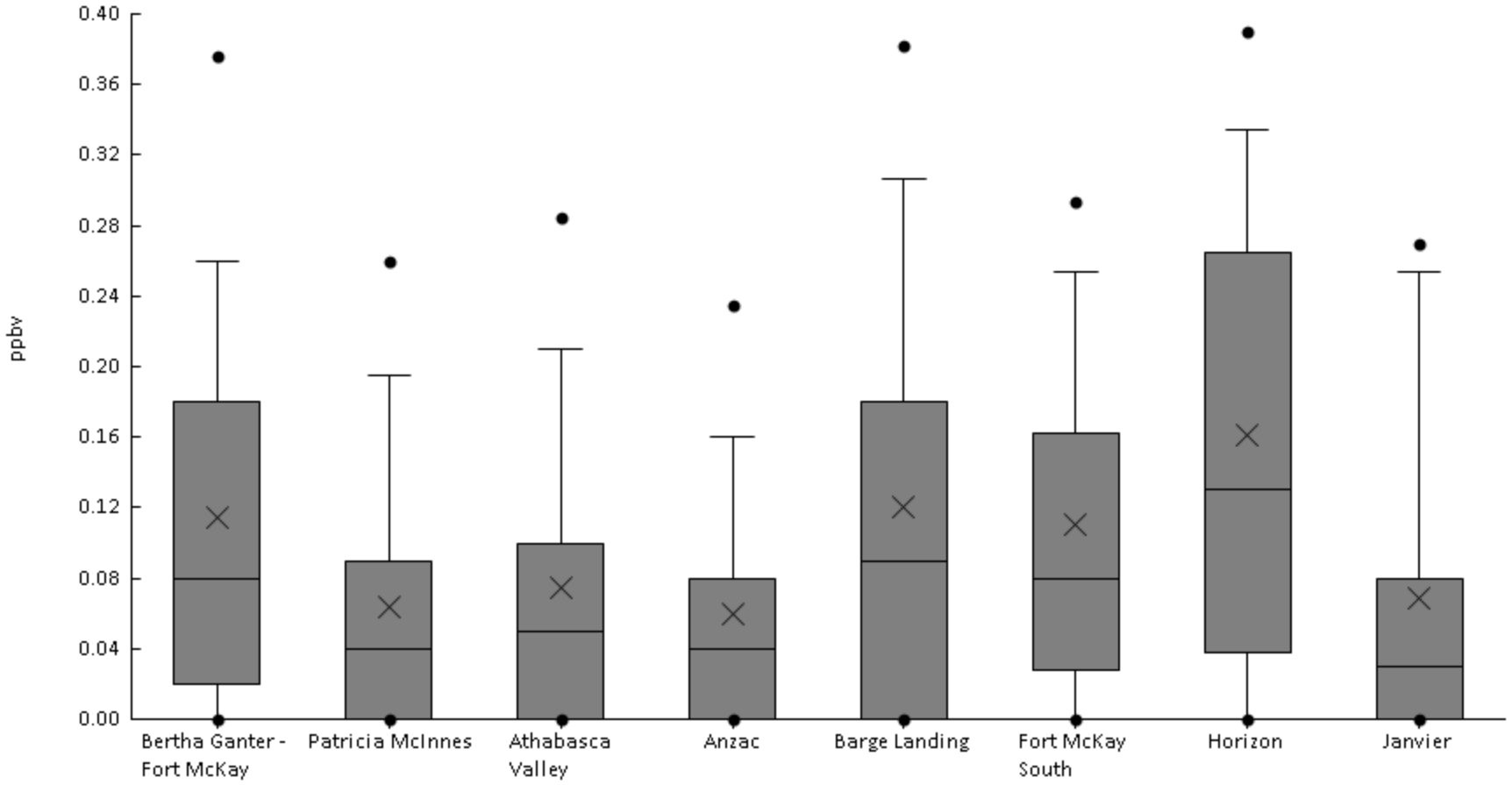
Volatile Organic Compounds - 2,3,4-Trimethylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	59%	0	0	0	0	0.02	0.05	0.09	0.1	0.13	0.032	0.038
AMS06	Patricia McInnes	60	60%	0	0	0	0	0.02	0.045	0.085	0.1	0.13	0.03	0.035
AMS07	Athabasca Valley	60	53%	0	0	0	0	0.01	0.04	0.075	0.095	0.13	0.026	0.034
AMS14	Anzac	61	48%	0	0	0	0	0	0.04	0.08	0.09	0.13	0.023	0.033
AMS09	Barge Landing	61	56%	0	0	0	0	0.02	0.06	0.09	0.1	0.13	0.032	0.038
AMS13	Fort McKay South	61	57%	0	0	0	0	0.02	0.05	0.094	0.11	0.14	0.033	0.039
AMS15	Horizon	61	66%	0	0	0	0	0.03	0.07	0.1	0.13	0.19	0.041	0.045
AMS22	Janvier	58	45%	0	0	0	0	0	0.04	0.07	0.08	0.09	0.02	0.029



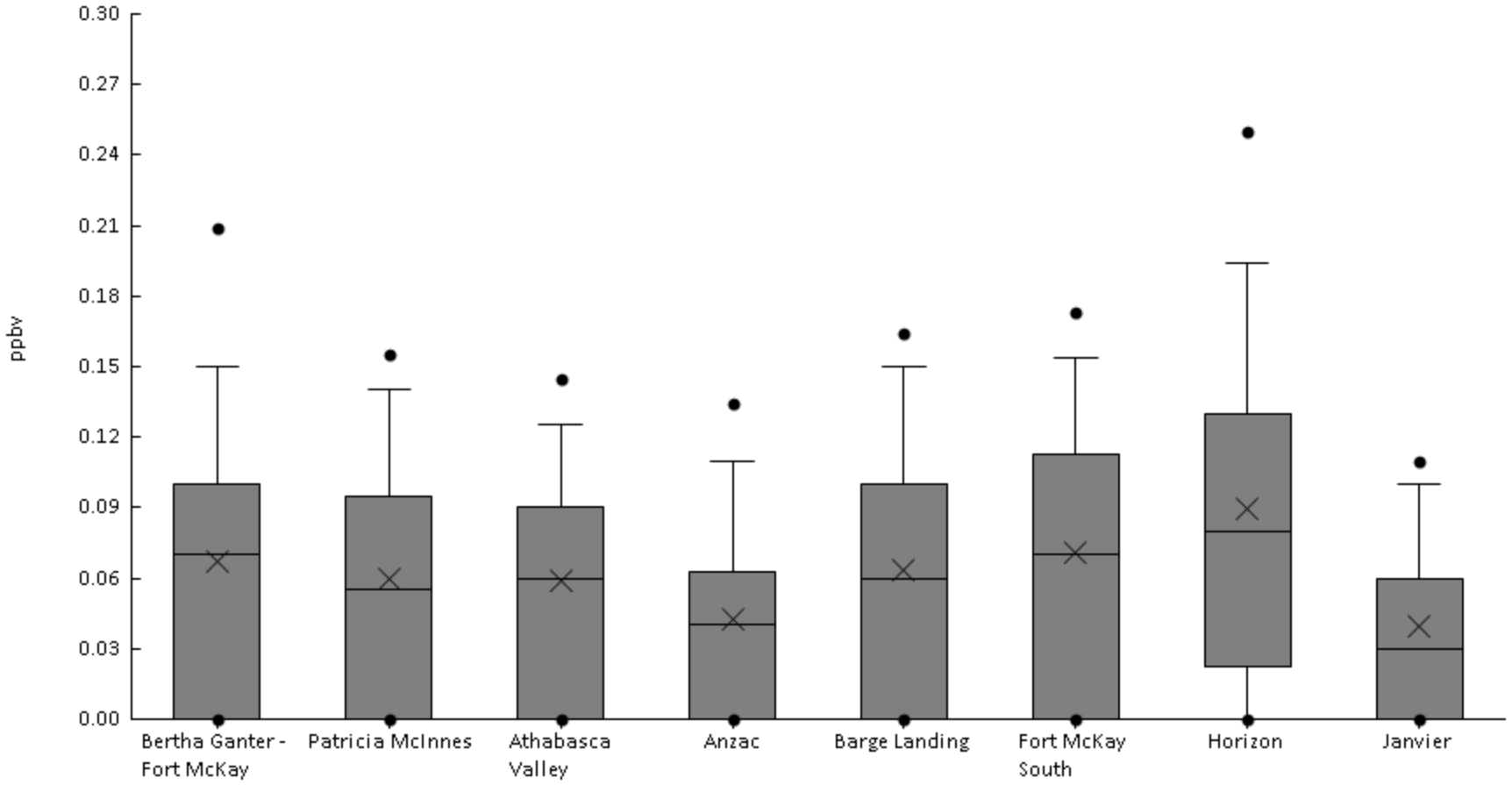
Volatile Organic Compounds - 2,3-Dimethylbutane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	77%	0	0	0	0.02	0.08	0.18	0.26	0.38	0.47	0.11	0.12
AMS06	Patricia McInnes	60	60%	0	0	0	0	0.04	0.09	0.2	0.26	0.31	0.064	0.08
AMS07	Athabasca Valley	60	60%	0	0	0	0	0.05	0.1	0.21	0.29	0.39	0.075	0.095
AMS14	Anzac	61	57%	0	0	0	0	0.04	0.08	0.16	0.23	0.35	0.06	0.077
AMS09	Barge Landing	61	72%	0	0	0	0	0.09	0.18	0.31	0.38	0.57	0.12	0.13
AMS13	Fort McKay South	61	79%	0	0	0	0.028	0.08	0.16	0.25	0.29	0.43	0.11	0.11
AMS15	Horizon	61	82%	0	0	0	0.038	0.13	0.27	0.33	0.39	0.95	0.16	0.16
AMS22	Janvier	58	52%	0	0	0	0	0.03	0.08	0.25	0.27	0.39	0.068	0.098



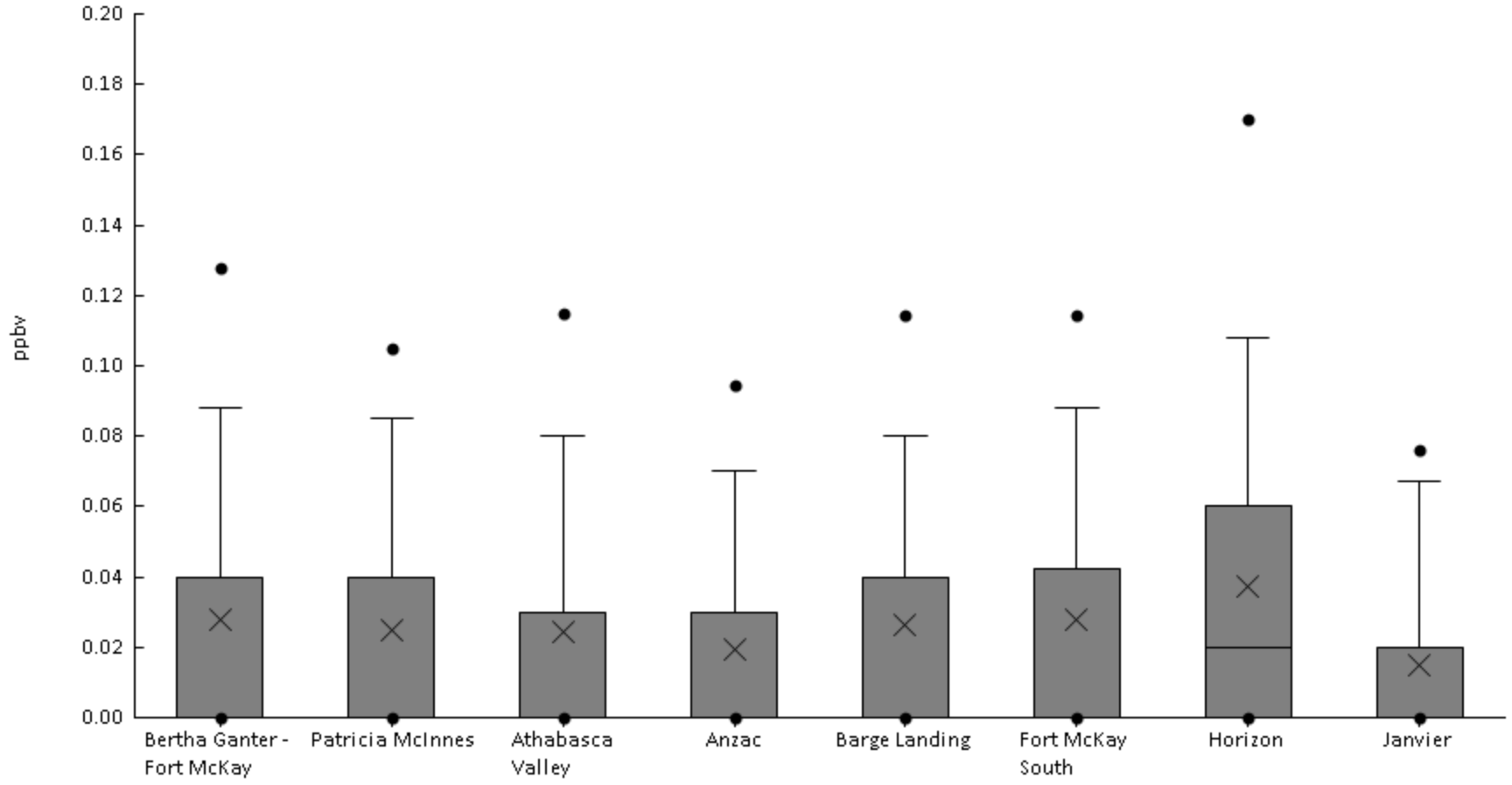
Volatile Organic Compounds - 2,3-Dimethylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	66%	0	0	0	0	0.07	0.1	0.15	0.21	0.27	0.067	0.067
AMS06	Patricia McInnes	60	67%	0	0	0	0	0.055	0.095	0.14	0.16	0.38	0.06	0.066
AMS07	Athabasca Valley	60	73%	0	0	0	0	0.06	0.09	0.13	0.15	0.21	0.059	0.05
AMS14	Anzac	61	62%	0	0	0	0	0.04	0.063	0.11	0.13	0.21	0.042	0.046
AMS09	Barge Landing	61	67%	0	0	0	0	0.06	0.1	0.15	0.16	0.19	0.063	0.057
AMS13	Fort McKay South	61	70%	0	0	0	0	0.07	0.11	0.15	0.17	0.24	0.071	0.062
AMS15	Horizon	61	75%	0	0	0	0.023	0.08	0.13	0.19	0.25	0.38	0.09	0.08
AMS22	Janvier	58	60%	0	0	0	0	0.03	0.06	0.1	0.11	0.14	0.039	0.041



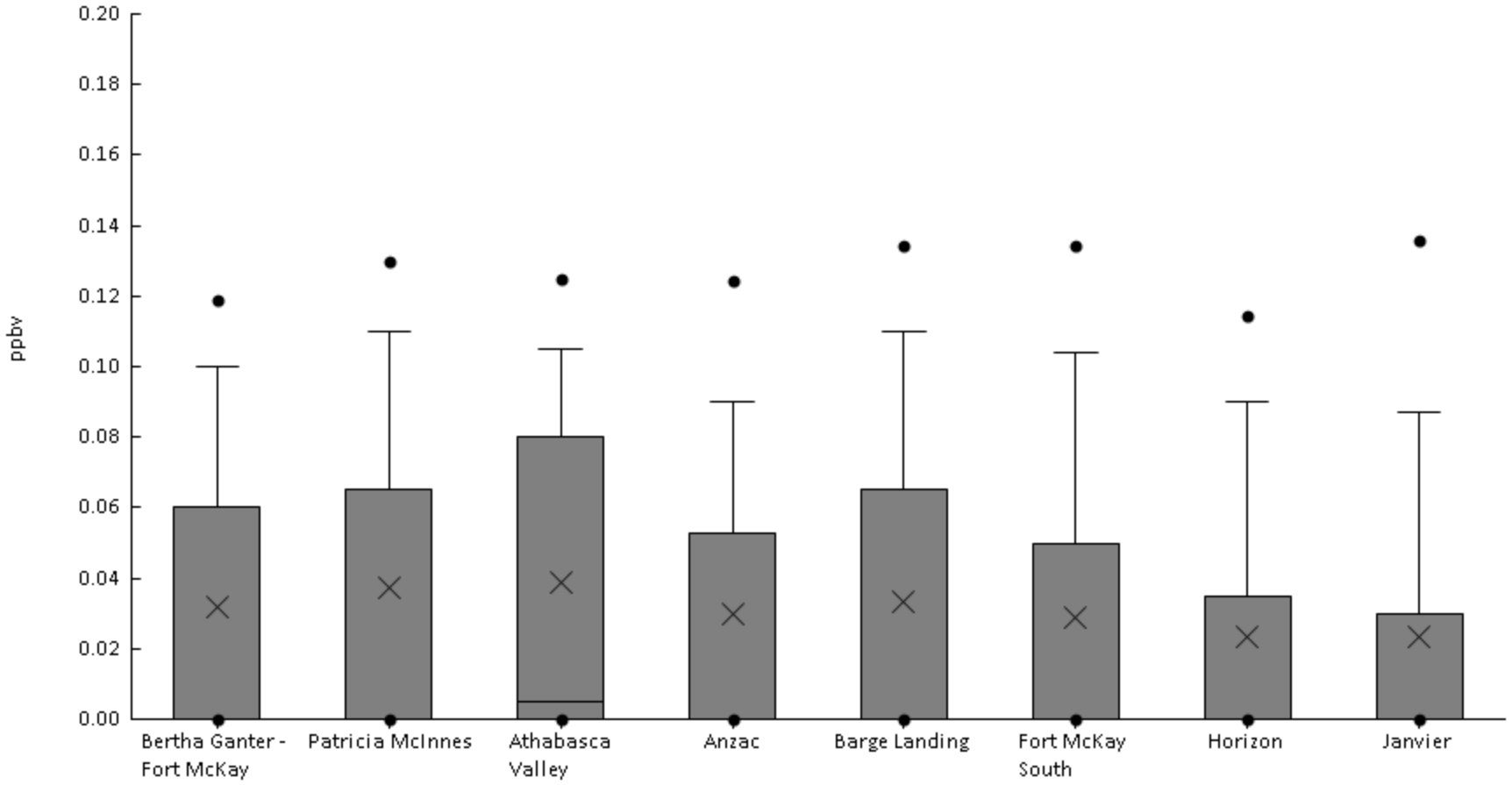
Volatile Organic Compounds - 2,4-Dimethylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	44%	0	0	0	0	0	0.04	0.088	0.13	0.18	0.028	0.044
AMS06	Patricia McInnes	60	43%	0	0	0	0	0	0.04	0.085	0.11	0.15	0.025	0.037
AMS07	Athabasca Valley	60	43%	0	0	0	0	0	0.03	0.08	0.12	0.15	0.024	0.038
AMS14	Anzac	61	38%	0	0	0	0	0	0.03	0.07	0.095	0.18	0.02	0.036
AMS09	Barge Landing	61	41%	0	0	0	0	0	0.04	0.08	0.11	0.18	0.027	0.042
AMS13	Fort McKay South	61	46%	0	0	0	0	0	0.043	0.088	0.11	0.16	0.028	0.041
AMS15	Horizon	61	59%	0	0	0	0	0.02	0.06	0.11	0.17	0.18	0.037	0.048
AMS22	Janvier	58	31%	0	0	0	0	0	0.02	0.067	0.076	0.1	0.015	0.026



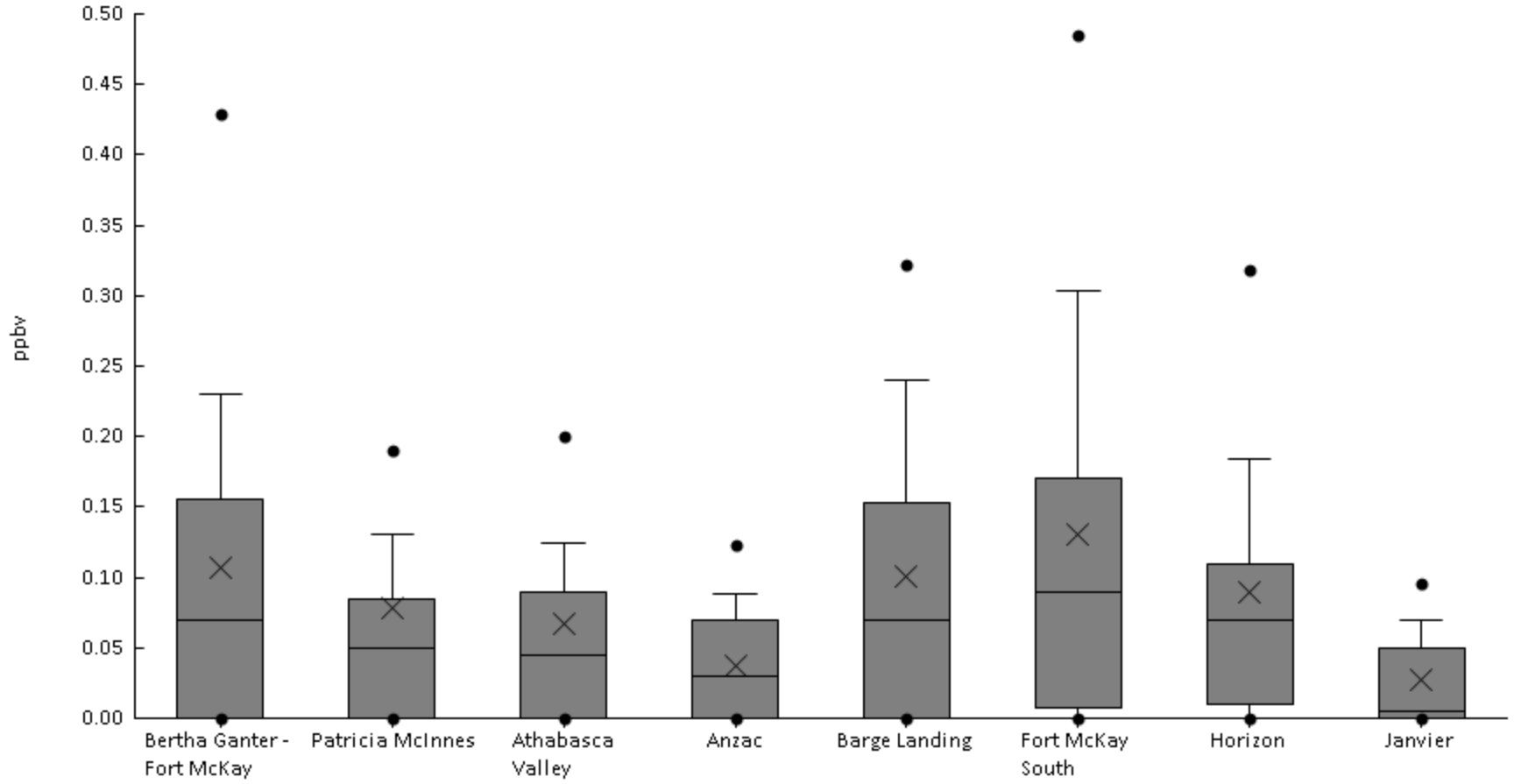
Volatile Organic Compounds - 2-Methyl-2-butene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	43%	0	0	0	0	0	0.06	0.1	0.12	0.17	0.032	0.044
AMS06	Patricia McInnes	60	48%	0	0	0	0	0	0.065	0.11	0.13	0.16	0.038	0.047
AMS07	Athabasca Valley	60	50%	0	0	0	0	5E-3	0.08	0.11	0.13	0.16	0.039	0.047
AMS14	Anzac	61	39%	0	0	0	0	0	0.053	0.09	0.12	0.17	0.03	0.045
AMS09	Barge Landing	61	39%	0	0	0	0	0	0.065	0.11	0.13	0.17	0.033	0.05
AMS13	Fort McKay South	61	38%	0	0	0	0	0	0.05	0.1	0.13	0.16	0.029	0.046
AMS15	Horizon	61	31%	0	0	0	0	0	0.035	0.09	0.11	0.16	0.023	0.041
AMS22	Janvier	58	31%	0	0	0	0	0	0.03	0.087	0.14	0.16	0.024	0.043



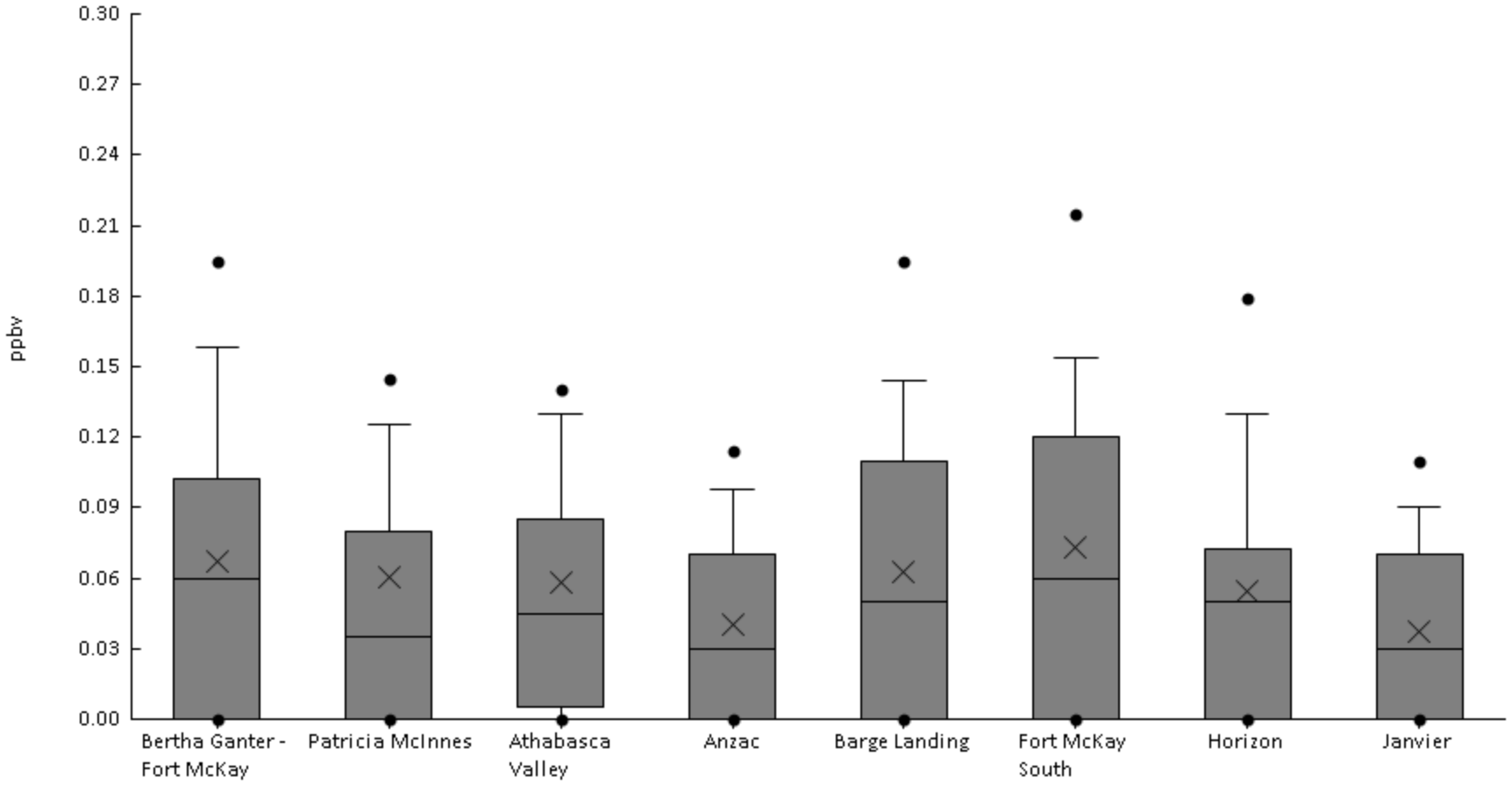
Volatile Organic Compounds - 2-Methylheptane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	69%	0	0	0	0	0.07	0.16	0.23	0.43	0.64	0.11	0.13
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.05	0.085	0.13	0.19	1.3	0.078	0.17
AMS07	Athabasca Valley	60	70%	0	0	0	0	0.045	0.09	0.13	0.2	0.84	0.067	0.12
AMS14	Anzac	61	59%	0	0	0	0	0.03	0.07	0.088	0.12	0.16	0.038	0.042
AMS09	Barge Landing	61	74%	0	0	0	0	0.07	0.15	0.24	0.32	0.46	0.1	0.11
AMS13	Fort McKay South	61	75%	0	0	0	7.5E-3	0.09	0.17	0.3	0.49	0.86	0.13	0.17
AMS15	Horizon	61	79%	0	0	0	0.01	0.07	0.11	0.18	0.32	0.61	0.089	0.11
AMS22	Janvier	58	50%	0	0	0	0	5E-3	0.05	0.07	0.096	0.12	0.028	0.034



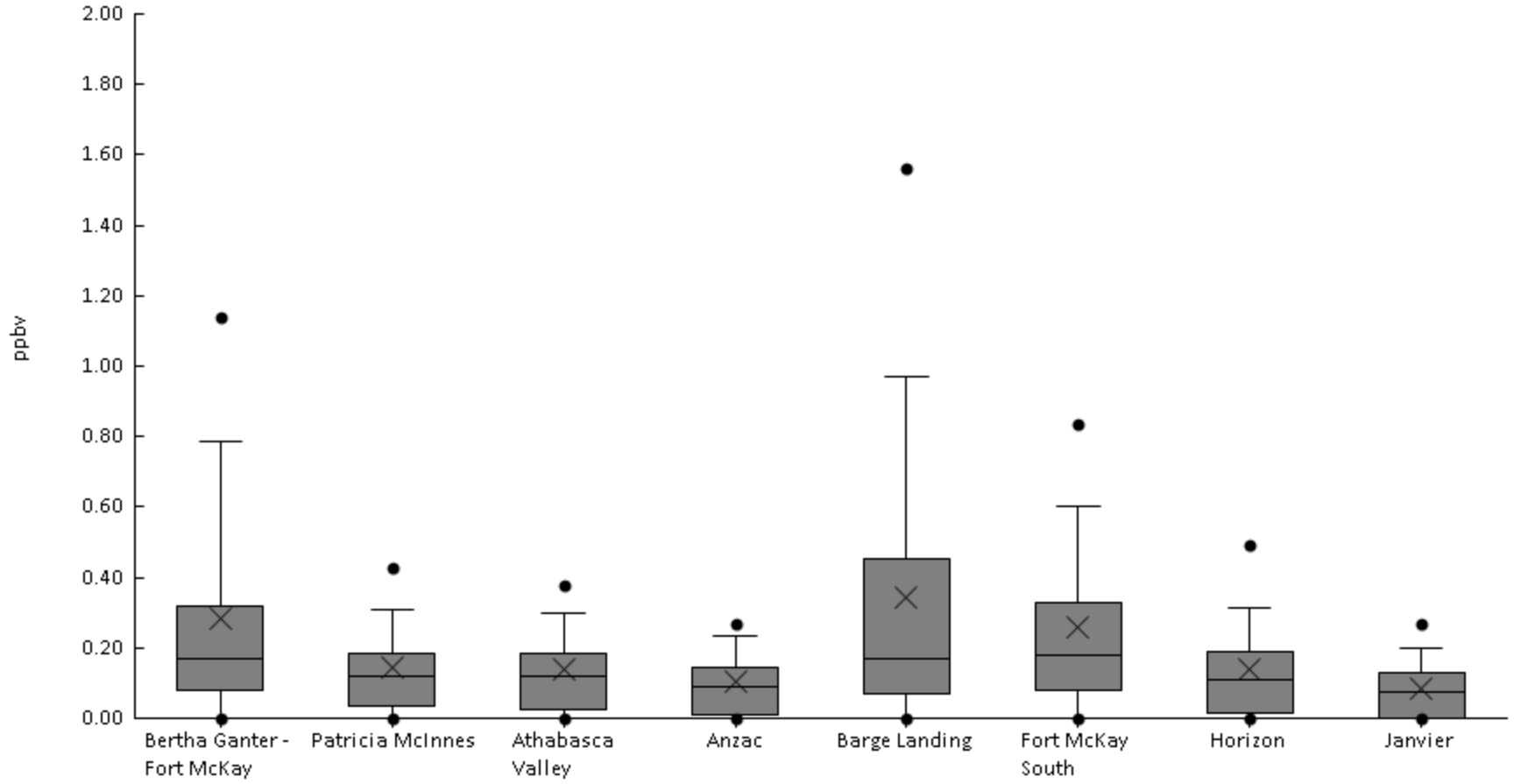
Volatile Organic Compounds - 2-Methylhexane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	74%	0	0	0	0	0.06	0.1	0.16	0.19	0.41	0.067	0.075
AMS06	Patricia McInnes	60	72%	0	0	0	0	0.035	0.08	0.13	0.15	0.76	0.06	0.1
AMS07	Athabasca Valley	60	75%	0	0	0	5E-3	0.045	0.085	0.13	0.14	0.39	0.059	0.064
AMS14	Anzac	61	66%	0	0	0	0	0.03	0.07	0.098	0.11	0.23	0.041	0.045
AMS09	Barge Landing	61	70%	0	0	0	0	0.05	0.11	0.14	0.19	0.23	0.063	0.064
AMS13	Fort McKay South	61	74%	0	0	0	0	0.06	0.12	0.15	0.22	0.41	0.073	0.081
AMS15	Horizon	61	72%	0	0	0	0	0.05	0.073	0.13	0.18	0.22	0.055	0.054
AMS22	Janvier	58	60%	0	0	0	0	0.03	0.07	0.09	0.11	0.16	0.037	0.039



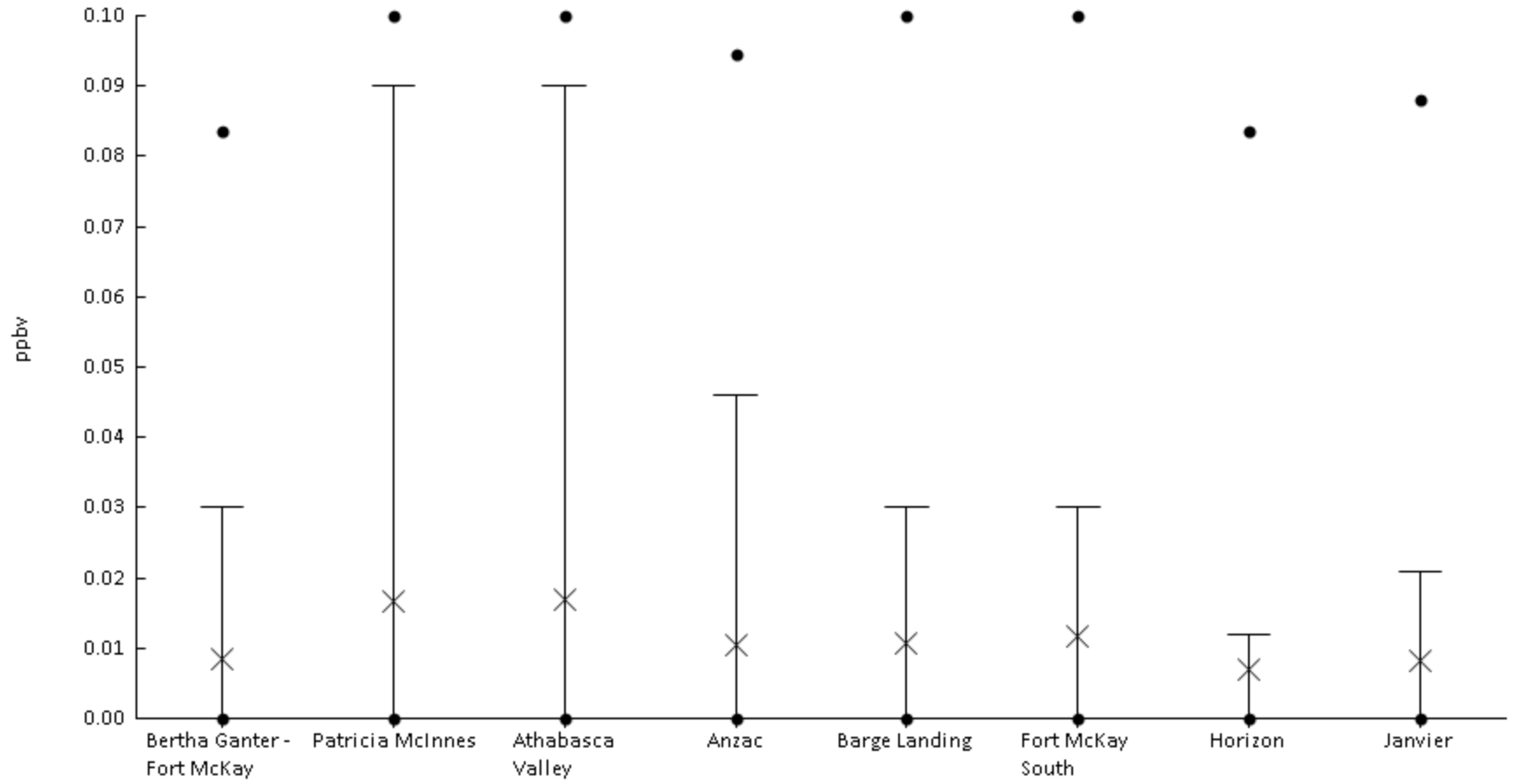
Volatile Organic Compounds - 2-Methylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	85%	0	0	0	0.078	0.17	0.32	0.79	1.1	2	0.28	0.36
AMS06	Patricia McInnes	60	80%	0	0	0	0.035	0.12	0.19	0.31	0.43	1	0.15	0.17
AMS07	Athabasca Valley	60	77%	0	0	0	0.025	0.12	0.19	0.3	0.38	0.91	0.14	0.15
AMS14	Anzac	61	75%	0	0	0	7.5E-3	0.09	0.14	0.23	0.27	0.69	0.1	0.12
AMS09	Barge Landing	61	89%	0	0	0	0.07	0.17	0.46	0.97	1.6	1.8	0.35	0.43
AMS13	Fort McKay South	61	89%	0	0	0	0.08	0.18	0.33	0.6	0.83	1.3	0.26	0.28
AMS15	Horizon	61	75%	0	0	0	0.015	0.11	0.19	0.31	0.49	0.61	0.14	0.15
AMS22	Janvier	58	72%	0	0	0	0	0.075	0.13	0.2	0.27	0.35	0.083	0.083



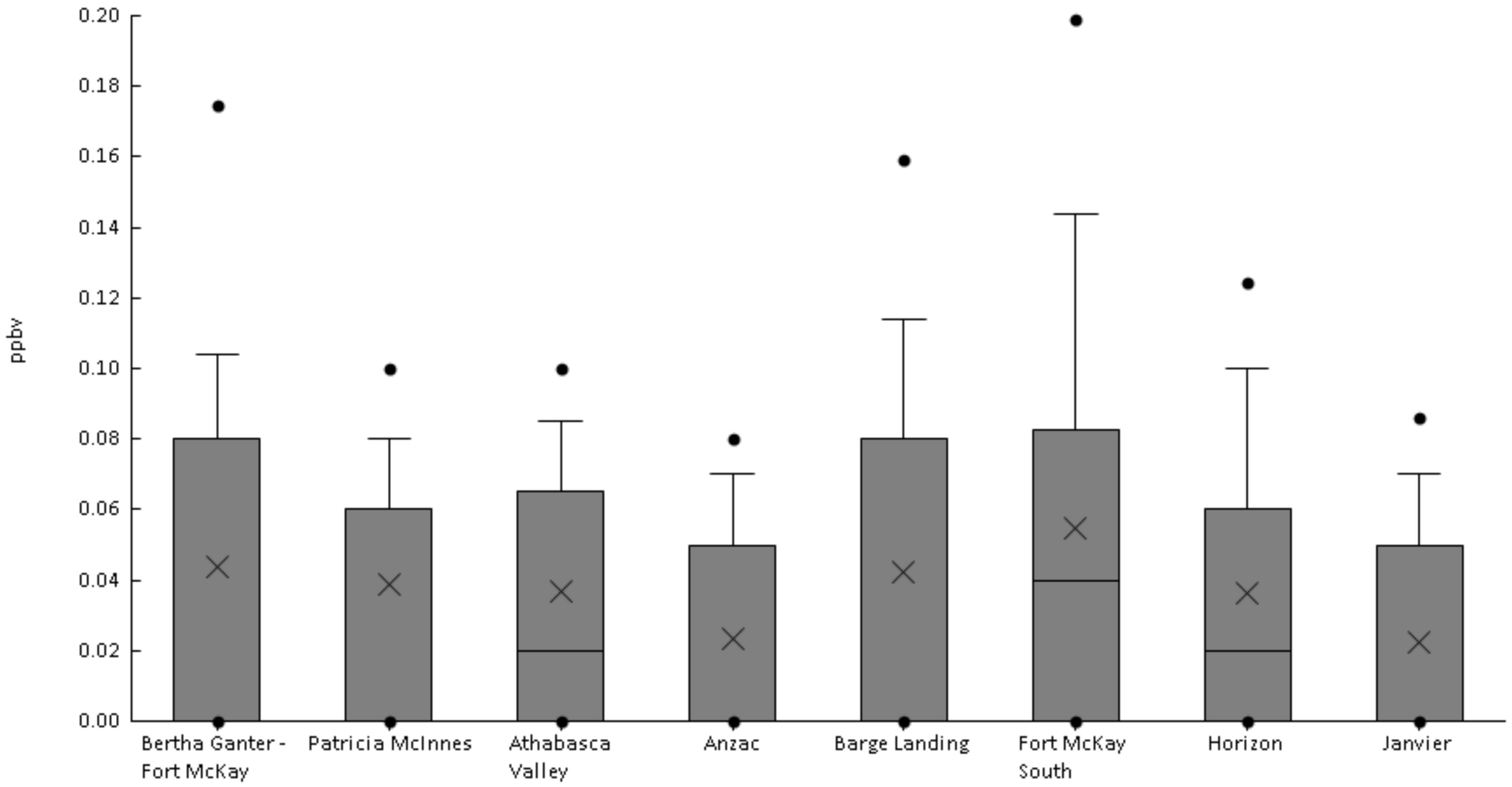
Volatile Organic Compounds - 3-Methyl-1-butene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	15%	0	0	0	0	0	0	0.03	0.083	0.1	8.4E-3	0.024
AMS06	Patricia McInnes	60	22%	0	0	0	0	0	0	0.09	0.1	0.15	0.017	0.036
AMS07	Athabasca Valley	60	23%	0	0	0	0	0	0	0.09	0.1	0.16	0.017	0.036
AMS14	Anzac	61	15%	0	0	0	0	0	0	0.046	0.095	0.1	0.01	0.028
AMS09	Barge Landing	60	15%	0	0	0	0	0	0	0.03	0.1	0.15	0.011	0.03
AMS13	Fort McKay South	61	18%	0	0	0	0	0	0	0.03	0.1	0.16	0.012	0.031
AMS15	Horizon	61	10%	0	0	0	0	0	0	0.012	0.083	0.1	7E-3	0.024
AMS22	Janvier	58	10%	0	0	0	0	0	0	0.021	0.088	0.15	8.3E-3	0.028



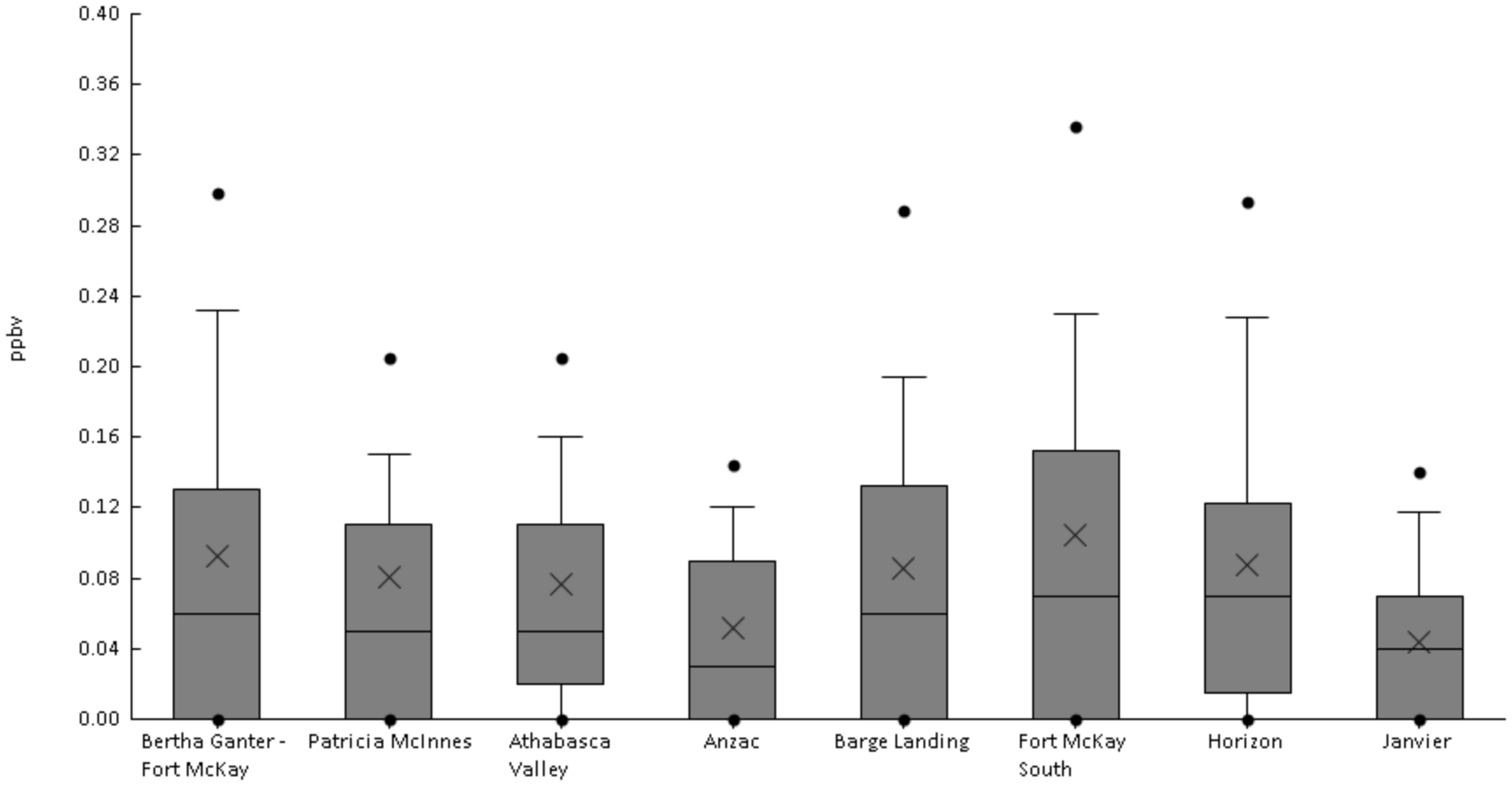
Volatile Organic Compounds - 3-Methylheptane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	48%	0	0	0	0	0	0.08	0.1	0.17	0.26	0.044	0.06
AMS06	Patricia McInnes	60	48%	0	0	0	0	0	0.06	0.08	0.1	0.58	0.039	0.079
AMS07	Athabasca Valley	60	55%	0	0	0	0	0.02	0.065	0.085	0.1	0.34	0.037	0.053
AMS14	Anzac	61	41%	0	0	0	0	0	0.05	0.07	0.08	0.11	0.023	0.032
AMS09	Barge Landing	61	48%	0	0	0	0	0	0.08	0.11	0.16	0.21	0.042	0.054
AMS13	Fort McKay South	61	57%	0	0	0	0	0.04	0.083	0.14	0.2	0.32	0.055	0.071
AMS15	Horizon	61	52%	0	0	0	0	0.02	0.06	0.1	0.12	0.24	0.036	0.048
AMS22	Janvier	58	38%	0	0	0	0	0	0.05	0.07	0.086	0.13	0.022	0.033



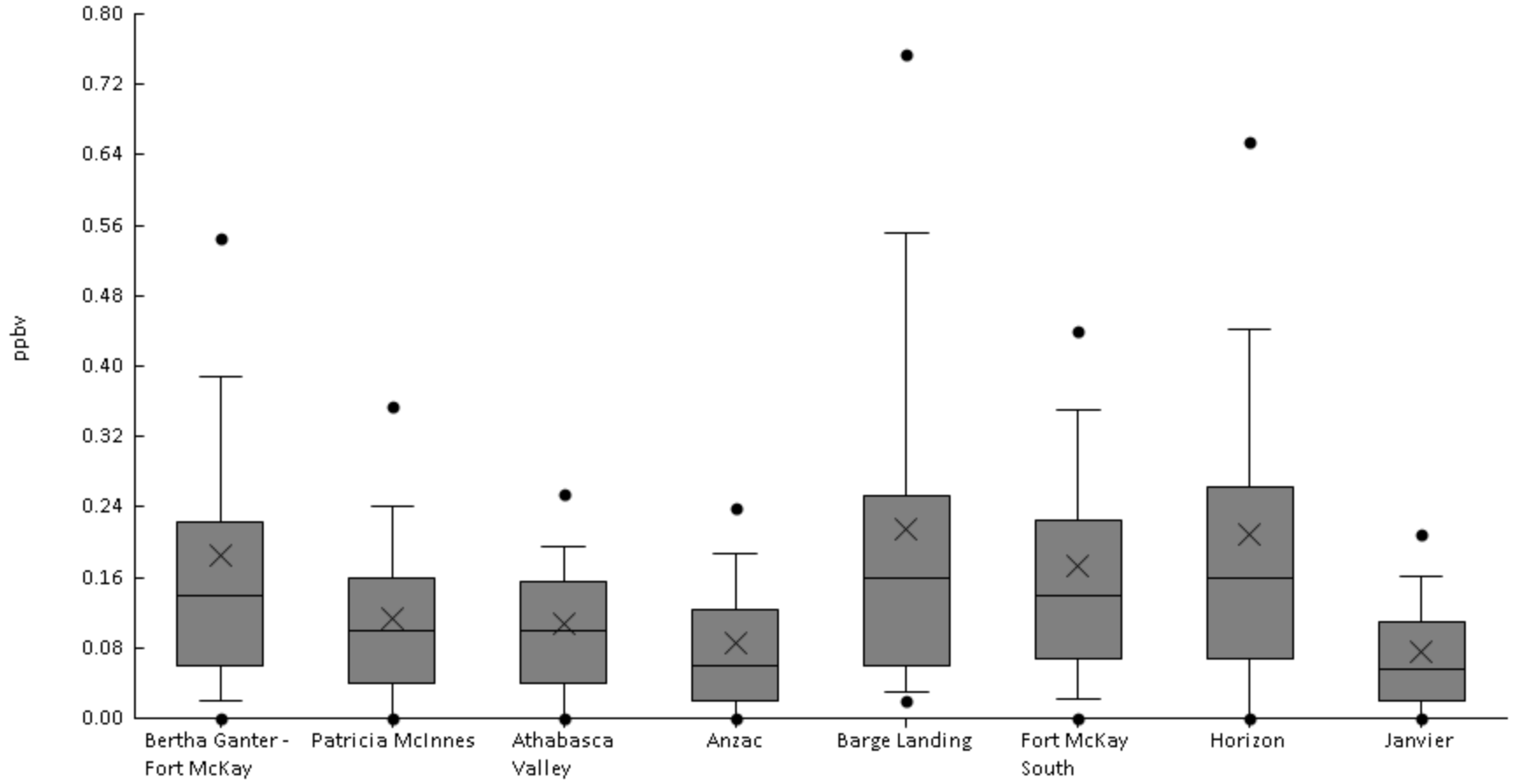
Volatile Organic Compounds - 3-Methylhexane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	70%	0	0	0	0	0.06	0.13	0.23	0.3	0.64	0.092	0.11
AMS06	Patricia McInnes	60	70%	0	0	0	0	0.05	0.11	0.15	0.21	1.2	0.08	0.15
AMS07	Athabasca Valley	60	77%	0	0	0	0.02	0.05	0.11	0.16	0.21	0.59	0.077	0.091
AMS14	Anzac	61	62%	0	0	0	0	0.03	0.09	0.12	0.14	0.44	0.052	0.073
AMS09	Barge Landing	61	72%	0	0	0	0	0.06	0.13	0.19	0.29	0.36	0.086	0.089
AMS13	Fort McKay South	61	74%	0	0	0	0	0.07	0.15	0.23	0.34	0.66	0.1	0.12
AMS15	Horizon	61	75%	0	0	0	0.015	0.07	0.12	0.23	0.29	0.34	0.087	0.088
AMS22	Janvier	58	60%	0	0	0	0	0.04	0.07	0.12	0.14	0.16	0.043	0.047



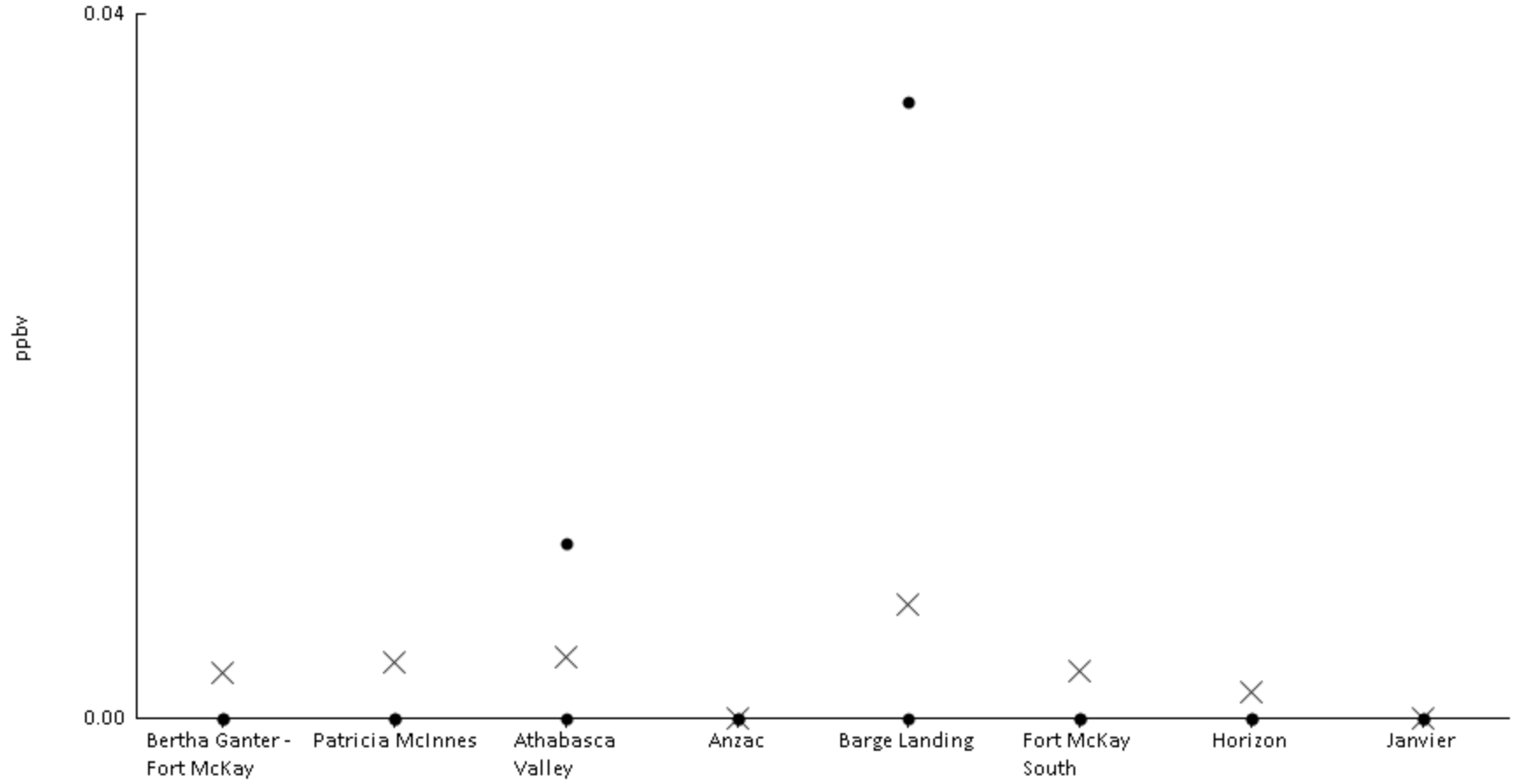
Volatile Organic Compounds - 3-Methylpentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	0.02	0.06	0.14	0.22	0.39	0.54	1.2	0.18	0.19
AMS06	Patricia McInnes	60	83%	0	0	0	0.04	0.1	0.16	0.24	0.36	0.54	0.11	0.11
AMS07	Athabasca Valley	60	88%	0	0	0	0.04	0.1	0.16	0.2	0.26	0.48	0.11	0.089
AMS14	Anzac	61	84%	0	0	0	0.02	0.06	0.12	0.19	0.24	0.38	0.085	0.08
AMS09	Barge Landing	61	98%	0	0.02	0.03	0.06	0.16	0.25	0.55	0.75	1	0.21	0.22
AMS13	Fort McKay South	61	92%	0	0	0.022	0.068	0.14	0.23	0.35	0.44	0.76	0.17	0.15
AMS15	Horizon	61	89%	0	0	0	0.068	0.16	0.26	0.44	0.65	1.4	0.21	0.23
AMS22	Janvier	58	81%	0	0	0	0.02	0.055	0.11	0.16	0.21	0.51	0.075	0.082



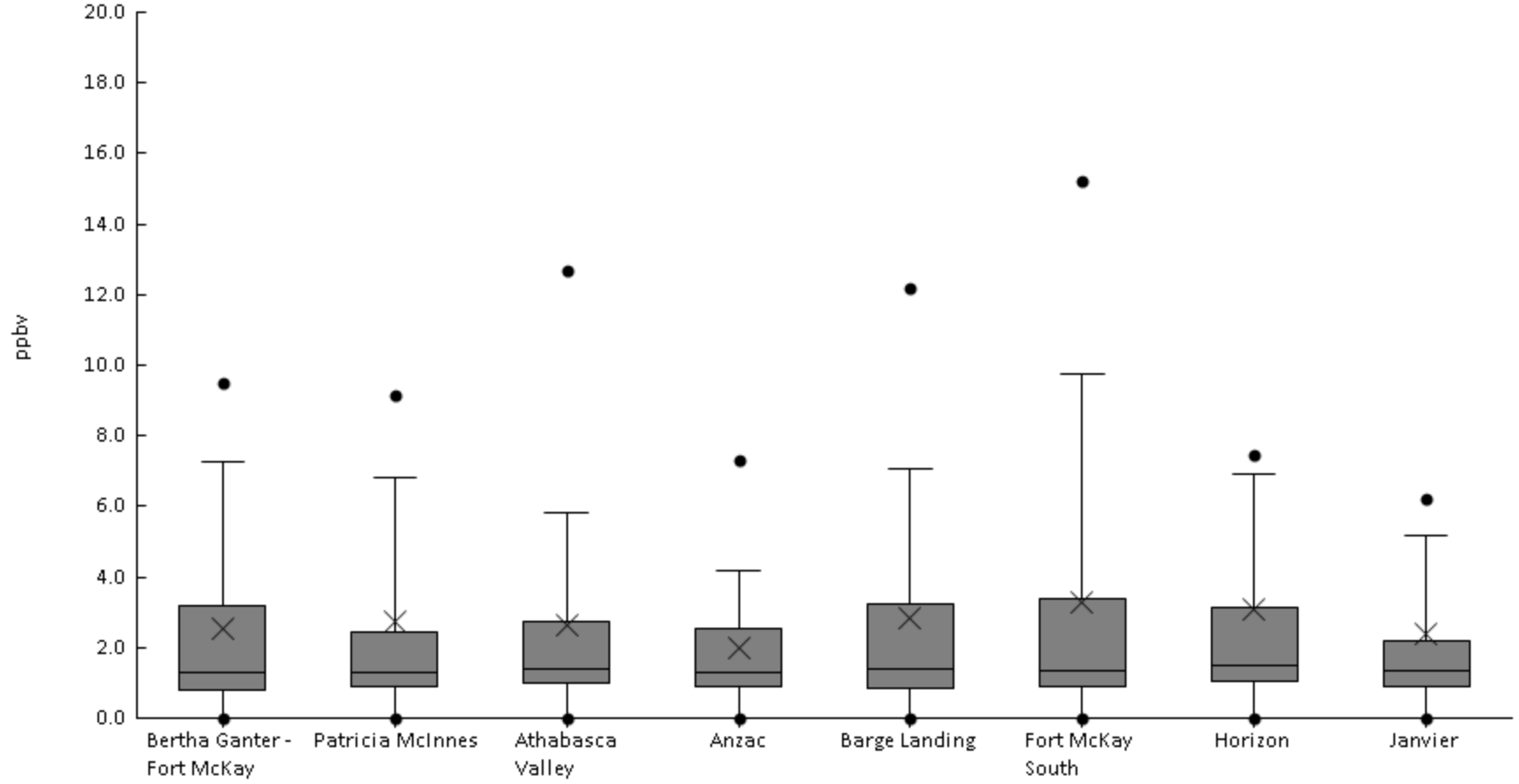
Volatile Organic Compounds - 4-Methyl-1-pentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	3%	0	0	0	0	0	0	0	0	0.09	2.6E-3	0.014
AMS06	Patricia McInnes	60	3%	0	0	0	0	0	0	0	0	0.1	3.2E-3	0.017
AMS07	Athabasca Valley	60	5%	0	0	0	0	0	0	0	0.01	0.1	3.5E-3	0.017
AMS14	Anzac	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	60	5%	0	0	0	0	0	0	0	0.035	0.23	6.5E-3	0.033
AMS13	Fort McKay South	60	3%	0	0	0	0	0	0	0	0	0.09	2.7E-3	0.015
AMS15	Horizon	61	2%	0	0	0	0	0	0	0	0	0.09	1.5E-3	0.012
AMS22	Janvier	58	0%	0	0	0	0	0	0	0	0	0	0	0



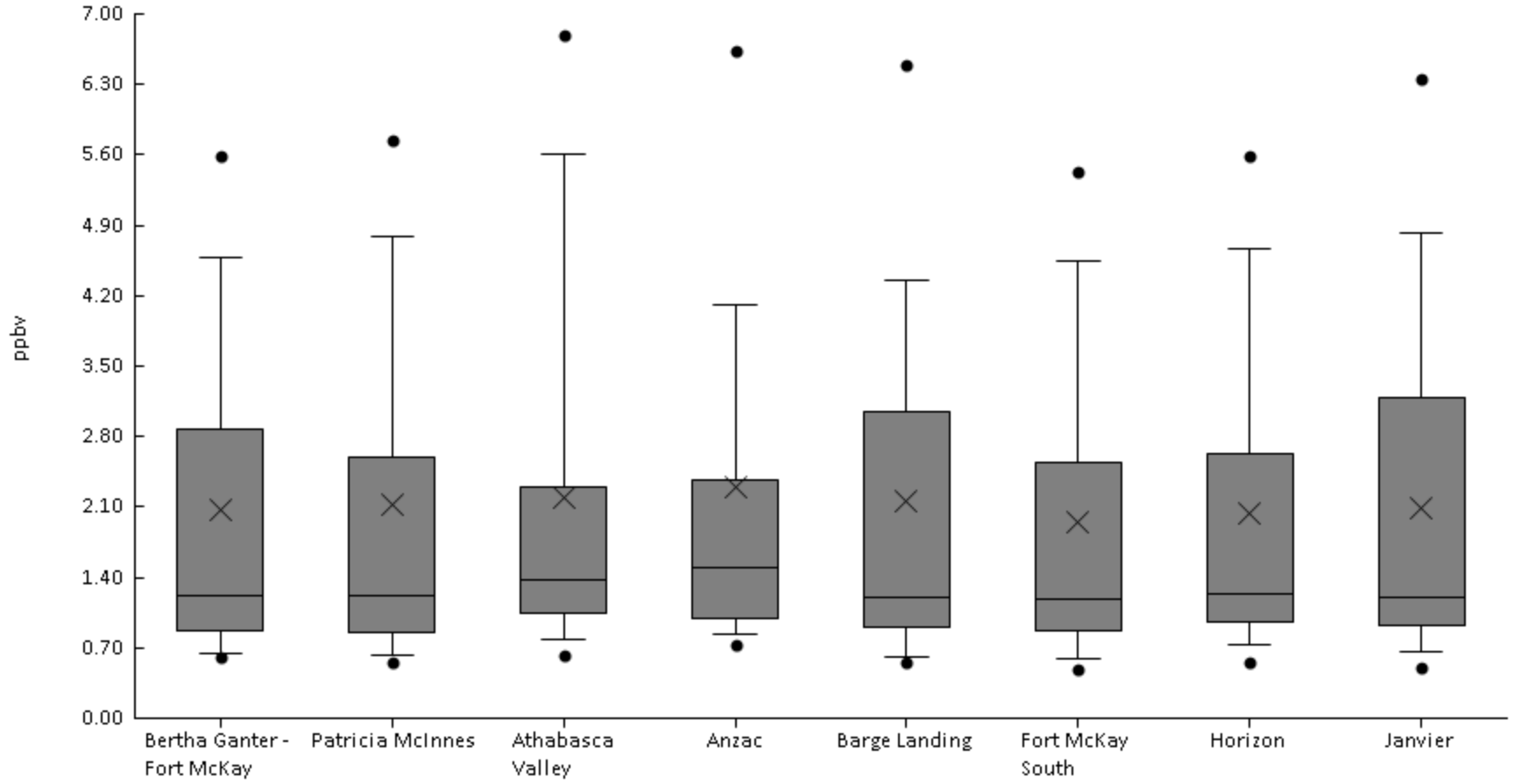
Volatile Organic Compounds - Acetaldehyde (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	84%	0	0	0	0.8	1.3	3.2	7.2	9.5	13	2.6	3
AMS06	Patricia McInnes	57	84%	0	0	0	0.9	1.3	2.5	6.8	9.2	24	2.7	4.5
AMS07	Athabasca Valley	56	84%	0	0	0	1	1.4	2.8	5.8	13	15	2.6	3.4
AMS14	Anzac	56	84%	0	0	0	0.9	1.3	2.6	4.2	7.3	9.4	2	2.1
AMS09	Barge Landing	59	85%	0	0	0	0.83	1.4	3.3	7.1	12	20	2.8	3.9
AMS13	Fort McKay South	58	84%	0	0	0	0.9	1.4	3.4	9.8	15	19	3.3	4.6
AMS15	Horizon	56	84%	0	0	0	1.1	1.5	3.2	6.9	7.4	40	3.1	5.8
AMS22	Janvier	54	83%	0	0	0	0.9	1.4	2.2	5.2	6.2	23	2.4	3.7



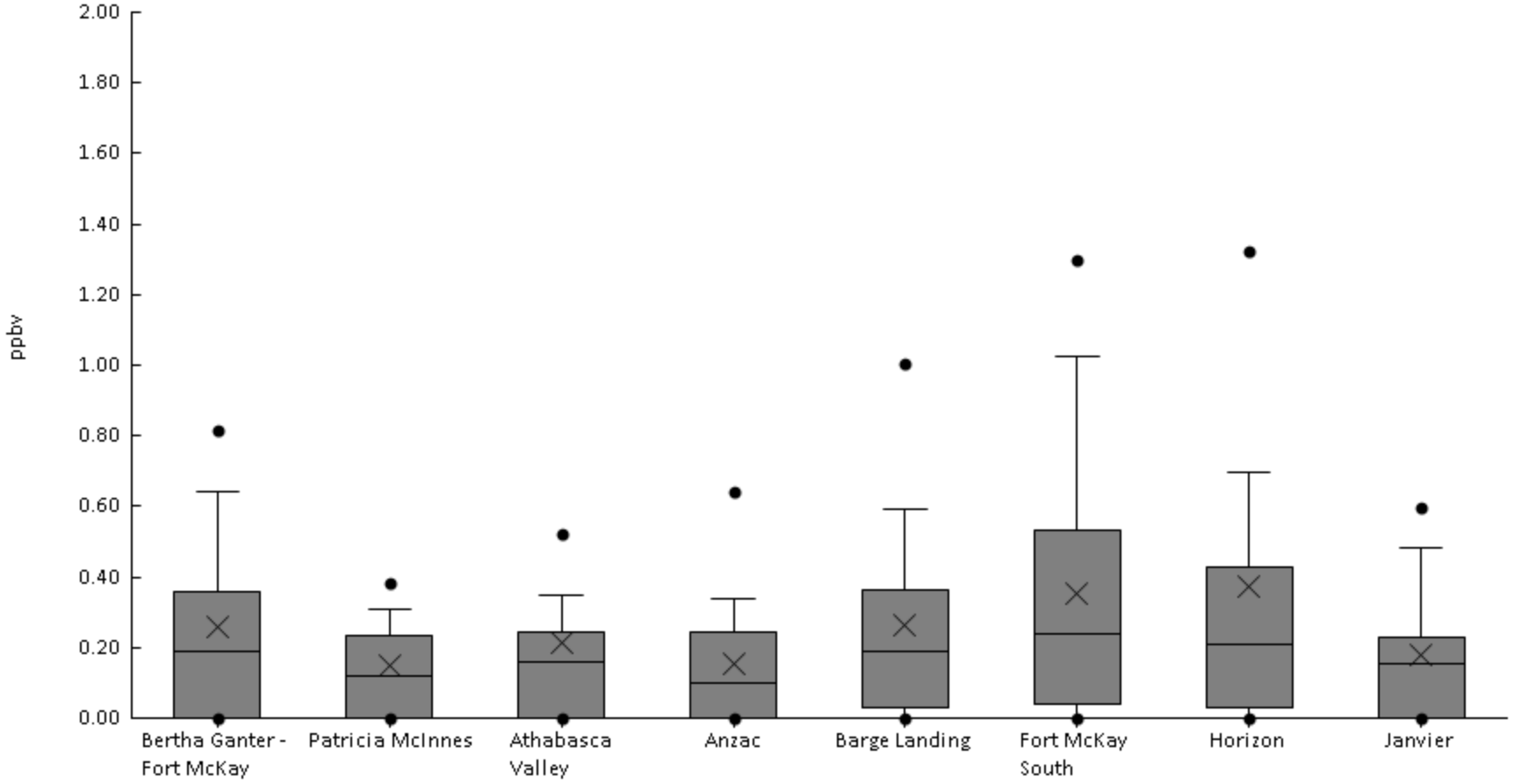
Volatile Organic Compounds - Acetone (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	0.61	0.64	0.87	1.2	2.9	4.6	5.6	8.2	2.1	1.8
AMS06	Patricia McInnes	60	97%	0	0.56	0.62	0.85	1.2	2.6	4.8	5.7	16	2.1	2.4
AMS07	Athabasca Valley	60	98%	0	0.63	0.78	1	1.4	2.3	5.6	6.8	9.6	2.2	2.1
AMS14	Anzac	61	100%	0.4	0.74	0.83	1	1.5	2.4	4.1	6.6	17	2.3	2.6
AMS09	Barge Landing	61	97%	0	0.56	0.62	0.9	1.2	3.1	4.3	6.5	12	2.2	2.1
AMS13	Fort McKay South	61	97%	0	0.5	0.6	0.87	1.2	2.5	4.5	5.4	7.3	2	1.7
AMS15	Horizon	61	100%	0.41	0.56	0.74	0.97	1.2	2.6	4.7	5.6	7.1	2	1.7
AMS22	Janvier	58	98%	0	0.5	0.66	0.92	1.2	3.2	4.8	6.4	9.6	2.1	2



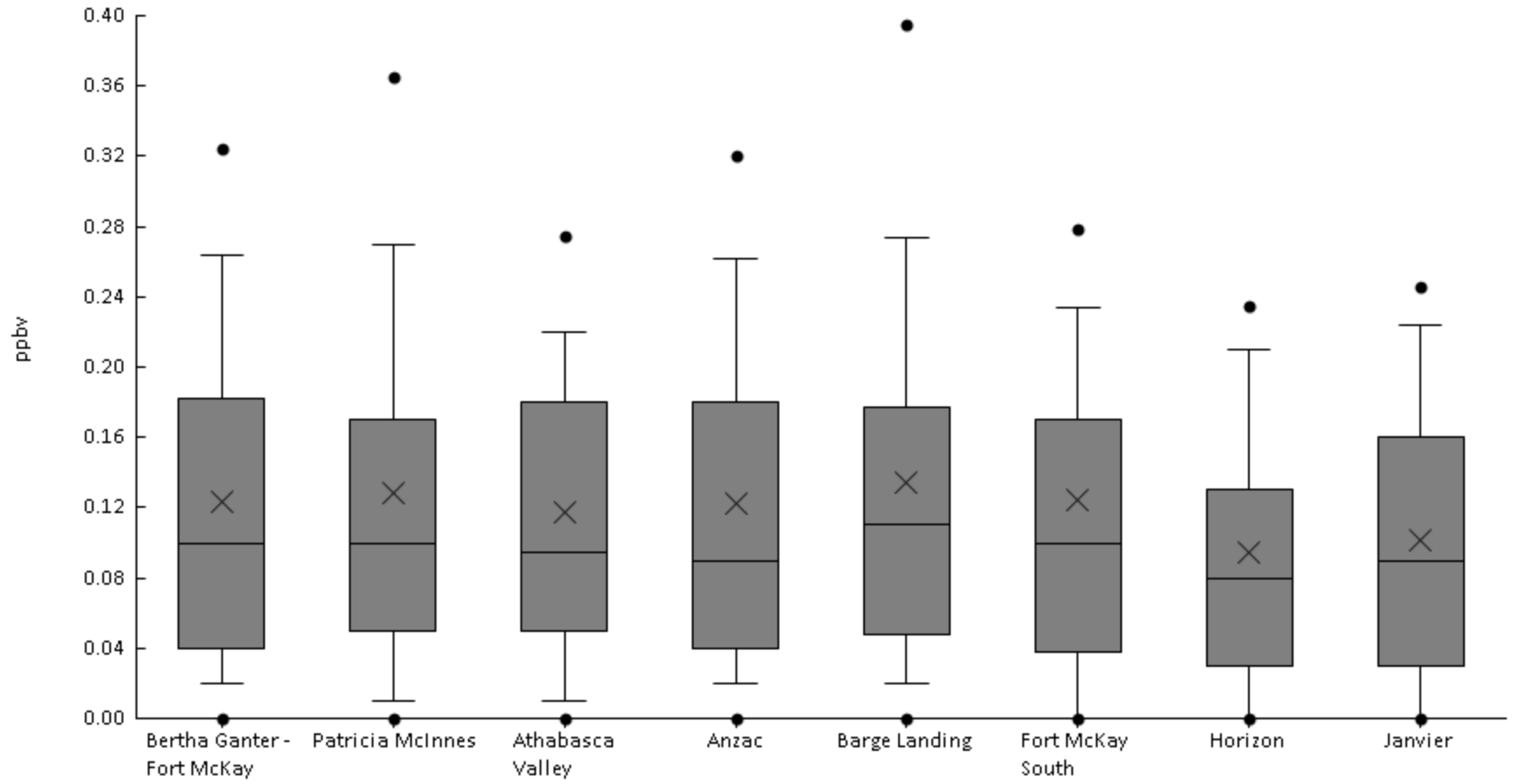
Volatile Organic Compounds - alpha-Pinene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	72%	0	0	0	0	0.19	0.36	0.64	0.81	1.6	0.26	0.31
AMS06	Patricia McInnes	60	72%	0	0	0	0	0.12	0.24	0.31	0.39	1	0.15	0.17
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.16	0.25	0.35	0.52	3.3	0.22	0.44
AMS14	Anzac	61	66%	0	0	0	0	0.1	0.24	0.34	0.64	0.84	0.16	0.19
AMS09	Barge Landing	61	77%	0	0	0	0.028	0.19	0.37	0.59	1	1.3	0.26	0.31
AMS13	Fort McKay South	61	77%	0	0	0	0.038	0.24	0.53	1	1.3	1.9	0.35	0.42
AMS15	Horizon	61	80%	0	0	0	0.03	0.21	0.43	0.7	1.3	4	0.37	0.63
AMS22	Janvier	58	74%	0	0	0	0	0.16	0.23	0.48	0.6	0.94	0.18	0.21



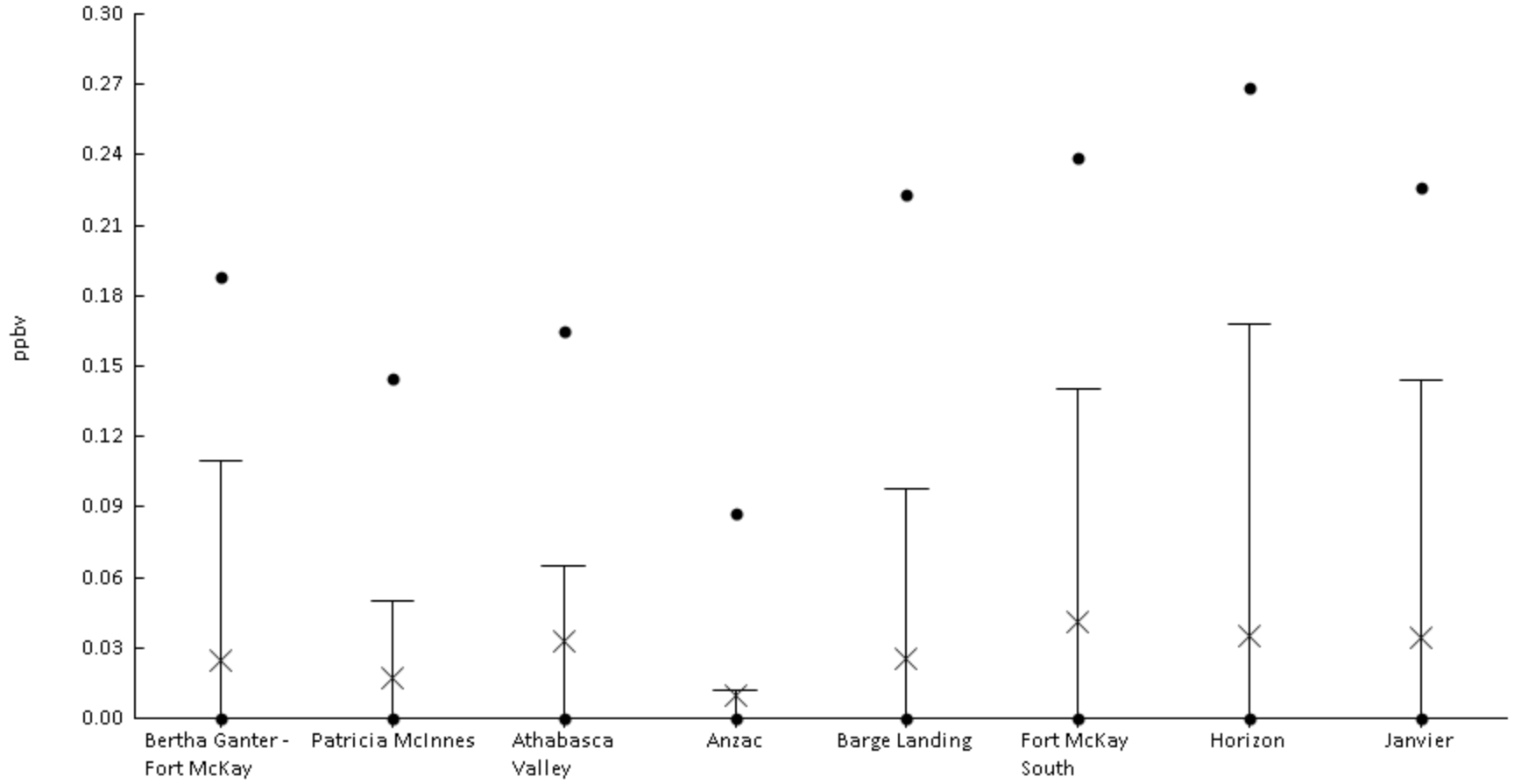
Volatile Organic Compounds - Benzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	0.02	0.04	0.1	0.18	0.26	0.32	0.39	0.12	0.099
AMS06	Patricia McInnes	60	90%	0	0	0.01	0.05	0.1	0.17	0.27	0.37	0.52	0.13	0.11
AMS07	Athabasca Valley	60	90%	0	0	0.01	0.05	0.095	0.18	0.22	0.28	0.46	0.12	0.09
AMS14	Anzac	61	92%	0	0	0.02	0.04	0.09	0.18	0.26	0.32	0.49	0.12	0.1
AMS09	Barge Landing	61	93%	0	0	0.02	0.048	0.11	0.18	0.27	0.4	0.57	0.13	0.12
AMS13	Fort McKay South	61	89%	0	0	0	0.038	0.1	0.17	0.23	0.28	1	0.12	0.14
AMS15	Horizon	61	87%	0	0	0	0.03	0.08	0.13	0.21	0.23	0.37	0.094	0.078
AMS22	Janvier	58	86%	0	0	0	0.03	0.09	0.16	0.22	0.25	0.34	0.1	0.084



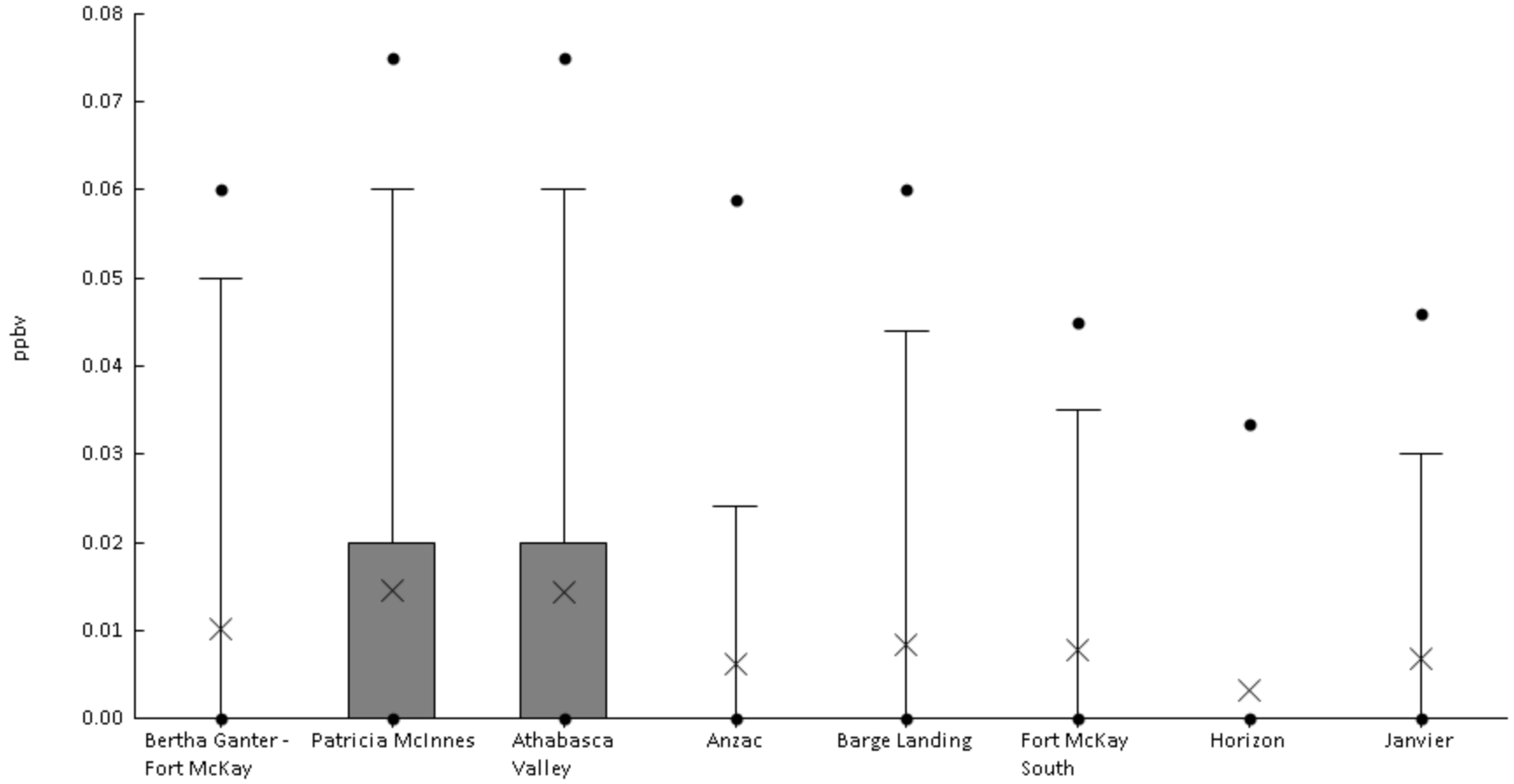
Volatile Organic Compounds - beta-Pinene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	16%	0	0	0	0	0	0	0.11	0.19	0.3	0.025	0.066
AMS06	Patricia McInnes	60	20%	0	0	0	0	0	0	0.05	0.15	0.2	0.017	0.045
AMS07	Athabasca Valley	60	18%	0	0	0	0	0	0	0.065	0.17	1.1	0.033	0.14
AMS14	Anzac	61	10%	0	0	0	0	0	0	0.012	0.087	0.16	9.3E-3	0.033
AMS09	Barge Landing	61	16%	0	0	0	0	0	0	0.098	0.22	0.36	0.026	0.075
AMS13	Fort McKay South	61	18%	0	0	0	0	0	0	0.14	0.24	0.8	0.041	0.12
AMS15	Horizon	61	20%	0	0	0	0	0	0	0.17	0.27	0.37	0.035	0.088
AMS22	Janvier	58	17%	0	0	0	0	0	0	0.14	0.23	0.66	0.034	0.1



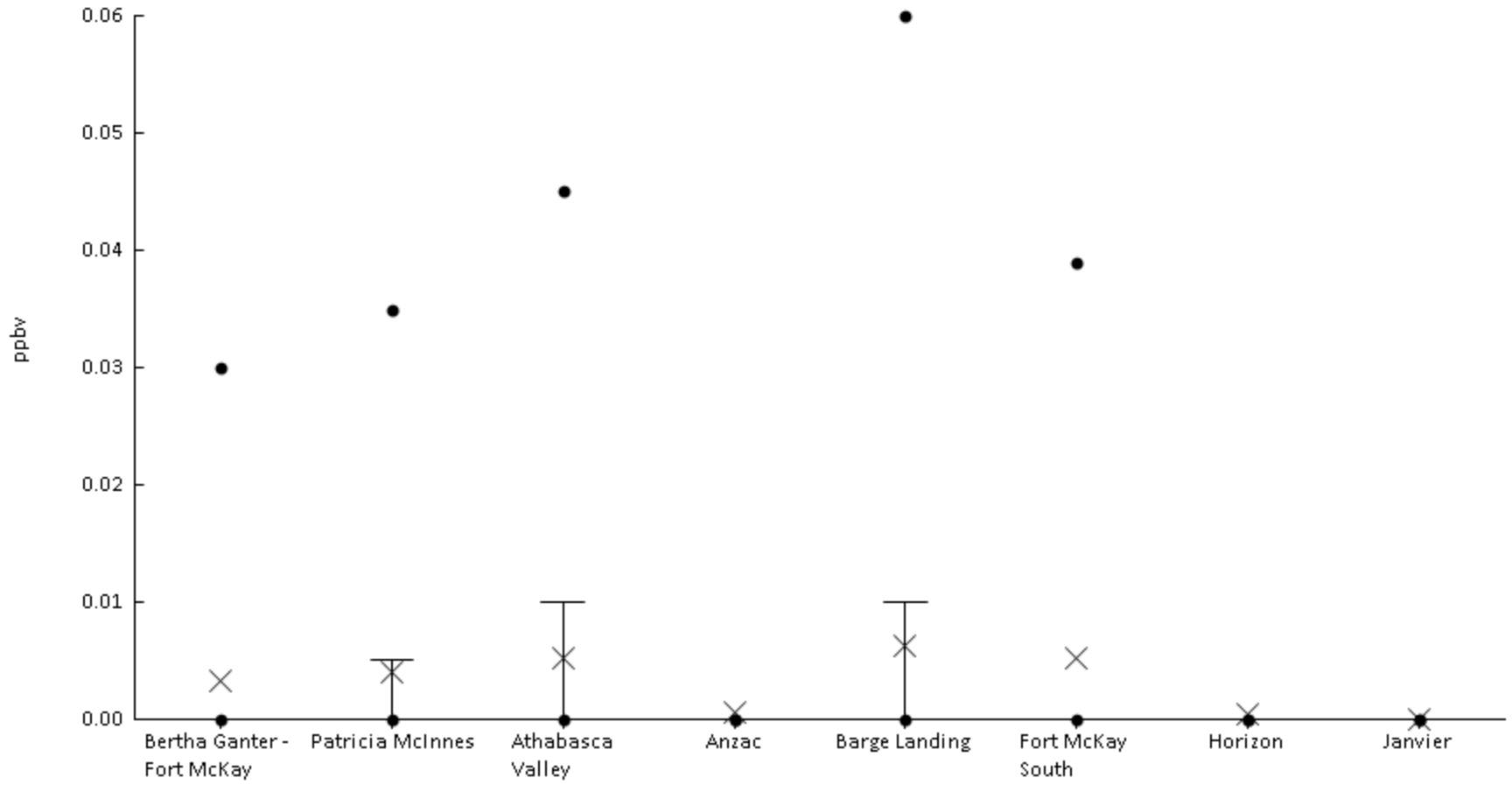
Volatile Organic Compounds - cis-2-Butene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	21%	0	0	0	0	0	0	0.05	0.06	0.08	0.01	0.021
AMS06	Patricia McInnes	60	28%	0	0	0	0	0	0.02	0.06	0.075	0.09	0.015	0.026
AMS07	Athabasca Valley	60	28%	0	0	0	0	0	0.02	0.06	0.075	0.11	0.014	0.026
AMS14	Anzac	61	13%	0	0	0	0	0	0	0.024	0.059	0.08	6.2E-3	0.018
AMS09	Barge Landing	61	16%	0	0	0	0	0	0	0.044	0.06	0.09	8.4E-3	0.021
AMS13	Fort McKay South	60	20%	0	0	0	0	0	0	0.035	0.045	0.08	7.7E-3	0.017
AMS15	Horizon	61	7%	0	0	0	0	0	0	0	0.033	0.07	3.3E-3	0.013
AMS22	Janvier	58	17%	0	0	0	0	0	0	0.03	0.046	0.07	6.7E-3	0.016



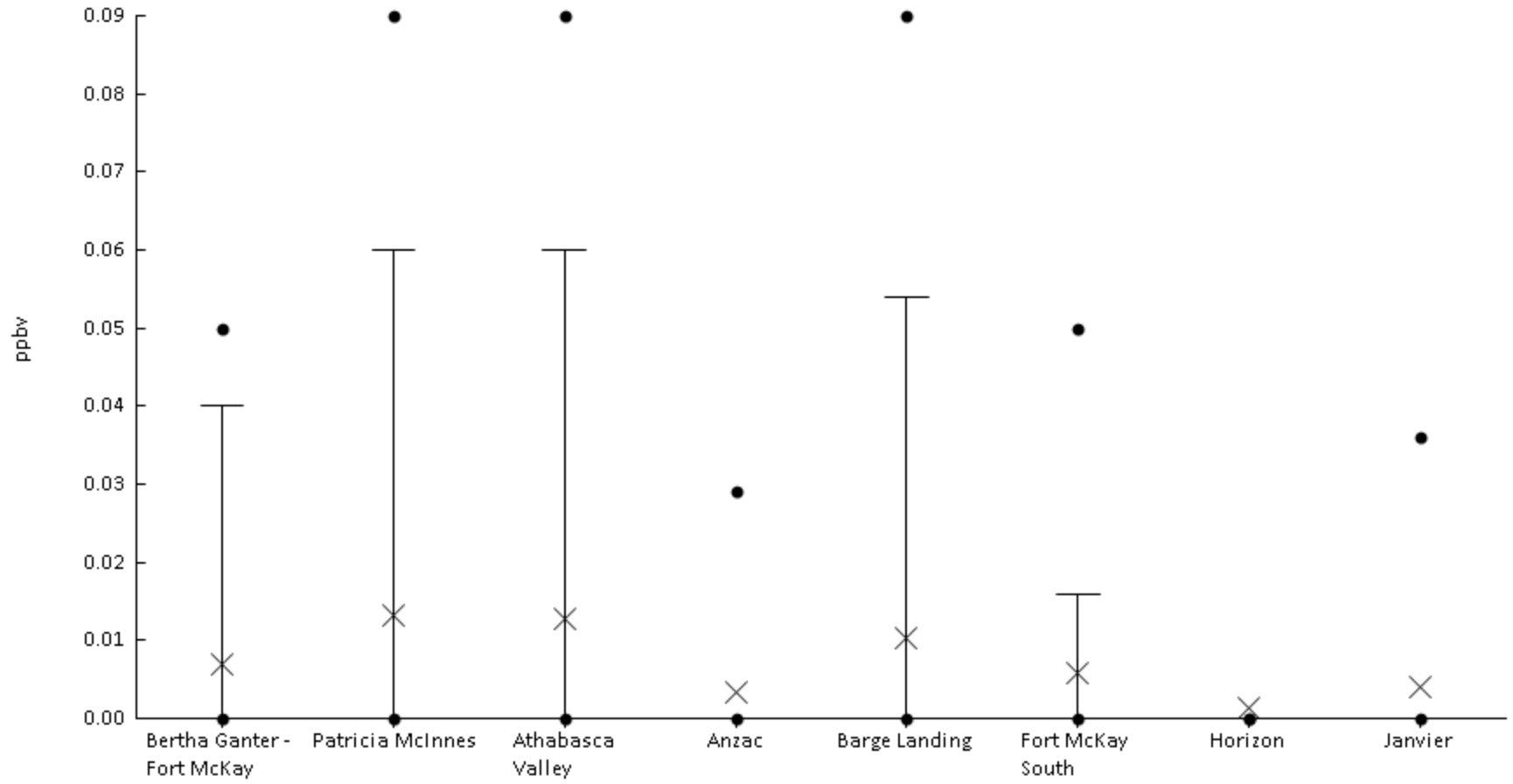
Volatile Organic Compounds - cis-2-Hexene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	7%	0	0	0	0	0	0	0	0.03	0.09	3.3E-3	0.014
AMS06	Patricia McInnes	60	10%	0	0	0	0	0	0	5E-3	0.035	0.09	4E-3	0.015
AMS07	Athabasca Valley	60	10%	0	0	0	0	0	0	0.01	0.045	0.09	5.2E-3	0.018
AMS14	Anzac	61	2%	0	0	0	0	0	0	0	0	0.04	6.6E-4	5.1E-3
AMS09	Barge Landing	60	10%	0	0	0	0	0	0	0.01	0.06	0.12	6.3E-3	0.022
AMS13	Fort McKay South	61	8%	0	0	0	0	0	0	0	0.039	0.12	5.2E-3	0.02
AMS15	Horizon	61	2%	0	0	0	0	0	0	0	0	0.03	4.9E-4	3.8E-3
AMS22	Janvier	58	0%	0	0	0	0	0	0	0	0	0	0	0



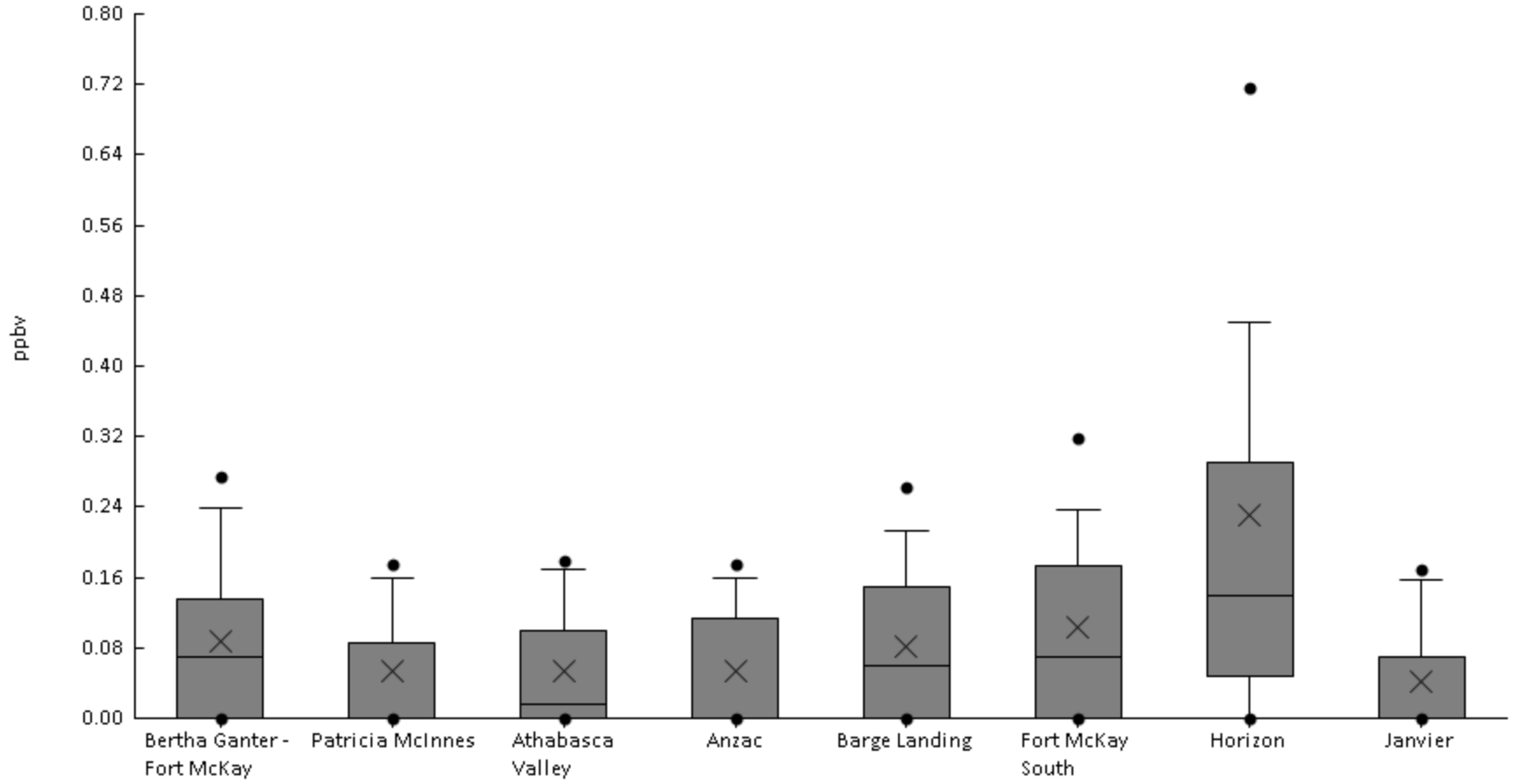
Volatile Organic Compounds - cis-2-Pentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	11%	0	0	0	0	0	0	0.04	0.05	0.1	6.9E-3	0.021
AMS06	Patricia McInnes	60	20%	0	0	0	0	0	0	0.06	0.09	0.1	0.013	0.028
AMS07	Athabasca Valley	60	20%	0	0	0	0	0	0	0.06	0.09	0.09	0.013	0.028
AMS14	Anzac	61	7%	0	0	0	0	0	0	0	0.029	0.09	3.3E-3	0.014
AMS09	Barge Landing	61	13%	0	0	0	0	0	0	0.054	0.09	0.11	0.01	0.028
AMS13	Fort McKay South	61	10%	0	0	0	0	0	0	0.016	0.05	0.09	5.9E-3	0.019
AMS15	Horizon	61	3%	0	0	0	0	0	0	0	0	0.04	1.3E-3	7.2E-3
AMS22	Janvier	58	9%	0	0	0	0	0	0	0	0.036	0.08	4E-3	0.014



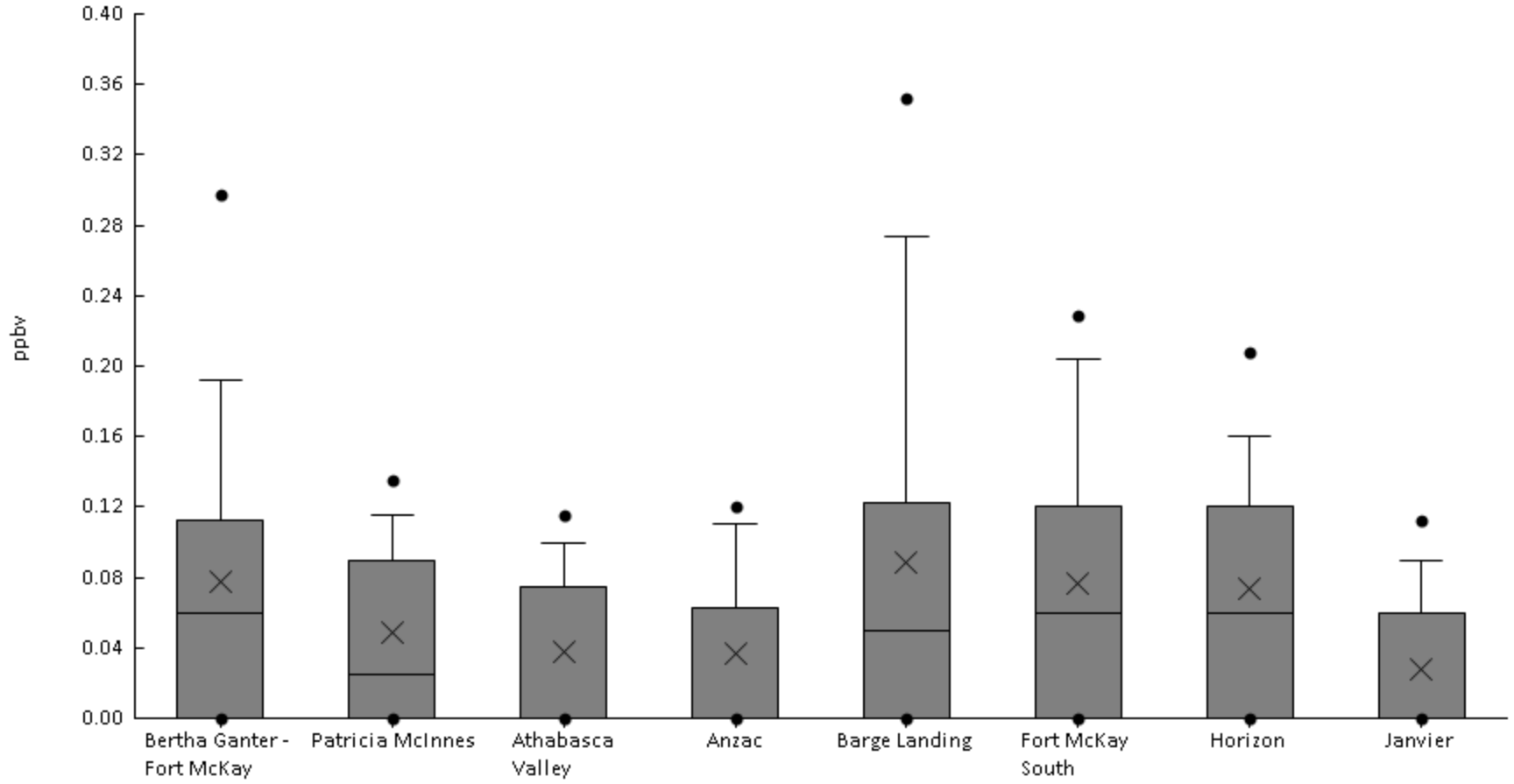
Volatile Organic Compounds - Cyclohexane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	66%	0	0	0	0	0.07	0.14	0.24	0.27	0.34	0.087	0.095
AMS06	Patricia McInnes	60	48%	0	0	0	0	0	0.085	0.16	0.18	0.36	0.053	0.076
AMS07	Athabasca Valley	60	50%	0	0	0	0	0.015	0.1	0.17	0.18	0.19	0.053	0.066
AMS14	Anzac	61	49%	0	0	0	0	0	0.11	0.16	0.17	0.21	0.054	0.068
AMS09	Barge Landing	61	61%	0	0	0	0	0.06	0.15	0.21	0.26	0.42	0.082	0.096
AMS13	Fort McKay South	61	74%	0	0	0	0	0.07	0.17	0.24	0.32	0.4	0.1	0.1
AMS15	Horizon	61	84%	0	0	0	0.048	0.14	0.29	0.45	0.72	2.3	0.23	0.34
AMS22	Janvier	58	40%	0	0	0	0	0	0.07	0.16	0.17	0.21	0.042	0.063



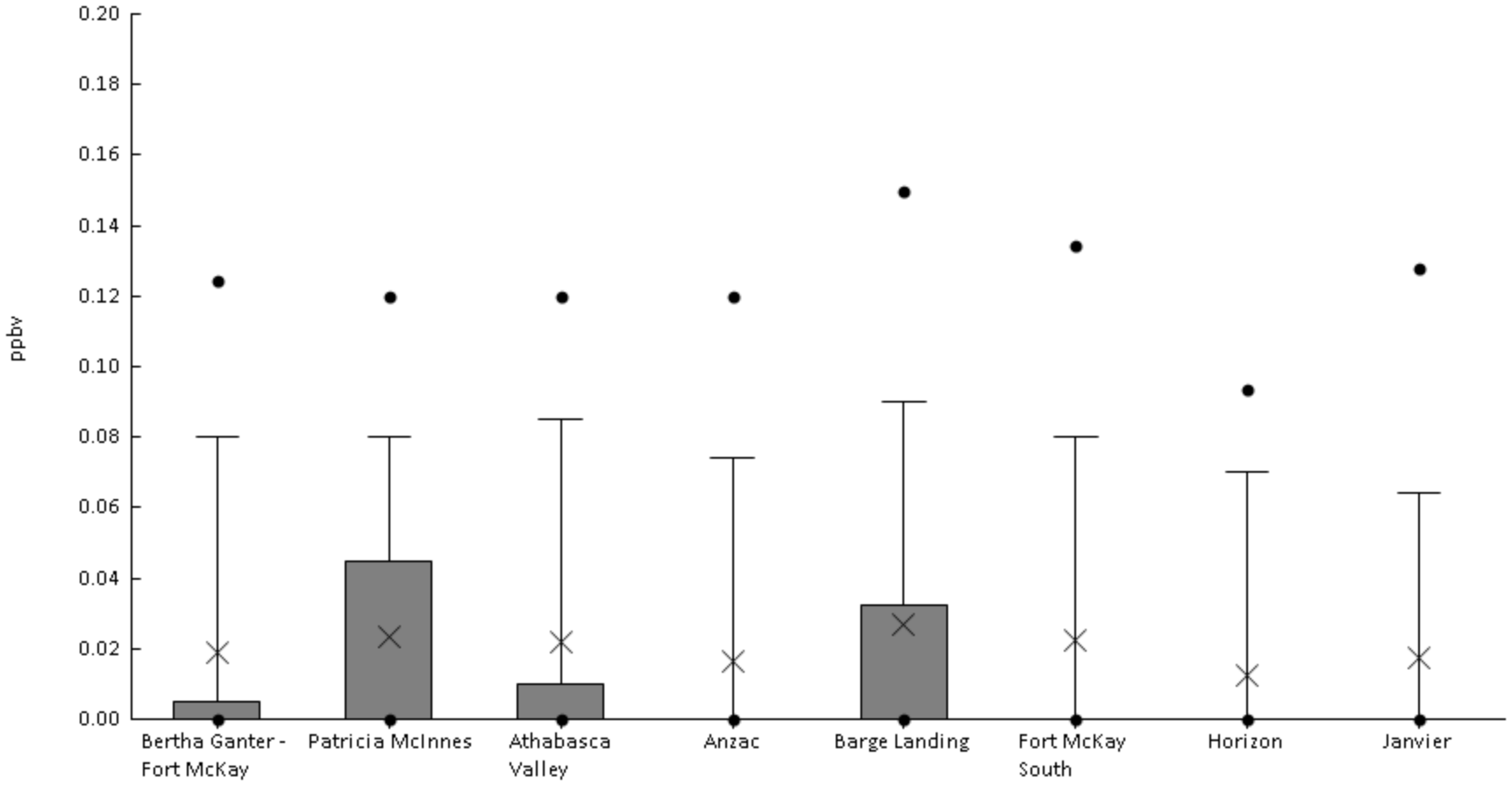
Volatile Organic Compounds - Cyclopentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	61%	0	0	0	0	0.06	0.11	0.19	0.3	0.44	0.078	0.097
AMS06	Patricia McInnes	60	53%	0	0	0	0	0.025	0.09	0.12	0.14	0.27	0.049	0.058
AMS07	Athabasca Valley	60	47%	0	0	0	0	0	0.075	0.1	0.12	0.25	0.038	0.05
AMS14	Anzac	61	48%	0	0	0	0	0	0.063	0.11	0.12	0.2	0.037	0.048
AMS09	Barge Landing	61	59%	0	0	0	0	0.05	0.12	0.27	0.35	0.48	0.089	0.12
AMS13	Fort McKay South	61	66%	0	0	0	0	0.06	0.12	0.2	0.23	0.39	0.076	0.086
AMS15	Horizon	61	62%	0	0	0	0	0.06	0.12	0.16	0.21	0.51	0.074	0.089
AMS22	Janvier	58	40%	0	0	0	0	0	0.06	0.09	0.11	0.13	0.028	0.041



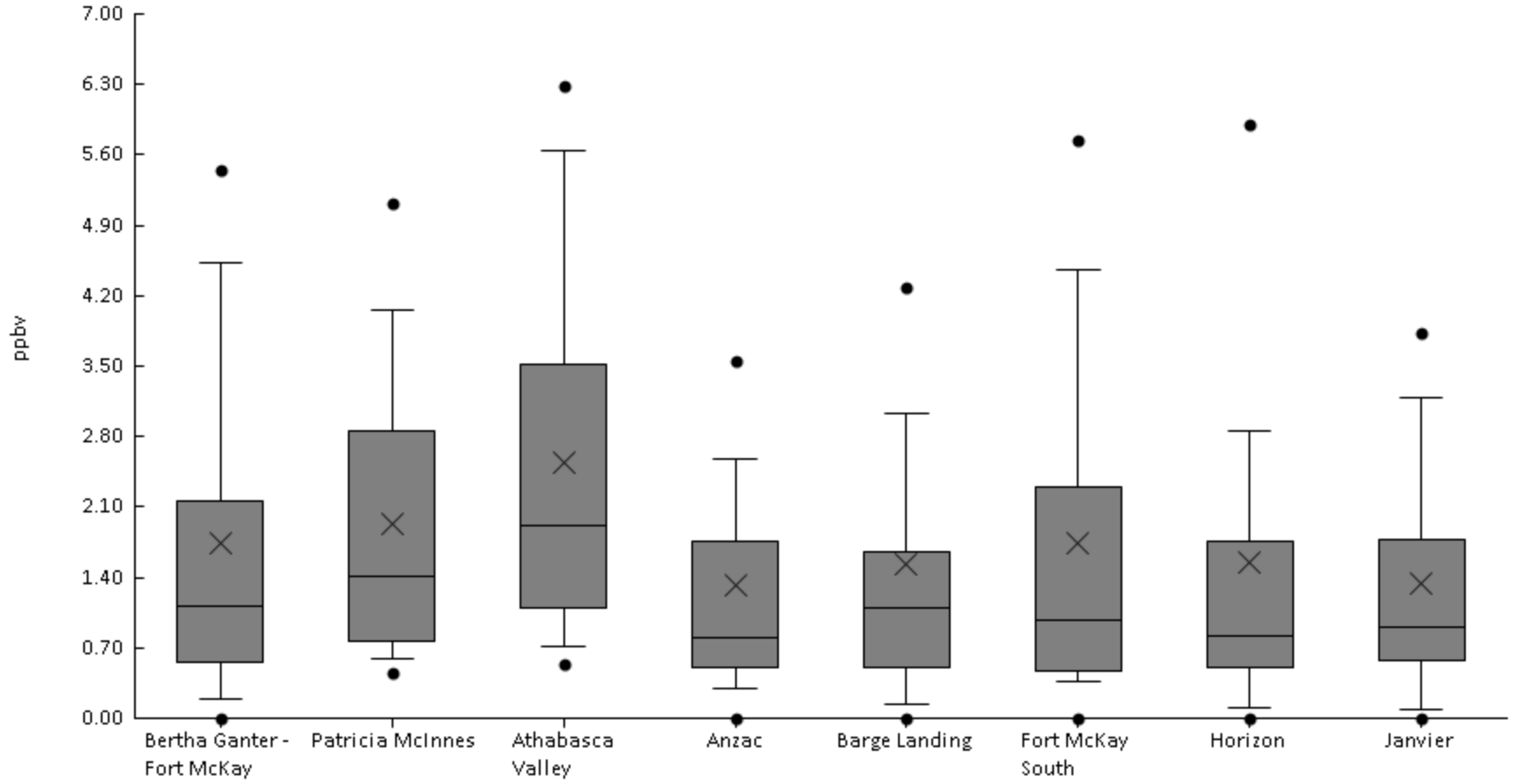
Volatile Organic Compounds - Cyclopentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	25%	0	0	0	0	0	5E-3	0.08	0.12	0.15	0.019	0.039
AMS06	Patricia McInnes	60	28%	0	0	0	0	0	0.045	0.08	0.12	0.15	0.023	0.042
AMS07	Athabasca Valley	60	25%	0	0	0	0	0	0.01	0.085	0.12	0.15	0.022	0.042
AMS14	Anzac	61	21%	0	0	0	0	0	0	0.074	0.12	0.15	0.016	0.038
AMS09	Barge Landing	61	28%	0	0	0	0	0	0.033	0.09	0.15	0.25	0.027	0.054
AMS13	Fort McKay South	61	23%	0	0	0	0	0	0	0.08	0.13	0.24	0.022	0.049
AMS15	Horizon	61	16%	0	0	0	0	0	0	0.07	0.093	0.15	0.013	0.033
AMS22	Janvier	58	22%	0	0	0	0	0	0	0.064	0.13	0.22	0.017	0.043



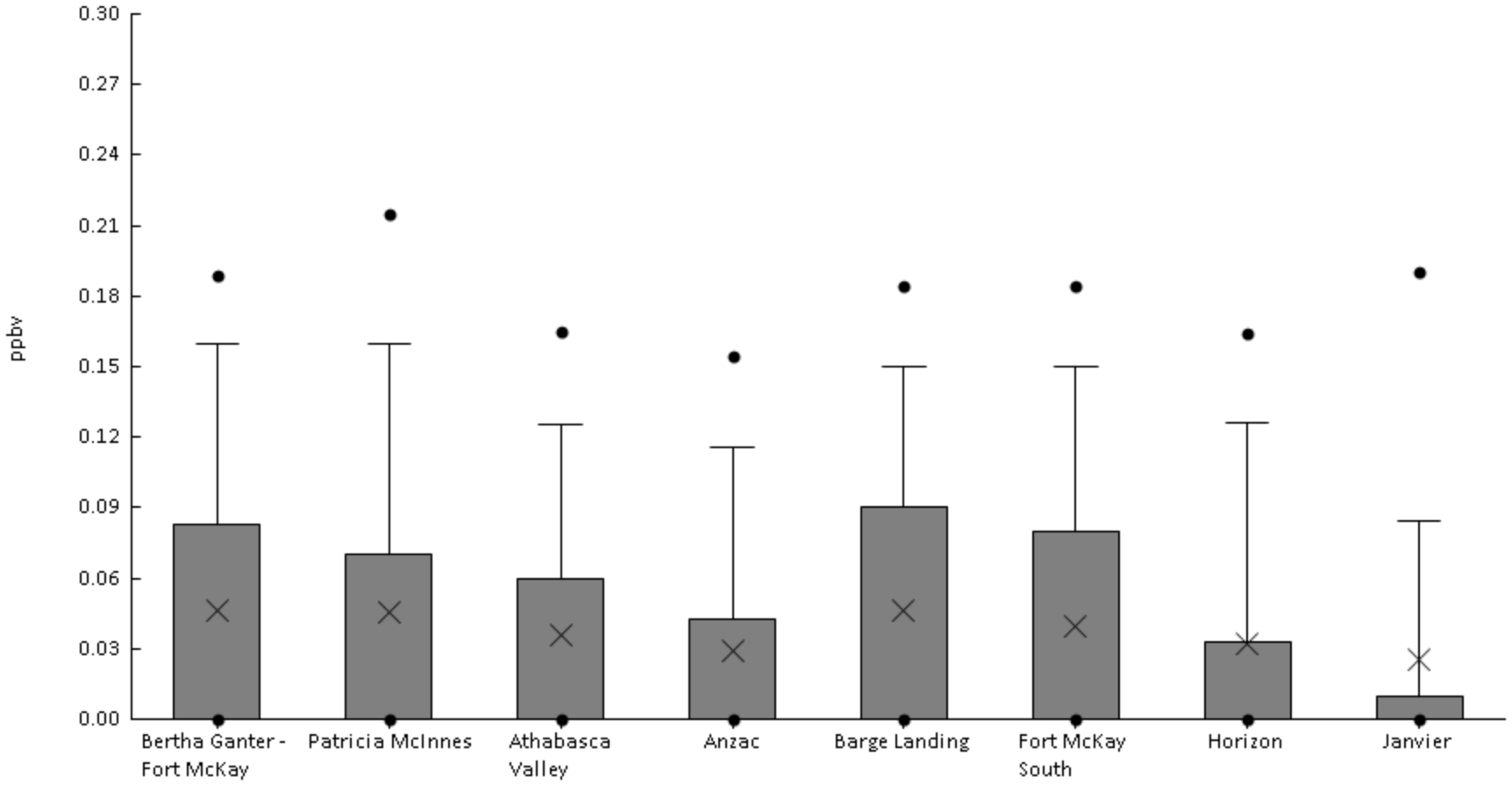
Volatile Organic Compounds - Ethanol (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	60	90%	0	0	0.2	0.56	1.1	2.2	4.5	5.4	9.4	1.7	1.9
AMS06	Patricia McInnes	57	96%	0	0.45	0.6	0.76	1.4	2.9	4.1	5.1	5.8	1.9	1.5
AMS07	Athabasca Valley	59	97%	0	0.55	0.72	1.1	1.9	3.5	5.6	6.3	9.8	2.5	2
AMS14	Anzac	59	93%	0	0	0.3	0.5	0.8	1.8	2.6	3.5	9.4	1.3	1.5
AMS09	Barge Landing	60	90%	0	0	0.15	0.51	1.1	1.7	3	4.3	11	1.5	1.7
AMS13	Fort McKay South	61	93%	0	0	0.37	0.47	0.98	2.3	4.5	5.7	11	1.7	2
AMS15	Horizon	60	90%	0	0	0.11	0.51	0.81	1.8	2.9	5.9	13	1.5	2.1
AMS22	Janvier	56	91%	0	0	0.093	0.58	0.91	1.8	3.2	3.8	9	1.3	1.5



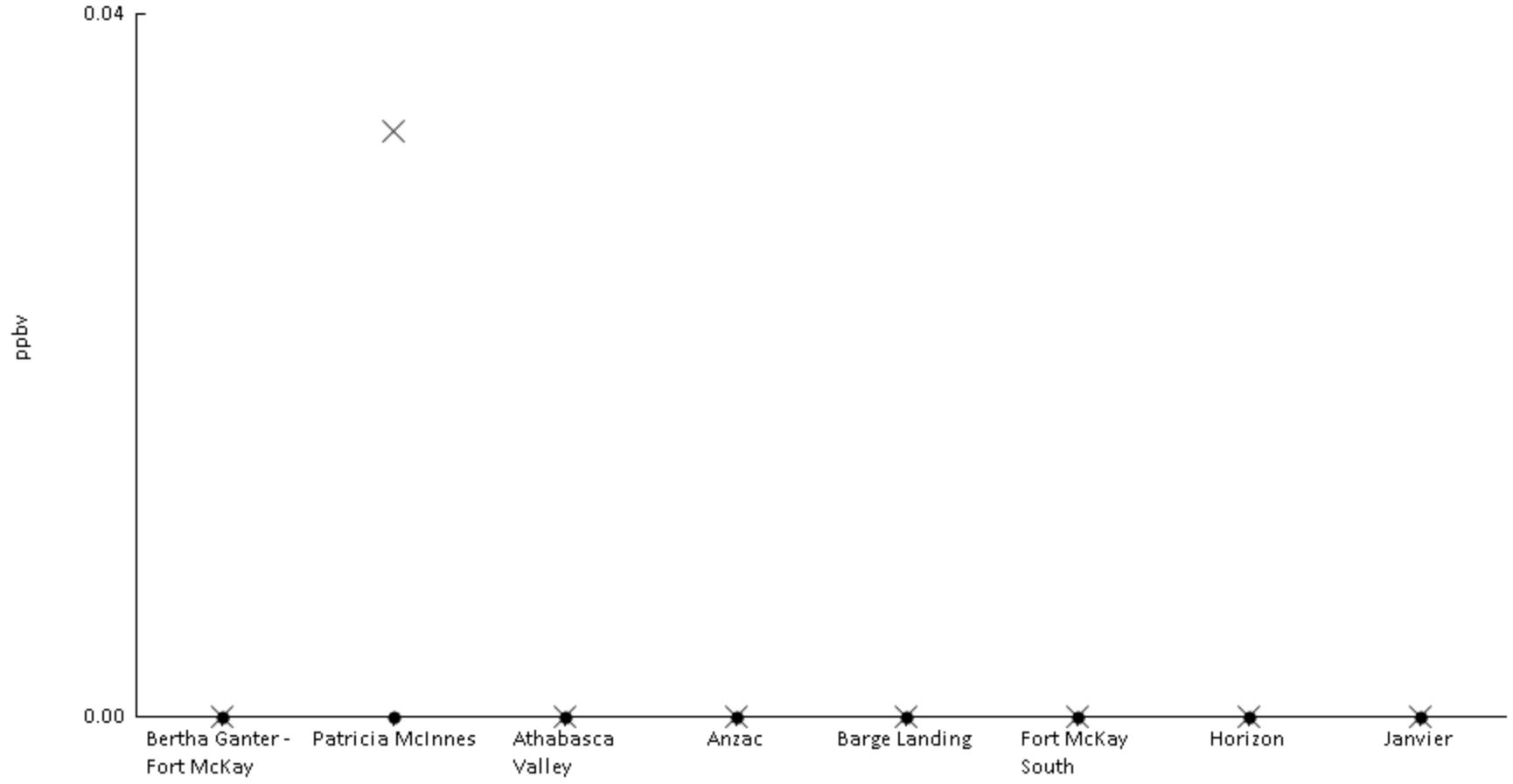
Volatile Organic Compounds - Ethylbenzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	39%	0	0	0	0	0	0.083	0.16	0.19	0.26	0.047	0.07
AMS06	Patricia McInnes	60	47%	0	0	0	0	0	0.07	0.16	0.22	0.34	0.046	0.075
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.06	0.13	0.17	0.24	0.036	0.057
AMS14	Anzac	61	30%	0	0	0	0	0	0.043	0.12	0.15	0.25	0.029	0.057
AMS09	Barge Landing	61	44%	0	0	0	0	0	0.09	0.15	0.18	0.25	0.046	0.068
AMS13	Fort McKay South	61	41%	0	0	0	0	0	0.08	0.15	0.18	0.22	0.04	0.062
AMS15	Horizon	61	31%	0	0	0	0	0	0.033	0.13	0.16	0.32	0.032	0.064
AMS22	Janvier	58	28%	0	0	0	0	0	0.01	0.084	0.19	0.25	0.025	0.059



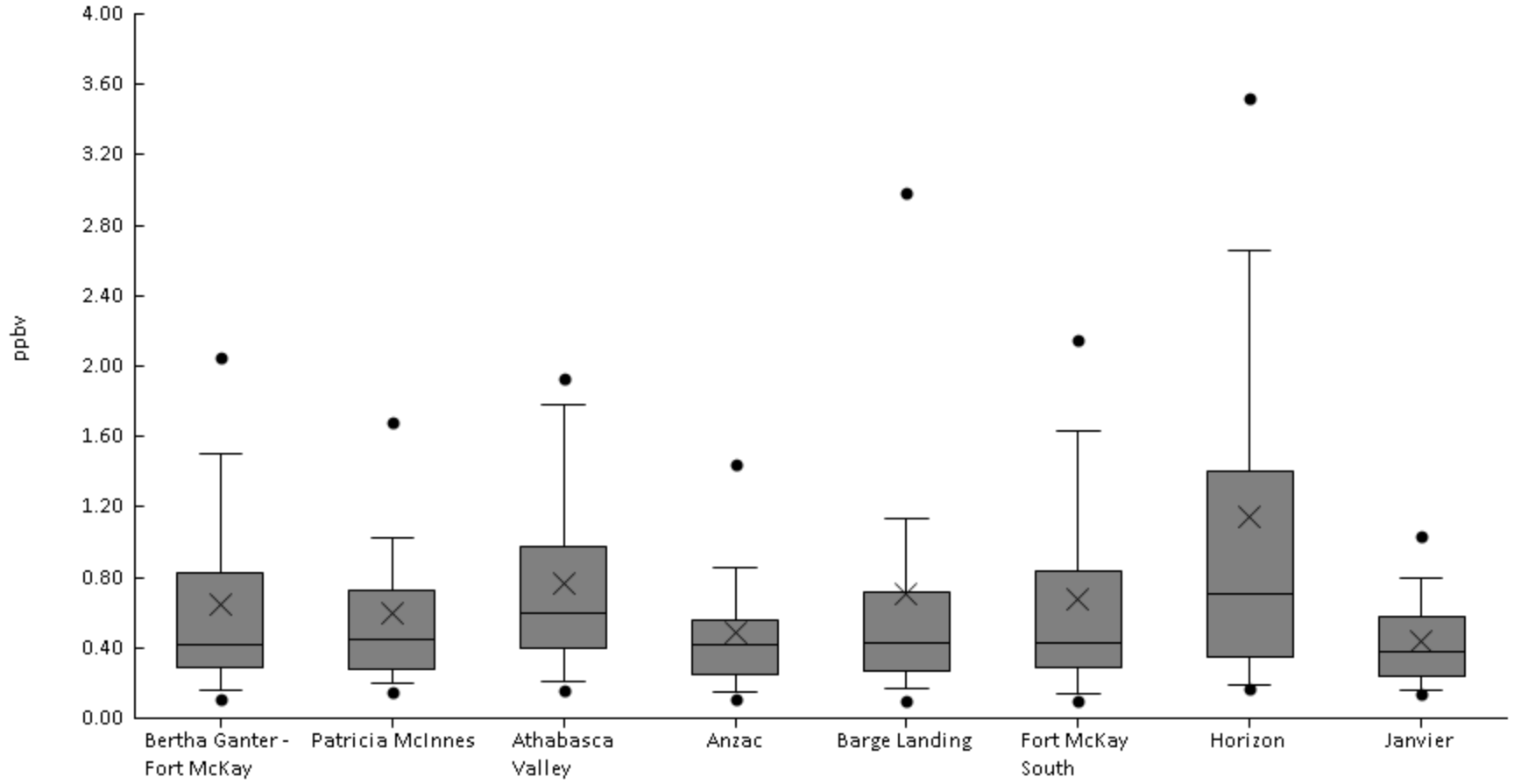
Volatile Organic Compounds - Formaldehyde (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS06	Patricia McInnes	60	2%	0	0	0	0	0	0	0	0	2	0.033	0.26
AMS07	Athabasca Valley	60	0%	0	0	0	0	0	0	0	0	0	0	0
AMS14	Anzac	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS13	Fort McKay South	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS15	Horizon	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	58	0%	0	0	0	0	0	0	0	0	0	0	0



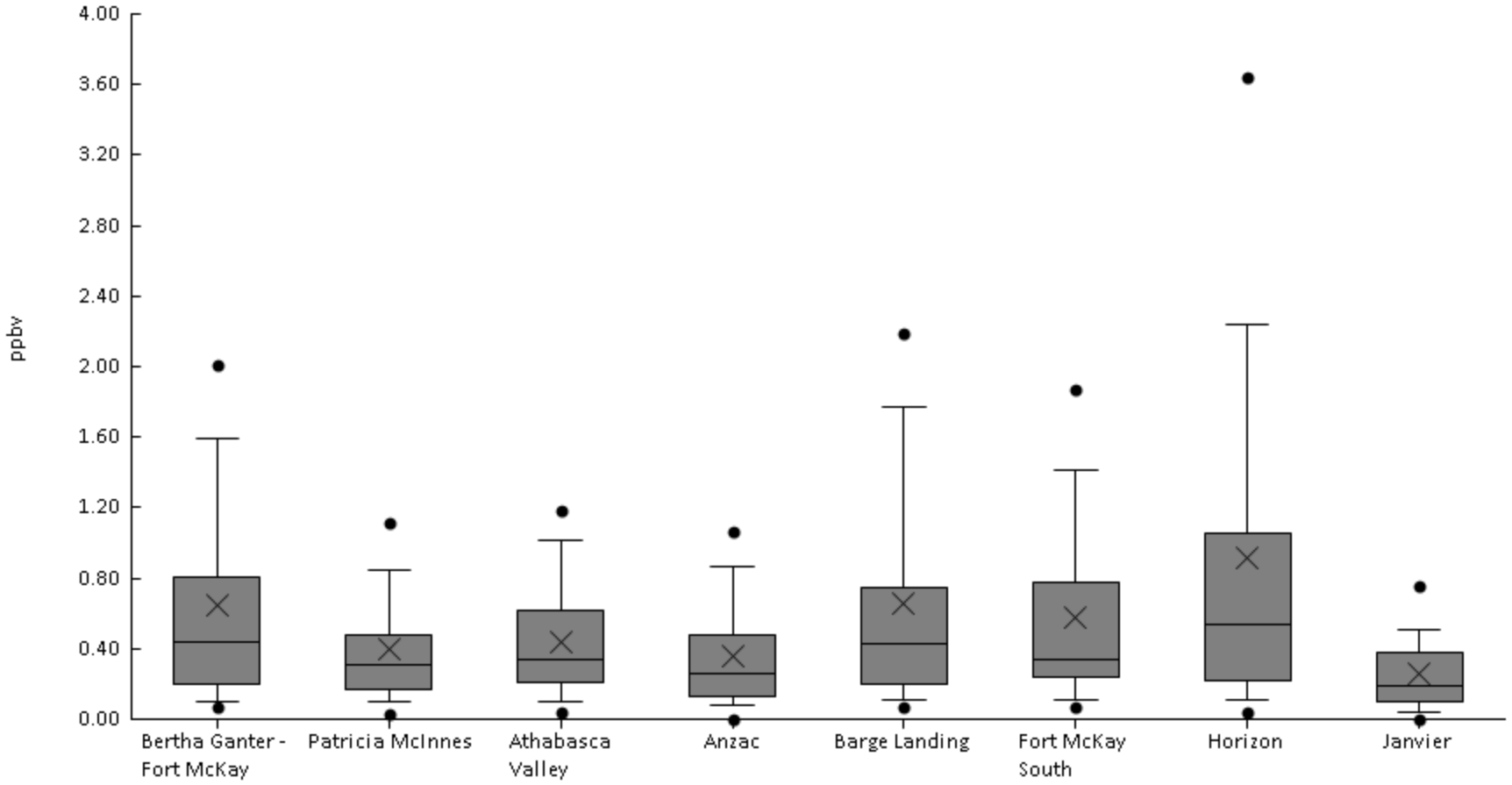
Volatile Organic Compounds - Isobutane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	98%	0	0.11	0.16	0.29	0.42	0.83	1.5	2	2.6	0.64	0.59
AMS06	Patricia McInnes	58	100%	0.07	0.15	0.2	0.28	0.45	0.73	1	1.7	3.2	0.6	0.56
AMS07	Athabasca Valley	60	98%	0	0.16	0.21	0.4	0.6	0.98	1.8	1.9	3.5	0.77	0.64
AMS14	Anzac	59	98%	0	0.11	0.15	0.25	0.42	0.55	0.86	1.4	2.4	0.49	0.41
AMS09	Barge Landing	61	97%	0	0.099	0.17	0.27	0.43	0.71	1.1	3	5.1	0.71	1
AMS13	Fort McKay South	61	100%	0.08	0.096	0.14	0.29	0.43	0.84	1.6	2.1	2.4	0.68	0.59
AMS15	Horizon	59	100%	0.09	0.16	0.19	0.35	0.71	1.4	2.7	3.5	6.1	1.1	1.2
AMS22	Janvier	53	98%	0	0.14	0.16	0.24	0.38	0.58	0.79	1	1.1	0.43	0.26



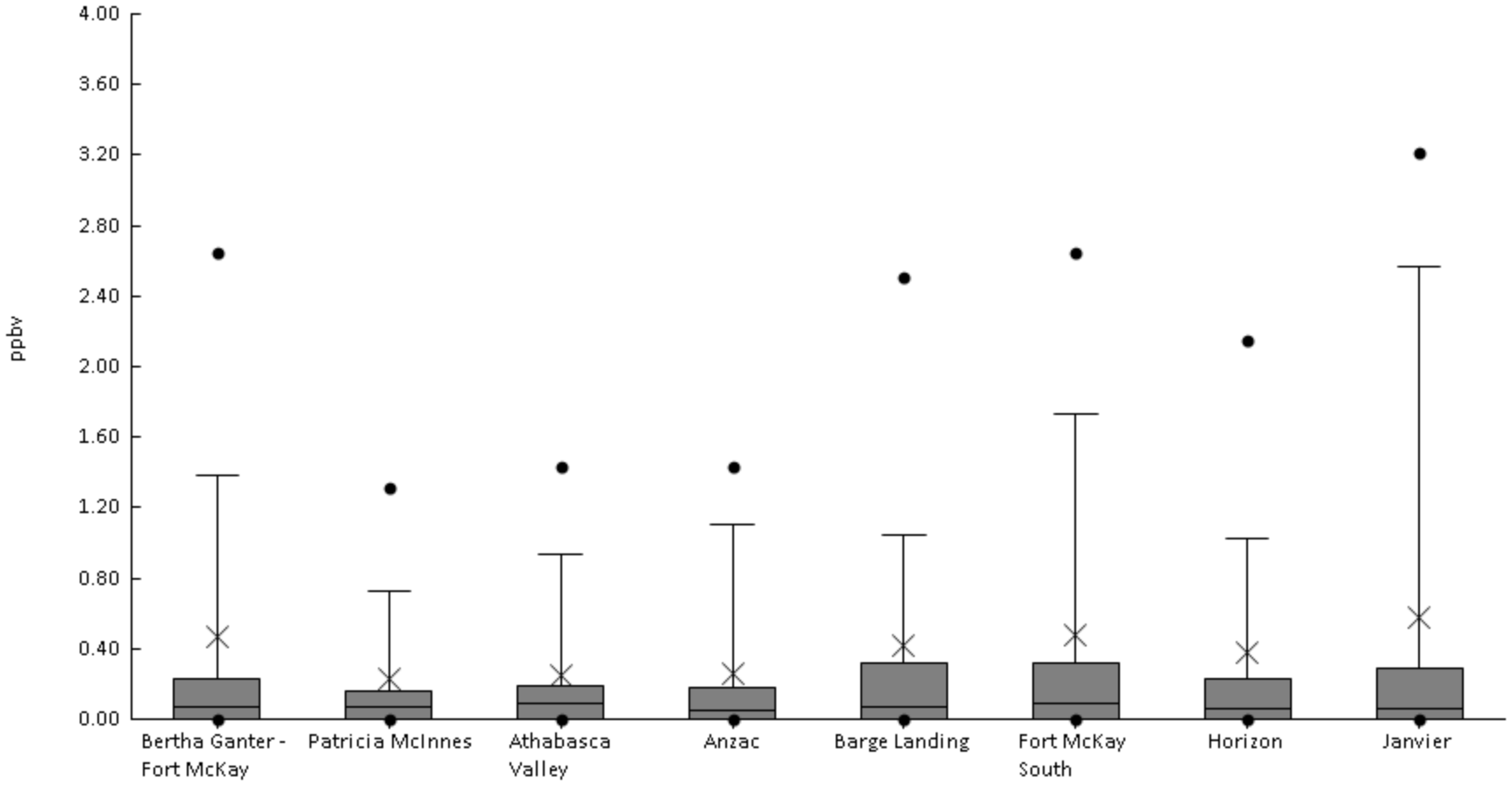
Volatile Organic Compounds - Isopentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	0.066	0.1	0.2	0.44	0.81	1.6	2	3.6	0.65	0.69
AMS06	Patricia McInnes	60	95%	0	0.025	0.095	0.17	0.31	0.48	0.85	1.1	1.7	0.39	0.34
AMS07	Athabasca Valley	60	97%	0	0.035	0.095	0.21	0.34	0.62	1	1.2	1.4	0.44	0.34
AMS14	Anzac	61	93%	0	0	0.082	0.13	0.26	0.48	0.86	1.1	1.2	0.35	0.31
AMS09	Barge Landing	60	98%	0	0.065	0.11	0.2	0.43	0.75	1.8	2.2	3.6	0.66	0.73
AMS13	Fort McKay South	61	97%	0	0.072	0.11	0.24	0.34	0.78	1.4	1.9	2.2	0.58	0.53
AMS15	Horizon	61	95%	0	0.039	0.11	0.22	0.54	1.1	2.2	3.6	6.4	0.92	1.2
AMS22	Janvier	58	93%	0	0	0.04	0.1	0.19	0.38	0.5	0.75	0.87	0.26	0.21



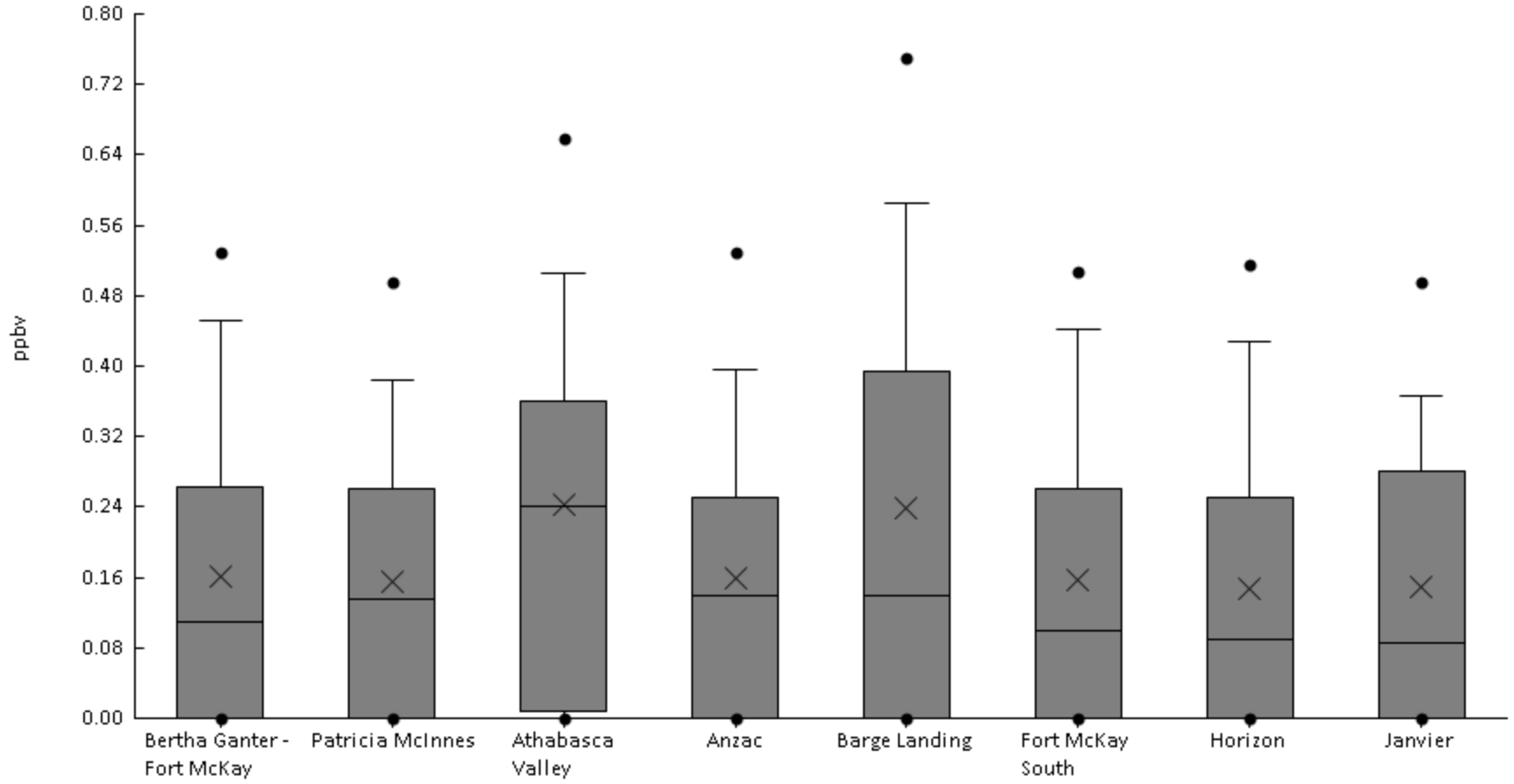
Volatile Organic Compounds - Isoprene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	70%	0	0	0	0	0.07	0.23	1.4	2.6	6.3	0.47	1.1
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.065	0.16	0.73	1.3	2.4	0.23	0.47
AMS07	Athabasca Valley	60	70%	0	0	0	0	0.085	0.19	0.94	1.4	2	0.25	0.47
AMS14	Anzac	61	64%	0	0	0	0	0.05	0.18	1.1	1.4	2.6	0.26	0.53
AMS09	Barge Landing	61	72%	0	0	0	0	0.07	0.32	1	2.5	5.5	0.42	0.93
AMS13	Fort McKay South	61	69%	0	0	0	0	0.09	0.32	1.7	2.6	5.8	0.48	1
AMS15	Horizon	61	66%	0	0	0	0	0.06	0.23	1	2.1	5.2	0.37	0.87
AMS22	Janvier	58	69%	0	0	0	0	0.06	0.29	2.6	3.2	7.4	0.58	1.3



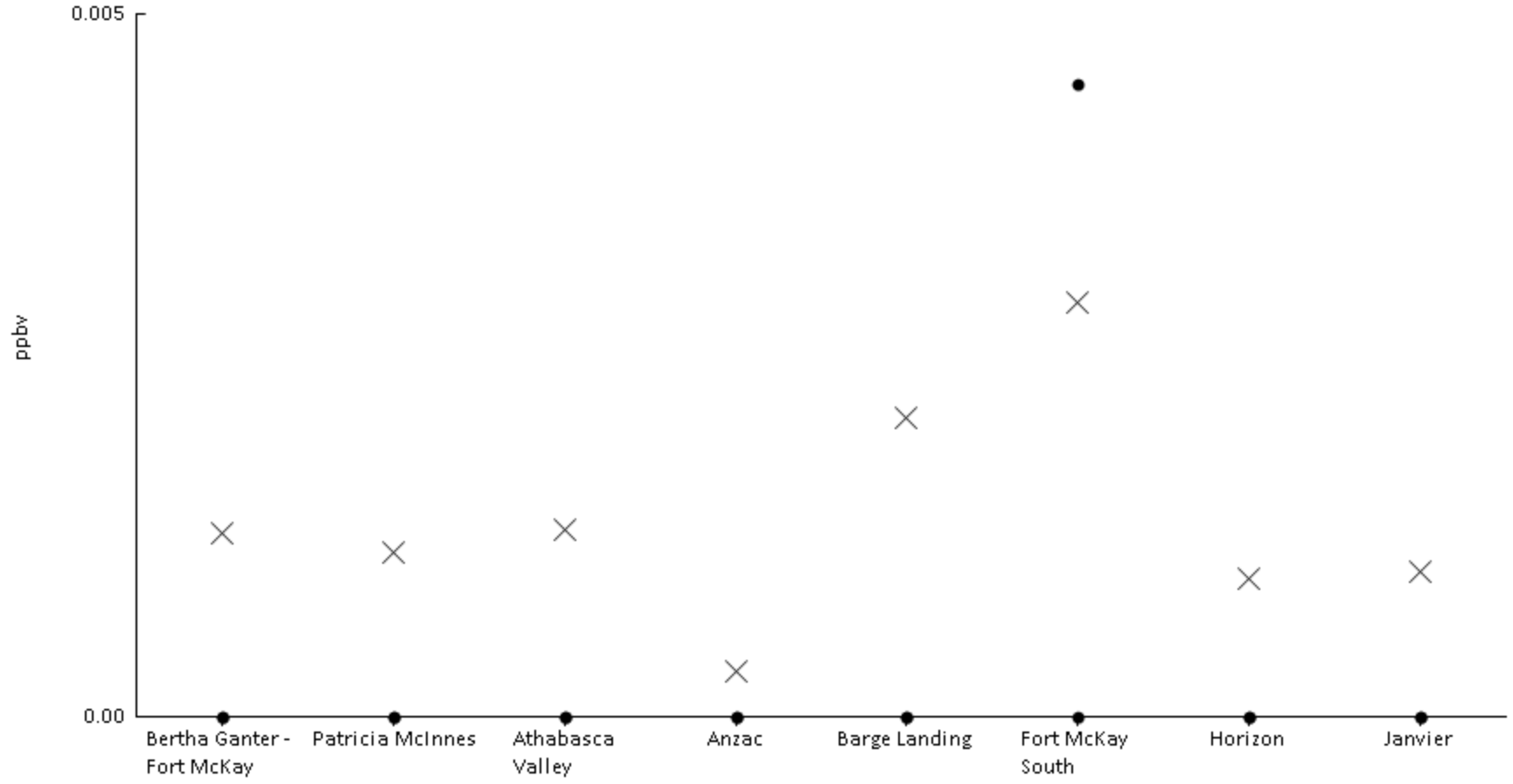
Volatile Organic Compounds - Isopropylalcohol (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	61%	0	0	0	0	0.11	0.26	0.45	0.53	0.64	0.16	0.18
AMS06	Patricia McInnes	60	62%	0	0	0	0	0.14	0.26	0.39	0.5	0.56	0.15	0.16
AMS07	Athabasca Valley	59	75%	0	0	0	7.5E-3	0.24	0.36	0.51	0.66	0.78	0.24	0.21
AMS14	Anzac	61	62%	0	0	0	0	0.14	0.25	0.4	0.53	0.73	0.16	0.18
AMS09	Barge Landing	61	72%	0	0	0	0	0.14	0.4	0.59	0.75	0.95	0.24	0.25
AMS13	Fort McKay South	61	61%	0	0	0	0	0.1	0.26	0.44	0.51	0.85	0.16	0.19
AMS15	Horizon	61	64%	0	0	0	0	0.09	0.25	0.43	0.51	0.55	0.15	0.17
AMS22	Janvier	58	62%	0	0	0	0	0.085	0.28	0.37	0.5	0.85	0.15	0.18



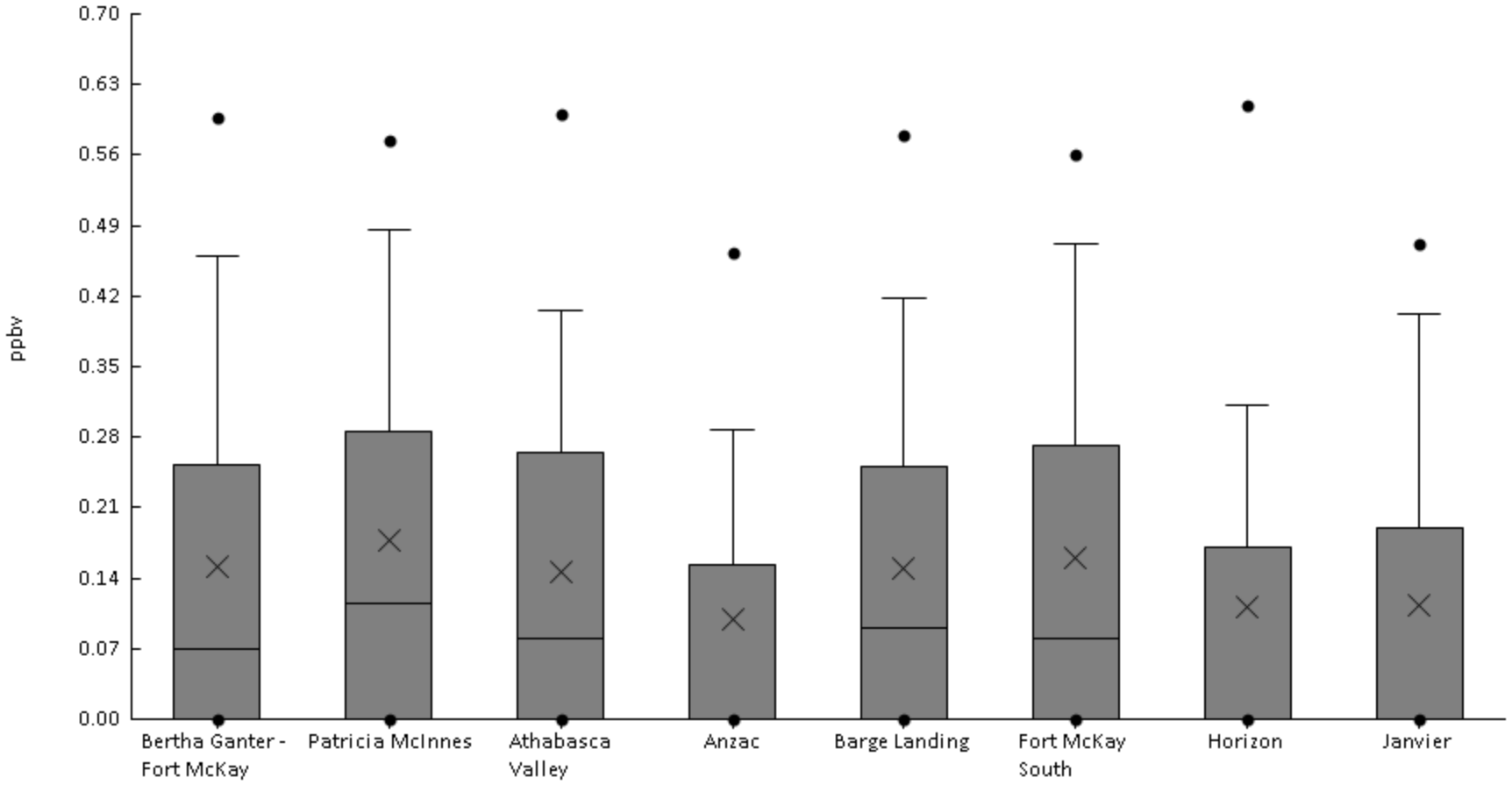
Volatile Organic Compounds - Isopropylbenzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	3%	0	0	0	0	0	0	0	0	0.06	1.3E-3	8.1E-3
AMS06	Patricia McInnes	60	3%	0	0	0	0	0	0	0	0	0.05	1.2E-3	6.9E-3
AMS07	Athabasca Valley	60	3%	0	0	0	0	0	0	0	0	0.06	1.3E-3	8.1E-3
AMS14	Anzac	61	2%	0	0	0	0	0	0	0	0	0.02	3.3E-4	2.6E-3
AMS09	Barge Landing	61	3%	0	0	0	0	0	0	0	0	0.11	2.1E-3	0.014
AMS13	Fort McKay South	61	5%	0	0	0	0	0	0	0	4.5E-3	0.11	3E-3	0.016
AMS15	Horizon	61	2%	0	0	0	0	0	0	0	0	0.06	9.8E-4	7.7E-3
AMS22	Janvier	58	3%	0	0	0	0	0	0	0	0	0.03	1E-3	5.5E-3



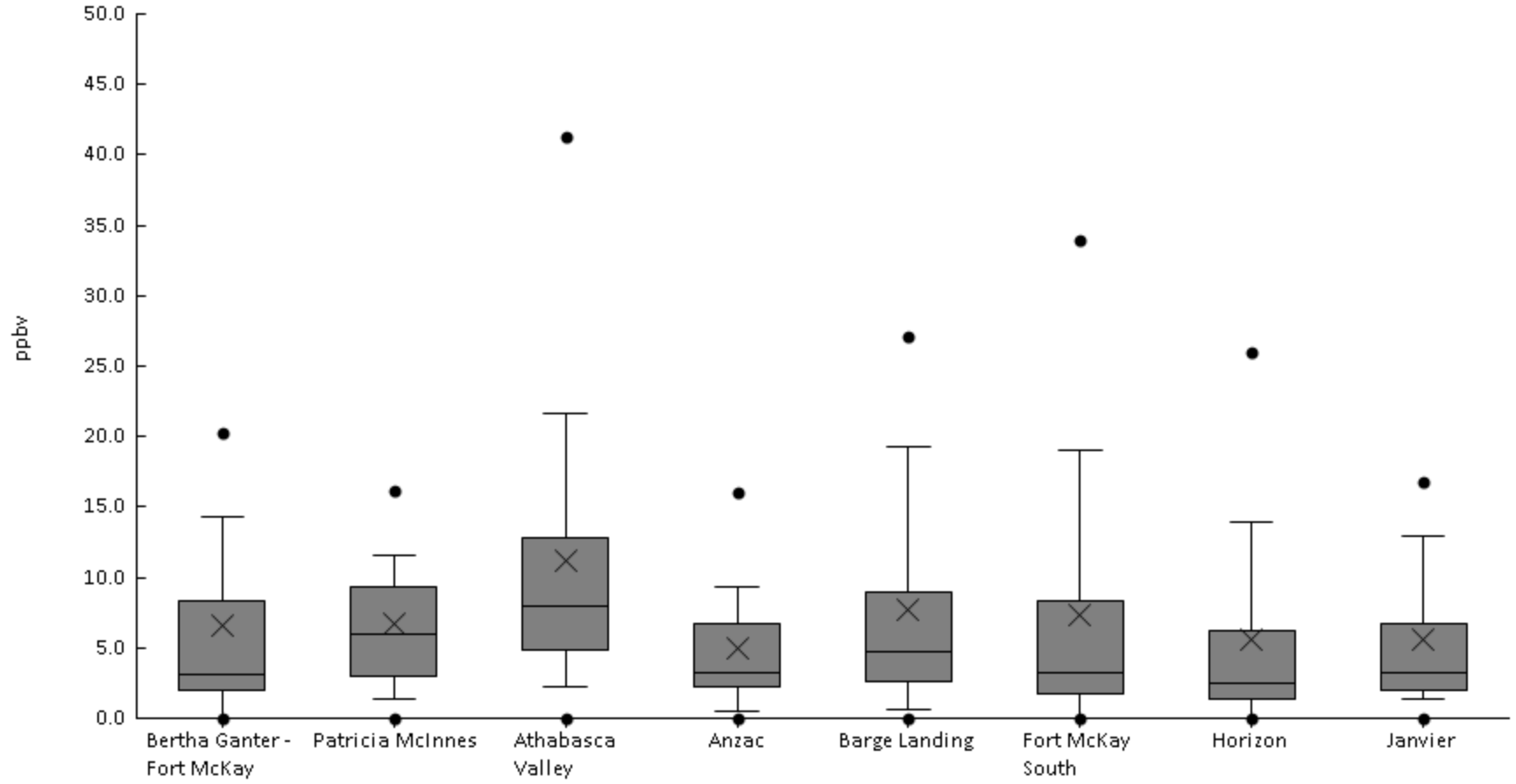
Volatile Organic Compounds - m,p-Xylene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	52%	0	0	0	0	0.07	0.25	0.46	0.6	0.74	0.15	0.19
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.12	0.29	0.49	0.58	0.91	0.18	0.2
AMS07	Athabasca Valley	60	60%	0	0	0	0	0.08	0.27	0.41	0.6	0.62	0.15	0.18
AMS14	Anzac	61	48%	0	0	0	0	0	0.15	0.29	0.46	0.57	0.1	0.15
AMS09	Barge Landing	61	59%	0	0	0	0	0.09	0.25	0.42	0.58	0.68	0.15	0.18
AMS13	Fort McKay South	61	56%	0	0	0	0	0.08	0.27	0.47	0.56	0.71	0.16	0.19
AMS15	Horizon	61	43%	0	0	0	0	0	0.17	0.31	0.61	0.8	0.11	0.18
AMS22	Janvier	58	48%	0	0	0	0	0	0.19	0.4	0.47	0.71	0.11	0.17



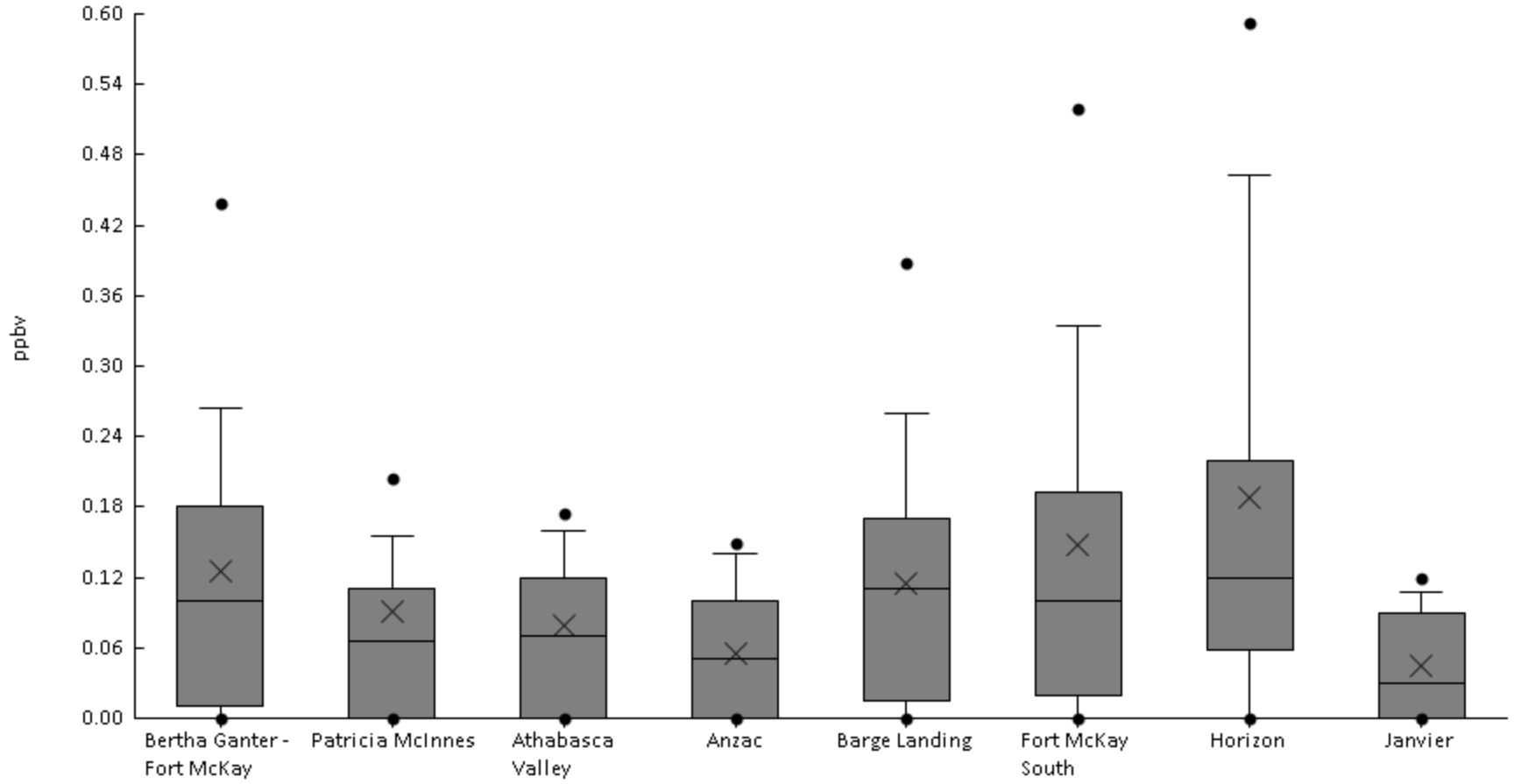
Volatile Organic Compounds - Methanol (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	88%	0	0	0	2	3.1	8.4	14	20	50	6.6	8.9
AMS06	Patricia McInnes	58	91%	0	0	1.4	3	6	9.3	12	16	36	6.7	6
AMS07	Athabasca Valley	58	91%	0	0	2.3	4.8	8	13	22	41	56	11	12
AMS14	Anzac	59	90%	0	0	0.52	2.2	3.2	6.8	9.3	16	21	5	4.5
AMS09	Barge Landing	61	90%	0	0	0.66	2.6	4.7	8.9	19	27	57	7.7	9.7
AMS13	Fort McKay South	58	88%	0	0	0	1.7	3.2	8.3	19	34	41	7.3	9.9
AMS15	Horizon	61	89%	0	0	0	1.4	2.5	6.3	14	26	42	5.6	8.1
AMS22	Janvier	56	93%	0	0	1.3	2	3.2	6.8	13	17	37	5.7	6.4



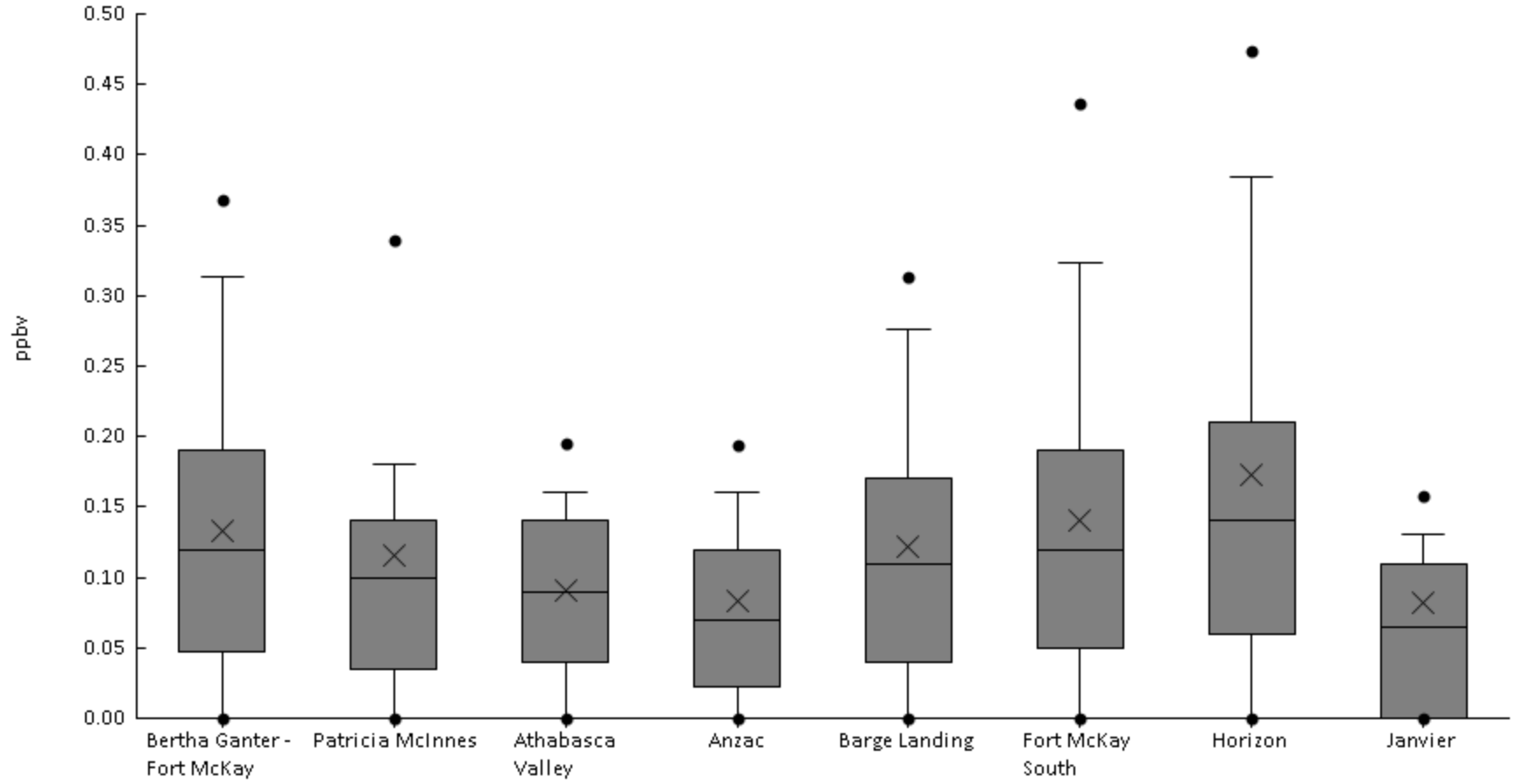
Volatile Organic Compounds - Methylcyclohexane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	77%	0	0	0	0.01	0.1	0.18	0.26	0.44	0.77	0.12	0.14
AMS06	Patricia McInnes	60	72%	0	0	0	0	0.065	0.11	0.16	0.21	1.4	0.091	0.18
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.07	0.12	0.16	0.18	0.76	0.08	0.11
AMS14	Anzac	61	66%	0	0	0	0	0.05	0.1	0.14	0.15	0.16	0.055	0.053
AMS09	Barge Landing	61	75%	0	0	0	0.015	0.11	0.17	0.26	0.39	0.53	0.12	0.12
AMS13	Fort McKay South	61	80%	0	0	0	0.02	0.1	0.19	0.33	0.52	0.94	0.15	0.19
AMS15	Horizon	61	87%	0	0	0	0.058	0.12	0.22	0.46	0.59	1.2	0.19	0.22
AMS22	Janvier	58	64%	0	0	0	0	0.03	0.09	0.11	0.12	0.14	0.045	0.045



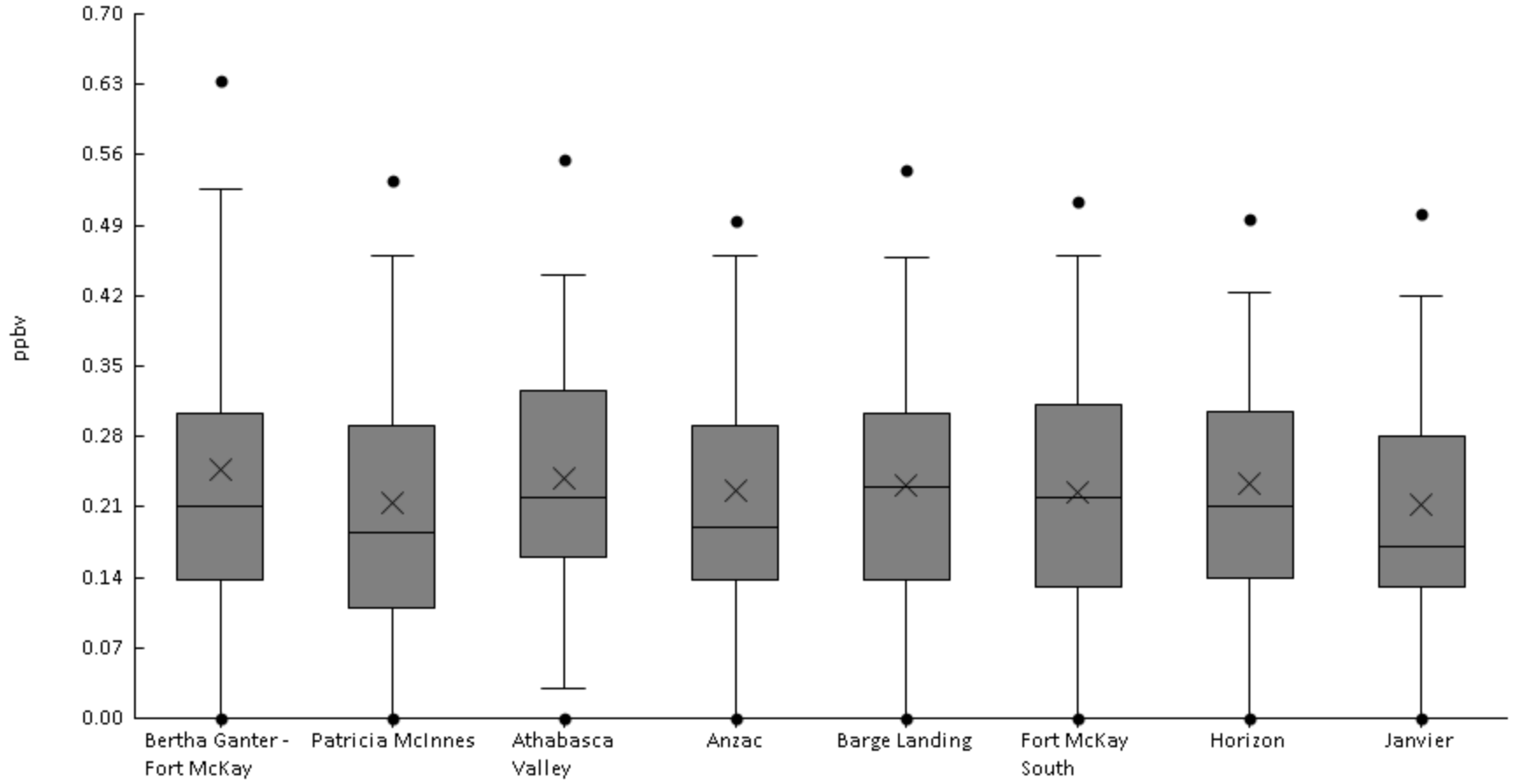
Volatile Organic Compounds - Methylcyclopentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	82%	0	0	0	0.048	0.12	0.19	0.31	0.37	0.54	0.13	0.12
AMS06	Patricia McInnes	60	83%	0	0	0	0.035	0.1	0.14	0.18	0.34	0.84	0.12	0.15
AMS07	Athabasca Valley	60	82%	0	0	0	0.04	0.09	0.14	0.16	0.2	0.39	0.091	0.073
AMS14	Anzac	61	75%	0	0	0	0.023	0.07	0.12	0.16	0.19	0.58	0.083	0.088
AMS09	Barge Landing	61	87%	0	0	0	0.04	0.11	0.17	0.28	0.31	0.49	0.12	0.1
AMS13	Fort McKay South	61	82%	0	0	0	0.05	0.12	0.19	0.32	0.44	0.56	0.14	0.13
AMS15	Horizon	61	87%	0	0	0	0.06	0.14	0.21	0.38	0.47	0.99	0.17	0.17
AMS22	Janvier	58	71%	0	0	0	0	0.065	0.11	0.13	0.16	1.1	0.083	0.15



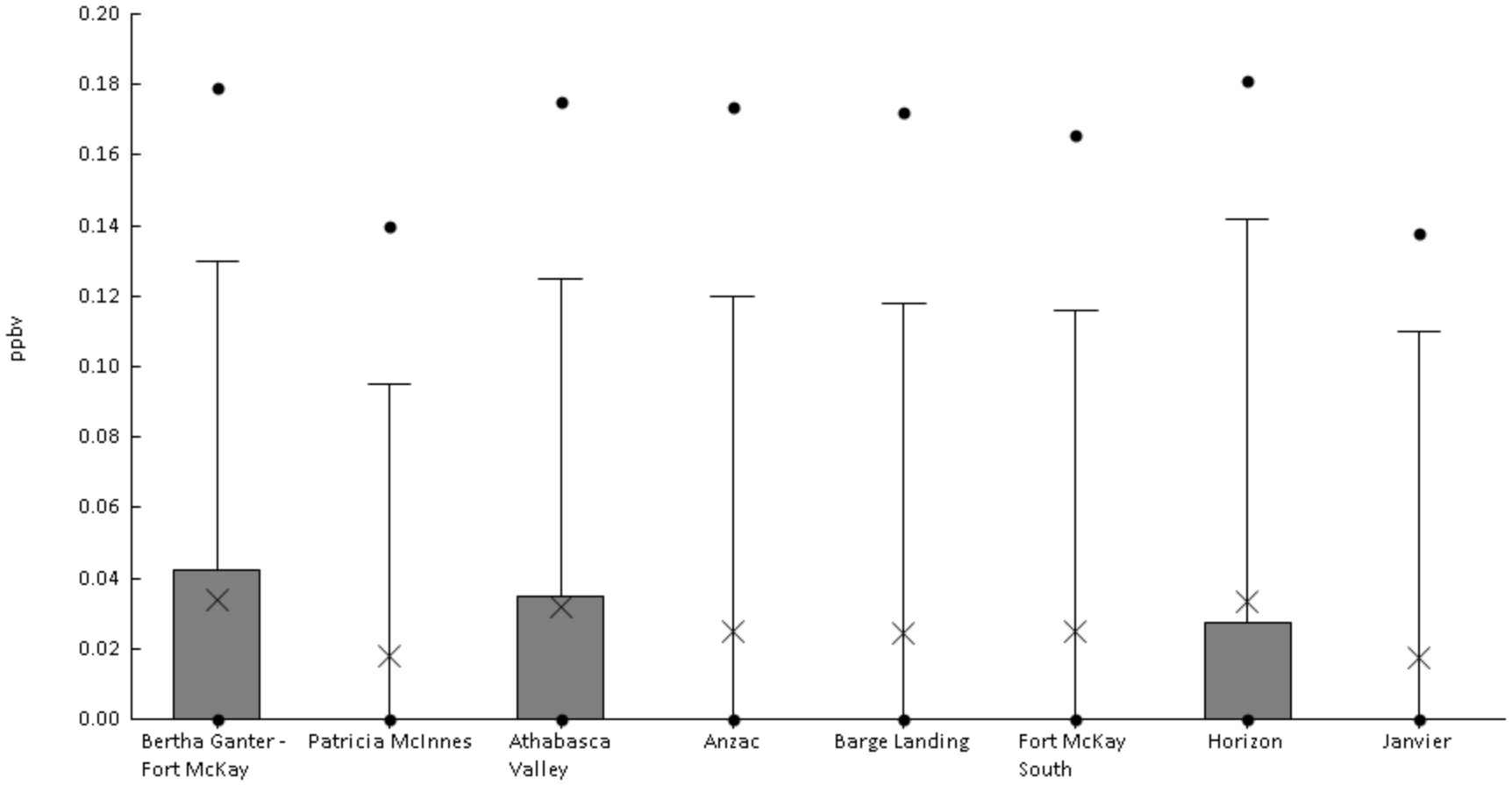
Volatile Organic Compounds - Methylethylketone (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	89%	0	0	0	0.14	0.21	0.3	0.53	0.63	0.87	0.25	0.19
AMS06	Patricia McInnes	60	88%	0	0	0	0.11	0.19	0.29	0.46	0.54	0.67	0.21	0.16
AMS07	Athabasca Valley	60	90%	0	0	0.03	0.16	0.22	0.33	0.44	0.56	0.63	0.24	0.15
AMS14	Anzac	61	89%	0	0	0	0.14	0.19	0.29	0.46	0.49	0.98	0.23	0.17
AMS09	Barge Landing	61	89%	0	0	0	0.14	0.23	0.3	0.46	0.54	0.67	0.23	0.16
AMS13	Fort McKay South	61	89%	0	0	0	0.13	0.22	0.31	0.46	0.51	0.56	0.23	0.15
AMS15	Horizon	61	89%	0	0	0	0.14	0.21	0.31	0.42	0.5	1	0.23	0.18
AMS22	Janvier	58	88%	0	0	0	0.13	0.17	0.28	0.42	0.5	0.64	0.21	0.15



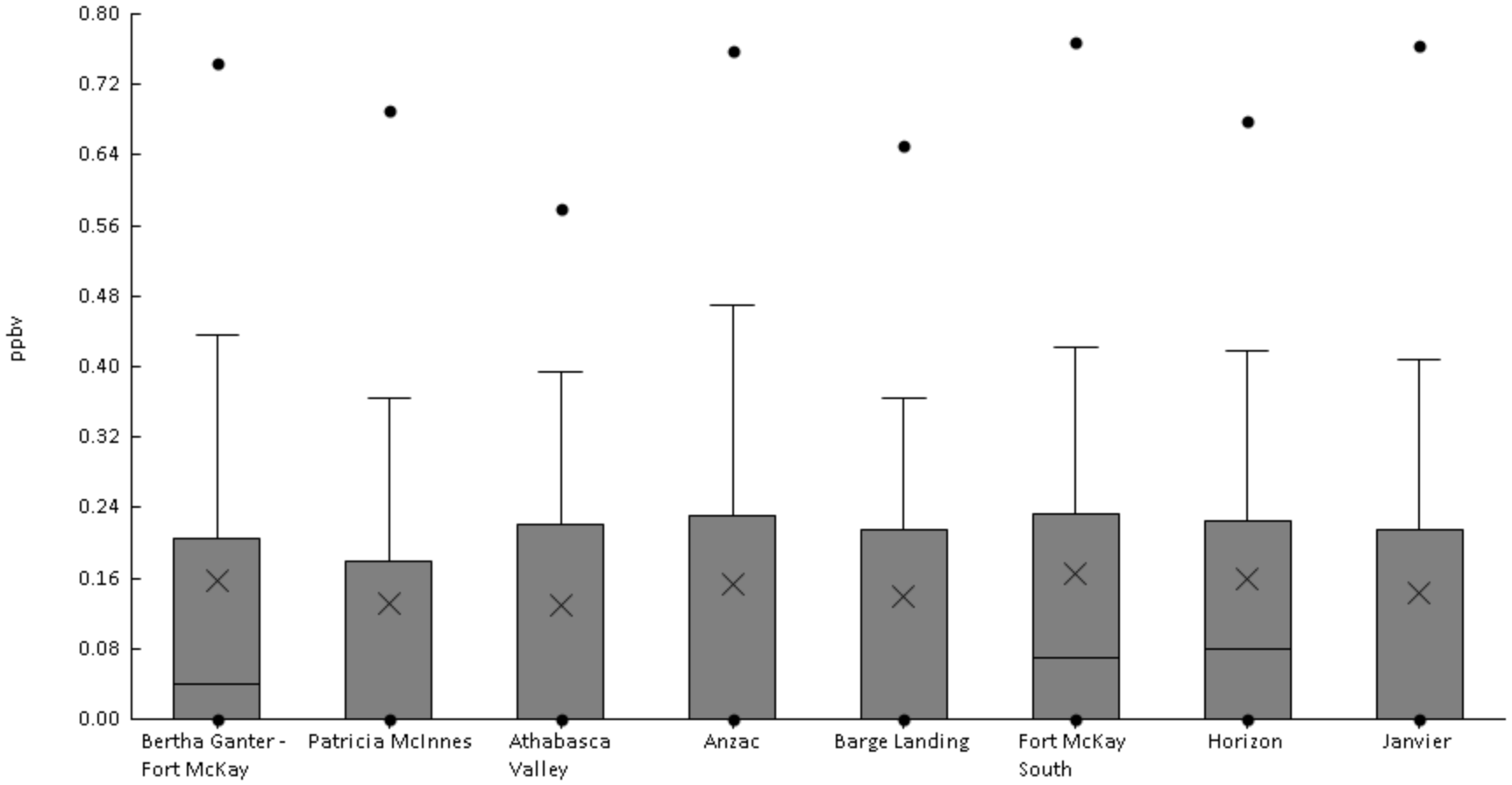
Volatile Organic Compounds - Methylisobutylketone (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	30%	0	0	0	0	0	0.043	0.13	0.18	0.27	0.034	0.063
AMS06	Patricia McInnes	60	15%	0	0	0	0	0	0	0.095	0.14	0.21	0.018	0.048
AMS07	Athabasca Valley	60	28%	0	0	0	0	0	0.035	0.13	0.18	0.26	0.032	0.061
AMS14	Anzac	61	20%	0	0	0	0	0	0	0.12	0.17	0.3	0.025	0.061
AMS09	Barge Landing	59	20%	0	0	0	0	0	0	0.12	0.17	0.22	0.024	0.056
AMS13	Fort McKay South	59	22%	0	0	0	0	0	0	0.12	0.17	0.21	0.025	0.054
AMS15	Horizon	59	27%	0	0	0	0	0	0.028	0.14	0.18	0.26	0.033	0.065
AMS22	Janvier	58	14%	0	0	0	0	0	0	0.11	0.14	0.18	0.017	0.046



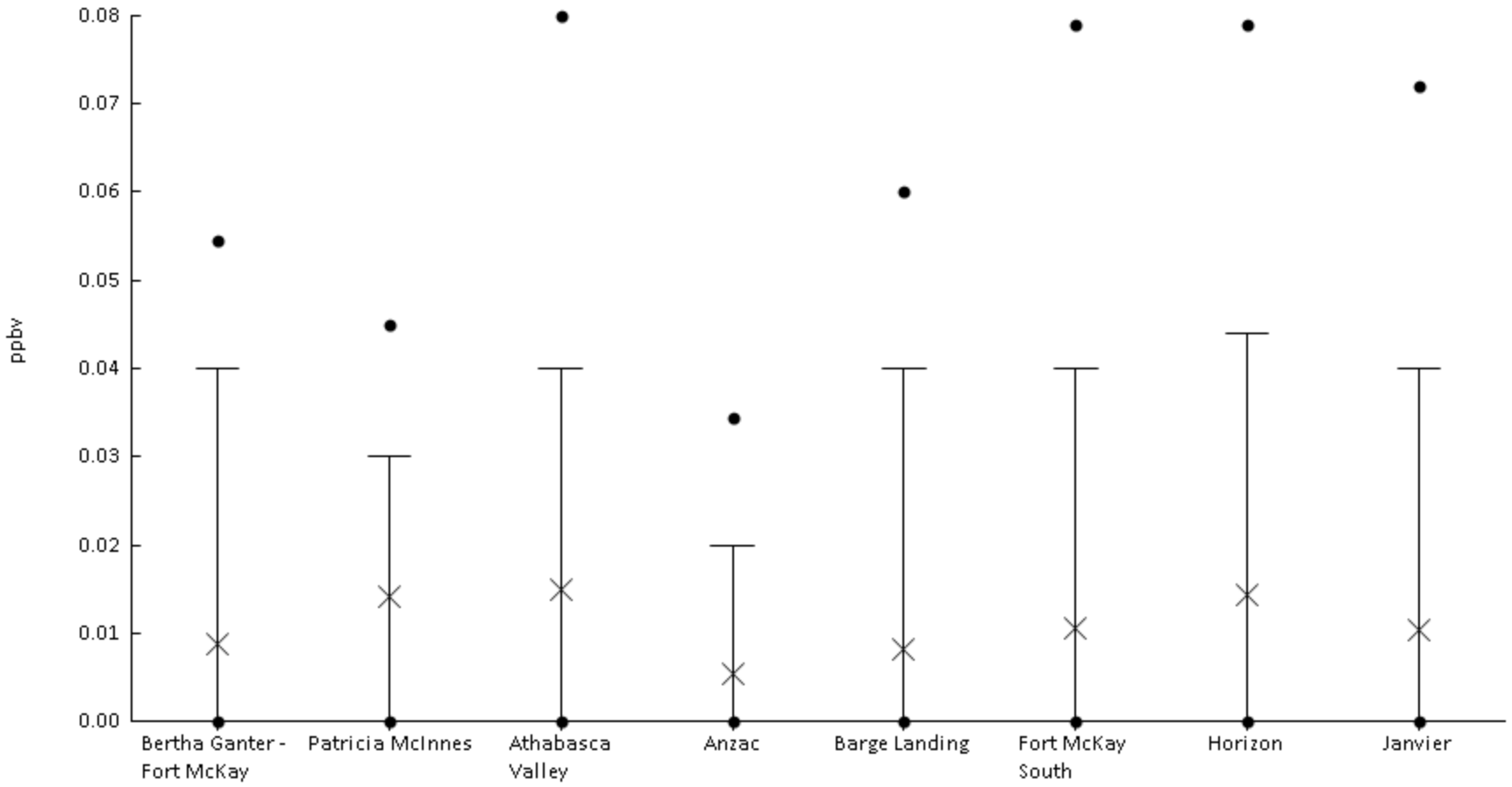
Volatile Organic Compounds - Methylvinylketone (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	51%	0	0	0	0	0.04	0.21	0.44	0.74	1.5	0.16	0.28
AMS06	Patricia McInnes	60	38%	0	0	0	0	0	0.18	0.37	0.69	1.5	0.13	0.26
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.22	0.4	0.58	1.4	0.13	0.25
AMS14	Anzac	61	38%	0	0	0	0	0	0.23	0.47	0.76	1.7	0.15	0.29
AMS09	Barge Landing	60	47%	0	0	0	0	0	0.22	0.37	0.65	1.1	0.14	0.24
AMS13	Fort McKay South	61	59%	0	0	0	0	0.07	0.23	0.42	0.77	1.3	0.17	0.25
AMS15	Horizon	61	54%	0	0	0	0	0.08	0.23	0.42	0.68	1.5	0.16	0.26
AMS22	Janvier	56	36%	0	0	0	0	0	0.22	0.41	0.76	1.6	0.14	0.29



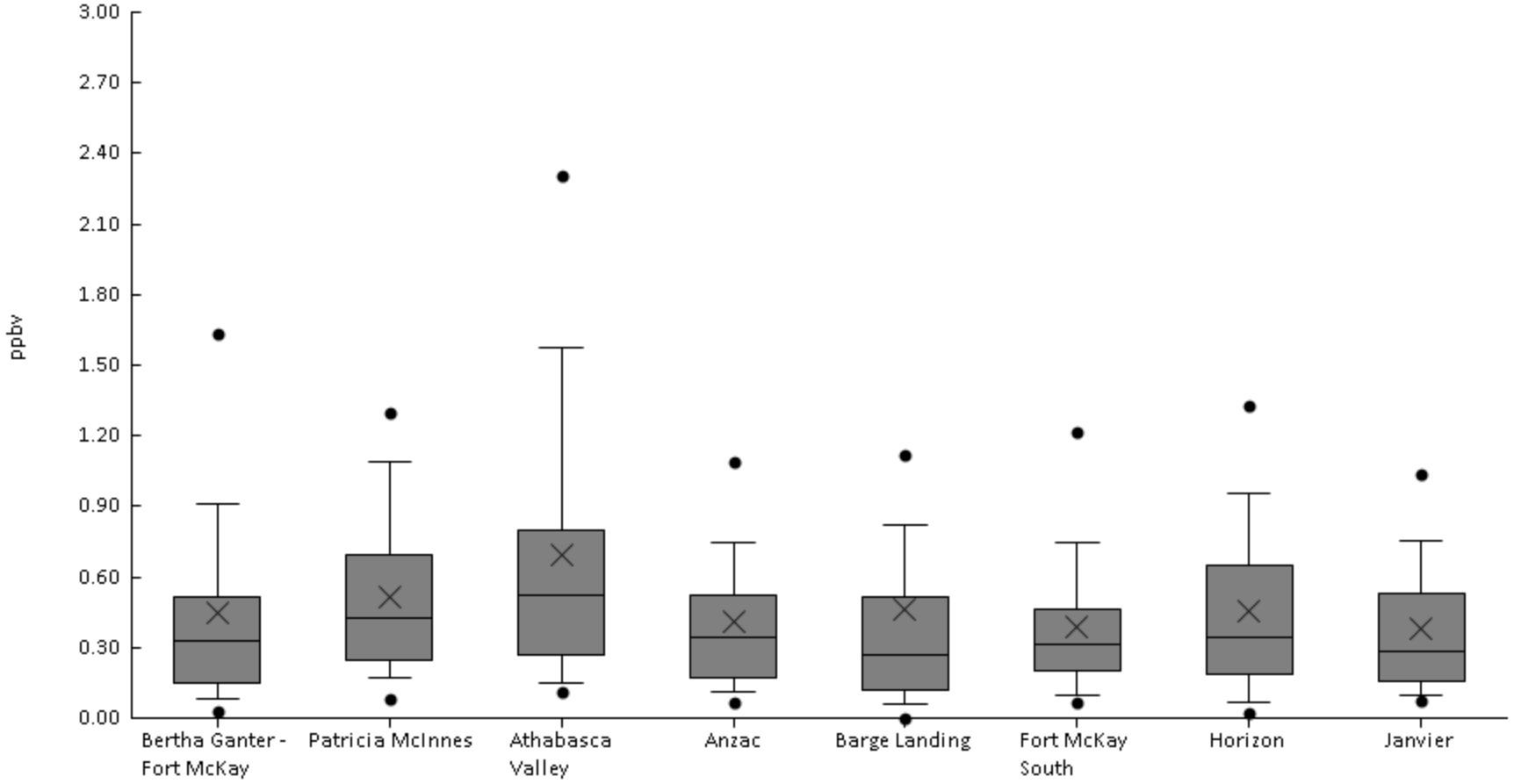
Volatile Organic Compounds - Naphthalene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	16%	0	0	0	0	0	0	0.04	0.055	0.12	8.7E-3	0.023
AMS06	Patricia McInnes	60	17%	0	0	0	0	0	0	0.03	0.045	0.56	0.014	0.073
AMS07	Athabasca Valley	60	17%	0	0	0	0	0	0	0.04	0.08	0.44	0.015	0.06
AMS14	Anzac	61	11%	0	0	0	0	0	0	0.02	0.035	0.11	5.4E-3	0.019
AMS09	Barge Landing	61	15%	0	0	0	0	0	0	0.04	0.06	0.14	8.2E-3	0.024
AMS13	Fort McKay South	61	16%	0	0	0	0	0	0	0.04	0.079	0.15	0.01	0.029
AMS15	Horizon	61	18%	0	0	0	0	0	0	0.044	0.079	0.36	0.014	0.051
AMS22	Janvier	58	19%	0	0	0	0	0	0	0.04	0.072	0.16	0.01	0.028



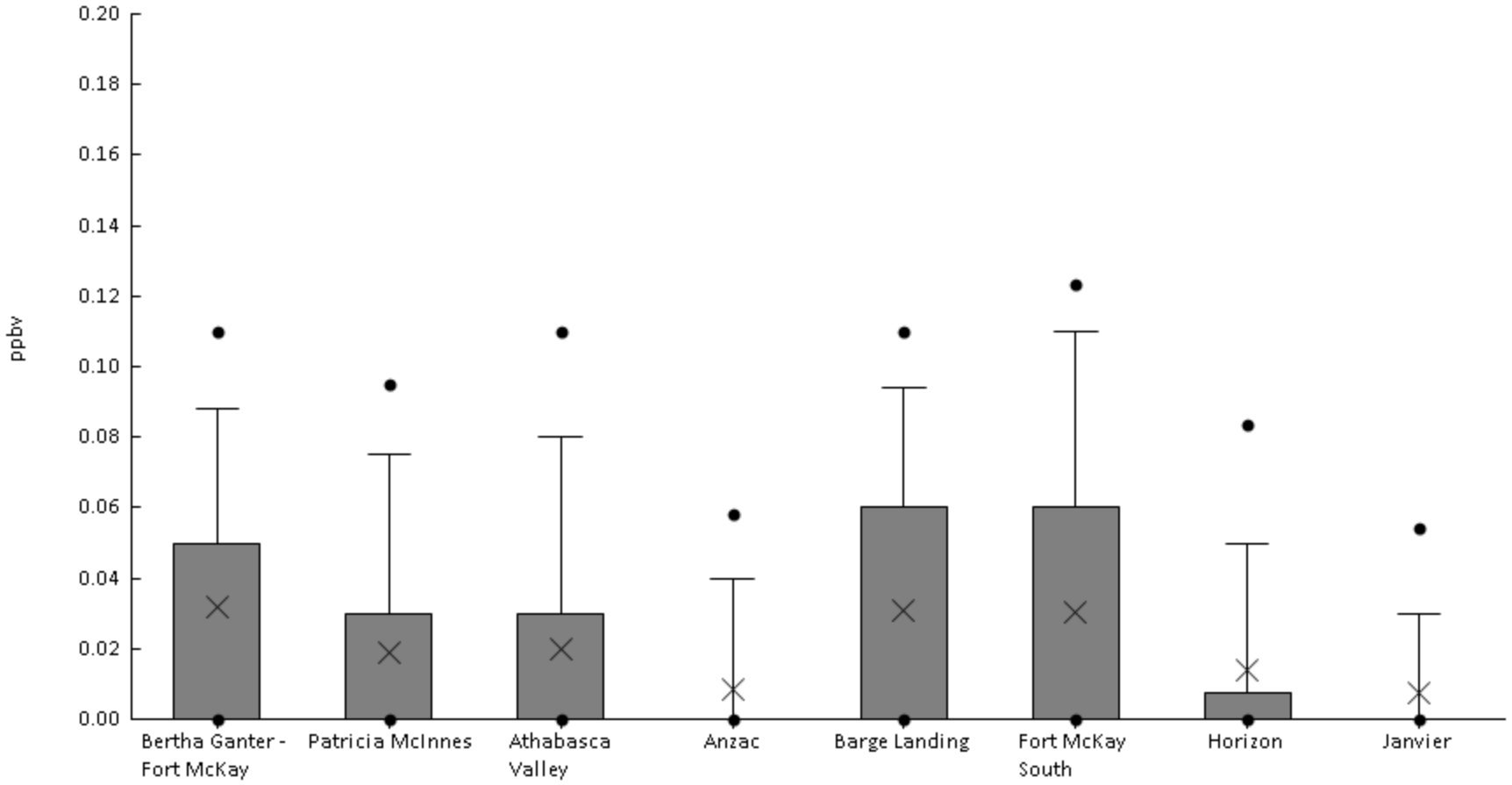
Volatile Organic Compounds - n-Butane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	0.028	0.08	0.15	0.33	0.52	0.91	1.6	2.5	0.45	0.5
AMS06	Patricia McInnes	60	98%	0	0.085	0.17	0.25	0.43	0.7	1.1	1.3	1.6	0.52	0.36
AMS07	Athabasca Valley	60	98%	0	0.11	0.15	0.27	0.53	0.8	1.6	2.3	2.7	0.69	0.63
AMS14	Anzac	61	97%	0	0.07	0.11	0.17	0.34	0.53	0.75	1.1	1.8	0.41	0.33
AMS09	Barge Landing	61	92%	0	0	0.062	0.12	0.27	0.51	0.82	1.1	6.3	0.46	0.81
AMS13	Fort McKay South	61	97%	0	0.066	0.096	0.2	0.31	0.47	0.75	1.2	1.6	0.38	0.33
AMS15	Horizon	61	95%	0	0.022	0.07	0.19	0.34	0.65	0.96	1.3	2.1	0.46	0.42
AMS22	Janvier	58	97%	0	0.074	0.1	0.16	0.29	0.53	0.76	1	1.5	0.38	0.32



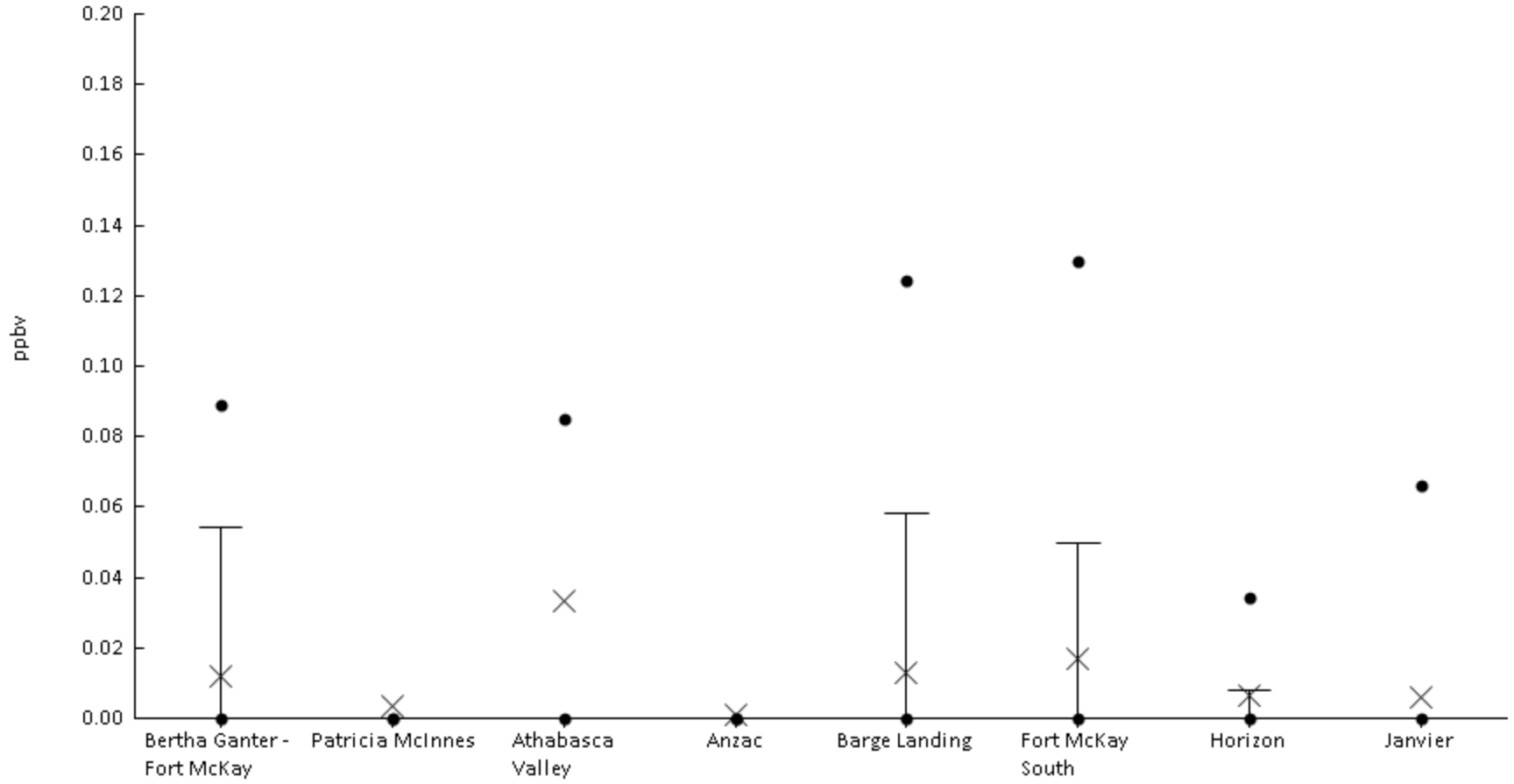
Volatile Organic Compounds - n-Decane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	48%	0	0	0	0	0	0.05	0.088	0.11	0.18	0.032	0.043
AMS06	Patricia McInnes	60	32%	0	0	0	0	0	0.03	0.075	0.095	0.14	0.019	0.034
AMS07	Athabasca Valley	60	33%	0	0	0	0	0	0.03	0.08	0.11	0.13	0.02	0.035
AMS14	Anzac	61	15%	0	0	0	0	0	0	0.04	0.058	0.14	8.7E-3	0.026
AMS09	Barge Landing	61	44%	0	0	0	0	0	0.06	0.094	0.11	0.19	0.031	0.044
AMS13	Fort McKay South	61	38%	0	0	0	0	0	0.06	0.11	0.12	0.16	0.03	0.046
AMS15	Horizon	61	25%	0	0	0	0	0	7.5E-3	0.05	0.083	0.1	0.014	0.027
AMS22	Janvier	58	16%	0	0	0	0	0	0	0.03	0.054	0.1	7.2E-3	0.02



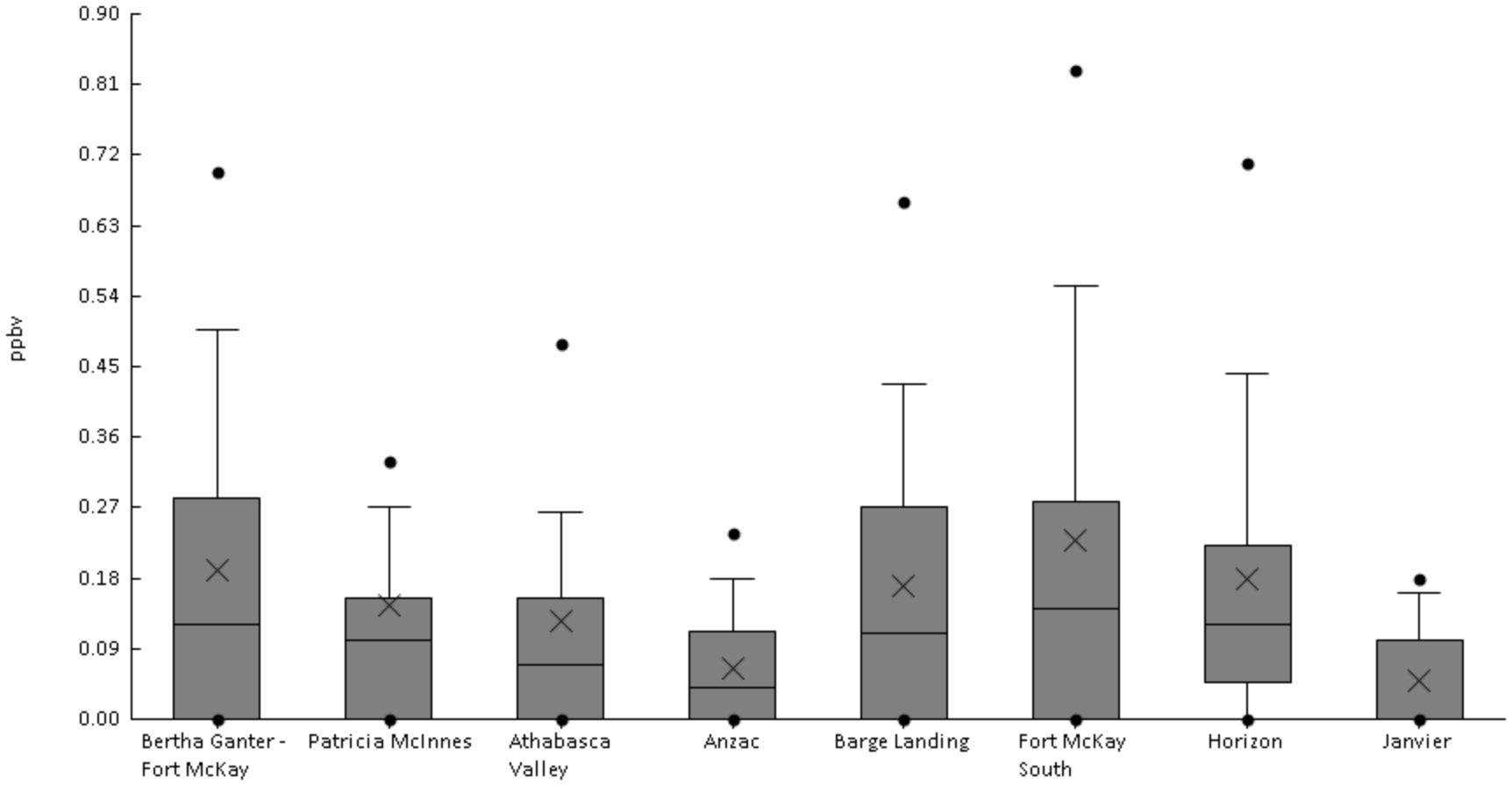
Volatile Organic Compounds - n-Dodecane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	18%	0	0	0	0	0	0	0.054	0.089	0.13	0.012	0.03
AMS06	Patricia McInnes	60	3%	0	0	0	0	0	0	0	0	0.15	3.7E-3	0.021
AMS07	Athabasca Valley	60	8%	0	0	0	0	0	0	0	0.085	1.6	0.033	0.21
AMS14	Anzac	61	2%	0	0	0	0	0	0	0	0	0.07	1.1E-3	9E-3
AMS09	Barge Landing	61	13%	0	0	0	0	0	0	0.058	0.12	0.15	0.013	0.036
AMS13	Fort McKay South	61	18%	0	0	0	0	0	0	0.05	0.13	0.32	0.017	0.051
AMS15	Horizon	61	10%	0	0	0	0	0	0	8E-3	0.035	0.15	6.2E-3	0.025
AMS22	Janvier	58	7%	0	0	0	0	0	0	0	0.066	0.12	6E-3	0.024



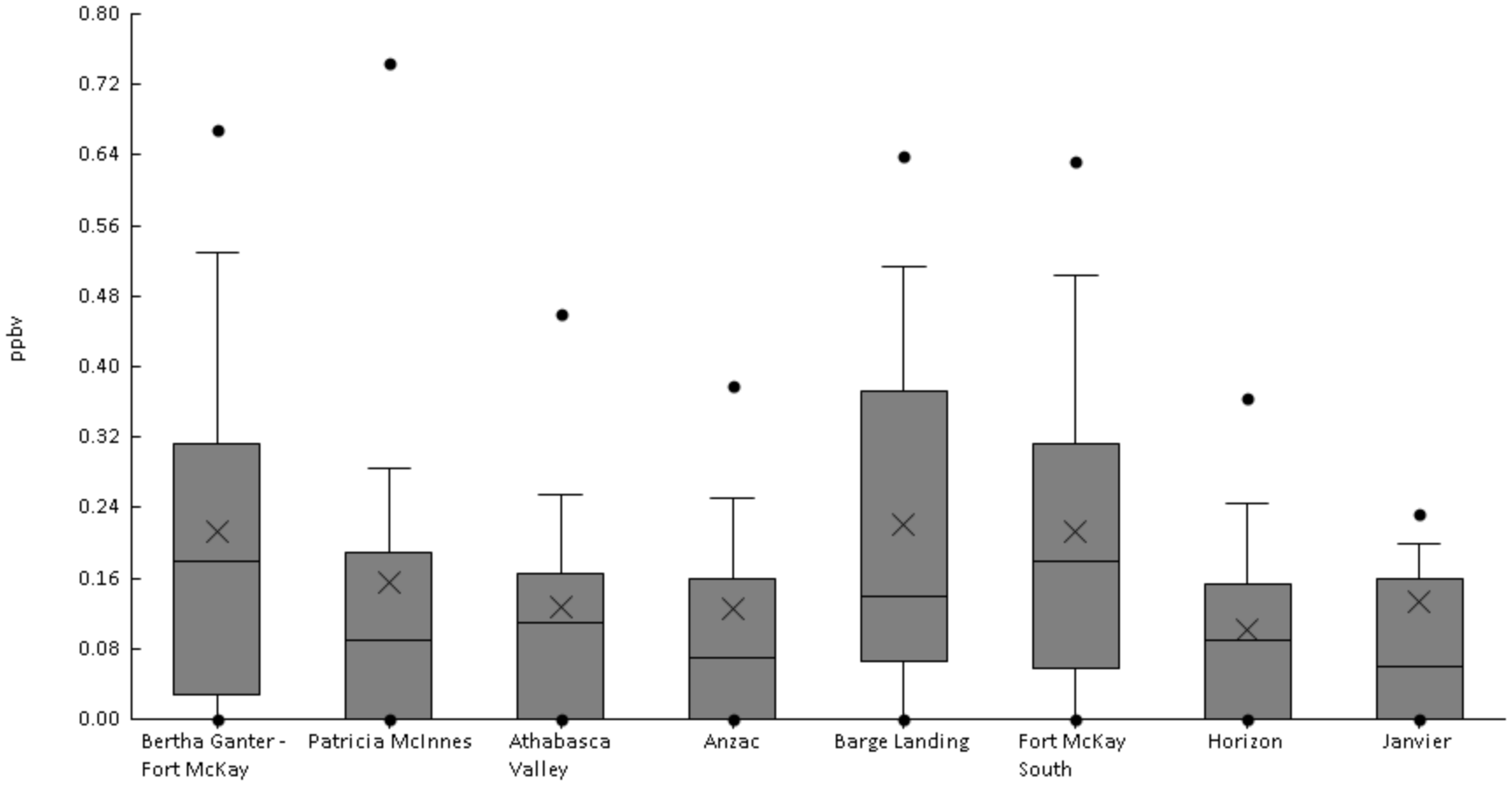
Volatile Organic Compounds - n-Heptane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	64%	0	0	0	0	0.12	0.28	0.5	0.7	1.5	0.19	0.27
AMS06	Patricia McInnes	60	67%	0	0	0	0	0.1	0.16	0.27	0.33	2.8	0.15	0.36
AMS07	Athabasca Valley	60	65%	0	0	0	0	0.07	0.16	0.27	0.48	1.5	0.13	0.22
AMS14	Anzac	61	56%	0	0	0	0	0.04	0.11	0.18	0.24	0.27	0.066	0.079
AMS09	Barge Landing	61	64%	0	0	0	0	0.11	0.27	0.43	0.66	0.78	0.17	0.2
AMS13	Fort McKay South	61	74%	0	0	0	0	0.14	0.28	0.55	0.83	1.5	0.23	0.32
AMS15	Horizon	61	79%	0	0	0	0.048	0.12	0.22	0.44	0.71	0.93	0.18	0.21
AMS22	Janvier	58	47%	0	0	0	0	0	0.1	0.16	0.18	0.22	0.05	0.066



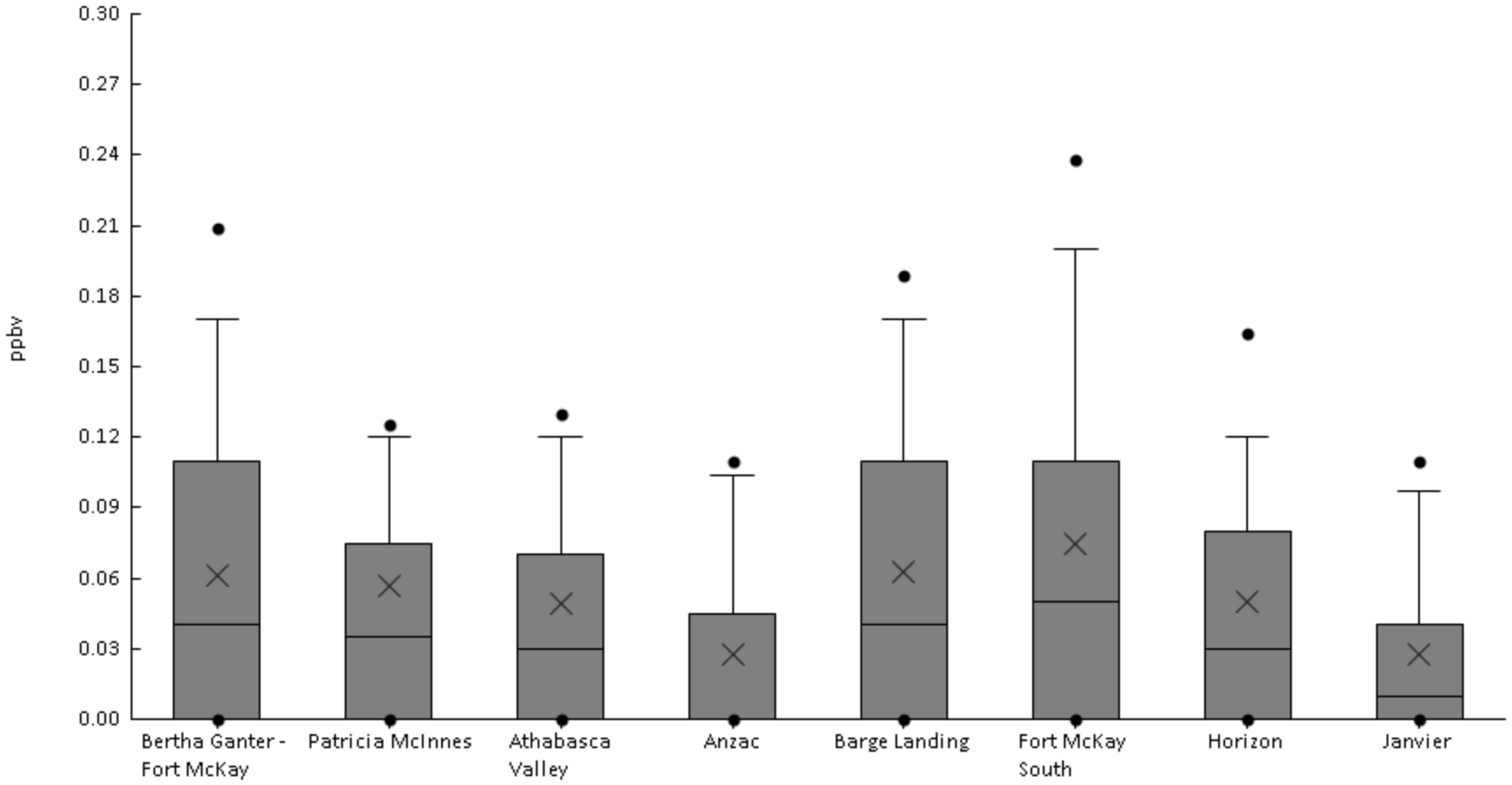
Volatile Organic Compounds - n-Hexane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	80%	0	0	0	0.028	0.18	0.31	0.53	0.67	0.88	0.21	0.21
AMS06	Patricia McInnes	60	70%	0	0	0	0	0.09	0.19	0.29	0.75	1.5	0.15	0.26
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.11	0.17	0.26	0.46	0.78	0.13	0.15
AMS14	Anzac	61	66%	0	0	0	0	0.07	0.16	0.25	0.38	1.5	0.13	0.21
AMS09	Barge Landing	61	85%	0	0	0	0.065	0.14	0.37	0.51	0.64	0.91	0.22	0.21
AMS13	Fort McKay South	61	84%	0	0	0	0.058	0.18	0.31	0.5	0.63	0.87	0.21	0.21
AMS15	Horizon	61	69%	0	0	0	0	0.09	0.15	0.24	0.36	0.42	0.1	0.11
AMS22	Janvier	58	66%	0	0	0	0	0.06	0.16	0.2	0.23	3.2	0.13	0.42



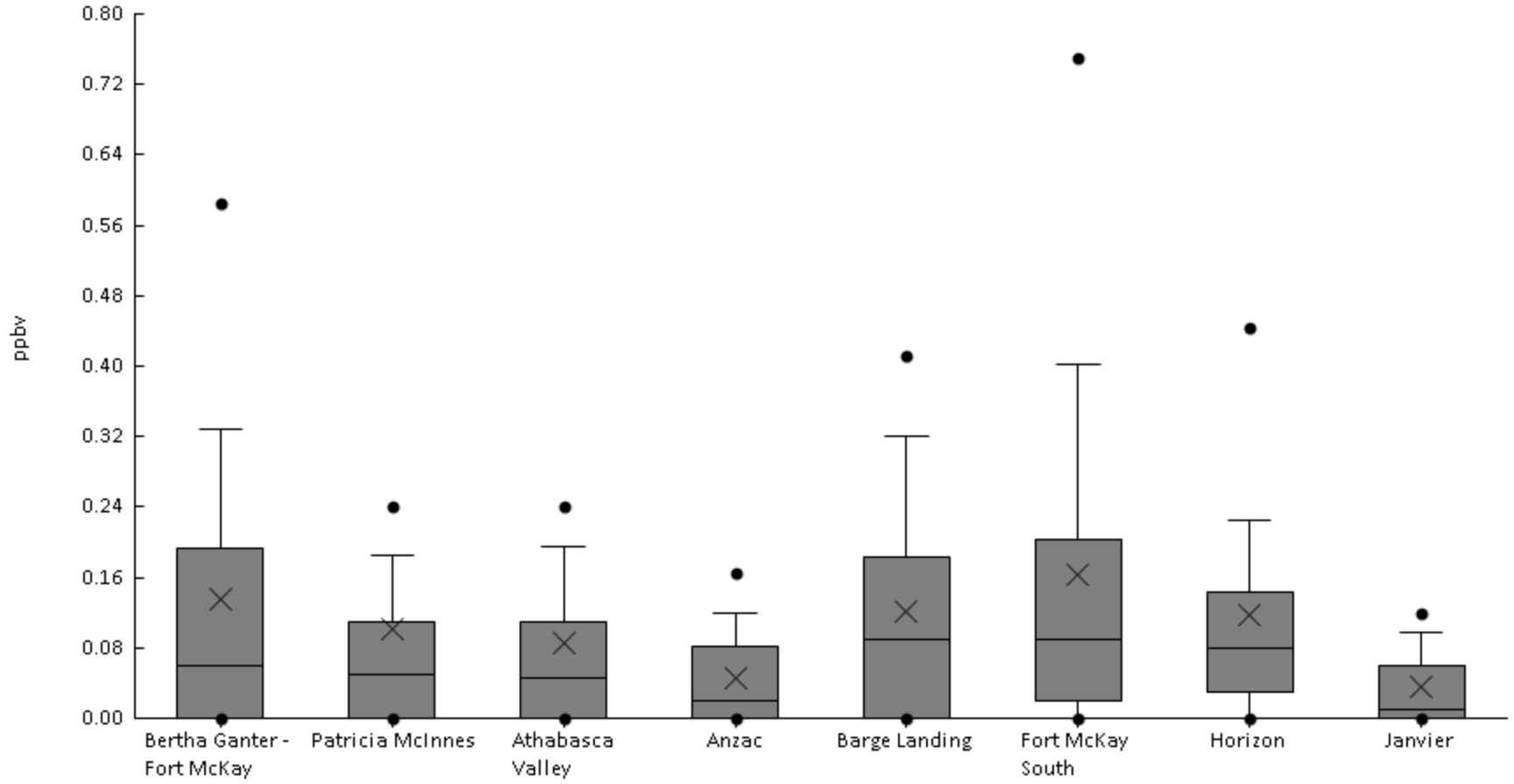
Volatile Organic Compounds - n-Nonane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	62%	0	0	0	0	0.04	0.11	0.17	0.21	0.26	0.061	0.069
AMS06	Patricia McInnes	60	62%	0	0	0	0	0.035	0.075	0.12	0.13	0.94	0.057	0.12
AMS07	Athabasca Valley	60	60%	0	0	0	0	0.03	0.07	0.12	0.13	0.63	0.049	0.088
AMS14	Anzac	61	44%	0	0	0	0	0	0.045	0.1	0.11	0.12	0.028	0.039
AMS09	Barge Landing	61	67%	0	0	0	0	0.04	0.11	0.17	0.19	0.21	0.063	0.064
AMS13	Fort McKay South	61	72%	0	0	0	0	0.05	0.11	0.2	0.24	0.35	0.075	0.084
AMS15	Horizon	61	66%	0	0	0	0	0.03	0.08	0.12	0.16	0.25	0.05	0.055
AMS22	Janvier	58	53%	0	0	0	0	0.01	0.04	0.097	0.11	0.12	0.028	0.037



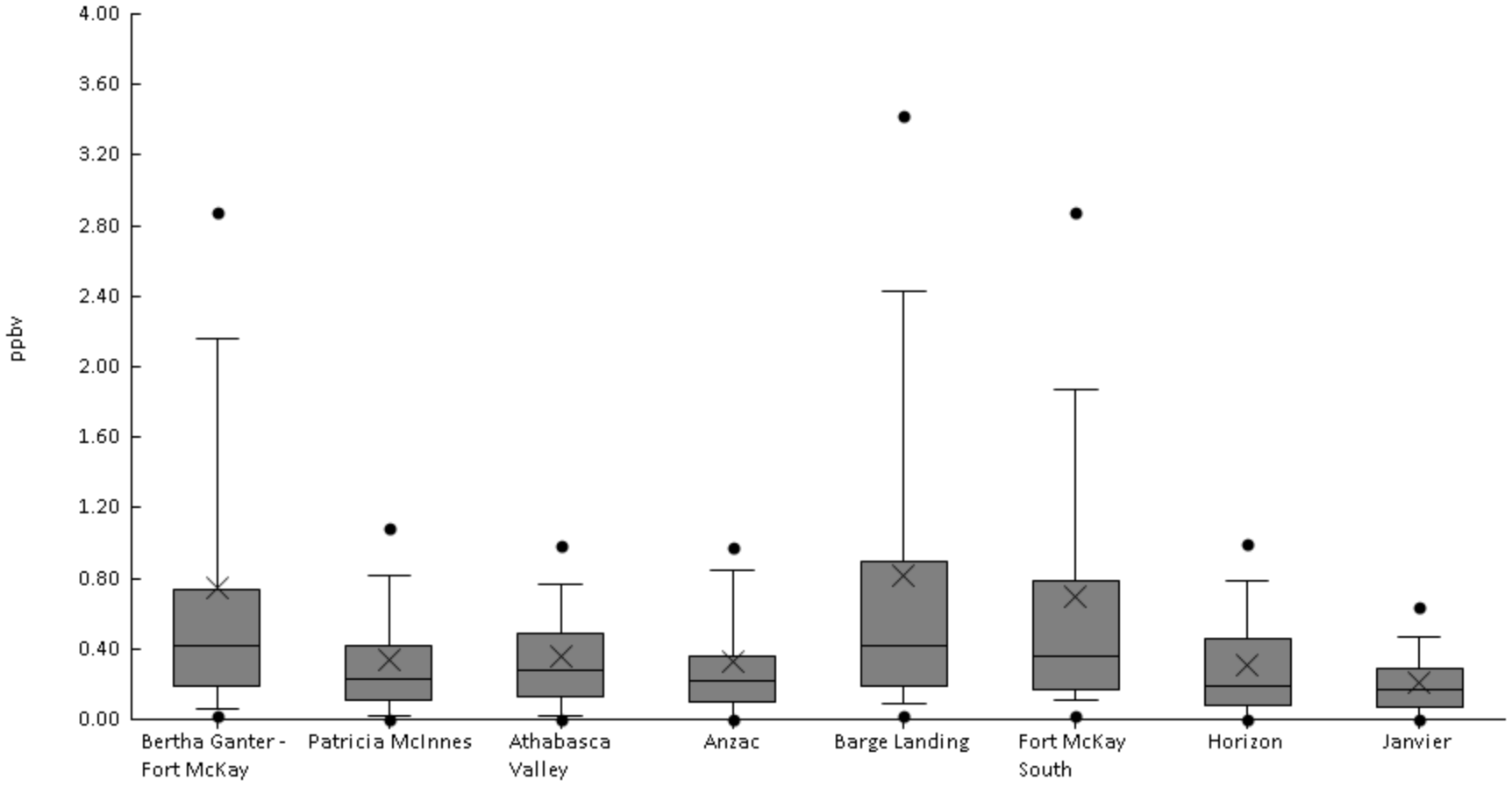
Volatile Organic Compounds - n-Octane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	69%	0	0	0	0	0.06	0.19	0.33	0.59	0.84	0.14	0.19
AMS06	Patricia McInnes	60	65%	0	0	0	0	0.05	0.11	0.19	0.24	2.1	0.1	0.27
AMS07	Athabasca Valley	60	70%	0	0	0	0	0.045	0.11	0.2	0.24	1.3	0.086	0.17
AMS14	Anzac	61	57%	0	0	0	0	0.02	0.083	0.12	0.16	0.22	0.045	0.055
AMS09	Barge Landing	61	67%	0	0	0	0	0.09	0.18	0.32	0.41	0.7	0.12	0.15
AMS13	Fort McKay South	61	80%	0	0	0	0.02	0.09	0.2	0.4	0.75	0.98	0.16	0.22
AMS15	Horizon	61	79%	0	0	0	0.03	0.08	0.14	0.22	0.44	0.97	0.12	0.15
AMS22	Janvier	58	50%	0	0	0	0	0.01	0.06	0.097	0.12	0.18	0.036	0.044



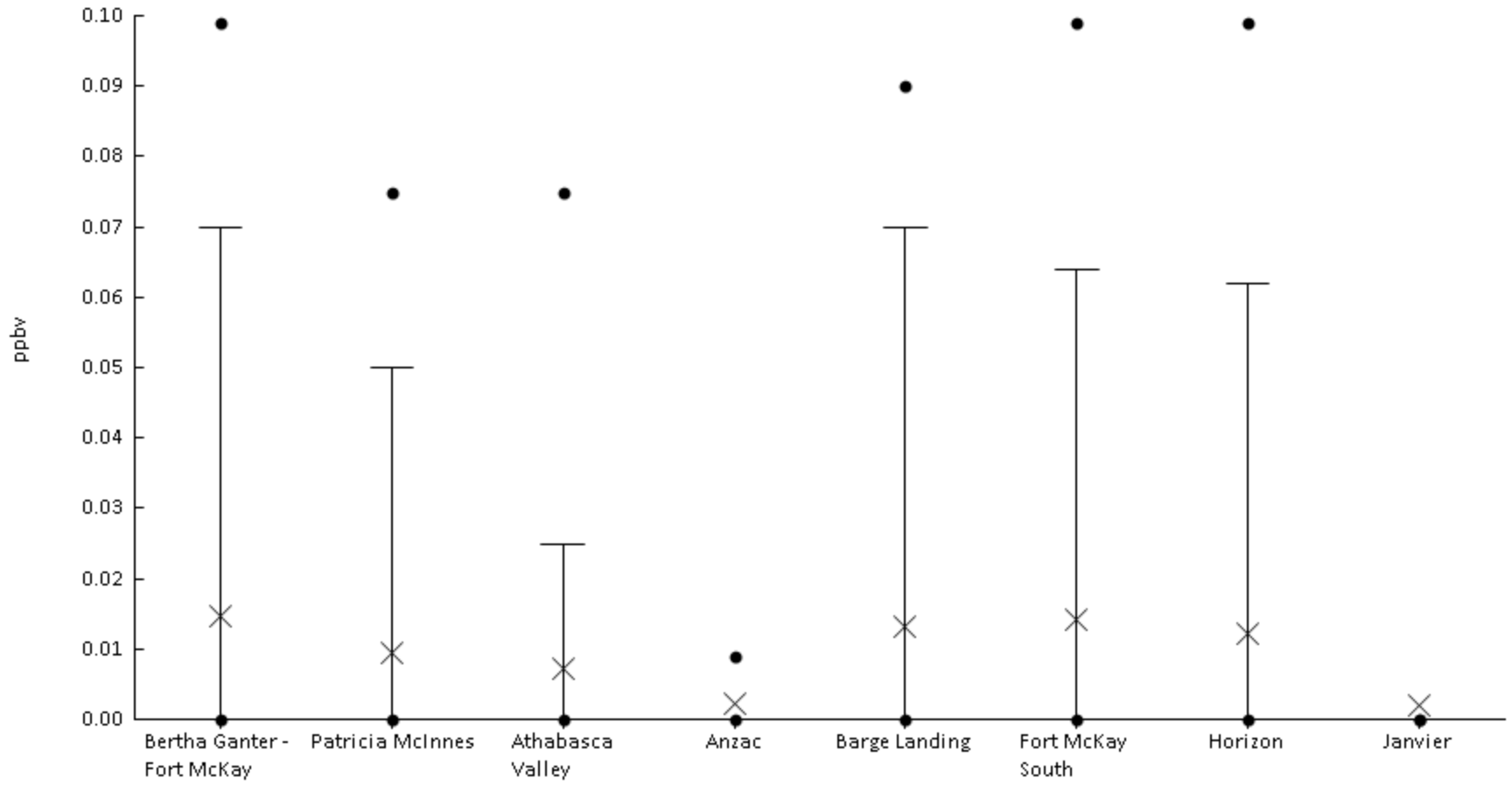
Volatile Organic Compounds - n-Pentane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	0.017	0.056	0.19	0.42	0.74	2.2	2.9	5.7	0.75	1
AMS06	Patricia McInnes	60	90%	0	0	0.02	0.11	0.23	0.42	0.82	1.1	2.5	0.34	0.41
AMS07	Athabasca Valley	60	90%	0	0	0.02	0.13	0.28	0.49	0.77	0.99	2	0.36	0.35
AMS14	Anzac	61	89%	0	0	0	0.098	0.22	0.36	0.84	0.98	1.8	0.32	0.34
AMS09	Barge Landing	61	95%	0	0.022	0.086	0.19	0.42	0.9	2.4	3.4	4.8	0.82	1.1
AMS13	Fort McKay South	61	95%	0	0.017	0.11	0.17	0.36	0.79	1.9	2.9	3.6	0.69	0.83
AMS15	Horizon	61	84%	0	0	0	0.08	0.19	0.46	0.79	1	1.8	0.31	0.35
AMS22	Janvier	58	84%	0	0	0	0.07	0.17	0.29	0.47	0.64	1.1	0.21	0.2



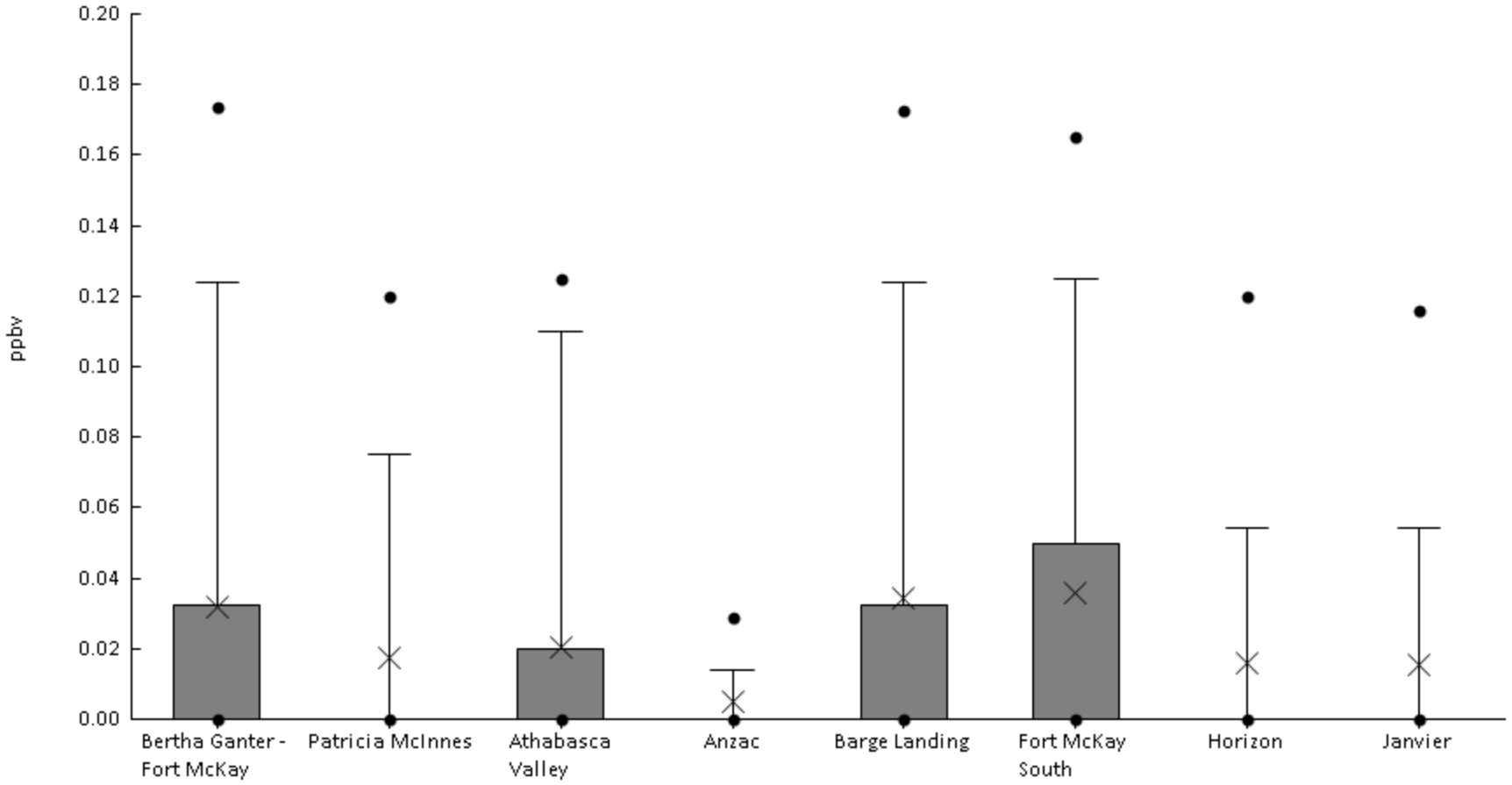
Volatile Organic Compounds - n-Propylbenzene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	18%	0	0	0	0	0	0	0.07	0.099	0.21	0.015	0.038
AMS06	Patricia McInnes	60	15%	0	0	0	0	0	0	0.05	0.075	0.11	9.3E-3	0.025
AMS07	Athabasca Valley	60	12%	0	0	0	0	0	0	0.025	0.075	0.11	7.3E-3	0.023
AMS14	Anzac	61	5%	0	0	0	0	0	0	0	9E-3	0.09	2.1E-3	0.012
AMS09	Barge Landing	61	16%	0	0	0	0	0	0	0.07	0.09	0.2	0.013	0.036
AMS13	Fort McKay South	61	20%	0	0	0	0	0	0	0.064	0.099	0.2	0.014	0.037
AMS15	Horizon	61	16%	0	0	0	0	0	0	0.062	0.099	0.13	0.012	0.032
AMS22	Janvier	58	3%	0	0	0	0	0	0	0	0	0.09	1.9E-3	0.012



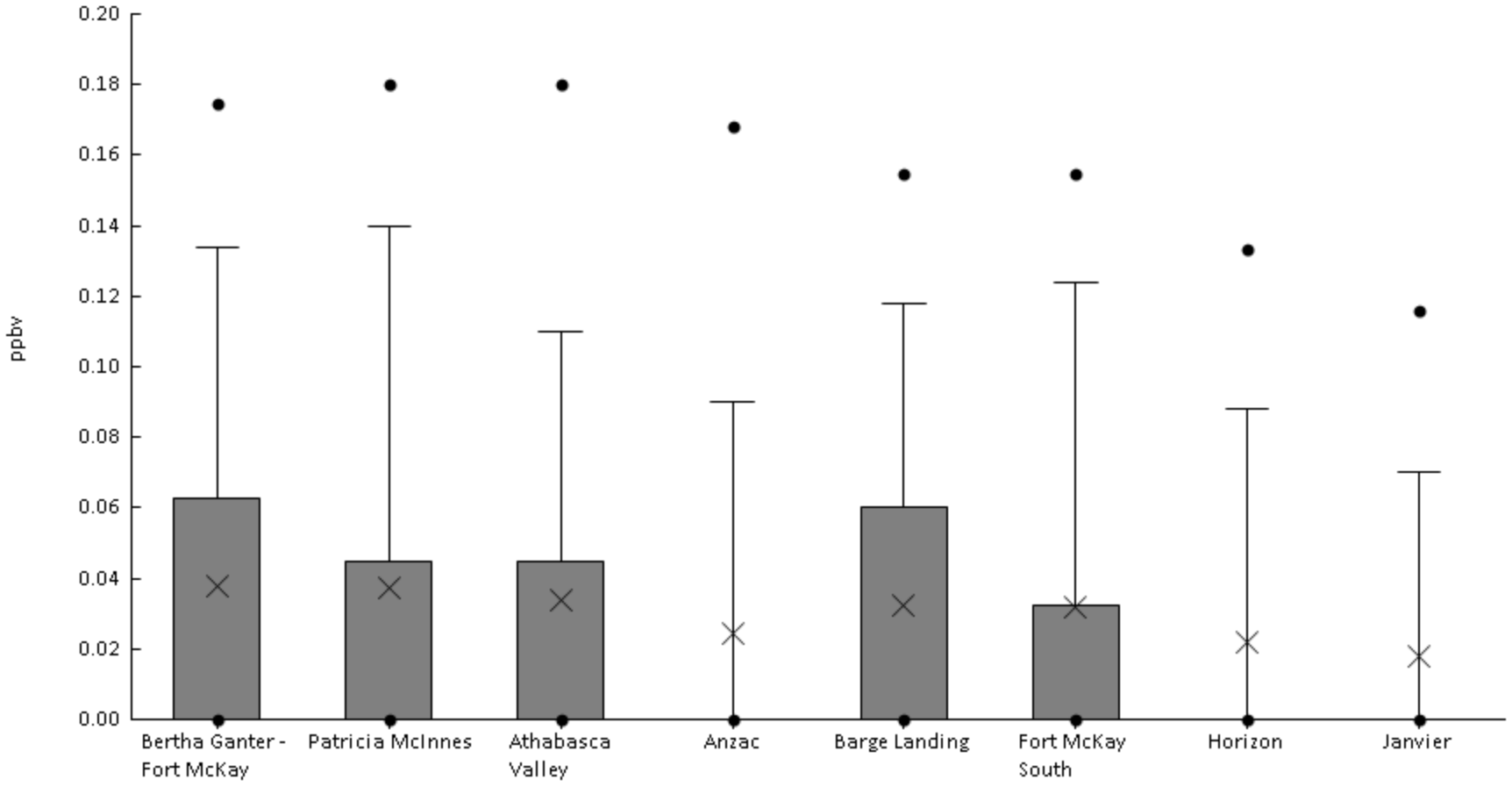
Volatile Organic Compounds - n-Undecane (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	36%	0	0	0	0	0	0.033	0.12	0.17	0.22	0.032	0.059
AMS06	Patricia McInnes	60	23%	0	0	0	0	0	0	0.075	0.12	0.23	0.017	0.046
AMS07	Athabasca Valley	60	27%	0	0	0	0	0	0.02	0.11	0.13	0.22	0.021	0.047
AMS14	Anzac	61	11%	0	0	0	0	0	0	0.014	0.029	0.12	5.1E-3	0.019
AMS09	Barge Landing	61	36%	0	0	0	0	0	0.033	0.12	0.17	0.22	0.034	0.06
AMS13	Fort McKay South	60	40%	0	0	0	0	0	0.05	0.13	0.17	0.22	0.036	0.059
AMS15	Horizon	61	23%	0	0	0	0	0	0	0.054	0.12	0.17	0.016	0.038
AMS22	Janvier	58	22%	0	0	0	0	0	0	0.054	0.12	0.22	0.016	0.043



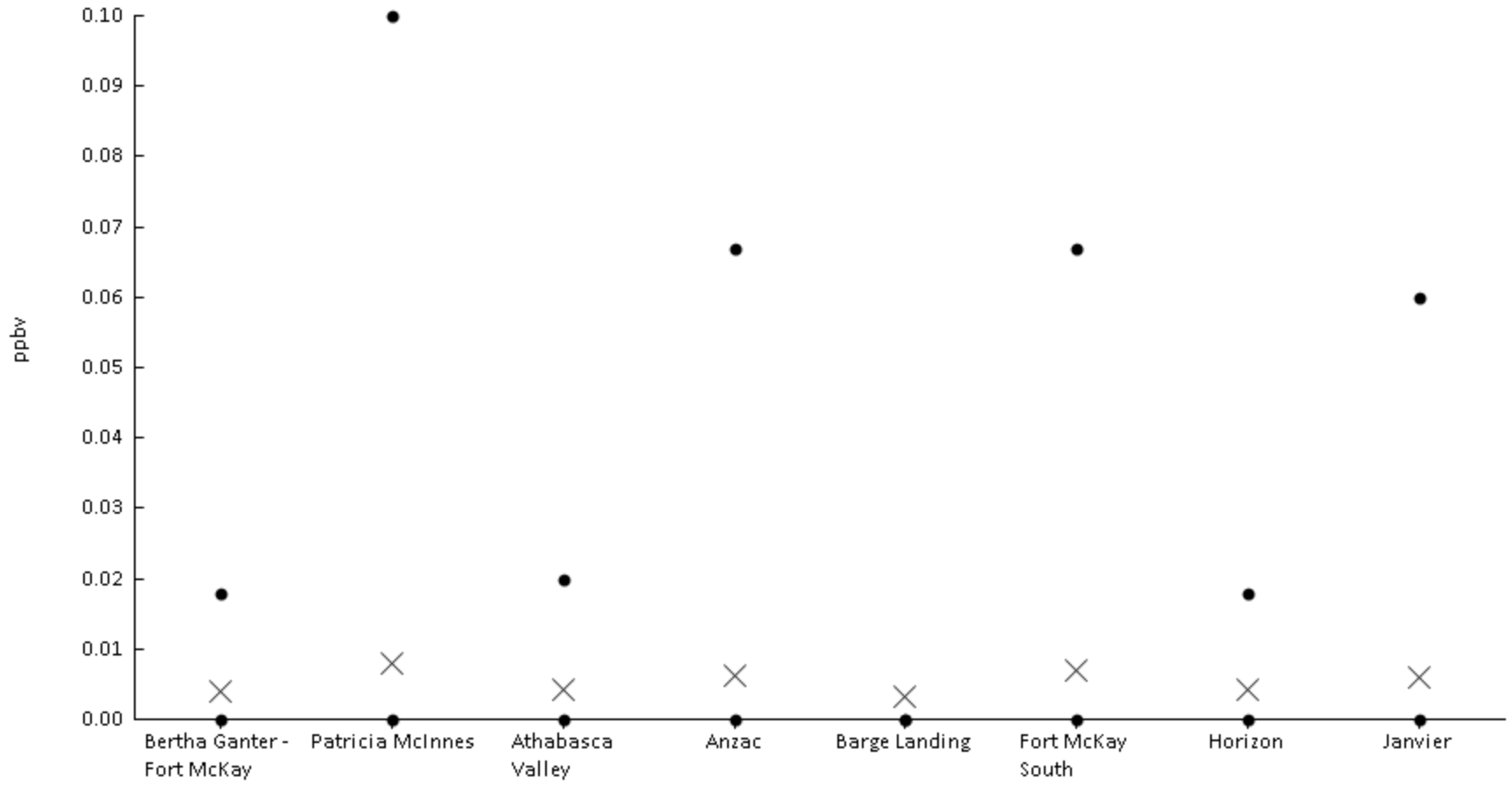
Volatile Organic Compounds - o-Xylene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	31%	0	0	0	0	0	0.063	0.13	0.17	0.39	0.038	0.072
AMS06	Patricia McInnes	60	33%	0	0	0	0	0	0.045	0.14	0.18	0.37	0.037	0.077
AMS07	Athabasca Valley	60	35%	0	0	0	0	0	0.045	0.11	0.18	0.35	0.034	0.067
AMS14	Anzac	61	23%	0	0	0	0	0	0	0.09	0.17	0.35	0.024	0.061
AMS09	Barge Landing	61	30%	0	0	0	0	0	0.06	0.12	0.15	0.36	0.032	0.064
AMS13	Fort McKay South	61	28%	0	0	0	0	0	0.033	0.12	0.15	0.35	0.032	0.065
AMS15	Horizon	61	21%	0	0	0	0	0	0	0.088	0.13	0.29	0.022	0.054
AMS22	Janvier	58	21%	0	0	0	0	0	0	0.07	0.12	0.21	0.018	0.044



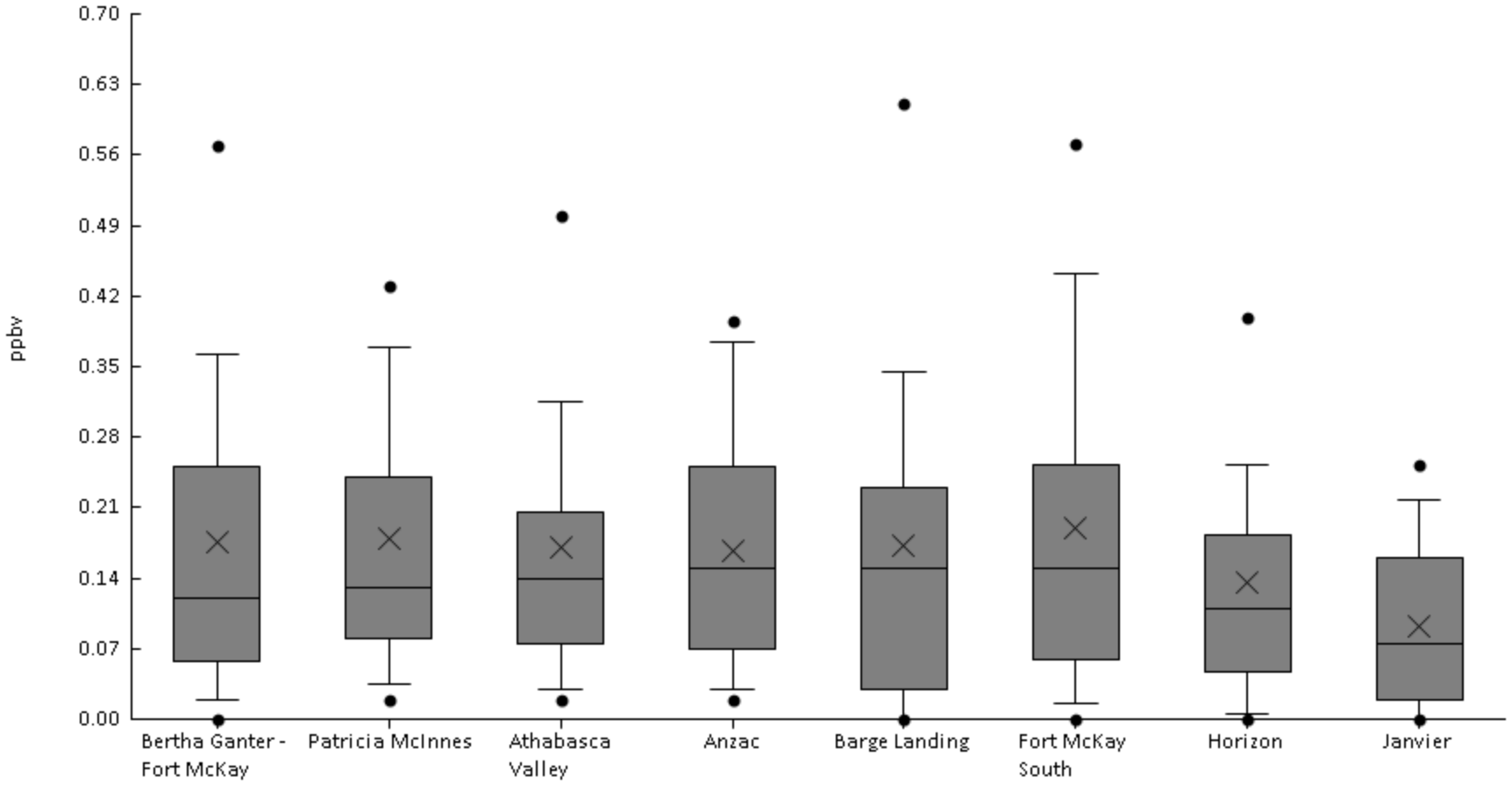
Volatile Organic Compounds - Styrene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	5%	0	0	0	0	0	0	0	0.018	0.1	3.9E-3	0.019
AMS06	Patricia McInnes	60	8%	0	0	0	0	0	0	0	0.1	0.13	8E-3	0.028
AMS07	Athabasca Valley	60	5%	0	0	0	0	0	0	0	0.02	0.11	4.2E-3	0.02
AMS14	Anzac	61	7%	0	0	0	0	0	0	0	0.067	0.13	6.2E-3	0.025
AMS09	Barge Landing	61	3%	0	0	0	0	0	0	0	0	0.1	3.3E-3	0.018
AMS13	Fort McKay South	61	7%	0	0	0	0	0	0	0	0.067	0.19	7E-3	0.03
AMS15	Horizon	61	5%	0	0	0	0	0	0	0	0.018	0.12	4.3E-3	0.02
AMS22	Janvier	58	5%	0	0	0	0	0	0	0	0.06	0.13	6E-3	0.026



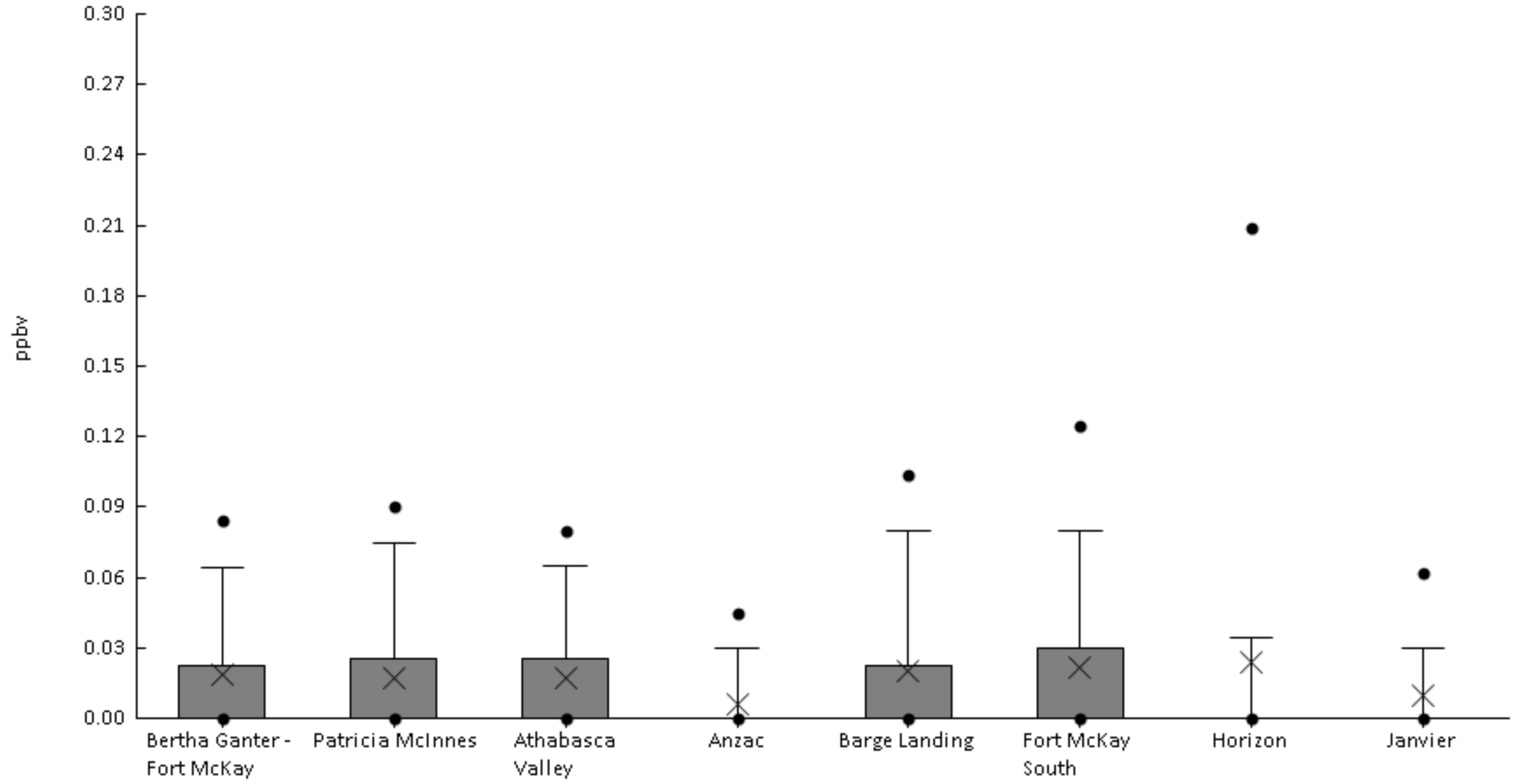
Volatile Organic Compounds - Toluene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	0.02	0.058	0.12	0.25	0.36	0.57	0.86	0.18	0.18
AMS06	Patricia McInnes	60	97%	0	0.02	0.035	0.08	0.13	0.24	0.37	0.43	1.2	0.18	0.18
AMS07	Athabasca Valley	60	97%	0	0.02	0.03	0.075	0.14	0.21	0.32	0.5	0.88	0.17	0.16
AMS14	Anzac	61	97%	0	0.02	0.03	0.07	0.15	0.25	0.37	0.39	0.41	0.17	0.12
AMS09	Barge Landing	61	89%	0	0	0	0.03	0.15	0.23	0.34	0.61	0.67	0.17	0.16
AMS13	Fort McKay South	61	92%	0	0	0.016	0.06	0.15	0.25	0.44	0.57	0.83	0.19	0.18
AMS15	Horizon	61	90%	0	0	6E-3	0.048	0.11	0.18	0.25	0.4	0.72	0.14	0.13
AMS22	Janvier	58	79%	0	0	0	0.02	0.075	0.16	0.22	0.25	0.33	0.092	0.084



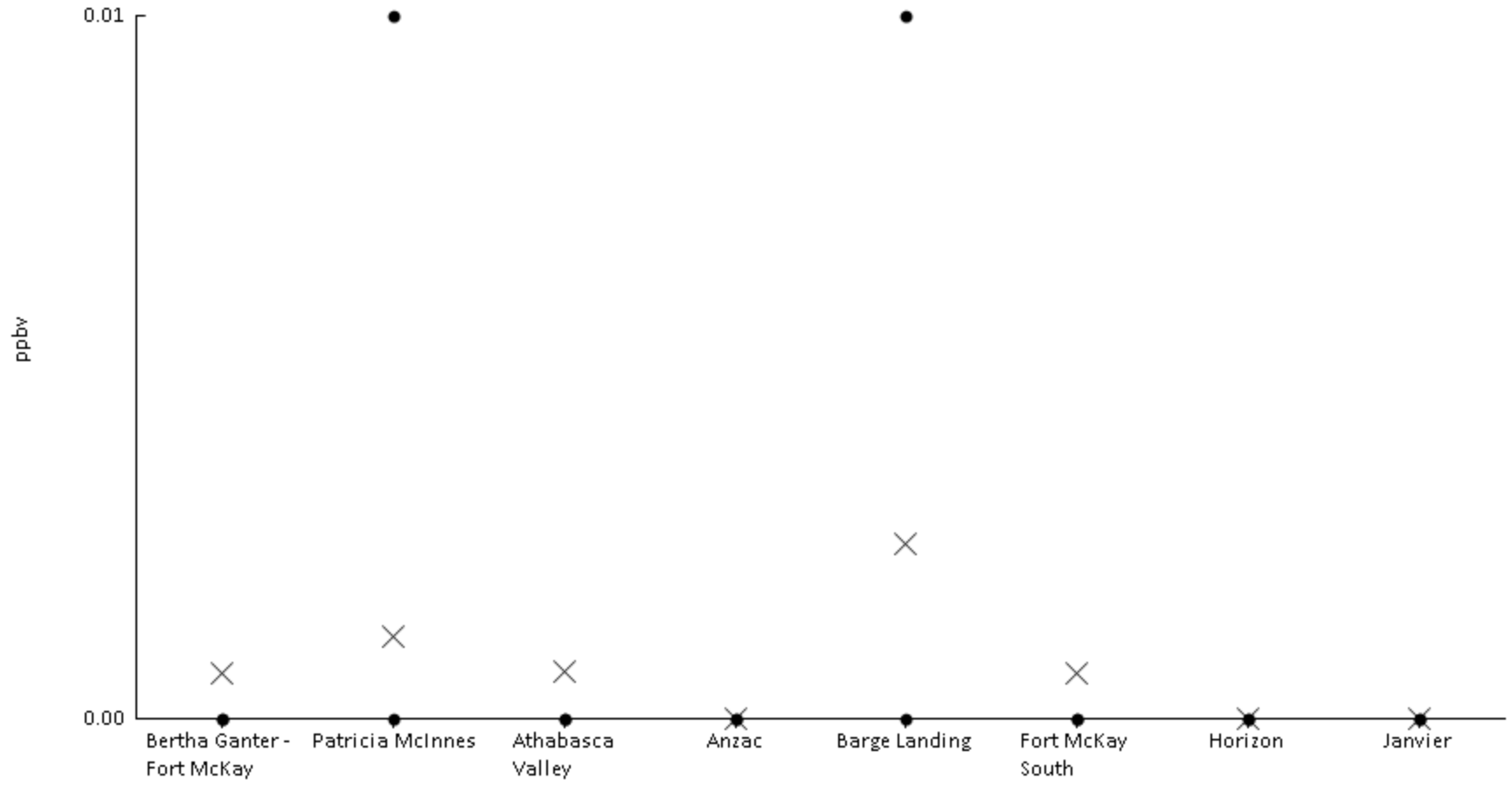
Volatile Organic Compounds - trans-2-Butene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	33%	0	0	0	0	0	0.023	0.064	0.085	0.24	0.019	0.041
AMS06	Patricia McInnes	60	33%	0	0	0	0	0	0.025	0.075	0.09	0.15	0.017	0.033
AMS07	Athabasca Valley	60	32%	0	0	0	0	0	0.025	0.065	0.08	0.19	0.017	0.033
AMS14	Anzac	61	16%	0	0	0	0	0	0	0.03	0.045	0.08	6.2E-3	0.016
AMS09	Barge Landing	61	31%	0	0	0	0	0	0.023	0.08	0.1	0.23	0.02	0.044
AMS13	Fort McKay South	61	31%	0	0	0	0	0	0.03	0.08	0.12	0.28	0.022	0.048
AMS15	Horizon	61	20%	0	0	0	0	0	0	0.034	0.21	0.42	0.024	0.077
AMS22	Janvier	58	21%	0	0	0	0	0	0	0.03	0.062	0.15	0.01	0.026



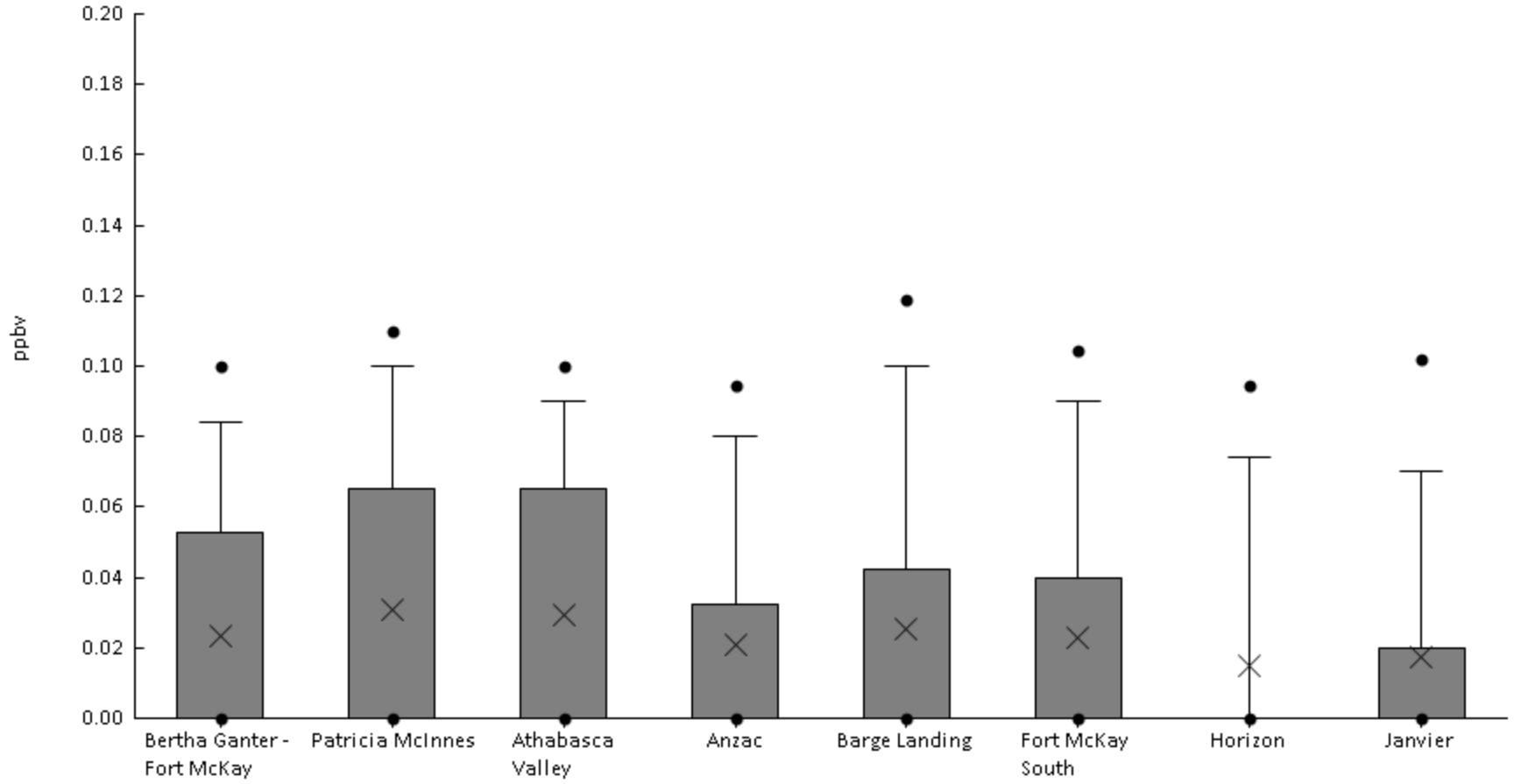
Volatile Organic Compounds - trans-2-Hexene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	3%	0	0	0	0	0	0	0	0	0.02	6.6E-4	3.6E-3
AMS06	Patricia McInnes	60	5%	0	0	0	0	0	0	0	0.01	0.03	1.2E-3	5.2E-3
AMS07	Athabasca Valley	60	3%	0	0	0	0	0	0	0	0	0.02	6.7E-4	3.6E-3
AMS14	Anzac	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	60	5%	0	0	0	0	0	0	0	0.01	0.07	2.5E-3	0.012
AMS13	Fort McKay South	61	3%	0	0	0	0	0	0	0	0	0.02	6.6E-4	3.6E-3
AMS15	Horizon	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	58	0%	0	0	0	0	0	0	0	0	0	0	0



Volatile Organic Compounds - trans-2-Pentene (ppbv) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	33%	0	0	0	0	0	0.053	0.084	0.1	0.17	0.024	0.04
AMS06	Patricia McInnes	60	42%	0	0	0	0	0	0.065	0.1	0.11	0.17	0.031	0.043
AMS07	Athabasca Valley	60	40%	0	0	0	0	0	0.065	0.09	0.1	0.17	0.029	0.042
AMS14	Anzac	61	30%	0	0	0	0	0	0.033	0.08	0.095	0.17	0.021	0.037
AMS09	Barge Landing	61	33%	0	0	0	0	0	0.043	0.1	0.12	0.18	0.025	0.044
AMS13	Fort McKay South	61	33%	0	0	0	0	0	0.04	0.09	0.1	0.17	0.023	0.04
AMS15	Horizon	61	20%	0	0	0	0	0	0	0.074	0.095	0.17	0.015	0.035
AMS22	Janvier	58	26%	0	0	0	0	0	0.02	0.07	0.1	0.17	0.018	0.036



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER - IONS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER ($PM_{2.5}$) - IONS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

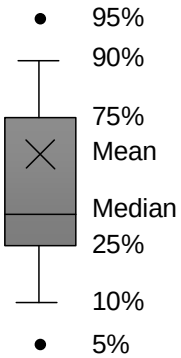
PM ions:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	µg/m^3 (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $PM_{2.5}$
PARTICLE DIAMETER	< 2.5 µm or < 10 µm
MEDIUM	47 mm Teflon Filter
ANALYTICALMETHODS	MASS by Microbalance
	ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS)
	IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc Desert Research Institute
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (µg/m^3) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler
	For $PM_{2.5}$ FRM Partisol $PM_{2.5}$ sampler

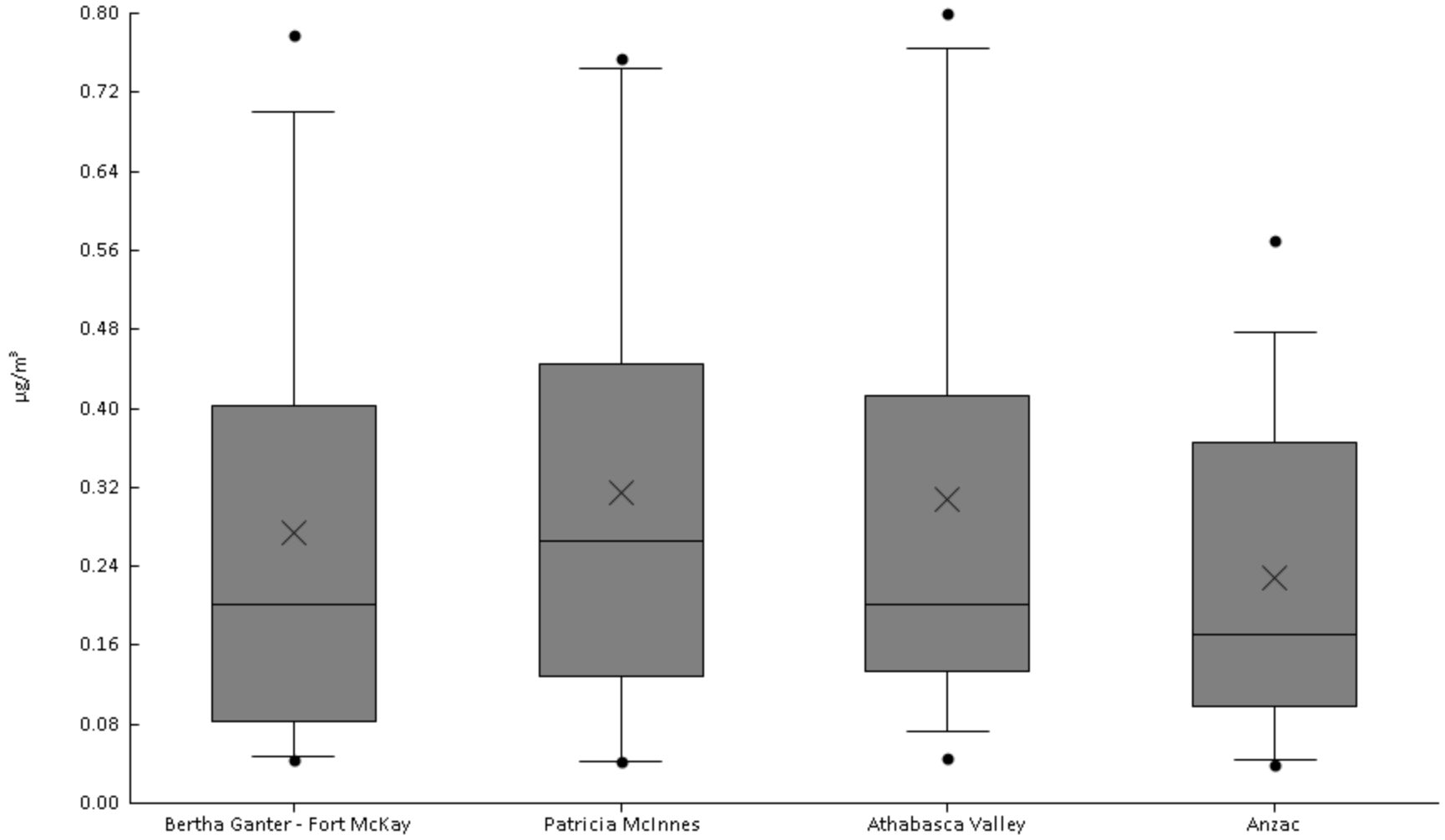
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



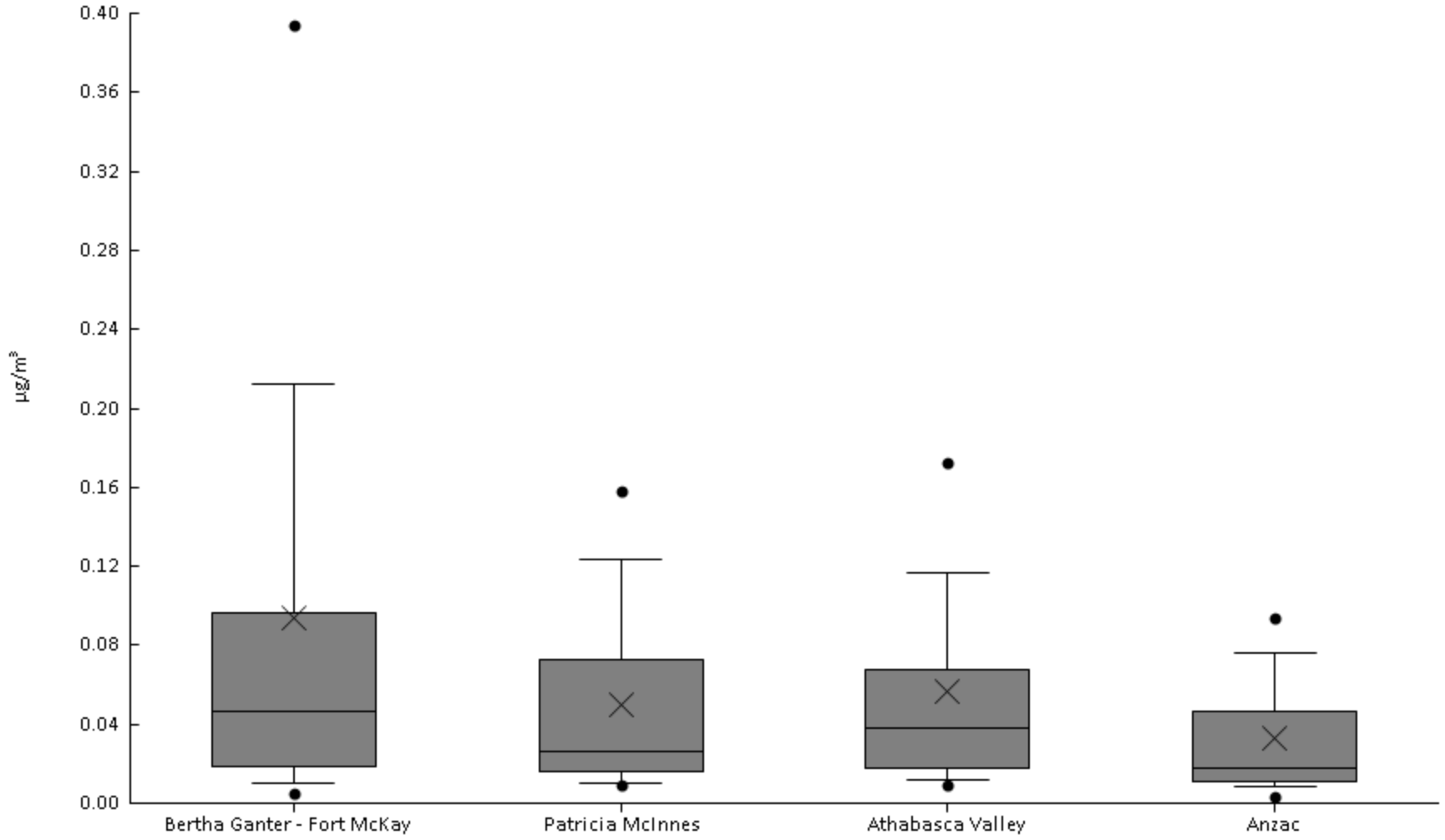
Particulate Matter (PM2.5 IONS) - Ammonium (as N) (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	14	100%	0.043	0.044	0.047	0.083	0.2	0.4	0.7	0.78	0.8	0.27	0.24
AMS06	Patricia McInnes	13	100%	0.042	0.042	0.043	0.13	0.26	0.45	0.74	0.75	0.76	0.31	0.25
AMS07	Athabasca Valley	13	100%	0.04	0.046	0.072	0.13	0.2	0.41	0.77	0.8	0.81	0.31	0.25
AMS14	Anzac	14	100%	0.038	0.039	0.044	0.098	0.17	0.36	0.48	0.57	0.6	0.23	0.17



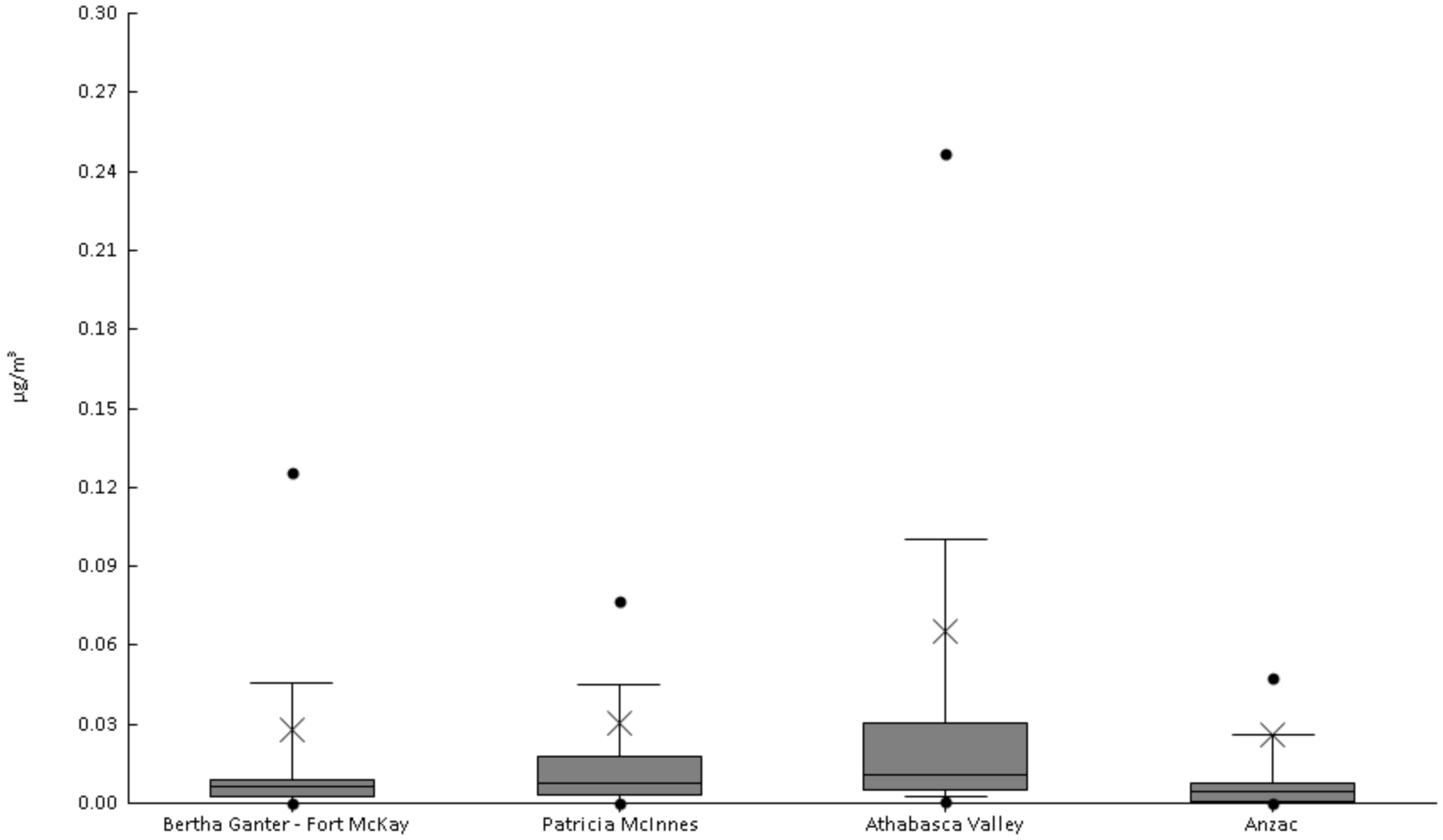
Particulate Matter (PM2.5 IONS) - Calcium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	4.3E-3	5E-3	0.01	0.019	0.047	0.097	0.21	0.39	0.84	0.094	0.14
AMS06	Patricia McInnes	59	100%	4.1E-3	9.1E-3	0.011	0.016	0.026	0.072	0.12	0.16	0.19	0.05	0.048
AMS07	Athabasca Valley	60	100%	6.2E-3	9.1E-3	0.012	0.018	0.038	0.068	0.12	0.17	0.48	0.057	0.072
AMS14	Anzac	58	98%	0	3.7E-3	8.5E-3	0.011	0.018	0.047	0.076	0.094	0.14	0.033	0.031



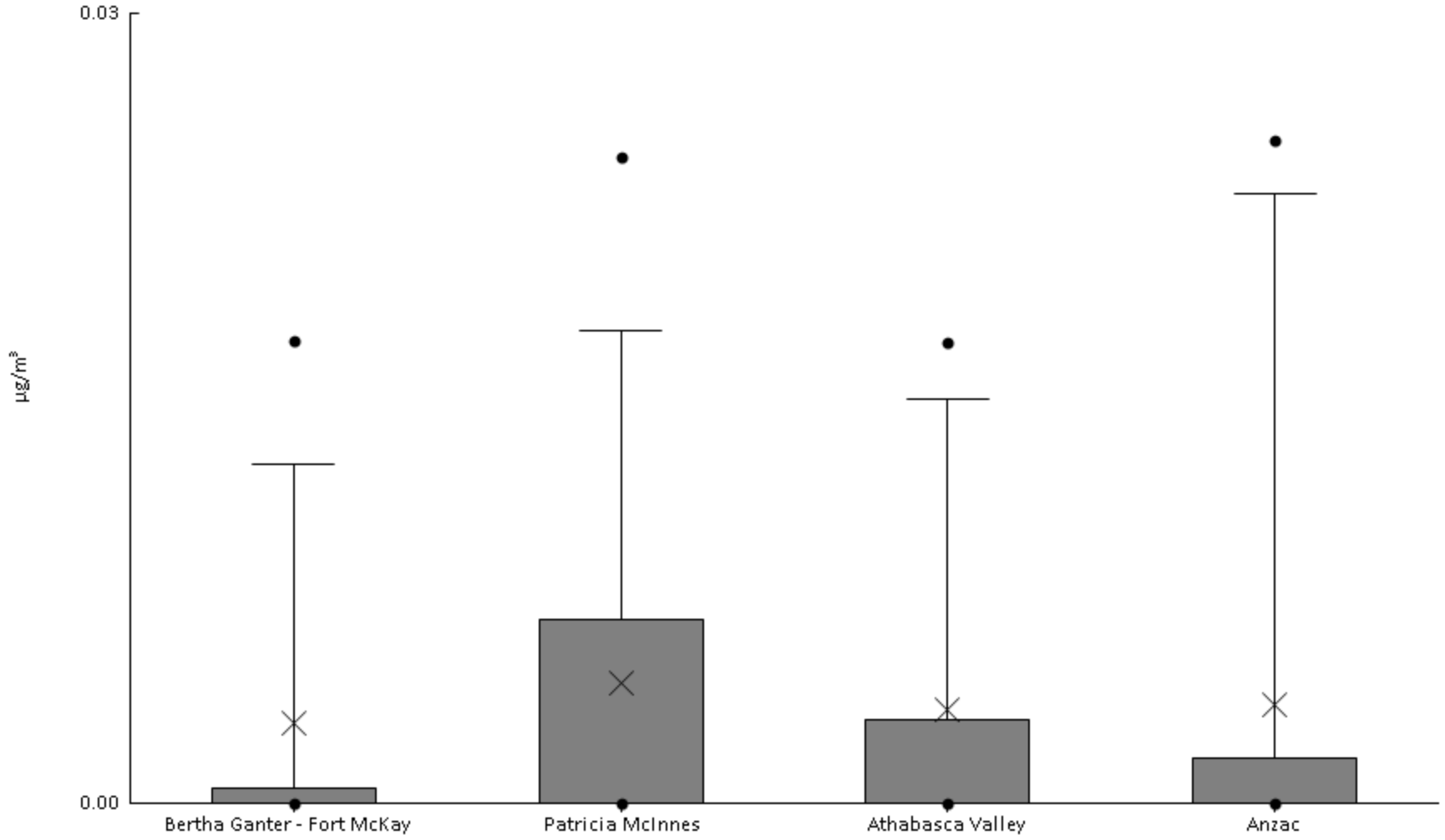
Particulate Matter (PM2.5 IONS) - Chloride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	85%	0	0	0	2.7E-3	6.3E-3	9.1E-3	0.046	0.13	0.48	0.028	0.089
AMS06	Patricia McInnes	58	83%	0	0	0	2.9E-3	7.9E-3	0.018	0.045	0.076	0.69	0.031	0.1
AMS07	Athabasca Valley	60	93%	0	3.5E-4	2.5E-3	5.2E-3	0.011	0.03	0.1	0.25	1.3	0.065	0.21
AMS14	Anzac	55	73%	0	0	0	8.5E-4	4.6E-3	7.5E-3	0.026	0.048	0.54	0.026	0.097



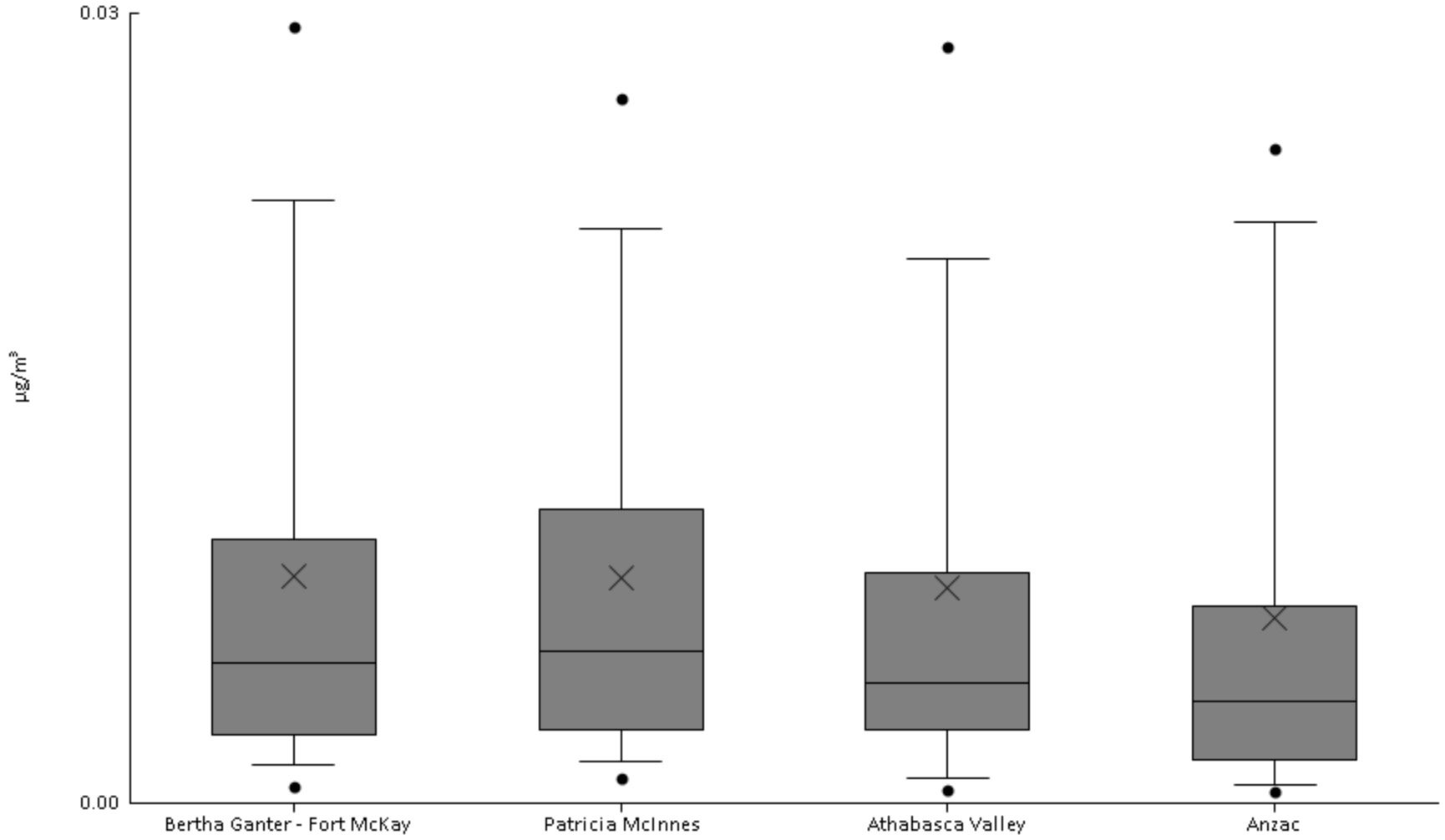
Particulate Matter (PM2.5 IONS) - Fluoride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	49	27%	0	0	0	0	0	6E-4	0.013	0.018	0.031	3E-3	7E-3
AMS06	Patricia McInnes	41	34%	0	0	0	0	0	7E-3	0.018	0.025	0.032	4.6E-3	8.4E-3
AMS07	Athabasca Valley	41	34%	0	0	0	0	0	3.2E-3	0.015	0.018	0.028	3.6E-3	6.9E-3
AMS14	Anzac	33	27%	0	0	0	0	0	1.7E-3	0.023	0.025	0.028	3.8E-3	8.3E-3



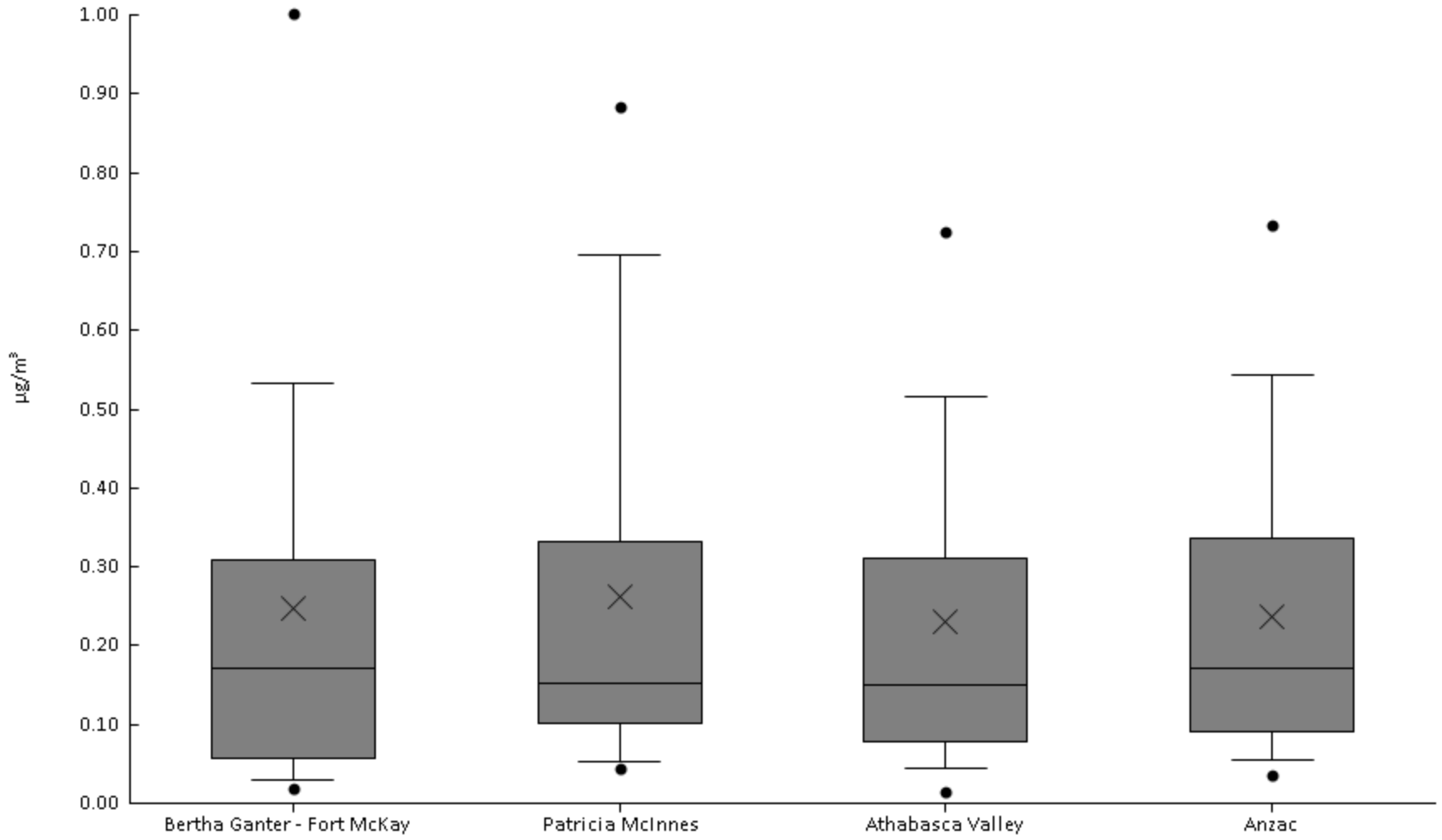
Particulate Matter (PM2.5 IONS) - Magnesium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	1.6E-4	6.6E-4	1.5E-3	2.6E-3	5.3E-3	0.01	0.023	0.029	0.044	8.6E-3	9.5E-3
AMS06	Patricia McInnes	57	100%	4.4E-4	9.3E-4	1.6E-3	2.8E-3	5.8E-3	0.011	0.022	0.027	0.04	8.5E-3	8.7E-3
AMS07	Athabasca Valley	60	98%	0	5.3E-4	9.3E-4	2.8E-3	4.6E-3	8.8E-3	0.021	0.029	0.056	8.2E-3	9.9E-3
AMS14	Anzac	58	100%	1.5E-4	4.1E-4	7.2E-4	1.7E-3	3.9E-3	7.5E-3	0.022	0.025	0.031	7E-3	7.9E-3



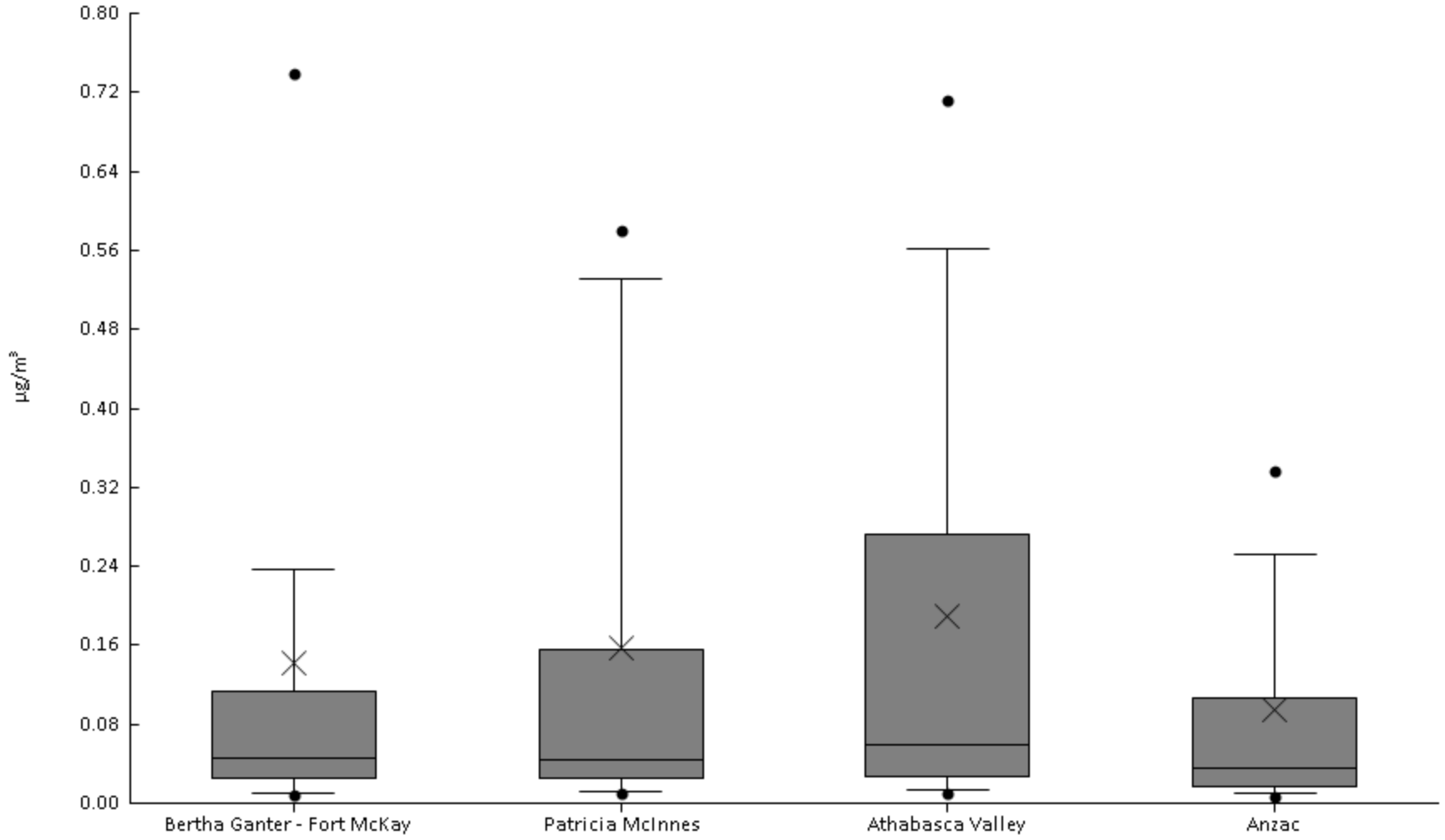
Particulate Matter (PM2.5 IONS) - Ammonium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	44	100%	7.9E-3	0.019	0.03	0.057	0.17	0.31	0.53	1	1.2	0.25	0.28
AMS06	Patricia McInnes	46	100%	3E-4	0.044	0.052	0.1	0.15	0.33	0.7	0.88	1.5	0.26	0.29
AMS07	Athabasca Valley	47	98%	0	0.015	0.044	0.078	0.15	0.31	0.52	0.73	1	0.23	0.23
AMS14	Anzac	44	100%	2E-4	0.036	0.056	0.09	0.17	0.34	0.54	0.73	0.87	0.24	0.21



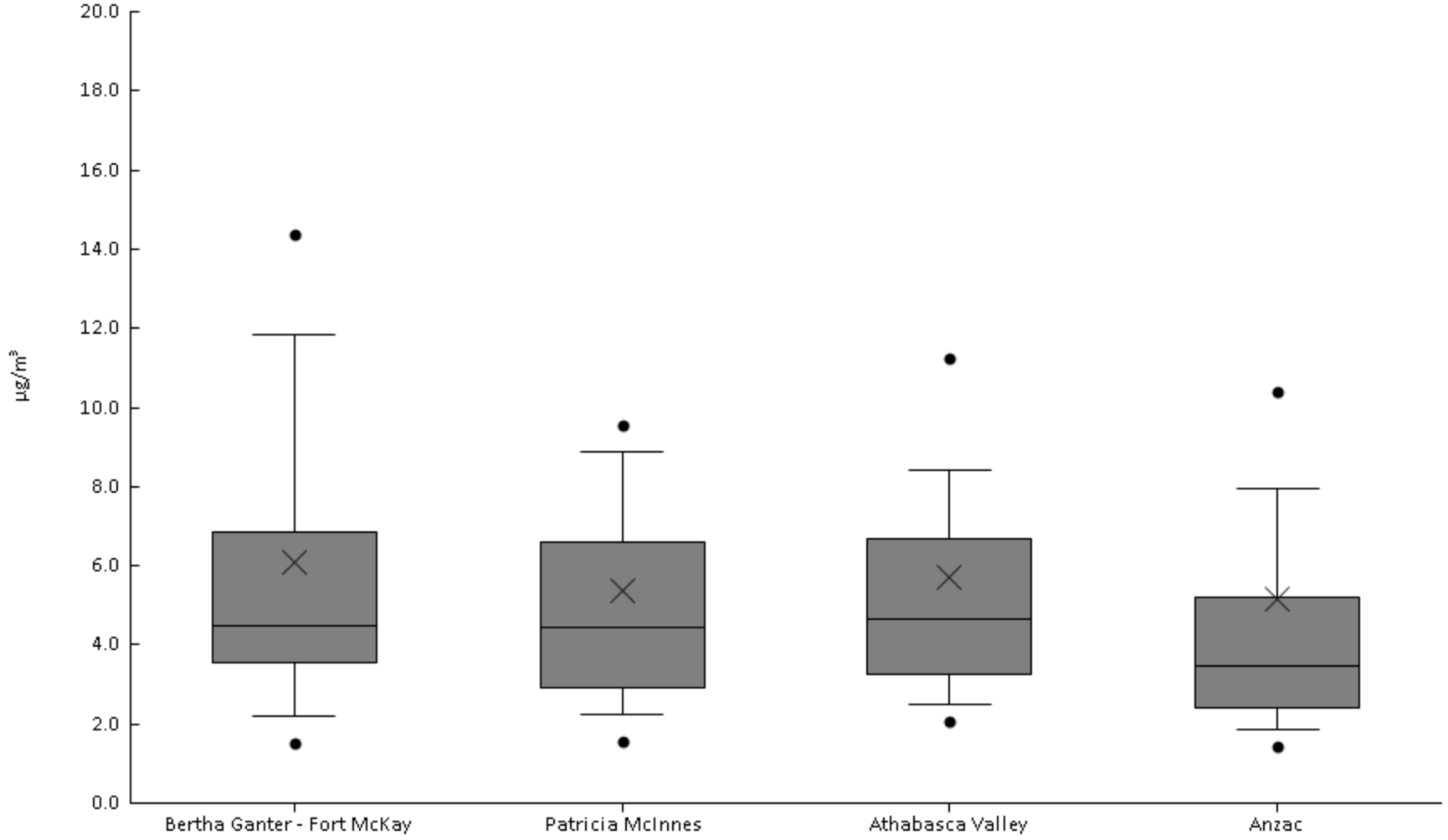
Particulate Matter (PM2.5 IONS) - Nitrate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	6.8E-3	8.2E-3	9.5E-3	0.025	0.045	0.11	0.24	0.74	1.9	0.14	0.3
AMS06	Patricia McInnes	58	100%	6.2E-3	0.011	0.012	0.026	0.043	0.16	0.53	0.58	1.3	0.16	0.26
AMS07	Athabasca Valley	59	100%	6.6E-3	0.01	0.013	0.028	0.059	0.27	0.56	0.71	1.9	0.19	0.3
AMS14	Anzac	58	98%	0	7.3E-3	9.4E-3	0.017	0.036	0.11	0.25	0.34	1.3	0.095	0.19



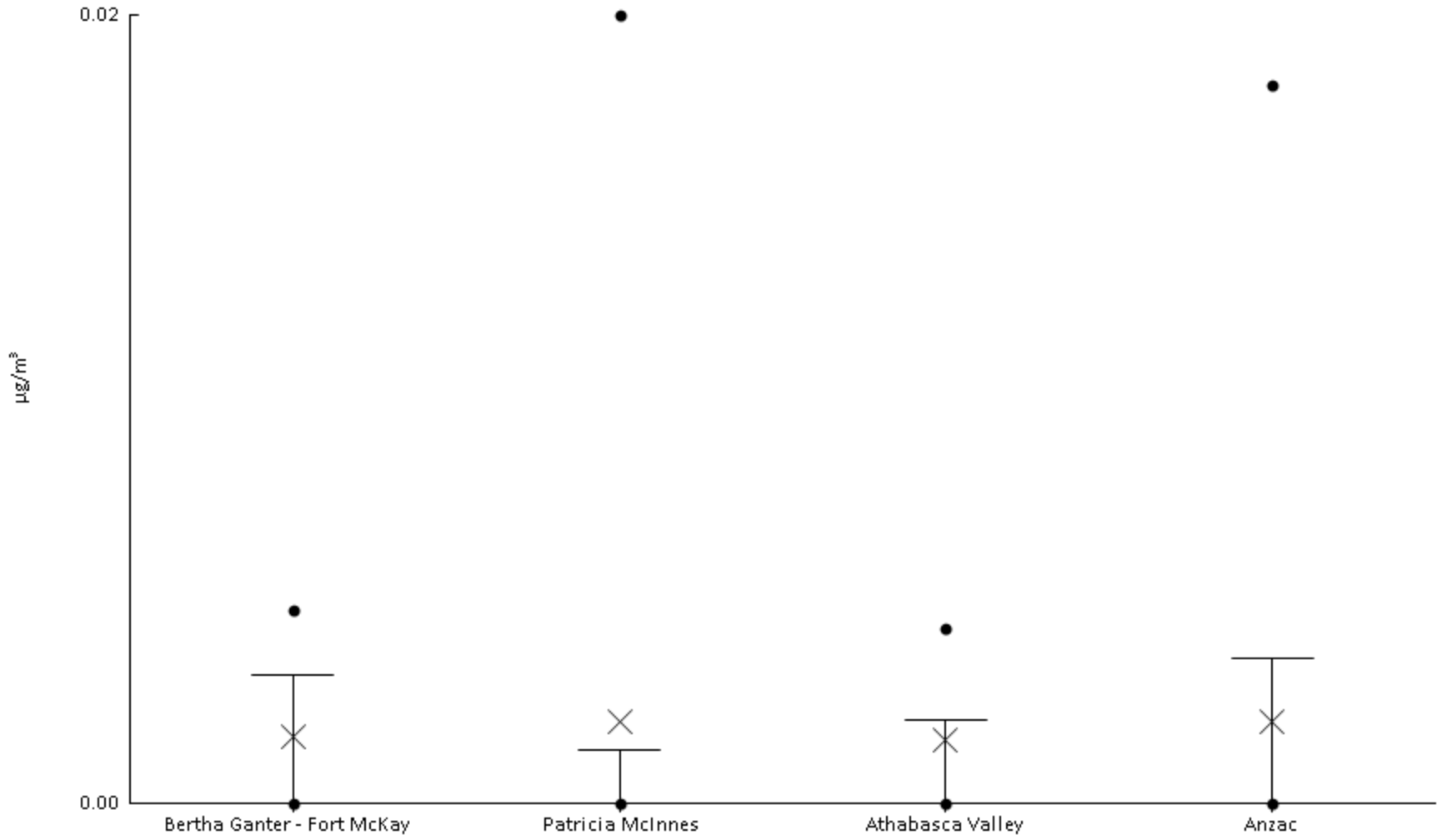
Particulate Matter (PM2.5 IONS) - Particulate Matter (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	0.96	1.5	2.2	3.6	4.5	6.8	12	14	32	6.1	5.1
AMS06	Patricia McInnes	57	100%	0.75	1.6	2.2	2.9	4.5	6.6	8.9	9.5	37	5.4	4.9
AMS07	Athabasca Valley	59	100%	1.2	2.1	2.5	3.2	4.7	6.7	8.4	11	43	5.7	5.6
AMS14	Anzac	57	100%	0.89	1.5	1.8	2.4	3.5	5.2	8	10	45	5.1	6.3



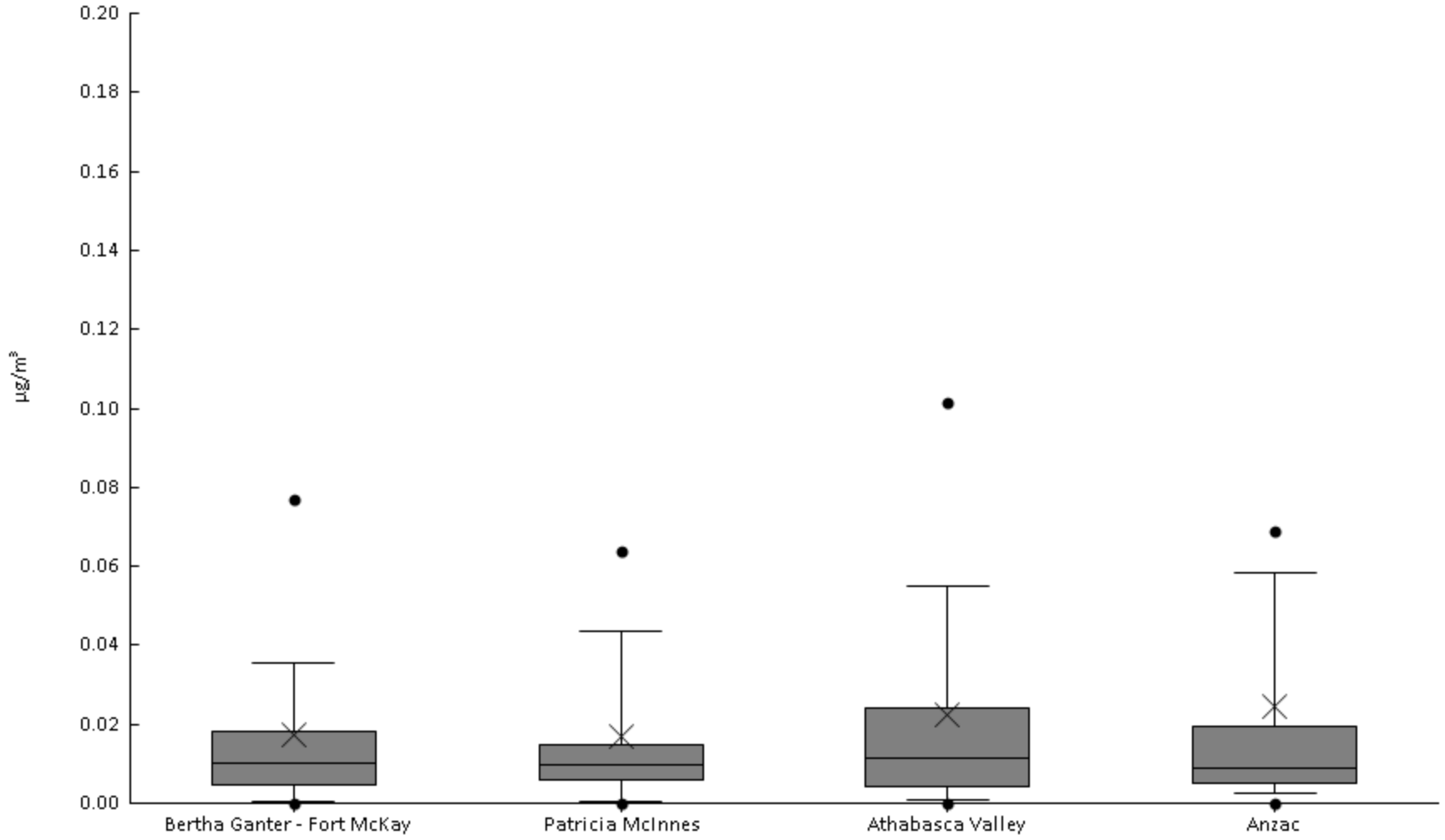
Particulate Matter (PM2.5 IONS) - Phosphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	12%	0	0	0	0	0	0	3.3E-3	4.9E-3	0.047	1.7E-3	7.3E-3
AMS06	Patricia McInnes	56	9%	0	0	0	0	0	0	1.4E-3	0.02	0.052	2.1E-3	8.5E-3
AMS07	Athabasca Valley	58	10%	0	0	0	0	0	0	2.1E-3	4.4E-3	0.047	1.6E-3	7.4E-3
AMS14	Anzac	56	12%	0	0	0	0	0	0	3.7E-3	0.018	0.05	2.1E-3	8E-3



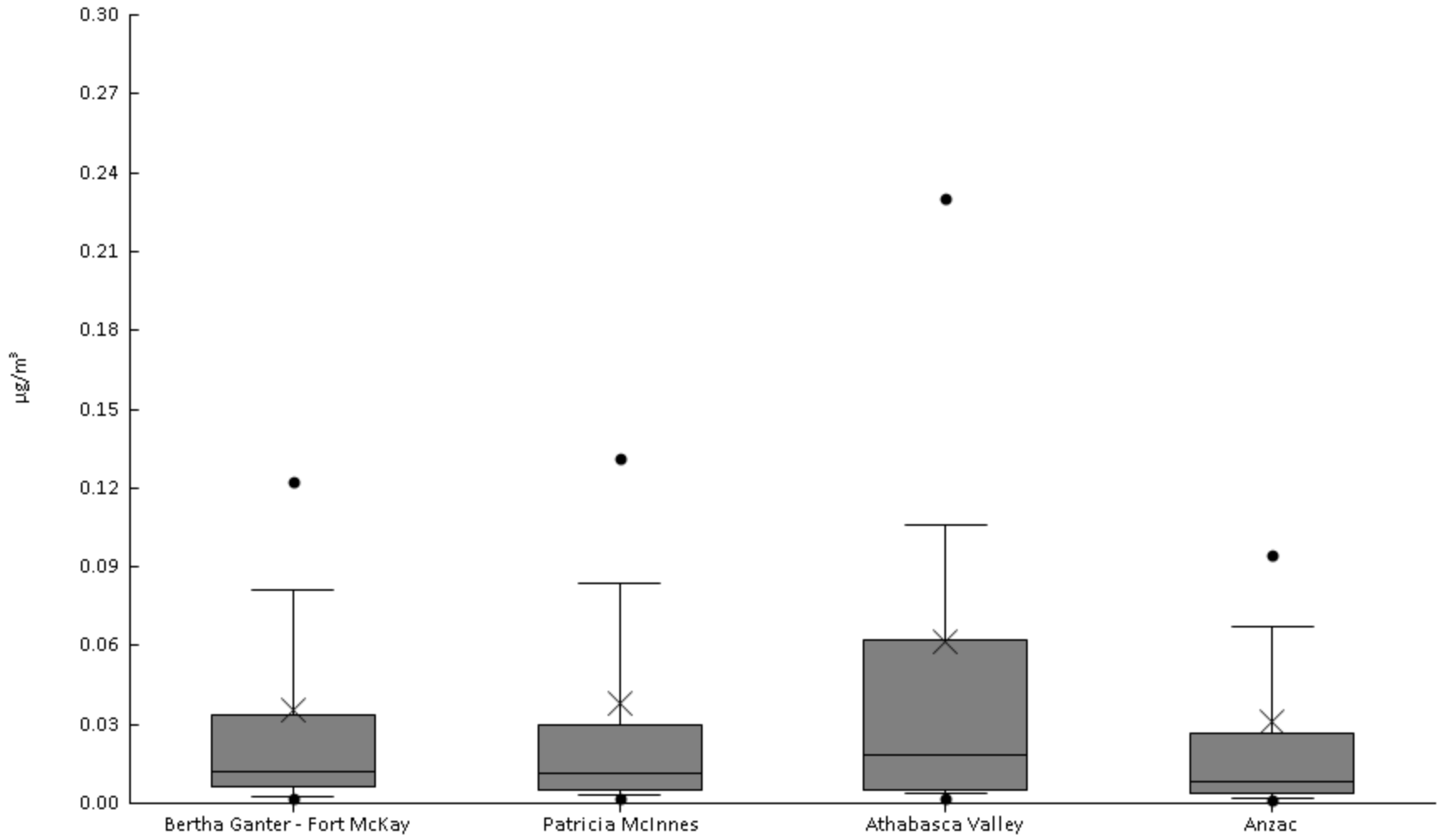
Particulate Matter (PM2.5 IONS) - Potassium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	91%	0	0	2.6E-4	4.5E-3	0.01	0.018	0.036	0.077	0.13	0.017	0.025
AMS06	Patricia McInnes	58	91%	0	0	6.3E-4	5.9E-3	9.8E-3	0.015	0.044	0.064	0.16	0.017	0.026
AMS07	Athabasca Valley	60	92%	0	0	7.5E-4	4.3E-3	0.011	0.024	0.055	0.1	0.21	0.023	0.035
AMS14	Anzac	58	93%	0	4E-5	2.7E-3	5E-3	8.9E-3	0.019	0.058	0.069	0.38	0.025	0.057



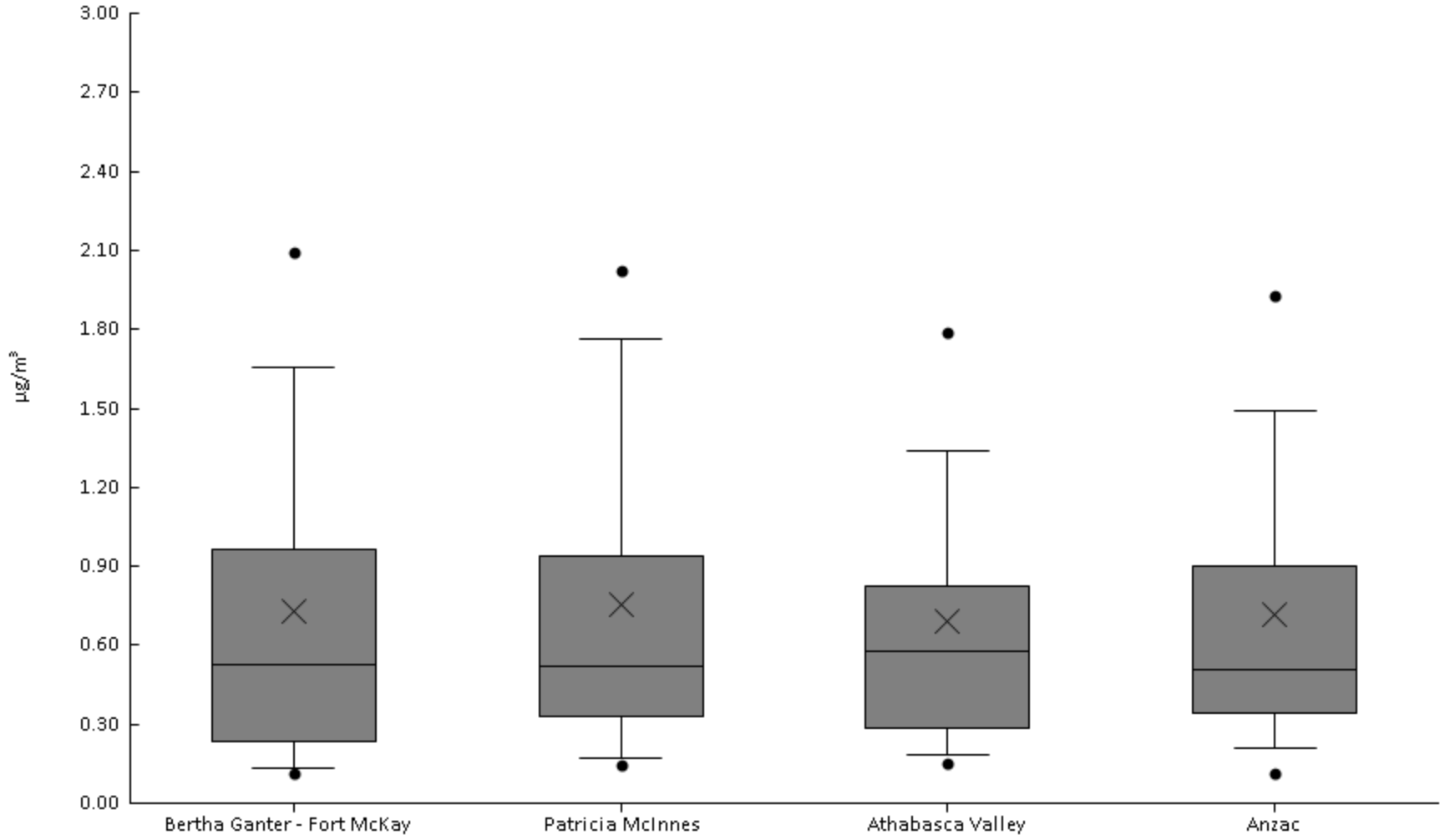
Particulate Matter (PM2.5 IONS) - Sodium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	7E-4	2.1E-3	2.8E-3	6.3E-3	0.012	0.034	0.081	0.12	0.37	0.036	0.066
AMS06	Patricia McInnes	58	100%	1E-3	2E-3	3.1E-3	5E-3	0.012	0.03	0.084	0.13	0.44	0.038	0.082
AMS07	Athabasca Valley	60	100%	8E-4	2.1E-3	3.8E-3	5.3E-3	0.018	0.062	0.11	0.23	0.91	0.062	0.14
AMS14	Anzac	55	100%	6E-4	1.5E-3	1.9E-3	3.7E-3	8.4E-3	0.027	0.068	0.094	0.41	0.031	0.072



Particulate Matter (PM2.5 IONS) - Sulphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	59	100%	0.069	0.11	0.13	0.24	0.53	0.97	1.7	2.1	2.8	0.73	0.65
AMS06	Patricia McInnes	59	100%	0.014	0.14	0.17	0.33	0.52	0.94	1.8	2	3.4	0.76	0.68
AMS07	Athabasca Valley	60	100%	0.018	0.15	0.19	0.29	0.58	0.82	1.3	1.8	2.5	0.69	0.53
AMS14	Anzac	58	100%	0.034	0.11	0.21	0.35	0.51	0.9	1.5	1.9	3.3	0.71	0.6



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER (PM_{10}) - IONS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

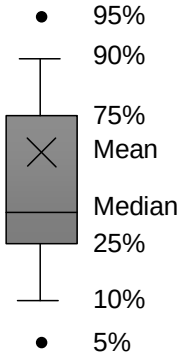
PM ions:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	µg/m^3 (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $PM_{2.5}$
PARTICLE DIAMETER	< 2.5 µm or < 10 µm
MEDIUM	47 mm Teflon Filter
ANALYTICALMETHODS	MASS by Microbalance
	ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS)
	IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc Desert Research Institute
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (µg/m^3) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler
	For $PM_{2.5}$ FRM Partisol $PM_{2.5}$ sampler

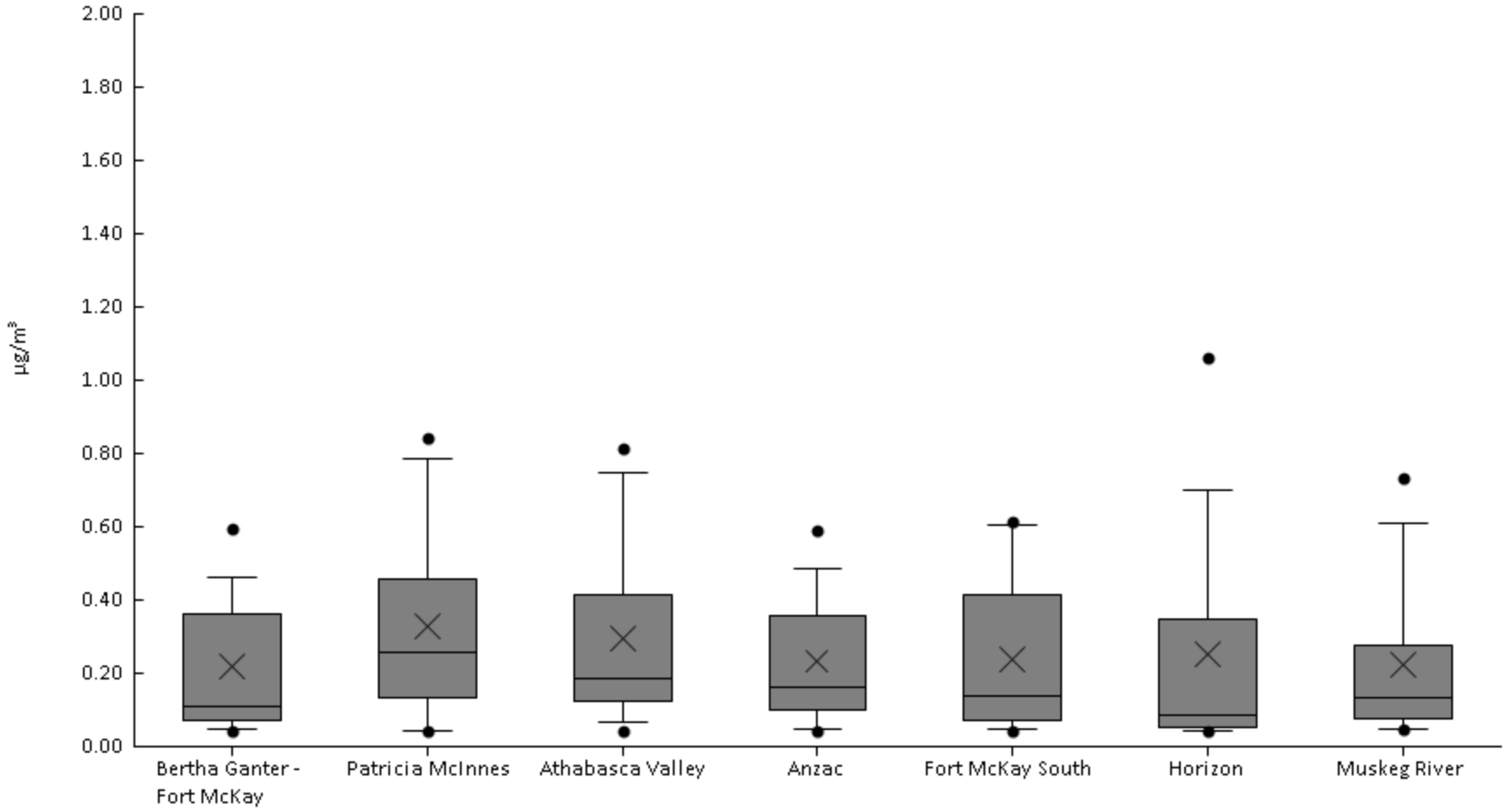
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



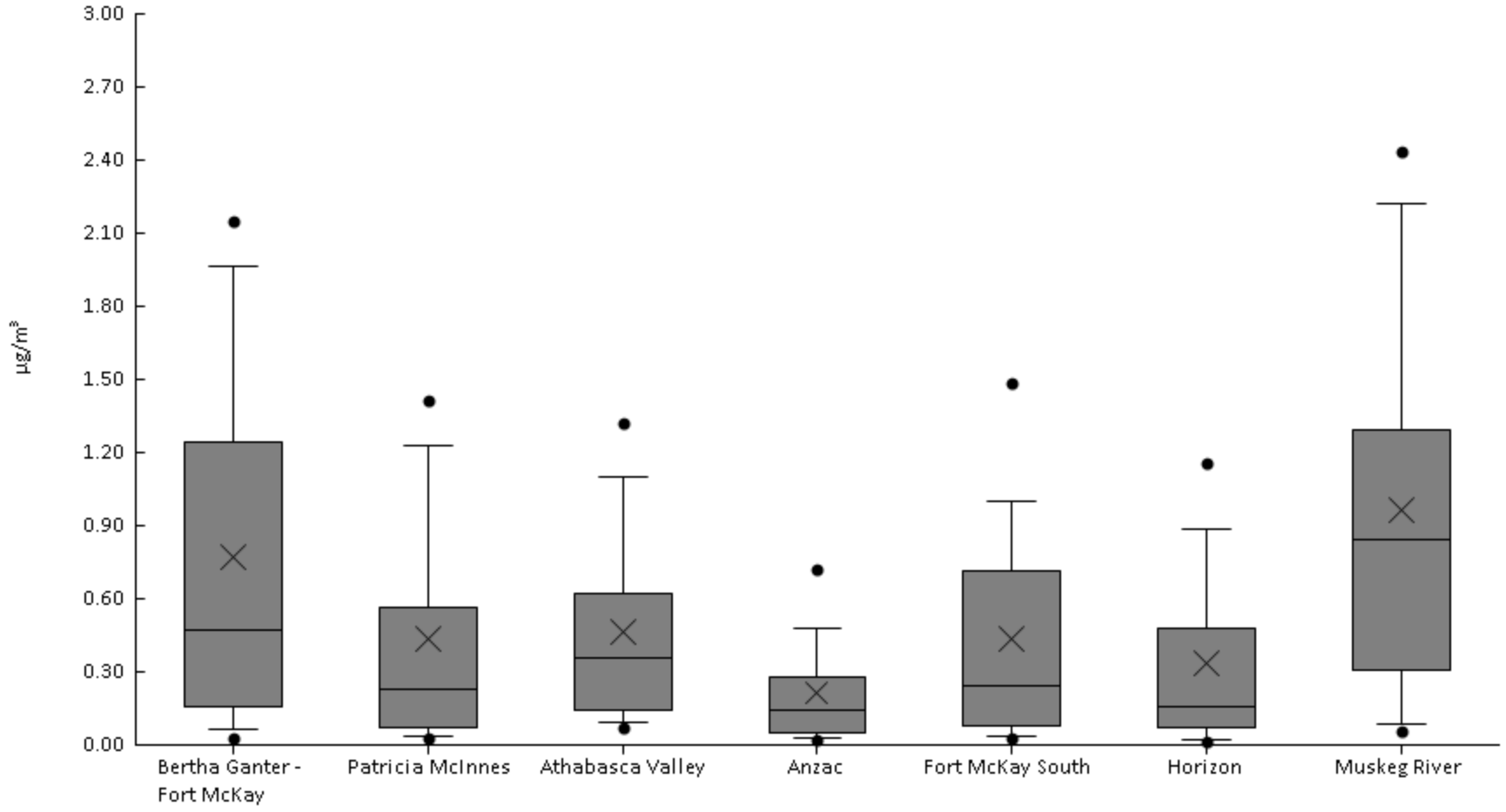
Particulate Matter (PM10 IONS) - Ammonium (as N) (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	13	100%	0.045	0.045	0.045	0.069	0.11	0.36	0.46	0.6	0.63	0.22	0.18
AMS06	Patricia McInnes	13	100%	0.041	0.041	0.042	0.13	0.26	0.46	0.78	0.84	0.86	0.33	0.27
AMS07	Athabasca Valley	12	100%	0.039	0.043	0.066	0.12	0.18	0.42	0.75	0.81	0.82	0.3	0.26
AMS14	Anzac	14	100%	0.039	0.041	0.047	0.1	0.16	0.36	0.48	0.59	0.62	0.23	0.17
AMS13	Fort McKay South	13	100%	0.045	0.045	0.045	0.07	0.14	0.41	0.61	0.62	0.62	0.24	0.21
AMS15	Horizon	13	100%	0.044	0.044	0.044	0.051	0.087	0.35	0.7	1.1	1.1	0.25	0.32
AMS16	Muskeg River	12	100%	0.049	0.049	0.05	0.075	0.13	0.28	0.61	0.73	0.75	0.22	0.22



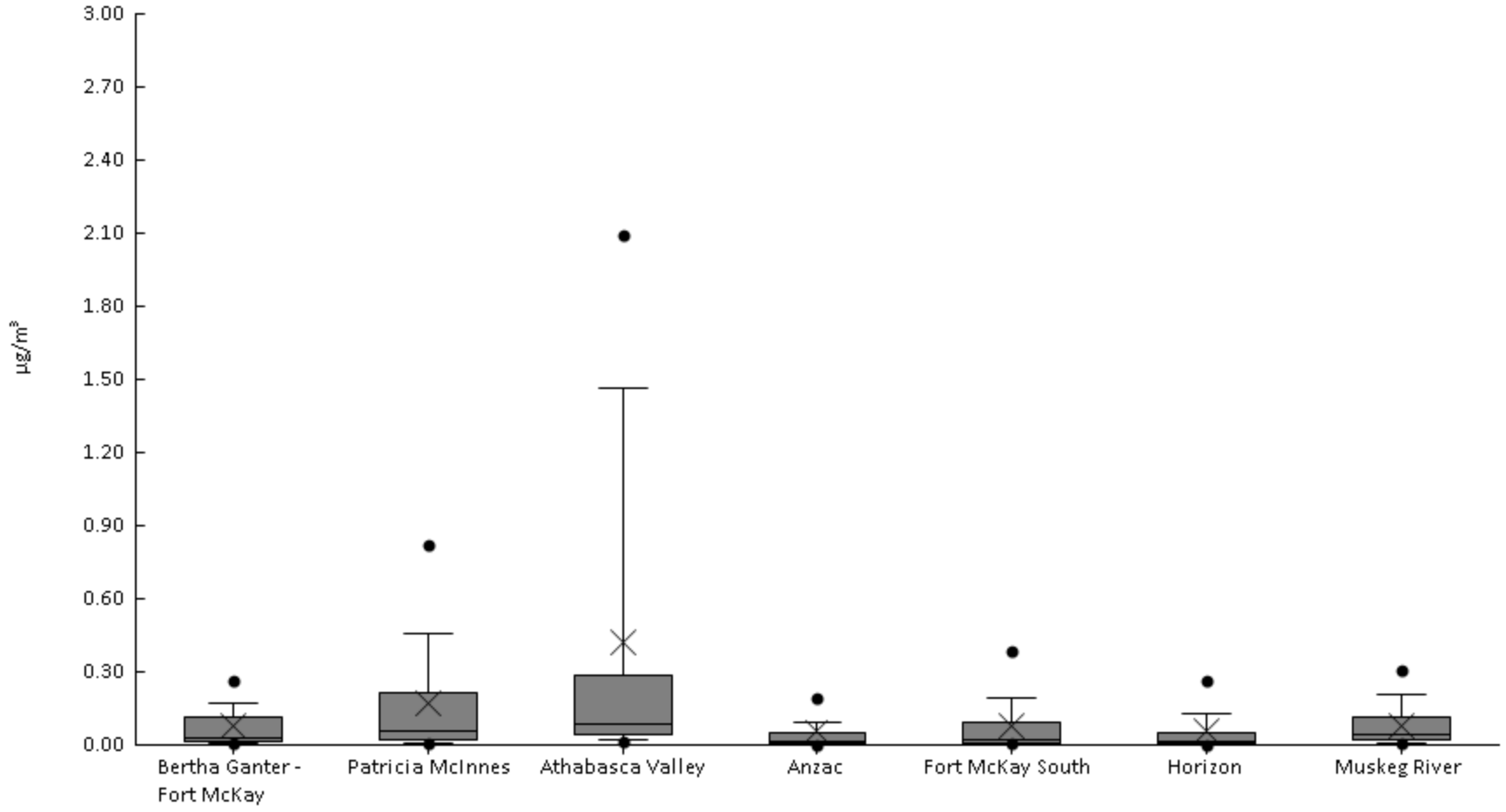
Particulate Matter (PM10 IONS) - Calcium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.013	0.032	0.066	0.16	0.47	1.2	2	2.2	2.7	0.77	0.74
AMS06	Patricia McInnes	58	100%	5.4E-3	0.027	0.034	0.072	0.23	0.56	1.2	1.4	2.6	0.44	0.5
AMS07	Athabasca Valley	59	100%	7.9E-3	0.073	0.095	0.15	0.36	0.62	1.1	1.3	2	0.47	0.42
AMS14	Anzac	59	100%	0.011	0.022	0.03	0.053	0.14	0.28	0.48	0.72	1.1	0.21	0.22
AMS13	Fort McKay South	60	100%	7.1E-3	0.026	0.038	0.076	0.24	0.71	1	1.5	2.2	0.44	0.49
AMS15	Horizon	59	100%	0.01	0.017	0.025	0.071	0.16	0.48	0.88	1.2	1.4	0.33	0.36
AMS16	Muskeg River	51	100%	0.036	0.054	0.088	0.31	0.85	1.3	2.2	2.4	3.1	0.96	0.78



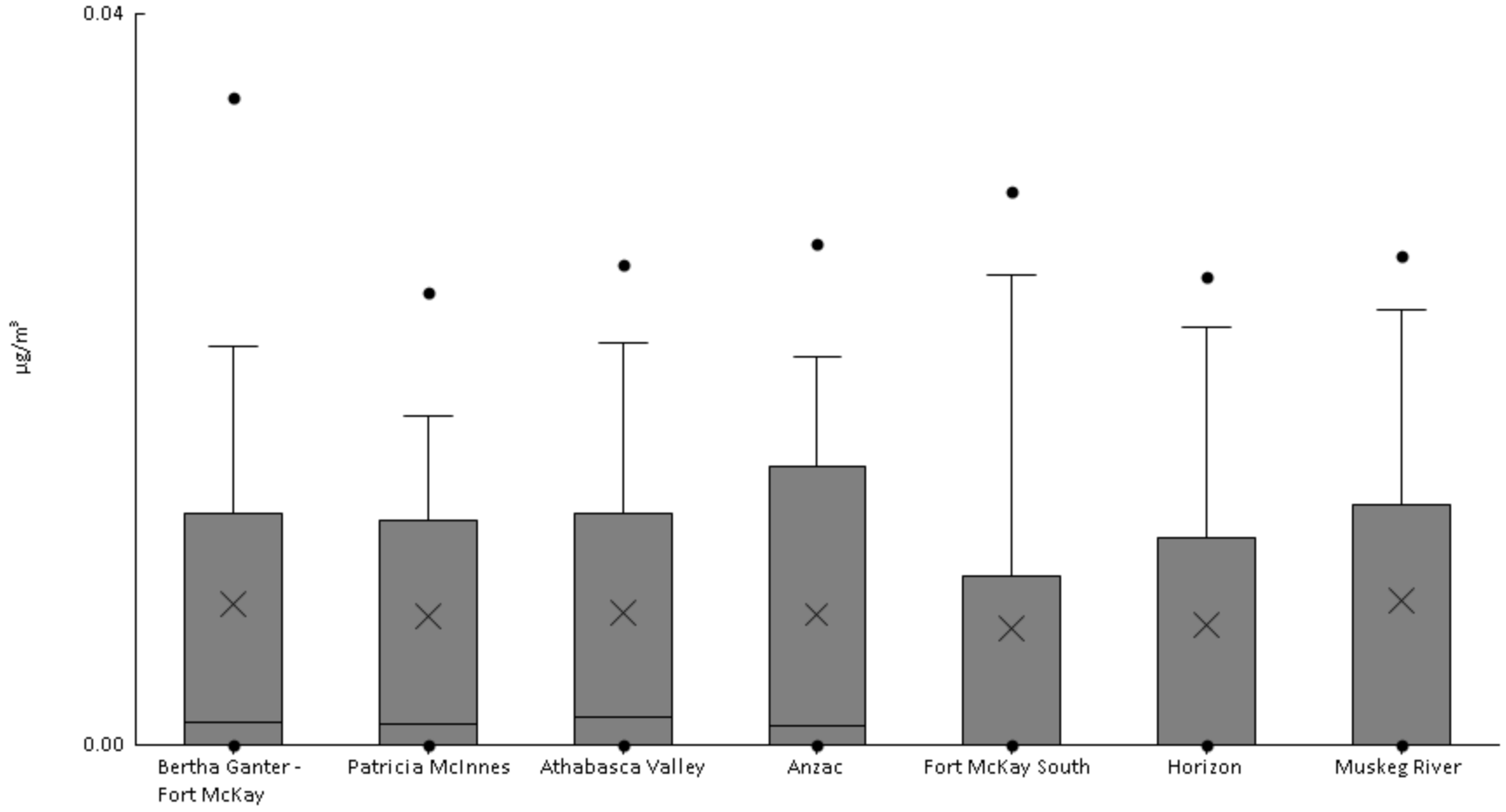
Particulate Matter (PM10 IONS) - Chloride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	3E-3	7.5E-3	9.2E-3	0.014	0.031	0.11	0.17	0.27	0.69	0.082	0.13
AMS06	Patricia McInnes	58	100%	2.7E-3	5.1E-3	8.2E-3	0.018	0.057	0.21	0.46	0.82	1.3	0.17	0.28
AMS07	Athabasca Valley	59	100%	6.3E-3	0.012	0.023	0.044	0.084	0.28	1.5	2.1	3.4	0.42	0.71
AMS14	Anzac	58	95%	0	7.2E-4	4.7E-3	8.8E-3	0.015	0.052	0.092	0.19	0.8	0.058	0.14
AMS13	Fort McKay South	60	100%	4.5E-3	5.2E-3	6.2E-3	9.2E-3	0.02	0.093	0.19	0.39	0.59	0.077	0.13
AMS15	Horizon	59	97%	0	3.3E-3	5.3E-3	7.6E-3	0.014	0.047	0.13	0.26	0.79	0.058	0.13
AMS16	Muskeg River	51	100%	4.5E-3	6.7E-3	0.01	0.021	0.045	0.11	0.21	0.31	0.39	0.08	0.086



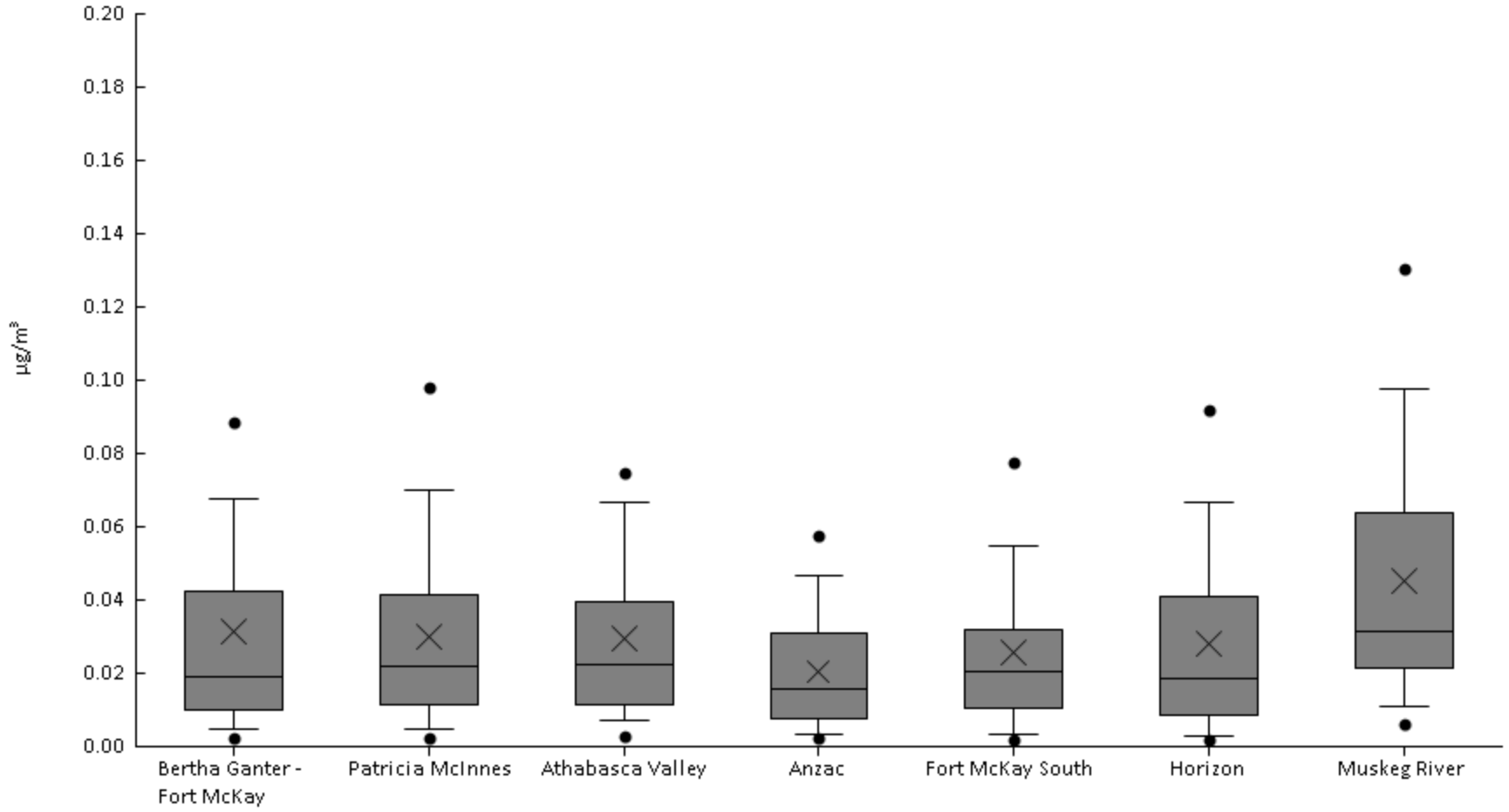
Particulate Matter (PM10 IONS) - Fluoride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	54%	0	0	0	0	1.3E-3	0.013	0.022	0.035	0.044	7.8E-3	0.011
AMS06	Patricia McInnes	57	53%	0	0	0	0	1.2E-3	0.012	0.018	0.025	0.041	7E-3	9.8E-3
AMS07	Athabasca Valley	56	55%	0	0	0	0	1.5E-3	0.013	0.022	0.026	0.047	7.3E-3	0.01
AMS14	Anzac	56	52%	0	0	0	0	1.1E-3	0.015	0.021	0.027	0.041	7.1E-3	0.01
AMS13	Fort McKay South	60	42%	0	0	0	0	0	9.2E-3	0.026	0.03	0.035	6.4E-3	0.01
AMS15	Horizon	59	46%	0	0	0	0	0	0.011	0.023	0.026	0.064	6.5E-3	0.012
AMS16	Muskeg River	51	43%	0	0	0	0	0	0.013	0.024	0.027	0.059	7.9E-3	0.012



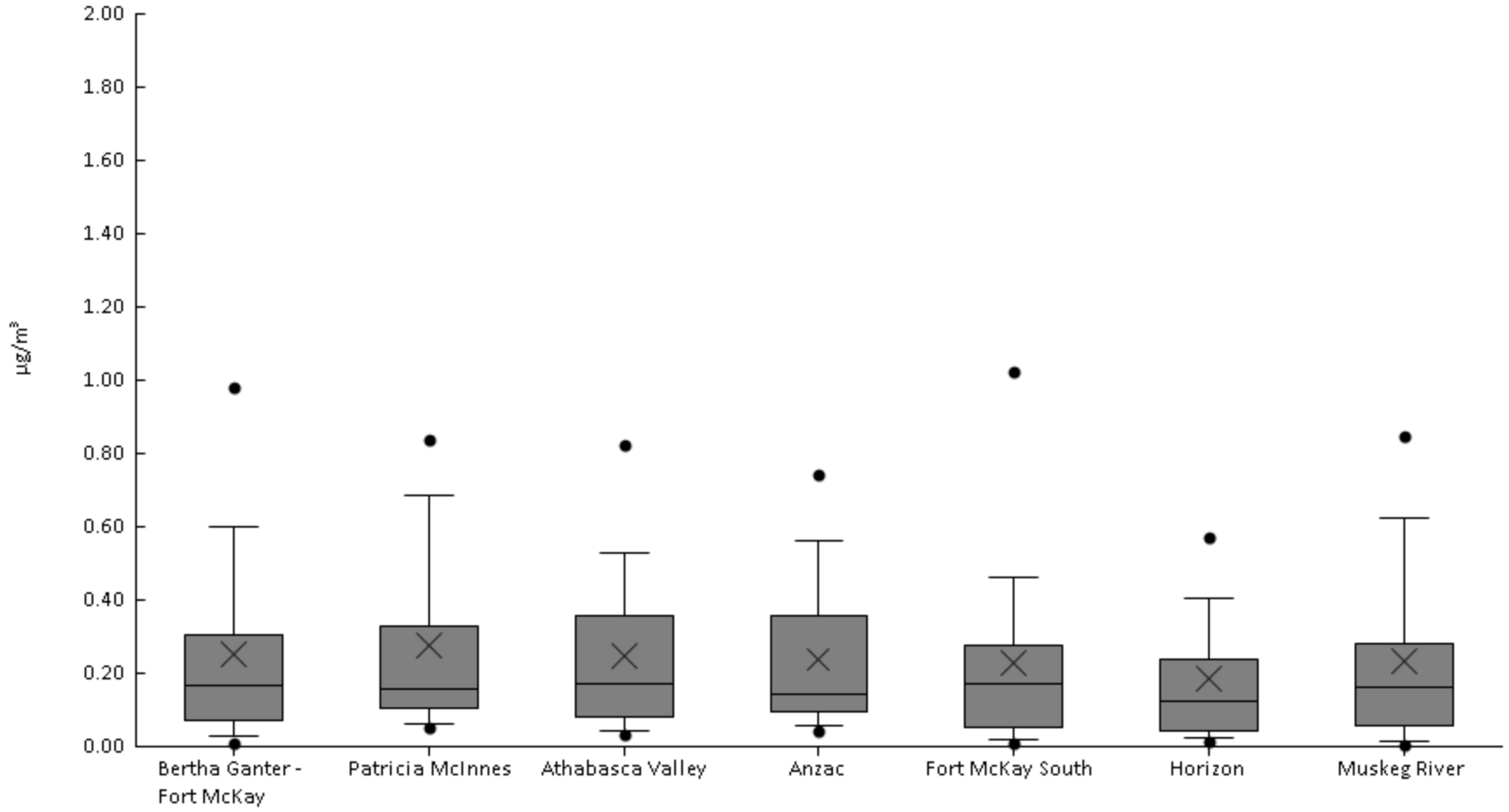
Particulate Matter (PM10 IONS) - Magnesium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	1.4E-3	2.5E-3	4.7E-3	0.01	0.019	0.043	0.068	0.089	0.18	0.031	0.034
AMS06	Patricia McInnes	55	100%	7.9E-4	2.2E-3	5E-3	0.011	0.022	0.041	0.07	0.098	0.13	0.03	0.027
AMS07	Athabasca Valley	59	100%	1.1E-3	2.9E-3	7.3E-3	0.011	0.022	0.04	0.067	0.075	0.14	0.03	0.025
AMS14	Anzac	59	100%	1.6E-3	2.4E-3	3.2E-3	7.7E-3	0.016	0.031	0.047	0.058	0.074	0.021	0.017
AMS13	Fort McKay South	60	100%	1.1E-3	2E-3	3.2E-3	0.01	0.02	0.032	0.055	0.078	0.13	0.026	0.024
AMS15	Horizon	59	100%	1.1E-3	1.7E-3	2.6E-3	8.4E-3	0.018	0.041	0.067	0.092	0.15	0.028	0.029
AMS16	Muskeg River	51	100%	2.3E-3	6.3E-3	0.011	0.021	0.032	0.064	0.098	0.13	0.18	0.045	0.038



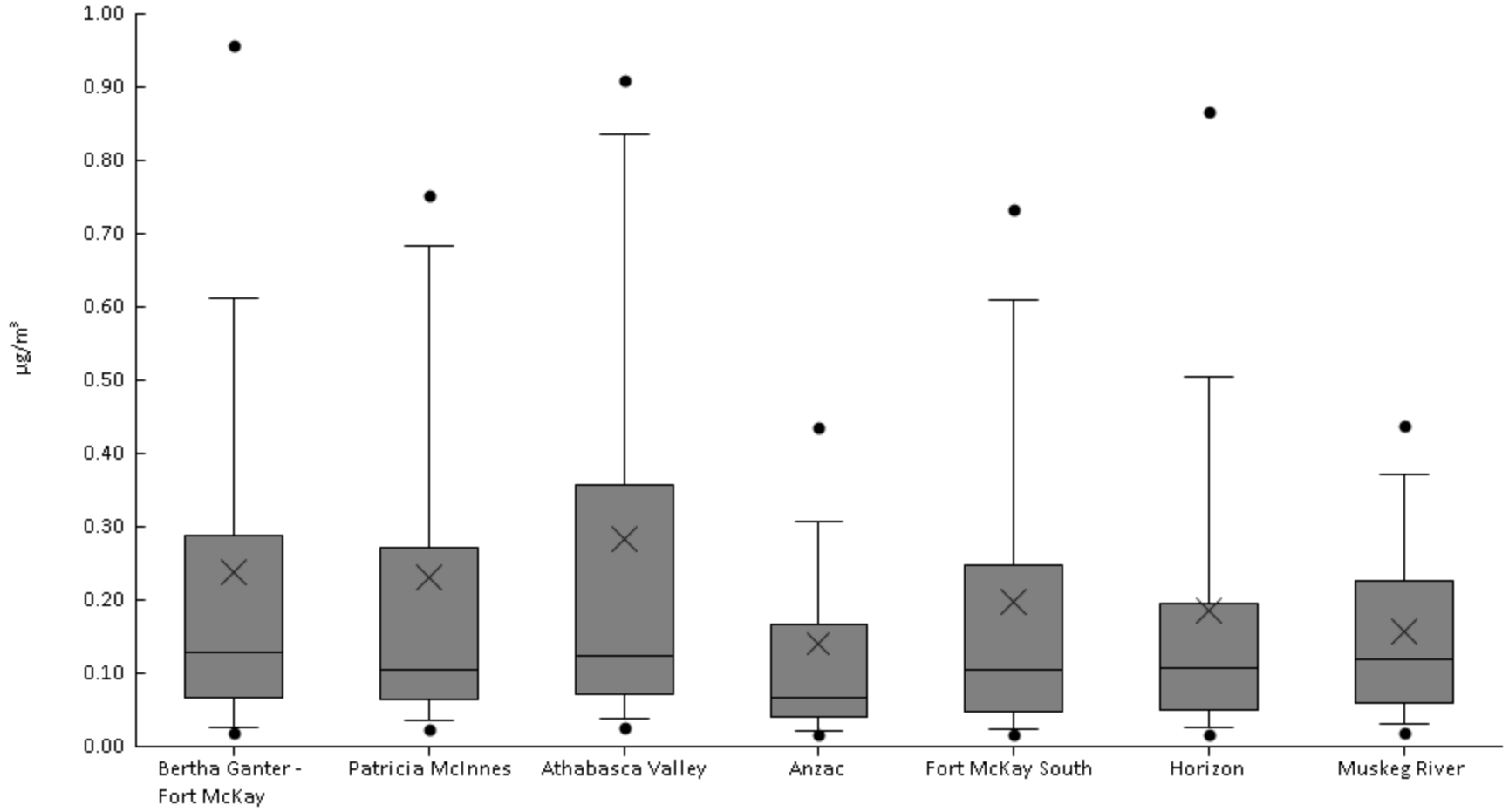
Particulate Matter (PM10 IONS) - Ammonium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	38	97%	0	0.012	0.029	0.071	0.17	0.31	0.6	0.98	1.2	0.25	0.28
AMS06	Patricia McInnes	40	100%	0.04	0.051	0.063	0.1	0.16	0.33	0.68	0.84	1.4	0.28	0.28
AMS07	Athabasca Valley	40	98%	0	0.032	0.041	0.083	0.17	0.36	0.53	0.83	0.99	0.25	0.23
AMS14	Anzac	39	100%	0.036	0.04	0.056	0.094	0.14	0.36	0.56	0.74	0.91	0.24	0.22
AMS13	Fort McKay South	45	98%	0	0.01	0.018	0.05	0.17	0.28	0.46	1	1.1	0.23	0.26
AMS15	Horizon	43	98%	0	0.013	0.023	0.042	0.12	0.24	0.4	0.57	1.1	0.19	0.21
AMS16	Muskeg River	37	97%	0	3.5E-3	0.016	0.058	0.16	0.28	0.63	0.85	1.1	0.23	0.26



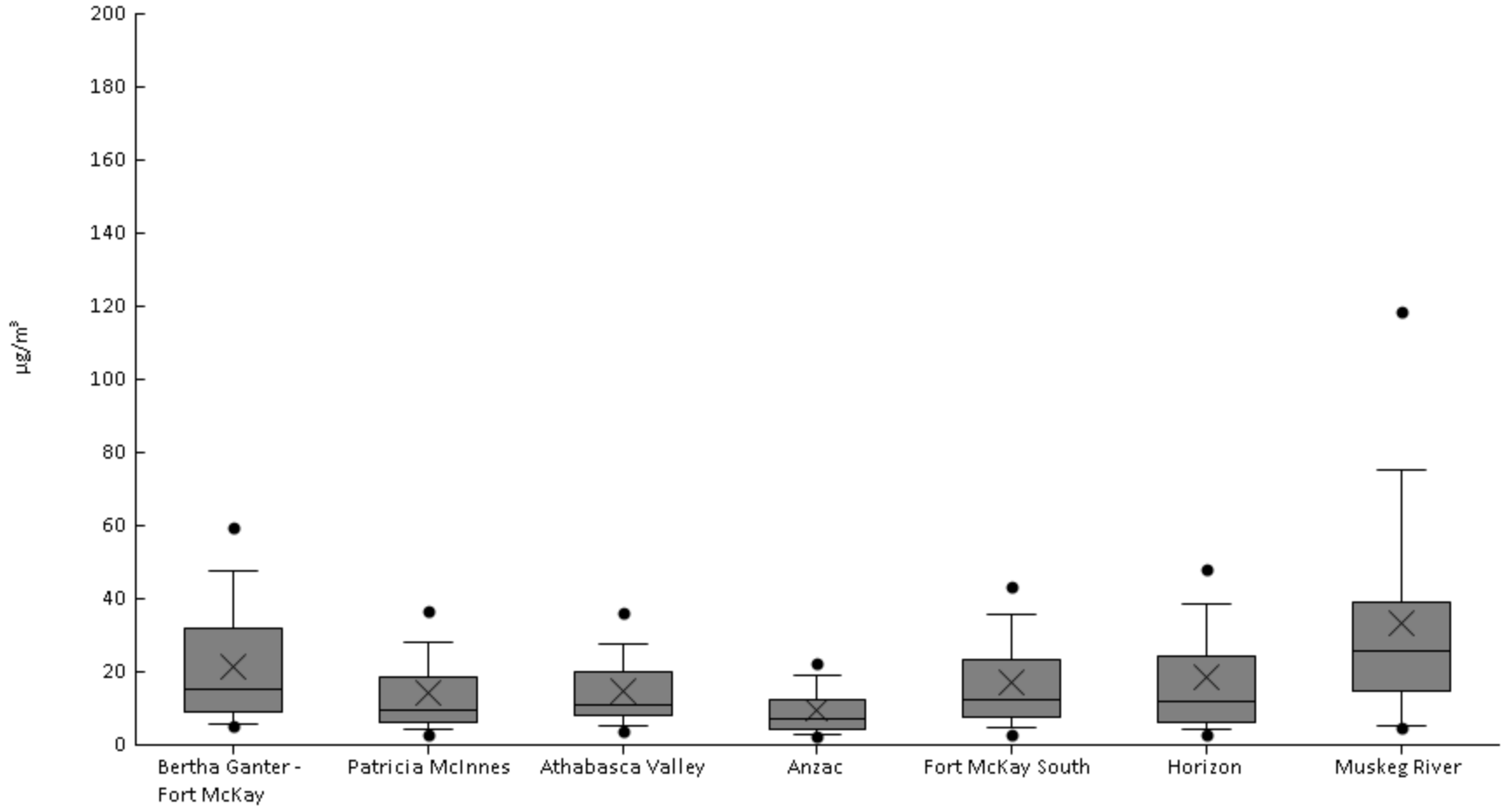
Particulate Matter (PM10 IONS) - Nitrate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.016	0.02	0.026	0.067	0.13	0.29	0.61	0.96	2	0.24	0.33
AMS06	Patricia McInnes	58	100%	0.016	0.023	0.036	0.063	0.11	0.27	0.68	0.75	1.3	0.23	0.29
AMS07	Athabasca Valley	59	100%	0.013	0.026	0.037	0.072	0.12	0.36	0.84	0.91	1.9	0.28	0.35
AMS14	Anzac	59	100%	7E-3	0.016	0.02	0.04	0.068	0.17	0.31	0.44	1.2	0.14	0.19
AMS13	Fort McKay South	60	100%	9.5E-3	0.017	0.024	0.048	0.1	0.25	0.61	0.73	1.4	0.2	0.26
AMS15	Horizon	59	100%	7E-3	0.016	0.025	0.05	0.11	0.19	0.5	0.87	1	0.19	0.24
AMS16	Muskeg River	51	100%	0.015	0.019	0.03	0.061	0.12	0.23	0.37	0.44	0.62	0.16	0.14



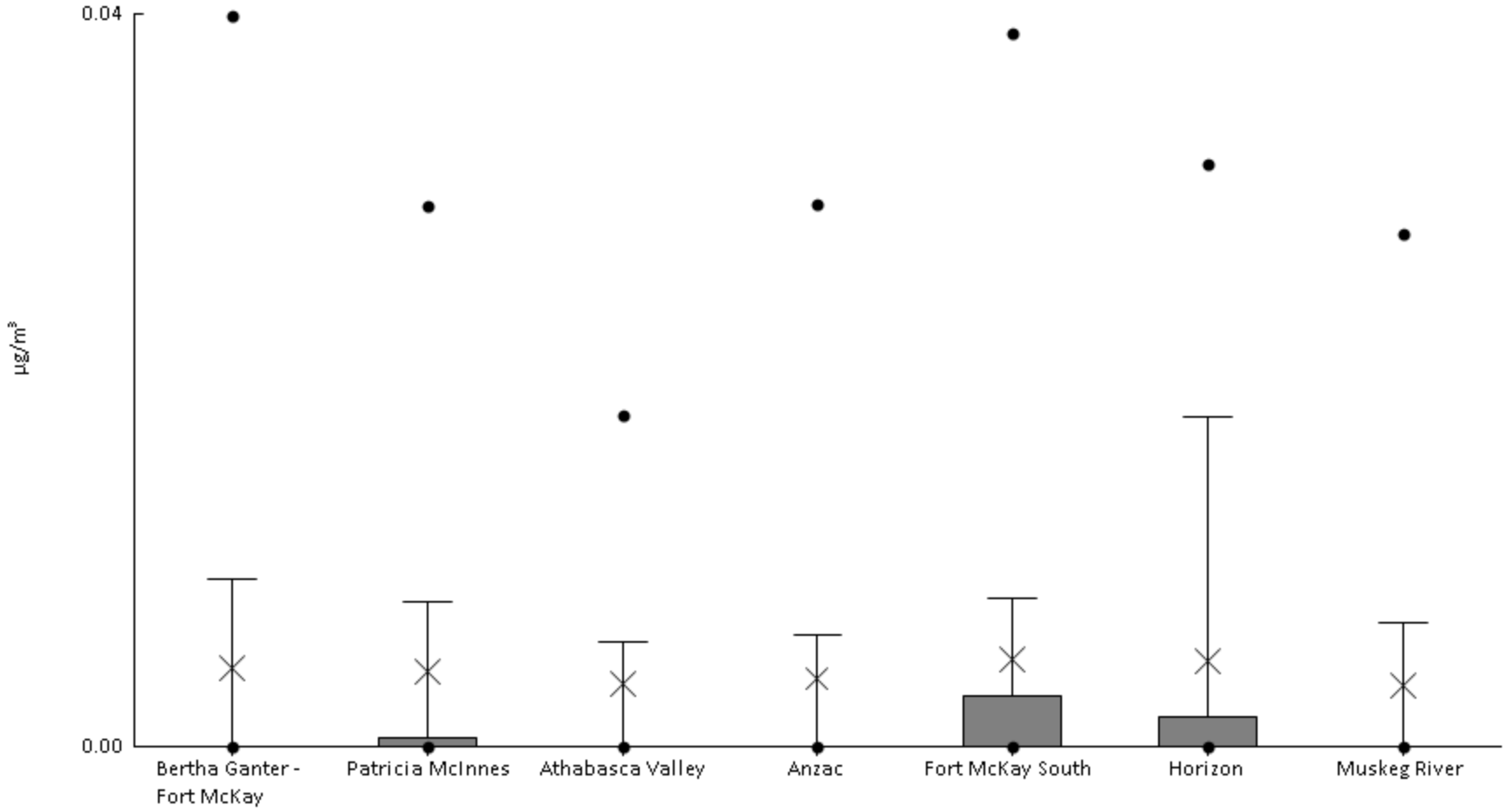
Particulate Matter (PM10 IONS) - Particulate Matter (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	2.3	5	5.6	8.8	15	32	48	60	74	22	17
AMS06	Patricia McInnes	58	100%	2	2.9	4.1	6.3	9.5	18	28	37	89	14	14
AMS07	Athabasca Valley	59	100%	3.2	3.8	5.1	7.9	11	20	28	36	58	15	11
AMS14	Anzac	59	100%	1.8	2.5	3.1	4.5	7.2	12	19	22	59	9.7	8.6
AMS13	Fort McKay South	59	100%	2.1	3	4.7	7.5	13	23	36	43	71	17	14
AMS15	Horizon	59	100%	1.8	2.8	4.3	6.3	12	24	39	48	95	19	19
AMS16	Muskeg River	51	100%	2.5	4.9	5.5	15	26	39	75	119	125	34	30



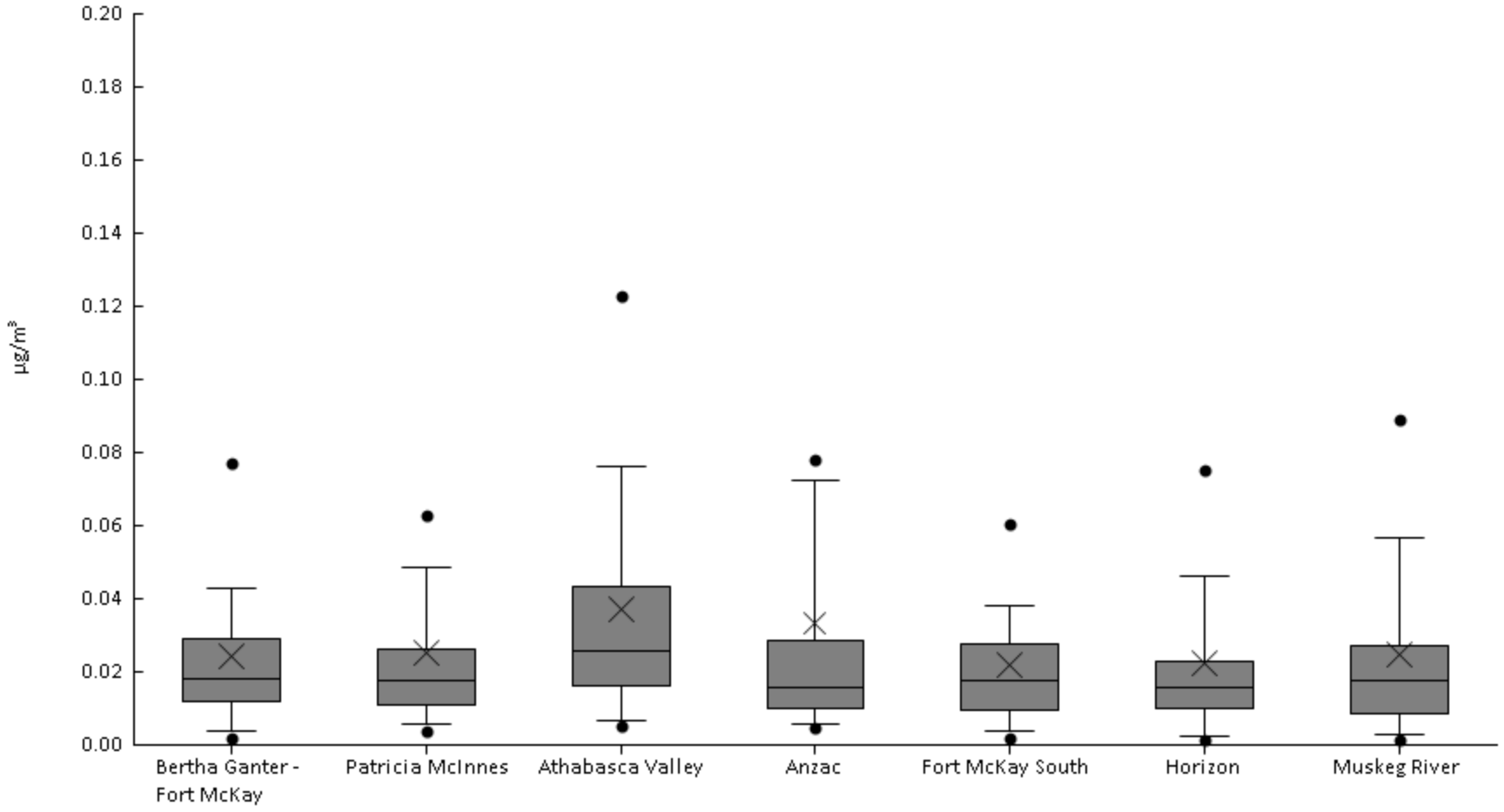
Particulate Matter (PM10 IONS) - Phosphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	22%	0	0	0	0	0	0	9.2E-3	0.04	0.077	4.3E-3	0.014
AMS06	Patricia McInnes	57	23%	0	0	0	0	0	4.5E-4	7.9E-3	0.029	0.081	4.1E-3	0.013
AMS07	Athabasca Valley	59	19%	0	0	0	0	0	0	5.7E-3	0.018	0.099	3.4E-3	0.014
AMS14	Anzac	59	20%	0	0	0	0	0	0	6.1E-3	0.03	0.089	3.7E-3	0.013
AMS13	Fort McKay South	60	27%	0	0	0	0	0	2.7E-3	8.1E-3	0.039	0.067	4.7E-3	0.013
AMS15	Horizon	59	25%	0	0	0	0	0	1.7E-3	0.018	0.032	0.078	4.7E-3	0.013
AMS16	Muskeg River	51	22%	0	0	0	0	0	0	6.7E-3	0.028	0.066	3.3E-3	0.011



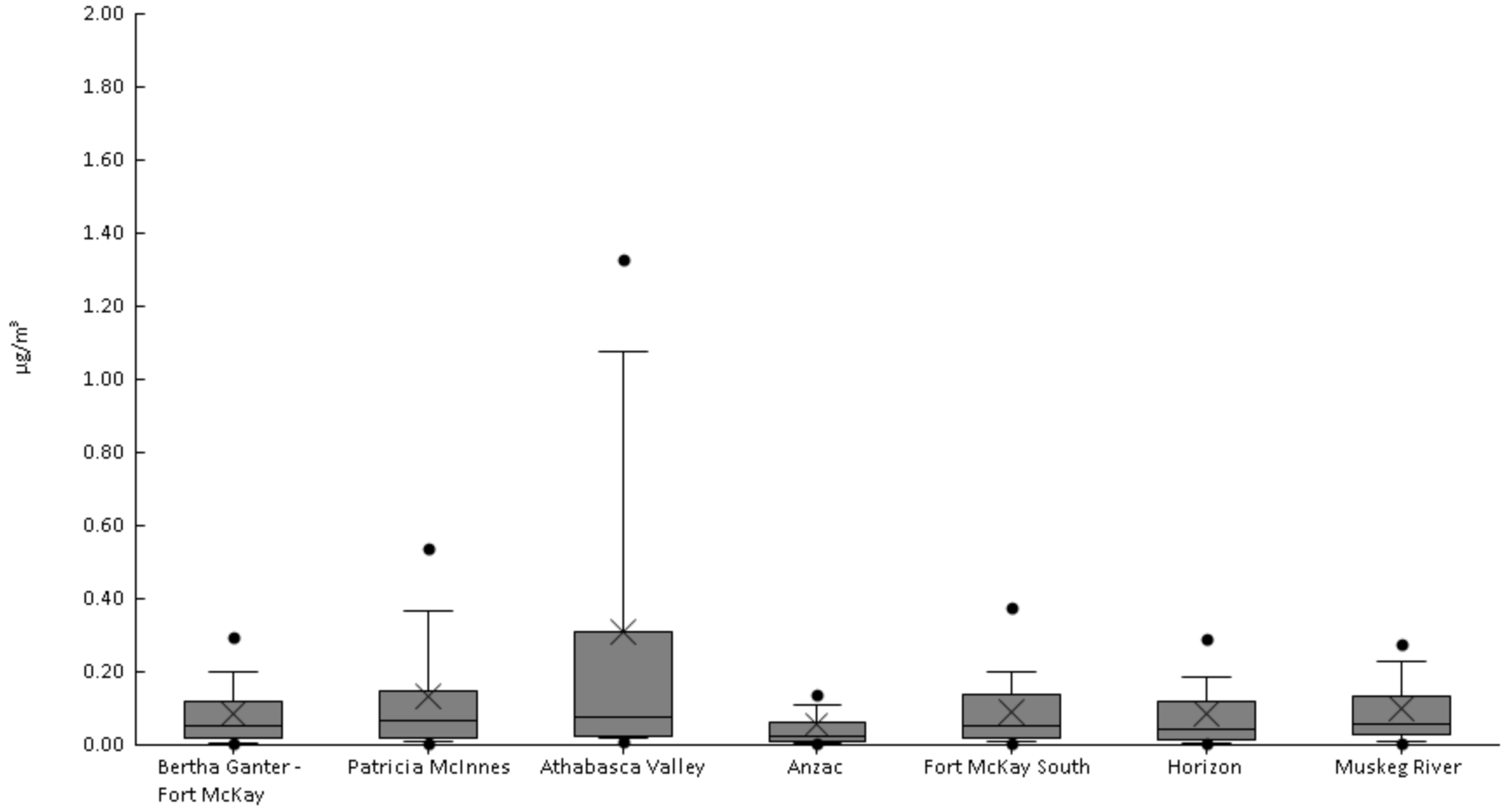
Particulate Matter (PM10 IONS) - Potassium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	0	2E-3	4E-3	0.012	0.018	0.029	0.043	0.077	0.15	0.024	0.024
AMS06	Patricia McInnes	56	98%	0	3.9E-3	5.8E-3	0.011	0.018	0.026	0.049	0.063	0.19	0.025	0.029
AMS07	Athabasca Valley	58	100%	2.4E-3	5.4E-3	6.5E-3	0.016	0.026	0.043	0.076	0.12	0.23	0.037	0.04
AMS14	Anzac	56	100%	1.7E-3	4.6E-3	5.6E-3	0.01	0.016	0.029	0.072	0.078	0.41	0.033	0.061
AMS13	Fort McKay South	60	98%	0	1.8E-3	3.6E-3	9.3E-3	0.018	0.028	0.038	0.061	0.13	0.022	0.022
AMS15	Horizon	59	98%	0	1.4E-3	2.5E-3	9.9E-3	0.016	0.023	0.046	0.075	0.16	0.022	0.026
AMS16	Muskeg River	51	98%	0	1.4E-3	2.8E-3	8.6E-3	0.018	0.027	0.057	0.089	0.17	0.025	0.029



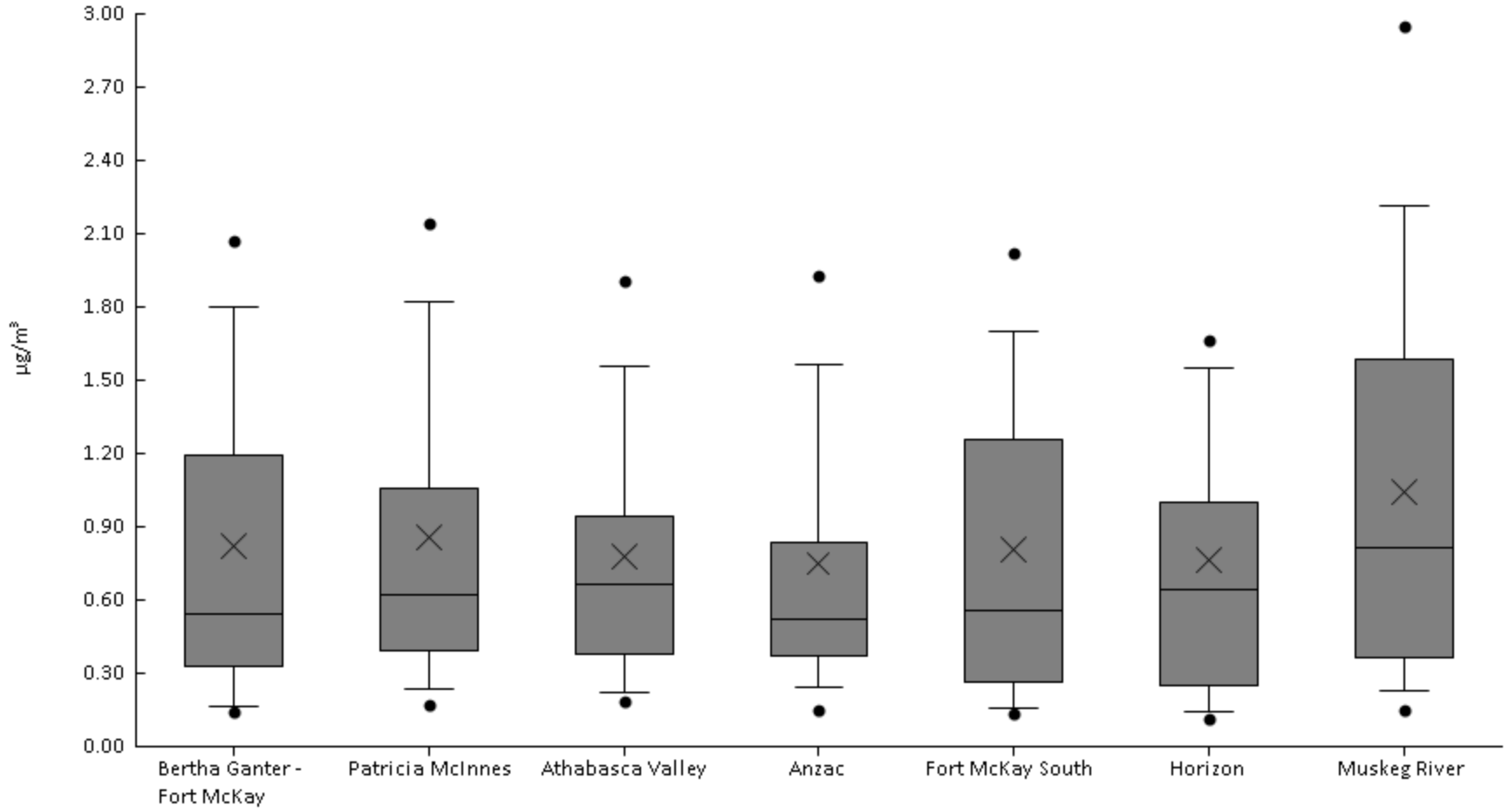
Particulate Matter (PM10 IONS) - Sodium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	1.1E-3	3.5E-3	7E-3	0.019	0.053	0.12	0.2	0.3	0.45	0.087	0.1
AMS06	Patricia McInnes	57	100%	1E-3	5.6E-3	9E-3	0.02	0.065	0.15	0.36	0.54	0.96	0.14	0.2
AMS07	Athabasca Valley	59	100%	4.6E-3	8.1E-3	0.017	0.026	0.078	0.31	1.1	1.3	2.3	0.31	0.47
AMS14	Anzac	58	100%	8E-4	2.5E-3	3.8E-3	8.2E-3	0.022	0.061	0.11	0.14	0.58	0.055	0.096
AMS13	Fort McKay South	60	100%	1E-3	2.9E-3	7.3E-3	0.017	0.051	0.14	0.2	0.37	0.4	0.091	0.1
AMS15	Horizon	59	100%	1.1E-3	3.3E-3	6.3E-3	0.014	0.045	0.12	0.19	0.29	0.6	0.086	0.12
AMS16	Muskeg River	51	100%	1.9E-3	5.9E-3	0.011	0.031	0.058	0.13	0.23	0.28	0.51	0.1	0.099



Particulate Matter (PM10 IONS) - Sulphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.019	0.14	0.17	0.33	0.54	1.2	1.8	2.1	2.9	0.82	0.68
AMS06	Patricia McInnes	58	100%	0.014	0.17	0.24	0.4	0.62	1.1	1.8	2.1	4.2	0.86	0.74
AMS07	Athabasca Valley	59	100%	0.021	0.19	0.22	0.38	0.66	0.95	1.6	1.9	2.9	0.78	0.58
AMS14	Anzac	59	100%	0.031	0.15	0.24	0.37	0.52	0.84	1.6	1.9	3.8	0.75	0.65
AMS13	Fort McKay South	60	100%	0.016	0.13	0.16	0.26	0.55	1.3	1.7	2	3.3	0.81	0.71
AMS15	Horizon	59	100%	0.011	0.12	0.14	0.25	0.65	1	1.5	1.7	3.9	0.77	0.7
AMS16	Muskeg River	51	100%	0.022	0.15	0.23	0.37	0.81	1.6	2.2	3	3.8	1	0.86



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER - METALS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER ($PM_{2.5}$) - METALS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

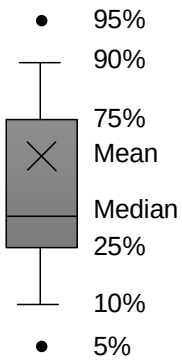
PM metals:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	µg/m^3 (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $PM_{2.5}$
PARTICLE DIAMETER	< 2.5 µm or < 10 µm
MEDIUM	47 mm Teflon Filter
ANALYTICALMETHODS	MASS by Microbalance
	ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS)
	IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc Desert Research Institute
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (µg/m^3) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler
	For $PM_{2.5}$ FRM Partisol $PM_{2.5}$ sampler

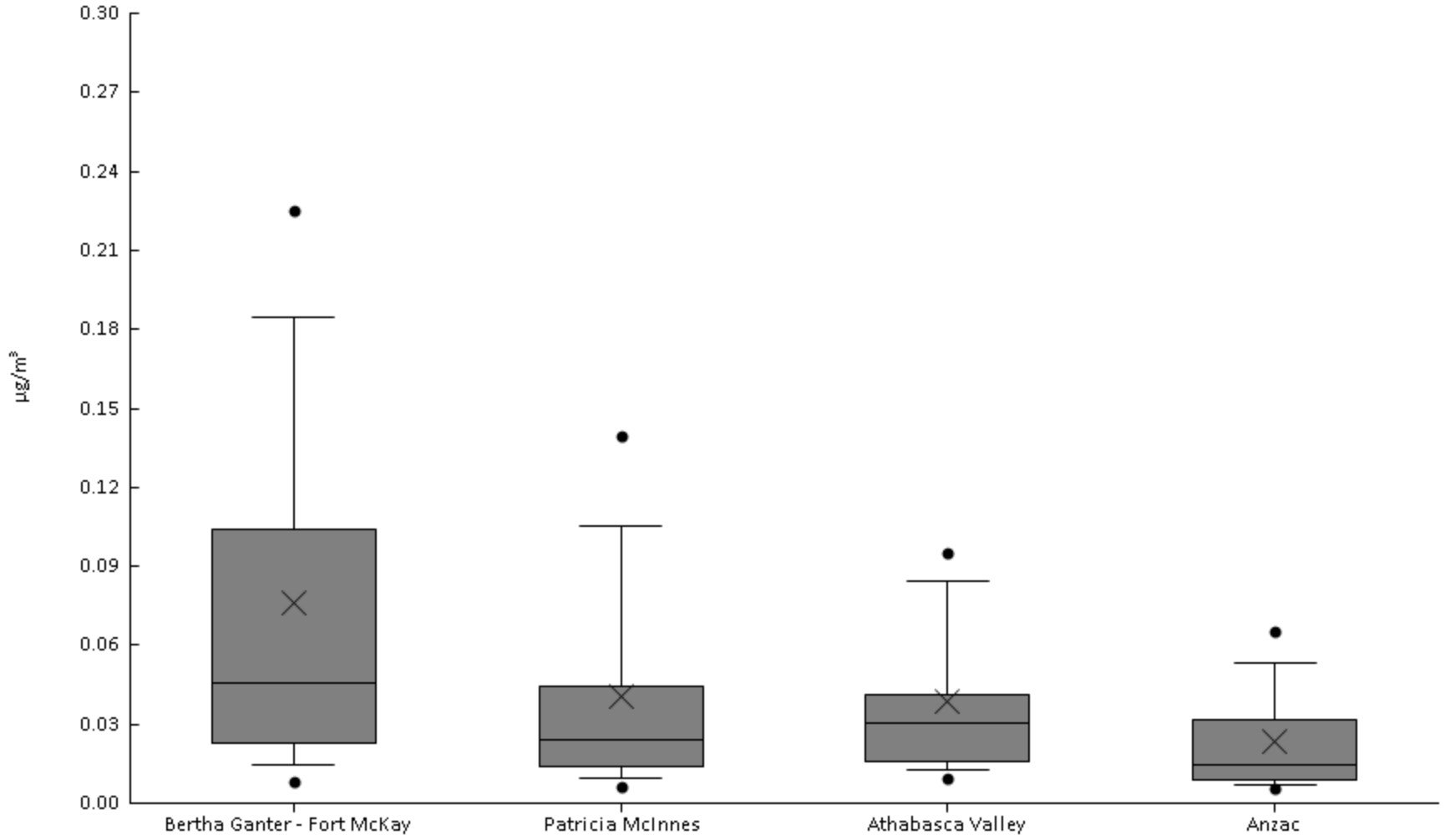
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



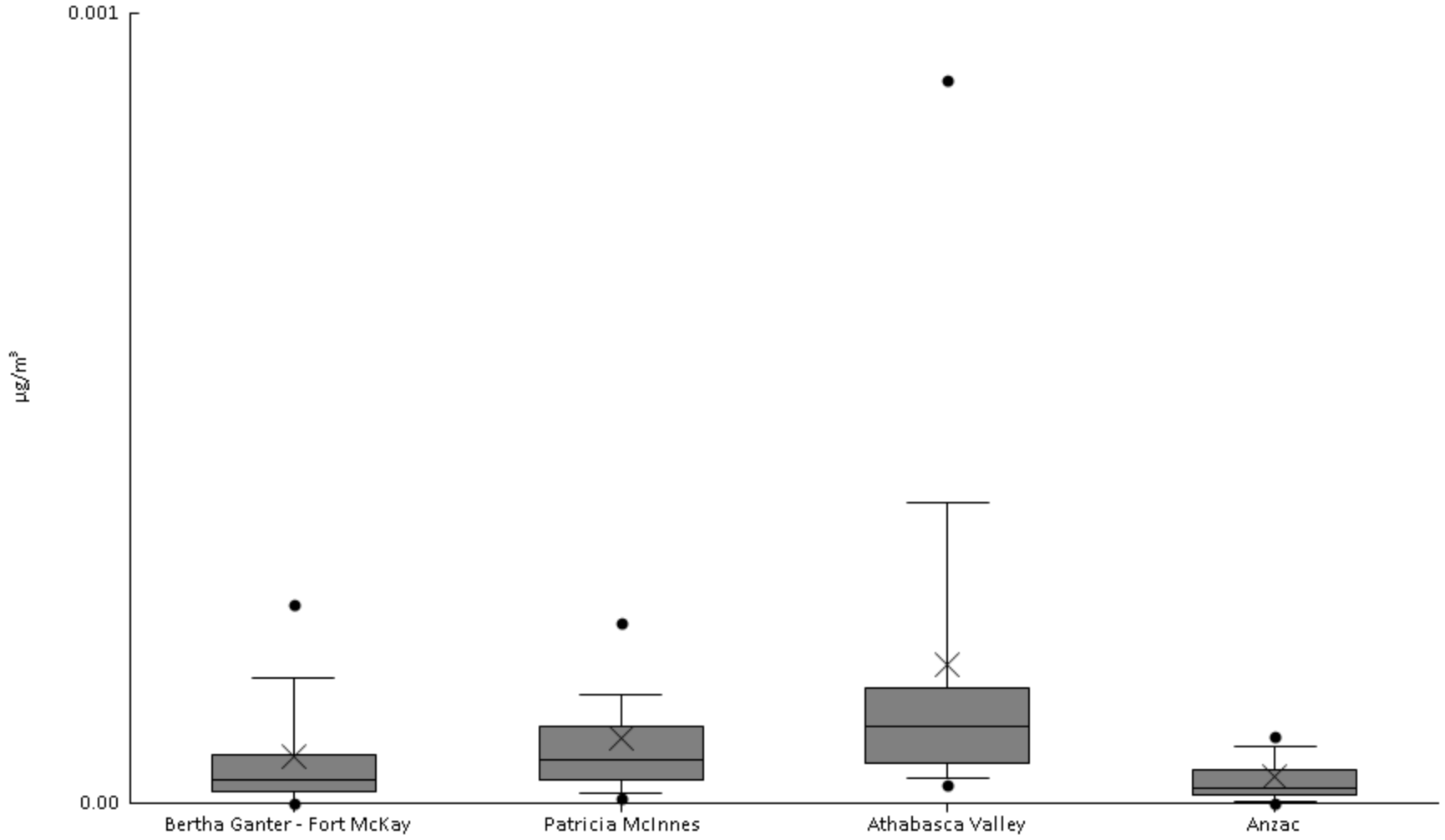
Particulate Matter (PM2.5 METALS) - Aluminum (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	6.4E-3	8.5E-3	0.015	0.023	0.046	0.1	0.18	0.23	0.47	0.076	0.082
AMS06	Patricia McInnes	56	98%	0	6.1E-3	9.6E-3	0.014	0.024	0.045	0.11	0.14	0.21	0.04	0.045
AMS07	Athabasca Valley	59	100%	7.5E-3	9.7E-3	0.013	0.016	0.03	0.041	0.084	0.095	0.23	0.039	0.038
AMS14	Anzac	58	98%	2.7E-3	5.8E-3	7.1E-3	8.9E-3	0.015	0.031	0.053	0.065	0.14	0.024	0.023



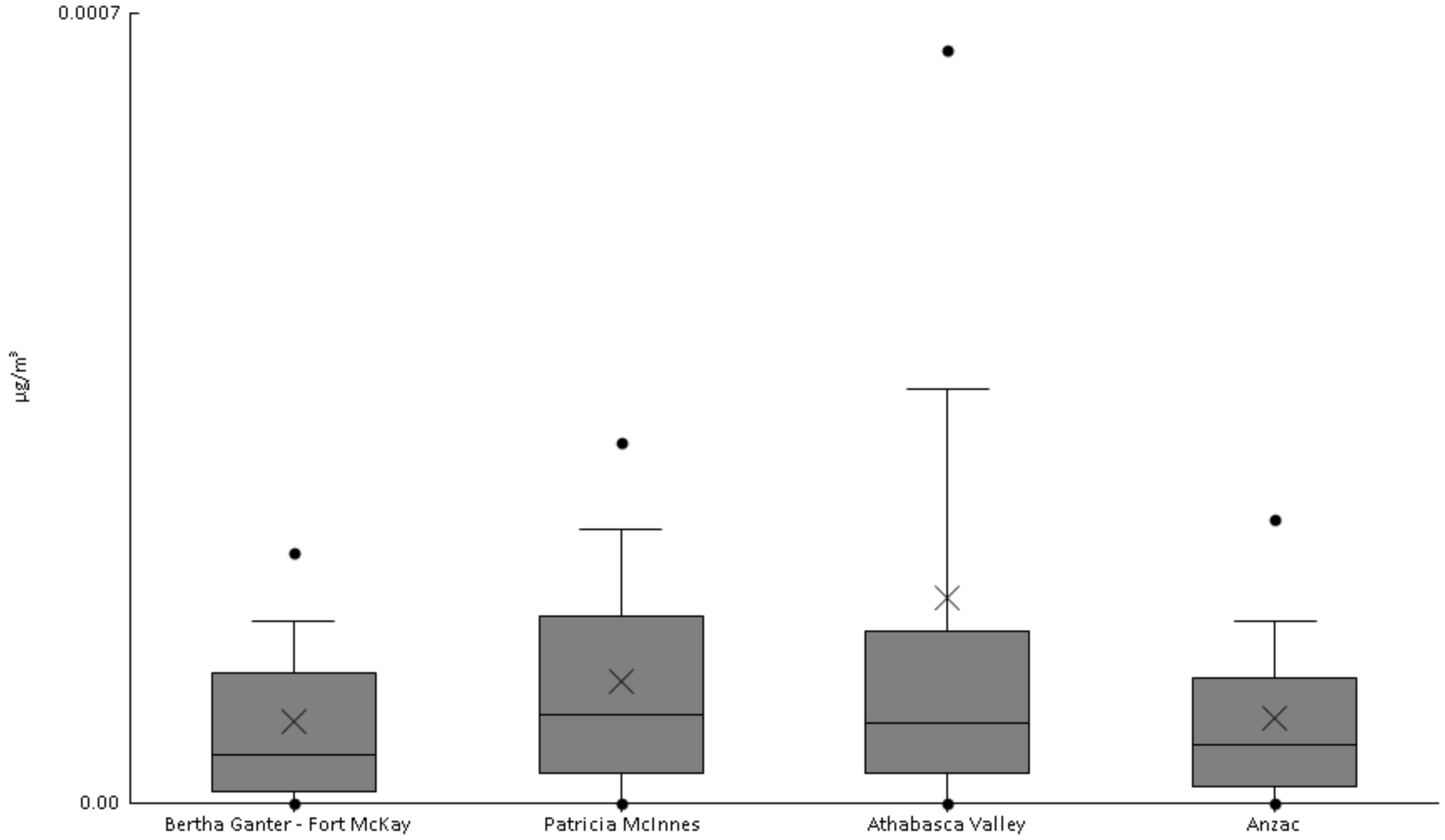
Particulate Matter (PM2.5 METALS) - Antimony (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	54	78%	0	0	0	1.5E-5	2.9E-5	6.1E-5	1.6E-4	2.5E-4	4.6E-4	5.8E-5	8.5E-5
AMS06	Patricia McInnes	56	93%	0	6.6E-6	1.2E-5	2.9E-5	5.6E-5	9.7E-5	1.4E-4	2.3E-4	9.1E-4	8.3E-5	1.3E-4
AMS07	Athabasca Valley	59	98%	0	2.4E-5	3.2E-5	5E-5	9.8E-5	1.5E-4	3.8E-4	9.2E-4	1.2E-3	1.8E-4	2.6E-4
AMS14	Anzac	56	66%	0	0	1.4E-6	1.1E-5	2E-5	4.3E-5	7.2E-5	8.5E-5	4.6E-4	3.5E-5	6.2E-5



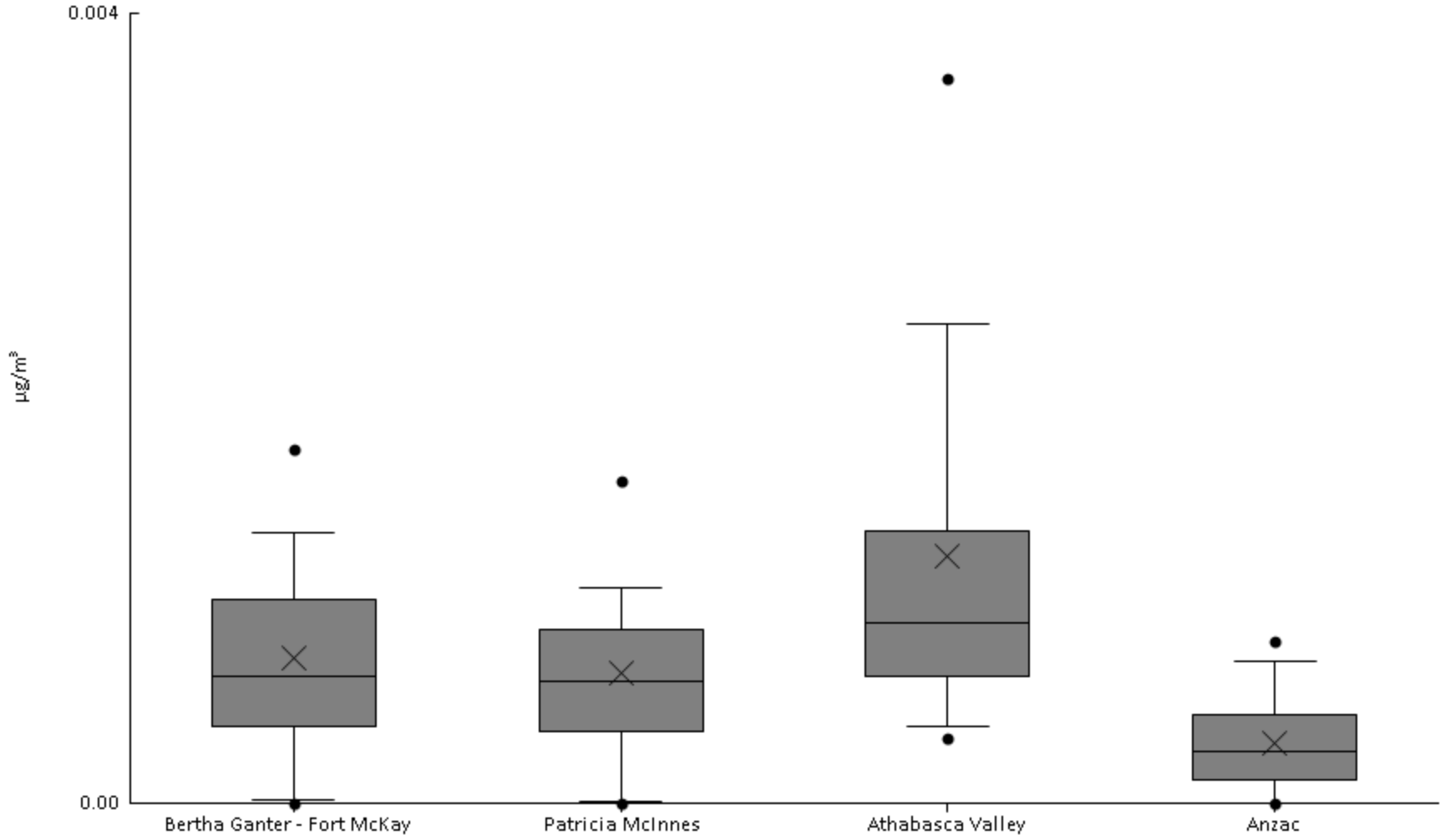
Particulate Matter (PM2.5 METALS) - Arsenic (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	52	77%	0	0	0	9.9E-6	4.3E-5	1.1E-4	1.6E-4	2.2E-4	3.3E-4	7.3E-5	7.8E-5
AMS06	Patricia McInnes	54	85%	0	0	0	2.7E-5	7.8E-5	1.7E-4	2.4E-4	3.2E-4	5.7E-4	1.1E-4	1.1E-4
AMS07	Athabasca Valley	54	85%	0	0	0	2.7E-5	7.2E-5	1.5E-4	3.7E-4	6.7E-4	2.9E-3	1.8E-4	4.2E-4
AMS14	Anzac	55	78%	0	0	0	1.4E-5	5.1E-5	1.1E-4	1.6E-4	2.5E-4	5E-4	7.5E-5	9.2E-5



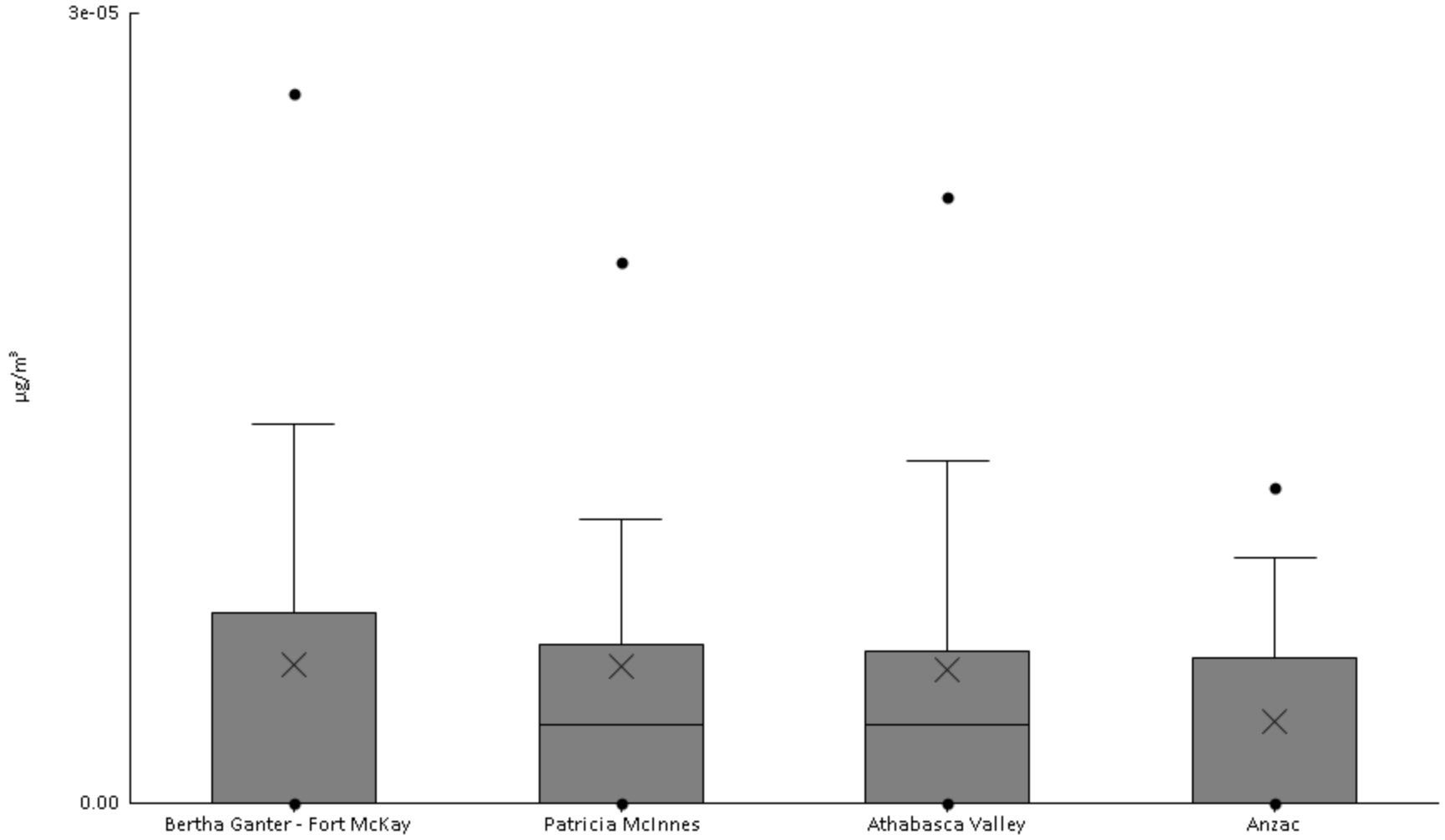
Particulate Matter (PM2.5 METALS) - Barium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	89%	0	0	1.7E-5	3.9E-4	6.4E-4	1E-3	1.4E-3	1.8E-3	2.9E-3	7.3E-4	5.6E-4
AMS06	Patricia McInnes	56	89%	0	0	1.1E-5	3.7E-4	6.2E-4	8.8E-4	1.1E-3	1.6E-3	2.4E-3	6.6E-4	4.6E-4
AMS07	Athabasca Valley	59	98%	0	3.3E-4	3.9E-4	6.4E-4	9.1E-4	1.4E-3	2.4E-3	3.7E-3	5.6E-3	1.3E-3	1.1E-3
AMS14	Anzac	57	81%	0	0	0	1.2E-4	2.6E-4	4.5E-4	7.2E-4	8.2E-4	9.4E-4	3E-4	2.5E-4



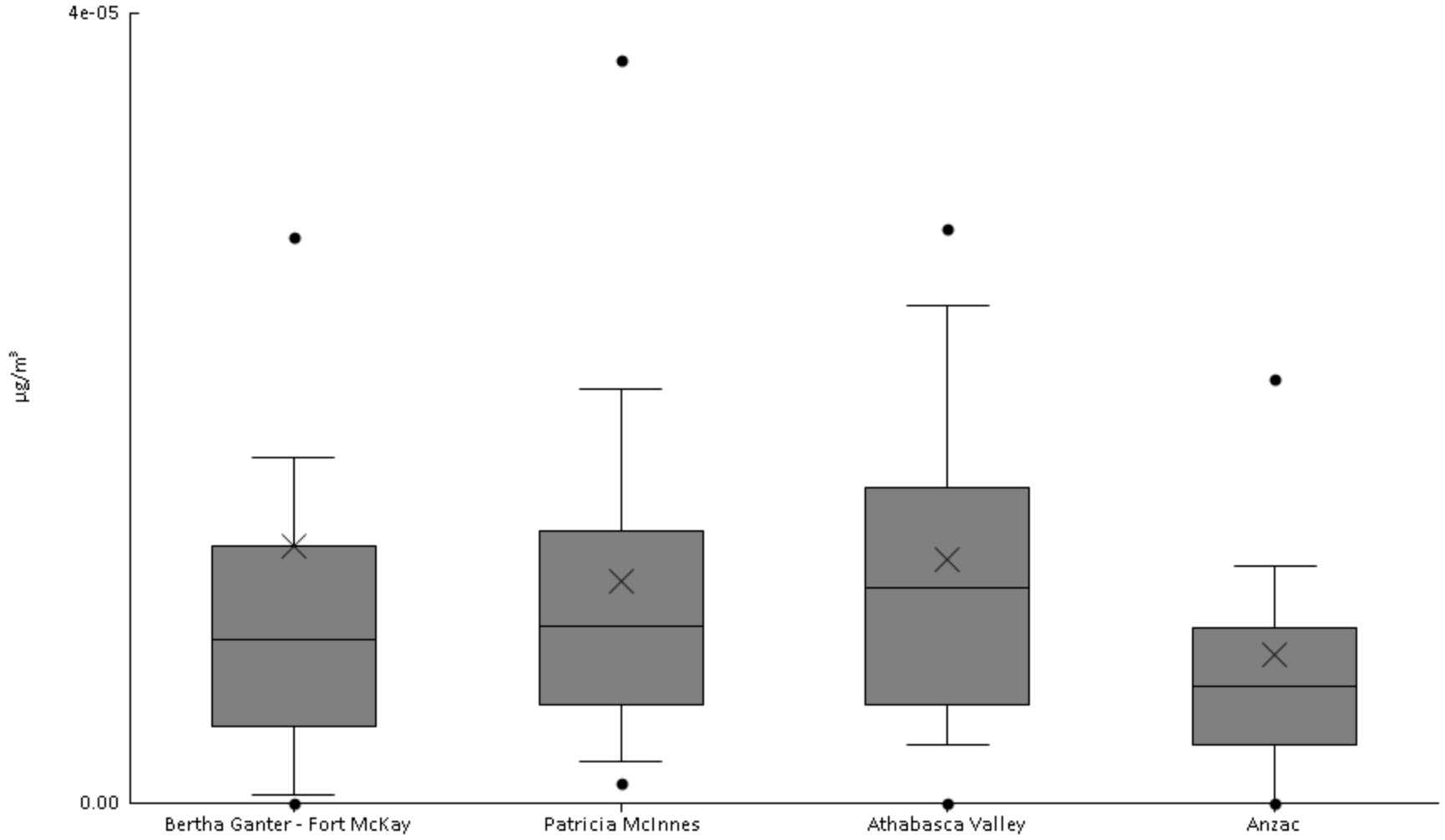
Particulate Matter (PM2.5 METALS) - Beryllium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	53	11%	0	0	0	0	0	7.3E-6	1.4E-5	2.7E-5	3.4E-5	5.3E-6	8E-6
AMS06	Patricia McInnes	51	8%	0	0	0	0	3E-6	6E-6	1.1E-5	2.1E-5	5.9E-5	5.2E-6	9.6E-6
AMS07	Athabasca Valley	55	13%	0	0	0	0	3E-6	5.8E-6	1.3E-5	2.3E-5	4.9E-5	5.1E-6	8.5E-6
AMS14	Anzac	52	4%	0	0	0	0	0	5.5E-6	9.3E-6	1.2E-5	2.6E-5	3.1E-6	5E-6



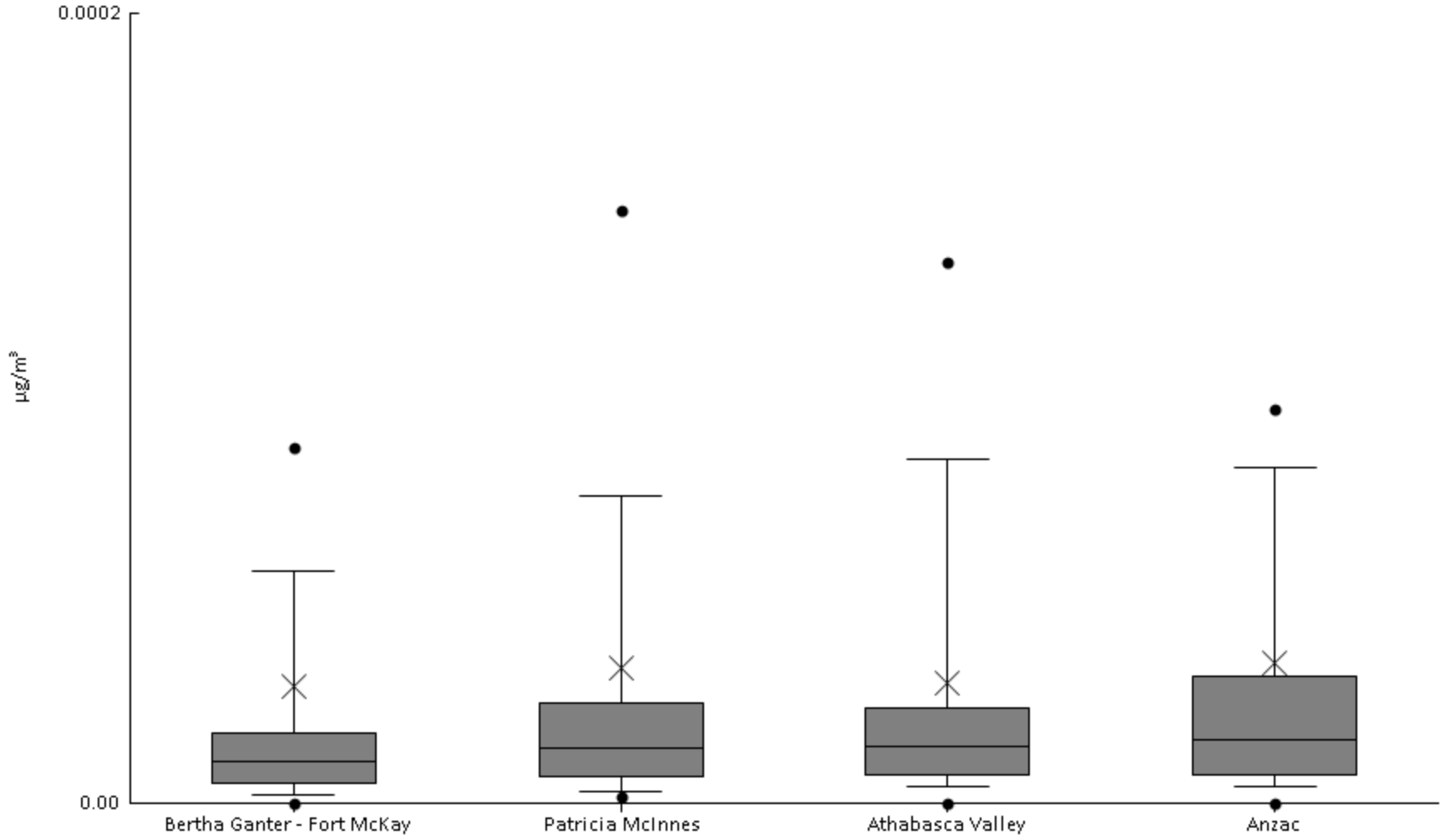
Particulate Matter (PM2.5 METALS) - Bismuth (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	49	82%	0	0	4E-7	3.9E-6	8.3E-6	1.3E-5	1.8E-5	2.9E-5	1.5E-4	1.3E-5	2.4E-5
AMS06	Patricia McInnes	47	87%	0	1E-6	2.1E-6	5E-6	9E-6	1.4E-5	2.1E-5	3.8E-5	4.6E-5	1.1E-5	1E-5
AMS07	Athabasca Valley	49	84%	0	0	3E-6	5E-6	1.1E-5	1.6E-5	2.5E-5	2.9E-5	5E-5	1.2E-5	1.1E-5
AMS14	Anzac	40	72%	0	0	0	3E-6	5.9E-6	8.9E-6	1.2E-5	2.2E-5	5.9E-5	7.5E-6	9.8E-6



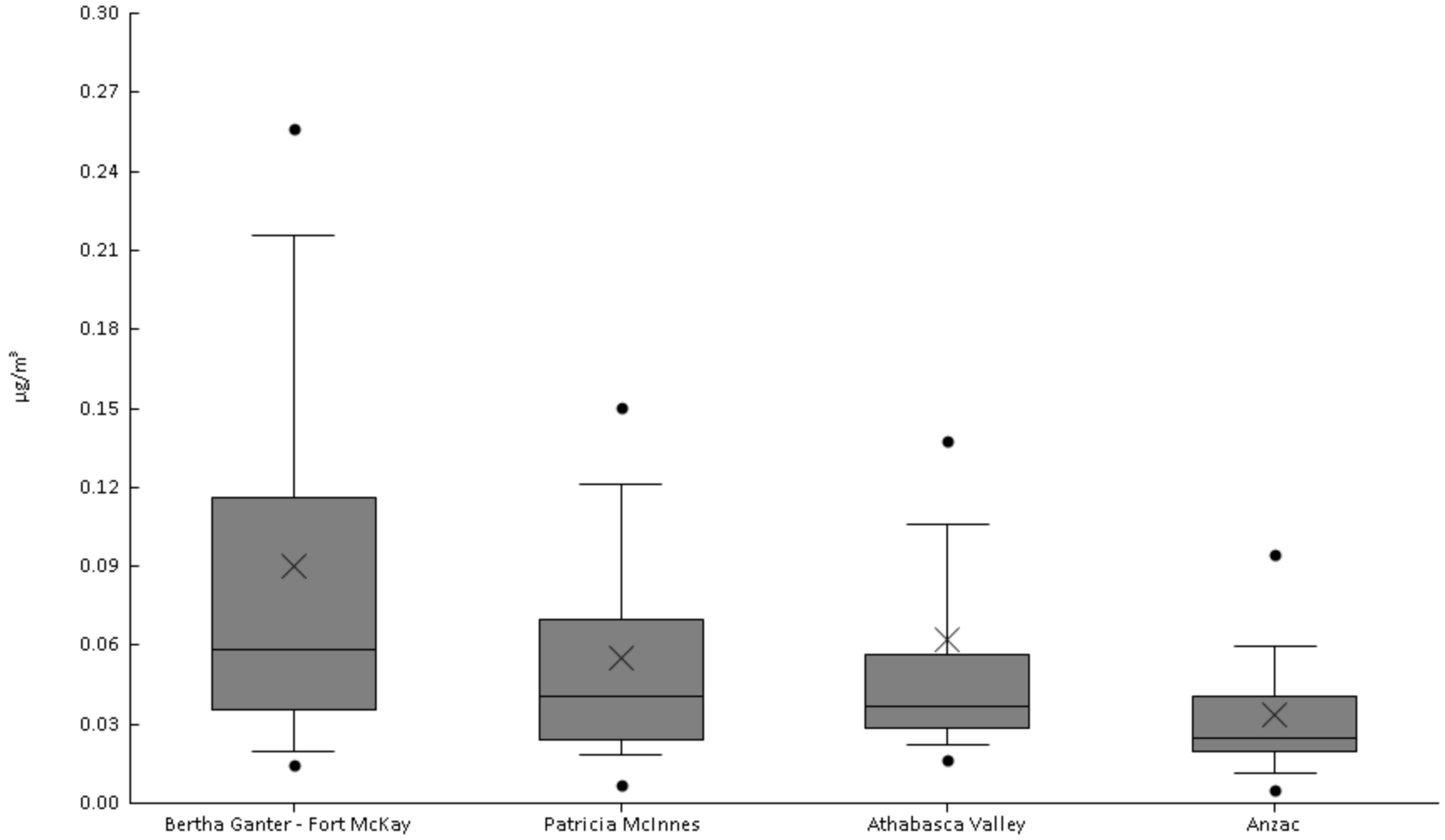
Particulate Matter (PM2.5 METALS) - Cadmium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	50	68%	0	0	2E-6	5.1E-6	1.1E-5	1.8E-5	5.9E-5	9E-5	6.2E-4	3E-5	8.8E-5
AMS06	Patricia McInnes	45	80%	0	1.5E-6	3E-6	6.7E-6	1.4E-5	2.5E-5	7.8E-5	1.5E-4	3.1E-4	3.4E-5	6.4E-5
AMS07	Athabasca Valley	54	74%	0	2E-7	4.2E-6	7E-6	1.5E-5	2.4E-5	8.7E-5	1.4E-4	2.6E-4	3.1E-5	4.8E-5
AMS14	Anzac	51	75%	0	5E-8	4.2E-6	7.3E-6	1.6E-5	3.2E-5	8.5E-5	1E-4	4.1E-4	3.5E-5	6.4E-5



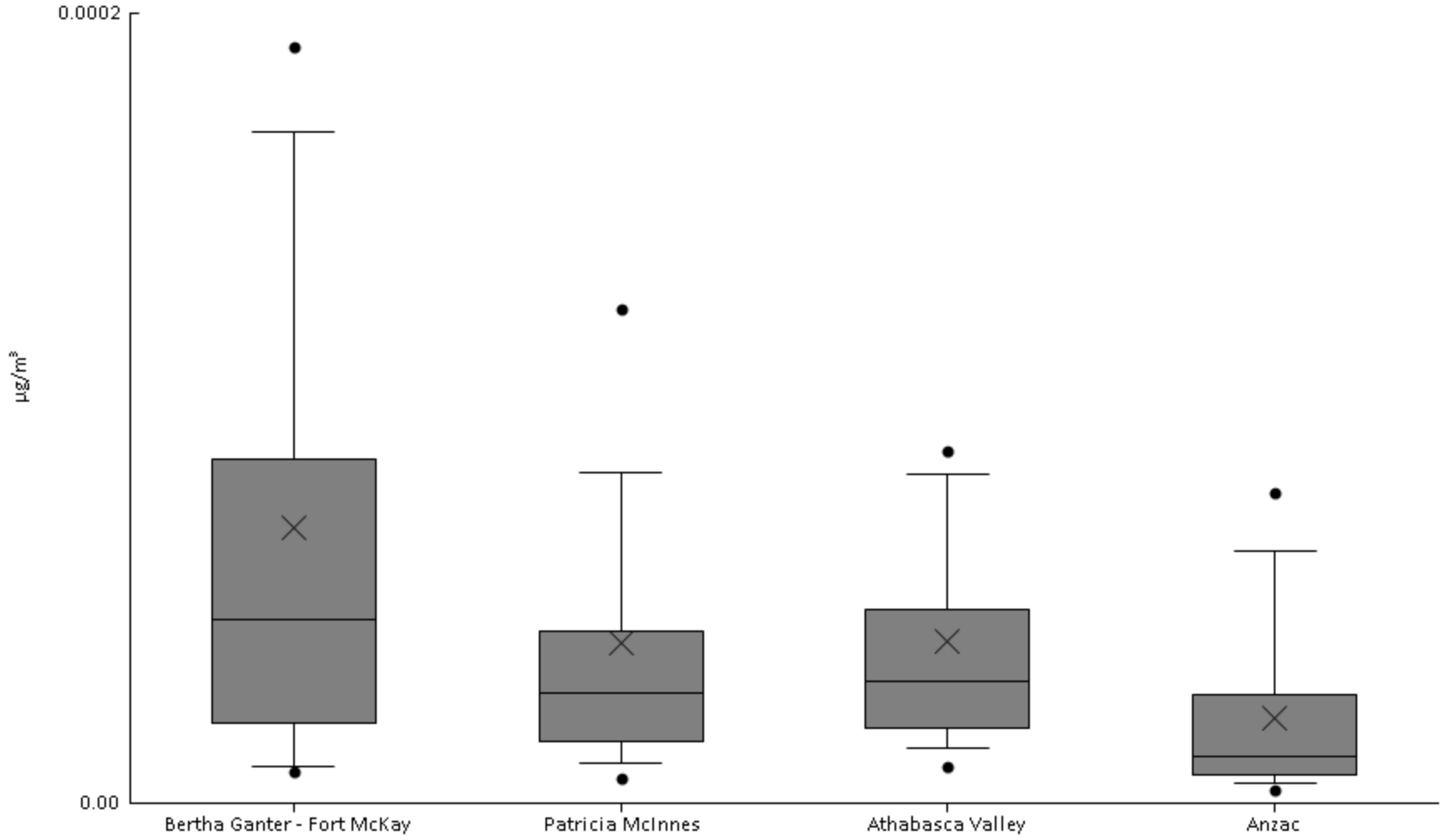
Particulate Matter (PM2.5 METALS) - Calcium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	96%	0	0.014	0.02	0.035	0.059	0.12	0.22	0.26	0.39	0.09	0.082
AMS06	Patricia McInnes	56	93%	0	7.2E-3	0.018	0.024	0.041	0.069	0.12	0.15	0.21	0.055	0.044
AMS07	Athabasca Valley	59	98%	0	0.016	0.022	0.029	0.037	0.056	0.11	0.14	0.77	0.062	0.1
AMS14	Anzac	58	90%	0	5.2E-3	0.011	0.019	0.025	0.041	0.06	0.095	0.17	0.034	0.03



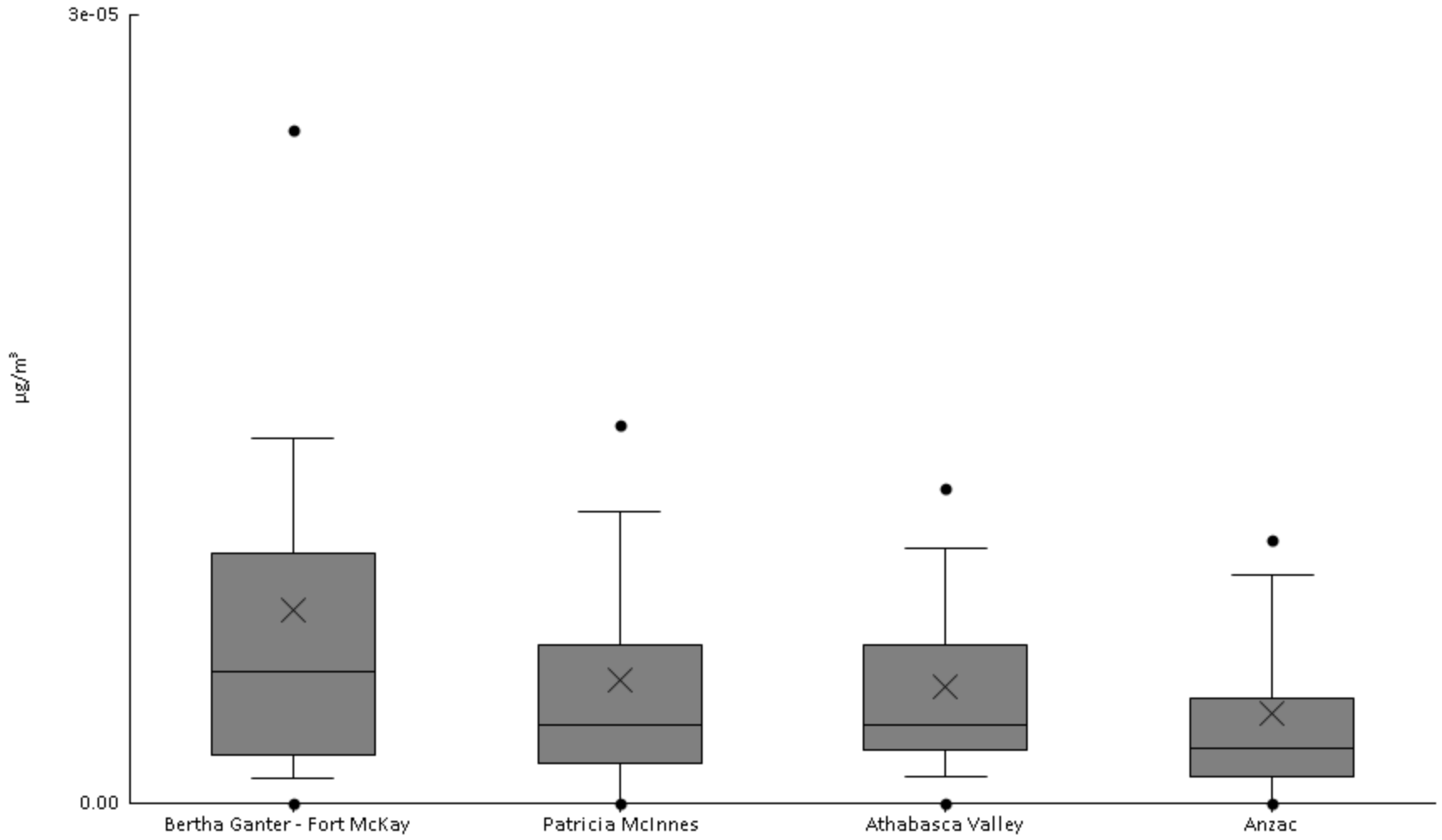
Particulate Matter (PM2.5 METALS) - Cerium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	89%	6E-6	8.1E-6	9.4E-6	2E-5	4.7E-5	8.7E-5	1.7E-4	1.9E-4	3.8E-4	7E-5	6.9E-5
AMS06	Patricia McInnes	56	91%	3E-6	6.2E-6	1E-5	1.6E-5	2.8E-5	4.4E-5	8.4E-5	1.3E-4	2.4E-4	4.1E-5	4.1E-5
AMS07	Athabasca Valley	58	97%	8.5E-6	9.4E-6	1.4E-5	1.9E-5	3.1E-5	4.9E-5	8.3E-5	8.9E-5	2.7E-4	4.1E-5	3.9E-5
AMS14	Anzac	57	65%	0	3.4E-6	5.2E-6	7.1E-6	1.2E-5	2.8E-5	6.4E-5	7.9E-5	8.9E-5	2.1E-5	2.2E-5



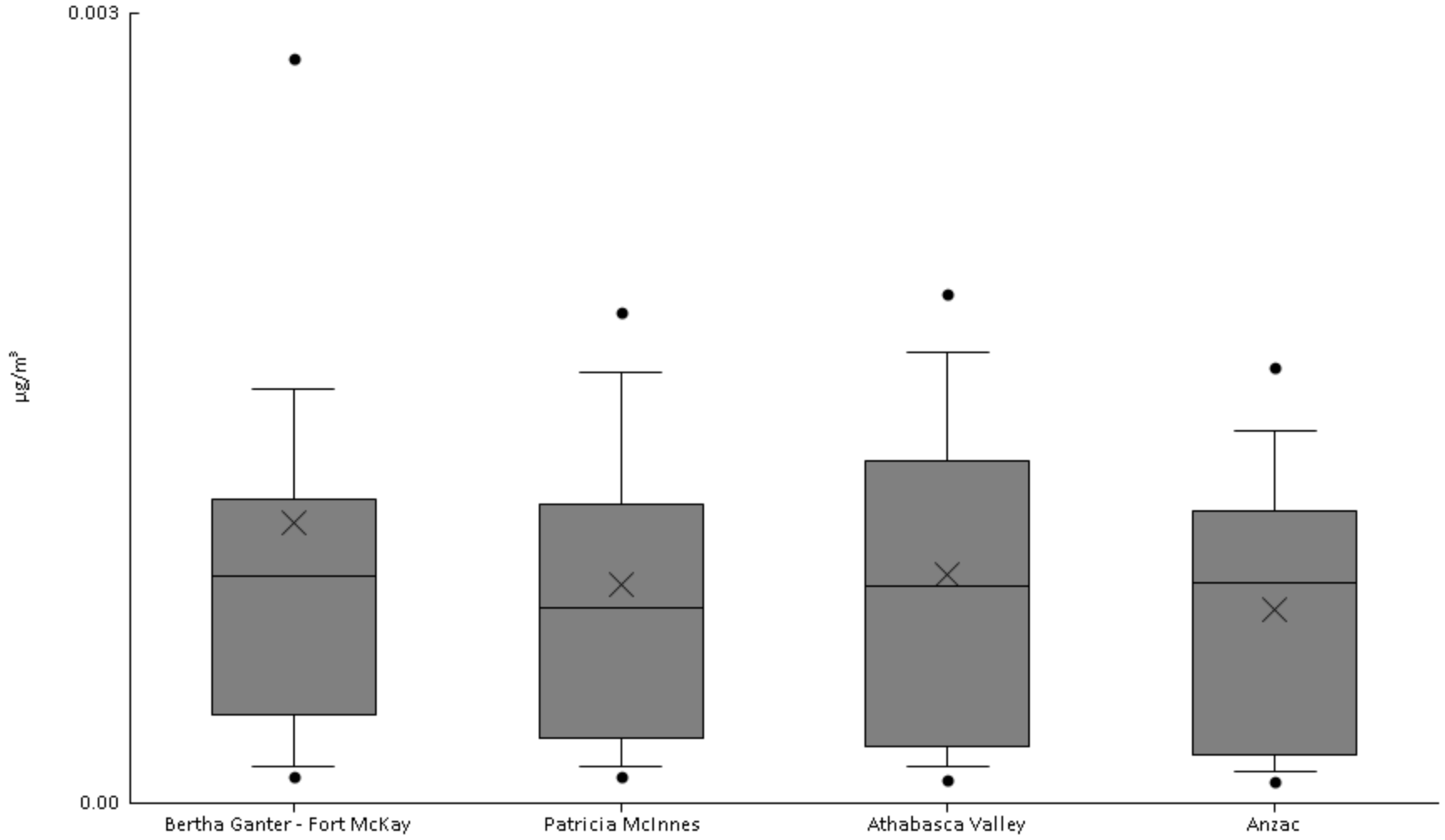
Particulate Matter (PM2.5 METALS) - Cesium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	73%	0	0	9.4E-7	1.9E-6	5E-6	9.5E-6	1.4E-5	2.6E-5	6.7E-5	7.4E-6	1.1E-5
AMS06	Patricia McInnes	54	65%	0	0	0	1.5E-6	3E-6	6E-6	1.1E-5	1.4E-5	1.9E-5	4.7E-6	4.6E-6
AMS07	Athabasca Valley	58	59%	0	0	1E-6	2E-6	3E-6	6E-6	9.7E-6	1.2E-5	1.6E-5	4.4E-6	3.6E-6
AMS14	Anzac	58	53%	0	0	0	1E-6	2.1E-6	4E-6	8.7E-6	1E-5	1.3E-5	3.4E-6	3.3E-6



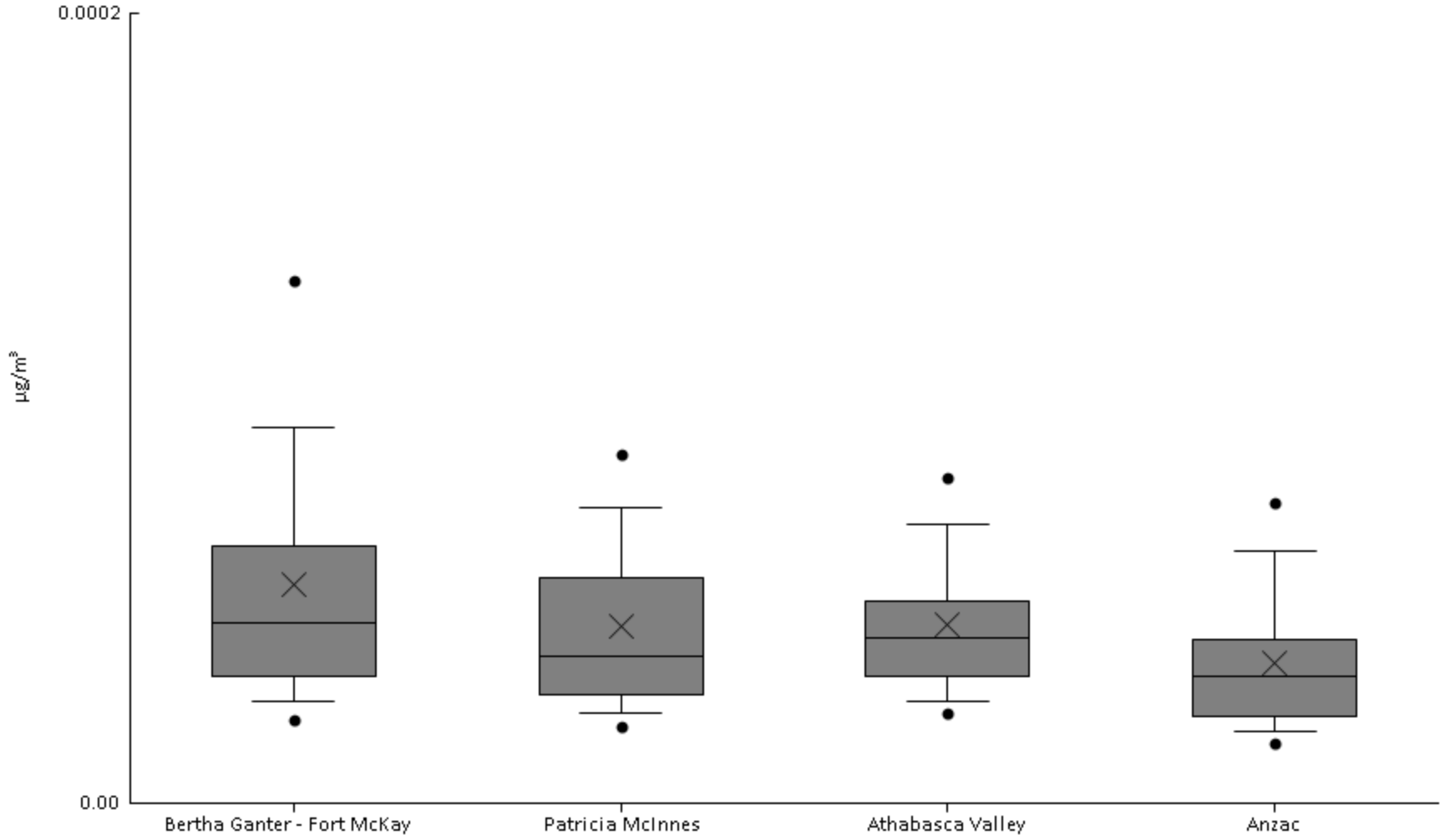
Particulate Matter (PM2.5 METALS) - Chromium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	98%	0	1E-4	1.4E-4	3.4E-4	8.7E-4	1.2E-3	1.6E-3	2.8E-3	0.012	1.1E-3	1.6E-3
AMS06	Patricia McInnes	50	98%	1.4E-5	1E-4	1.4E-4	2.5E-4	7.4E-4	1.1E-3	1.6E-3	1.9E-3	2.9E-3	8.3E-4	6.2E-4
AMS07	Athabasca Valley	56	100%	6.7E-5	8.7E-5	1.4E-4	2.2E-4	8.2E-4	1.3E-3	1.7E-3	1.9E-3	3E-3	8.7E-4	6.5E-4
AMS14	Anzac	47	96%	0	8E-5	1.2E-4	1.8E-4	8.4E-4	1.1E-3	1.4E-3	1.7E-3	1.9E-3	7.4E-4	5.3E-4



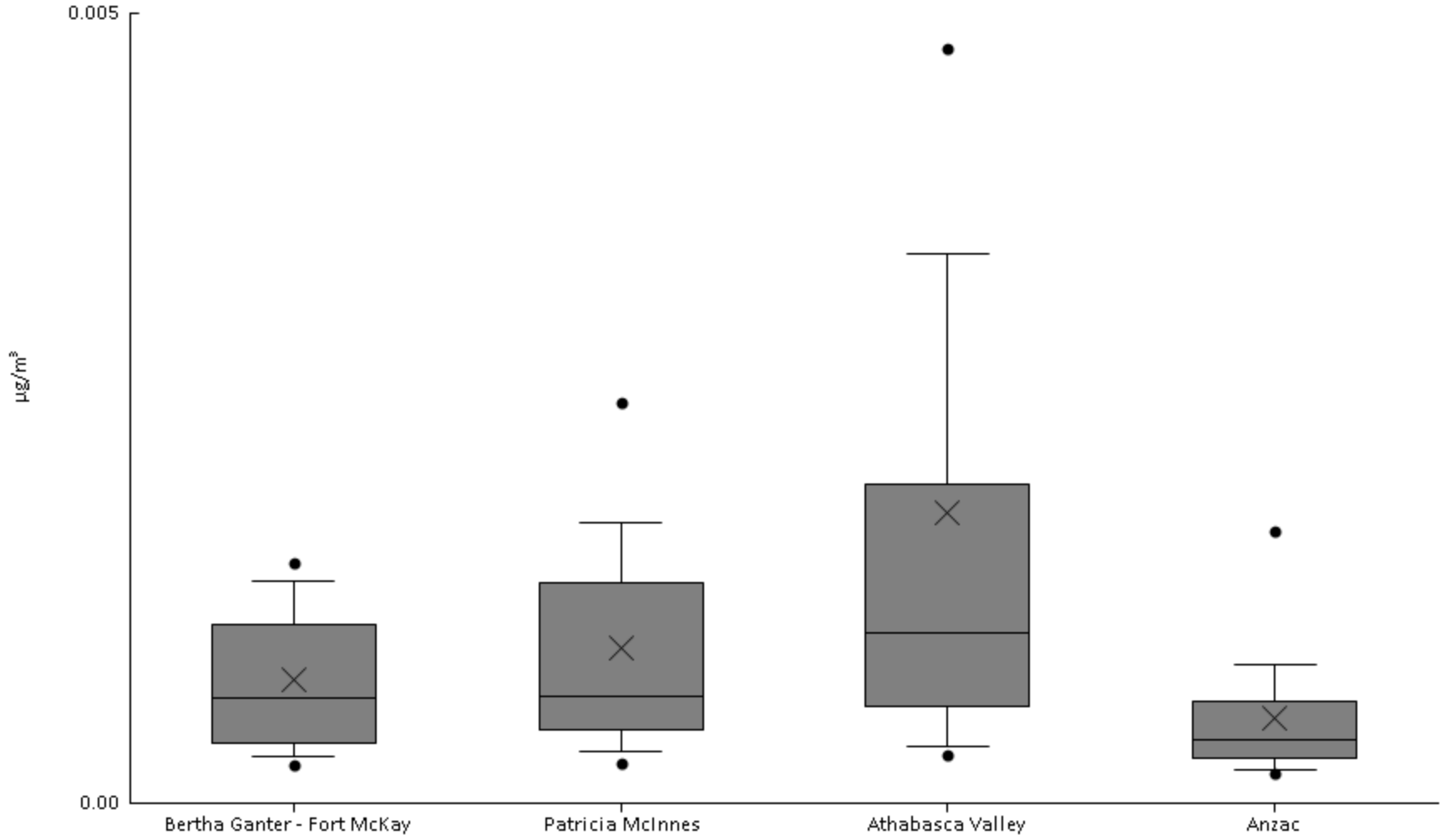
Particulate Matter (PM2.5 METALS) - Cobalt (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	100%	7E-6	2.1E-5	2.6E-5	3.2E-5	4.6E-5	6.5E-5	9.5E-5	1.3E-4	1.8E-4	5.5E-5	3.4E-5
AMS06	Patricia McInnes	56	100%	1.4E-5	2E-5	2.3E-5	2.8E-5	3.7E-5	5.7E-5	7.5E-5	8.8E-5	1.4E-4	4.5E-5	2.6E-5
AMS07	Athabasca Valley	58	100%	2.1E-5	2.3E-5	2.6E-5	3.2E-5	4.2E-5	5.1E-5	7.1E-5	8.2E-5	1.3E-4	4.5E-5	2E-5
AMS14	Anzac	55	100%	8.7E-6	1.5E-5	1.8E-5	2.2E-5	3.2E-5	4.2E-5	6.4E-5	7.6E-5	1E-4	3.5E-5	1.9E-5



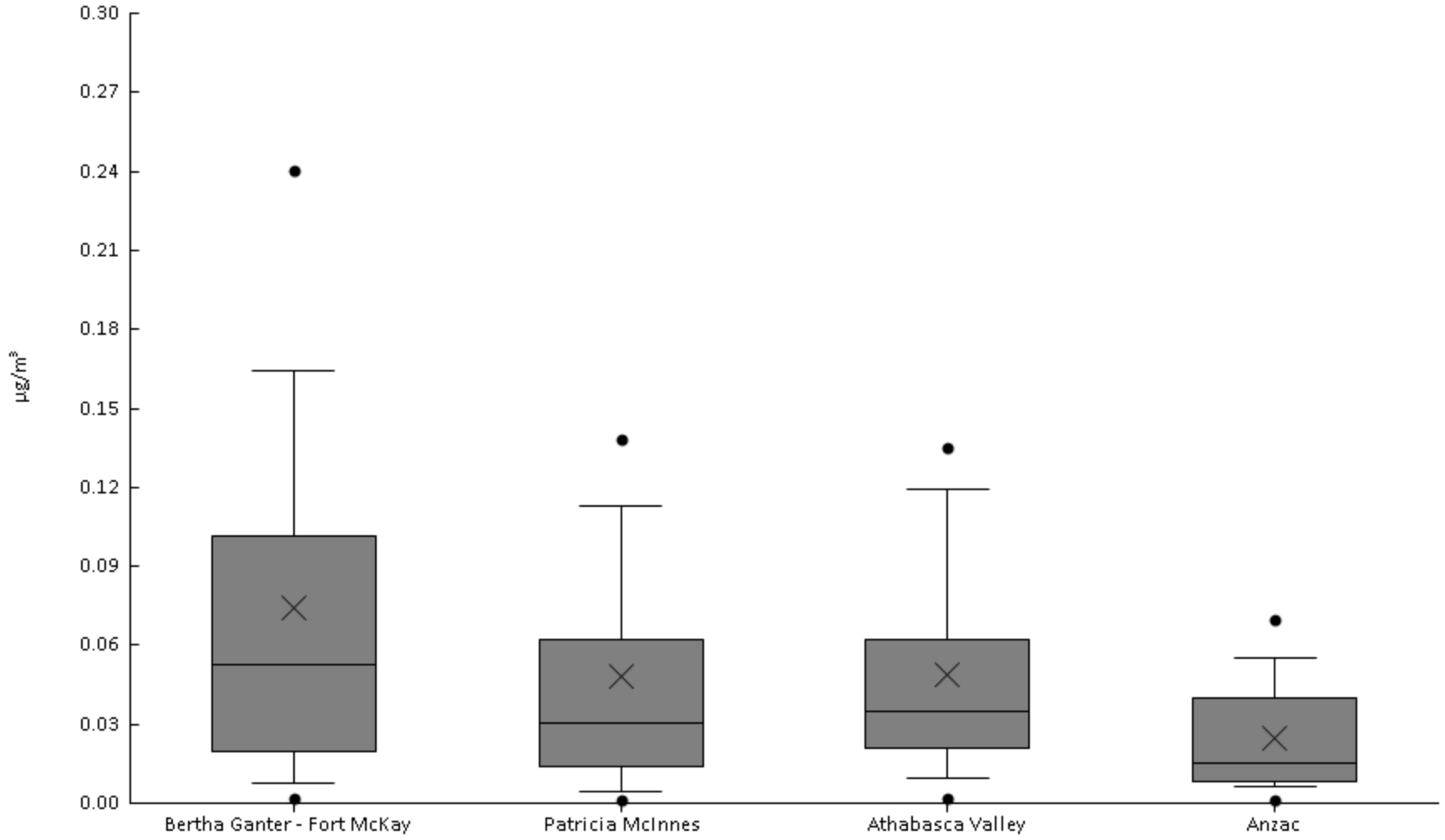
Particulate Matter (PM2.5 METALS) - Copper (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	49	100%	1.9E-4	2.4E-4	3E-4	3.9E-4	6.6E-4	1.1E-3	1.4E-3	1.5E-3	2E-3	7.8E-4	4.5E-4
AMS06	Patricia McInnes	54	100%	2E-4	2.6E-4	3.2E-4	4.6E-4	6.7E-4	1.4E-3	1.8E-3	2.5E-3	5E-3	9.8E-4	8.5E-4
AMS07	Athabasca Valley	56	100%	2.8E-4	3.1E-4	3.6E-4	6.2E-4	1.1E-3	2E-3	3.5E-3	4.8E-3	0.017	1.8E-3	2.6E-3
AMS14	Anzac	49	100%	1.3E-4	1.9E-4	2.1E-4	2.8E-4	4.1E-4	6.4E-4	8.7E-4	1.7E-3	2.1E-3	5.4E-4	4.3E-4



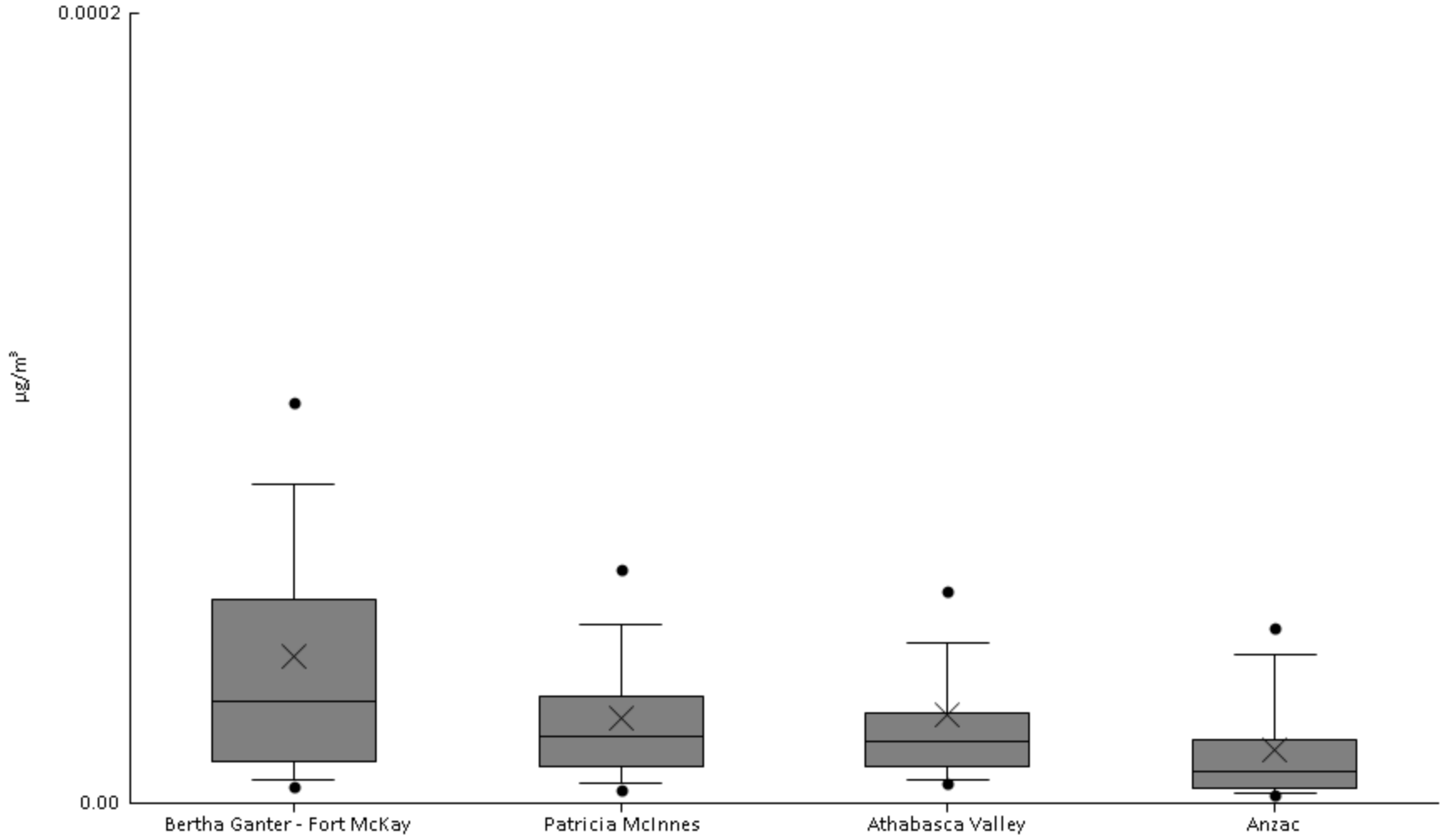
Particulate Matter (PM2.5 METALS) - Iron (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	96%	3E-4	2.1E-3	7.7E-3	0.02	0.053	0.1	0.16	0.24	0.36	0.074	0.076
AMS06	Patricia McInnes	55	95%	5.5E-4	1.1E-3	4.1E-3	0.014	0.03	0.062	0.11	0.14	0.25	0.048	0.049
AMS07	Athabasca Valley	59	95%	7.4E-4	1.9E-3	9.7E-3	0.021	0.035	0.062	0.12	0.14	0.26	0.049	0.047
AMS14	Anzac	57	95%	3.2E-4	1.3E-3	6.2E-3	8.1E-3	0.015	0.04	0.055	0.07	0.095	0.024	0.022



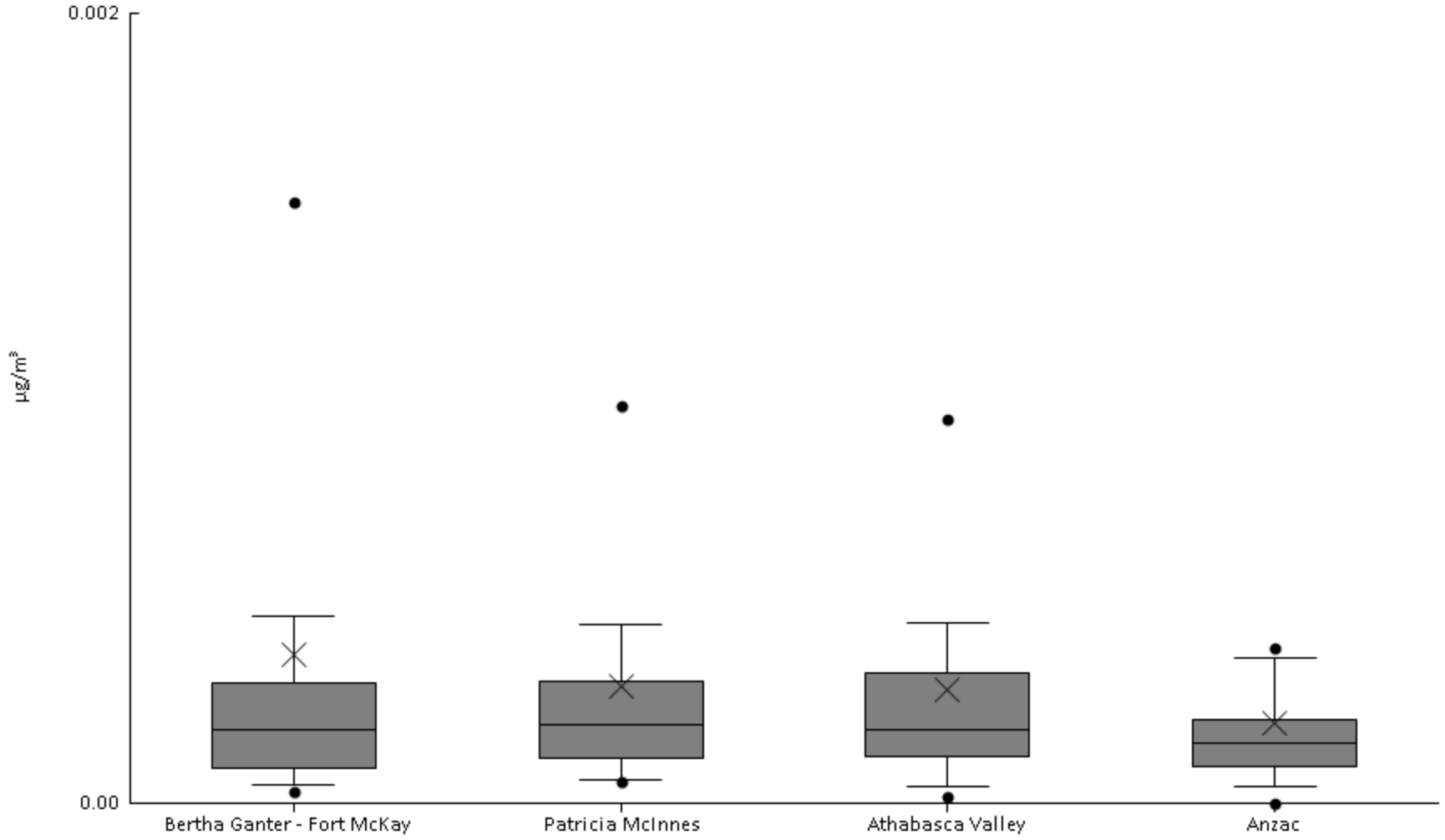
Particulate Matter (PM2.5 METALS) - Lanthanum (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	2.8E-6	4.4E-6	5.8E-6	1E-5	2.6E-5	5.2E-5	8.1E-5	1E-4	1.8E-4	3.7E-5	3.5E-5
AMS06	Patricia McInnes	56	96%	1.7E-6	3.6E-6	5E-6	9.1E-6	1.7E-5	2.7E-5	4.5E-5	5.9E-5	1.2E-4	2.2E-5	2.1E-5
AMS07	Athabasca Valley	58	100%	3.1E-6	5E-6	6E-6	9.4E-6	1.6E-5	2.3E-5	4.1E-5	5.4E-5	1.6E-4	2.3E-5	2.6E-5
AMS14	Anzac	57	88%	0	2E-6	2.4E-6	4E-6	8E-6	1.6E-5	3.8E-5	4.5E-5	1.1E-4	1.4E-5	1.8E-5



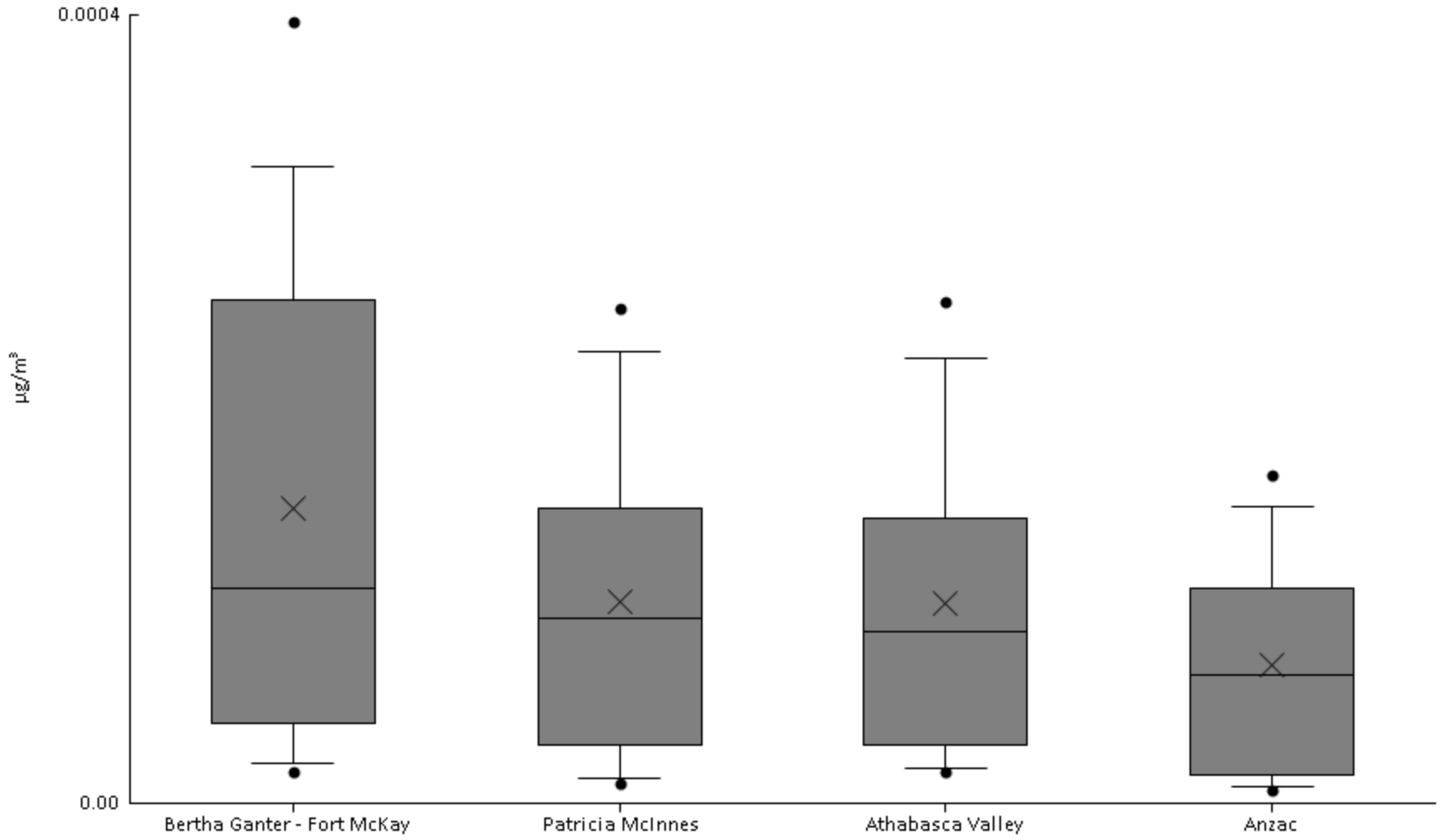
Particulate Matter (PM2.5 METALS) - Lead (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	50	98%	0	3.1E-5	4.7E-5	8.9E-5	1.9E-4	3E-4	4.7E-4	1.5E-3	5.9E-3	3.8E-4	8.8E-4
AMS06	Patricia McInnes	53	96%	0	5.3E-5	6E-5	1.1E-4	2E-4	3.1E-4	4.5E-4	1E-3	2.3E-3	3E-4	4.3E-4
AMS07	Athabasca Valley	55	95%	0	1.7E-5	4.3E-5	1.2E-4	1.9E-4	3.3E-4	4.6E-4	9.7E-4	2.4E-3	2.9E-4	3.6E-4
AMS14	Anzac	52	92%	0	0	4.3E-5	9.3E-5	1.5E-4	2.1E-4	3.7E-4	3.9E-4	1.7E-3	2E-4	2.7E-4



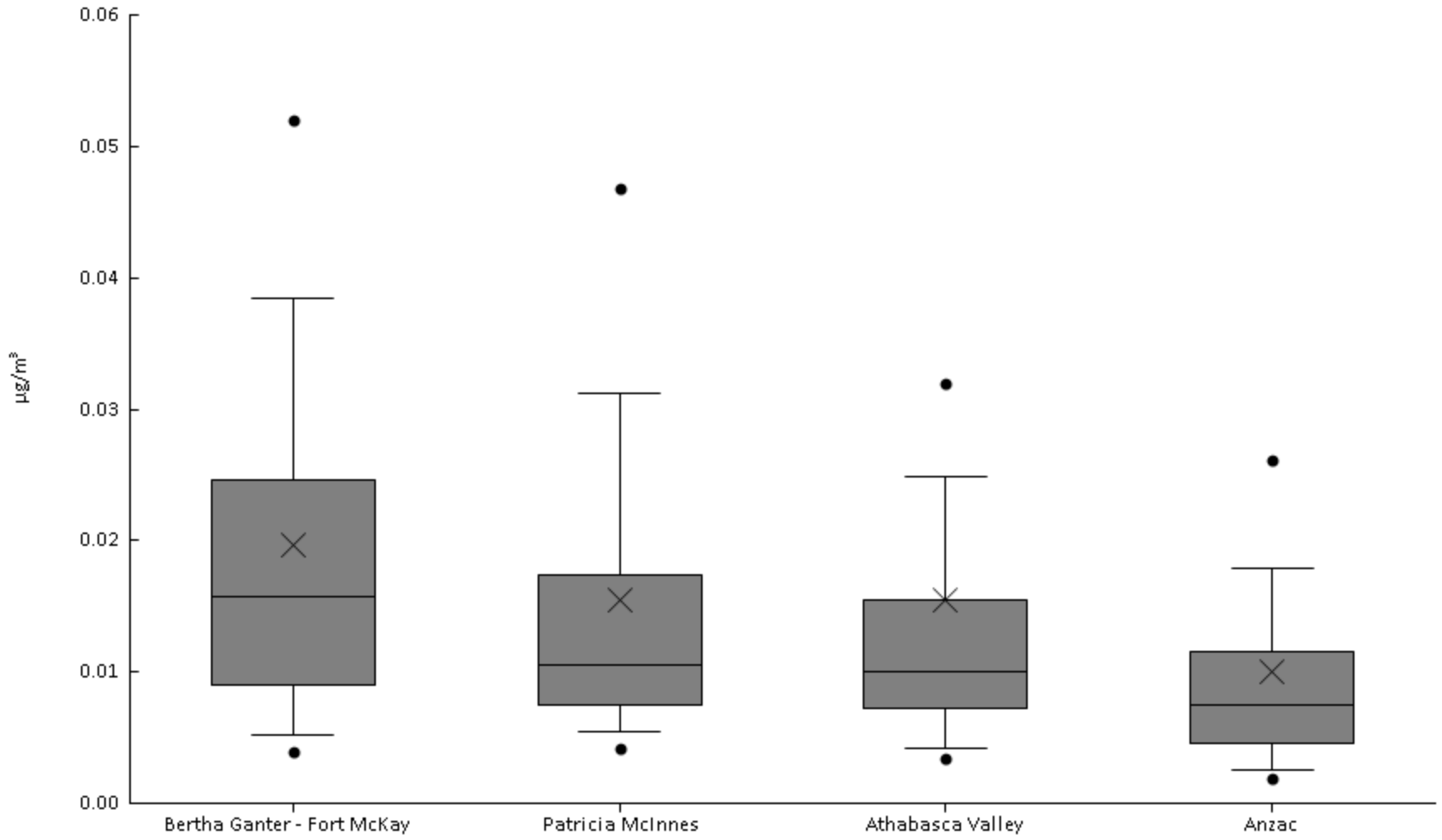
Particulate Matter (PM2.5 METALS) - Lithium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	9.4E-6	1.6E-5	2E-5	4.1E-5	1.1E-4	2.6E-4	3.2E-4	4E-4	5.5E-4	1.5E-4	1.3E-4
AMS06	Patricia McInnes	56	96%	9.8E-6	1E-5	1.3E-5	3E-5	9.4E-5	1.5E-4	2.3E-4	2.5E-4	3.5E-4	1E-4	8.4E-5
AMS07	Athabasca Valley	59	100%	1.3E-5	1.6E-5	1.7E-5	3E-5	8.7E-5	1.5E-4	2.3E-4	2.5E-4	3.6E-4	1E-4	7.9E-5
AMS14	Anzac	53	94%	3E-6	6.9E-6	8.5E-6	1.4E-5	6.5E-5	1.1E-4	1.5E-4	1.7E-4	2.7E-4	7E-5	6E-5



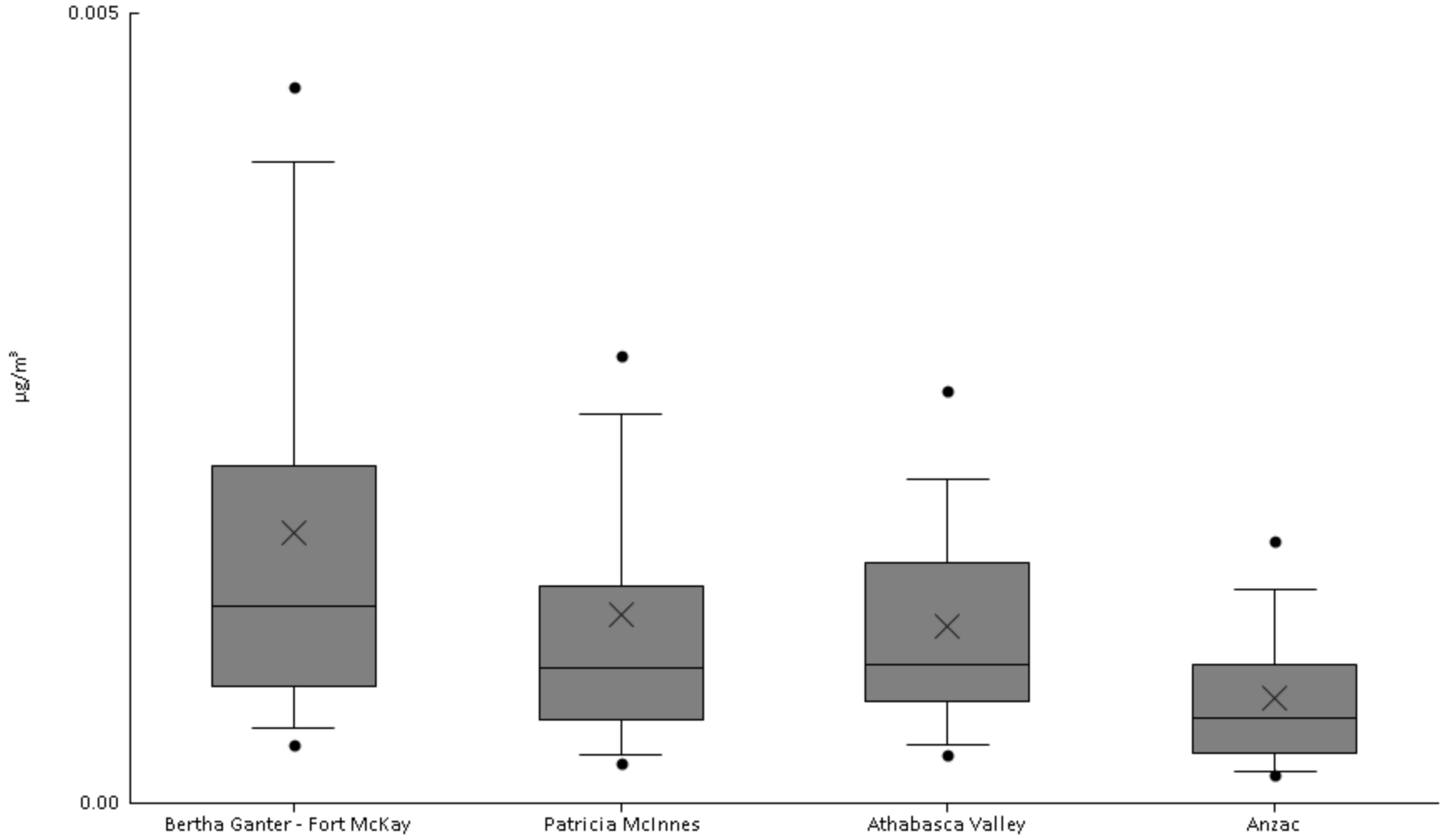
Particulate Matter (PM2.5 METALS) - Magnesium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	1.3E-3	3.9E-3	5.3E-3	9E-3	0.016	0.025	0.038	0.052	0.083	0.02	0.017
AMS06	Patricia McInnes	56	100%	1.7E-3	4.2E-3	5.4E-3	7.5E-3	0.011	0.017	0.031	0.047	0.088	0.015	0.015
AMS07	Athabasca Valley	58	100%	2E-3	3.4E-3	4.2E-3	7.3E-3	1E-2	0.016	0.025	0.032	0.13	0.015	0.02
AMS14	Anzac	57	100%	1.2E-3	1.9E-3	2.5E-3	4.6E-3	7.5E-3	0.012	0.018	0.026	0.077	0.01	0.012



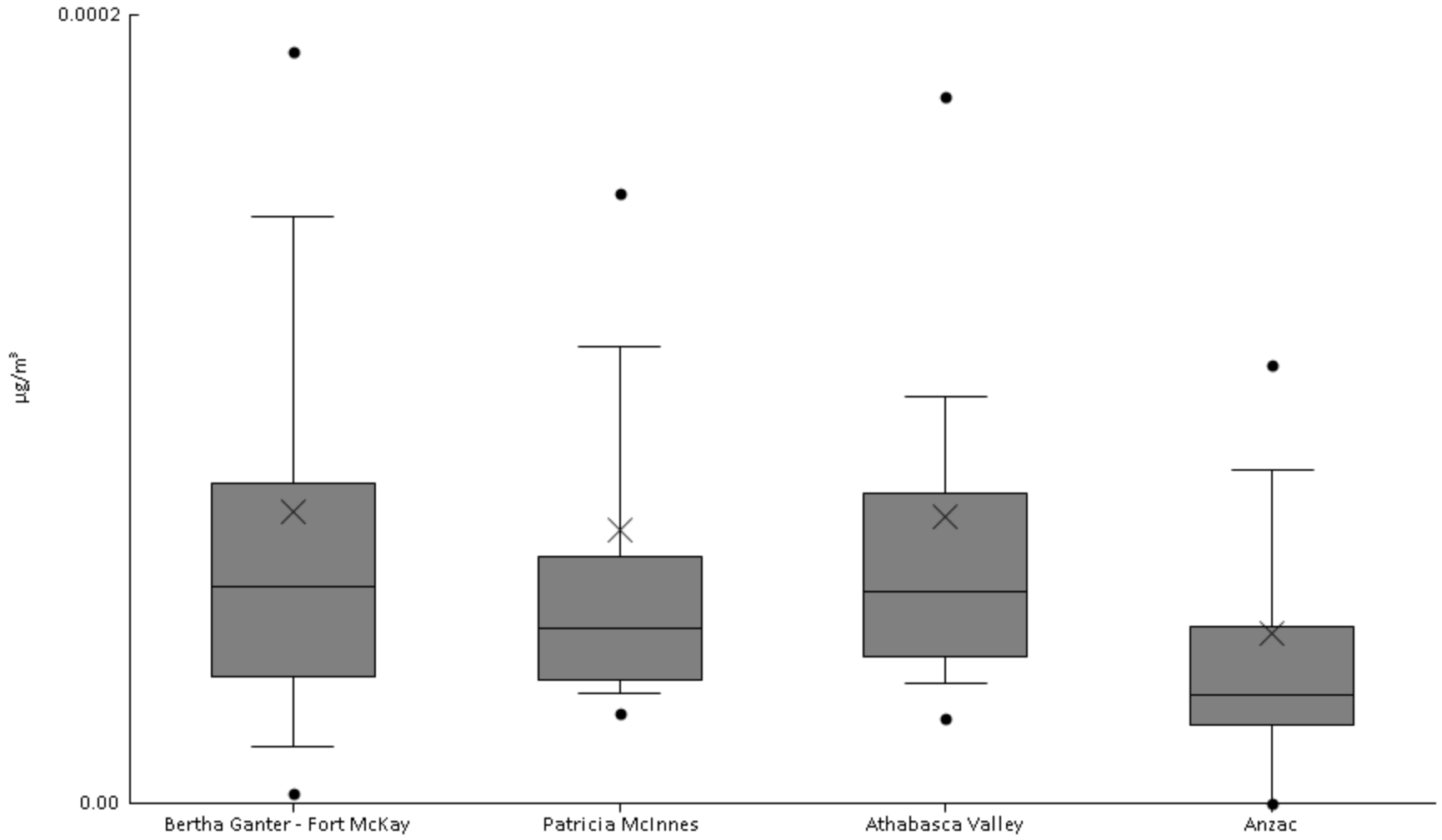
Particulate Matter (PM2.5 METALS) - Manganese (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	1.5E-4	3.7E-4	4.8E-4	7.4E-4	1.2E-3	2.1E-3	4.1E-3	4.5E-3	6.6E-3	1.7E-3	1.4E-3
AMS06	Patricia McInnes	56	100%	1.9E-4	2.5E-4	3.1E-4	5.3E-4	8.6E-4	1.4E-3	2.5E-3	2.8E-3	7.5E-3	1.2E-3	1.2E-3
AMS07	Athabasca Valley	59	100%	2.7E-4	3E-4	3.7E-4	6.4E-4	8.8E-4	1.5E-3	2E-3	2.6E-3	4.9E-3	1.1E-3	7.9E-4
AMS14	Anzac	57	100%	1.4E-4	1.8E-4	2E-4	3.2E-4	5.4E-4	8.8E-4	1.4E-3	1.7E-3	2.4E-3	6.7E-4	4.9E-4



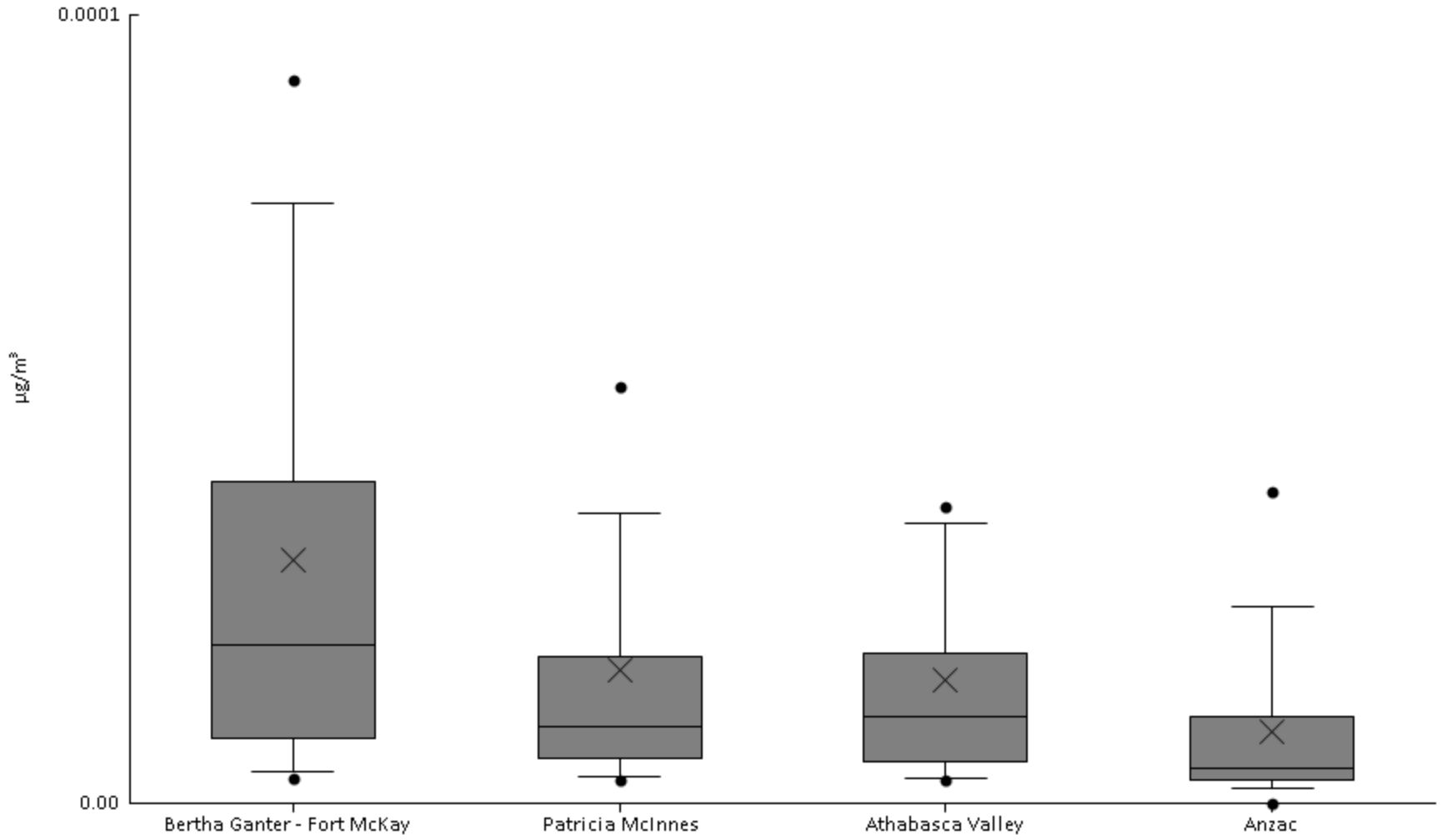
Particulate Matter (PM2.5 METALS) - Molybdenum (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	82%	0	2.4E-6	1.4E-5	3.2E-5	5.5E-5	8.1E-5	1.5E-4	1.9E-4	4.6E-4	7.4E-5	8.2E-5
AMS06	Patricia McInnes	56	95%	0	2.3E-5	2.8E-5	3.1E-5	4.5E-5	6.3E-5	1.2E-4	1.5E-4	8.4E-4	6.9E-5	1.1E-4
AMS07	Athabasca Valley	59	93%	0	2.2E-5	3E-5	3.7E-5	5.4E-5	7.9E-5	1E-4	1.8E-4	6.8E-4	7.3E-5	8.9E-5
AMS14	Anzac	52	58%	0	0	0	2E-5	2.8E-5	4.5E-5	8.5E-5	1.1E-4	3.7E-4	4.3E-5	6.2E-5



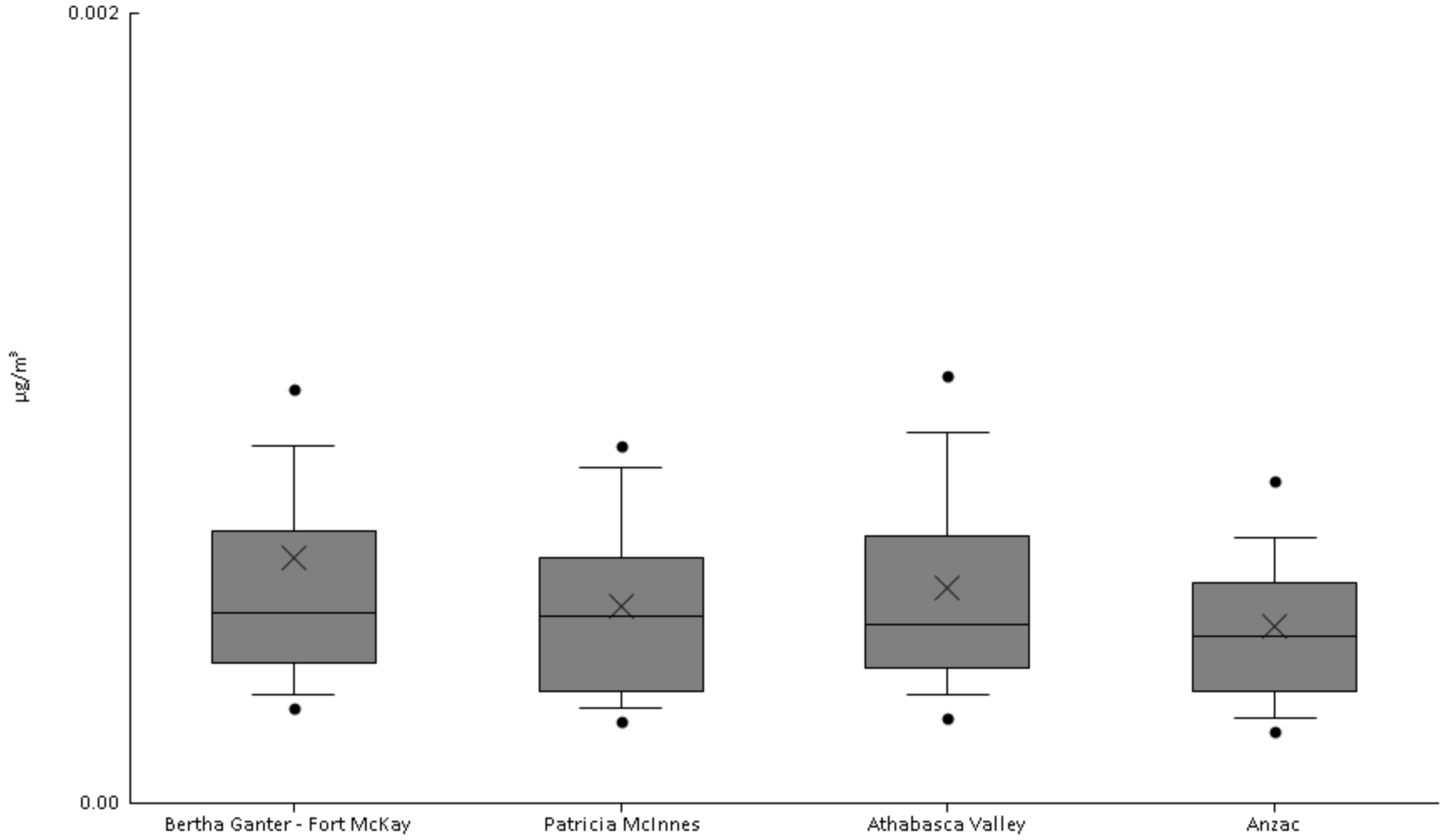
Particulate Matter (PM2.5 METALS) - Neodymium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	89%	2E-6	3.2E-6	4.1E-6	8.2E-6	2E-5	4.1E-5	7.6E-5	9.2E-5	1.8E-4	3.1E-5	3.3E-5
AMS06	Patricia McInnes	56	93%	2E-6	3E-6	3.5E-6	5.6E-6	9.7E-6	1.9E-5	3.7E-5	5.3E-5	9.9E-5	1.7E-5	1.9E-5
AMS07	Athabasca Valley	59	80%	0	3E-6	3.2E-6	5.3E-6	1.1E-5	1.9E-5	3.6E-5	3.8E-5	1.1E-4	1.6E-5	1.6E-5
AMS14	Anzac	58	67%	0	0	2E-6	2.9E-6	4.5E-6	1.1E-5	2.5E-5	4E-5	4.2E-5	9.1E-6	1.1E-5



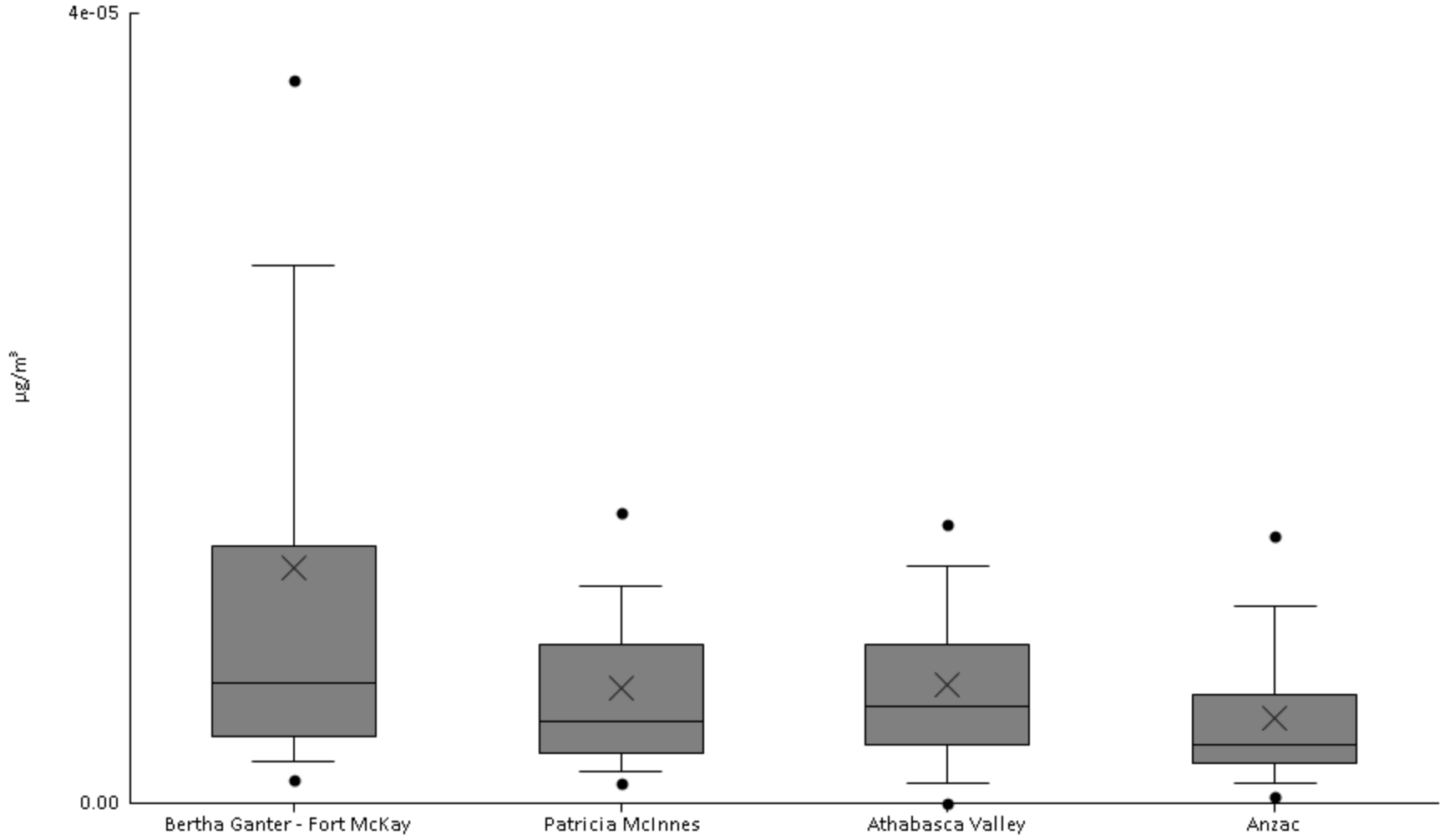
Particulate Matter (PM2.5 METALS) - Nickel (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	55	100%	2.1E-4	2.4E-4	2.7E-4	3.6E-4	4.8E-4	6.9E-4	9E-4	1E-3	4.7E-3	6.2E-4	6.2E-4
AMS06	Patricia McInnes	51	100%	1.8E-4	2.1E-4	2.4E-4	2.8E-4	4.7E-4	6.2E-4	8.5E-4	9.1E-4	1.3E-3	5E-4	2.4E-4
AMS07	Athabasca Valley	57	100%	1.5E-4	2.1E-4	2.7E-4	3.4E-4	4.5E-4	6.8E-4	9.4E-4	1.1E-3	1.3E-3	5.4E-4	2.7E-4
AMS14	Anzac	53	100%	1.3E-4	1.8E-4	2.2E-4	2.9E-4	4.2E-4	5.6E-4	6.7E-4	8.2E-4	1.1E-3	4.5E-4	2E-4



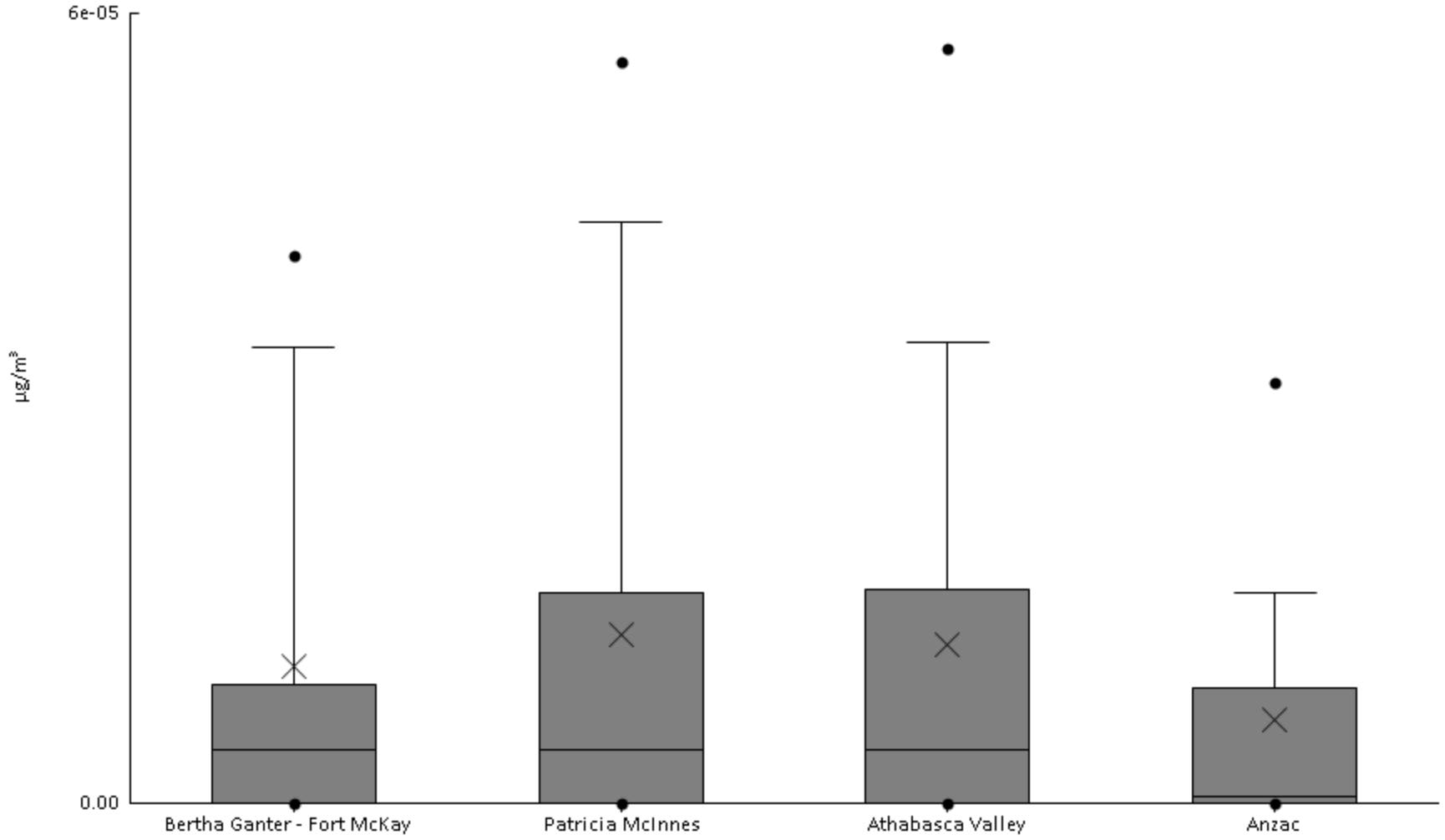
Particulate Matter (PM2.5 METALS) - Niobium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	72%	0	1.2E-6	2.1E-6	3.4E-6	6.1E-6	1.3E-5	2.7E-5	3.7E-5	1E-4	1.2E-5	1.6E-5
AMS06	Patricia McInnes	56	57%	0	1E-6	1.6E-6	2.5E-6	4.1E-6	8E-6	1.1E-5	1.5E-5	3.1E-5	5.8E-6	5.4E-6
AMS07	Athabasca Valley	59	56%	0	0	1E-6	3E-6	4.9E-6	8E-6	1.2E-5	1.4E-5	3.4E-5	6E-6	5.4E-6
AMS14	Anzac	56	46%	0	3E-7	1E-6	2E-6	2.9E-6	5.5E-6	1E-5	1.4E-5	1.9E-5	4.3E-6	4.2E-6



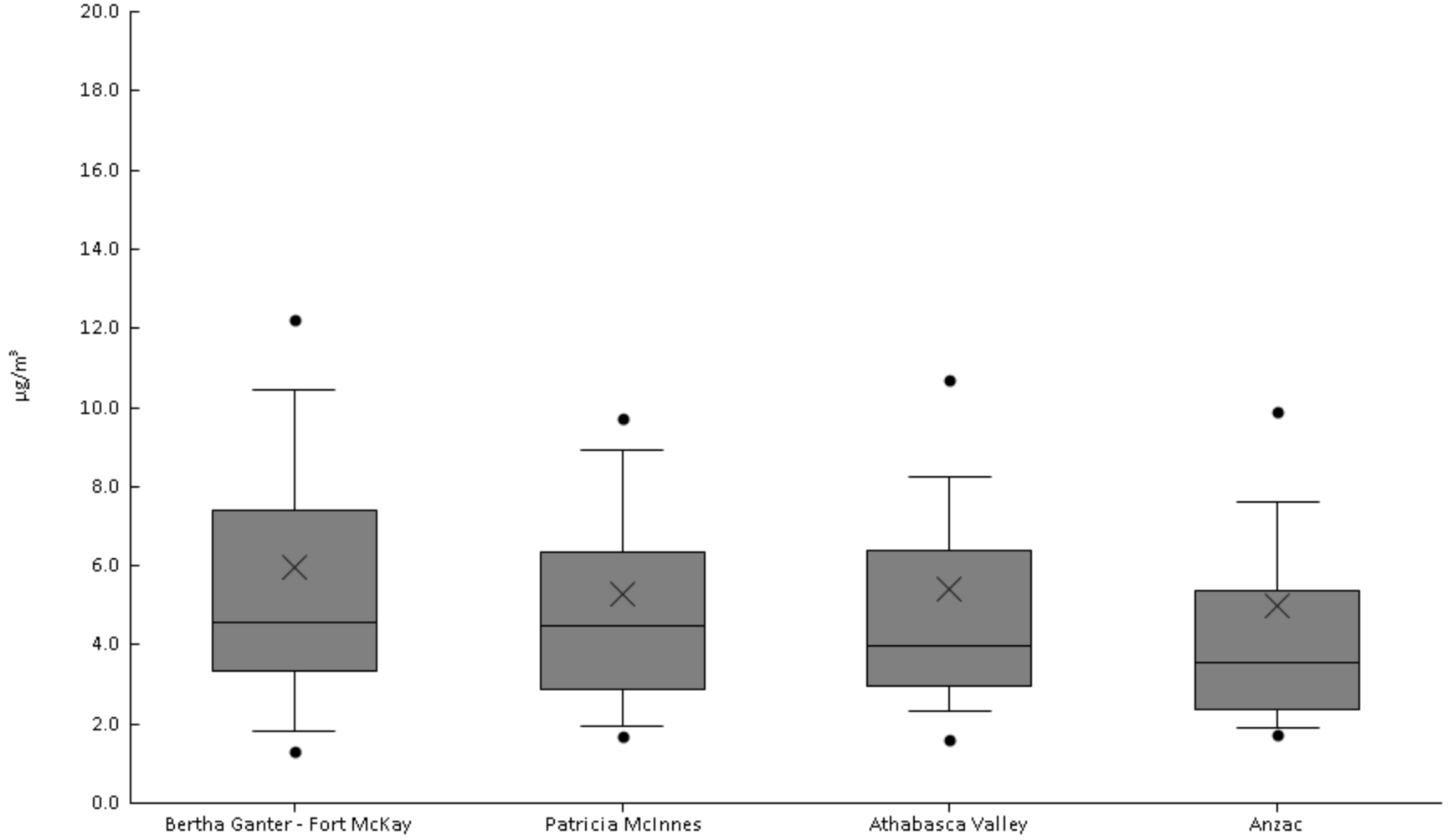
Particulate Matter (PM2.5 METALS) - Palladium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	53	25%	0	0	0	0	4E-6	9E-6	3.5E-5	4.2E-5	6.9E-5	1E-5	1.6E-5
AMS06	Patricia McInnes	49	31%	0	0	0	0	4E-6	1.6E-5	4.4E-5	5.6E-5	1E-4	1.3E-5	2.1E-5
AMS07	Athabasca Valley	53	21%	0	0	0	0	4.1E-6	1.6E-5	3.5E-5	5.7E-5	8.8E-5	1.2E-5	1.9E-5
AMS14	Anzac	46	22%	0	0	0	0	5E-7	8.7E-6	1.6E-5	3.2E-5	6.2E-5	6.4E-6	1.2E-5



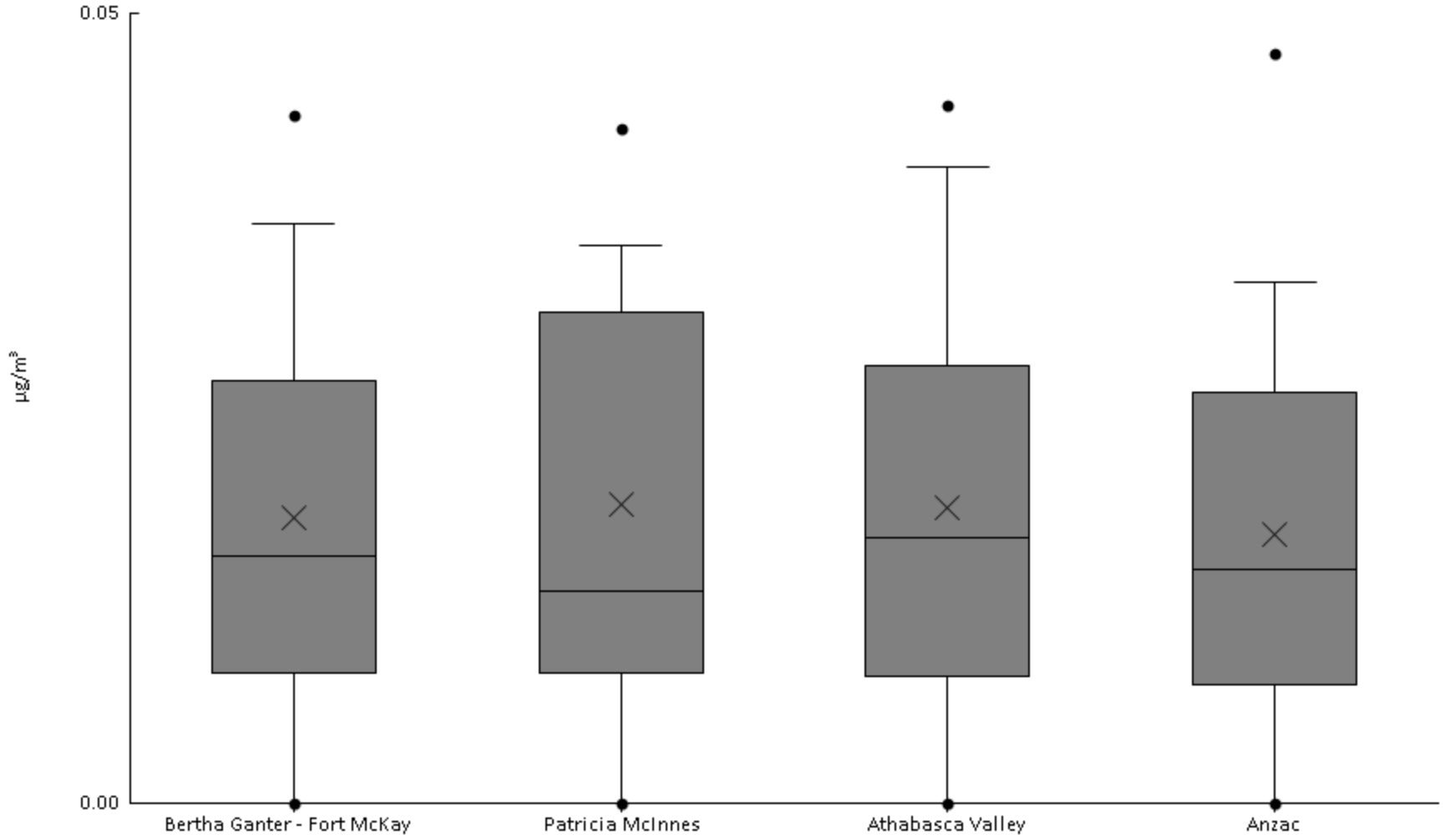
Particulate Matter (PM2.5 METALS) - Particulate Matter (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.79	1.3	1.8	3.3	4.6	7.4	10	12	31	6	4.7
AMS06	Patricia McInnes	56	100%	1.1	1.7	1.9	2.9	4.5	6.3	8.9	9.7	38	5.3	5
AMS07	Athabasca Valley	59	100%	0.33	1.6	2.3	2.9	4	6.4	8.2	11	42	5.4	5.5
AMS14	Anzac	57	100%	1	1.7	1.9	2.4	3.5	5.4	7.6	9.9	39	5	5.7



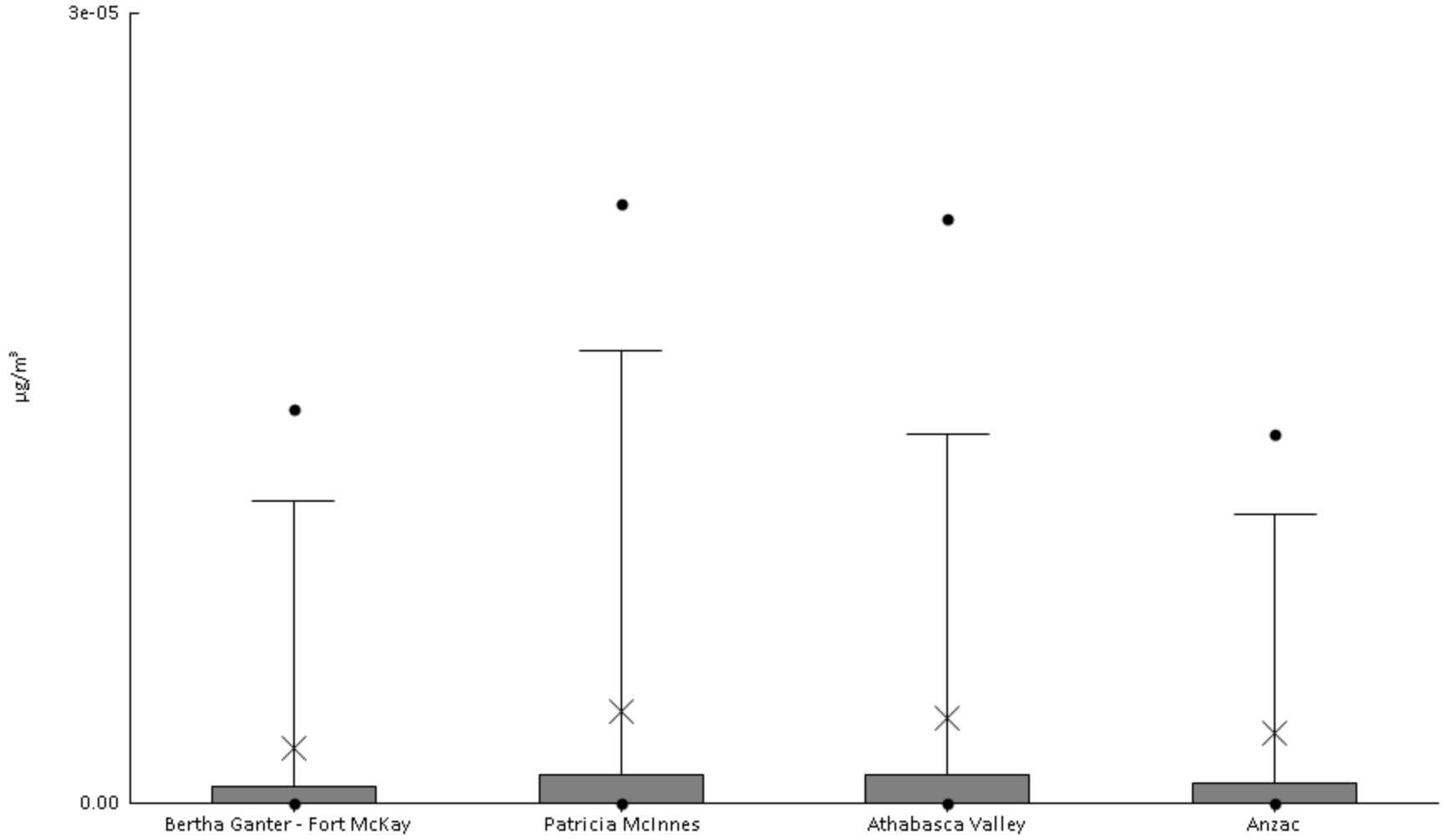
Particulate Matter (PM2.5 METALS) - Phosphorus (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	54	81%	0	0	0	8.2E-3	0.016	0.027	0.037	0.044	0.045	0.018	0.014
AMS06	Patricia McInnes	51	84%	0	0	0	8.2E-3	0.013	0.031	0.035	0.043	0.057	0.019	0.015
AMS07	Athabasca Valley	56	82%	0	0	0	8E-3	0.017	0.028	0.04	0.044	0.048	0.019	0.014
AMS14	Anzac	54	80%	0	0	0	7.5E-3	0.015	0.026	0.033	0.047	0.058	0.017	0.014



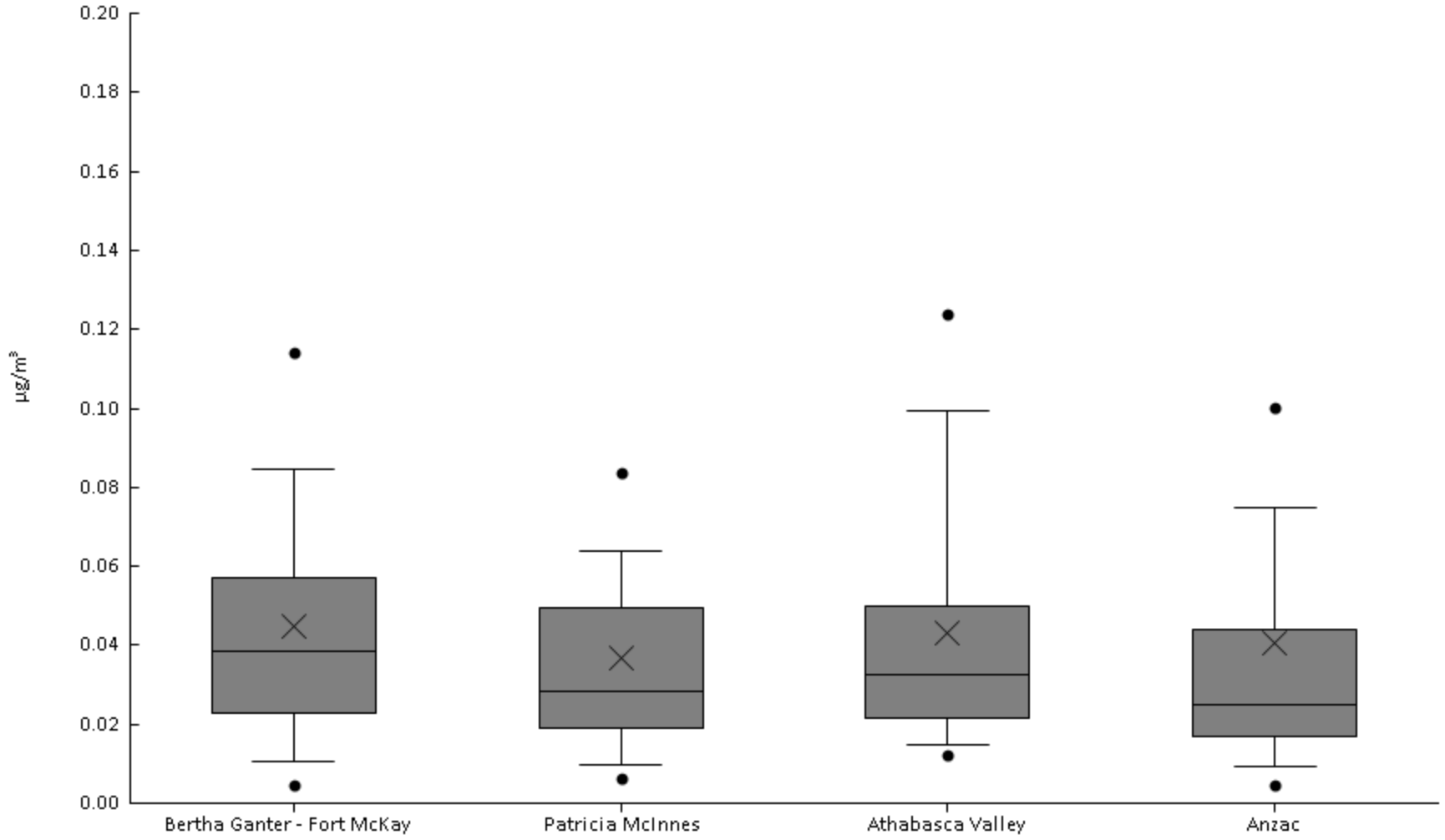
Particulate Matter (PM2.5 METALS) - Platinum (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	50	28%	0	0	0	0	0	6.5E-7	1.2E-5	1.5E-5	2.4E-5	2.1E-6	5.4E-6
AMS06	Patricia McInnes	47	36%	0	0	0	0	0	1.1E-6	1.7E-5	2.3E-5	2.7E-5	3.5E-6	7.4E-6
AMS07	Athabasca Valley	54	39%	0	0	0	0	0	1.1E-6	1.4E-5	2.2E-5	3.3E-5	3.3E-6	7.3E-6
AMS14	Anzac	50	38%	0	0	0	0	0	7.5E-7	1.1E-5	1.4E-5	2.6E-5	2.6E-6	5.4E-6



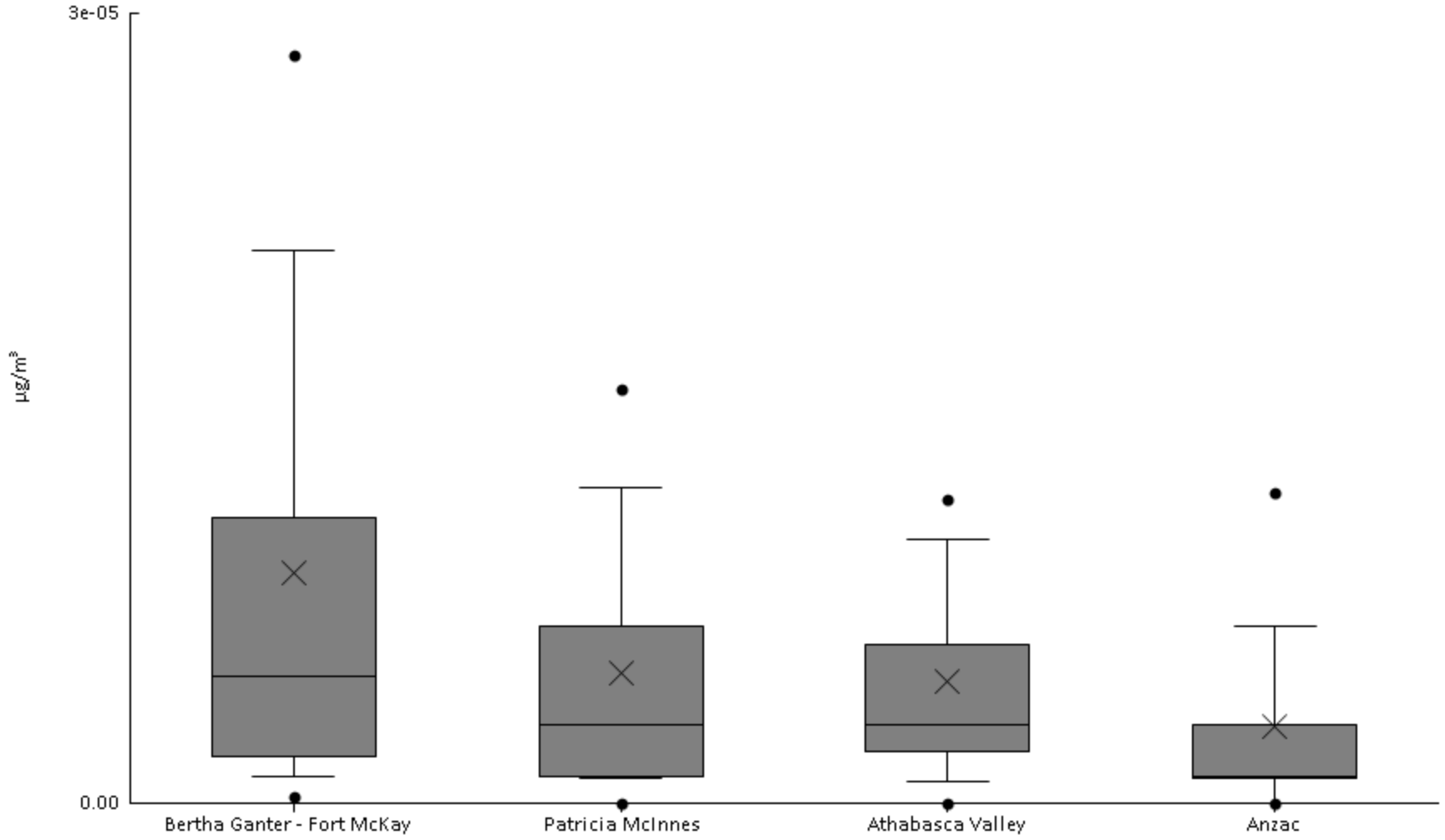
Particulate Matter (PM2.5 METALS) - Potassium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	96%	0	4.8E-3	0.01	0.023	0.038	0.057	0.085	0.11	0.14	0.045	0.032
AMS06	Patricia McInnes	56	98%	0	6.5E-3	9.8E-3	0.019	0.028	0.049	0.064	0.084	0.18	0.037	0.029
AMS07	Athabasca Valley	59	98%	0	0.012	0.015	0.021	0.032	0.05	0.1	0.12	0.19	0.043	0.036
AMS14	Anzac	58	98%	0	4.5E-3	9.4E-3	0.017	0.025	0.044	0.075	0.1	0.4	0.041	0.057



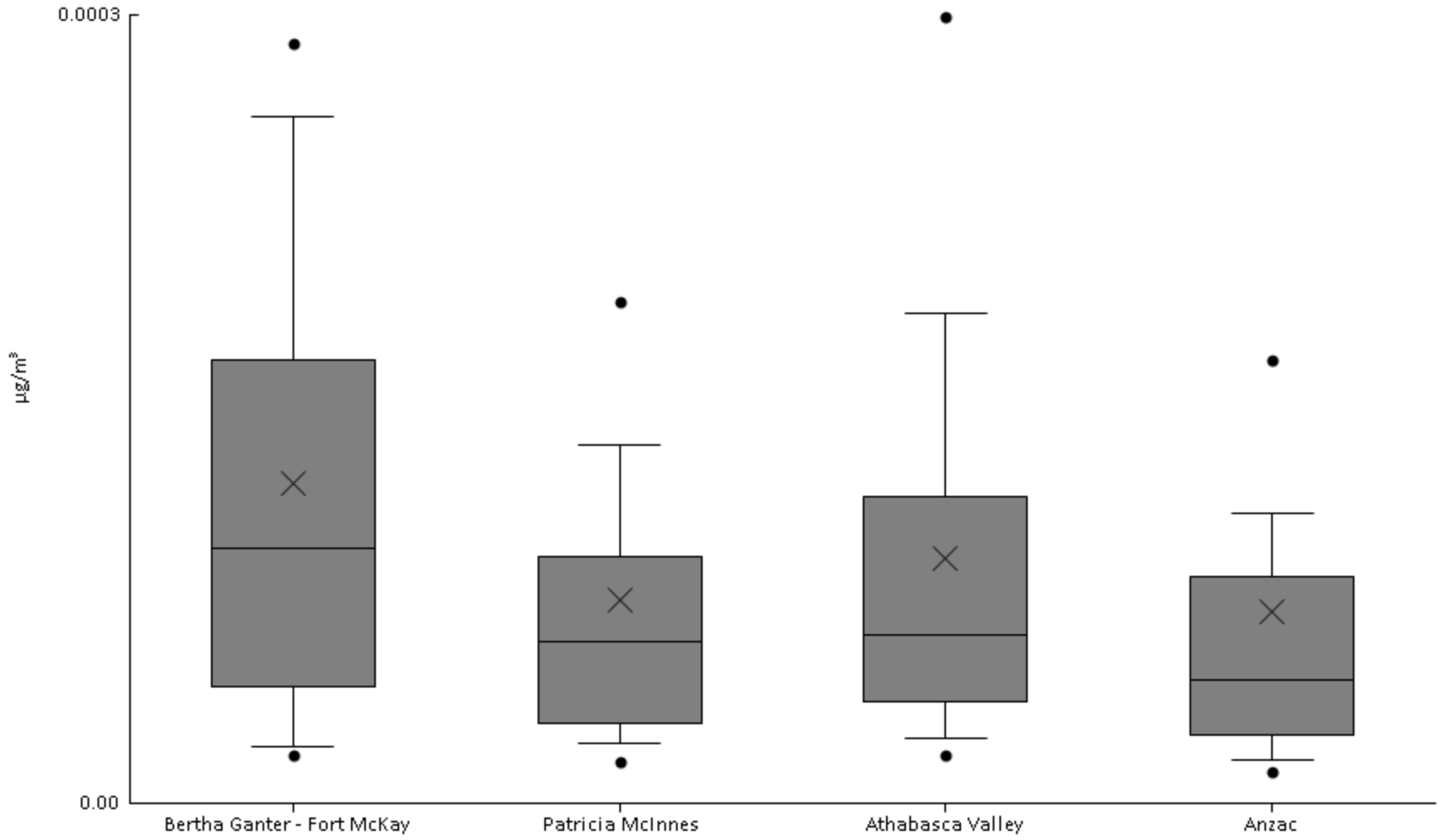
Particulate Matter (PM2.5 METALS) - Praseodymium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	82%	0	2.7E-7	1E-6	1.8E-6	4.8E-6	1.1E-5	2.1E-5	2.8E-5	5.8E-5	8.7E-6	1.1E-5
AMS06	Patricia McInnes	55	82%	0	0	9.4E-7	1E-6	3E-6	6.8E-6	1.2E-5	1.6E-5	2.7E-5	4.9E-6	5.4E-6
AMS07	Athabasca Valley	59	85%	0	0	8E-7	2E-6	3E-6	6E-6	1E-5	1.2E-5	3E-5	4.6E-6	4.8E-6
AMS14	Anzac	58	64%	0	0	0	9.3E-7	1E-6	3E-6	6.7E-6	1.2E-5	2E-5	2.9E-6	4.1E-6



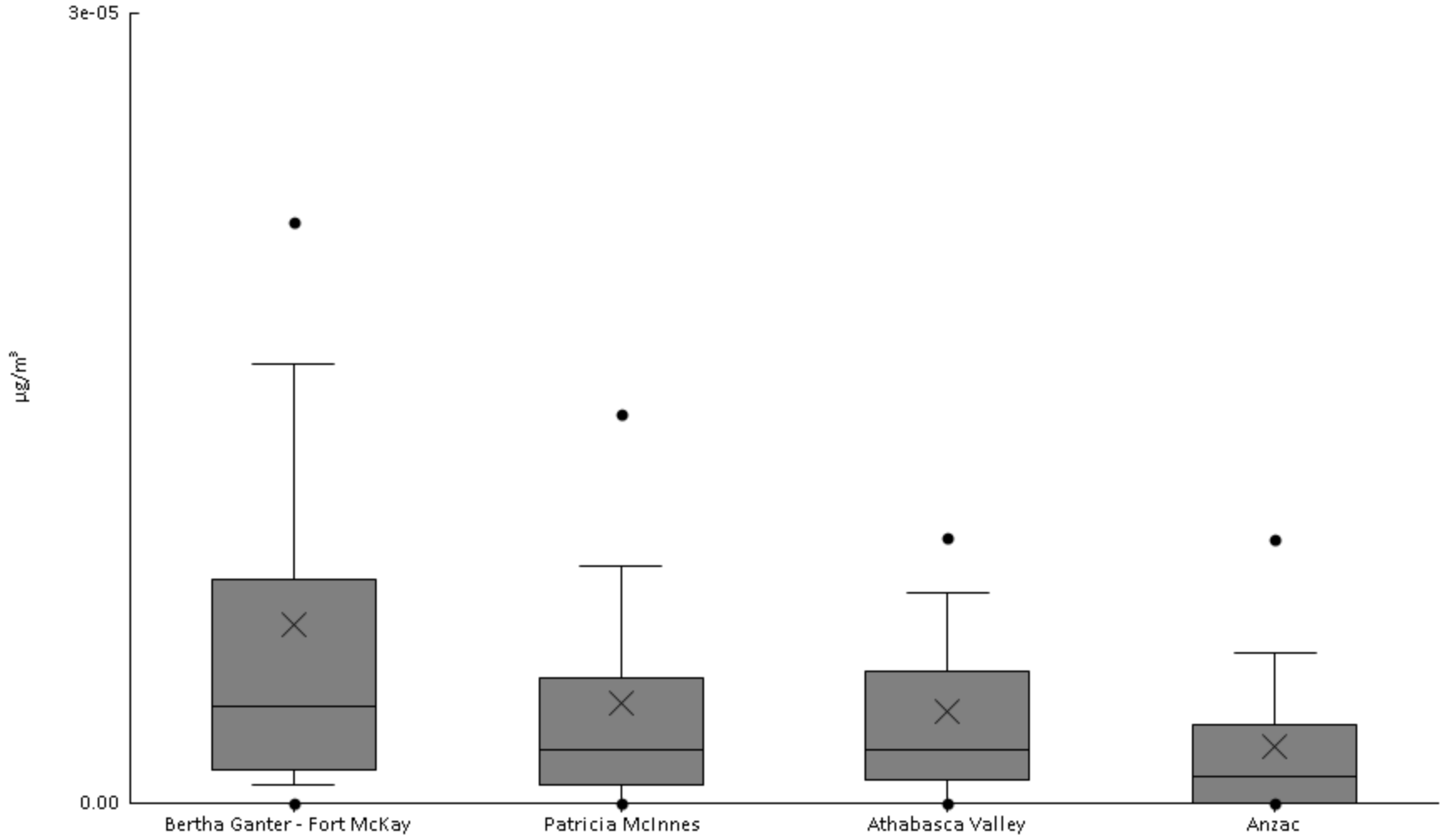
Particulate Matter (PM2.5 METALS) - Rubidium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	1.4E-5	1.8E-5	2.2E-5	4.5E-5	9.7E-5	1.7E-4	2.6E-4	2.9E-4	5.7E-4	1.2E-4	1E-4
AMS06	Patricia McInnes	56	100%	1.3E-5	1.6E-5	2.3E-5	3.1E-5	6.2E-5	9.4E-5	1.4E-4	1.9E-4	4.7E-4	7.7E-5	7.2E-5
AMS07	Athabasca Valley	59	100%	1.1E-5	1.9E-5	2.5E-5	3.9E-5	6.4E-5	1.2E-4	1.9E-4	3E-4	4.1E-4	9.3E-5	8.3E-5
AMS14	Anzac	58	98%	3E-6	1.2E-5	1.6E-5	2.6E-5	4.7E-5	8.6E-5	1.1E-4	1.7E-4	8.3E-4	7.3E-5	1.1E-4



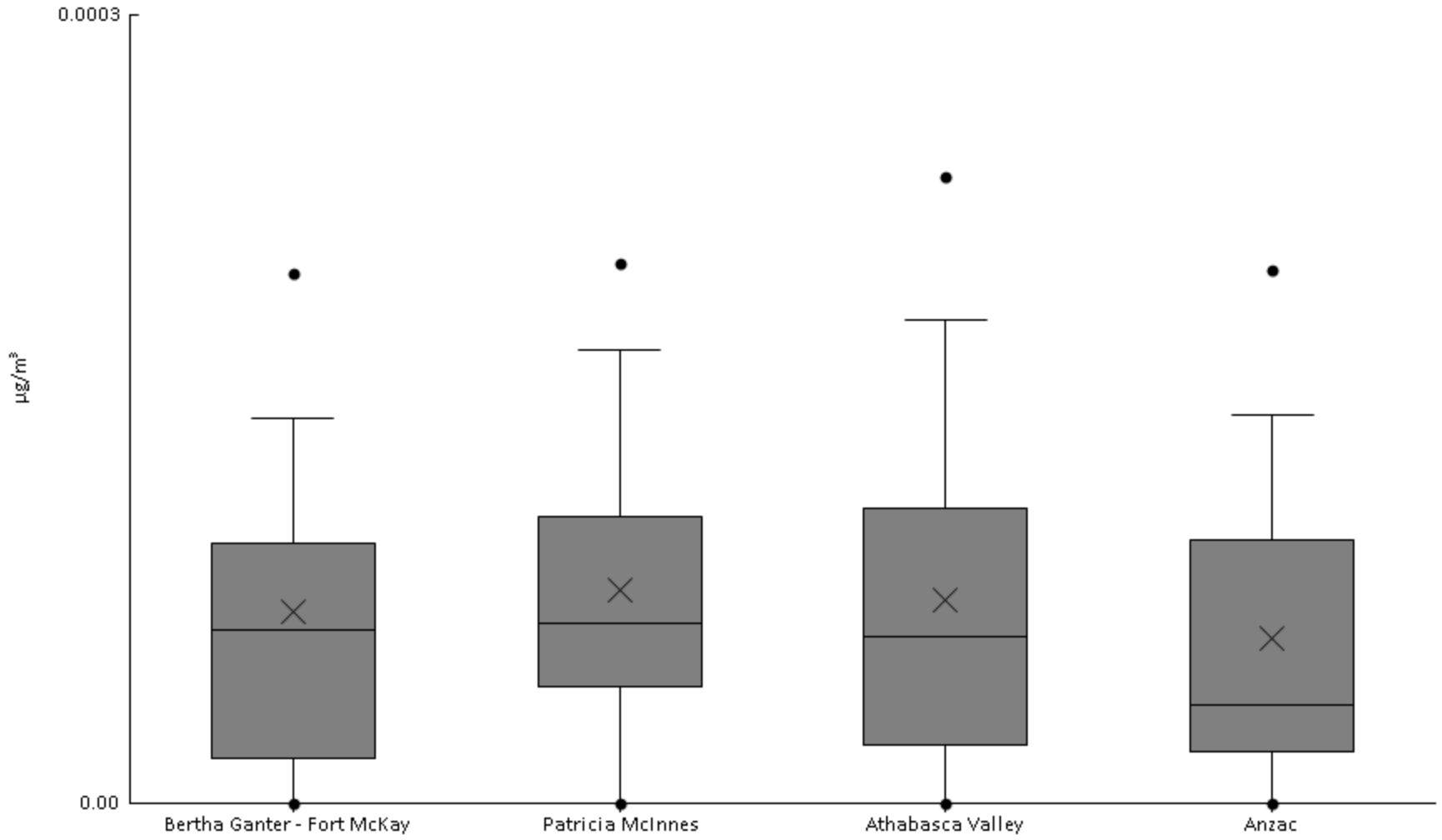
Particulate Matter (PM2.5 METALS) - Samarium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	52%	0	0	7.3E-7	1.3E-6	3.7E-6	8.5E-6	1.7E-5	2.2E-5	5.7E-5	6.8E-6	9.7E-6
AMS06	Patricia McInnes	55	38%	0	0	0	6.8E-7	2E-6	4.8E-6	9E-6	1.5E-5	2.2E-5	3.8E-6	4.9E-6
AMS07	Athabasca Valley	59	37%	0	0	0	9.1E-7	2E-6	5E-6	8E-6	1E-5	2.4E-5	3.5E-6	4.1E-6
AMS14	Anzac	58	16%	0	0	0	0	1E-6	3E-6	5.7E-6	1E-5	1.9E-5	2.2E-6	3.8E-6



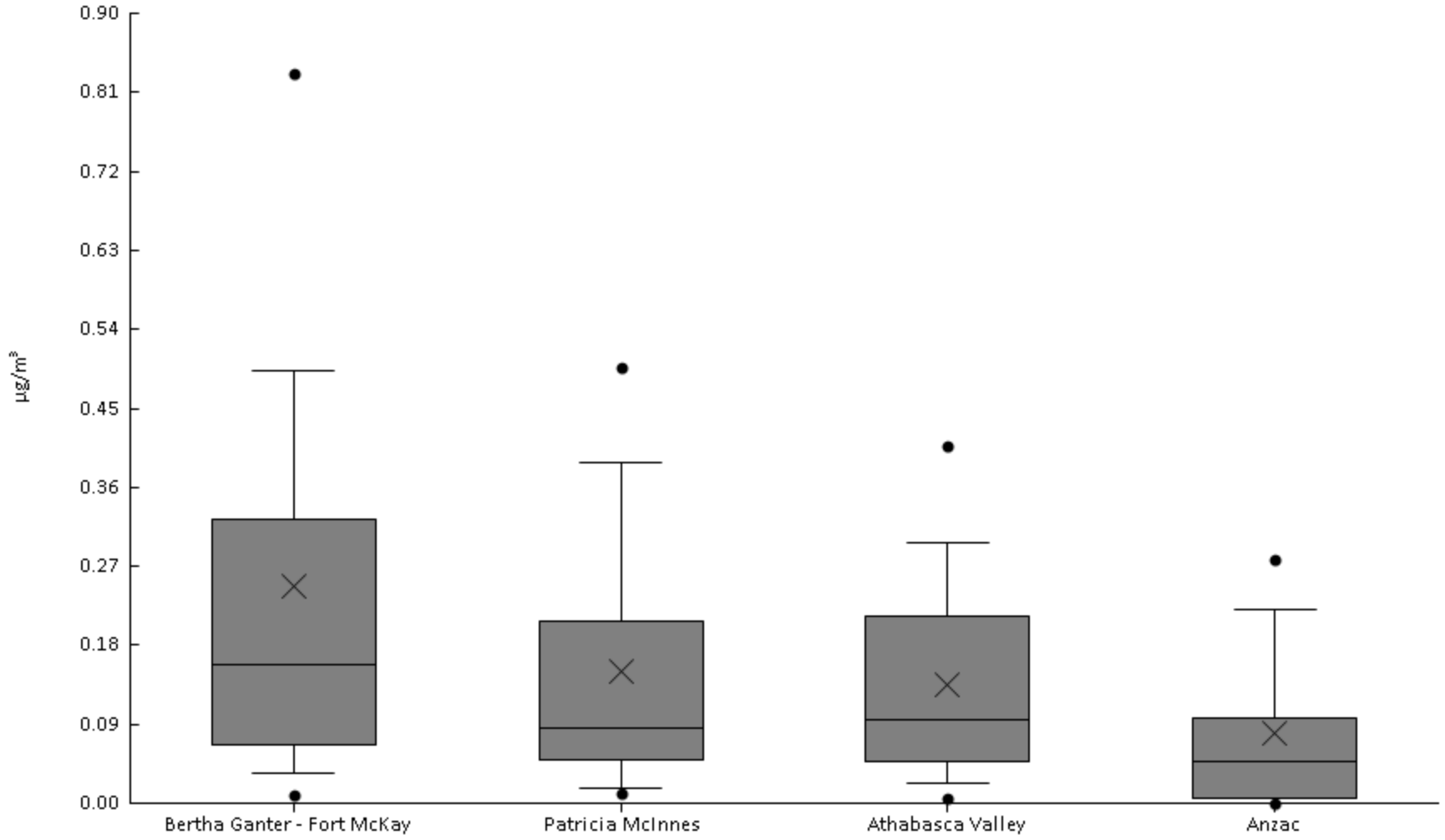
Particulate Matter (PM2.5 METALS) - Selenium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	48	35%	0	0	0	1.7E-5	6.6E-5	9.9E-5	1.5E-4	2E-4	4E-4	7.3E-5	7.4E-5
AMS06	Patricia McInnes	44	48%	0	0	0	4.4E-5	6.8E-5	1.1E-4	1.7E-4	2.1E-4	3.1E-4	8.1E-5	6.6E-5
AMS07	Athabasca Valley	46	48%	0	0	0	2.2E-5	6.3E-5	1.1E-4	1.8E-4	2.4E-4	2.7E-4	7.8E-5	7.1E-5
AMS14	Anzac	41	49%	0	0	0	2E-5	3.8E-5	1E-4	1.5E-4	2E-4	2.2E-4	6.3E-5	6.3E-5



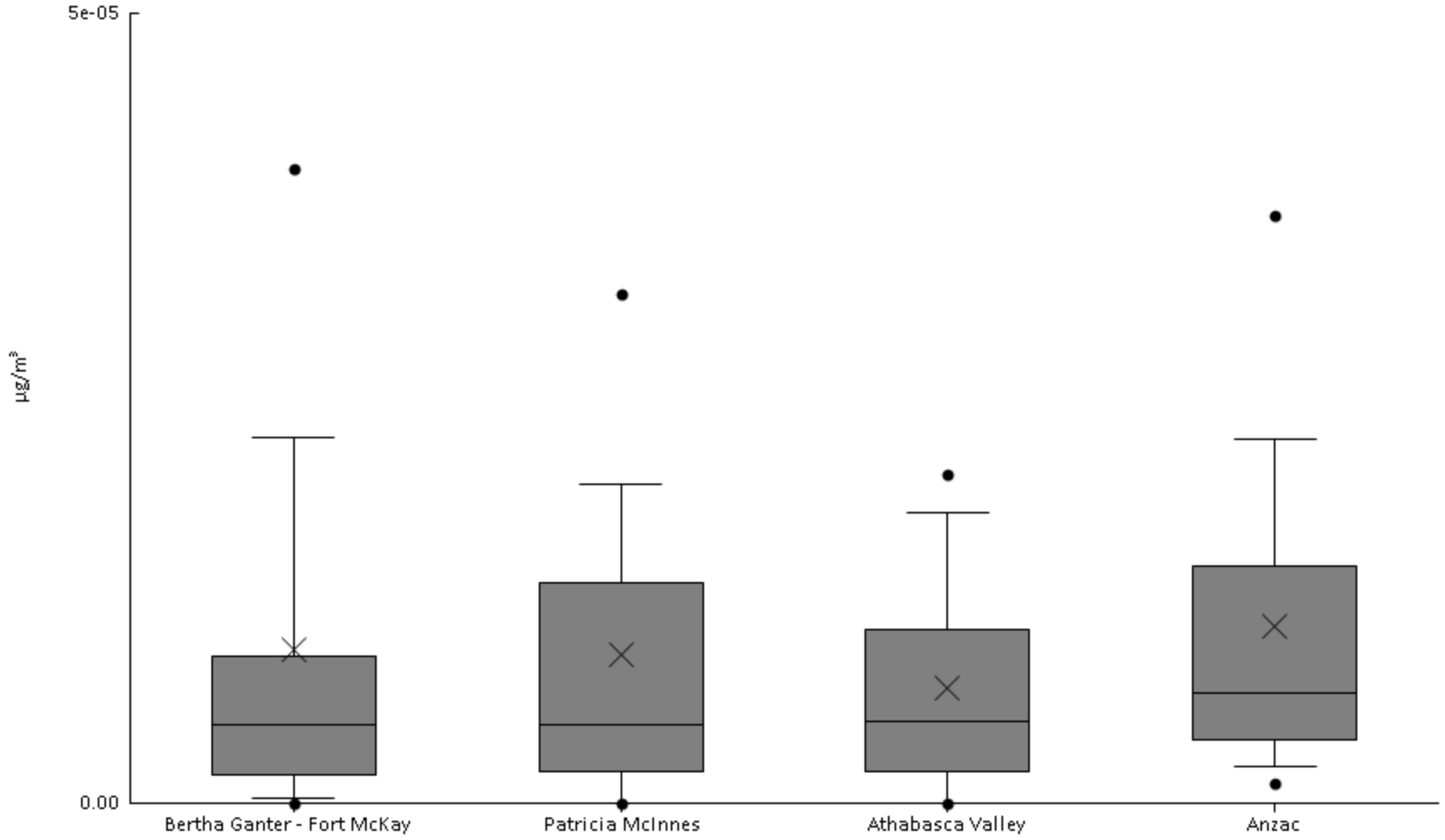
Particulate Matter (PM2.5 METALS) - Silicon (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	95%	0	9.6E-3	0.034	0.067	0.16	0.32	0.49	0.83	1.8	0.25	0.3
AMS06	Patricia McInnes	55	96%	0	0.011	0.018	0.049	0.085	0.21	0.39	0.5	0.88	0.15	0.17
AMS07	Athabasca Valley	59	95%	0	4.8E-3	0.024	0.047	0.095	0.21	0.3	0.41	0.5	0.14	0.12
AMS14	Anzac	57	72%	0	0	0	5.6E-3	0.047	0.098	0.22	0.28	0.56	0.079	0.1



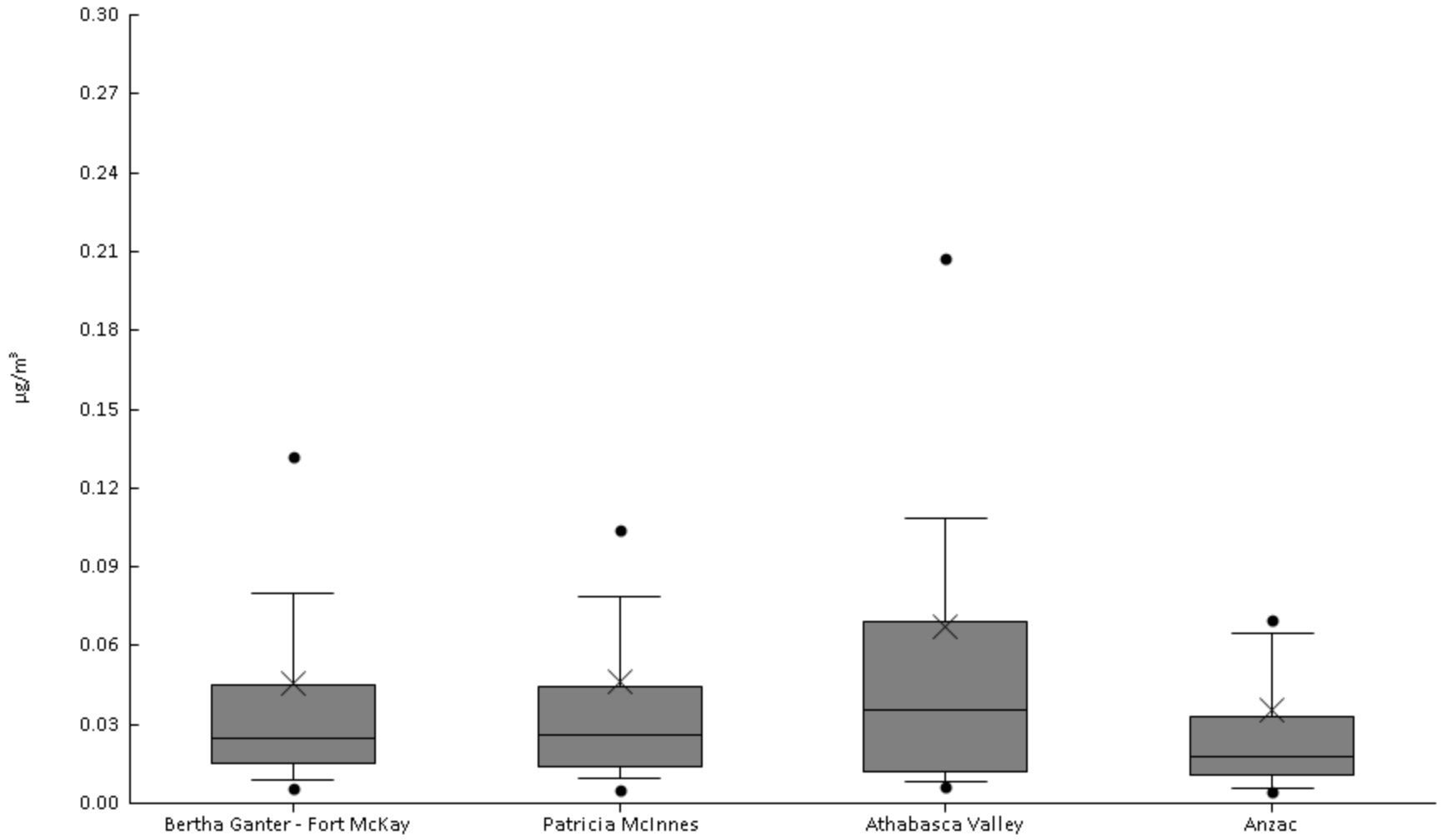
Particulate Matter (PM2.5 METALS) - Silver (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	49	71%	0	0	2.7E-7	1.8E-6	5E-6	9.3E-6	2.3E-5	4E-5	9.6E-5	9.7E-6	1.6E-5
AMS06	Patricia McInnes	49	65%	0	0	0	2E-6	5E-6	1.4E-5	2E-5	3.2E-5	6.2E-5	9.4E-6	1.1E-5
AMS07	Athabasca Valley	53	70%	0	0	0	2E-6	5.2E-6	1.1E-5	1.8E-5	2.1E-5	2.8E-5	7.3E-6	6.6E-6
AMS14	Anzac	45	84%	0	1.3E-6	2.4E-6	4E-6	7E-6	1.5E-5	2.3E-5	3.7E-5	5.3E-5	1.1E-5	1.2E-5



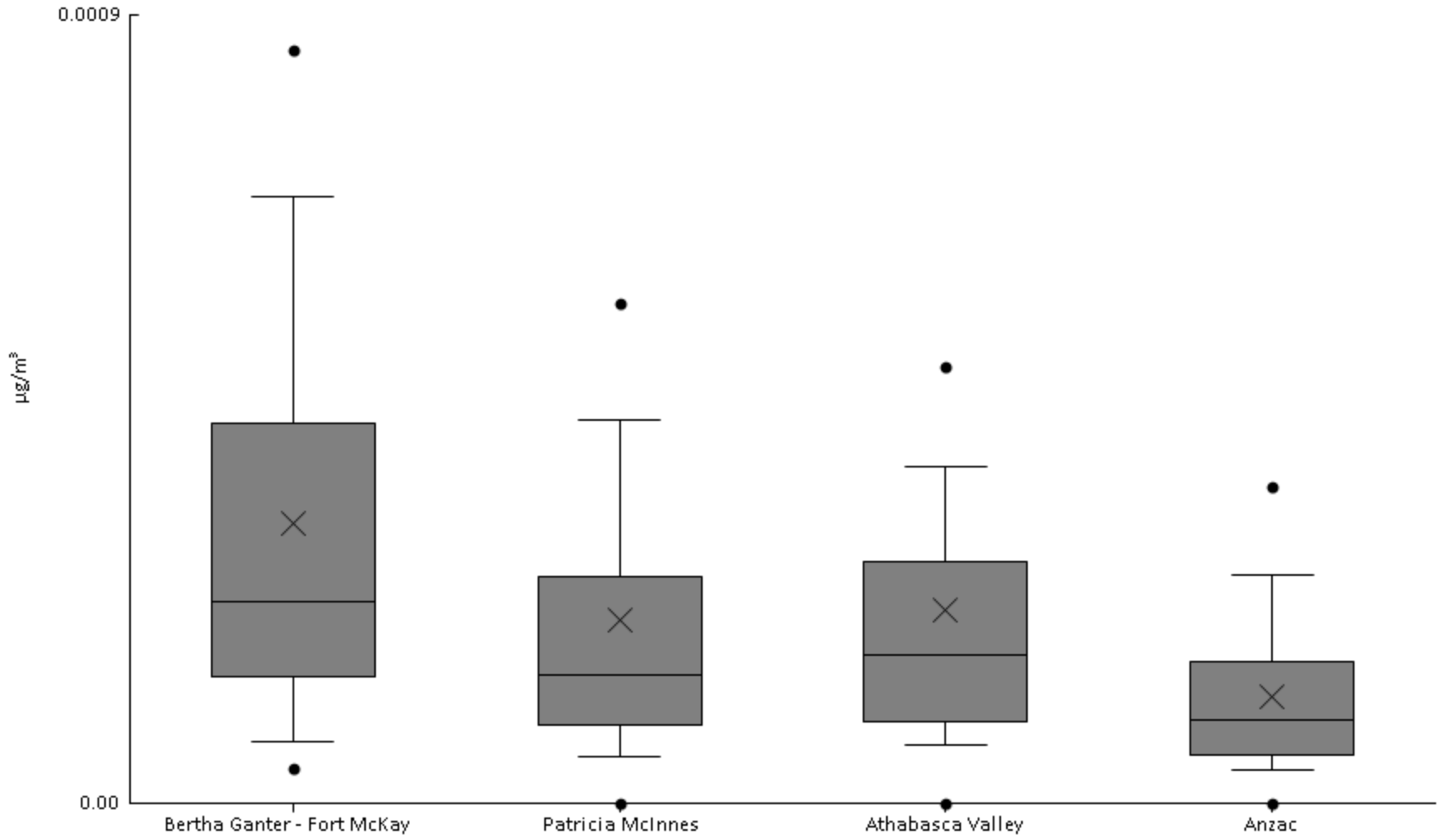
Particulate Matter (PM2.5 METALS) - Sodium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	100%	2.4E-3	5.7E-3	9E-3	0.015	0.025	0.045	0.08	0.13	0.42	0.046	0.071
AMS06	Patricia McInnes	56	100%	1.6E-3	5.3E-3	9.6E-3	0.014	0.026	0.045	0.079	0.1	0.46	0.046	0.08
AMS07	Athabasca Valley	59	100%	3.3E-3	6.6E-3	8.3E-3	0.012	0.035	0.069	0.11	0.21	0.93	0.067	0.14
AMS14	Anzac	56	100%	2.1E-3	4.3E-3	6E-3	0.011	0.017	0.033	0.065	0.07	0.39	0.035	0.066



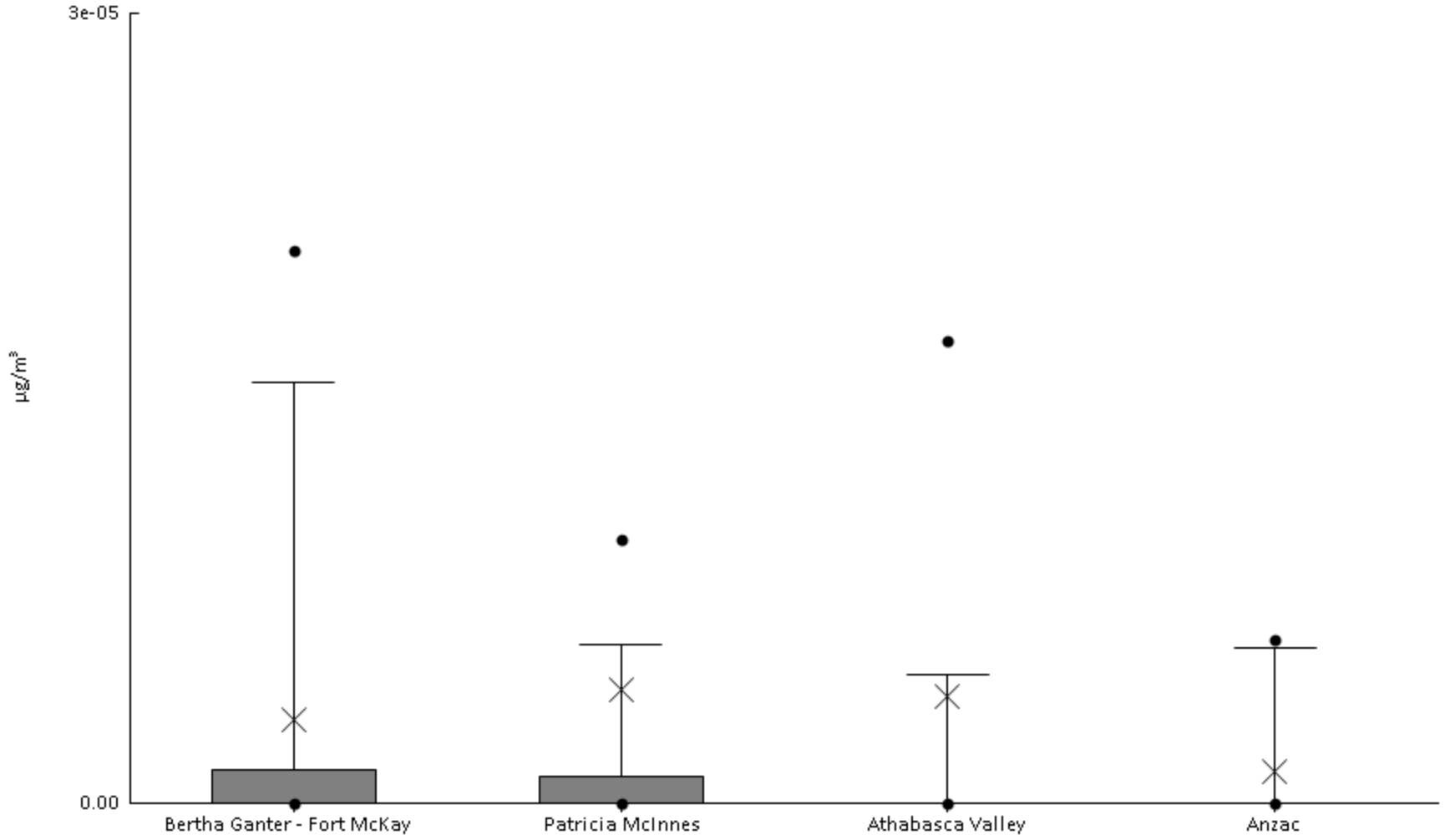
Particulate Matter (PM2.5 METALS) - Strontium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	96%	0	4E-5	7.1E-5	1.4E-4	2.3E-4	4.3E-4	6.9E-4	8.6E-4	1.5E-3	3.2E-4	2.8E-4
AMS06	Patricia McInnes	56	93%	0	0	5.3E-5	8.9E-5	1.5E-4	2.6E-4	4.4E-4	5.7E-4	8.6E-4	2.1E-4	1.8E-4
AMS07	Athabasca Valley	59	93%	0	0	6.7E-5	9.3E-5	1.7E-4	2.8E-4	3.9E-4	5E-4	1.6E-3	2.2E-4	2.2E-4
AMS14	Anzac	58	93%	0	0	3.8E-5	5.5E-5	9.6E-5	1.6E-4	2.6E-4	3.6E-4	4.6E-4	1.2E-4	1E-4



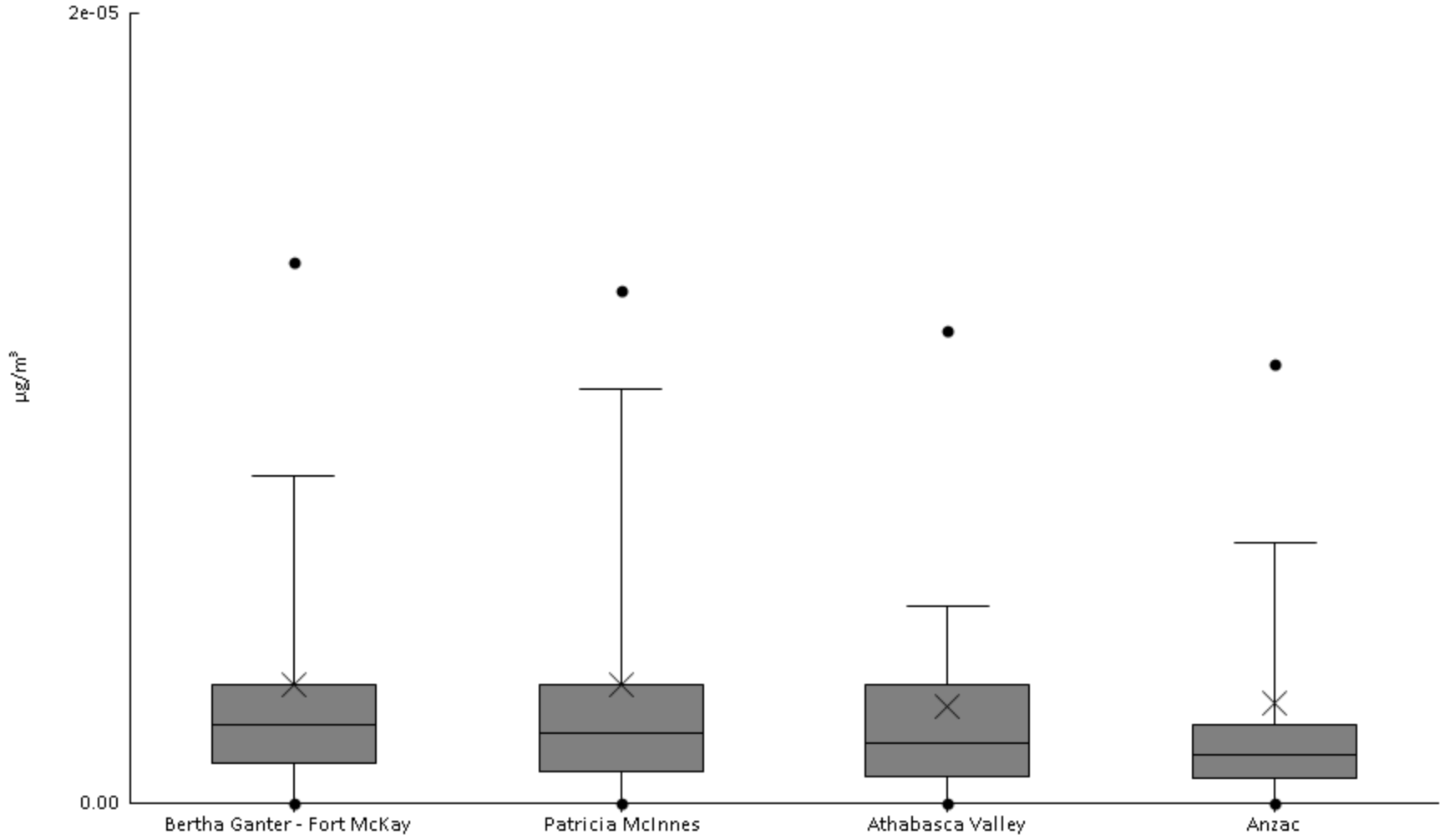
Particulate Matter (PM2.5 METALS) - Tantalum (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	49	22%	0	0	0	0	0	1.3E-6	1.6E-5	2.1E-5	2.2E-5	3.1E-6	6.5E-6
AMS06	Patricia McInnes	46	17%	0	0	0	0	0	1E-6	6E-6	1E-5	1.4E-4	4.3E-6	2E-5
AMS07	Athabasca Valley	46	13%	0	0	0	0	0	0	4.9E-6	1.8E-5	1.3E-4	4E-6	2E-5
AMS14	Anzac	46	15%	0	0	0	0	0	0	5.9E-6	6.2E-6	2E-5	1.2E-6	3.5E-6



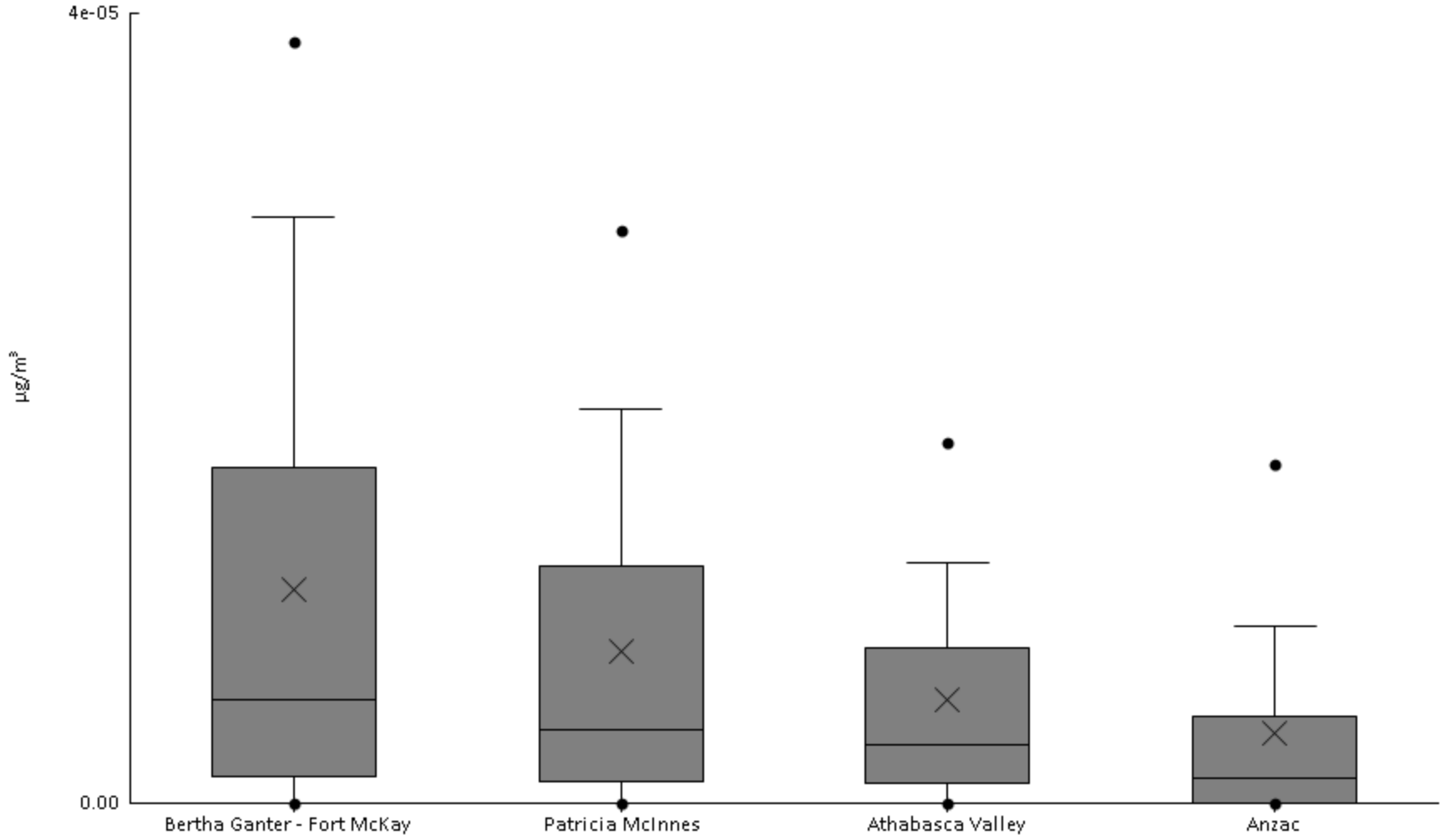
Particulate Matter (PM2.5 METALS) - Thallium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	52	42%	0	0	0	1E-6	2E-6	3E-6	8.3E-6	1.4E-5	1.7E-5	3E-6	3.9E-6
AMS06	Patricia McInnes	50	34%	0	0	0	7.9E-7	1.8E-6	3E-6	1.1E-5	1.3E-5	1.9E-5	3E-6	4.2E-6
AMS07	Athabasca Valley	53	32%	0	0	0	6.6E-7	1.5E-6	3E-6	5E-6	1.2E-5	2.1E-5	2.4E-6	3.8E-6
AMS14	Anzac	49	45%	0	0	0	6.5E-7	1.2E-6	2E-6	6.6E-6	1.1E-5	1.8E-5	2.5E-6	3.6E-6



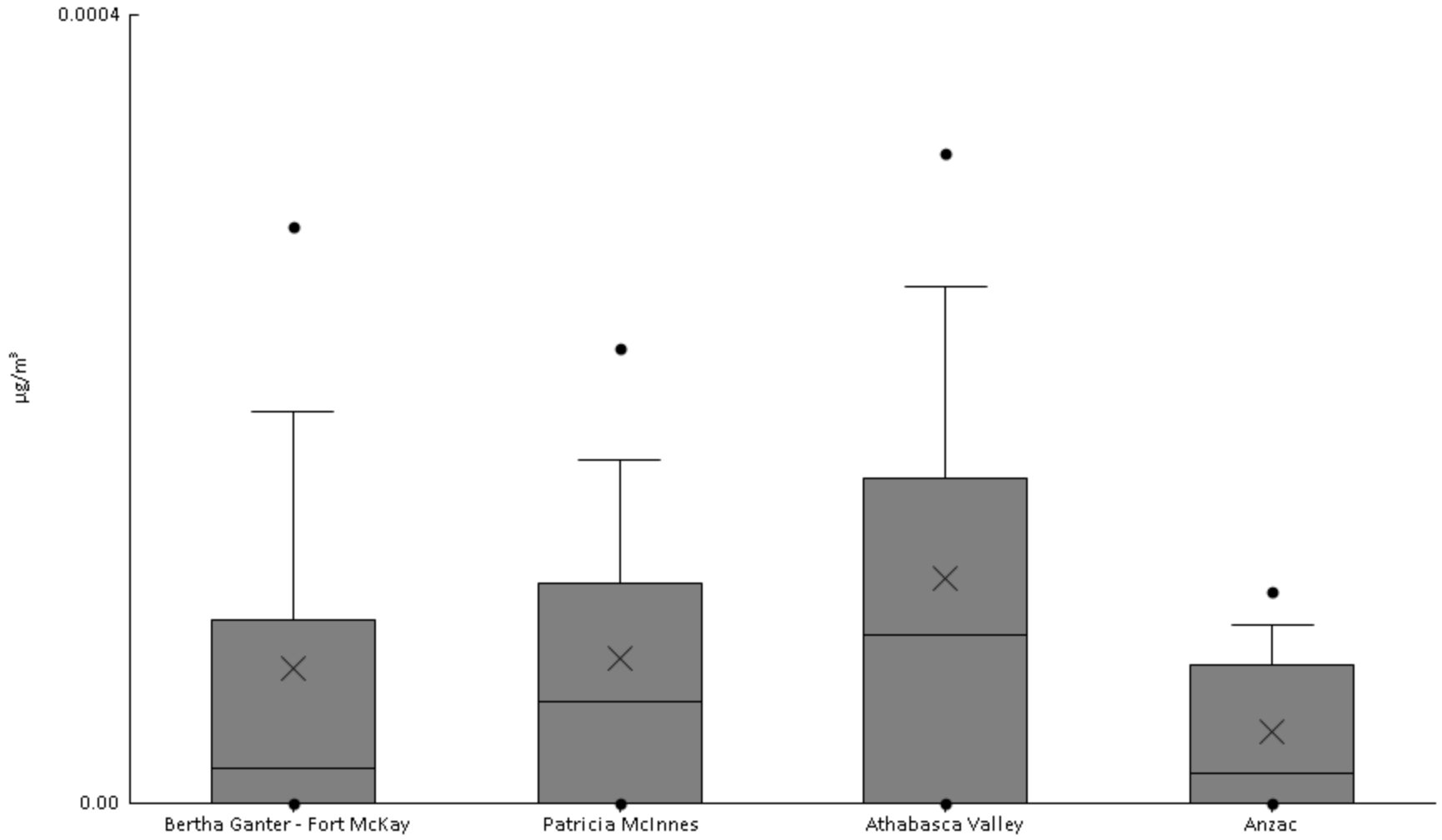
Particulate Matter (PM2.5 METALS) - Thorium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	77%	0	0	0	1.4E-6	5.2E-6	1.7E-5	3E-5	3.9E-5	6.4E-5	1.1E-5	1.3E-5
AMS06	Patricia McInnes	55	75%	0	0	0	1.1E-6	3.7E-6	1.2E-5	2E-5	2.9E-5	4.6E-5	7.7E-6	1E-5
AMS07	Athabasca Valley	59	69%	0	0	0	1E-6	3E-6	7.9E-6	1.2E-5	1.8E-5	3.2E-5	5.3E-6	6.4E-6
AMS14	Anzac	58	59%	0	0	0	0	1.3E-6	4.4E-6	9E-6	1.7E-5	2.7E-5	3.5E-6	5.5E-6



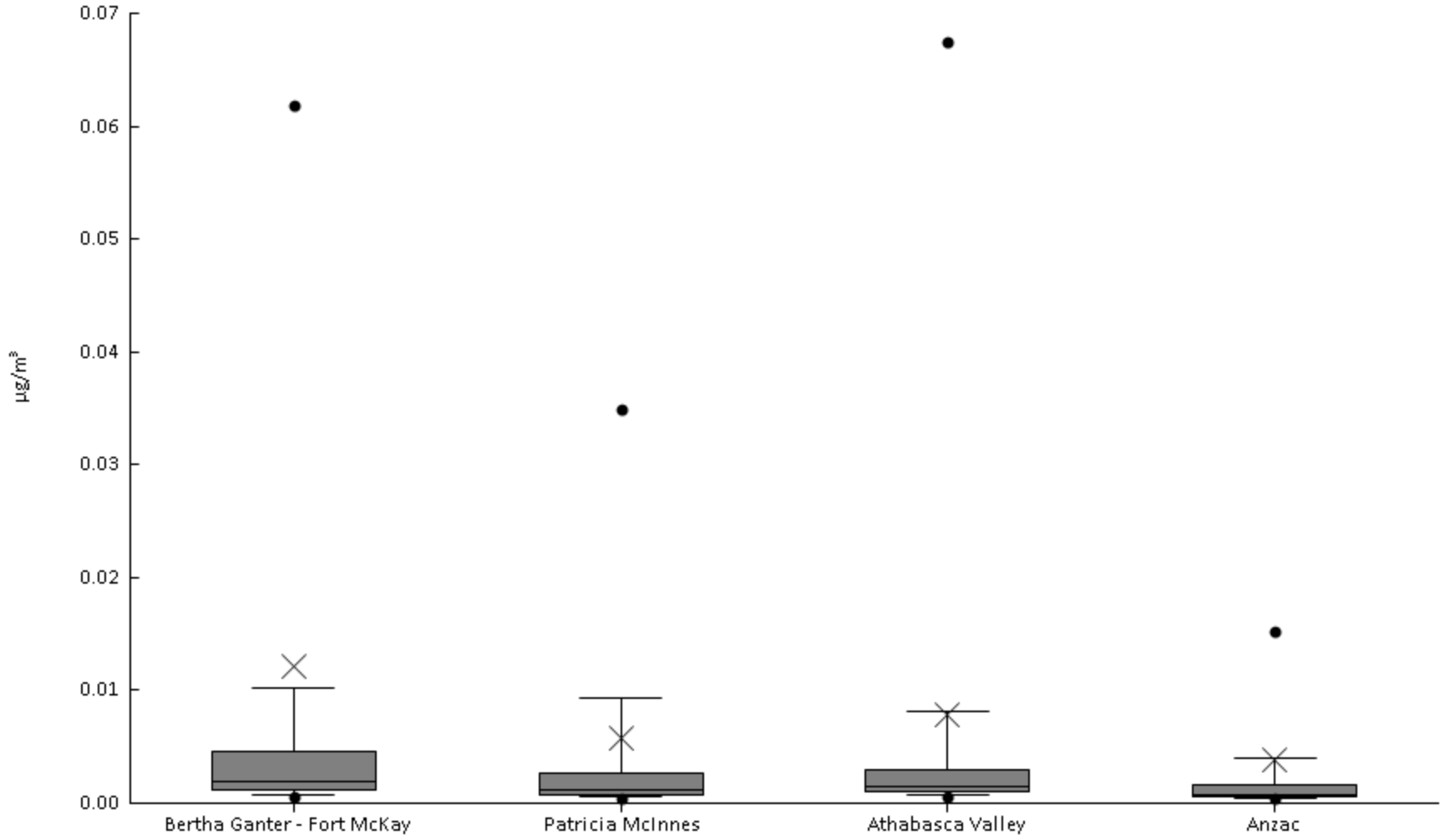
Particulate Matter (PM2.5 METALS) - Tin (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	40	52%	0	0	0	0	1.8E-5	9.3E-5	2E-4	2.9E-4	5.4E-4	6.9E-5	1.1E-4
AMS06	Patricia McInnes	49	67%	0	0	0	0	5.2E-5	1.1E-4	1.7E-4	2.3E-4	6E-4	7.4E-5	1E-4
AMS07	Athabasca Valley	52	69%	0	0	0	0	8.6E-5	1.7E-4	2.6E-4	3.3E-4	5.7E-4	1.1E-4	1.2E-4
AMS14	Anzac	39	54%	0	0	0	0	1.5E-5	7E-5	9.1E-5	1.1E-4	1.7E-4	3.6E-5	4.3E-5



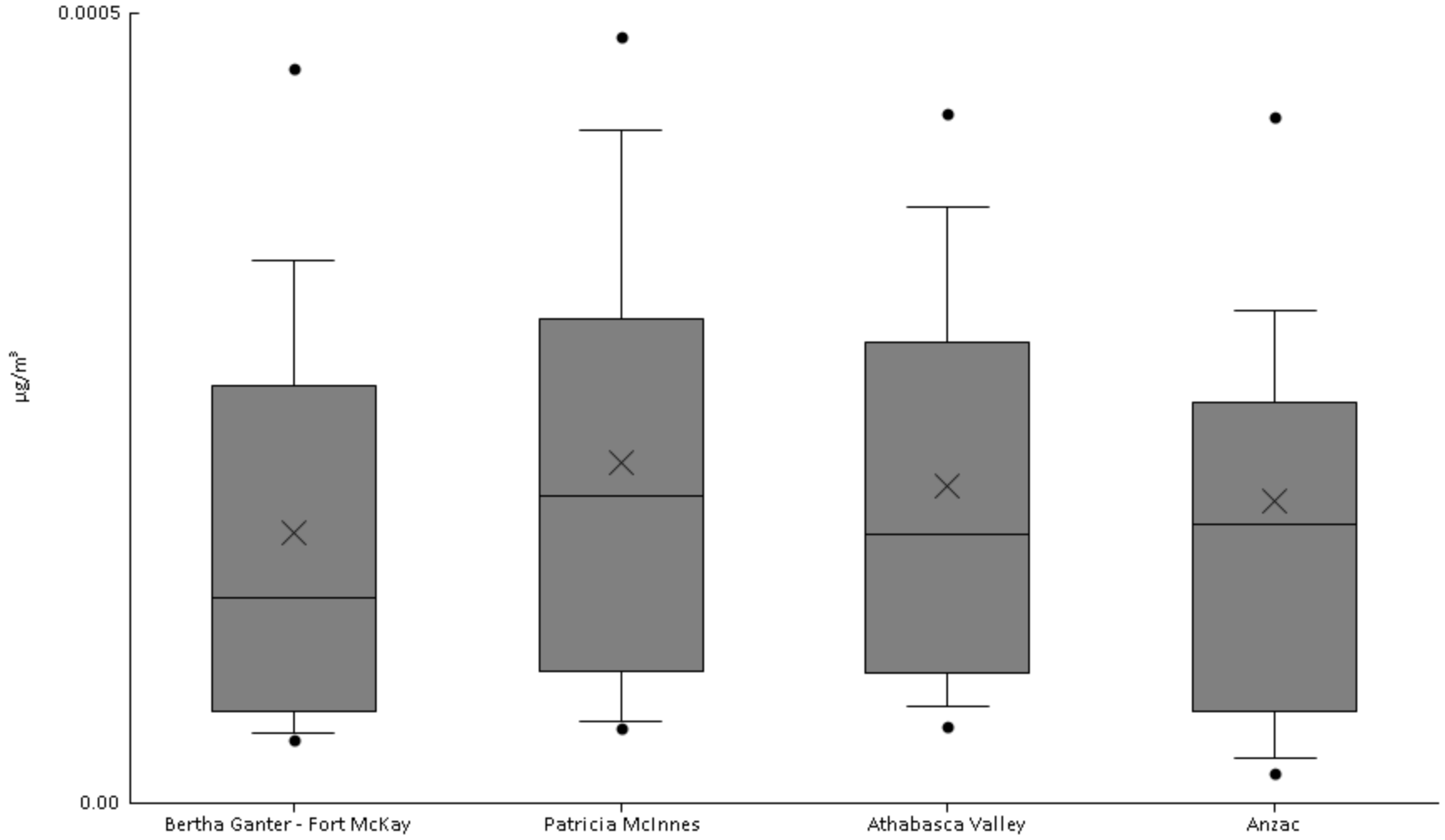
Particulate Matter (PM2.5 METALS) - Titanium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	3.8E-4	5.8E-4	6.9E-4	1.2E-3	2E-3	4.6E-3	0.01	0.062	0.24	0.012	0.04
AMS06	Patricia McInnes	56	100%	4.1E-4	4.9E-4	6.3E-4	7.6E-4	1.2E-3	2.6E-3	9.3E-3	0.035	0.097	5.8E-3	0.016
AMS07	Athabasca Valley	59	100%	4.4E-4	6.5E-4	7.6E-4	1E-3	1.5E-3	3E-3	8.2E-3	0.067	0.13	7.9E-3	0.023
AMS14	Anzac	58	100%	3.5E-4	4.1E-4	4.3E-4	5.2E-4	7.8E-4	1.6E-3	3.9E-3	0.015	0.073	3.8E-3	0.012



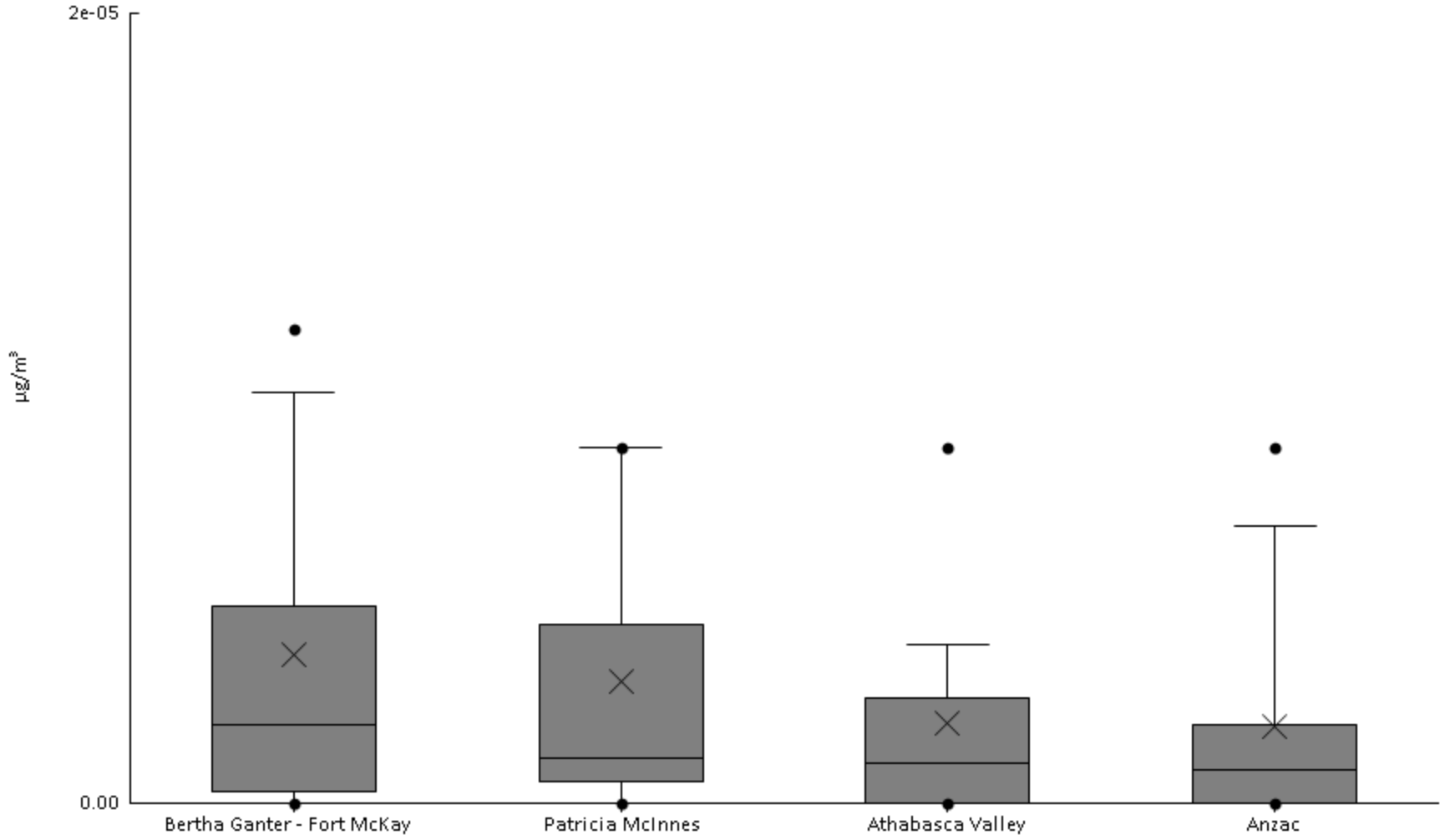
Particulate Matter (PM2.5 METALS) - Tungsten (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	51	100%	1.4E-5	4E-5	4.4E-5	5.8E-5	1.3E-4	2.6E-4	3.4E-4	4.6E-4	5.7E-4	1.7E-4	1.4E-4
AMS06	Patricia McInnes	53	100%	2.3E-5	4.7E-5	5.2E-5	8.4E-5	2E-4	3.1E-4	4.3E-4	4.9E-4	6.5E-4	2.2E-4	1.5E-4
AMS07	Athabasca Valley	54	100%	2.6E-5	4.9E-5	6.2E-5	8.2E-5	1.7E-4	2.9E-4	3.8E-4	4.4E-4	6.4E-4	2E-4	1.4E-4
AMS14	Anzac	54	100%	1E-5	1.9E-5	2.9E-5	5.8E-5	1.8E-4	2.5E-4	3.1E-4	4.3E-4	1.3E-3	1.9E-4	1.9E-4



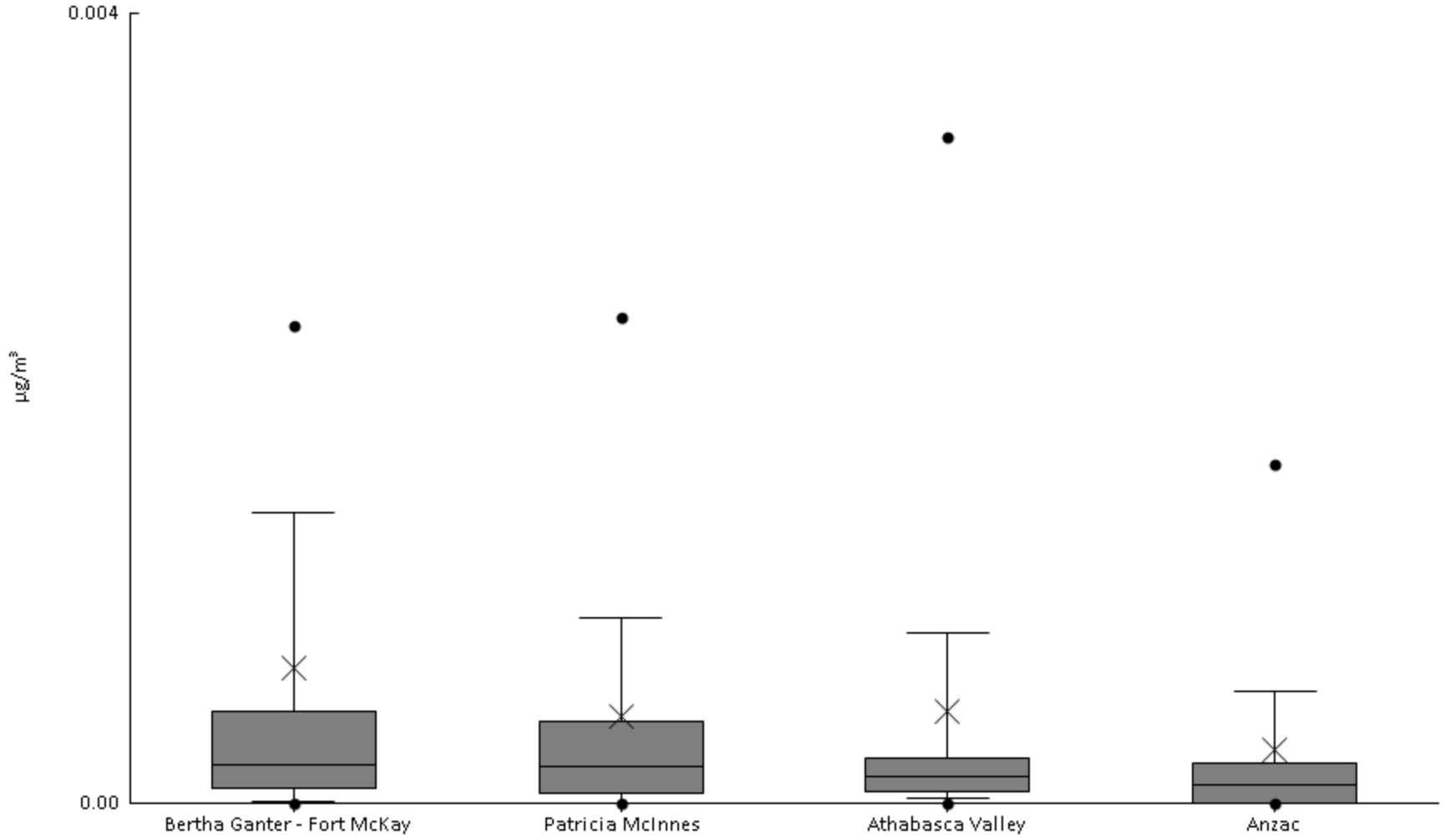
Particulate Matter (PM2.5 METALS) - Uranium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	53	62%	0	0	0	3E-7	2E-6	5E-6	1E-5	1.2E-5	3.2E-5	3.7E-6	5.4E-6
AMS06	Patricia McInnes	54	52%	0	0	0	5.6E-7	1.2E-6	4.5E-6	9E-6	9E-6	2.1E-5	3.1E-6	4E-6
AMS07	Athabasca Valley	56	43%	0	0	0	0	1E-6	2.7E-6	4E-6	9E-6	1.4E-5	2E-6	2.7E-6
AMS14	Anzac	55	40%	0	0	0	0	8.5E-7	2E-6	7E-6	9E-6	2E-5	1.9E-6	3.6E-6



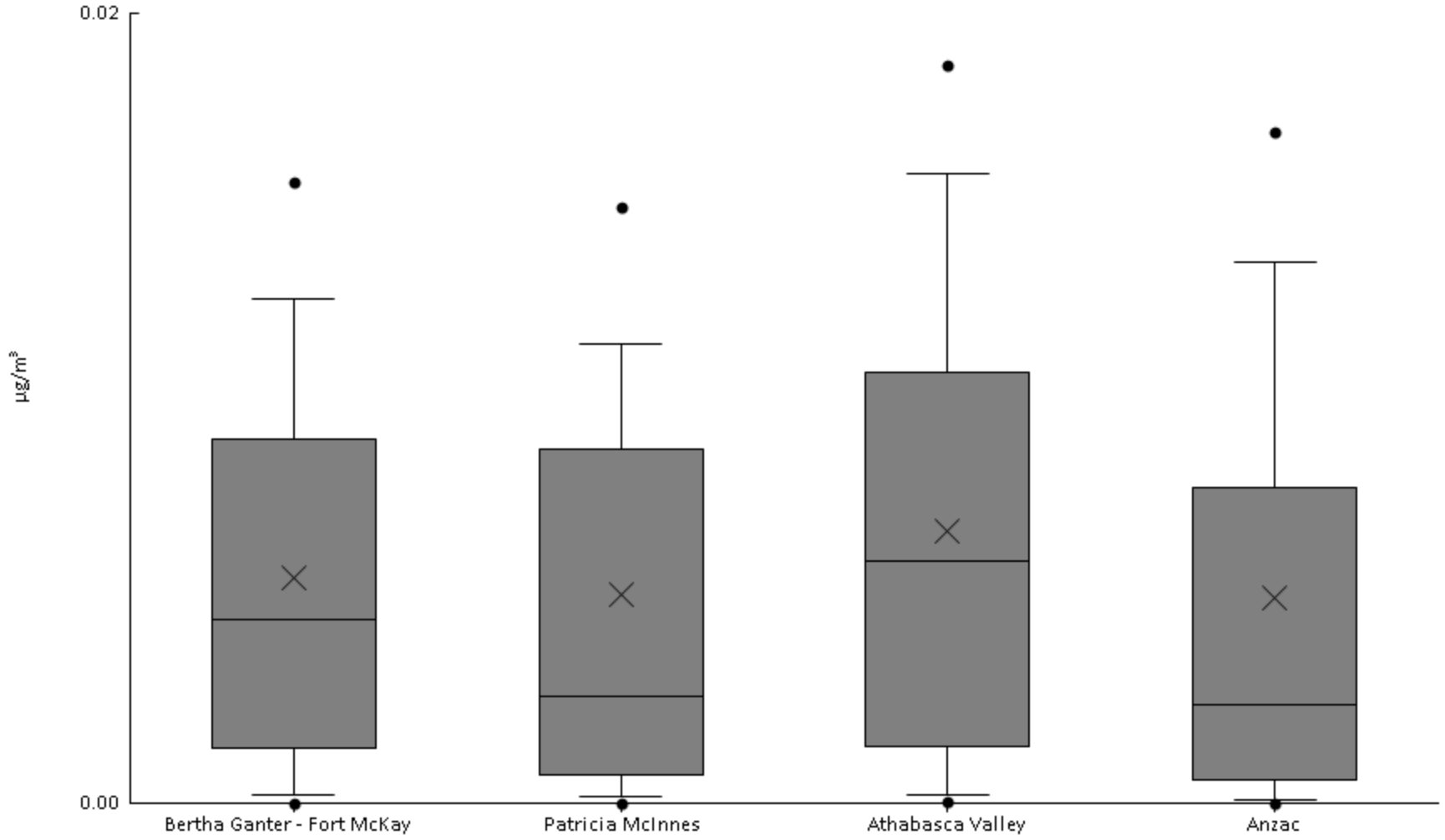
Particulate Matter (PM2.5 METALS) - Vanadium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	89%	0	0	7E-6	7.3E-5	2E-4	4.7E-4	1.5E-3	2.4E-3	9.4E-3	6.9E-4	1.7E-3
AMS06	Patricia McInnes	56	82%	0	0	0	4.9E-5	1.8E-4	4.1E-4	9.4E-4	2.5E-3	4.7E-3	4.4E-4	8.4E-4
AMS07	Athabasca Valley	59	92%	0	0	2.4E-5	5.8E-5	1.4E-4	2.3E-4	8.6E-4	3.4E-3	5.3E-3	4.6E-4	1.1E-3
AMS14	Anzac	57	74%	0	0	0	0	8.9E-5	2.1E-4	5.7E-4	1.7E-3	2.9E-3	2.7E-4	5.6E-4



Particulate Matter (PM2.5 METALS) - Zinc (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	52	92%	0	0	2E-4	1.4E-3	4.6E-3	9.2E-3	0.013	0.016	0.017	5.7E-3	5E-3
AMS06	Patricia McInnes	53	91%	0	0	1.8E-4	7.3E-4	2.7E-3	9E-3	0.012	0.015	0.019	5.3E-3	5.1E-3
AMS07	Athabasca Valley	57	93%	0	4.7E-5	2.3E-4	1.4E-3	6.1E-3	0.011	0.016	0.019	0.021	6.9E-3	5.9E-3
AMS14	Anzac	50	90%	0	0	9.1E-5	5.9E-4	2.5E-3	8E-3	0.014	0.017	0.023	5.2E-3	5.7E-3



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER (PM_{10}) - IONS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

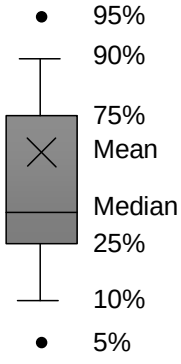
PM ions:
Atmospheric Research & Analysis, Inc.
Morrisville, NC

Desert Research Institute
Reno, NV

FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	µg/m^3 (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $PM_{2.5}$
PARTICLE DIAMETER	< 2.5 µm or < 10 µm
MEDIUM	47 mm Teflon Filter
ANALYTICALMETHODS	MASS by Microbalance
	ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS)
	IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc Desert Research Institute
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (µg/m^3) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler
	For $PM_{2.5}$ FRM Partisol $PM_{2.5}$ sampler

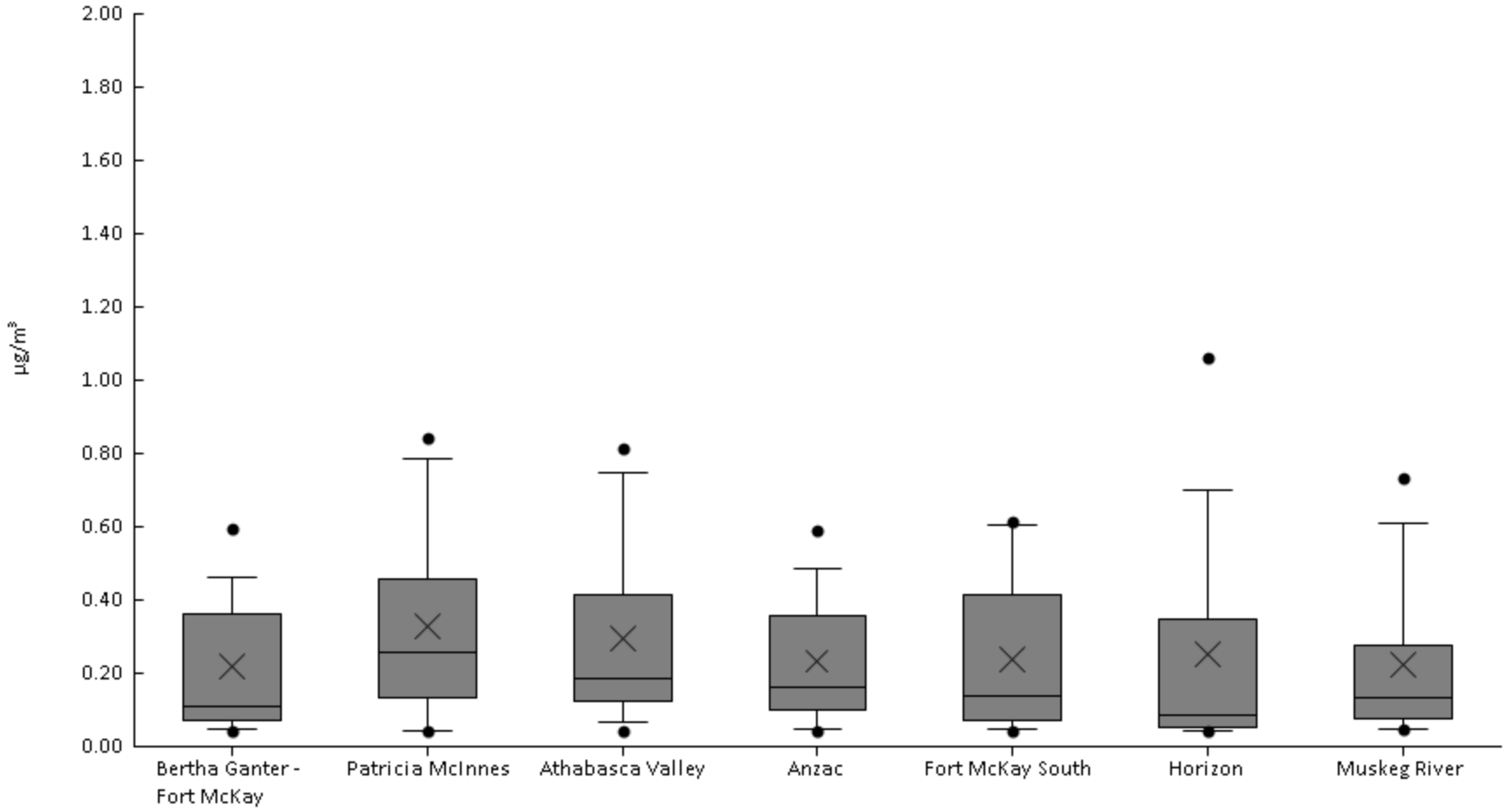
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



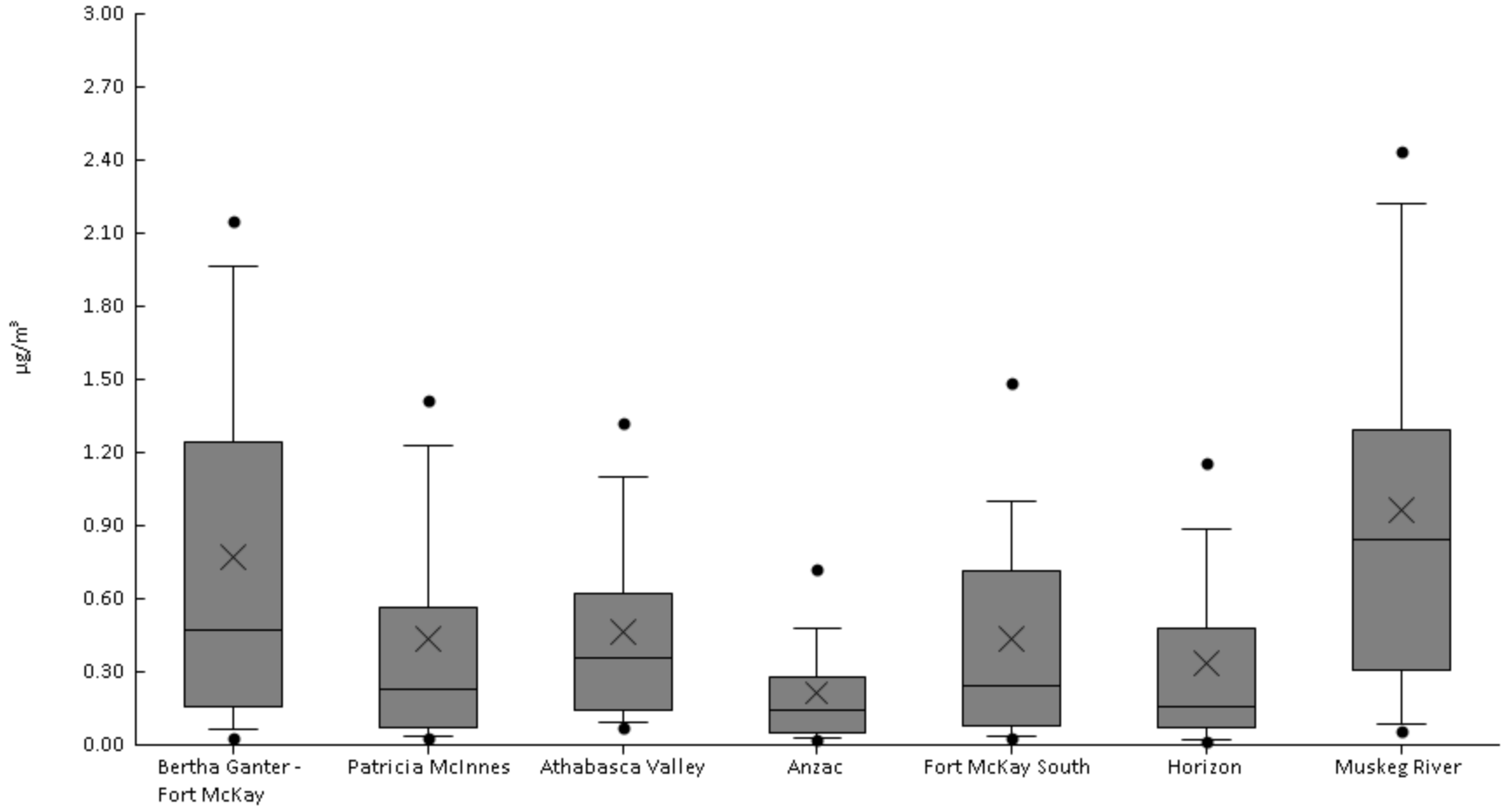
Particulate Matter (PM10 IONS) - Ammonium (as N) (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	13	100%	0.045	0.045	0.045	0.069	0.11	0.36	0.46	0.6	0.63	0.22	0.18
AMS06	Patricia McInnes	13	100%	0.041	0.041	0.042	0.13	0.26	0.46	0.78	0.84	0.86	0.33	0.27
AMS07	Athabasca Valley	12	100%	0.039	0.043	0.066	0.12	0.18	0.42	0.75	0.81	0.82	0.3	0.26
AMS14	Anzac	14	100%	0.039	0.041	0.047	0.1	0.16	0.36	0.48	0.59	0.62	0.23	0.17
AMS13	Fort McKay South	13	100%	0.045	0.045	0.045	0.07	0.14	0.41	0.61	0.62	0.62	0.24	0.21
AMS15	Horizon	13	100%	0.044	0.044	0.044	0.051	0.087	0.35	0.7	1.1	1.1	0.25	0.32
AMS16	Muskeg River	12	100%	0.049	0.049	0.05	0.075	0.13	0.28	0.61	0.73	0.75	0.22	0.22



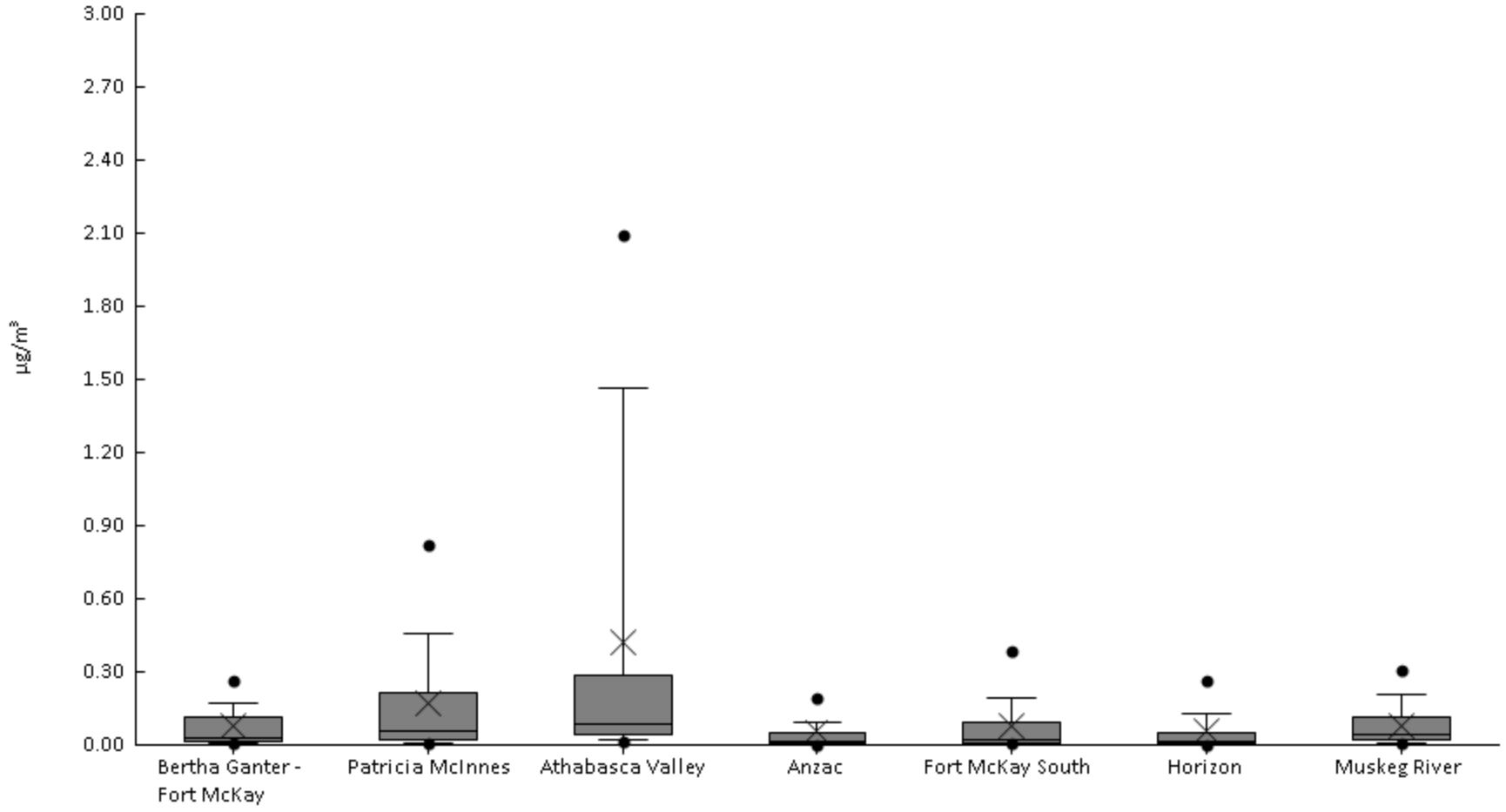
Particulate Matter (PM10 IONS) - Calcium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.013	0.032	0.066	0.16	0.47	1.2	2	2.2	2.7	0.77	0.74
AMS06	Patricia McInnes	58	100%	5.4E-3	0.027	0.034	0.072	0.23	0.56	1.2	1.4	2.6	0.44	0.5
AMS07	Athabasca Valley	59	100%	7.9E-3	0.073	0.095	0.15	0.36	0.62	1.1	1.3	2	0.47	0.42
AMS14	Anzac	59	100%	0.011	0.022	0.03	0.053	0.14	0.28	0.48	0.72	1.1	0.21	0.22
AMS13	Fort McKay South	60	100%	7.1E-3	0.026	0.038	0.076	0.24	0.71	1	1.5	2.2	0.44	0.49
AMS15	Horizon	59	100%	0.01	0.017	0.025	0.071	0.16	0.48	0.88	1.2	1.4	0.33	0.36
AMS16	Muskeg River	51	100%	0.036	0.054	0.088	0.31	0.85	1.3	2.2	2.4	3.1	0.96	0.78



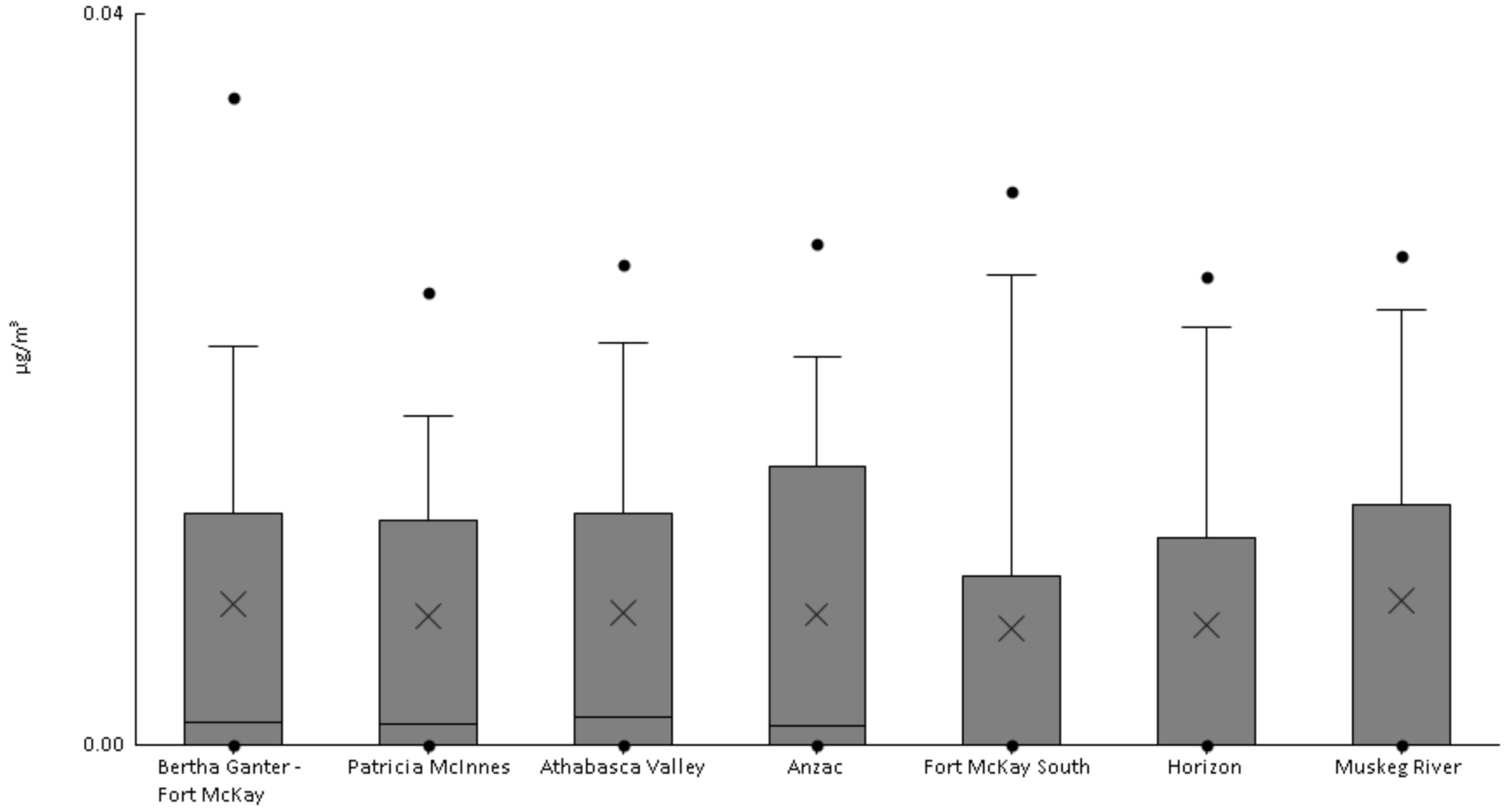
Particulate Matter (PM10 IONS) - Chloride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	3E-3	7.5E-3	9.2E-3	0.014	0.031	0.11	0.17	0.27	0.69	0.082	0.13
AMS06	Patricia McInnes	58	100%	2.7E-3	5.1E-3	8.2E-3	0.018	0.057	0.21	0.46	0.82	1.3	0.17	0.28
AMS07	Athabasca Valley	59	100%	6.3E-3	0.012	0.023	0.044	0.084	0.28	1.5	2.1	3.4	0.42	0.71
AMS14	Anzac	58	95%	0	7.2E-4	4.7E-3	8.8E-3	0.015	0.052	0.092	0.19	0.8	0.058	0.14
AMS13	Fort McKay South	60	100%	4.5E-3	5.2E-3	6.2E-3	9.2E-3	0.02	0.093	0.19	0.39	0.59	0.077	0.13
AMS15	Horizon	59	97%	0	3.3E-3	5.3E-3	7.6E-3	0.014	0.047	0.13	0.26	0.79	0.058	0.13
AMS16	Muskeg River	51	100%	4.5E-3	6.7E-3	0.01	0.021	0.045	0.11	0.21	0.31	0.39	0.08	0.086



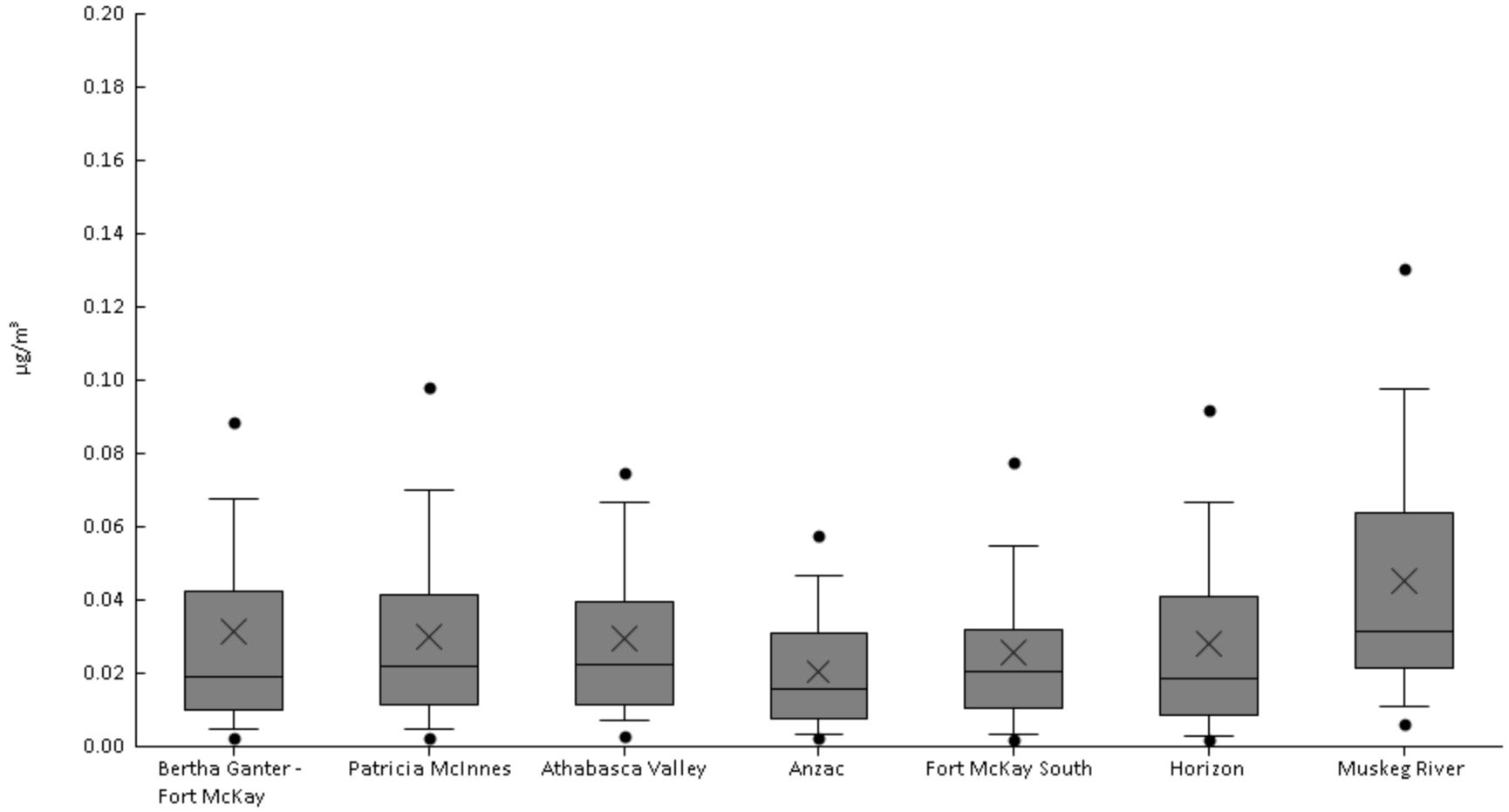
Particulate Matter (PM10 IONS) - Fluoride (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	56	54%	0	0	0	0	1.3E-3	0.013	0.022	0.035	0.044	7.8E-3	0.011
AMS06	Patricia McInnes	57	53%	0	0	0	0	1.2E-3	0.012	0.018	0.025	0.041	7E-3	9.8E-3
AMS07	Athabasca Valley	56	55%	0	0	0	0	1.5E-3	0.013	0.022	0.026	0.047	7.3E-3	0.01
AMS14	Anzac	56	52%	0	0	0	0	1.1E-3	0.015	0.021	0.027	0.041	7.1E-3	0.01
AMS13	Fort McKay South	60	42%	0	0	0	0	0	9.2E-3	0.026	0.03	0.035	6.4E-3	0.01
AMS15	Horizon	59	46%	0	0	0	0	0	0.011	0.023	0.026	0.064	6.5E-3	0.012
AMS16	Muskeg River	51	43%	0	0	0	0	0	0.013	0.024	0.027	0.059	7.9E-3	0.012



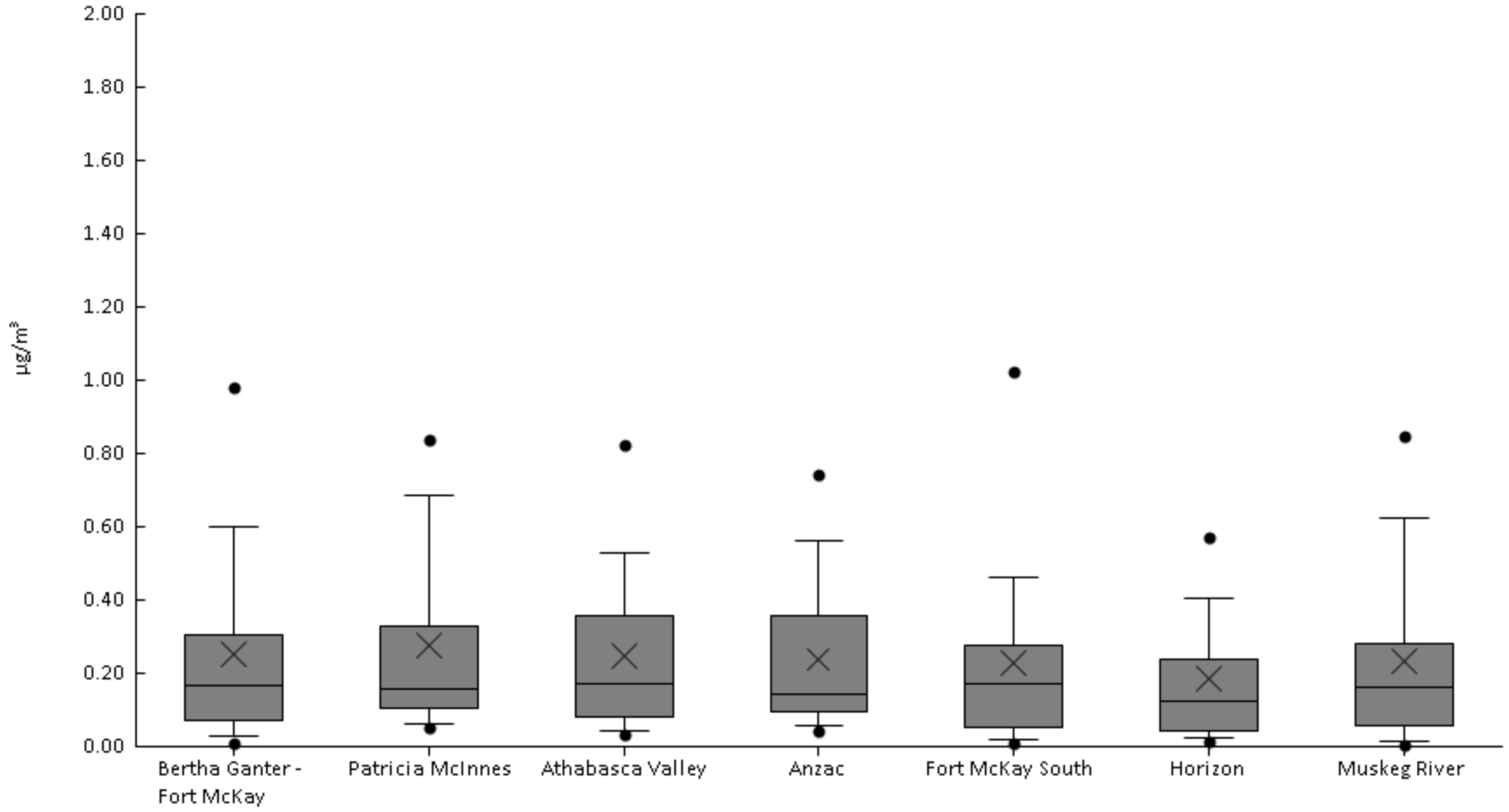
Particulate Matter (PM10 IONS) - Magnesium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	1.4E-3	2.5E-3	4.7E-3	0.01	0.019	0.043	0.068	0.089	0.18	0.031	0.034
AMS06	Patricia McInnes	55	100%	7.9E-4	2.2E-3	5E-3	0.011	0.022	0.041	0.07	0.098	0.13	0.03	0.027
AMS07	Athabasca Valley	59	100%	1.1E-3	2.9E-3	7.3E-3	0.011	0.022	0.04	0.067	0.075	0.14	0.03	0.025
AMS14	Anzac	59	100%	1.6E-3	2.4E-3	3.2E-3	7.7E-3	0.016	0.031	0.047	0.058	0.074	0.021	0.017
AMS13	Fort McKay South	60	100%	1.1E-3	2E-3	3.2E-3	0.01	0.02	0.032	0.055	0.078	0.13	0.026	0.024
AMS15	Horizon	59	100%	1.1E-3	1.7E-3	2.6E-3	8.4E-3	0.018	0.041	0.067	0.092	0.15	0.028	0.029
AMS16	Muskeg River	51	100%	2.3E-3	6.3E-3	0.011	0.021	0.032	0.064	0.098	0.13	0.18	0.045	0.038



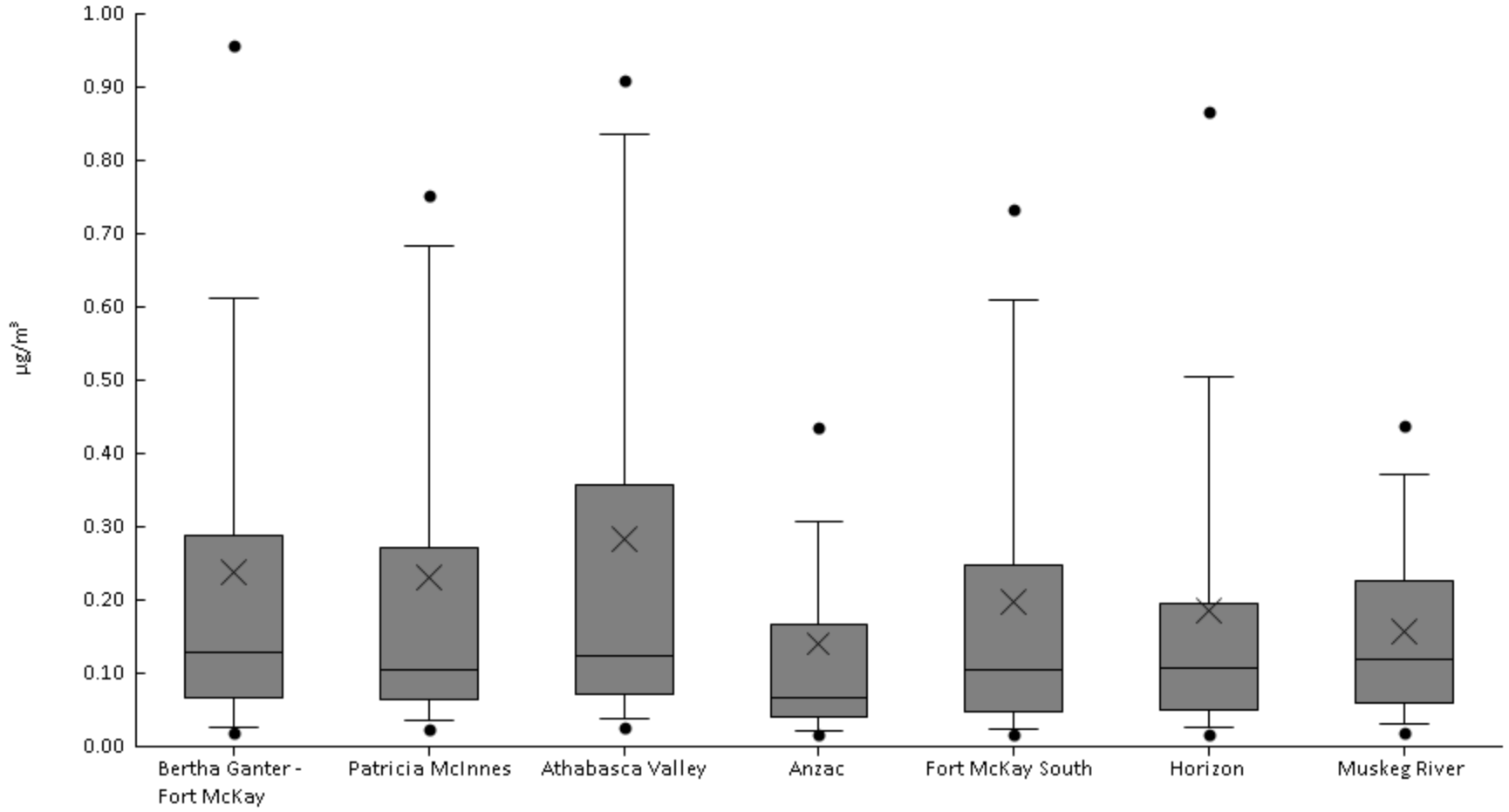
Particulate Matter (PM10 IONS) - Ammonium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	38	97%	0	0.012	0.029	0.071	0.17	0.31	0.6	0.98	1.2	0.25	0.28
AMS06	Patricia McInnes	40	100%	0.04	0.051	0.063	0.1	0.16	0.33	0.68	0.84	1.4	0.28	0.28
AMS07	Athabasca Valley	40	98%	0	0.032	0.041	0.083	0.17	0.36	0.53	0.83	0.99	0.25	0.23
AMS14	Anzac	39	100%	0.036	0.04	0.056	0.094	0.14	0.36	0.56	0.74	0.91	0.24	0.22
AMS13	Fort McKay South	45	98%	0	0.01	0.018	0.05	0.17	0.28	0.46	1	1.1	0.23	0.26
AMS15	Horizon	43	98%	0	0.013	0.023	0.042	0.12	0.24	0.4	0.57	1.1	0.19	0.21
AMS16	Muskeg River	37	97%	0	3.5E-3	0.016	0.058	0.16	0.28	0.63	0.85	1.1	0.23	0.26



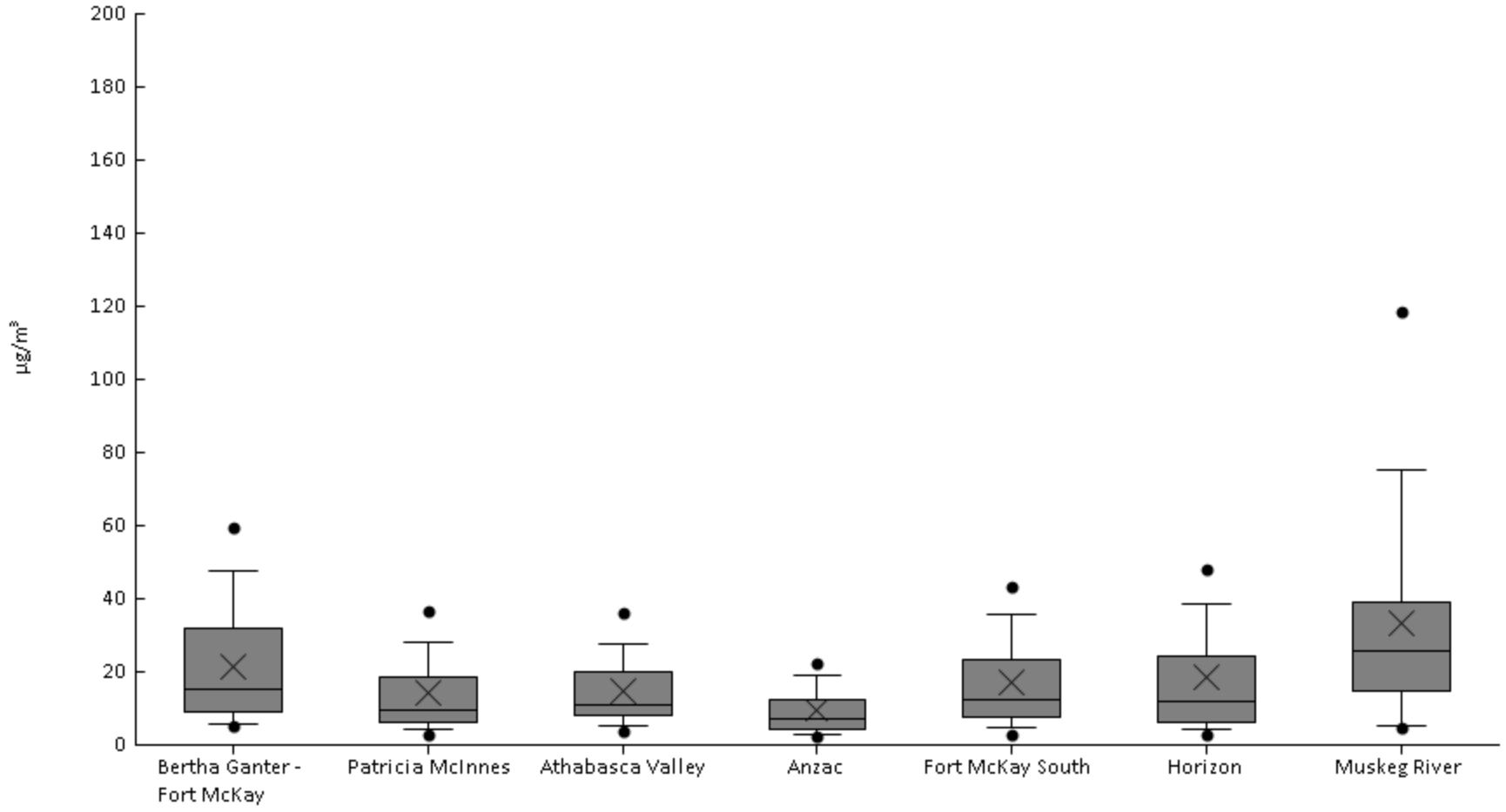
Particulate Matter (PM10 IONS) - Nitrate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.016	0.02	0.026	0.067	0.13	0.29	0.61	0.96	2	0.24	0.33
AMS06	Patricia McInnes	58	100%	0.016	0.023	0.036	0.063	0.11	0.27	0.68	0.75	1.3	0.23	0.29
AMS07	Athabasca Valley	59	100%	0.013	0.026	0.037	0.072	0.12	0.36	0.84	0.91	1.9	0.28	0.35
AMS14	Anzac	59	100%	7E-3	0.016	0.02	0.04	0.068	0.17	0.31	0.44	1.2	0.14	0.19
AMS13	Fort McKay South	60	100%	9.5E-3	0.017	0.024	0.048	0.1	0.25	0.61	0.73	1.4	0.2	0.26
AMS15	Horizon	59	100%	7E-3	0.016	0.025	0.05	0.11	0.19	0.5	0.87	1	0.19	0.24
AMS16	Muskeg River	51	100%	0.015	0.019	0.03	0.061	0.12	0.23	0.37	0.44	0.62	0.16	0.14



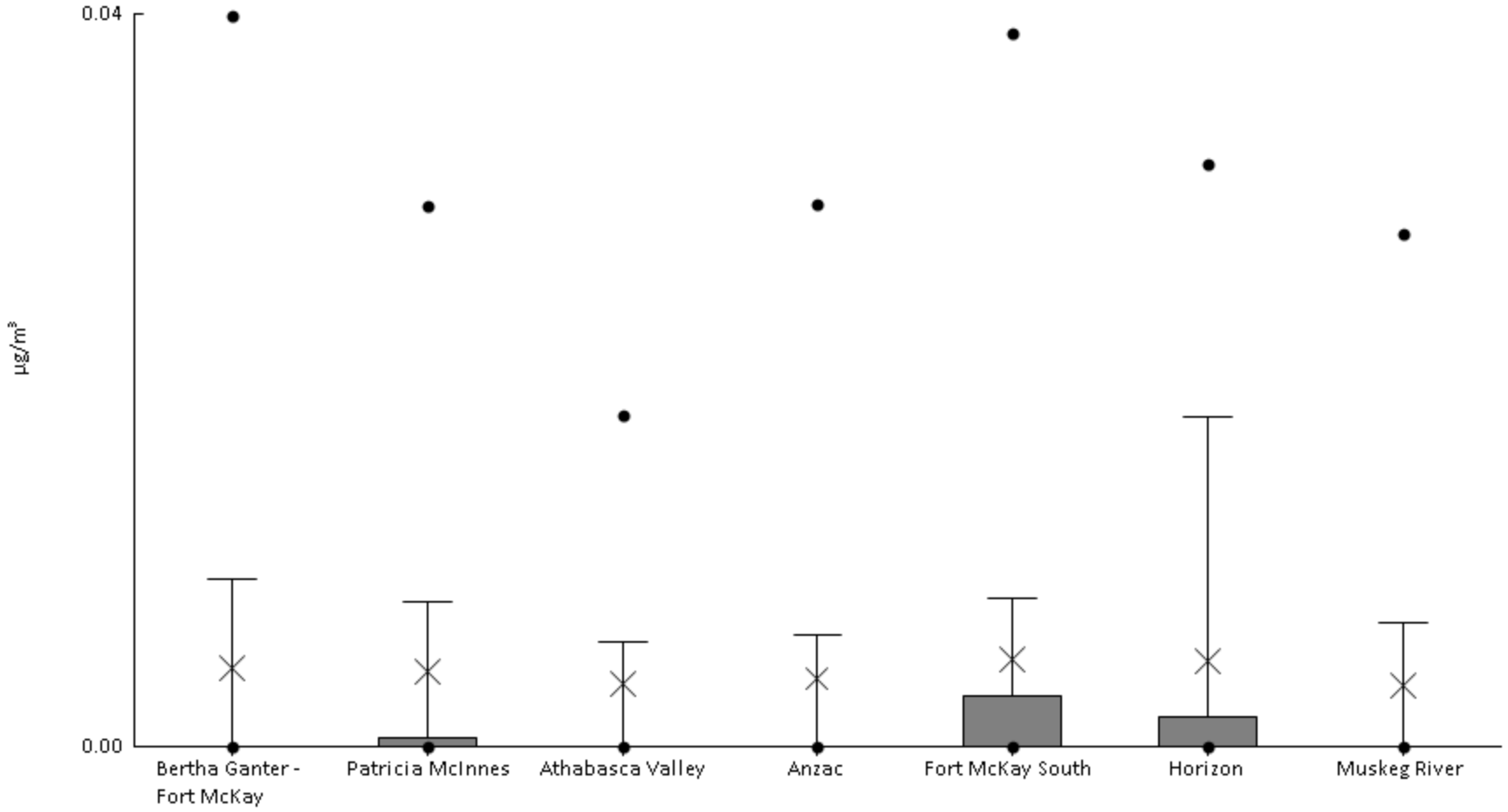
Particulate Matter (PM10 IONS) - Particulate Matter (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	2.3	5	5.6	8.8	15	32	48	60	74	22	17
AMS06	Patricia McInnes	58	100%	2	2.9	4.1	6.3	9.5	18	28	37	89	14	14
AMS07	Athabasca Valley	59	100%	3.2	3.8	5.1	7.9	11	20	28	36	58	15	11
AMS14	Anzac	59	100%	1.8	2.5	3.1	4.5	7.2	12	19	22	59	9.7	8.6
AMS13	Fort McKay South	59	100%	2.1	3	4.7	7.5	13	23	36	43	71	17	14
AMS15	Horizon	59	100%	1.8	2.8	4.3	6.3	12	24	39	48	95	19	19
AMS16	Muskeg River	51	100%	2.5	4.9	5.5	15	26	39	75	119	125	34	30



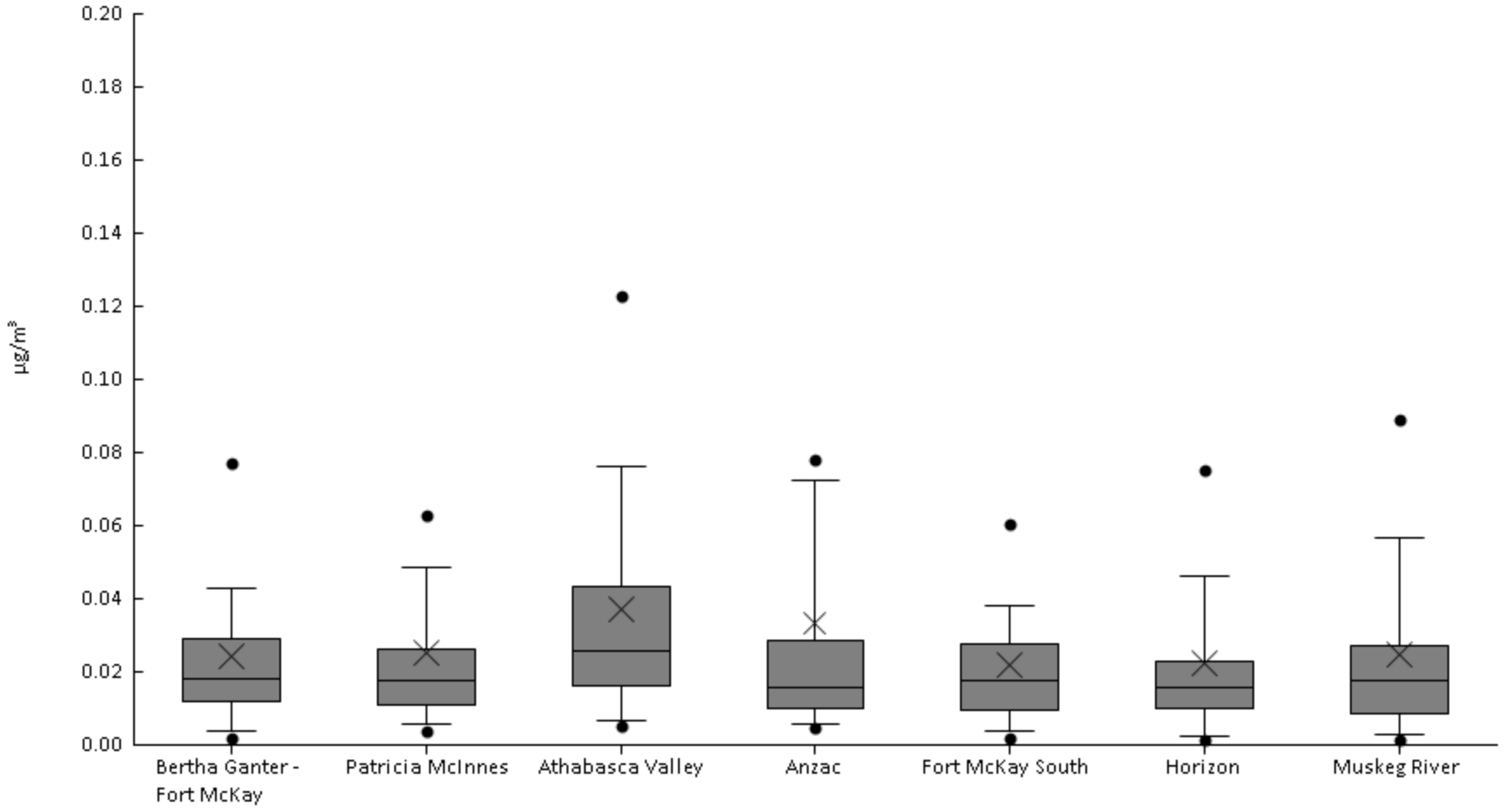
Particulate Matter (PM10 IONS) - Phosphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	22%	0	0	0	0	0	0	9.2E-3	0.04	0.077	4.3E-3	0.014
AMS06	Patricia McInnes	57	23%	0	0	0	0	0	4.5E-4	7.9E-3	0.029	0.081	4.1E-3	0.013
AMS07	Athabasca Valley	59	19%	0	0	0	0	0	0	5.7E-3	0.018	0.099	3.4E-3	0.014
AMS14	Anzac	59	20%	0	0	0	0	0	0	6.1E-3	0.03	0.089	3.7E-3	0.013
AMS13	Fort McKay South	60	27%	0	0	0	0	0	2.7E-3	8.1E-3	0.039	0.067	4.7E-3	0.013
AMS15	Horizon	59	25%	0	0	0	0	0	1.7E-3	0.018	0.032	0.078	4.7E-3	0.013
AMS16	Muskeg River	51	22%	0	0	0	0	0	0	6.7E-3	0.028	0.066	3.3E-3	0.011



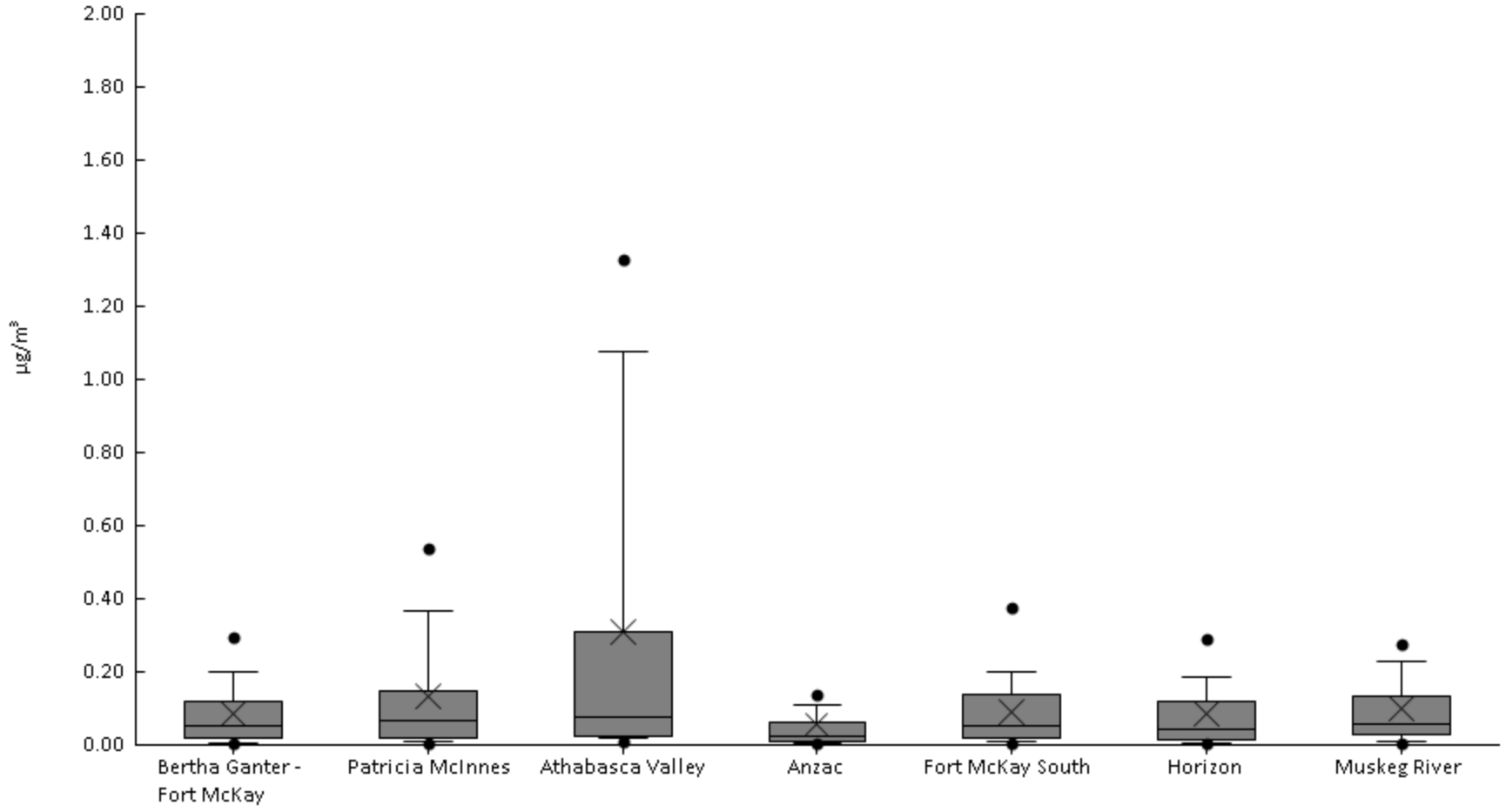
Particulate Matter (PM10 IONS) - Potassium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	0	2E-3	4E-3	0.012	0.018	0.029	0.043	0.077	0.15	0.024	0.024
AMS06	Patricia McInnes	56	98%	0	3.9E-3	5.8E-3	0.011	0.018	0.026	0.049	0.063	0.19	0.025	0.029
AMS07	Athabasca Valley	58	100%	2.4E-3	5.4E-3	6.5E-3	0.016	0.026	0.043	0.076	0.12	0.23	0.037	0.04
AMS14	Anzac	56	100%	1.7E-3	4.6E-3	5.6E-3	0.01	0.016	0.029	0.072	0.078	0.41	0.033	0.061
AMS13	Fort McKay South	60	98%	0	1.8E-3	3.6E-3	9.3E-3	0.018	0.028	0.038	0.061	0.13	0.022	0.022
AMS15	Horizon	59	98%	0	1.4E-3	2.5E-3	9.9E-3	0.016	0.023	0.046	0.075	0.16	0.022	0.026
AMS16	Muskeg River	51	98%	0	1.4E-3	2.8E-3	8.6E-3	0.018	0.027	0.057	0.089	0.17	0.025	0.029



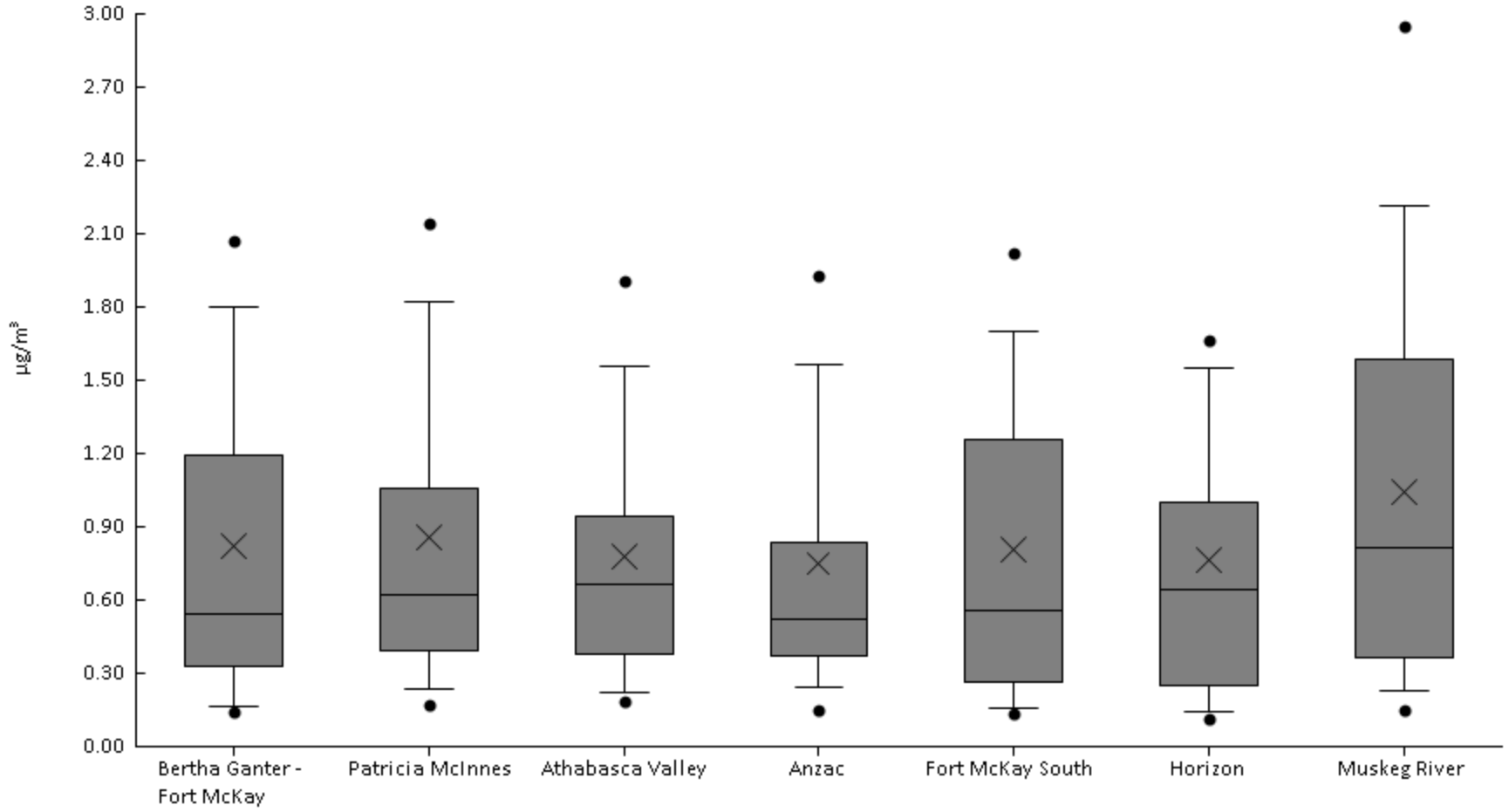
Particulate Matter (PM10 IONS) - Sodium (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	1.1E-3	3.5E-3	7E-3	0.019	0.053	0.12	0.2	0.3	0.45	0.087	0.1
AMS06	Patricia McInnes	57	100%	1E-3	5.6E-3	9E-3	0.02	0.065	0.15	0.36	0.54	0.96	0.14	0.2
AMS07	Athabasca Valley	59	100%	4.6E-3	8.1E-3	0.017	0.026	0.078	0.31	1.1	1.3	2.3	0.31	0.47
AMS14	Anzac	58	100%	8E-4	2.5E-3	3.8E-3	8.2E-3	0.022	0.061	0.11	0.14	0.58	0.055	0.096
AMS13	Fort McKay South	60	100%	1E-3	2.9E-3	7.3E-3	0.017	0.051	0.14	0.2	0.37	0.4	0.091	0.1
AMS15	Horizon	59	100%	1.1E-3	3.3E-3	6.3E-3	0.014	0.045	0.12	0.19	0.29	0.6	0.086	0.12
AMS16	Muskeg River	51	100%	1.9E-3	5.9E-3	0.011	0.031	0.058	0.13	0.23	0.28	0.51	0.1	0.099



Particulate Matter (PM10 IONS) - Sulphate (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	58	100%	0.019	0.14	0.17	0.33	0.54	1.2	1.8	2.1	2.9	0.82	0.68
AMS06	Patricia McInnes	58	100%	0.014	0.17	0.24	0.4	0.62	1.1	1.8	2.1	4.2	0.86	0.74
AMS07	Athabasca Valley	59	100%	0.021	0.19	0.22	0.38	0.66	0.95	1.6	1.9	2.9	0.78	0.58
AMS14	Anzac	59	100%	0.031	0.15	0.24	0.37	0.52	0.84	1.6	1.9	3.8	0.75	0.65
AMS13	Fort McKay South	60	100%	0.016	0.13	0.16	0.26	0.55	1.3	1.7	2	3.3	0.81	0.71
AMS15	Horizon	59	100%	0.011	0.12	0.14	0.25	0.65	1	1.5	1.7	3.9	0.77	0.7
AMS16	Muskeg River	51	100%	0.022	0.15	0.23	0.37	0.81	1.6	2.2	3	3.8	1	0.86



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER – ELEMENTAL CARBON/ORGANIC CARBON DATA SUMMARY 2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

Desert Research Institute
Reno, NV

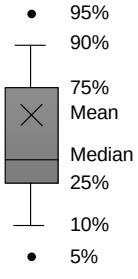
EC/OC:

Desert Research Institute
Reno, NV

FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of elemental carbon (EC) and organic carbon (OC)
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	µg/m^3 (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet/Very Sharp Cut Cyclone for $PM_{2.5}$
PARTICLE DIAMETER	< 2.5 µm
MEDIUM	47 mm Quartz Filter
ANALYTICALMETHODS	DRI Model 2001 Thermal/Optical Carbon Analyzer
SAMPLE PREPARATION	NA
ANALYTICAL LABORATORY	Desert Research Institute
USER NOTE 1	Data are blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (µg/m^3) is calculated using expected actual volume of sampler
USER NOTE 4	O1TC Organic Carbon Fraction 1 O2TC Organic Carbon Fraction 2 O3TC Organic Carbon Fraction 3 O4TC Organic Carbon Fraction 4 OPTTC Pyrolyzed organic carbon, thermal (transmittance) OPTRC Pyrolyzed organic carbon, thermal (reflectance) OCTTC Organic carbon, thermal (transmittance) OCTRC Organic carbon, thermal (reflectance) E1TC Elemental Carbon Fraction 1 E2TC Elemental Carbon Fraction 2 E3TC Elemental Carbon Fraction 3 ECTTC Elemental carbon, thermal (transmittance) ECTRC Elemental carbon, thermal (reflectance) TCTC Total Carbon
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions
SAMPLING INSTRUMENT TYPE	FRM Partisol $PM_{2.5}$ sampler

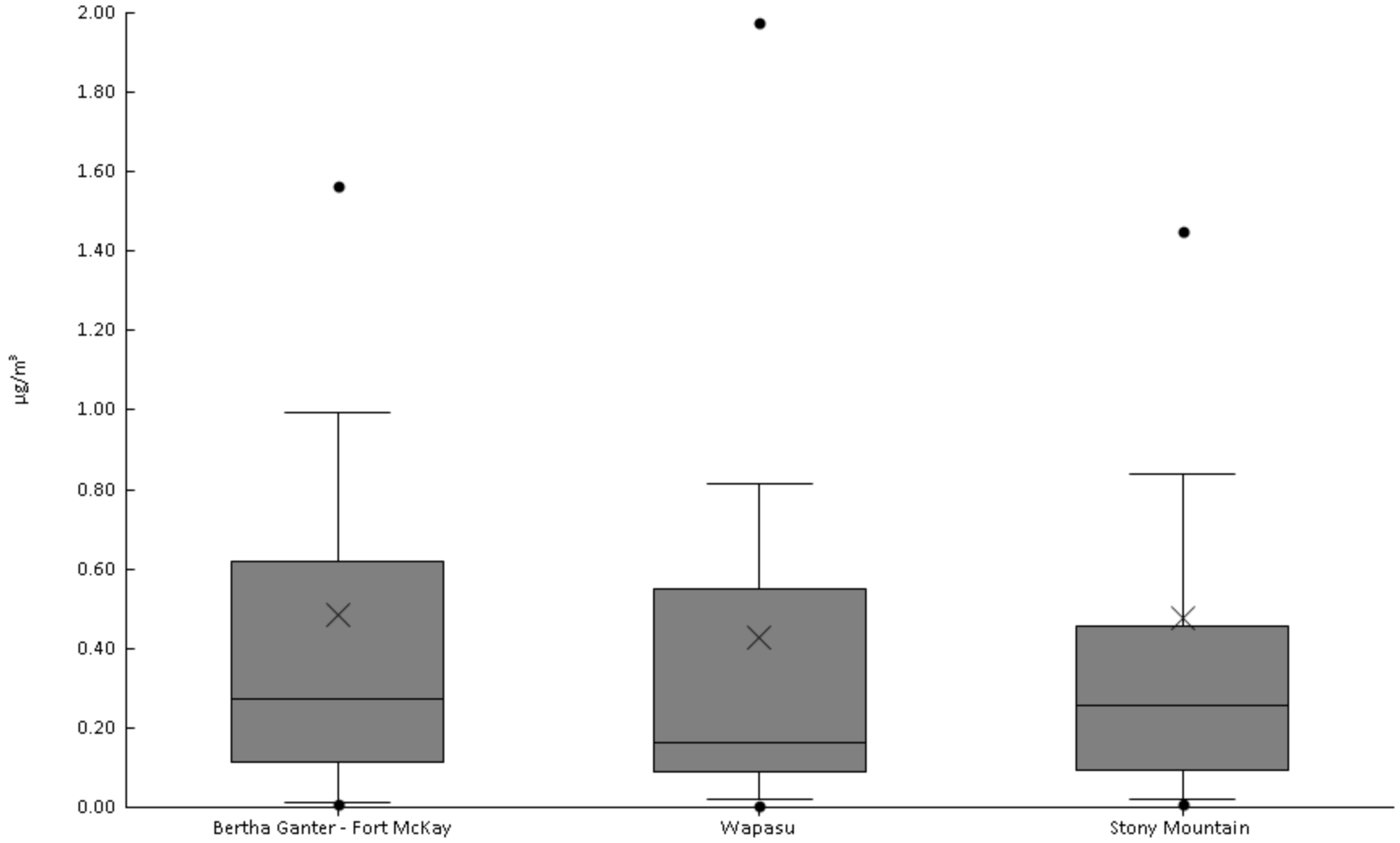
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



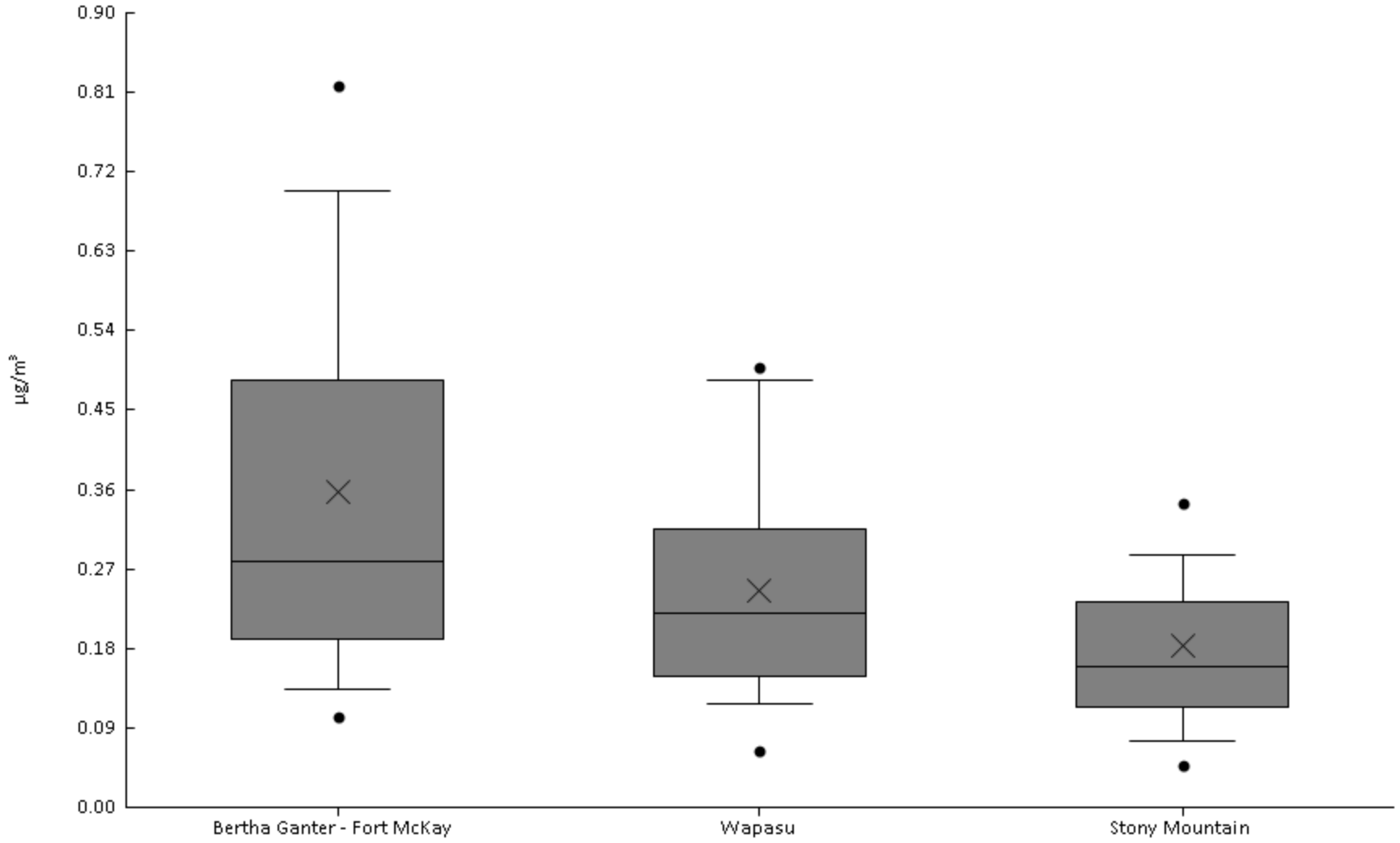
ECOC - Elemental Carbon Fraction 1 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	0	8.1E-3	0.013	0.11	0.27	0.62	0.99	1.6	4.3	0.48	0.66
AMS17	Wapasu	38	97%	0	5.8E-3	0.018	0.089	0.16	0.55	0.82	2	3.7	0.43	0.71
AMS18	Stony Mountain	41	98%	0	9.8E-3	0.02	0.093	0.26	0.45	0.84	1.5	7.1	0.48	1.1



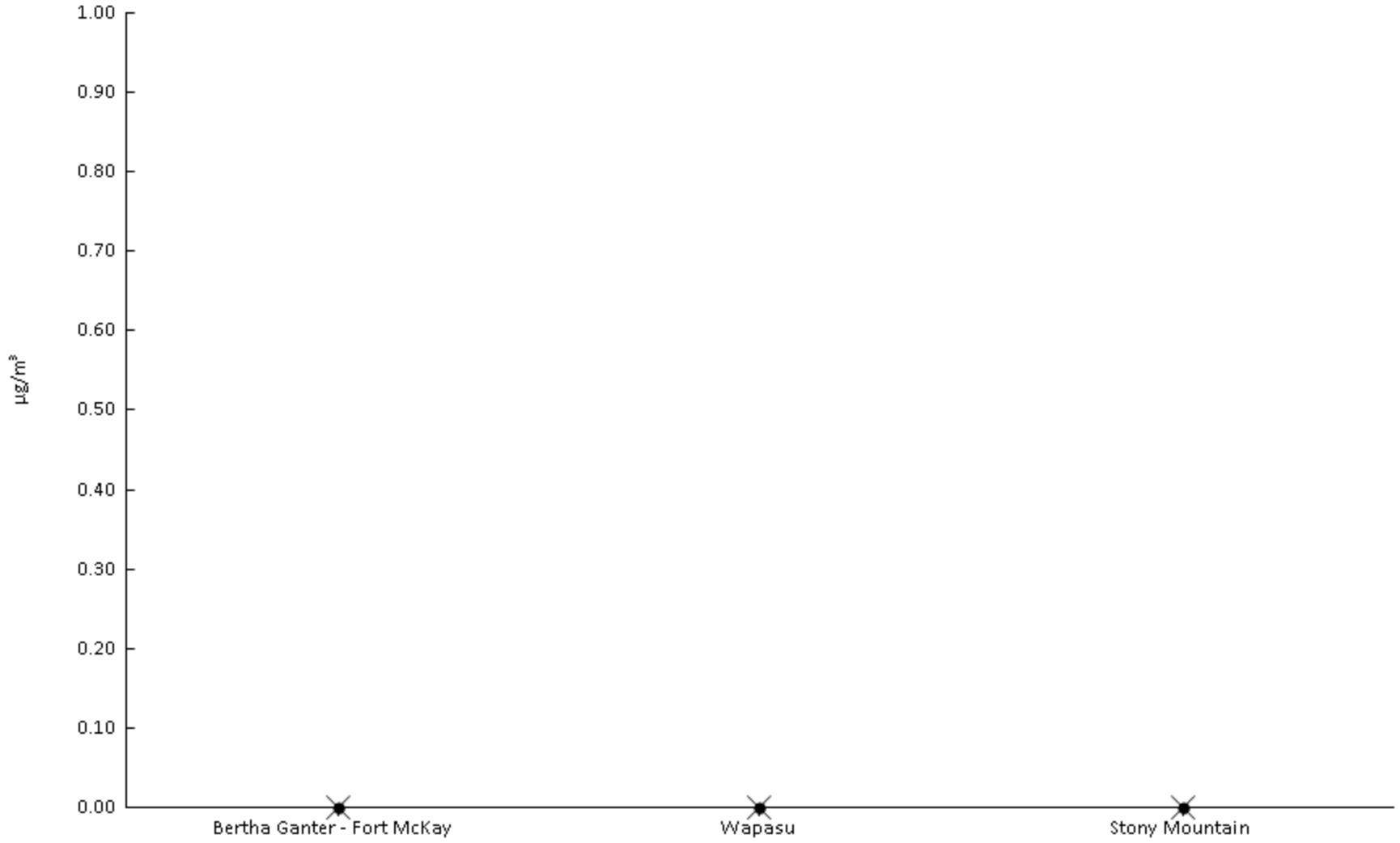
ECOC - Elemental Carbon Fraction 2 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.09	0.1	0.13	0.19	0.28	0.48	0.7	0.82	0.98	0.36	0.22
AMS17	Wapasu	38	100%	0.045	0.064	0.12	0.15	0.22	0.32	0.48	0.5	0.53	0.25	0.13
AMS18	Stony Mountain	41	100%	0.029	0.047	0.075	0.11	0.16	0.23	0.29	0.35	0.83	0.18	0.13



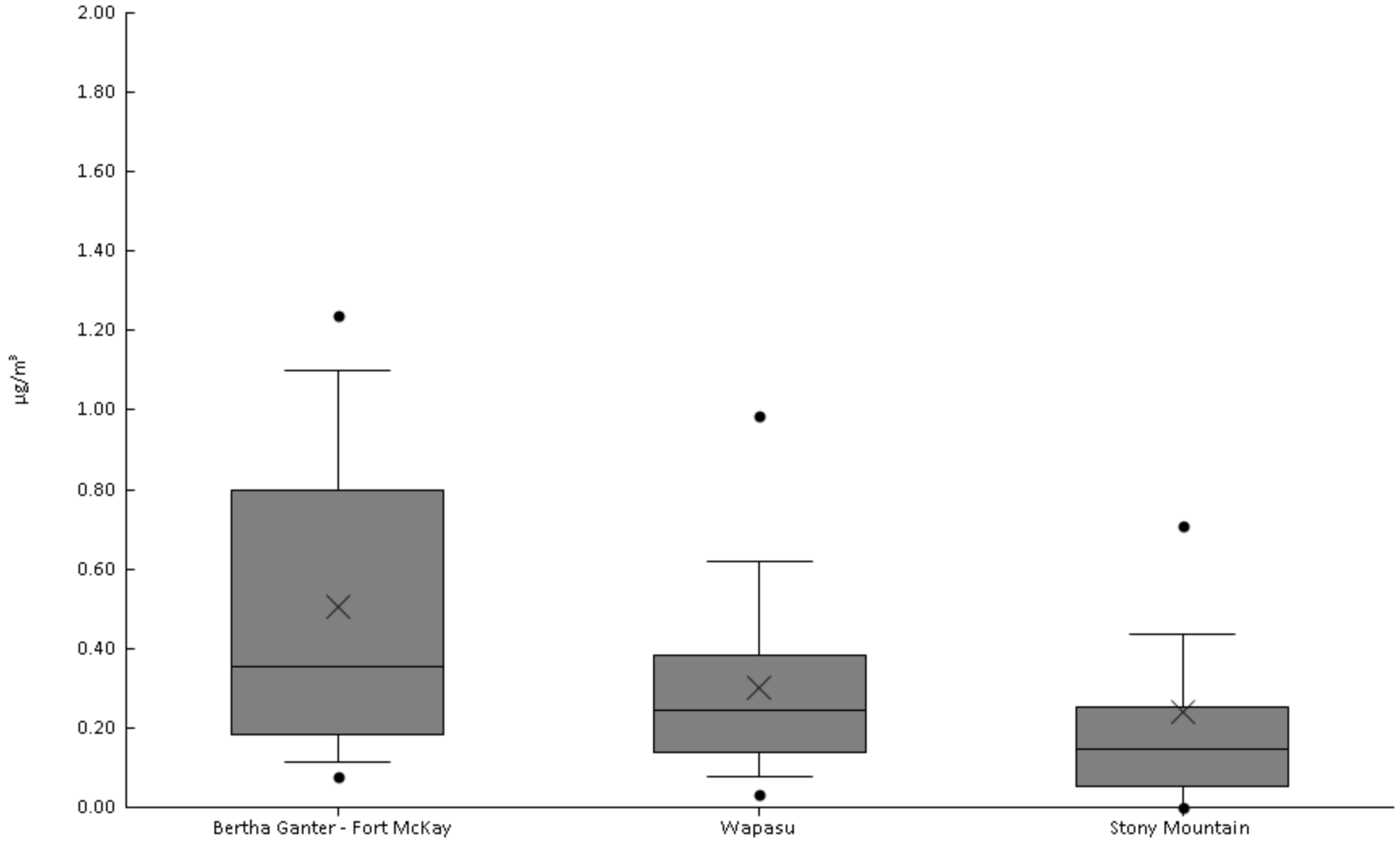
ECOC - Elemental Carbon Fraction 3 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	0%	0	0	0	0	0	0	0	0	0	0	0
AMS17	Wapasu	38	0%	0	0	0	0	0	0	0	0	0	0	0
AMS18	Stony Mountain	41	0%	0	0	0	0	0	0	0	0	0	0	0



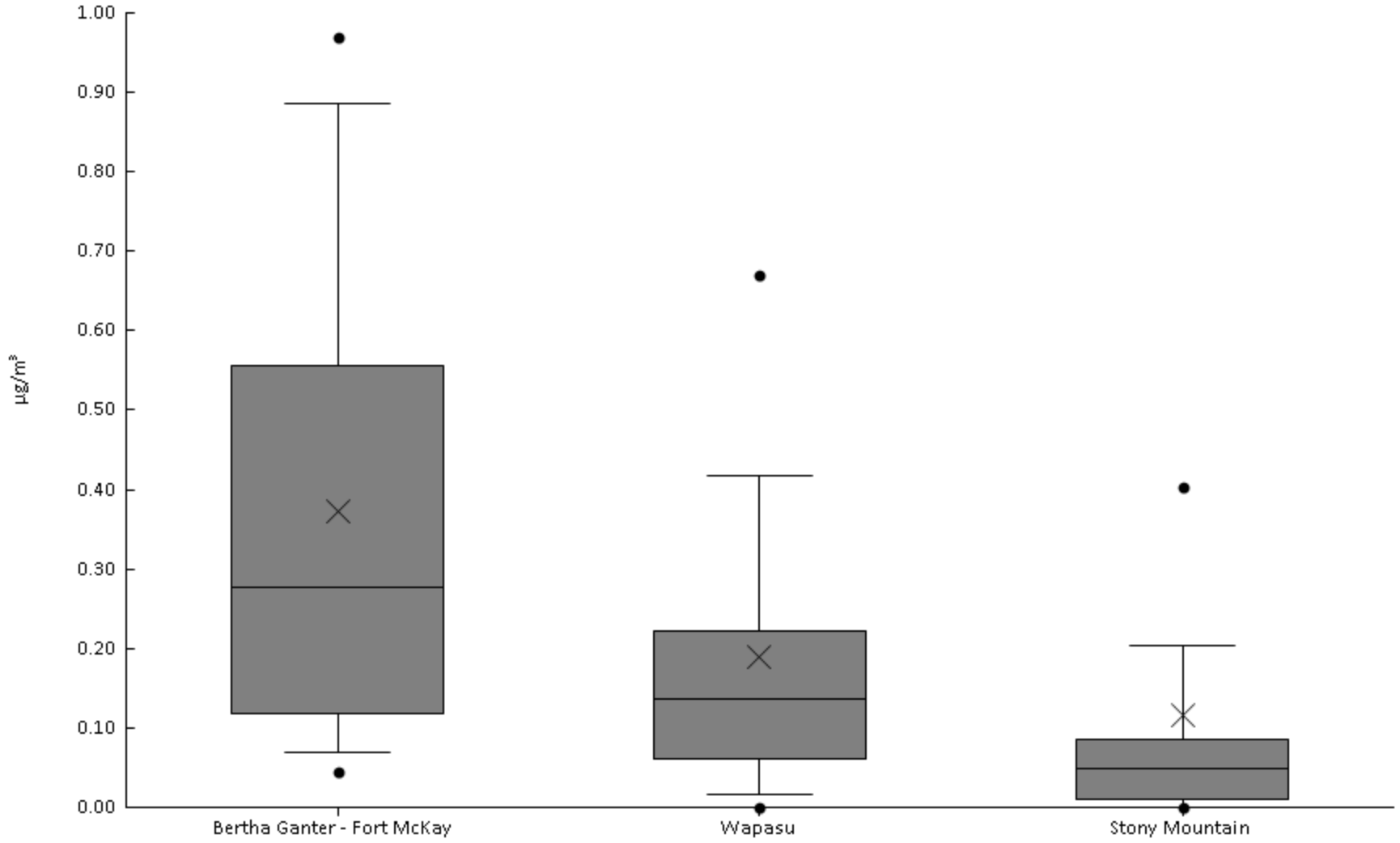
ECOC - Elemental carbon,thermal method, reflectance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	0	0.076	0.11	0.18	0.35	0.8	1.1	1.2	1.7	0.51	0.42
AMS17	Wapasu	38	97%	0	0.033	0.076	0.14	0.24	0.38	0.62	0.99	1.2	0.3	0.28
AMS18	Stony Mountain	41	85%	0	0	0	0.053	0.15	0.25	0.44	0.71	2.9	0.24	0.46



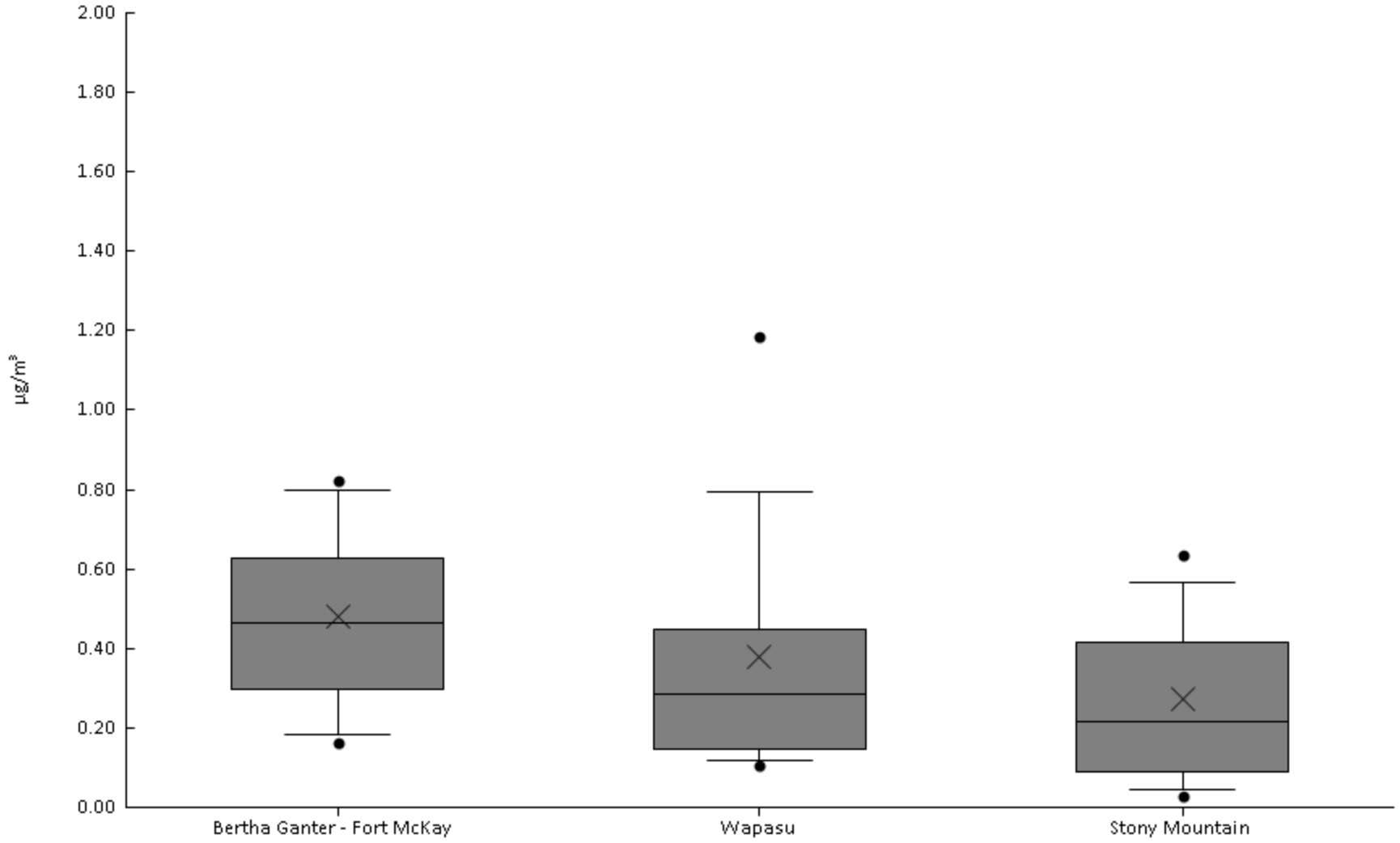
ECOC - Elemental carbon,thermal method, transmittance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	98%	0	0.044	0.07	0.12	0.28	0.56	0.89	0.97	1.2	0.37	0.32
AMS17	Wapasu	38	92%	0	0	0.017	0.06	0.14	0.22	0.42	0.67	0.86	0.19	0.19
AMS18	Stony Mountain	41	76%	0	0	0	0.011	0.05	0.085	0.2	0.4	1.9	0.12	0.3



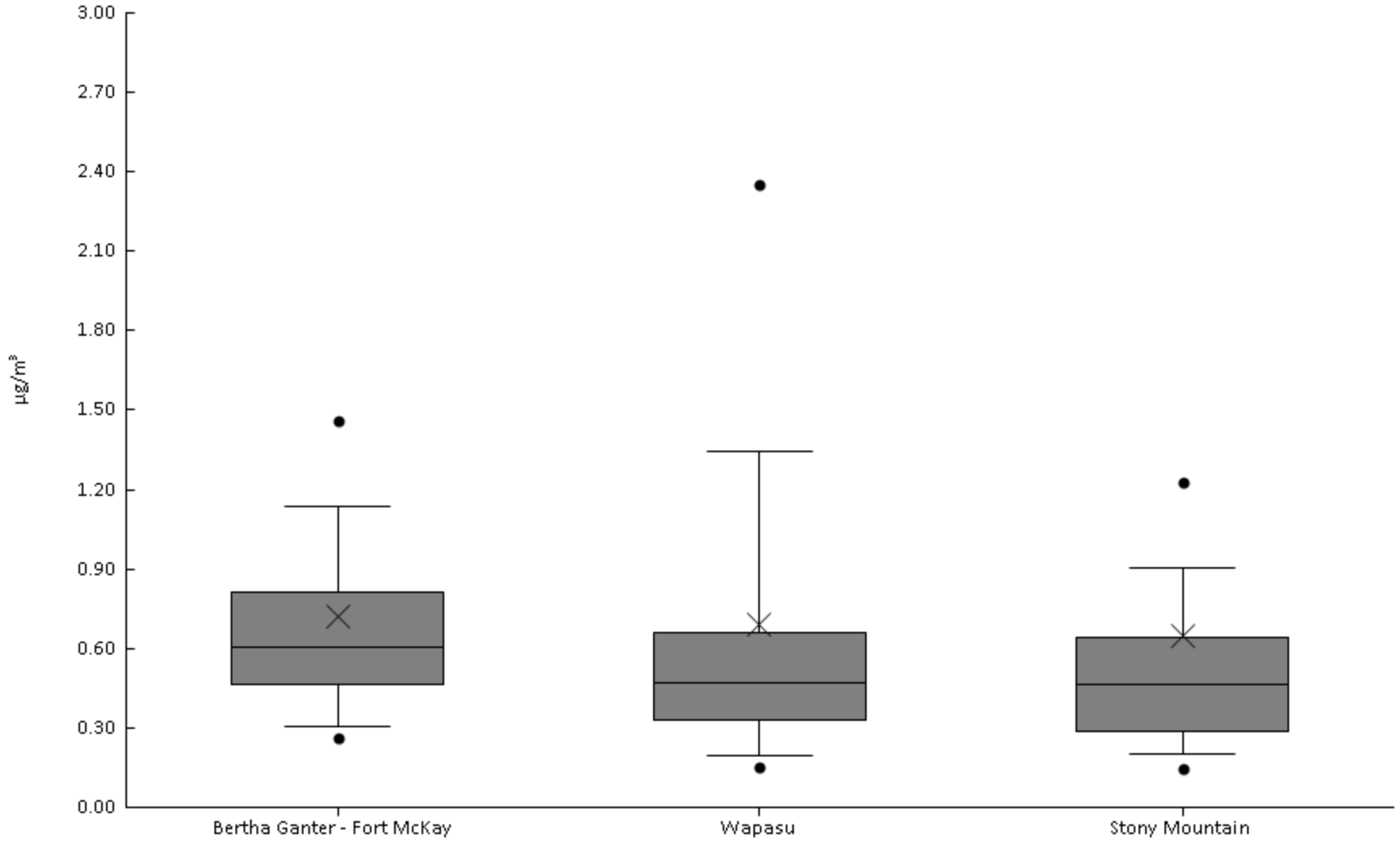
ECOC - Organic Carbon Fraction 1 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.12	0.16	0.18	0.3	0.47	0.63	0.8	0.82	1.2	0.48	0.24
AMS17	Wapasu	38	100%	0.073	0.11	0.12	0.15	0.29	0.45	0.79	1.2	1.5	0.38	0.33
AMS18	Stony Mountain	41	100%	0.027	0.028	0.044	0.091	0.22	0.41	0.57	0.63	1.2	0.27	0.23



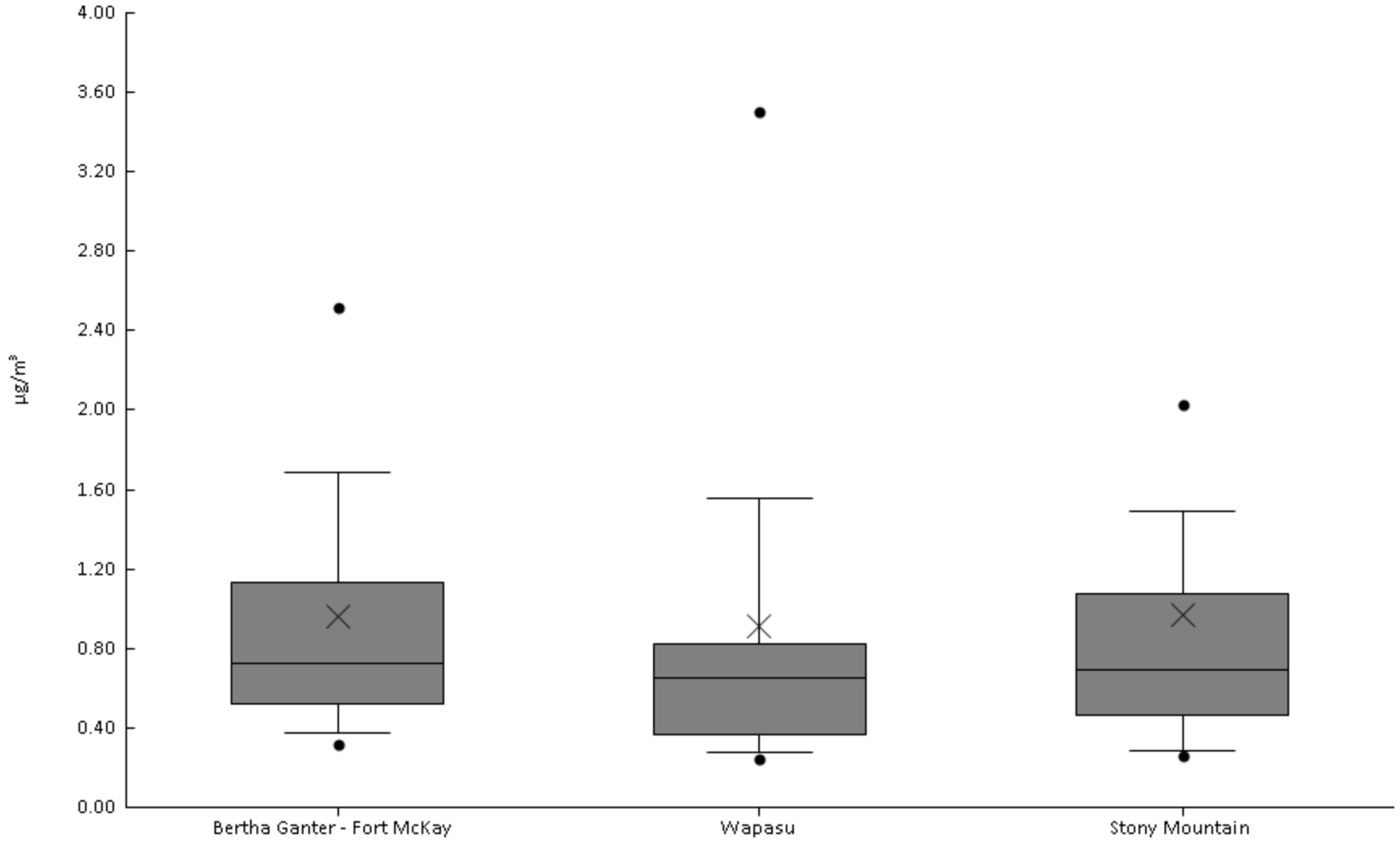
ECOC - Organic Carbon Fraction 2 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.2	0.26	0.31	0.46	0.6	0.81	1.1	1.5	3.7	0.72	0.5
AMS17	Wapasu	38	100%	0.11	0.15	0.19	0.33	0.47	0.66	1.3	2.4	4.2	0.69	0.77
AMS18	Stony Mountain	41	100%	0.14	0.15	0.2	0.29	0.46	0.64	0.9	1.2	6.9	0.65	1



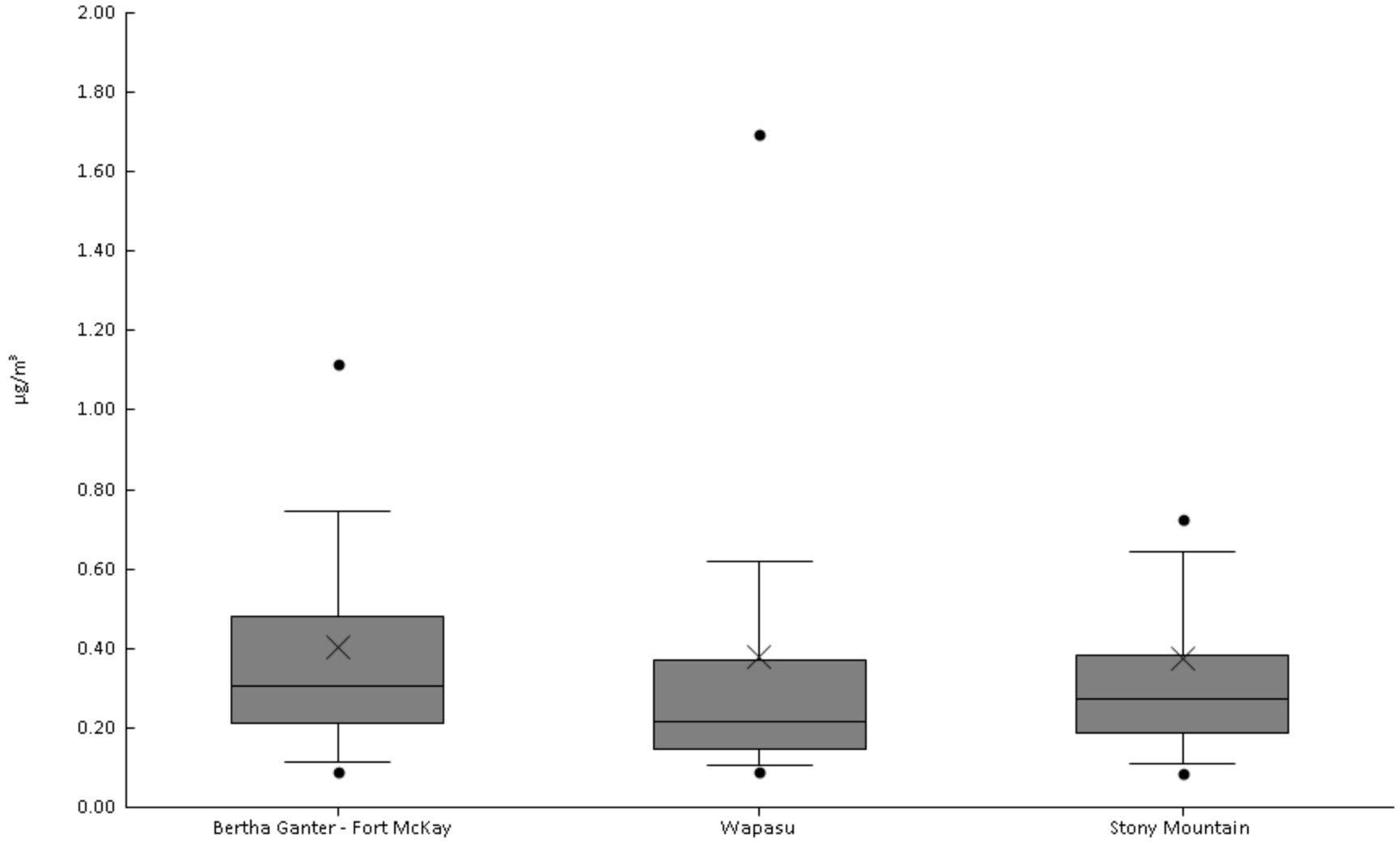
ECOC - Organic Carbon Fraction 3 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.23	0.32	0.38	0.52	0.73	1.1	1.7	2.5	5.7	0.96	0.85
AMS17	Wapasu	38	100%	0.19	0.25	0.28	0.36	0.65	0.83	1.6	3.5	5.8	0.91	1.1
AMS18	Stony Mountain	41	100%	0.23	0.26	0.28	0.46	0.69	1.1	1.5	2	8.1	0.97	1.2



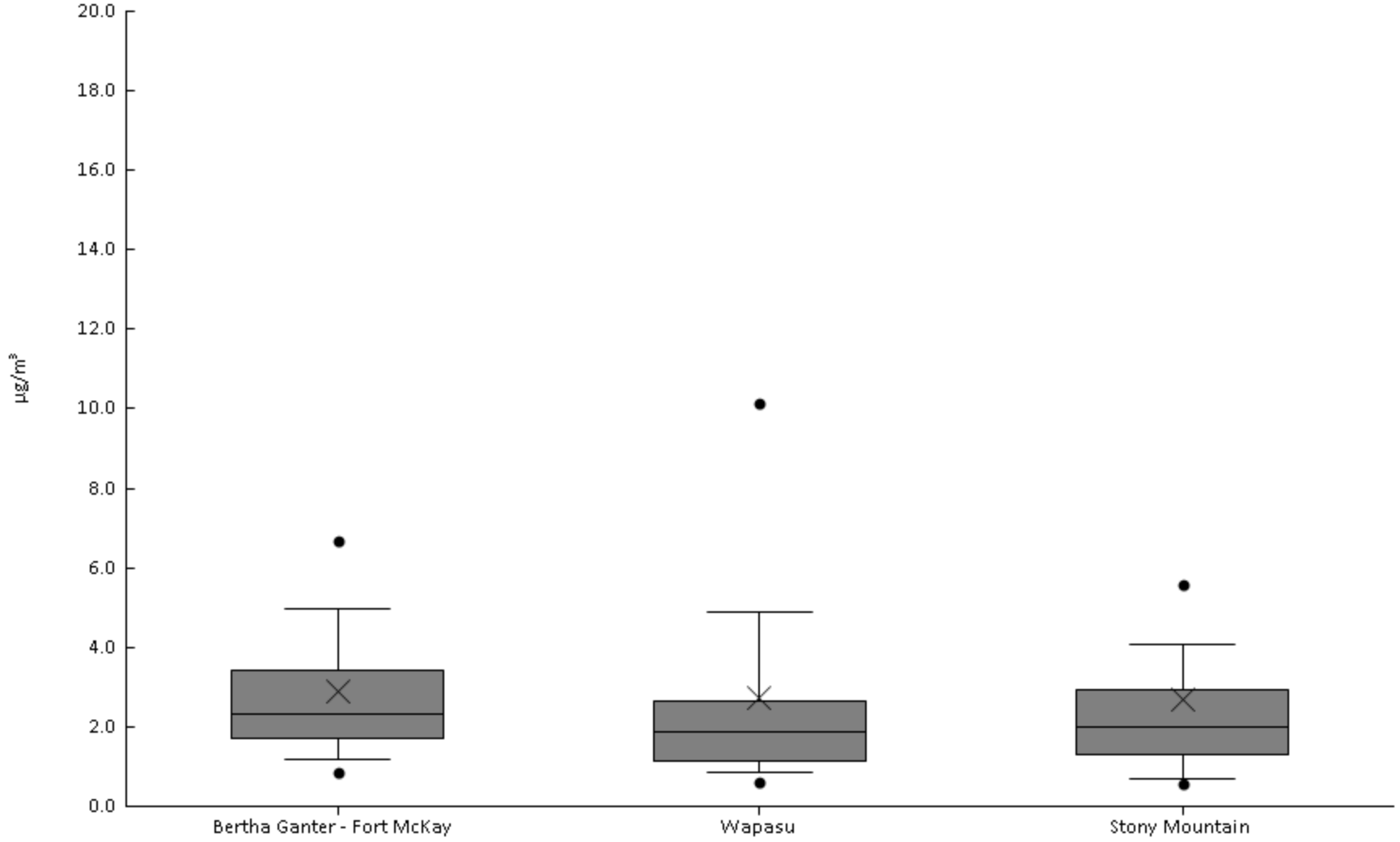
ECOC - Organic Carbon Fraction 4 concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.05	0.091	0.12	0.21	0.31	0.48	0.75	1.1	1.8	0.4	0.32
AMS17	Wapasu	38	100%	0.034	0.089	0.11	0.14	0.21	0.37	0.62	1.7	2.2	0.38	0.48
AMS18	Stony Mountain	41	100%	0.049	0.087	0.11	0.19	0.27	0.38	0.64	0.72	3.3	0.37	0.49



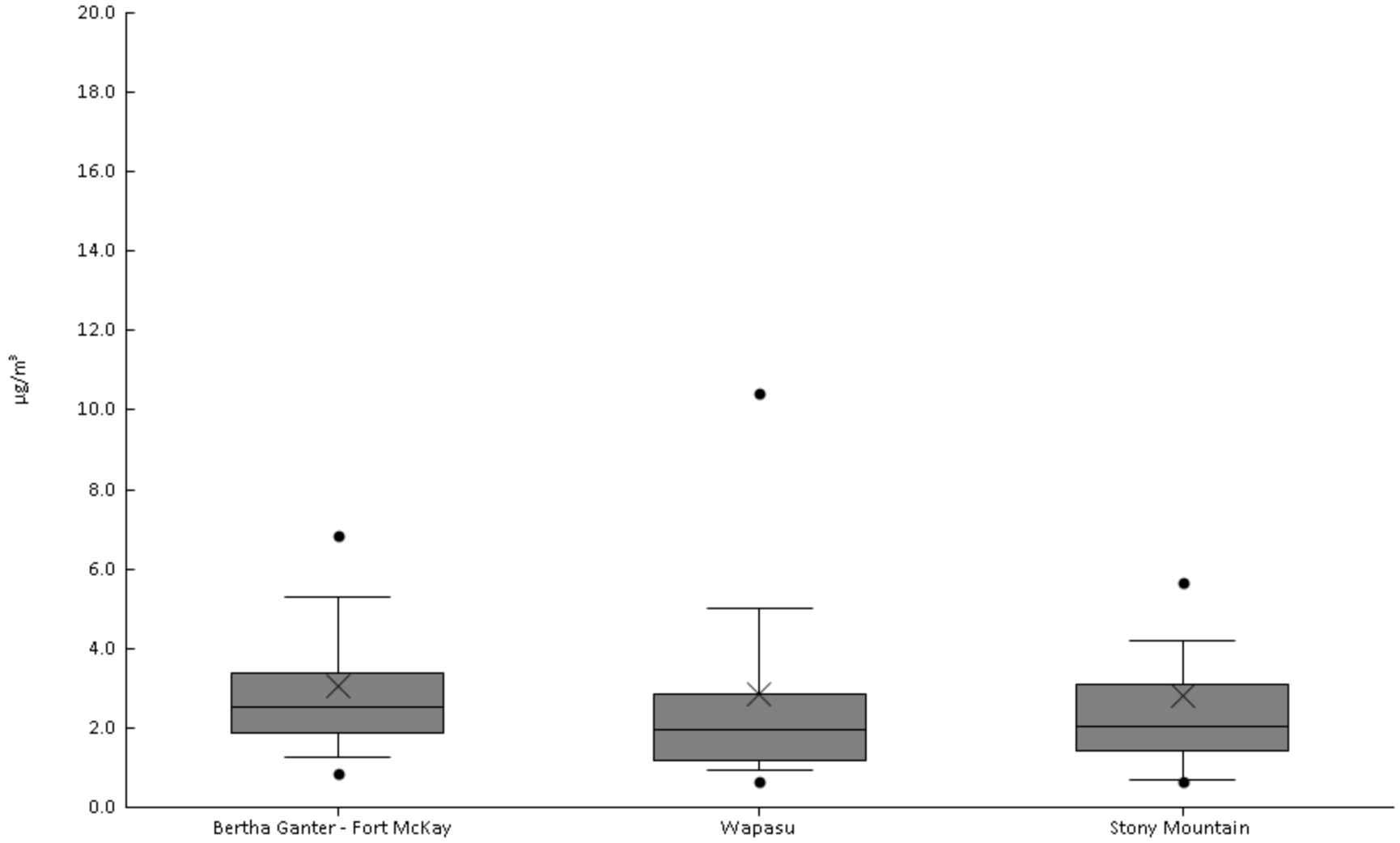
ECOC - Organic carbon,thermal method, reflectance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.7	0.85	1.2	1.7	2.3	3.4	5	6.7	16	2.9	2.3
AMS17	Wapasu	38	100%	0.53	0.6	0.84	1.2	1.9	2.6	4.9	10	17	2.7	3.2
AMS18	Stony Mountain	41	100%	0.52	0.59	0.68	1.3	2	2.9	4.1	5.6	24	2.7	3.7



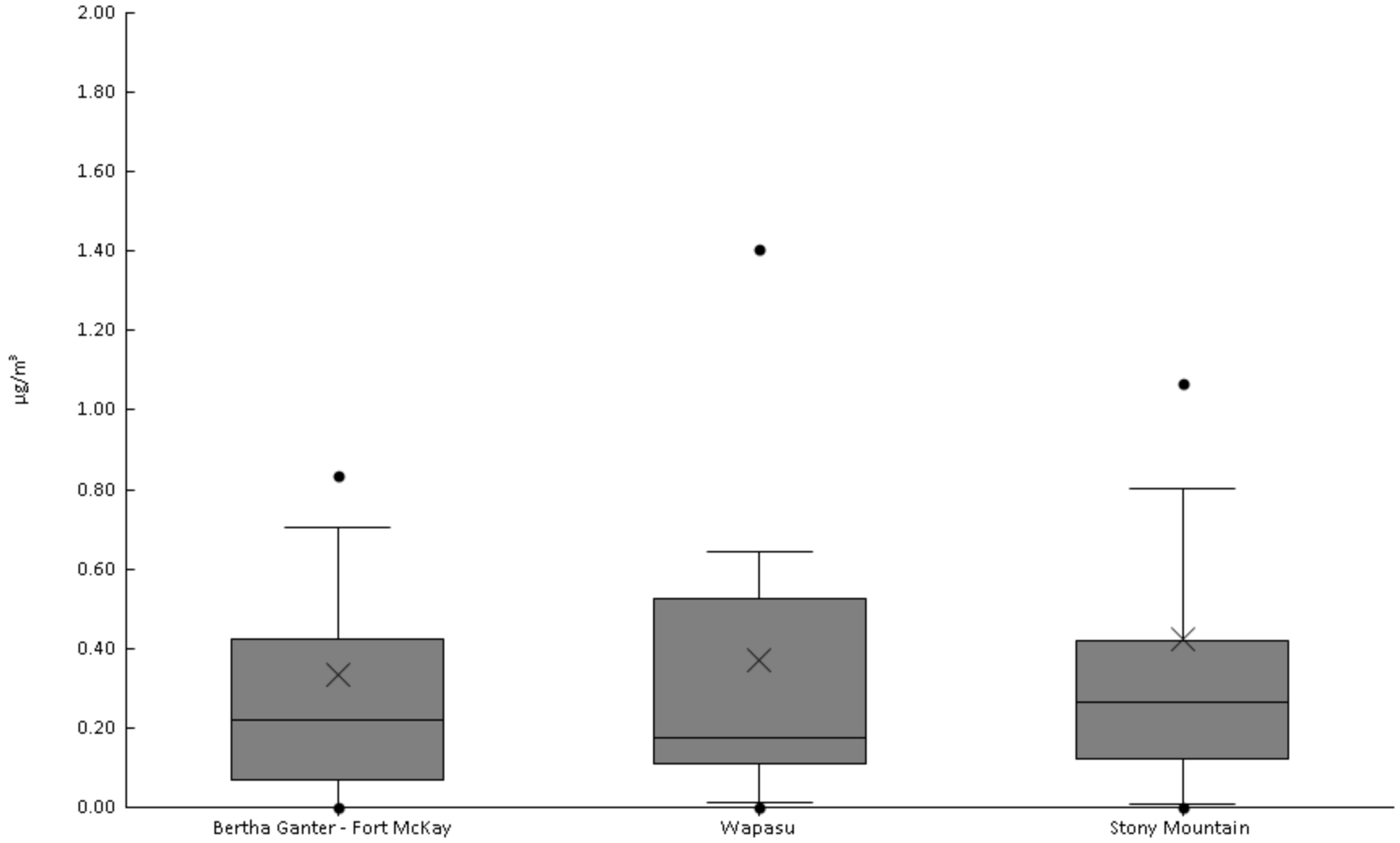
ECOC - Organic carbon,thermal method, transmittance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.75	0.85	1.3	1.9	2.5	3.4	5.3	6.8	16	3	2.3
AMS17	Wapasu	38	100%	0.53	0.66	0.93	1.2	1.9	2.9	5	10	17	2.8	3.2
AMS18	Stony Mountain	41	100%	0.52	0.64	0.7	1.4	2.1	3.1	4.2	5.6	25	2.8	3.8



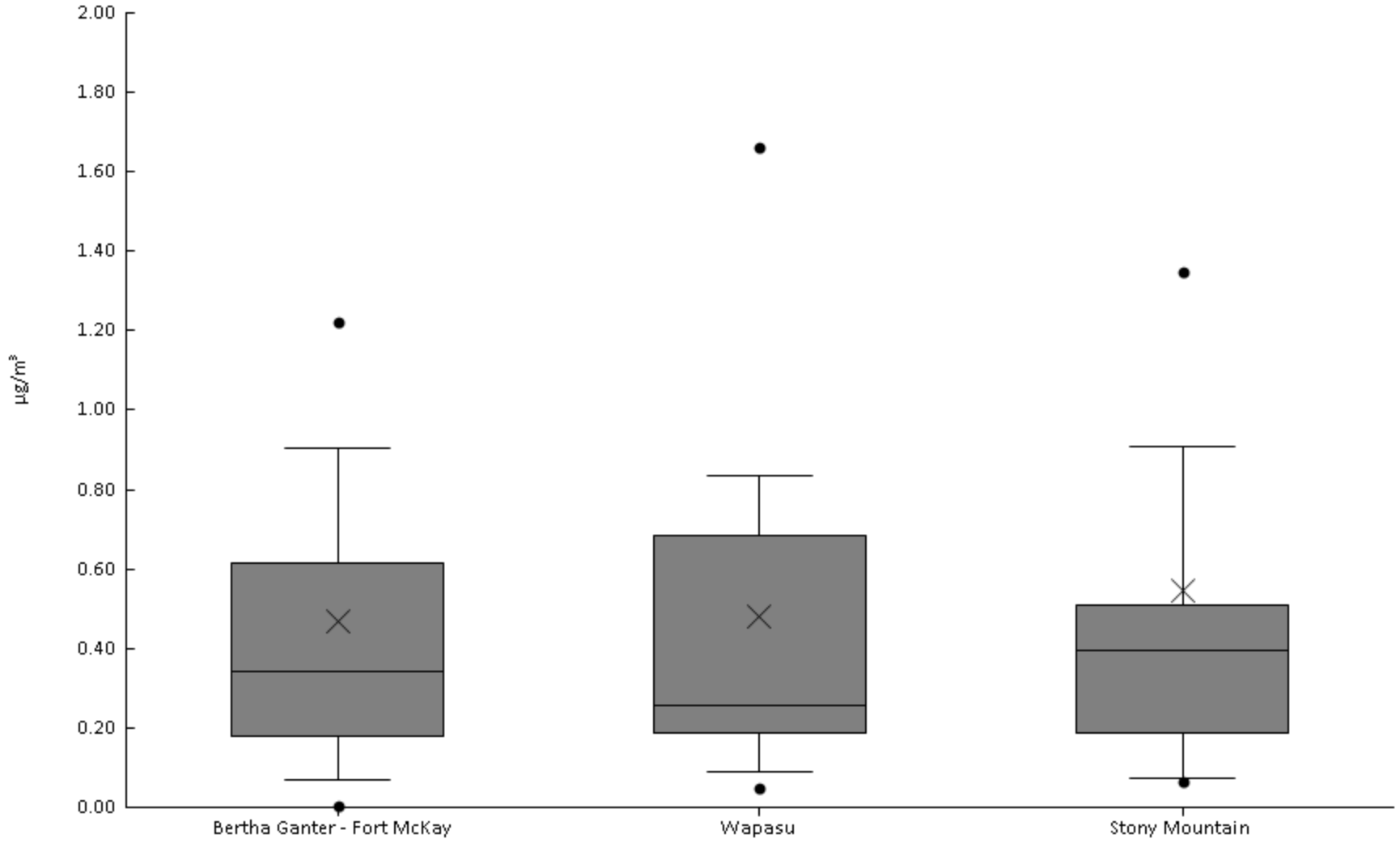
ECOC - Pyrolyzed organic carbon, thermal method,reflectance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	84%	0	0	0	0.069	0.22	0.42	0.7	0.83	3.2	0.33	0.47
AMS17	Wapasu	38	89%	0	0	0.011	0.11	0.17	0.52	0.64	1.4	3	0.37	0.54
AMS18	Stony Mountain	41	90%	0	0	9.8E-3	0.12	0.26	0.42	0.8	1.1	5	0.42	0.78



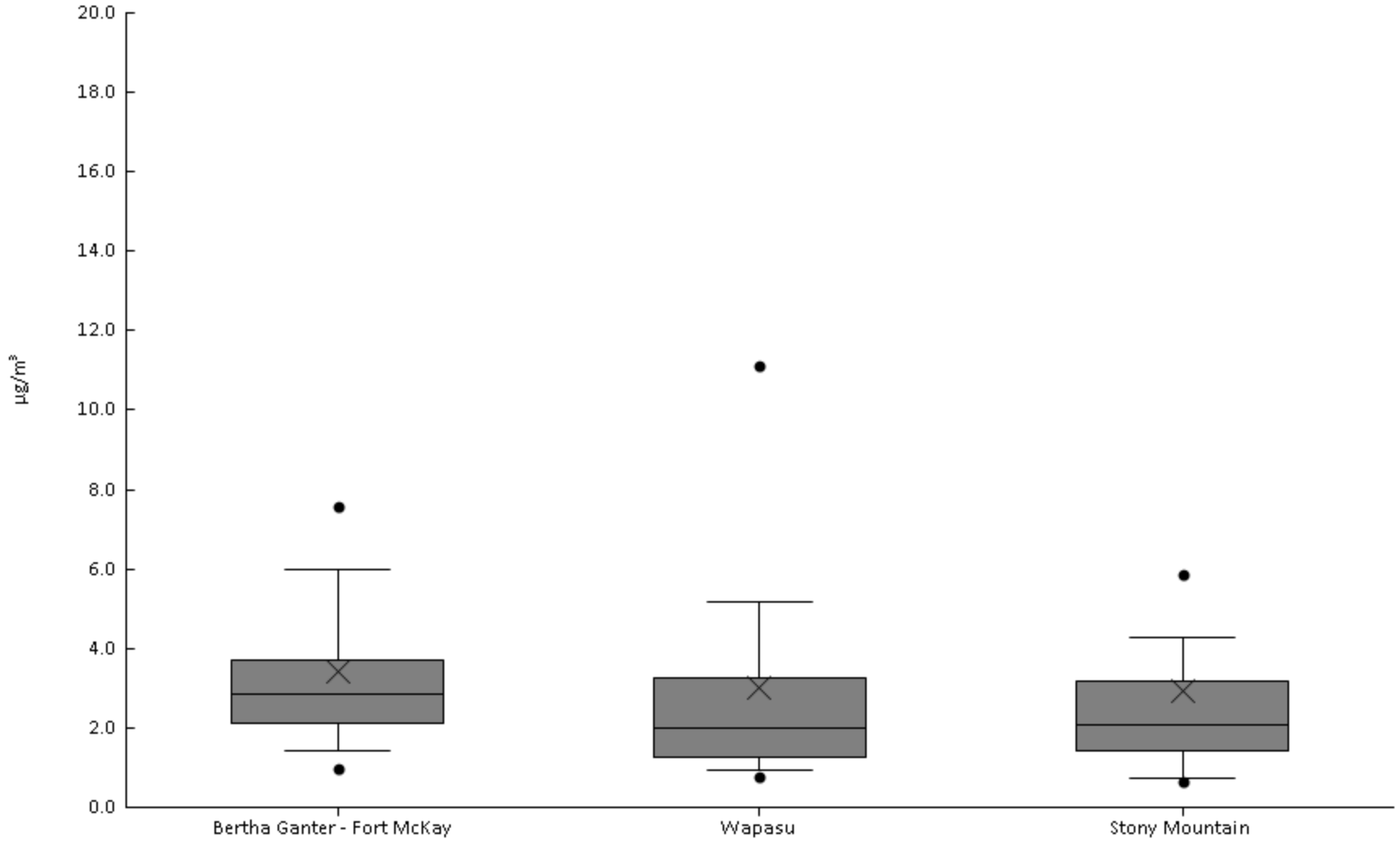
ECOC - Pyrolyzed organic carbon, thermal method, transmittance concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	95%	0	5.2E-3	0.069	0.18	0.34	0.61	0.9	1.2	4	0.47	0.57
AMS17	Wapasu	38	97%	0	0.051	0.09	0.19	0.25	0.68	0.83	1.7	3.4	0.48	0.62
AMS18	Stony Mountain	41	98%	0	0.065	0.072	0.19	0.39	0.51	0.91	1.3	6	0.55	0.93



ECOC - Total Carbon concentration (µg/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	57	100%	0.77	0.99	1.4	2.1	2.9	3.7	6	7.6	17	3.4	2.5
AMS17	Wapasu	38	100%	0.64	0.76	0.95	1.3	2	3.2	5.2	11	18	3	3.4
AMS18	Stony Mountain	41	100%	0.6	0.65	0.74	1.4	2.1	3.2	4.3	5.9	27	2.9	4.1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

POLYCYCLIC AROMATIC HYDROCARBONS
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

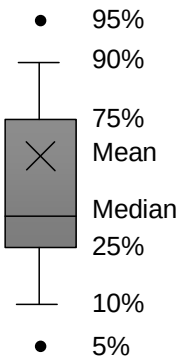
Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

Total PAHs: Air Zone One Incorporated
Mississauga, Ontario

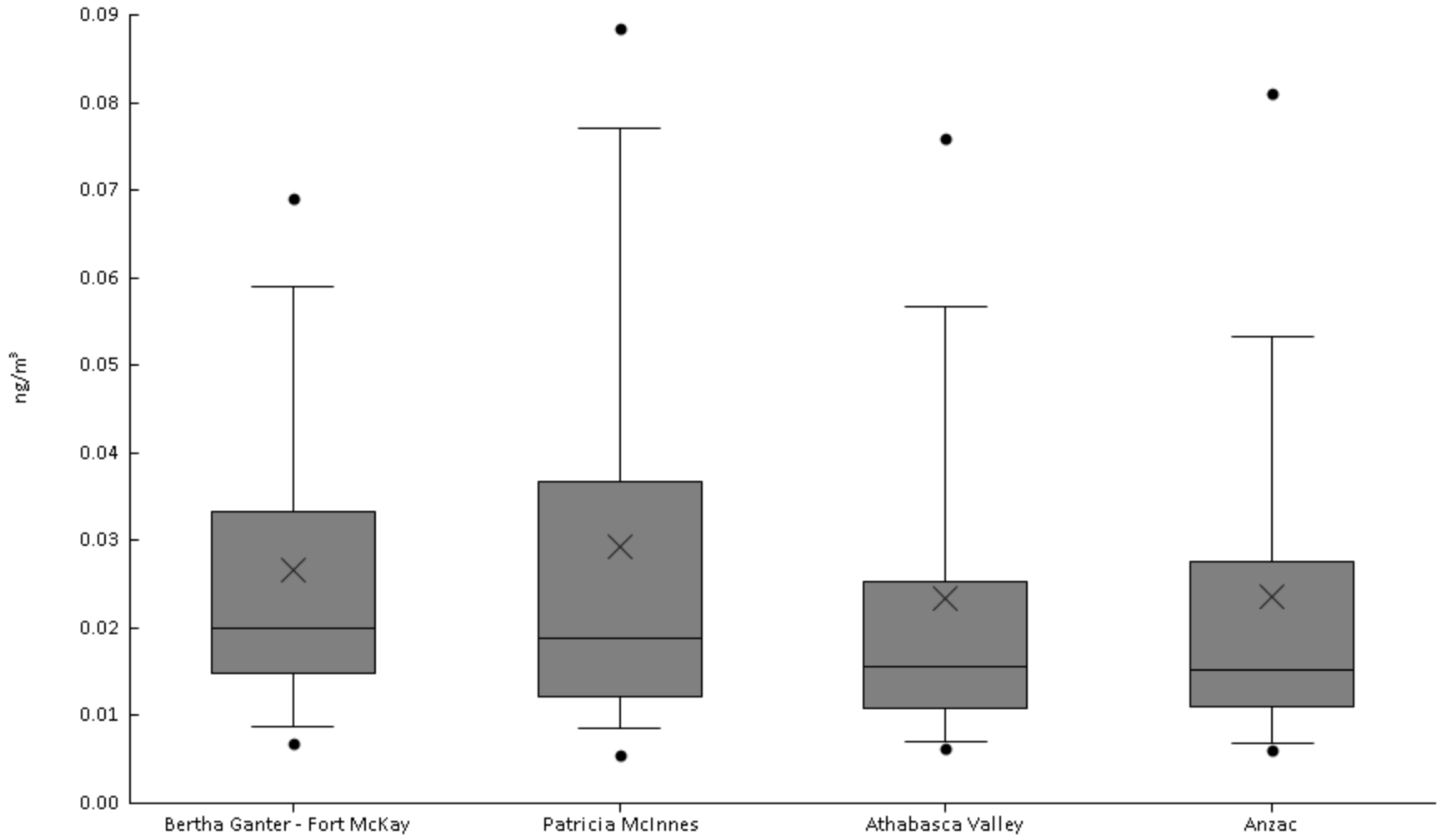
FILE CONTENTS DESCRIPTION	PAH - Speciated PAH Gas + Particle Phase Measurements
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
UNITS	ng/m^3 (nanogram per cubic meter)
OBSERVATION TYPE	Particles + gas
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	filtration and adsorbent
PARTICLE DIAMETER	TSP (total suspended particle)
MEDIUM	a glass fiber filter + PUF/XAD-2/PUF
ANALYTICALMETHOD	Gas Chromatograph/Mass Spectrometer (GC/MS)
SAMPLE PREPARATION	Solvent Extraction
ANALYTICAL LABORATORY	AIRZONE One Inc.
USER NOTE 1	Data are recovery corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (ng/m^3) is calculated using expected actual volume of sampler
USER NOTE 4	Travel blank sample has been discounted in June 2018 (2018-06-25)
USER NOTE 5	Field blank has been initiated in May 2018 (2018-05-02)
USER NOTE 6	Field duplicate has been initiated in June 2018 (2018-06-13)
USERNOTE 7	Average is calculated using the reported lab value. If the lab value provided is <MDL and is not a number, then the value 0 will be used.
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions
SAMPLING INSTRUMENT TYPE	Tisch TE-1000 High-Volume Sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

Legend description



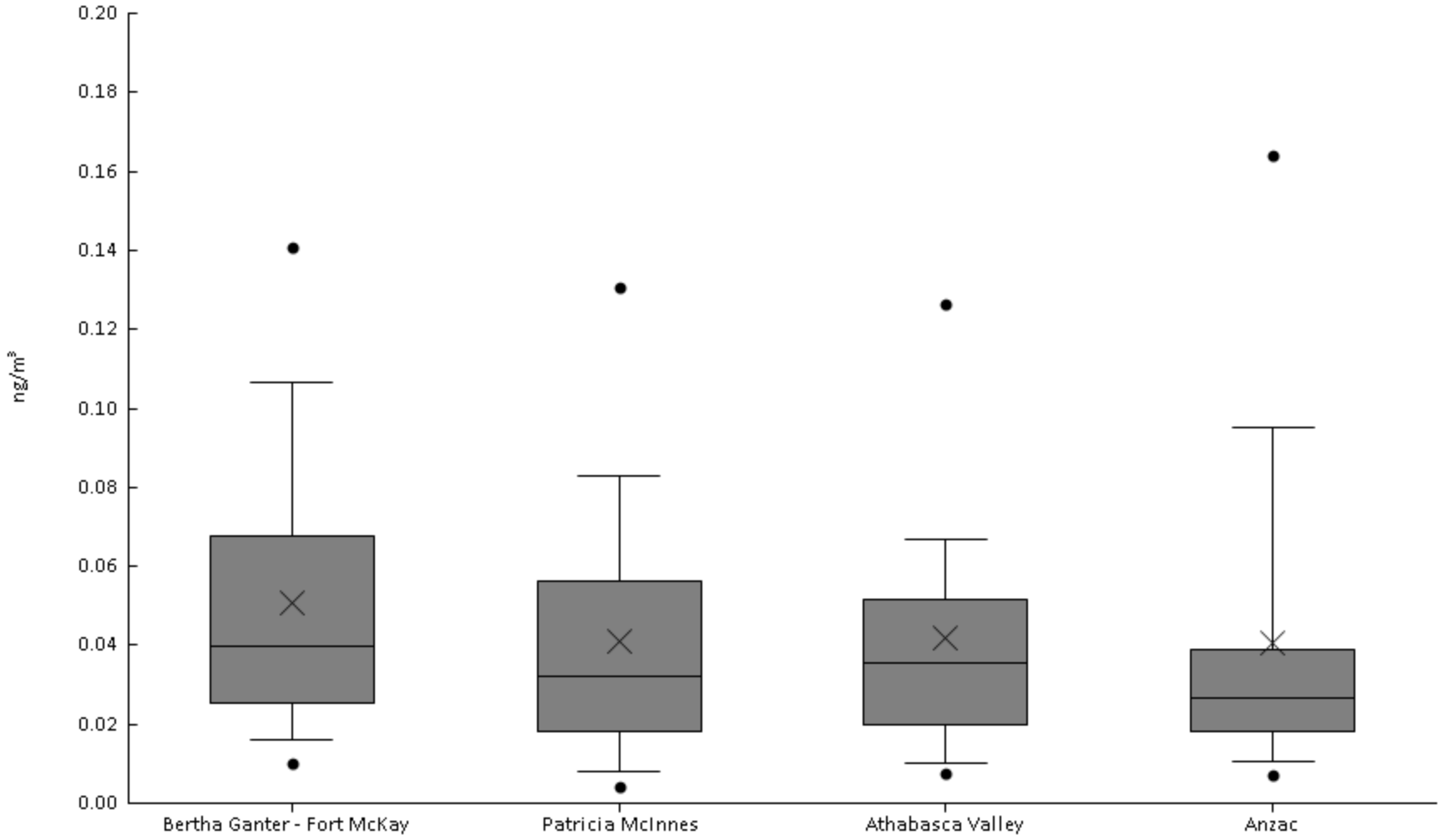
Polycyclic Aromatic Hydrocarbons - 3-Methylcholanthrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	46%	5E-3	6.9E-3	8.8E-3	0.015	0.02	0.033	0.059	0.069	0.093	0.027	0.019
AMS06	Patricia McInnes	61	39%	4.2E-3	5.5E-3	8.5E-3	0.012	0.019	0.037	0.077	0.088	0.13	0.029	0.027
AMS07	Athabasca Valley	60	30%	1.5E-3	6.3E-3	7.1E-3	0.011	0.016	0.025	0.057	0.076	0.084	0.023	0.021
AMS14	Anzac	61	34%	4.5E-3	6.1E-3	6.8E-3	0.011	0.015	0.028	0.053	0.081	0.091	0.024	0.021



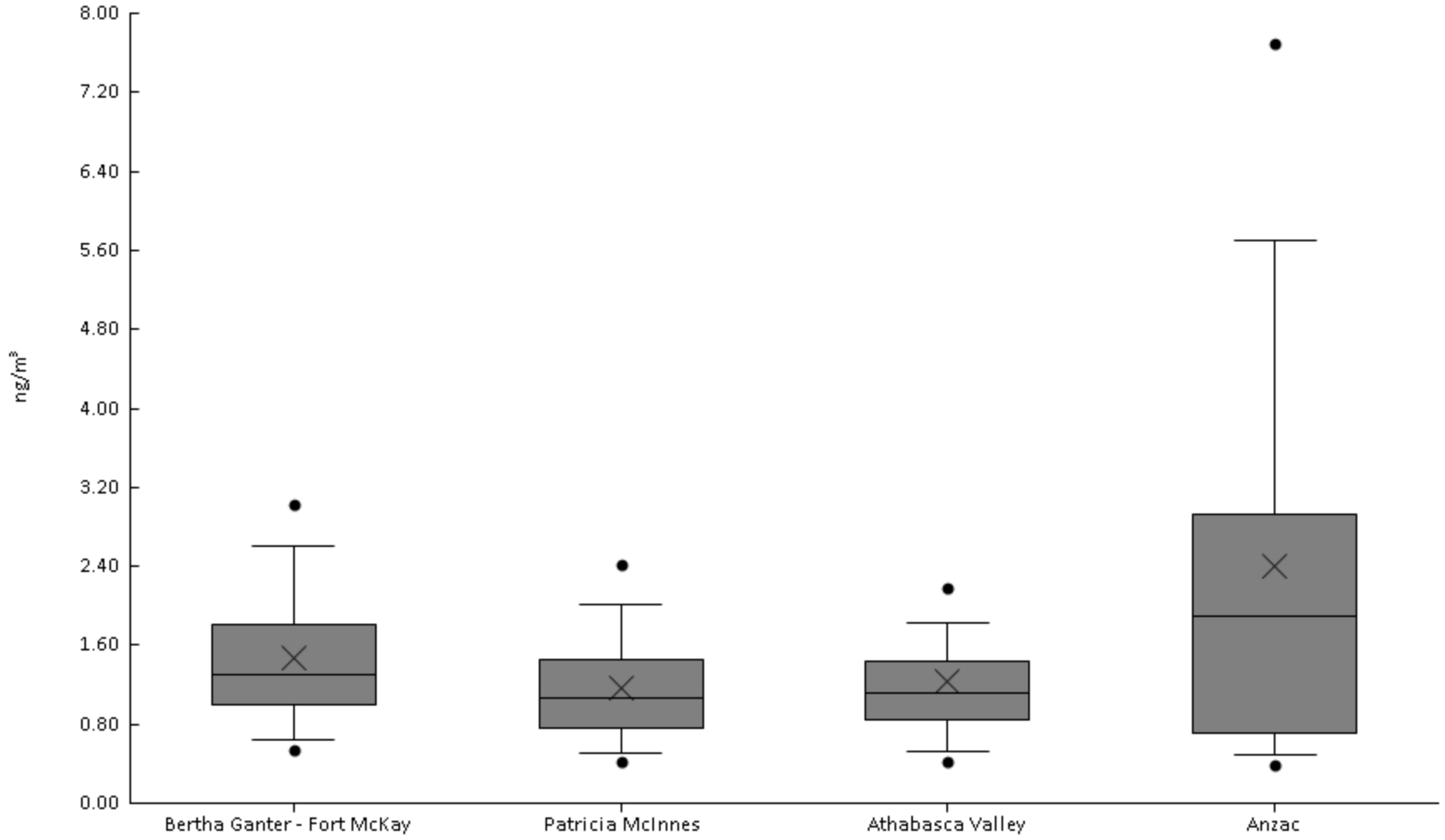
Polycyclic Aromatic Hydrocarbons - 7,12-Dimethylbenz(a)anthracene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	4.7E-3	9.9E-3	0.016	0.025	0.04	0.068	0.11	0.14	0.16	0.051	0.037
AMS06	Patricia McInnes	61	80%	1.6E-3	4.4E-3	8.2E-3	0.018	0.032	0.056	0.083	0.13	0.15	0.041	0.034
AMS07	Athabasca Valley	60	85%	4E-3	7.6E-3	0.01	0.02	0.036	0.052	0.067	0.13	0.17	0.042	0.034
AMS14	Anzac	61	82%	1.8E-3	7.3E-3	0.011	0.018	0.027	0.039	0.095	0.16	0.2	0.04	0.043



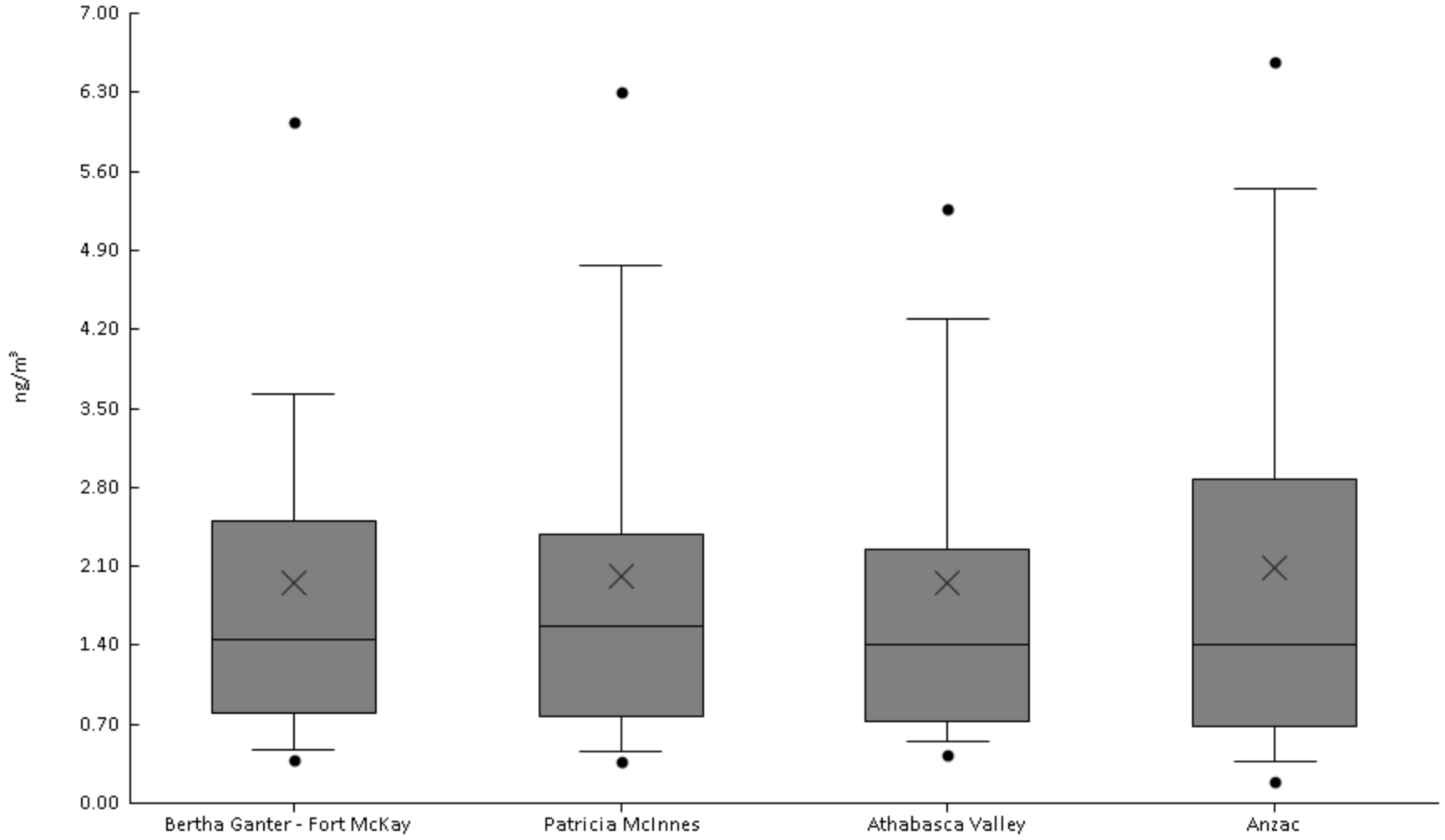
Polycyclic Aromatic Hydrocarbons - Acenaphthene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.081	0.53	0.64	1	1.3	1.8	2.6	3	4.1	1.5	0.78
AMS06	Patricia McInnes	61	100%	0.24	0.43	0.51	0.76	1.1	1.5	2	2.4	2.6	1.2	0.58
AMS07	Athabasca Valley	60	100%	0.23	0.42	0.52	0.84	1.1	1.4	1.8	2.2	6.2	1.2	0.83
AMS14	Anzac	61	100%	0.28	0.38	0.49	0.71	1.9	2.9	5.7	7.7	13	2.4	2.5



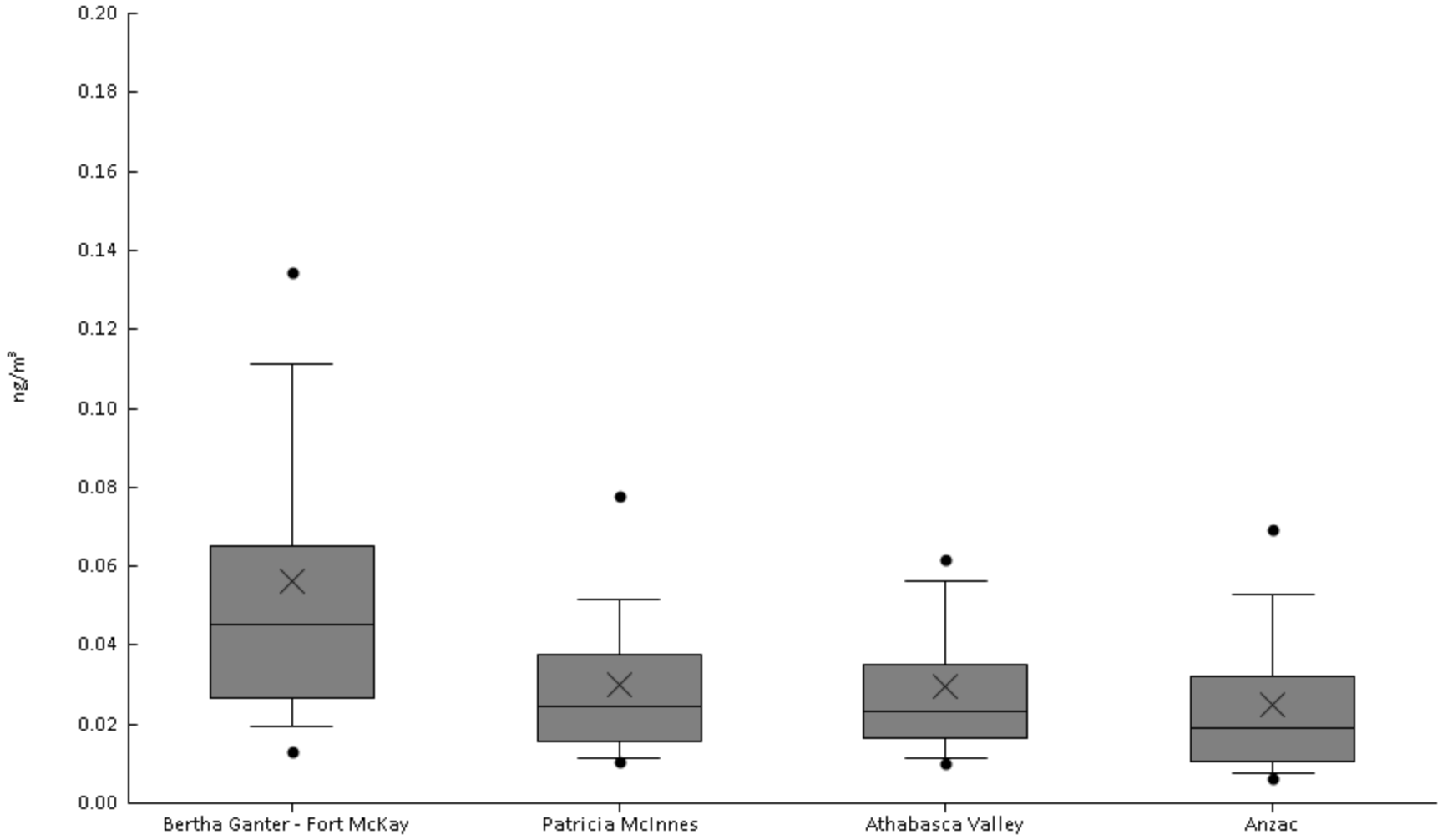
Polycyclic Aromatic Hydrocarbons - Acenaphthylene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.26	0.39	0.47	0.79	1.4	2.5	3.6	6	9	2	1.7
AMS06	Patricia McInnes	61	100%	0.26	0.37	0.46	0.77	1.6	2.4	4.8	6.3	8.8	2	1.8
AMS07	Athabasca Valley	60	100%	0.12	0.43	0.54	0.72	1.4	2.2	4.3	5.3	14	1.9	2.1
AMS14	Anzac	61	100%	0.058	0.2	0.37	0.68	1.4	2.9	5.4	6.6	11	2.1	2.1



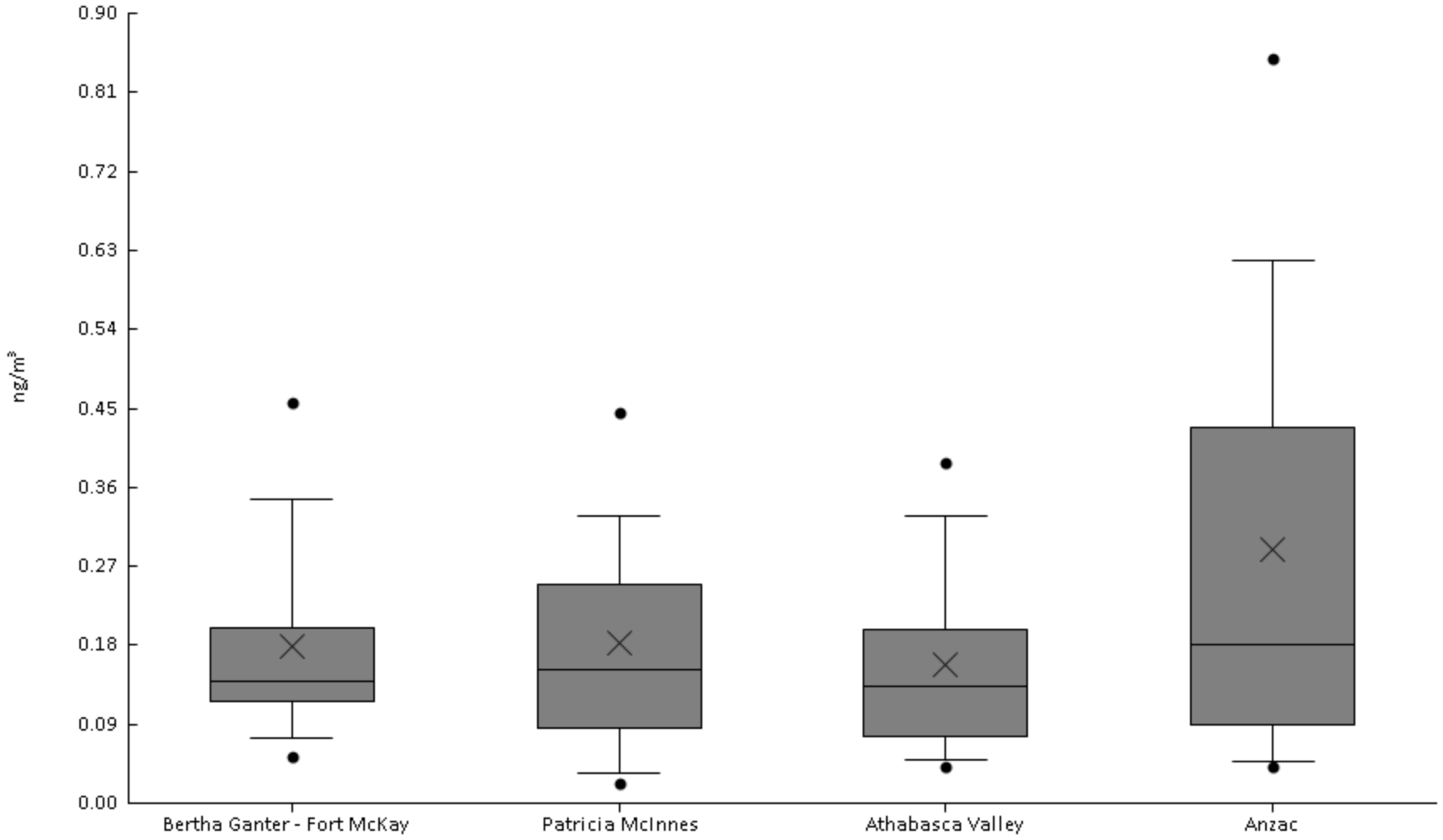
Polycyclic Aromatic Hydrocarbons - Acridine (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	90%	0.012	0.013	0.02	0.027	0.045	0.065	0.11	0.13	0.24	0.056	0.041
AMS06	Patricia McInnes	61	69%	7.5E-3	0.011	0.012	0.016	0.025	0.038	0.051	0.078	0.1	0.03	0.021
AMS07	Athabasca Valley	60	68%	4.6E-3	0.01	0.012	0.016	0.023	0.035	0.056	0.062	0.15	0.03	0.022
AMS14	Anzac	61	52%	5.1E-3	6.4E-3	7.5E-3	0.011	0.019	0.032	0.053	0.069	0.1	0.025	0.02



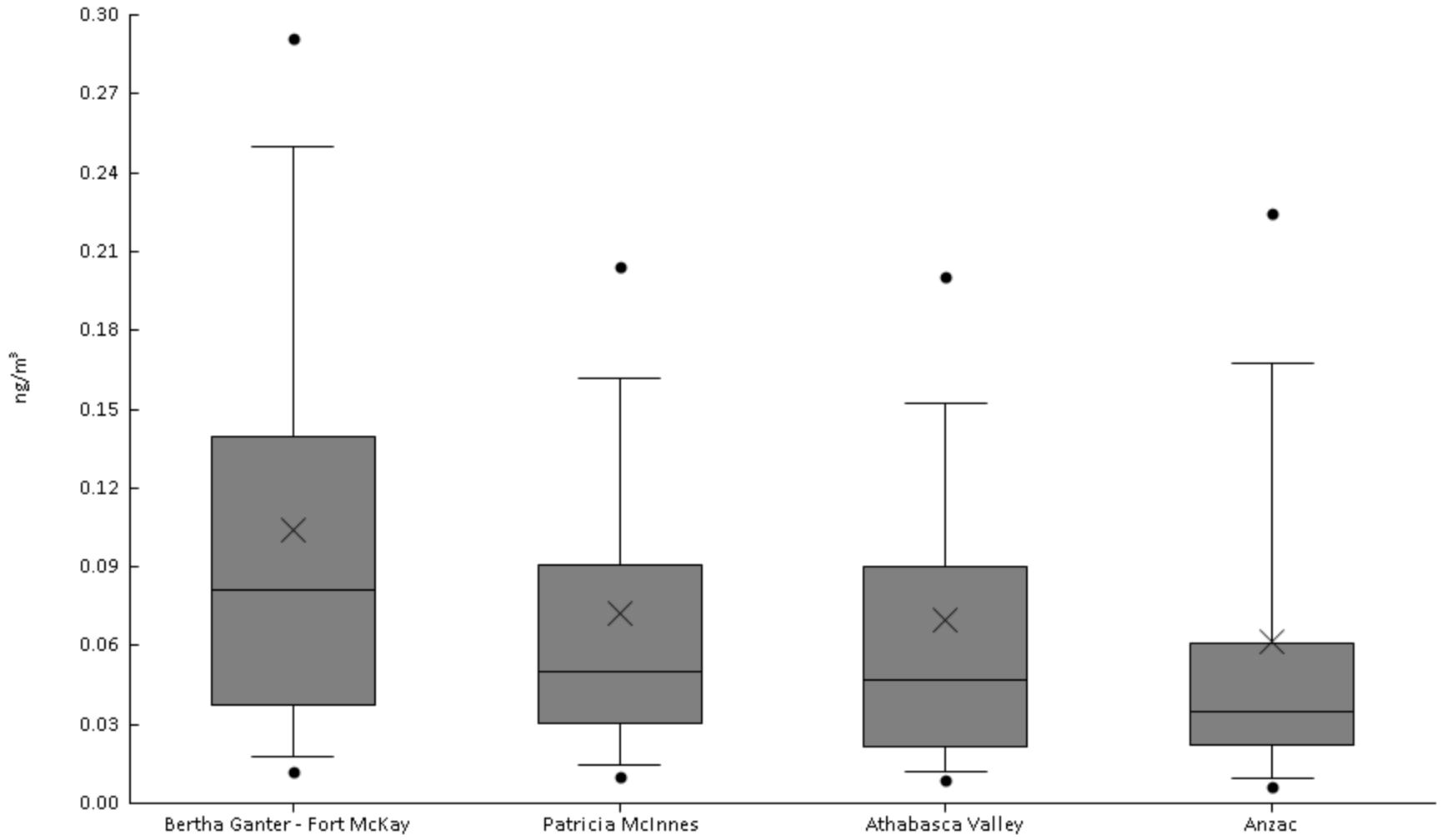
Polycyclic Aromatic Hydrocarbons - Anthracene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.031	0.053	0.075	0.12	0.14	0.2	0.35	0.46	0.54	0.18	0.12
AMS06	Patricia McInnes	61	97%	0.013	0.023	0.034	0.086	0.15	0.25	0.33	0.44	0.58	0.18	0.13
AMS07	Athabasca Valley	60	100%	0.023	0.042	0.05	0.075	0.13	0.2	0.33	0.39	0.44	0.16	0.11
AMS14	Anzac	61	100%	0.019	0.041	0.048	0.09	0.18	0.43	0.62	0.85	1.8	0.29	0.32



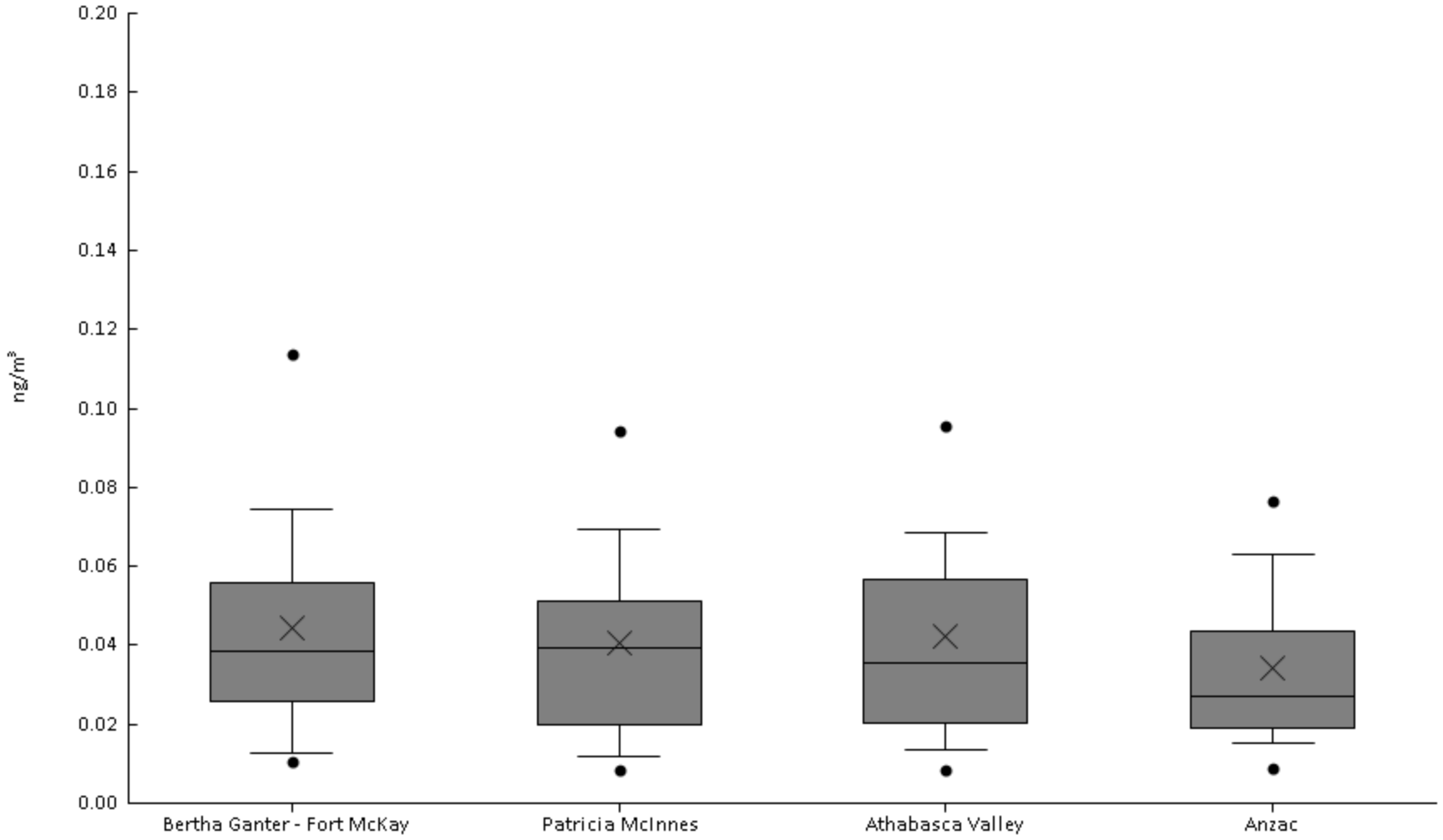
Polycyclic Aromatic Hydrocarbons - Benz(a)anthracene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	5.1E-3	0.012	0.018	0.038	0.081	0.14	0.25	0.29	0.36	0.1	0.085
AMS06	Patricia McInnes	61	90%	5.6E-3	9.8E-3	0.014	0.03	0.05	0.091	0.16	0.2	0.32	0.072	0.063
AMS07	Athabasca Valley	60	90%	4.3E-3	8.9E-3	0.012	0.022	0.047	0.09	0.15	0.2	0.37	0.07	0.067
AMS14	Anzac	61	84%	2.6E-3	6.1E-3	9.4E-3	0.022	0.035	0.061	0.17	0.22	0.34	0.062	0.072



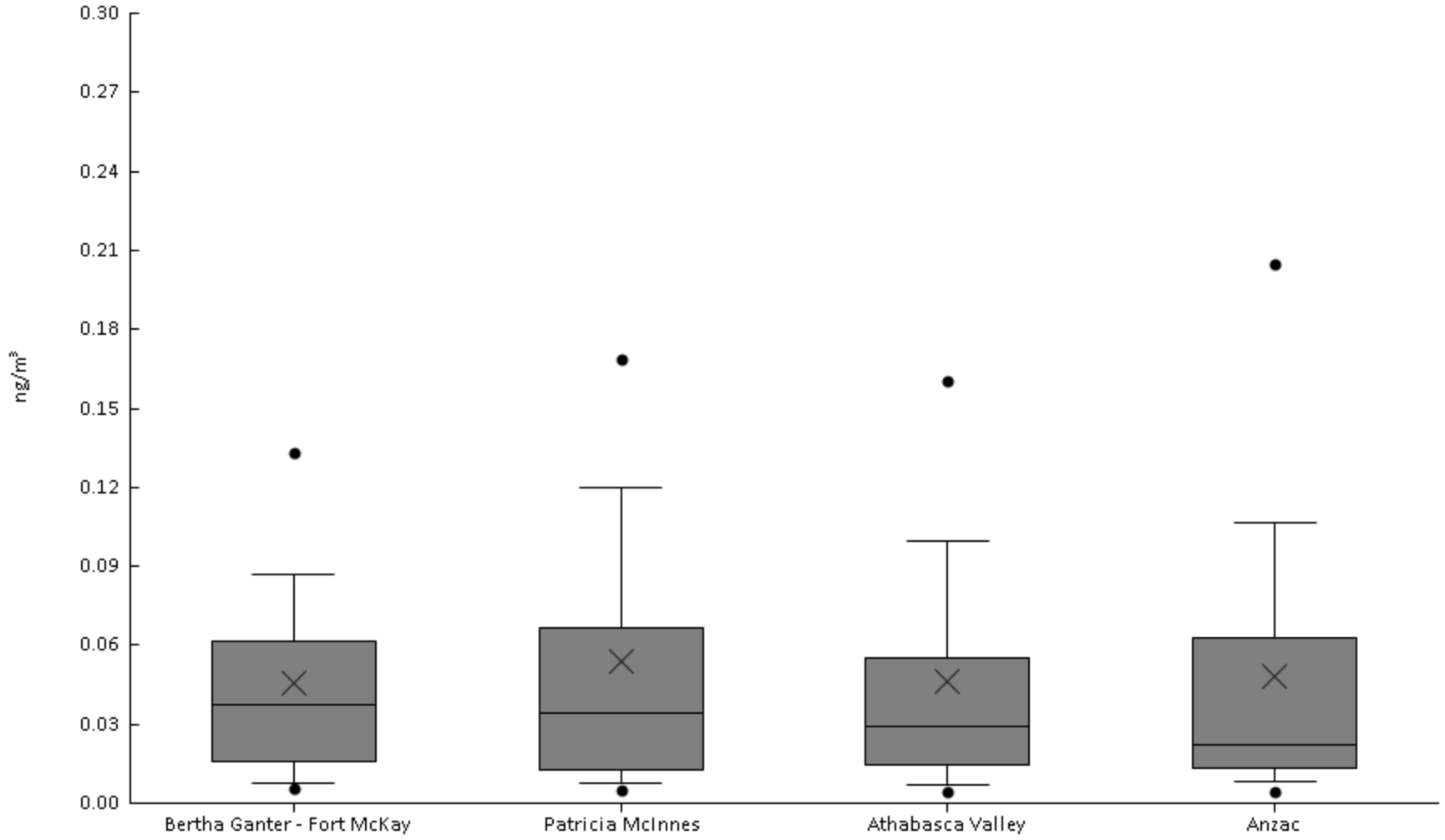
Polycyclic Aromatic Hydrocarbons - Benzo(a)pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	85%	7E-3	0.011	0.013	0.026	0.039	0.056	0.074	0.11	0.17	0.044	0.031
AMS06	Patricia McInnes	61	82%	6.1E-3	8.5E-3	0.012	0.02	0.04	0.051	0.07	0.094	0.12	0.041	0.025
AMS07	Athabasca Valley	60	90%	6.7E-3	8.5E-3	0.014	0.02	0.035	0.057	0.068	0.096	0.16	0.042	0.03
AMS14	Anzac	61	85%	7.3E-3	8.7E-3	0.015	0.019	0.027	0.044	0.063	0.077	0.15	0.034	0.024



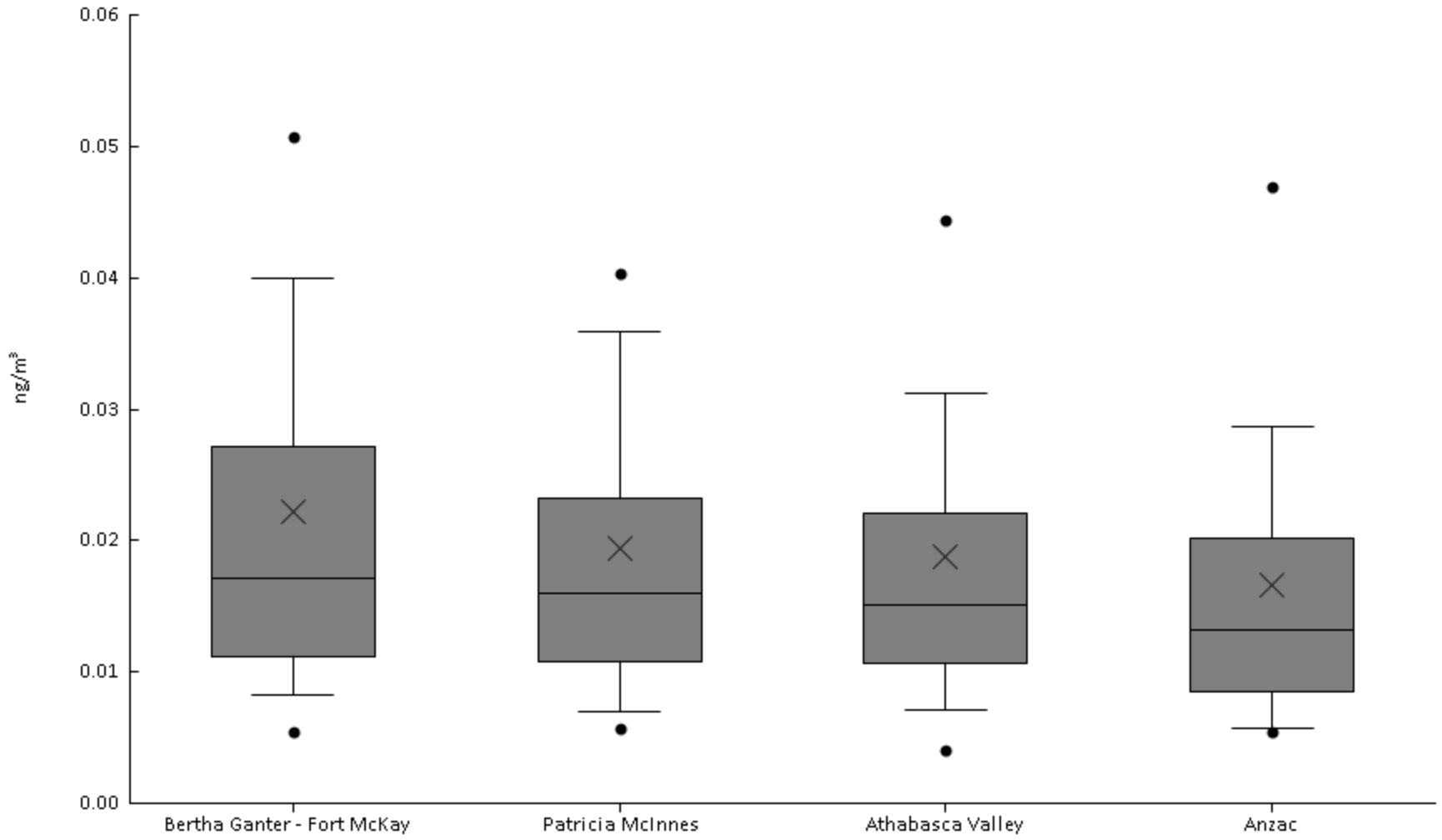
Polycyclic Aromatic Hydrocarbons - Benzo(b)fluoranthene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	72%	3.8E-3	5.7E-3	7.8E-3	0.016	0.037	0.062	0.087	0.13	0.18	0.045	0.039
AMS06	Patricia McInnes	61	64%	4E-3	5.2E-3	7.3E-3	0.013	0.034	0.067	0.12	0.17	0.38	0.054	0.063
AMS07	Athabasca Valley	60	68%	3.8E-3	4.6E-3	6.8E-3	0.015	0.029	0.055	0.1	0.16	0.24	0.046	0.047
AMS14	Anzac	61	52%	3.5E-3	4.6E-3	8.4E-3	0.013	0.022	0.063	0.11	0.2	0.31	0.048	0.064



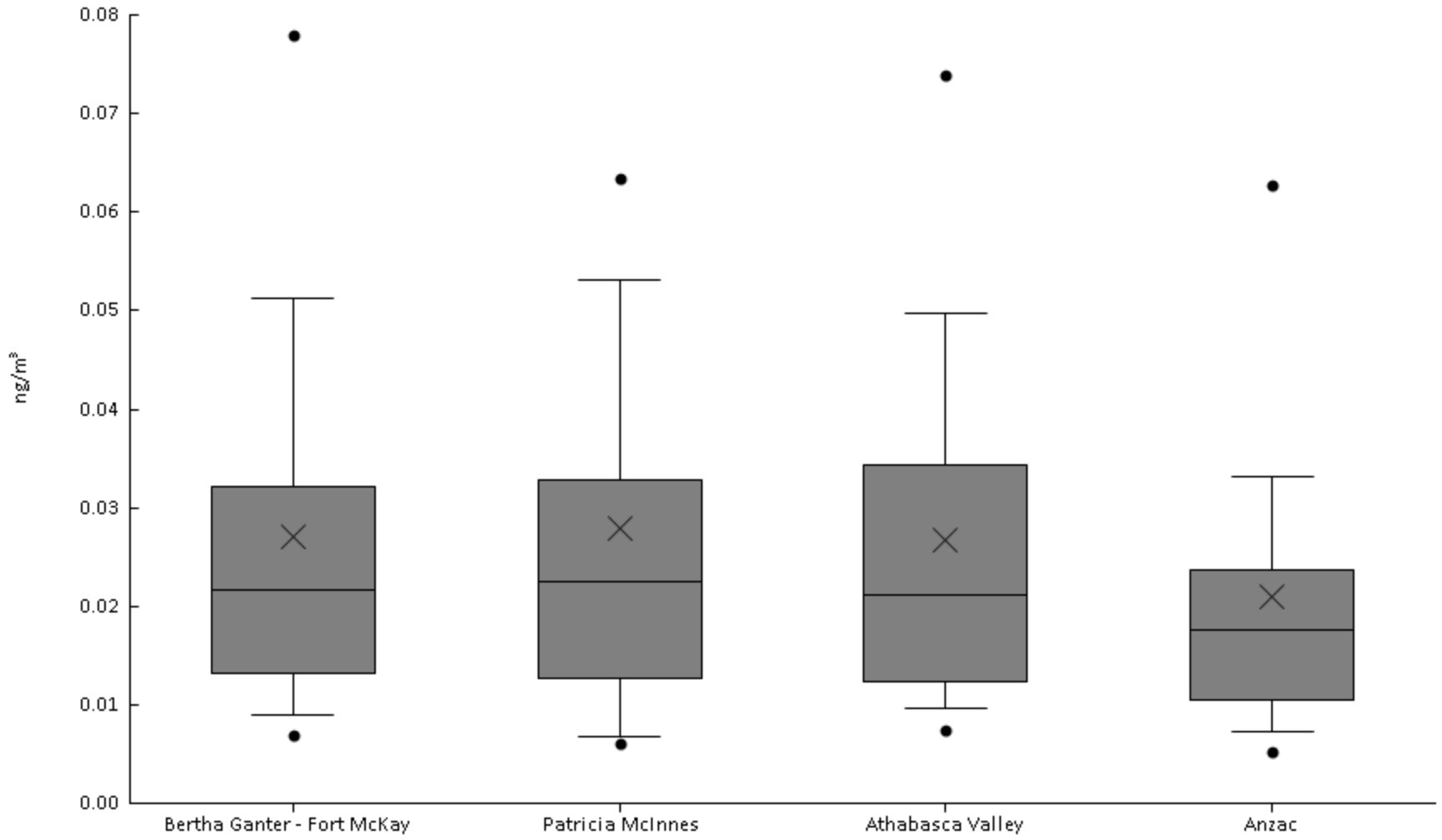
Polycyclic Aromatic Hydrocarbons - Benzo(c)phenanthrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	62%	2.4E-3	5.5E-3	8.2E-3	0.011	0.017	0.027	0.04	0.051	0.097	0.022	0.017
AMS06	Patricia McInnes	61	56%	1.7E-3	5.7E-3	7E-3	0.011	0.016	0.023	0.036	0.04	0.1	0.019	0.016
AMS07	Athabasca Valley	60	52%	3E-3	4.1E-3	7E-3	0.011	0.015	0.022	0.031	0.044	0.098	0.019	0.015
AMS14	Anzac	61	38%	4.7E-3	5.4E-3	5.6E-3	8.6E-3	0.013	0.02	0.029	0.047	0.074	0.017	0.013



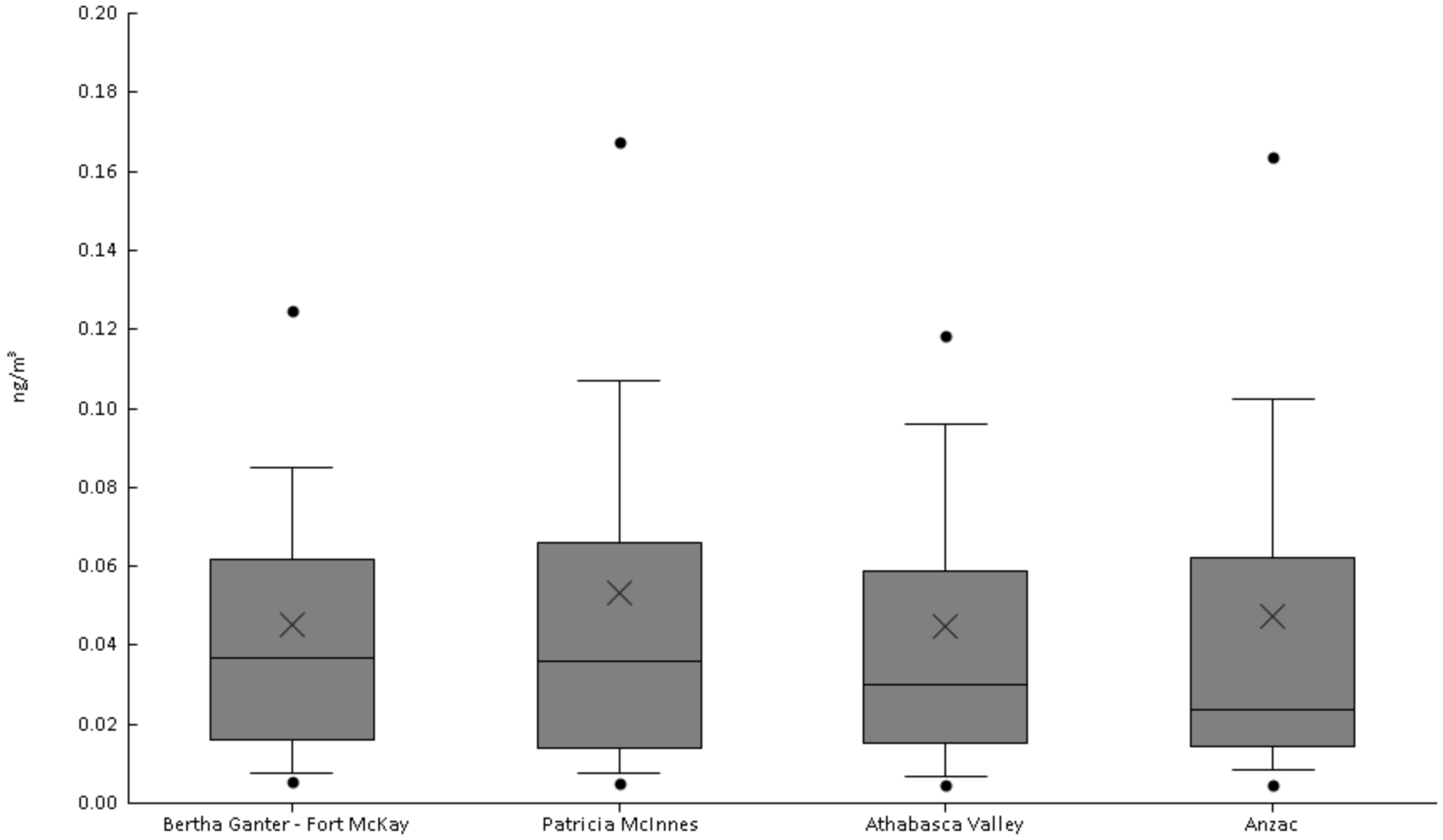
Polycyclic Aromatic Hydrocarbons - Benzo(ghi)perylene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	6.3E-3	6.9E-3	9E-3	0.013	0.022	0.032	0.051	0.078	0.1	0.027	0.02
AMS06	Patricia McInnes	61	59%	0	6.1E-3	6.8E-3	0.013	0.023	0.033	0.053	0.063	0.18	0.028	0.026
AMS07	Athabasca Valley	60	55%	4.1E-3	7.5E-3	9.6E-3	0.012	0.021	0.034	0.05	0.074	0.1	0.027	0.02
AMS14	Anzac	61	41%	2.2E-3	5.2E-3	7.2E-3	0.011	0.018	0.024	0.033	0.063	0.098	0.021	0.017



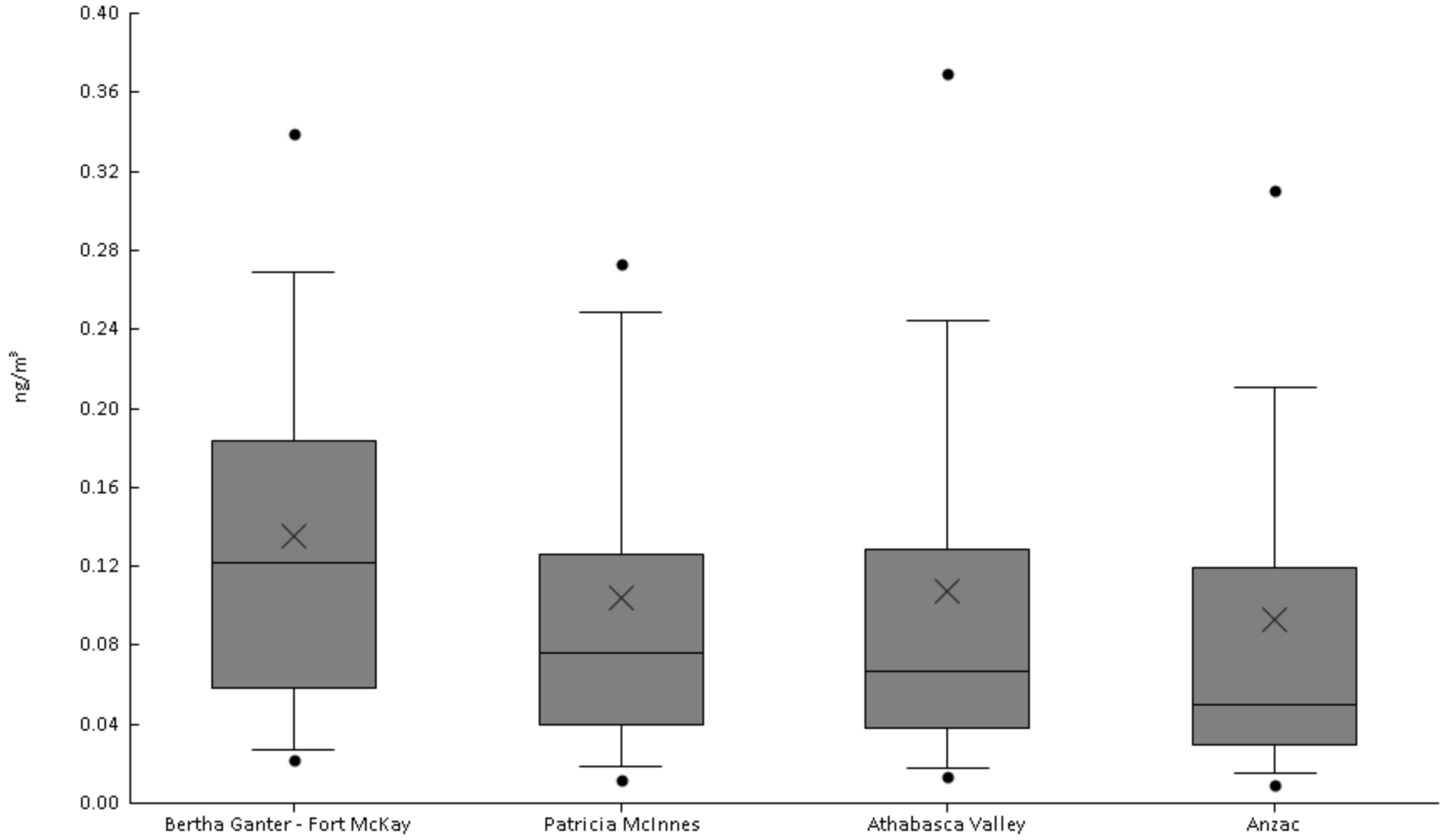
Polycyclic Aromatic Hydrocarbons - Benzo(k)fluoranthene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	80%	3.8E-3	5.7E-3	7.7E-3	0.016	0.037	0.062	0.085	0.12	0.18	0.045	0.038
AMS06	Patricia McInnes	61	75%	4.2E-3	5.2E-3	7.7E-3	0.014	0.036	0.066	0.11	0.17	0.38	0.053	0.062
AMS07	Athabasca Valley	60	78%	3.8E-3	4.6E-3	6.8E-3	0.015	0.03	0.059	0.096	0.12	0.24	0.045	0.043
AMS14	Anzac	61	77%	3.5E-3	4.6E-3	8.3E-3	0.014	0.024	0.062	0.1	0.16	0.31	0.047	0.061



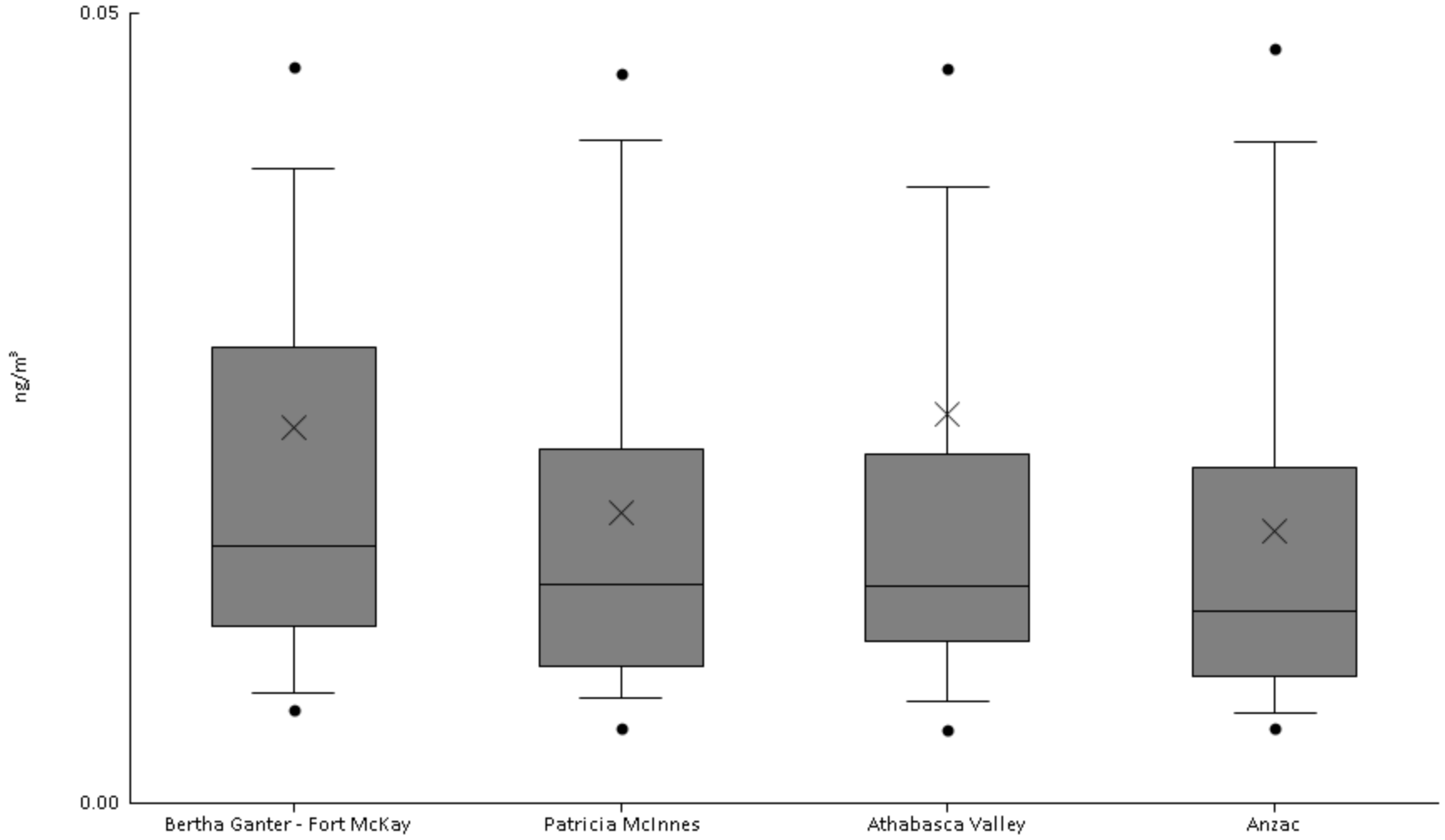
Polycyclic Aromatic Hydrocarbons - Chrysene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.016	0.022	0.027	0.058	0.12	0.18	0.27	0.34	0.44	0.13	0.099
AMS06	Patricia McInnes	61	93%	9.5E-3	0.012	0.019	0.039	0.076	0.13	0.25	0.27	0.55	0.1	0.098
AMS07	Athabasca Valley	60	95%	8.3E-3	0.014	0.018	0.038	0.067	0.13	0.24	0.37	0.49	0.11	0.11
AMS14	Anzac	61	92%	5.7E-3	9.5E-3	0.015	0.03	0.05	0.12	0.21	0.31	0.69	0.093	0.11



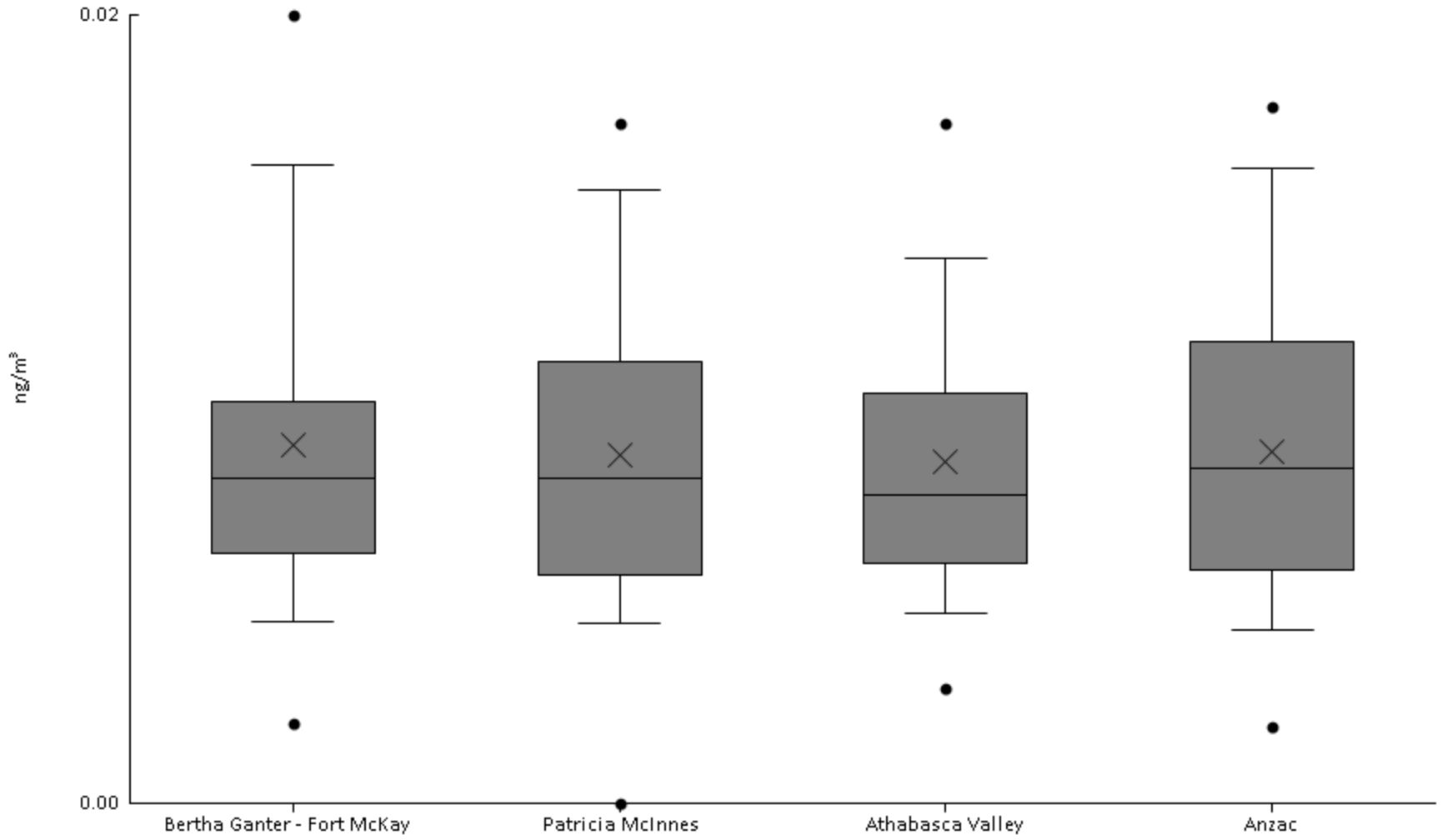
Polycyclic Aromatic Hydrocarbons - Dibenz(a,h)anthracene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	43%	1.6E-3	5.9E-3	6.9E-3	0.011	0.016	0.029	0.04	0.047	0.19	0.024	0.027
AMS06	Patricia McInnes	61	33%	0	4.7E-3	6.6E-3	8.6E-3	0.014	0.022	0.042	0.046	0.058	0.018	0.013
AMS07	Athabasca Valley	60	33%	0	4.6E-3	6.4E-3	0.01	0.014	0.022	0.039	0.046	0.43	0.025	0.054
AMS14	Anzac	61	31%	0	4.8E-3	5.7E-3	8E-3	0.012	0.021	0.042	0.048	0.058	0.017	0.014



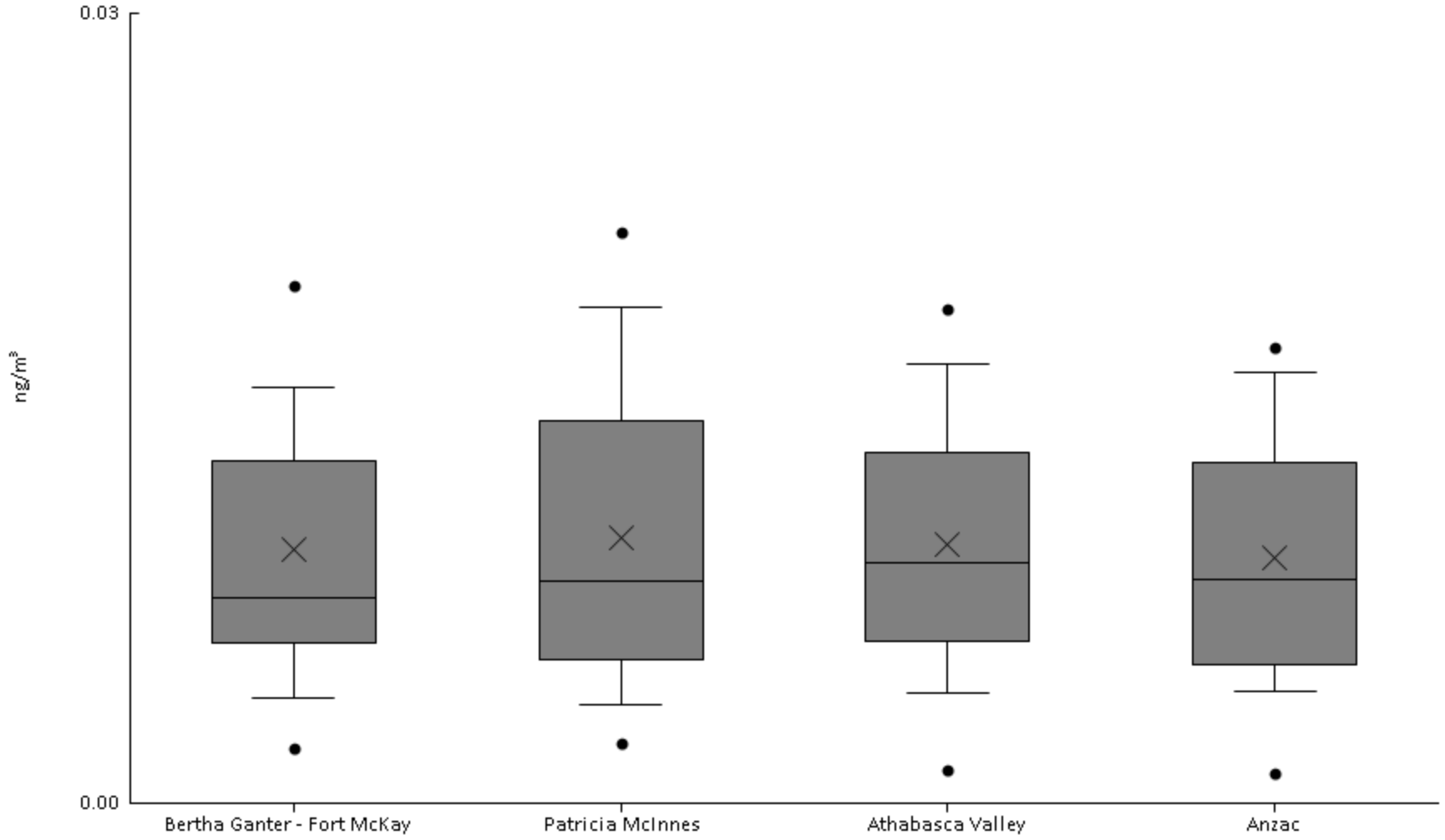
Polycyclic Aromatic Hydrocarbons - Dibenzo(a,h)pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	5%	0	2E-3	4.6E-3	6.4E-3	8.2E-3	0.01	0.016	0.02	0.024	9.1E-3	4.8E-3
AMS06	Patricia McInnes	61	2%	0	0	4.6E-3	5.8E-3	8.2E-3	0.011	0.016	0.017	0.021	8.8E-3	4.6E-3
AMS07	Athabasca Valley	60	0%	0	2.9E-3	4.8E-3	6.1E-3	7.8E-3	0.01	0.014	0.017	0.018	8.7E-3	4E-3
AMS14	Anzac	61	2%	0	2E-3	4.4E-3	5.9E-3	8.5E-3	0.012	0.016	0.018	0.024	8.9E-3	4.7E-3



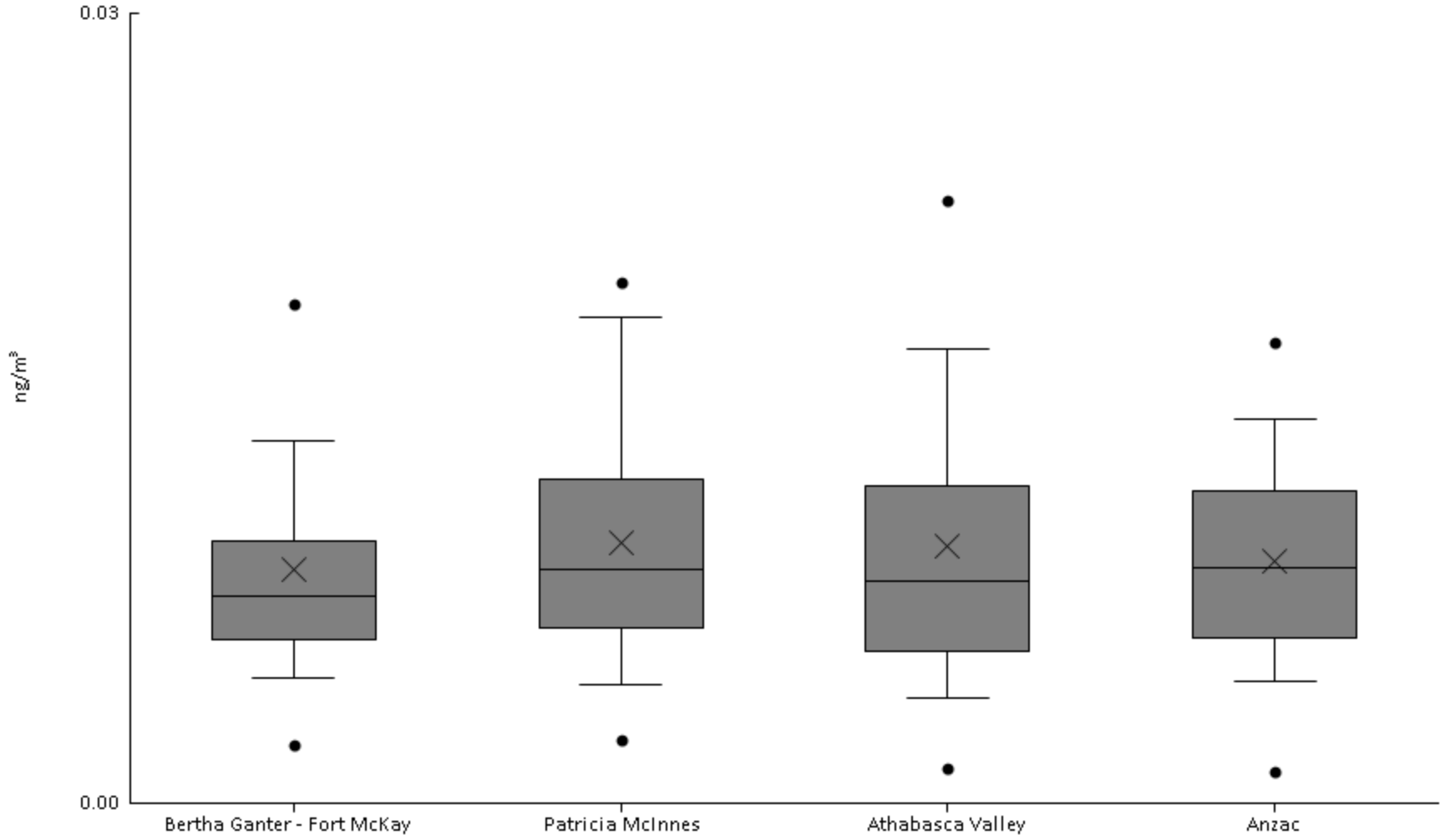
Polycyclic Aromatic Hydrocarbons - Dibenzo(a,i)pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	3%	0	2.1E-3	4E-3	6.1E-3	7.8E-3	0.013	0.016	0.02	0.031	9.6E-3	6E-3
AMS06	Patricia McInnes	61	2%	0	2.3E-3	3.7E-3	5.5E-3	8.4E-3	0.015	0.019	0.022	0.026	0.01	6.2E-3
AMS07	Athabasca Valley	60	0%	0	1.3E-3	4.2E-3	6.2E-3	9.1E-3	0.013	0.017	0.019	0.024	9.9E-3	5.2E-3
AMS14	Anzac	61	0%	0	1.1E-3	4.3E-3	5.3E-3	8.5E-3	0.013	0.016	0.017	0.019	9.4E-3	4.8E-3



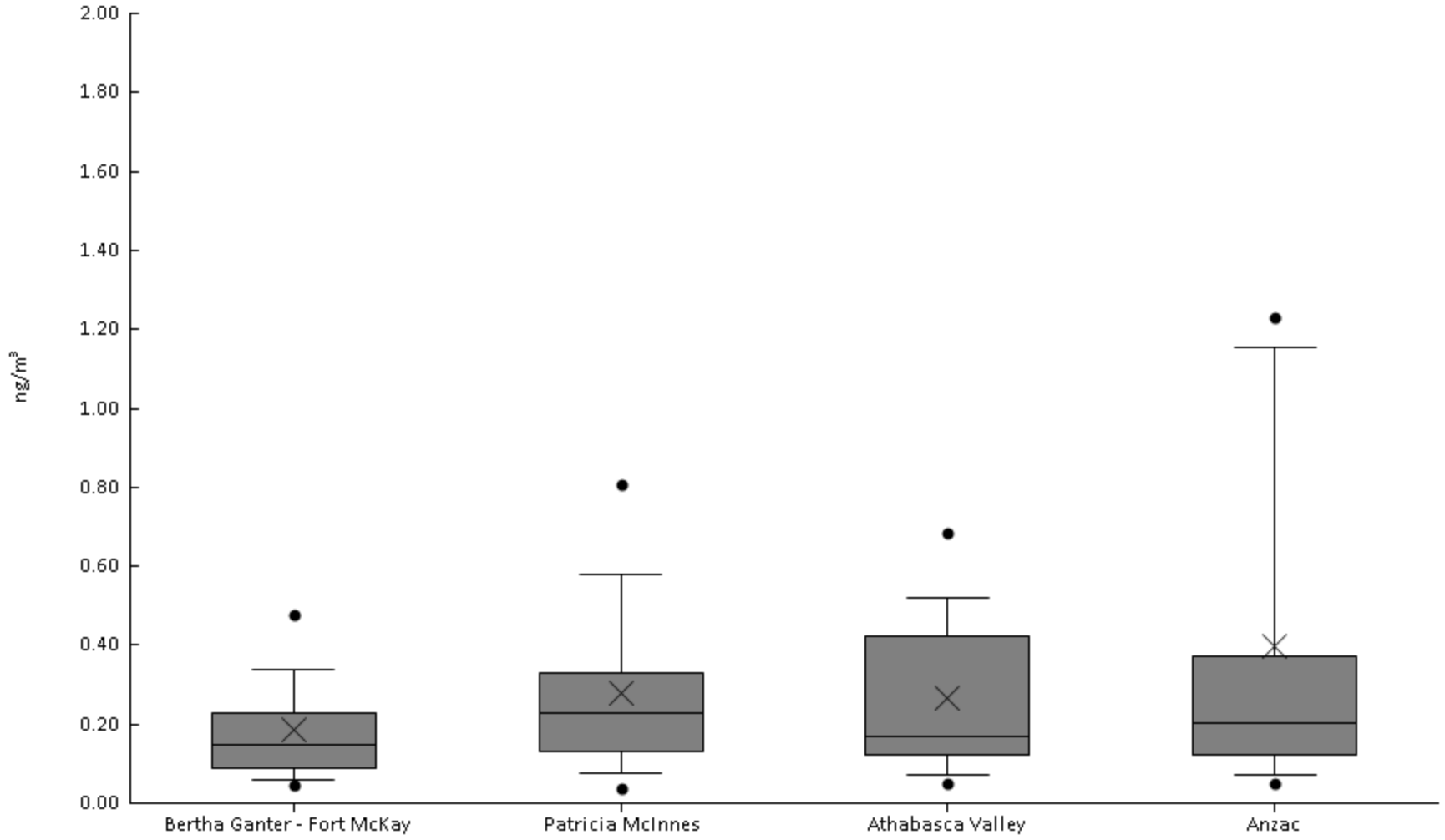
Polycyclic Aromatic Hydrocarbons - Dibenzo(a,l)pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	2%	0	2.2E-3	4.7E-3	6.2E-3	7.8E-3	9.9E-3	0.014	0.019	0.039	8.9E-3	5.7E-3
AMS06	Patricia McInnes	61	0%	0	2.4E-3	4.5E-3	6.7E-3	8.9E-3	0.012	0.018	0.02	0.023	9.9E-3	5E-3
AMS07	Athabasca Valley	60	5%	0	1.3E-3	4E-3	5.8E-3	8.4E-3	0.012	0.017	0.023	0.029	9.8E-3	6.1E-3
AMS14	Anzac	61	0%	0	1.2E-3	4.6E-3	6.3E-3	8.9E-3	0.012	0.015	0.018	0.021	9.2E-3	4.4E-3



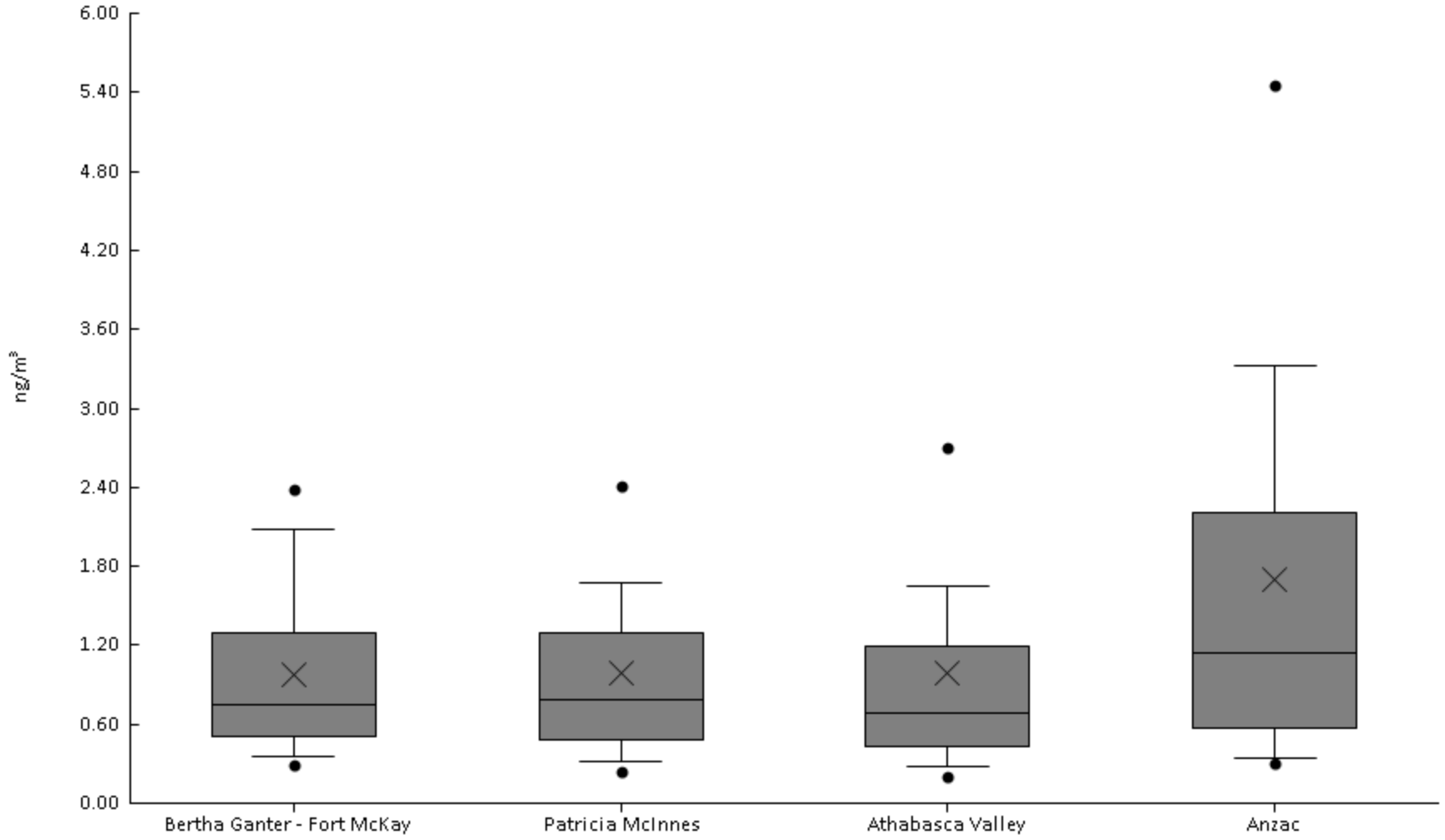
Polycyclic Aromatic Hydrocarbons - Fluoranthene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.035	0.048	0.061	0.088	0.15	0.23	0.34	0.48	0.88	0.18	0.15
AMS06	Patricia McInnes	61	100%	0.013	0.037	0.075	0.13	0.23	0.33	0.58	0.81	1.4	0.28	0.25
AMS07	Athabasca Valley	60	100%	0.024	0.052	0.073	0.12	0.17	0.42	0.52	0.68	1.4	0.27	0.23
AMS14	Anzac	61	100%	0.038	0.05	0.07	0.12	0.2	0.37	1.2	1.2	3	0.4	0.53



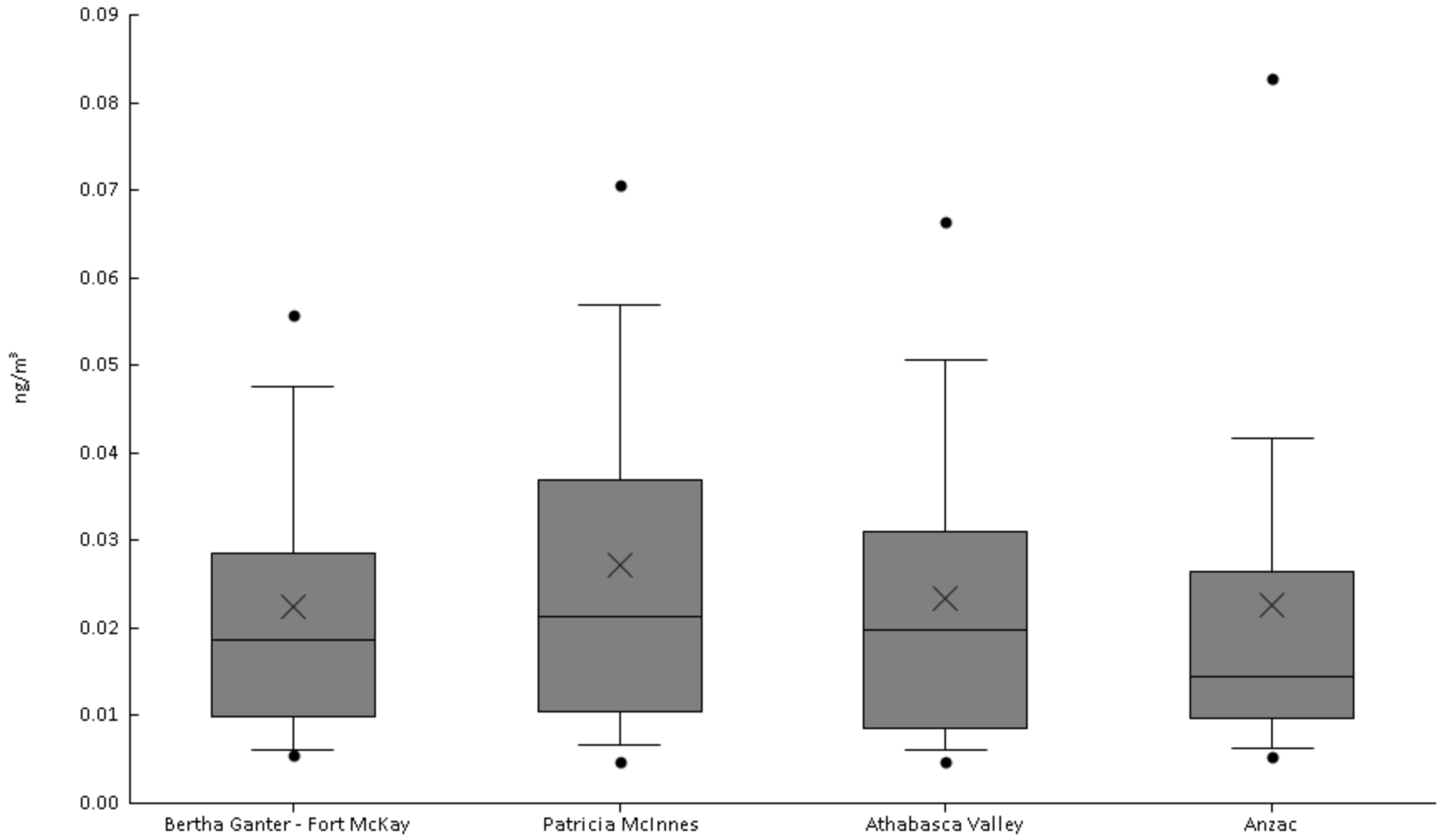
Polycyclic Aromatic Hydrocarbons - Fluorene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.068	0.29	0.35	0.51	0.75	1.3	2.1	2.4	2.7	0.98	0.66
AMS06	Patricia McInnes	61	100%	0.17	0.25	0.31	0.48	0.79	1.3	1.7	2.4	3.9	0.98	0.73
AMS07	Athabasca Valley	60	100%	0.15	0.2	0.27	0.43	0.68	1.2	1.7	2.7	8	0.99	1.1
AMS14	Anzac	61	100%	0.18	0.31	0.34	0.57	1.1	2.2	3.3	5.5	9.1	1.7	1.8



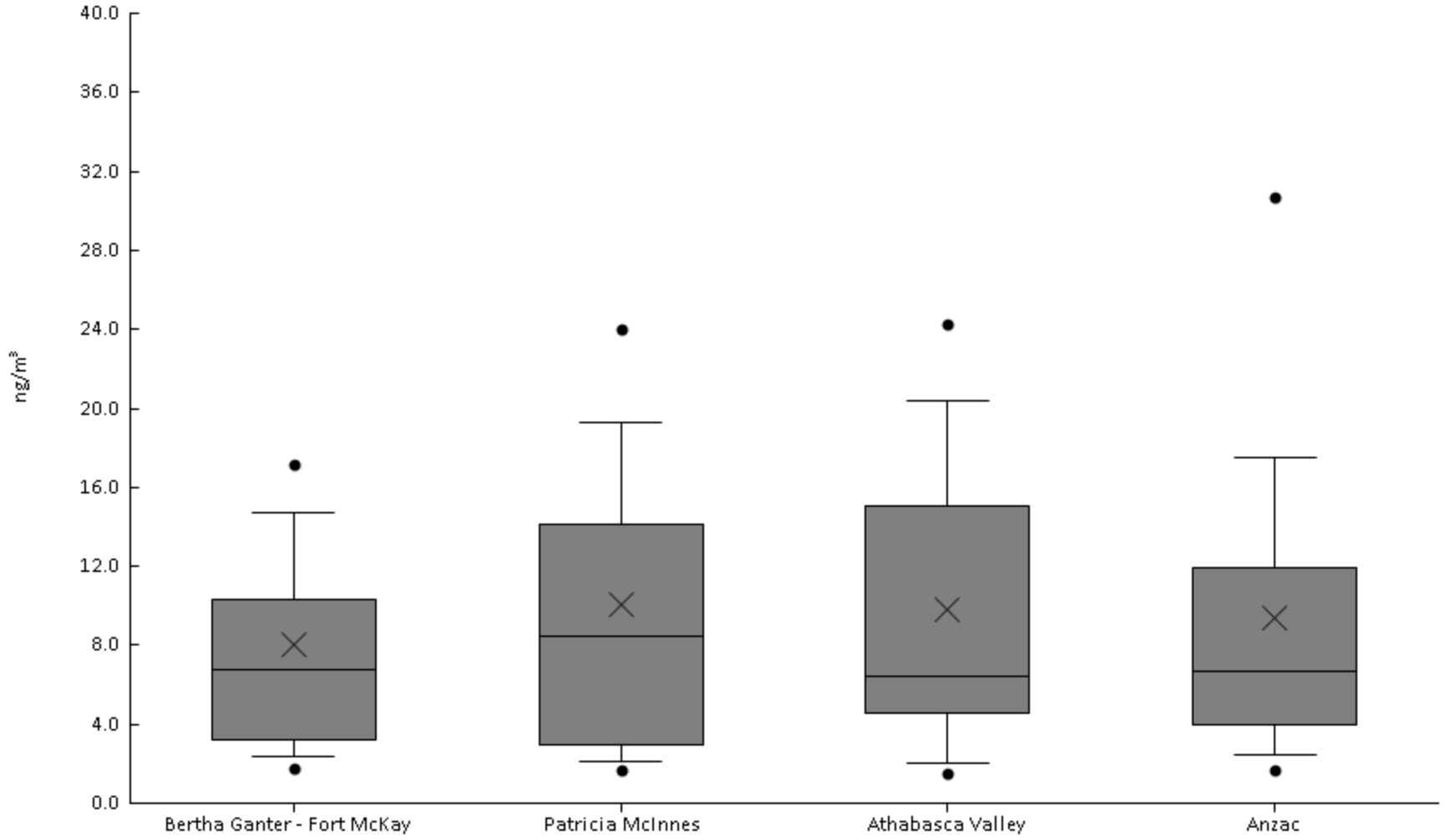
Polycyclic Aromatic Hydrocarbons - Indeno(123-cd)pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	54%	0	5.5E-3	6.1E-3	9.8E-3	0.019	0.028	0.048	0.056	0.087	0.022	0.017
AMS06	Patricia McInnes	61	57%	0	4.8E-3	6.7E-3	0.01	0.021	0.037	0.057	0.071	0.13	0.027	0.024
AMS07	Athabasca Valley	60	55%	3.8E-3	4.8E-3	6.1E-3	8.6E-3	0.02	0.031	0.051	0.066	0.087	0.023	0.019
AMS14	Anzac	61	44%	2.6E-3	5.4E-3	6.3E-3	9.7E-3	0.014	0.026	0.042	0.083	0.12	0.023	0.025



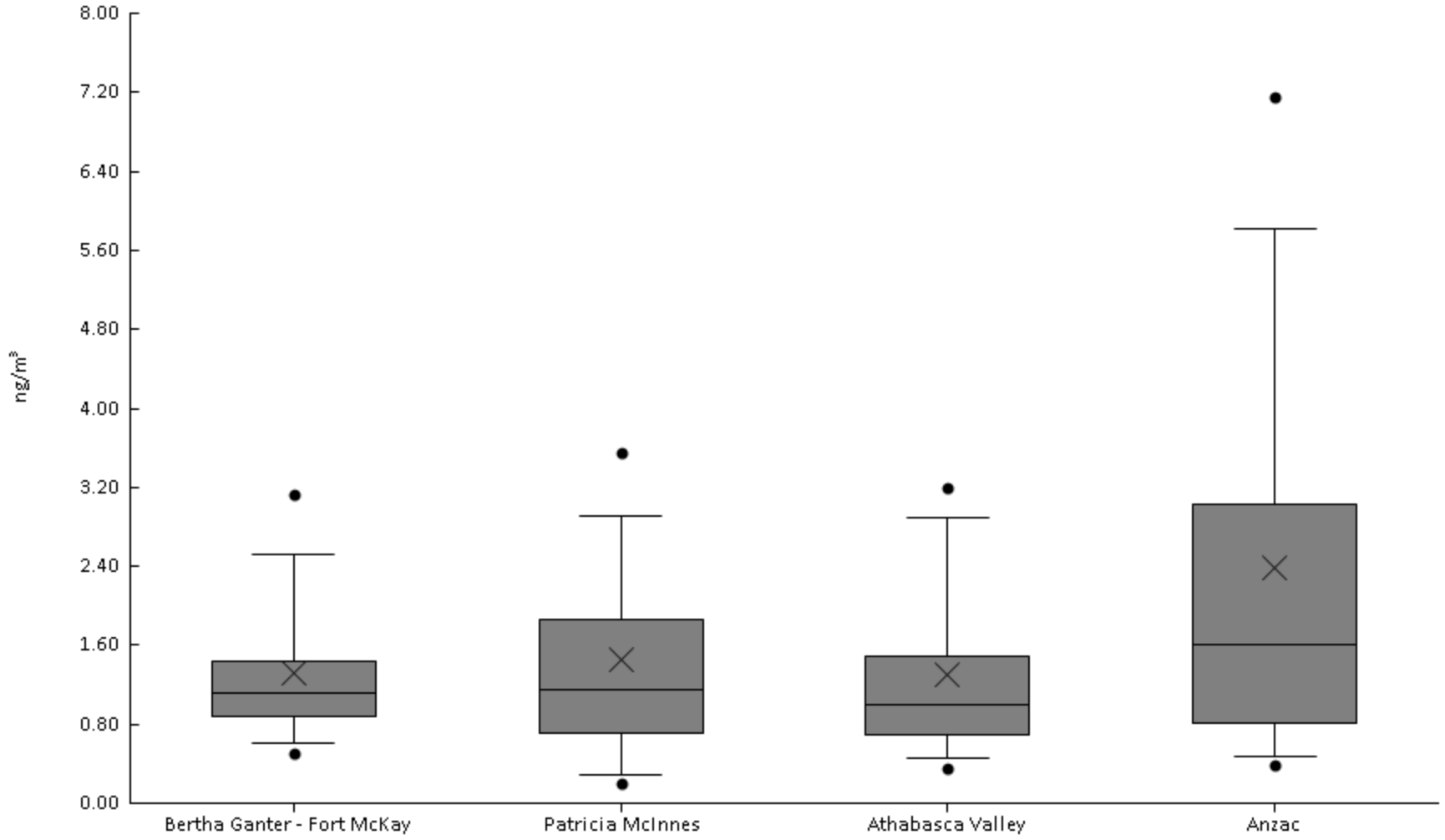
Polycyclic Aromatic Hydrocarbons - Naphthalene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.5	1.8	2.4	3.2	6.7	10	15	17	42	8	6.7
AMS06	Patricia McInnes	61	100%	1.5	1.7	2.1	3	8.5	14	19	24	60	10	9.4
AMS07	Athabasca Valley	60	100%	1	1.5	2	4.5	6.4	15	20	24	34	9.8	7.4
AMS14	Anzac	61	100%	1.1	1.7	2.5	4	6.7	12	17	31	47	9.4	8.6



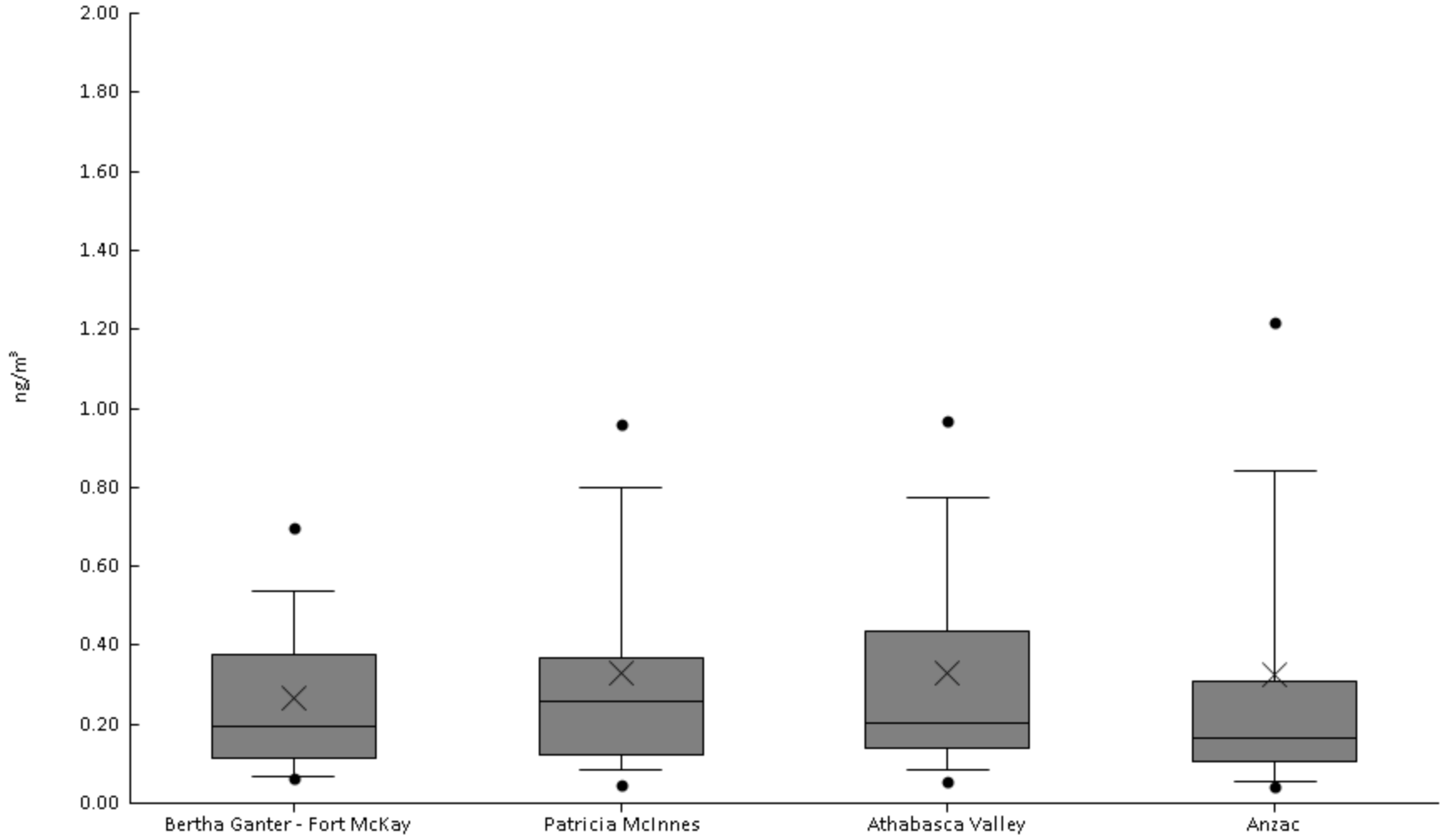
Polycyclic Aromatic Hydrocarbons - Phenanthrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.28	0.51	0.61	0.87	1.1	1.4	2.5	3.1	3.8	1.3	0.74
AMS06	Patricia McInnes	61	100%	0.1	0.2	0.28	0.71	1.2	1.9	2.9	3.5	4.9	1.4	1.1
AMS07	Athabasca Valley	60	100%	0.15	0.36	0.45	0.7	1	1.5	2.9	3.2	4.2	1.3	0.91
AMS14	Anzac	61	100%	0.19	0.38	0.48	0.81	1.6	3	5.8	7.1	14	2.4	2.5



Polycyclic Aromatic Hydrocarbons - Pyrene (ng/m³) - 2018

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.041	0.061	0.067	0.11	0.2	0.38	0.54	0.7	1.2	0.27	0.22
AMS06	Patricia McInnes	61	100%	0.016	0.048	0.084	0.12	0.26	0.37	0.8	0.96	1.6	0.33	0.31
AMS07	Athabasca Valley	60	100%	0.034	0.056	0.086	0.14	0.2	0.44	0.77	0.97	1.1	0.33	0.28
AMS14	Anzac	61	100%	0.027	0.044	0.056	0.1	0.17	0.31	0.84	1.2	2.8	0.33	0.47



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
ANNUAL REPORT

PRECIPITATION
DATA SUMMARY
2018

Prepared
March 2019

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

InnoTech Alberta, Inc.
Vegreville, Alberta

Precipitation: Central Analytical Laboratory
Champaign, IL

Wisconsin State Laboratory of Hygiene
Madison, WI

FILE CONTENTS DESCRIPTION	Precipitation Measurement of ions, pH and conductivity
SAMPLING INTERVAL	A week
SAMPLING FREQUENCY OF DATA	A week
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection values (MDL.) are provided with each observation
UNITS	mg/L (milligram per liter)
OBSERVATION TYPE	Wet Precipitation
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	moveable cover with precipitation sensors
MEDIUM	Polyethylene Collection bucket
ANALYTICALMETHODS	pH by pH meter
	Conductivity by Conductivity meter
InnoTech Alberta Inc	Ions by Ion Chromatography (IC)
Central Analytical Lab	Anions by Ion Chromatography (IC)
	Cations by Inductively Coupled Plasma (ICP)
	Ammonium and phosphate by Flow Injection Analysis (FIA)
ANALYTICAL LABORATORY	InnoTech Alberta Inc
	Central Analytical Lab
USER NOTE 1	Data are not blank corrected
SAMPLING INSTRUMENT TYPE	Total Precipitation Collector (TPC-3000)
	N-CON Precipitation Collector

FLAGS USED

V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
V8	Dry Week
V9	Insufficient sample collected for analyzes
V10	Insufficient data to conduct all quality control checks
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2018**

Precipitation Volume Weighted Averages

Fort McKay Bertha Ganter

TPC-3000

Month	Start Date	End Date	Total Precip (mm)	Volume Collected (mL)	Sulfate (mg/L)	Nitrate (mg/L)	Chloride (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Ammonium (mg/L)
January	Jan-03	Jan-30	12.8	989.8	0.58	1.23	0.37	0.06	0.23	0.96	0.10	0.08
February	Jan-30	Feb-27	1.3	161.2	0.79	2.12	1.56	0.19	1.02	2.99	0.28	0.06
March	Feb-27	Apr-04	8.9	295.1	1.46	1.31	0.75	0.13	0.66	8.71	0.34	0.07
April	Apr-04	May-01	6.6	237.5	2.01	1.78	1.35	0.13	0.98	2.39	0.26	1.00
May	May-01	May-30	8.6	413.7	1.68	2.00	0.52	0.39	0.42	2.09	0.43	1.28
June	May-30	Jul-03	127.5	6063.0	0.39	0.34	0.15	0.05	0.09	0.33	0.05	0.13
July	Jul-03	Aug-01	88.3	2850.0	0.34	0.33	0.11	0.03	0.08	0.41	0.06	0.05
August	Aug-01	Sep-04	45.4	2498.0	1.11	0.43	0.11	0.10	0.07	0.43	0.06	0.57
September	Sep-04	Oct-02	18.4	1297.8	0.51	0.53	0.13	0.06	0.11	0.73	0.08	0.28
October	Oct-02	Oct-30	3.8	252.3	0.55	1.16	0.21	0.05	0.13	1.79	0.12	0.09
November	Oct-30	Dec-03	16.4	1124.5	7.01	2.84	0.74	0.18	0.77	8.25	0.43	0.84
December	Dec-03	Jan-02	15.6	1309.4	0.37	1.08	0.37	0.04	0.25	0.73	0.10	0.08
Annual VWA	**Jan-03-2018**	**Jan-02-2019**	**353.5**	**17492.2**	**0.67**	**0.61**	**0.22**	**0.07**	**0.16**	**0.82**	**0.09**	**0.26**

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2018**

Precipitation Volume Weighted Averages

Fort McKay Bertha Ganter

Month	Start Date	End Date	Total Precip (mm)	Volume Collected (mL)	Sulfate (mg/L)	Nitrate (mg/L)	Chloride (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	N-CON Ammonium (mg/L)
January	Jan-03	Jan-30	12.8	881.2	0.48	1.17	0.14	0.03	0.08	0.52	0.08	0.09
February	Jan-30	Feb-27	1.3	87.1	0.81	2.19	0.50	0.23	0.49	4.45	0.57	0.18
March	Feb-27	Apr-04	8.9	350.3	1.55	1.56	0.43	0.11	0.41	6.33	0.45	0.17
April	Apr-04	May-01	6.6	446.4	1.92	1.81	0.31	0.11	0.25	2.30	0.28	0.69
May	May-01	May-30	8.6	589.0	1.74	1.97	0.17	0.27	0.18	1.70	0.34	1.21
June	May-30	Jul-03	135.6	8973.0	0.29	0.25	0.04	0.03	0.02	0.19	0.03	0.05
July	Jul-03	Aug-01	88.3	6173.7	0.24	0.28	0.03	0.01	0.01	0.21	0.02	0.04
August	Aug-01	Sep-04	45.4	2930.0	0.98	0.35	0.03	0.04	0.01	0.25	0.02	0.48
September	Sep-04	Oct-02	18.4	1245.7	0.32	0.51	0.03	0.02	0.03	0.40	0.05	0.11
October	Oct-02	Oct-30	3.8	230.8	1.33	0.58	0.36	NaN	NaN	NaN	NaN	0.25
November	Oct-30	Dec-03	17.6	1127.4	0.59	1.68	0.14	0.04	0.10	0.58	0.06	0.18
December	Dec-03	Jan-02	15.6	1199.7	0.29	1.07	0.06	0.02	0.04	0.35	0.03	0.08
Annual VWA	**Jan-03-2018**	**Jan-02-2019**	**362.8**	**24234.3**	**0.48**	**0.47**	**0.06**	**0.03**	**0.04**	**0.42**	**0.05**	**0.16**

End of Report - Volume 2