



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

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Wood Buffalo Environmental Association

ANNUAL REPORT – VOLUME 2

2019 INTEGRATED DATA

March 2020



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 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS

Passive Measurements: Bureau Veritas Laboratories
Edmonton, Alberta

Volatile Organic Compounds: InnoTech Alberta, Inc.
Vegreville, Alberta

Particulate Matter: Desert Research Institute
Reno, NV

Elemental Carbon and Organic Carbon: Desert Research Institute
Reno, NV

Polycyclic Aromatic Hydrocarbons: Air Zone One Incorporated
Mississauga, Ontario

Precipitation: Wisconsin State Laboratory of Hygiene
Madison, WI

InnoTech Alberta, Inc.
Vegreville, Alberta



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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

HNO₃, NH₃, NO₂, O₃ AND SO₂ PASSIVE MEASUREMENTS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPIRATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS

Passive Measurements: Bureau Veritas Laboratories
Edmonton, Alberta



CONTENTS DESCRIPTION	Passive Measurements of SO ₂ , NO ₂ , O ₃ , NH ₃ and HNO ₃
SAMPLE PERIOD	Monthly
SAMPLING INTERVAL	Monthly
UNITS	ppbv
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 except HNO ₃ . HNO ₃ is calculated from ug/m ³ to ppbv $ppbv = (\text{ug/m}^3 * T) / (R * M)$
USER NOTE 3	M = 63.01 R = 12.187 T = Average temp in K
USER NOTE 4	<MDL values are taken as ½ MDL for calculation purposes. (Averaging of replicates)
USER NOTE 5	Data was computed on a monthly dataset.
USER NOTE 6	Summary statistics include flags beginning with V.
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
V6	Valid value but qualified due to non-standard sampling conditions (Duration > 34 days or Duration < 26 days)
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator

In the case of a data point qualifying for both V1 and V6. V6 is displayed.



Wood Buffalo Environmental Association
Time Weighted Annual Passive Averages 2019

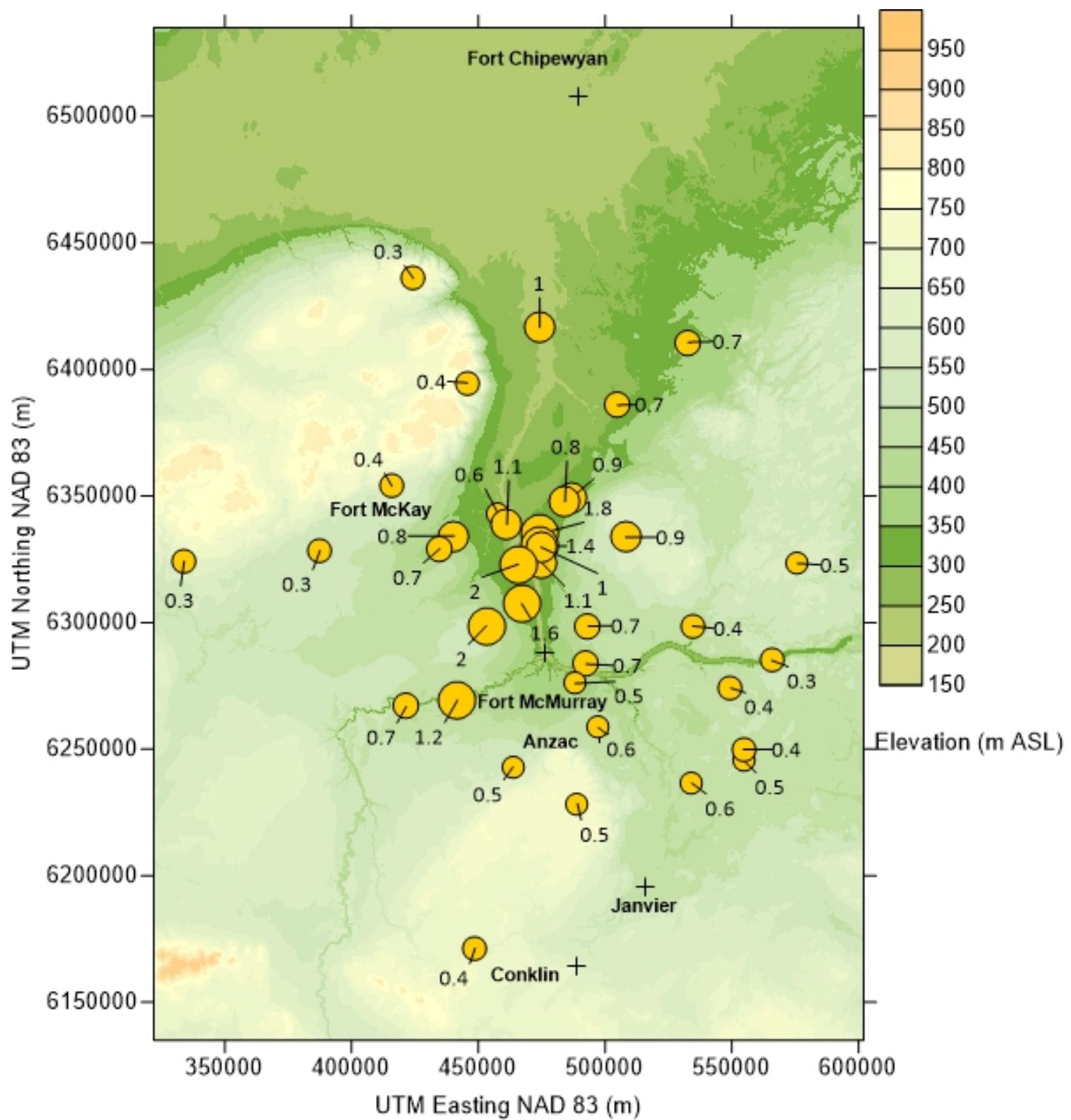
Species Column Contains:

Concentration, SC = Samples Collected, VP = Valid Periods

Site ID	Start Date	End Date	Lat.	Long.	Ammonia			Nitric Acid			Nitrogen Dioxide			Ozone			Sulfur Dioxide		
					ppb	SC	VP	ppb	SC	VP	ppb	SC	VP	ppb	SC	VP	ppb	SC	VP
1001	2019-01-08	2020-01-09	56.539867	-112.276583	1.0	24	12	0.4	24	12	0.9	24	12	36.8	24	12	0.7	24	12
1002	2019-01-08	2020-01-03	56.910317	-111.538267	1.2	24	12	0.5	24	12	3.3	24	12	35.9	24	12	1.6	24	12
1004	2019-01-02	2020-01-03	57.120867	-111.424217	1.2	24	12	0.5	24	12	5.5	24	12	32.4	24	12	1.8	24	12
1007	2019-01-03	2020-01-08	57.889483	-111.433700	1.0	24	12	0.4	24	12	2.5	24	12	36.4	24	12	1.0	24	12
1008	2019-01-05	2020-01-07	56.709267	-109.927283	0.8	24	12	0.4	24	12	0.3	24	12	32.5	24	12	0.3	24	12
1023	2019-01-03	2020-01-08	56.696417	-111.122283	1.0	24	12	0.4	24	12	1.5	24	12	34.1	24	12	0.7	24	12
1027	2019-01-08	2020-01-03	56.829833	-111.768167	1.0	23	12	0.4	23	12	2.3	23	12	38.4	23	12	2.0	23	12
1947	2019-01-04	2020-01-08	57.146783	-110.866050	0.8	11	11	0.4	12	12	1.0	12	12	33.9	12	12	0.9	12	12
1991	2019-01-03	2020-01-10	58.058133	-112.281967	0.8	10	10	0.3	11	11	0.1	11	11	36.2	11	11	0.3	11	11
1992	2019-01-04	2020-01-03	57.320050	-112.396967	1.0	11	11	0.4	12	12	0.4	12	12	28.4	12	12	0.4	12	12
1993	2019-01-03	2020-01-10	57.691150	-111.909400	0.9	10	9	0.3	11	11	0.2	11	11	33.9	11	11	0.4	11	11
1994	2019-01-04	2020-01-03	57.147867	-111.984033	0.9	12	12	0.4	12	12	1.5	12	12	23.6	12	12	0.8	12	11
1995	2019-01-05	2020-01-07	56.608433	-110.192883	0.9	12	11	0.3	12	12	0.4	12	12	28.7	12	12	0.4	12	12
1996	2019-01-03	2020-01-08	57.288033	-111.216950	0.8	12	12	0.4	12	12	2.2	12	12	27.7	12	12	0.9	12	12
1997	2019-01-08	2020-01-09	55.685533	-111.815367	0.8	11	11	0.4	11	11	0.4	11	10	31.5	11	10	0.4	11	10
1998	2019-01-08	2020-01-09	56.201617	-111.175283	1.0	12	12	0.4	12	12	0.4	12	12	29.9	12	12	0.5	12	12
2001	2019-01-04	2020-01-03	57.032217	-113.733217	1.0	24	12	0.3	24	12	0.3	24	12	42.4	24	12	0.3	24	12
2005	2019-01-03	2020-01-08	57.840200	-110.446433	0.9	24	12	0.4	24	12	0.5	24	12	38.4	24	12	0.7	24	12
2010	2019-01-05	2020-01-07	56.276083	-110.452000	0.8	22	11	0.4	24	12	0.6	24	12	36.0	24	12	0.6	24	12
2013	2019-01-05	2020-01-07	57.046467	-109.748767	0.9	22	11	0.4	24	12	0.3	24	12	39.4	24	12	0.5	24	12
2054	2019-01-02	2020-01-03	57.114450	-111.428967	1.2	12	12	0.5	12	12	5.2	12	12	25.3	12	12	1.4	12	12
3009	2019-01-04	2020-01-03	57.101800	-112.072517	0.9	22	11	0.5	24	12	1.6	24	12	32.7	24	12	0.7	24	12
3011	2019-01-08	2020-01-07	56.565750	-111.947417	0.8	22	11	0.4	24	12	1.1	24	12	37.0	24	12	1.2	24	12
3016	2019-01-05	2020-01-07	56.353250	-110.118833	0.8	22	10	0.4	24	11	0.4	24	12	39.4	24	12	0.5	24	12
3083	2019-01-04	2020-01-08	56.833167	-111.109133	0.8	11	11	0.5	12	12	1.0	12	12	25.3	12	12	0.7	12	12
3086	2019-01-03	2020-01-08	57.618833	-110.918117	0.8	11	11	0.5	12	12	1.2	12	12	29.8	12	12	0.7	12	12
3088	2019-01-04	2020-01-03	57.085917	-112.855550	0.7	11	11	0.4	12	12	0.4	12	12	28.8	12	12	0.3	12	12
3092	2019-01-05	2020-01-07	56.829950	-110.434767	0.7	12	12	0.4	12	12	0.6	12	12	31.8	12	12	0.4	12	12
3096	2019-01-05	2020-01-07	56.353250	-110.118833	0.7	11	11	0.3	12	12	0.4	12	12	32.8	12	12	0.4	12	12
3212	2019-01-04	2020-01-06	57.053633	-111.406567	1.4	11	11	0.4	12	12	4.3	12	12	26.0	12	12	1.1	12	12
4000	2019-01-05	2020-01-09	56.329442	-111.588619	0.8	24	12	0.4	24	12	1.3	24	12				0.5	24	12
4001	2019-01-02	2020-01-03	57.228355	-111.699922	1.1	24	12	0.5	24	12	3.1	24	12				0.6	24	12
4002	2019-01-03	2020-01-08	57.272539	-111.261758	0.9	24	12	0.5	24	12	2.0	24	12				0.8	24	12
4003	2019-01-03	2020-01-09	56.627549	-111.194622	0.9	24	12	0.5	24	12	1.2	24	12				0.5	24	12
4004	2019-01-02	2020-01-03	57.110828	-111.417987	1.0	22	11	0.5	22	11	2.8	22	11				1.0	22	11
4014	2019-01-05	2020-01-09	56.471364	-111.044156	0.9	24	12	0.5	24	12	0.9	24	12				0.6	24	12
ATHV	2019-01-04	2020-01-06	56.733628	-111.390431							5.5	24	12						
BGFM	2019-01-02	2020-01-03	57.189428	-111.640583	1.2	36	12	0.5	36	12	5.0	36</							

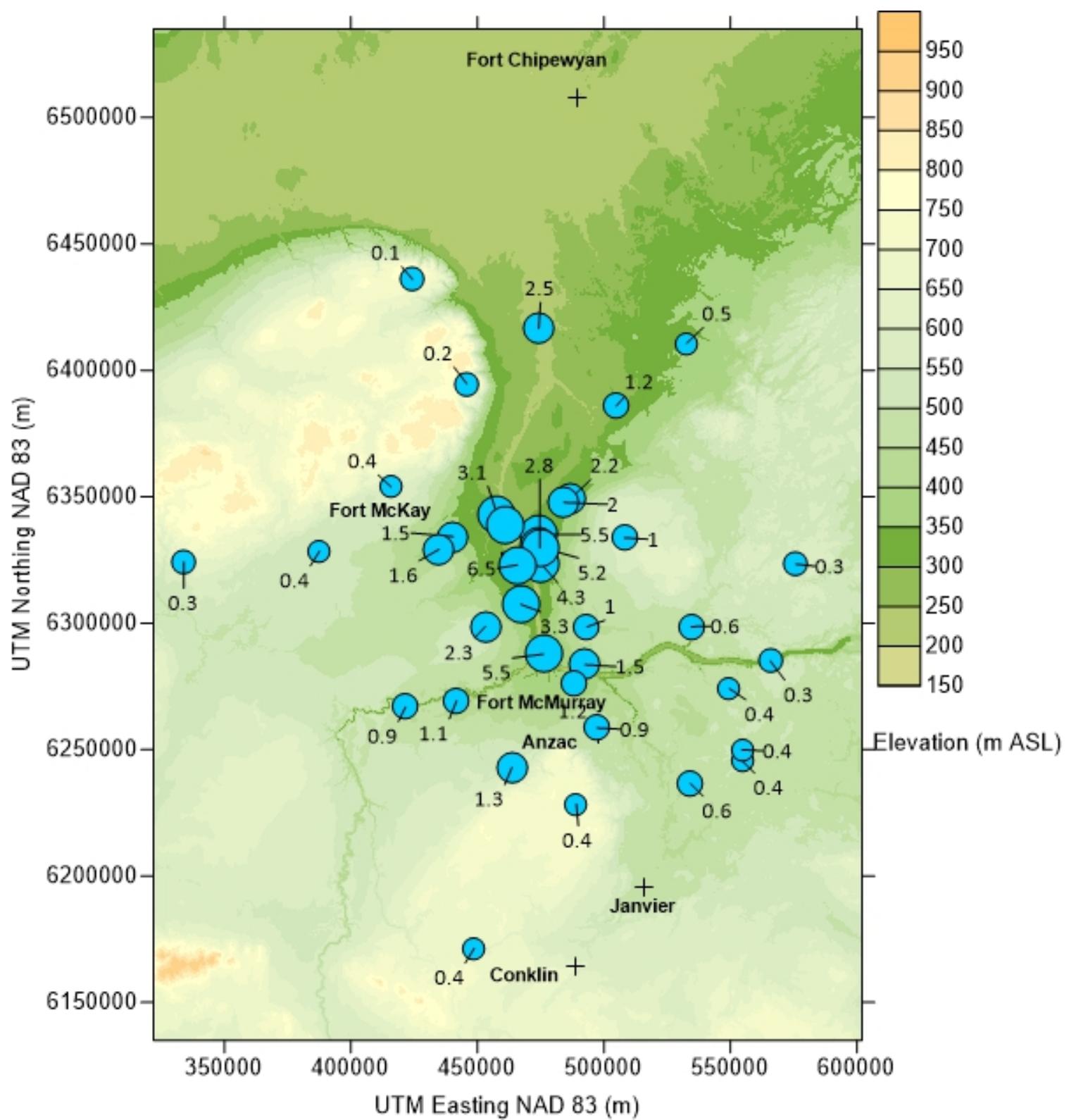


SPATIAL PLOT OF SO₂ CONCENTRATIONS - 2019 ANNUAL



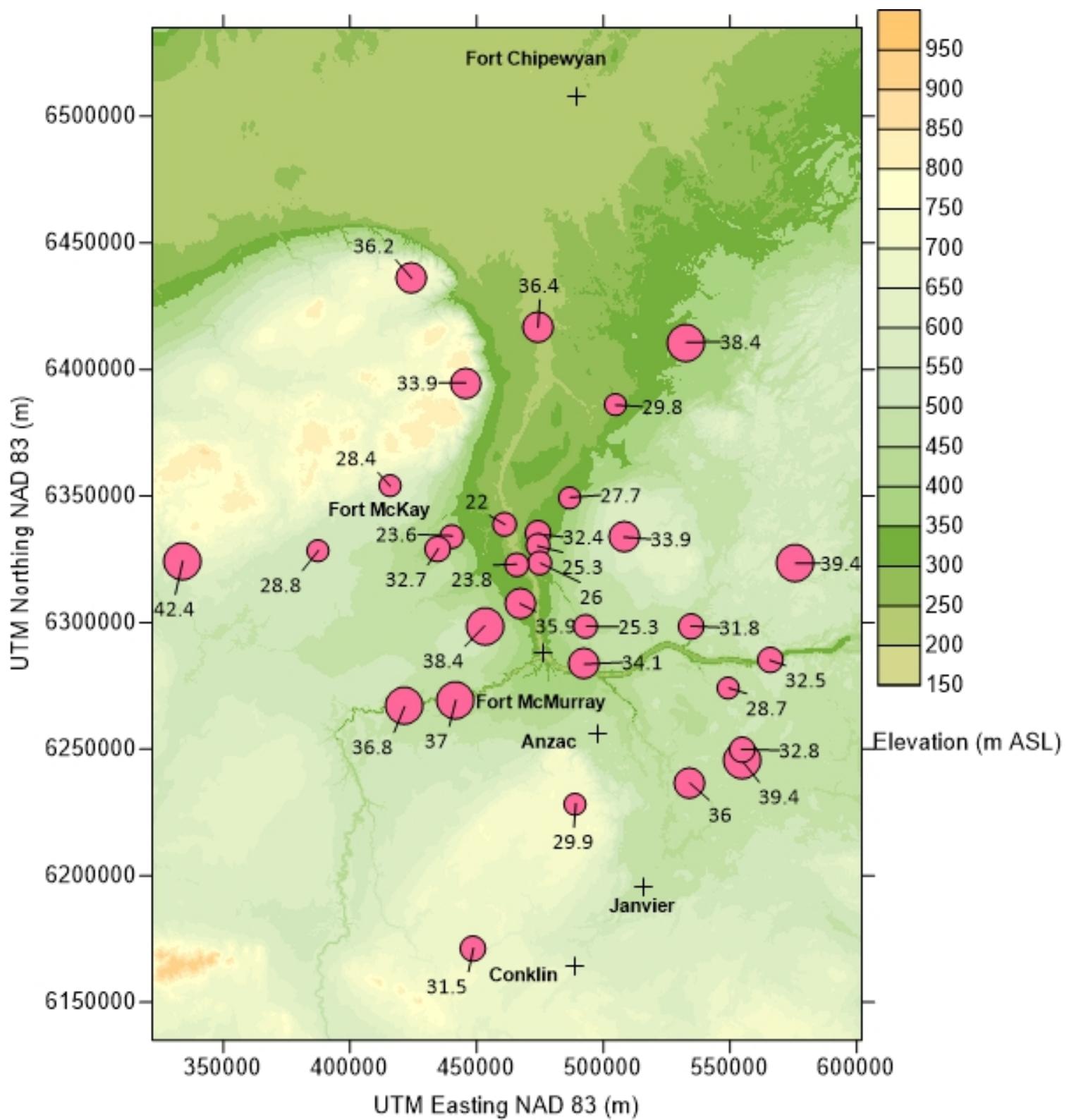


SPATIAL PLOT OF NO₂ CONCENTRATIONS - 2019 ANNUAL



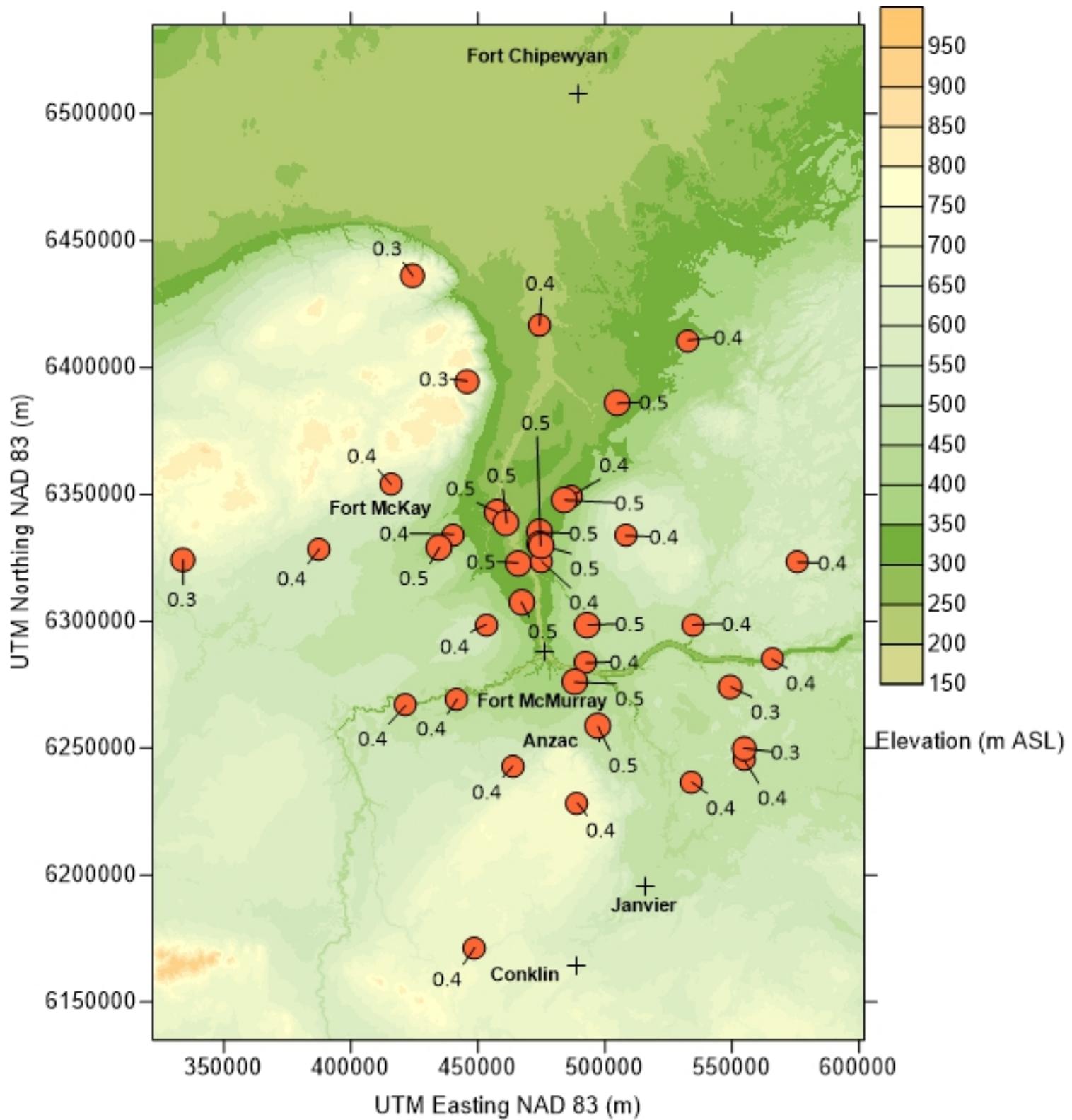


SPATIAL PLOT OF O₃ CONCENTRATIONS - 2019 ANNUAL



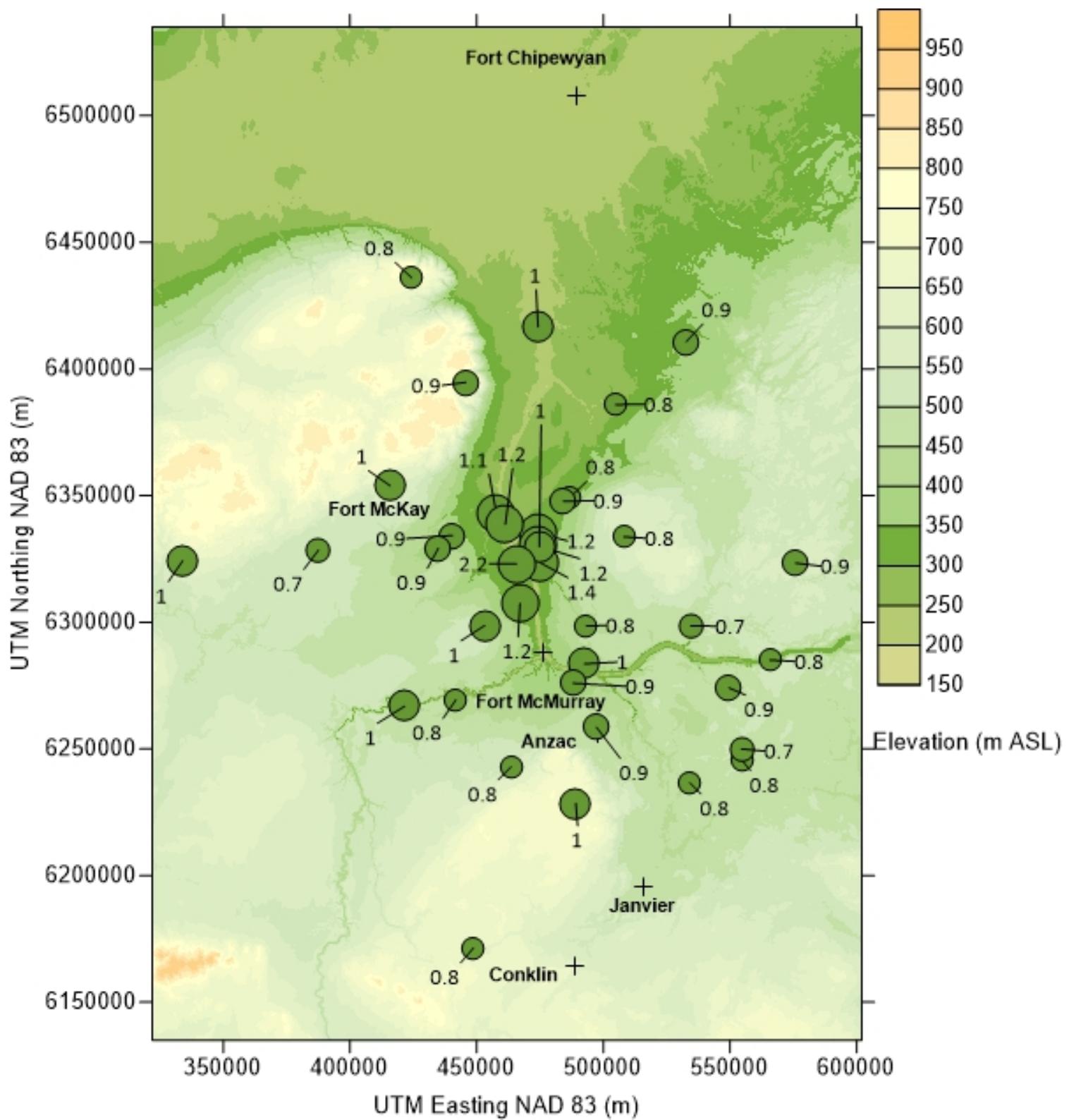


SPATIAL PLOT OF HNO₃ CONCENTRATIONS - 2019 ANNUAL





SPATIAL PLOT OF NH₃ CONCENTRATIONS - 2019 ANNUAL





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

VOLATILE ORGANIC COMPOUNDS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

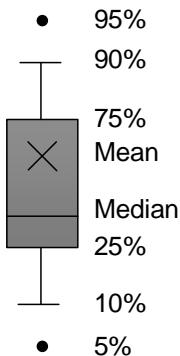
LABORATORY ANALYSIS BY:

VOCs: InnoTech Alberta, Inc.
Vegreville, Alberta



CONTENTS DESCRIPTION	VOC – Measurements of Speciated Volatile Organic Compounds
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	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	Data qualifies for V4 if greater than average + 5x Standard Dev with 5 passes. Computed on a monthly dataset.
USER NOTE 3	Summary statistics include flags beginning with V.
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

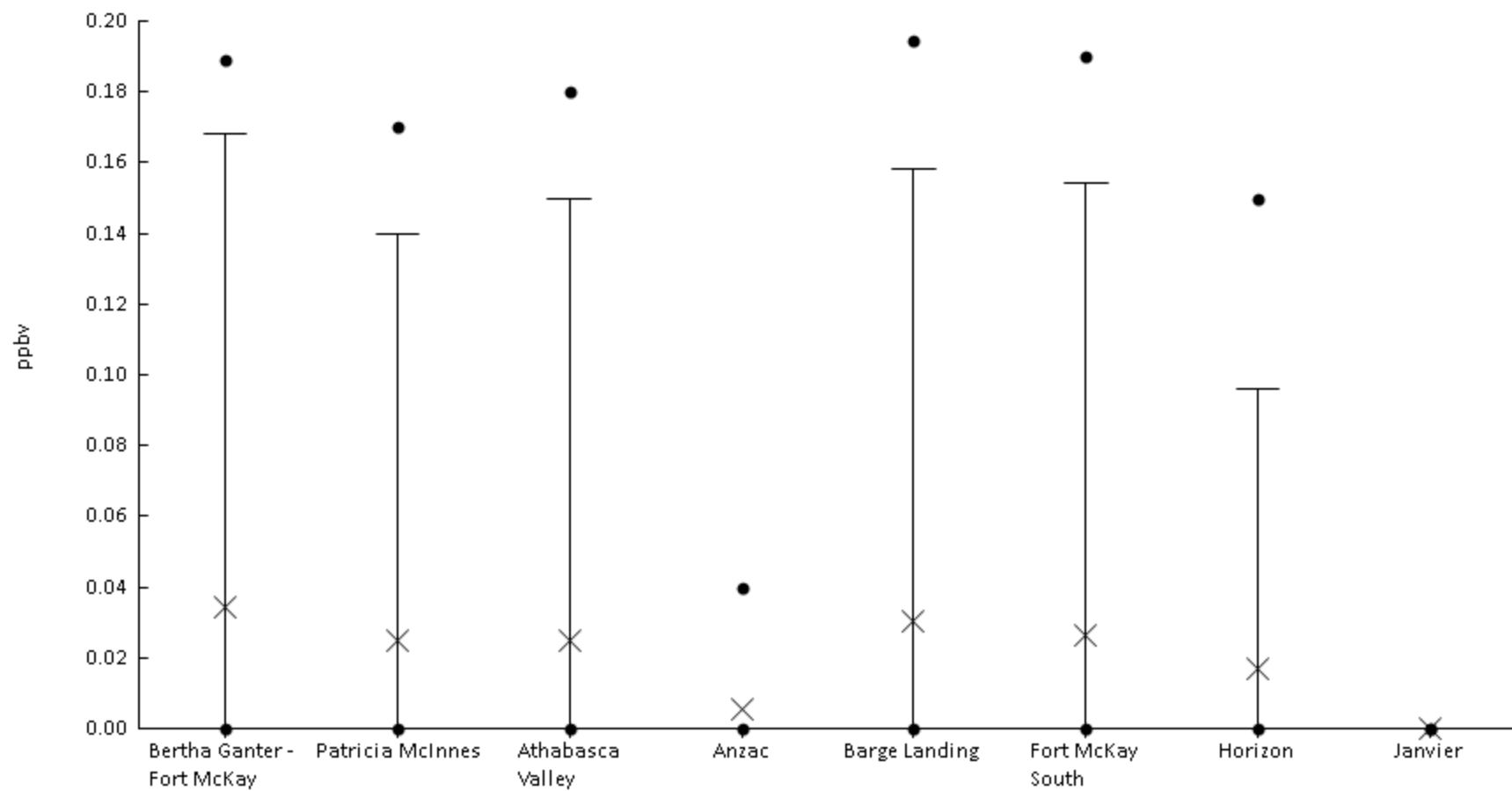
Legend description





Volatile Organic Compounds - 1,2,4-Trimethylbenzene (ppbv) - 2019

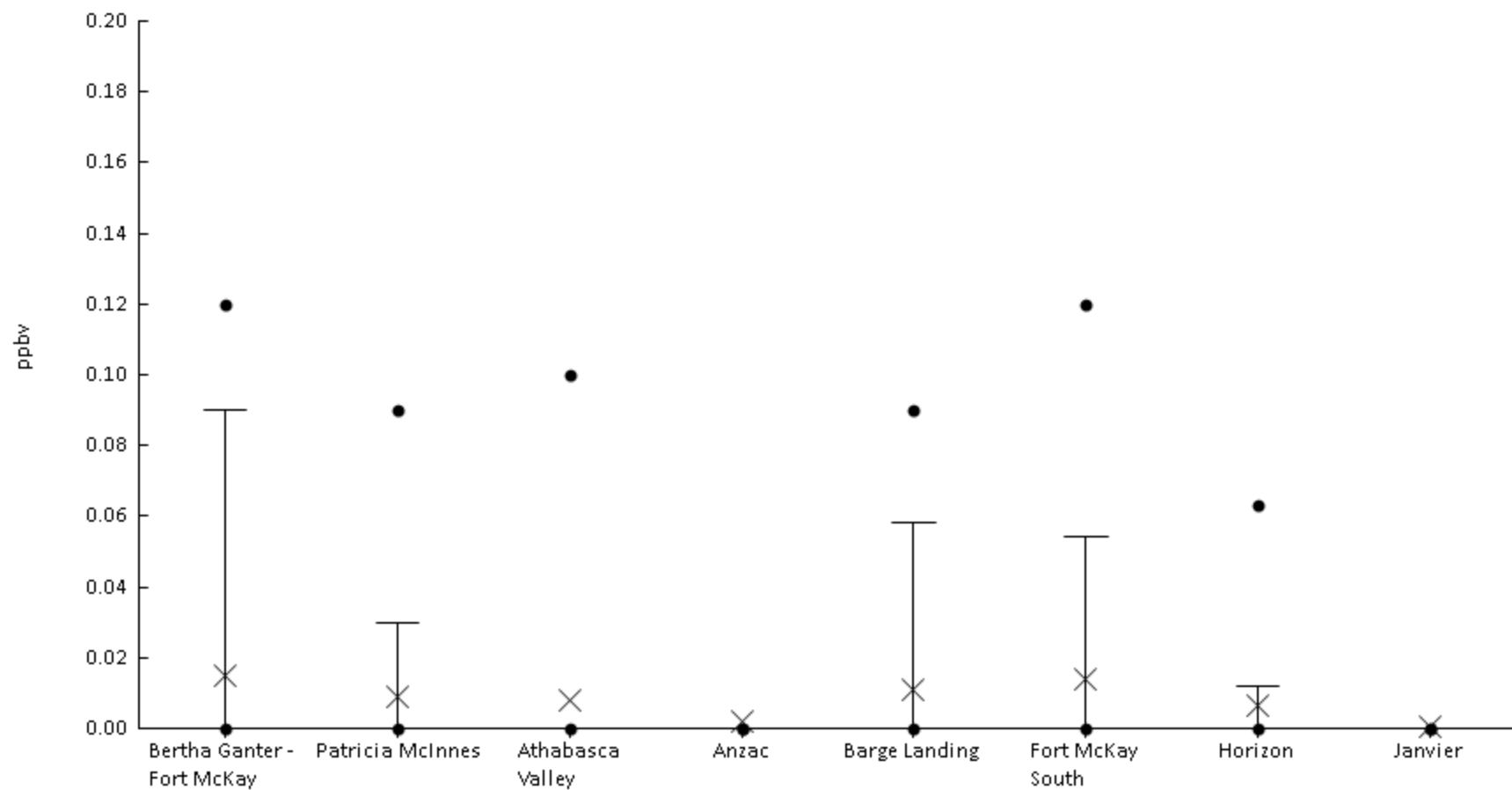
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	23%	0	0	0	0	0	0.17	0.19	0.23	0.034	0.069	
AMS06	Patricia McInnes	60	18%	0	0	0	0	0	0	0.14	0.17	0.22	0.025	0.058
AMS07	Athabasca Valley	60	18%	0	0	0	0	0	0	0.15	0.18	0.22	0.025	0.059
AMS14	Anzac	59	7%	0	0	0	0	0	0	0	0.04	0.14	5.6E-3	0.024
AMS09	Barge Landing	61	20%	0	0	0	0	0	0	0.16	0.19	0.23	0.03	0.066
AMS13	Fort McKay South	61	21%	0	0	0	0	0	0	0.15	0.19	0.25	0.027	0.062
AMS15	Horizon	59	14%	0	0	0	0	0	0	0.096	0.15	0.19	0.017	0.048
AMS22	Janvier	60	0%	0	0	0	0	0	0	0	0	0	0	0





Volatile Organic Compounds - 1,3,5-Trimethylbenzene (ppbv) - 2019

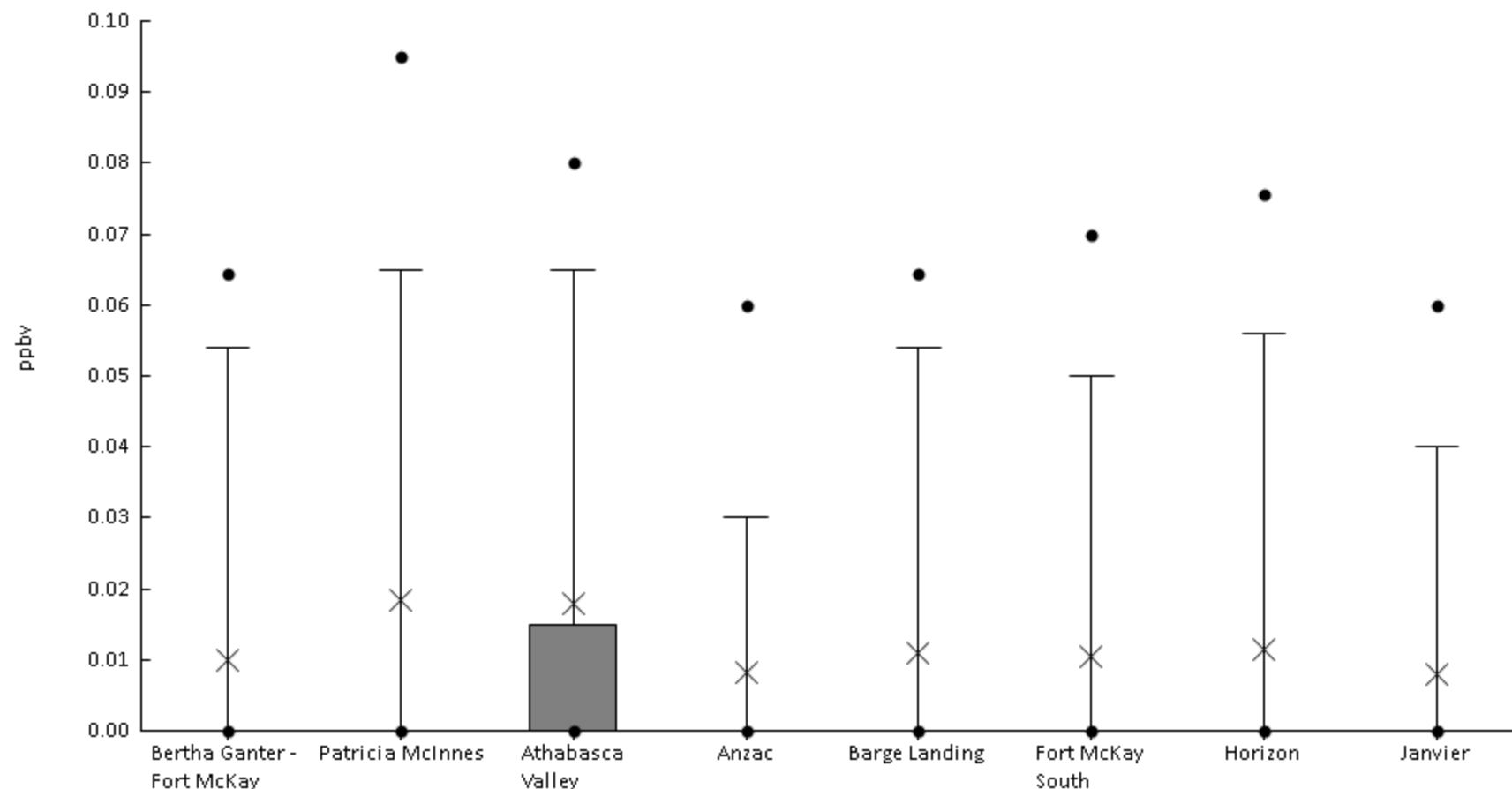
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	18%	0	0	0	0	0	0	0.09	0.12	0.13	0.015	0.037
AMS06	Patricia McInnes	60	12%	0	0	0	0	0	0	0.03	0.09	0.14	9.2E-3	0.029
AMS07	Athabasca Valley	60	8%	0	0	0	0	0	0	0	0.1	0.12	7.8E-3	0.028
AMS14	Anzac	59	3%	0	0	0	0	0	0	0	0	0.09	2.2E-3	0.013
AMS09	Barge Landing	61	15%	0	0	0	0	0	0	0.058	0.09	0.13	0.011	0.03
AMS13	Fort McKay South	61	16%	0	0	0	0	0	0	0.054	0.12	0.16	0.014	0.037
AMS15	Horizon	59	10%	0	0	0	0	0	0	0.012	0.063	0.12	6.6E-3	0.024
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.02	3.3E-4	2.6E-3





Volatile Organic Compounds - 1,3-Butadiene (ppbv) - 2019

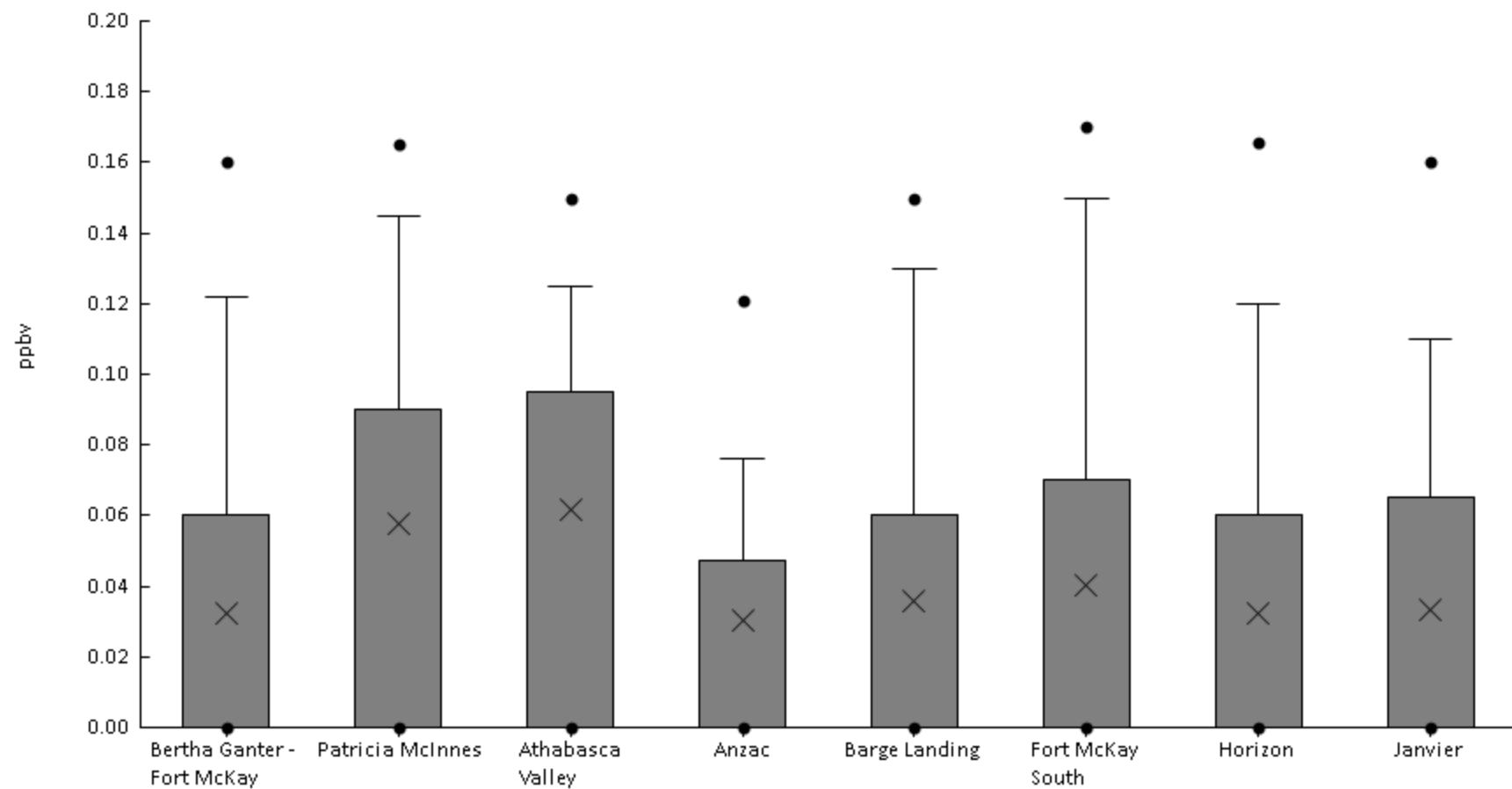
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	18%	0	0	0	0	0	0.054	0.064	0.09	0.01	0.01	0.023
AMS06	Patricia McInnes	60	23%	0	0	0	0	0	0	0.065	0.095	0.26	0.018	0.043
AMS07	Athabasca Valley	60	25%	0	0	0	0	0	0.015	0.065	0.08	0.27	0.018	0.042
AMS14	Anzac	59	14%	0	0	0	0	0	0	0.03	0.06	0.18	8.3E-3	0.027
AMS09	Barge Landing	61	21%	0	0	0	0	0	0	0.054	0.064	0.08	0.011	0.023
AMS13	Fort McKay South	61	21%	0	0	0	0	0	0	0.05	0.07	0.08	0.01	0.022
AMS15	Horizon	59	20%	0	0	0	0	0	0	0.056	0.076	0.09	0.012	0.025
AMS22	Janvier	60	17%	0	0	0	0	0	0	0.04	0.06	0.08	8E-3	0.019





Volatile Organic Compounds - 1-Butene/Isobutylene (ppbv) - 2019

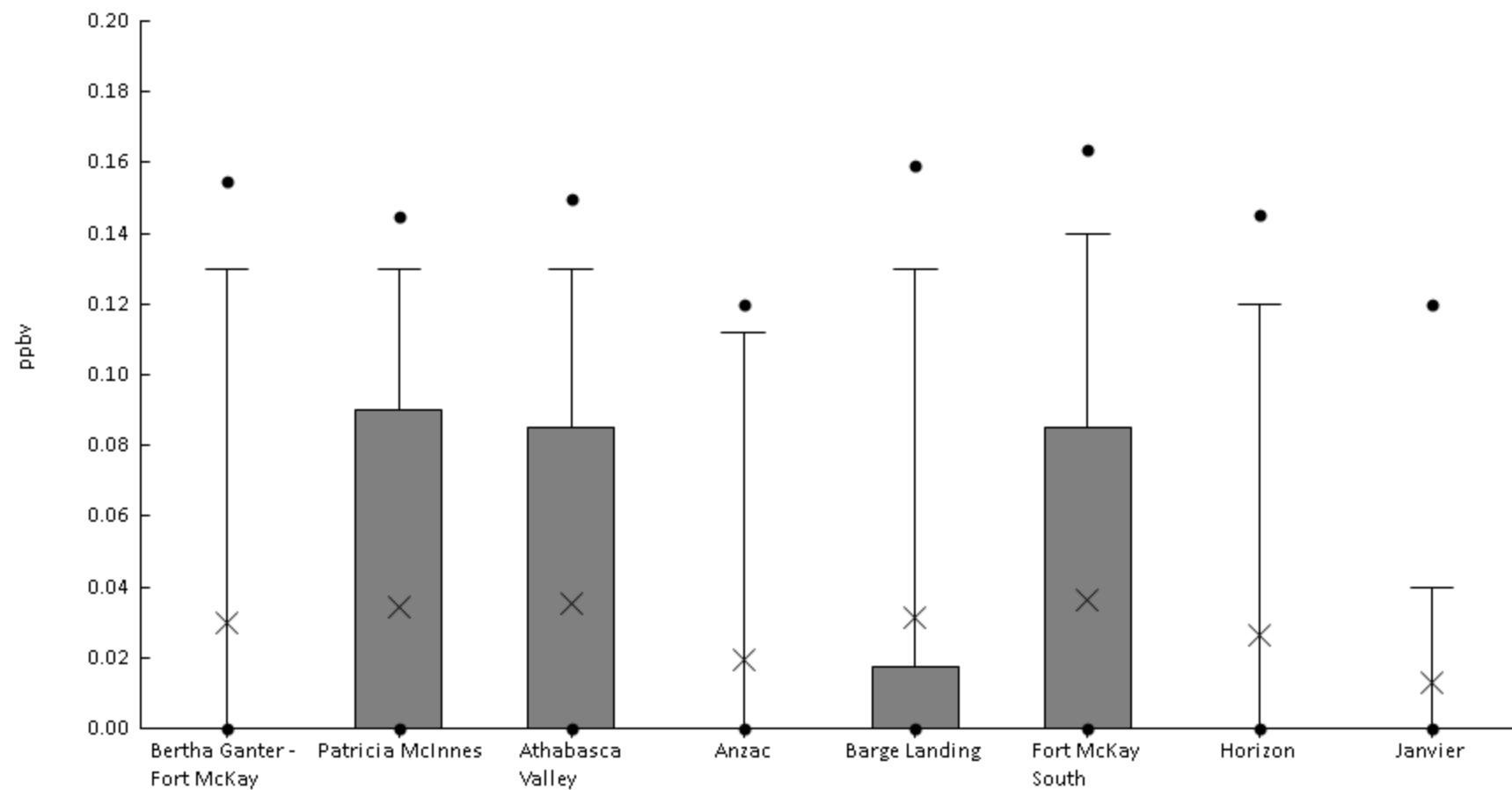
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	36%	0	0	0	0	0	0.06	0.12	0.16	0.19	0.032	0.052
AMS06	Patricia McInnes	60	47%	0	0	0	0	0	0.09	0.15	0.17	0.84	0.058	0.12
AMS07	Athabasca Valley	60	47%	0	0	0	0	0	0.095	0.13	0.15	0.85	0.062	0.13
AMS14	Anzac	59	31%	0	0	0	0	0	0.048	0.076	0.12	0.58	0.031	0.082
AMS09	Barge Landing	61	38%	0	0	0	0	0	0.06	0.13	0.15	0.2	0.036	0.054
AMS13	Fort McKay South	61	39%	0	0	0	0	0	0.07	0.15	0.17	0.19	0.04	0.059
AMS15	Horizon	59	32%	0	0	0	0	0	0.06	0.12	0.17	0.19	0.032	0.055
AMS22	Janvier	60	33%	0	0	0	0	0	0.065	0.11	0.16	0.24	0.033	0.056





Volatile Organic Compounds - 1-Hexene/2-Methyl-1-pentene (ppbv) - 2019

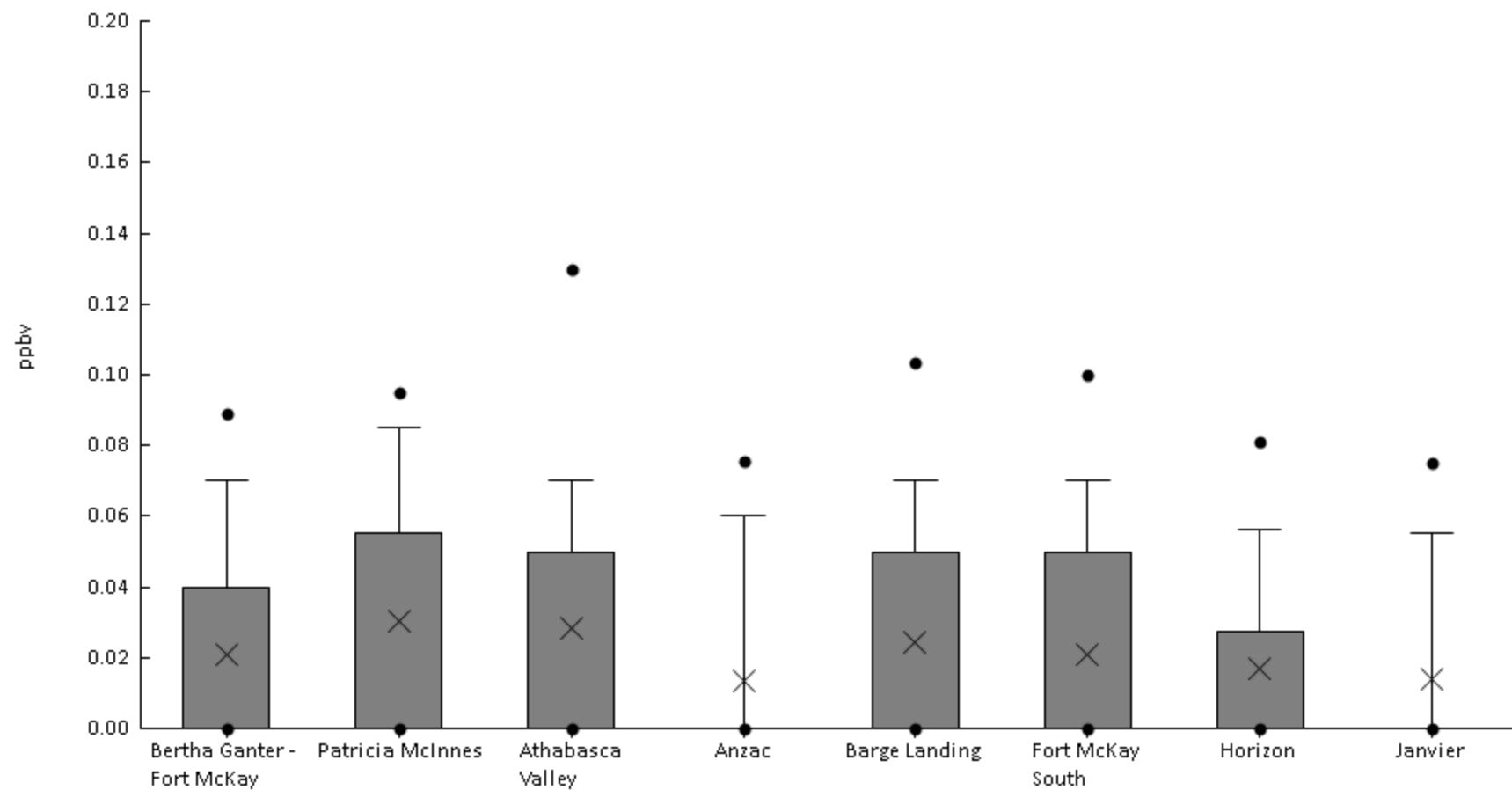
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	23%	0	0	0	0	0	0	0.13	0.15	0.19	0.03	0.057
AMS06	Patricia McInnes	60	28%	0	0	0	0	0	0.09	0.13	0.15	0.19	0.034	0.057
AMS07	Athabasca Valley	60	28%	0	0	0	0	0	0.085	0.13	0.15	0.19	0.036	0.059
AMS14	Anzac	59	17%	0	0	0	0	0	0	0.11	0.12	0.19	0.019	0.046
AMS09	Barge Landing	61	25%	0	0	0	0	0	0.018	0.13	0.16	0.2	0.031	0.059
AMS13	Fort McKay South	61	28%	0	0	0	0	0	0.085	0.14	0.16	0.19	0.036	0.061
AMS15	Horizon	59	22%	0	0	0	0	0	0	0.12	0.15	0.19	0.026	0.052
AMS22	Janvier	60	10%	0	0	0	0	0	0	0.04	0.12	0.19	0.013	0.04





Volatile Organic Compounds - 1-Pentene (ppbv) - 2019

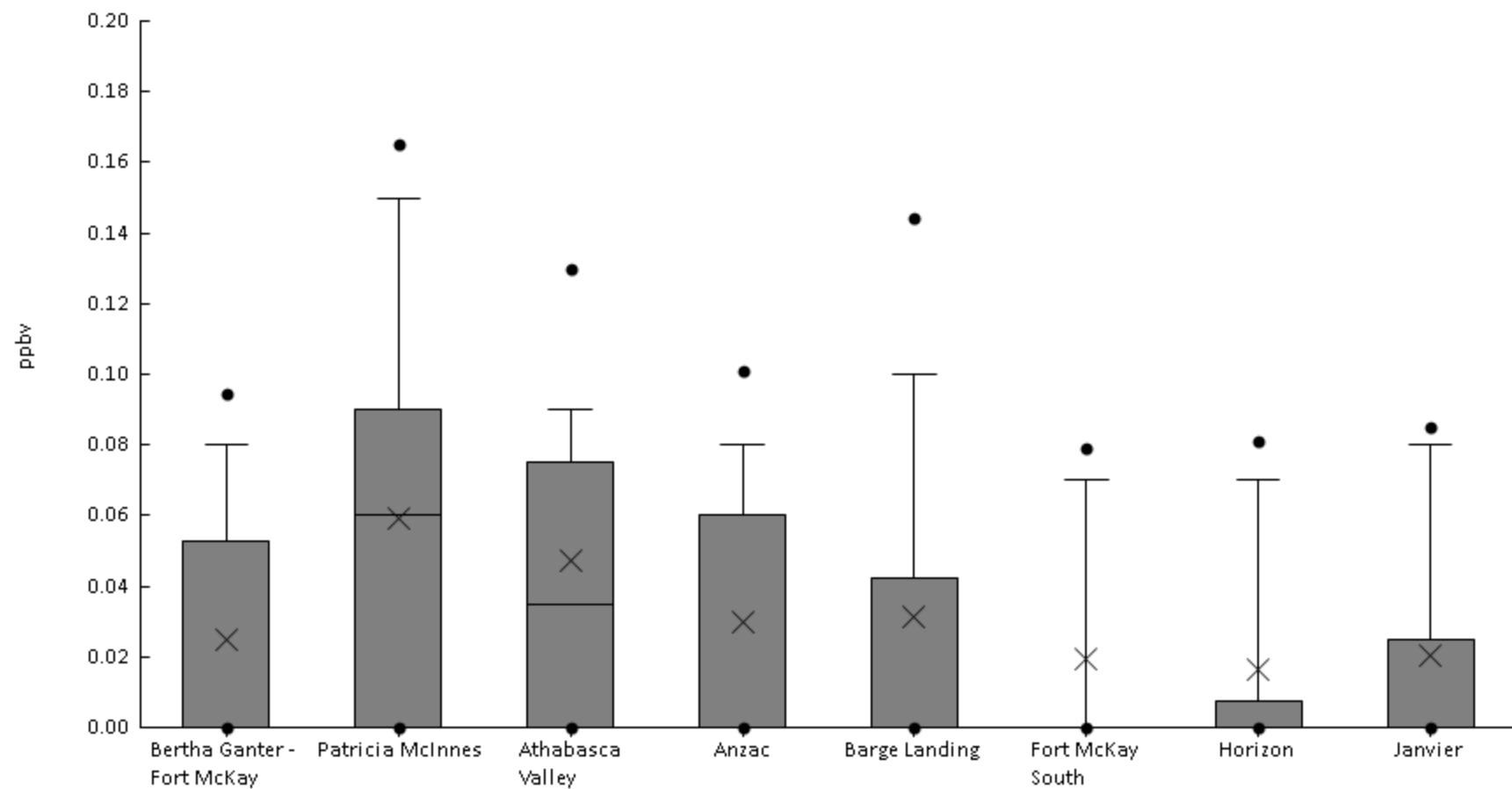
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	34%	0	0	0	0	0	0.04	0.07	0.089	0.12	0.021	0.033
AMS06	Patricia McInnes	60	43%	0	0	0	0	0	0.055	0.085	0.095	0.24	0.03	0.046
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.05	0.07	0.13	0.24	0.028	0.047
AMS14	Anzac	59	20%	0	0	0	0	0	0	0.06	0.076	0.18	0.014	0.033
AMS09	Barge Landing	61	34%	0	0	0	0	0	0.05	0.07	0.1	0.19	0.024	0.04
AMS13	Fort McKay South	61	31%	0	0	0	0	0	0.05	0.07	0.1	0.15	0.021	0.035
AMS15	Horizon	59	29%	0	0	0	0	0	0.028	0.056	0.081	0.15	0.017	0.032
AMS22	Janvier	60	22%	0	0	0	0	0	0	0.055	0.075	0.17	0.014	0.032





Volatile Organic Compounds - 2,2,4-Trimethylpentane (ppbv) - 2019

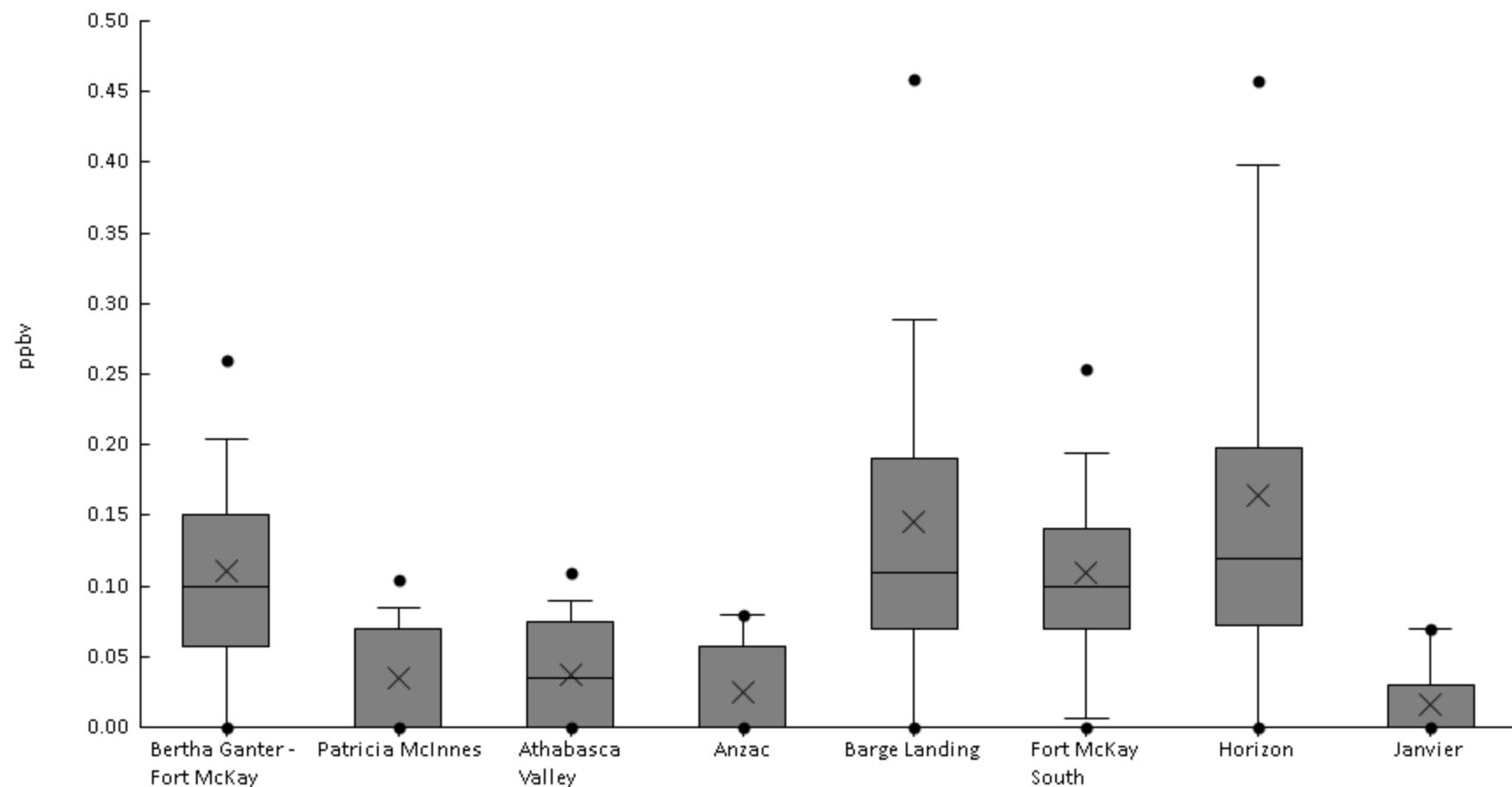
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	36%	0	0	0	0	0	0.053	0.08	0.095	0.17	0.025	0.039
AMS06	Patricia McInnes	60	63%	0	0	0	0	0.06	0.09	0.15	0.17	0.32	0.059	0.064
AMS07	Athabasca Valley	60	57%	0	0	0	0	0.035	0.075	0.09	0.13	0.37	0.047	0.062
AMS14	Anzac	59	41%	0	0	0	0	0	0.06	0.08	0.1	0.24	0.03	0.046
AMS09	Barge Landing	61	31%	0	0	0	0	0	0.043	0.1	0.14	0.39	0.031	0.068
AMS13	Fort McKay South	61	23%	0	0	0	0	0	0	0.07	0.079	0.32	0.019	0.05
AMS15	Horizon	59	25%	0	0	0	0	0	7.5E-3	0.07	0.081	0.15	0.016	0.034
AMS22	Janvier	60	27%	0	0	0	0	0	0.025	0.08	0.085	0.19	0.02	0.04





Volatile Organic Compounds - 2,2-Dimethylbutane (ppbv) - 2019

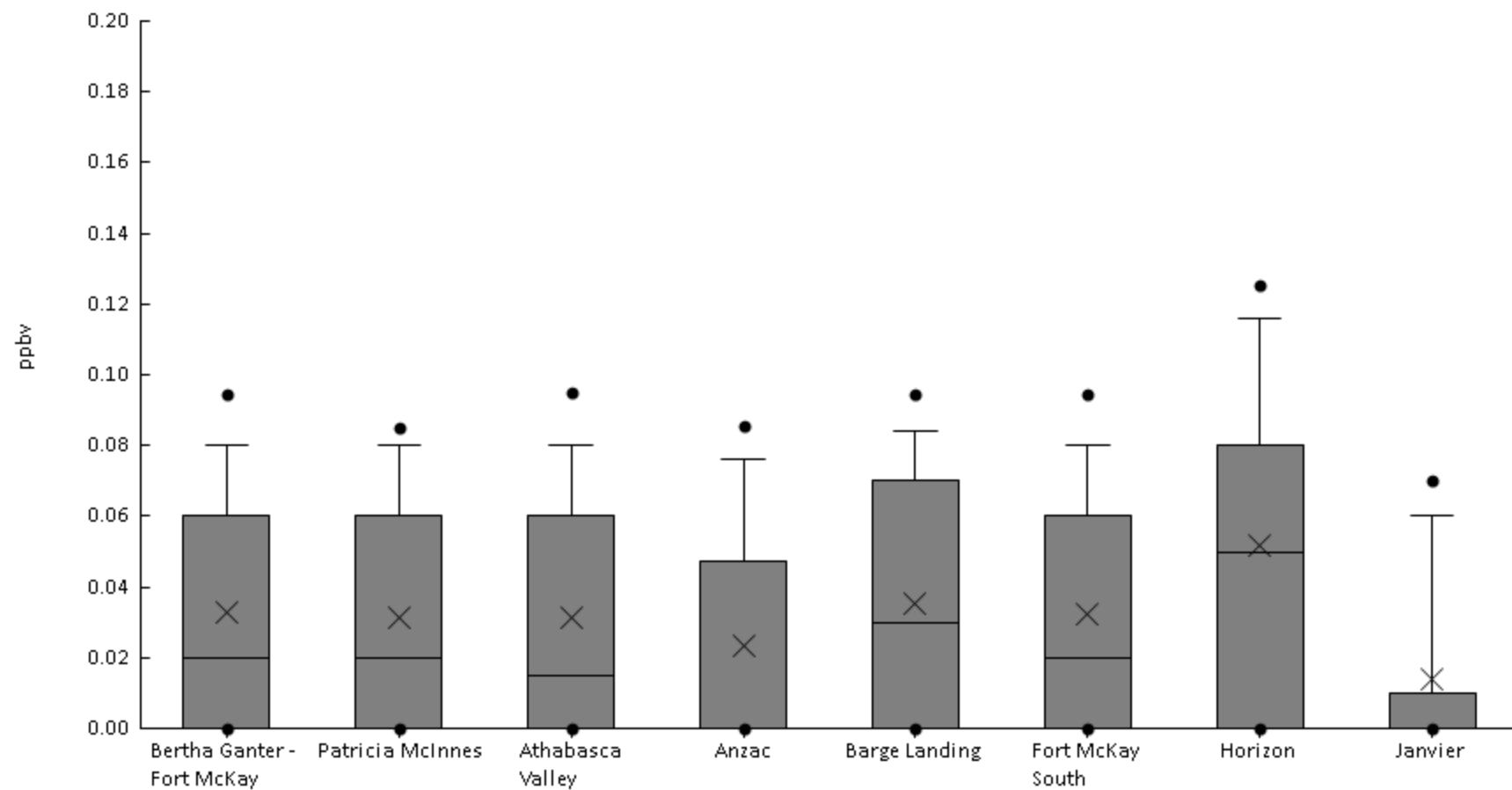
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	82%	0	0	0	0.058	0.1	0.15	0.2	0.26	0.67	0.11	0.1
AMS06	Patricia McInnes	60	48%	0	0	0	0	0	0.07	0.085	0.11	0.14	0.035	0.04
AMS07	Athabasca Valley	60	53%	0	0	0	0	0.035	0.075	0.09	0.11	0.11	0.038	0.04
AMS14	Anzac	59	42%	0	0	0	0	0	0.058	0.08	0.08	0.09	0.024	0.032
AMS09	Barge Landing	61	85%	0	0	0	0.07	0.11	0.19	0.29	0.46	0.68	0.14	0.14
AMS13	Fort McKay South	61	90%	0	0	6E-3	0.07	0.1	0.14	0.19	0.25	0.4	0.11	0.075
AMS15	Horizon	59	88%	0	0	0	0.073	0.12	0.2	0.4	0.46	0.71	0.16	0.14
AMS22	Janvier	60	32%	0	0	0	0	0	0.03	0.07	0.07	0.08	0.016	0.026





Volatile Organic Compounds - 2,3,4-Trimethylpentane (ppbv) - 2019

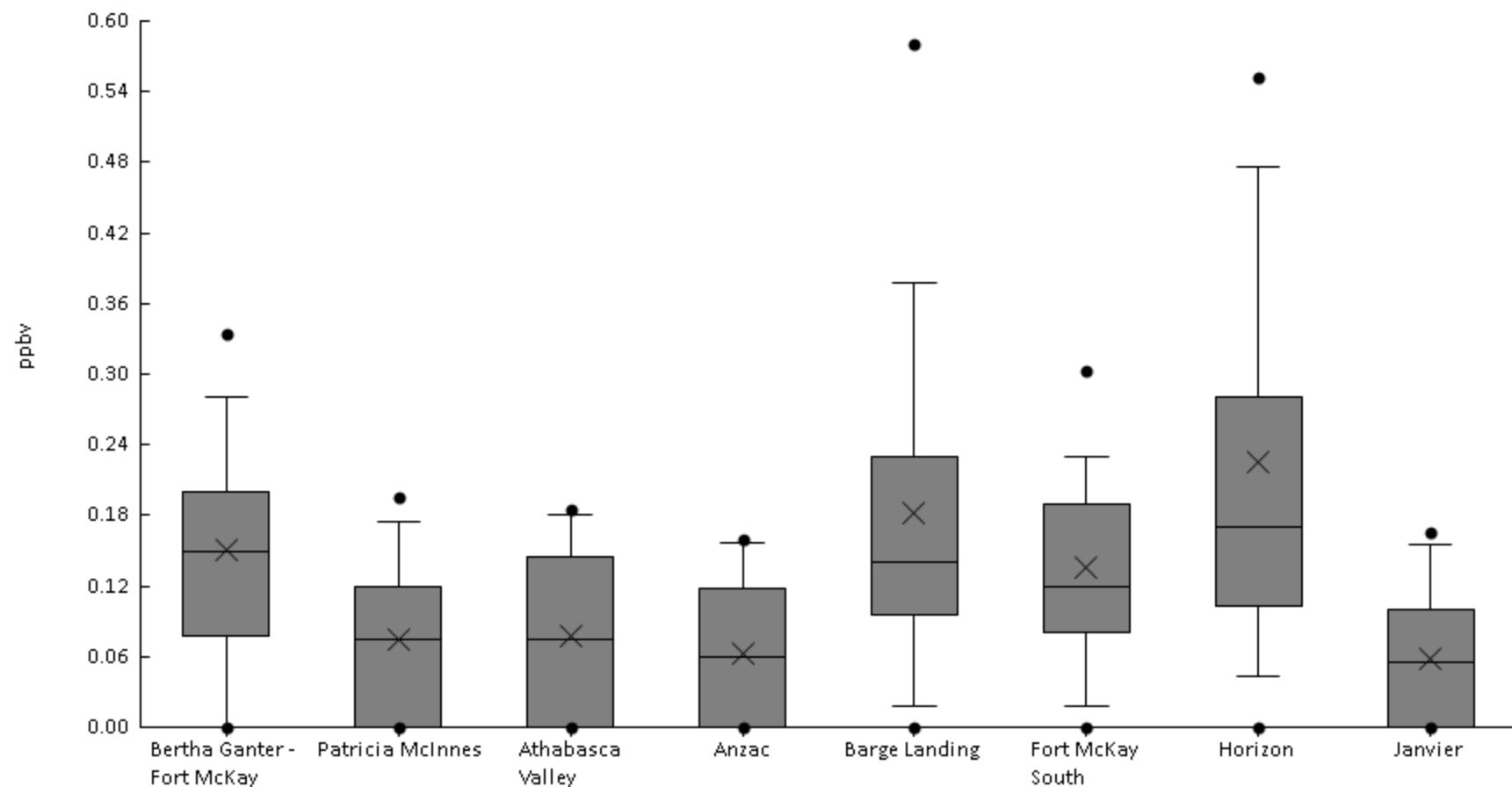
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	0	0	0	0	0.02	0.06	0.08	0.095	0.11	0.033	0.035
AMS06	Patricia McInnes	60	62%	0	0	0	0	0.02	0.06	0.08	0.085	0.11	0.031	0.034
AMS07	Athabasca Valley	60	57%	0	0	0	0	0.015	0.06	0.08	0.095	0.15	0.031	0.037
AMS14	Anzac	59	42%	0	0	0	0	0	0.048	0.076	0.086	0.1	0.024	0.032
AMS09	Barge Landing	61	61%	0	0	0	0	0.03	0.07	0.084	0.095	0.16	0.035	0.038
AMS13	Fort McKay South	61	61%	0	0	0	0	0.02	0.06	0.08	0.095	0.16	0.032	0.036
AMS15	Horizon	59	71%	0	0	0	0	0.05	0.08	0.12	0.13	0.18	0.052	0.046
AMS22	Janvier	60	27%	0	0	0	0	0	0.01	0.06	0.07	0.1	0.014	0.026





Volatile Organic Compounds - 2,3-Dimethylbutane (ppbv) - 2019

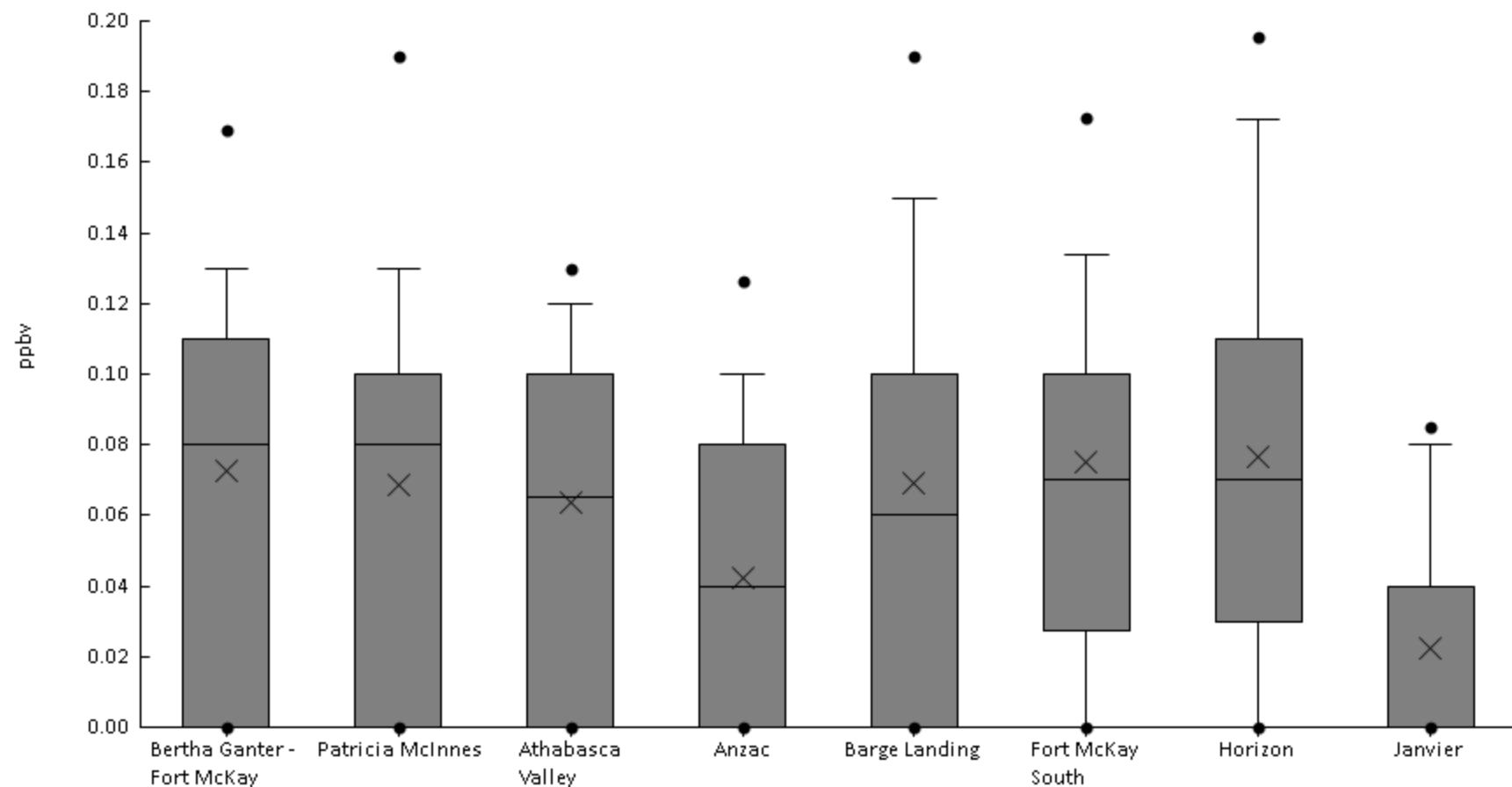
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	0.078	0.15	0.2	0.28	0.33	0.68	0.15	0.12
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.075	0.12	0.18	0.2	0.23	0.075	0.068
AMS07	Athabasca Valley	60	68%	0	0	0	0	0.075	0.15	0.18	0.19	0.21	0.078	0.069
AMS14	Anzac	59	63%	0	0	0	0	0.06	0.12	0.16	0.16	0.18	0.063	0.06
AMS09	Barge Landing	61	90%	0	0	0.018	0.095	0.14	0.23	0.38	0.58	0.9	0.18	0.17
AMS13	Fort McKay South	61	90%	0	0	0.018	0.08	0.12	0.19	0.23	0.3	0.46	0.14	0.092
AMS15	Horizon	59	93%	0	0	0.044	0.1	0.17	0.28	0.48	0.55	0.81	0.22	0.17
AMS22	Janvier	60	62%	0	0	0	0	0.055	0.1	0.16	0.17	0.17	0.059	0.058





Volatile Organic Compounds - 2,3-Dimethylpentane (ppbv) - 2019

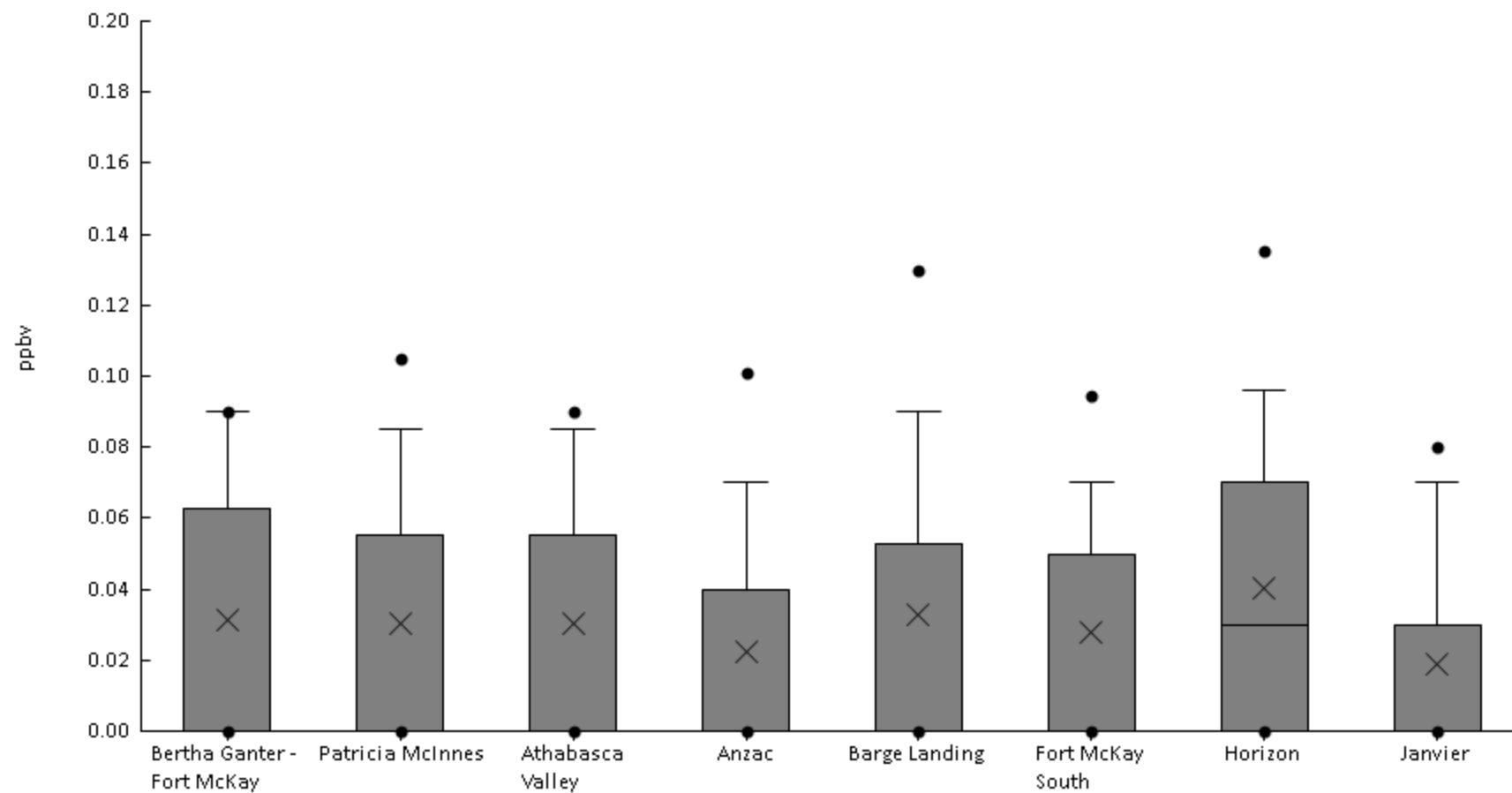
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	72%	0	0	0	0	0.08	0.11	0.13	0.17	0.27	0.073	0.06
AMS06	Patricia McInnes	60	70%	0	0	0	0	0.08	0.1	0.13	0.19	0.29	0.069	0.064
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.065	0.1	0.12	0.13	0.35	0.064	0.06
AMS14	Anzac	59	58%	0	0	0	0	0.04	0.08	0.1	0.13	0.16	0.042	0.045
AMS09	Barge Landing	61	70%	0	0	0	0	0.06	0.1	0.15	0.19	0.4	0.069	0.071
AMS13	Fort McKay South	61	77%	0	0	0	0.028	0.07	0.1	0.13	0.17	0.4	0.075	0.072
AMS15	Horizon	59	76%	0	0	0	0.03	0.07	0.11	0.17	0.2	0.27	0.077	0.065
AMS22	Janvier	60	35%	0	0	0	0	0	0.04	0.08	0.085	0.18	0.022	0.037





Volatile Organic Compounds - 2,4-Dimethylpentane (ppbv) - 2019

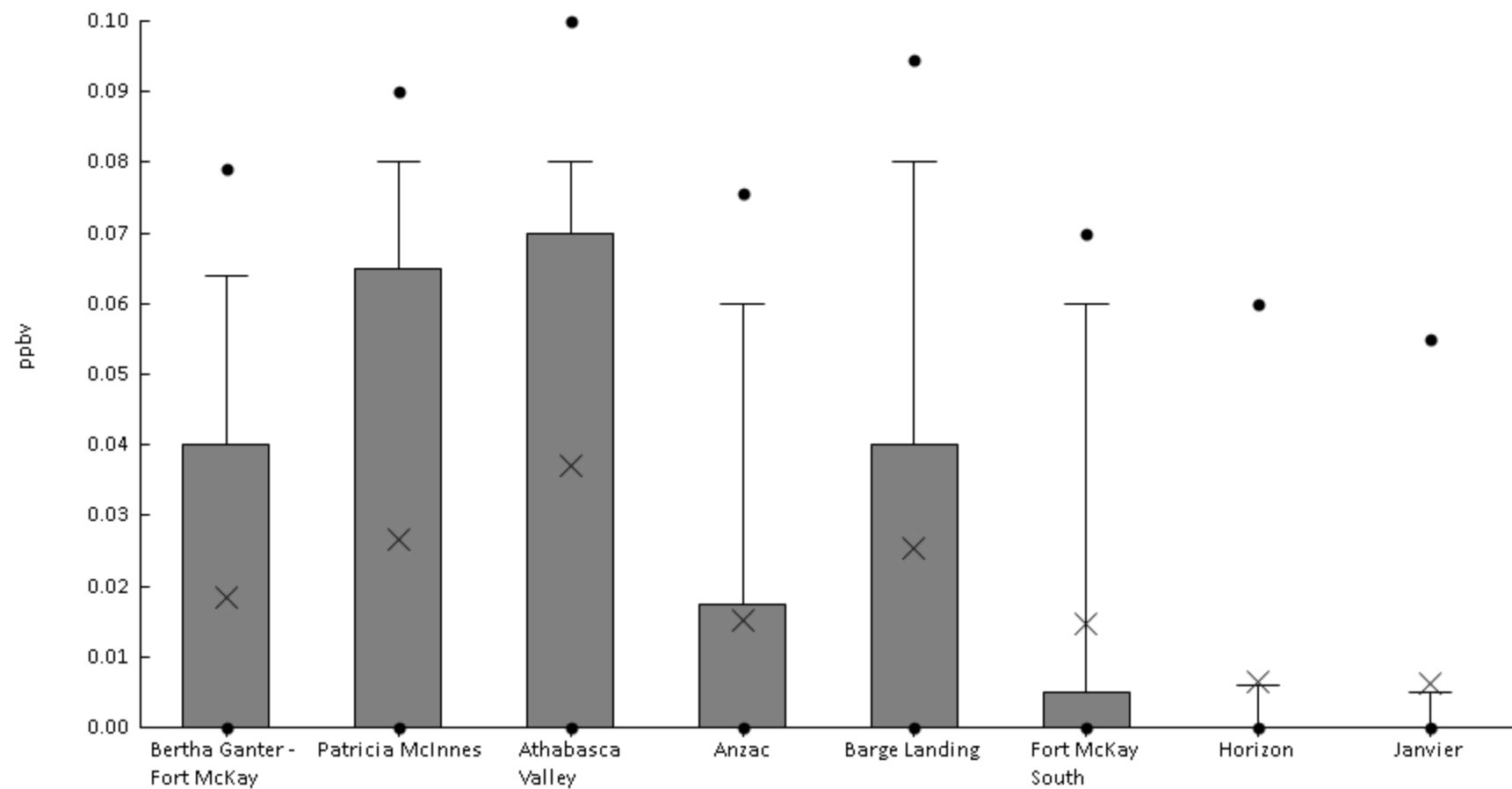
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	49%	0	0	0	0	0	0.063	0.09	0.09	0.15	0.031	0.039
AMS06	Patricia McInnes	60	47%	0	0	0	0	0	0.055	0.085	0.11	0.15	0.03	0.039
AMS07	Athabasca Valley	60	48%	0	0	0	0	0	0.055	0.085	0.09	0.17	0.031	0.039
AMS14	Anzac	59	41%	0	0	0	0	0	0.04	0.07	0.1	0.14	0.023	0.034
AMS09	Barge Landing	61	49%	0	0	0	0	0	0.053	0.09	0.13	0.19	0.033	0.043
AMS13	Fort McKay South	61	48%	0	0	0	0	0	0.05	0.07	0.095	0.16	0.028	0.037
AMS15	Horizon	59	56%	0	0	0	0	0.03	0.07	0.096	0.14	0.15	0.041	0.044
AMS22	Janvier	60	30%	0	0	0	0	0	0.03	0.07	0.08	0.14	0.019	0.034





Volatile Organic Compounds - 2-Methyl-2-butene (ppbv) - 2019

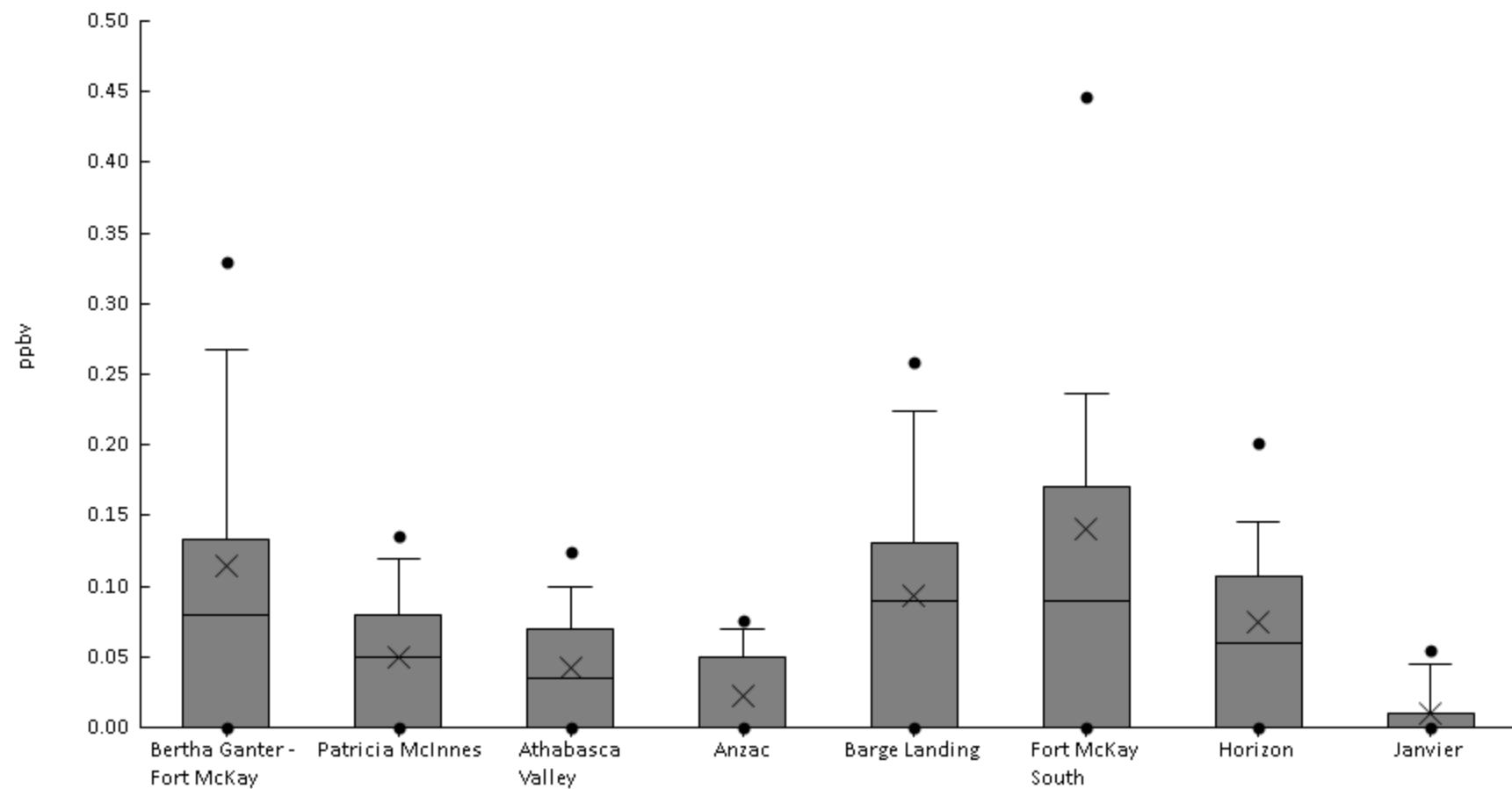
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	33%	0	0	0	0	0	0.04	0.064	0.079	0.1	0.018	0.029
AMS06	Patricia McInnes	60	42%	0	0	0	0	0	0.065	0.08	0.09	0.11	0.027	0.035
AMS07	Athabasca Valley	60	47%	0	0	0	0	0	0.07	0.08	0.1	0.41	0.037	0.061
AMS14	Anzac	59	27%	0	0	0	0	0	0.018	0.06	0.076	0.09	0.015	0.028
AMS09	Barge Landing	61	33%	0	0	0	0	0	0.04	0.08	0.095	0.43	0.025	0.061
AMS13	Fort McKay South	61	25%	0	0	0	0	0	5E-3	0.06	0.07	0.18	0.015	0.032
AMS15	Horizon	59	10%	0	0	0	0	0	0	6E-3	0.06	0.12	6.4E-3	0.022
AMS22	Janvier	60	10%	0	0	0	0	0	0	5E-3	0.055	0.13	6.3E-3	0.023





Volatile Organic Compounds - 2-Methylheptane (ppbv) - 2019

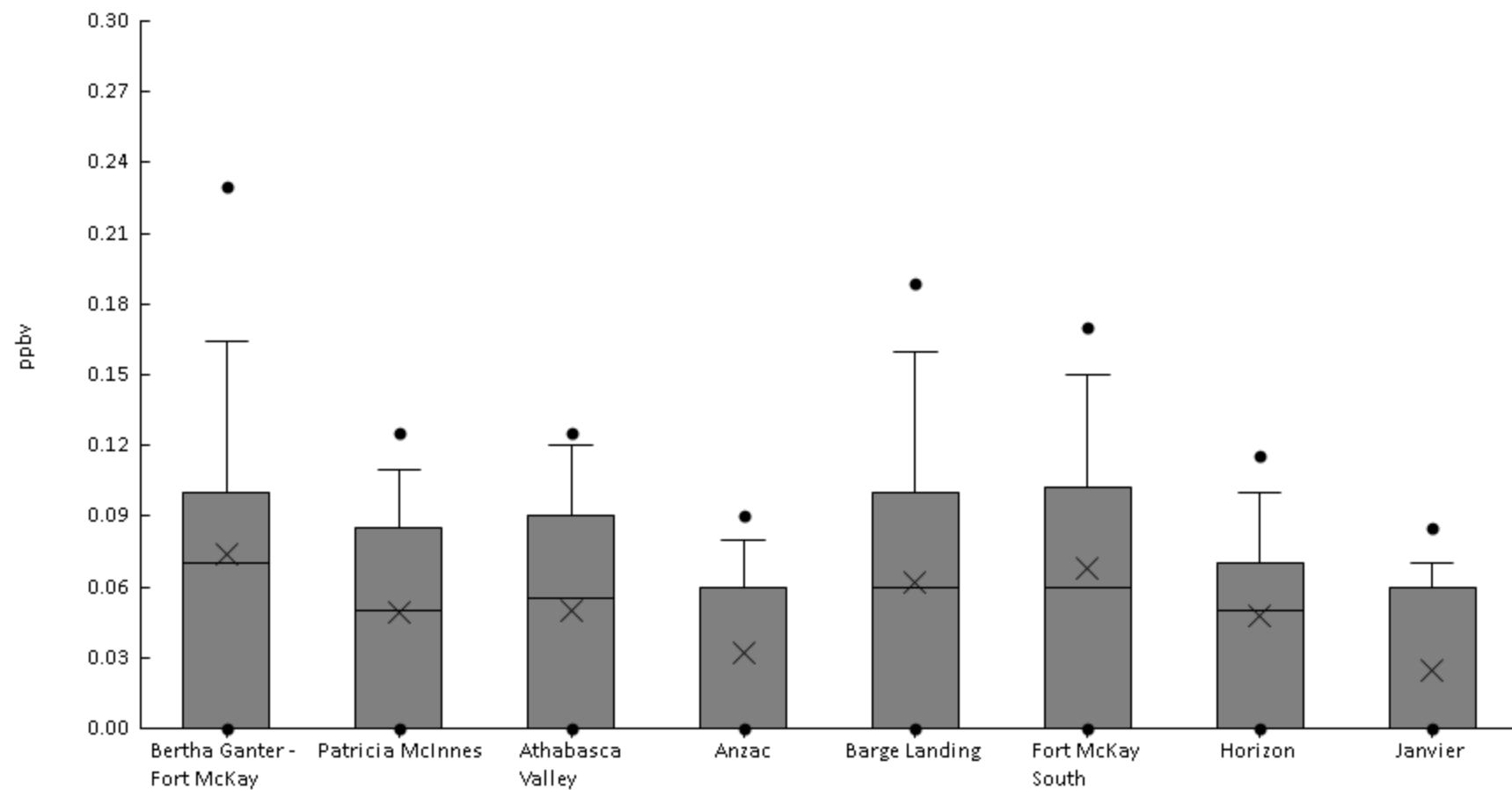
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	66%	0	0	0	0	0.08	0.13	0.27	0.33	1.3	0.11	0.19
AMS06	Patricia McInnes	60	60%	0	0	0	0	0.05	0.08	0.12	0.14	0.19	0.05	0.051
AMS07	Athabasca Valley	60	58%	0	0	0	0	0.035	0.07	0.1	0.13	0.18	0.042	0.045
AMS14	Anzac	59	42%	0	0	0	0	0	0.05	0.07	0.076	0.1	0.023	0.03
AMS09	Barge Landing	61	64%	0	0	0	0	0.09	0.13	0.22	0.26	0.61	0.094	0.12
AMS13	Fort McKay South	61	66%	0	0	0	0	0.09	0.17	0.24	0.45	2.2	0.14	0.29
AMS15	Horizon	59	59%	0	0	0	0	0.06	0.11	0.15	0.2	0.63	0.074	0.12
AMS22	Janvier	60	25%	0	0	0	0	0	0.01	0.045	0.055	0.07	0.01	0.019





Volatile Organic Compounds - 2-Methylhexane (ppbv) - 2019

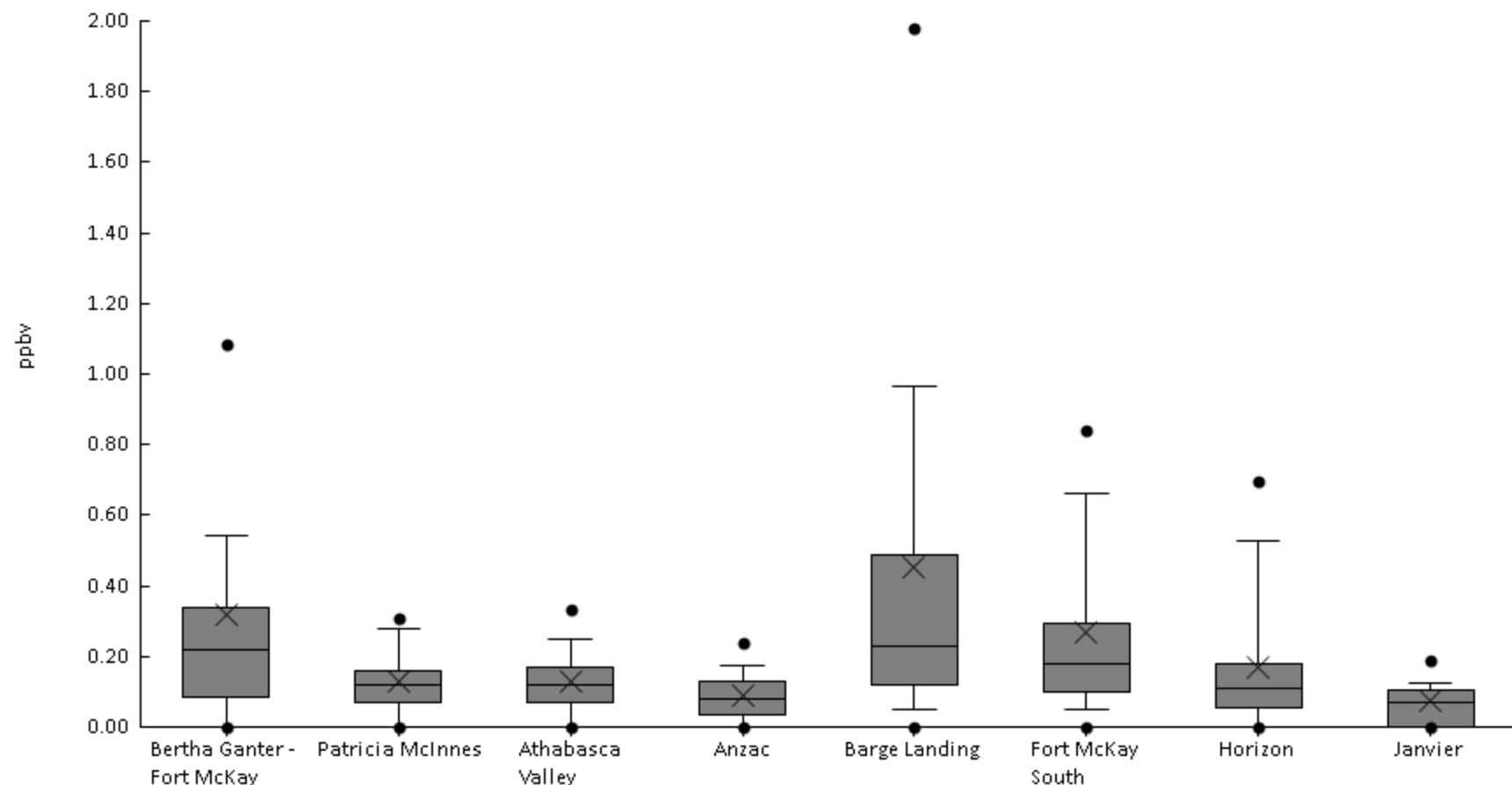
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	70%	0	0	0	0	0.07	0.1	0.16	0.23	0.36	0.074	0.078
AMS06	Patricia McInnes	60	62%	0	0	0	0	0.05	0.085	0.11	0.13	0.18	0.05	0.048
AMS07	Athabasca Valley	60	65%	0	0	0	0	0.055	0.09	0.12	0.13	0.14	0.05	0.045
AMS14	Anzac	59	47%	0	0	0	0	0	0.06	0.08	0.09	0.16	0.032	0.039
AMS09	Barge Landing	61	62%	0	0	0	0	0.06	0.1	0.16	0.19	0.24	0.062	0.064
AMS13	Fort McKay South	61	67%	0	0	0	0	0.06	0.1	0.15	0.17	0.42	0.068	0.074
AMS15	Horizon	59	63%	0	0	0	0	0.05	0.07	0.1	0.12	0.22	0.047	0.048
AMS22	Janvier	60	42%	0	0	0	0	0	0.06	0.07	0.085	0.09	0.025	0.032





Volatile Organic Compounds - 2-Methylpentane (ppbv) - 2019

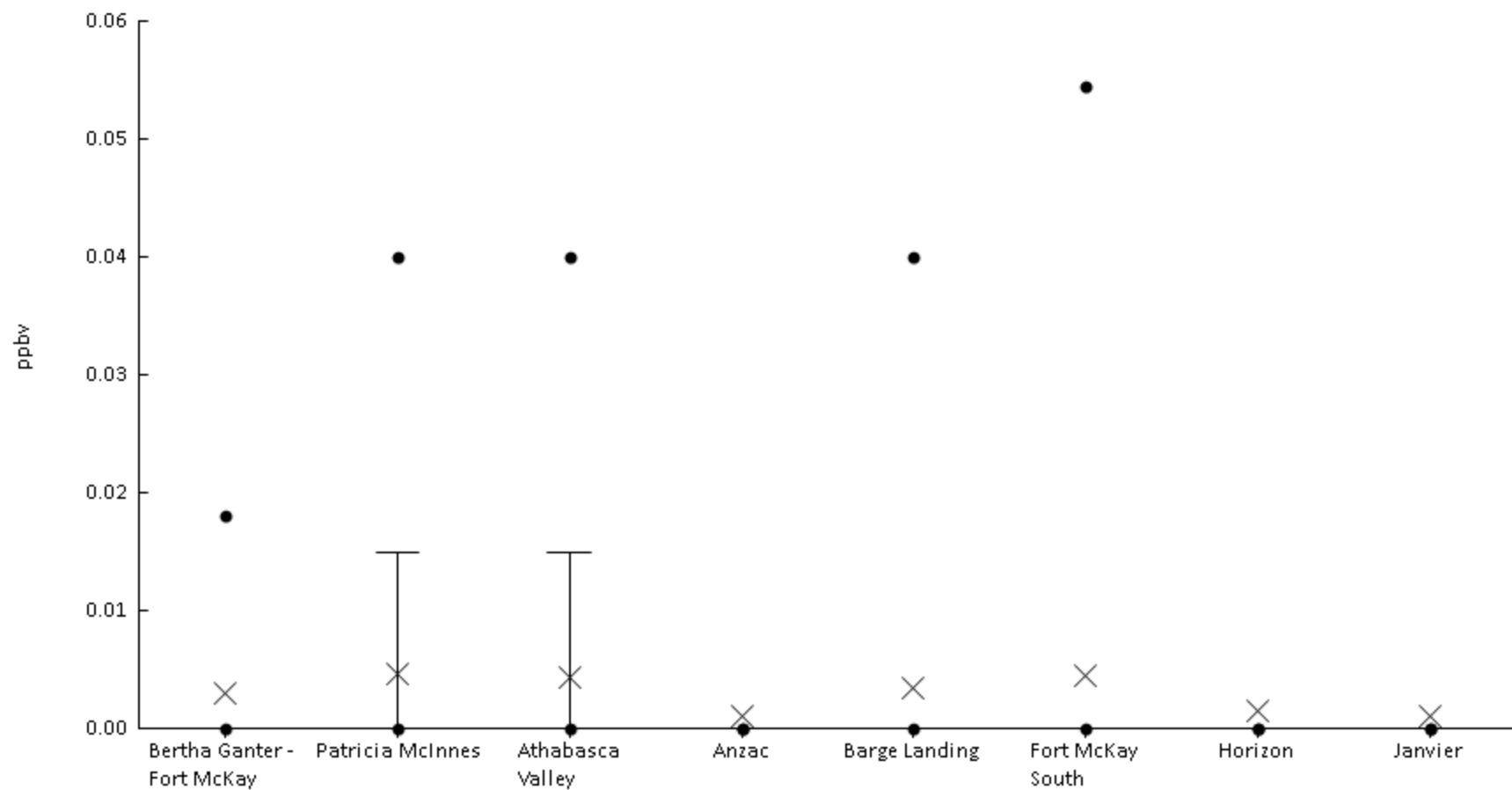
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	89%	0	0	0	0.085	0.22	0.34	0.54	1.1	3.8	0.32	0.52
AMS06	Patricia McInnes	60	87%	0	0	0	0.07	0.12	0.16	0.28	0.31	0.42	0.13	0.097
AMS07	Athabasca Valley	60	85%	0	0	0	0.07	0.12	0.17	0.25	0.34	0.36	0.13	0.09
AMS14	Anzac	59	76%	0	0	0	0.033	0.08	0.13	0.18	0.24	0.27	0.089	0.071
AMS09	Barge Landing	61	92%	0	0	0.052	0.12	0.23	0.49	0.96	2	3.4	0.45	0.67
AMS13	Fort McKay South	61	93%	0	0	0.052	0.098	0.18	0.29	0.66	0.84	2.1	0.27	0.33
AMS15	Horizon	59	78%	0	0	0	0.053	0.11	0.18	0.53	0.7	0.95	0.17	0.21
AMS22	Janvier	60	67%	0	0	0	0	0.07	0.11	0.13	0.19	0.66	0.075	0.095





Volatile Organic Compounds - 3-Methyl-1-butene (ppbv) - 2019

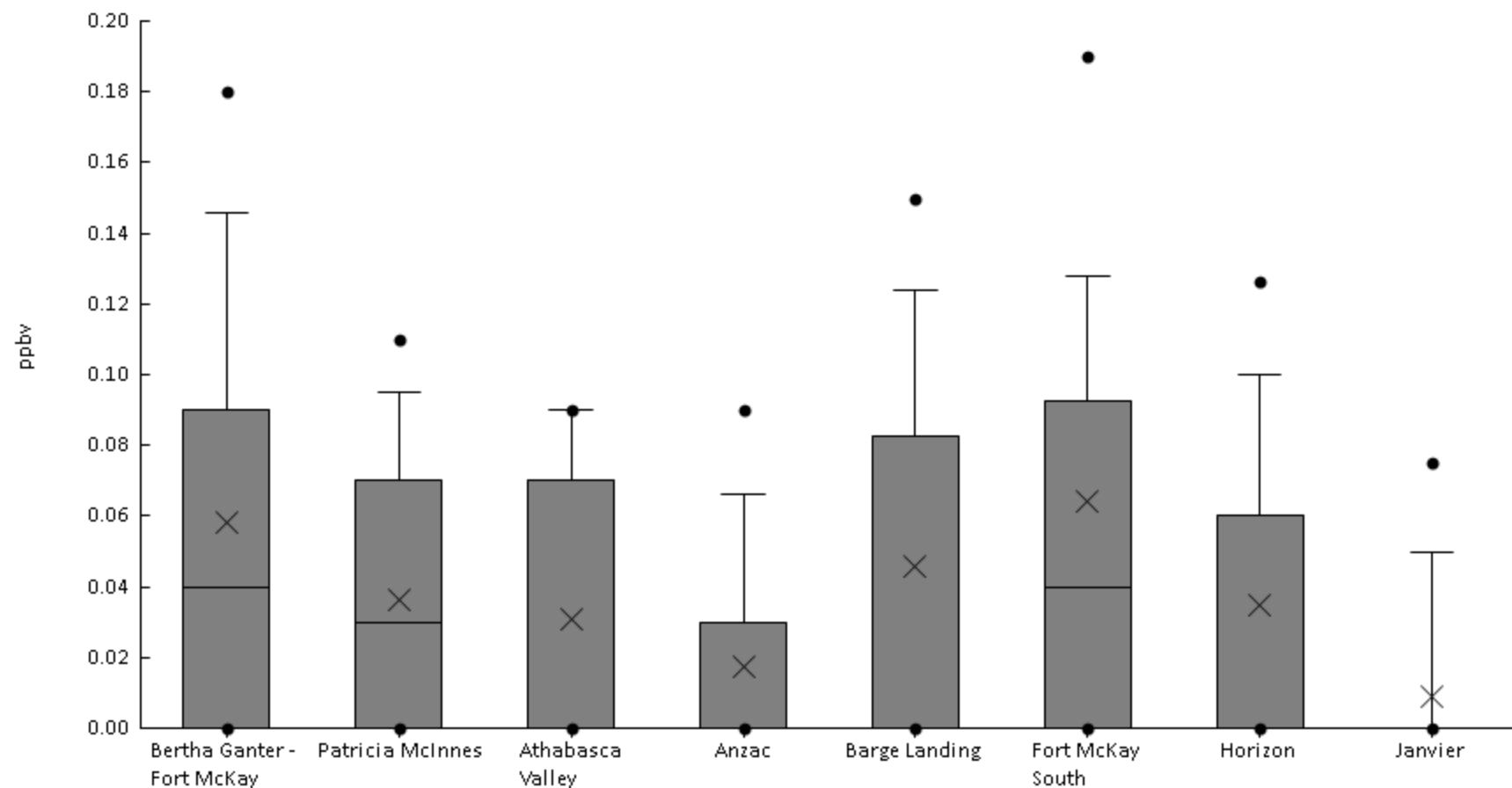
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	5%	0	0	0	0	0	0	0.018	0.08	3E-3	0.014	
AMS06	Patricia McInnes	60	10%	0	0	0	0	0	0	0.015	0.04	0.08	4.7E-3	0.015
AMS07	Athabasca Valley	60	10%	0	0	0	0	0	0	0.015	0.04	0.06	4.3E-3	0.013
AMS14	Anzac	59	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.8E-3
AMS09	Barge Landing	61	7%	0	0	0	0	0	0	0	0.04	0.07	3.4E-3	0.014
AMS13	Fort McKay South	61	8%	0	0	0	0	0	0	0	0.055	0.07	4.4E-3	0.015
AMS15	Horizon	59	3%	0	0	0	0	0	0	0	0	0.06	1.5E-3	8.7E-3
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.7E-3





Volatile Organic Compounds - 3-Methylheptane (ppbv) - 2019

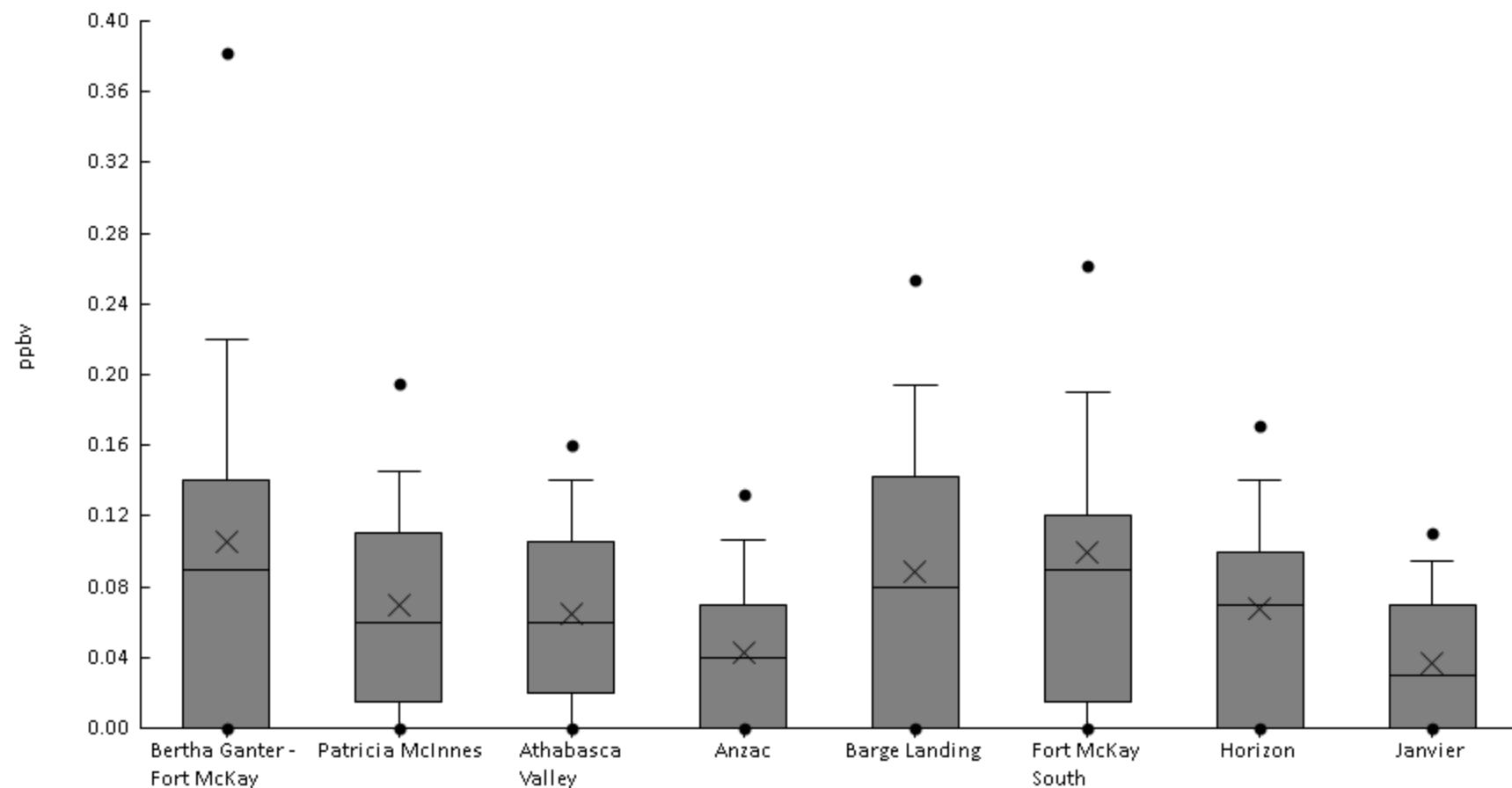
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	54%	0	0	0	0	0.04	0.09	0.15	0.18	0.45	0.058	0.081
AMS06	Patricia McInnes	60	52%	0	0	0	0	0.03	0.07	0.095	0.11	0.12	0.036	0.04
AMS07	Athabasca Valley	60	45%	0	0	0	0	0	0.07	0.09	0.09	0.12	0.031	0.039
AMS14	Anzac	59	29%	0	0	0	0	0	0.03	0.066	0.09	0.1	0.017	0.03
AMS09	Barge Landing	61	49%	0	0	0	0	0	0.083	0.12	0.15	0.21	0.046	0.056
AMS13	Fort McKay South	61	56%	0	0	0	0	0.04	0.093	0.13	0.19	0.71	0.064	0.1
AMS15	Horizon	59	41%	0	0	0	0	0	0.06	0.1	0.13	0.23	0.035	0.051
AMS22	Janvier	60	15%	0	0	0	0	0	0	0.05	0.075	0.09	9.2E-3	0.024





Volatile Organic Compounds - 3-Methylhexane (ppbv) - 2019

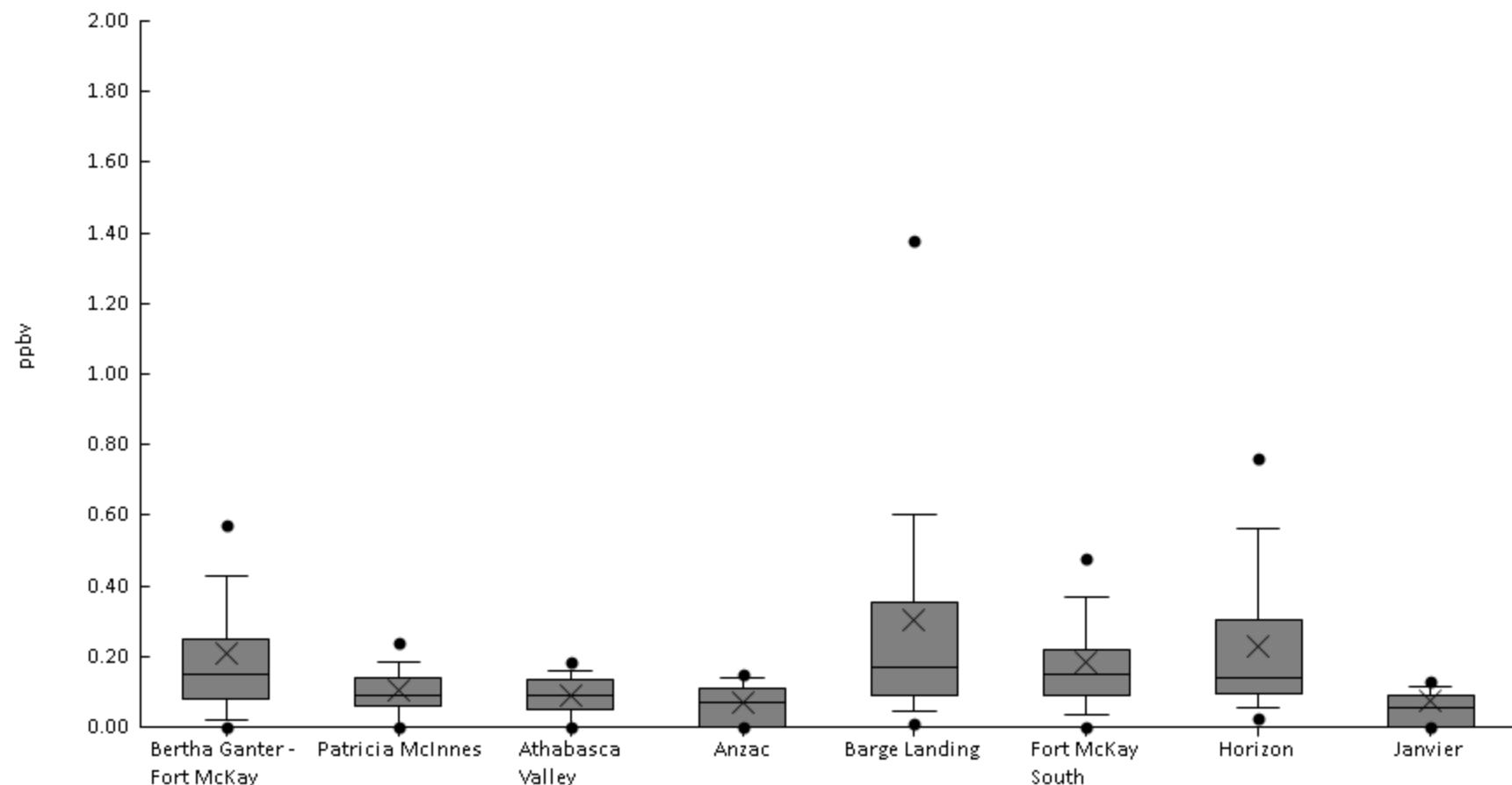
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	72%	0	0	0	0	0.09	0.14	0.22	0.38	0.59	0.11	0.12
AMS06	Patricia McInnes	60	82%	0	0	0	0.015	0.06	0.11	0.15	0.2	0.22	0.069	0.059
AMS07	Athabasca Valley	60	77%	0	0	0	0.02	0.06	0.11	0.14	0.16	0.23	0.065	0.055
AMS14	Anzac	59	61%	0	0	0	0	0.04	0.07	0.11	0.13	0.16	0.043	0.044
AMS09	Barge Landing	61	67%	0	0	0	0	0.08	0.14	0.19	0.25	0.39	0.088	0.09
AMS13	Fort McKay South	61	75%	0	0	0	0.015	0.09	0.12	0.19	0.26	0.76	0.1	0.12
AMS15	Horizon	59	73%	0	0	0	0	0.07	0.1	0.14	0.17	0.38	0.068	0.072
AMS22	Janvier	60	53%	0	0	0	0	0.03	0.07	0.095	0.11	0.17	0.037	0.042





Volatile Organic Compounds - 3-Methylpentane (ppbv) - 2019

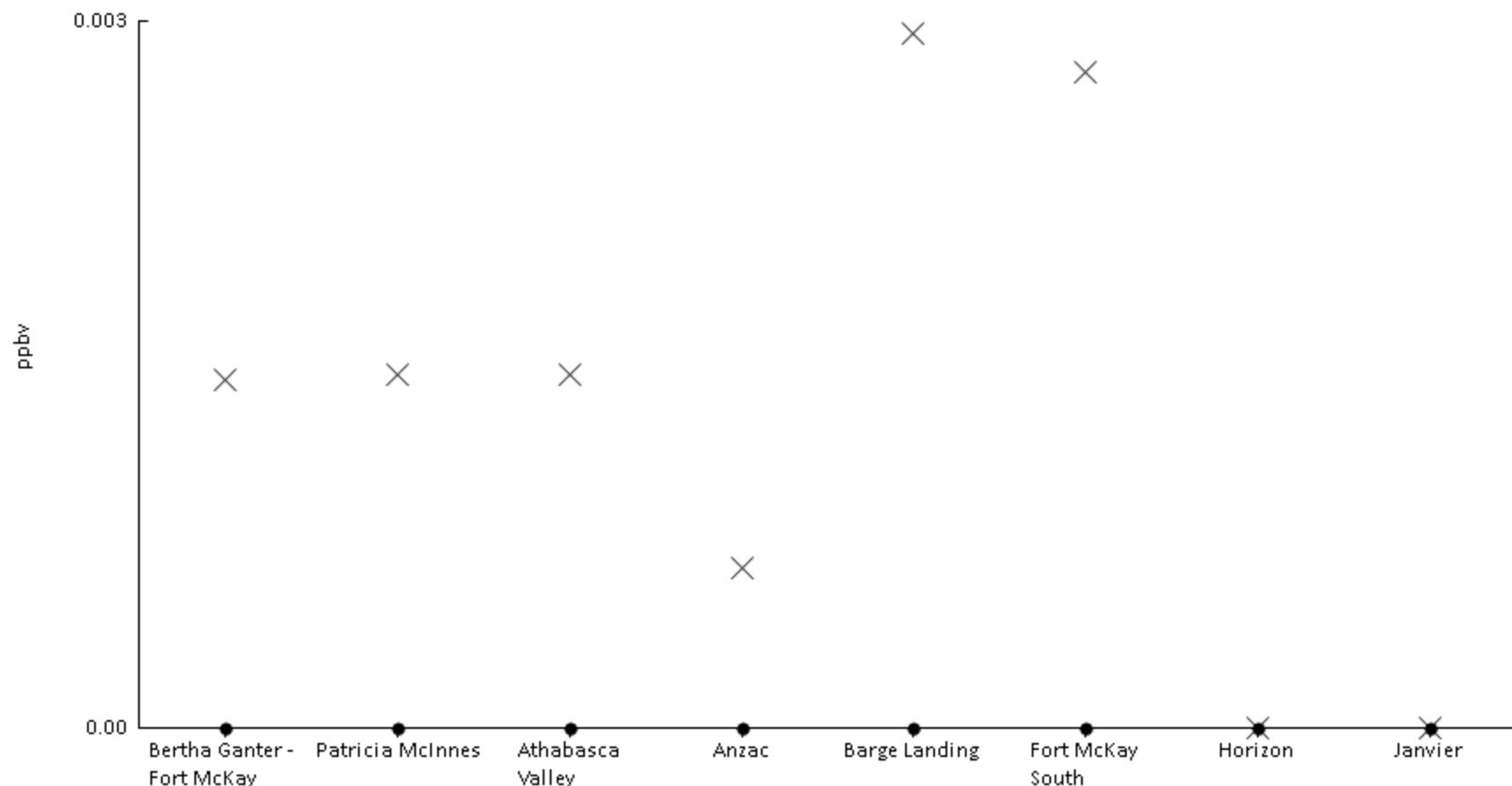
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	0.022	0.078	0.15	0.25	0.43	0.57	1.8	0.21	0.26
AMS06	Patricia McInnes	60	87%	0	0	0	0.06	0.09	0.14	0.19	0.24	0.44	0.1	0.08
AMS07	Athabasca Valley	60	85%	0	0	0	0.05	0.09	0.14	0.16	0.19	0.28	0.091	0.06
AMS14	Anzac	59	73%	0	0	0	0	0.07	0.11	0.14	0.15	0.3	0.071	0.064
AMS09	Barge Landing	61	95%	0	0.011	0.046	0.09	0.17	0.36	0.6	1.4	2	0.31	0.39
AMS13	Fort McKay South	61	93%	0	0	0.036	0.088	0.15	0.22	0.37	0.48	1	0.19	0.17
AMS15	Horizon	59	97%	0	0.025	0.054	0.093	0.14	0.31	0.56	0.76	1.1	0.23	0.23
AMS22	Janvier	60	67%	0	0	0	0	0.055	0.09	0.12	0.13	1.5	0.076	0.19





Volatile Organic Compounds - 4-Methyl-1-pentene (ppbv) - 2019

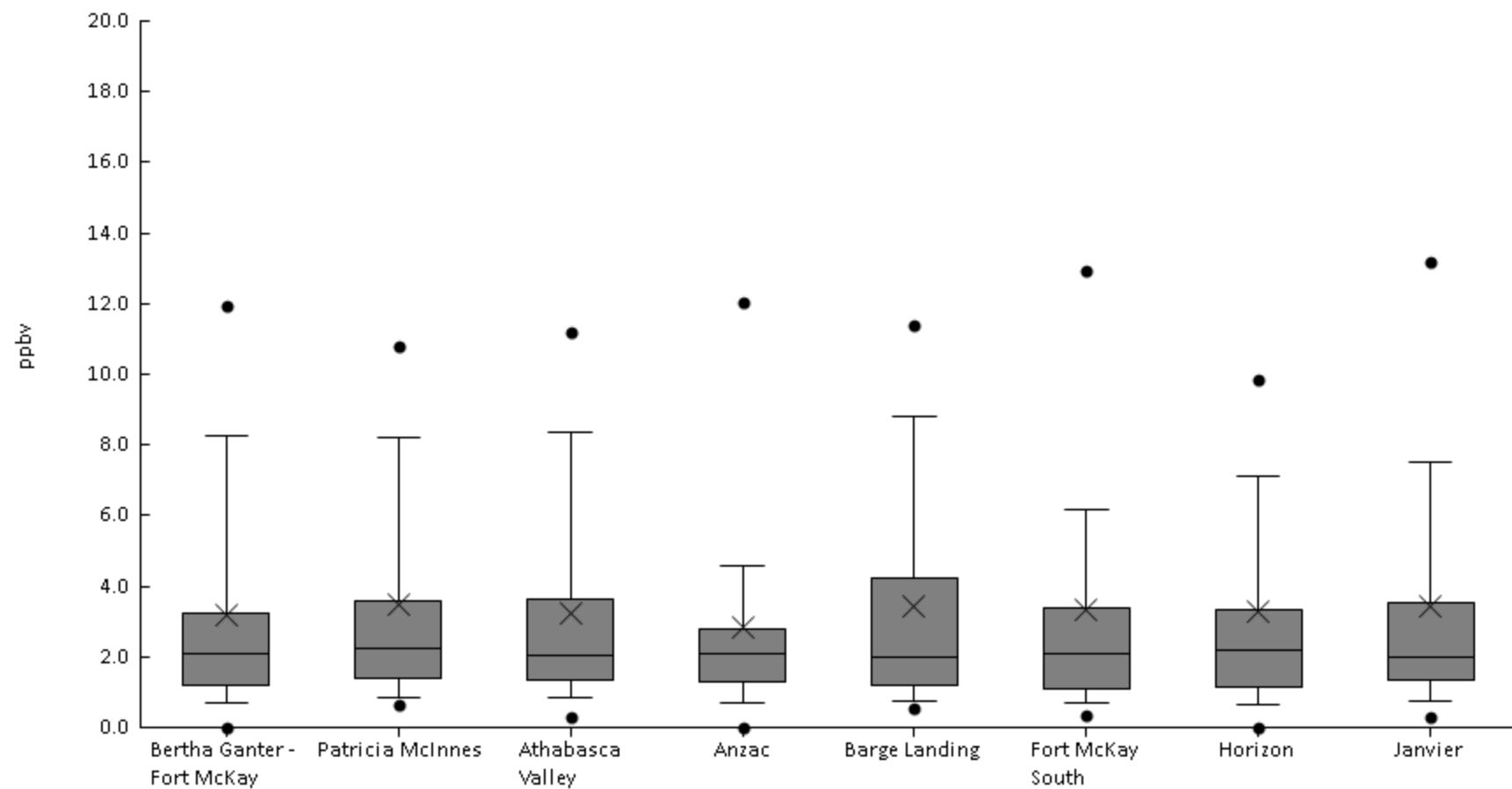
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	2%	0	0	0	0	0	0	0	0	0.09	1.5E-3	0.012
AMS06	Patricia McInnes	60	2%	0	0	0	0	0	0	0	0	0.09	1.5E-3	0.012
AMS07	Athabasca Valley	60	2%	0	0	0	0	0	0	0	0	0.09	1.5E-3	0.012
AMS14	Anzac	59	2%	0	0	0	0	0	0	0	0	0.04	6.8E-4	5.2E-3
AMS09	Barge Landing	61	3%	0	0	0	0	0	0	0	0	0.09	3E-3	0.016
AMS13	Fort McKay South	61	3%	0	0	0	0	0	0	0	0	0.09	2.8E-3	0.015
AMS15	Horizon	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	60	0%	0	0	0	0	0	0	0	0	0	0	0





Volatile Organic Compounds - Acetaldehyde (ppbv) - 2019

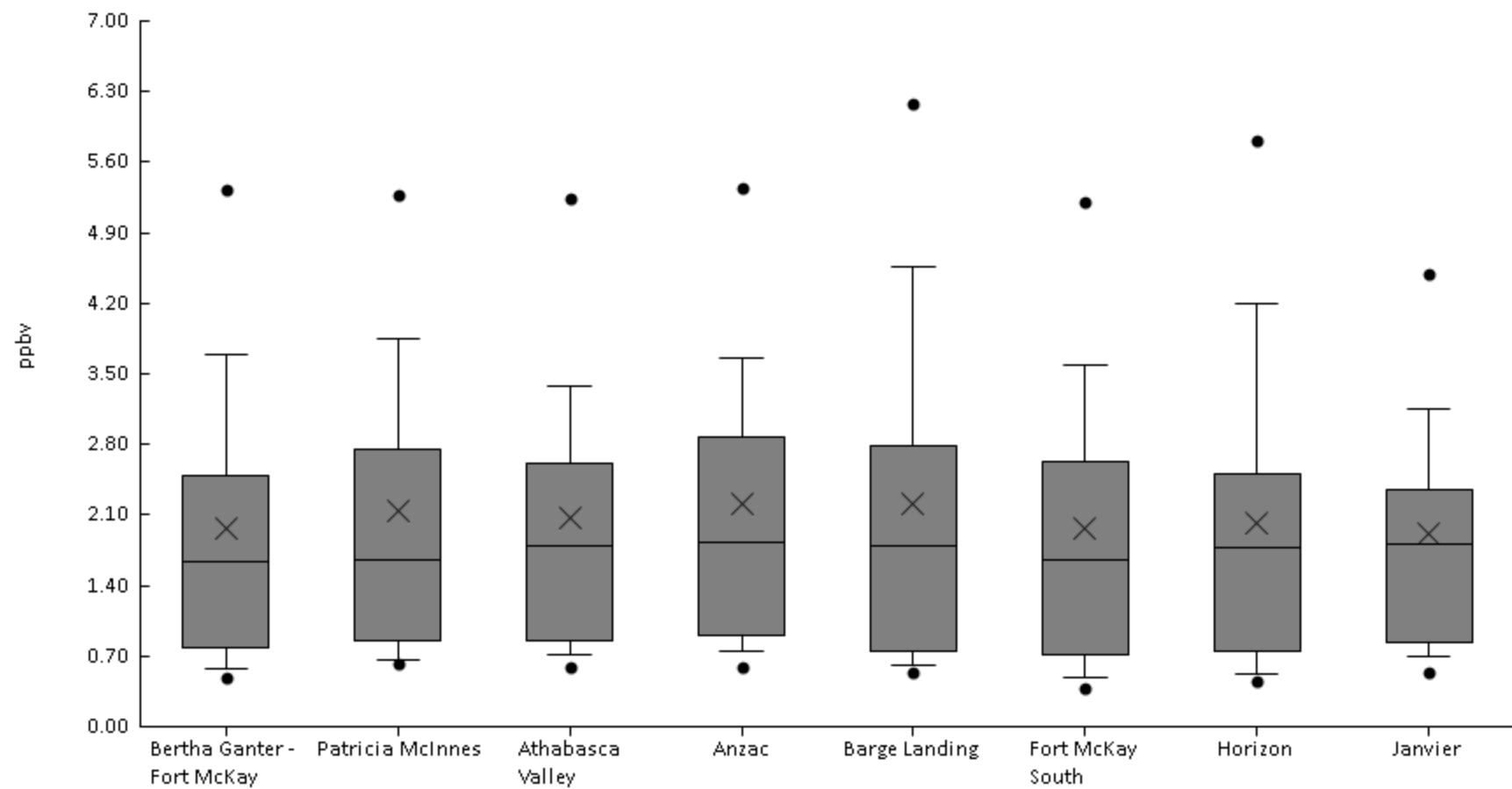
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	0	0.7	1.2	2.1	3.2	8.2	12	18	3.2	3.5
AMS06	Patricia McInnes	60	97%	0	0.65	0.85	1.4	2.3	3.6	8.2	11	20	3.5	3.8
AMS07	Athabasca Valley	60	95%	0	0.3	0.85	1.4	2.1	3.7	8.4	11	15	3.2	3.3
AMS14	Anzac	59	93%	0	0	0.7	1.3	2.1	2.8	4.6	12	14	2.8	3
AMS09	Barge Landing	61	97%	0	0.56	0.76	1.2	2	4.2	8.8	11	15	3.4	3.5
AMS13	Fort McKay South	61	95%	0	0.33	0.7	1.1	2.1	3.4	6.2	13	34	3.3	5
AMS15	Horizon	59	92%	0	0	0.64	1.1	2.2	3.4	7.1	9.9	22	3.3	4.1
AMS22	Janvier	60	95%	0	0.3	0.75	1.4	2	3.6	7.5	13	21	3.4	4.1





Volatile Organic Compounds - Acetone (ppbv) - 2019

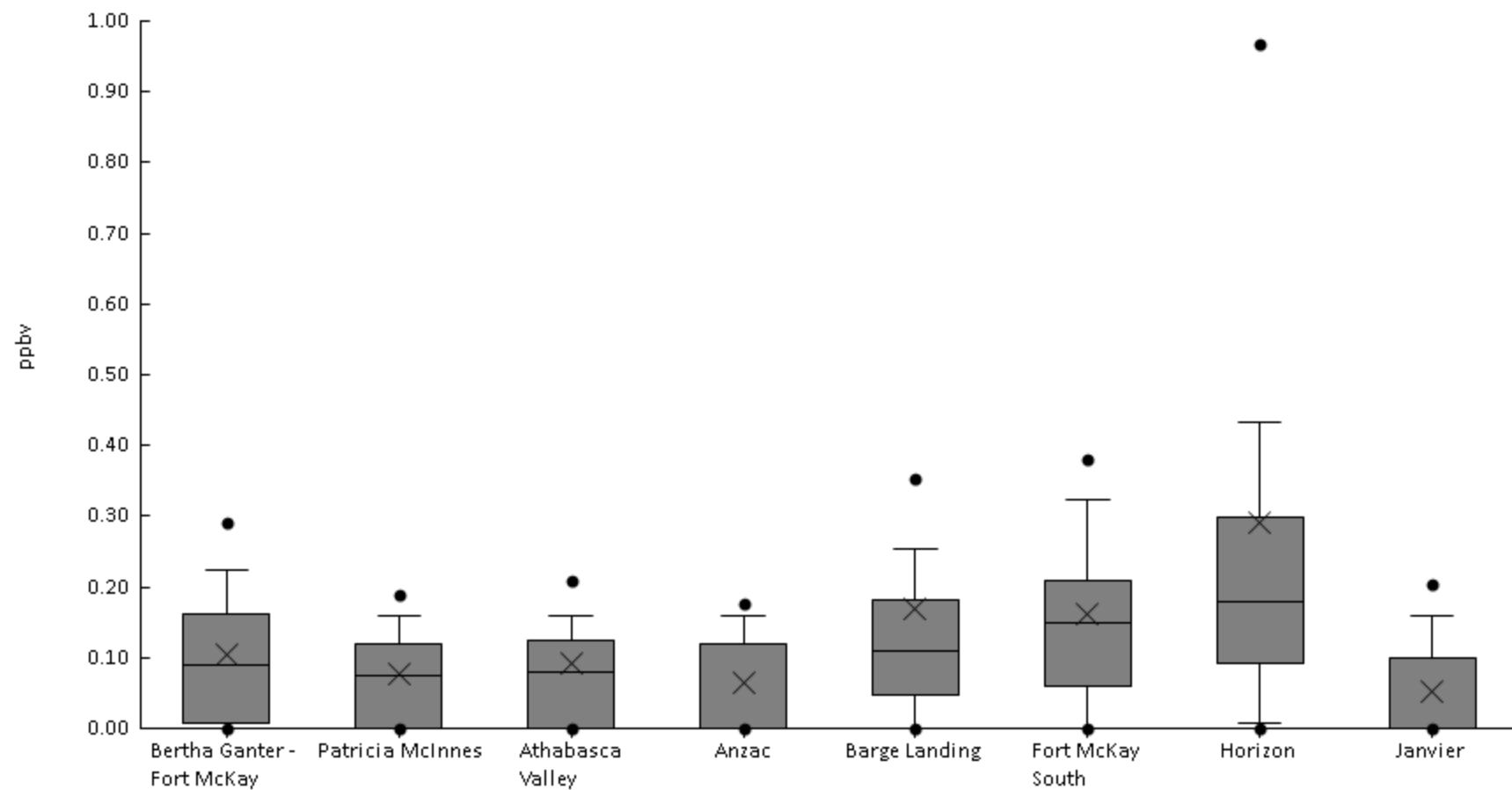
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.38	0.5	0.58	0.79	1.6	2.5	3.7	5.3	8.2	2	1.5
AMS06	Patricia McInnes	60	100%	0.42	0.63	0.67	0.86	1.7	2.8	3.8	5.3	11	2.1	1.8
AMS07	Athabasca Valley	60	100%	0.49	0.6	0.72	0.85	1.8	2.6	3.4	5.2	11	2.1	1.7
AMS14	Anzac	59	100%	0.47	0.59	0.75	0.9	1.8	2.9	3.7	5.3	9	2.2	1.7
AMS09	Barge Landing	61	100%	0.45	0.53	0.6	0.75	1.8	2.8	4.6	6.2	7	2.2	1.7
AMS13	Fort McKay South	61	100%	0.34	0.39	0.49	0.72	1.7	2.6	3.6	5.2	11	2	1.7
AMS15	Horizon	59	100%	0.33	0.45	0.52	0.75	1.8	2.5	4.2	5.8	7.6	2	1.6
AMS22	Janvier	60	100%	0.44	0.55	0.7	0.84	1.8	2.3	3.2	4.5	8.9	1.9	1.4





Volatile Organic Compounds - alpha-Pinene (ppbv) - 2019

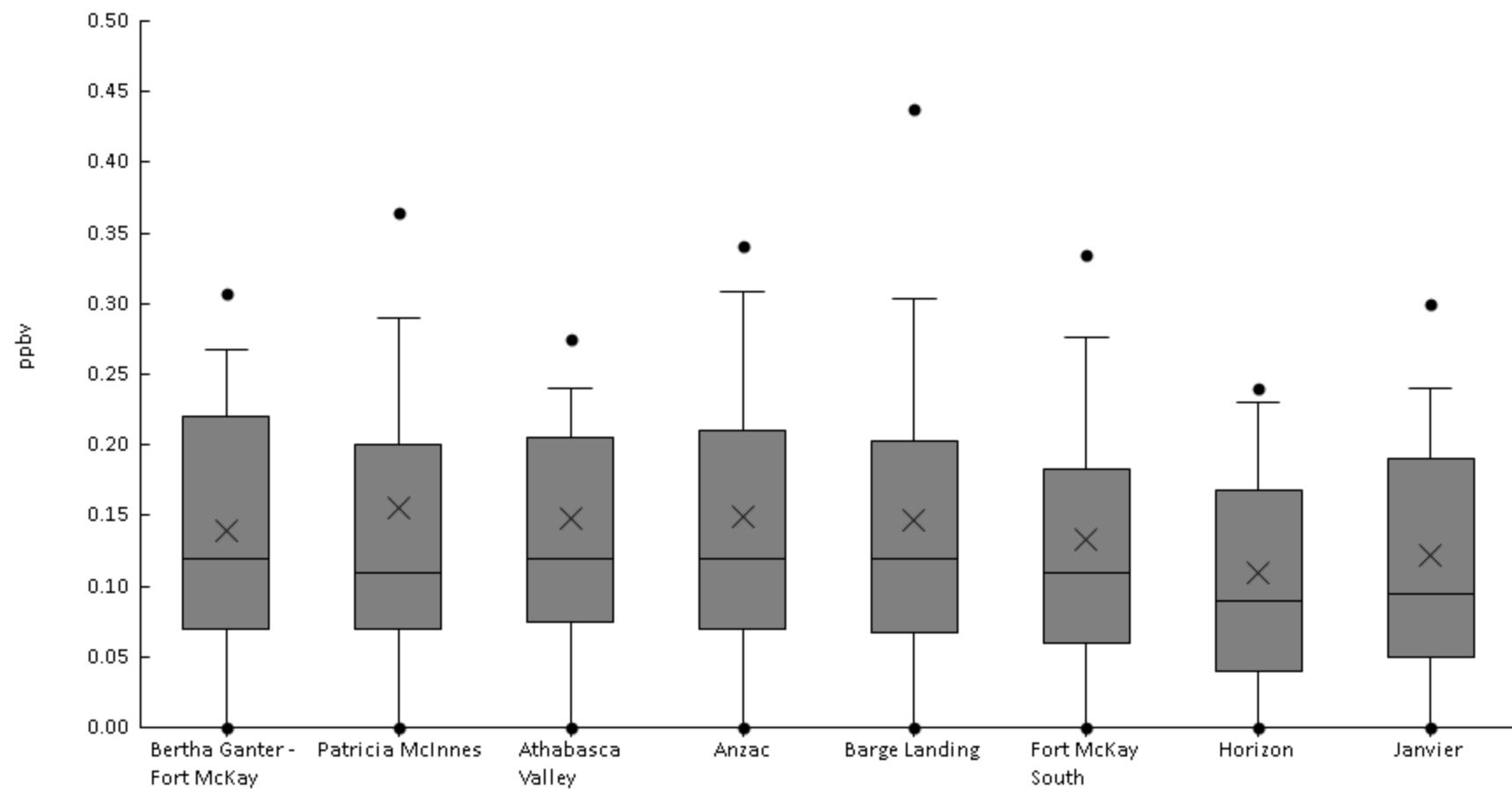
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	75%	0	0	0	7.5E-3	0.09	0.16	0.22	0.29	0.34	0.1	0.092
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.075	0.12	0.16	0.19	0.46	0.078	0.083
AMS07	Athabasca Valley	60	72%	0	0	0	0	0.08	0.13	0.16	0.21	0.78	0.092	0.12
AMS14	Anzac	59	46%	0	0	0	0	0	0.12	0.16	0.18	0.89	0.065	0.13
AMS09	Barge Landing	61	80%	0	0	0	0.048	0.11	0.18	0.25	0.35	3.2	0.17	0.41
AMS13	Fort McKay South	61	89%	0	0	0	0.06	0.15	0.21	0.32	0.38	0.77	0.16	0.15
AMS15	Horizon	59	90%	0	0	8E-3	0.093	0.18	0.3	0.43	0.97	2.7	0.29	0.5
AMS22	Janvier	60	42%	0	0	0	0	0	0.1	0.16	0.21	0.26	0.051	0.073





Volatile Organic Compounds - Benzene (ppbv) - 2019

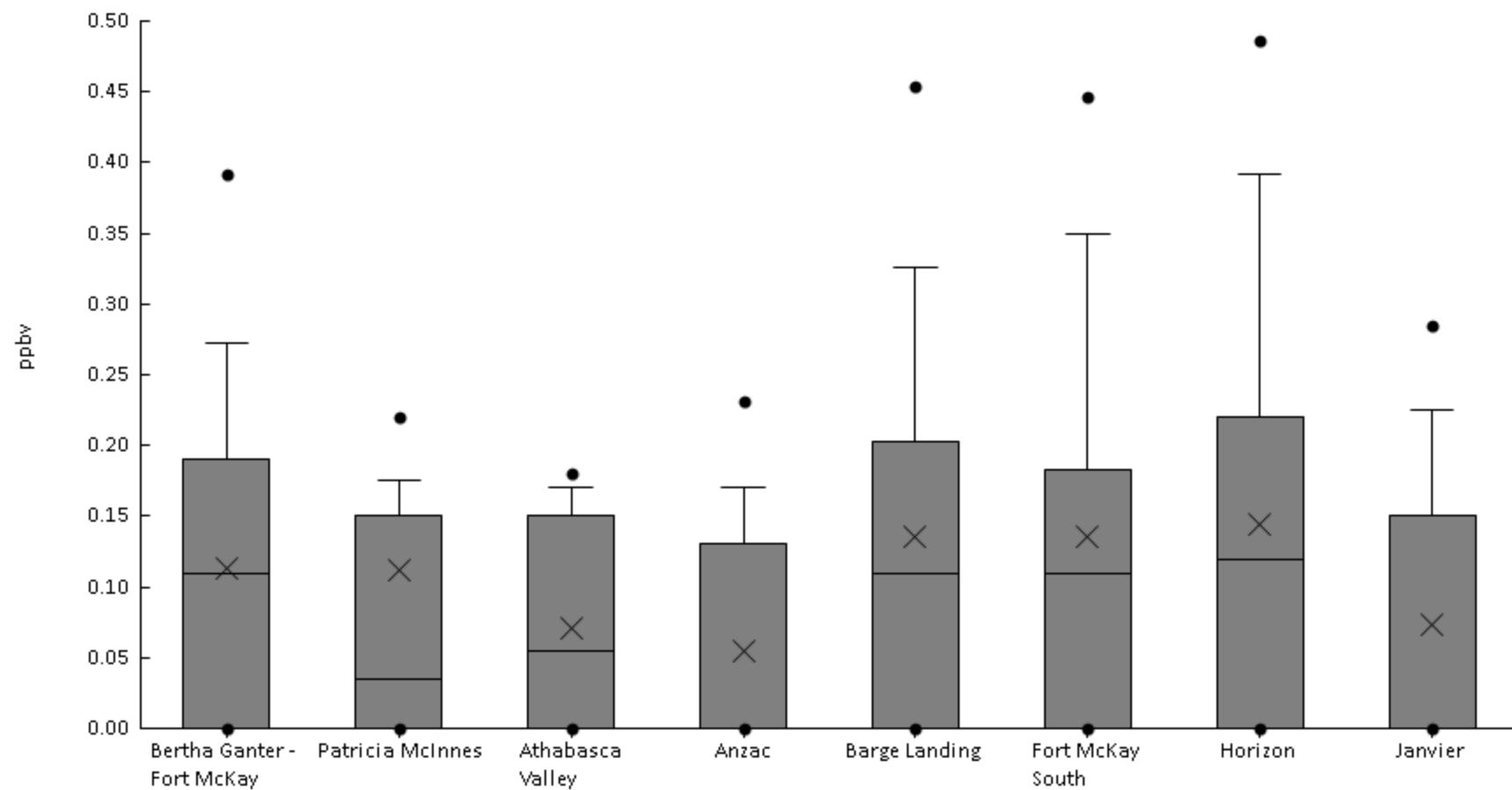
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	0.07	0.12	0.22	0.27	0.31	0.5	0.14	0.11
AMS06	Patricia McInnes	60	85%	0	0	0	0.07	0.11	0.2	0.29	0.37	1.4	0.16	0.19
AMS07	Athabasca Valley	60	85%	0	0	0	0.075	0.12	0.21	0.24	0.28	1.4	0.15	0.18
AMS14	Anzac	59	85%	0	0	0	0.07	0.12	0.21	0.31	0.34	0.98	0.15	0.16
AMS09	Barge Landing	61	84%	0	0	0	0.068	0.12	0.2	0.3	0.44	0.54	0.15	0.13
AMS13	Fort McKay South	61	84%	0	0	0	0.06	0.11	0.18	0.28	0.33	0.46	0.13	0.1
AMS15	Horizon	59	80%	0	0	0	0.04	0.09	0.17	0.23	0.24	0.4	0.11	0.092
AMS22	Janvier	60	80%	0	0	0	0.05	0.095	0.19	0.24	0.3	0.43	0.12	0.1





Volatile Organic Compounds - beta-Pinene (ppbv) - 2019

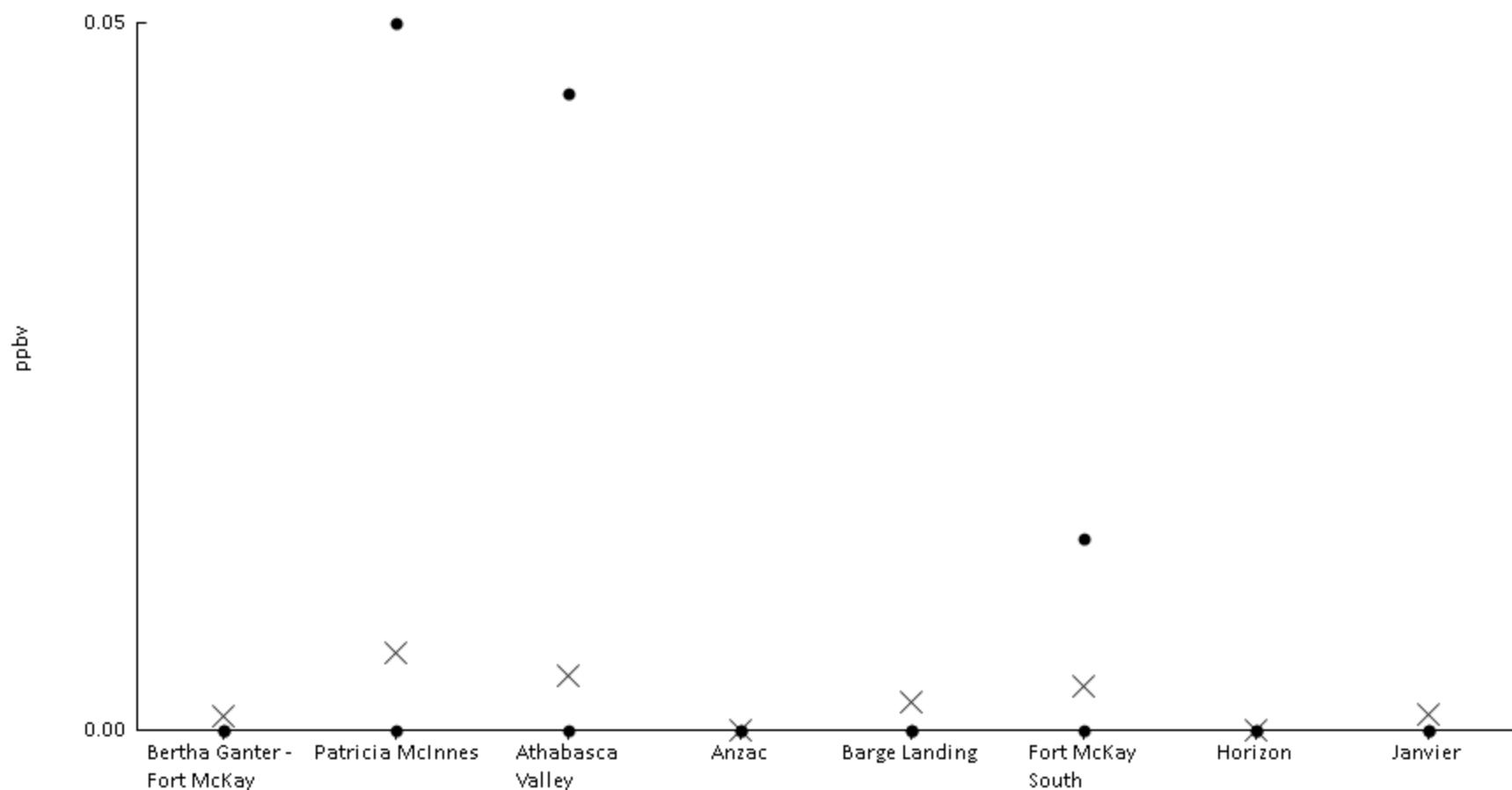
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	0	0	0	0	0.11	0.19	0.27	0.39	0.48	0.11	0.13
AMS06	Patricia McInnes	60	52%	0	0	0	0	0.035	0.15	0.18	0.22	2.6	0.11	0.34
AMS07	Athabasca Valley	60	55%	0	0	0	0	0.055	0.15	0.17	0.18	0.19	0.071	0.073
AMS14	Anzac	59	32%	0	0	0	0	0	0.13	0.17	0.23	0.33	0.055	0.09
AMS09	Barge Landing	61	62%	0	0	0	0	0.11	0.2	0.33	0.45	1.1	0.14	0.18
AMS13	Fort McKay South	61	64%	0	0	0	0	0.11	0.18	0.35	0.45	0.82	0.14	0.16
AMS15	Horizon	59	64%	0	0	0	0	0.12	0.22	0.39	0.49	0.62	0.14	0.16
AMS22	Janvier	60	43%	0	0	0	0	0	0.15	0.23	0.29	0.37	0.073	0.1





Volatile Organic Compounds - cis-2-Butene (ppbv) - 2019

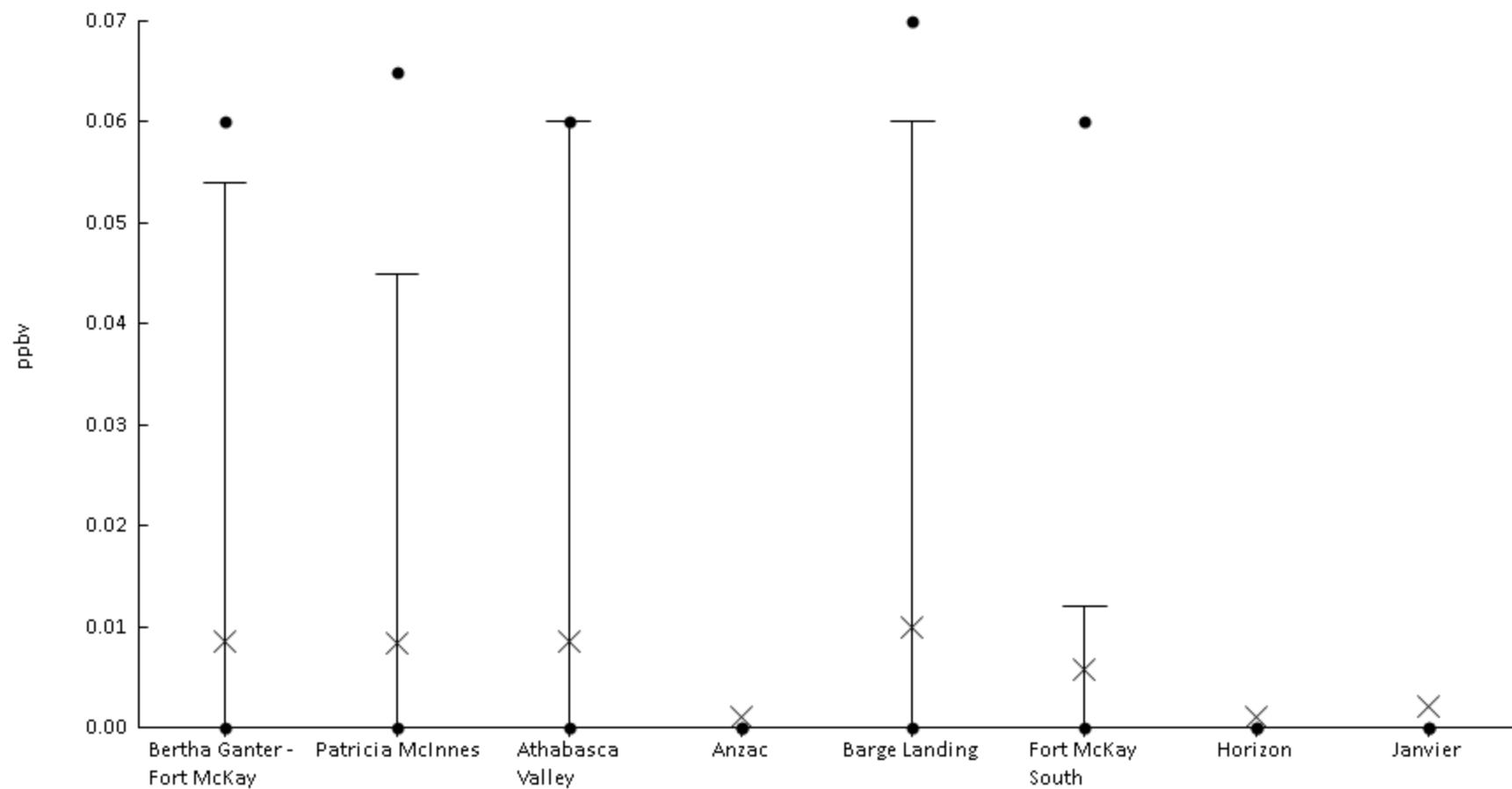
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	2%	0	0	0	0	0	0	0	0	0.06	9.8E-4	7.7E-3
AMS06	Patricia McInnes	60	8%	0	0	0	0	0	0	0	0.05	0.1	5.5E-3	0.02
AMS07	Athabasca Valley	60	8%	0	0	0	0	0	0	0	0.045	0.06	3.8E-3	0.013
AMS14	Anzac	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	61	3%	0	0	0	0	0	0	0	0	0.06	2E-3	0.011
AMS13	Fort McKay South	61	5%	0	0	0	0	0	0	0	0.013	0.1	3.1E-3	0.015
AMS15	Horizon	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.07	1.2E-3	9E-3





Volatile Organic Compounds - cis-2-Hexene (ppbv) - 2019

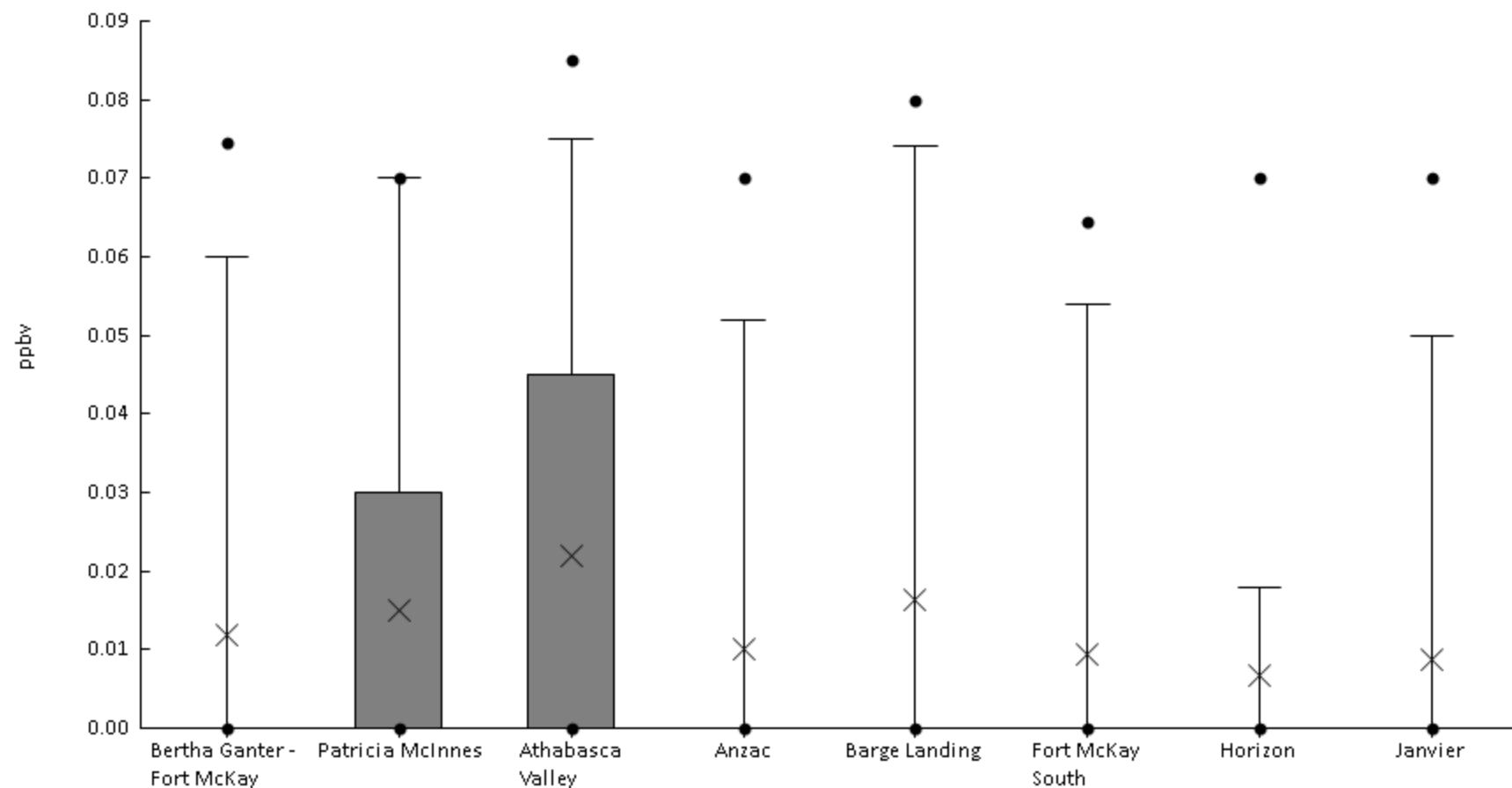
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	15%	0	0	0	0	0	0.054	0.06	0.06	0.1	8.5E-3	0.022
AMS06	Patricia McInnes	60	13%	0	0	0	0	0	0	0.045	0.065	0.11	8.3E-3	0.023
AMS07	Athabasca Valley	60	13%	0	0	0	0	0	0	0.06	0.06	0.1	8.5E-3	0.023
AMS14	Anzac	59	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.8E-3
AMS09	Barge Landing	61	16%	0	0	0	0	0	0	0.06	0.07	0.1	0.01	0.024
AMS13	Fort McKay South	61	10%	0	0	0	0	0	0	0.012	0.06	0.1	5.7E-3	0.019
AMS15	Horizon	59	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.8E-3
AMS22	Janvier	60	3%	0	0	0	0	0	0	0	0	0.1	2.2E-3	0.013





Volatile Organic Compounds - cis-2-Pentene (ppbv) - 2019

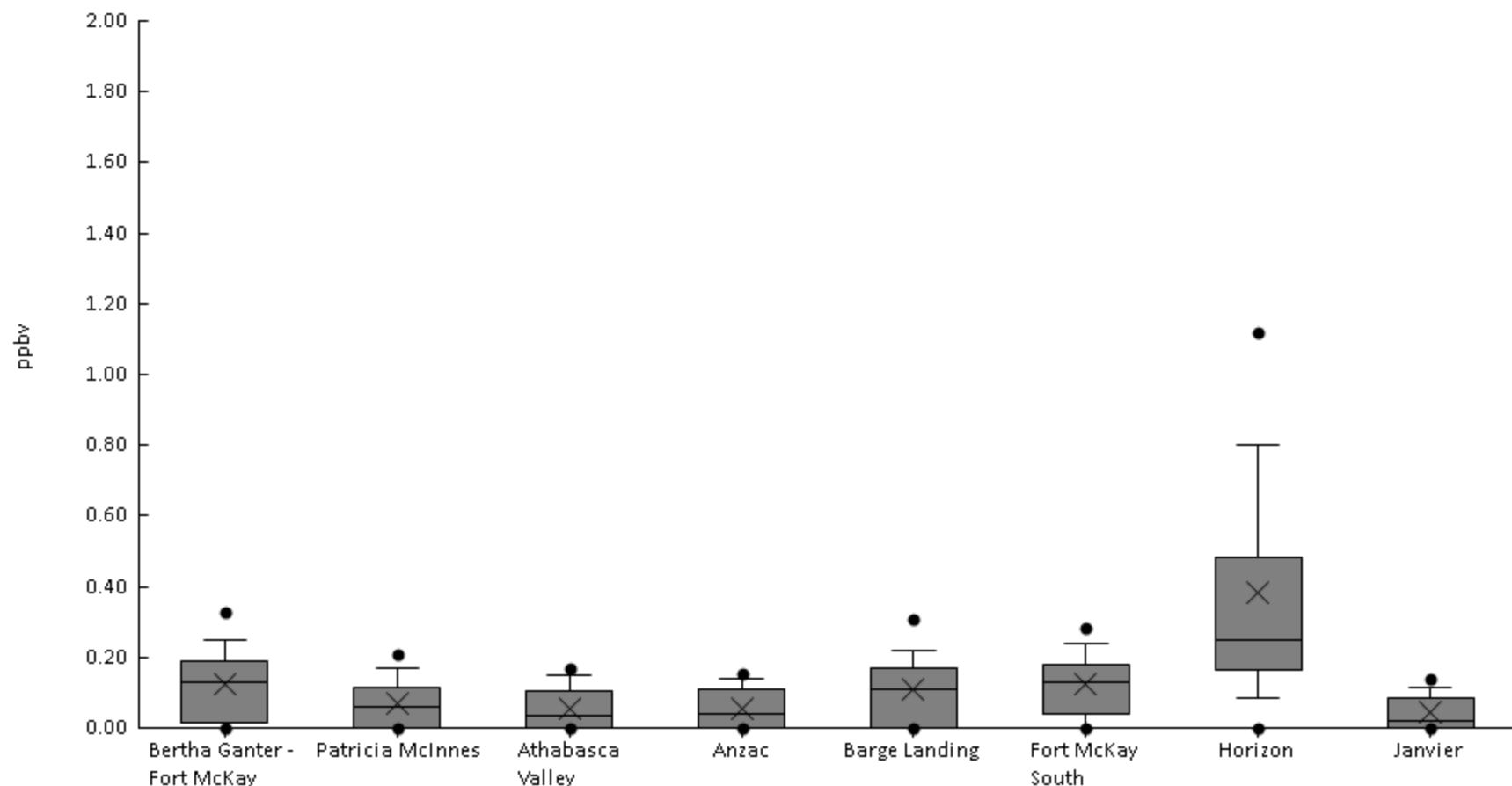
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	21%	0	0	0	0	0	0	0.06	0.075	0.08	0.012	0.025
AMS06	Patricia McInnes	60	27%	0	0	0	0	0	0.03	0.07	0.07	0.08	0.015	0.027
AMS07	Athabasca Valley	60	30%	0	0	0	0	0	0.045	0.075	0.085	0.23	0.022	0.041
AMS14	Anzac	59	15%	0	0	0	0	0	0	0.052	0.07	0.14	0.01	0.028
AMS09	Barge Landing	61	23%	0	0	0	0	0	0	0.074	0.08	0.23	0.016	0.038
AMS13	Fort McKay South	61	16%	0	0	0	0	0	0	0.054	0.064	0.11	9.5E-3	0.023
AMS15	Horizon	59	10%	0	0	0	0	0	0	0.018	0.07	0.09	6.6E-3	0.021
AMS22	Janvier	60	15%	0	0	0	0	0	0	0.05	0.07	0.09	8.8E-3	0.023





Volatile Organic Compounds - Cyclohexane (ppbv) - 2019

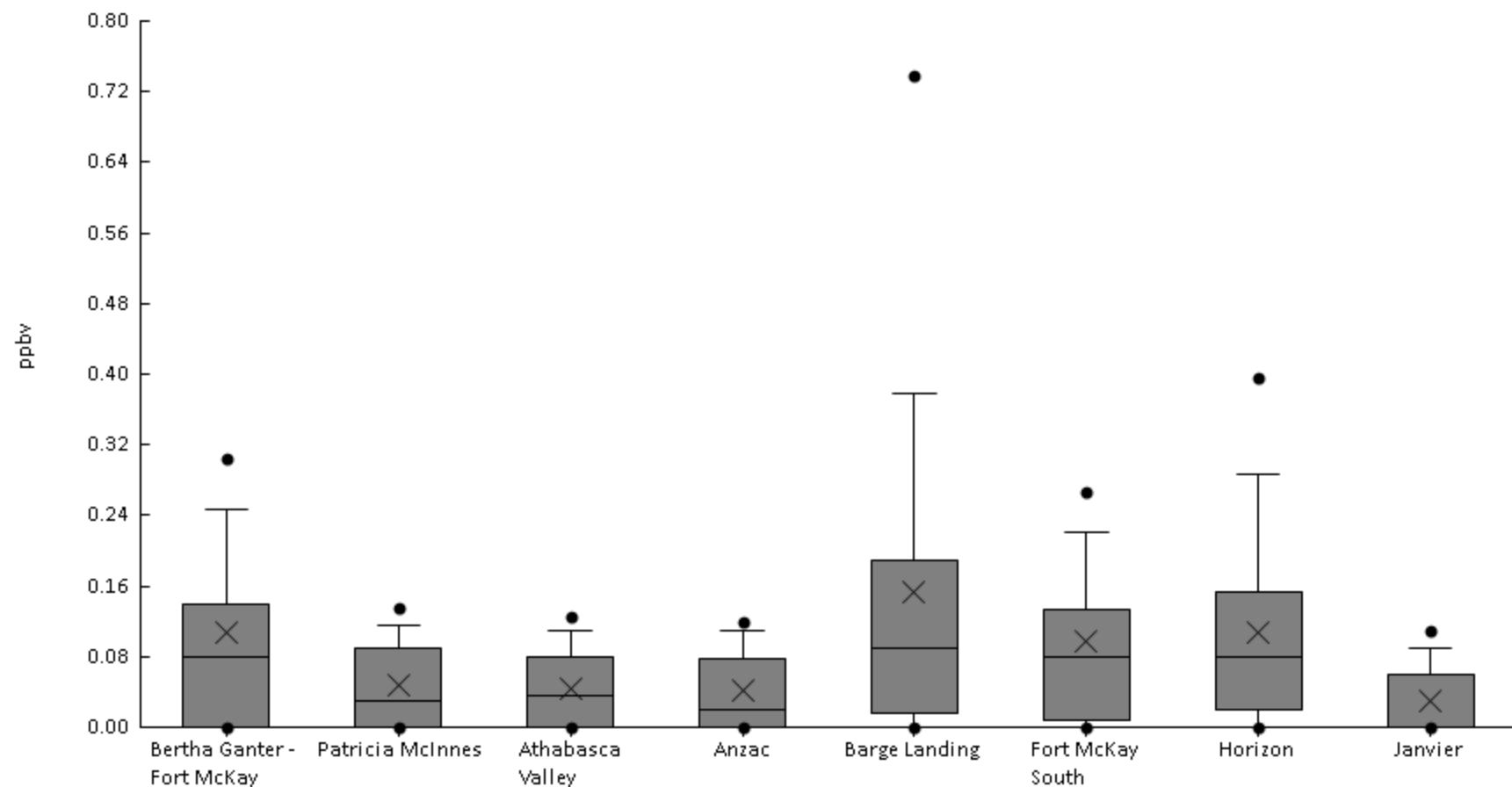
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	75%	0	0	0	0.015	0.13	0.19	0.25	0.33	0.47	0.12	0.11
AMS06	Patricia McInnes	60	58%	0	0	0	0	0.06	0.12	0.17	0.21	0.27	0.068	0.074
AMS07	Athabasca Valley	60	57%	0	0	0	0	0.035	0.11	0.15	0.17	0.27	0.057	0.064
AMS14	Anzac	59	56%	0	0	0	0	0.04	0.11	0.14	0.16	0.18	0.055	0.059
AMS09	Barge Landing	61	69%	0	0	0	0	0.11	0.17	0.22	0.31	0.49	0.11	0.11
AMS13	Fort McKay South	61	77%	0	0	0	0.04	0.13	0.18	0.24	0.28	0.45	0.12	0.097
AMS15	Horizon	59	92%	0	0	0.084	0.16	0.25	0.49	0.8	1.1	1.9	0.38	0.38
AMS22	Janvier	60	53%	0	0	0	0	0.02	0.085	0.12	0.14	0.17	0.045	0.052





Volatile Organic Compounds - Cyclopentane (ppbv) - 2019

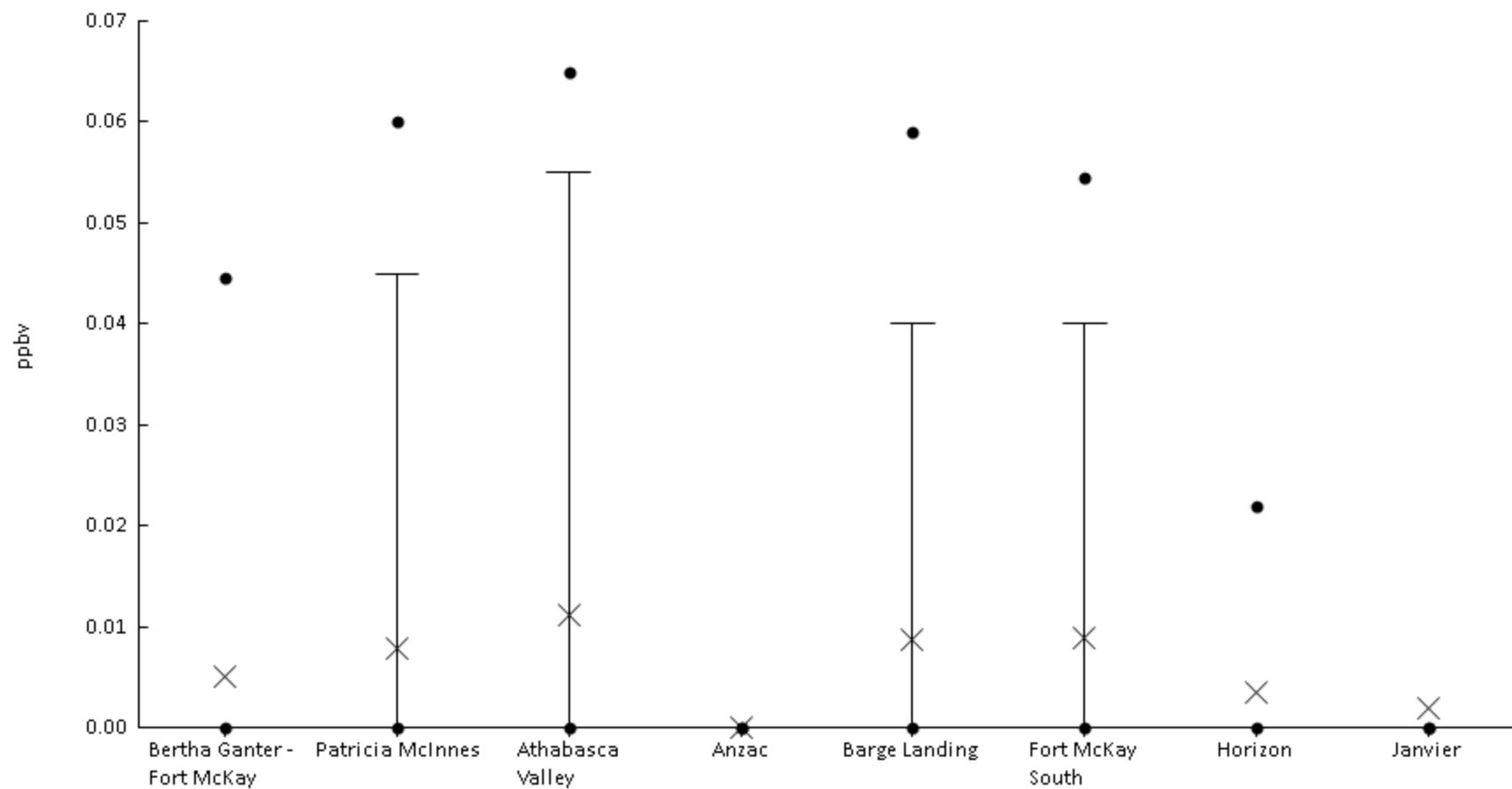
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	74%	0	0	0	0	0.08	0.14	0.25	0.3	0.87	0.11	0.14
AMS06	Patricia McInnes	60	58%	0	0	0	0	0.03	0.09	0.12	0.14	0.17	0.047	0.049
AMS07	Athabasca Valley	60	58%	0	0	0	0	0.035	0.08	0.11	0.13	0.14	0.045	0.046
AMS14	Anzac	59	51%	0	0	0	0	0.02	0.078	0.11	0.12	0.23	0.041	0.051
AMS09	Barge Landing	61	75%	0	0	0	0.015	0.09	0.19	0.38	0.74	0.89	0.15	0.2
AMS13	Fort McKay South	61	75%	0	0	0	7.5E-3	0.08	0.13	0.22	0.27	0.55	0.097	0.1
AMS15	Horizon	59	78%	0	0	0	0.02	0.08	0.15	0.29	0.4	0.44	0.11	0.12
AMS22	Janvier	60	45%	0	0	0	0	0	0.06	0.09	0.11	0.12	0.03	0.038





Volatile Organic Compounds - Cyclopentene (ppbv) - 2019

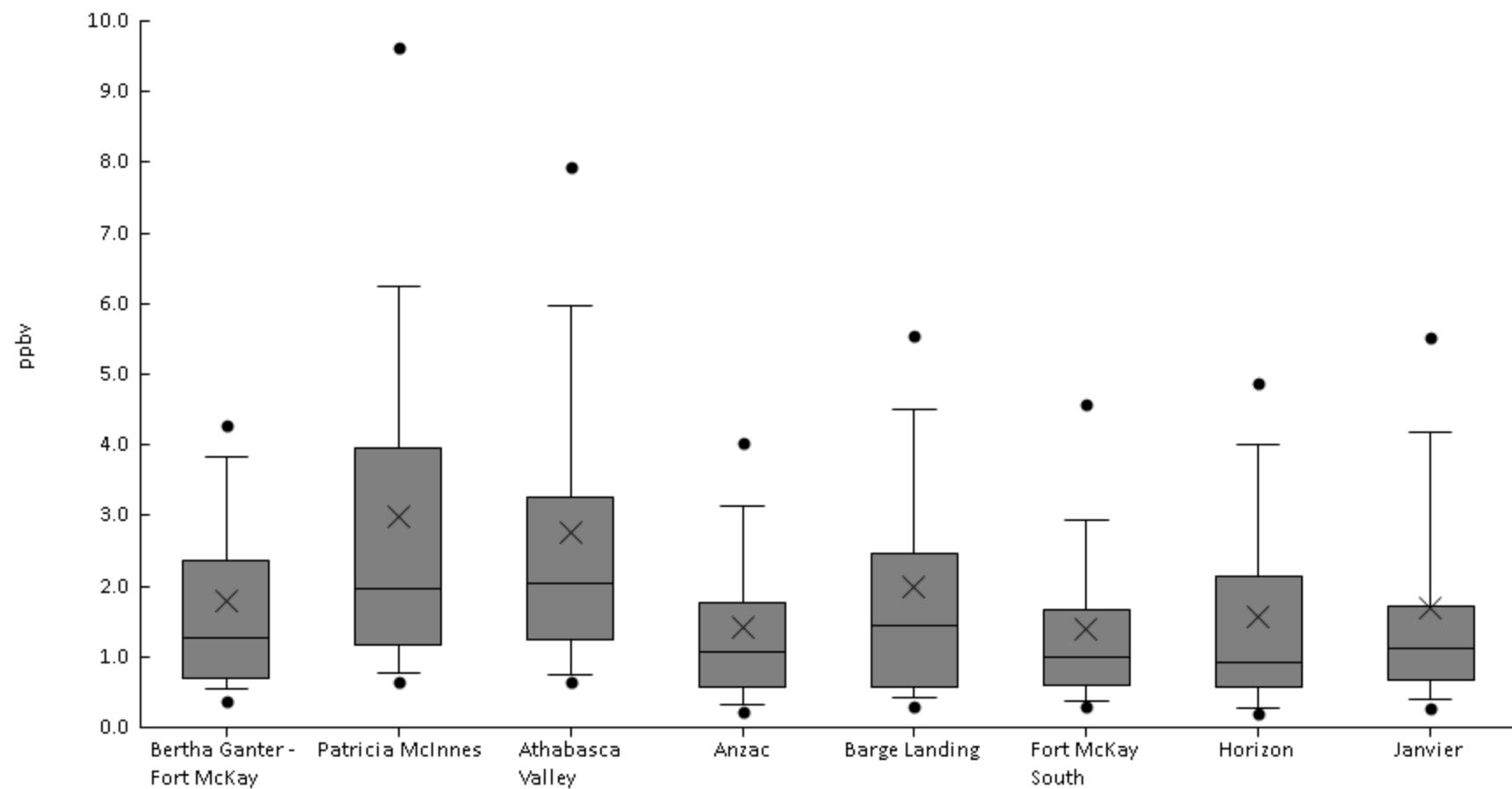
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	8%	0	0	0	0	0	0	0	0.045	0.12	5.1E-3	0.019
AMS06	Patricia McInnes	60	13%	0	0	0	0	0	0	0.045	0.06	0.12	7.8E-3	0.022
AMS07	Athabasca Valley	60	18%	0	0	0	0	0	0	0.055	0.065	0.12	0.011	0.026
AMS14	Anzac	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	61	15%	0	0	0	0	0	0	0.04	0.059	0.12	8.7E-3	0.024
AMS13	Fort McKay South	61	16%	0	0	0	0	0	0	0.04	0.055	0.12	8.9E-3	0.023
AMS15	Horizon	59	5%	0	0	0	0	0	0	0	0.022	0.12	3.6E-3	0.017
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.12	2E-3	0.015





Volatile Organic Compounds - Ethanol (ppbv) - 2019

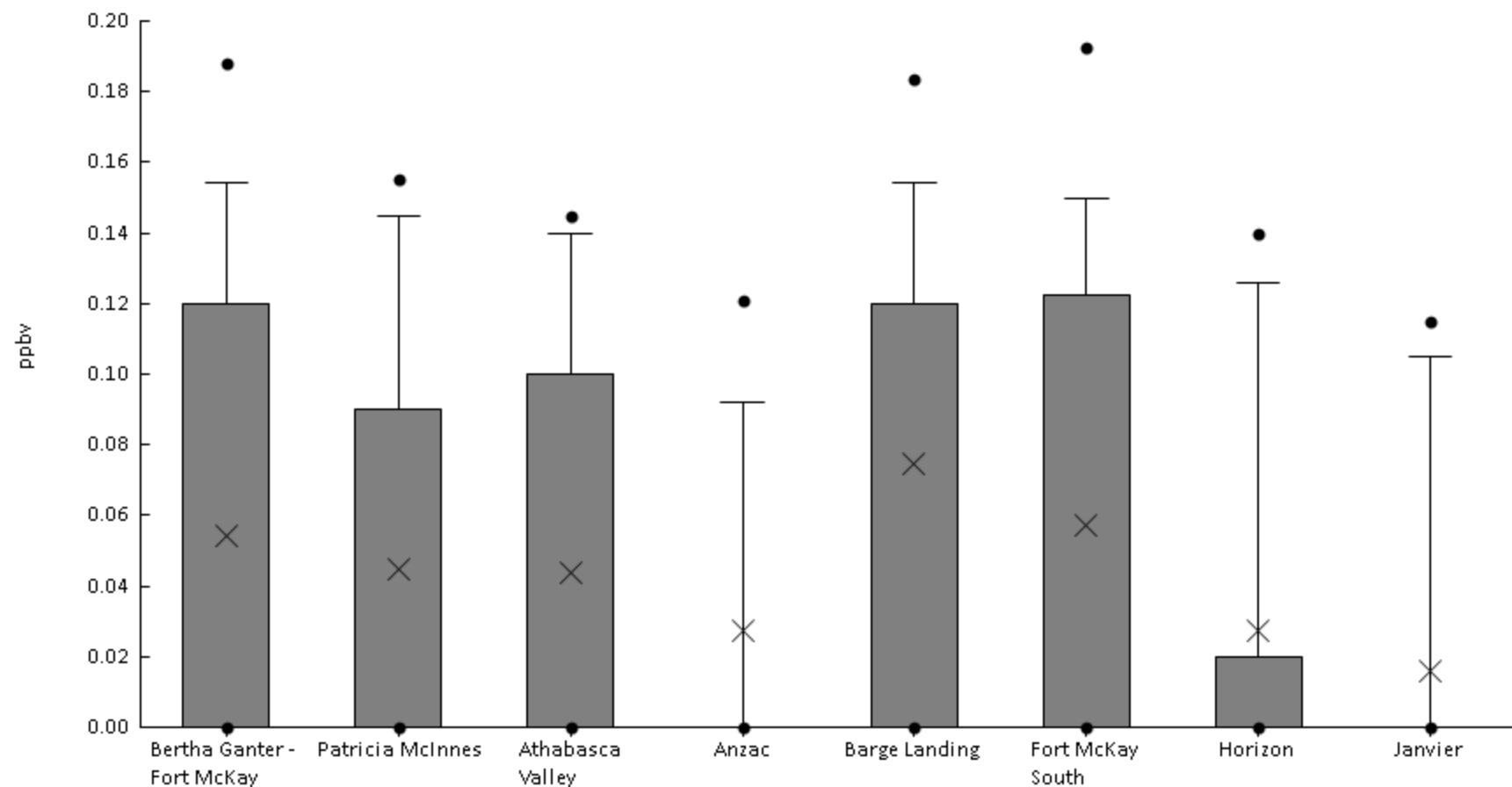
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.22	0.36	0.54	0.7	1.3	2.4	3.8	4.3	9.9	1.8	1.6
AMS06	Patricia McInnes	60	100%	0.18	0.64	0.76	1.2	2	4	6.3	9.6	12	3	2.6
AMS07	Athabasca Valley	60	100%	0.51	0.65	0.75	1.2	2	3.3	6	7.9	12	2.7	2.3
AMS14	Anzac	59	98%	0	0.22	0.31	0.57	1.1	1.8	3.1	4	7	1.4	1.3
AMS09	Barge Landing	61	100%	0.22	0.3	0.42	0.58	1.5	2.5	4.5	5.6	12	2	2
AMS13	Fort McKay South	61	100%	0.11	0.31	0.37	0.59	1	1.7	2.9	4.6	5.9	1.4	1.3
AMS15	Horizon	59	100%	0.14	0.2	0.28	0.58	0.93	2.1	4	4.9	5.2	1.6	1.4
AMS22	Janvier	60	100%	0.03	0.27	0.41	0.67	1.1	1.7	4.2	5.5	9.7	1.7	1.8





Volatile Organic Compounds - Ethylbenzene (ppbv) - 2019

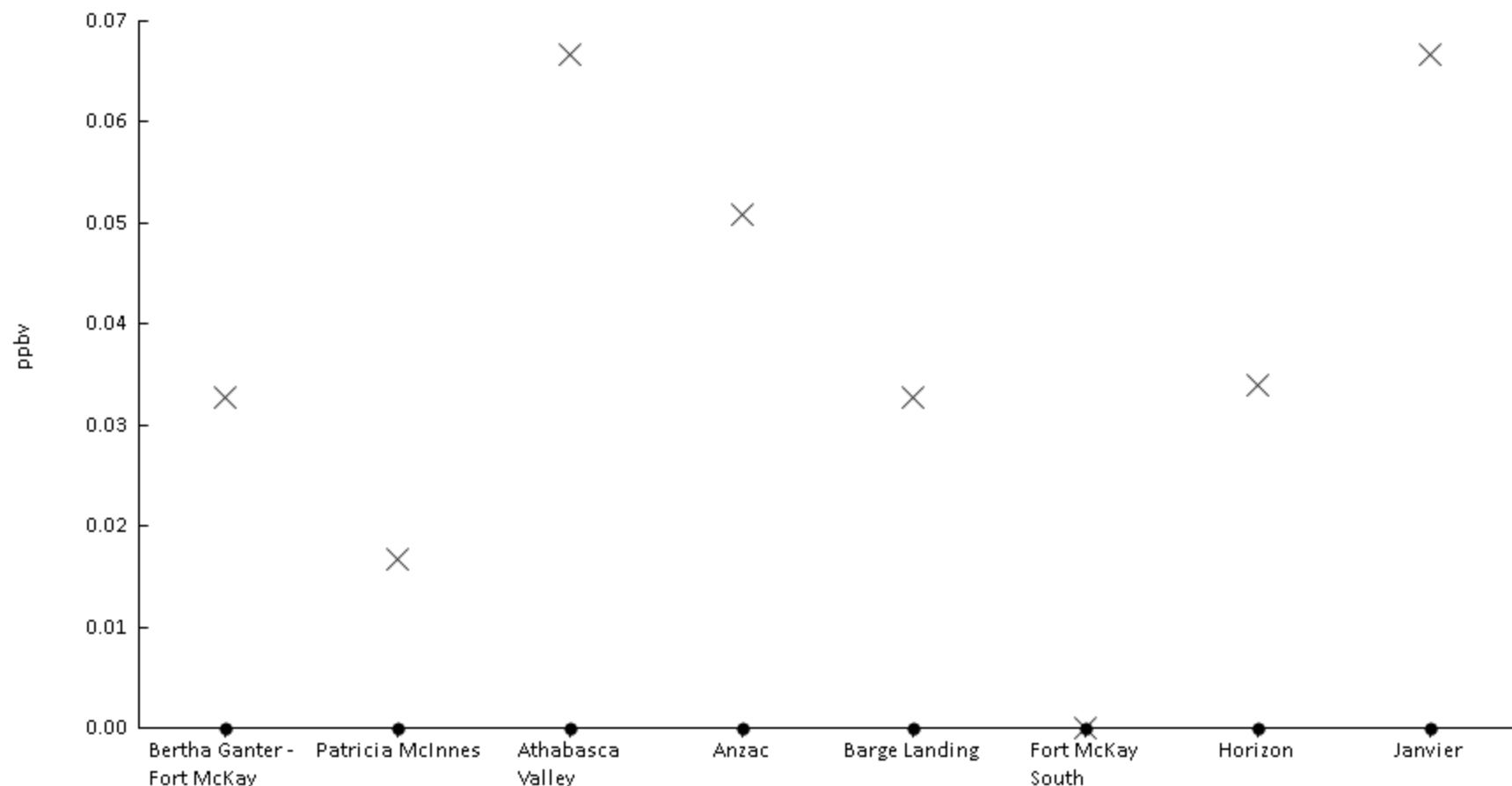
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	44%	0	0	0	0	0	0.12	0.15	0.19	0.26	0.054	0.072
AMS06	Patricia McInnes	60	42%	0	0	0	0	0	0.09	0.15	0.16	0.23	0.045	0.064
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.1	0.14	0.15	0.22	0.044	0.061
AMS14	Anzac	59	17%	0	0	0	0	0	0	0.092	0.12	0.81	0.027	0.11
AMS09	Barge Landing	61	46%	0	0	0	0	0	0.12	0.15	0.18	1.3	0.074	0.17
AMS13	Fort McKay South	61	46%	0	0	0	0	0	0.12	0.15	0.19	0.33	0.057	0.079
AMS15	Horizon	59	27%	0	0	0	0	0	0.02	0.13	0.14	0.19	0.027	0.053
AMS22	Janvier	60	18%	0	0	0	0	0	0	0.11	0.12	0.14	0.016	0.039





Volatile Organic Compounds - Formaldehyde (ppbv) - 2019

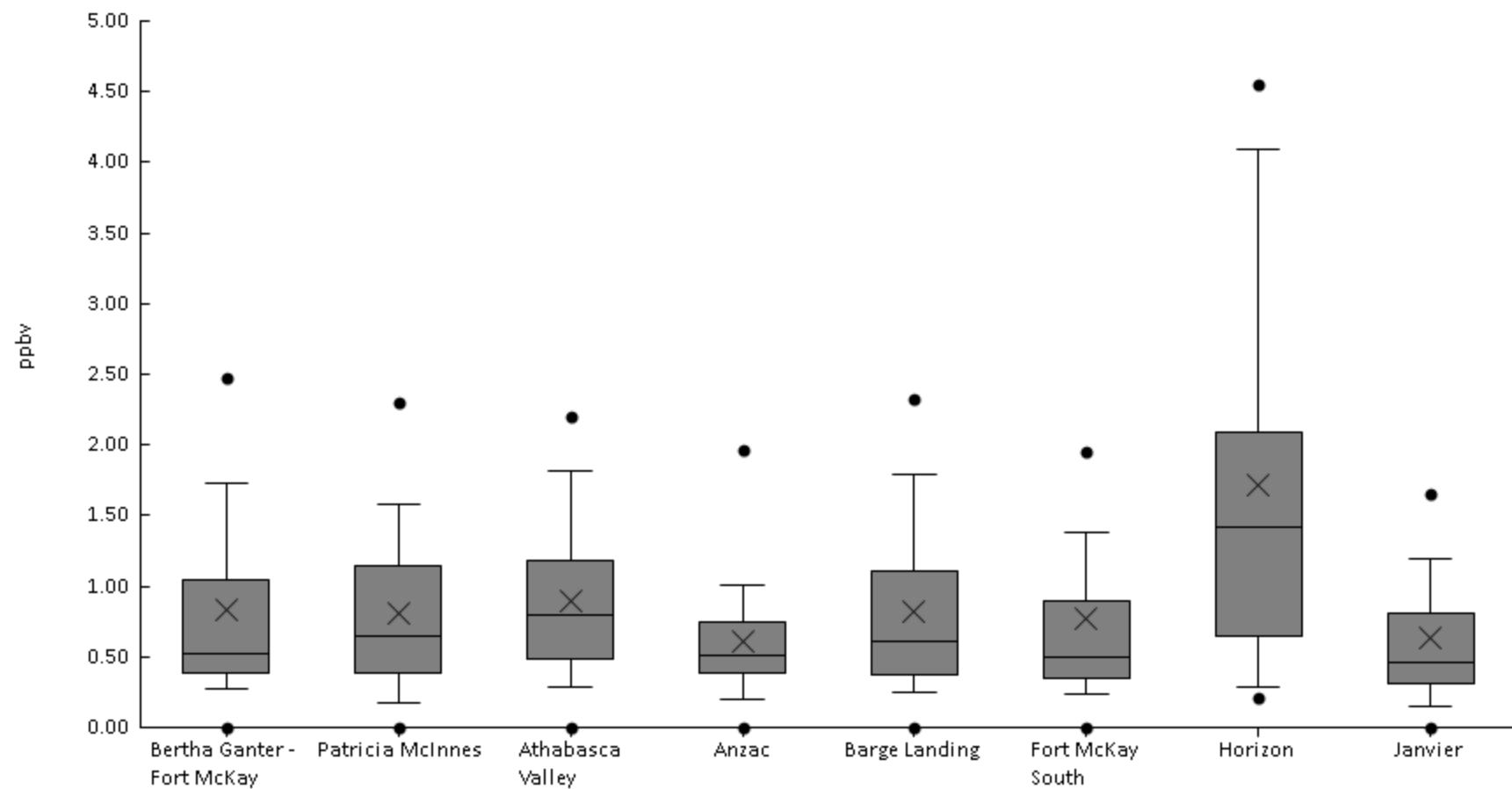
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	2%	0	0	0	0	0	0	0	0	2	0.033	0.26
AMS06	Patricia McInnes	60	2%	0	0	0	0	0	0	0	0	1	0.017	0.13
AMS07	Athabasca Valley	60	3%	0	0	0	0	0	0	0	0	3	0.067	0.41
AMS14	Anzac	59	2%	0	0	0	0	0	0	0	0	3	0.051	0.39
AMS09	Barge Landing	61	2%	0	0	0	0	0	0	0	0	2	0.033	0.26
AMS13	Fort McKay South	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS15	Horizon	59	3%	0	0	0	0	0	0	0	0	1	0.034	0.18
AMS22	Janvier	60	3%	0	0	0	0	0	0	0	0	3	0.067	0.41





Volatile Organic Compounds - Isobutane (ppbv) - 2019

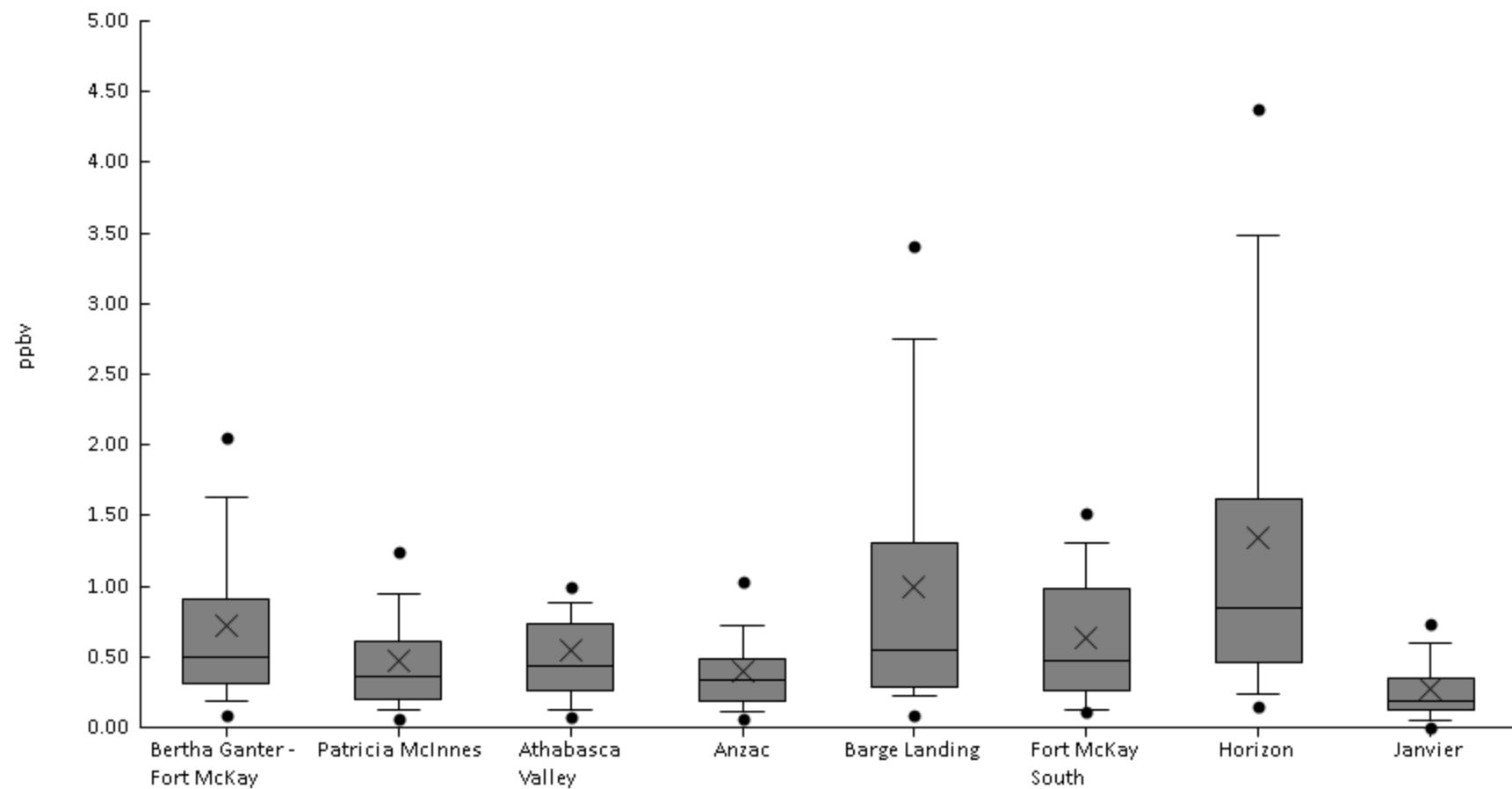
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	0	0.27	0.39	0.52	1	1.7	2.5	4.5	0.83	0.78
AMS06	Patricia McInnes	60	92%	0	0	0.17	0.39	0.65	1.1	1.6	2.3	2.9	0.81	0.63
AMS07	Athabasca Valley	60	93%	0	0	0.29	0.48	0.79	1.2	1.8	2.2	3	0.9	0.62
AMS14	Anzac	59	92%	0	0	0.2	0.38	0.51	0.75	1	2	2.2	0.61	0.47
AMS09	Barge Landing	61	93%	0	0	0.25	0.38	0.61	1.1	1.8	2.3	3.1	0.82	0.67
AMS13	Fort McKay South	61	92%	0	0	0.24	0.35	0.5	0.89	1.4	2	6.5	0.77	0.91
AMS15	Horizon	59	97%	0	0.21	0.29	0.65	1.4	2.1	4.1	4.6	6.9	1.7	1.4
AMS22	Janvier	60	92%	0	0	0.15	0.32	0.47	0.81	1.2	1.7	4.1	0.64	0.61





Volatile Organic Compounds - Isopentane (ppbv) - 2019

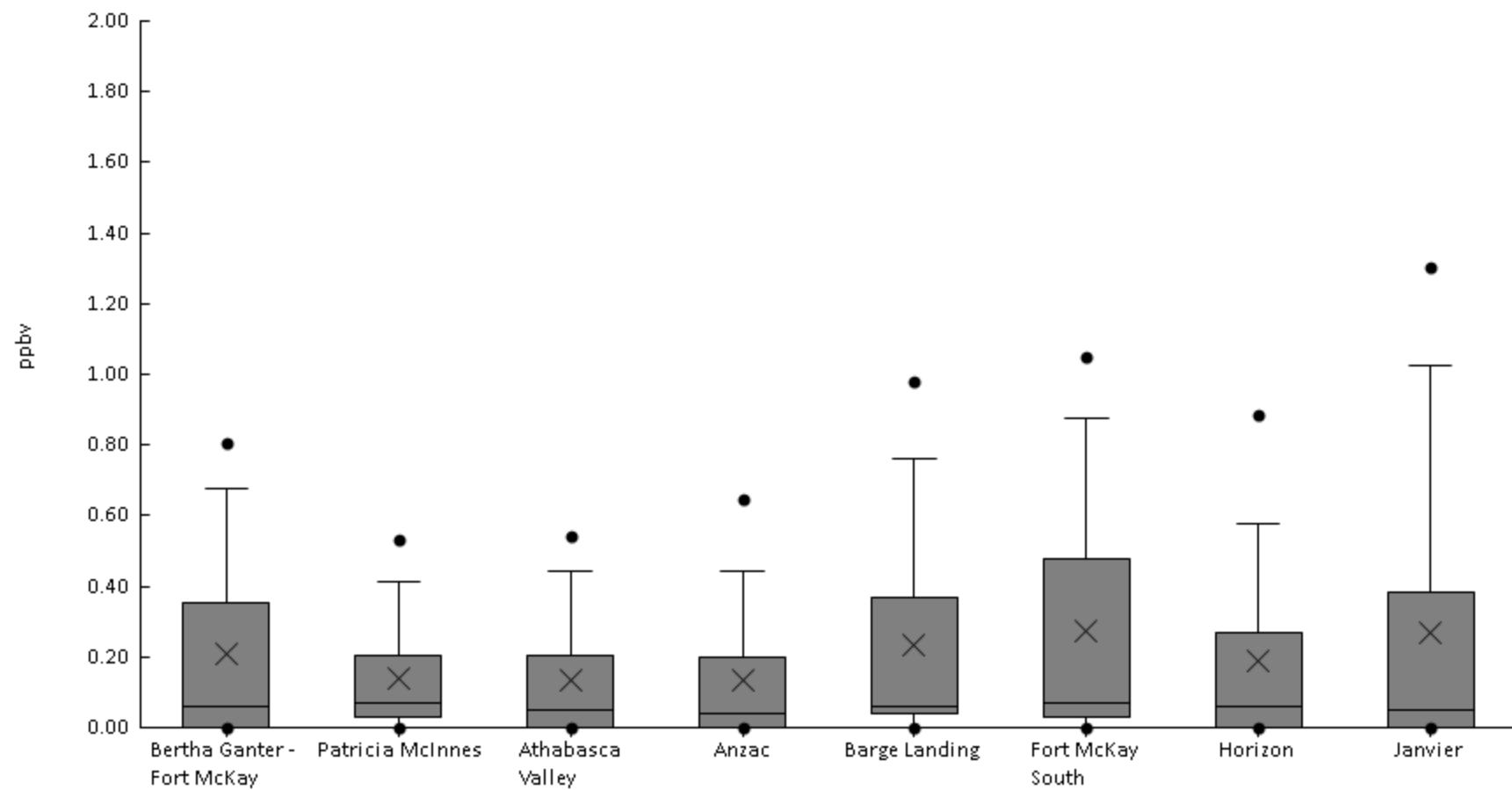
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.08	0.091	0.18	0.31	0.5	0.91	1.6	2.1	3.7	0.72	0.66
AMS06	Patricia McInnes	60	97%	0	0.065	0.13	0.2	0.37	0.62	0.94	1.2	1.9	0.47	0.37
AMS07	Athabasca Valley	60	97%	0	0.07	0.13	0.26	0.44	0.74	0.88	1	4.8	0.54	0.62
AMS14	Anzac	59	97%	0	0.068	0.11	0.18	0.33	0.49	0.72	1	2.5	0.4	0.38
AMS09	Barge Landing	61	100%	0.04	0.09	0.22	0.29	0.55	1.3	2.8	3.4	4.9	0.99	1.1
AMS13	Fort McKay South	61	100%	0.05	0.12	0.13	0.27	0.47	0.98	1.3	1.5	2.4	0.64	0.52
AMS15	Horizon	59	100%	0.09	0.15	0.23	0.46	0.85	1.6	3.5	4.4	6	1.3	1.4
AMS22	Janvier	60	93%	0	0	0.05	0.12	0.19	0.35	0.6	0.73	1.4	0.27	0.27





Volatile Organic Compounds - Isoprene (ppbv) - 2019

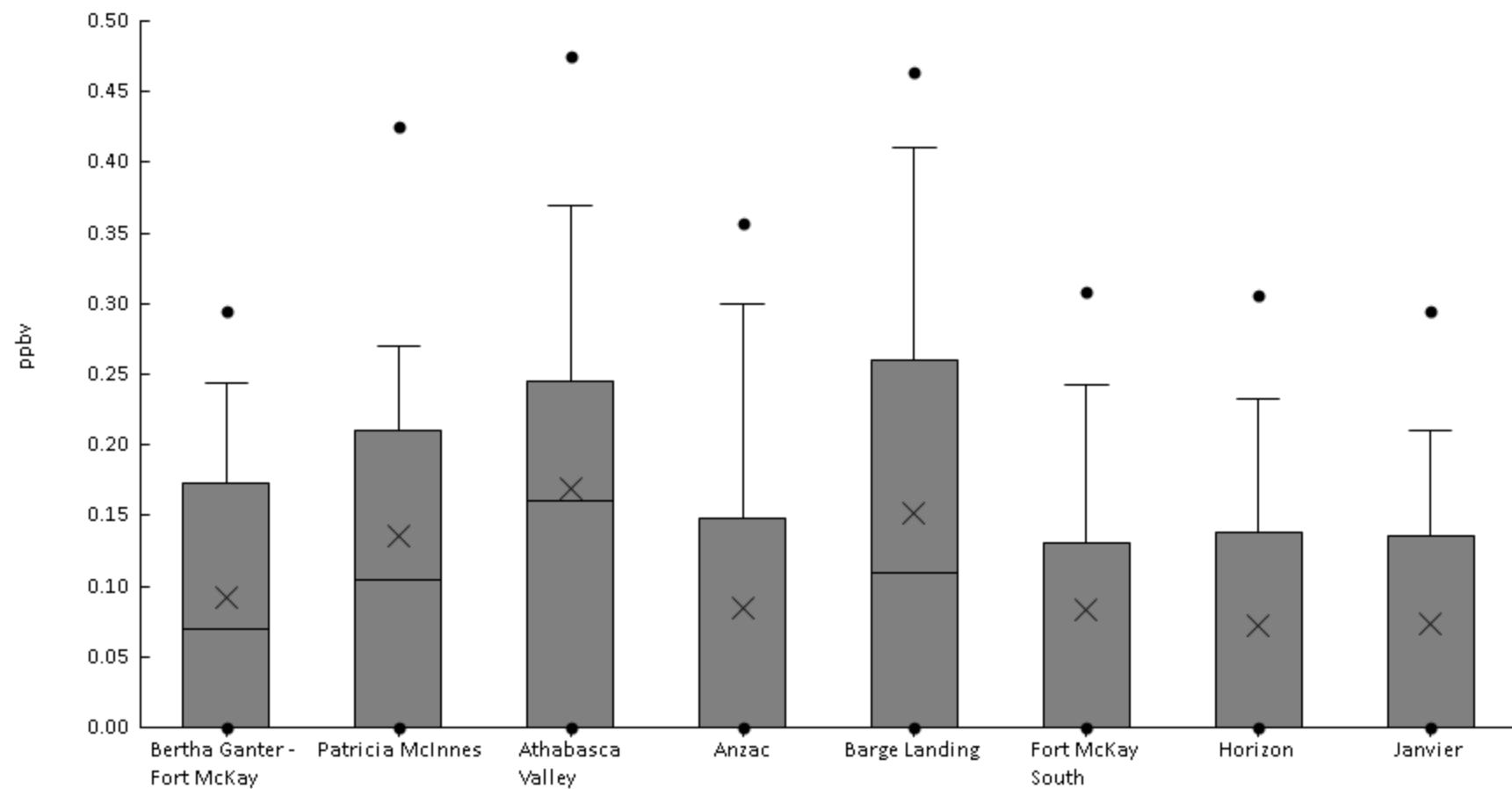
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	74%	0	0	0	0	0.06	0.35	0.68	0.81	1.2	0.21	0.29
AMS06	Patricia McInnes	60	77%	0	0	0	0.03	0.07	0.21	0.42	0.53	0.73	0.14	0.17
AMS07	Athabasca Valley	60	70%	0	0	0	0	0.05	0.21	0.45	0.54	0.57	0.13	0.17
AMS14	Anzac	59	59%	0	0	0	0	0.04	0.2	0.44	0.65	1	0.14	0.22
AMS09	Barge Landing	61	80%	0	0	0	0.04	0.06	0.37	0.76	0.98	1.2	0.23	0.32
AMS13	Fort McKay South	61	79%	0	0	0	0.03	0.07	0.48	0.87	1.1	1.6	0.27	0.38
AMS15	Horizon	59	69%	0	0	0	0	0.06	0.27	0.58	0.89	1.2	0.19	0.29
AMS22	Janvier	60	67%	0	0	0	0	0.05	0.39	1	1.3	1.6	0.27	0.43





Volatile Organic Compounds - Isopropylalcohol (ppbv) - 2019

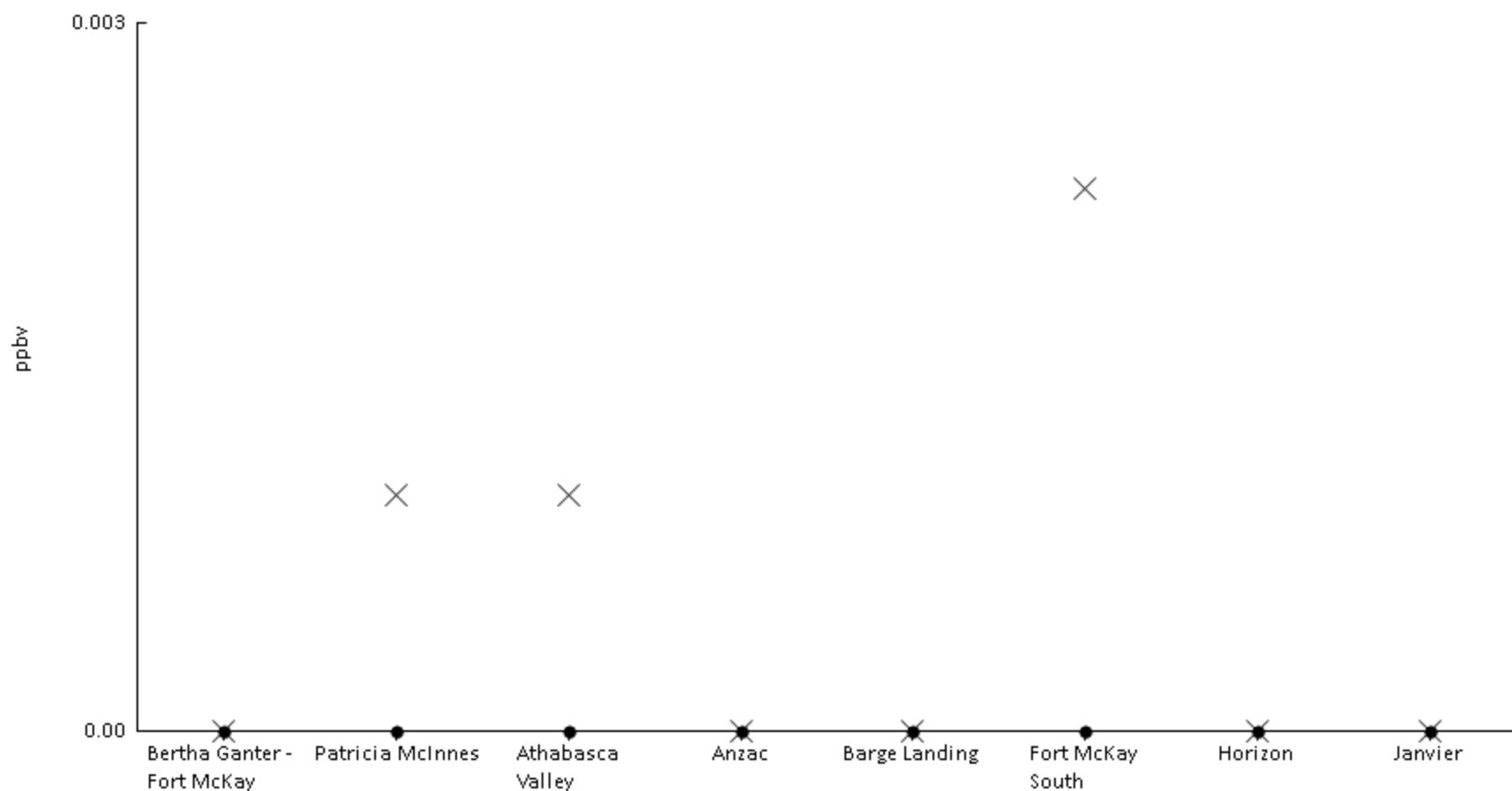
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	54%	0	0	0	0	0.07	0.17	0.24	0.29	0.37	0.092	0.1
AMS06	Patricia McInnes	60	55%	0	0	0	0	0.11	0.21	0.27	0.43	1.5	0.14	0.23
AMS07	Athabasca Valley	60	68%	0	0	0	0	0.16	0.25	0.37	0.48	1.1	0.17	0.18
AMS14	Anzac	59	41%	0	0	0	0	0	0.15	0.3	0.36	0.42	0.084	0.13
AMS09	Barge Landing	61	61%	0	0	0	0	0.11	0.26	0.41	0.46	1	0.15	0.19
AMS13	Fort McKay South	61	49%	0	0	0	0	0	0.13	0.24	0.31	0.38	0.083	0.11
AMS15	Horizon	59	39%	0	0	0	0	0	0.14	0.23	0.31	0.43	0.073	0.11
AMS22	Janvier	60	42%	0	0	0	0	0	0.14	0.21	0.3	0.62	0.073	0.12





Volatile Organic Compounds - Isopropylbenzene (ppbv) - 2019

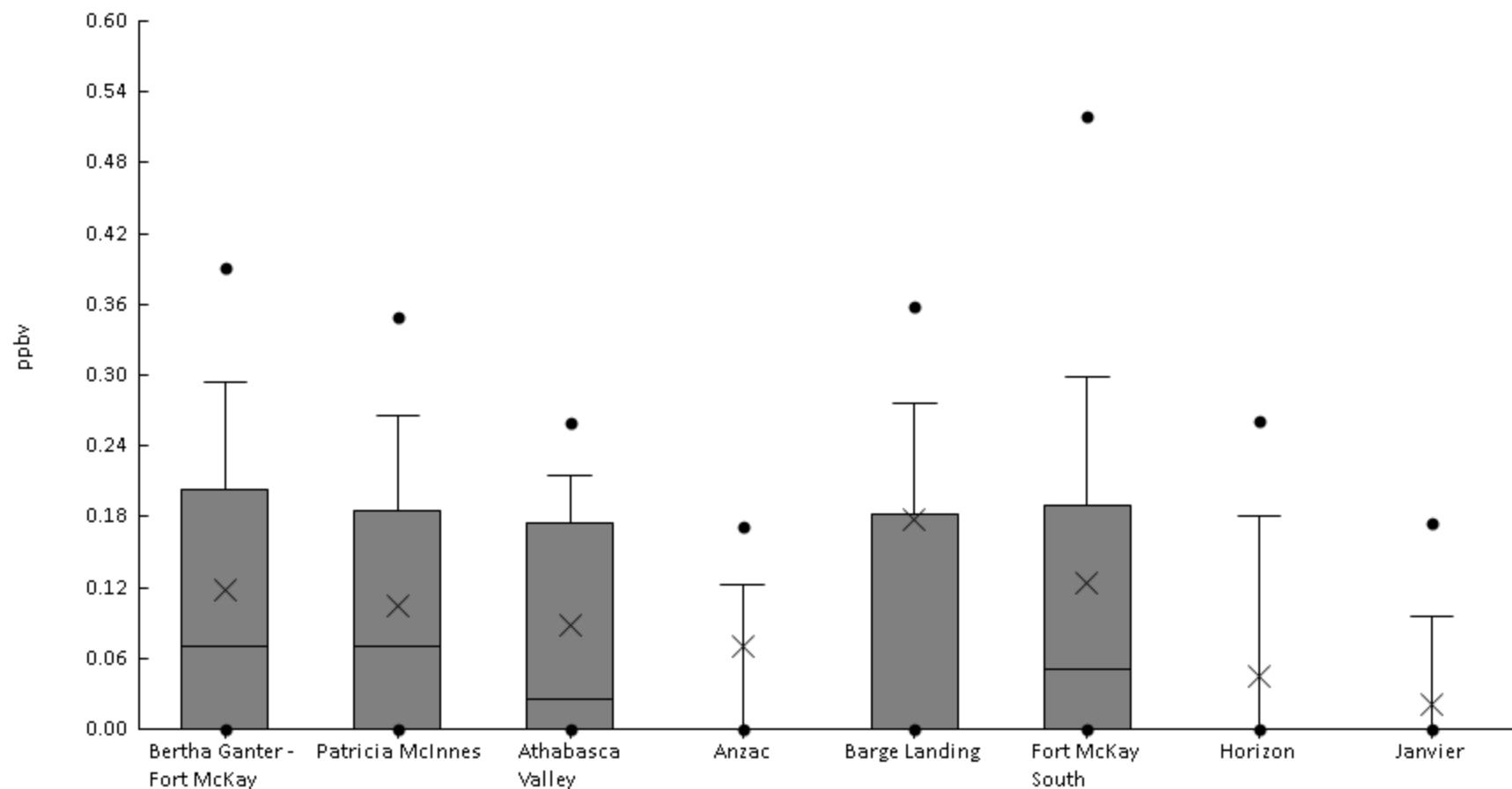
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS06	Patricia McInnes	60	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.7E-3
AMS07	Athabasca Valley	60	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.7E-3
AMS14	Anzac	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS09	Barge Landing	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS13	Fort McKay South	61	3%	0	0	0	0	0	0	0	0	0.11	2.3E-3	0.015
AMS15	Horizon	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	60	0%	0	0	0	0	0	0	0	0	0	0	0





Volatile Organic Compounds - m,p-Xylene (ppbv) - 2019

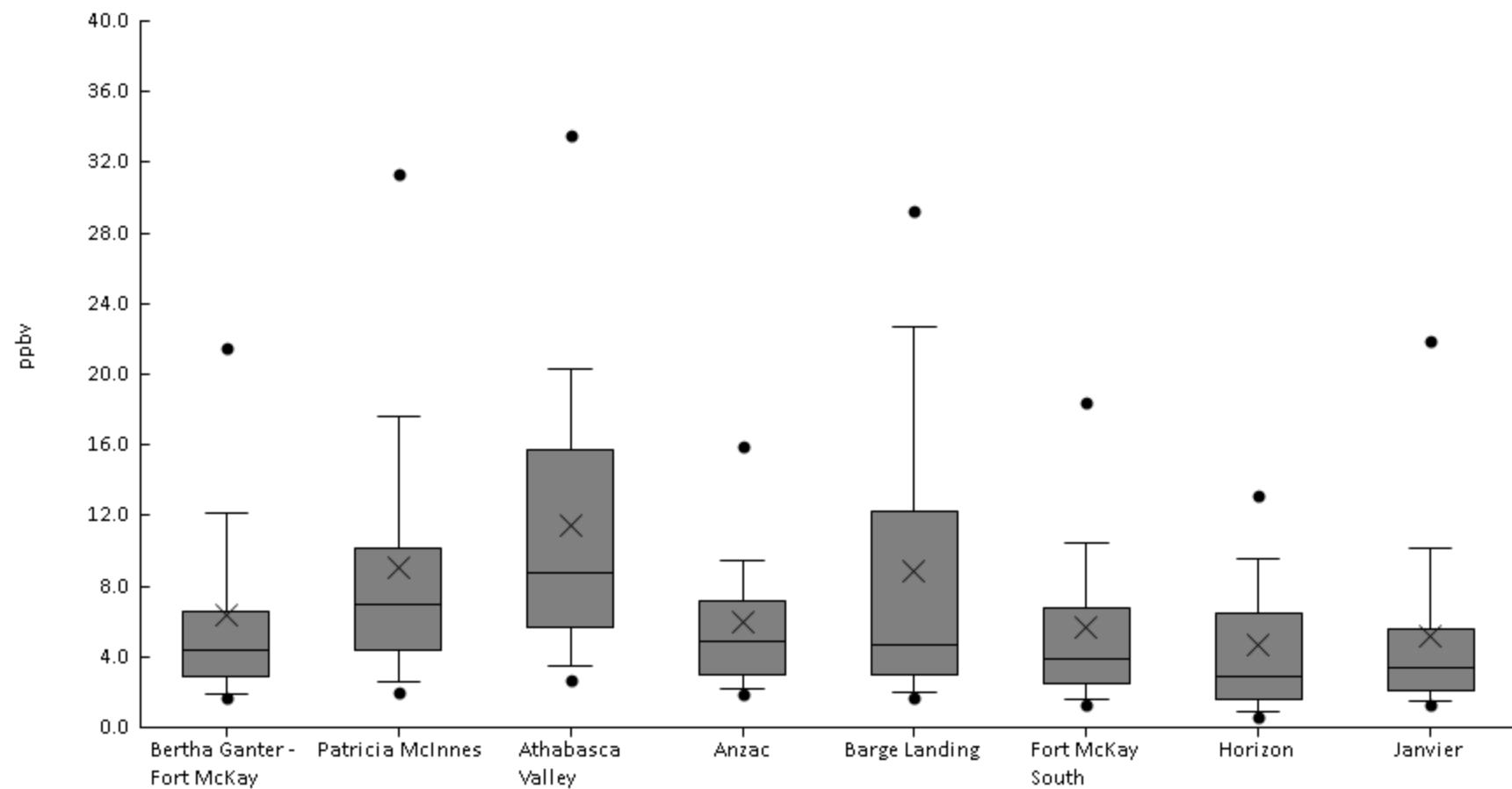
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	56%	0	0	0	0	0.07	0.2	0.29	0.39	0.58	0.12	0.14
AMS06	Patricia McInnes	60	52%	0	0	0	0	0.07	0.19	0.27	0.35	0.58	0.11	0.13
AMS07	Athabasca Valley	60	50%	0	0	0	0	0.025	0.18	0.22	0.26	0.51	0.088	0.11
AMS14	Anzac	59	17%	0	0	0	0	0	0	0.12	0.17	3	0.07	0.39
AMS09	Barge Landing	61	49%	0	0	0	0	0	0.18	0.28	0.36	5	0.18	0.64
AMS13	Fort McKay South	61	56%	0	0	0	0	0.05	0.19	0.3	0.52	0.98	0.12	0.18
AMS15	Horizon	59	24%	0	0	0	0	0	0	0.18	0.26	0.33	0.044	0.088
AMS22	Janvier	60	15%	0	0	0	0	0	0	0.095	0.18	0.24	0.021	0.055





Volatile Organic Compounds - Methanol (ppbv) - 2019

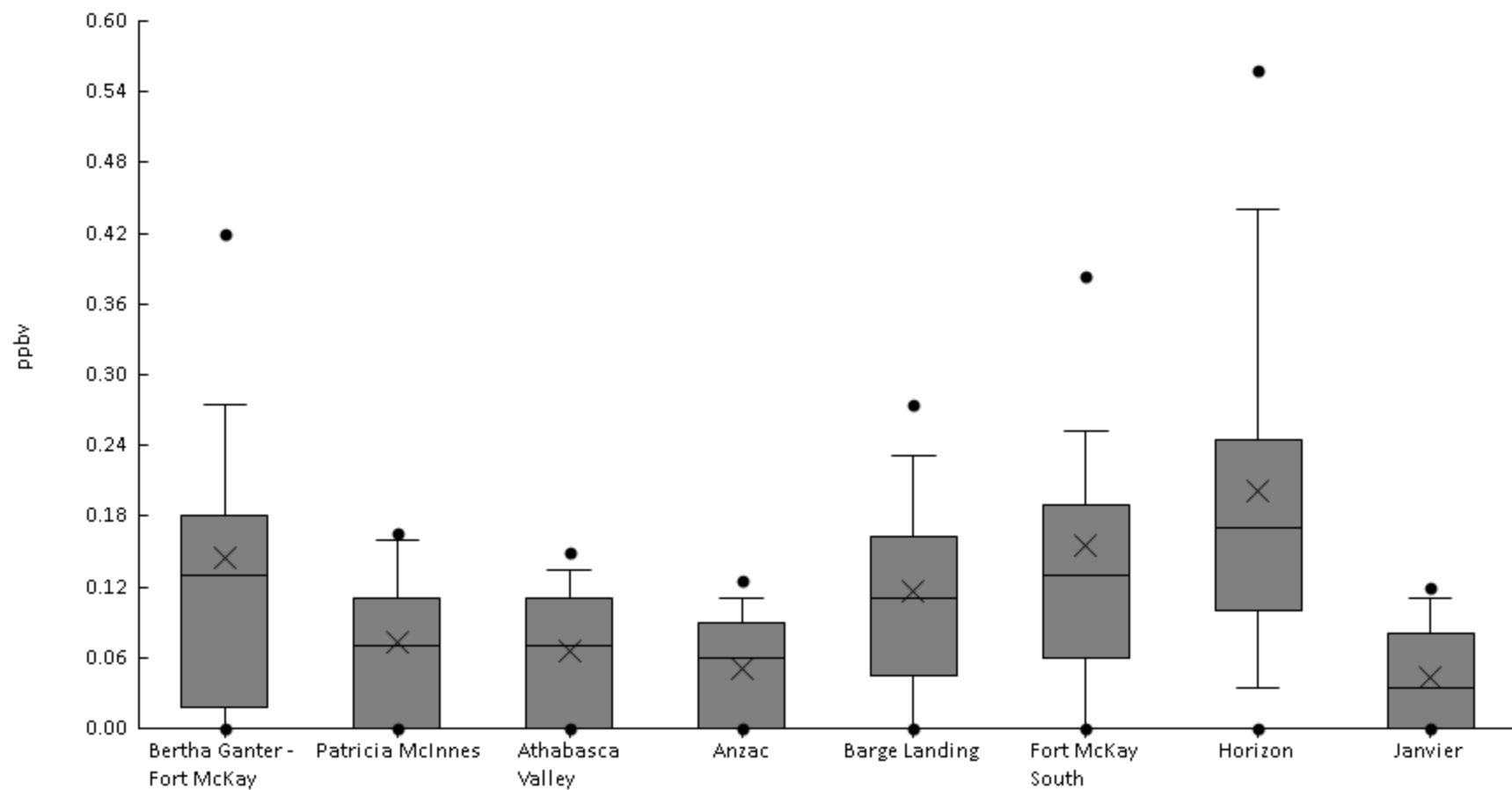
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.1	1.7	1.9	2.9	4.4	6.6	12	21	41	6.4	6.7
AMS06	Patricia McInnes	60	100%	0.9	2	2.6	4.4	7	10	18	31	38	9.1	8
AMS07	Athabasca Valley	60	100%	1.3	2.7	3.5	5.7	8.8	16	20	34	41	11	9
AMS14	Anzac	59	100%	1.5	1.9	2.1	3	4.9	7.2	9.4	16	37	5.9	5.3
AMS09	Barge Landing	61	100%	1.3	1.7	2	3	4.7	12	23	29	34	8.8	8.3
AMS13	Fort McKay South	61	100%	0.7	1.3	1.6	2.5	3.9	6.7	10	18	29	5.6	5.2
AMS15	Horizon	59	97%	0	0.59	0.94	1.6	2.9	6.5	9.5	13	24	4.7	4.7
AMS22	Janvier	60	98%	0	1.3	1.5	2.1	3.4	5.6	10	22	28	5.2	5.9





Volatile Organic Compounds - Methylcyclohexane (ppbv) - 2019

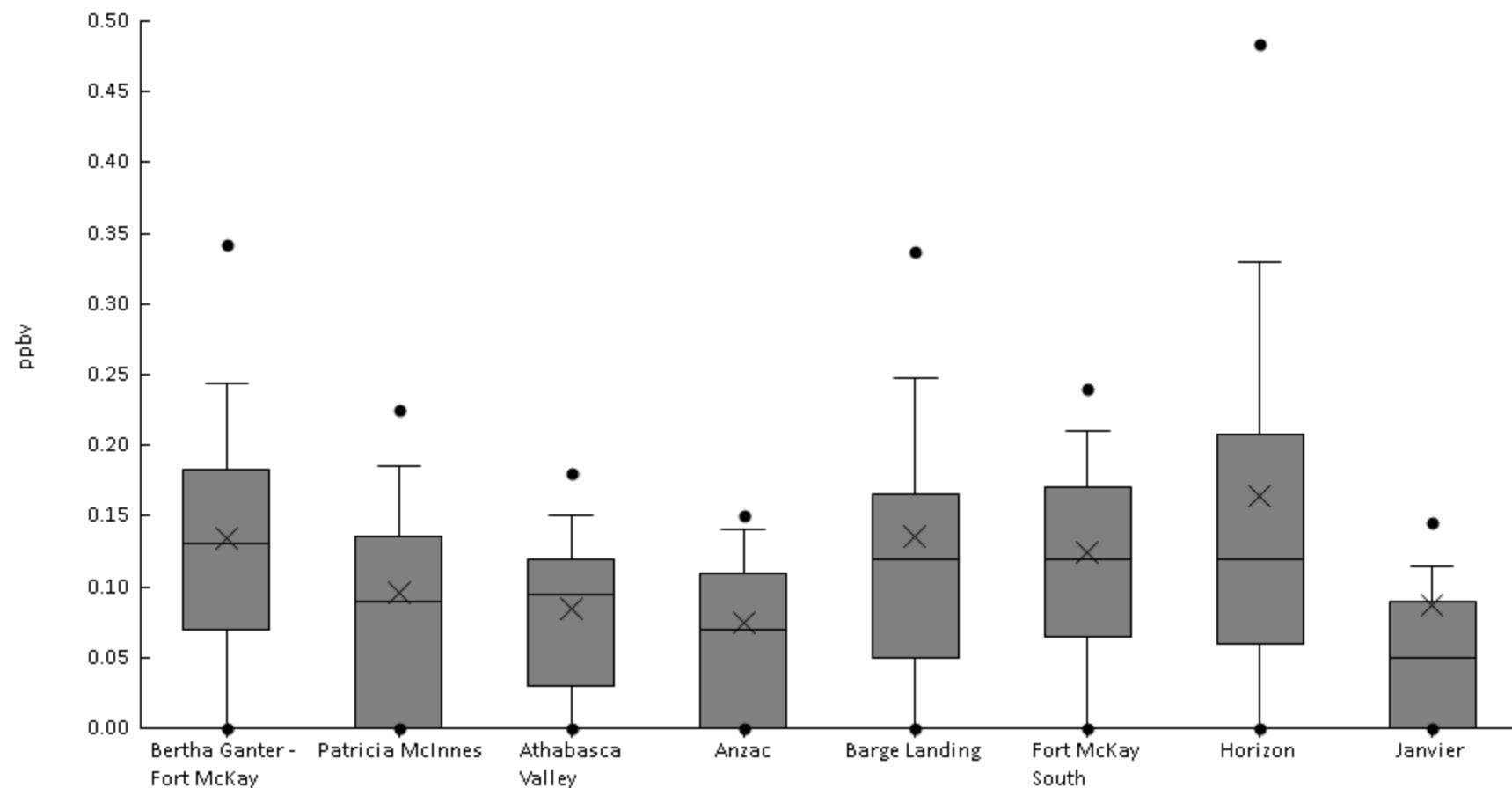
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	79%	0	0	0	0.018	0.13	0.18	0.27	0.42	1	0.15	0.17
AMS06	Patricia McInnes	60	73%	0	0	0	0	0.07	0.11	0.16	0.17	0.27	0.073	0.062
AMS07	Athabasca Valley	60	73%	0	0	0	0	0.07	0.11	0.14	0.15	0.16	0.065	0.052
AMS14	Anzac	59	63%	0	0	0	0	0.06	0.09	0.11	0.13	0.15	0.051	0.047
AMS09	Barge Landing	61	80%	0	0	0	0.045	0.11	0.16	0.23	0.27	0.53	0.12	0.1
AMS13	Fort McKay South	61	82%	0	0	0	0.06	0.13	0.19	0.25	0.38	1.5	0.15	0.21
AMS15	Horizon	59	92%	0	0	0.034	0.1	0.17	0.25	0.44	0.56	0.86	0.2	0.17
AMS22	Janvier	60	58%	0	0	0	0	0.035	0.08	0.11	0.12	0.13	0.043	0.044





Volatile Organic Compounds - Methylcyclopentane (ppbv) - 2019

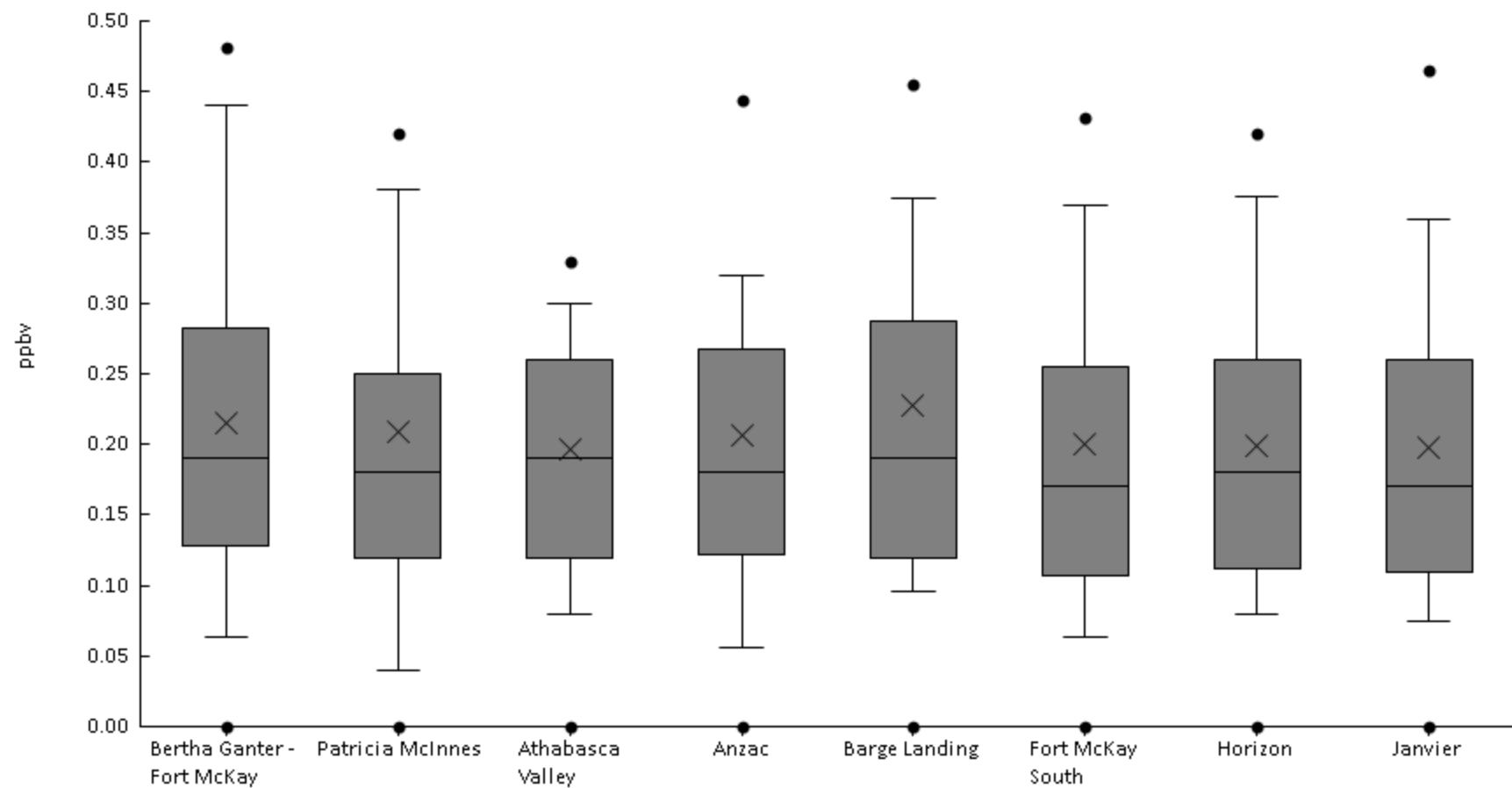
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	85%	0	0	0	0.07	0.13	0.18	0.24	0.34	0.46	0.13	0.1
AMS06	Patricia McInnes	60	73%	0	0	0	0	0.09	0.14	0.19	0.23	0.63	0.096	0.1
AMS07	Athabasca Valley	60	77%	0	0	0	0.03	0.095	0.12	0.15	0.18	0.33	0.084	0.064
AMS14	Anzac	59	69%	0	0	0	0	0.07	0.11	0.14	0.15	0.41	0.075	0.078
AMS09	Barge Landing	61	84%	0	0	0	0.05	0.12	0.17	0.25	0.34	0.78	0.14	0.13
AMS13	Fort McKay South	61	84%	0	0	0	0.065	0.12	0.17	0.21	0.24	0.51	0.12	0.094
AMS15	Horizon	59	85%	0	0	0	0.06	0.12	0.21	0.33	0.48	1.1	0.16	0.18
AMS22	Janvier	60	58%	0	0	0	0	0.05	0.09	0.12	0.15	2.3	0.087	0.29





Volatile Organic Compounds - Methyl Ethyl Ketone (ppbv) - 2019

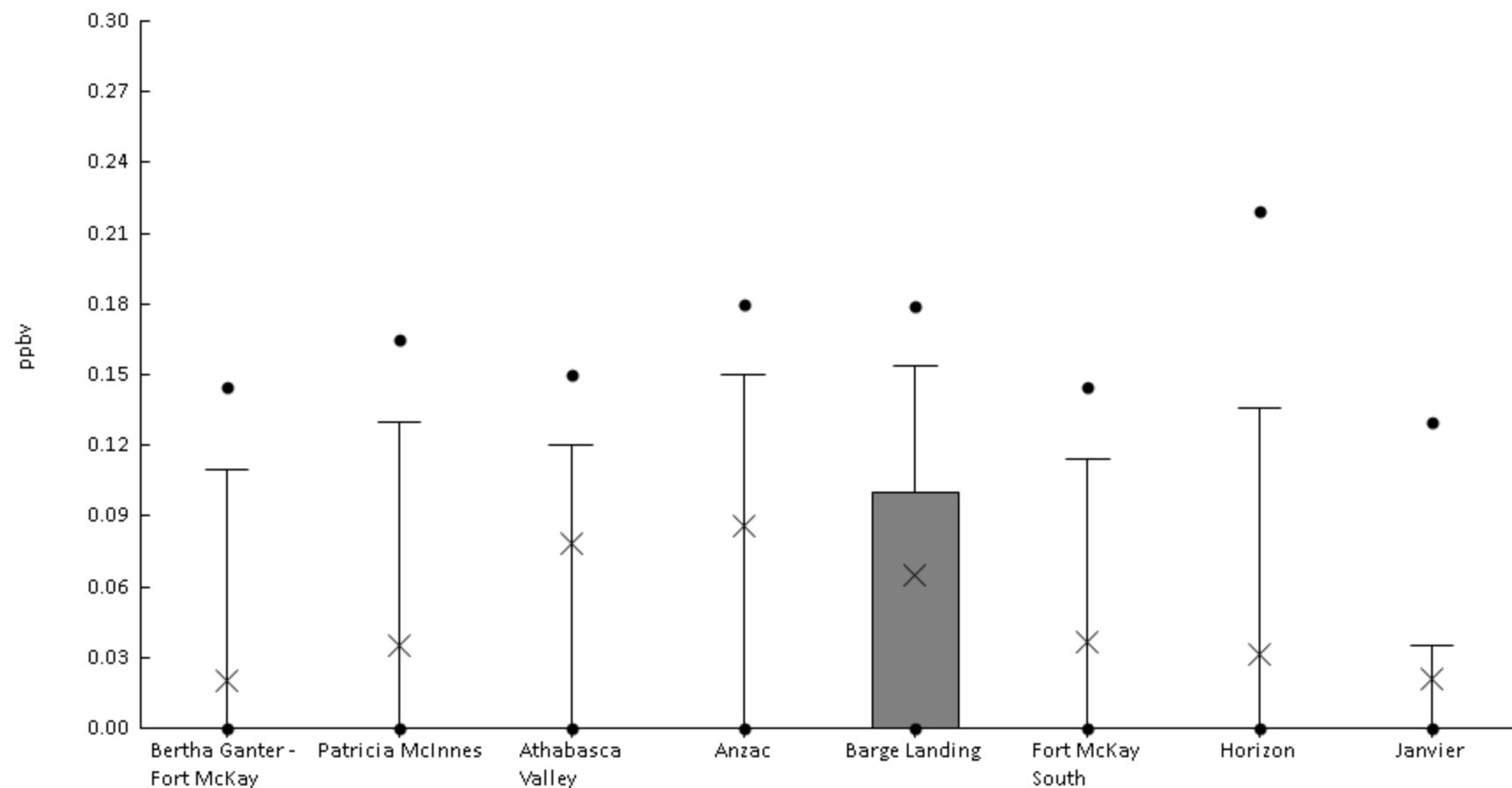
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	0.064	0.13	0.19	0.28	0.44	0.48	0.61	0.21	0.14
AMS06	Patricia McInnes	60	90%	0	0	0.04	0.12	0.18	0.25	0.38	0.42	1.1	0.21	0.17
AMS07	Athabasca Valley	60	92%	0	0	0.08	0.12	0.19	0.26	0.3	0.33	0.84	0.2	0.12
AMS14	Anzac	59	92%	0	0	0.056	0.12	0.18	0.27	0.32	0.44	0.93	0.21	0.15
AMS09	Barge Landing	61	92%	0	0	0.096	0.12	0.19	0.29	0.37	0.46	1.4	0.23	0.19
AMS13	Fort McKay South	61	92%	0	0	0.064	0.11	0.17	0.26	0.37	0.43	0.76	0.2	0.14
AMS15	Horizon	59	92%	0	0	0.08	0.11	0.18	0.26	0.38	0.42	0.73	0.2	0.13
AMS22	Janvier	60	93%	0	0	0.075	0.11	0.17	0.26	0.36	0.47	0.56	0.2	0.12





Volatile Organic Compounds - Methylisobutylketone (ppbv) - 2019

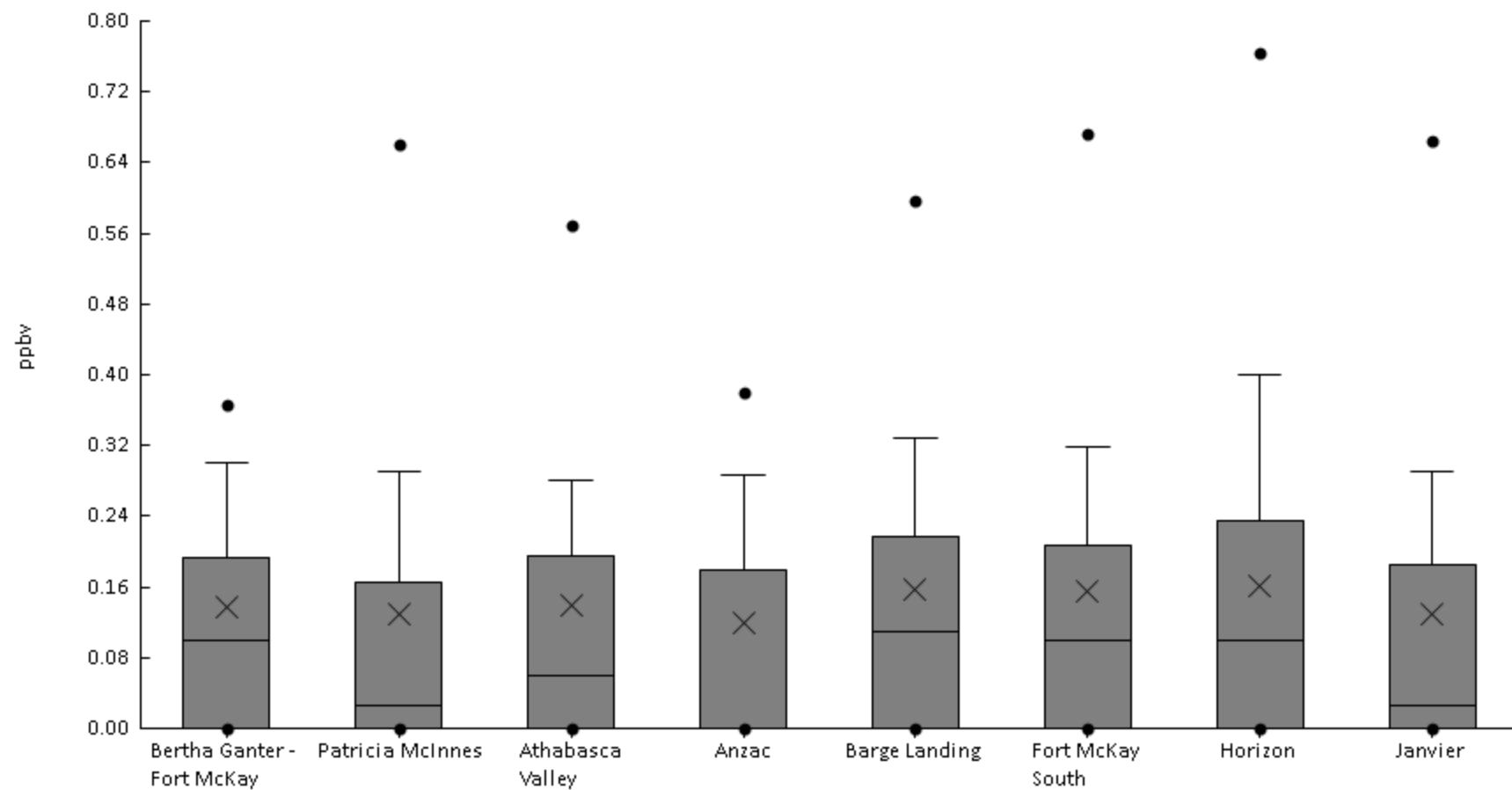
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	16%	0	0	0	0	0	0	0.11	0.14	0.19	0.02	0.049
AMS06	Patricia McInnes	60	18%	0	0	0	0	0	0	0.13	0.17	0.53	0.035	0.1
AMS07	Athabasca Valley	60	20%	0	0	0	0	0	0	0.12	0.15	3.5	0.078	0.45
AMS14	Anzac	59	24%	0	0	0	0	0	0	0.15	0.18	3.2	0.086	0.42
AMS09	Barge Landing	61	33%	0	0	0	0	0	0.1	0.15	0.18	1.4	0.065	0.19
AMS13	Fort McKay South	61	20%	0	0	0	0	0	0	0.11	0.14	0.97	0.036	0.13
AMS15	Horizon	59	19%	0	0	0	0	0	0	0.14	0.22	0.31	0.031	0.075
AMS22	Janvier	60	10%	0	0	0	0	0	0	0.035	0.13	0.5	0.021	0.08





Volatile Organic Compounds - Methylvinylketone (ppbv) - 2019

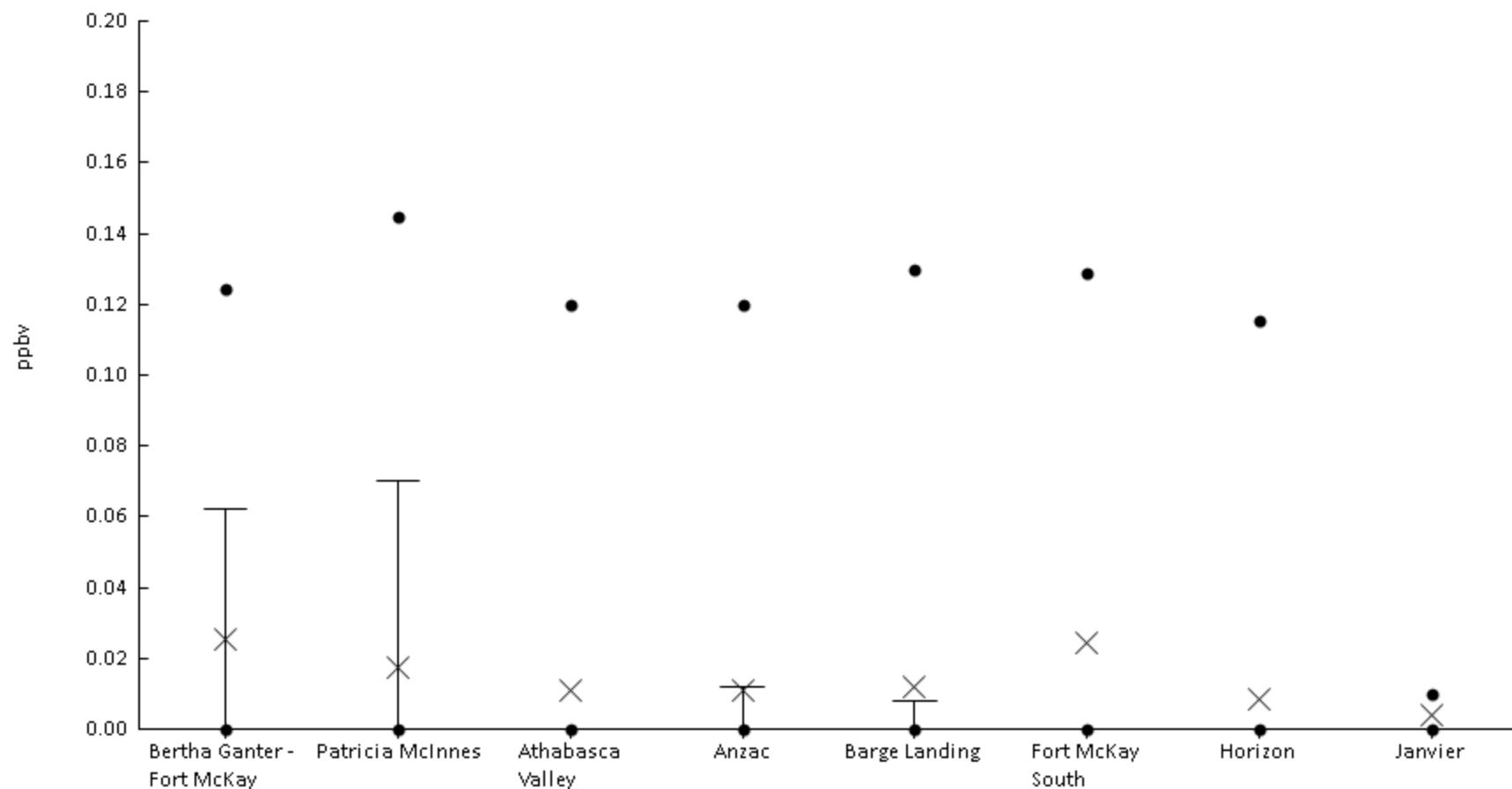
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	0	0	0	0	0.1	0.19	0.3	0.37	1.4	0.14	0.23
AMS06	Patricia McInnes	60	50%	0	0	0	0	0.025	0.17	0.29	0.66	1.4	0.13	0.24
AMS07	Athabasca Valley	60	52%	0	0	0	0	0.06	0.2	0.28	0.57	1.4	0.14	0.26
AMS14	Anzac	59	49%	0	0	0	0	0	0.18	0.29	0.38	1.2	0.12	0.22
AMS09	Barge Landing	61	61%	0	0	0	0	0.11	0.22	0.33	0.6	1.2	0.16	0.23
AMS13	Fort McKay South	61	59%	0	0	0	0	0.1	0.21	0.32	0.67	1.2	0.15	0.24
AMS15	Horizon	59	59%	0	0	0	0	0.1	0.24	0.4	0.76	1.2	0.16	0.24
AMS22	Janvier	60	50%	0	0	0	0	0.025	0.19	0.29	0.67	1.1	0.13	0.23





Volatile Organic Compounds - Naphthalene (ppbv) - 2019

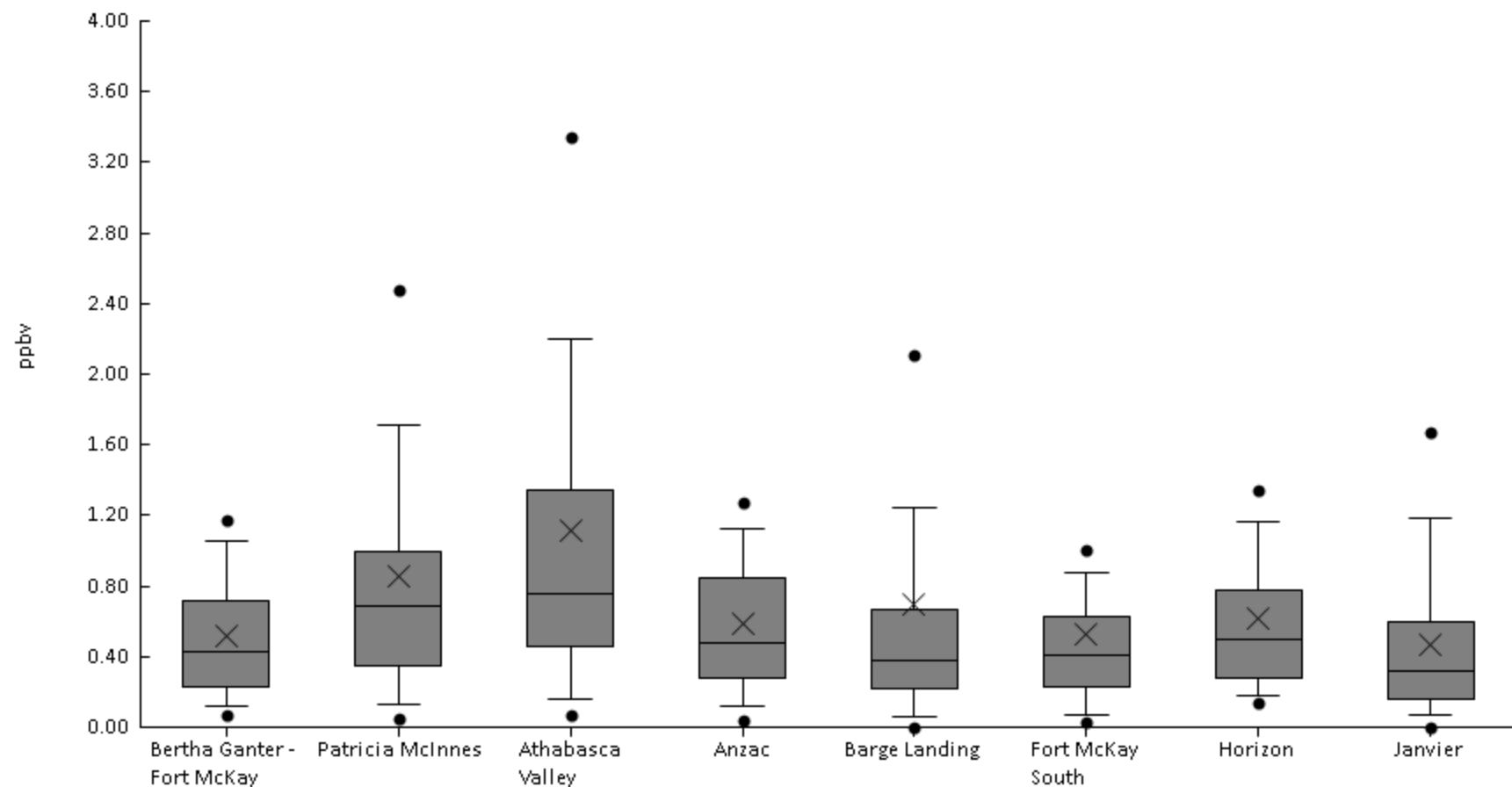
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	13%	0	0	0	0	0	0.062	0.12	0.15	0.81	0.025	0.11
AMS06	Patricia McInnes	60	13%	0	0	0	0	0	0	0.07	0.15	0.31	0.017	0.054
AMS07	Athabasca Valley	60	8%	0	0	0	0	0	0	0	0.12	0.25	0.011	0.043
AMS14	Anzac	59	10%	0	0	0	0	0	0	0.012	0.12	0.15	0.011	0.035
AMS09	Barge Landing	61	10%	0	0	0	0	0	0	8E-3	0.13	0.17	0.012	0.04
AMS13	Fort McKay South	61	8%	0	0	0	0	0	0	0	0.13	0.88	0.024	0.12
AMS15	Horizon	59	8%	0	0	0	0	0	0	0	0.12	0.14	8.5E-3	0.031
AMS22	Janvier	60	5%	0	0	0	0	0	0	0	0.01	0.12	4.2E-3	0.021





Volatile Organic Compounds - n-Butane (ppbv) - 2019

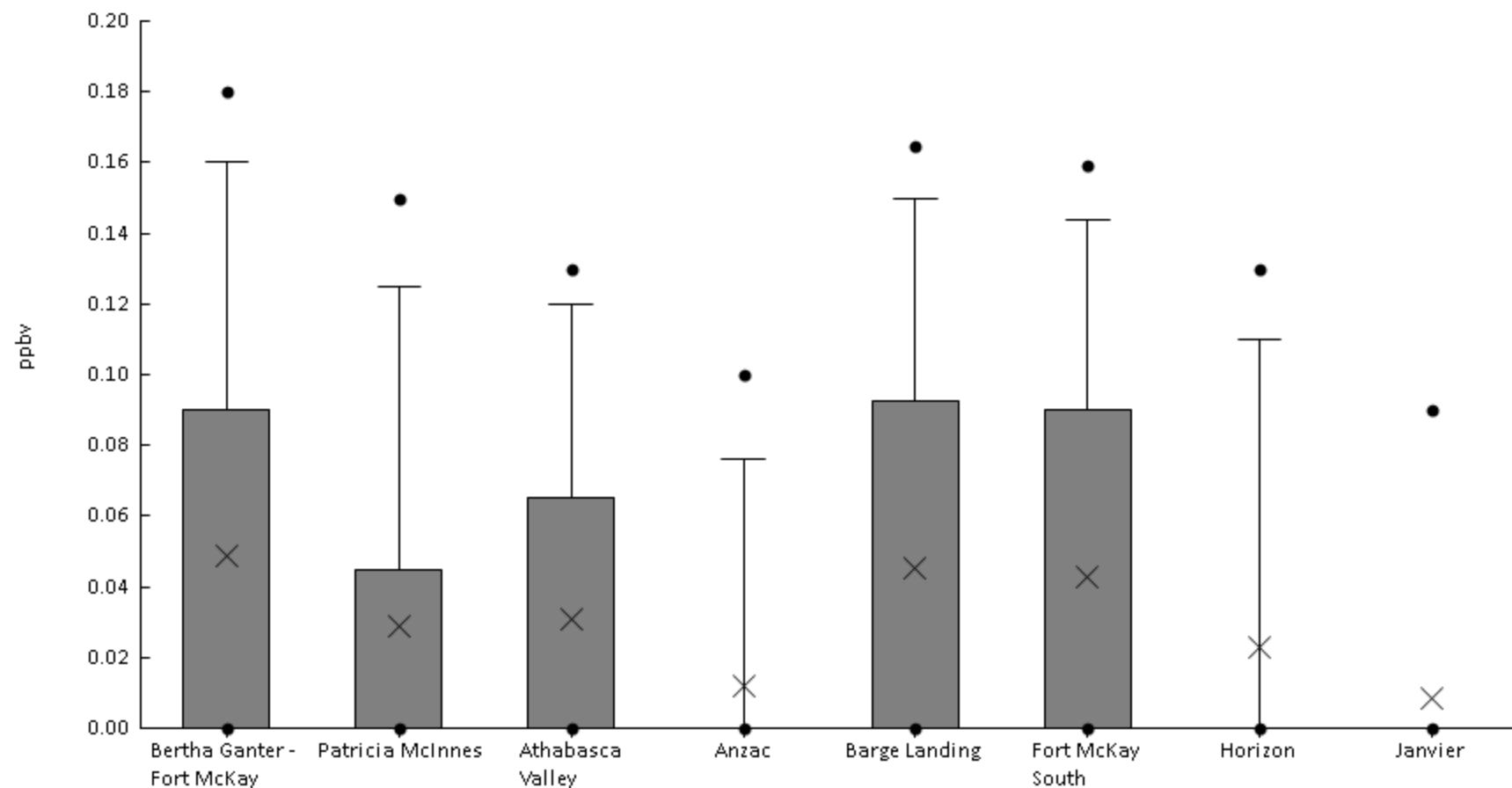
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	0.068	0.12	0.23	0.43	0.72	1.1	1.2	2	0.51	0.37
AMS06	Patricia McInnes	60	95%	0	0.05	0.13	0.35	0.69	1	1.7	2.5	4.7	0.86	0.86
AMS07	Athabasca Valley	60	97%	0	0.065	0.16	0.46	0.76	1.3	2.2	3.3	9.9	1.1	1.4
AMS14	Anzac	59	95%	0	0.041	0.12	0.28	0.48	0.85	1.1	1.3	2.1	0.59	0.45
AMS09	Barge Landing	61	93%	0	0	0.062	0.22	0.38	0.67	1.2	2.1	9.7	0.7	1.3
AMS13	Fort McKay South	61	95%	0	0.028	0.072	0.23	0.41	0.62	0.88	1	6.3	0.53	0.82
AMS15	Horizon	59	100%	0.08	0.14	0.18	0.28	0.5	0.78	1.2	1.3	2.8	0.62	0.49
AMS22	Janvier	60	93%	0	0	0.065	0.16	0.32	0.6	1.2	1.7	2	0.47	0.47





Volatile Organic Compounds - n-Decane (ppbv) - 2019

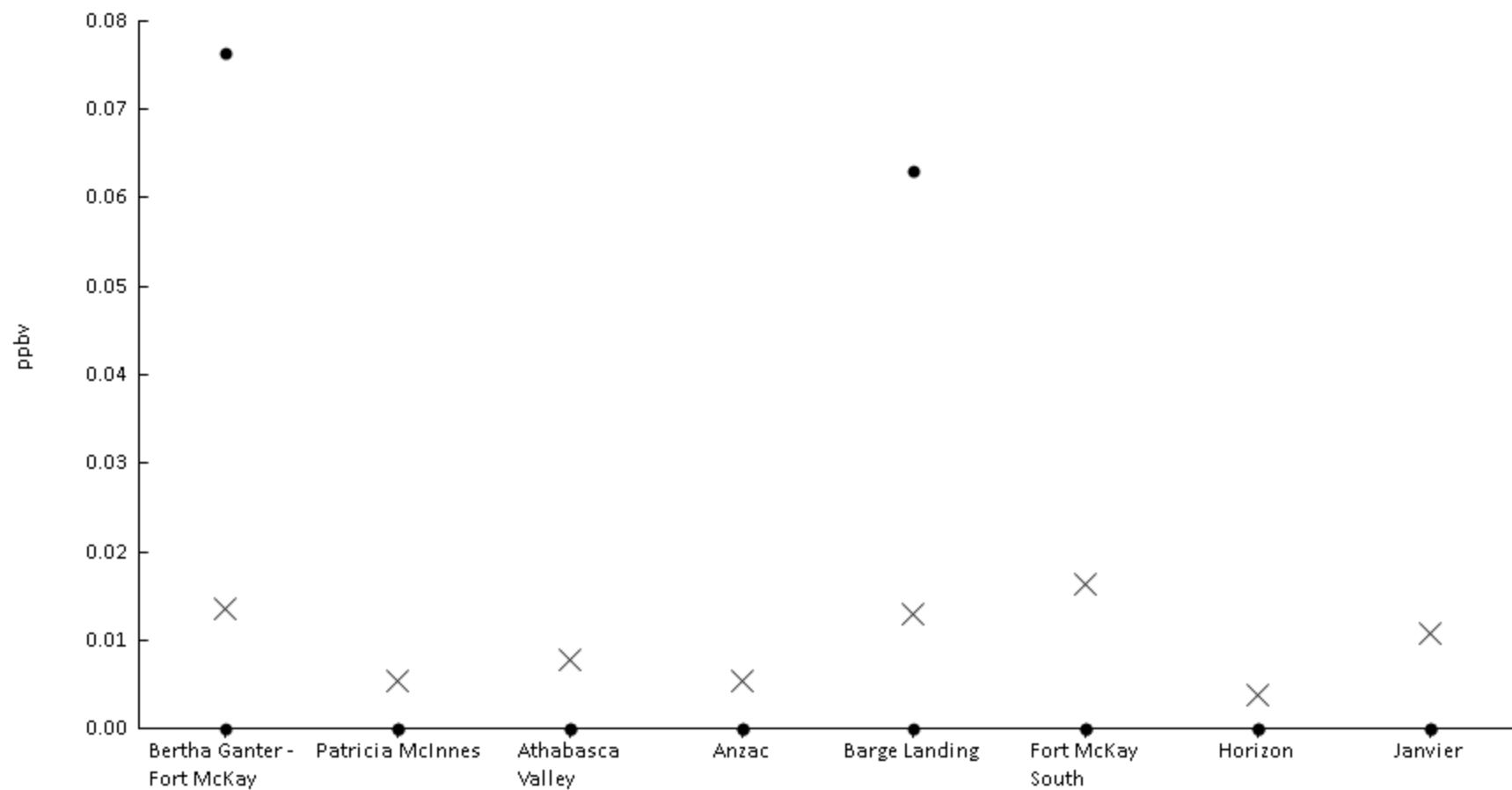
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	41%	0	0	0	0	0	0.09	0.16	0.18	0.23	0.049	0.066
AMS06	Patricia McInnes	60	32%	0	0	0	0	0	0.045	0.13	0.15	0.16	0.029	0.049
AMS07	Athabasca Valley	60	32%	0	0	0	0	0	0.065	0.12	0.13	0.15	0.031	0.05
AMS14	Anzac	59	12%	0	0	0	0	0	0	0.076	0.1	0.14	0.012	0.034
AMS09	Barge Landing	61	41%	0	0	0	0	0	0.093	0.15	0.16	0.19	0.045	0.061
AMS13	Fort McKay South	61	38%	0	0	0	0	0	0.09	0.14	0.16	0.18	0.043	0.06
AMS15	Horizon	59	22%	0	0	0	0	0	0	0.11	0.13	0.16	0.023	0.046
AMS22	Janvier	60	8%	0	0	0	0	0	0	0	0.09	0.14	8.5E-3	0.029





Volatile Organic Compounds - n-Dodecane (ppbv) - 2019

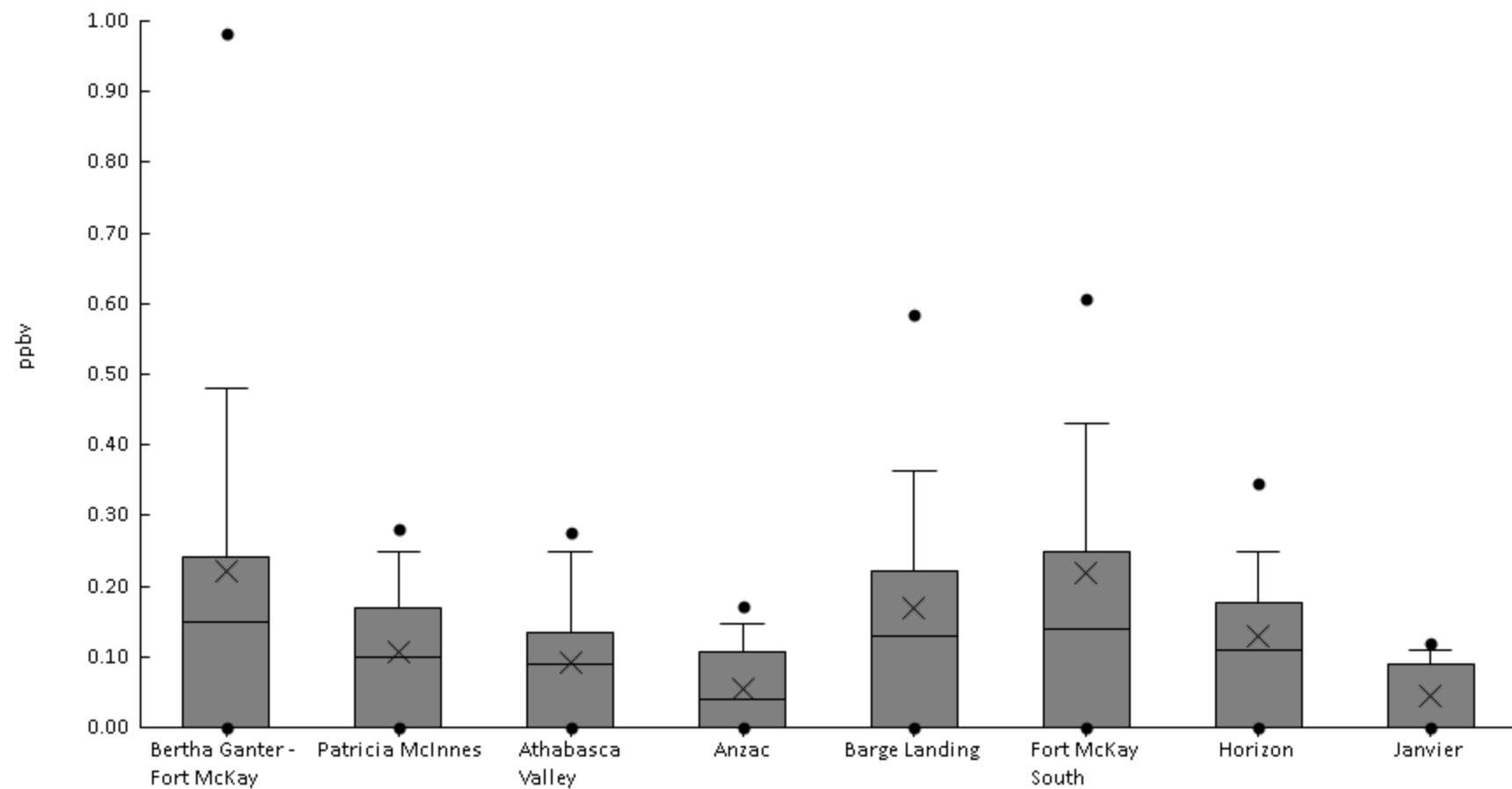
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	5%	0	0	0	0	0	0	0	0.076	0.43	0.013	0.065
AMS06	Patricia McInnes	60	3%	0	0	0	0	0	0	0	0	0.22	5.3E-3	0.031
AMS07	Athabasca Valley	60	3%	0	0	0	0	0	0	0	0	0.24	7.7E-3	0.042
AMS14	Anzac	59	3%	0	0	0	0	0	0	0	0	0.21	5.4E-3	0.031
AMS09	Barge Landing	61	5%	0	0	0	0	0	0	0	0.063	0.43	0.013	0.064
AMS13	Fort McKay South	61	3%	0	0	0	0	0	0	0	0	0.77	0.016	0.1
AMS15	Horizon	59	2%	0	0	0	0	0	0	0	0	0.22	3.7E-3	0.029
AMS22	Janvier	60	3%	0	0	0	0	0	0	0	0	0.43	0.011	0.062





Volatile Organic Compounds - n-Heptane (ppbv) - 2019

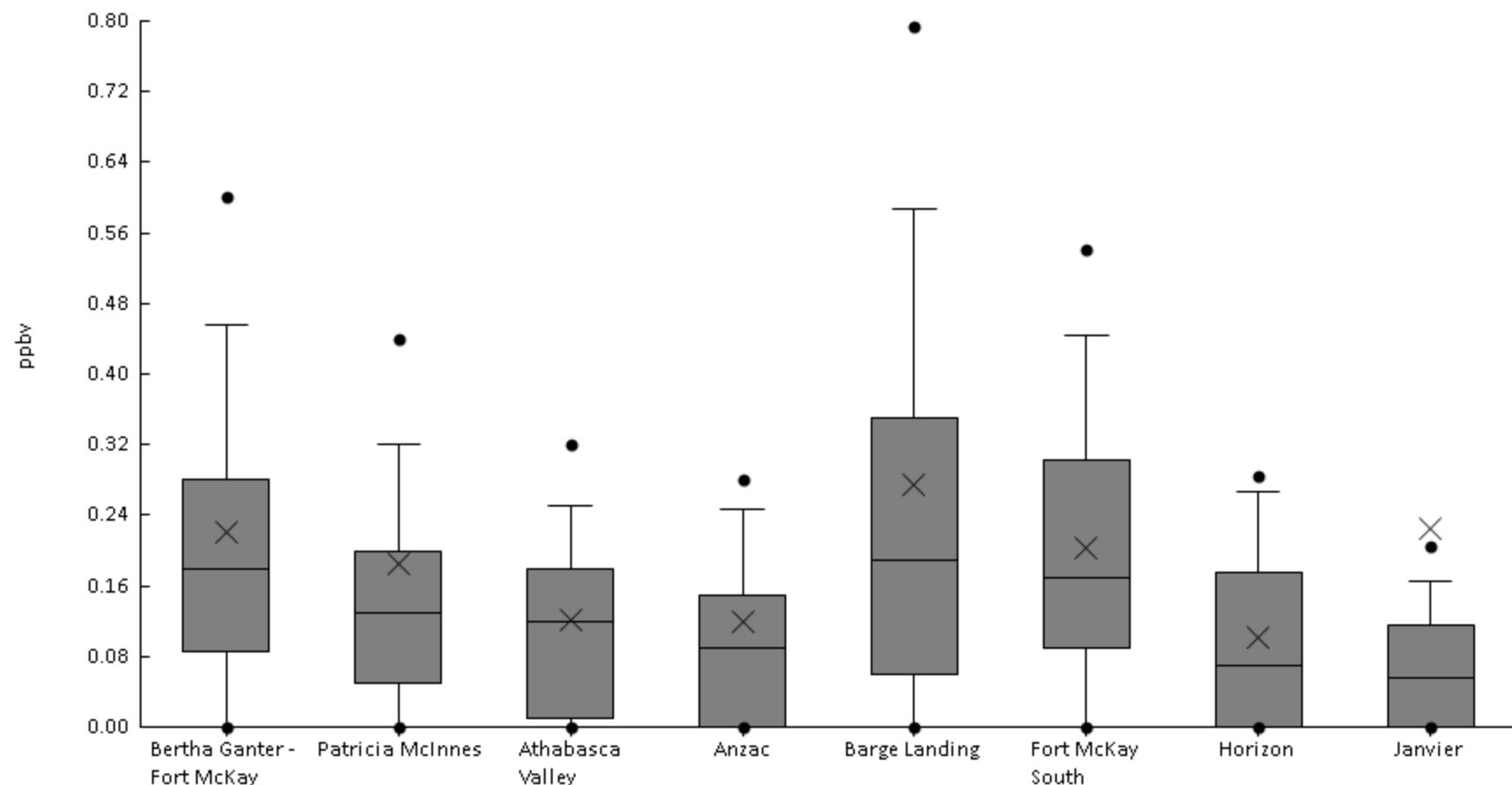
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	69%	0	0	0	0	0.15	0.24	0.48	0.98	1.8	0.22	0.34
AMS06	Patricia McInnes	60	70%	0	0	0	0	0.1	0.17	0.25	0.28	0.43	0.11	0.1
AMS07	Athabasca Valley	60	65%	0	0	0	0	0.09	0.14	0.25	0.28	0.32	0.092	0.091
AMS14	Anzac	59	54%	0	0	0	0	0.04	0.11	0.15	0.17	0.21	0.055	0.061
AMS09	Barge Landing	61	69%	0	0	0	0	0.13	0.22	0.36	0.58	0.97	0.17	0.2
AMS13	Fort McKay South	61	74%	0	0	0	0	0.14	0.25	0.43	0.61	2.6	0.22	0.37
AMS15	Horizon	59	69%	0	0	0	0	0.11	0.18	0.25	0.35	1	0.13	0.17
AMS22	Janvier	60	48%	0	0	0	0	0	0.09	0.11	0.12	0.22	0.045	0.053





Volatile Organic Compounds - n-Hexane (ppbv) - 2019

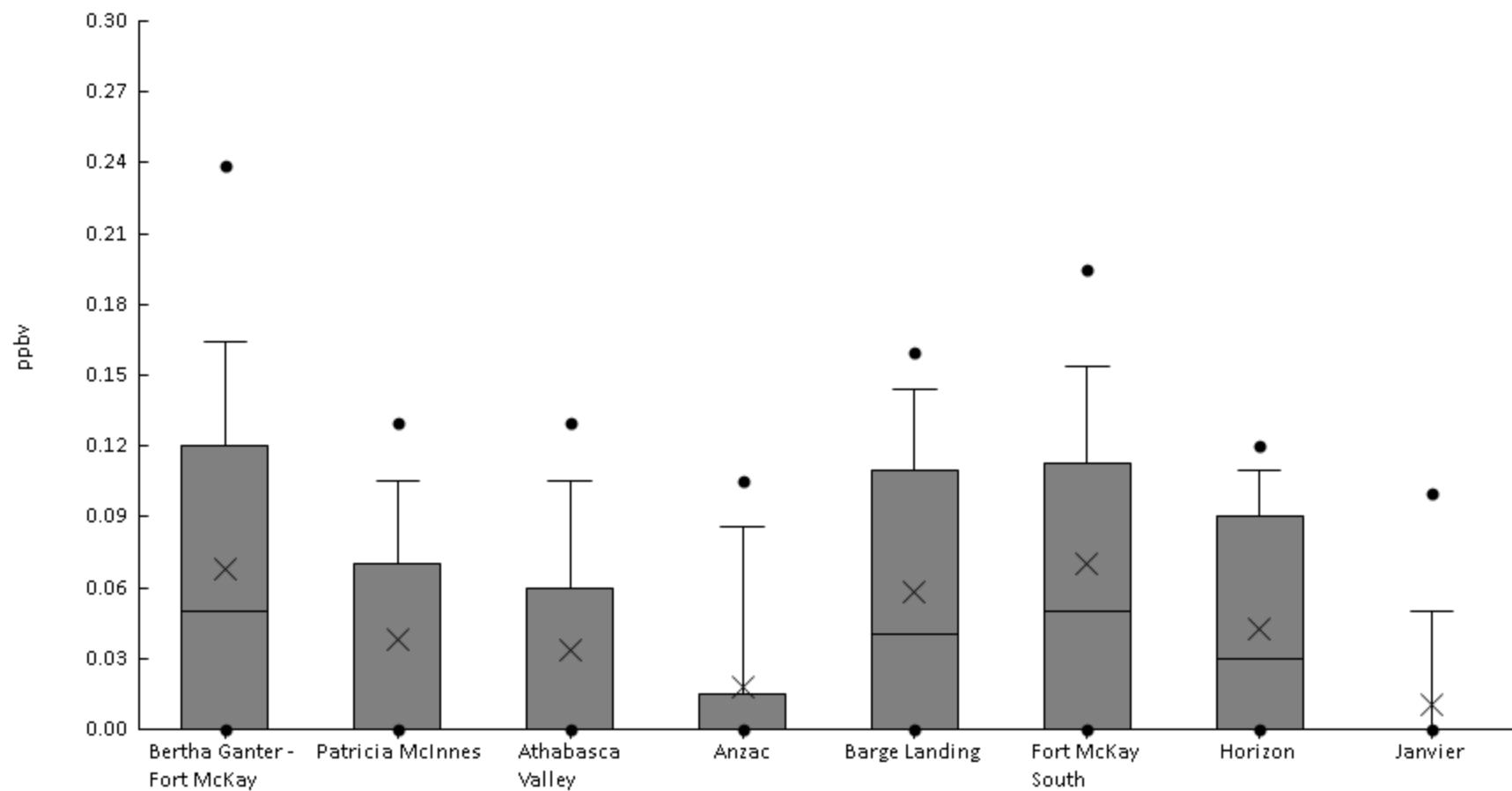
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	82%	0	0	0	0.085	0.18	0.28	0.46	0.6	1	0.22	0.21
AMS06	Patricia McInnes	60	82%	0	0	0	0.05	0.13	0.2	0.32	0.44	2.6	0.19	0.35
AMS07	Athabasca Valley	60	75%	0	0	0	0.01	0.12	0.18	0.25	0.32	0.53	0.12	0.11
AMS14	Anzac	59	69%	0	0	0	0	0.09	0.15	0.25	0.28	1.2	0.12	0.19
AMS09	Barge Landing	61	85%	0	0	0	0.06	0.19	0.35	0.59	0.79	2.7	0.27	0.39
AMS13	Fort McKay South	61	84%	0	0	0	0.09	0.17	0.3	0.44	0.54	0.64	0.2	0.17
AMS15	Horizon	59	61%	0	0	0	0	0.07	0.18	0.27	0.29	0.54	0.1	0.12
AMS22	Janvier	60	65%	0	0	0	0	0.055	0.12	0.17	0.21	9.8	0.22	1.3





Volatile Organic Compounds - n-Nonane (ppbv) - 2019

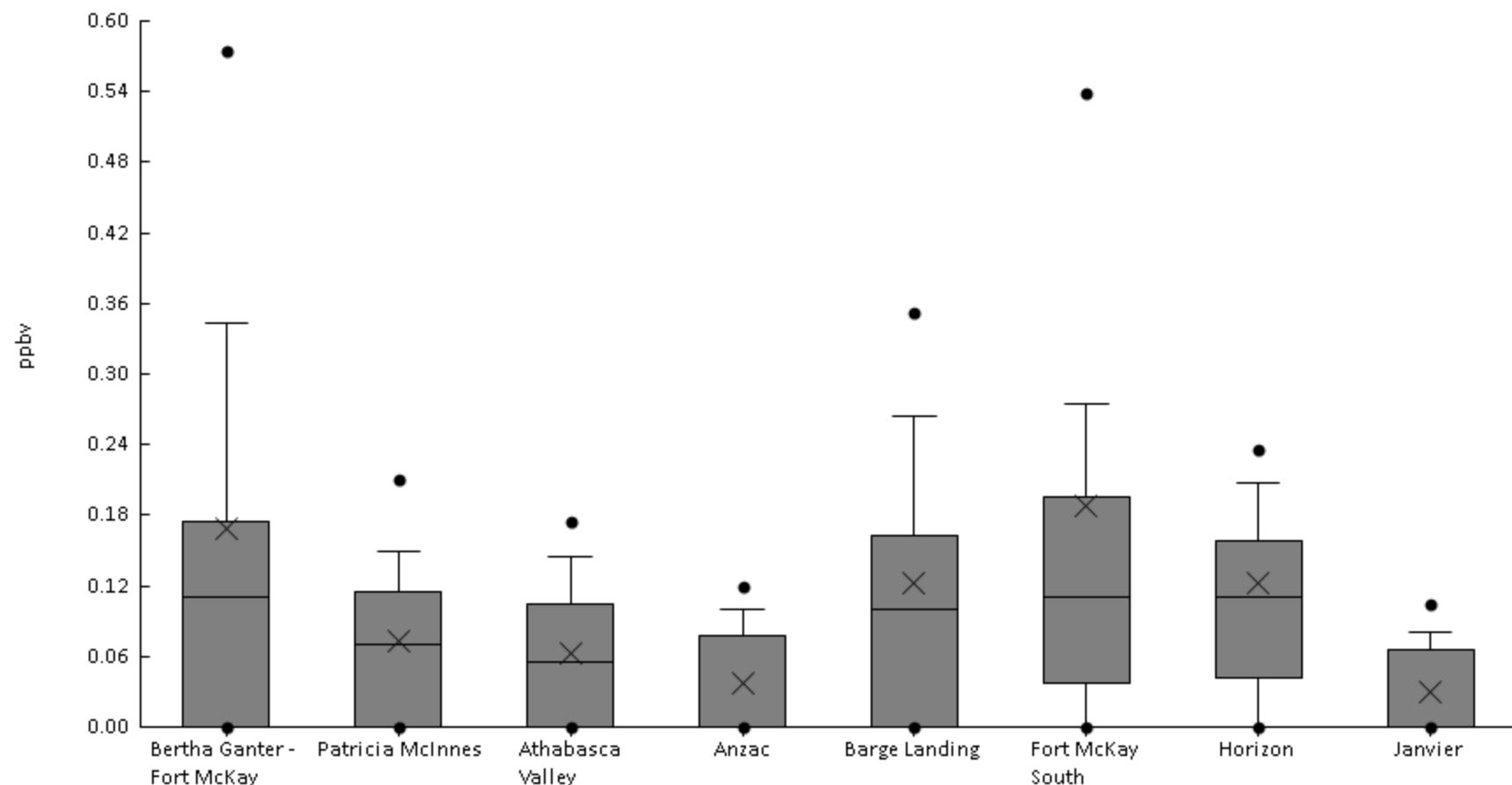
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	0	0	0	0	0.05	0.12	0.16	0.24	0.41	0.068	0.088
AMS06	Patricia McInnes	60	45%	0	0	0	0	0	0.07	0.11	0.13	0.23	0.038	0.053
AMS07	Athabasca Valley	60	45%	0	0	0	0	0	0.06	0.11	0.13	0.18	0.034	0.047
AMS14	Anzac	59	25%	0	0	0	0	0	0.015	0.086	0.11	0.11	0.018	0.035
AMS09	Barge Landing	61	57%	0	0	0	0	0.04	0.11	0.14	0.16	0.24	0.059	0.064
AMS13	Fort McKay South	61	64%	0	0	0	0	0.05	0.11	0.15	0.19	0.44	0.07	0.084
AMS15	Horizon	59	51%	0	0	0	0	0.03	0.09	0.11	0.12	0.19	0.043	0.049
AMS22	Janvier	60	15%	0	0	0	0	0	0	0.05	0.1	0.11	0.011	0.029





Volatile Organic Compounds - n-Octane (ppbv) - 2019

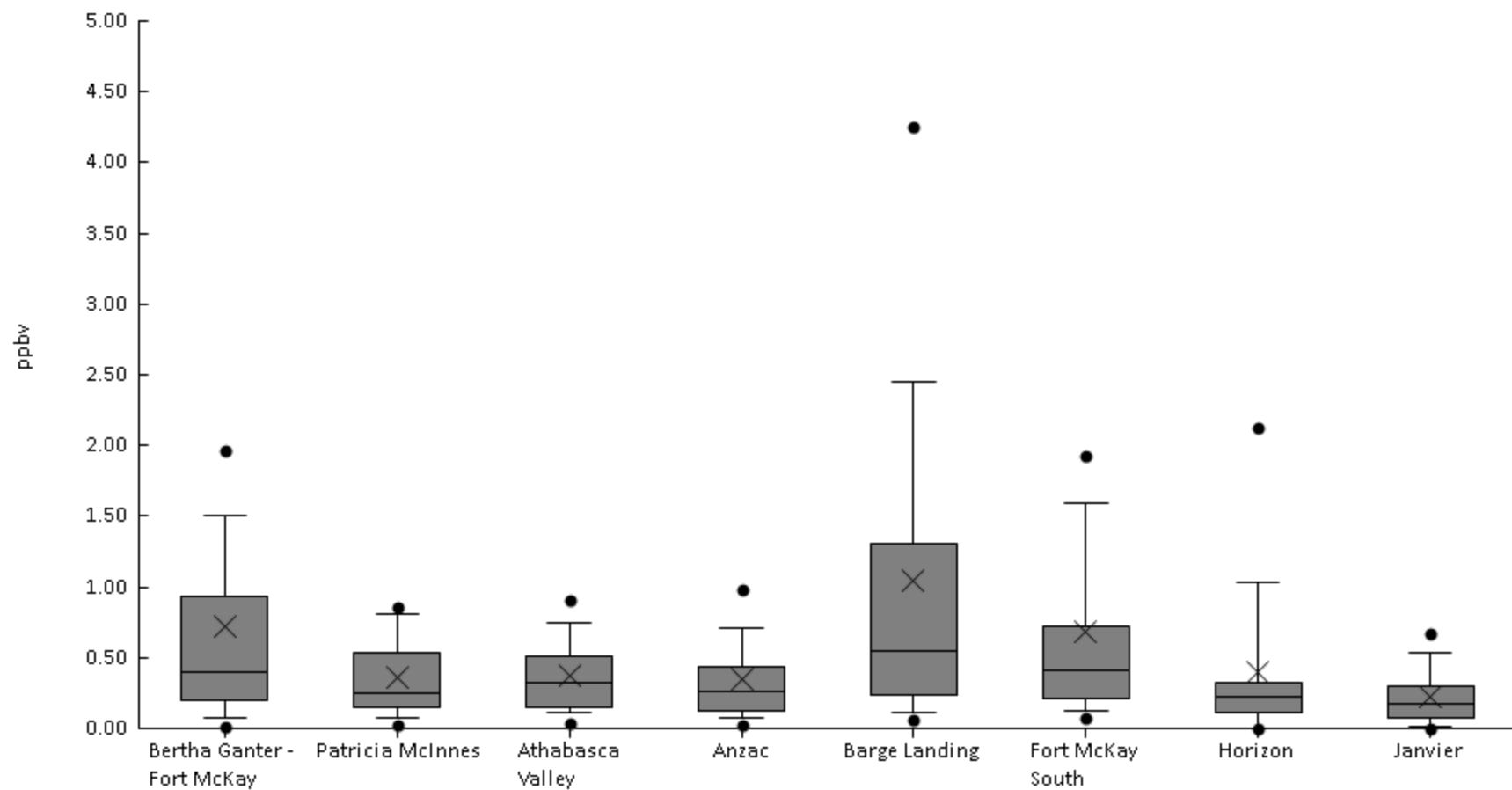
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	74%	0	0	0	0	0.11	0.18	0.34	0.57	1.8	0.17	0.29
AMS06	Patricia McInnes	60	68%	0	0	0	0	0.07	0.12	0.15	0.21	0.29	0.073	0.071
AMS07	Athabasca Valley	60	62%	0	0	0	0	0.055	0.11	0.15	0.18	0.26	0.062	0.063
AMS14	Anzac	59	47%	0	0	0	0	0	0.078	0.1	0.12	0.15	0.037	0.045
AMS09	Barge Landing	61	69%	0	0	0	0	0.1	0.16	0.26	0.35	0.82	0.12	0.16
AMS13	Fort McKay South	61	77%	0	0	0	0.038	0.11	0.2	0.27	0.54	3	0.19	0.4
AMS15	Horizon	59	78%	0	0	0	0.043	0.11	0.16	0.21	0.24	0.88	0.12	0.16
AMS22	Janvier	60	43%	0	0	0	0	0	0.065	0.08	0.11	0.12	0.03	0.039





Volatile Organic Compounds - n-Pentane (ppbv) - 2019

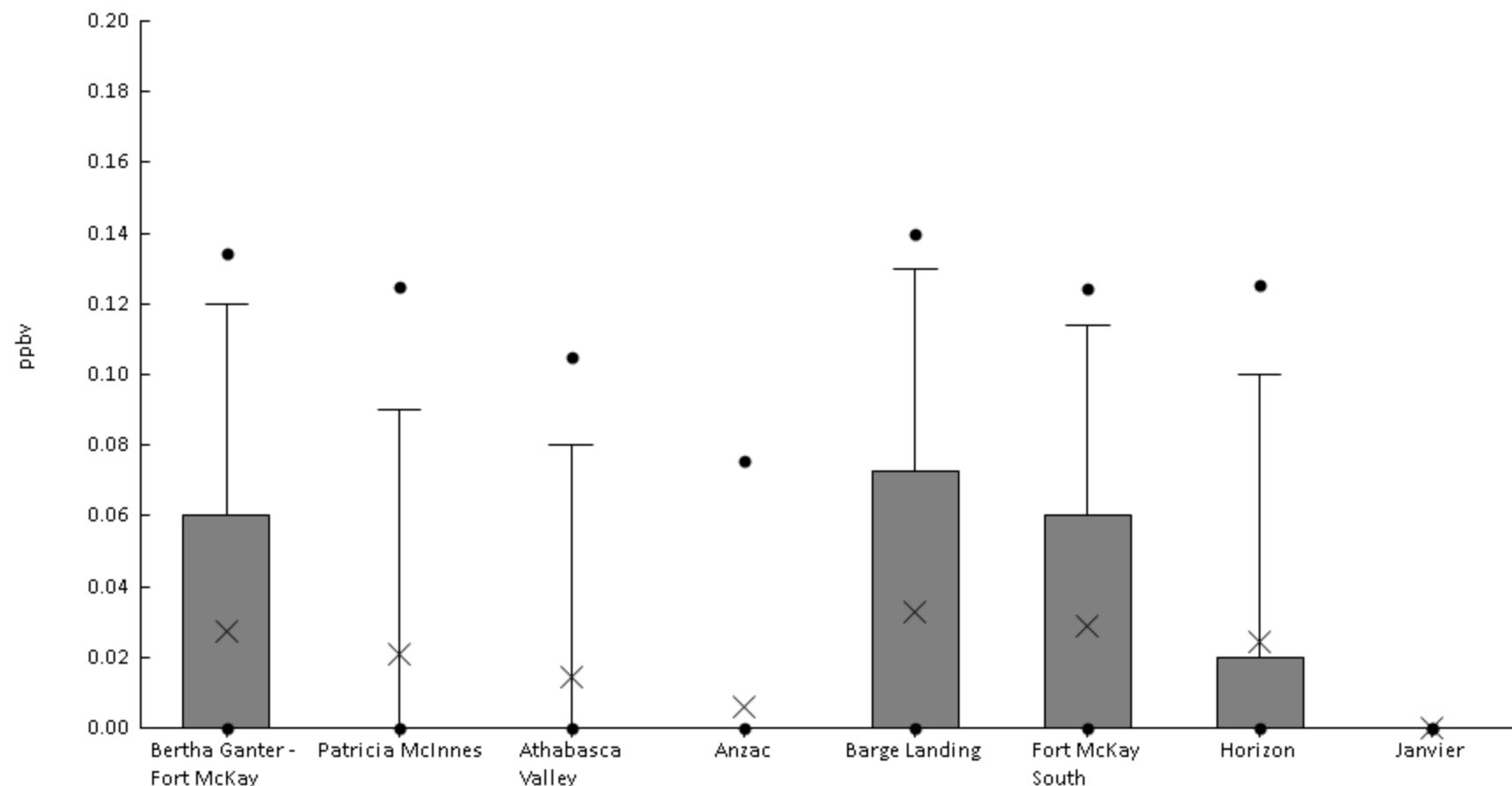
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	0.017	0.08	0.2	0.4	0.93	1.5	2	7.1	0.72	1
AMS06	Patricia McInnes	60	95%	0	0.02	0.075	0.15	0.25	0.54	0.81	0.86	1.7	0.36	0.31
AMS07	Athabasca Valley	60	97%	0	0.035	0.11	0.15	0.32	0.52	0.75	0.91	1.5	0.37	0.29
AMS14	Anzac	59	97%	0	0.03	0.08	0.12	0.26	0.44	0.71	0.98	2.4	0.35	0.37
AMS09	Barge Landing	61	97%	0	0.057	0.12	0.24	0.55	1.3	2.5	4.3	6.4	1	1.4
AMS13	Fort McKay South	61	98%	0	0.071	0.13	0.21	0.41	0.73	1.6	1.9	4.4	0.68	0.78
AMS15	Horizon	59	85%	0	0	0	0.11	0.22	0.33	1	2.1	2.5	0.4	0.58
AMS22	Janvier	60	90%	0	0	0.015	0.08	0.17	0.3	0.53	0.67	1.1	0.22	0.21





Volatile Organic Compounds - n-Propylbenzene (ppbv) - 2019

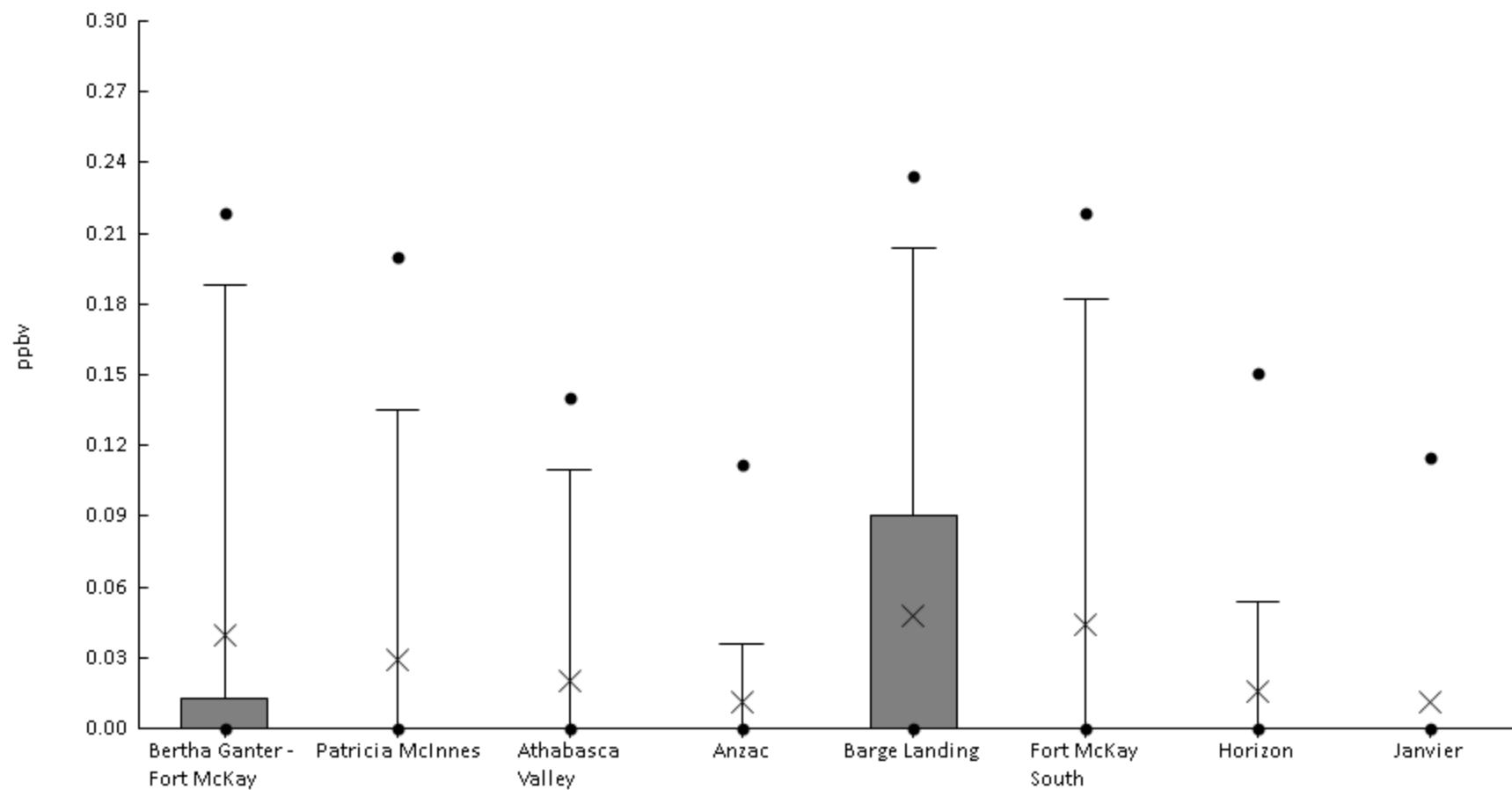
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	28%	0	0	0	0	0	0.06	0.12	0.13	0.15	0.028	0.048
AMS06	Patricia McInnes	60	23%	0	0	0	0	0	0	0.09	0.13	0.14	0.021	0.042
AMS07	Athabasca Valley	60	17%	0	0	0	0	0	0	0.08	0.11	0.14	0.015	0.036
AMS14	Anzac	59	8%	0	0	0	0	0	0	0	0.076	0.09	5.8E-3	0.021
AMS09	Barge Landing	61	34%	0	0	0	0	0	0.073	0.13	0.14	0.17	0.033	0.053
AMS13	Fort McKay South	61	33%	0	0	0	0	0	0.06	0.11	0.12	0.14	0.029	0.046
AMS15	Horizon	59	27%	0	0	0	0	0	0.02	0.1	0.13	0.14	0.024	0.044
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.01	1.7E-4	1.3E-3





Volatile Organic Compounds - n-Undecane (ppbv) - 2019

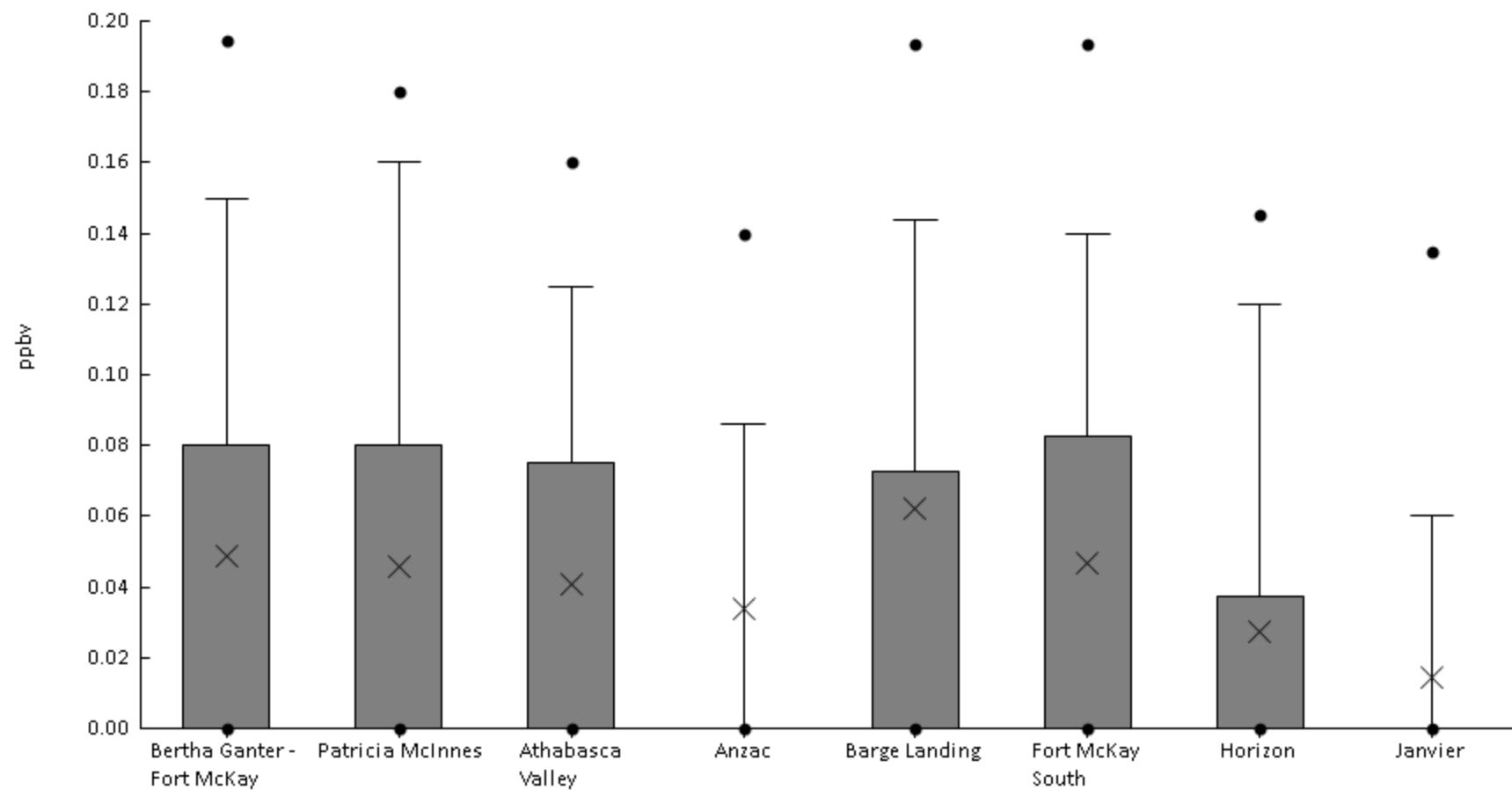
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	25%	0	0	0	0	0	0.013	0.19	0.22	0.28	0.04	0.077
AMS06	Patricia McInnes	60	20%	0	0	0	0	0	0	0.14	0.2	0.27	0.029	0.066
AMS07	Athabasca Valley	60	17%	0	0	0	0	0	0	0.11	0.14	0.23	0.02	0.05
AMS14	Anzac	59	10%	0	0	0	0	0	0	0.036	0.11	0.14	0.011	0.034
AMS09	Barge Landing	61	30%	0	0	0	0	0	0.09	0.2	0.23	0.27	0.048	0.084
AMS13	Fort McKay South	61	21%	0	0	0	0	0	0	0.18	0.22	0.7	0.044	0.11
AMS15	Horizon	59	10%	0	0	0	0	0	0	0.054	0.15	0.26	0.016	0.05
AMS22	Janvier	60	8%	0	0	0	0	0	0	0	0.12	0.2	0.011	0.039





Volatile Organic Compounds - o-Xylene (ppbv) - 2019

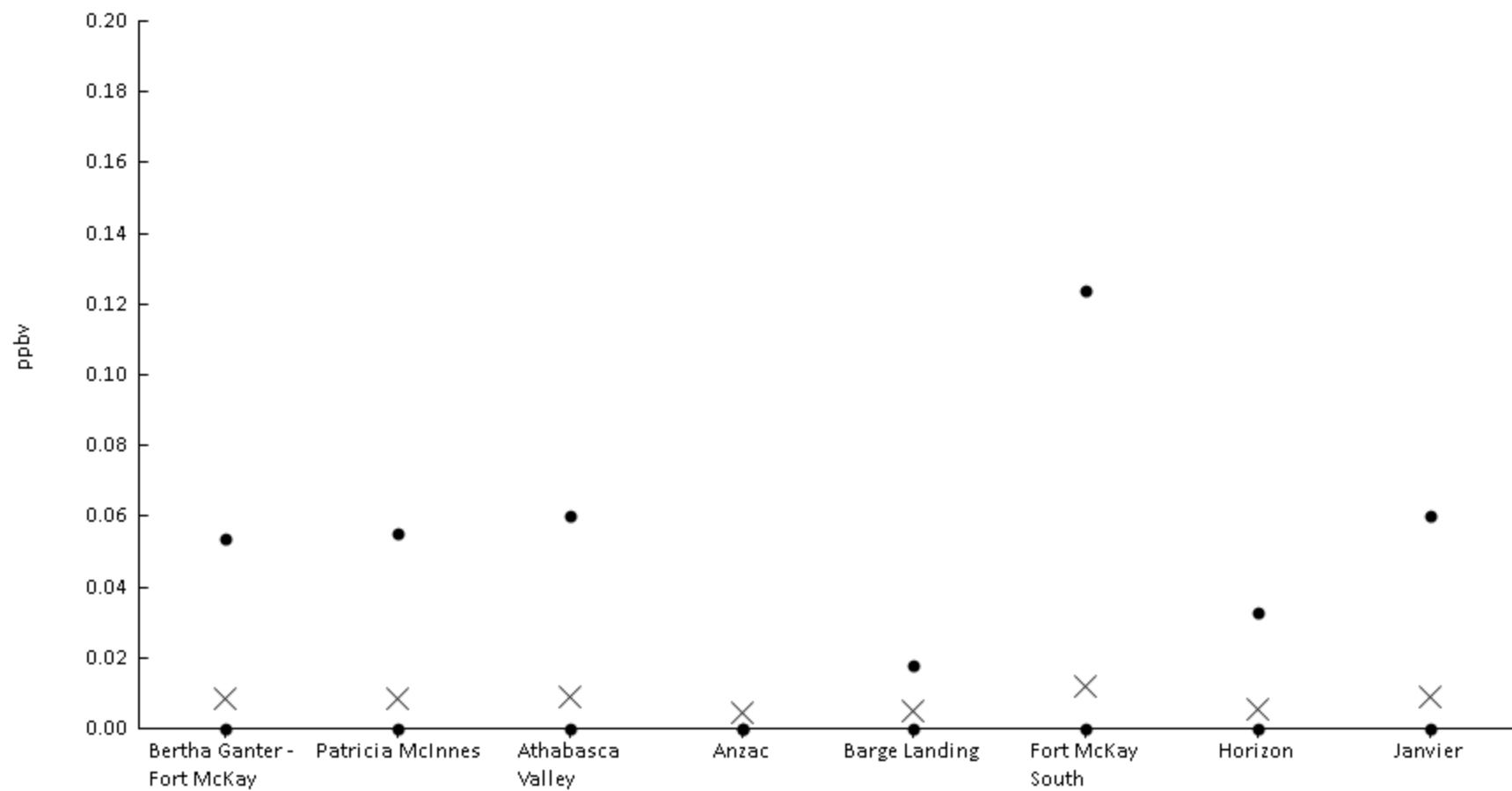
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	41%	0	0	0	0	0	0.08	0.15	0.19	0.4	0.049	0.077
AMS06	Patricia McInnes	60	38%	0	0	0	0	0	0.08	0.16	0.18	0.3	0.046	0.071
AMS07	Athabasca Valley	60	42%	0	0	0	0	0	0.075	0.13	0.16	0.23	0.041	0.058
AMS14	Anzac	59	22%	0	0	0	0	0	0	0.086	0.14	0.87	0.034	0.12
AMS09	Barge Landing	61	43%	0	0	0	0	0	0.073	0.14	0.19	1.3	0.062	0.17
AMS13	Fort McKay South	61	41%	0	0	0	0	0	0.083	0.14	0.19	0.29	0.047	0.069
AMS15	Horizon	59	29%	0	0	0	0	0	0.038	0.12	0.15	0.18	0.027	0.051
AMS22	Janvier	60	15%	0	0	0	0	0	0	0.06	0.14	0.15	0.014	0.038





Volatile Organic Compounds - Styrene (ppbv) - 2019

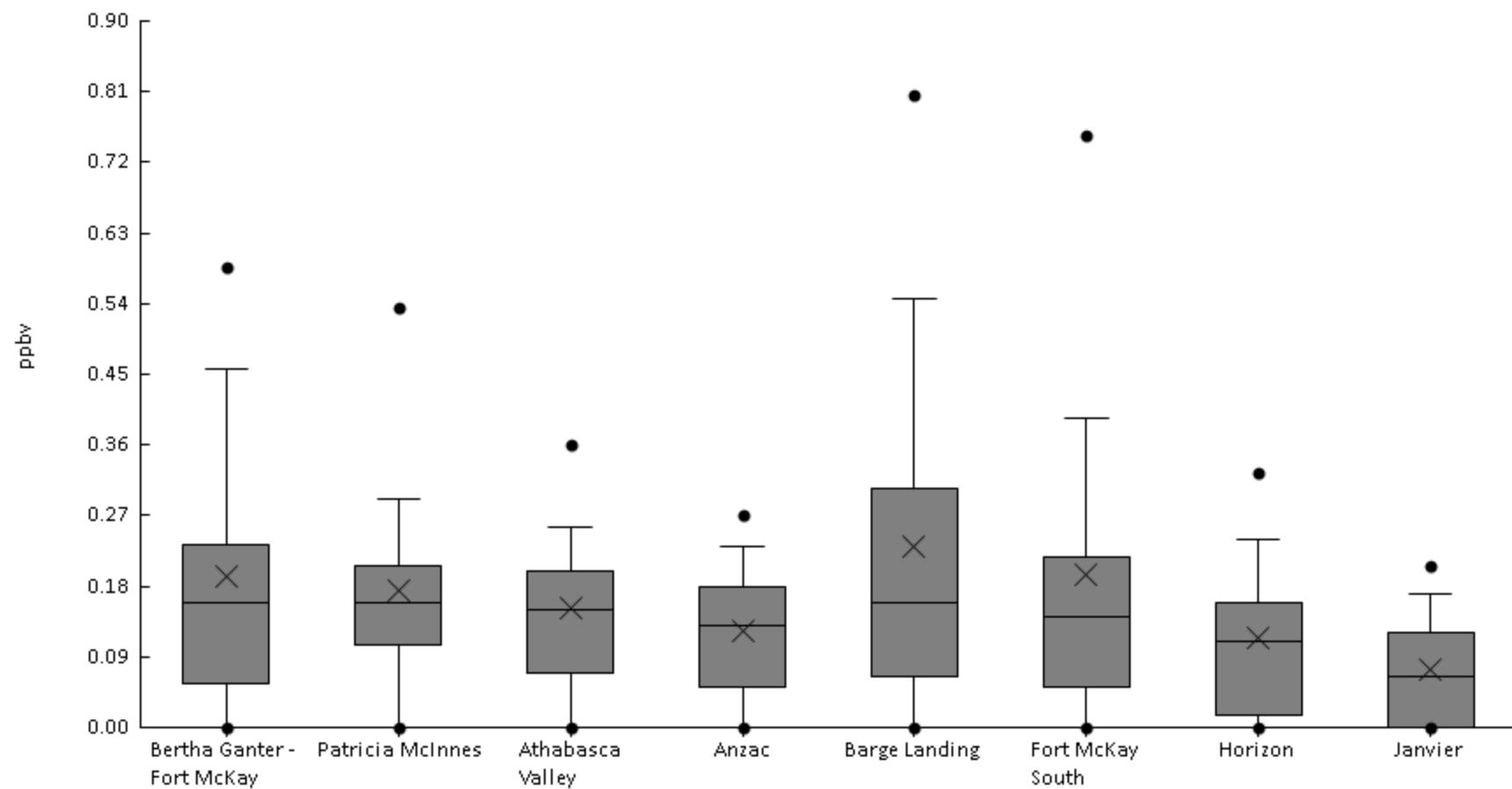
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	7%	0	0	0	0	0	0	0	0.053	0.21	8.4E-3	0.037
AMS06	Patricia McInnes	60	7%	0	0	0	0	0	0	0	0.055	0.21	8.5E-3	0.037
AMS07	Athabasca Valley	60	5%	0	0	0	0	0	0	0	0.06	0.21	8.8E-3	0.04
AMS14	Anzac	59	3%	0	0	0	0	0	0	0	0	0.21	4.6E-3	0.028
AMS09	Barge Landing	61	5%	0	0	0	0	0	0	0	0.018	0.19	4.9E-3	0.026
AMS13	Fort McKay South	61	7%	0	0	0	0	0	0	0	0.12	0.25	0.012	0.048
AMS15	Horizon	59	5%	0	0	0	0	0	0	0	0.033	0.19	5.4E-3	0.027
AMS22	Janvier	60	7%	0	0	0	0	0	0	0	0.06	0.22	9E-3	0.039





Volatile Organic Compounds - Toluene (ppbv) - 2019

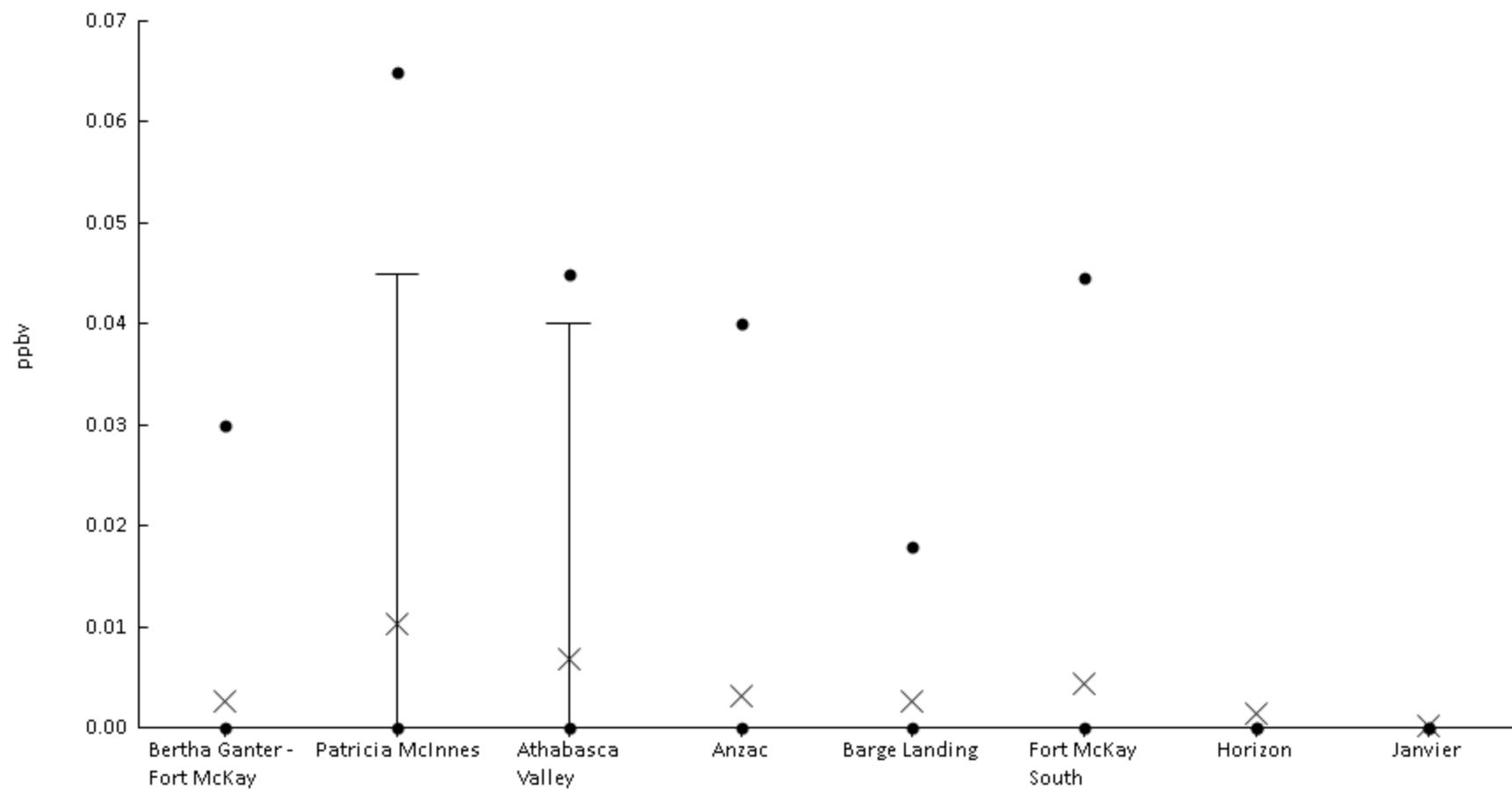
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	77%	0	0	0	0.055	0.16	0.23	0.46	0.59	1.1	0.19	0.21
AMS06	Patricia McInnes	60	87%	0	0	0	0.11	0.16	0.21	0.29	0.54	0.73	0.17	0.15
AMS07	Athabasca Valley	60	83%	0	0	0	0.07	0.15	0.2	0.26	0.36	0.79	0.15	0.13
AMS14	Anzac	59	78%	0	0	0	0.053	0.13	0.18	0.23	0.27	0.44	0.12	0.093
AMS09	Barge Landing	61	77%	0	0	0	0.065	0.16	0.31	0.55	0.81	1	0.23	0.25
AMS13	Fort McKay South	61	75%	0	0	0	0.053	0.14	0.22	0.39	0.75	1.3	0.2	0.25
AMS15	Horizon	59	76%	0	0	0	0.015	0.11	0.16	0.24	0.33	0.51	0.11	0.11
AMS22	Janvier	60	65%	0	0	0	0	0.065	0.12	0.17	0.21	0.29	0.074	0.074





Volatile Organic Compounds - trans-2-Butene (ppbv) - 2019

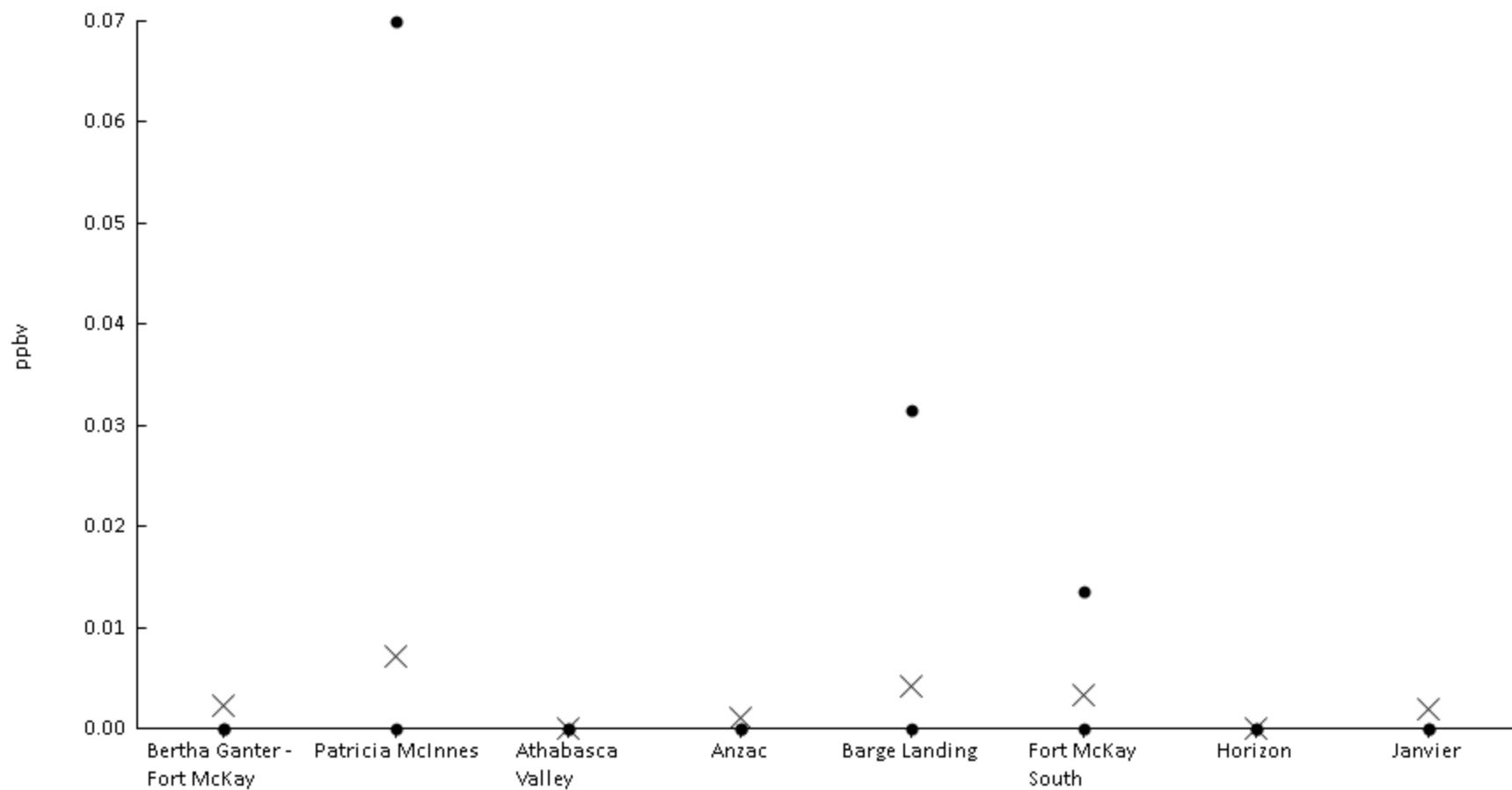
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	7%	0	0	0	0	0	0	0.03	0.06	2.6E-3	0.01	
AMS06	Patricia McInnes	60	22%	0	0	0	0	0	0	0.045	0.065	0.09	0.01	0.023
AMS07	Athabasca Valley	60	17%	0	0	0	0	0	0	0.04	0.045	0.05	6.8E-3	0.016
AMS14	Anzac	59	7%	0	0	0	0	0	0	0	0.04	0.05	3.1E-3	0.011
AMS09	Barge Landing	61	5%	0	0	0	0	0	0	0	0.018	0.06	2.6E-3	0.012
AMS13	Fort McKay South	61	8%	0	0	0	0	0	0	0	0.045	0.09	4.4E-3	0.016
AMS15	Horizon	59	3%	0	0	0	0	0	0	0	0	0.04	1.4E-3	7.3E-3
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.01	1.7E-4	1.3E-3





Volatile Organic Compounds - trans-2-Hexene (ppbv) - 2019

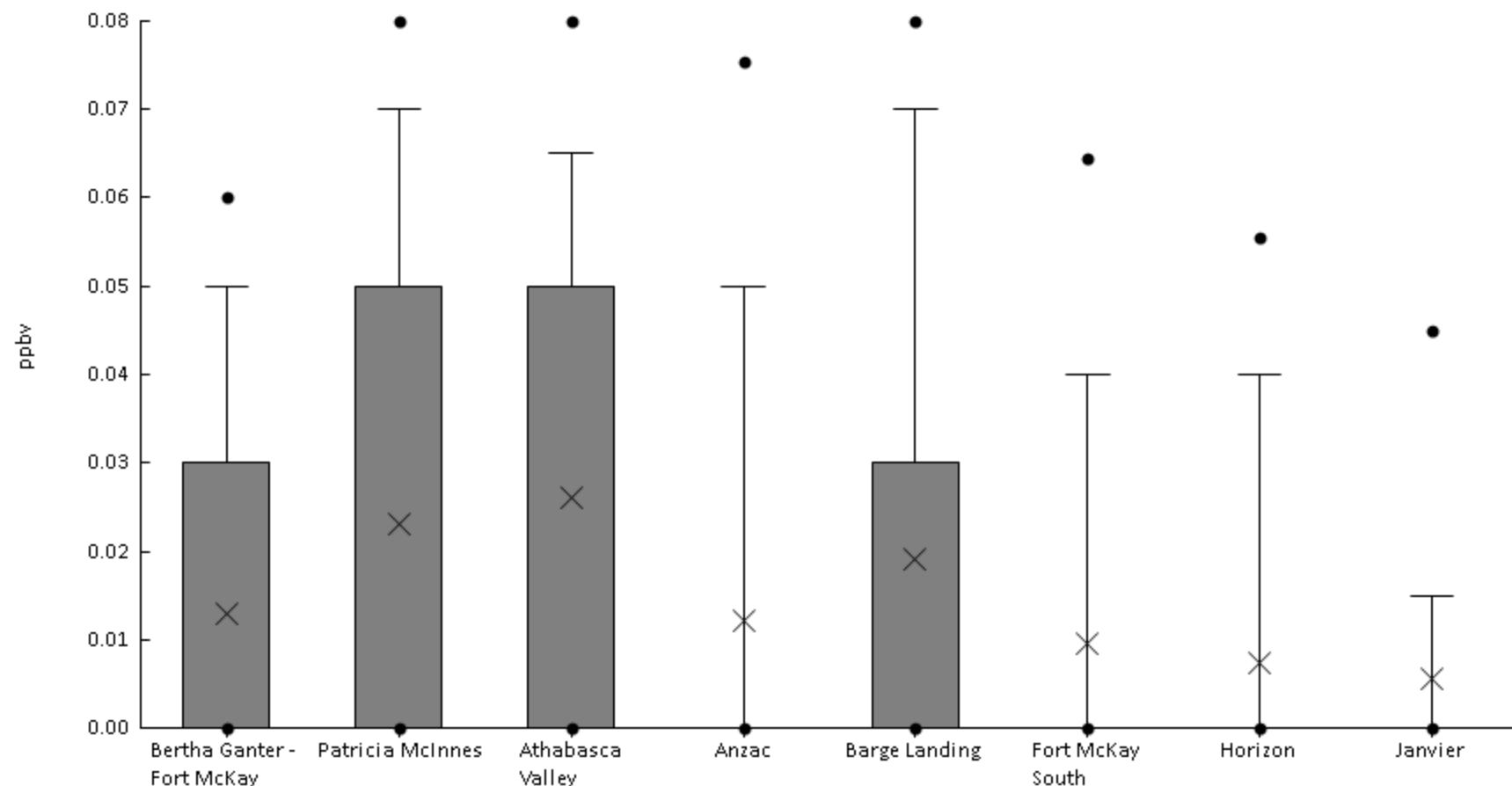
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	3%	0	0	0	0	0	0	0	0	0.07	2.3E-3	0.013
AMS06	Patricia McInnes	60	8%	0	0	0	0	0	0	0	0.07	0.11	7.2E-3	0.025
AMS07	Athabasca Valley	60	0%	0	0	0	0	0	0	0	0	0	0	0
AMS14	Anzac	59	2%	0	0	0	0	0	0	0	0	0.06	1E-3	7.8E-3
AMS09	Barge Landing	61	5%	0	0	0	0	0	0	0	0.031	0.11	4.1E-3	0.019
AMS13	Fort McKay South	61	5%	0	0	0	0	0	0	0	0.013	0.11	3.3E-3	0.016
AMS15	Horizon	59	0%	0	0	0	0	0	0	0	0	0	0	0
AMS22	Janvier	60	2%	0	0	0	0	0	0	0	0	0.11	1.8E-3	0.014





Volatile Organic Compounds - trans-2-Pentene (ppbv) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	26%	0	0	0	0	0	0.03	0.05	0.06	0.08	0.013	0.023
AMS06	Patricia McInnes	60	38%	0	0	0	0	0	0.05	0.07	0.08	0.1	0.023	0.031
AMS07	Athabasca Valley	60	40%	0	0	0	0	0	0.05	0.065	0.08	0.3	0.026	0.046
AMS14	Anzac	59	22%	0	0	0	0	0	0	0.05	0.076	0.09	0.012	0.025
AMS09	Barge Landing	61	28%	0	0	0	0	0	0.03	0.07	0.08	0.31	0.019	0.046
AMS13	Fort McKay South	61	16%	0	0	0	0	0	0	0.04	0.064	0.13	9.5E-3	0.025
AMS15	Horizon	59	14%	0	0	0	0	0	0	0.04	0.056	0.09	7.3E-3	0.02
AMS22	Janvier	60	10%	0	0	0	0	0	0	0.015	0.045	0.1	5.7E-3	0.019





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PARTICULATE MATTER - IONS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: 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 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Desert Research Institute
Reno, NV

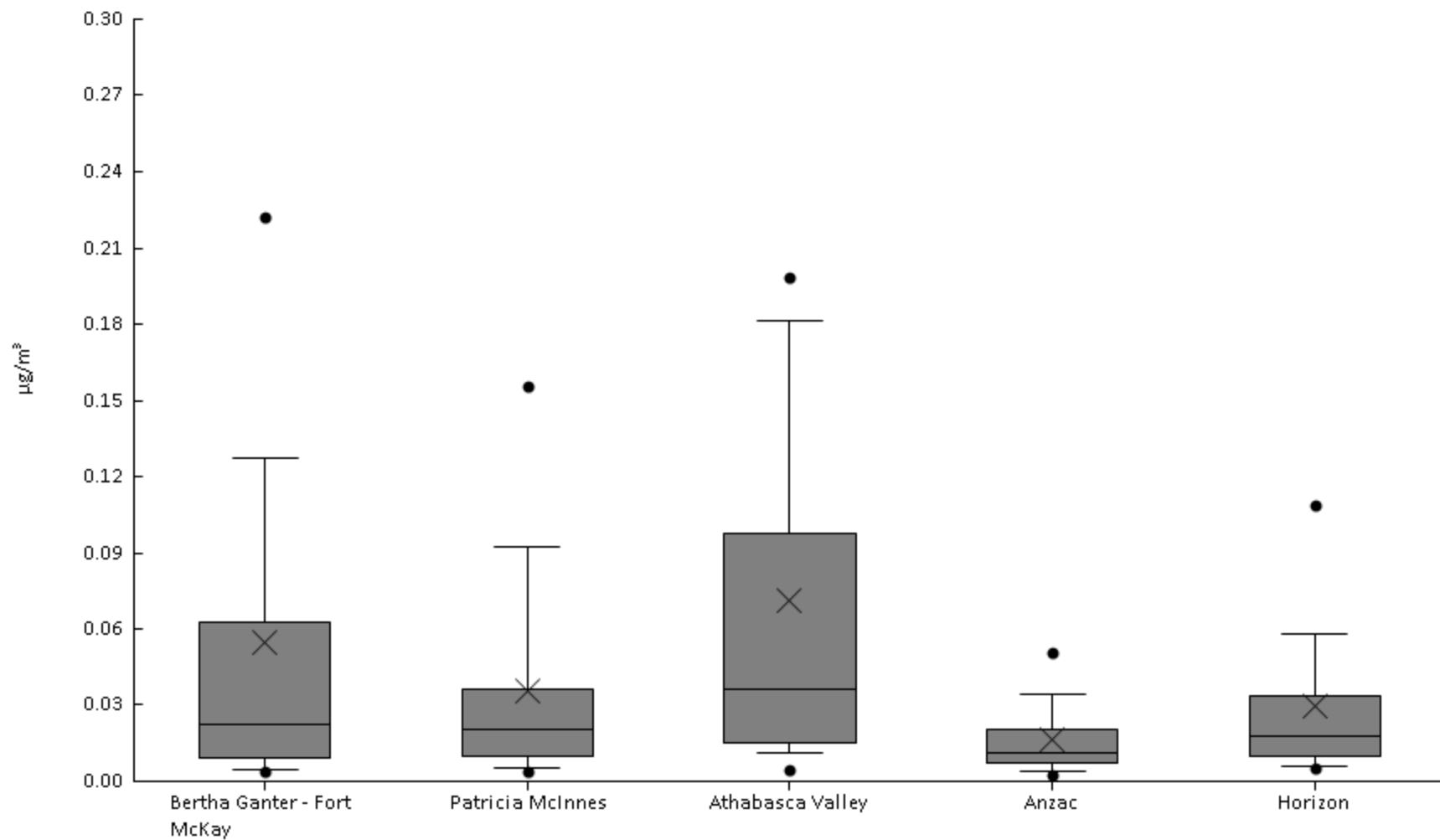


CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (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) DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
SAMPLE PREPARATION	Desert Research Institute
ANALYTICAL LABORATORY	Data are not blank corrected
USER NOTE 1	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 2	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
USER NOTE 3	Partisols for PM _{2.5} at AMS 15 occasionally samples 24.1 m ³ despite being set for 24 m ³ . Flow has been calibrated. Reason for this behaviour is unknown.
USER NOTE 4	Data is computed on a monthly dataset.
USER NOTE 5	Summary statistics include flags beginning with V.
USER NOTE 6	Actual Volume at Ambient Conditions (since 01-Jan-2011)
VOLUME STANDARDIZATION	For PM ₁₀ FRM Partisol PM ₁₀ sampler
SAMPLING INSTRUMENT TYPE	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



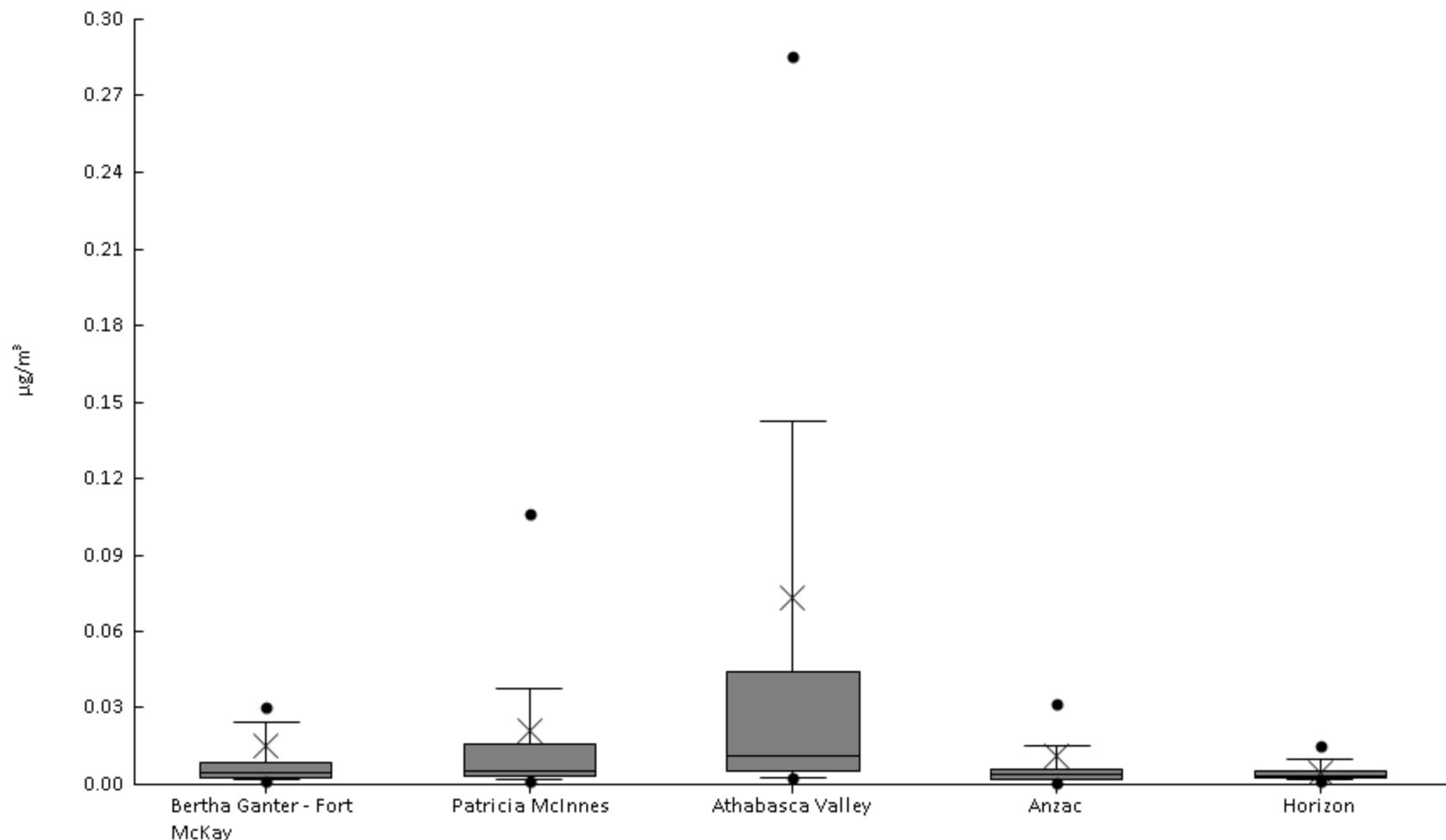
Particulate Matter (PM_{2.5}) IONS - Calcium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	2.6E-3	4E-3	4.6E-3	9.2E-3	0.023	0.063	0.13	0.22	0.52	0.055	0.084
AMS06	Patricia McInnes	61	100%	2.6E-3	4.2E-3	5.4E-3	1E-2	0.021	0.036	0.092	0.16	0.19	0.035	0.044
AMS07	Athabasca Valley	61	100%	4.1E-3	4.9E-3	0.011	0.015	0.036	0.097	0.18	0.2	0.5	0.071	0.083
AMS14	Anzac	60	100%	2.3E-3	2.9E-3	4E-3	7.3E-3	0.012	0.021	0.034	0.05	0.064	0.016	0.014
AMS15	Horizon	59	100%	3.8E-3	5.1E-3	5.6E-3	9.7E-3	0.018	0.034	0.058	0.11	0.2	0.029	0.035



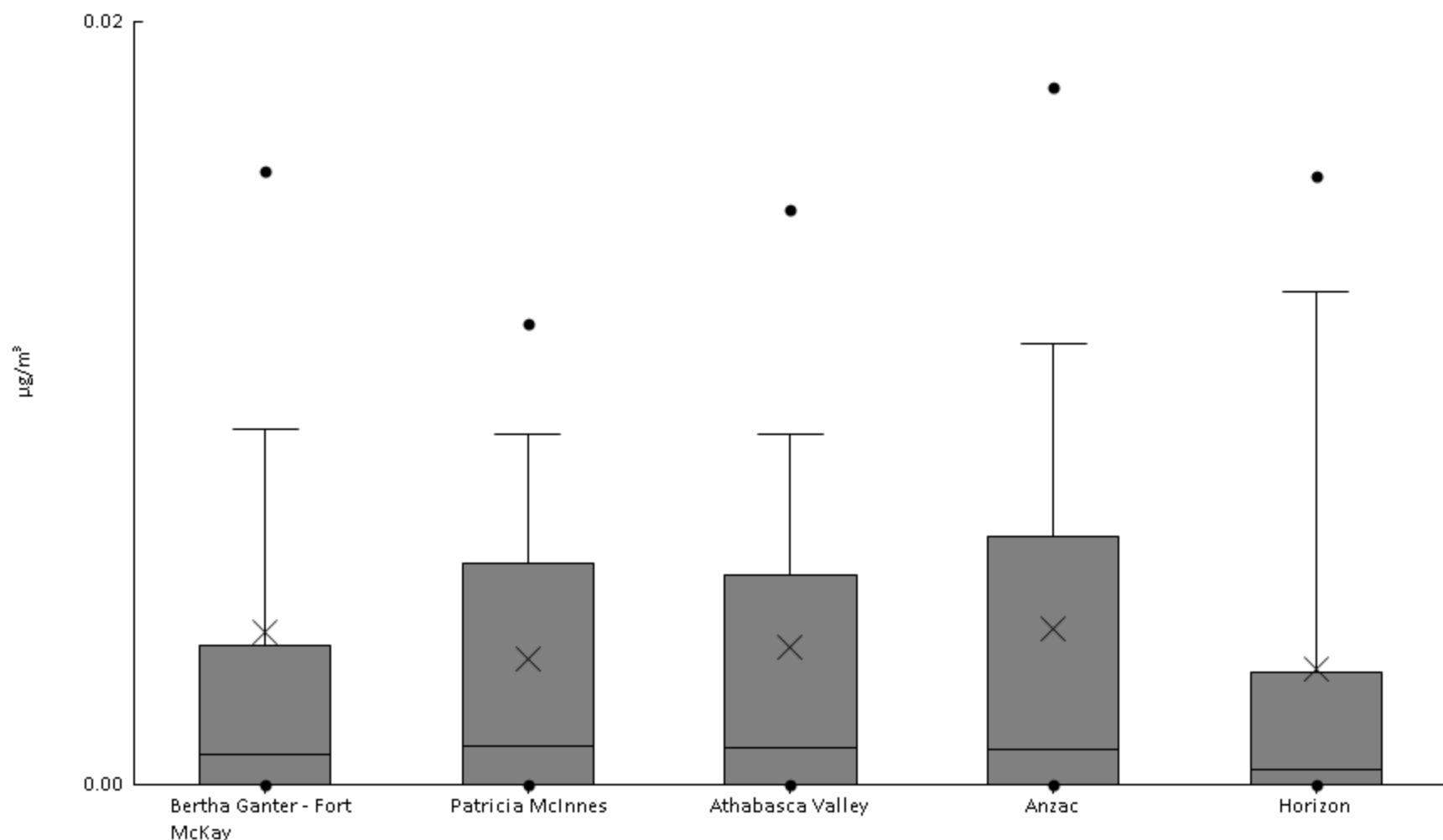
Particulate Matter (PM2.5 IONS) - Chloride ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	1.4E-3	1.8E-3	2.4E-3	4.6E-3	8.4E-3	0.024	0.03	0.29	0.015	0.047
AMS06	Patricia McInnes	61	95%	9.3E-4	1.4E-3	1.8E-3	3.1E-3	5.2E-3	0.016	0.038	0.11	0.4	0.021	0.055
AMS07	Athabasca Valley	61	100%	1.6E-3	2.7E-3	3E-3	5.5E-3	0.011	0.044	0.14	0.29	1.3	0.073	0.21
AMS14	Anzac	60	95%	0	9.8E-4	1.8E-3	2.1E-3	3.8E-3	5.8E-3	0.015	0.032	0.31	0.011	0.04
AMS15	Horizon	59	95%	0	1.1E-3	2E-3	2.4E-3	3.1E-3	5.4E-3	9.9E-3	0.015	0.026	4.9E-3	4.6E-3



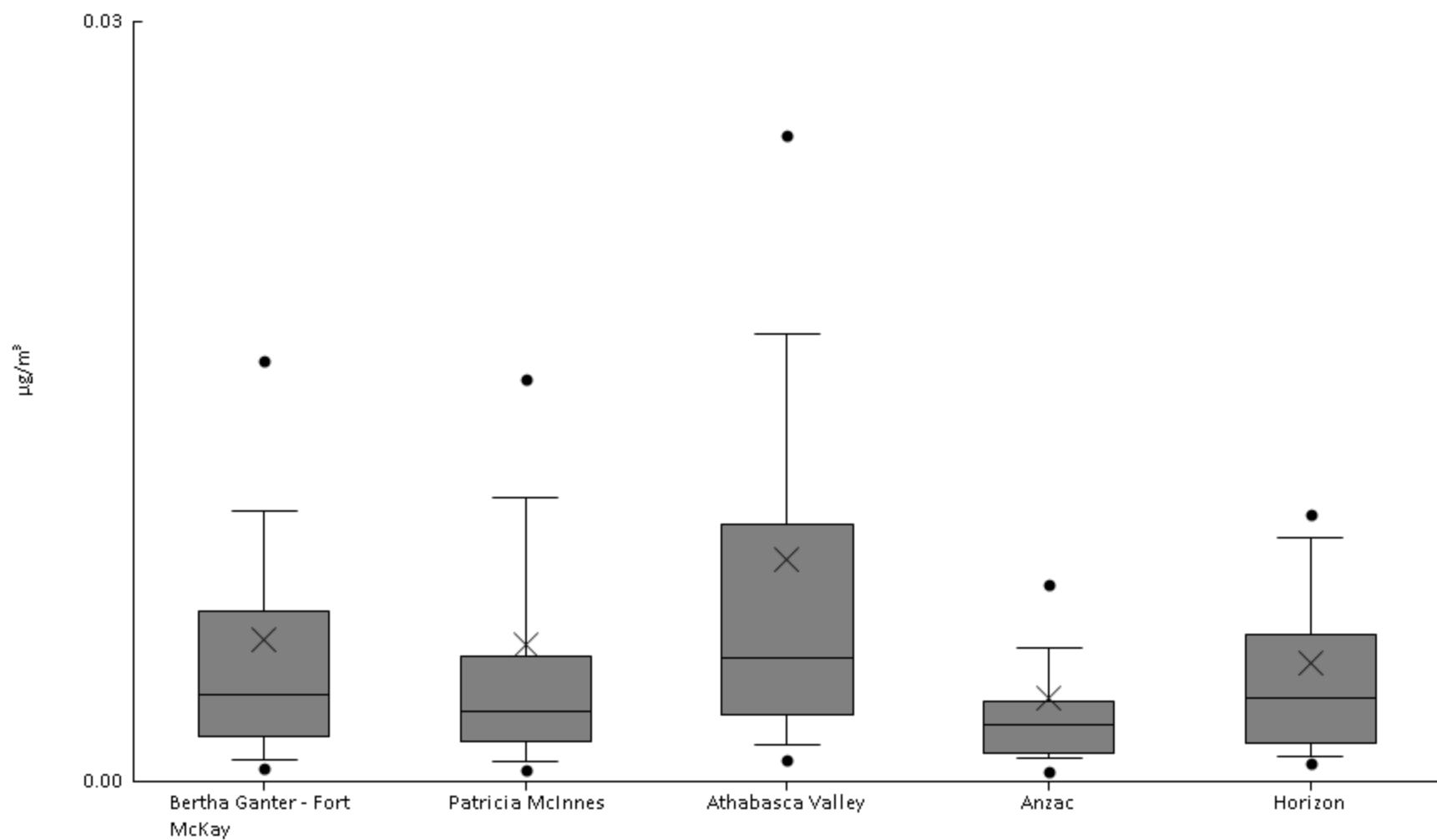
Particulate Matter (PM2.5 IONS) - Fluoride ($\mu\text{g}/\text{m}^3$) - 2019

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	8E-4	3.6E-3	9.3E-3	0.016	0.072	4E-3	0.01
AMS06	Patricia McInnes	61	56%	0	0	0	0	1E-3	5.8E-3	9.2E-3	0.012	0.029	3.3E-3	5.1E-3
AMS07	Athabasca Valley	61	59%	0	0	0	0	9.5E-4	5.5E-3	9.2E-3	0.015	0.035	3.6E-3	6.2E-3
AMS14	Anzac	60	62%	0	0	0	0	9.3E-4	6.5E-3	0.012	0.018	0.027	4.1E-3	6.1E-3
AMS15	Horizon	59	53%	0	0	0	0	4E-4	2.9E-3	0.013	0.016	0.017	3E-3	5E-3



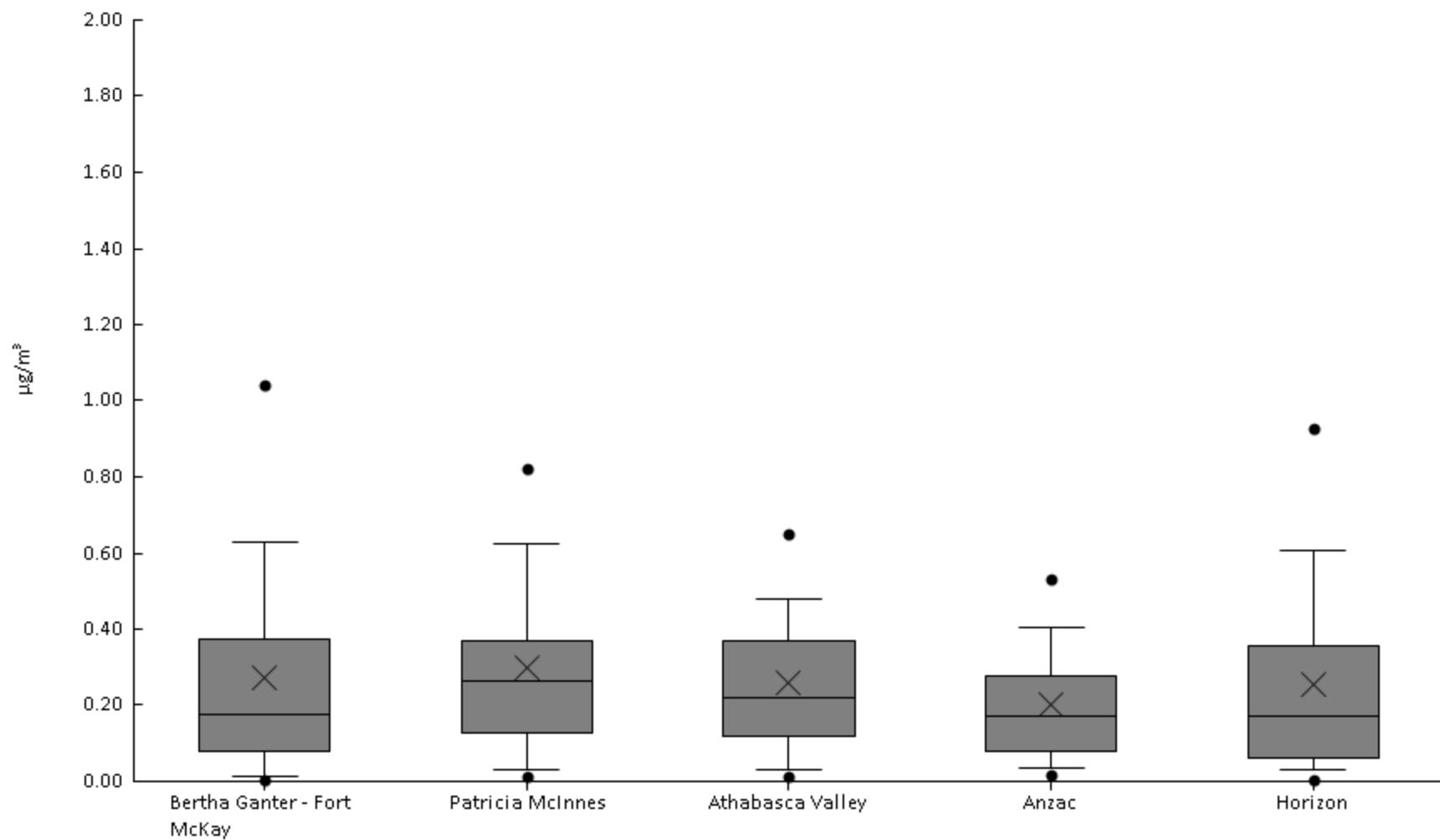
Particulate Matter (PM2.5 IONS) - Magnesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4.4E-4	5.4E-4	8.6E-4	1.8E-3	3.4E-3	6.7E-3	0.011	0.017	0.056	5.6E-3	7.8E-3
AMS06	Patricia McInnes	61	100%	2.6E-4	4.3E-4	7.7E-4	1.6E-3	2.8E-3	5E-3	0.011	0.016	0.058	5.4E-3	9.1E-3
AMS07	Athabasca Valley	61	100%	4.1E-4	8.7E-4	1.5E-3	2.7E-3	4.9E-3	0.01	0.018	0.026	0.092	8.8E-3	0.013
AMS14	Anzac	60	100%	2.6E-4	4E-4	9E-4	1.2E-3	2.3E-3	3.2E-3	5.3E-3	7.8E-3	0.049	3.3E-3	6.3E-3
AMS15	Horizon	59	98%	0	7.3E-4	1E-3	1.5E-3	3.3E-3	5.8E-3	9.6E-3	0.011	0.045	4.7E-3	6.2E-3



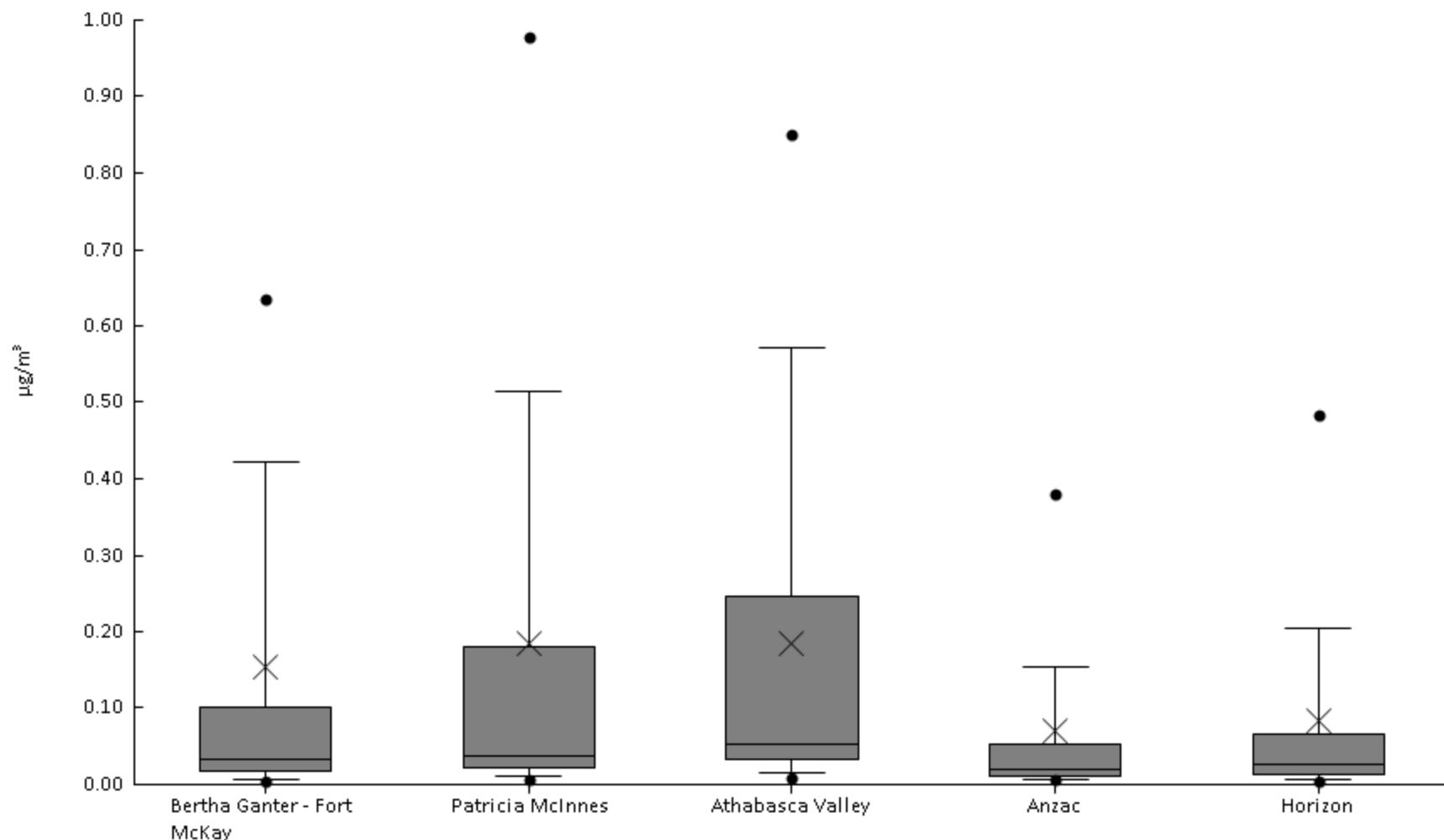
Particulate Matter (PM2.5 IONS) - Ammonium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	2.3E-3	0.015	0.078	0.17	0.37	0.63	1	1.3	0.27	0.3
AMS06	Patricia McInnes	61	100%	1E-4	0.013	0.029	0.13	0.26	0.37	0.63	0.82	1.1	0.3	0.24
AMS07	Athabasca Valley	61	98%	0	0.013	0.032	0.12	0.22	0.37	0.48	0.65	0.84	0.26	0.19
AMS14	Anzac	60	100%	3E-4	0.019	0.033	0.08	0.17	0.28	0.41	0.53	0.73	0.2	0.16
AMS15	Horizon	59	98%	0	6E-3	0.032	0.063	0.17	0.35	0.6	0.93	1.2	0.25	0.27



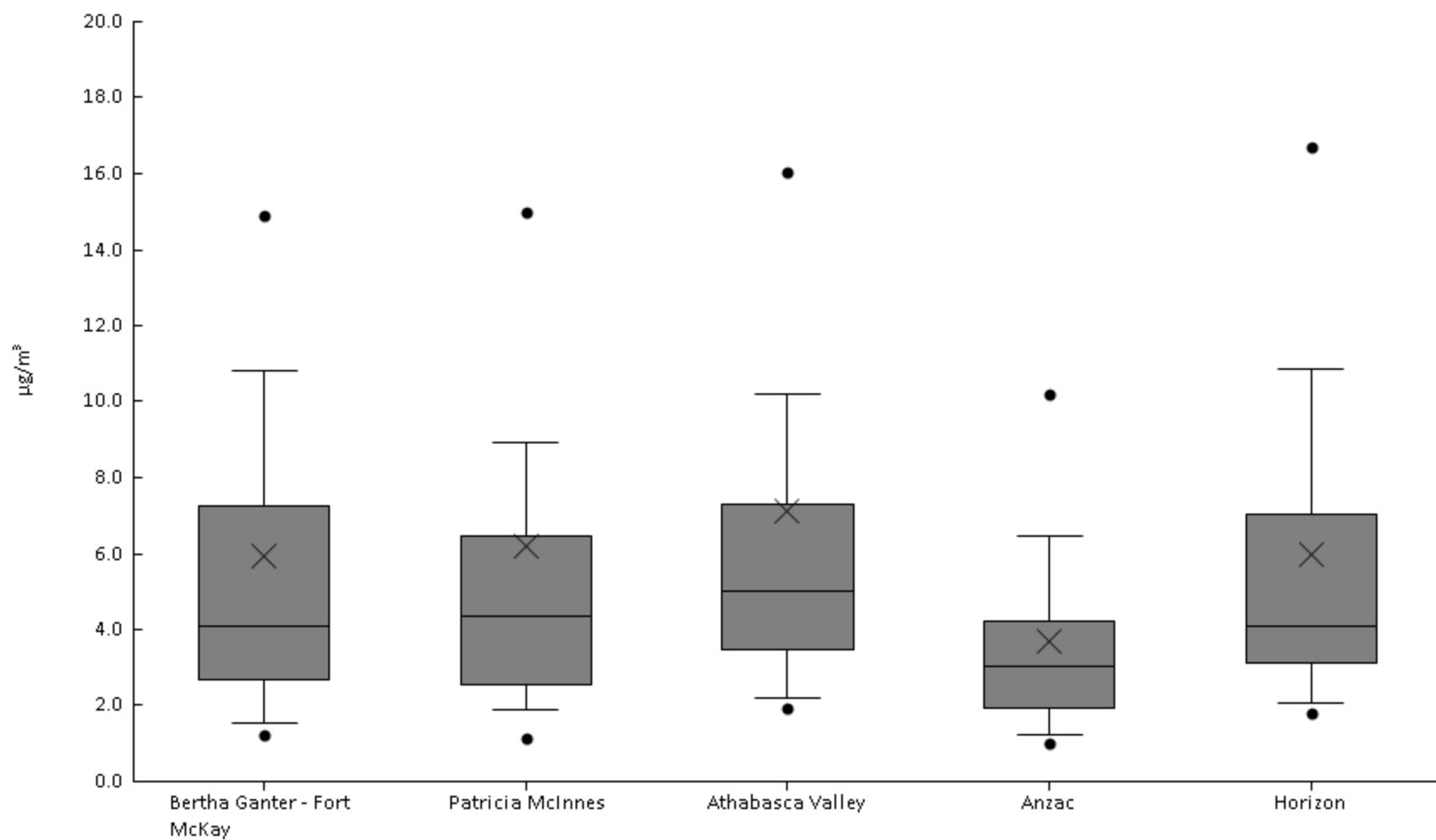
Particulate Matter (PM2.5 IONS) - Nitrate ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3E-4	4.7E-3	7.5E-3	0.018	0.033	0.1	0.42	0.64	2.1	0.15	0.36
AMS06	Patricia McInnes	61	100%	3E-4	6.3E-3	0.01	0.022	0.037	0.18	0.52	0.98	1.9	0.18	0.36
AMS07	Athabasca Valley	61	100%	6.6E-3	9.1E-3	0.015	0.033	0.052	0.25	0.57	0.85	1	0.18	0.26
AMS14	Anzac	60	100%	4.1E-3	5.6E-3	7.2E-3	0.012	0.021	0.052	0.15	0.38	0.7	0.071	0.13
AMS15	Horizon	59	100%	3E-4	4.6E-3	6.7E-3	0.014	0.027	0.066	0.2	0.48	1	0.085	0.17



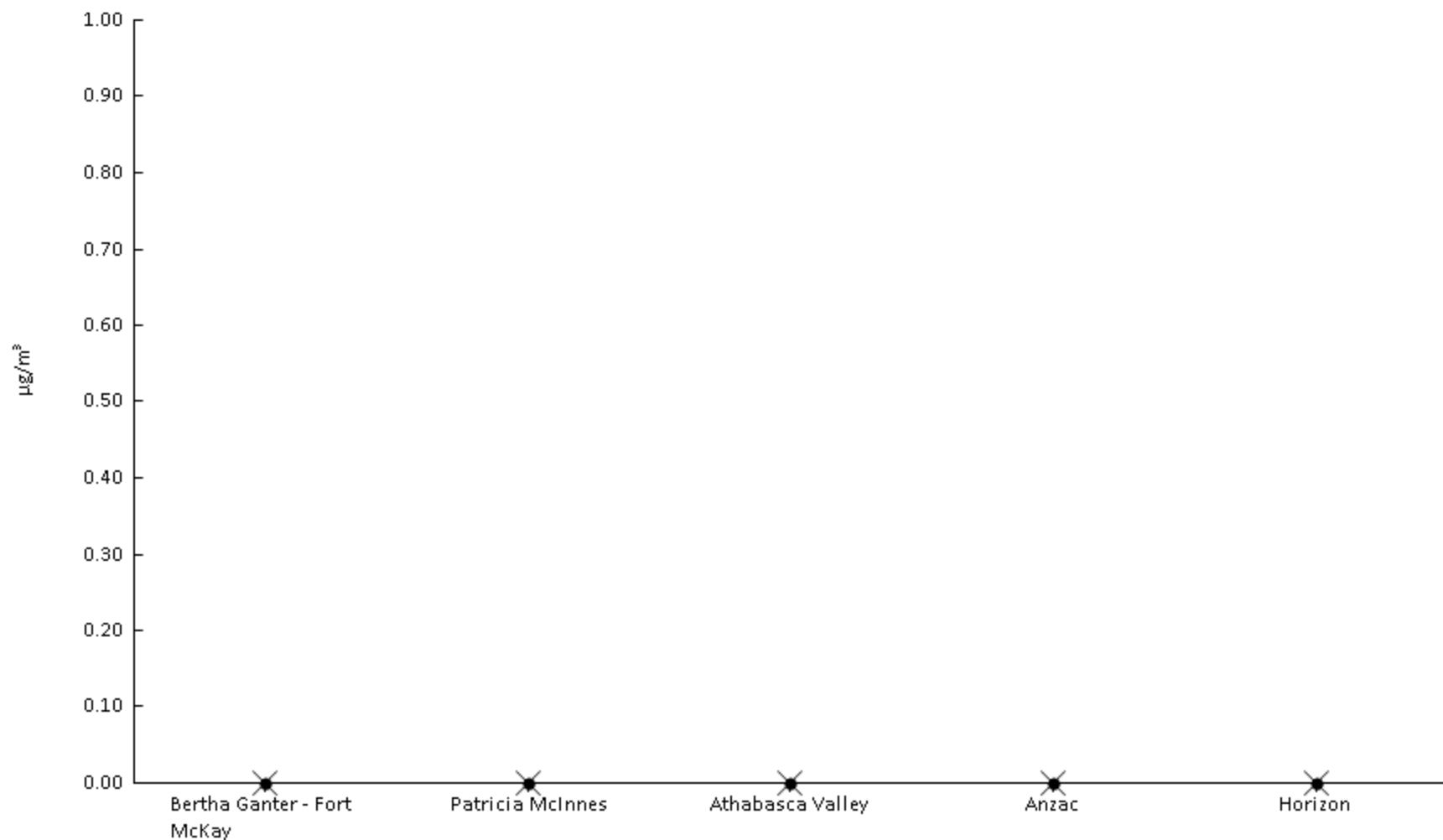
Particulate Matter (PM_{2.5}) IONS - Particulate Matter ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.25	1.2	1.5	2.7	4.1	7.2	11	15	43	5.9	6.2
AMS06	Patricia McInnes	61	100%	0.71	1.1	1.9	2.5	4.3	6.5	8.9	15	74	6.2	9.6
AMS07	Athabasca Valley	61	100%	1.2	1.9	2.2	3.5	5	7.3	10	16	73	7.1	9.7
AMS14	Anzac	60	100%	0.75	1	1.2	1.9	3	4.2	6.5	10	18	3.7	3
AMS15	Horizon	59	100%	1	1.8	2.1	3.1	4.1	7.1	11	17	34	6	5.4



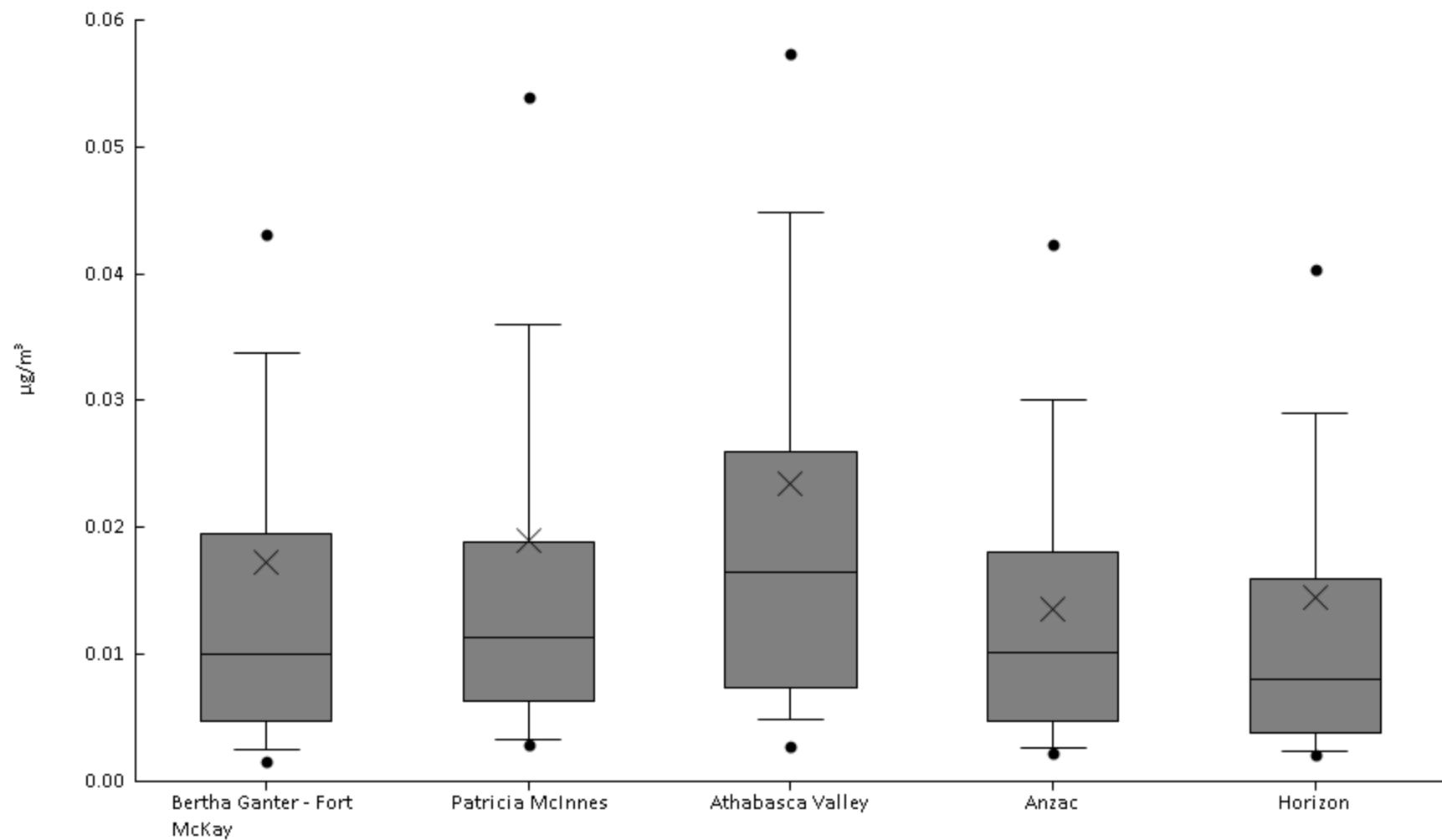
Particulate Matter (PM2.5 IONS) - Phosphate ($\mu\text{g}/\text{m}^3$) - 2019

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	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS07	Athabasca Valley	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS14	Anzac	60	0%	0	0	0	0	0	0	0	0	0	0	0
AMS15	Horizon	59	0%	0	0	0	0	0	0	0	0	0	0	0



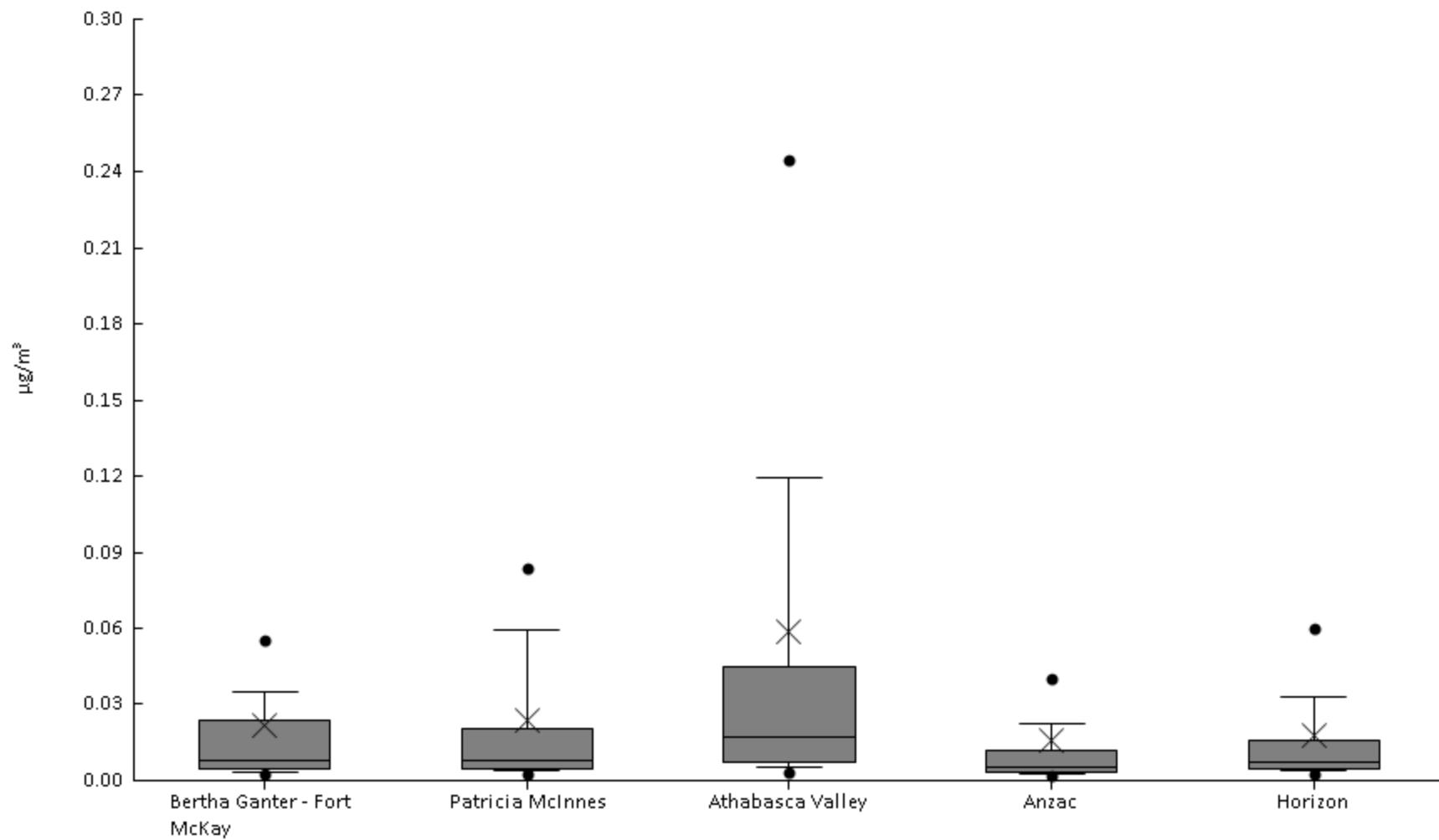
Particulate Matter (PM2.5 IONS) - Potassium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	1.6E-3	2.5E-3	4.8E-3	0.01	0.02	0.034	0.043	0.24	0.017	0.031
AMS06	Patricia McInnes	61	100%	1.9E-3	2.9E-3	3.3E-3	6.3E-3	0.011	0.019	0.036	0.054	0.25	0.019	0.033
AMS07	Athabasca Valley	61	100%	1.5E-3	2.8E-3	4.8E-3	7.4E-3	0.017	0.026	0.045	0.057	0.24	0.023	0.033
AMS14	Anzac	60	100%	1.3E-3	2.2E-3	2.7E-3	4.8E-3	0.01	0.018	0.03	0.042	0.053	0.014	0.012
AMS15	Horizon	59	100%	8E-4	2.1E-3	2.3E-3	3.9E-3	8.1E-3	0.016	0.029	0.04	0.19	0.015	0.026



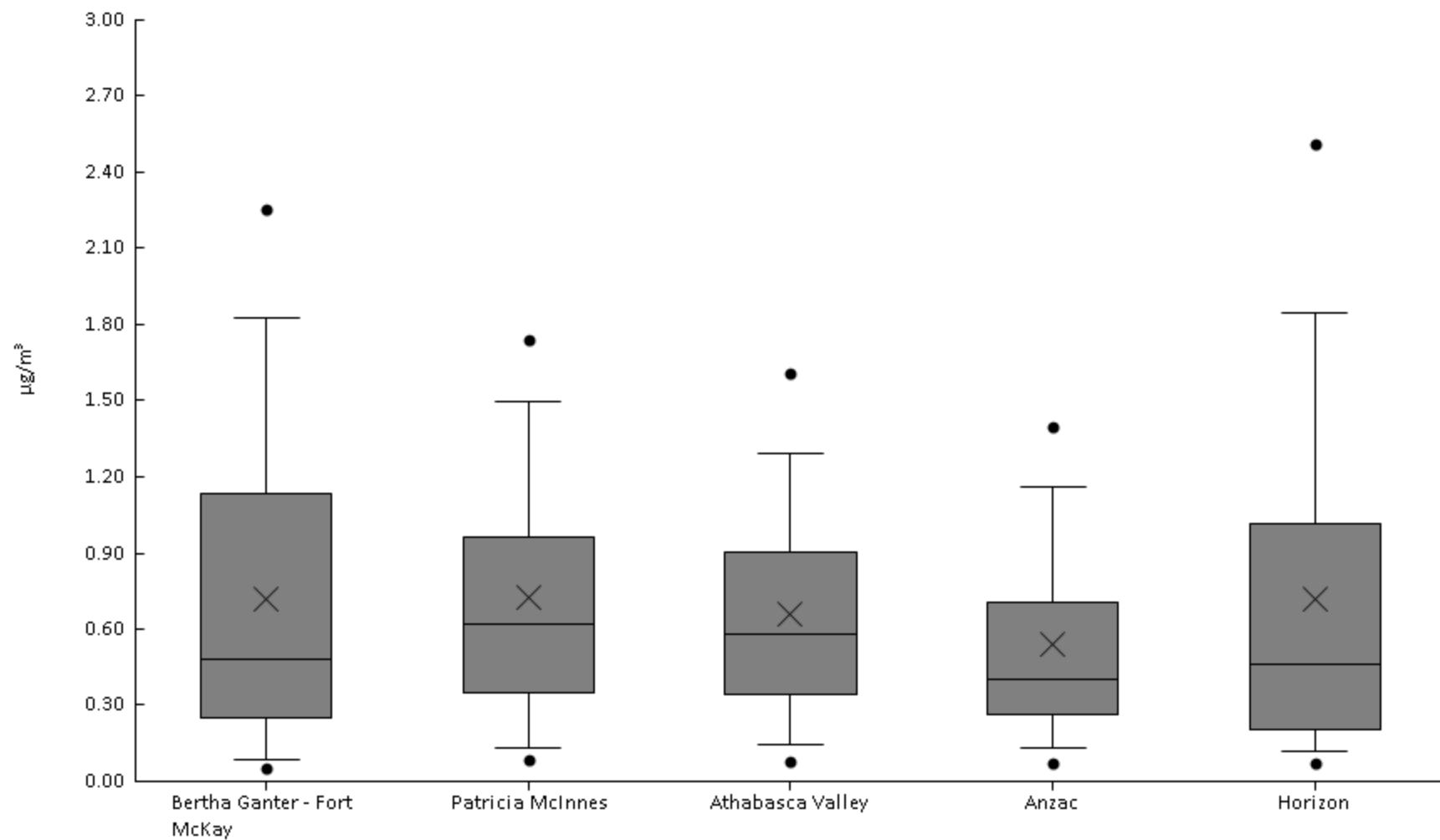
Particulate Matter (PM2.5 IONS) - Sodium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.4E-3	2.3E-3	3.1E-3	4.7E-3	7.6E-3	0.024	0.035	0.055	0.46	0.022	0.059
AMS06	Patricia McInnes	61	100%	1.2E-3	2.5E-3	3.8E-3	4.9E-3	7.6E-3	0.02	0.059	0.084	0.4	0.024	0.054
AMS07	Athabasca Valley	61	100%	2.2E-3	3.4E-3	5.2E-3	7.2E-3	0.017	0.045	0.12	0.24	0.91	0.059	0.14
AMS14	Anzac	60	100%	1.4E-3	1.8E-3	2.5E-3	3.5E-3	5.1E-3	0.012	0.023	0.04	0.37	0.016	0.049
AMS15	Horizon	59	100%	1.5E-3	2.8E-3	3.8E-3	4.6E-3	7.2E-3	0.016	0.033	0.06	0.31	0.018	0.041



Particulate Matter (PM2.5 IONS) - Sulphate ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4E-4	0.056	0.085	0.25	0.48	1.1	1.8	2.3	3.2	0.72	0.7
AMS06	Patricia McInnes	61	100%	0.055	0.086	0.13	0.35	0.62	0.97	1.5	1.7	2.4	0.72	0.51
AMS07	Athabasca Valley	61	100%	0.052	0.081	0.15	0.34	0.58	0.9	1.3	1.6	2.1	0.66	0.46
AMS14	Anzac	60	98%	0	0.075	0.13	0.26	0.4	0.7	1.2	1.4	1.6	0.54	0.4
AMS15	Horizon	59	100%	0.015	0.073	0.12	0.2	0.46	1	1.8	2.5	3.4	0.72	0.76





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PARTICULATE MATTER (PM₁₀) - IONS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Desert Research Institute
Reno, NV

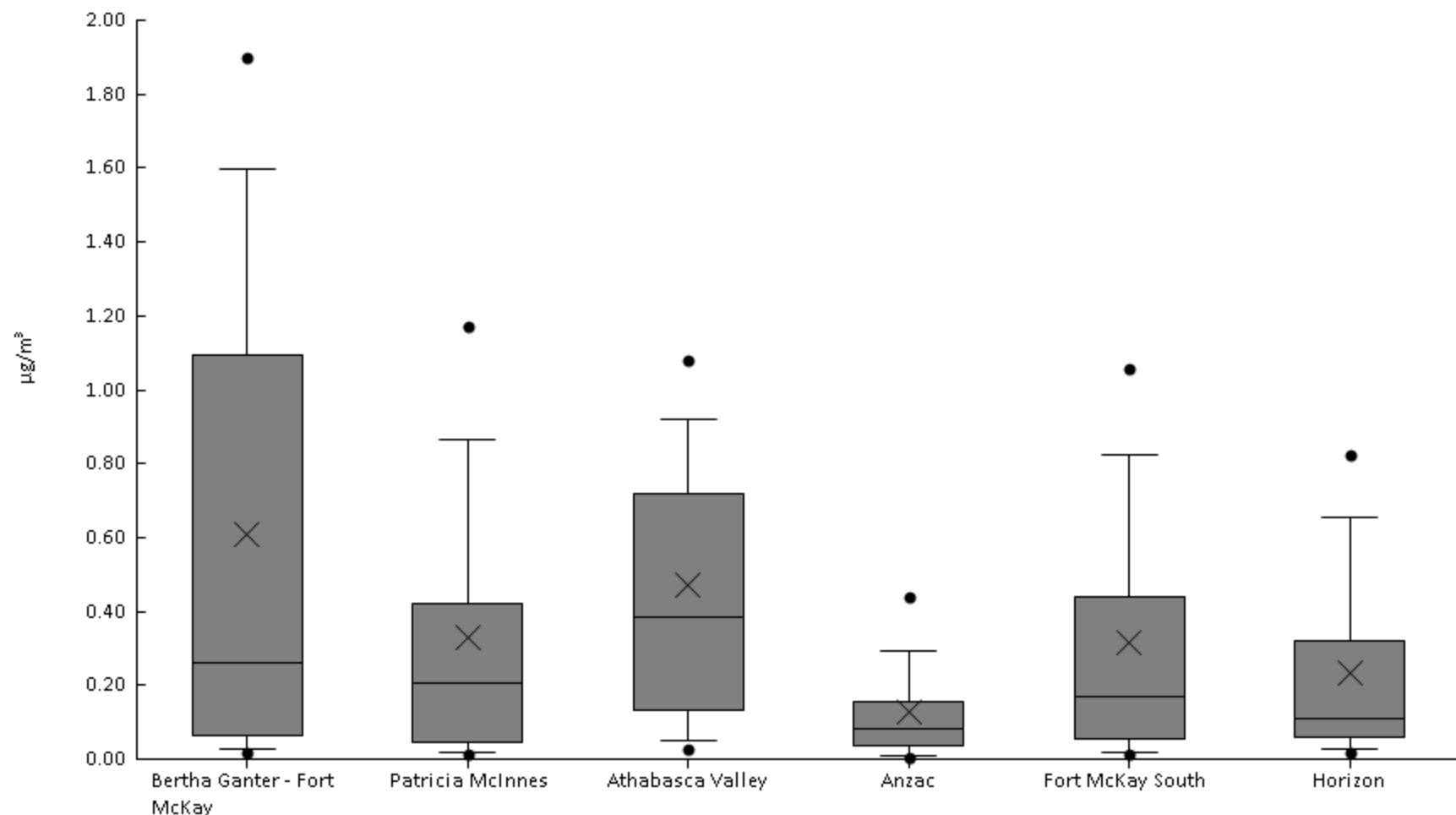


CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (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) DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
SAMPLE PREPARATION	Desert Research Institute
ANALYTICAL LABORATORY	Data are not blank corrected
USER NOTE 1	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 2	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
USER NOTE 3	Partisols for PM _{2.5} at AMS 15 occasionally samples 24.1 m ³ despite being set for 24 m ³ . Flow has been calibrated. Reason for this behaviour is unknown.
USER NOTE 4	Data is computed on a monthly dataset.
USER NOTE 5	Summary statistics include flags beginning with V.
USER NOTE 6	Actual Volume at Ambient Conditions (since 01-Jan-2011)
VOLUME STANDARDIZATION	For PM ₁₀ FRM Partisol PM ₁₀ sampler
SAMPLING INSTRUMENT TYPE	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



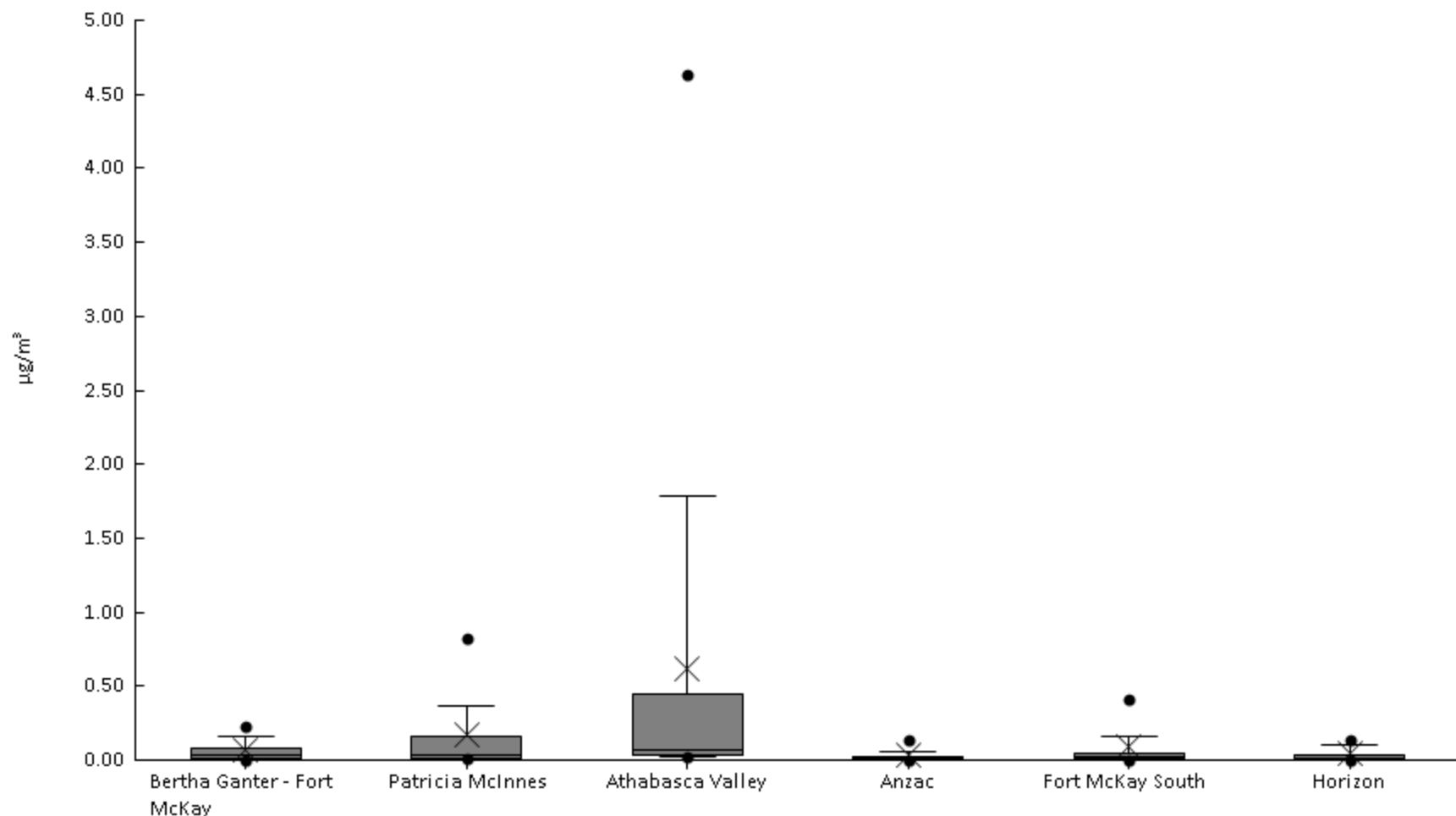
Particulate Matter (PM10 IONS) - Calcium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	5.2E-3	0.018	0.028	0.064	0.26	1.1	1.6	1.9	3.7	0.61	0.73
AMS06	Patricia McInnes	61	100%	3.9E-3	0.015	0.018	0.046	0.21	0.42	0.86	1.2	2	0.33	0.4
AMS07	Athabasca Valley	61	100%	0.02	0.029	0.049	0.13	0.39	0.72	0.92	1.1	1.7	0.47	0.38
AMS14	Anzac	60	100%	3.5E-3	6.1E-3	0.011	0.036	0.081	0.16	0.29	0.44	0.82	0.13	0.14
AMS13	Fort McKay South	60	100%	2.8E-3	0.012	0.016	0.055	0.17	0.44	0.82	1.1	1.9	0.31	0.39
AMS15	Horizon	61	100%	3.2E-3	0.018	0.026	0.061	0.11	0.32	0.66	0.82	0.98	0.23	0.26



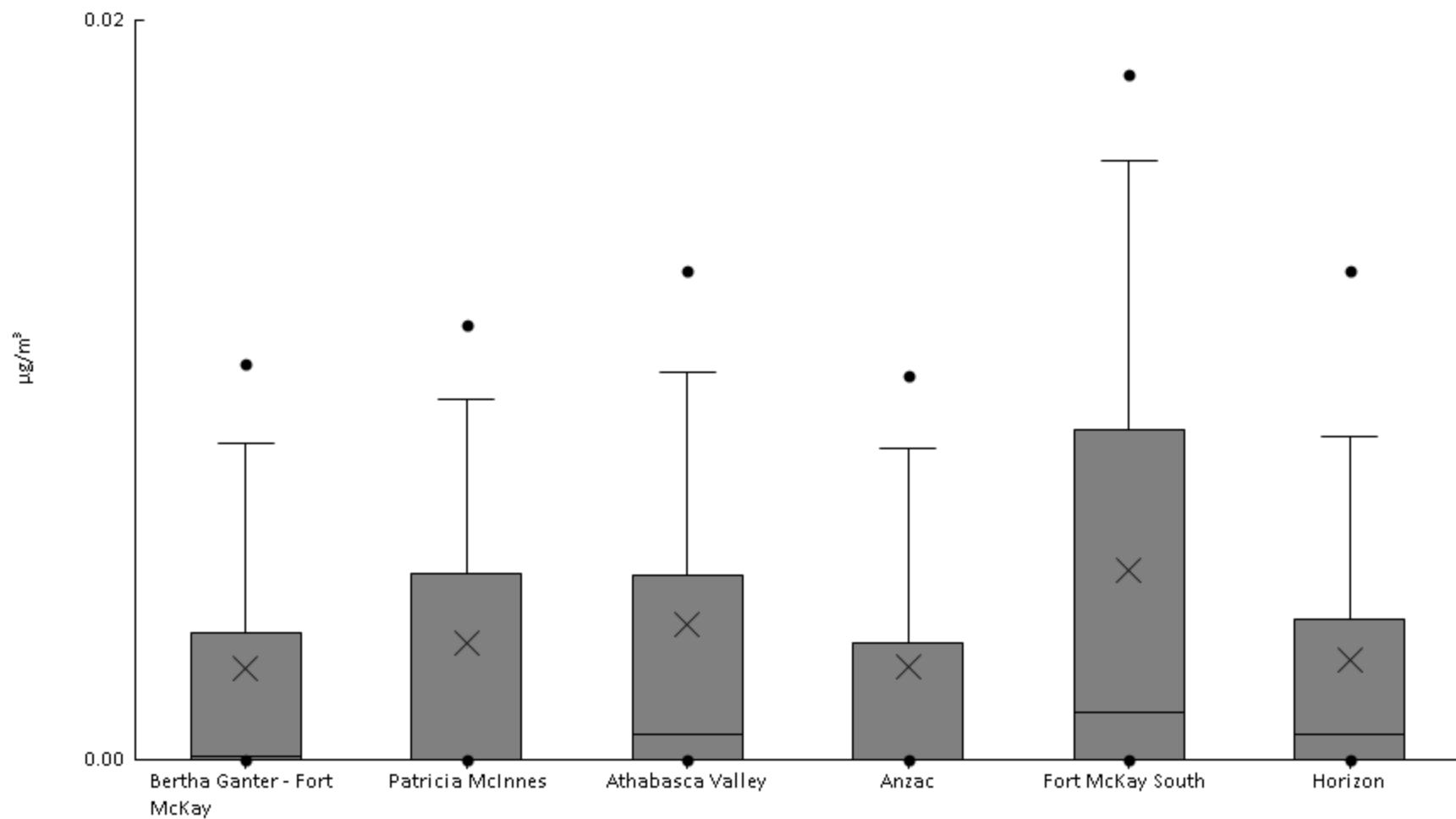
Particulate Matter (PM10 IONS) - Chloride ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.3E-3	4.6E-3	6.7E-3	0.01	0.029	0.075	0.16	0.23	1.1	0.072	0.15
AMS06	Patricia McInnes	61	100%	3.7E-3	7.4E-3	0.01	0.015	0.038	0.16	0.36	0.83	2	0.17	0.38
AMS07	Athabasca Valley	61	100%	0.017	0.018	0.02	0.031	0.074	0.44	1.8	4.6	6	0.62	1.3
AMS14	Anzac	60	95%	0	2.3E-3	3.7E-3	6.2E-3	0.011	0.021	0.061	0.14	0.53	0.033	0.08
AMS13	Fort McKay South	60	100%	2.5E-3	4.4E-3	5.7E-3	9.8E-3	0.018	0.044	0.16	0.41	2.3	0.096	0.31
AMS15	Horizon	61	100%	2.8E-3	5.7E-3	6.9E-3	0.011	0.017	0.038	0.1	0.14	0.75	0.045	0.1



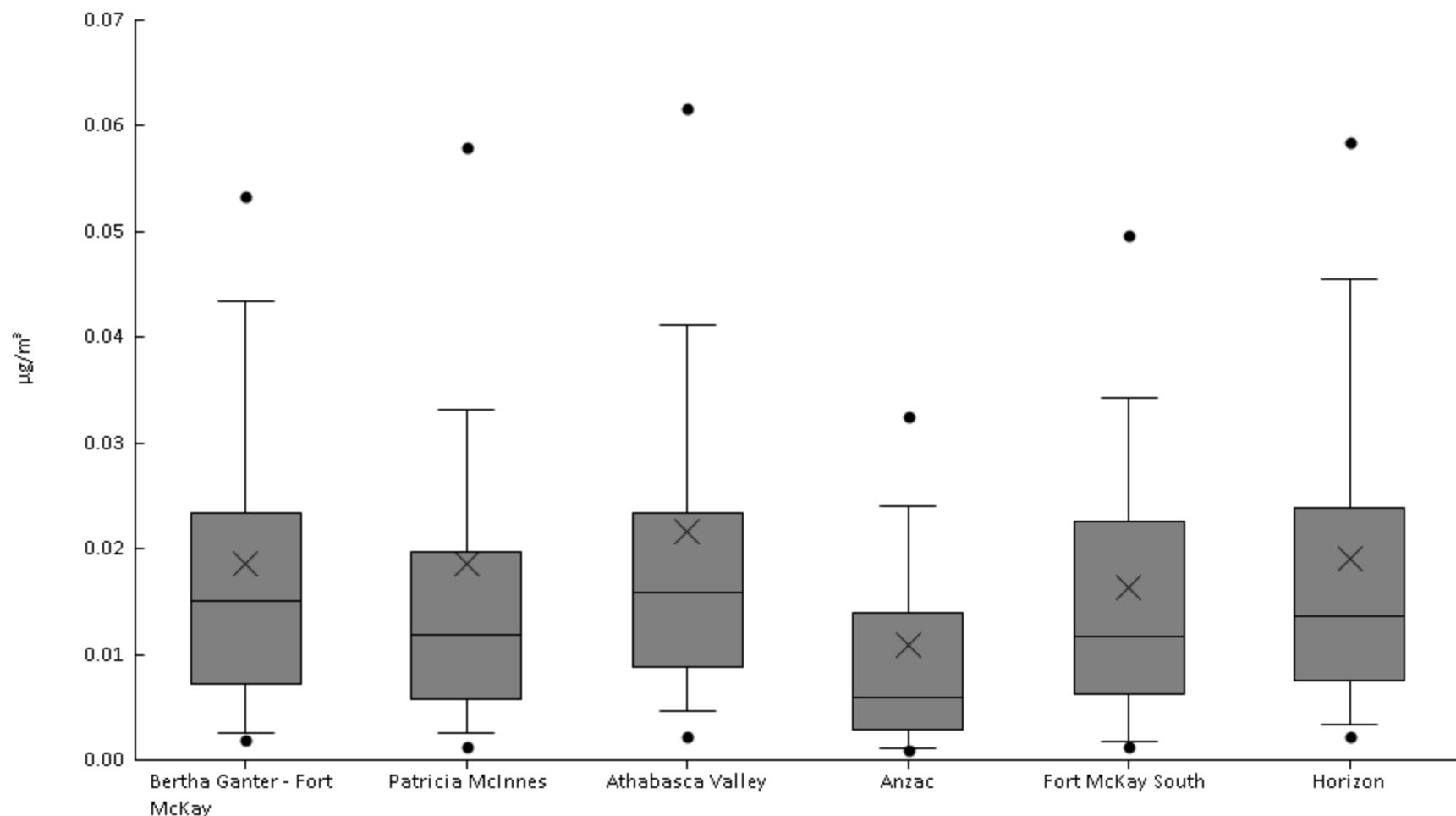
Particulate Matter (PM10 IONS) - Fluoride ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% \geq MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	52%	0	0	0	0	1E-4	3.5E-3	8.5E-3	0.011	0.018	2.5E-3	3.9E-3
AMS06	Patricia McInnes	61	46%	0	0	0	0	0	5E-3	9.7E-3	0.012	0.032	3.1E-3	5.4E-3
AMS07	Athabasca Valley	61	59%	0	0	0	0	7E-4	5E-3	0.01	0.013	0.04	3.6E-3	6.4E-3
AMS14	Anzac	60	45%	0	0	0	0	0	3.2E-3	8.4E-3	0.01	0.023	2.5E-3	4.6E-3
AMS13	Fort McKay South	60	65%	0	0	0	0	1.3E-3	8.9E-3	0.016	0.019	0.023	5.1E-3	6.4E-3
AMS15	Horizon	61	59%	0	0	0	0	7E-4	3.8E-3	8.8E-3	0.013	0.016	2.7E-3	4.2E-3



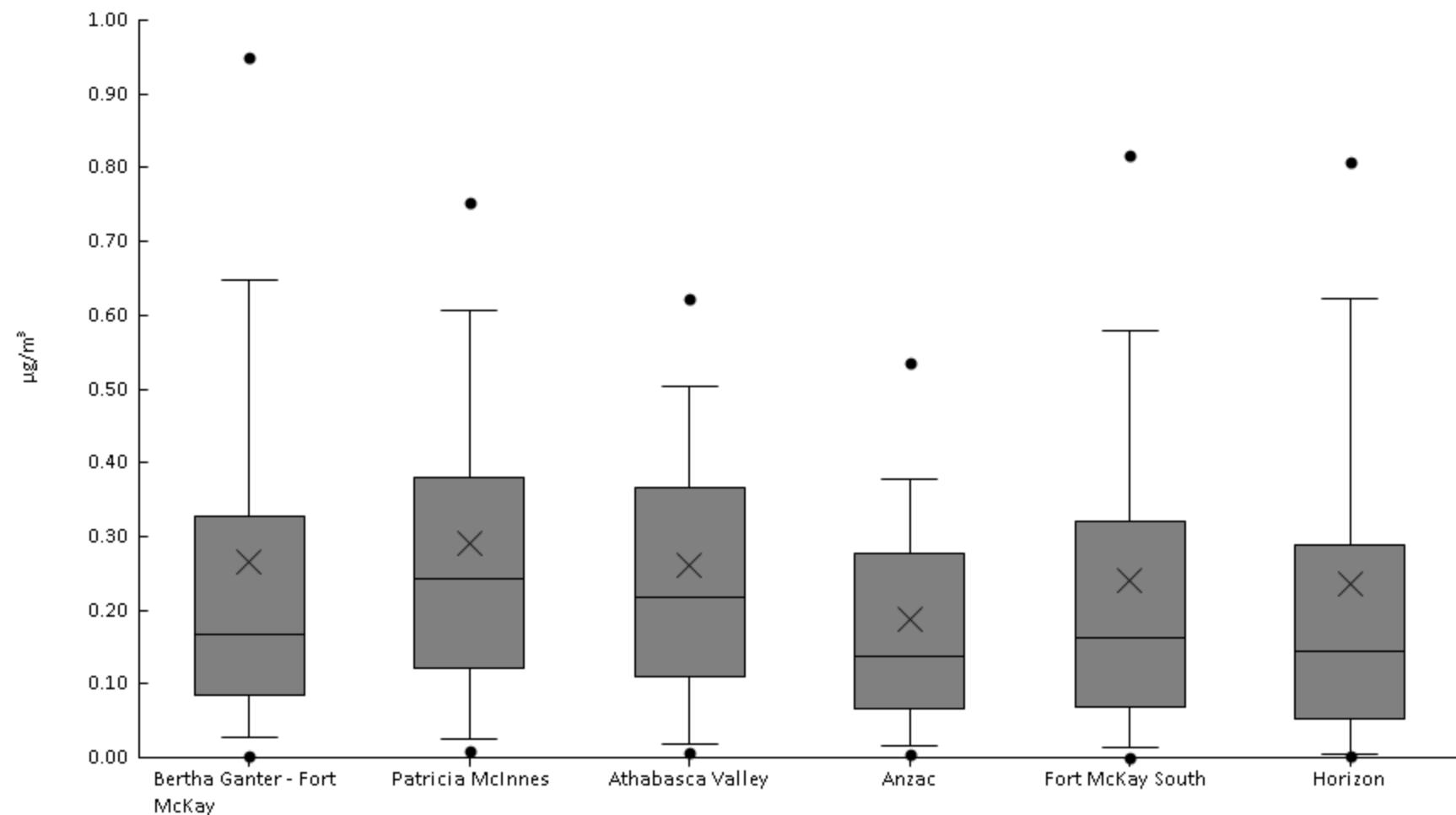
Particulate Matter (PM10 IONS) - Magnesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	6.5E-4	1.9E-3	2.6E-3	7.2E-3	0.015	0.023	0.043	0.053	0.082	0.019	0.017
AMS06	Patricia McInnes	61	100%	3.7E-4	1.3E-3	2.6E-3	5.7E-3	0.012	0.02	0.033	0.058	0.2	0.019	0.029
AMS07	Athabasca Valley	61	100%	1.9E-3	2.2E-3	4.6E-3	8.8E-3	0.016	0.023	0.041	0.062	0.14	0.022	0.025
AMS14	Anzac	60	100%	4E-4	9E-4	1.1E-3	3E-3	6E-3	0.014	0.024	0.033	0.082	0.011	0.013
AMS13	Fort McKay South	60	100%	3.6E-4	1.3E-3	1.8E-3	6.2E-3	0.012	0.023	0.034	0.05	0.074	0.016	0.016
AMS15	Horizon	61	100%	3.1E-4	2.3E-3	3.4E-3	7.5E-3	0.014	0.024	0.046	0.058	0.095	0.019	0.018



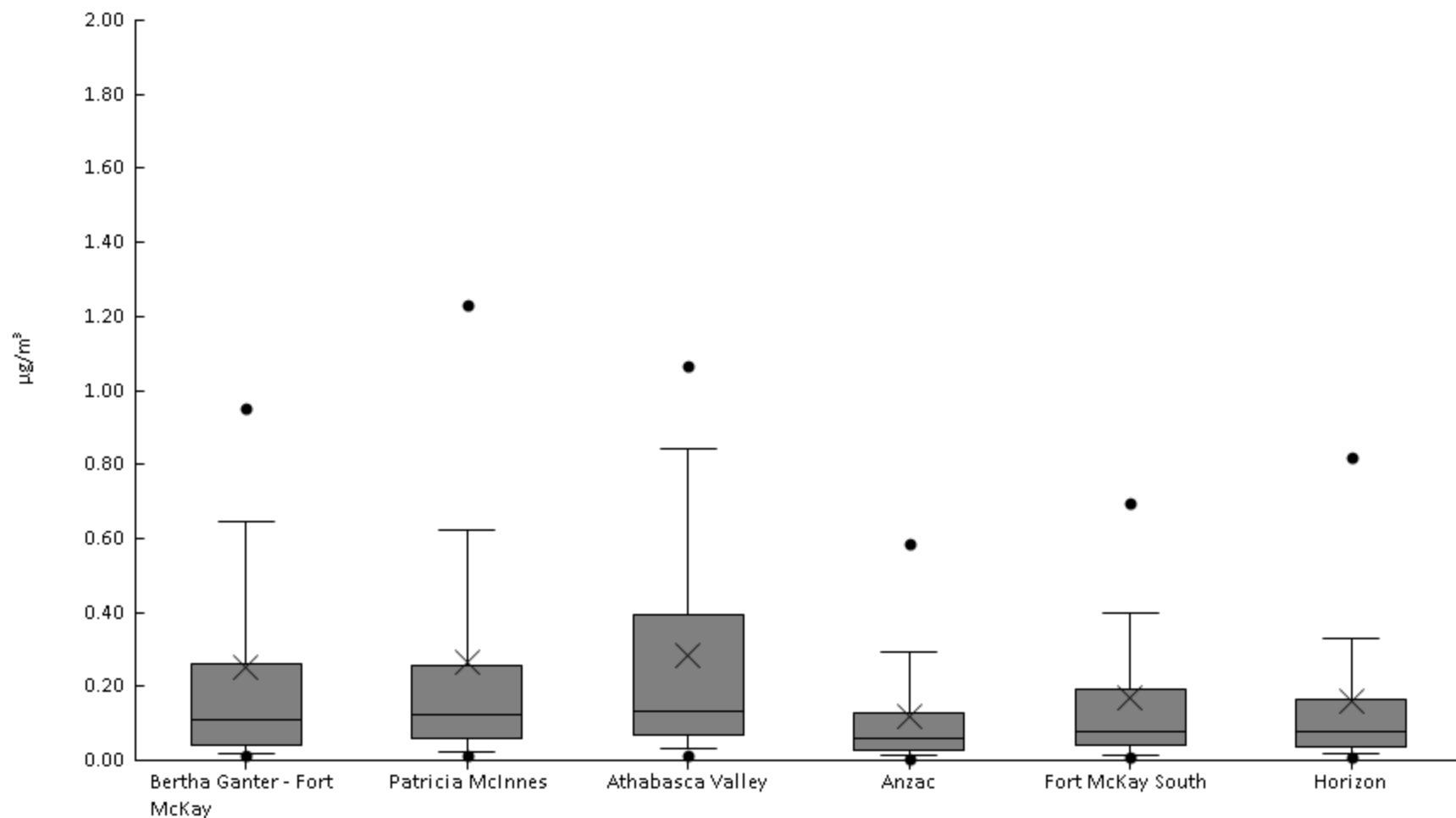
Particulate Matter (PM10 IONS) - Ammonium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	1.7E-3	0.026	0.085	0.17	0.33	0.65	0.95	1.2	0.27	0.28
AMS06	Patricia McInnes	61	98%	0	8.5E-3	0.024	0.12	0.24	0.38	0.61	0.75	1.2	0.29	0.23
AMS07	Athabasca Valley	61	98%	0	7.4E-3	0.018	0.11	0.22	0.37	0.5	0.62	0.96	0.26	0.2
AMS14	Anzac	60	97%	0	5.2E-3	0.016	0.066	0.14	0.28	0.38	0.53	0.73	0.19	0.16
AMS13	Fort McKay South	60	98%	0	9E-4	0.014	0.068	0.16	0.32	0.58	0.82	1	0.24	0.24
AMS15	Horizon	61	97%	0	3.2E-3	5.7E-3	0.053	0.14	0.29	0.62	0.81	1.3	0.24	0.27



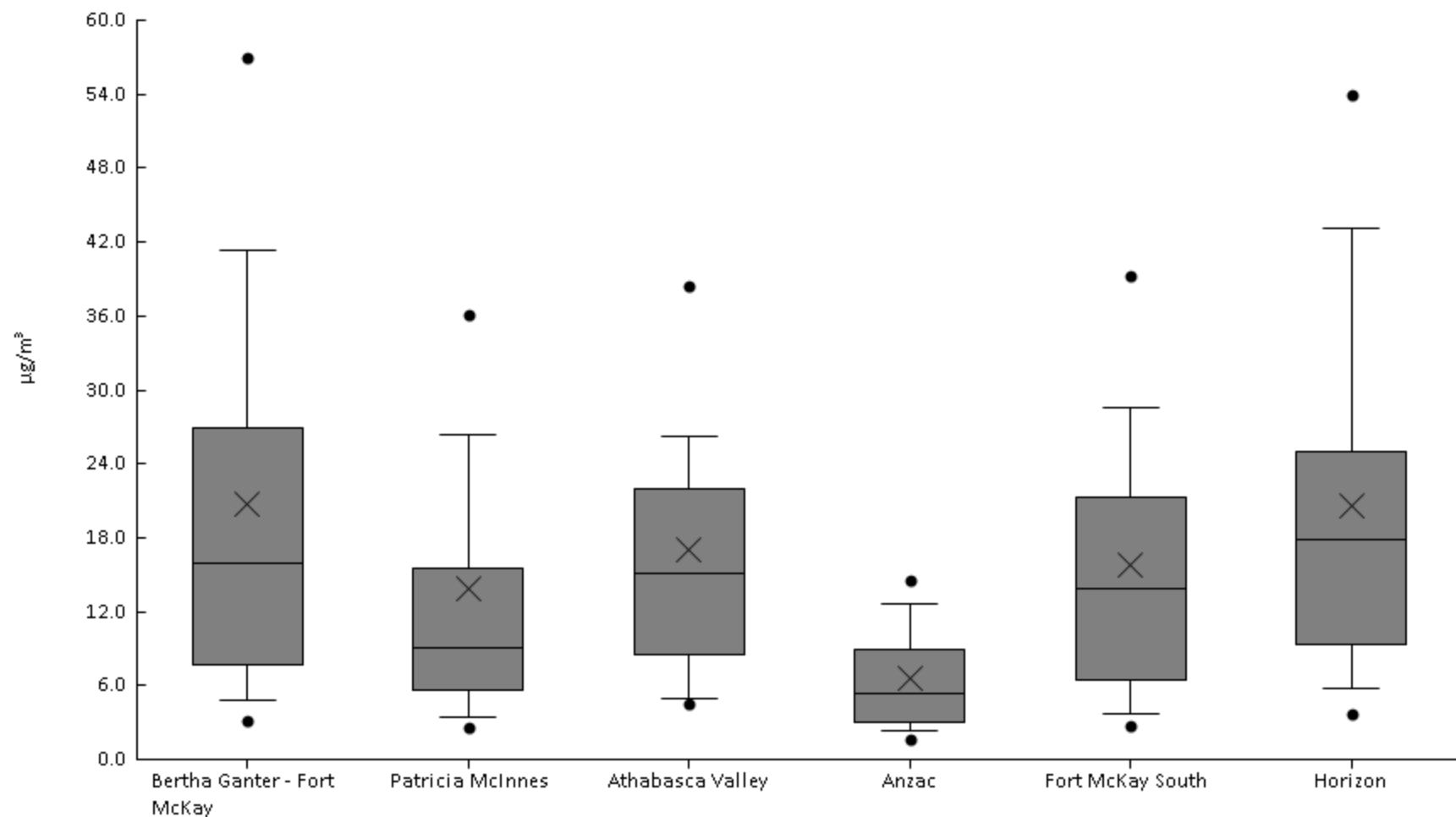
Particulate Matter (PM10 IONS) - Nitrate ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	0.012	0.02	0.041	0.11	0.26	0.65	0.95	2.3	0.25	0.41
AMS06	Patricia McInnes	61	100%	1.9E-3	0.015	0.025	0.058	0.13	0.26	0.62	1.2	2.1	0.27	0.4
AMS07	Athabasca Valley	61	100%	1.3E-3	0.013	0.032	0.069	0.13	0.39	0.84	1.1	1.3	0.28	0.34
AMS14	Anzac	60	100%	7E-4	6.2E-3	0.013	0.029	0.057	0.13	0.29	0.59	0.81	0.12	0.17
AMS13	Fort McKay South	60	98%	0	8E-3	0.013	0.039	0.08	0.19	0.4	0.69	1.4	0.17	0.27
AMS15	Horizon	61	98%	0	9.7E-3	0.016	0.035	0.079	0.16	0.33	0.82	1.2	0.16	0.26



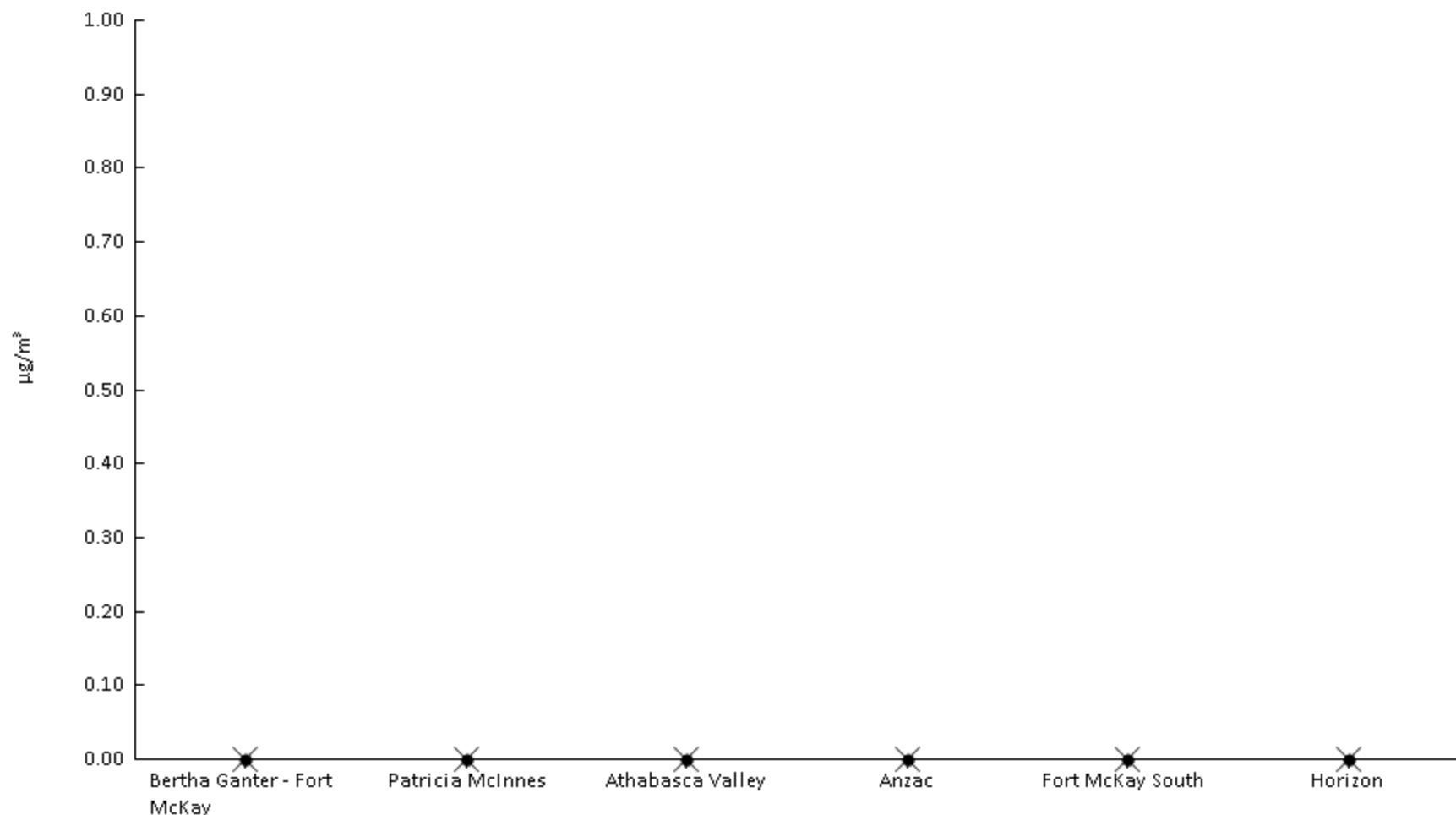
Particulate Matter (PM10) IONS - Particulate Matter ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.6	3.1	4.8	7.6	16	27	41	57	87	21	17
AMS06	Patricia McInnes	61	100%	1.8	2.6	3.4	5.7	9.1	15	26	36	114	14	16
AMS07	Athabasca Valley	61	100%	2.6	4.6	5	8.4	15	22	26	38	89	17	14
AMS14	Anzac	60	100%	0.29	1.7	2.4	3	5.3	8.9	13	15	22	6.6	4.7
AMS13	Fort McKay South	60	100%	1.4	2.8	3.7	6.4	14	21	29	39	66	16	12
AMS15	Horizon	61	100%	0.92	3.7	5.7	9.4	18	25	43	54	69	21	15



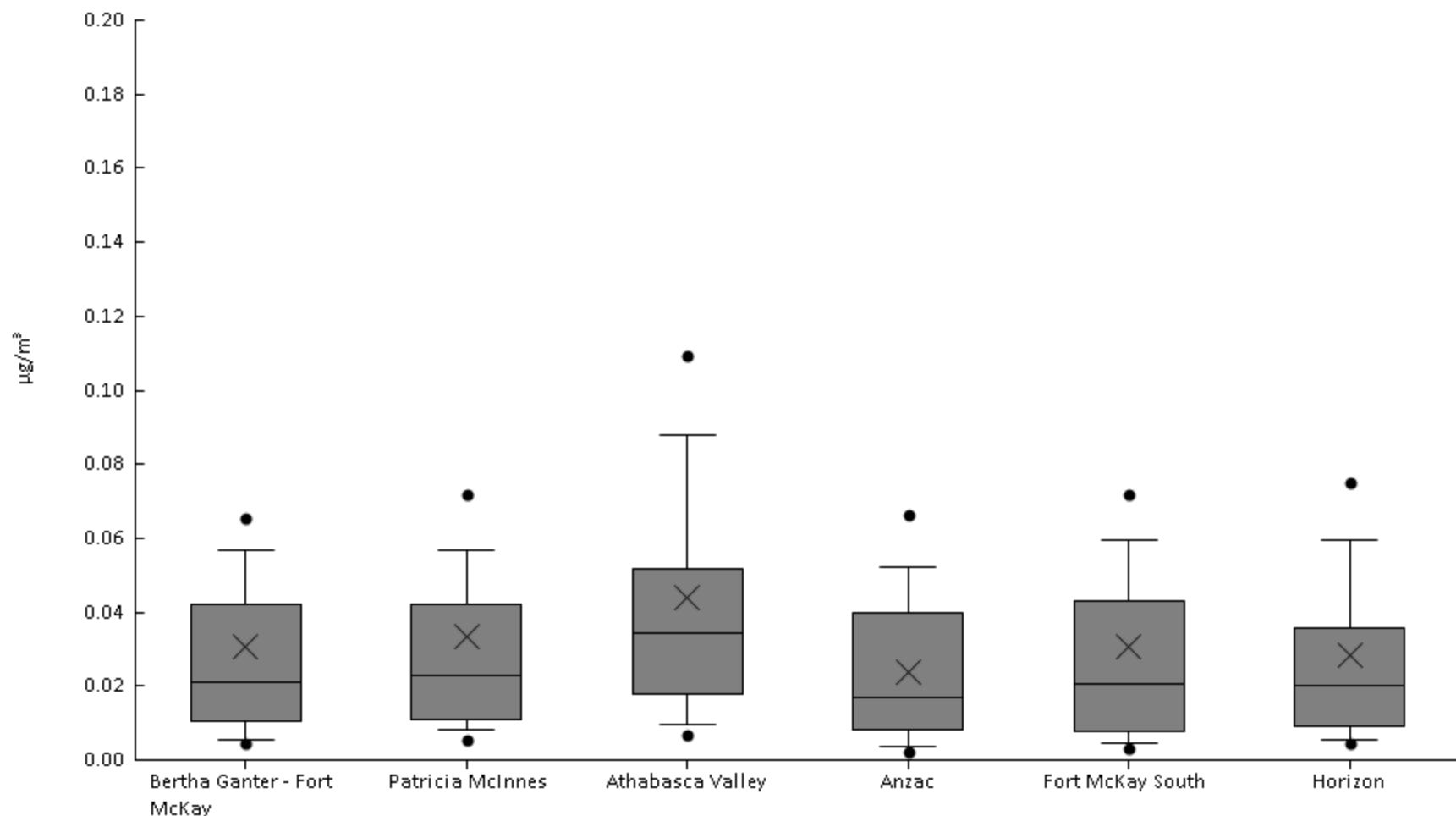
Particulate Matter (PM10 IONS) - Phosphate ($\mu\text{g}/\text{m}^3$) - 2019

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	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS07	Athabasca Valley	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS14	Anzac	60	0%	0	0	0	0	0	0	0	0	0	0	0
AMS13	Fort McKay South	60	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



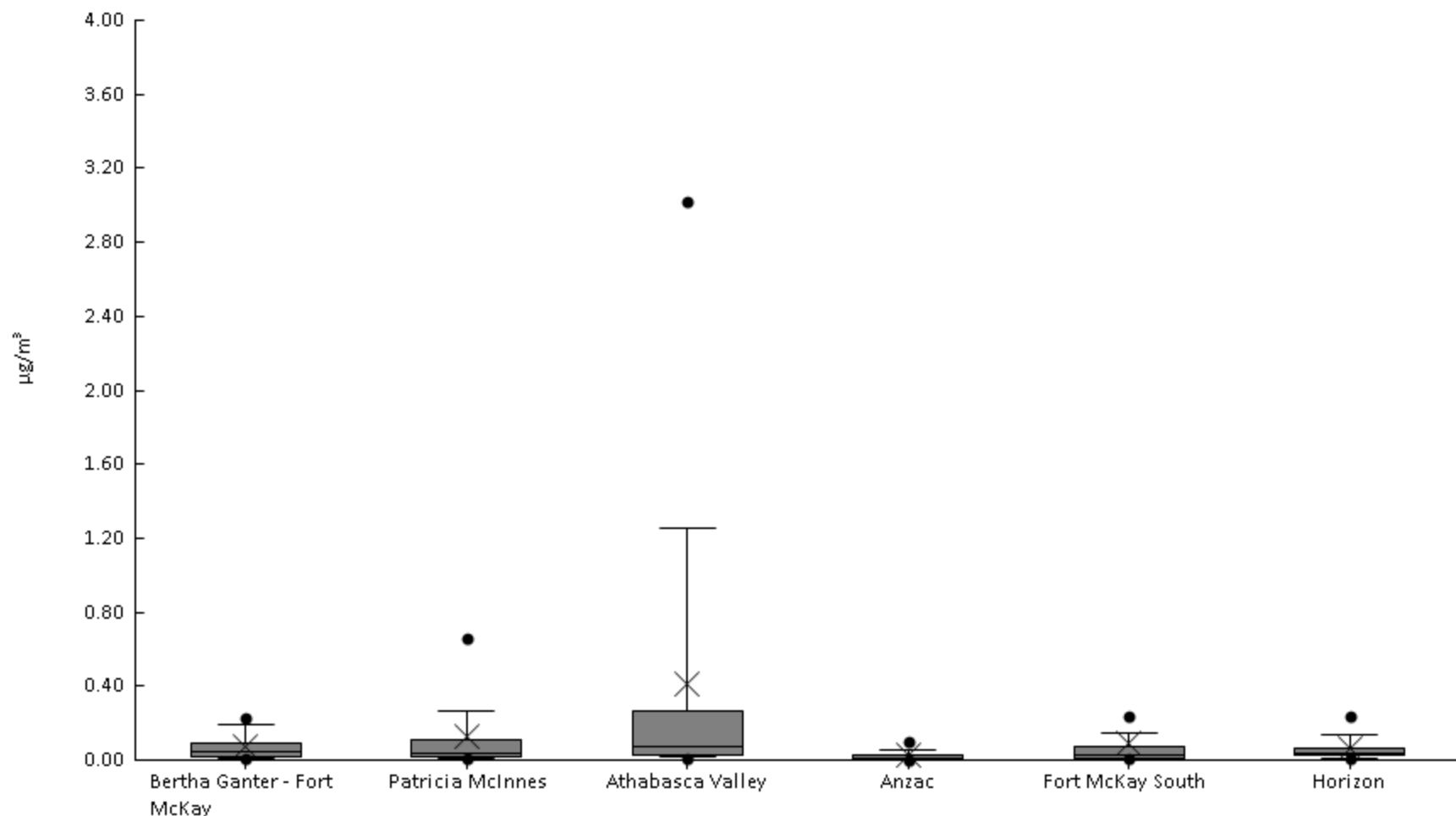
Particulate Matter (PM10 IONS) - Potassium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.4E-3	4.4E-3	5.7E-3	0.011	0.021	0.042	0.057	0.065	0.26	0.031	0.036
AMS06	Patricia McInnes	61	100%	2E-3	5.6E-3	8.3E-3	0.011	0.023	0.042	0.057	0.072	0.38	0.033	0.05
AMS07	Athabasca Valley	61	100%	4.2E-3	6.7E-3	9.7E-3	0.018	0.035	0.052	0.088	0.11	0.32	0.044	0.046
AMS14	Anzac	60	100%	1.7E-3	2.3E-3	3.7E-3	8.1E-3	0.017	0.04	0.052	0.066	0.088	0.024	0.021
AMS13	Fort McKay South	60	100%	7.5E-4	3.4E-3	4.8E-3	7.8E-3	0.021	0.043	0.059	0.072	0.24	0.03	0.036
AMS15	Horizon	61	100%	9.1E-4	4.6E-3	5.6E-3	9.1E-3	0.02	0.036	0.059	0.075	0.21	0.028	0.031



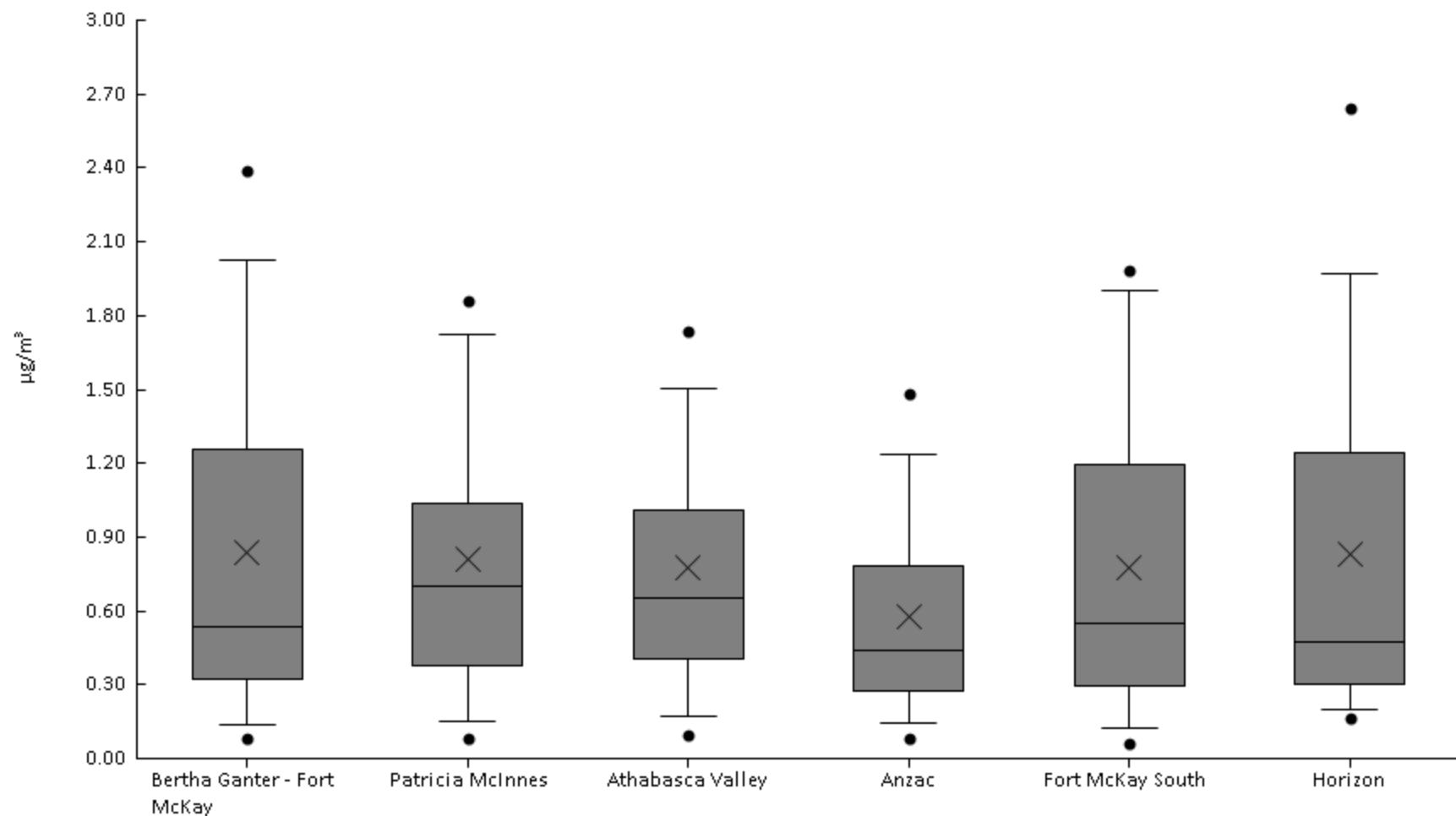
Particulate Matter (PM10 IONS) - Sodium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.3E-3	6.1E-3	7.5E-3	0.015	0.042	0.091	0.19	0.22	0.92	0.078	0.13
AMS06	Patricia McInnes	61	100%	2E-3	6.5E-3	0.01	0.016	0.035	0.11	0.26	0.66	1.2	0.13	0.25
AMS07	Athabasca Valley	61	100%	6.8E-3	0.013	0.018	0.027	0.072	0.27	1.3	3	3.7	0.41	0.85
AMS14	Anzac	60	100%	1.6E-3	2.6E-3	4.2E-3	7.6E-3	0.011	0.029	0.058	0.099	0.53	0.031	0.072
AMS13	Fort McKay South	60	100%	4.3E-3	5E-3	7.6E-3	0.014	0.029	0.074	0.15	0.24	1.7	0.089	0.23
AMS15	Horizon	61	100%	6E-3	7E-3	8.6E-3	0.025	0.039	0.067	0.14	0.24	0.53	0.066	0.087



Particulate Matter (PM10 IONS) - Sulphate ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.017	0.082	0.14	0.32	0.53	1.3	2	2.4	2.9	0.84	0.74
AMS06	Patricia McInnes	61	100%	0.063	0.081	0.15	0.38	0.7	1	1.7	1.9	2.4	0.81	0.55
AMS07	Athabasca Valley	61	100%	0.071	0.099	0.17	0.4	0.65	1	1.5	1.7	2.5	0.77	0.52
AMS14	Anzac	60	100%	2.3E-3	0.083	0.14	0.27	0.44	0.78	1.2	1.5	1.8	0.58	0.42
AMS13	Fort McKay South	60	100%	0.02	0.061	0.12	0.29	0.55	1.2	1.9	2	2.4	0.77	0.64
AMS15	Horizon	61	100%	0.052	0.16	0.2	0.3	0.47	1.2	2	2.6	3.7	0.83	0.79





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PARTICULATE MATTER - METALS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals: 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 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals: Desert Research Institute
Reno, NV

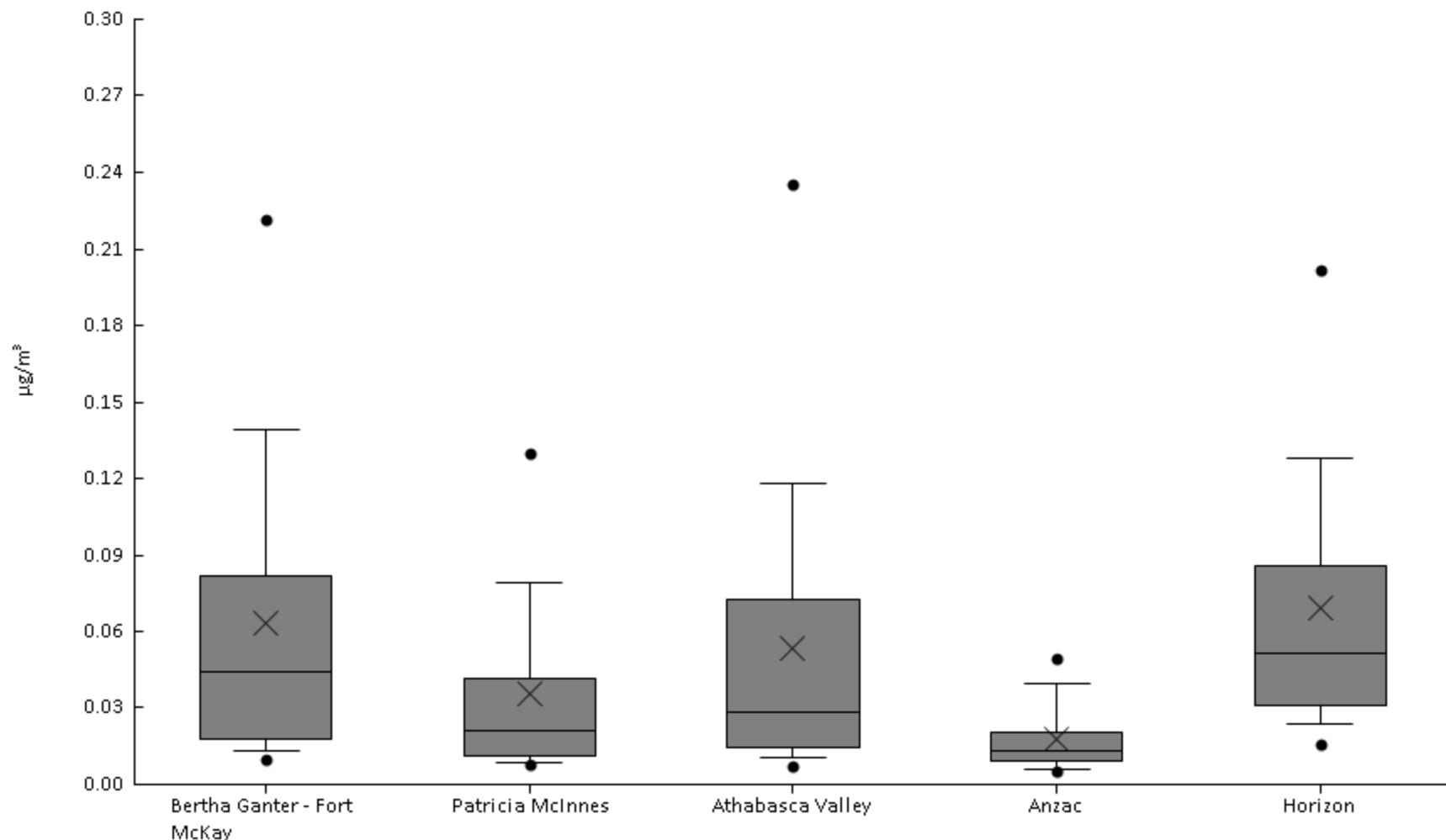


CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (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) DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
SAMPLE PREPARATION	Desert Research Institute
ANALYTICAL LABORATORY	Data are not blank corrected
USER NOTE 1	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 2	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
USER NOTE 3	Partisols for PM _{2.5} at AMS 15 occasionally samples 24.1 m ³ despite being set for 24 m ³ . Flow has been calibrated. Reason for this behaviour is unknown.
USER NOTE 4	Data is computed on a monthly dataset.
USER NOTE 5	Summary statistics include flags beginning with V.
USER NOTE 6	Actual Volume at Ambient Conditions (since 01-Jan-2011)
VOLUME STANDARDIZATION	For PM ₁₀ FRM Partisol PM ₁₀ sampler
SAMPLING INSTRUMENT TYPE	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



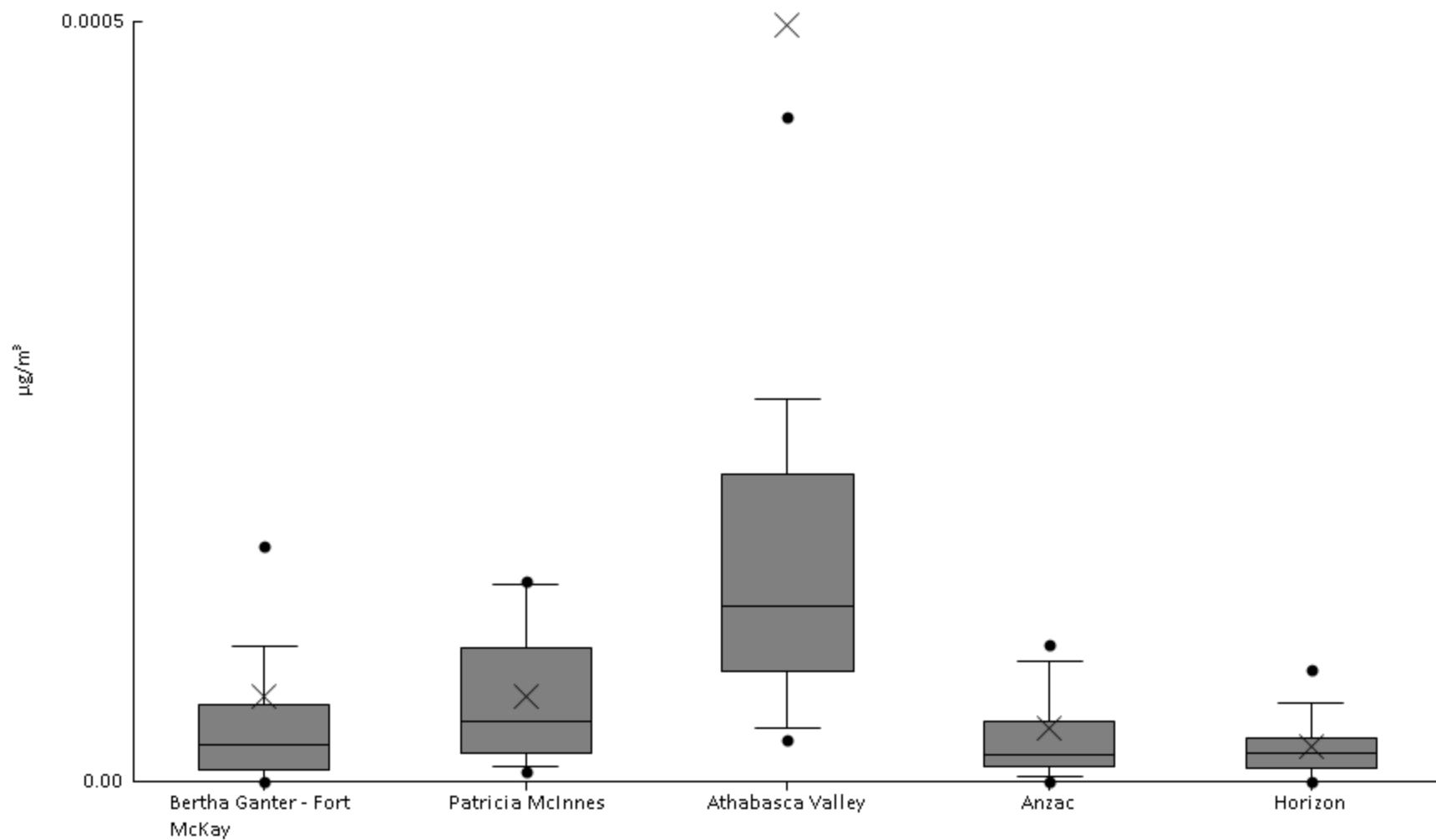
Particulate Matter (PM2.5 METALS) - Aluminum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	6.1E-3	9.8E-3	0.013	0.018	0.044	0.082	0.14	0.22	0.31	0.063	0.064
AMS06	Patricia McInnes	61	100%	6.1E-3	8E-3	8.5E-3	0.011	0.021	0.042	0.079	0.13	0.22	0.036	0.042
AMS07	Athabasca Valley	61	100%	5.8E-3	7E-3	0.011	0.014	0.028	0.073	0.12	0.24	0.29	0.054	0.064
AMS14	Anzac	60	100%	4.8E-3	5.5E-3	6.2E-3	9.3E-3	0.013	0.021	0.04	0.05	0.055	0.018	0.013
AMS15	Horizon	59	100%	0.012	0.016	0.024	0.031	0.051	0.086	0.13	0.2	0.27	0.069	0.054



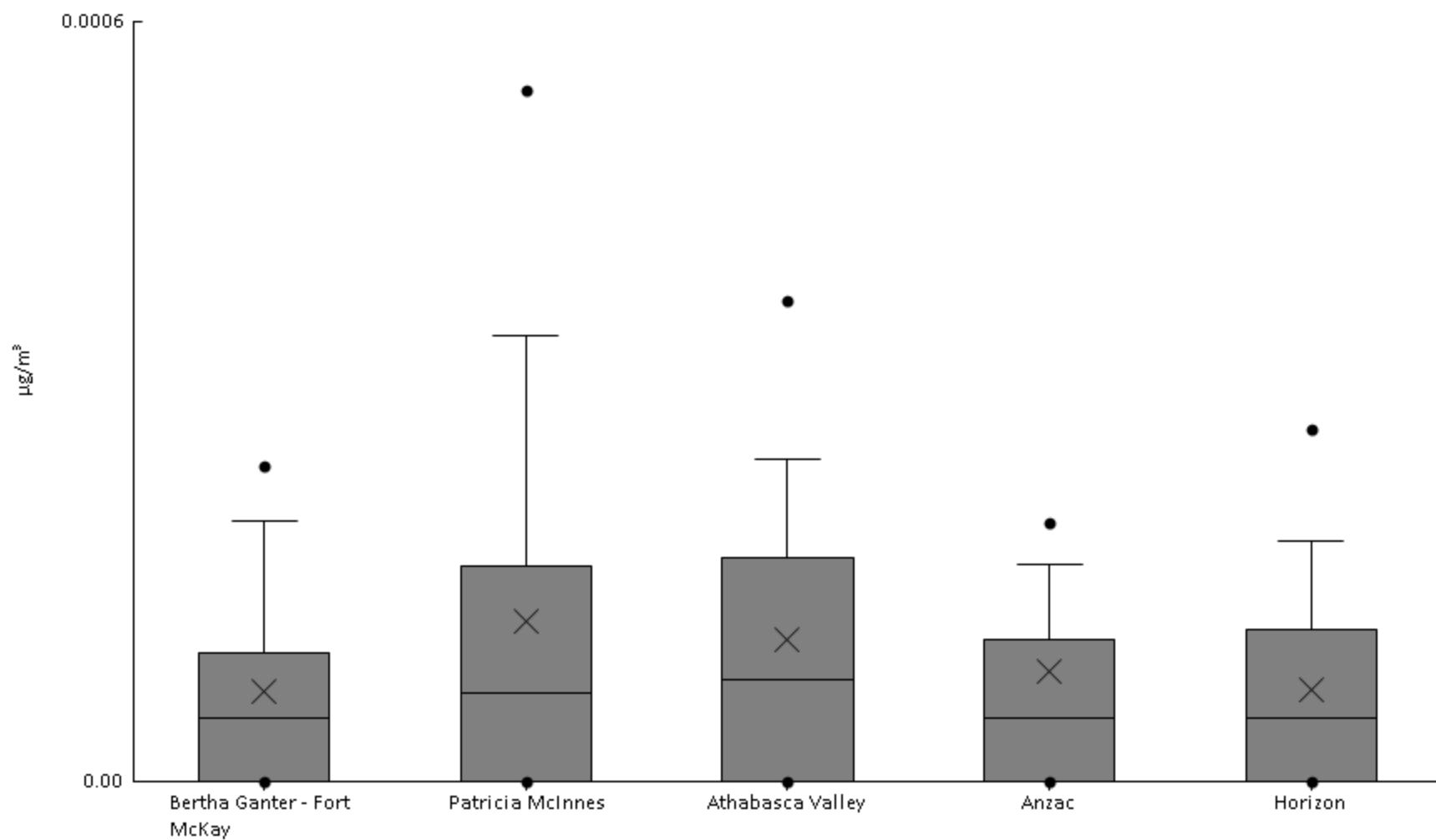
Particulate Matter (PM2.5 METALS) - Antimony ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	56%	0	0	0	8E-6	2.4E-5	5E-5	8.9E-5	1.6E-4	1.2E-3	5.6E-5	1.6E-4
AMS06	Patricia McInnes	61	82%	0	6.6E-6	1E-5	1.9E-5	4E-5	8.8E-5	1.3E-4	1.3E-4	1.8E-4	5.6E-5	4.5E-5
AMS07	Athabasca Valley	61	100%	2.3E-5	2.7E-5	3.5E-5	7.3E-5	1.2E-4	2E-4	2.5E-4	4.4E-4	0.022	5E-4	2.8E-3
AMS14	Anzac	60	58%	0	0	3.5E-6	1E-5	1.8E-5	4E-5	8E-5	9E-5	5.1E-4	3.6E-5	6.8E-5
AMS15	Horizon	59	54%	0	0	0	9E-6	1.9E-5	2.9E-5	5.2E-5	7.4E-5	1.2E-4	2.3E-5	2.5E-5



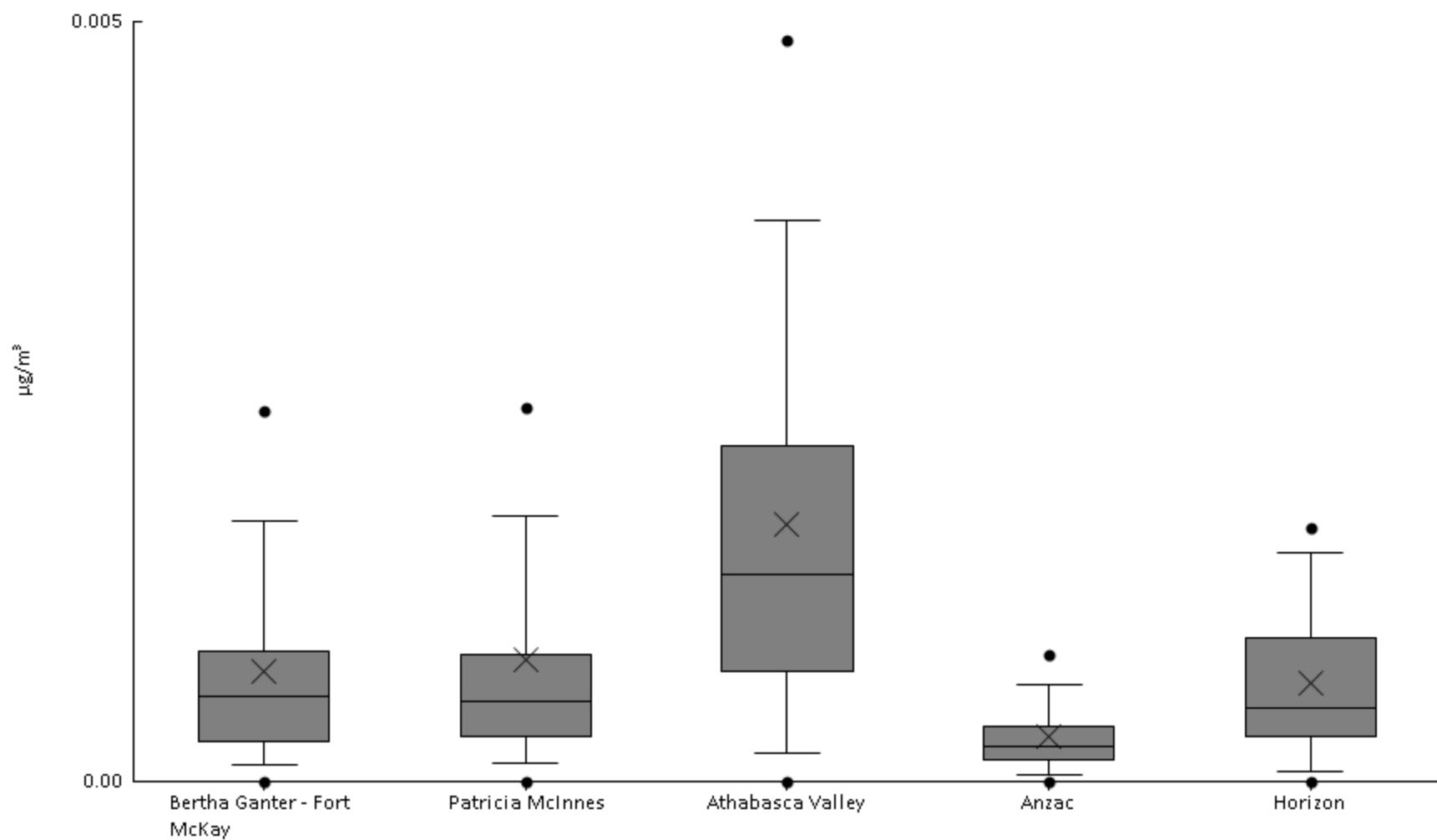
Particulate Matter (PM2.5 METALS) - Arsenic ($\mu\text{g}/\text{m}^3$) - 2019

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	5E-5	1E-4	2.1E-4	2.5E-4	3.1E-4	7.1E-5	8.3E-5
AMS06	Patricia McInnes	61	64%	0	0	0	0	7E-5	1.7E-4	3.5E-4	5.5E-4	6.9E-4	1.3E-4	1.7E-4
AMS07	Athabasca Valley	61	72%	0	0	0	0	8E-5	1.8E-4	2.5E-4	3.8E-4	6E-4	1.1E-4	1.3E-4
AMS14	Anzac	60	65%	0	0	0	0	5.1E-5	1.1E-4	1.7E-4	2E-4	1.5E-3	8.7E-5	2E-4
AMS15	Horizon	59	66%	0	0	0	0	5E-5	1.2E-4	1.9E-4	2.8E-4	3.8E-4	7.2E-5	8.7E-5



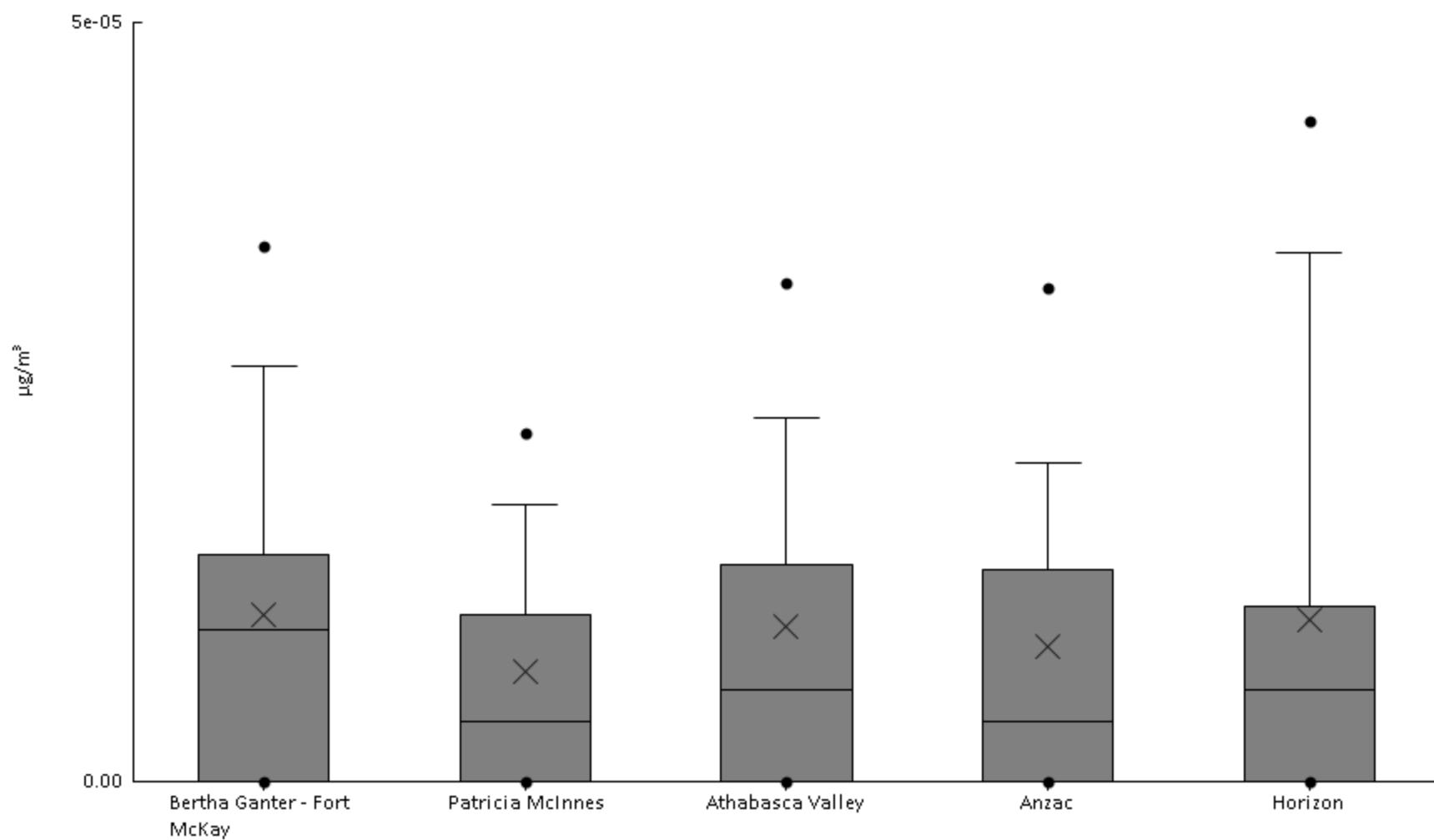
Particulate Matter (PM2.5 METALS) - Barium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	1.1E-4	2.6E-4	5.6E-4	8.6E-4	1.7E-3	2.4E-3	3.4E-3	7.2E-4	7.2E-4
AMS06	Patricia McInnes	61	92%	0	0	1.2E-4	3E-4	5.3E-4	8.3E-4	1.8E-3	2.5E-3	7.8E-3	8.1E-4	1.1E-3
AMS07	Athabasca Valley	61	90%	0	0	1.9E-4	7.3E-4	1.4E-3	2.2E-3	3.7E-3	4.9E-3	5.4E-3	1.7E-3	1.3E-3
AMS14	Anzac	60	90%	0	0	4.8E-5	1.5E-4	2.3E-4	3.7E-4	6.4E-4	8.3E-4	1E-3	3E-4	2.3E-4
AMS15	Horizon	59	90%	0	0	6.6E-5	2.9E-4	4.9E-4	9.5E-4	1.5E-3	1.7E-3	2.7E-3	6.5E-4	5.5E-4



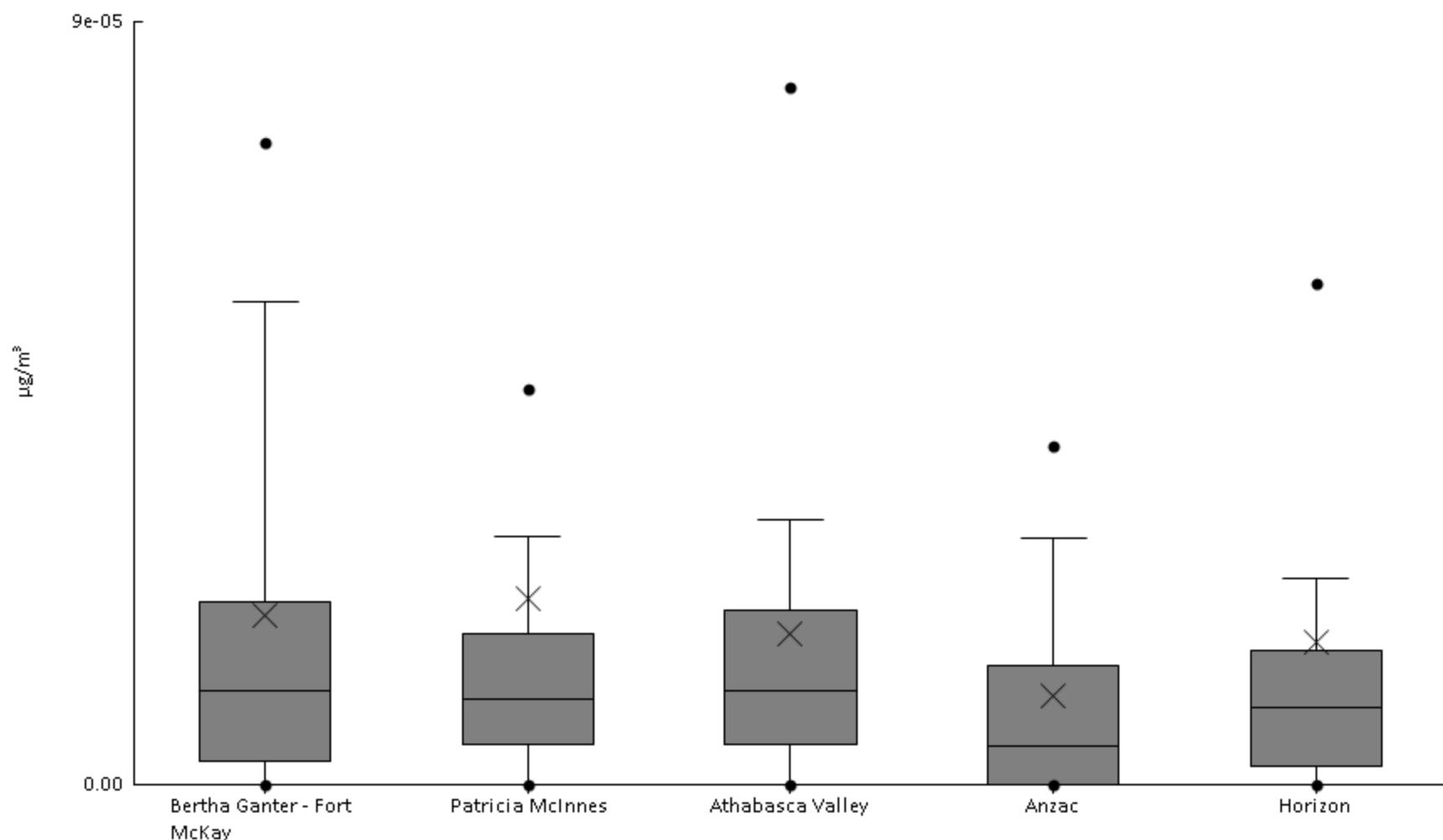
Particulate Matter (PM2.5 METALS) - Beryllium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	28%	0	0	0	0	1E-5	1.5E-5	2.7E-5	3.5E-5	5.8E-5	1.1E-5	1.2E-5
AMS06	Patricia McInnes	61	18%	0	0	0	0	4E-6	1.1E-5	1.8E-5	2.3E-5	5.8E-5	7.3E-6	1E-5
AMS07	Athabasca Valley	61	26%	0	0	0	0	6E-6	1.4E-5	2.4E-5	3.3E-5	1E-4	1E-5	1.5E-5
AMS14	Anzac	60	25%	0	0	0	0	4E-6	1.4E-5	2.1E-5	3.3E-5	7.9E-5	8.9E-6	1.3E-5
AMS15	Horizon	59	19%	0	0	0	0	6E-6	1.2E-5	3.5E-5	4.4E-5	8.8E-5	1.1E-5	1.7E-5



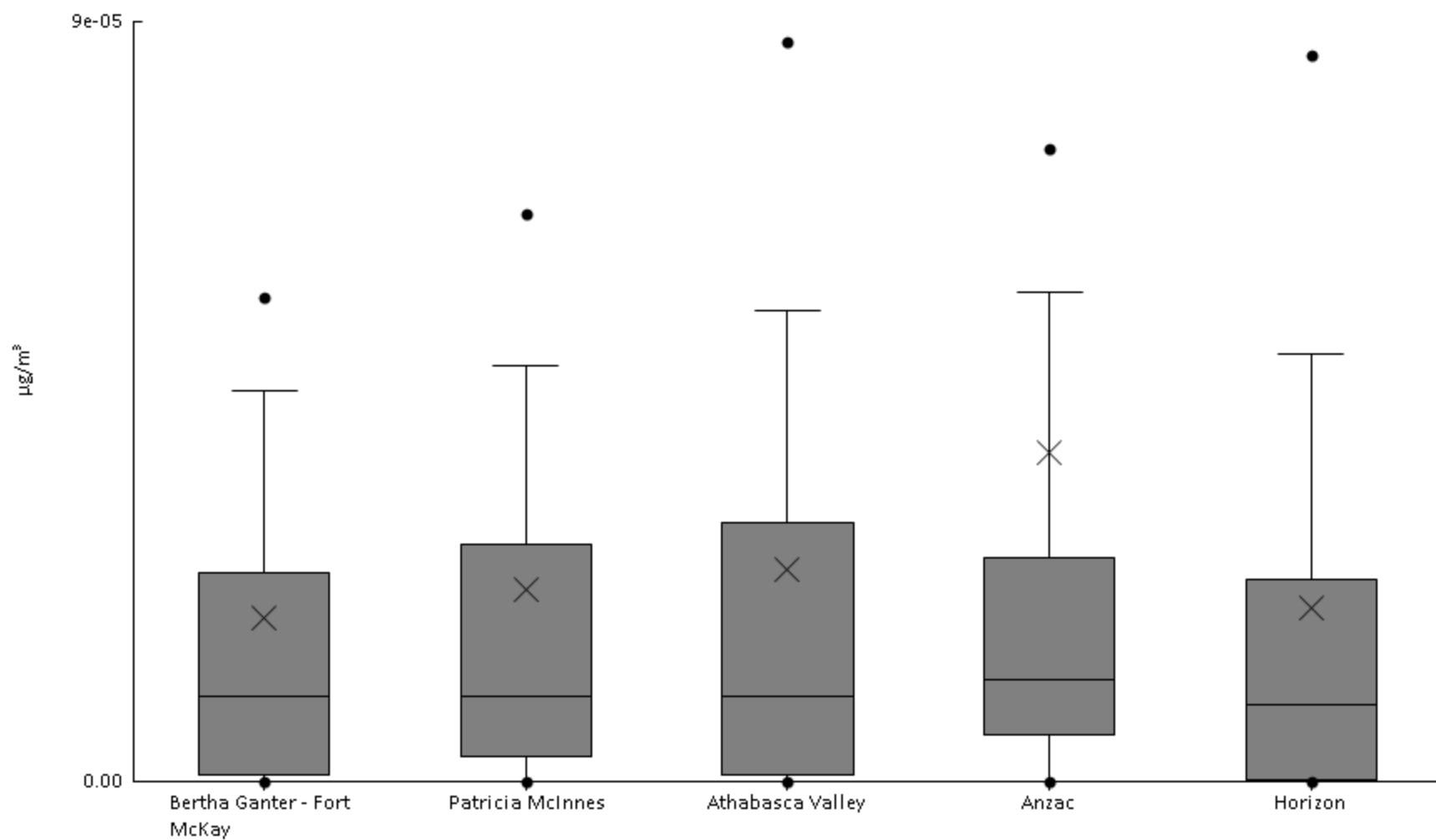
Particulate Matter (PM2.5 METALS) - Bismuth ($\mu\text{g}/\text{m}^3$) - 2019

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	2.8E-6	1.1E-5	2.2E-5	5.7E-5	7.6E-5	1.5E-4	2E-5	2.7E-5
AMS06	Patricia McInnes	61	75%	0	0	0	4.8E-6	1E-5	1.8E-5	2.9E-5	4.7E-5	6.1E-4	2.2E-5	7.8E-5
AMS07	Athabasca Valley	61	75%	0	0	0	4.8E-6	1.1E-5	2.1E-5	3.1E-5	8.2E-5	1.2E-4	1.8E-5	2.2E-5
AMS14	Anzac	60	50%	0	0	0	0	4.5E-6	1.4E-5	2.9E-5	4E-5	8.5E-5	1E-5	1.5E-5
AMS15	Horizon	59	75%	0	0	0	2.3E-6	9E-6	1.6E-5	2.4E-5	5.9E-5	3.2E-4	1.7E-5	4.3E-5



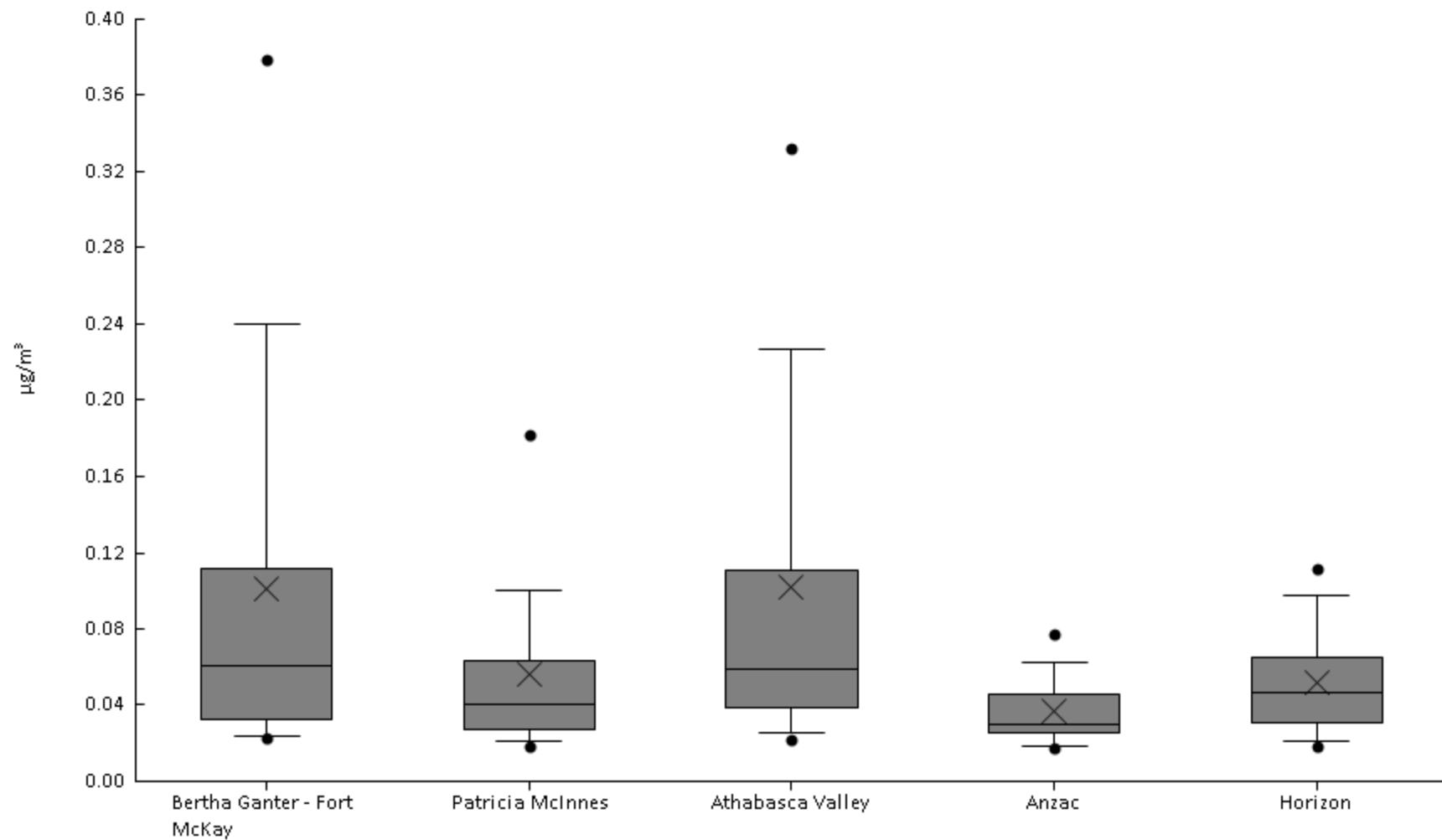
Particulate Matter (PM2.5 METALS) - Cadmium ($\mu\text{g}/\text{m}^3$) - 2019

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	7.5E-7	1E-5	2.5E-5	4.6E-5	5.7E-5	2.3E-4	1.9E-5	3.2E-5
AMS06	Patricia McInnes	61	51%	0	0	0	3E-6	1E-5	2.8E-5	4.9E-5	6.7E-5	3.5E-4	2.3E-5	4.6E-5
AMS07	Athabasca Valley	61	51%	0	0	0	7.5E-7	1E-5	3.1E-5	5.6E-5	8.8E-5	3E-4	2.5E-5	4.4E-5
AMS14	Anzac	60	55%	0	0	0	5.5E-6	1.2E-5	2.7E-5	5.8E-5	7.5E-5	1.1E-3	3.9E-5	1.5E-4
AMS15	Horizon	59	46%	0	0	0	2.5E-7	9E-6	2.4E-5	5.1E-5	8.6E-5	2E-4	2.1E-5	3.3E-5



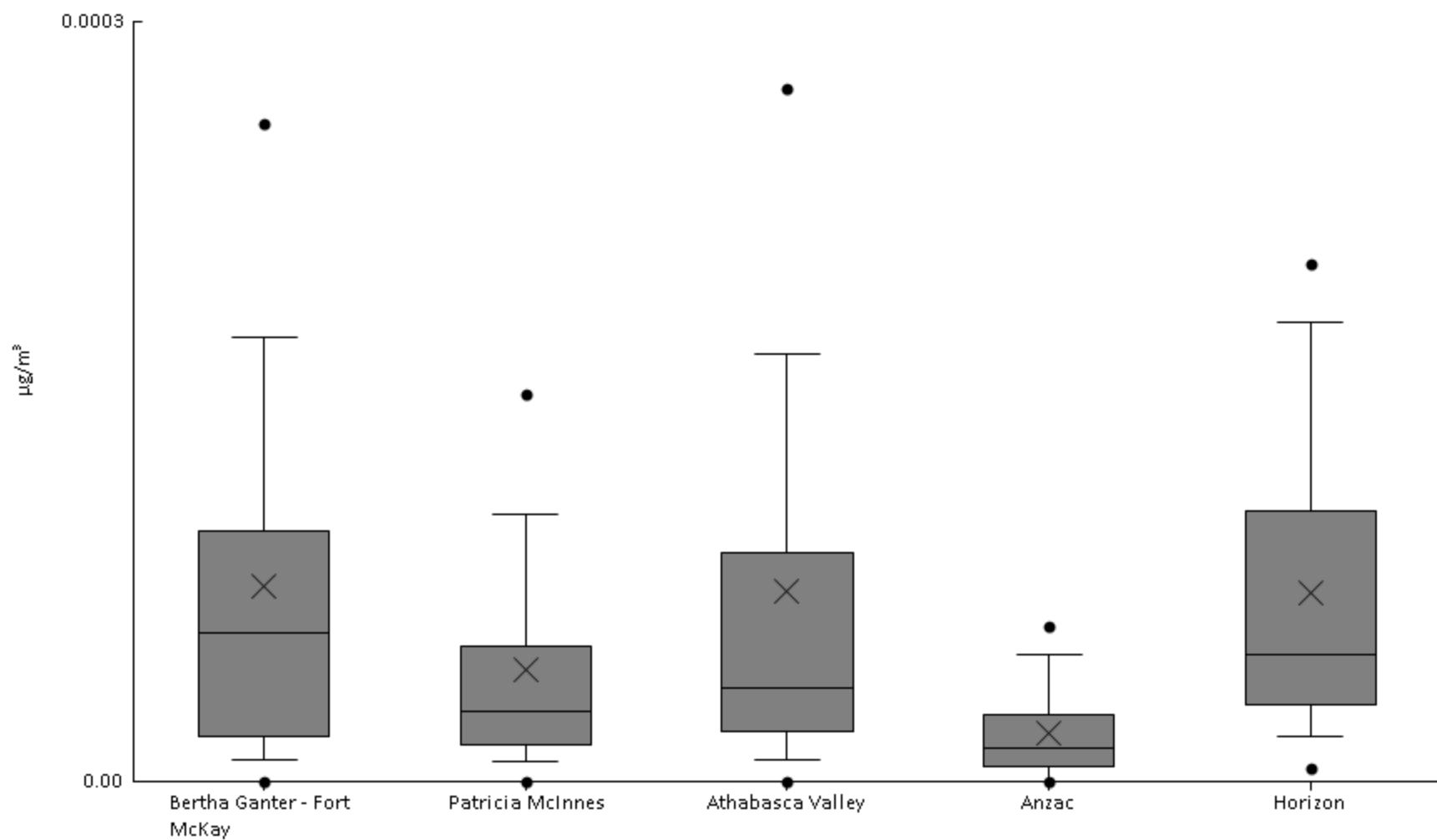
Particulate Matter (PM_{2.5} METALS) - Calcium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.019	0.023	0.024	0.032	0.06	0.11	0.24	0.38	0.56	0.1	0.11
AMS06	Patricia McInnes	61	100%	0.016	0.018	0.021	0.027	0.04	0.064	0.1	0.18	0.26	0.056	0.048
AMS07	Athabasca Valley	61	100%	0.018	0.022	0.025	0.039	0.059	0.11	0.23	0.33	0.74	0.1	0.12
AMS14	Anzac	60	100%	0.015	0.017	0.019	0.026	0.03	0.046	0.063	0.077	0.095	0.037	0.018
AMS15	Horizon	59	100%	0.015	0.019	0.021	0.03	0.047	0.065	0.098	0.11	0.13	0.052	0.029



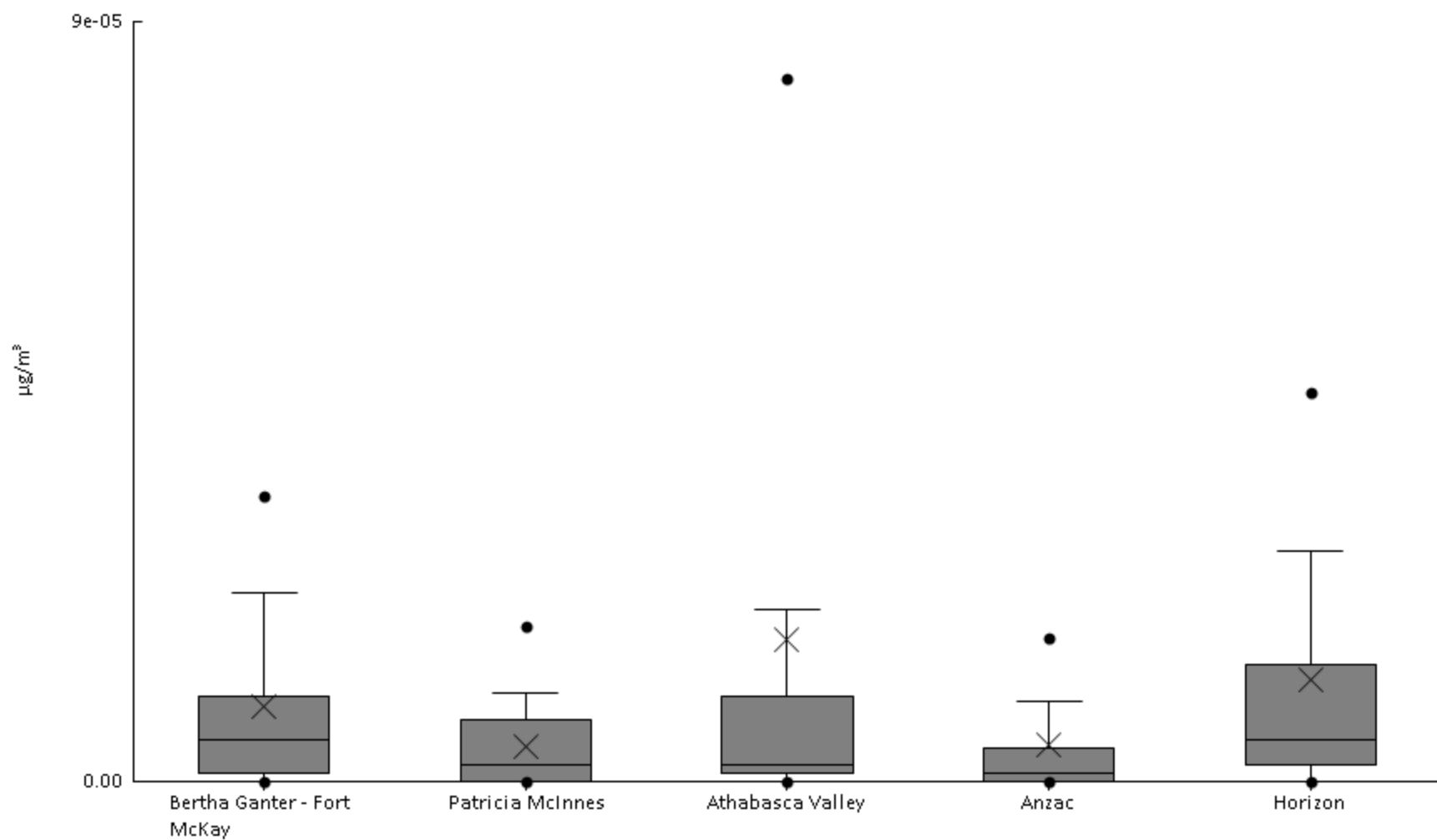
Particulate Matter (PM2.5 METALS) - Cerium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	79%	0	0	8.4E-6	1.8E-5	5.9E-5	9.9E-5	1.8E-4	2.6E-4	5E-4	7.7E-5	9E-5
AMS06	Patricia McInnes	61	75%	0	0	7.8E-6	1.4E-5	2.8E-5	5.3E-5	1.1E-4	1.5E-4	2.2E-4	4.4E-5	4.9E-5
AMS07	Athabasca Valley	61	84%	0	0	8.8E-6	2E-5	3.7E-5	9E-5	1.7E-4	2.7E-4	5.3E-4	7.5E-5	1E-4
AMS14	Anzac	60	53%	0	0	0	6E-6	1.3E-5	2.7E-5	5E-5	6.2E-5	9.2E-5	1.9E-5	2E-5
AMS15	Horizon	59	93%	0	5.6E-6	1.8E-5	3E-5	5E-5	1.1E-4	1.8E-4	2E-4	3.2E-4	7.5E-5	6.4E-5



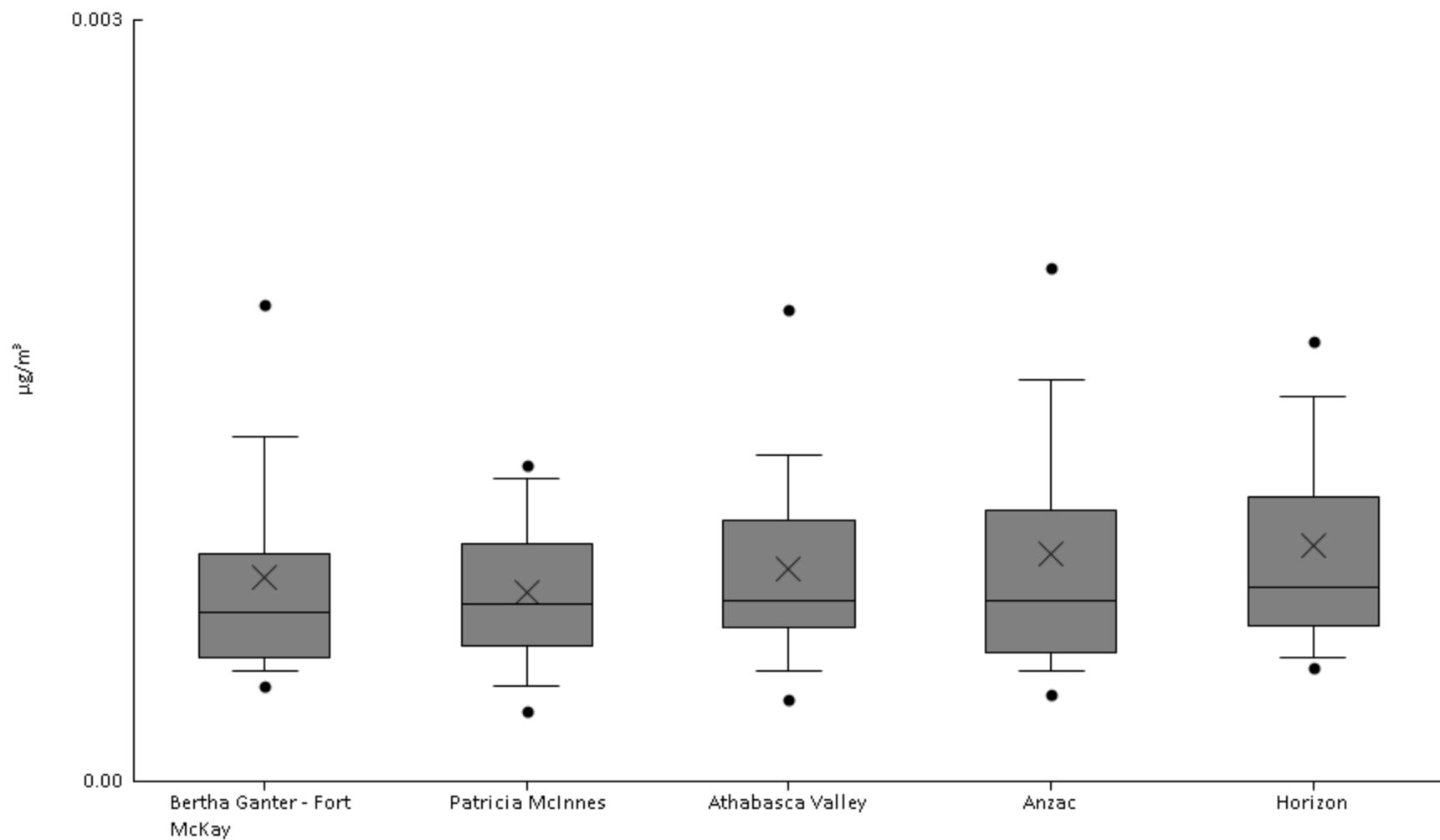
Particulate Matter (PM2.5 METALS) - Cesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	57%	0	0	0	1E-6	5E-6	1E-5	2.2E-5	3.4E-5	8.7E-5	8.9E-6	1.4E-5
AMS06	Patricia McInnes	61	33%	0	0	0	0	2E-6	7.3E-6	1E-5	1.8E-5	2.1E-5	4.2E-6	5.5E-6
AMS07	Athabasca Valley	61	44%	0	0	0	1E-6	2E-6	1E-5	2E-5	8.3E-5	3.4E-4	1.7E-5	5.3E-5
AMS14	Anzac	60	30%	0	0	0	0	1E-6	4E-6	9.5E-6	1.7E-5	7.7E-5	4.3E-6	1.1E-5
AMS15	Horizon	59	64%	0	0	0	2E-6	5E-6	1.4E-5	2.7E-5	4.6E-5	1.4E-4	1.2E-5	2.1E-5



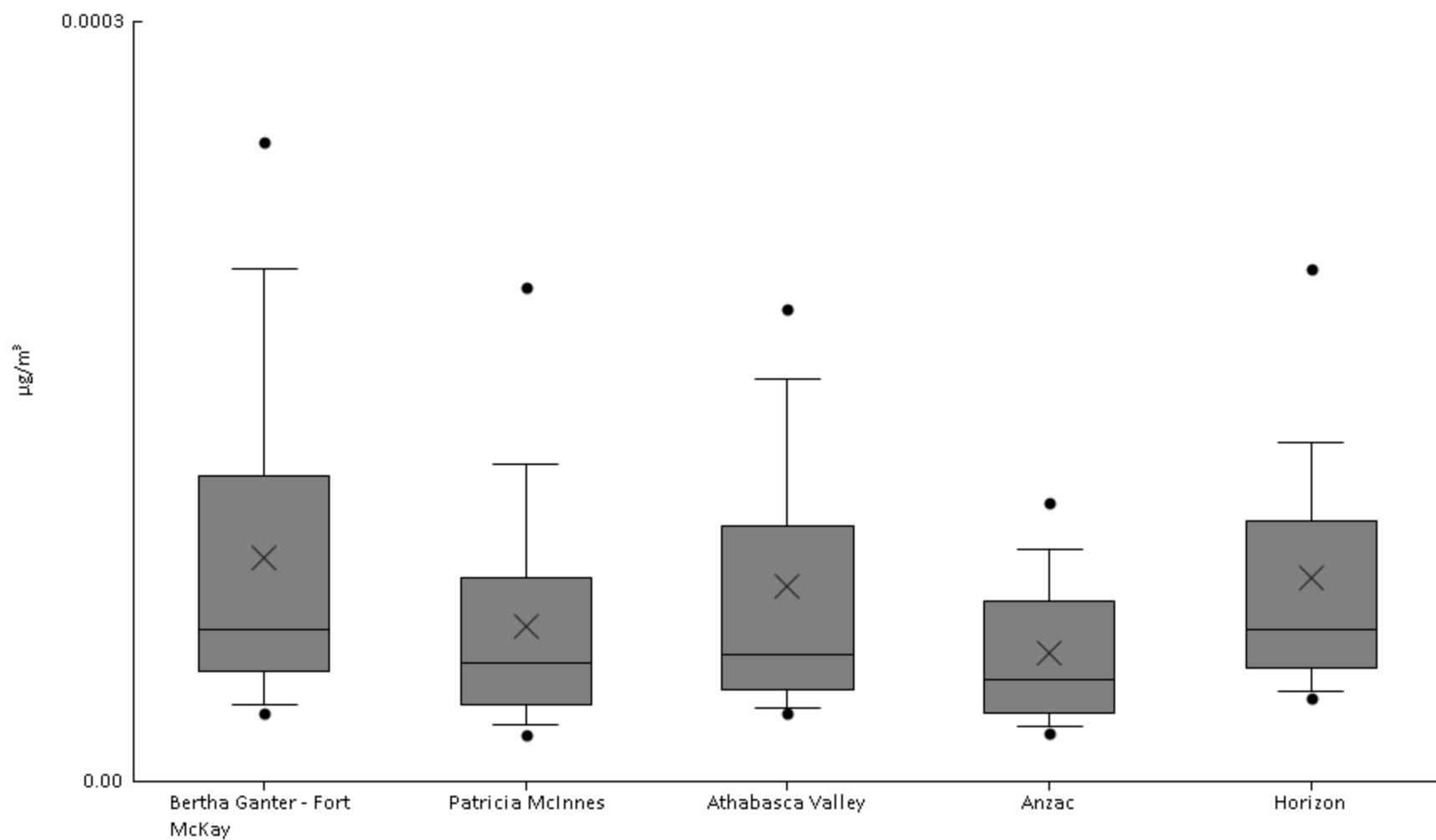
Particulate Matter (PM2.5 METALS) - Chromium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	3.7E-4	4.4E-4	4.9E-4	6.7E-4	8.9E-4	1.4E-3	1.9E-3	2.6E-3	8E-4	4.8E-4
AMS06	Patricia McInnes	61	98%	0	2.8E-4	3.8E-4	5.4E-4	7E-4	9.3E-4	1.2E-3	1.2E-3	1.4E-3	7.5E-4	3.1E-4
AMS07	Athabasca Valley	61	97%	0	3.3E-4	4.4E-4	6.1E-4	7.1E-4	1E-3	1.3E-3	1.9E-3	3E-3	8.4E-4	4.7E-4
AMS14	Anzac	60	98%	0	3.4E-4	4.3E-4	5.1E-4	7.1E-4	1.1E-3	1.6E-3	2E-3	3.8E-3	8.9E-4	6.2E-4
AMS15	Horizon	59	100%	3E-4	4.5E-4	4.9E-4	6.1E-4	7.7E-4	1.1E-3	1.5E-3	1.7E-3	5E-3	9.3E-4	6.5E-4



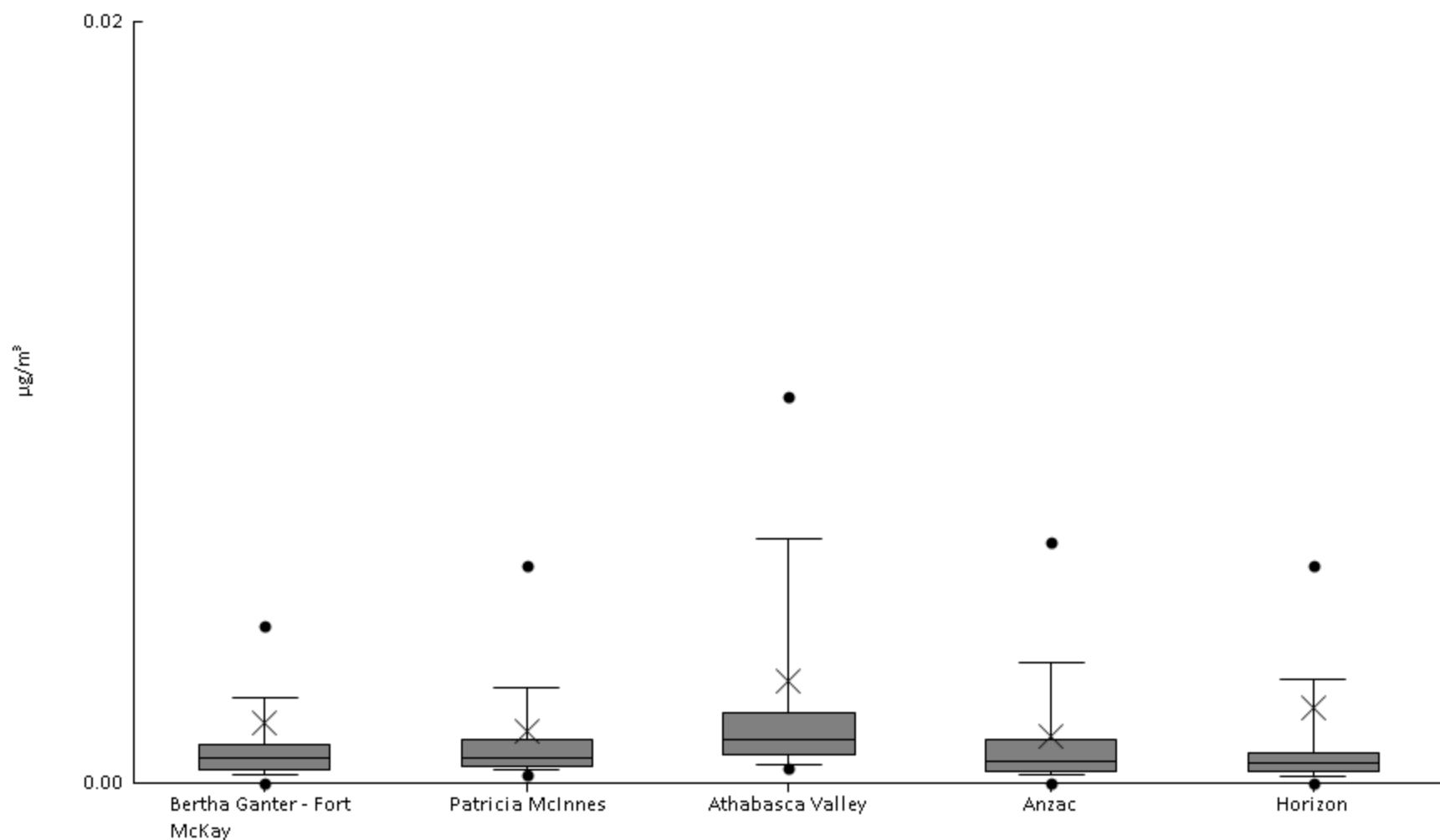
Particulate Matter (PM2.5 METALS) - Cobalt ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.9E-5	2.7E-5	3E-5	4.3E-5	6E-5	1.2E-4	2E-4	2.5E-4	2.7E-4	8.8E-5	6.7E-5
AMS06	Patricia McInnes	61	98%	0	1.9E-5	2.3E-5	3E-5	4.7E-5	8.1E-5	1.3E-4	1.9E-4	2.3E-4	6.1E-5	5E-5
AMS07	Athabasca Valley	61	100%	1.6E-5	2.7E-5	2.9E-5	3.6E-5	5E-5	1E-4	1.6E-4	1.9E-4	3.5E-4	7.7E-5	6.2E-5
AMS14	Anzac	60	100%	1.5E-5	1.9E-5	2.2E-5	2.7E-5	4E-5	7.1E-5	9.2E-5	1.1E-4	1.3E-4	5.1E-5	2.9E-5
AMS15	Horizon	59	100%	3E-5	3.3E-5	3.5E-5	4.5E-5	6E-5	1E-4	1.3E-4	2E-4	2.7E-4	8.1E-5	5.3E-5



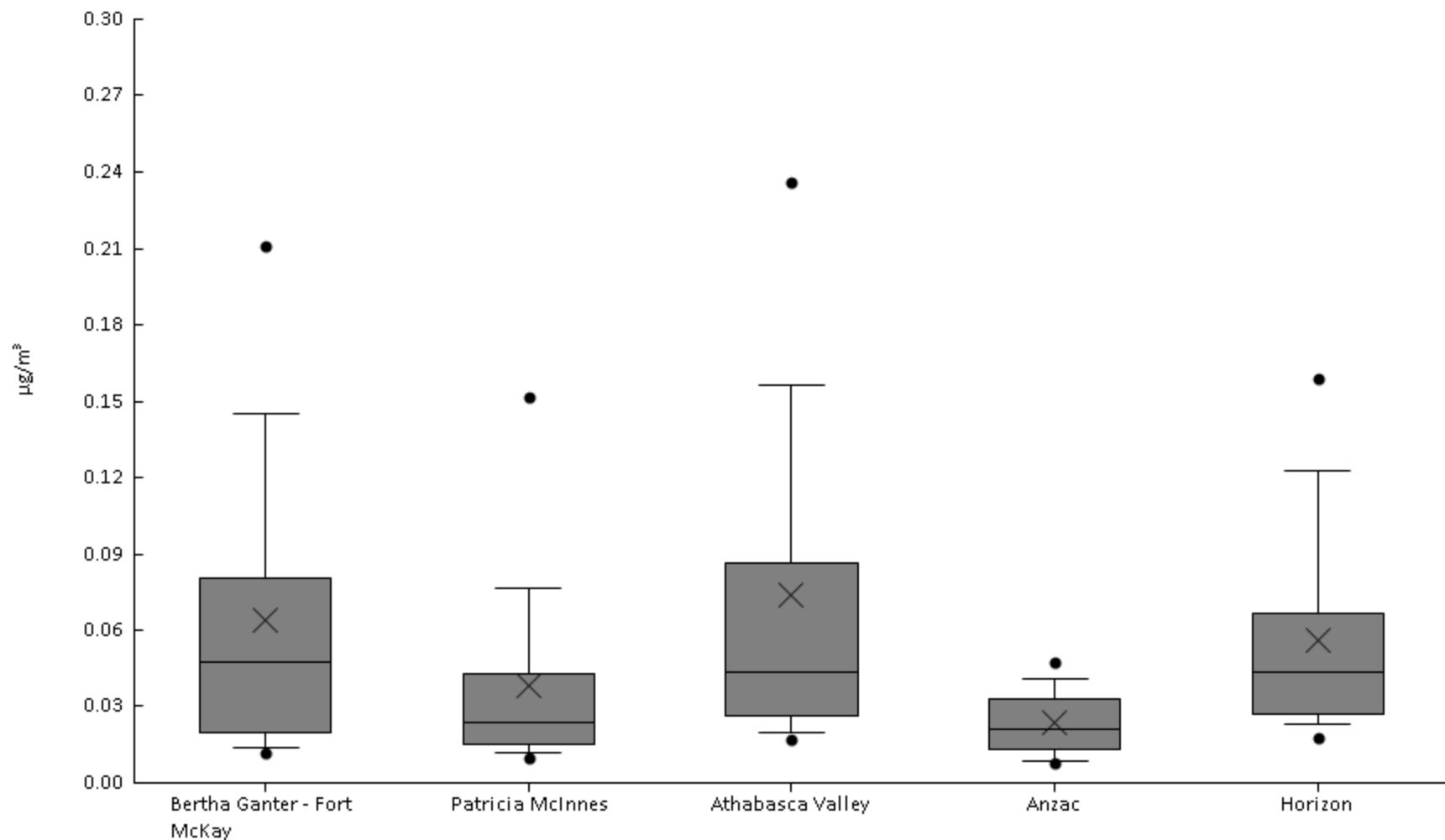
Particulate Matter (PM2.5 METALS) - Copper ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% \geq MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	0	2.3E-4	3.5E-4	6.8E-4	9.9E-4	2.3E-3	4.1E-3	0.034	1.6E-3	4.5E-3
AMS06	Patricia McInnes	61	97%	0	2E-4	3.5E-4	4.4E-4	6.8E-4	1.1E-3	2.5E-3	5.7E-3	0.012	1.3E-3	2.1E-3
AMS07	Athabasca Valley	61	98%	0	3.9E-4	4.8E-4	7.7E-4	1.1E-3	1.8E-3	6.4E-3	0.01	0.036	2.7E-3	5.7E-3
AMS14	Anzac	60	93%	0	0	2E-4	3.2E-4	5.7E-4	1.1E-3	3.2E-3	6.3E-3	0.01	1.2E-3	2E-3
AMS15	Horizon	59	93%	0	0	1.8E-4	2.9E-4	5.3E-4	7.9E-4	2.7E-3	5.7E-3	0.05	2E-3	6.9E-3



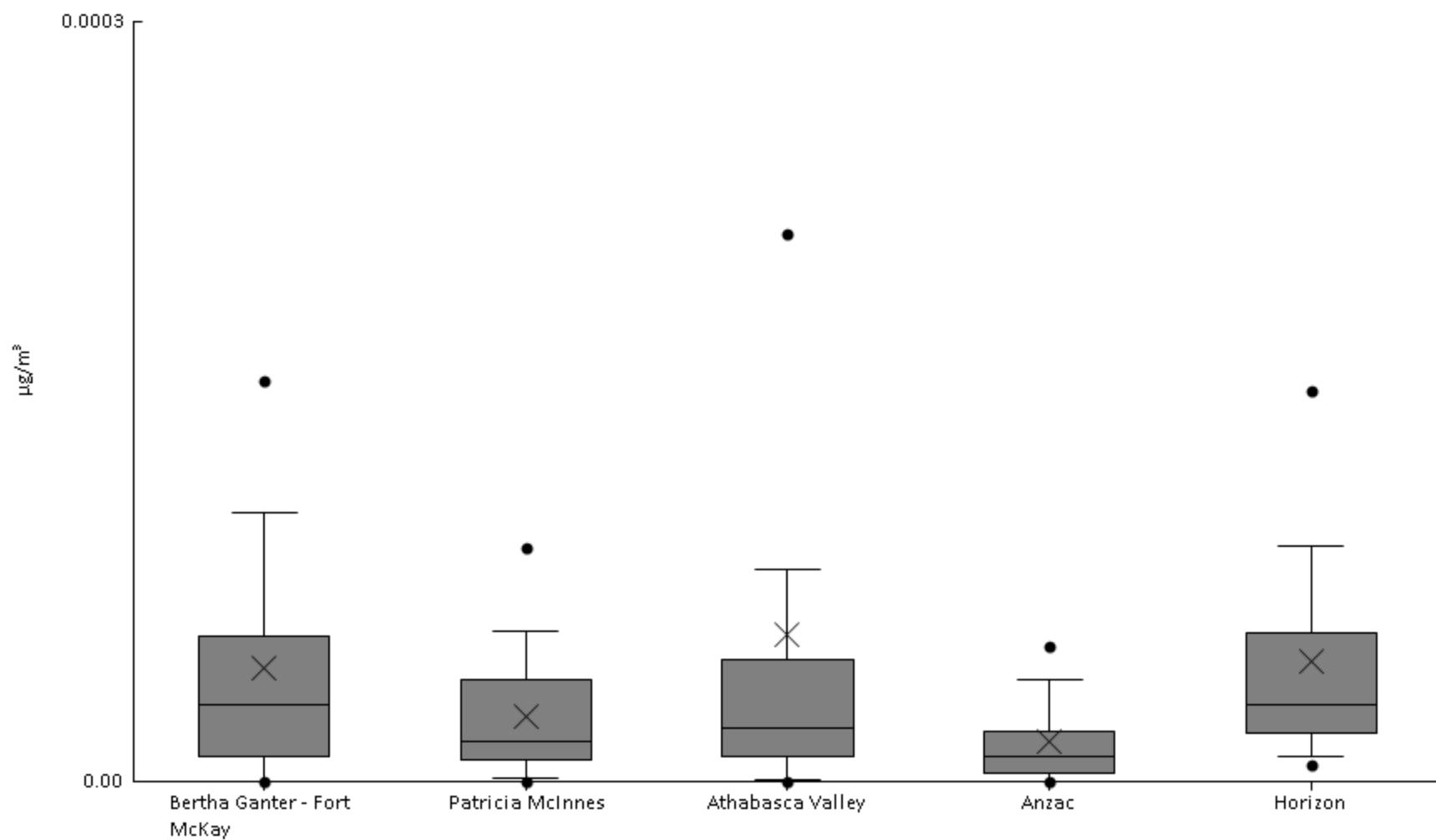
Particulate Matter (PM2.5 METALS) - Iron ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	9.6E-3	0.012	0.014	0.02	0.047	0.08	0.14	0.21	0.27	0.064	0.061
AMS06	Patricia McInnes	61	100%	8.5E-3	9.9E-3	0.012	0.015	0.024	0.043	0.077	0.15	0.22	0.038	0.041
AMS07	Athabasca Valley	61	100%	0.013	0.017	0.02	0.026	0.044	0.086	0.16	0.24	0.38	0.074	0.076
AMS14	Anzac	60	100%	5.6E-3	7.6E-3	8.7E-3	0.013	0.021	0.033	0.041	0.047	0.062	0.024	0.013
AMS15	Horizon	59	100%	0.014	0.018	0.023	0.027	0.044	0.067	0.12	0.16	0.19	0.056	0.041



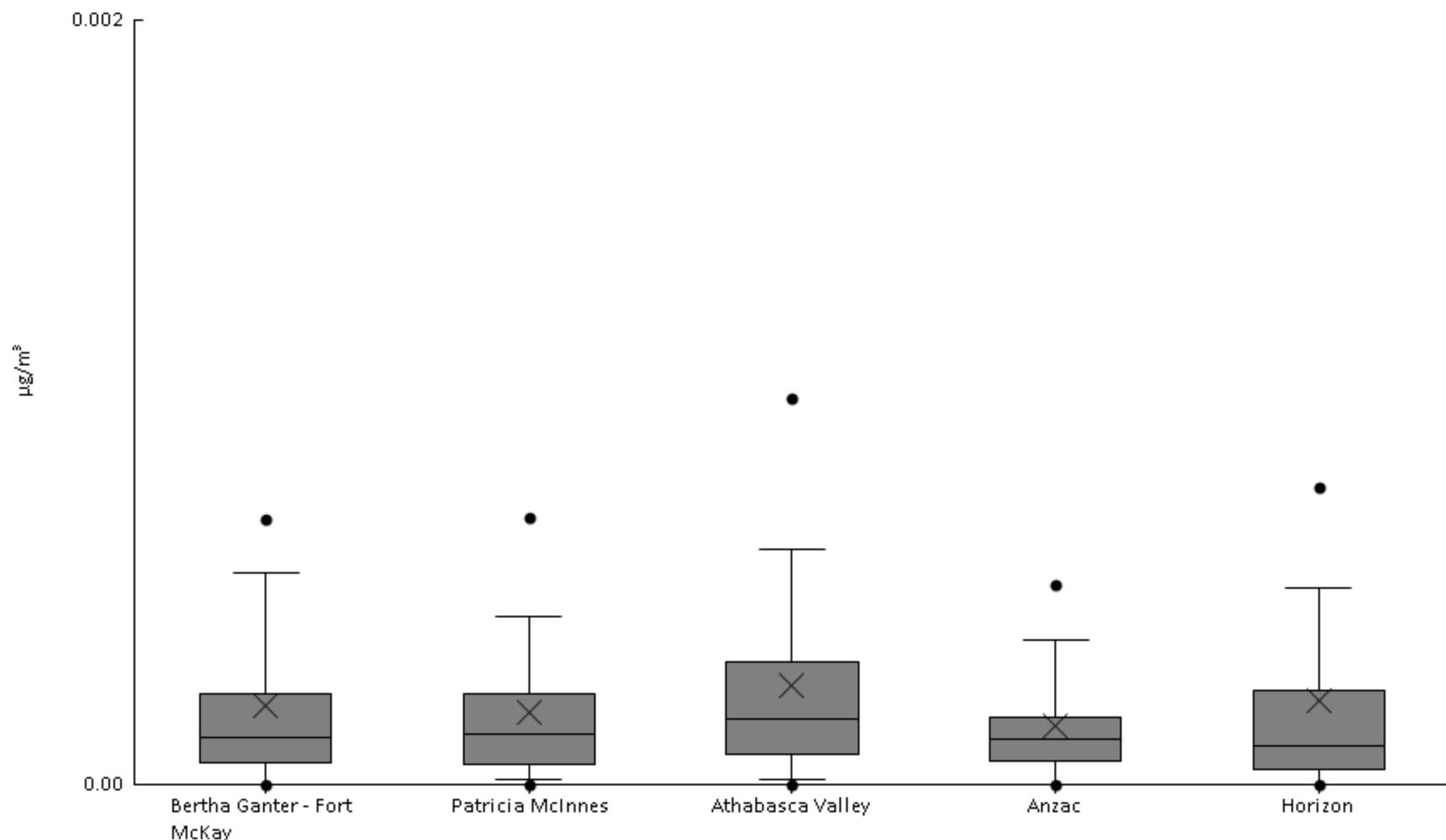
Particulate Matter (PM2.5 METALS) - Lanthanum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	1E-5	3E-5	5.8E-5	1.1E-4	1.6E-4	2.8E-4	4.5E-5	5.3E-5
AMS06	Patricia McInnes	61	89%	0	0	1.2E-6	8.8E-6	1.6E-5	4E-5	6E-5	9.2E-5	1.1E-4	2.6E-5	2.6E-5
AMS07	Athabasca Valley	61	87%	0	0	6E-7	9.8E-6	2.1E-5	4.8E-5	8.4E-5	2.2E-4	1.2E-3	5.8E-5	1.6E-4
AMS14	Anzac	60	75%	0	0	0	3E-6	1E-5	2E-5	4E-5	5.4E-5	9.1E-5	1.6E-5	1.8E-5
AMS15	Horizon	59	97%	0	6.4E-6	1E-5	1.9E-5	3E-5	5.9E-5	9.3E-5	1.5E-4	2.5E-4	4.7E-5	4.9E-5



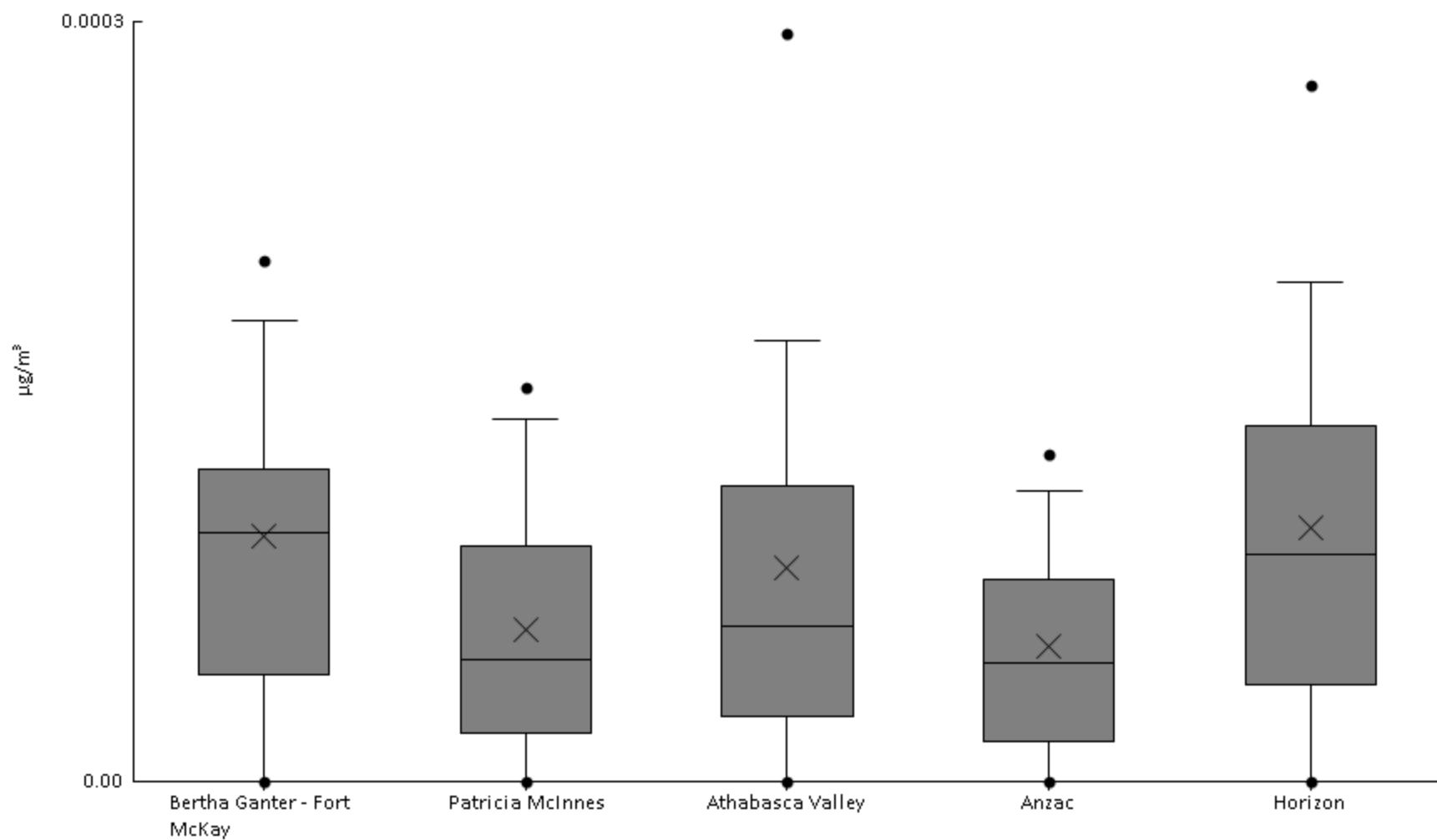
Particulate Matter (PM2.5 METALS) - Lead ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	84%	0	0	0	5.6E-5	1.2E-4	2.4E-4	5.6E-4	7E-4	1.8E-3	2.1E-4	2.9E-4
AMS06	Patricia McInnes	61	90%	0	0	1.2E-5	5.2E-5	1.3E-4	2.4E-4	4.4E-4	7E-4	8.2E-4	1.9E-4	1.9E-4
AMS07	Athabasca Valley	61	89%	0	0	1.5E-5	7.9E-5	1.7E-4	3.2E-4	6.2E-4	1E-3	1.3E-3	2.6E-4	2.9E-4
AMS14	Anzac	60	87%	0	0	0	6.3E-5	1.2E-4	1.8E-4	3.8E-4	5.2E-4	7.6E-4	1.5E-4	1.6E-4
AMS15	Horizon	59	81%	0	0	0	4.2E-5	1E-4	2.5E-4	5.2E-4	7.8E-4	2.7E-3	2.2E-4	3.9E-4



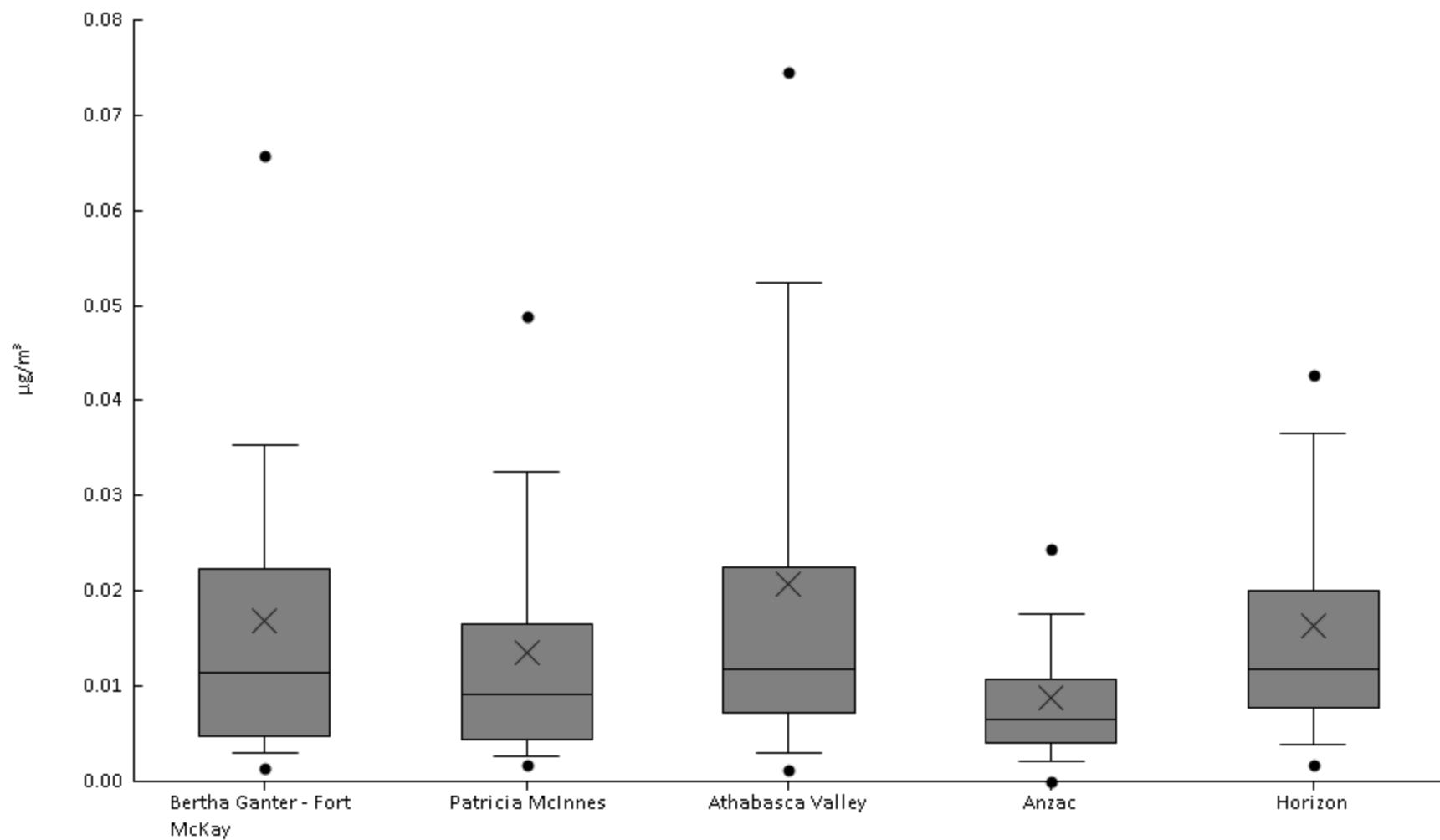
Particulate Matter (PM2.5 METALS) - Lithium ($\mu\text{g}/\text{m}^3$) - 2019

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	4.3E-5	9.8E-5	1.2E-4	1.8E-4	2.1E-4	4.8E-4	9.7E-5	7.8E-5
AMS06	Patricia McInnes	61	75%	0	0	0	1.9E-5	4.8E-5	9.3E-5	1.4E-4	1.6E-4	2.5E-4	6E-5	5.4E-5
AMS07	Athabasca Valley	61	79%	0	0	0	2.6E-5	6.1E-5	1.2E-4	1.7E-4	3E-4	3.8E-4	8.5E-5	8.8E-5
AMS14	Anzac	60	75%	0	0	0	1.6E-5	4.7E-5	8E-5	1.2E-4	1.3E-4	2.1E-4	5.3E-5	4.7E-5
AMS15	Horizon	59	83%	0	0	0	3.8E-5	9E-5	1.4E-4	2E-4	2.8E-4	4.5E-4	1E-4	8.8E-5



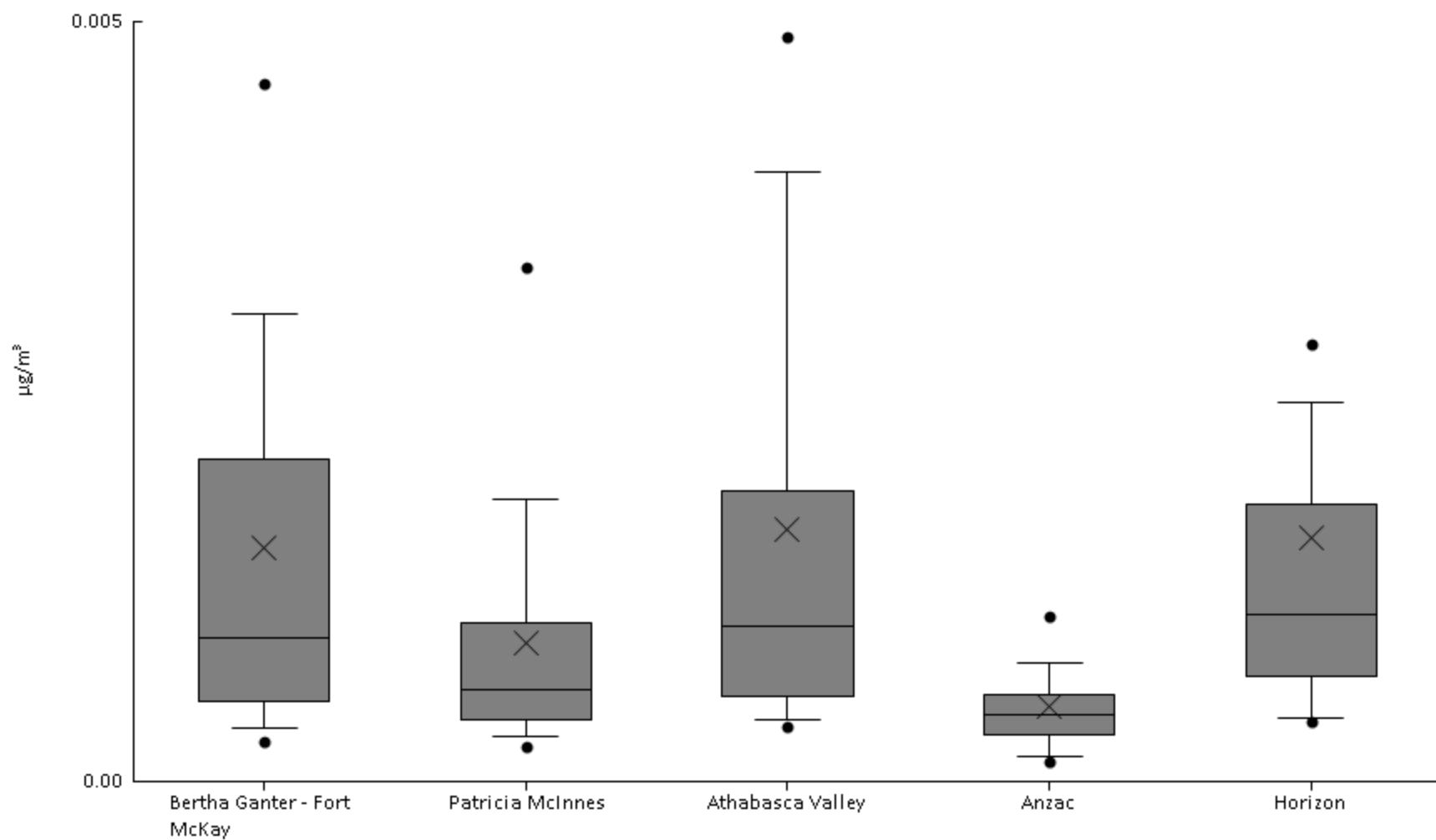
Particulate Matter (PM2.5 METALS) - Magnesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	1.4E-3	3E-3	4.8E-3	0.011	0.022	0.035	0.066	0.074	0.017	0.018
AMS06	Patricia McInnes	61	98%	0	1.8E-3	2.7E-3	4.5E-3	9.1E-3	0.017	0.032	0.049	0.073	0.013	0.015
AMS07	Athabasca Valley	61	95%	0	1.3E-3	3E-3	7.2E-3	0.012	0.022	0.052	0.075	0.11	0.021	0.024
AMS14	Anzac	60	93%	0	0	2.2E-3	4E-3	6.6E-3	0.011	0.018	0.024	0.067	8.9E-3	9.8E-3
AMS15	Horizon	59	97%	0	1.8E-3	3.8E-3	7.7E-3	0.012	0.02	0.037	0.043	0.062	0.016	0.013



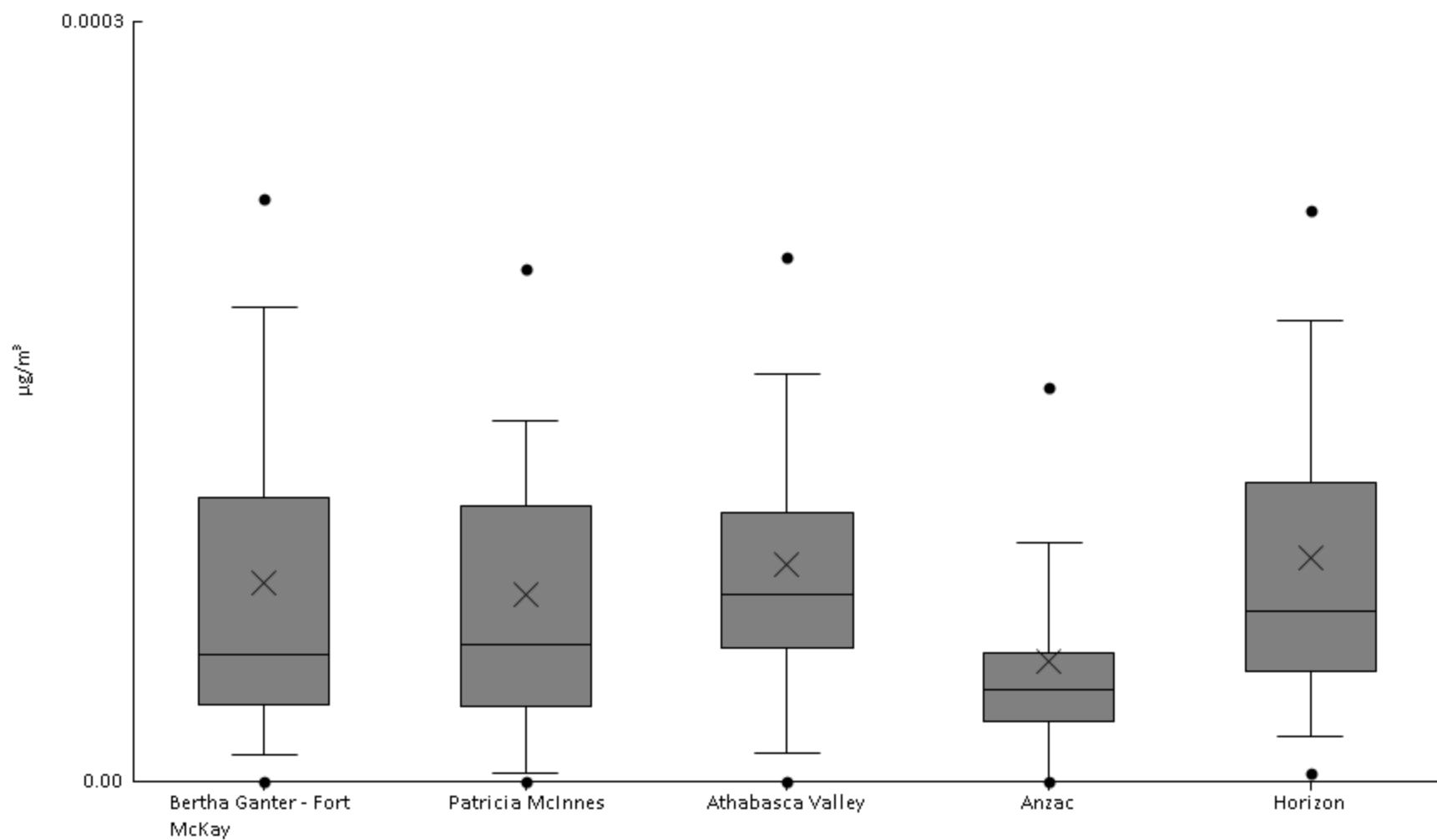
Particulate Matter (PM2.5 METALS) - Manganese ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	2E-4	2.7E-4	3.5E-4	5.3E-4	9.5E-4	2.1E-3	3.1E-3	4.6E-3	7.7E-3	1.5E-3	1.5E-3
AMS06	Patricia McInnes	61	100%	1.7E-4	2.4E-4	2.9E-4	4E-4	6E-4	1E-3	1.9E-3	3.4E-3	4.3E-3	9.1E-4	9.1E-4
AMS07	Athabasca Valley	61	100%	1.8E-4	3.6E-4	4.1E-4	5.6E-4	1E-3	1.9E-3	4E-3	4.9E-3	0.011	1.7E-3	1.9E-3
AMS14	Anzac	60	98%	0	1.3E-4	1.7E-4	3.1E-4	4.4E-4	5.7E-4	7.8E-4	1.1E-3	2.5E-3	4.9E-4	3.6E-4
AMS15	Horizon	59	100%	2.9E-4	3.9E-4	4.2E-4	6.9E-4	1.1E-3	1.8E-3	2.5E-3	2.9E-3	0.018	1.6E-3	2.3E-3



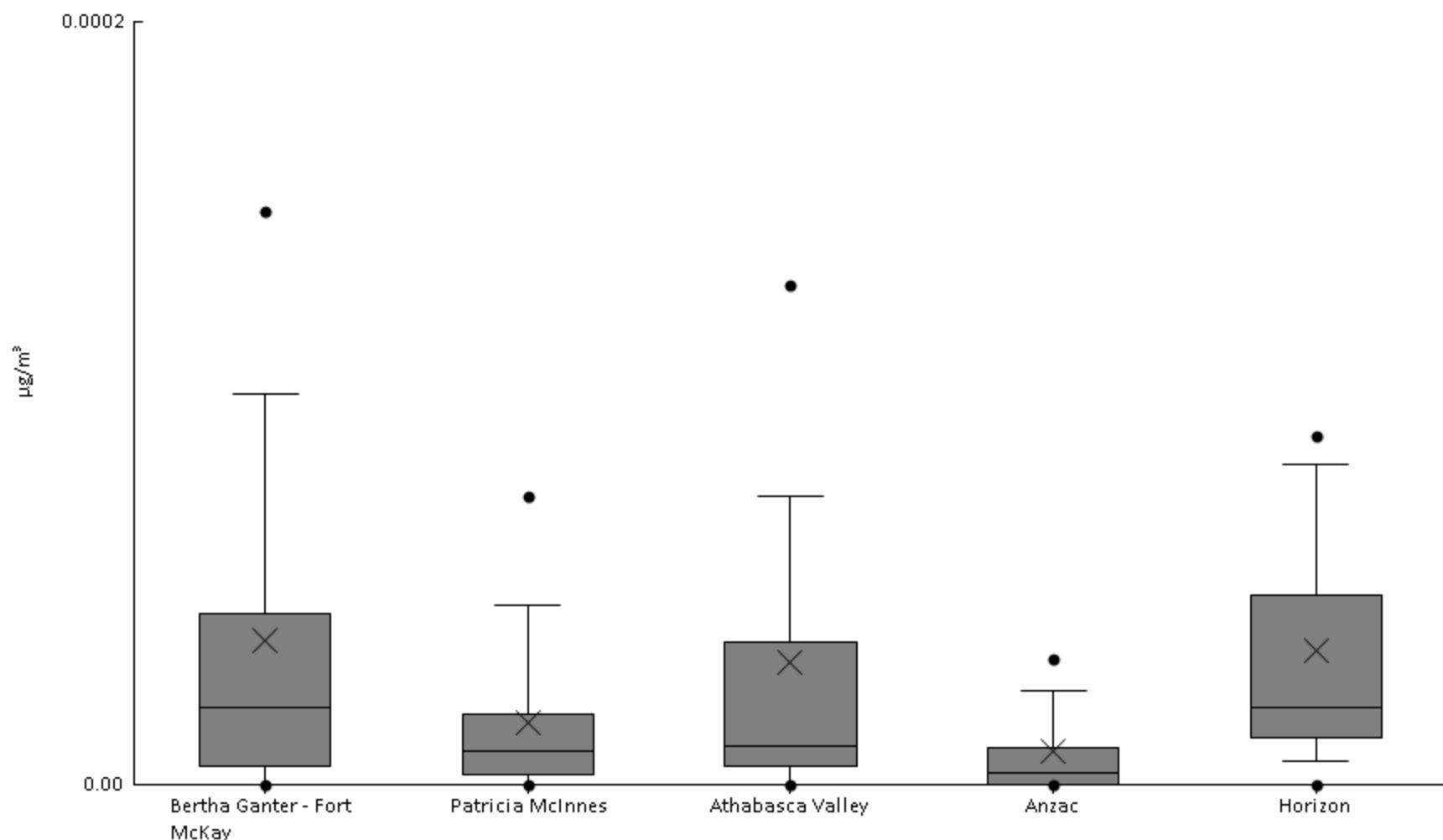
Particulate Matter (PM2.5 METALS) - Molybdenum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	79%	0	0	1E-5	3E-5	5E-5	1.1E-4	1.9E-4	2.3E-4	3.2E-4	7.9E-5	7.4E-5
AMS06	Patricia McInnes	61	77%	0	0	3E-6	3E-5	5.4E-5	1.1E-4	1.4E-4	2E-4	4E-4	7.4E-5	7.4E-5
AMS07	Athabasca Valley	61	84%	0	0	1.1E-5	5.3E-5	7.4E-5	1.1E-4	1.6E-4	2.1E-4	3.7E-4	8.5E-5	6.8E-5
AMS14	Anzac	60	75%	0	0	0	2.4E-5	3.6E-5	5.1E-5	9.4E-5	1.6E-4	2.6E-4	4.7E-5	5E-5
AMS15	Horizon	59	86%	0	3.6E-6	1.8E-5	4.4E-5	6.7E-5	1.2E-4	1.8E-4	2.3E-4	5.3E-4	8.8E-5	8.2E-5



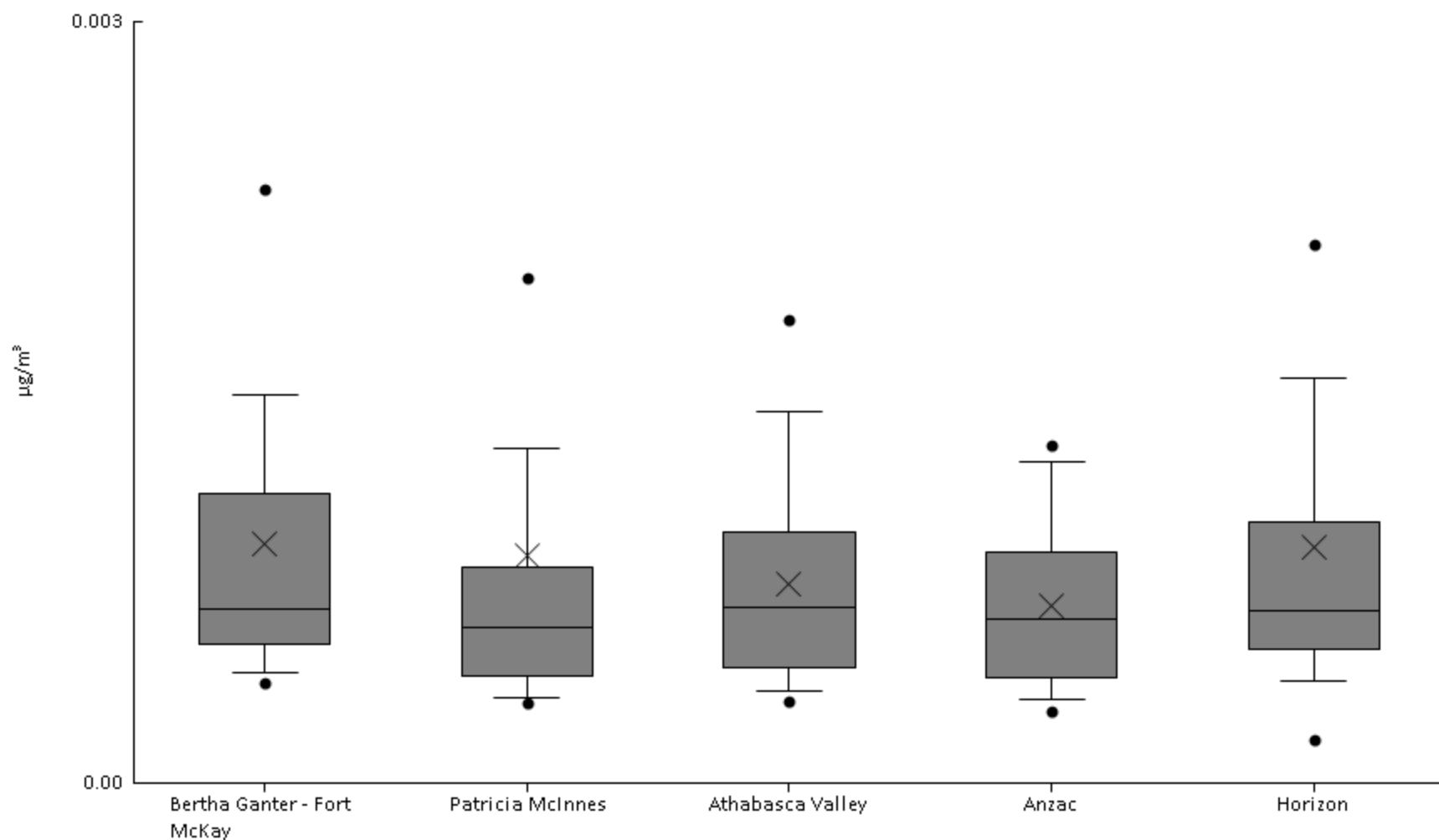
Particulate Matter (PM2.5 METALS) - Neodymium ($\mu\text{g}/\text{m}^3$) - 2019

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	5E-6	2E-5	4.5E-5	1E-4	1.5E-4	2.6E-4	3.8E-5	5.1E-5
AMS06	Patricia McInnes	61	61%	0	0	0	2.8E-6	9E-6	1.9E-5	4.7E-5	7.5E-5	9.2E-5	1.6E-5	2.2E-5
AMS07	Athabasca Valley	61	72%	0	0	0	4.8E-6	1E-5	3.7E-5	7.6E-5	1.3E-4	3.3E-4	3.2E-5	5.7E-5
AMS14	Anzac	60	45%	0	0	0	0	3E-6	9.5E-6	2.5E-5	3.3E-5	8E-5	8.6E-6	1.4E-5
AMS15	Horizon	59	92%	0	0	6E-6	1.2E-5	2E-5	5E-5	8.4E-5	9.2E-5	1.4E-4	3.5E-5	3.2E-5



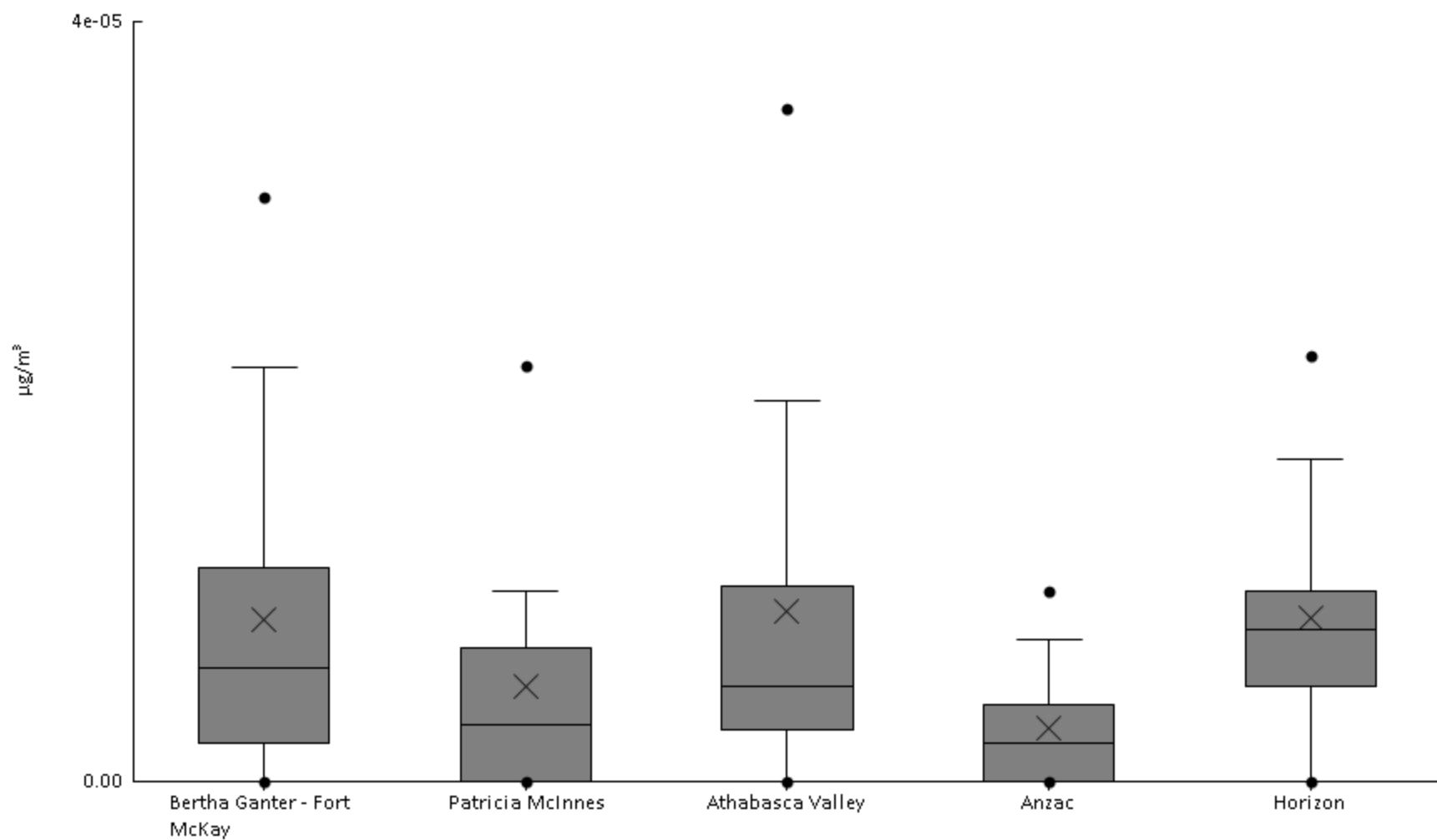
Particulate Matter (PM2.5 METALS) - Nickel ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	4E-4	4.3E-4	5.4E-4	6.9E-4	1.1E-3	1.5E-3	2.3E-3	3.8E-3	9.4E-4	6.6E-4
AMS06	Patricia McInnes	61	97%	0	3.2E-4	3.4E-4	4.2E-4	6.1E-4	8.5E-4	1.3E-3	2E-3	0.011	9E-4	1.4E-3
AMS07	Athabasca Valley	61	97%	0	3.2E-4	3.7E-4	4.6E-4	6.9E-4	9.9E-4	1.5E-3	1.8E-3	1.8E-3	7.8E-4	4.5E-4
AMS14	Anzac	60	97%	0	2.9E-4	3.3E-4	4.1E-4	6.5E-4	9.1E-4	1.3E-3	1.3E-3	1.5E-3	7E-4	3.6E-4
AMS15	Horizon	59	95%	0	1.7E-4	4E-4	5.3E-4	6.8E-4	1E-3	1.6E-3	2.1E-3	7E-3	9.3E-4	9.5E-4



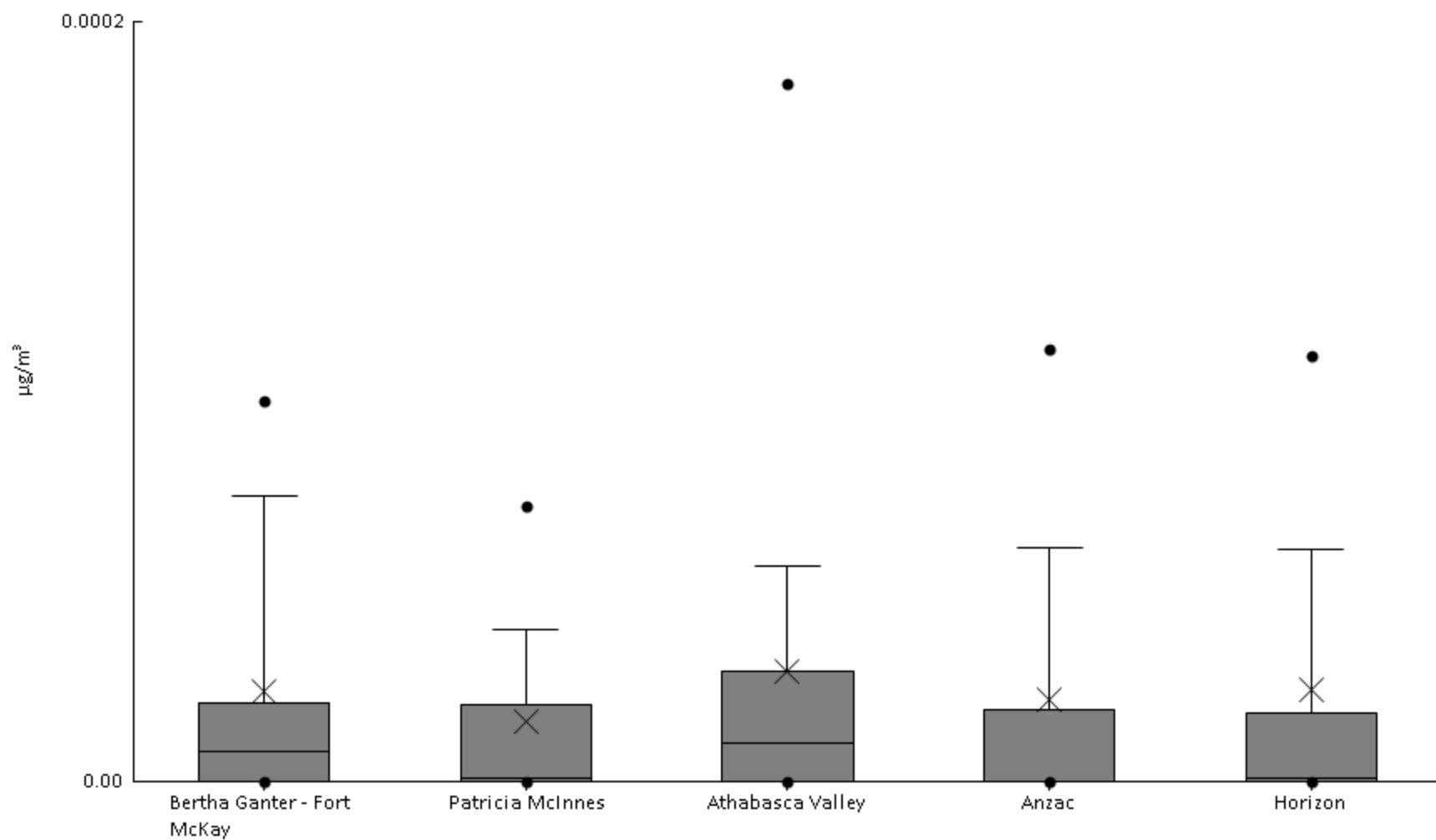
Particulate Matter (PM2.5 METALS) - Niobium ($\mu\text{g}/\text{m}^3$) - 2019

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	2E-6	6E-6	1.1E-5	2.2E-5	3.1E-5	3.5E-5	8.5E-6	9E-6
AMS06	Patricia McInnes	61	30%	0	0	0	0	3E-6	7E-6	1E-5	2.2E-5	3.1E-5	5E-6	6.8E-6
AMS07	Athabasca Valley	61	36%	0	0	0	2.8E-6	5E-6	1E-5	2E-5	3.5E-5	7.5E-5	9E-6	1.3E-5
AMS14	Anzac	60	12%	0	0	0	0	2E-6	4E-6	7.5E-6	1E-5	1E-5	2.8E-6	3E-6
AMS15	Horizon	59	68%	0	0	0	5E-6	8E-6	1E-5	1.7E-5	2.2E-5	3.5E-5	8.6E-6	7E-6



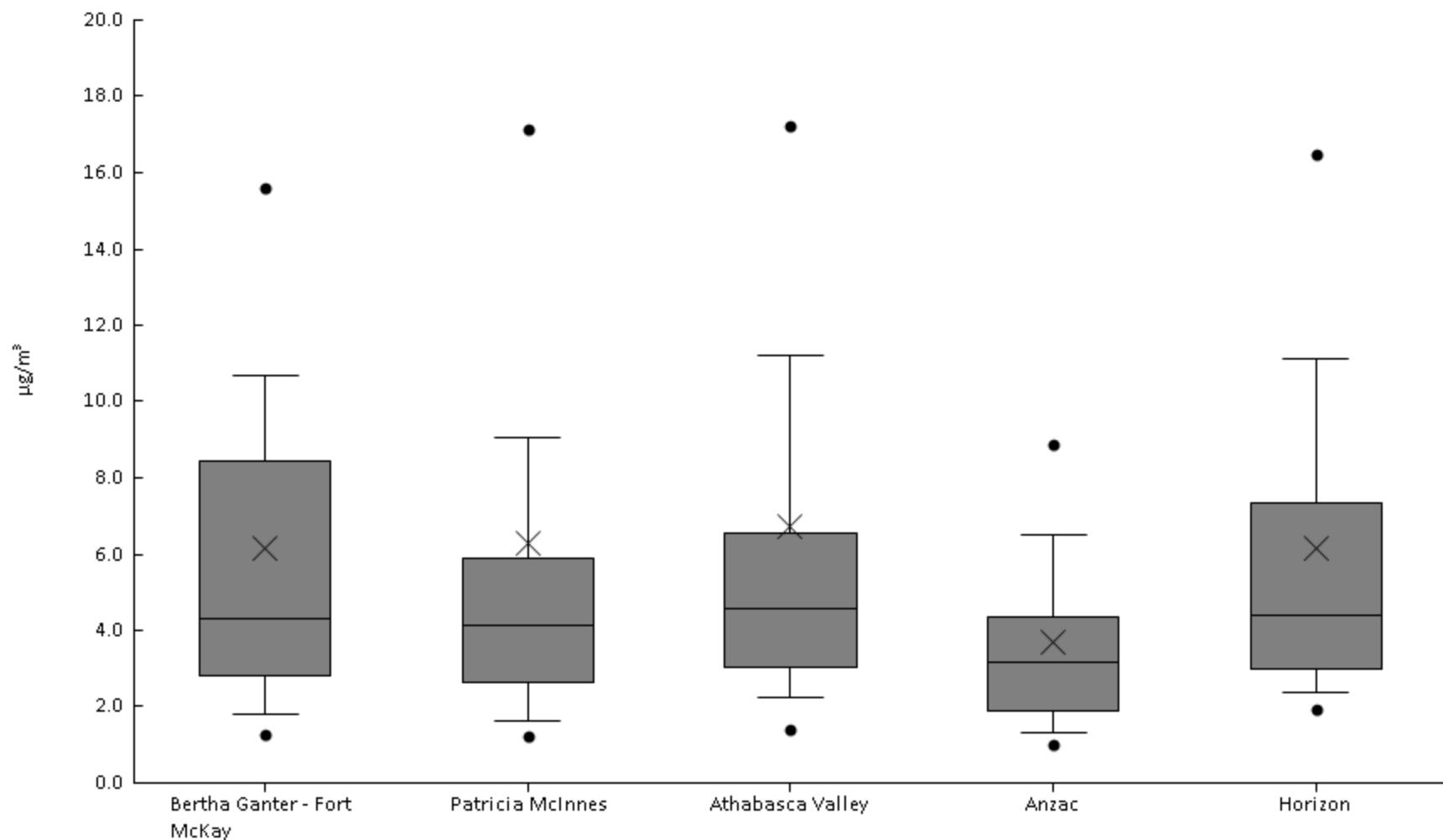
Particulate Matter (PM2.5 METALS) - Palladium ($\mu\text{g}/\text{m}^3$) - 2019

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	8E-6	2.1E-5	7.5E-5	1E-4	3.3E-4	2.4E-5	5E-5
AMS06	Patricia McInnes	61	5%	0	0	0	0	1E-6	2E-5	4E-5	7.3E-5	1.7E-4	1.6E-5	3E-5
AMS07	Athabasca Valley	61	11%	0	0	0	0	1E-5	2.9E-5	5.7E-5	1.8E-4	2.9E-4	2.9E-5	6.1E-5
AMS14	Anzac	60	13%	0	0	0	0	0	1.9E-5	6.2E-5	1.1E-4	3.2E-4	2.2E-5	5.2E-5
AMS15	Horizon	59	14%	0	0	0	0	1E-6	1.8E-5	6.1E-5	1.1E-4	3.1E-4	2.4E-5	5.8E-5



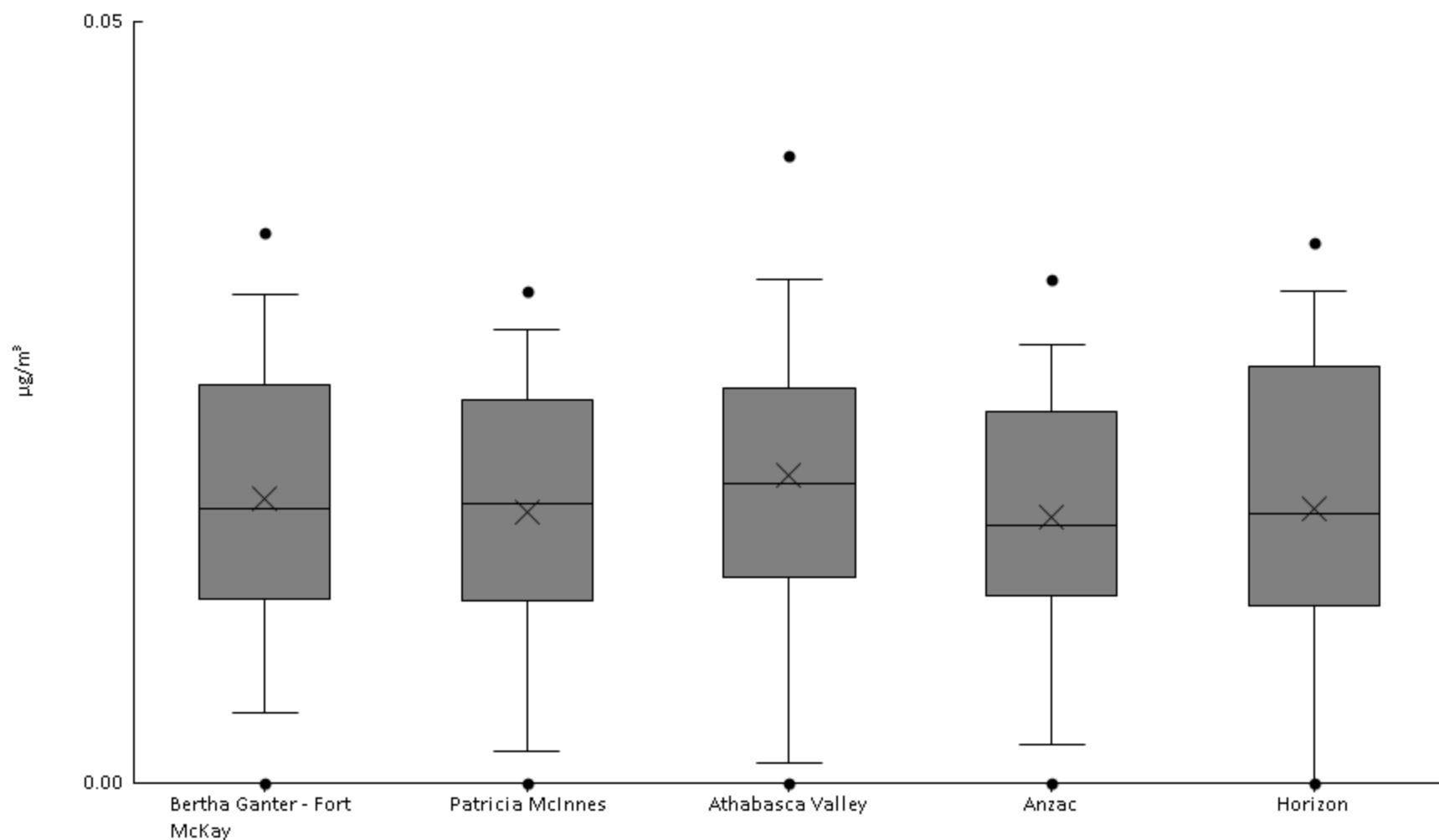
Particulate Matter (PM2.5 METALS) - Particulate Matter ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.54	1.3	1.8	2.8	4.3	8.4	11	16	42	6.2	6.2
AMS06	Patricia McInnes	61	100%	0.88	1.2	1.6	2.6	4.1	5.9	9.1	17	75	6.3	10
AMS07	Athabasca Valley	61	100%	1.1	1.4	2.2	3	4.6	6.6	11	17	69	6.7	9.3
AMS14	Anzac	60	100%	0.71	1	1.3	1.9	3.2	4.3	6.5	8.9	18	3.7	2.9
AMS15	Horizon	59	100%	1.2	1.9	2.4	3	4.4	7.3	11	17	33	6.2	5.3



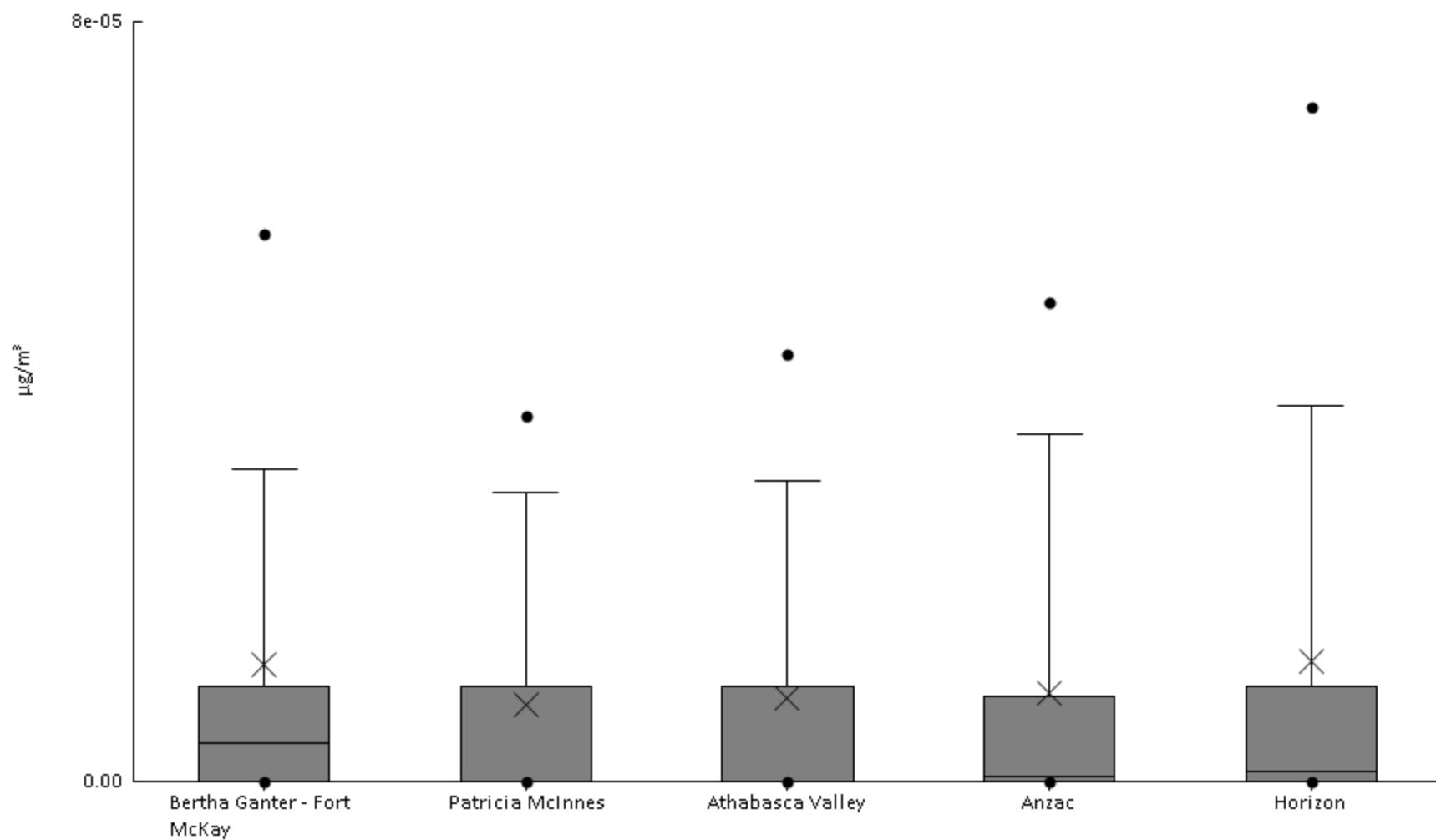
Particulate Matter (PM2.5 METALS) - Phosphorus ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	90%	0	0	4.6E-3	0.012	0.018	0.026	0.032	0.036	0.04	0.019	0.01
AMS06	Patricia McInnes	61	89%	0	0	2E-3	0.012	0.018	0.025	0.03	0.032	0.041	0.018	9.6E-3
AMS07	Athabasca Valley	61	89%	0	0	1.3E-3	0.014	0.02	0.026	0.033	0.041	0.07	0.02	0.013
AMS14	Anzac	60	88%	0	0	2.5E-3	0.012	0.017	0.024	0.029	0.033	0.042	0.017	9.6E-3
AMS15	Horizon	59	88%	0	0	0	0.012	0.018	0.027	0.032	0.035	0.038	0.018	0.01



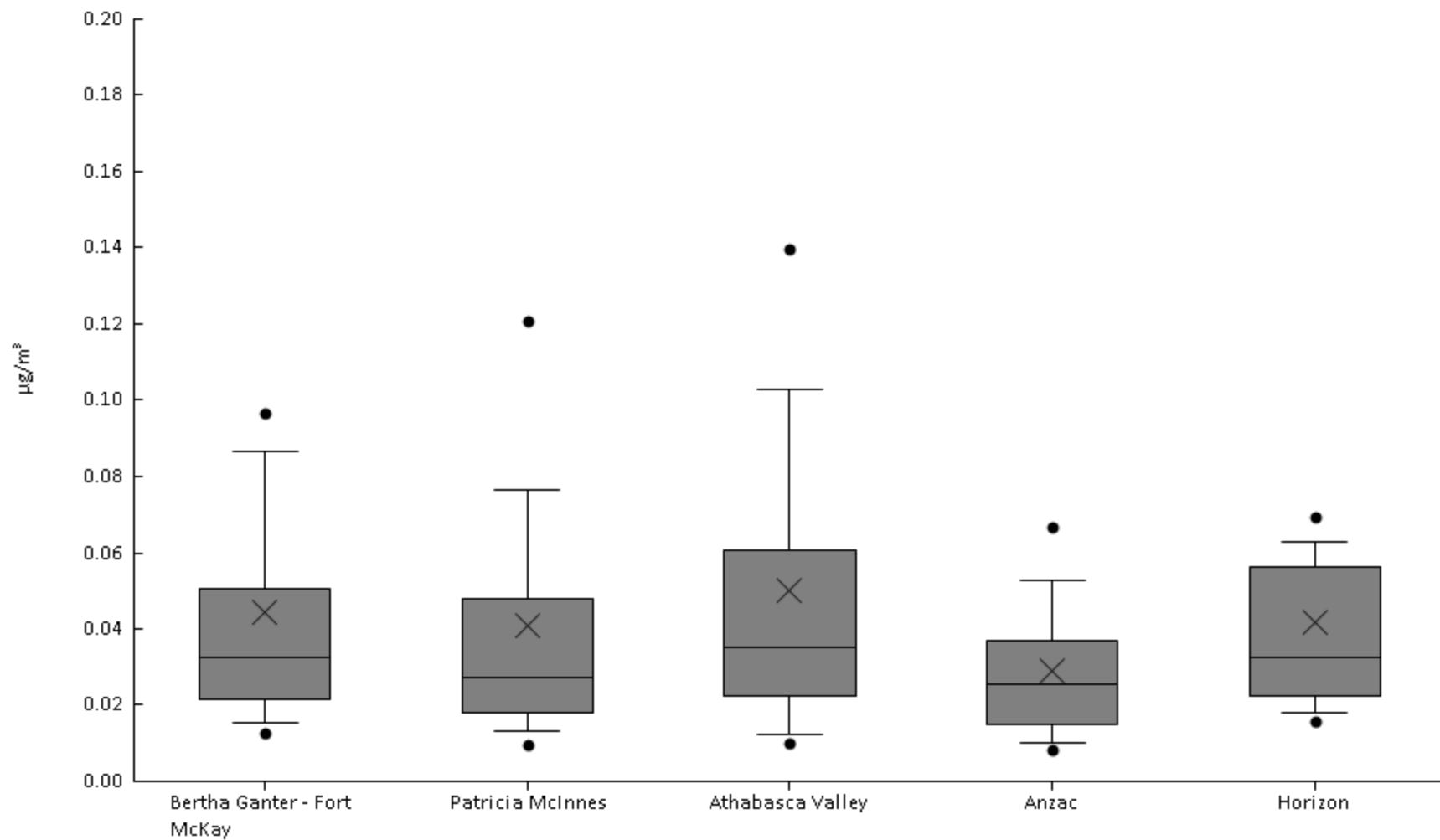
Particulate Matter (PM2.5 METALS) - Platinum ($\mu\text{g}/\text{m}^3$) - 2019

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	4E-6	1E-5	3.3E-5	5.8E-5	1.3E-4	1.2E-5	2.5E-5
AMS06	Patricia McInnes	61	43%	0	0	0	0	0	1E-5	3E-5	3.8E-5	1.1E-4	8.1E-6	1.7E-5
AMS07	Athabasca Valley	61	46%	0	0	0	0	0	1E-5	3.2E-5	4.5E-5	8E-5	8.7E-6	1.6E-5
AMS14	Anzac	60	42%	0	0	0	0	5E-7	9E-6	3.7E-5	5.1E-5	8.3E-5	9.3E-6	1.7E-5
AMS15	Horizon	59	47%	0	0	0	0	1E-6	1E-5	4E-5	7.1E-5	1E-4	1.3E-5	2.4E-5



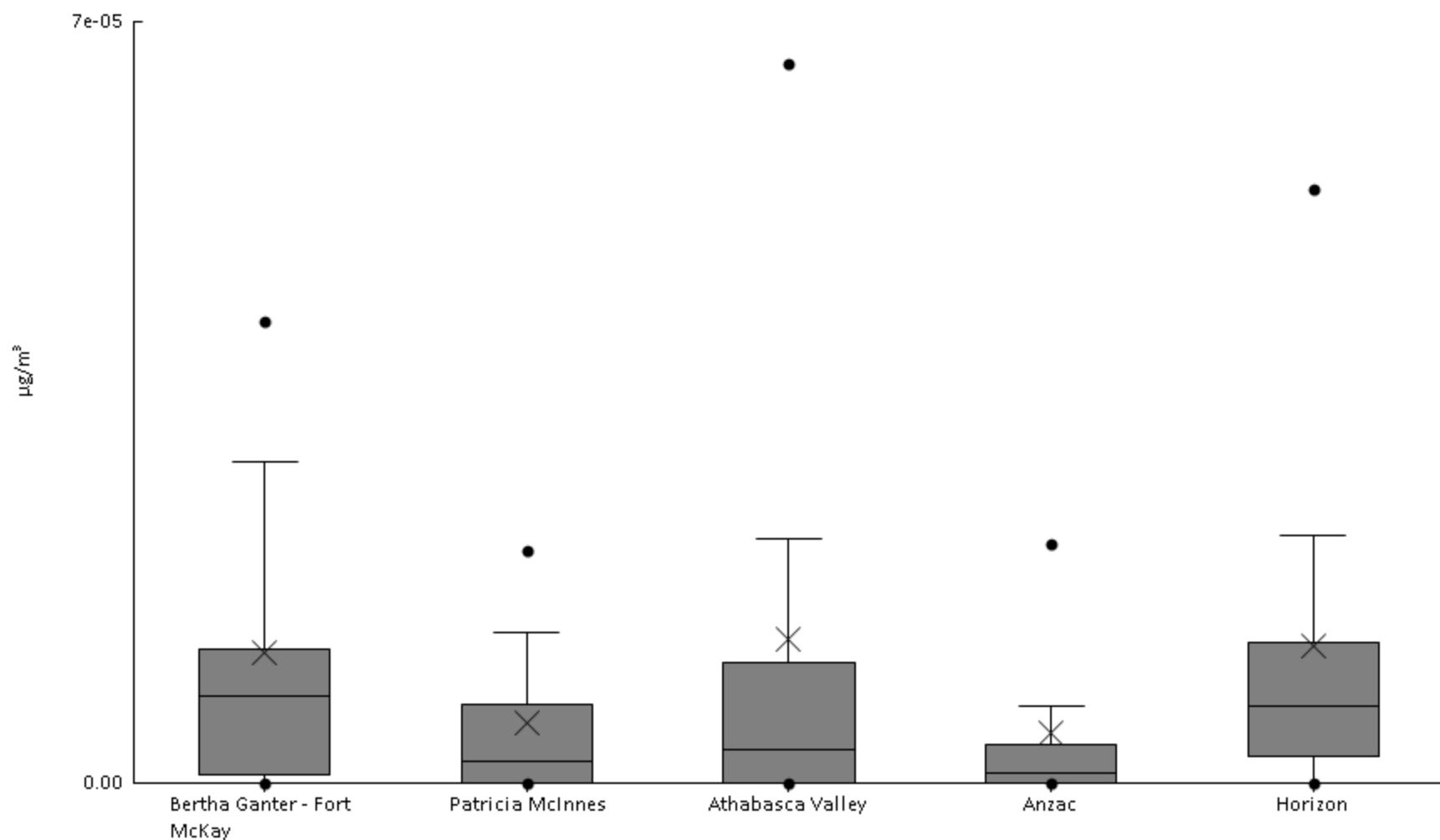
Particulate Matter (PM2.5 METALS) - Potassium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	2.9E-3	0.013	0.016	0.021	0.032	0.051	0.086	0.097	0.3	0.044	0.041
AMS06	Patricia McInnes	61	100%	6.9E-3	9.6E-3	0.013	0.018	0.027	0.048	0.077	0.12	0.31	0.041	0.047
AMS07	Athabasca Valley	61	100%	7.7E-3	0.01	0.012	0.022	0.035	0.061	0.1	0.14	0.27	0.05	0.045
AMS14	Anzac	60	100%	4.2E-3	8.4E-3	0.01	0.015	0.026	0.037	0.053	0.067	0.072	0.029	0.017
AMS15	Horizon	59	100%	0.013	0.016	0.018	0.022	0.033	0.056	0.063	0.069	0.26	0.042	0.035



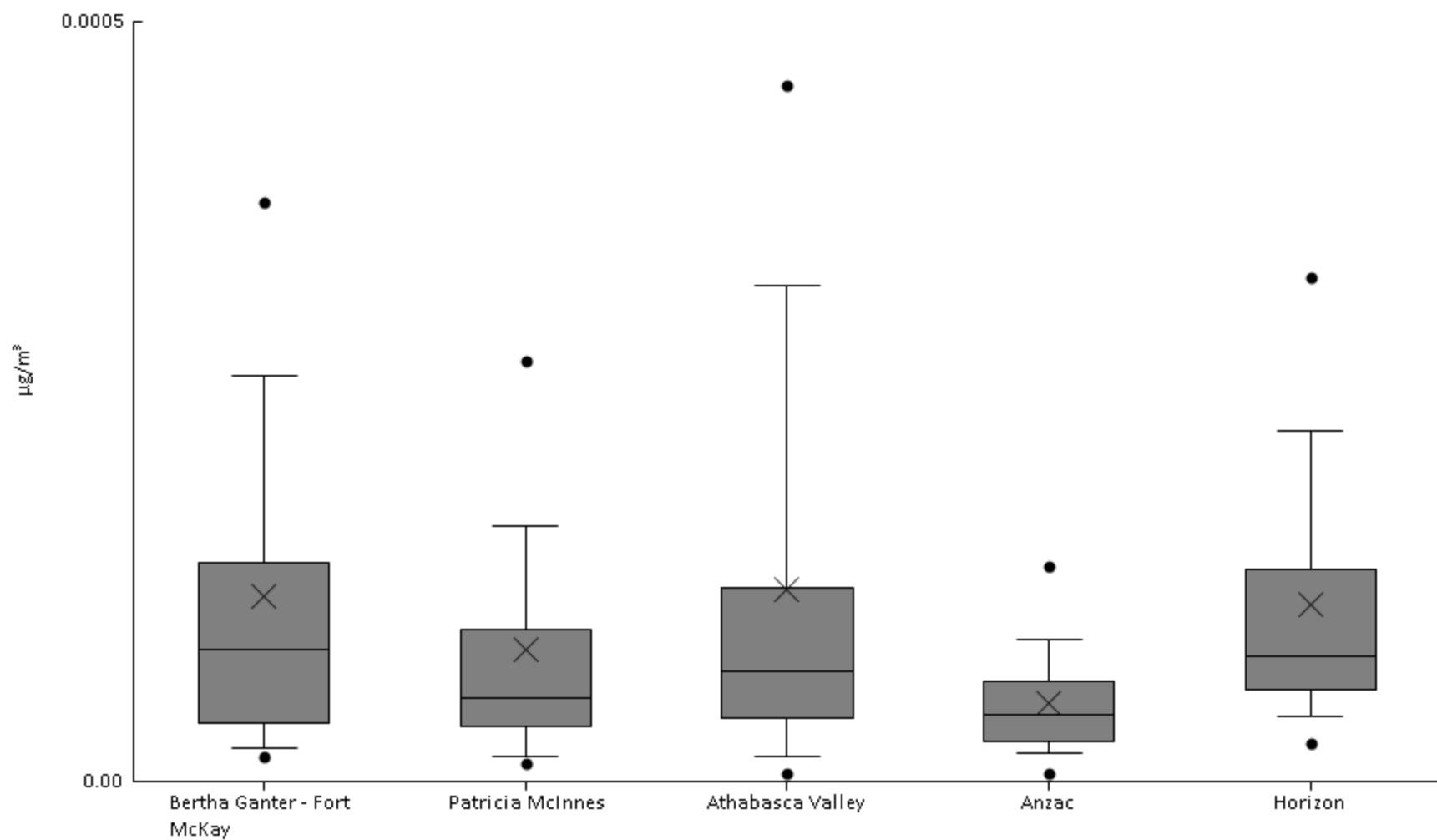
Particulate Matter (PM2.5 METALS) - Praseodymium ($\mu\text{g}/\text{m}^3$) - 2019

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	7.5E-7	8E-6	1.2E-5	3E-5	4.2E-5	1E-4	1.2E-5	1.9E-5
AMS06	Patricia McInnes	61	56%	0	0	0	0	2E-6	7.3E-6	1.4E-5	2.1E-5	5.9E-5	5.5E-6	9.5E-6
AMS07	Athabasca Valley	61	61%	0	0	0	0	3E-6	1.1E-5	2.2E-5	6.6E-5	2.2E-4	1.3E-5	3.4E-5
AMS14	Anzac	60	37%	0	0	0	0	1E-6	3.5E-6	7E-6	2.2E-5	8.6E-5	4.6E-6	1.3E-5
AMS15	Horizon	59	85%	0	0	0	2.5E-6	7E-6	1.3E-5	2.3E-5	5.5E-5	9.4E-5	1.3E-5	1.8E-5



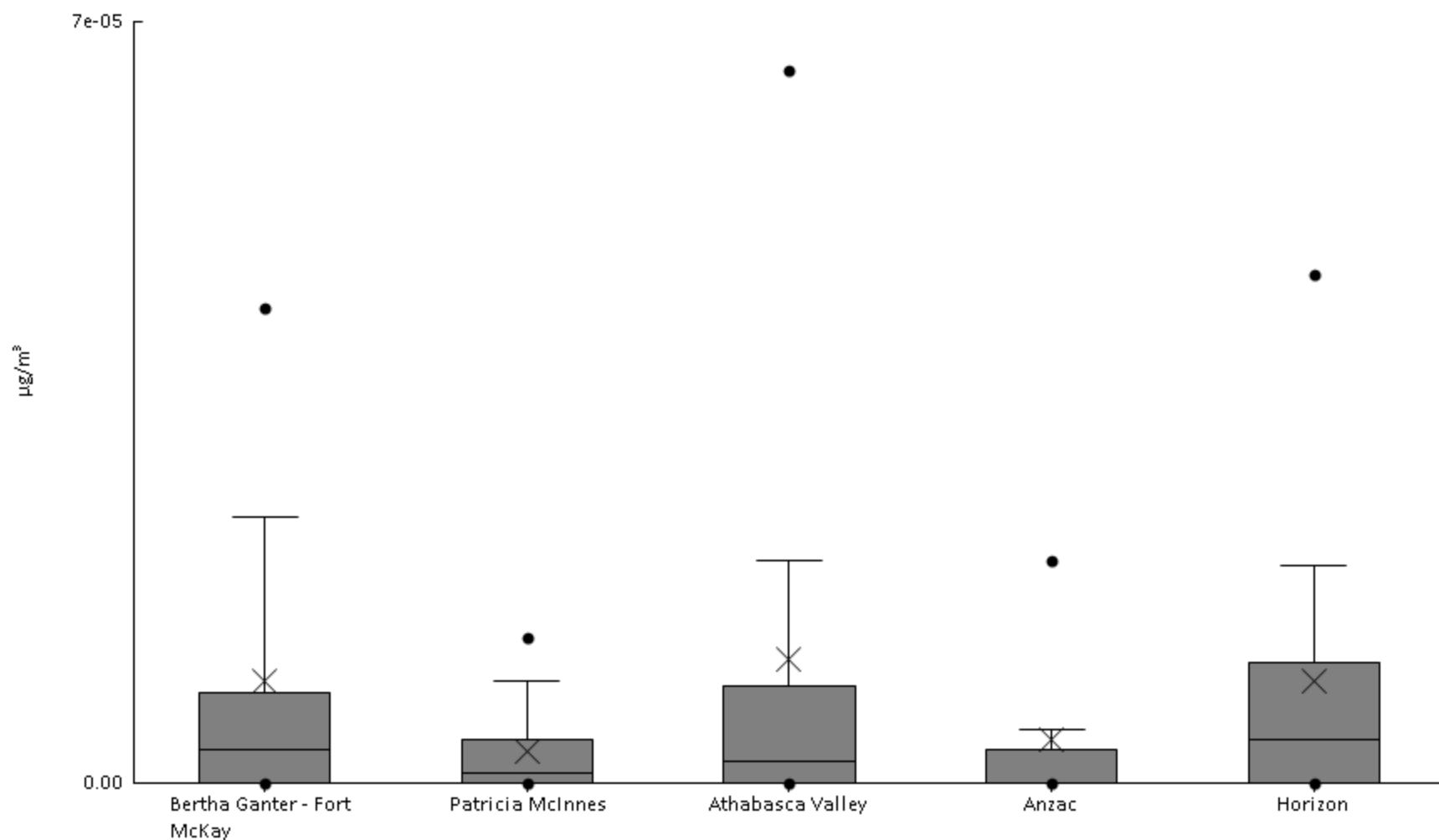
Particulate Matter (PM2.5 METALS) - Rubidium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4E-6	1.6E-5	2.2E-5	3.8E-5	8.7E-5	1.4E-4	2.7E-4	3.8E-4	7.1E-4	1.2E-4	1.3E-4
AMS06	Patricia McInnes	61	98%	0	1.2E-5	1.6E-5	3.6E-5	5.5E-5	1E-4	1.7E-4	2.8E-4	6.6E-4	8.7E-5	1.1E-4
AMS07	Athabasca Valley	61	97%	1E-6	6E-6	1.6E-5	4.2E-5	7.3E-5	1.3E-4	3.3E-4	4.6E-4	6.8E-4	1.3E-4	1.4E-4
AMS14	Anzac	60	98%	2E-6	5.5E-6	1.9E-5	2.6E-5	4.5E-5	6.6E-5	9.3E-5	1.4E-4	2E-4	5.1E-5	3.9E-5
AMS15	Horizon	59	97%	0	2.5E-5	4.3E-5	6E-5	8.2E-5	1.4E-4	2.3E-4	3.3E-4	5.3E-4	1.2E-4	9.6E-5



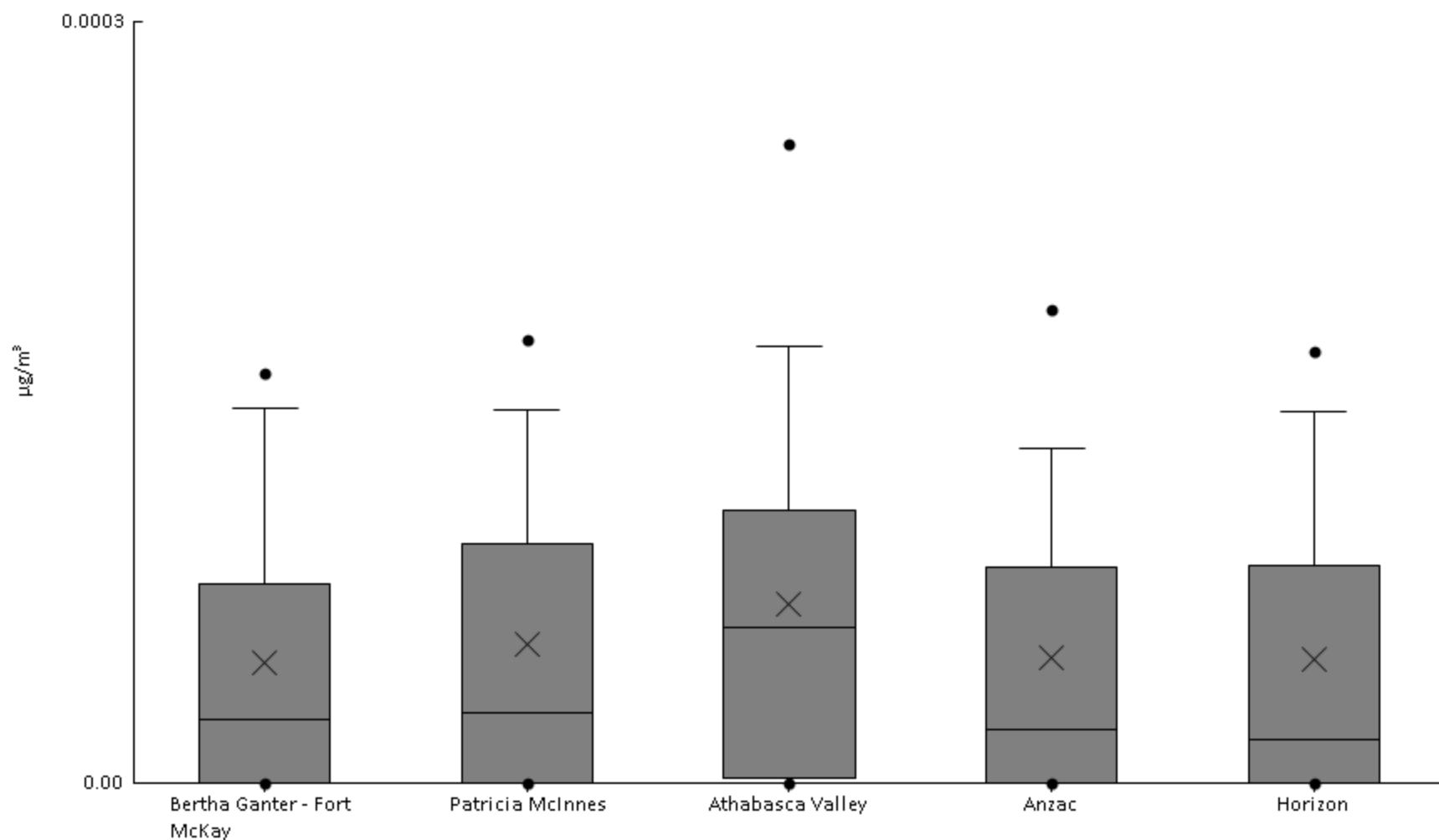
Particulate Matter (PM2.5 METALS) - Samarium ($\mu\text{g}/\text{m}^3$) - 2019

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	3E-6	8.3E-6	2.4E-5	4.4E-5	1.1E-4	9.4E-6	1.9E-5
AMS06	Patricia McInnes	61	16%	0	0	0	0	1E-6	4E-6	9.4E-6	1.3E-5	3.4E-5	3E-6	5.6E-6
AMS07	Athabasca Valley	61	33%	0	0	0	0	2E-6	9E-6	2E-5	6.6E-5	2.4E-4	1.1E-5	3.4E-5
AMS14	Anzac	60	8%	0	0	0	0	0	3E-6	5E-6	2.1E-5	8.2E-5	4E-6	1.2E-5
AMS15	Horizon	59	41%	0	0	0	0	4E-6	1.1E-5	2E-5	4.7E-5	7.9E-5	9.5E-6	1.6E-5



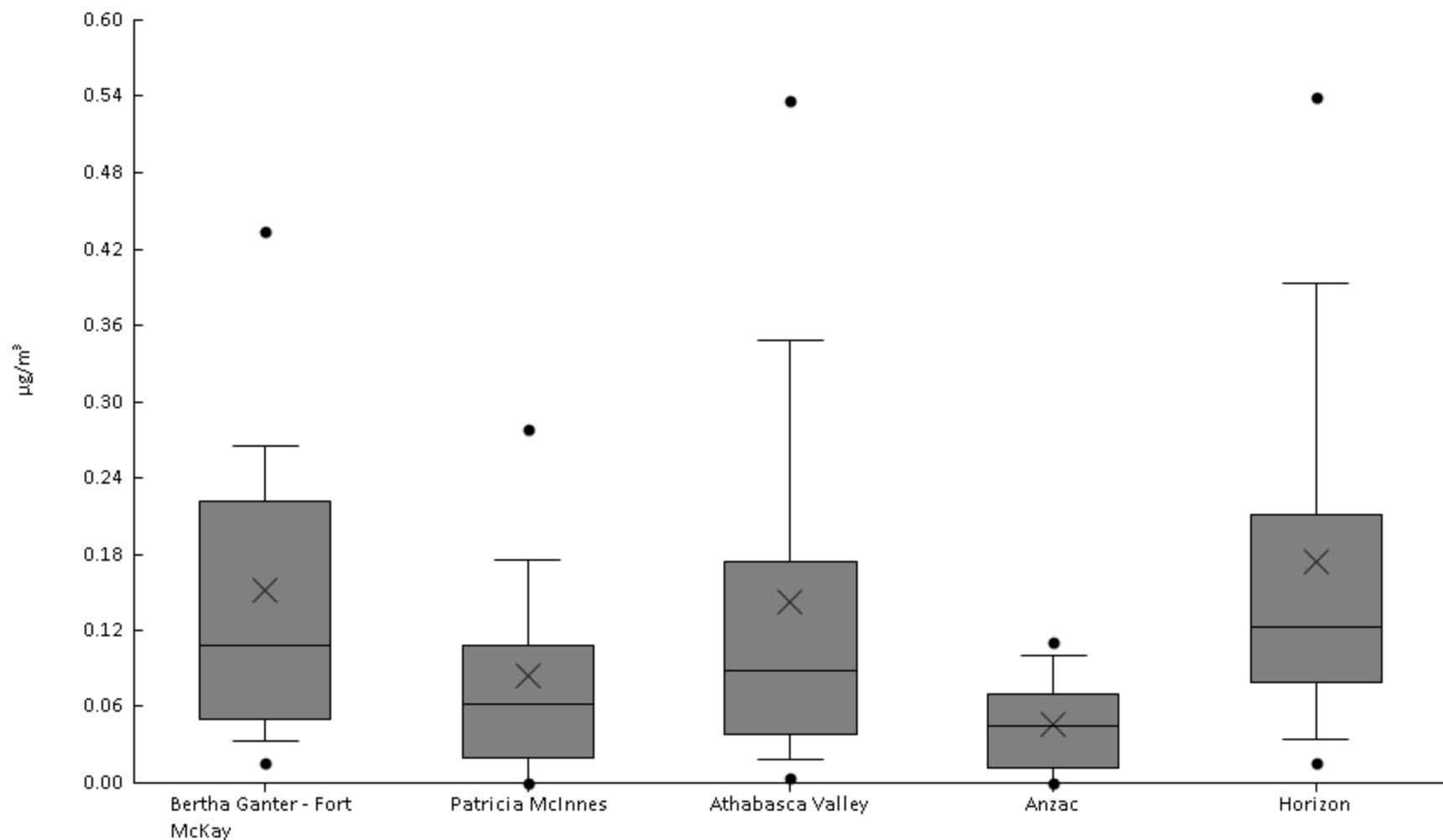
Particulate Matter (PM2.5 METALS) - Selenium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	13%	0	0	0	0	2.5E-5	7.9E-5	1.5E-4	1.6E-4	1.9E-4	4.8E-5	5.5E-5
AMS06	Patricia McInnes	61	11%	0	0	0	0	2.8E-5	9.5E-5	1.5E-4	1.7E-4	2.9E-4	5.5E-5	6.6E-5
AMS07	Athabasca Valley	61	15%	0	0	0	1.8E-6	6.1E-5	1.1E-4	1.7E-4	2.5E-4	3E-4	7.1E-5	7.4E-5
AMS14	Anzac	60	10%	0	0	0	0	2.1E-5	8.5E-5	1.3E-4	1.9E-4	2.5E-4	5E-5	6.4E-5
AMS15	Horizon	59	12%	0	0	0	0	1.7E-5	8.6E-5	1.5E-4	1.7E-4	2.4E-4	4.9E-5	6.1E-5



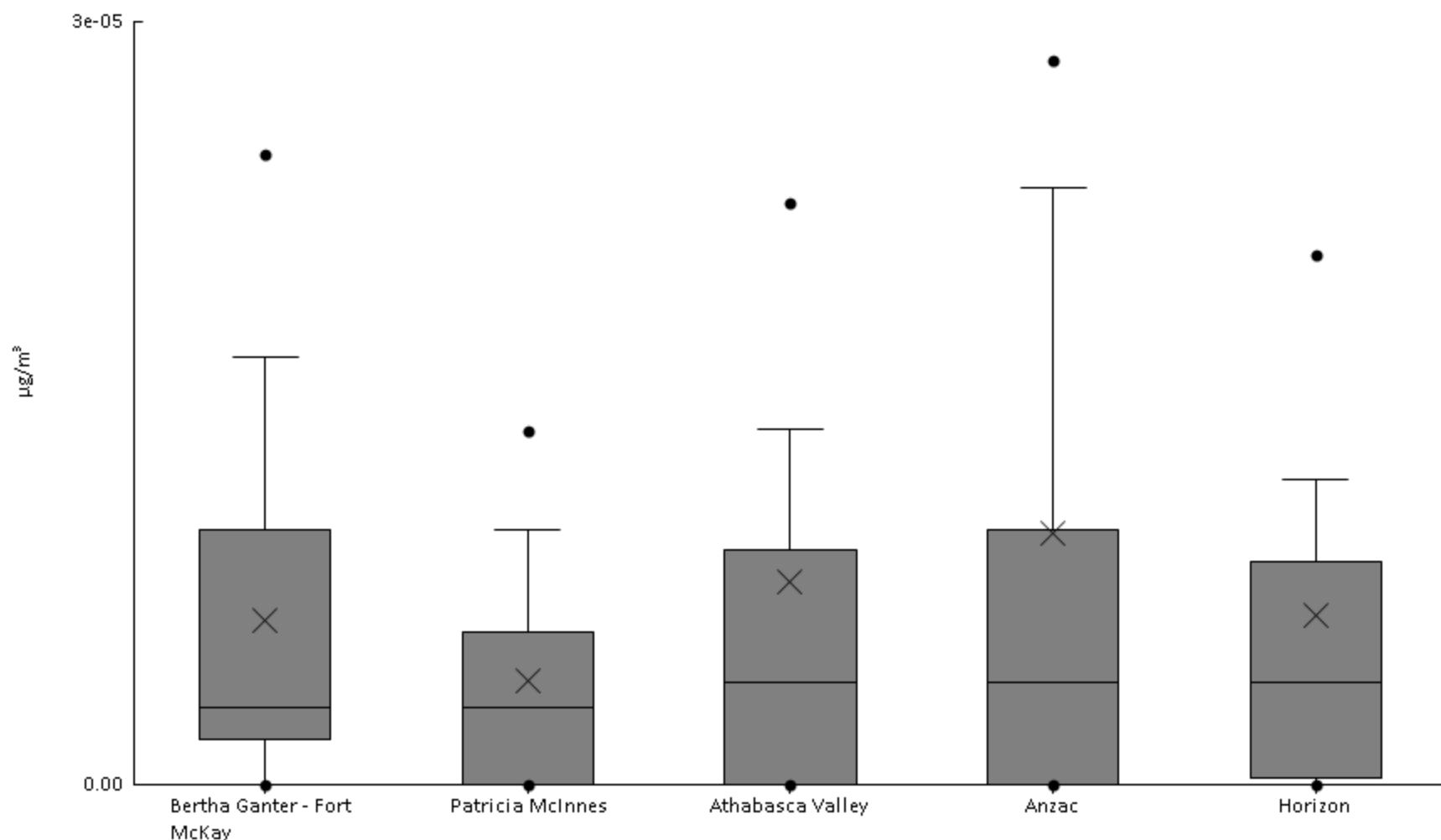
Particulate Matter (PM_{2.5} METALS) - Silicon ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	0.016	0.033	0.051	0.11	0.22	0.26	0.43	0.76	0.15	0.14
AMS06	Patricia McInnes	61	80%	0	0	0	0.02	0.062	0.11	0.18	0.28	0.63	0.084	0.1
AMS07	Athabasca Valley	61	93%	0	3.6E-3	0.018	0.038	0.088	0.17	0.35	0.54	1	0.14	0.18
AMS14	Anzac	60	78%	0	0	0	0.012	0.044	0.07	0.1	0.11	0.13	0.046	0.037
AMS15	Horizon	59	97%	0	0.016	0.034	0.079	0.12	0.21	0.39	0.54	0.69	0.17	0.15



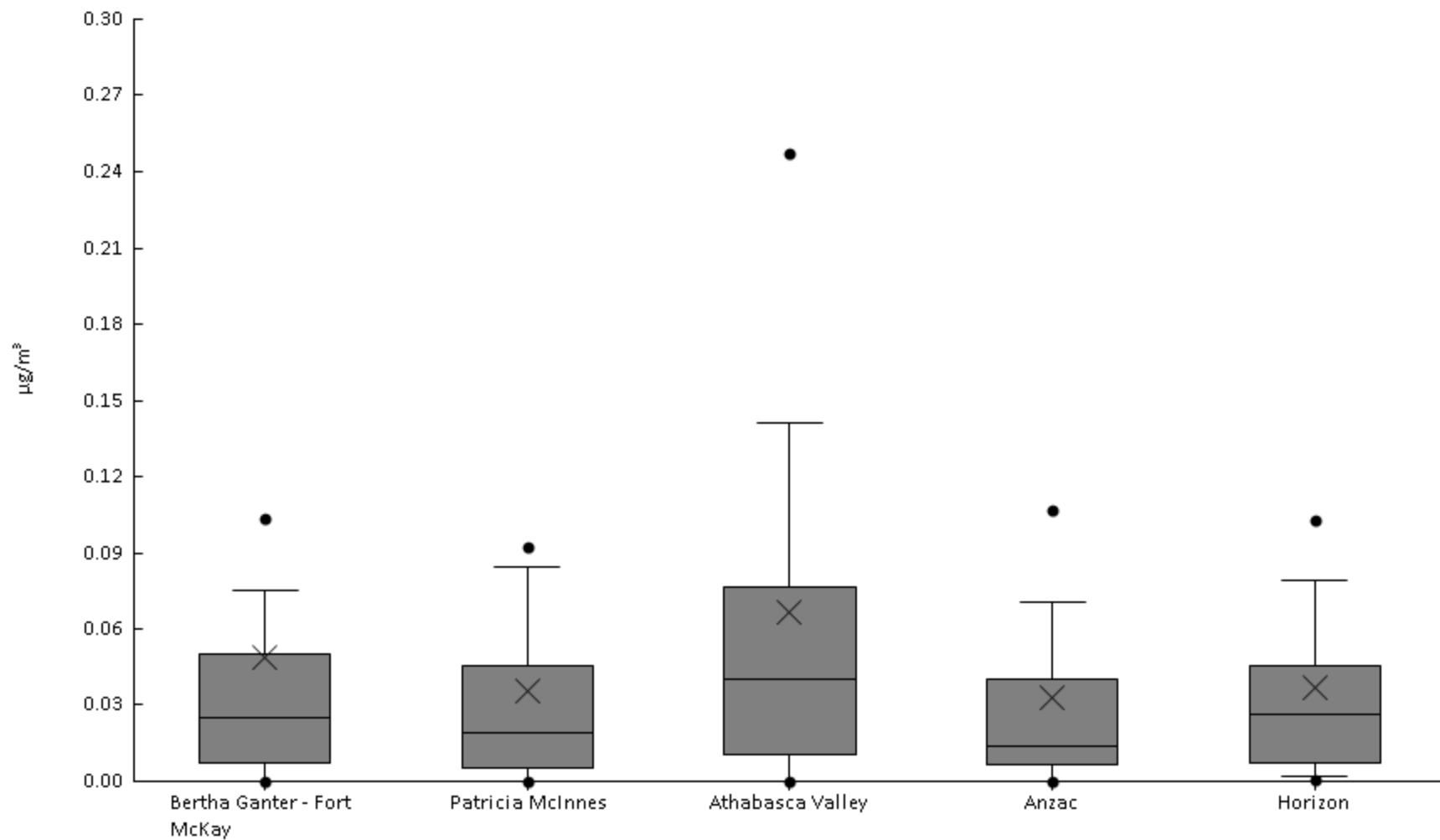
Particulate Matter (PM2.5 METALS) - Silver ($\mu\text{g}/\text{m}^3$) - 2019

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	1.8E-6	3E-6	1E-5	1.7E-5	2.5E-5	4E-5	6.4E-6	8.1E-6
AMS06	Patricia McInnes	61	30%	0	0	0	0	3E-6	6E-6	1E-5	1.4E-5	1.8E-5	4.1E-6	4.3E-6
AMS07	Athabasca Valley	61	41%	0	0	0	0	4E-6	9.3E-6	1.4E-5	2.3E-5	1.2E-4	8E-6	1.7E-5
AMS14	Anzac	60	33%	0	0	0	0	4E-6	1E-5	2.4E-5	2.9E-5	1.3E-4	9.9E-6	2.2E-5
AMS15	Horizon	59	32%	0	0	0	2.5E-7	4E-6	8.8E-6	1.2E-5	2.1E-5	6.9E-5	6.7E-6	1E-5



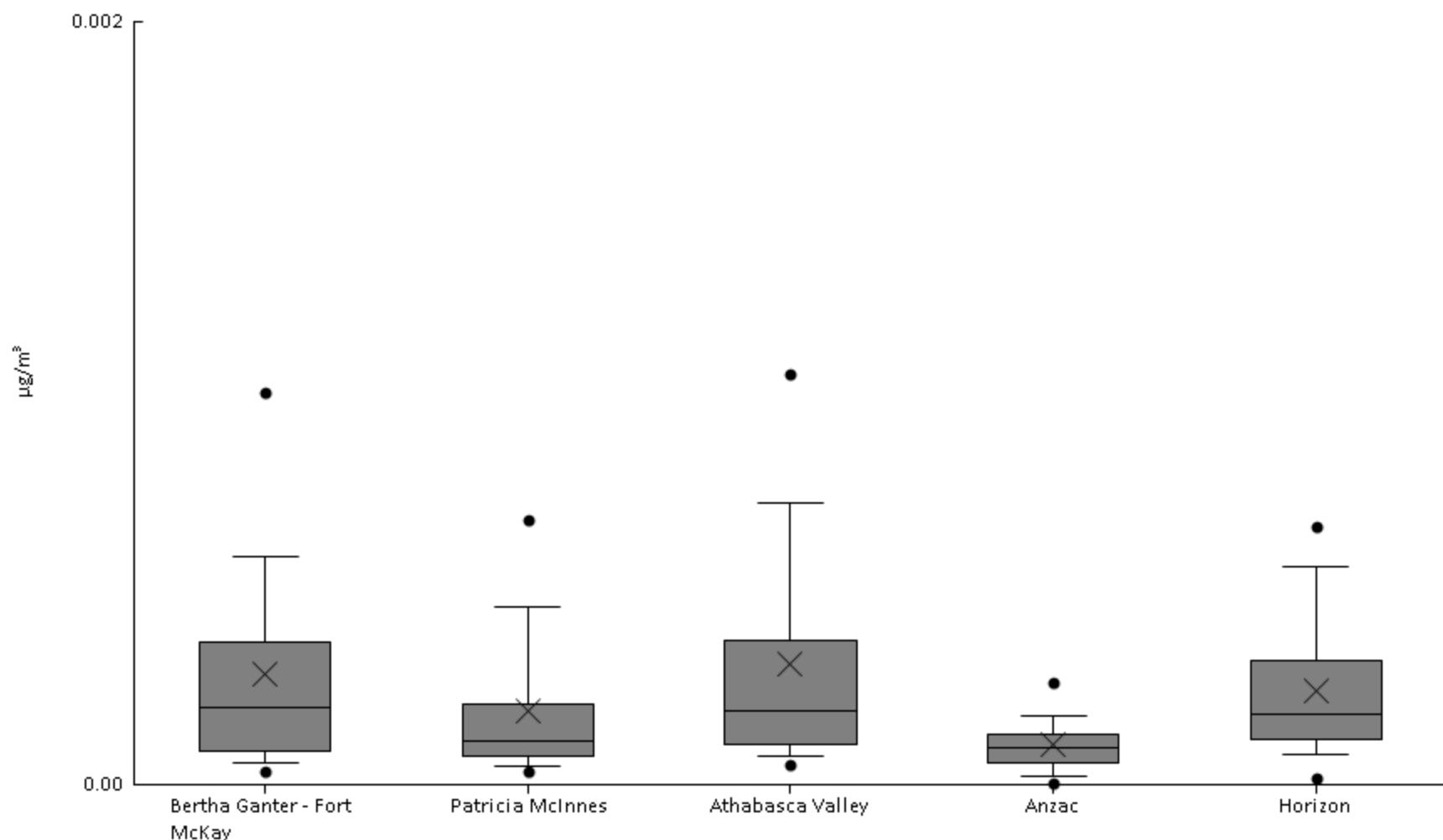
Particulate Matter (PM2.5 METALS) - Sodium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	7.3E-3	0.025	0.05	0.075	0.1	0.81	0.049	0.12
AMS06	Patricia McInnes	61	87%	0	0	0	5.6E-3	0.019	0.045	0.084	0.092	0.47	0.036	0.063
AMS07	Athabasca Valley	61	89%	0	0	0	0.011	0.04	0.077	0.14	0.25	0.6	0.067	0.11
AMS14	Anzac	60	83%	0	0	0	6.7E-3	0.014	0.04	0.071	0.11	0.43	0.033	0.061
AMS15	Horizon	59	95%	0	4.5E-4	2E-3	7.5E-3	0.026	0.045	0.079	0.1	0.34	0.037	0.054



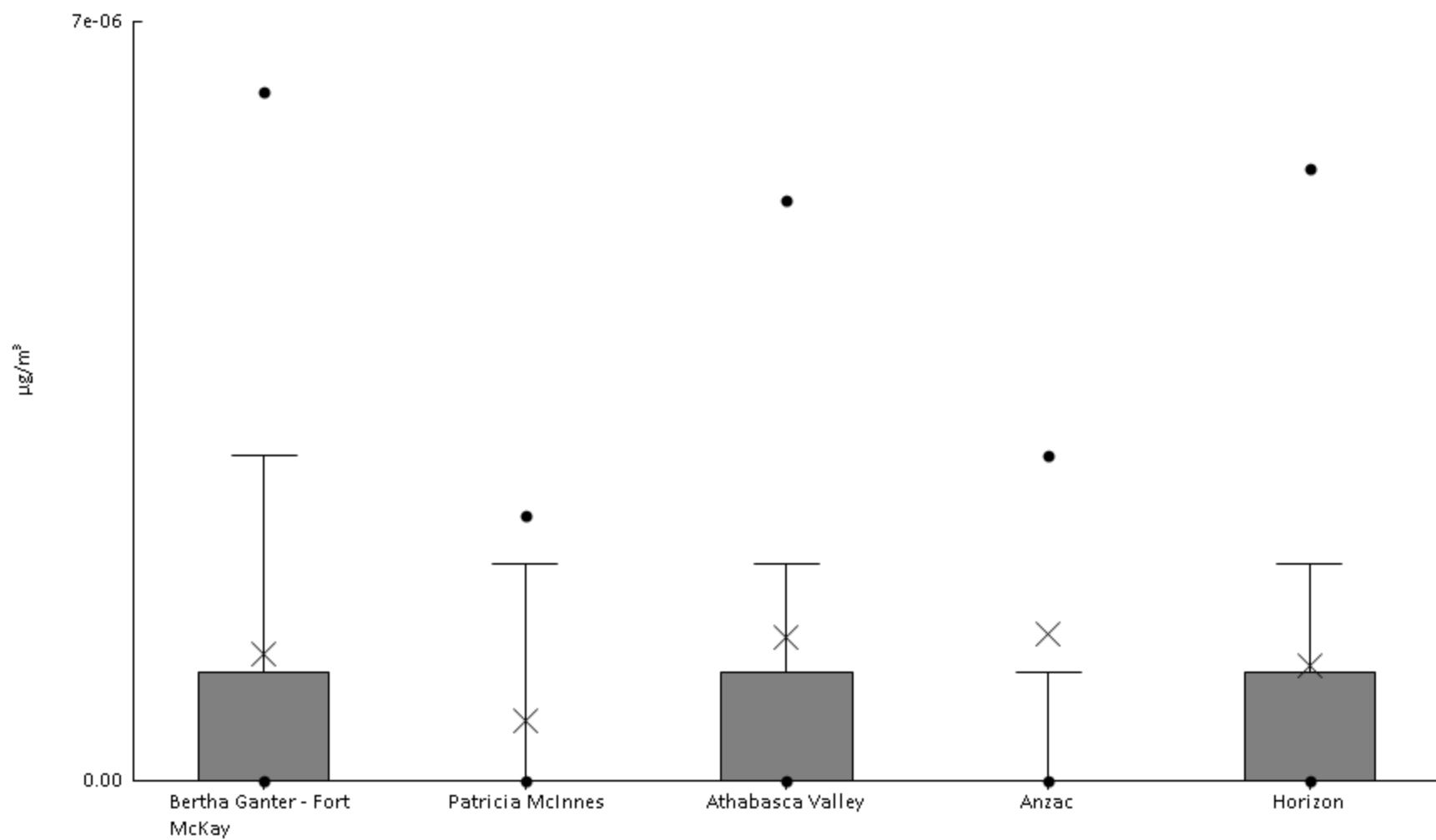
Particulate Matter (PM2.5 METALS) - Strontium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	3.4E-5	5.6E-5	8.6E-5	2E-4	3.7E-4	6E-4	1E-3	1.4E-3	2.9E-4	3E-4
AMS06	Patricia McInnes	61	100%	1E-5	3.7E-5	5E-5	7.5E-5	1.1E-4	2.1E-4	4.6E-4	6.9E-4	1.1E-3	1.9E-4	2.1E-4
AMS07	Athabasca Valley	61	98%	1E-5	5.5E-5	7.3E-5	1.1E-4	1.9E-4	3.8E-4	7.4E-4	1.1E-3	1.5E-3	3.2E-4	3.3E-4
AMS14	Anzac	60	93%	0	5E-6	2.4E-5	5.5E-5	9.5E-5	1.3E-4	1.8E-4	2.7E-4	4.4E-4	1.1E-4	7.9E-5
AMS15	Horizon	59	97%	0	1.9E-5	7.9E-5	1.2E-4	1.8E-4	3.3E-4	5.7E-4	6.8E-4	8.9E-4	2.5E-4	2E-4



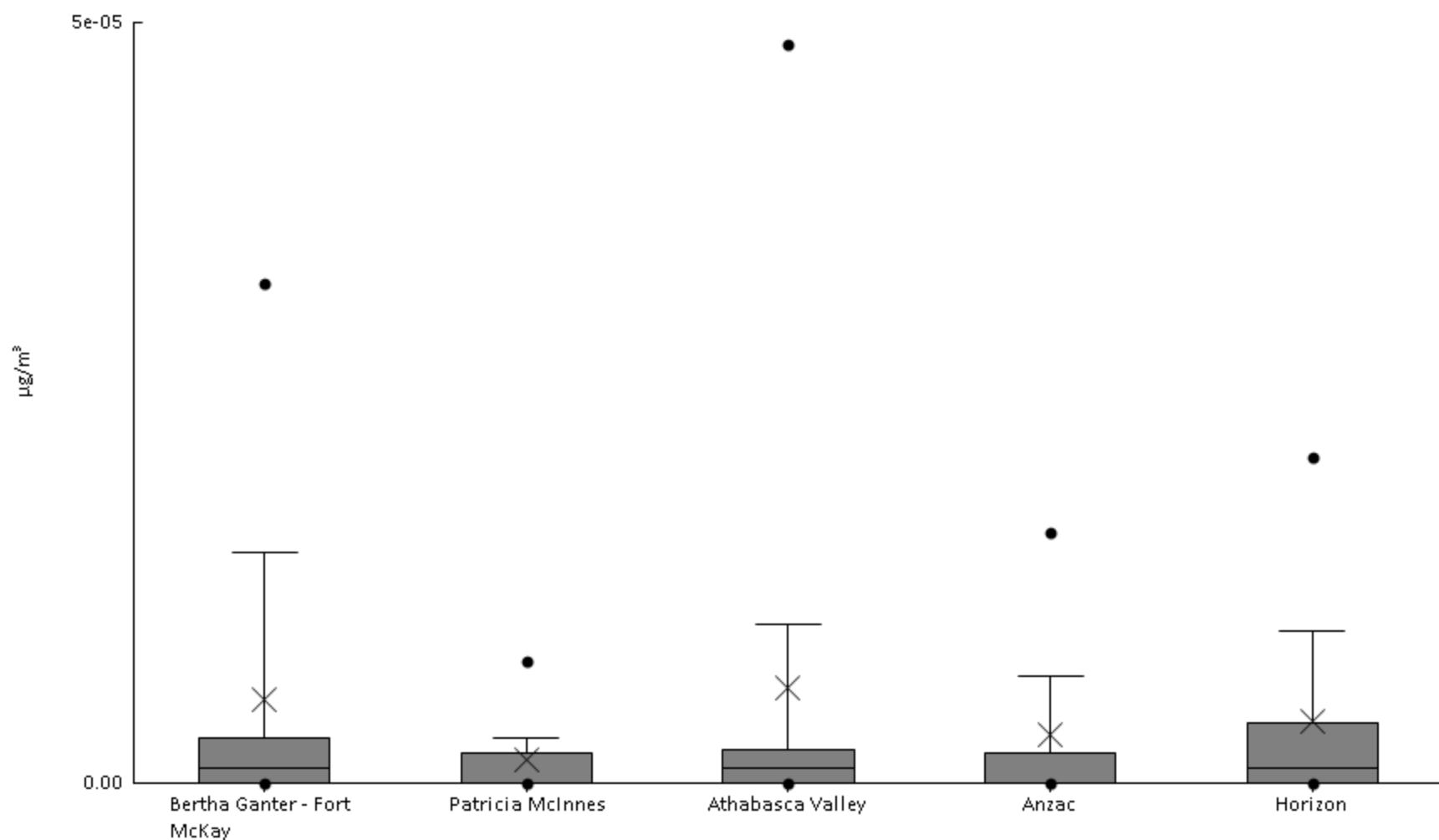
Particulate Matter (PM2.5 METALS) - Tantalum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	10%	0	0	0	0	0	1E-6	3E-6	6.3E-6	1.9E-5	1.2E-6	2.9E-6
AMS06	Patricia McInnes	61	5%	0	0	0	0	0	0	2E-6	2.5E-6	1E-5	5.6E-7	1.6E-6
AMS07	Athabasca Valley	61	7%	0	0	0	0	0	1E-6	2E-6	5.3E-6	3.3E-5	1.3E-6	4.5E-6
AMS14	Anzac	60	5%	0	0	0	0	0	0	1E-6	3E-6	5.2E-5	1.4E-6	7E-6
AMS15	Horizon	59	10%	0	0	0	0	0	1E-6	2E-6	5.6E-6	1.6E-5	1.1E-6	2.8E-6



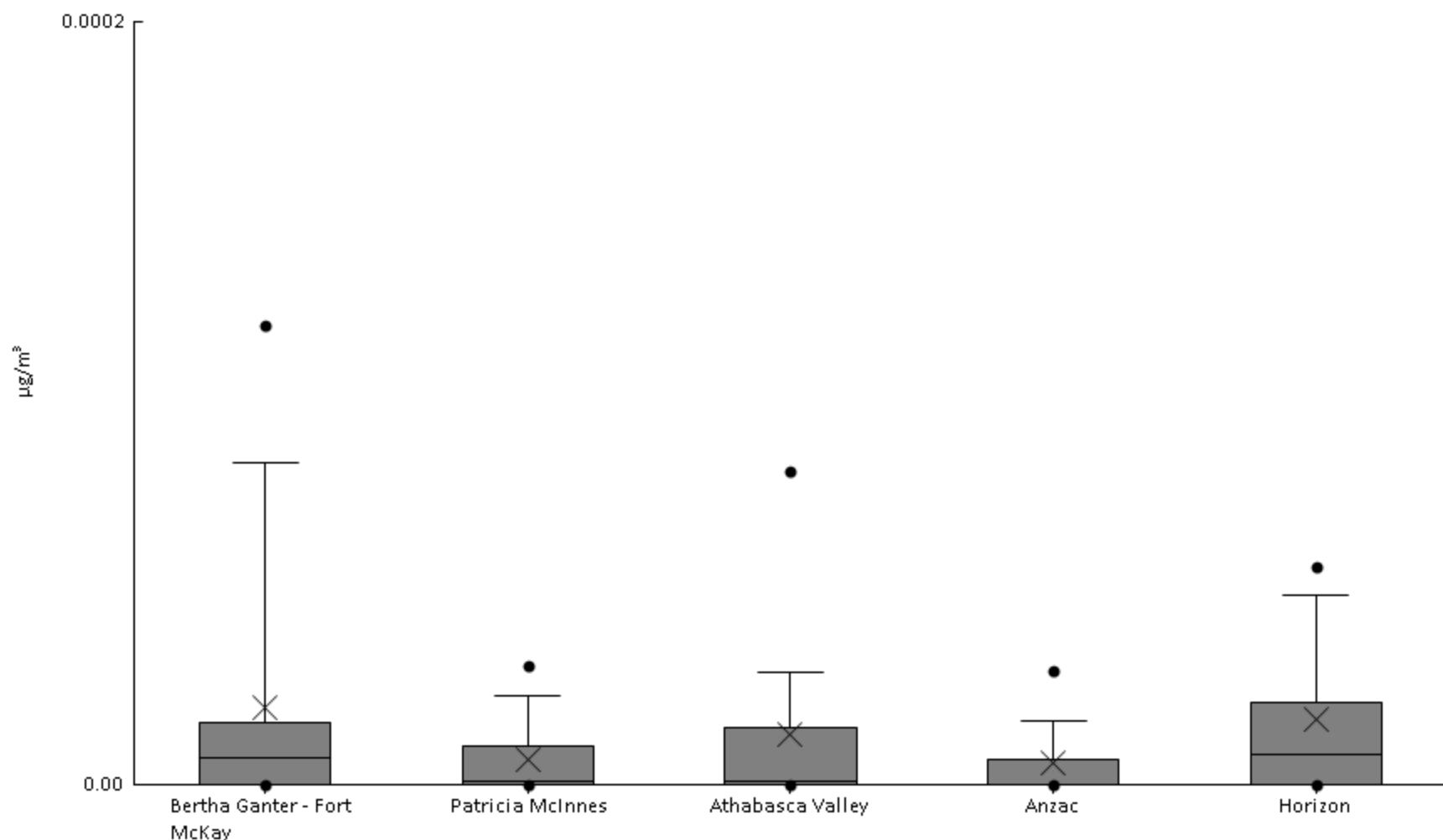
Particulate Matter (PM2.5 METALS) - Thallium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	20%	0	0	0	0	1E-6	3E-6	1.5E-5	3.3E-5	7.7E-5	5.5E-6	1.4E-5
AMS06	Patricia McInnes	61	7%	0	0	0	0	0	2E-6	3E-6	8E-6	2.1E-5	1.5E-6	3.2E-6
AMS07	Athabasca Valley	61	18%	0	0	0	0	1E-6	2.3E-6	1E-5	4.9E-5	1.2E-4	6.3E-6	1.9E-5
AMS14	Anzac	60	10%	0	0	0	0	0	2E-6	7E-6	1.7E-5	5.9E-5	3.2E-6	9.3E-6
AMS15	Horizon	59	19%	0	0	0	0	1E-6	4E-6	1E-5	2.1E-5	4.1E-5	4E-6	7.8E-6



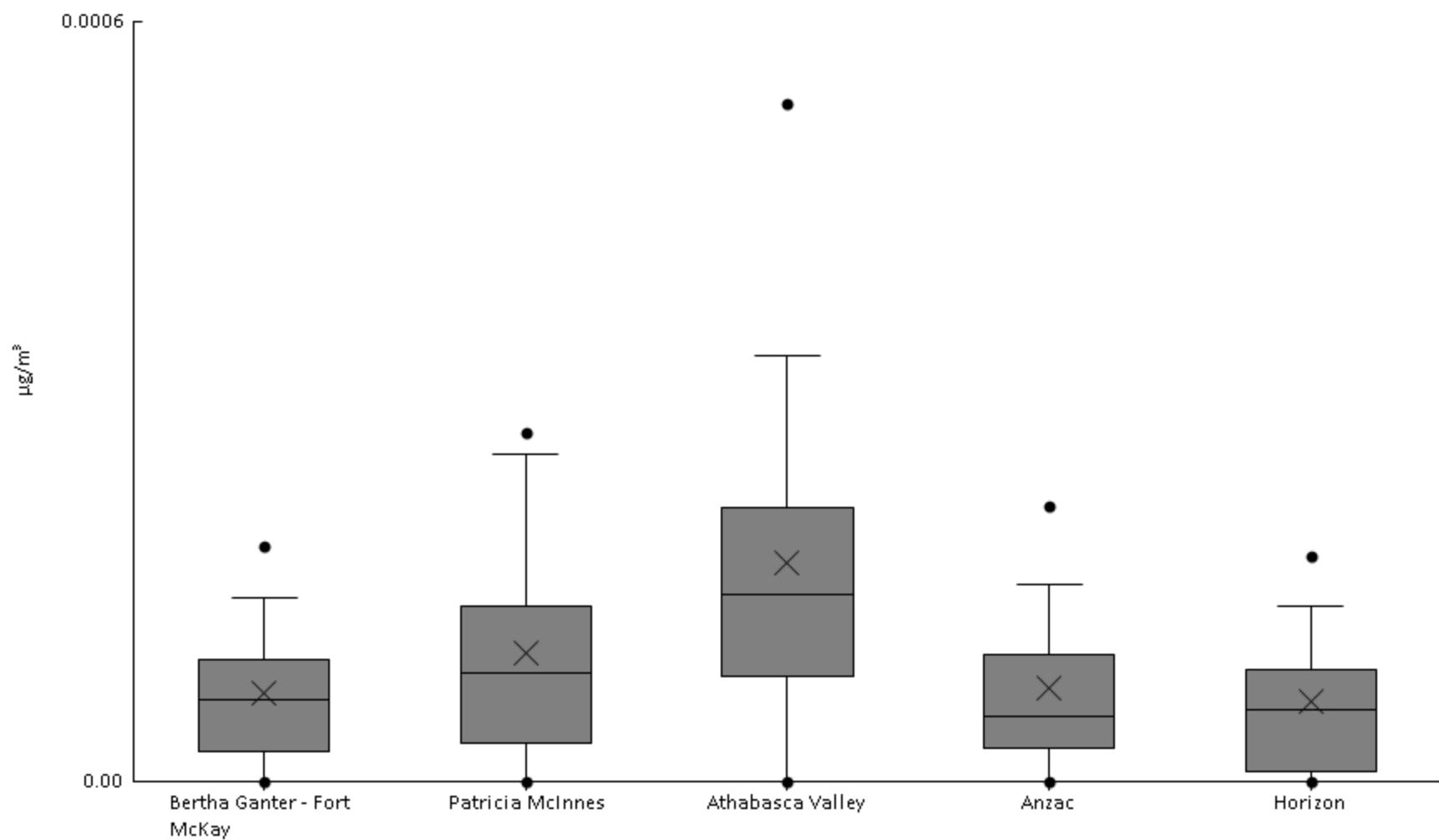
Particulate Matter (PM2.5 METALS) - Thorium ($\mu\text{g}/\text{m}^3$) - 2019

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	7E-6	1.6E-5	8.4E-5	1.2E-4	2E-4	2E-5	3.9E-5
AMS06	Patricia McInnes	61	46%	0	0	0	0	1E-6	1E-5	2.3E-5	3.1E-5	4.8E-5	6.7E-6	1.1E-5
AMS07	Athabasca Valley	61	46%	0	0	0	0	1E-6	1.5E-5	2.9E-5	8.2E-5	1.7E-4	1.3E-5	2.9E-5
AMS14	Anzac	60	37%	0	0	0	0	0	6.5E-6	1.7E-5	3E-5	7.1E-5	5.6E-6	1.2E-5
AMS15	Horizon	59	68%	0	0	0	0	8E-6	2.2E-5	5E-5	5.7E-5	1.6E-4	1.7E-5	2.7E-5



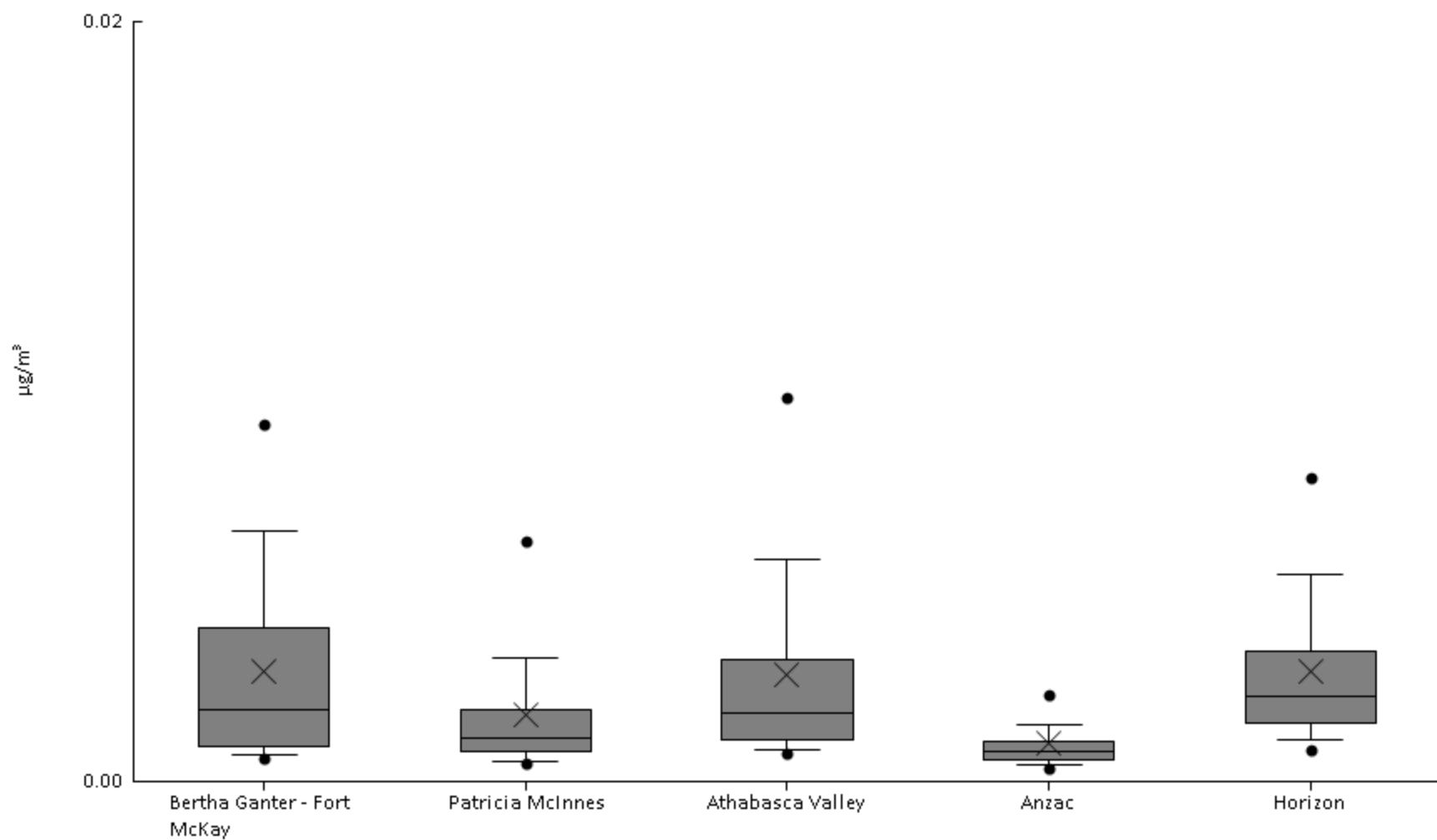
Particulate Matter (PM2.5 METALS) - Tin ($\mu\text{g}/\text{m}^3$) - 2019

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	2.4E-5	6.5E-5	9.6E-5	1.4E-4	1.9E-4	2.8E-4	7E-5	5.9E-5
AMS06	Patricia McInnes	61	82%	0	0	0	3E-5	8.6E-5	1.4E-4	2.6E-4	2.8E-4	4.6E-4	1E-4	9.2E-5
AMS07	Athabasca Valley	61	89%	0	0	0	8.4E-5	1.5E-4	2.2E-4	3.4E-4	5.4E-4	7.2E-4	1.7E-4	1.5E-4
AMS14	Anzac	60	83%	0	0	0	2.6E-5	5.1E-5	1E-4	1.6E-4	2.2E-4	3.9E-4	7.4E-5	7.5E-5
AMS15	Horizon	59	75%	0	0	0	8E-6	5.7E-5	8.8E-5	1.4E-4	1.8E-4	3.6E-4	6.3E-5	6.5E-5



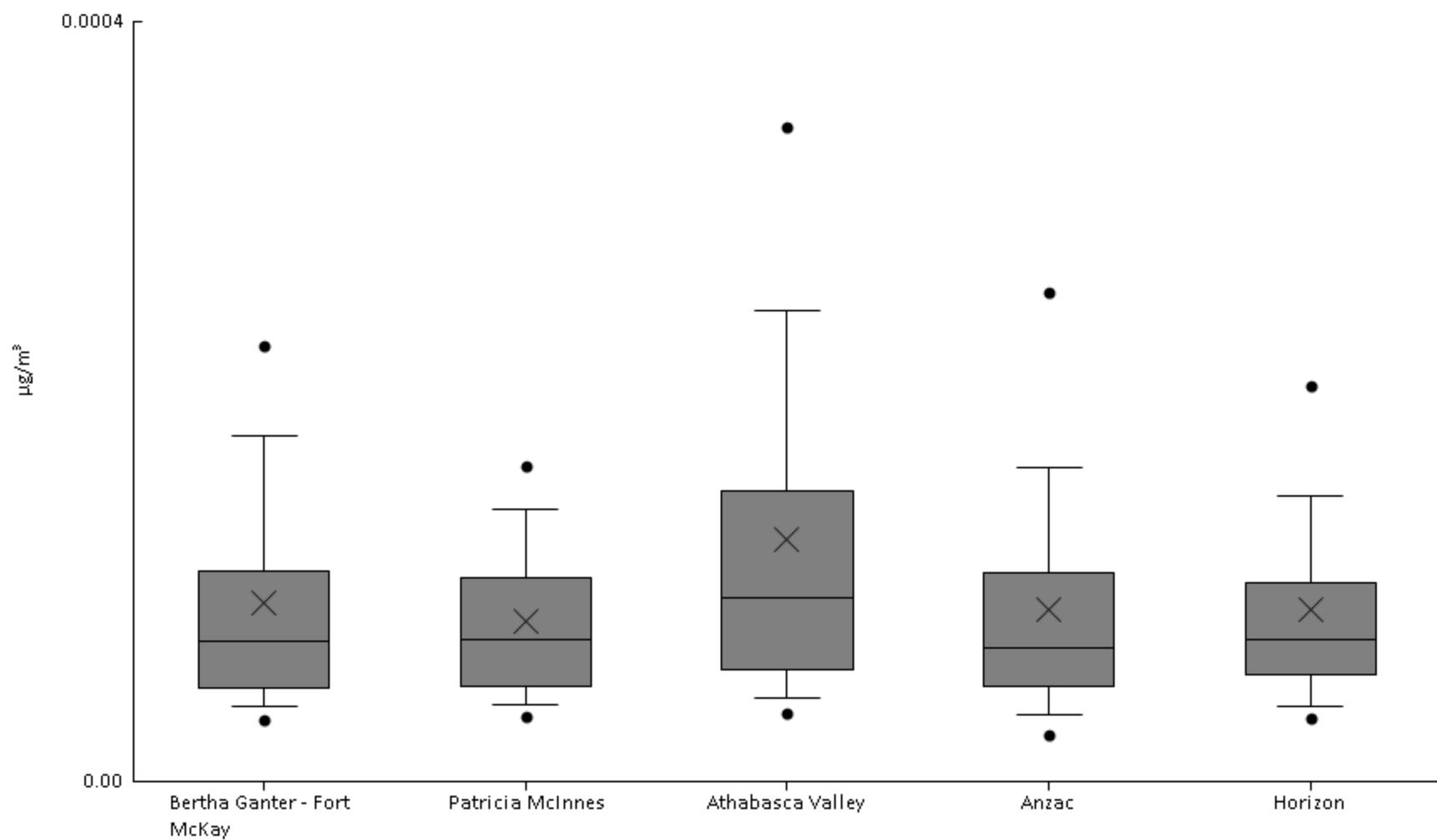
Particulate Matter (PM2.5 METALS) - Titanium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4.9E-4	6.2E-4	7.2E-4	9.3E-4	1.9E-3	4E-3	6.6E-3	9.4E-3	0.013	2.9E-3	2.7E-3
AMS06	Patricia McInnes	61	100%	3E-4	4.8E-4	5.3E-4	7.8E-4	1.1E-3	1.9E-3	3.2E-3	6.3E-3	9.3E-3	1.7E-3	1.9E-3
AMS07	Athabasca Valley	61	100%	4.7E-4	7.6E-4	8.4E-4	1.1E-3	1.8E-3	3.2E-3	5.9E-3	0.01	0.015	2.8E-3	2.9E-3
AMS14	Anzac	60	100%	2.9E-4	3.7E-4	4.6E-4	5.8E-4	8.1E-4	1.1E-3	1.5E-3	2.3E-3	6.8E-3	9.9E-4	9E-4
AMS15	Horizon	59	100%	7.5E-4	8.3E-4	1.1E-3	1.5E-3	2.2E-3	3.4E-3	5.5E-3	8E-3	0.011	2.9E-3	2.2E-3



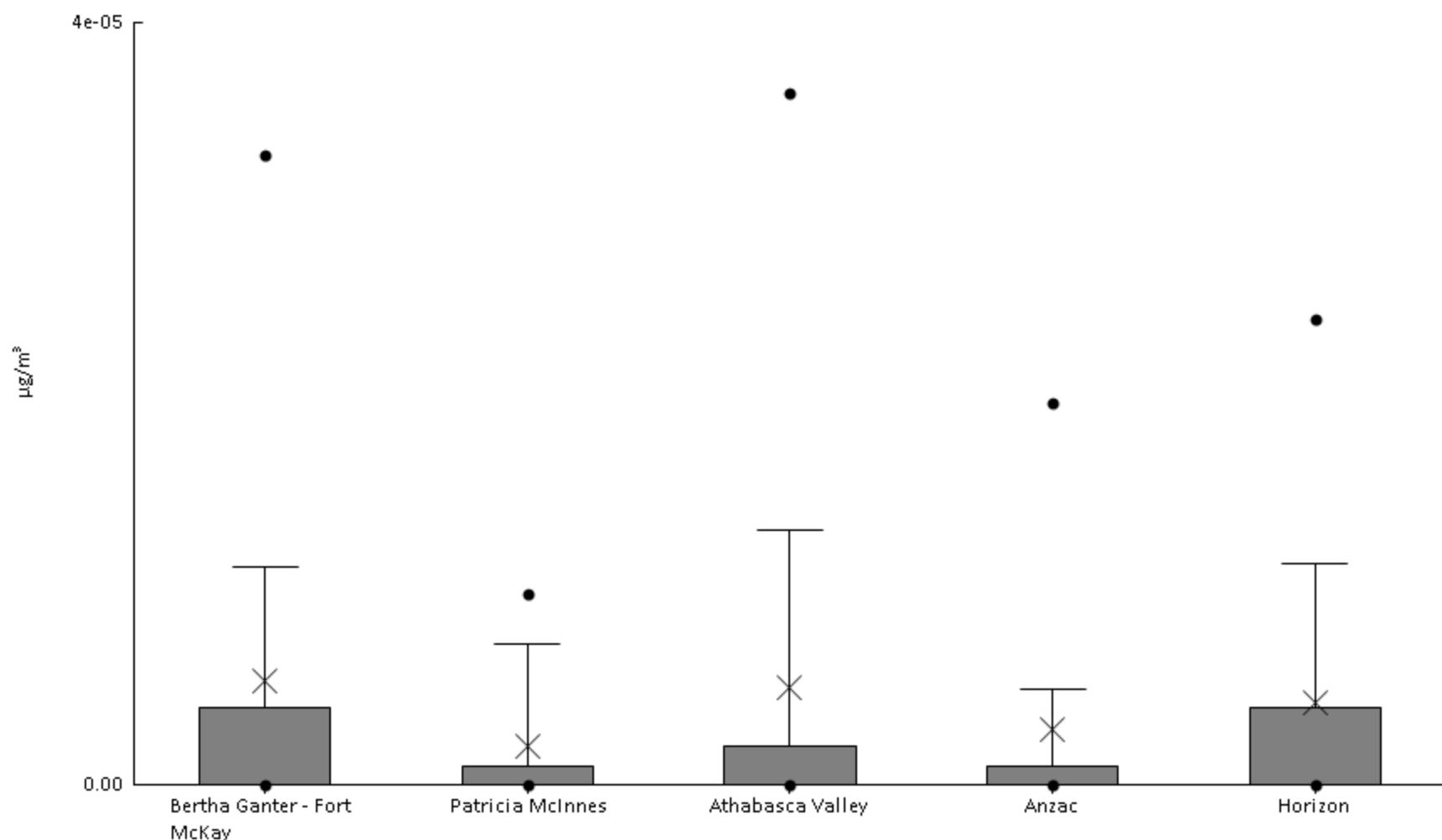
Particulate Matter (PM2.5 METALS) - Tungsten ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.8E-5	3.2E-5	4E-5	5E-5	7.4E-5	1.1E-4	1.8E-4	2.3E-4	4.4E-4	9.4E-5	7.1E-5
AMS06	Patricia McInnes	61	100%	2.2E-5	3.5E-5	4E-5	5E-5	7.5E-5	1.1E-4	1.4E-4	1.7E-4	2.4E-4	8.4E-5	4.4E-5
AMS07	Athabasca Valley	61	100%	3E-5	3.6E-5	4.4E-5	5.9E-5	9.7E-5	1.5E-4	2.5E-4	3.4E-4	5.6E-4	1.3E-4	1.1E-4
AMS14	Anzac	60	98%	0	2.5E-5	3.5E-5	5.1E-5	7E-5	1.1E-4	1.7E-4	2.6E-4	3.3E-4	9.1E-5	6.8E-5
AMS15	Horizon	59	98%	0	3.3E-5	3.9E-5	5.6E-5	7.5E-5	1.1E-4	1.5E-4	2.1E-4	3.9E-4	9.1E-5	6.1E-5



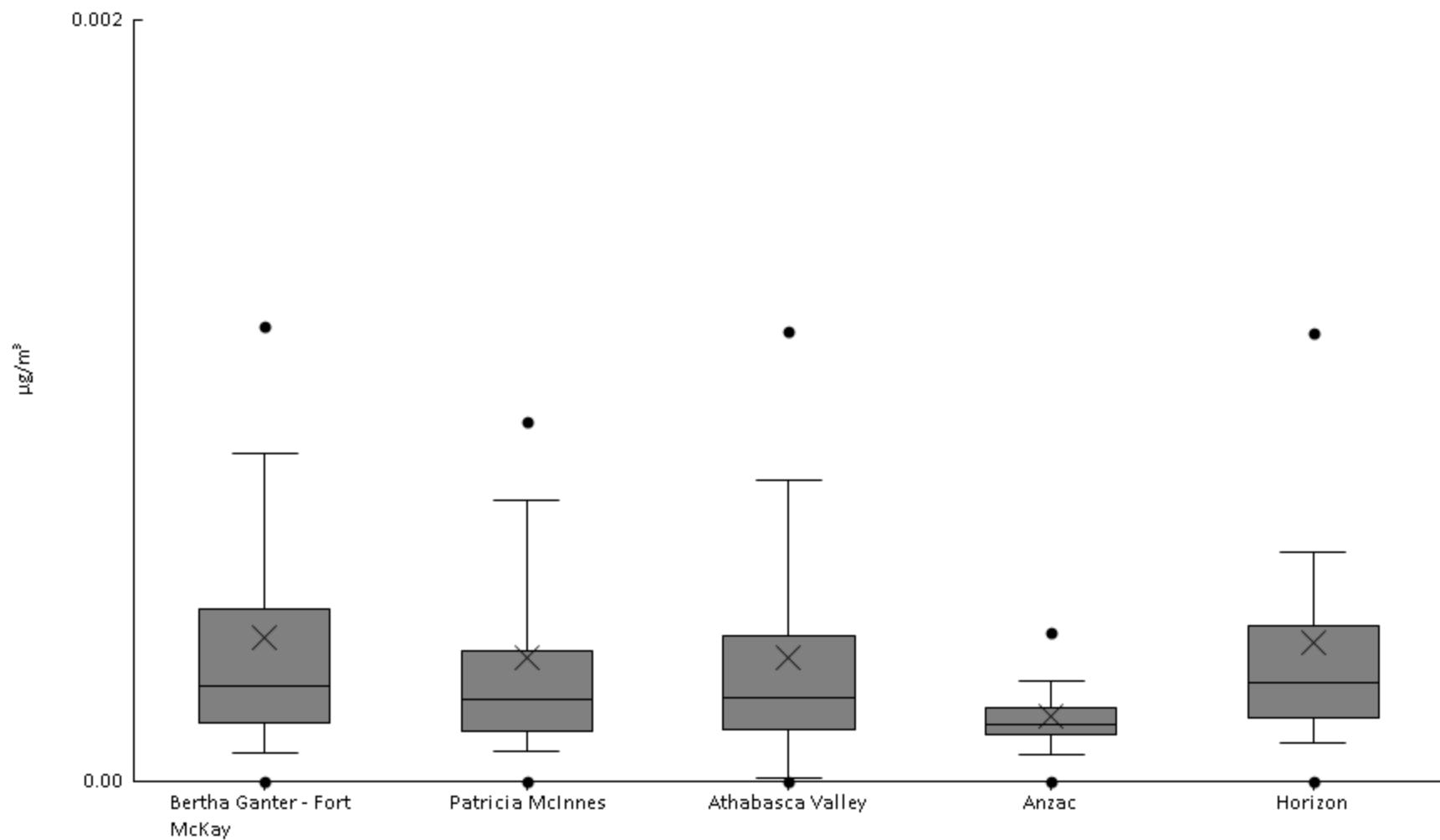
Particulate Matter (PM2.5 METALS) - Uranium ($\mu\text{g}/\text{m}^3$) - 2019

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	4E-6	1.1E-5	3.3E-5	7.6E-5	5.5E-6	1.4E-5
AMS06	Patricia McInnes	61	15%	0	0	0	0	0	1E-6	7.4E-6	1E-5	3.4E-5	2E-6	5.5E-6
AMS07	Athabasca Valley	61	23%	0	0	0	0	0	2E-6	1.3E-5	3.6E-5	6.3E-5	5.1E-6	1.3E-5
AMS14	Anzac	60	17%	0	0	0	0	0	1E-6	5E-6	2E-5	7E-5	2.9E-6	1E-5
AMS15	Horizon	59	34%	0	0	0	0	0	4E-6	1.2E-5	2.4E-5	5.6E-5	4.3E-6	1E-5



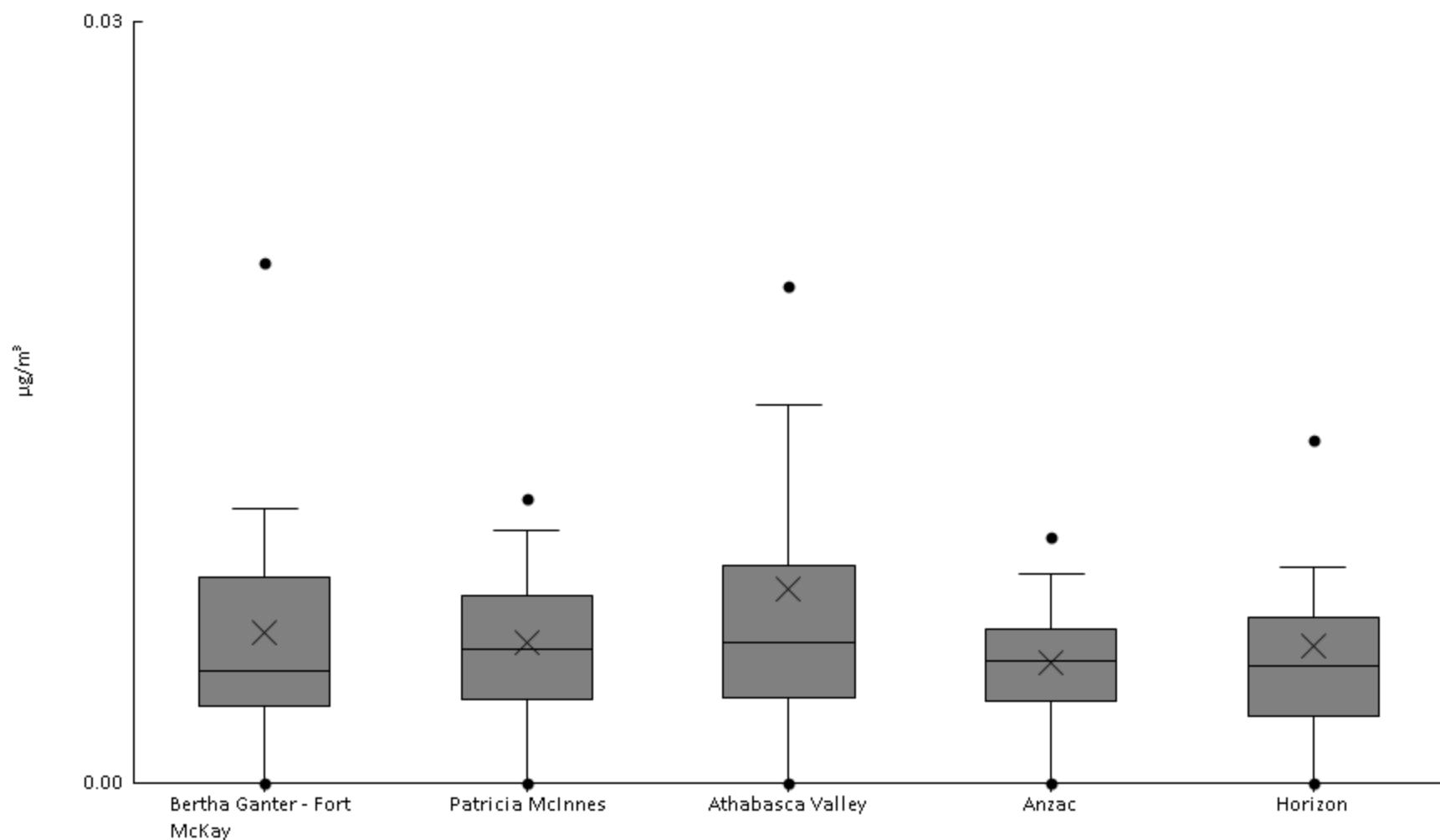
Particulate Matter (PM2.5 METALS) - Vanadium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	7.7E-5	1.5E-4	2.5E-4	4.5E-4	8.6E-4	1.2E-3	1.5E-3	3.8E-4	3.6E-4
AMS06	Patricia McInnes	61	92%	0	0	7.9E-5	1.3E-4	2.1E-4	3.4E-4	7.4E-4	9.5E-4	2.2E-3	3.2E-4	3.8E-4
AMS07	Athabasca Valley	61	89%	0	0	9.6E-6	1.4E-4	2.2E-4	3.8E-4	7.9E-4	1.2E-3	1.8E-3	3.2E-4	3.5E-4
AMS14	Anzac	60	92%	0	0	7.3E-5	1.2E-4	1.5E-4	1.9E-4	2.6E-4	3.9E-4	7.5E-4	1.7E-4	1.3E-4
AMS15	Horizon	59	92%	0	0	1E-4	1.7E-4	2.6E-4	4.1E-4	6E-4	1.2E-3	2.7E-3	3.6E-4	4.3E-4



Particulate Matter (PM2.5 METALS) - Zinc ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	84%	0	0	0	3E-3	4.4E-3	8.1E-3	0.011	0.021	0.024	5.9E-3	5.6E-3
AMS06	Patricia McInnes	61	89%	0	0	0	3.3E-3	5.3E-3	7.4E-3	9.9E-3	0.011	0.023	5.5E-3	3.9E-3
AMS07	Athabasca Valley	61	89%	0	0	0	3.3E-3	5.5E-3	8.6E-3	0.015	0.02	0.063	7.6E-3	8.9E-3
AMS14	Anzac	60	88%	0	0	0	3.3E-3	4.8E-3	6.1E-3	8.3E-3	9.7E-3	0.011	4.7E-3	2.7E-3
AMS15	Horizon	59	83%	0	0	0	2.6E-3	4.6E-3	6.5E-3	8.5E-3	0.014	0.037	5.4E-3	5.7E-3





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PARTICULATE MATTER (PM₁₀) - METALS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals: Desert Research Institute
Reno, NV

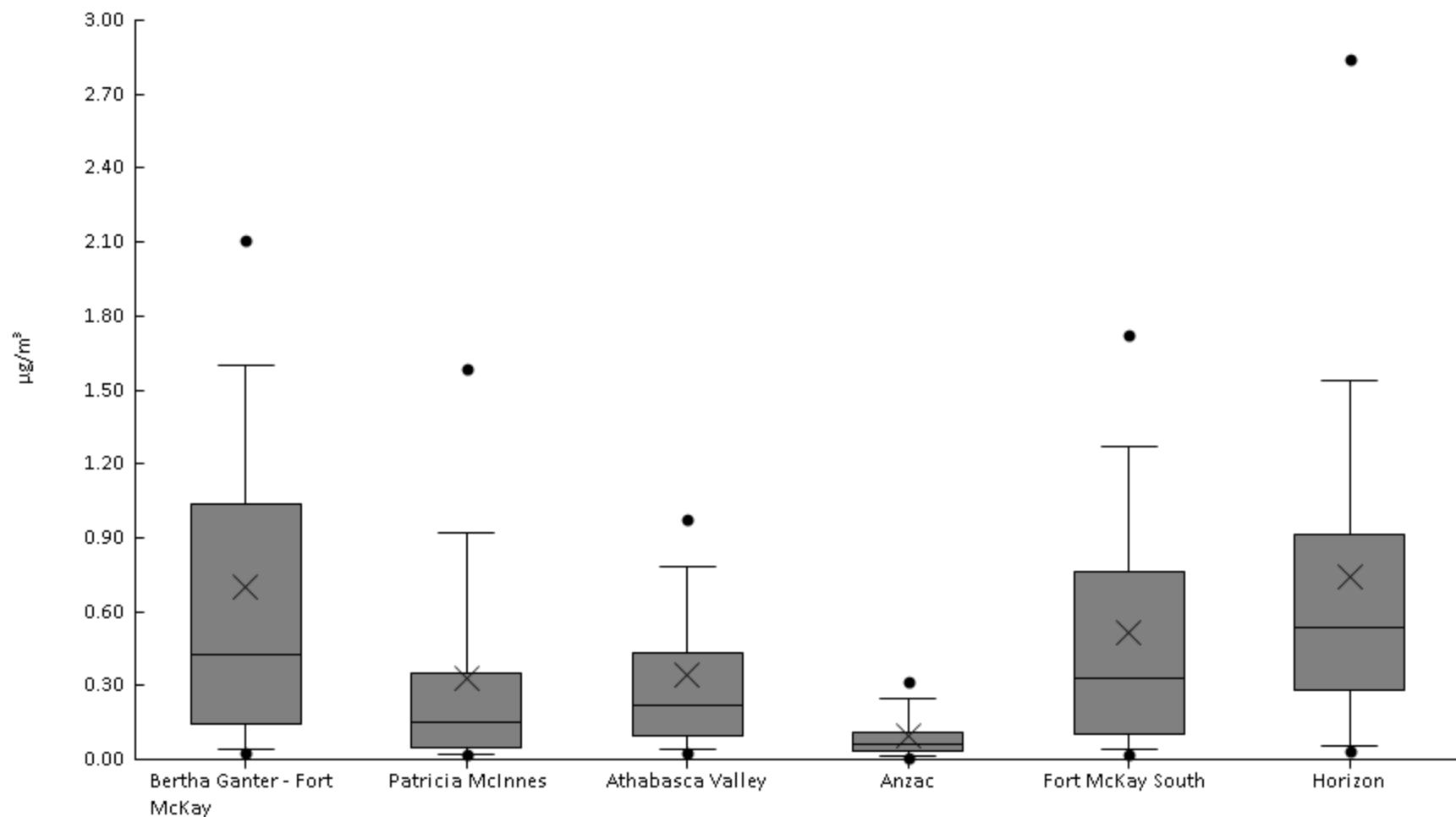


CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (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) DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
SAMPLE PREPARATION	Desert Research Institute
ANALYTICAL LABORATORY	Data are not blank corrected
USER NOTE 1	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 2	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
USER NOTE 3	Partisols for PM _{2.5} at AMS 15 occasionally samples 24.1 m ³ despite being set for 24 m ³ . Flow has been calibrated. Reason for this behaviour is unknown.
USER NOTE 4	Data is computed on a monthly dataset.
USER NOTE 5	Summary statistics include flags beginning with V.
USER NOTE 6	Actual Volume at Ambient Conditions (since 01-Jan-2011)
VOLUME STANDARDIZATION	For PM ₁₀ FRM Partisol PM ₁₀ sampler
SAMPLING INSTRUMENT TYPE	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



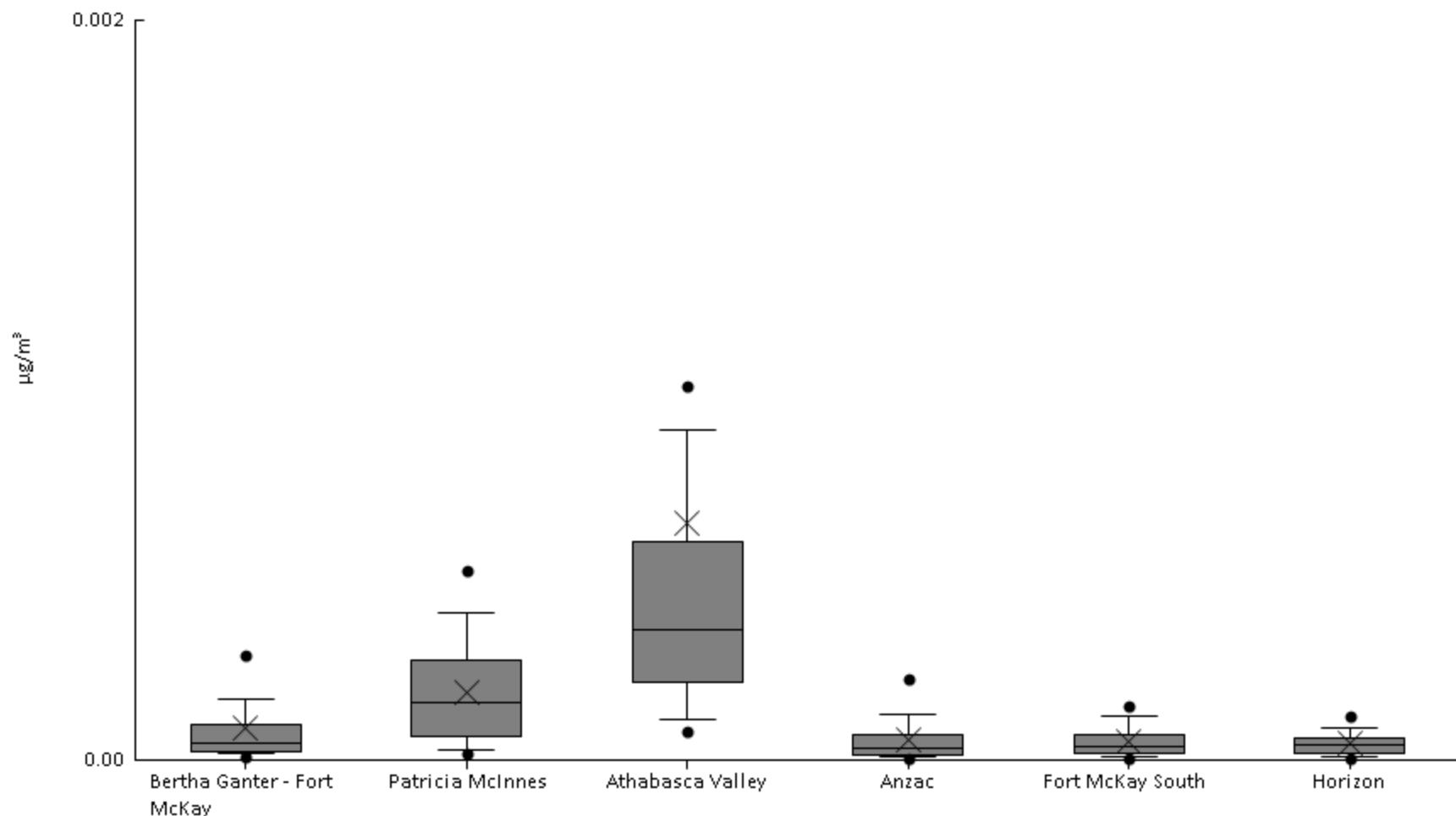
Particulate Matter (PM10 METALS) - Aluminum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.026	0.028	0.043	0.14	0.43	1	1.6	2.1	3.5	0.7	0.72
AMS06	Patricia McInnes	60	100%	0.012	0.02	0.024	0.049	0.15	0.35	0.92	1.6	1.9	0.33	0.45
AMS07	Athabasca Valley	58	100%	0.021	0.03	0.038	0.097	0.22	0.43	0.78	0.98	1.4	0.34	0.32
AMS14	Anzac	59	100%	9.8E-3	0.01	0.014	0.033	0.061	0.11	0.25	0.32	0.41	0.094	0.096
AMS13	Fort McKay South	61	100%	0.017	0.022	0.04	0.1	0.33	0.76	1.3	1.7	2.3	0.52	0.54
AMS15	Horizon	61	100%	0.013	0.036	0.057	0.28	0.53	0.91	1.5	2.8	3.3	0.74	0.76



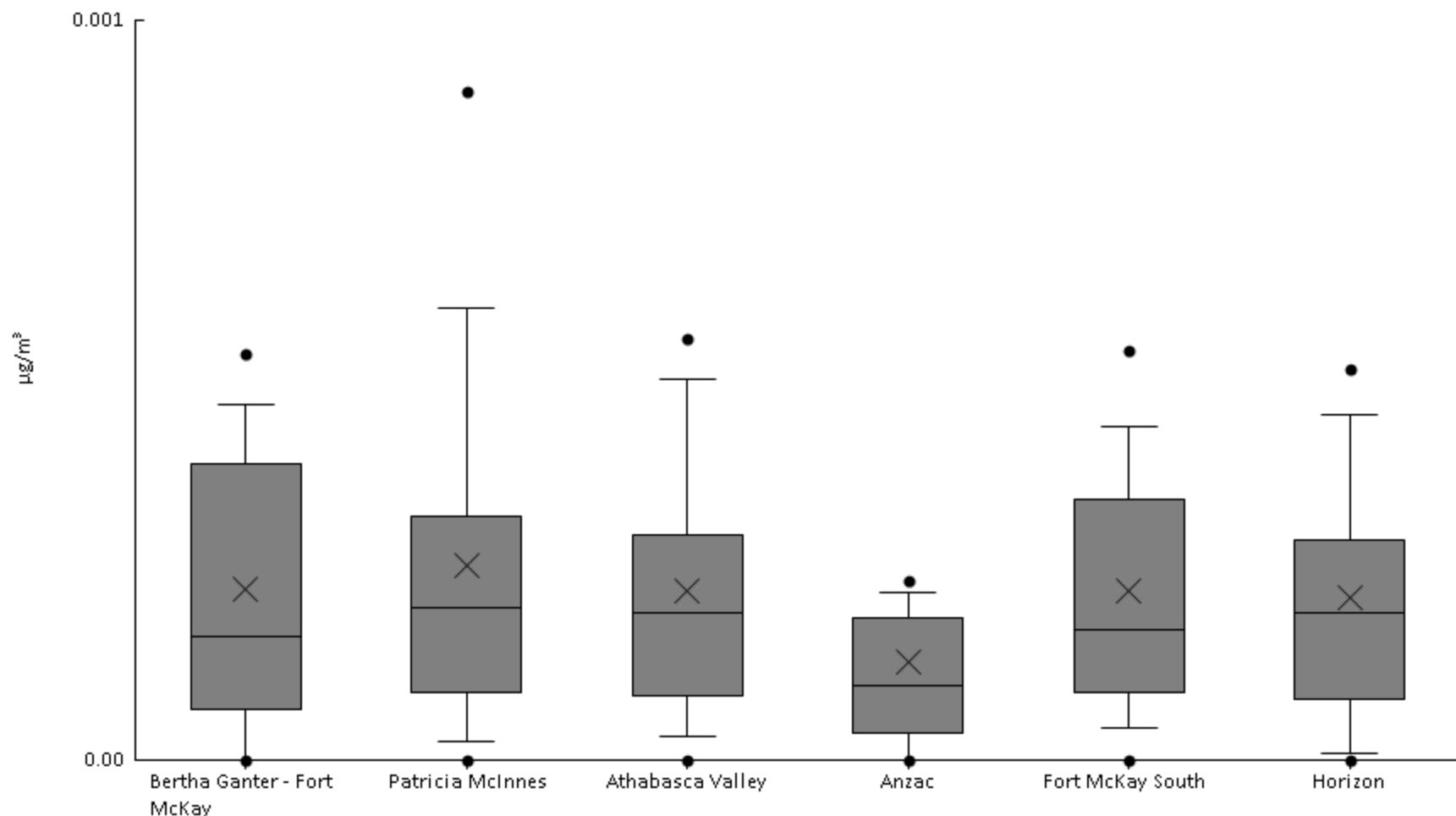
Particulate Matter (PM10 METALS) - Antimony ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	90%	7E-6	1E-5	1.7E-5	2.1E-5	4.8E-5	9.7E-5	1.7E-4	2.9E-4	1.2E-3	8.8E-5	1.7E-4
AMS06	Patricia McInnes	60	97%	7E-6	2E-5	2.9E-5	6.5E-5	1.5E-4	2.7E-4	4E-4	5.1E-4	5.8E-4	1.8E-4	1.5E-4
AMS07	Athabasca Valley	58	98%	1E-5	7.9E-5	1.1E-4	2.1E-4	3.5E-4	5.9E-4	8.9E-4	1E-3	0.013	6.4E-4	1.7E-3
AMS14	Anzac	59	75%	0	4.9E-6	9.4E-6	1.5E-5	3E-5	7.1E-5	1.2E-4	2.2E-4	4.6E-4	5.6E-5	7.6E-5
AMS13	Fort McKay South	61	79%	0	4E-6	1E-5	2E-5	3.6E-5	6.7E-5	1.2E-4	1.5E-4	2.2E-4	5E-5	4.5E-5
AMS15	Horizon	61	87%	0	3.3E-6	1E-5	2E-5	3.9E-5	5.9E-5	8.6E-5	1.2E-4	1.5E-4	4.4E-5	3.2E-5



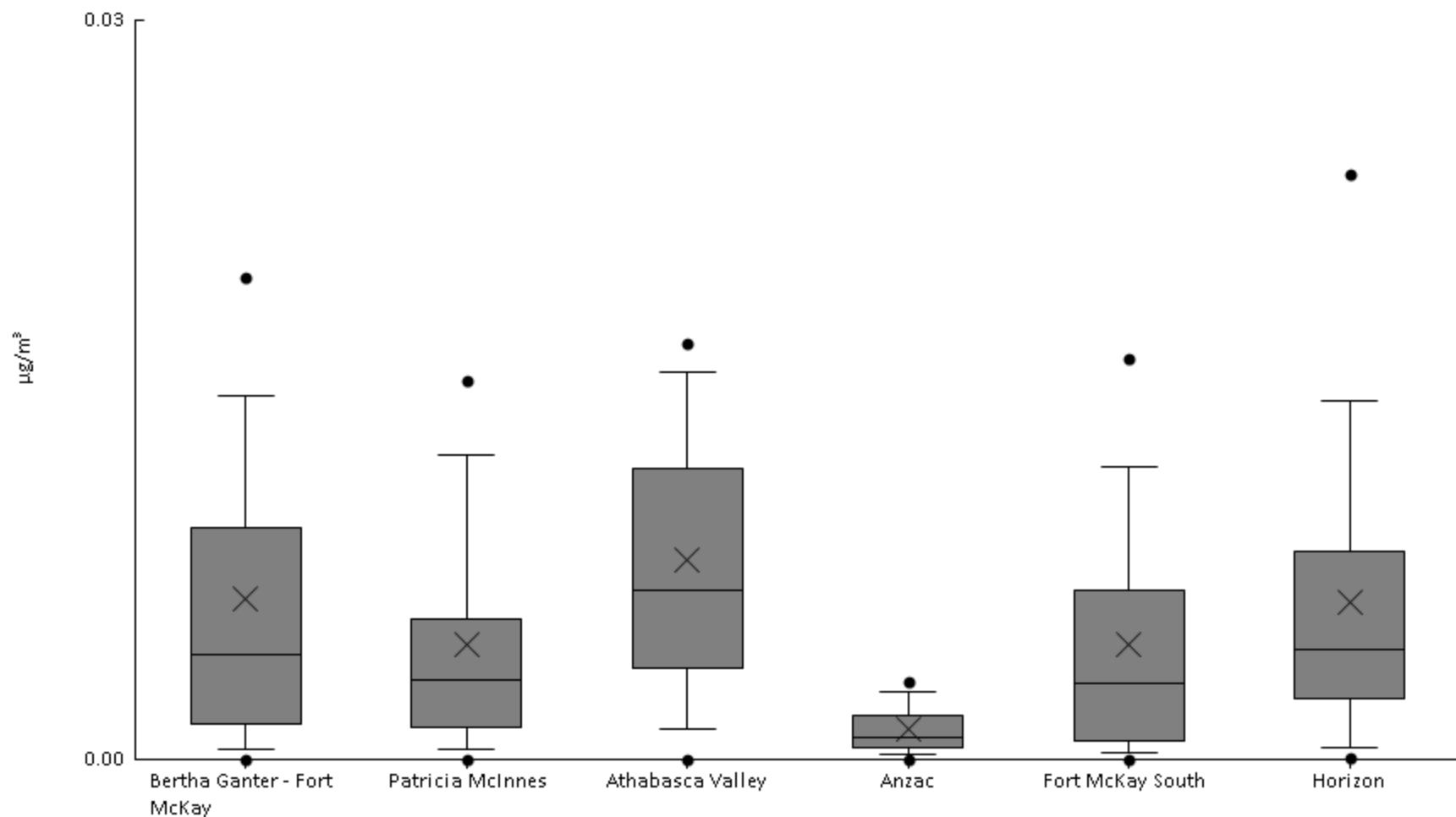
Particulate Matter (PM10 METALS) - Arsenic ($\mu\text{g}/\text{m}^3$) - 2019

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	6.9E-5	1.7E-4	4E-4	4.8E-4	5.5E-4	9.2E-4	2.3E-4	2E-4
AMS06	Patricia McInnes	60	95%	0	0	2.5E-5	9.3E-5	2.1E-4	3.3E-4	6.1E-4	9E-4	1.1E-3	2.6E-4	2.5E-4
AMS07	Athabasca Valley	58	93%	0	0	3.1E-5	8.7E-5	2E-4	3.1E-4	5.2E-4	5.7E-4	1.1E-3	2.3E-4	2E-4
AMS14	Anzac	59	85%	0	0	0	3.6E-5	1E-4	1.9E-4	2.3E-4	2.4E-4	1.2E-3	1.3E-4	1.7E-4
AMS13	Fort McKay South	61	93%	0	0	4.2E-5	9.1E-5	1.8E-4	3.5E-4	4.5E-4	5.5E-4	9.2E-4	2.3E-4	1.8E-4
AMS15	Horizon	61	90%	0	0	9.6E-6	8.2E-5	2E-4	3E-4	4.7E-4	5.3E-4	7.6E-4	2.2E-4	1.7E-4



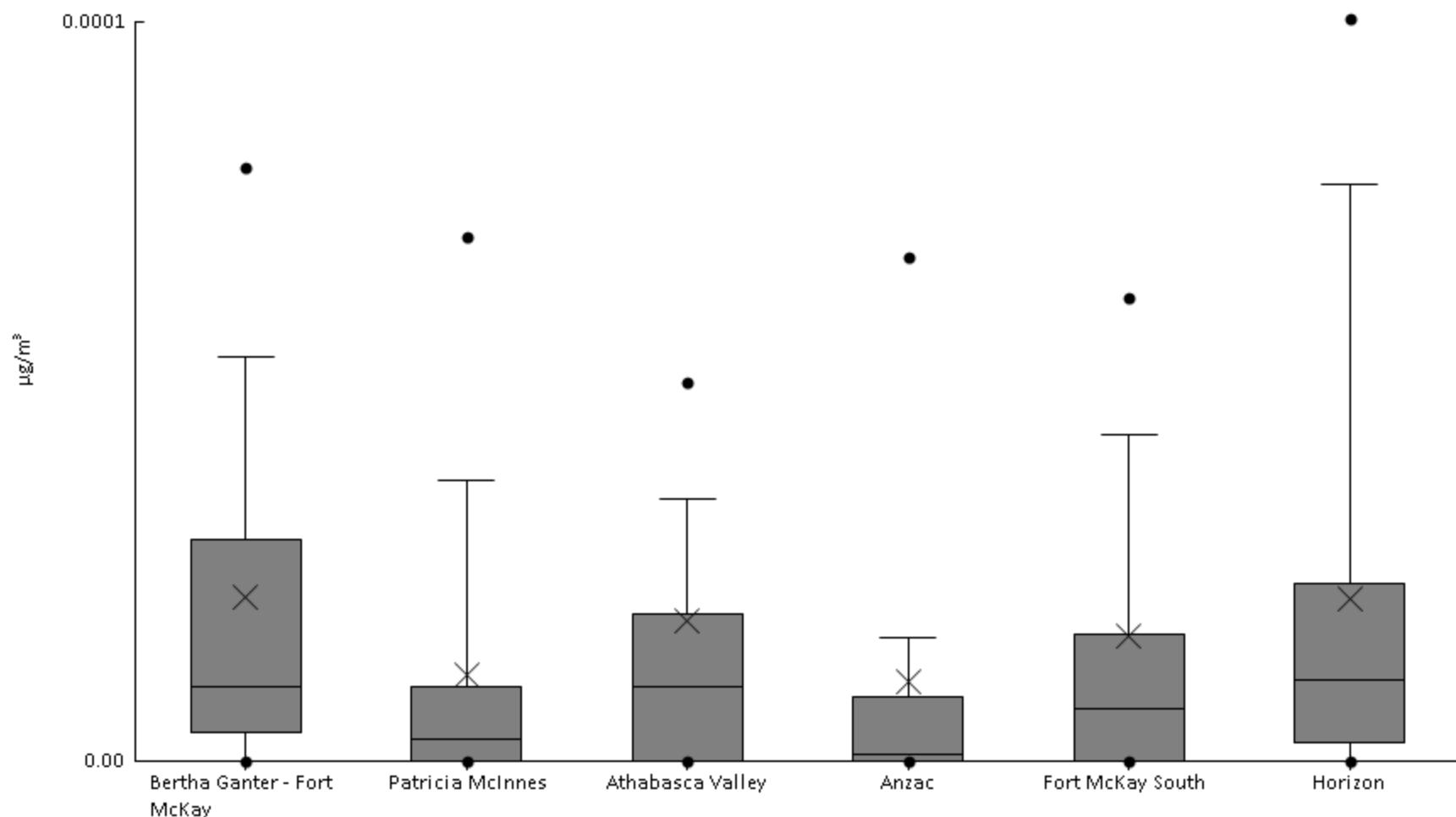
Particulate Matter (PM10 METALS) - Barium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	0	4.2E-4	1.4E-3	4.3E-3	9.4E-3	0.015	0.02	0.036	6.5E-3	6.9E-3
AMS06	Patricia McInnes	60	92%	0	0	4.2E-4	1.3E-3	3.3E-3	5.7E-3	0.012	0.015	0.028	4.7E-3	5.6E-3
AMS07	Athabasca Valley	58	93%	0	0	1.2E-3	3.7E-3	6.9E-3	0.012	0.016	0.017	0.041	8.1E-3	6.8E-3
AMS14	Anzac	59	92%	0	0	2.1E-4	4.7E-4	8.9E-4	1.8E-3	2.8E-3	3.1E-3	6.9E-3	1.3E-3	1.3E-3
AMS13	Fort McKay South	61	92%	0	0	2.5E-4	7.8E-4	3.1E-3	6.8E-3	0.012	0.016	0.021	4.7E-3	5.1E-3
AMS15	Horizon	61	95%	0	5.1E-5	5.1E-4	2.5E-3	4.4E-3	8.5E-3	0.015	0.024	0.03	6.4E-3	6.6E-3



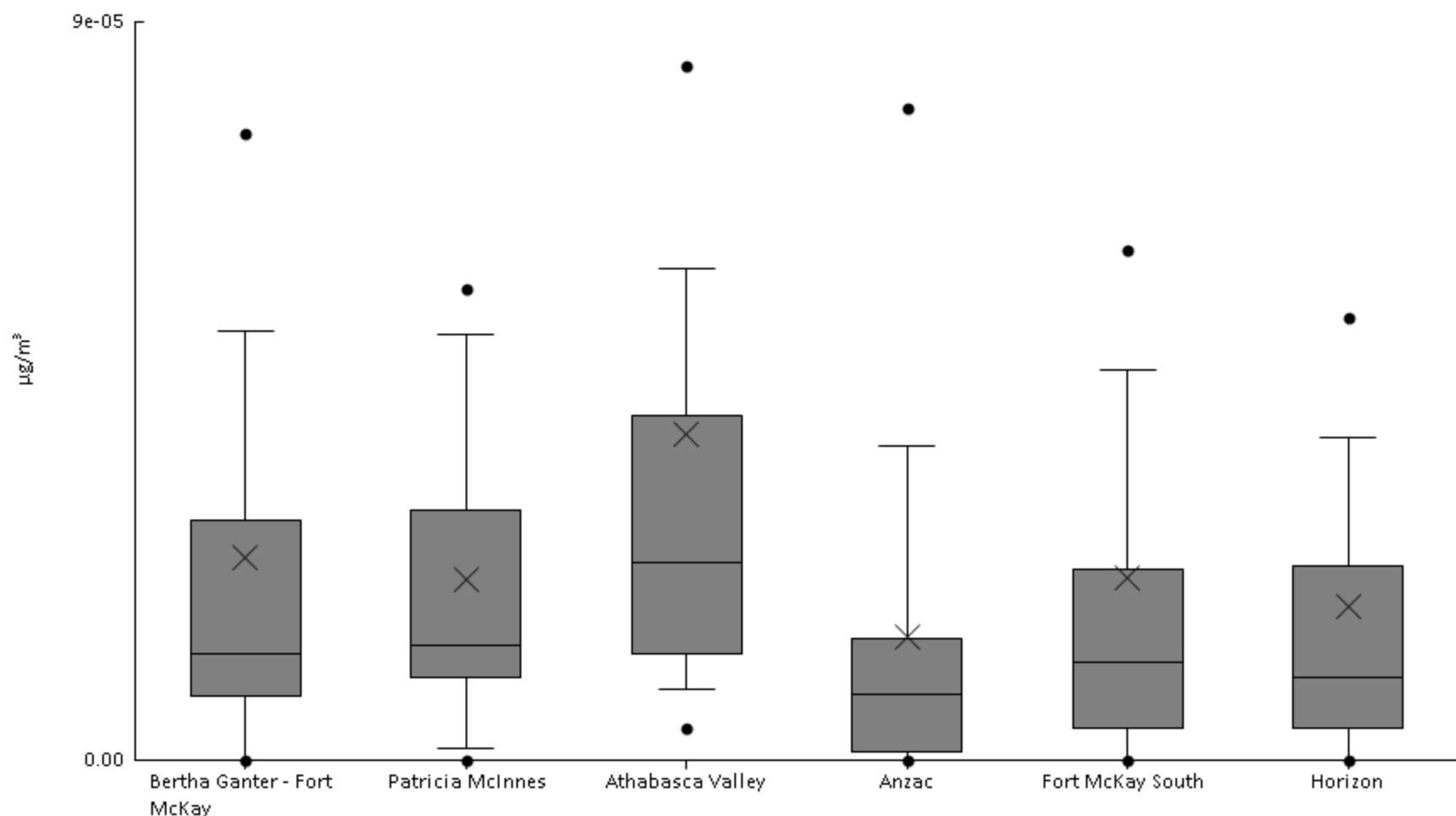
Particulate Matter (PM10 METALS) - Beryllium ($\mu\text{g}/\text{m}^3$) - 2019

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	4E-6	1E-5	3E-5	5.5E-5	8E-5	1.9E-4	2.2E-5	3.2E-5
AMS06	Patricia McInnes	60	20%	0	0	0	0	3E-6	1E-5	3.8E-5	7.1E-5	8.7E-5	1.2E-5	2.1E-5
AMS07	Athabasca Valley	58	38%	0	0	0	0	1E-5	2E-5	3.6E-5	5.1E-5	4.1E-4	1.9E-5	5.4E-5
AMS14	Anzac	59	12%	0	0	0	0	1E-6	8.8E-6	1.7E-5	6.8E-5	1.4E-4	1.1E-5	2.8E-5
AMS13	Fort McKay South	61	33%	0	0	0	0	7E-6	1.7E-5	4.4E-5	6.3E-5	2.2E-4	1.7E-5	3.3E-5
AMS15	Horizon	61	44%	0	0	0	2.5E-6	1.1E-5	2.4E-5	7.8E-5	1E-4	1.3E-4	2.2E-5	3E-5



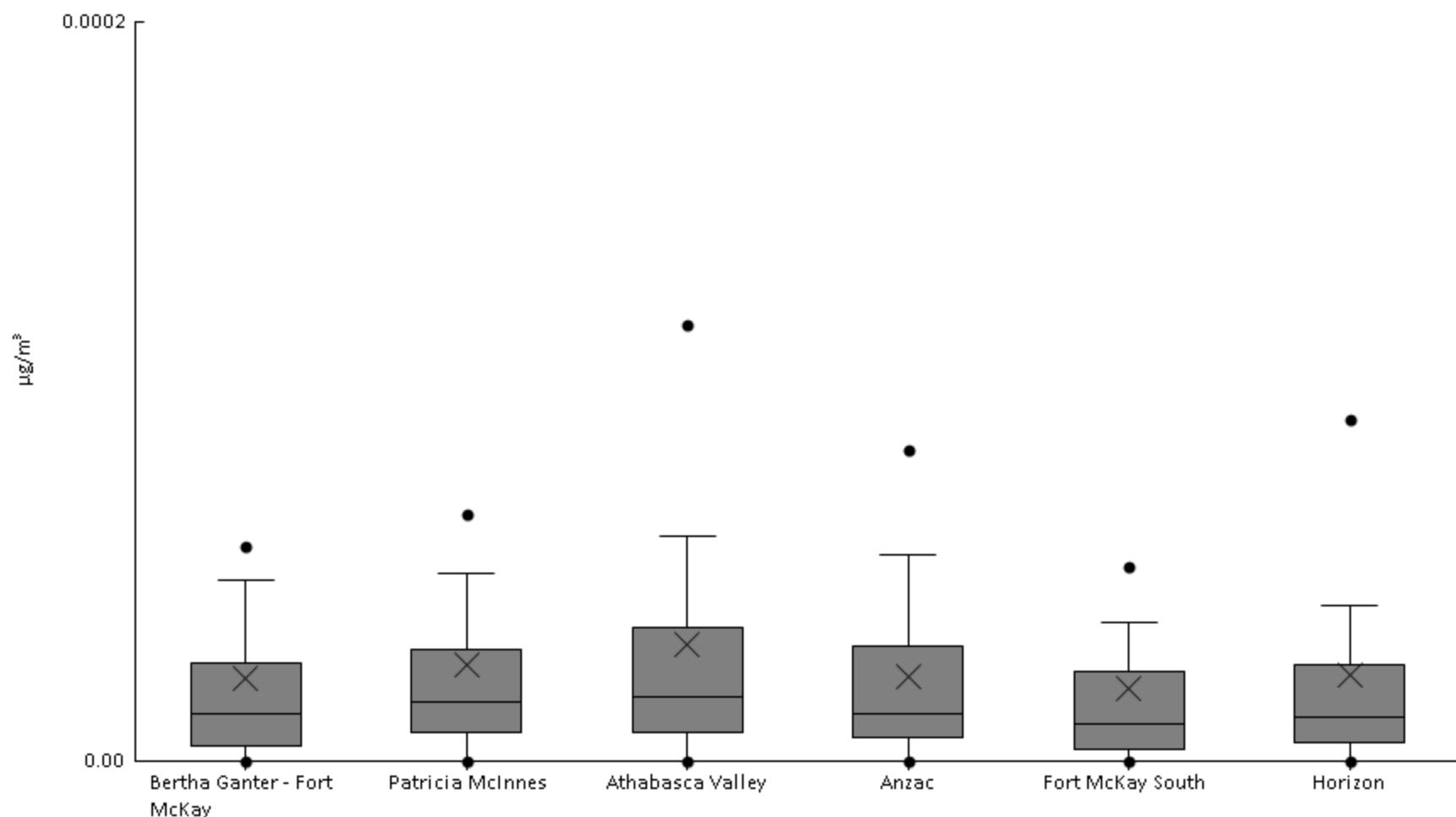
Particulate Matter (PM10 METALS) - Bismuth ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	84%	0	0	7.8E-6	1.3E-5	2.9E-5	5.2E-5	7.6E-5	3E-4	2.5E-5	4.1E-5	
AMS06	Patricia McInnes	60	88%	0	0	1.5E-6	1E-5	1.4E-5	3.1E-5	5.2E-5	5.8E-5	9E-5	2.2E-5	2E-5
AMS07	Athabasca Valley	58	93%	0	4E-6	8.6E-6	1.3E-5	2.4E-5	4.2E-5	6E-5	8.5E-5	5.9E-4	4E-5	7.7E-5
AMS14	Anzac	59	66%	0	0	0	1E-6	8E-6	1.5E-5	3.8E-5	8E-5	1.2E-4	1.5E-5	2.4E-5
AMS13	Fort McKay South	61	77%	0	0	0	4E-6	1.2E-5	2.3E-5	4.8E-5	6.2E-5	3.1E-4	2.2E-5	4.2E-5
AMS15	Horizon	61	74%	0	0	0	4E-6	1E-5	2.4E-5	3.9E-5	5.4E-5	1.6E-4	1.9E-5	2.6E-5



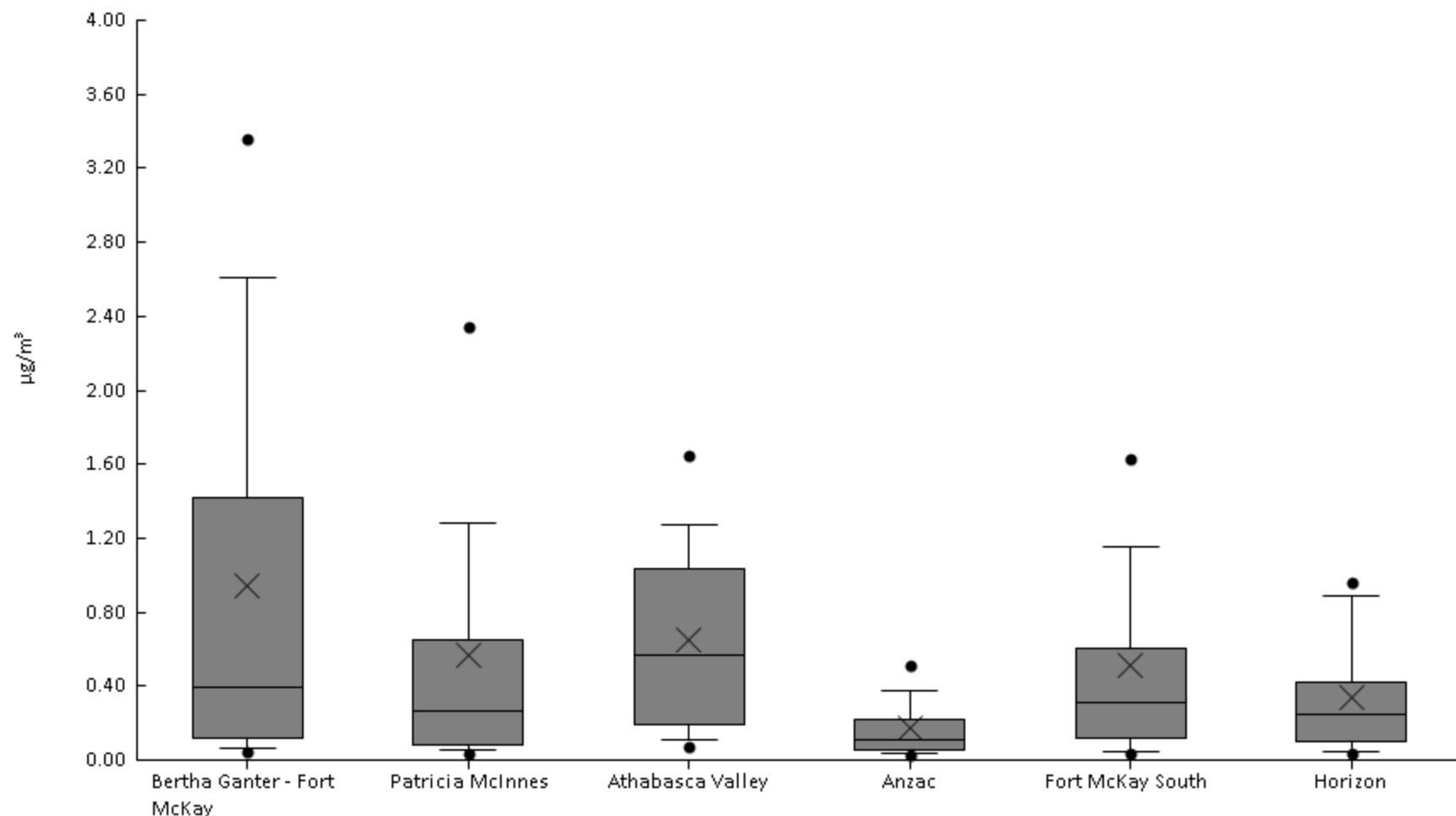
Particulate Matter (PM10 METALS) - Cadmium ($\mu\text{g}/\text{m}^3$) - 2019

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	4E-6	1.3E-5	2.7E-5	4.9E-5	5.8E-5	2.6E-4	2.2E-5	3.6E-5	
AMS06	Patricia McInnes	60	67%	0	0	0	8E-6	1.6E-5	3E-5	5.1E-5	6.7E-5	3.4E-4	2.6E-5	4.6E-5	
AMS07	Athabasca Valley	58	69%	0	0	0	8E-6	1.8E-5	3.6E-5	6.1E-5	1.2E-4	3.2E-4	3.1E-5	5.1E-5	
AMS14	Anzac	59	54%	0	0	0	0	6.3E-6	1.3E-5	3.1E-5	5.6E-5	8.4E-5	1.2E-4	2.3E-5	2.6E-5
AMS13	Fort McKay South	61	46%	0	0	0	0	3E-6	1E-5	2.4E-5	3.8E-5	5.3E-5	2.4E-4	2E-5	3.5E-5
AMS15	Horizon	61	54%	0	0	0	0	5E-6	1.2E-5	2.6E-5	4.2E-5	9.3E-5	2.1E-4	2.3E-5	3.8E-5



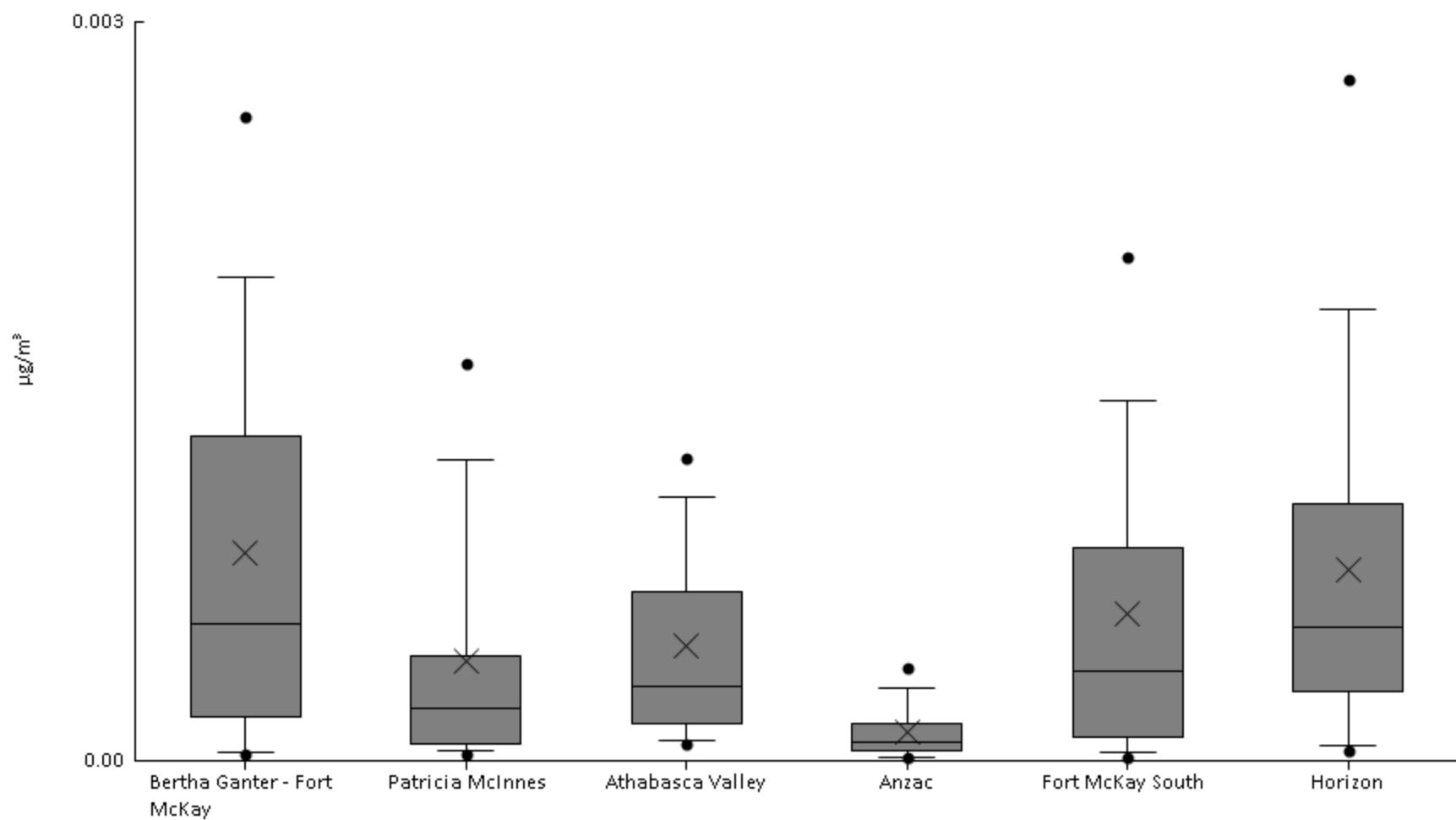
Particulate Matter (PM10 METALS) - Calcium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.025	0.045	0.065	0.12	0.39	1.4	2.6	3.4	5.4	0.95	1.2
AMS06	Patricia McInnes	60	100%	0.025	0.04	0.053	0.082	0.27	0.65	1.3	2.3	4.1	0.57	0.8
AMS07	Athabasca Valley	58	100%	0.051	0.077	0.11	0.19	0.56	1	1.3	1.6	2.9	0.65	0.55
AMS14	Anzac	59	100%	0.022	0.024	0.037	0.056	0.11	0.22	0.37	0.51	1.1	0.18	0.18
AMS13	Fort McKay South	61	100%	0.026	0.032	0.046	0.12	0.31	0.6	1.1	1.6	5	0.51	0.77
AMS15	Horizon	61	100%	0.024	0.033	0.043	0.1	0.25	0.42	0.89	0.96	1.4	0.34	0.32



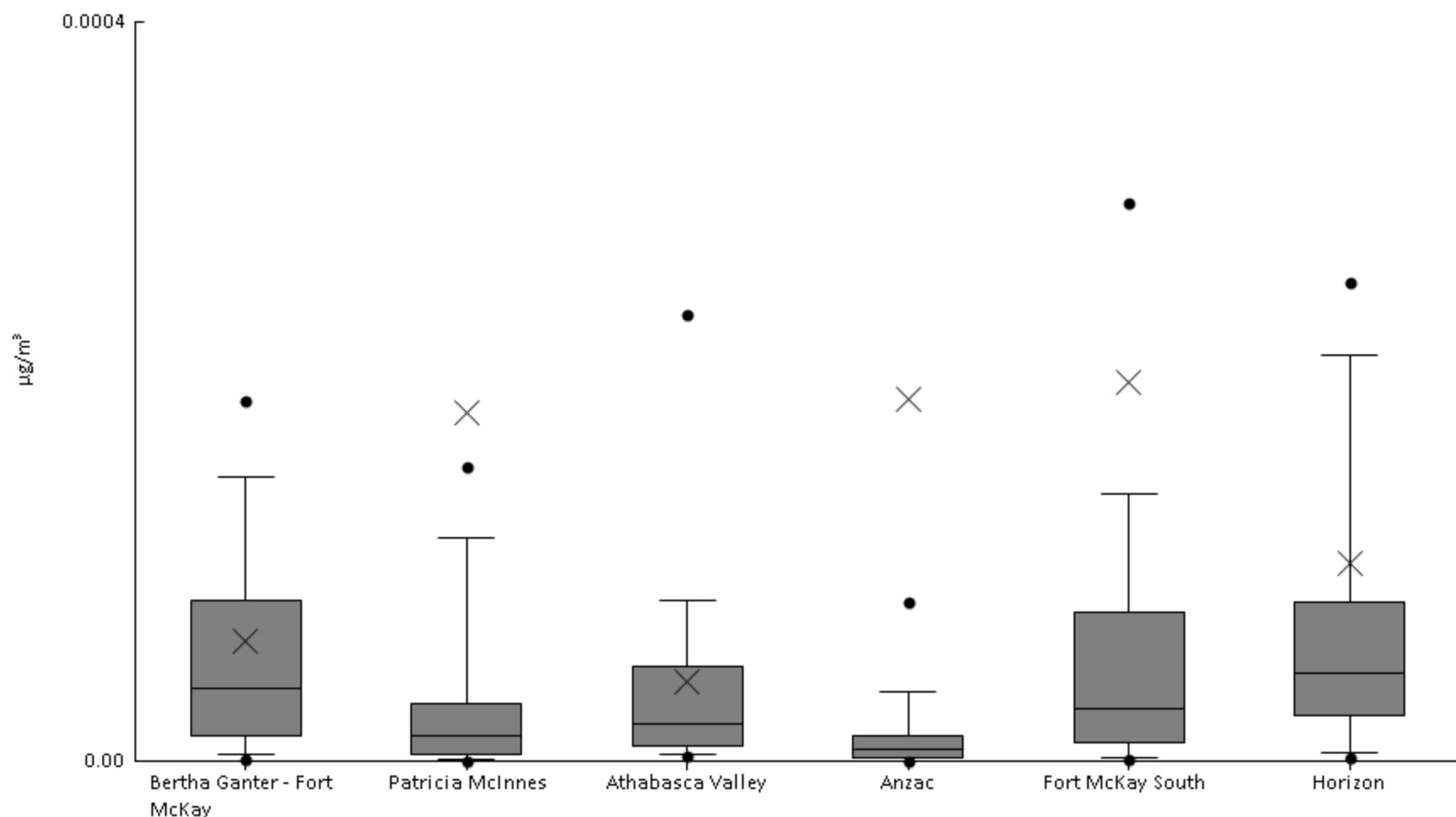
Particulate Matter (PM10 METALS) - Cerium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	1E-5	2.7E-5	3.7E-5	1.8E-4	5.5E-4	1.3E-3	2E-3	2.6E-3	5.3E-3	8.4E-4	9.4E-4
AMS06	Patricia McInnes	60	98%	4E-6	2.9E-5	3.9E-5	7E-5	2.2E-4	4.2E-4	1.2E-3	1.6E-3	2.3E-3	4E-4	5.3E-4
AMS07	Athabasca Valley	58	100%	2.9E-5	6.8E-5	8.6E-5	1.5E-4	3E-4	6.9E-4	1.1E-3	1.2E-3	2.3E-3	4.7E-4	4.3E-4
AMS14	Anzac	59	95%	1E-6	1.3E-5	1.5E-5	4E-5	7.8E-5	1.5E-4	3E-4	3.8E-4	5.9E-4	1.2E-4	1.2E-4
AMS13	Fort McKay South	61	97%	8E-6	1.6E-5	3.6E-5	9.7E-5	3.6E-4	8.7E-4	1.5E-3	2E-3	3.1E-3	6E-4	6.5E-4
AMS15	Horizon	61	97%	2E-6	4.1E-5	6.4E-5	2.8E-4	5.5E-4	1E-3	1.8E-3	2.8E-3	3.3E-3	7.8E-4	7.6E-4



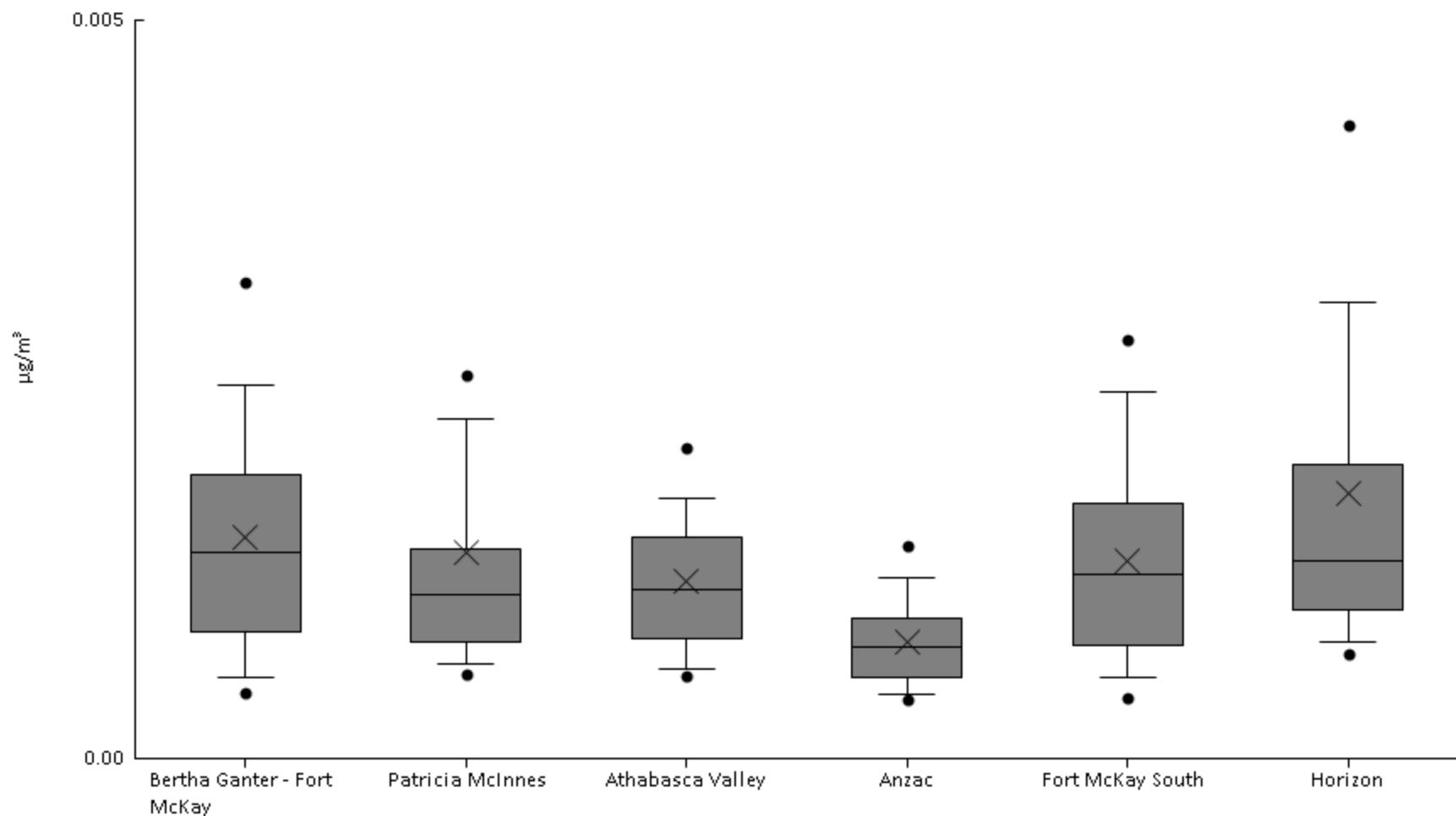
Particulate Matter (PM10 METALS) - Cesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	5.5E-7	4E-6	1.4E-5	3.9E-5	8.7E-5	1.5E-4	2E-4	3.8E-4	6.5E-5	7.2E-5
AMS06	Patricia McInnes	60	77%	0	0	1E-6	4E-6	1.4E-5	3.2E-5	1.2E-4	1.6E-4	9.1E-3	1.9E-4	1.2E-3
AMS07	Athabasca Valley	58	86%	1E-6	2.4E-6	4E-6	8E-6	2E-5	5.1E-5	8.7E-5	2.4E-4	3.8E-4	4.3E-5	7.1E-5
AMS14	Anzac	59	63%	0	0	0	2E-6	6E-6	1.4E-5	3.7E-5	8.6E-5	0.011	2E-4	1.4E-3
AMS13	Fort McKay South	61	89%	0	1.1E-6	2E-6	1E-5	2.8E-5	8.1E-5	1.4E-4	3E-4	5.4E-3	2.1E-4	8.5E-4
AMS15	Horizon	61	93%	0	1.6E-6	4.6E-6	2.5E-5	4.8E-5	8.6E-5	2.2E-4	2.6E-4	2.3E-3	1.1E-4	3E-4



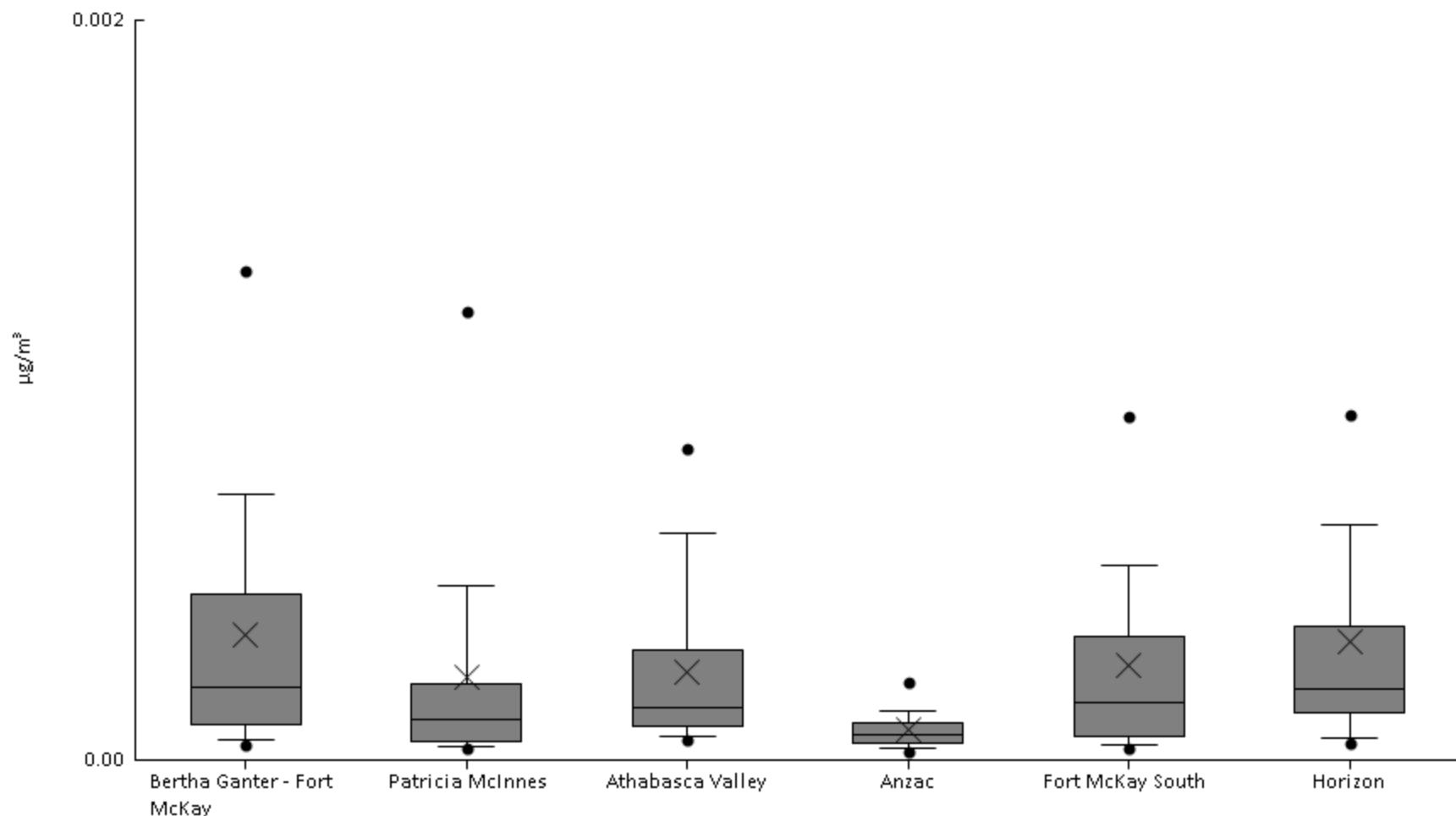
Particulate Matter (PM10 METALS) - Chromium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.3E-4	4.5E-4	5.5E-4	8.5E-4	1.4E-3	1.9E-3	2.5E-3	3.2E-3	4.7E-3	1.5E-3	8.6E-4
AMS06	Patricia McInnes	60	100%	3.6E-4	5.8E-4	6.5E-4	7.9E-4	1.1E-3	1.4E-3	2.3E-3	2.6E-3	0.011	1.4E-3	1.5E-3
AMS07	Athabasca Valley	58	100%	4.7E-4	5.6E-4	6E-4	8.1E-4	1.1E-3	1.5E-3	1.8E-3	2.1E-3	3.3E-3	1.2E-3	5.5E-4
AMS14	Anzac	59	100%	3.7E-4	4E-4	4.3E-4	5.5E-4	7.6E-4	9.6E-4	1.2E-3	1.4E-3	1.9E-3	7.9E-4	3.2E-4
AMS13	Fort McKay South	61	100%	2.1E-4	4.2E-4	5.5E-4	7.6E-4	1.3E-3	1.7E-3	2.5E-3	2.8E-3	3.5E-3	1.3E-3	7.6E-4
AMS15	Horizon	61	100%	6.3E-4	7E-4	7.9E-4	1E-3	1.3E-3	2E-3	3.1E-3	4.3E-3	9.9E-3	1.8E-3	1.5E-3



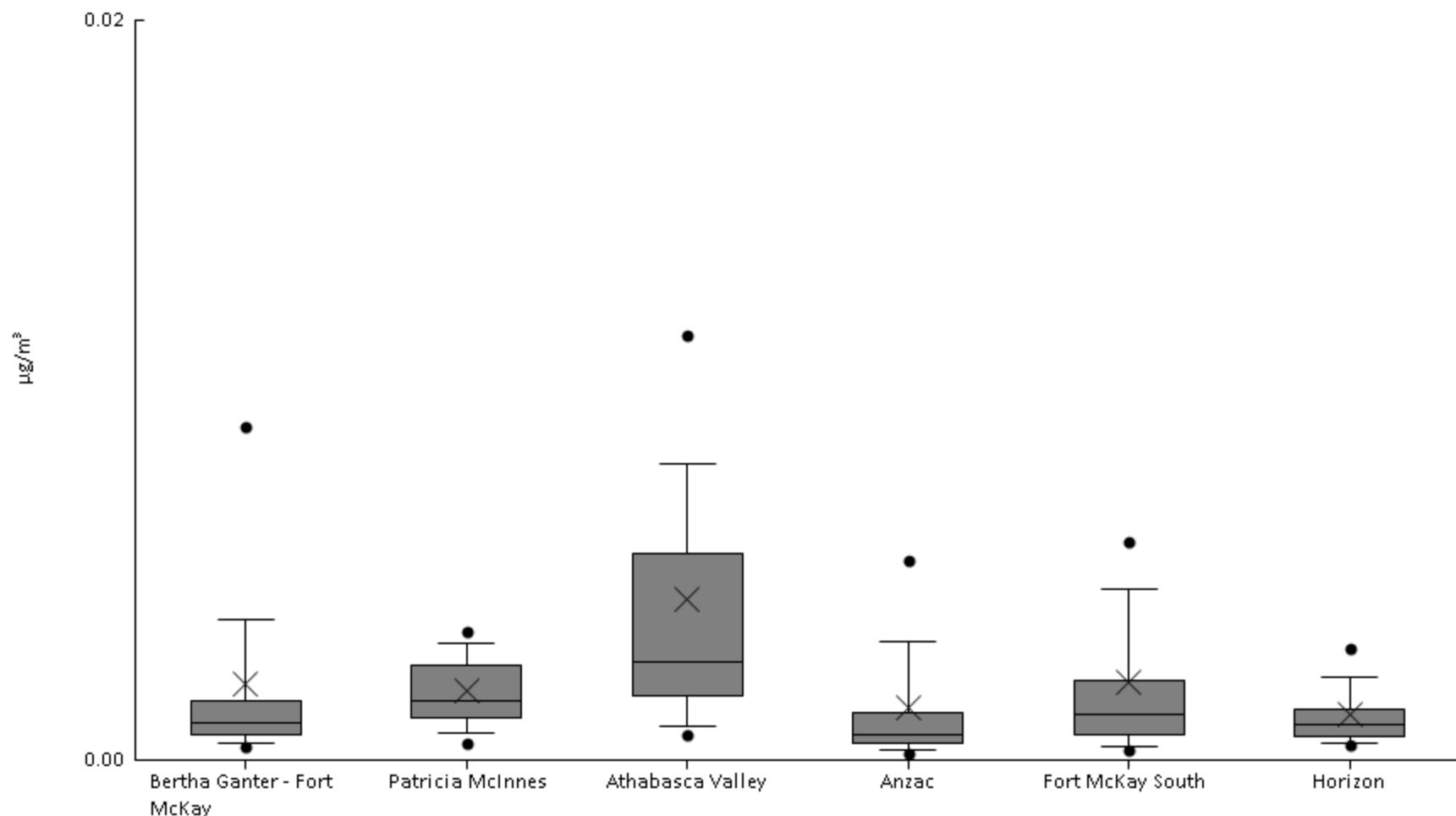
Particulate Matter (PM10 METALS) - Cobalt ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	2.9E-5	4.2E-5	5.6E-5	9.7E-5	2E-4	4.5E-4	7.2E-4	1.3E-3	1.9E-3	3.4E-4	3.9E-4
AMS06	Patricia McInnes	60	100%	2E-5	3.4E-5	3.9E-5	5.2E-5	1.1E-4	2.1E-4	4.7E-4	1.2E-3	1.8E-3	2.2E-4	3.5E-4
AMS07	Athabasca Valley	58	100%	5.1E-5	5.5E-5	6.4E-5	9.2E-5	1.4E-4	3E-4	6.1E-4	8.4E-4	1.1E-3	2.4E-4	2.4E-4
AMS14	Anzac	59	100%	1.7E-5	2.1E-5	3.2E-5	4.7E-5	6.9E-5	1E-4	1.3E-4	2.1E-4	3.4E-4	8.2E-5	5.8E-5
AMS13	Fort McKay South	61	100%	1.7E-5	3.1E-5	4E-5	6.6E-5	1.6E-4	3.4E-4	5.3E-4	9.3E-4	1.5E-3	2.5E-4	2.9E-4
AMS15	Horizon	61	100%	3.4E-5	4.5E-5	5.9E-5	1.3E-4	1.9E-4	3.6E-4	6.4E-4	9.4E-4	2.2E-3	3.2E-4	3.8E-4



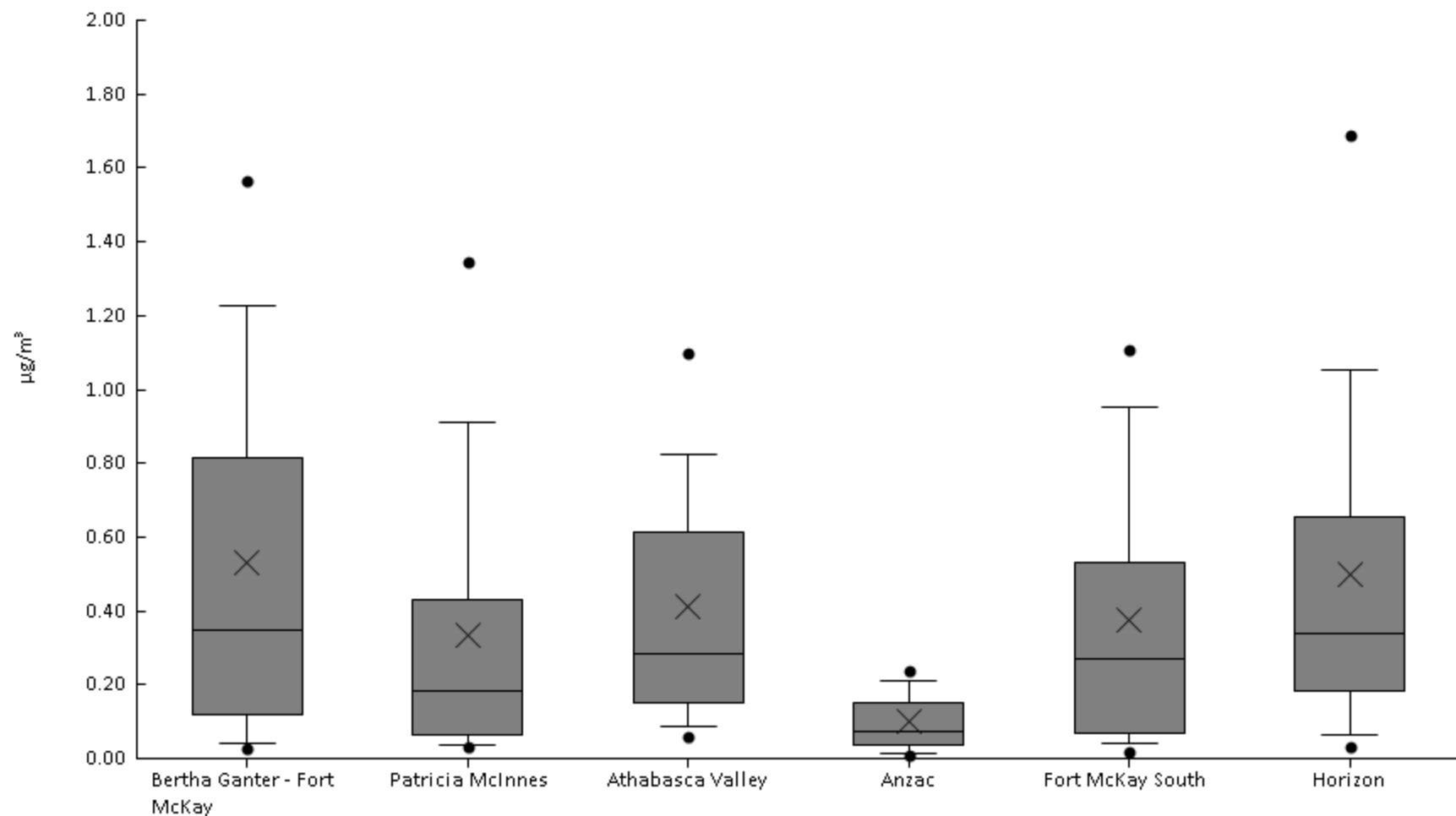
Particulate Matter (PM10 METALS) - Copper ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.8E-4	3.8E-4	4.4E-4	7E-4	1E-3	1.6E-3	3.8E-3	9E-3	0.025	2.1E-3	3.8E-3
AMS06	Patricia McInnes	60	100%	3.7E-4	4.5E-4	7.5E-4	1.1E-3	1.6E-3	2.6E-3	3.2E-3	3.5E-3	5.6E-3	1.9E-3	1.1E-3
AMS07	Athabasca Valley	58	100%	4.7E-4	6.8E-4	9.3E-4	1.8E-3	2.7E-3	5.6E-3	8E-3	0.011	0.035	4.4E-3	5.1E-3
AMS14	Anzac	59	100%	8.8E-5	2E-4	2.9E-4	4.6E-4	7.1E-4	1.3E-3	3.2E-3	5.4E-3	0.014	1.4E-3	2.2E-3
AMS13	Fort McKay South	61	100%	1.6E-4	2.7E-4	3.8E-4	6.8E-4	1.2E-3	2.2E-3	4.6E-3	5.9E-3	0.021	2.1E-3	3.1E-3
AMS15	Horizon	61	100%	1.8E-4	4E-4	4.8E-4	6.2E-4	9.7E-4	1.4E-3	2.2E-3	3E-3	5.4E-3	1.2E-3	9.1E-4



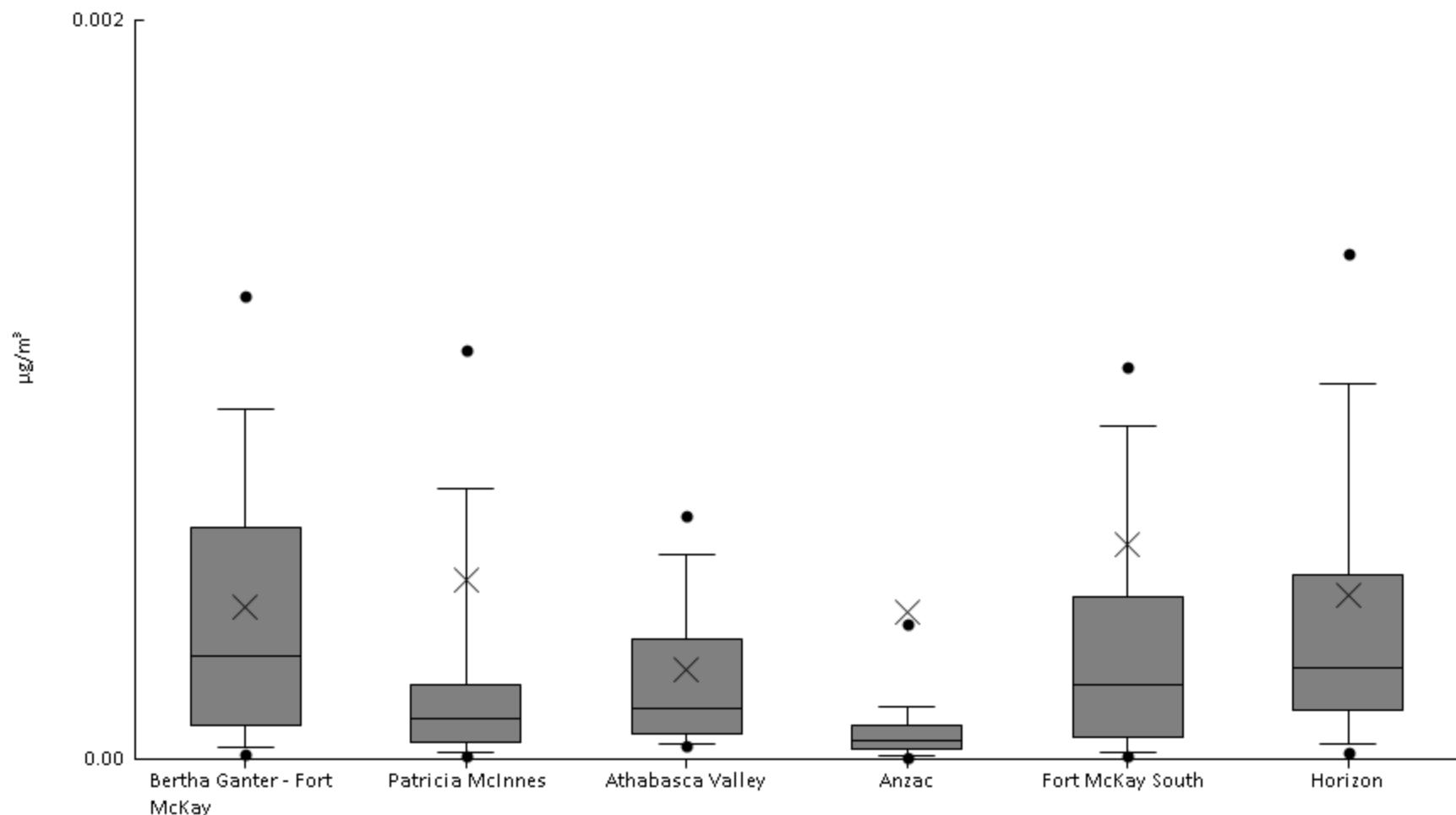
Particulate Matter (PM10 METALS) - Iron ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.019	0.027	0.04	0.12	0.35	0.81	1.2	1.6	2.3	0.53	0.51
AMS06	Patricia McInnes	60	100%	0.018	0.03	0.035	0.062	0.18	0.43	0.91	1.3	2.3	0.33	0.44
AMS07	Athabasca Valley	58	100%	0.053	0.062	0.085	0.15	0.28	0.61	0.82	1.1	1.7	0.41	0.36
AMS14	Anzac	59	100%	9.1E-3	0.011	0.015	0.037	0.074	0.15	0.21	0.24	0.43	0.1	0.086
AMS13	Fort McKay South	61	100%	0.014	0.021	0.039	0.071	0.27	0.53	0.95	1.1	1.6	0.38	0.37
AMS15	Horizon	61	100%	0.019	0.031	0.063	0.18	0.34	0.66	1.1	1.7	2.3	0.5	0.48



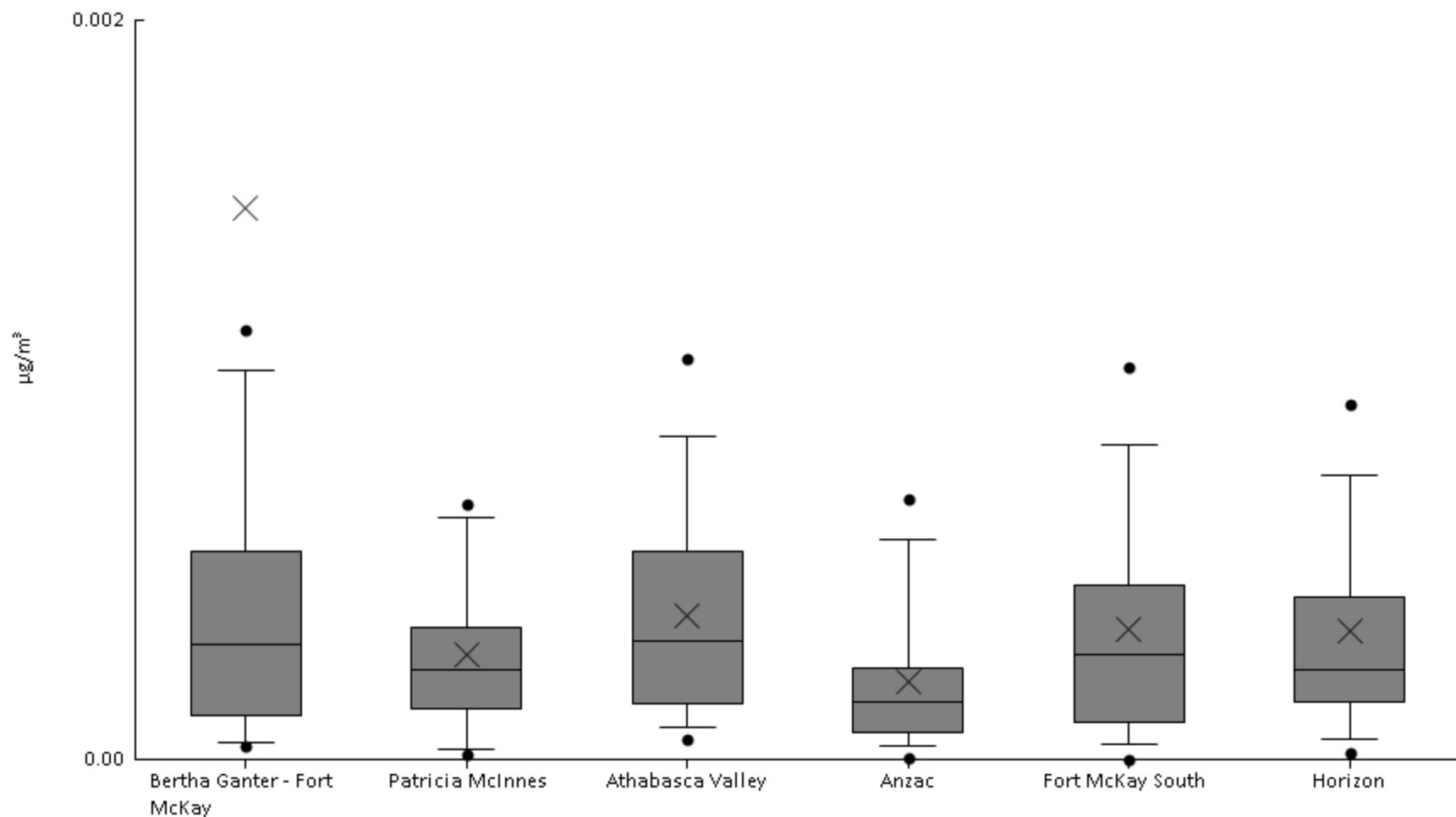
Particulate Matter (PM10 METALS) - Lanthanum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	2E-6	1.3E-5	3.4E-5	9E-5	2.8E-4	6.3E-4	9.5E-4	1.3E-3	2.4E-3	4.1E-4	4.5E-4
AMS06	Patricia McInnes	60	98%	0	1E-5	1.7E-5	4.4E-5	1.1E-4	2E-4	7.3E-4	1.1E-3	0.016	4.9E-4	2.1E-3
AMS07	Athabasca Valley	58	100%	1.1E-5	3.6E-5	4.3E-5	7E-5	1.4E-4	3.3E-4	5.5E-4	6.6E-4	1.7E-3	2.4E-4	2.8E-4
AMS14	Anzac	59	98%	0	6.5E-6	1.1E-5	2.7E-5	5E-5	9E-5	1.4E-4	3.7E-4	0.019	4E-4	2.5E-3
AMS13	Fort McKay South	61	98%	0	8.6E-6	1.9E-5	5.8E-5	2E-4	4.4E-4	9E-4	1.1E-3	0.01	5.8E-4	1.7E-3
AMS15	Horizon	61	98%	2E-6	2E-5	4E-5	1.3E-4	2.5E-4	5E-4	1E-3	1.4E-3	4.2E-3	4.4E-4	6.2E-4



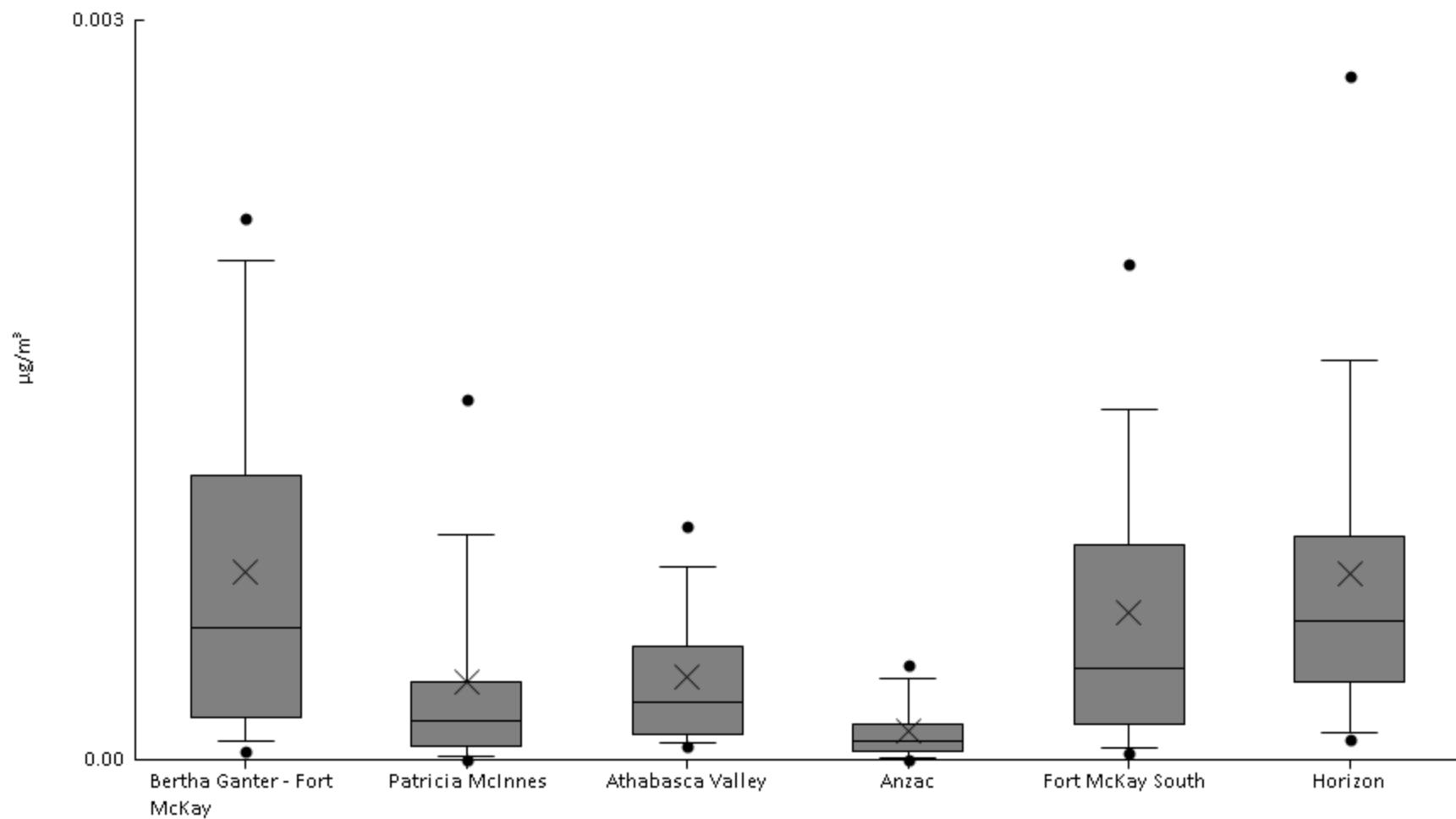
Particulate Matter (PM10 METALS) - Lead ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	3.5E-5	4.6E-5	1.2E-4	3.1E-4	5.6E-4	1.1E-3	1.2E-3	0.067	1.5E-3	8.5E-3
AMS06	Patricia McInnes	60	95%	0	1.5E-5	2.7E-5	1.4E-4	2.4E-4	3.6E-4	6.5E-4	6.9E-4	1.2E-3	2.8E-4	2.4E-4
AMS07	Athabasca Valley	58	98%	0	5.6E-5	8.8E-5	1.5E-4	3.2E-4	5.6E-4	8.7E-4	1.1E-3	1.6E-3	3.9E-4	3.3E-4
AMS14	Anzac	59	93%	0	4.5E-6	3.9E-5	7.5E-5	1.6E-4	2.5E-4	6E-4	7.1E-4	8.7E-4	2.1E-4	2.1E-4
AMS13	Fort McKay South	61	93%	0	0	4E-5	1E-4	2.8E-4	4.7E-4	8.5E-4	1.1E-3	1.5E-3	3.5E-4	3.4E-4
AMS15	Horizon	61	95%	0	1.9E-5	5.4E-5	1.5E-4	2.4E-4	4.4E-4	7.7E-4	9.6E-4	1.1E-3	3.5E-4	2.6E-4



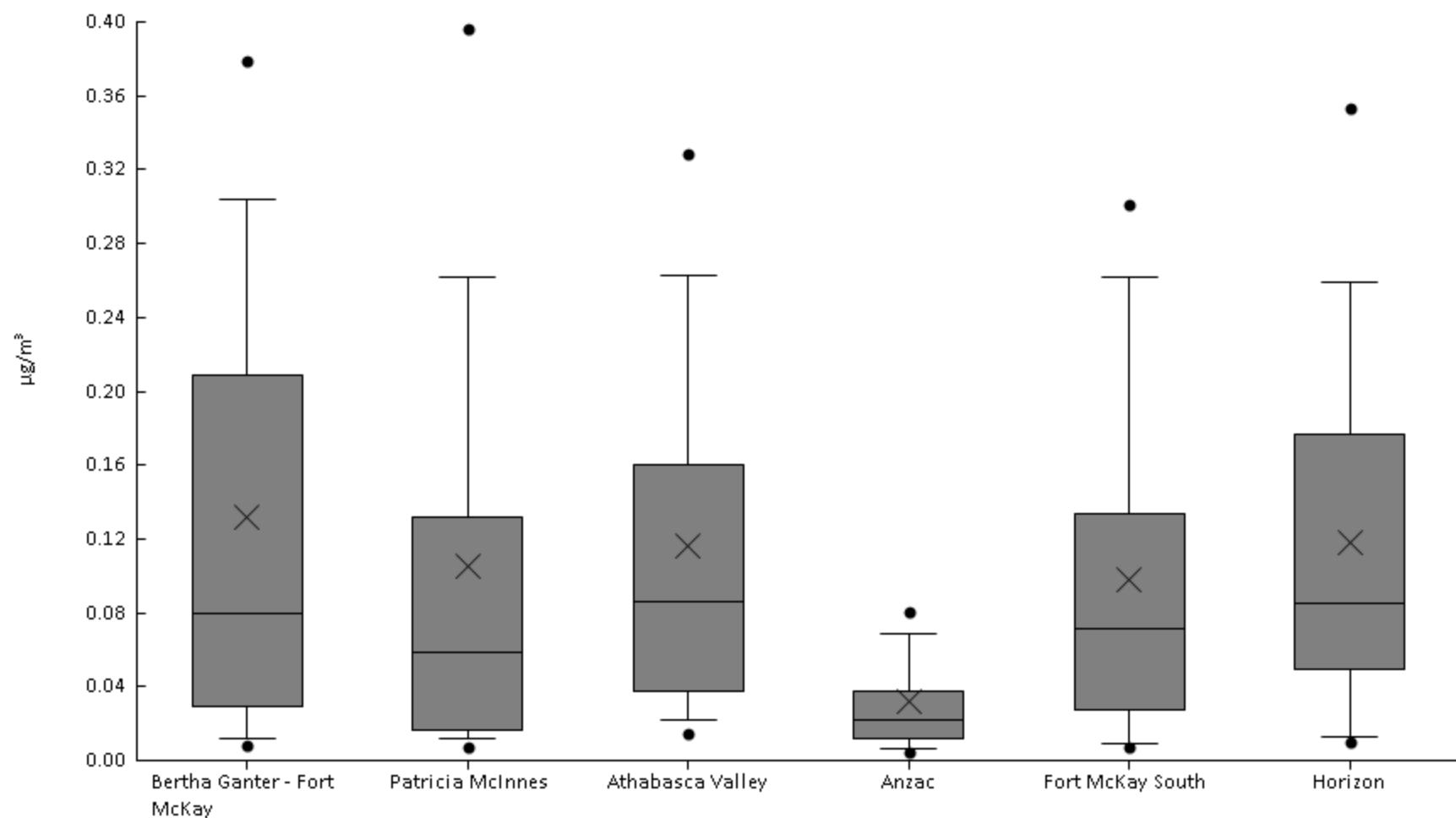
Particulate Matter (PM10 METALS) - Lithium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	3.6E-5	7.2E-5	1.7E-4	5.4E-4	1.2E-3	2E-3	2.2E-3	3.9E-3	7.7E-4	7.9E-4
AMS06	Patricia McInnes	60	90%	0	0	1.3E-5	5.5E-5	1.6E-4	3.2E-4	9.1E-4	1.5E-3	1.7E-3	3.1E-4	4.2E-4
AMS07	Athabasca Valley	58	98%	0	5.3E-5	7E-5	1.1E-4	2.3E-4	4.6E-4	7.8E-4	9.4E-4	1.3E-3	3.4E-4	3.1E-4
AMS14	Anzac	59	86%	0	0	8.2E-6	3.7E-5	7.3E-5	1.4E-4	3.3E-4	3.9E-4	5E-4	1.1E-4	1.2E-4
AMS13	Fort McKay South	61	95%	0	2.5E-5	4.7E-5	1.4E-4	3.7E-4	8.8E-4	1.4E-3	2E-3	3.1E-3	6E-4	6.2E-4
AMS15	Horizon	61	97%	3E-6	8E-5	1.1E-4	3.1E-4	5.6E-4	9.1E-4	1.6E-3	2.8E-3	3E-3	7.6E-4	7.1E-4



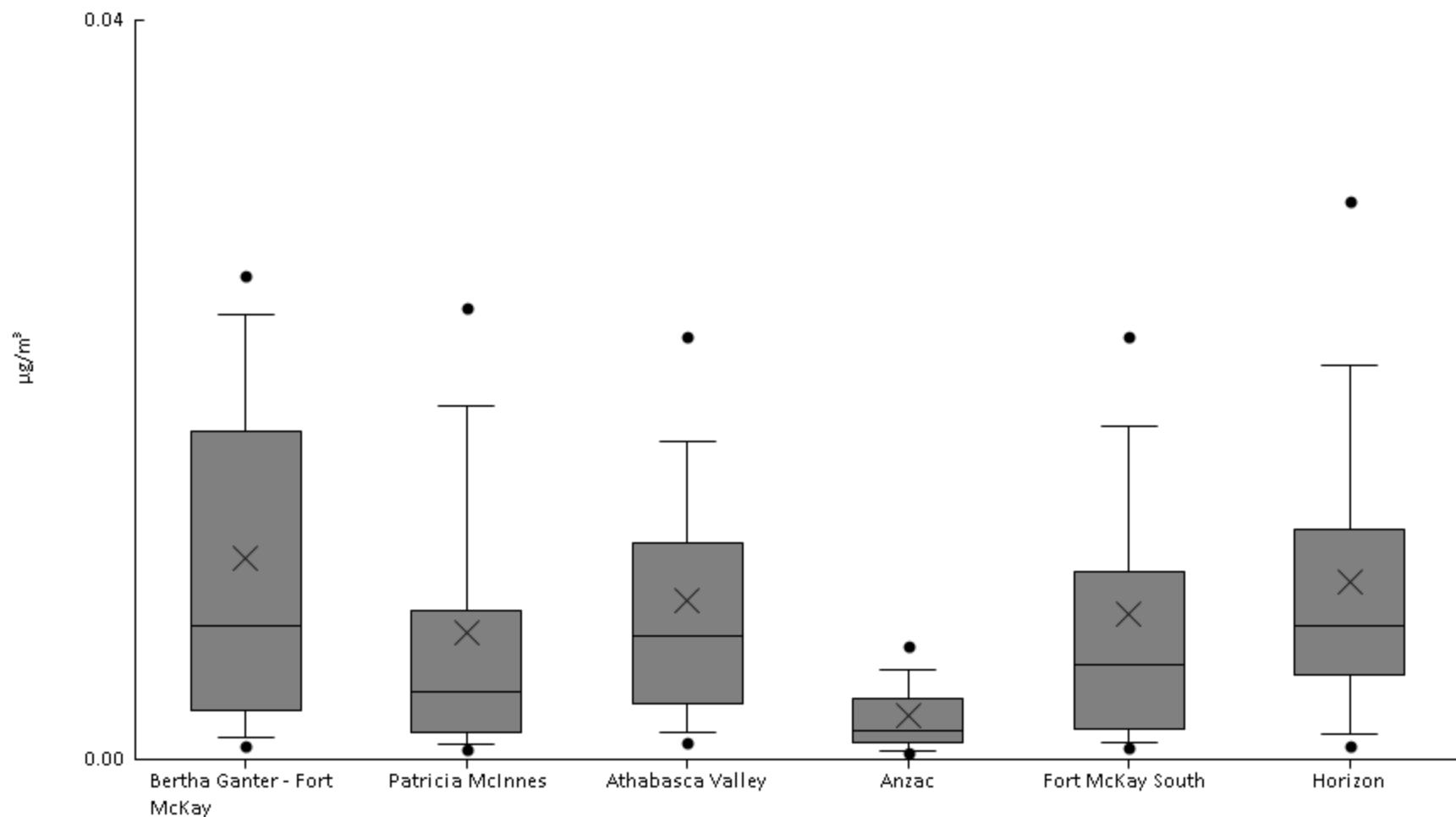
Particulate Matter (PM10 METALS) - Magnesium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4.9E-3	7.8E-3	0.012	0.03	0.08	0.21	0.3	0.38	0.57	0.13	0.13
AMS06	Patricia McInnes	60	100%	3.5E-3	7.3E-3	0.012	0.016	0.058	0.13	0.26	0.4	0.85	0.1	0.15
AMS07	Athabasca Valley	58	100%	9E-3	0.014	0.022	0.037	0.086	0.16	0.26	0.33	0.43	0.12	0.098
AMS14	Anzac	59	100%	3E-3	4.6E-3	6.3E-3	0.012	0.022	0.038	0.069	0.08	0.21	0.032	0.034
AMS13	Fort McKay South	61	100%	7.5E-4	7E-3	9.2E-3	0.028	0.072	0.13	0.26	0.3	0.42	0.098	0.096
AMS15	Horizon	61	100%	7.2E-3	0.01	0.013	0.049	0.085	0.18	0.26	0.35	0.5	0.12	0.11



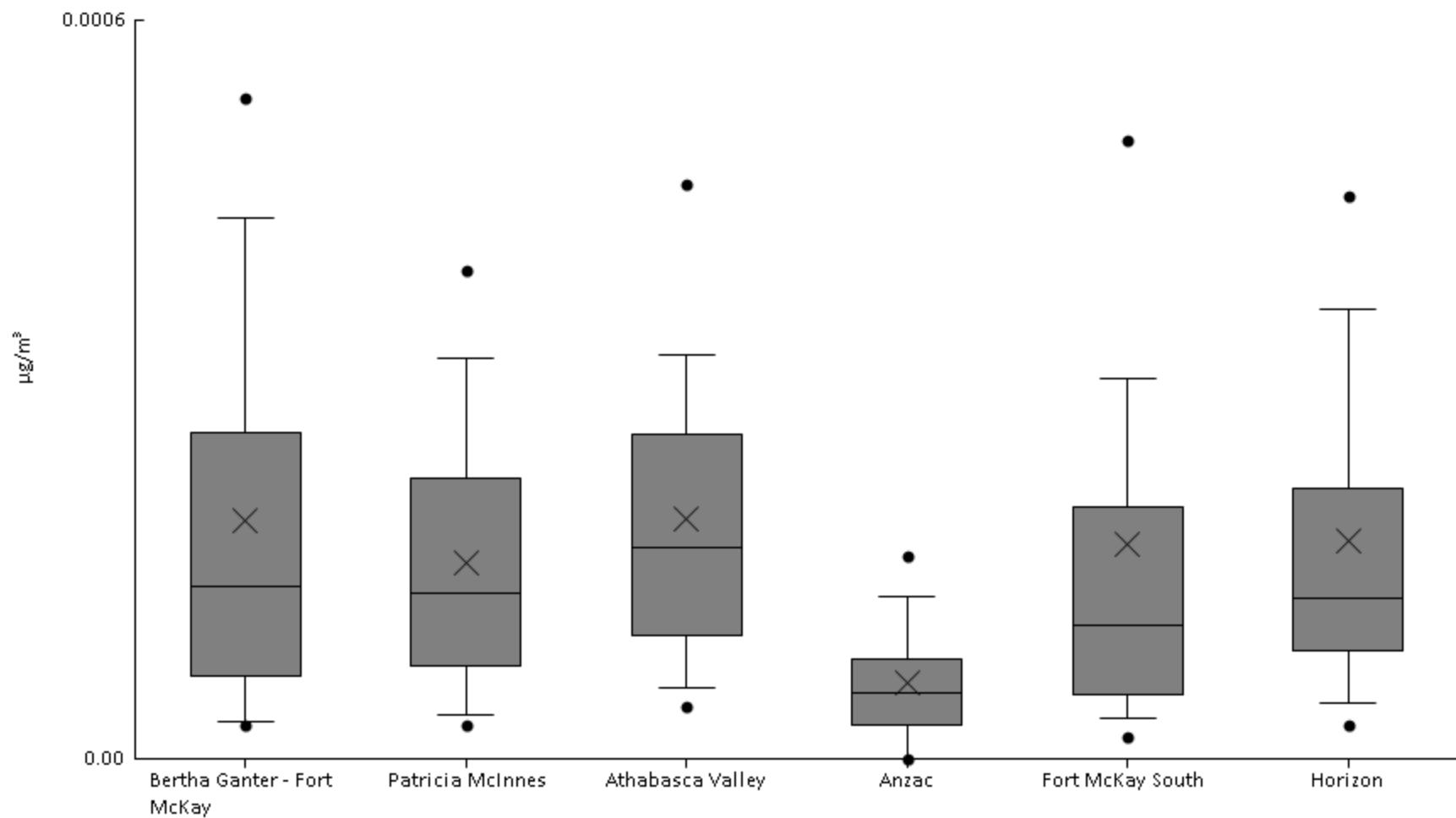
Particulate Matter (PM10 METALS) - Manganese ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.2E-4	7.6E-4	1.2E-3	2.6E-3	7.2E-3	0.018	0.024	0.026	0.067	0.011	0.011
AMS06	Patricia McInnes	60	100%	3.7E-4	5.1E-4	8.2E-4	1.5E-3	3.7E-3	8.1E-3	0.019	0.024	0.047	6.9E-3	9.3E-3
AMS07	Athabasca Valley	58	100%	7.9E-4	9.5E-4	1.5E-3	3.1E-3	6.7E-3	0.012	0.017	0.023	0.045	8.6E-3	8E-3
AMS14	Anzac	59	100%	2.3E-4	3.7E-4	4.5E-4	9E-4	1.6E-3	3.3E-3	4.9E-3	6.2E-3	0.012	2.4E-3	2.3E-3
AMS13	Fort McKay South	61	100%	2.5E-4	6.2E-4	9E-4	1.7E-3	5.1E-3	0.01	0.018	0.023	0.045	7.9E-3	8.5E-3
AMS15	Horizon	61	100%	3.9E-4	7.1E-4	1.3E-3	4.6E-3	7.2E-3	0.012	0.021	0.03	0.033	9.6E-3	8.2E-3



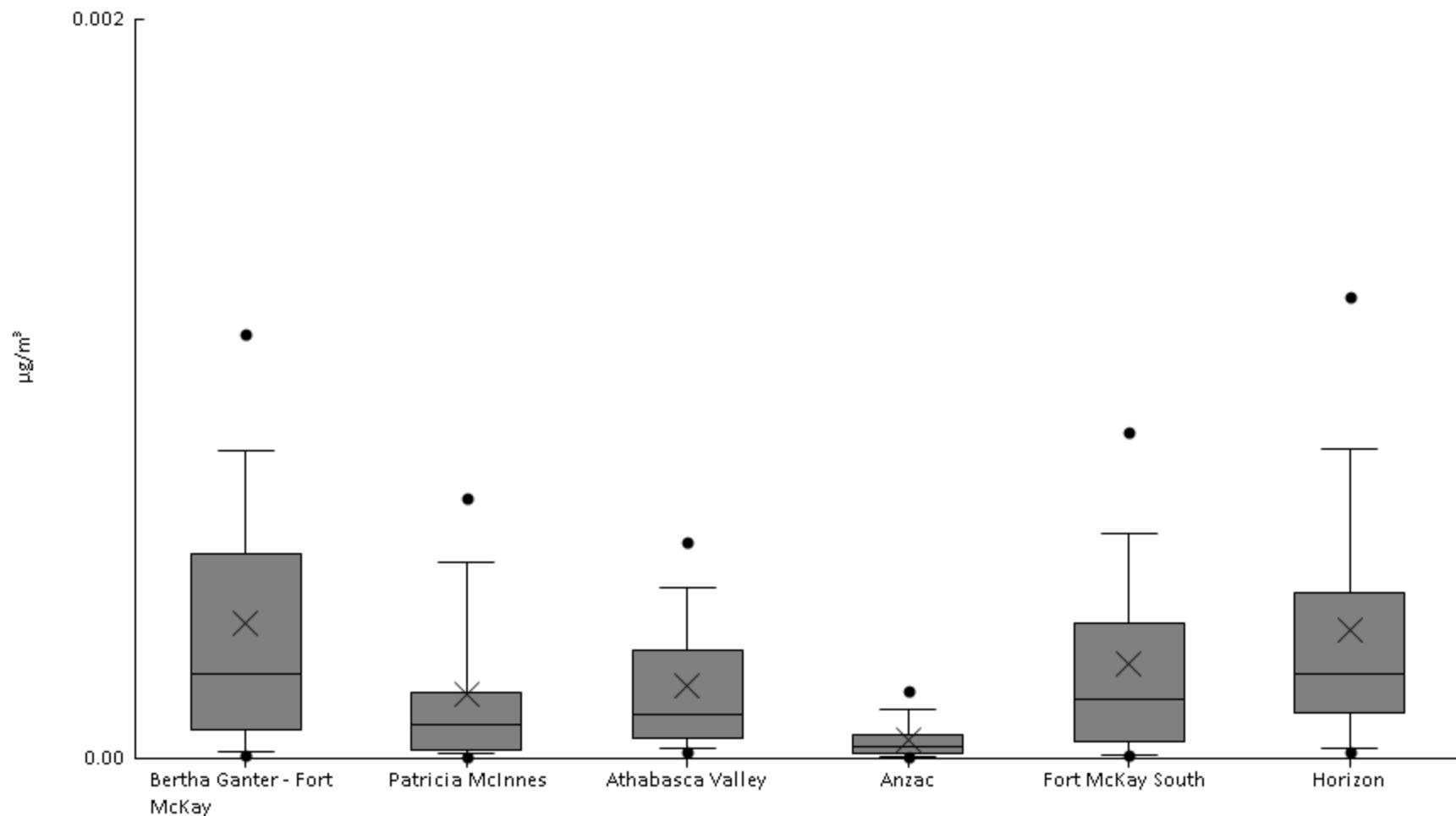
Particulate Matter (PM10 METALS) - Molybdenum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	1E-6	2.7E-5	3.1E-5	6.8E-5	1.4E-4	2.6E-4	4.4E-4	5.4E-4	9E-4	1.9E-4	1.8E-4
AMS06	Patricia McInnes	60	97%	1.2E-5	2.8E-5	3.6E-5	7.5E-5	1.4E-4	2.3E-4	3.3E-4	4E-4	5E-4	1.6E-4	1.1E-4
AMS07	Athabasca Valley	58	97%	2.1E-5	4.3E-5	5.8E-5	1E-4	1.7E-4	2.6E-4	3.3E-4	4.7E-4	6.6E-4	1.9E-4	1.3E-4
AMS14	Anzac	59	76%	0	0	0	2.8E-5	5.3E-5	8.1E-5	1.3E-4	1.6E-4	2.9E-4	6.1E-5	5.4E-5
AMS13	Fort McKay South	61	92%	1E-5	1.7E-5	3.4E-5	5.2E-5	1.1E-4	2.1E-4	3.1E-4	5E-4	1.9E-3	1.7E-4	2.6E-4
AMS15	Horizon	61	95%	0	2.7E-5	4.5E-5	8.9E-5	1.3E-4	2.2E-4	3.7E-4	4.6E-4	7.6E-4	1.8E-4	1.4E-4



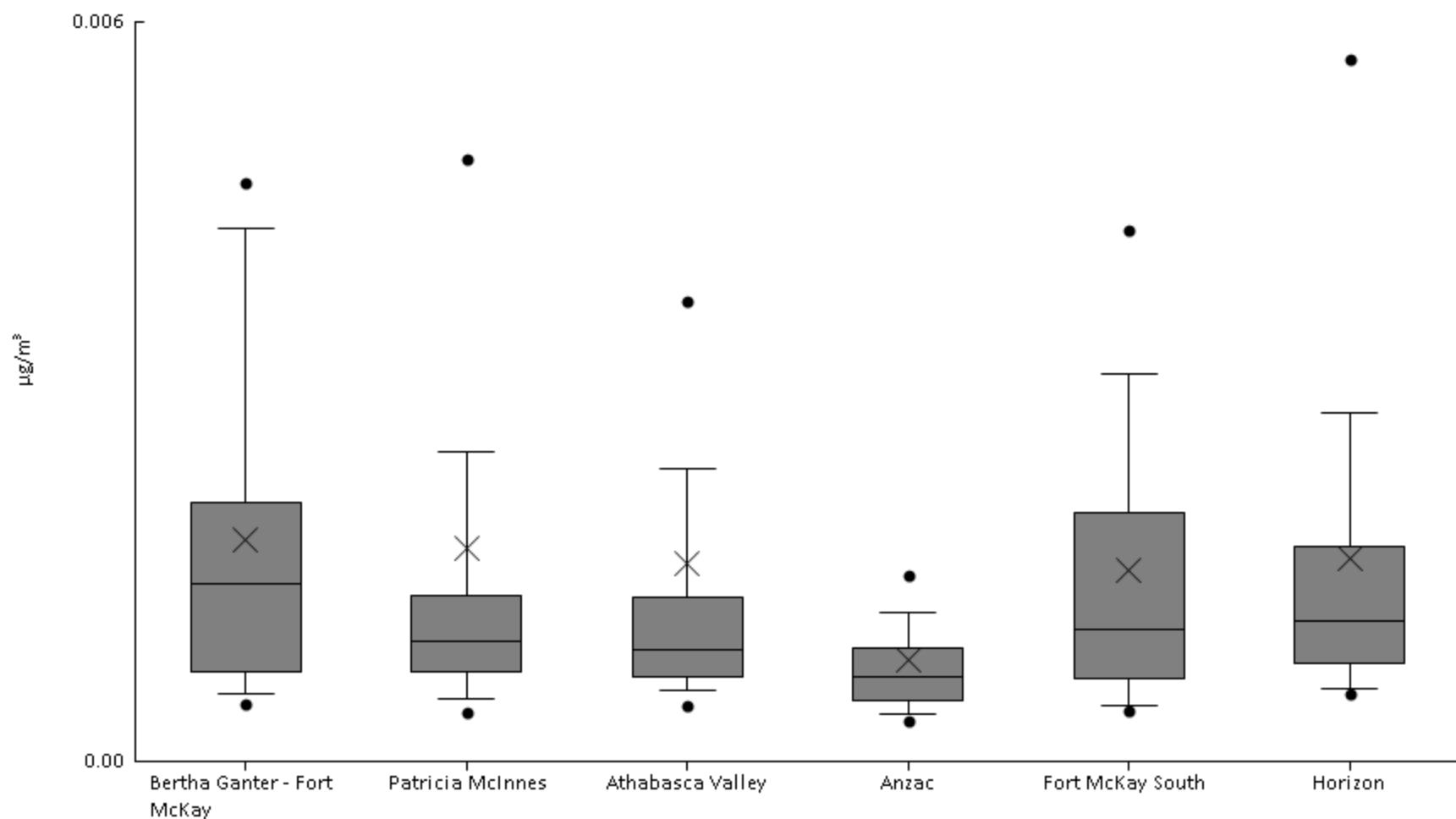
Particulate Matter (PM10 METALS) - Neodymium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	2E-6	8E-6	1.8E-5	7.6E-5	2.3E-4	5.6E-4	8.3E-4	1.1E-3	2.2E-3	3.7E-4	4.1E-4
AMS06	Patricia McInnes	60	97%	0	6E-6	1.4E-5	2.3E-5	9.1E-5	1.8E-4	5.3E-4	7.1E-4	1E-3	1.7E-4	2.3E-4
AMS07	Athabasca Valley	58	100%	9E-6	2E-5	2.9E-5	5.5E-5	1.2E-4	3E-4	4.6E-4	5.9E-4	9.4E-4	2E-4	1.9E-4
AMS14	Anzac	59	86%	0	2.5E-6	4.4E-6	1.4E-5	3E-5	6.4E-5	1.3E-4	1.8E-4	2.4E-4	5E-5	5.5E-5
AMS13	Fort McKay South	61	98%	0	7.6E-6	1E-5	4.8E-5	1.6E-4	3.6E-4	6.1E-4	8.8E-4	1.3E-3	2.6E-4	2.7E-4
AMS15	Horizon	61	97%	1E-6	1.9E-5	2.8E-5	1.2E-4	2.3E-4	4.5E-4	8.4E-4	1.3E-3	1.5E-3	3.5E-4	3.5E-4



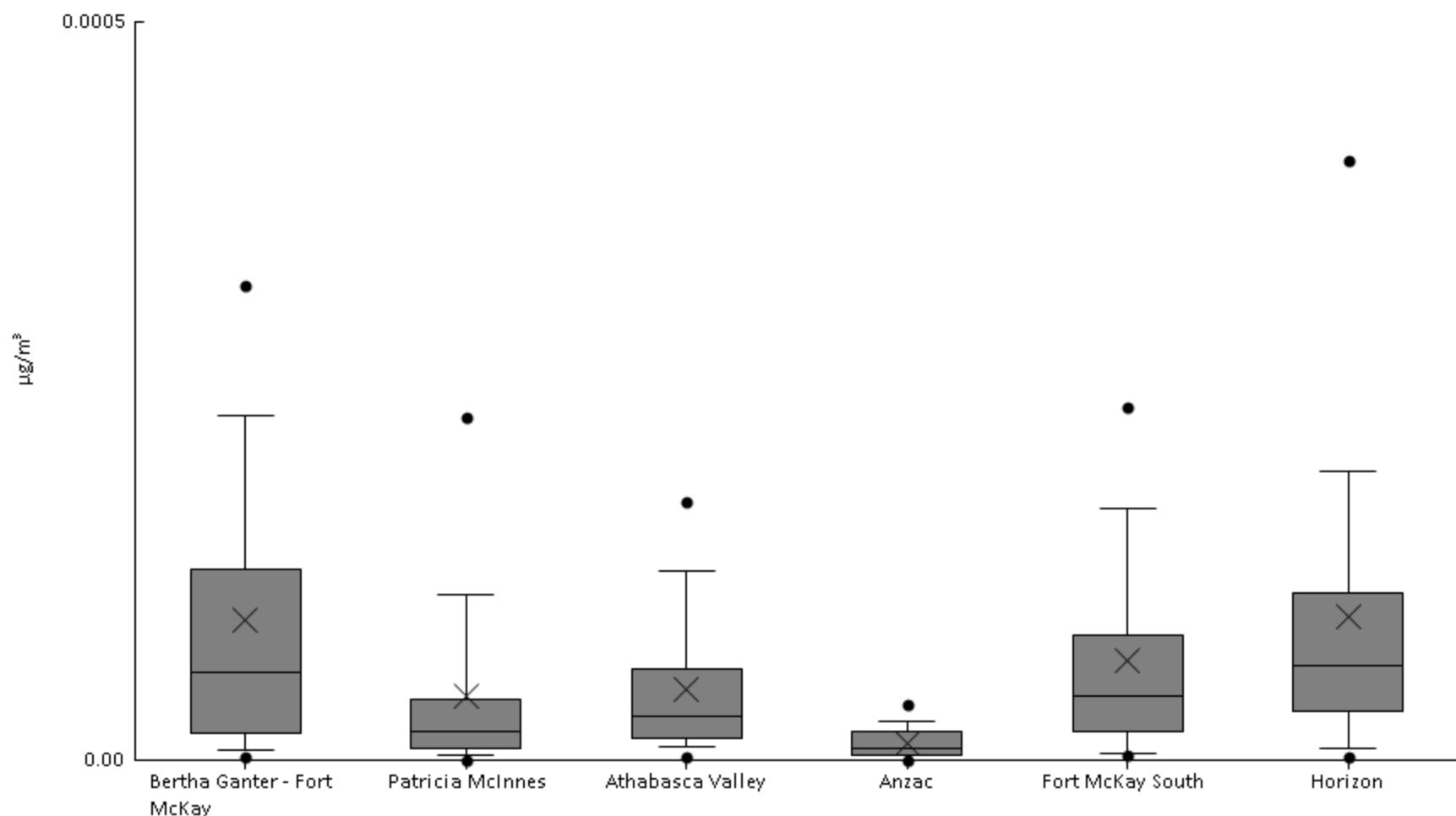
Particulate Matter (PM10 METALS) - Nickel ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	4.1E-4	4.7E-4	5.5E-4	7.3E-4	1.4E-3	2.1E-3	4.3E-3	4.7E-3	7.2E-3	1.8E-3	1.5E-3
AMS06	Patricia McInnes	60	100%	3.3E-4	4E-4	5.1E-4	7.3E-4	9.7E-4	1.3E-3	2.5E-3	4.9E-3	0.028	1.7E-3	3.6E-3
AMS07	Athabasca Valley	58	100%	3.9E-4	4.6E-4	5.7E-4	6.9E-4	9.1E-4	1.3E-3	2.4E-3	3.7E-3	0.027	1.6E-3	3.5E-3
AMS14	Anzac	59	100%	2.7E-4	3.4E-4	3.9E-4	5E-4	6.9E-4	9.3E-4	1.2E-3	1.5E-3	6.7E-3	8.3E-4	8.5E-4
AMS13	Fort McKay South	61	100%	2.5E-4	4.1E-4	4.5E-4	6.7E-4	1.1E-3	2E-3	3.1E-3	4.3E-3	7.7E-3	1.5E-3	1.4E-3
AMS15	Horizon	61	100%	4.7E-4	5.5E-4	5.9E-4	8E-4	1.1E-3	1.7E-3	2.8E-3	5.7E-3	9.2E-3	1.7E-3	1.6E-3



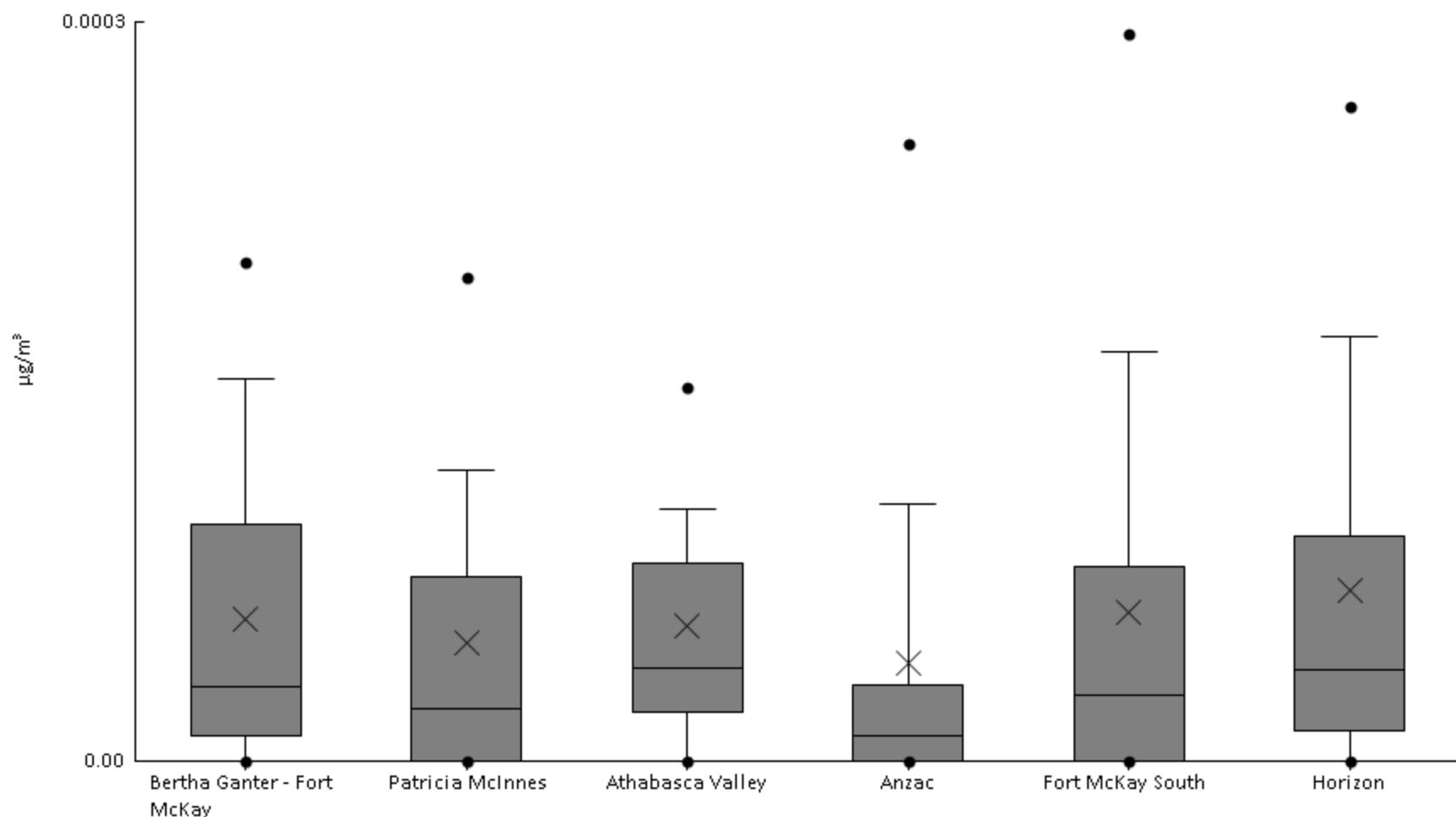
Particulate Matter (PM10 METALS) - Niobium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	2.2E-6	6.6E-6	1.8E-5	6E-5	1.3E-4	2.3E-4	3.2E-4	5.5E-4	9.5E-5	1E-4
AMS06	Patricia McInnes	60	88%	0	0	4E-6	7.5E-6	2E-5	4.2E-5	1.1E-4	2.3E-4	3E-4	4.4E-5	6.6E-5
AMS07	Athabasca Valley	58	95%	0	2.4E-6	8.6E-6	1.5E-5	3E-5	6.2E-5	1.3E-4	1.7E-4	2.1E-4	4.8E-5	5E-5
AMS14	Anzac	59	64%	0	0	0	3.3E-6	8E-6	2E-5	2.7E-5	3.8E-5	5E-5	1.1E-5	1.1E-5
AMS13	Fort McKay South	61	89%	0	3E-6	5E-6	1.9E-5	4.4E-5	8.5E-5	1.7E-4	2.4E-4	3.2E-4	6.7E-5	7.1E-5
AMS15	Horizon	61	93%	0	2.7E-6	8E-6	3.3E-5	6.4E-5	1.1E-4	2E-4	4.1E-4	5.1E-4	9.7E-5	1.1E-4



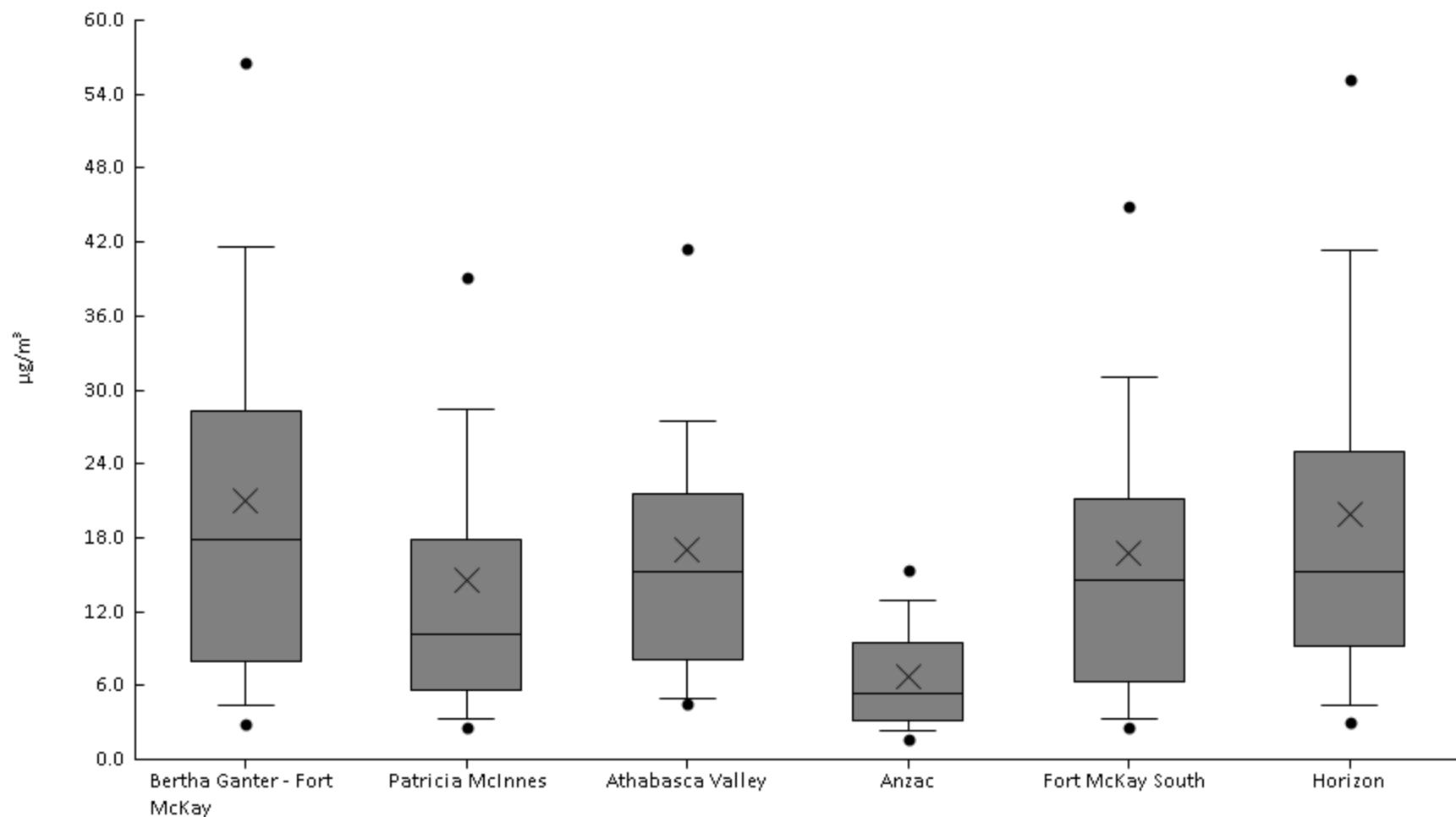
Particulate Matter (PM10 METALS) - Palladium ($\mu\text{g}/\text{m}^3$) - 2019

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	1E-5	3E-5	9.6E-5	1.6E-4	2E-4	2.3E-4	5.8E-5	6.4E-5
AMS06	Patricia McInnes	60	35%	0	0	0	0	2.1E-5	7.5E-5	1.2E-4	2E-4	3.1E-4	4.8E-5	6.3E-5
AMS07	Athabasca Valley	58	43%	0	0	0	2E-5	3.8E-5	8E-5	1E-4	1.5E-4	2.9E-4	5.5E-5	5.3E-5
AMS14	Anzac	59	22%	0	0	0	0	1E-5	3.1E-5	1E-4	2.5E-4	4.9E-4	4E-5	8.5E-5
AMS13	Fort McKay South	61	36%	0	0	0	0	2.7E-5	7.9E-5	1.7E-4	3E-4	3.8E-4	6E-5	8.6E-5
AMS15	Horizon	61	41%	0	0	0	1.2E-5	3.7E-5	9.1E-5	1.7E-4	2.7E-4	4.9E-4	6.9E-5	9.8E-5



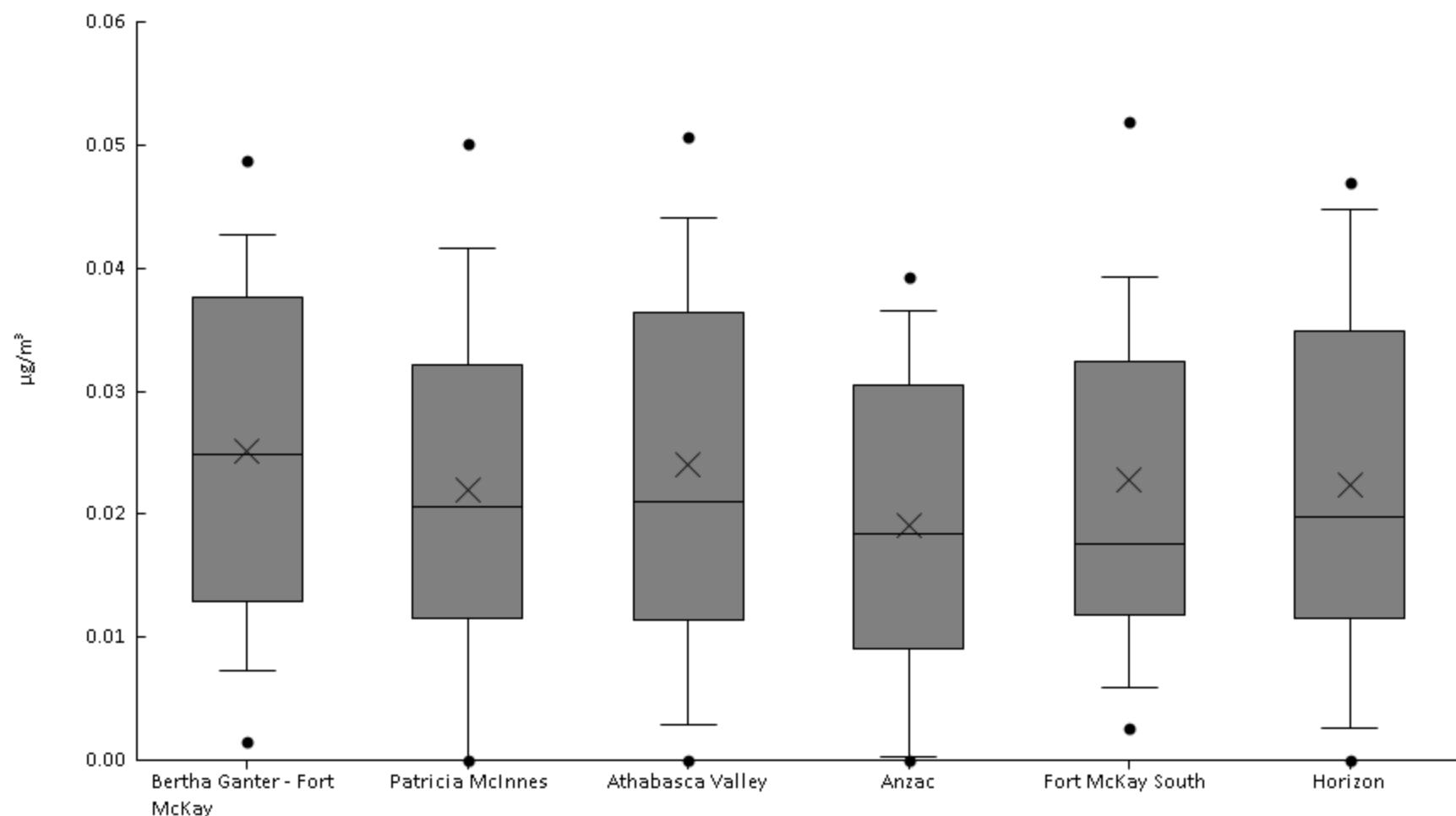
Particulate Matter (PM10 METALS) - Particulate Matter ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.8	2.9	4.4	8	18	28	42	56	90	21	17
AMS06	Patricia McInnes	60	100%	1.8	2.6	3.2	5.7	10	18	28	39	121	15	17
AMS07	Athabasca Valley	58	100%	3.1	4.5	5	8.1	15	22	27	41	90	17	14
AMS14	Anzac	59	100%	1.2	1.6	2.3	3.1	5.4	9.5	13	15	22	6.8	4.7
AMS13	Fort McKay South	61	100%	1.6	2.6	3.2	6.3	15	21	31	45	66	17	13
AMS15	Horizon	61	100%	0.29	3	4.3	9.2	15	25	41	55	66	20	15



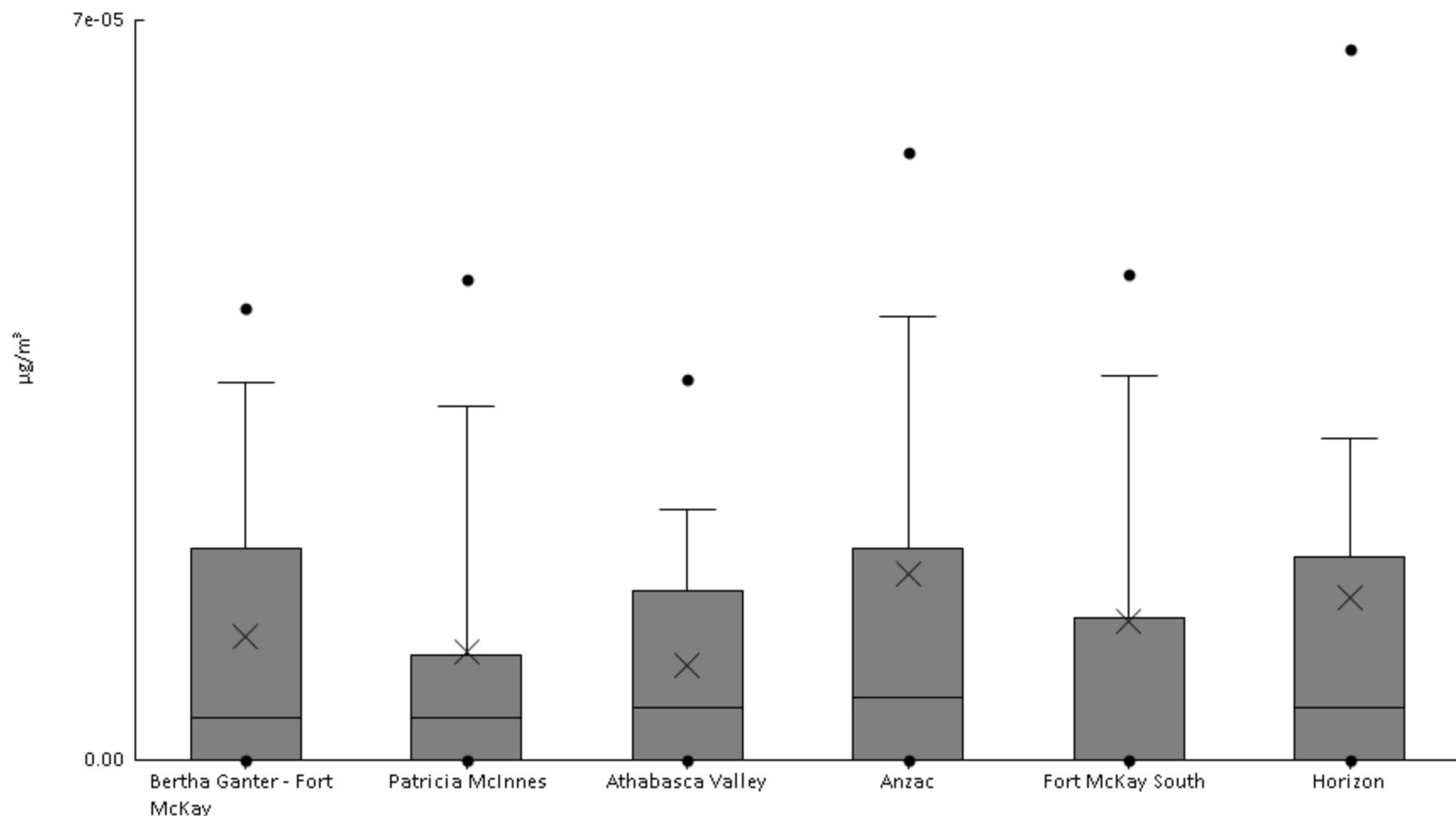
Particulate Matter (PM10 METALS) - Phosphorus ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	93%	0	1.6E-3	7.3E-3	0.013	0.025	0.038	0.043	0.049	0.055	0.025	0.015
AMS06	Patricia McInnes	60	87%	0	0	0	0.012	0.021	0.032	0.042	0.05	0.063	0.022	0.016
AMS07	Athabasca Valley	58	90%	0	0	2.9E-3	0.011	0.021	0.036	0.044	0.051	0.079	0.024	0.017
AMS14	Anzac	59	85%	0	0	2.5E-4	9.1E-3	0.018	0.031	0.037	0.039	0.049	0.019	0.013
AMS13	Fort McKay South	61	93%	0	2.7E-3	5.9E-3	0.012	0.018	0.032	0.039	0.052	0.079	0.023	0.016
AMS15	Horizon	61	87%	0	0	2.6E-3	0.012	0.02	0.035	0.045	0.047	0.052	0.022	0.015



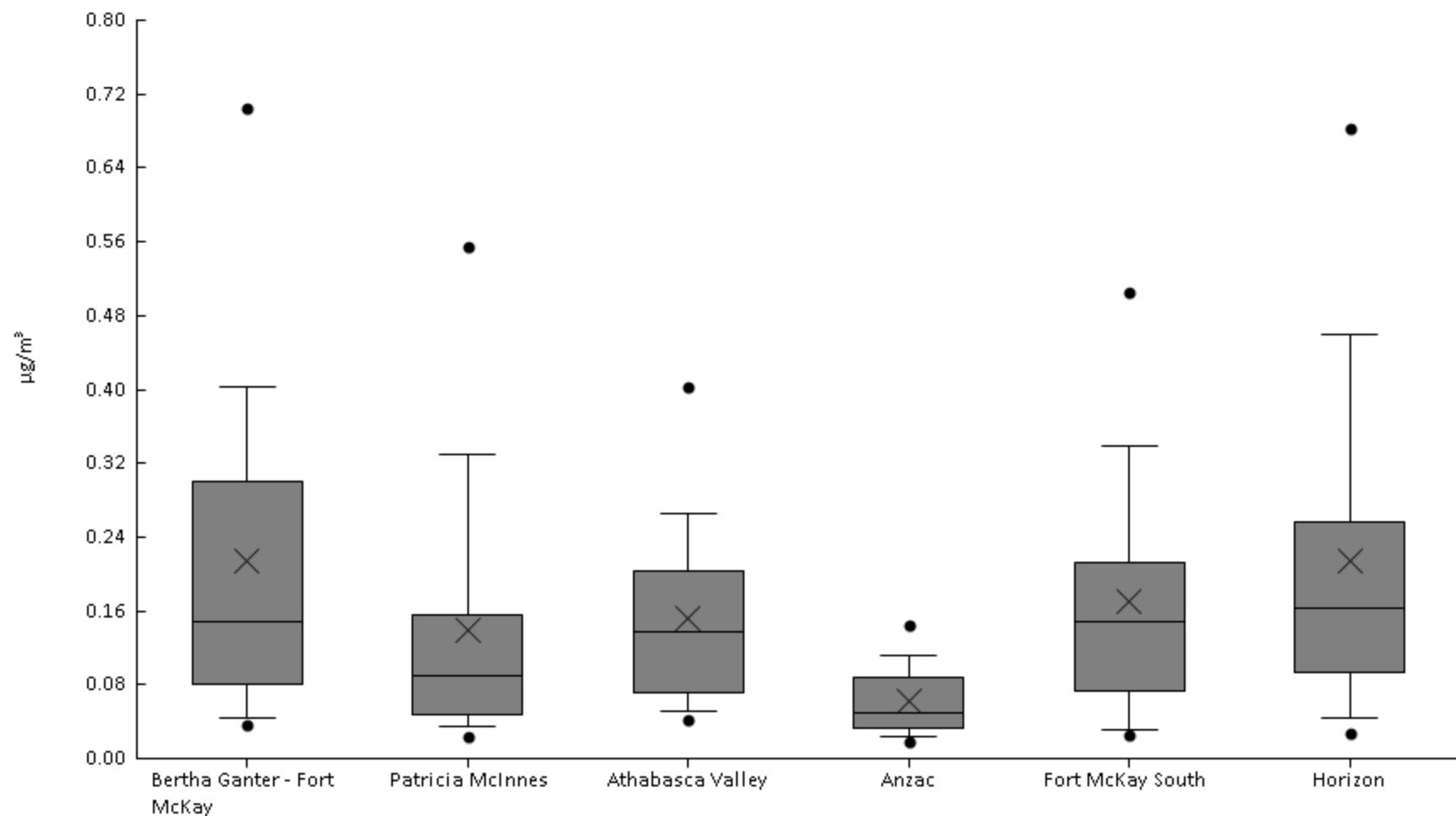
Particulate Matter (PM10 METALS) - Platinum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	49%	0	0	0	0	4E-6	2E-5	3.6E-5	4.3E-5	8.6E-5	1.2E-5	1.8E-5
AMS06	Patricia McInnes	60	53%	0	0	0	0	4E-6	1E-5	3.4E-5	4.6E-5	7.1E-5	1E-5	1.6E-5
AMS07	Athabasca Valley	58	53%	0	0	0	0	5E-6	1.6E-5	2.4E-5	3.6E-5	4.8E-5	9E-6	1.2E-5
AMS14	Anzac	59	54%	0	0	0	0	6E-6	2E-5	4.2E-5	5.8E-5	3.2E-4	1.8E-5	4.4E-5
AMS13	Fort McKay South	61	41%	0	0	0	0	0	1.4E-5	3.6E-5	4.6E-5	2.5E-4	1.3E-5	3.4E-5
AMS15	Horizon	61	54%	0	0	0	0	5E-6	1.9E-5	3E-5	6.7E-5	1.9E-4	1.5E-5	3.3E-5



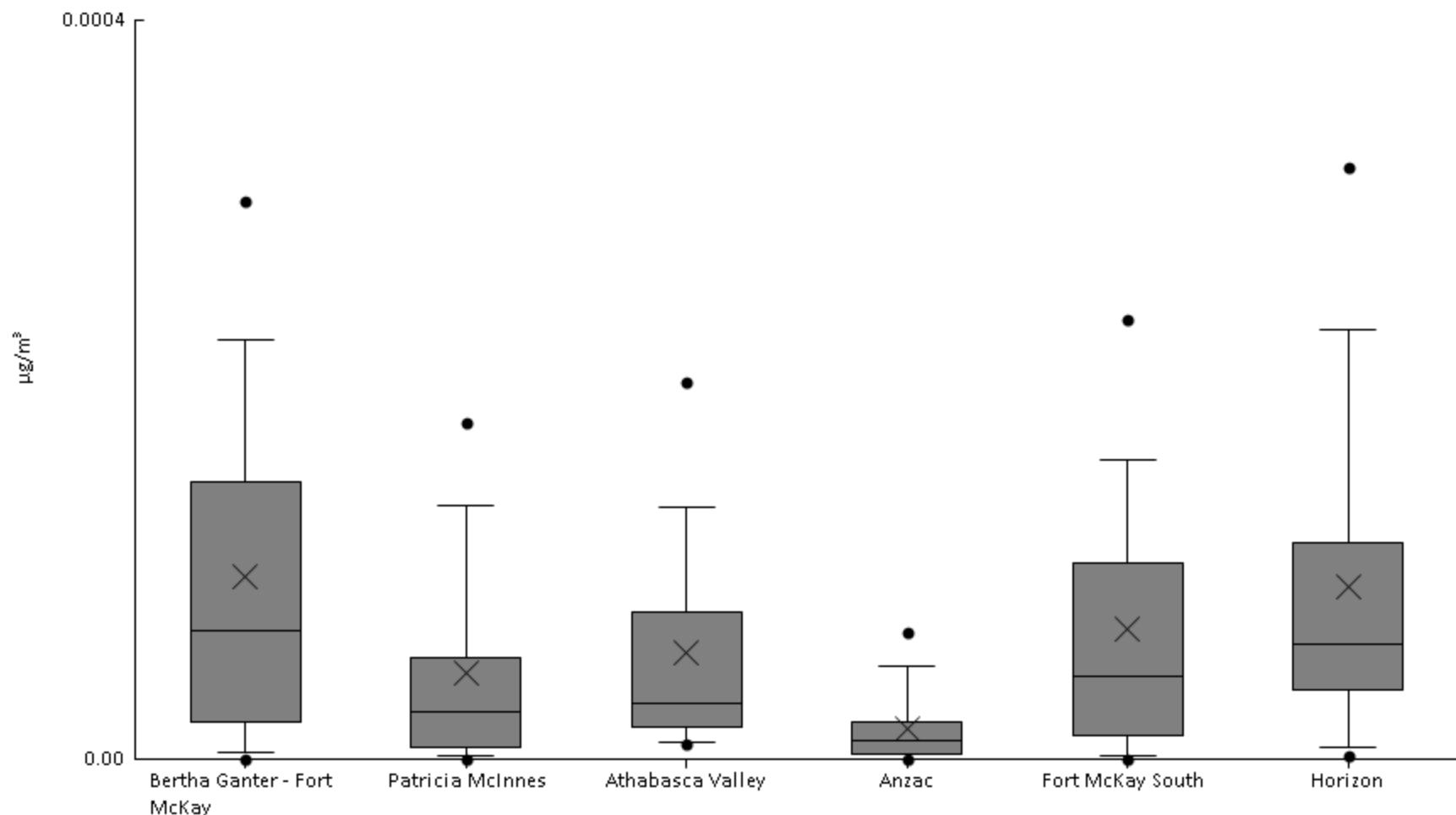
Particulate Matter (PM10 METALS) - Potassium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.025	0.037	0.045	0.081	0.15	0.3	0.4	0.71	0.78	0.21	0.18
AMS06	Patricia McInnes	60	100%	0.017	0.023	0.034	0.048	0.09	0.16	0.33	0.55	0.75	0.14	0.15
AMS07	Athabasca Valley	58	100%	0.032	0.042	0.051	0.071	0.14	0.2	0.26	0.4	0.49	0.15	0.1
AMS14	Anzac	59	100%	0.016	0.018	0.024	0.033	0.049	0.088	0.11	0.14	0.21	0.062	0.04
AMS13	Fort McKay South	61	100%	0.017	0.025	0.031	0.074	0.15	0.21	0.34	0.51	0.68	0.17	0.14
AMS15	Horizon	61	100%	4.6E-3	0.028	0.043	0.093	0.16	0.26	0.46	0.68	0.89	0.21	0.19



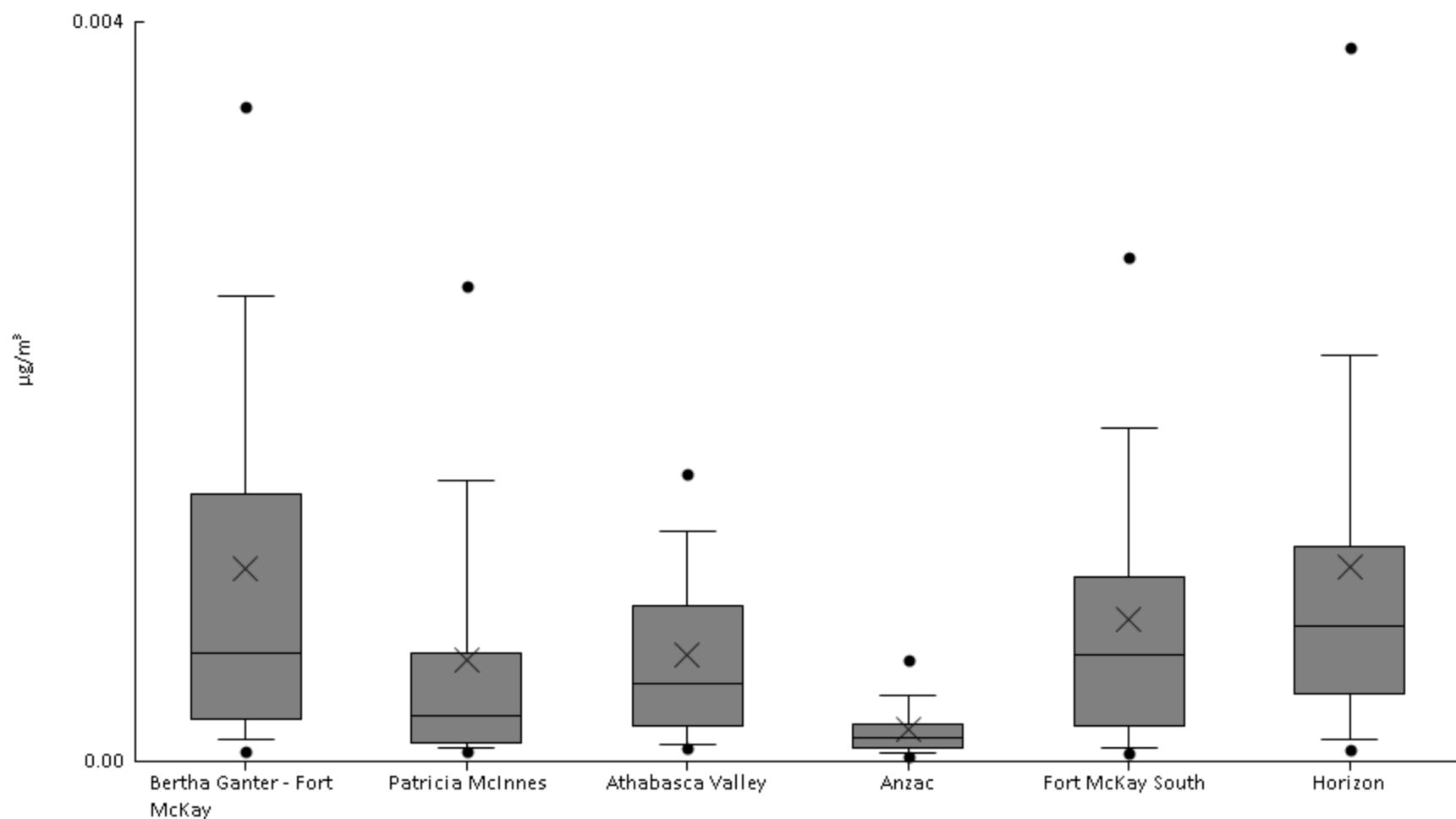
Particulate Matter (PM10 METALS) - Praseodymium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	0	3.6E-6	2E-5	7E-5	1.5E-4	2.3E-4	3E-4	6E-4	9.9E-5	1.1E-4
AMS06	Patricia McInnes	60	92%	0	0	2E-6	6.5E-6	2.6E-5	5.5E-5	1.4E-4	1.8E-4	2.7E-4	4.7E-5	6.1E-5
AMS07	Athabasca Valley	58	98%	0	7.8E-6	9E-6	1.7E-5	3E-5	8E-5	1.4E-4	2E-4	3E-4	5.8E-5	6.2E-5
AMS14	Anzac	59	80%	0	0	0	3E-6	1E-5	2E-5	5E-5	6.9E-5	8.4E-5	1.6E-5	2E-5
AMS13	Fort McKay South	61	92%	0	0	1.6E-6	1.3E-5	4.5E-5	1.1E-4	1.6E-4	2.4E-4	3.5E-4	7E-5	7.6E-5
AMS15	Horizon	61	93%	0	1.6E-6	6.2E-6	3.8E-5	6.2E-5	1.2E-4	2.3E-4	3.2E-4	4E-4	9.3E-5	9.1E-5



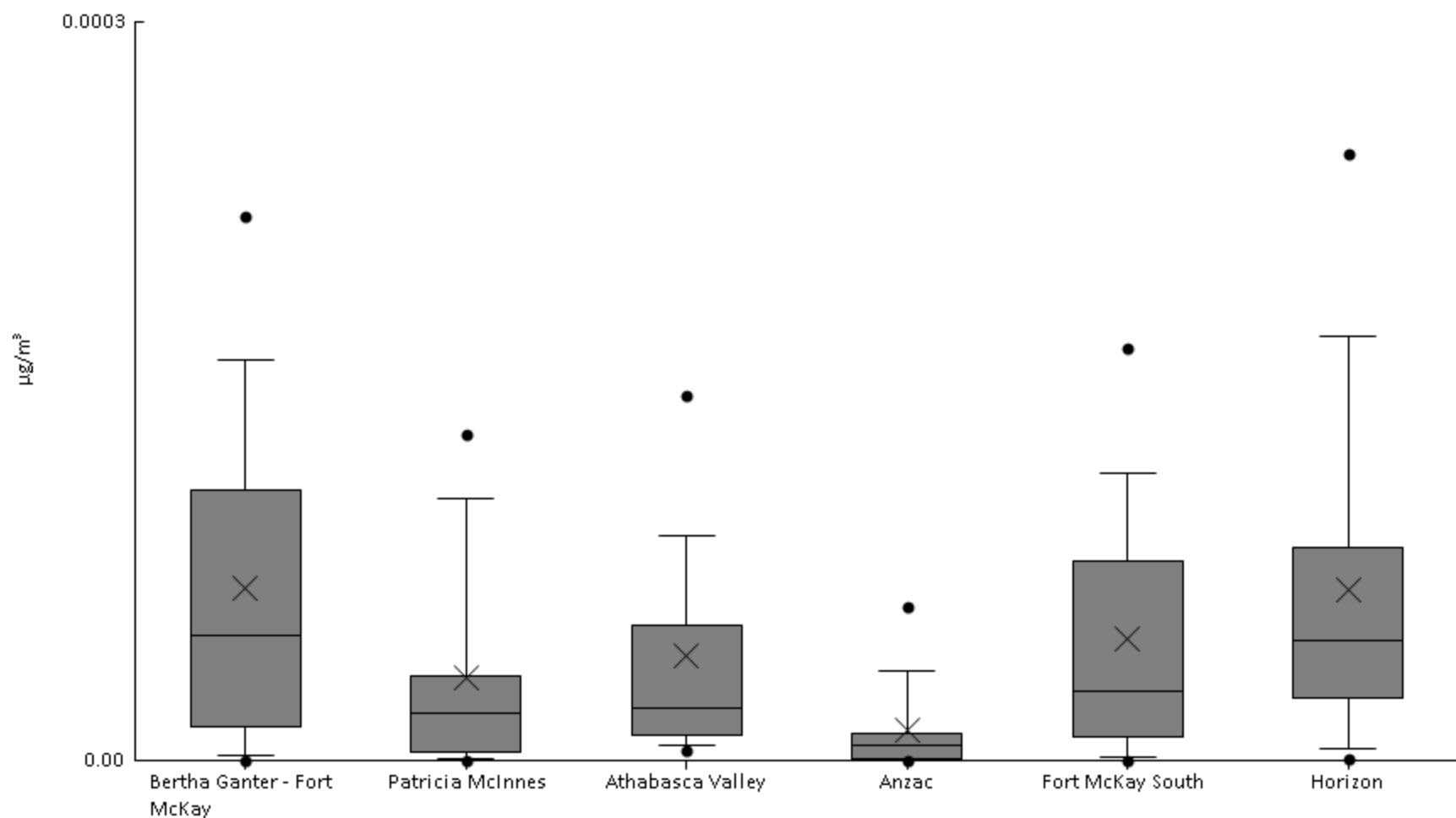
Particulate Matter (PM10 METALS) - Rubidium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.6E-5	5.8E-5	1.2E-4	2.3E-4	5.9E-4	1.4E-3	2.5E-3	3.5E-3	4.9E-3	1E-3	1.1E-3
AMS06	Patricia McInnes	60	100%	1.8E-5	5.1E-5	7.3E-5	1E-4	2.5E-4	5.9E-4	1.5E-3	2.6E-3	3.6E-3	5.5E-4	7.8E-4
AMS07	Athabasca Valley	58	100%	6.2E-5	7.5E-5	9.6E-5	1.9E-4	4.2E-4	8.4E-4	1.2E-3	1.6E-3	2.6E-3	5.8E-4	5.3E-4
AMS14	Anzac	59	100%	2.5E-5	2.9E-5	4.5E-5	7.6E-5	1.3E-4	2E-4	3.5E-4	5.5E-4	7.1E-4	1.8E-4	1.5E-4
AMS13	Fort McKay South	61	100%	3.6E-5	4.6E-5	7.5E-5	1.9E-4	5.8E-4	1E-3	1.8E-3	2.7E-3	3.2E-3	7.7E-4	7.8E-4
AMS15	Horizon	61	100%	8E-6	6.5E-5	1.2E-4	3.7E-4	7.3E-4	1.2E-3	2.2E-3	3.9E-3	5.3E-3	1E-3	1.1E-3



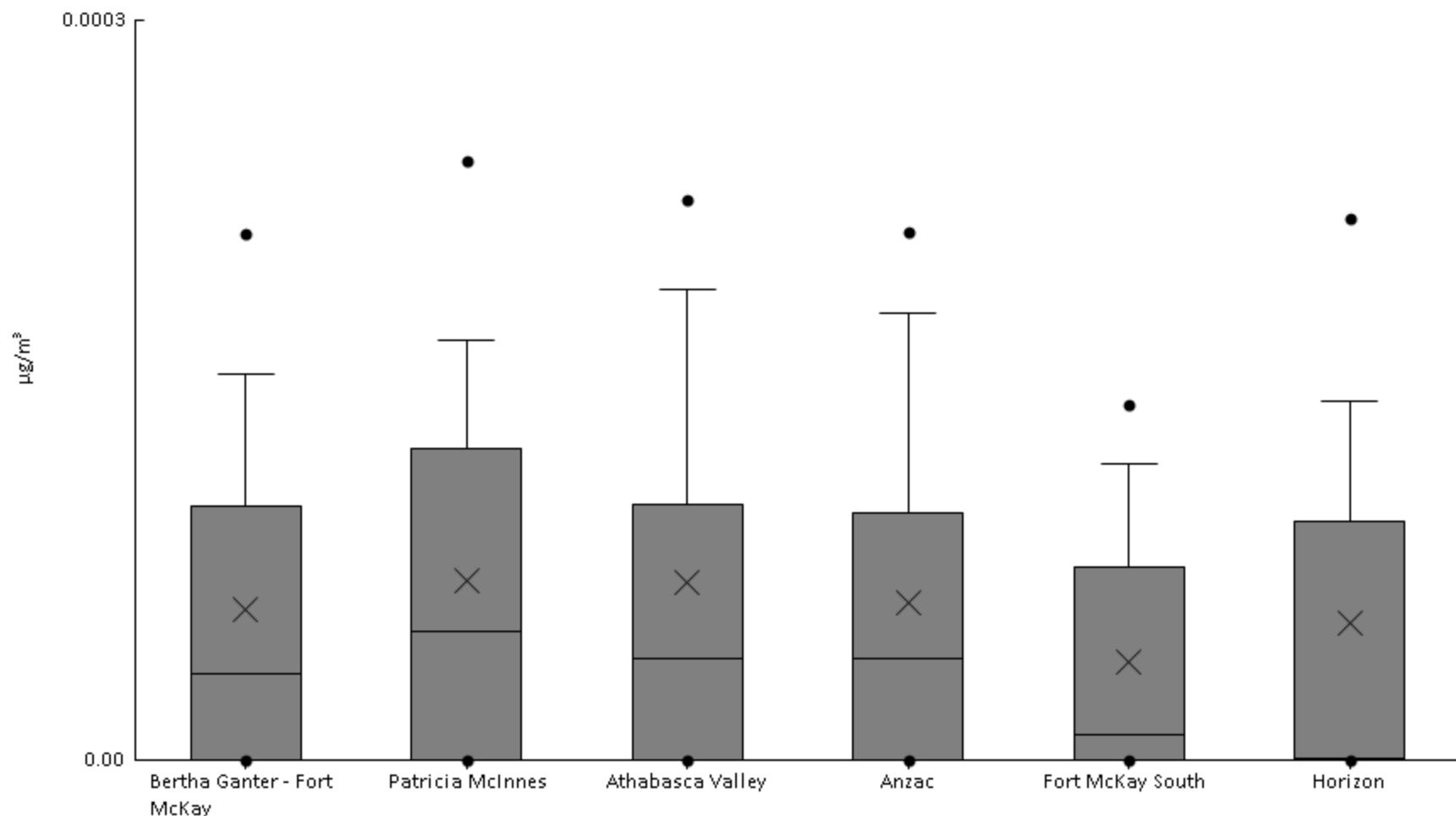
Particulate Matter (PM10 METALS) - Samarium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	2E-6	1.4E-5	5.1E-5	1.1E-4	1.6E-4	2.2E-4	3.8E-4	7E-5	7.5E-5
AMS06	Patricia McInnes	60	65%	0	0	1E-6	3.5E-6	1.9E-5	3.4E-5	1.1E-4	1.3E-4	1.9E-4	3.4E-5	4.5E-5
AMS07	Athabasca Valley	58	91%	0	4.4E-6	6E-6	1E-5	2.1E-5	5.5E-5	9.1E-5	1.5E-4	3E-4	4.3E-5	5.2E-5
AMS14	Anzac	59	47%	0	0	0	1E-6	6E-6	1.1E-5	3.6E-5	6.3E-5	7.6E-5	1.2E-5	1.8E-5
AMS13	Fort McKay South	61	82%	0	0	1.6E-6	9.8E-6	2.8E-5	8.1E-5	1.2E-4	1.7E-4	2.2E-4	5E-5	5.3E-5
AMS15	Horizon	61	89%	0	5.5E-7	4.6E-6	2.5E-5	4.9E-5	8.6E-5	1.7E-4	2.5E-4	3.1E-4	6.9E-5	7.1E-5



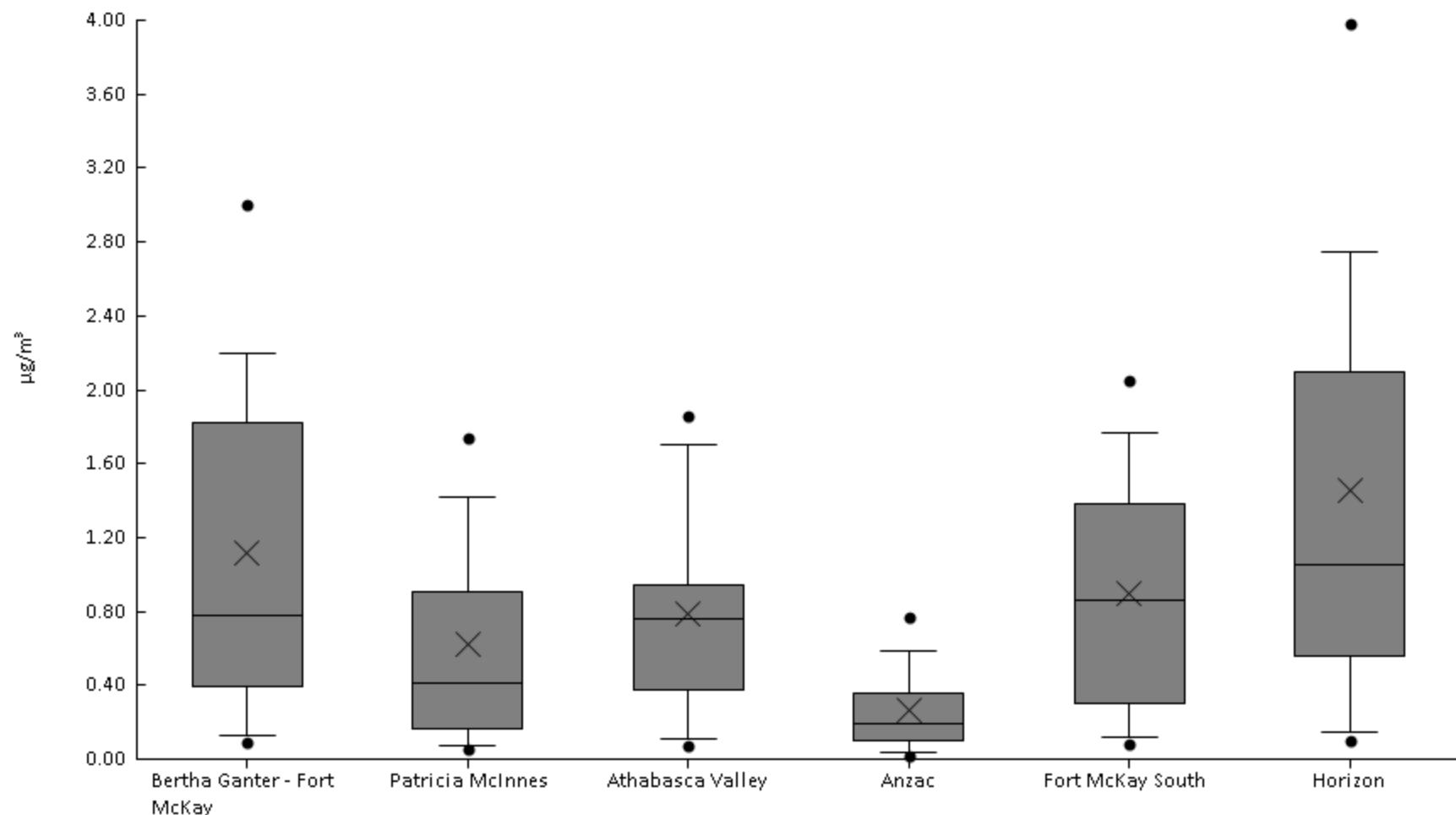
Particulate Matter (PM10 METALS) - Selenium ($\mu\text{g}/\text{m}^3$) - 2019

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	3.5E-5	1E-4	1.6E-4	2.1E-4	2.7E-4	6.1E-5	7E-5
AMS06	Patricia McInnes	60	22%	0	0	0	0	5.2E-5	1.3E-4	1.7E-4	2.4E-4	4.7E-4	7.3E-5	8.8E-5
AMS07	Athabasca Valley	58	19%	0	0	0	0	4.2E-5	1E-4	1.9E-4	2.3E-4	4.6E-4	7.2E-5	9.2E-5
AMS14	Anzac	59	15%	0	0	0	0	4.1E-5	1E-4	1.8E-4	2.1E-4	3.8E-4	6.4E-5	8.2E-5
AMS13	Fort McKay South	61	7%	0	0	0	0	1E-5	7.8E-5	1.2E-4	1.4E-4	2.2E-4	4E-5	5.5E-5
AMS15	Horizon	61	13%	0	0	0	0	1E-6	9.7E-5	1.5E-4	2.2E-4	5E-4	5.6E-5	8.9E-5



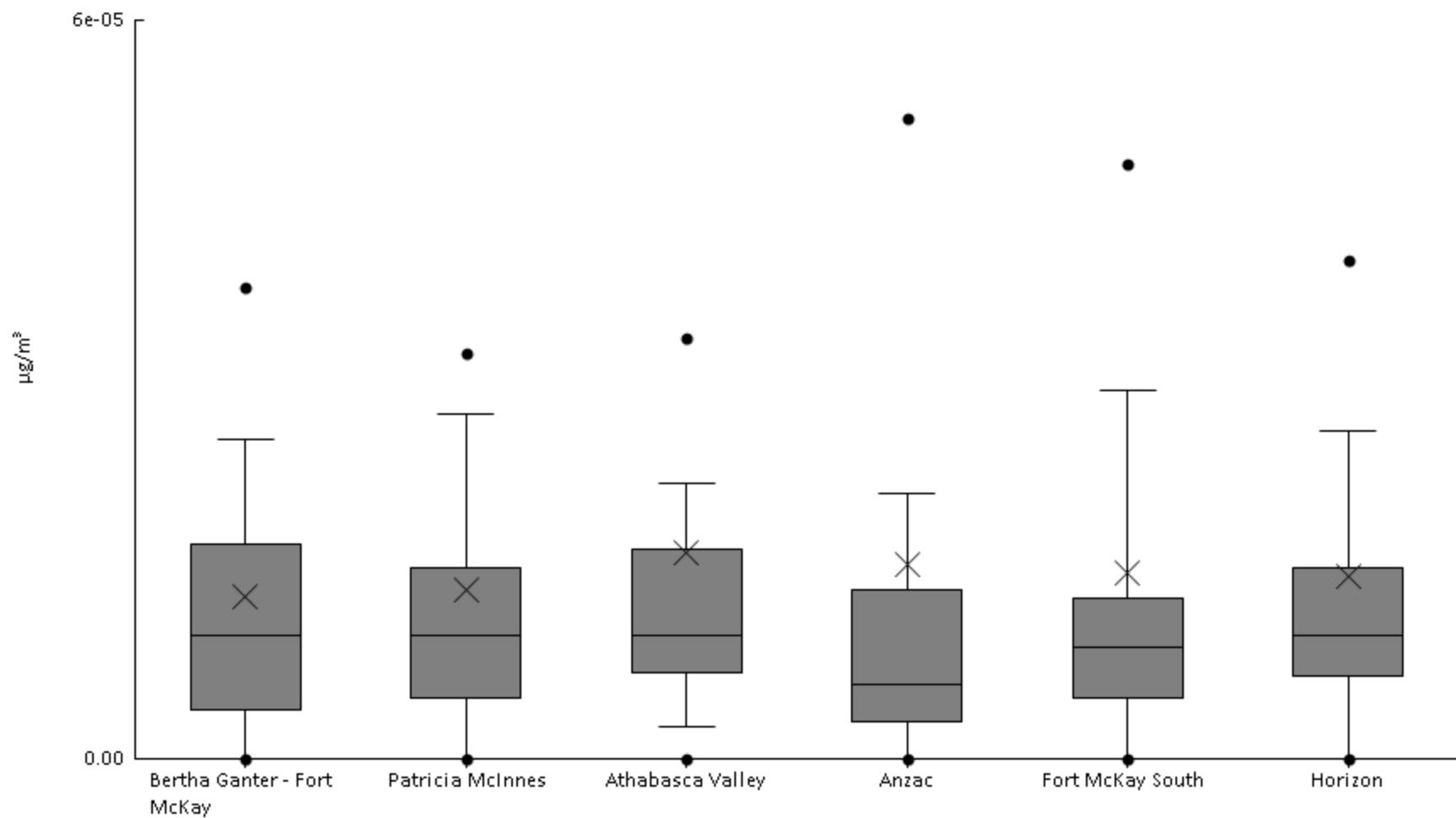
Particulate Matter (PM10 METALS) - Silicon ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.074	0.095	0.13	0.39	0.78	1.8	2.2	3	3.8	1.1	0.91
AMS06	Patricia McInnes	60	100%	0.037	0.053	0.077	0.16	0.41	0.9	1.4	1.7	3.4	0.63	0.62
AMS07	Athabasca Valley	58	100%	0.022	0.072	0.11	0.37	0.76	0.94	1.7	1.9	2.4	0.79	0.56
AMS14	Anzac	59	98%	4.1E-3	0.023	0.038	0.1	0.19	0.35	0.59	0.77	1.1	0.26	0.23
AMS13	Fort McKay South	61	100%	0.036	0.078	0.12	0.3	0.86	1.4	1.8	2	2.2	0.9	0.62
AMS15	Horizon	61	100%	0.064	0.099	0.15	0.56	1.1	2.1	2.7	4	7.3	1.5	1.3



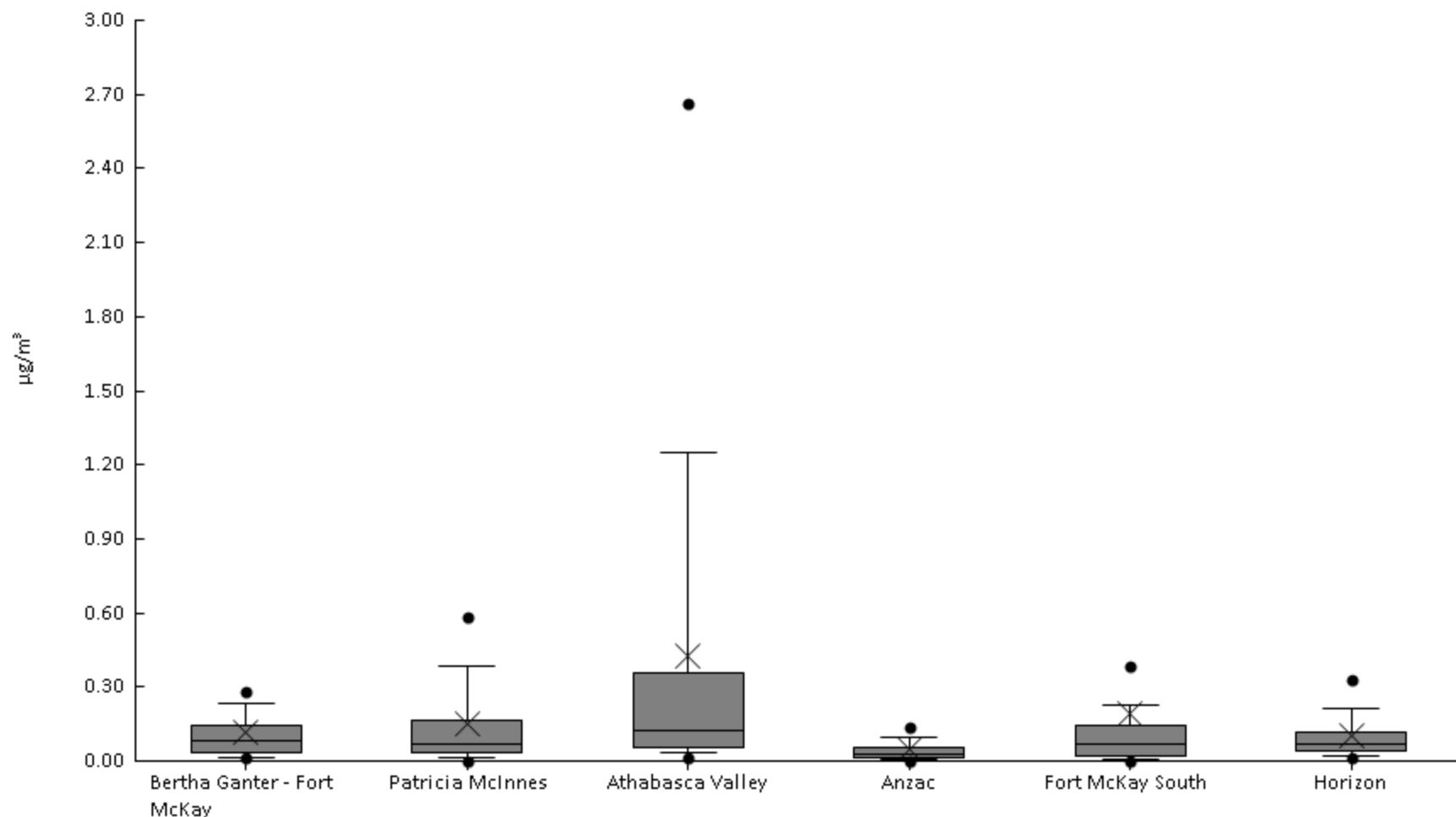
Particulate Matter (PM10 METALS) - Silver ($\mu\text{g}/\text{m}^3$) - 2019

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	4E-6	1E-5	1.8E-5	2.6E-5	3.8E-5	9.4E-5	1.3E-5	1.5E-5
AMS06	Patricia McInnes	60	72%	0	0	0	5E-6	1E-5	1.6E-5	2.8E-5	3.3E-5	1.2E-4	1.4E-5	1.8E-5
AMS07	Athabasca Valley	58	81%	0	0	2.6E-6	7E-6	1E-5	1.7E-5	2.2E-5	3.4E-5	1.8E-4	1.7E-5	2.9E-5
AMS14	Anzac	59	49%	0	0	0	3E-6	6E-6	1.4E-5	2.2E-5	5.2E-5	2.1E-4	1.6E-5	3.6E-5
AMS13	Fort McKay South	61	70%	0	0	0	5E-6	9E-6	1.3E-5	3E-5	4.8E-5	1.6E-4	1.5E-5	2.5E-5
AMS15	Horizon	61	79%	0	0	0	6.8E-6	1E-5	1.6E-5	2.7E-5	4E-5	1.3E-4	1.5E-5	2E-5



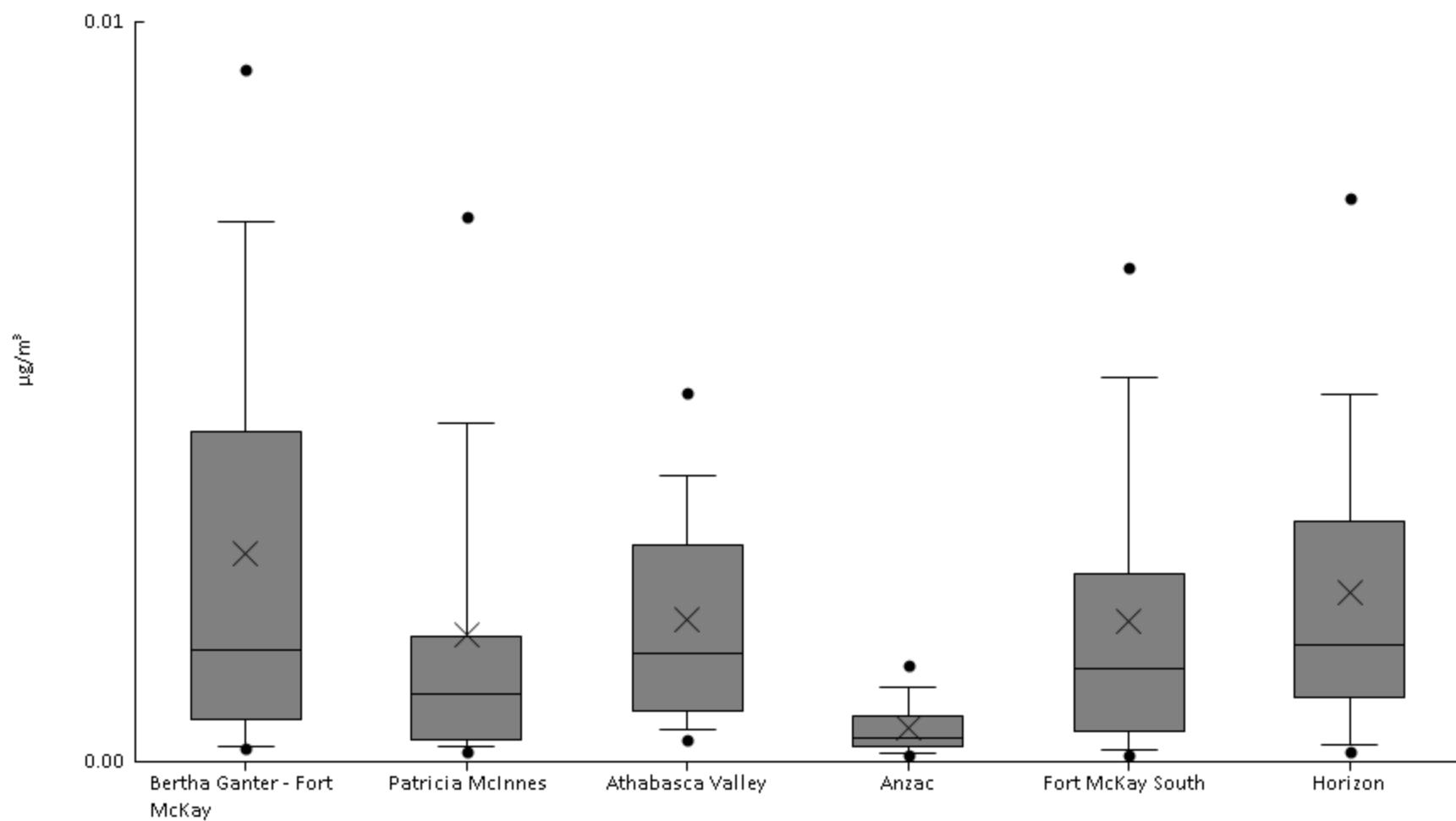
Particulate Matter (PM10 METALS) - Sodium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	0	0.011	0.015	0.035	0.083	0.14	0.23	0.28	1	0.12	0.14
AMS06	Patricia McInnes	60	95%	0	1.7E-3	0.015	0.034	0.071	0.17	0.38	0.58	0.98	0.15	0.2
AMS07	Athabasca Valley	58	100%	2.2E-3	0.017	0.032	0.056	0.12	0.36	1.3	2.7	4.1	0.43	0.82
AMS14	Anzac	59	92%	0	0	6.3E-3	0.013	0.026	0.054	0.094	0.14	0.5	0.046	0.071
AMS13	Fort McKay South	61	93%	0	0	7.4E-3	0.02	0.069	0.14	0.23	0.39	5.6	0.19	0.71
AMS15	Horizon	61	100%	4.1E-3	0.014	0.022	0.042	0.07	0.11	0.21	0.33	0.58	0.1	0.1



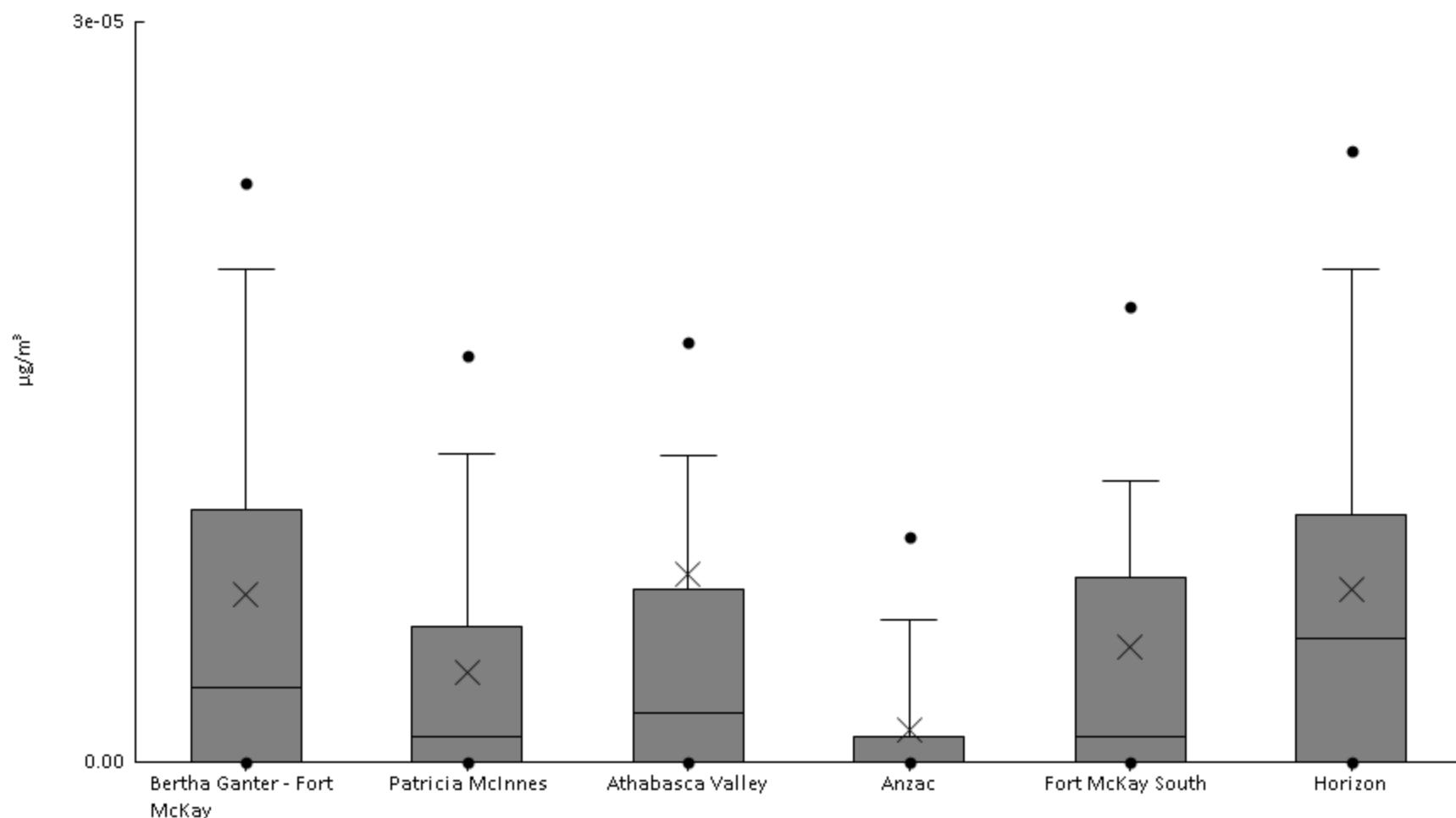
Particulate Matter (PM10 METALS) - Strontium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	7.7E-5	1.7E-4	2E-4	5.8E-4	1.5E-3	4.5E-3	7.3E-3	9.4E-3	0.012	2.8E-3	2.9E-3
AMS06	Patricia McInnes	60	100%	8.6E-5	1.3E-4	2.1E-4	3E-4	9.2E-4	1.7E-3	4.6E-3	7.4E-3	0.012	1.7E-3	2.4E-3
AMS07	Athabasca Valley	58	100%	2.2E-4	3E-4	4.4E-4	7E-4	1.5E-3	2.9E-3	3.9E-3	5E-3	8.8E-3	1.9E-3	1.7E-3
AMS14	Anzac	59	100%	6.2E-5	8E-5	1.1E-4	2.1E-4	3.1E-4	6.1E-4	1E-3	1.3E-3	2E-3	4.6E-4	4E-4
AMS13	Fort McKay South	61	100%	8.1E-5	1E-4	1.6E-4	4.1E-4	1.3E-3	2.5E-3	5.2E-3	6.7E-3	8.2E-3	1.9E-3	2E-3
AMS15	Horizon	61	100%	8.1E-5	1.4E-4	2.3E-4	8.7E-4	1.6E-3	3.3E-3	5E-3	7.6E-3	0.012	2.3E-3	2.3E-3



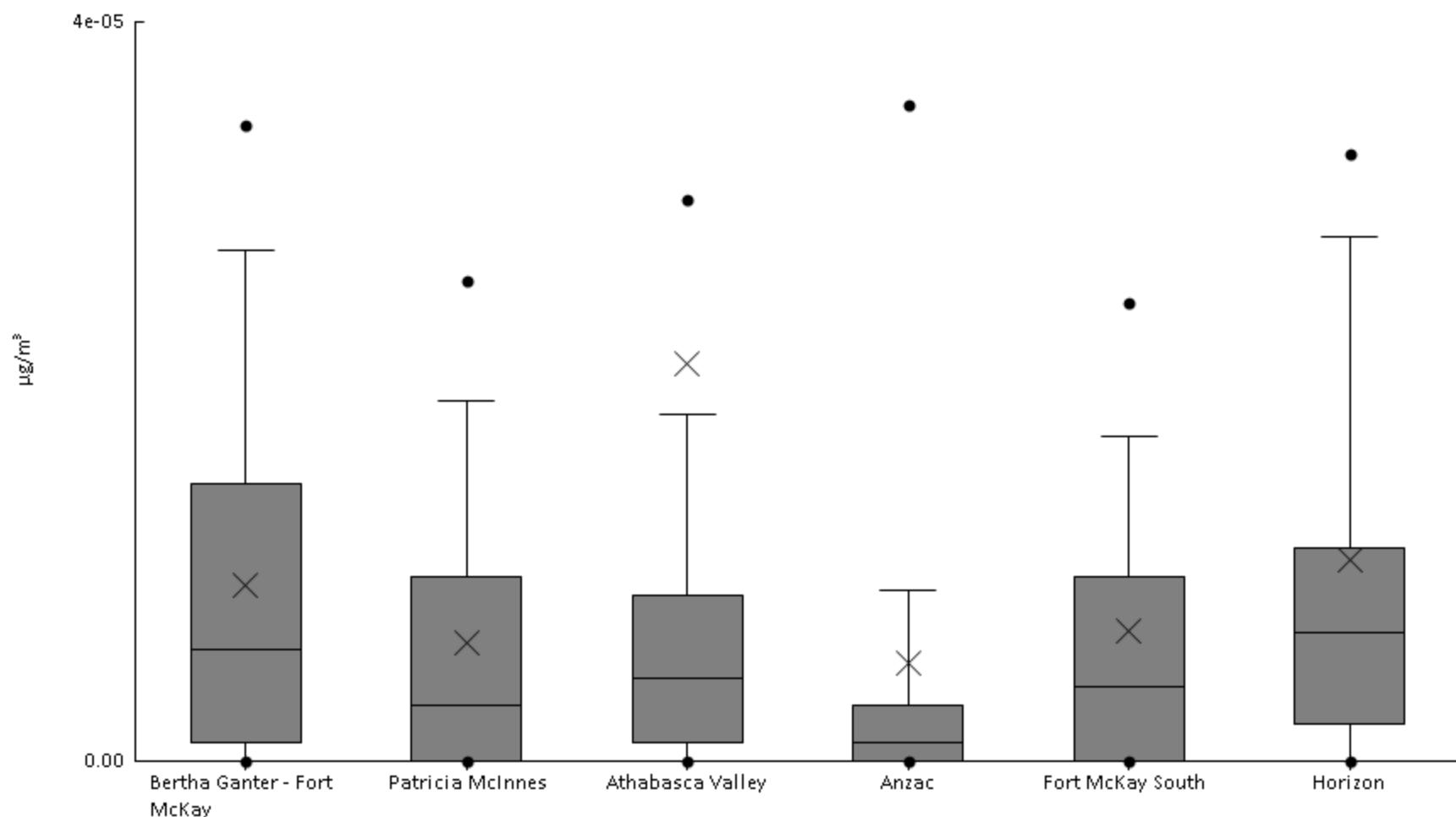
Particulate Matter (PM10 METALS) - Tantalum ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	46%	0	0	0	0	3E-6	1E-5	2E-5	2.3E-5	4.7E-5	6.8E-6	9.4E-6
AMS06	Patricia McInnes	60	37%	0	0	0	0	1E-6	5.5E-6	1.3E-5	1.7E-5	2.2E-5	3.7E-6	5.6E-6
AMS07	Athabasca Valley	58	45%	0	0	0	0	2E-6	7E-6	1.2E-5	1.7E-5	2.2E-4	7.6E-6	2.8E-5
AMS14	Anzac	59	14%	0	0	0	0	0	1E-6	5.8E-6	9.1E-6	1.2E-5	1.3E-6	2.8E-6
AMS13	Fort McKay South	61	41%	0	0	0	0	1E-6	7.5E-6	1.1E-5	1.8E-5	3.3E-5	4.7E-6	6.6E-6
AMS15	Horizon	61	59%	0	0	0	0	5E-6	1E-5	2E-5	2.5E-5	3.3E-5	7E-6	8.2E-6



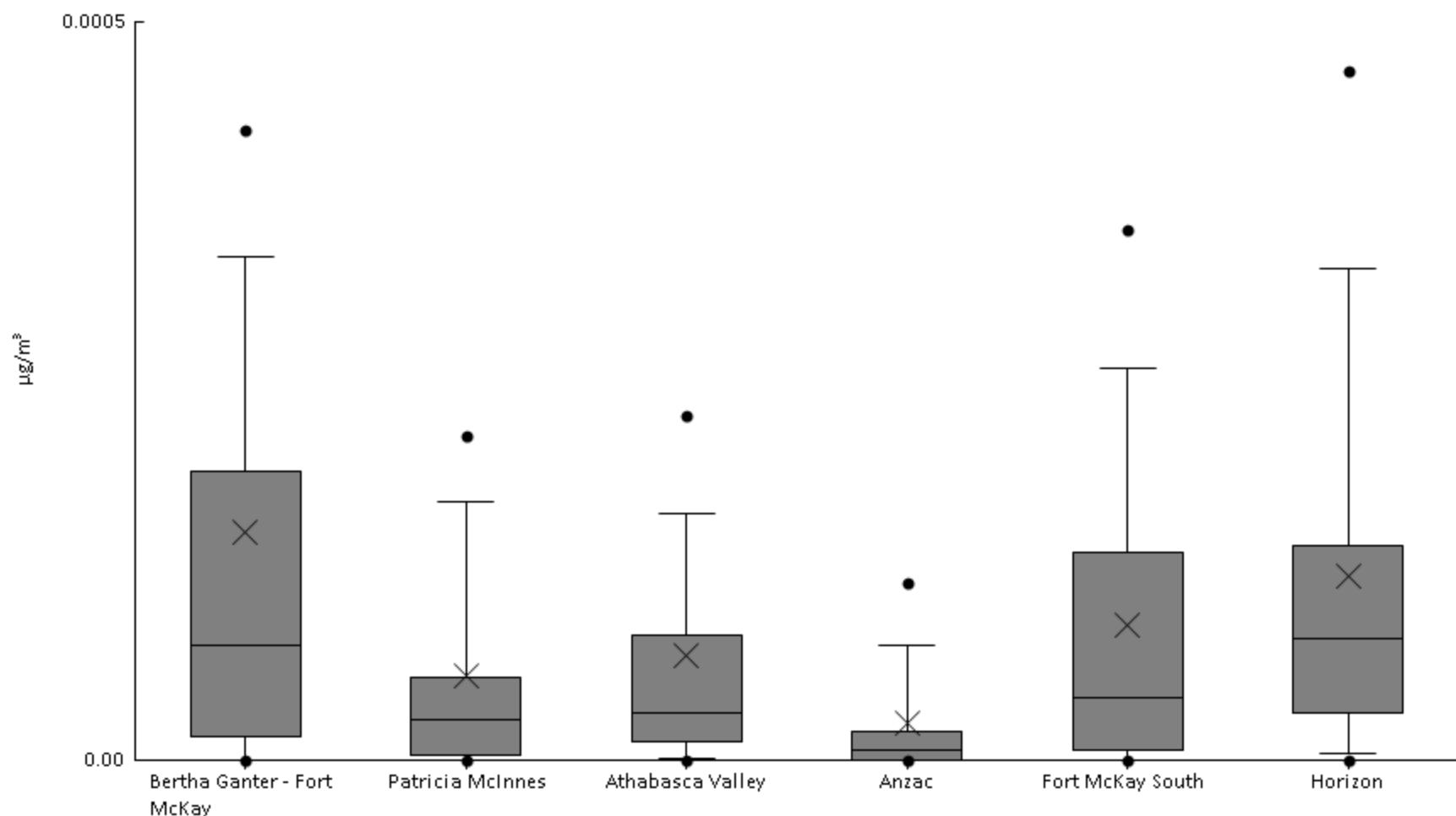
Particulate Matter (PM10 METALS) - Thallium ($\mu\text{g}/\text{m}^3$) - 2019

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	1E-6	6E-6	1.5E-5	2.8E-5	3.4E-5	4.1E-5	9.5E-6	1.1E-5
AMS06	Patricia McInnes	60	38%	0	0	0	0	3E-6	1E-5	2E-5	2.6E-5	5E-5	6.4E-6	9.4E-6
AMS07	Athabasca Valley	58	50%	0	0	0	1E-6	4.5E-6	9E-6	1.9E-5	3E-5	7.6E-4	2.1E-5	1E-4
AMS14	Anzac	59	15%	0	0	0	0	1E-6	3E-6	9.2E-6	3.6E-5	9.9E-5	5.3E-6	1.6E-5
AMS13	Fort McKay South	61	43%	0	0	0	0	4E-6	1E-5	1.8E-5	2.5E-5	6E-5	7E-6	9.9E-6
AMS15	Horizon	61	59%	0	0	0	2E-6	7E-6	1.2E-5	2.8E-5	3.3E-5	1.1E-4	1.1E-5	1.6E-5



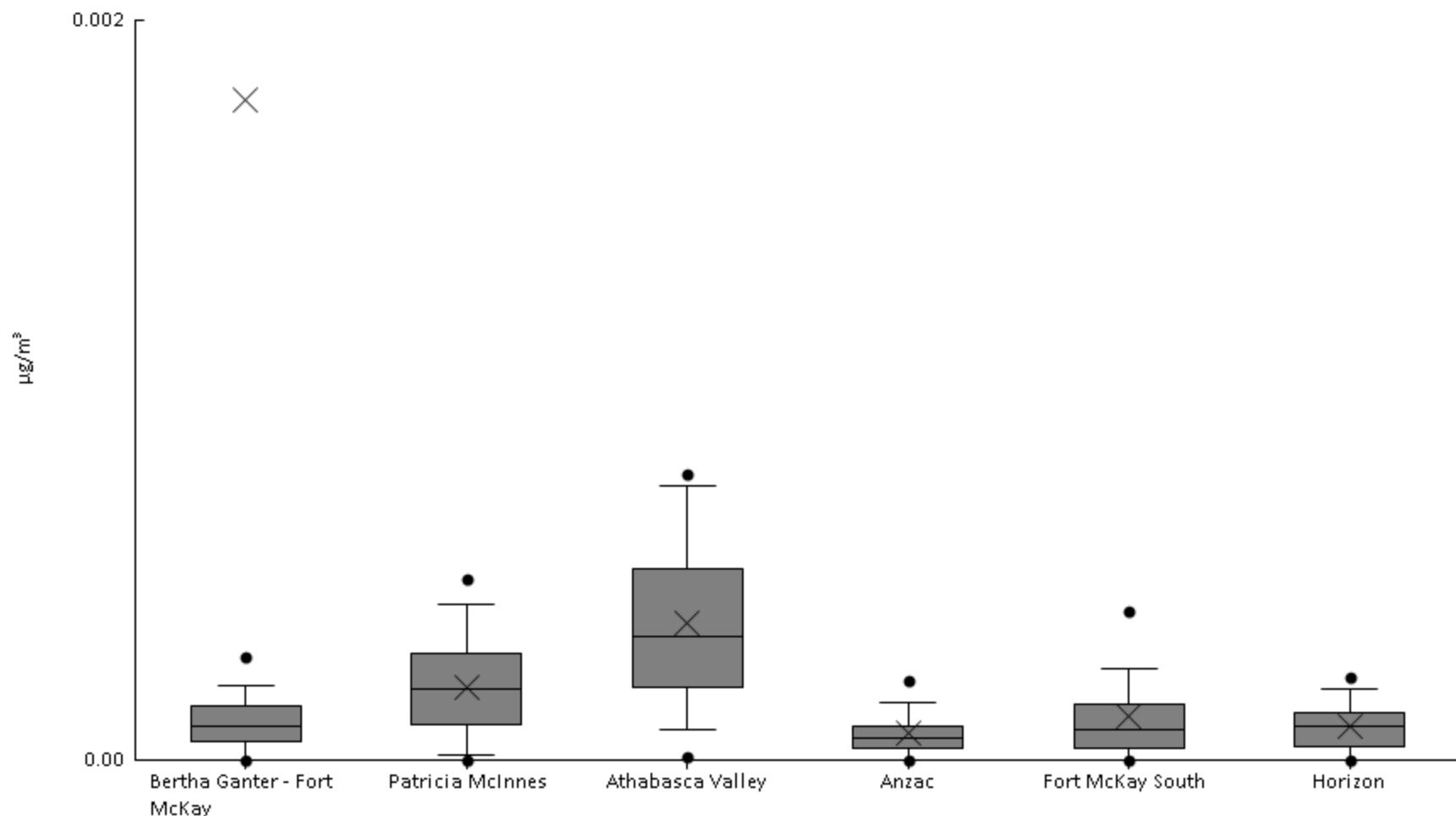
Particulate Matter (PM10 METALS) - Thorium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	1.7E-5	7.8E-5	2E-4	3.4E-4	4.3E-4	1.7E-3	1.5E-4	2.5E-4
AMS06	Patricia McInnes	60	78%	0	0	0	3E-6	2.8E-5	5.6E-5	1.8E-4	2.2E-4	3.7E-4	5.7E-5	8.3E-5
AMS07	Athabasca Valley	58	88%	0	0	6E-7	1.3E-5	3.2E-5	8.5E-5	1.7E-4	2.3E-4	6.3E-4	7.1E-5	1E-4
AMS14	Anzac	59	71%	0	0	0	0	7E-6	2E-5	7.8E-5	1.2E-4	3.1E-4	2.5E-5	5E-5
AMS13	Fort McKay South	61	80%	0	0	0	7E-6	4.2E-5	1.4E-4	2.7E-4	3.6E-4	5.3E-4	9.2E-5	1.1E-4
AMS15	Horizon	61	93%	0	0	4.4E-6	3.2E-5	8.2E-5	1.5E-4	3.3E-4	4.7E-4	7.3E-4	1.3E-4	1.4E-4



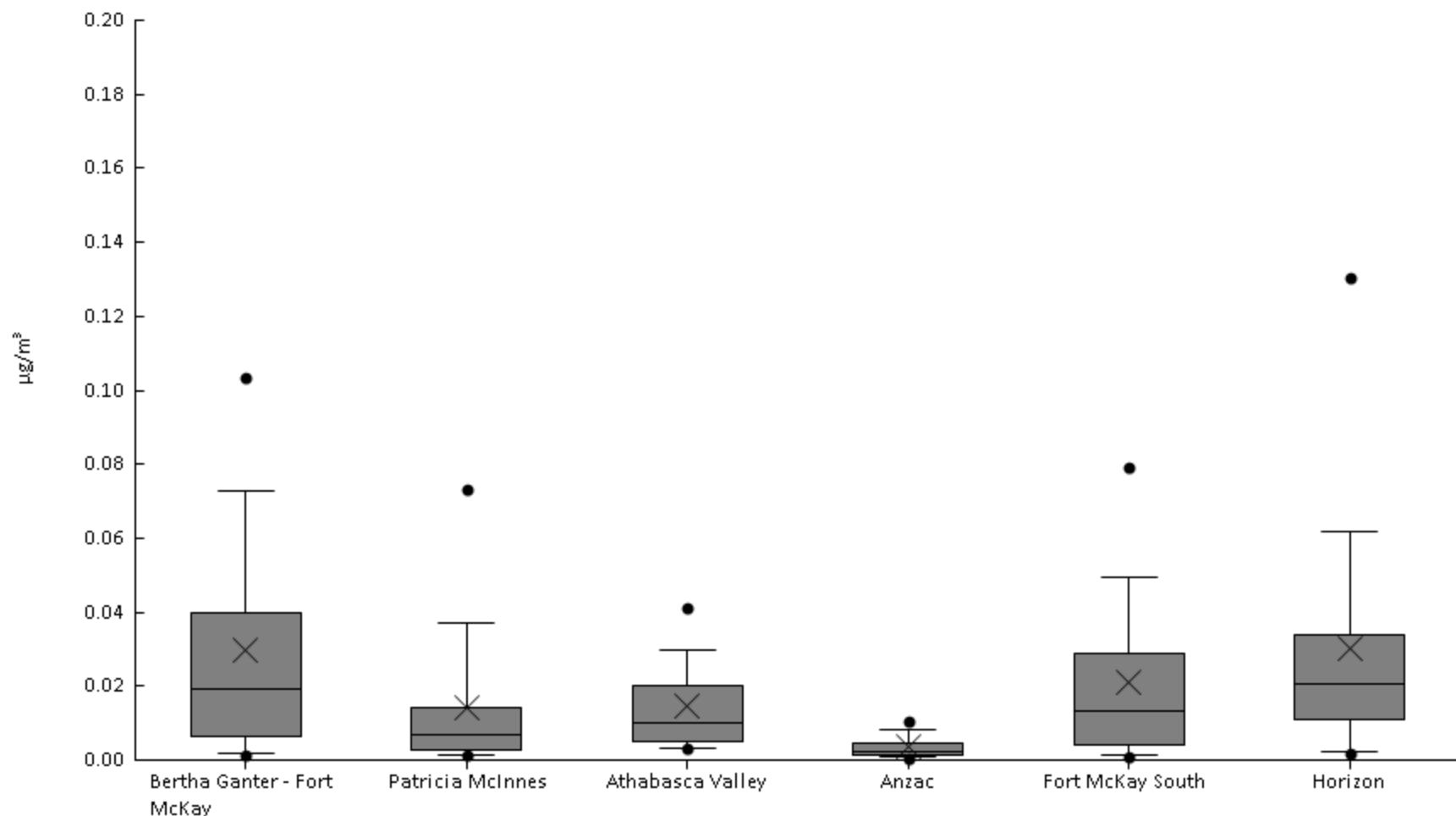
Particulate Matter (PM10 METALS) - Tin ($\mu\text{g}/\text{m}^3$) - 2019

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	5.2E-5	9.3E-5	1.4E-4	2E-4	2.8E-4	0.1	1.8E-3	0.013
AMS06	Patricia McInnes	60	90%	0	0	1.2E-5	9.7E-5	1.9E-4	2.9E-4	4.2E-4	4.9E-4	5.1E-4	2E-4	1.4E-4
AMS07	Athabasca Valley	58	95%	0	1E-5	8.4E-5	2E-4	3.3E-4	5.2E-4	7.4E-4	7.7E-4	1E-3	3.7E-4	2.4E-4
AMS14	Anzac	59	85%	0	0	0	3.3E-5	6.1E-5	9.3E-5	1.5E-4	2.1E-4	4.4E-4	7.5E-5	7.4E-5
AMS13	Fort McKay South	61	87%	0	0	0	3.3E-5	8.3E-5	1.5E-4	2.5E-4	4E-4	9E-4	1.2E-4	1.4E-4
AMS15	Horizon	61	85%	0	0	0	3.7E-5	9E-5	1.3E-4	1.9E-4	2.3E-4	4.2E-4	9.4E-5	7.7E-5



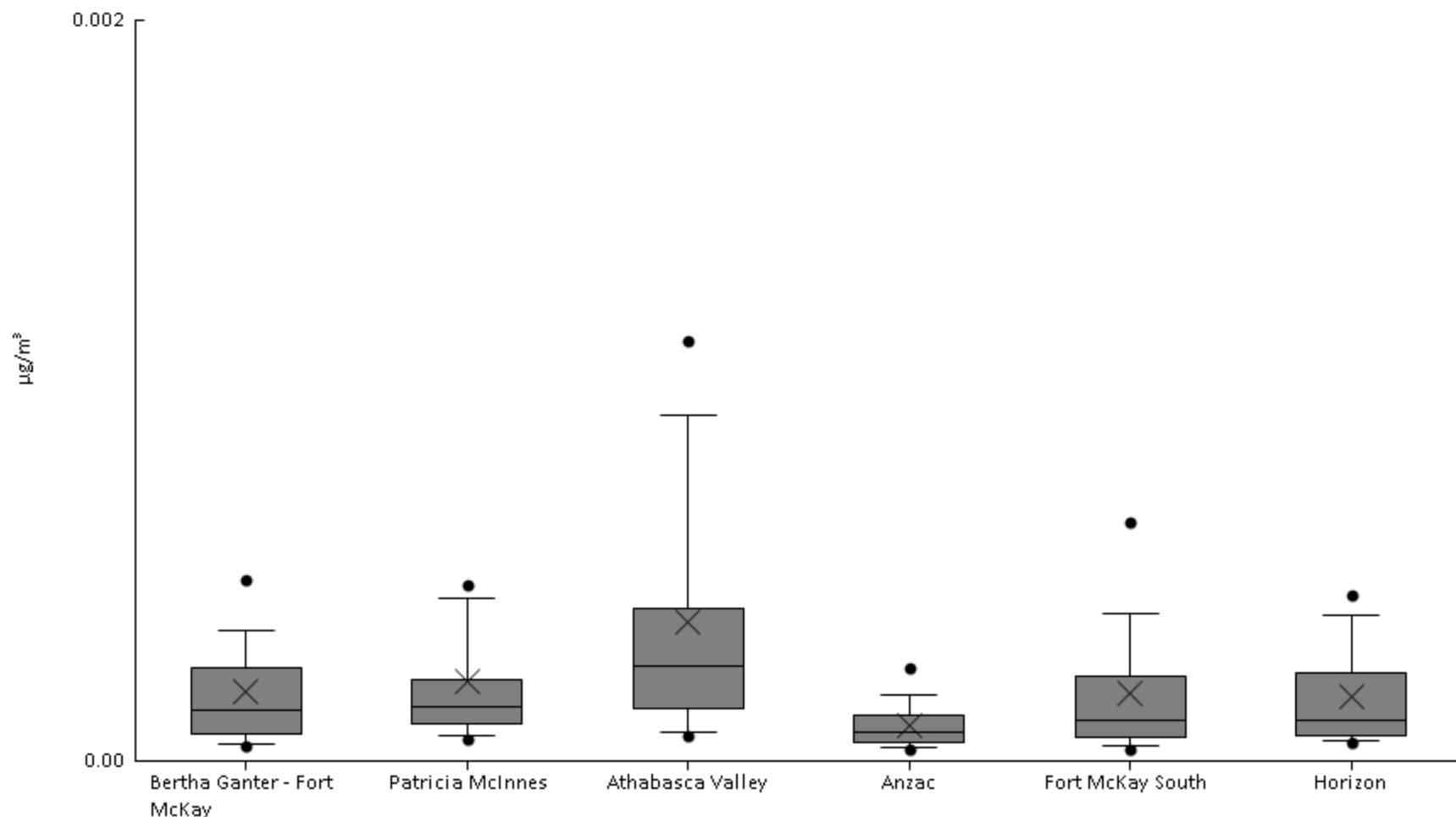
Particulate Matter (PM10 METALS) - Titanium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.1E-3	1.3E-3	1.9E-3	6.5E-3	0.019	0.04	0.073	0.1	0.17	0.03	0.034
AMS06	Patricia McInnes	60	100%	9E-4	1.3E-3	1.5E-3	2.6E-3	7E-3	0.014	0.037	0.073	0.086	0.014	0.02
AMS07	Athabasca Valley	58	100%	1.7E-3	3E-3	3.4E-3	5.2E-3	0.01	0.02	0.03	0.041	0.055	0.014	0.012
AMS14	Anzac	59	100%	3.8E-4	5.4E-4	7.9E-4	1.4E-3	2.4E-3	4.7E-3	8.1E-3	0.011	0.014	3.6E-3	3.1E-3
AMS13	Fort McKay South	61	100%	8E-4	9.7E-4	1.6E-3	3.9E-3	0.014	0.029	0.05	0.079	0.096	0.021	0.023
AMS15	Horizon	61	100%	4.3E-4	1.7E-3	2.3E-3	0.011	0.021	0.034	0.062	0.13	0.16	0.03	0.035



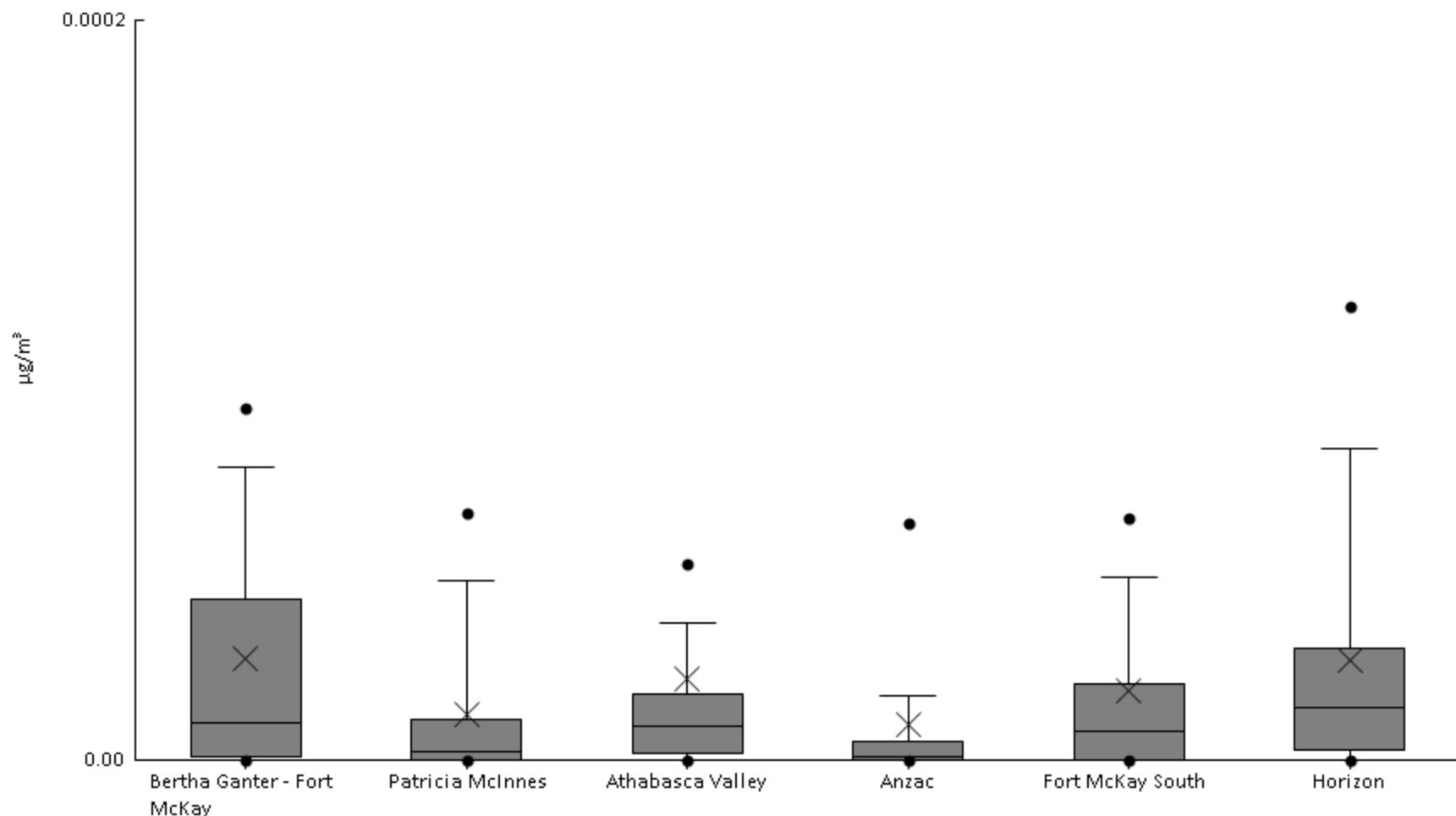
Particulate Matter (PM10 METALS) - Tungsten ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.8E-5	4.1E-5	4.8E-5	7.2E-5	1.4E-4	2.5E-4	3.5E-4	4.9E-4	7.9E-4	1.9E-4	1.6E-4
AMS06	Patricia McInnes	60	100%	5.1E-5	6E-5	6.7E-5	9.9E-5	1.5E-4	2.2E-4	4.4E-4	4.8E-4	1.3E-3	2.1E-4	2.3E-4
AMS07	Athabasca Valley	58	100%	3E-5	6.7E-5	7.9E-5	1.4E-4	2.6E-4	4.1E-4	9.3E-4	1.1E-3	1.9E-3	3.8E-4	3.7E-4
AMS14	Anzac	59	100%	3E-5	3.1E-5	3.7E-5	5.3E-5	7.9E-5	1.2E-4	1.8E-4	2.5E-4	3.2E-4	9.7E-5	6.5E-5
AMS13	Fort McKay South	61	100%	3E-5	3.3E-5	4E-5	6.5E-5	1.1E-4	2.3E-4	4E-4	6.5E-4	8.2E-4	1.8E-4	1.8E-4
AMS15	Horizon	61	100%	3.9E-5	4.8E-5	5.4E-5	7E-5	1.1E-4	2.4E-4	3.9E-4	4.5E-4	6.7E-4	1.7E-4	1.4E-4



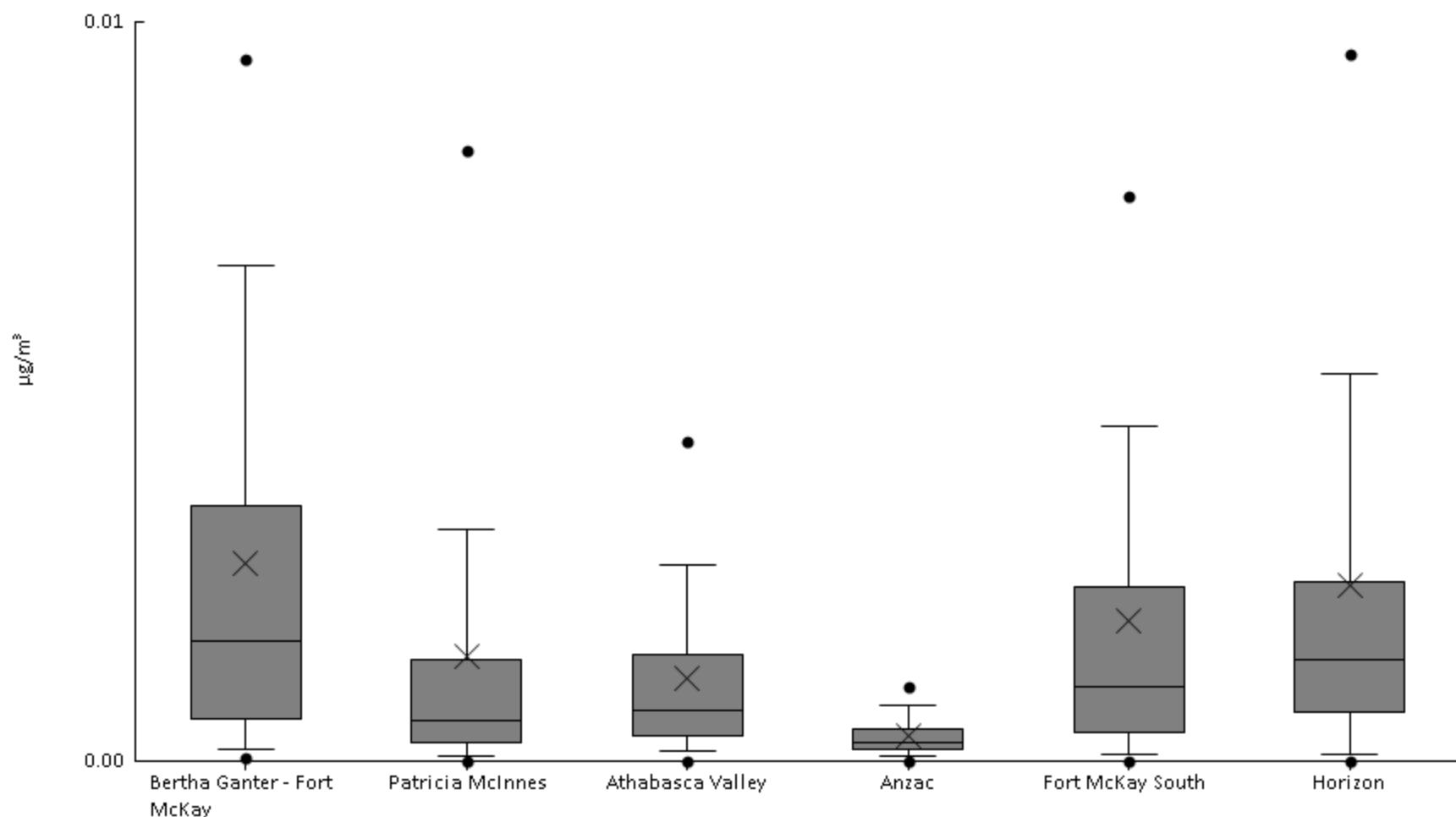
Particulate Matter (PM10 METALS) - Uranium ($\mu\text{g}/\text{m}^3$) - 2019

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	1E-6	1E-5	4.3E-5	7.9E-5	9.5E-5	2E-4	2.8E-5	3.7E-5
AMS06	Patricia McInnes	60	52%	0	0	0	0	2.5E-6	1.1E-5	4.9E-5	6.7E-5	1.1E-4	1.3E-5	2.3E-5
AMS07	Athabasca Valley	58	72%	0	0	0	2E-6	9E-6	1.8E-5	3.7E-5	5.3E-5	5.4E-4	2.2E-5	7.1E-5
AMS14	Anzac	59	36%	0	0	0	0	1E-6	5E-6	1.7E-5	6.4E-5	1.7E-4	9.5E-6	2.7E-5
AMS13	Fort McKay South	61	66%	0	0	0	0	8E-6	2.1E-5	4.9E-5	6.6E-5	2.6E-4	1.9E-5	3.7E-5
AMS15	Horizon	61	77%	0	0	0	2.8E-6	1.4E-5	3E-5	8.4E-5	1.2E-4	1.4E-4	2.7E-5	3.5E-5



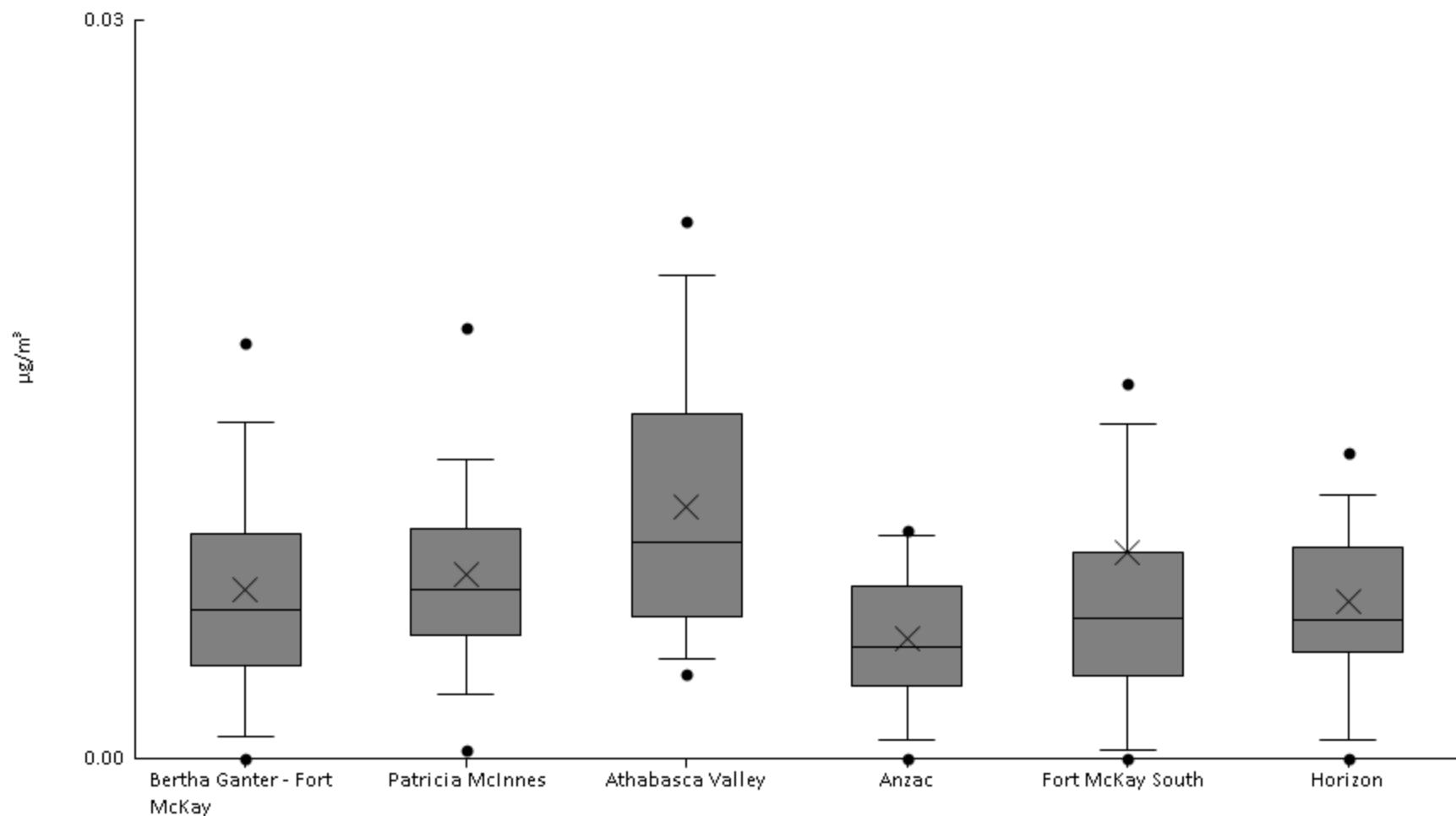
Particulate Matter (PM10 METALS) - Vanadium ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	95%	0	5.1E-5	1.7E-4	5.7E-4	1.6E-3	3.4E-3	6.7E-3	9.5E-3	0.018	2.7E-3	3.3E-3
AMS06	Patricia McInnes	60	92%	0	0	7E-5	2.5E-4	5.5E-4	1.4E-3	3.1E-3	8.3E-3	0.011	1.4E-3	2.4E-3
AMS07	Athabasca Valley	58	91%	0	0	1.4E-4	3.3E-4	6.8E-4	1.5E-3	2.7E-3	4.3E-3	5.6E-3	1.1E-3	1.3E-3
AMS14	Anzac	59	92%	0	0	7.4E-5	1.6E-4	2.4E-4	4.4E-4	7.5E-4	1E-3	1.8E-3	3.5E-4	3.3E-4
AMS13	Fort McKay South	61	93%	0	0	9.3E-5	3.9E-4	1E-3	2.3E-3	4.5E-3	7.6E-3	0.014	1.9E-3	2.5E-3
AMS15	Horizon	61	92%	0	0	9.4E-5	6.6E-4	1.4E-3	2.4E-3	5.2E-3	9.6E-3	0.018	2.4E-3	3.5E-3



Particulate Matter (PM10 METALS) - Zinc ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% \geq MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0	0	9E-4	3.8E-3	6.1E-3	9.1E-3	0.014	0.017	0.024	6.9E-3	4.9E-3
AMS06	Patricia McInnes	60	95%	0	3.6E-4	2.6E-3	5E-3	6.9E-3	9.3E-3	0.012	0.018	0.029	7.5E-3	5.1E-3
AMS07	Athabasca Valley	58	98%	0	3.4E-3	4E-3	5.7E-3	8.8E-3	0.014	0.02	0.022	0.031	0.01	6.1E-3
AMS14	Anzac	59	92%	0	0	7.8E-4	2.9E-3	4.5E-3	7E-3	9.1E-3	9.3E-3	0.011	4.9E-3	2.9E-3
AMS13	Fort McKay South	61	90%	0	0	3.4E-4	3.4E-3	5.7E-3	8.4E-3	0.014	0.015	0.14	8.4E-3	0.018
AMS15	Horizon	61	92%	0	0	7.4E-4	4.3E-3	5.7E-3	8.6E-3	0.011	0.012	0.02	6.4E-3	4.1E-3





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PARTICULATE MATTER – ELEMENTAL CARBON/ORGANIC CARBON DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

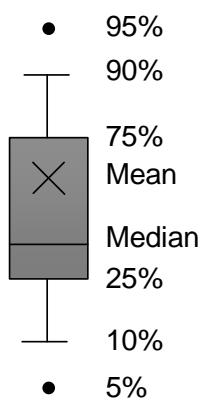
LABORATORY ANALYSIS BY:

EC/OC: Desert Research Institute
Reno, NV



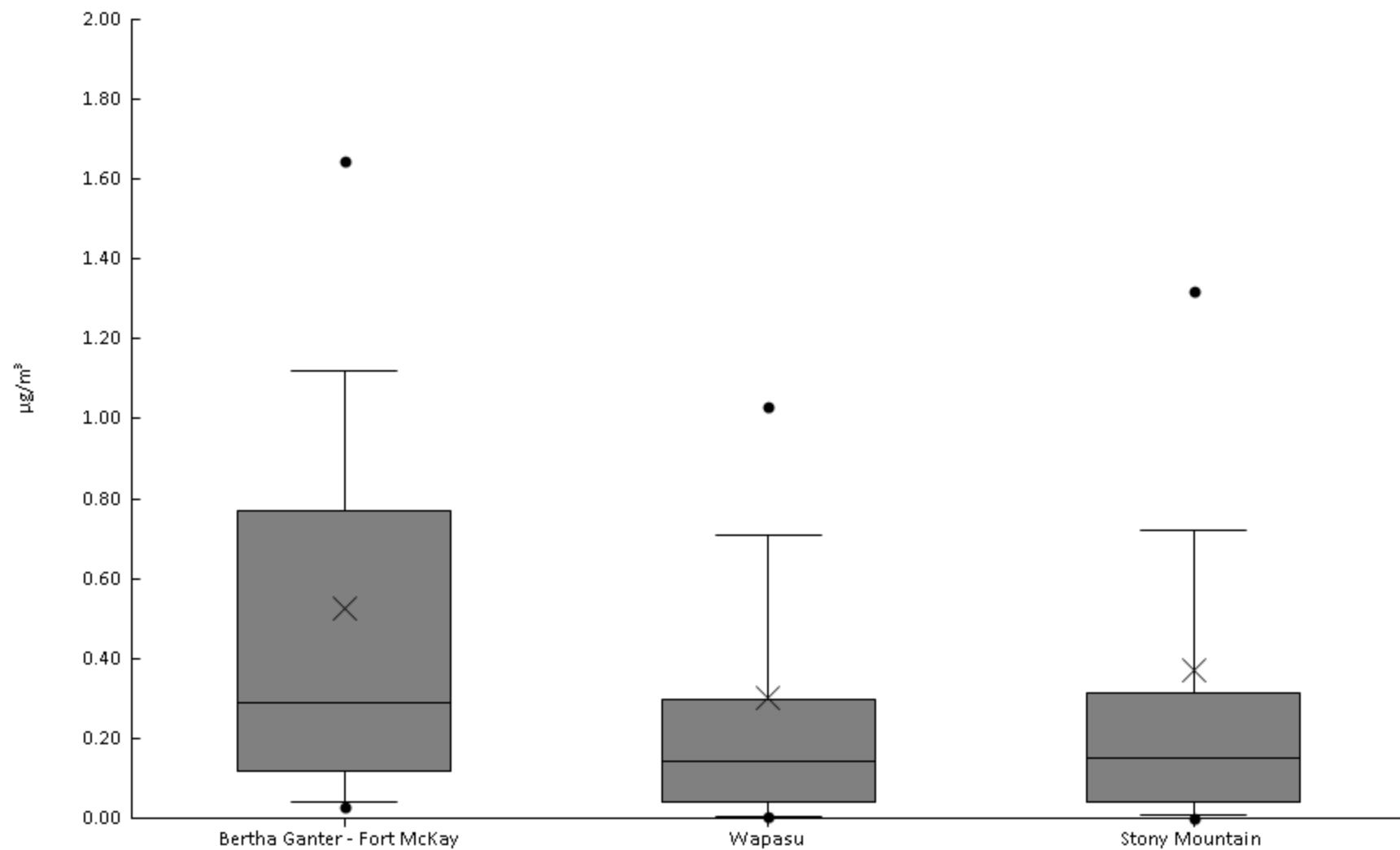
CONTENTS DESCRIPTION	Partisol Sampler Measurements of elemental carbon (EC) and organic carbon (OC)
SAMPLING PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (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 ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
USER NOTE 4	Values are computed on a monthly dataset.
USER NOTE 5	Summary statistics include flags beginning with V.
REPORT NOTE	Field Blanks are on a monthly interval. Their information is repeated on the report pages.
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



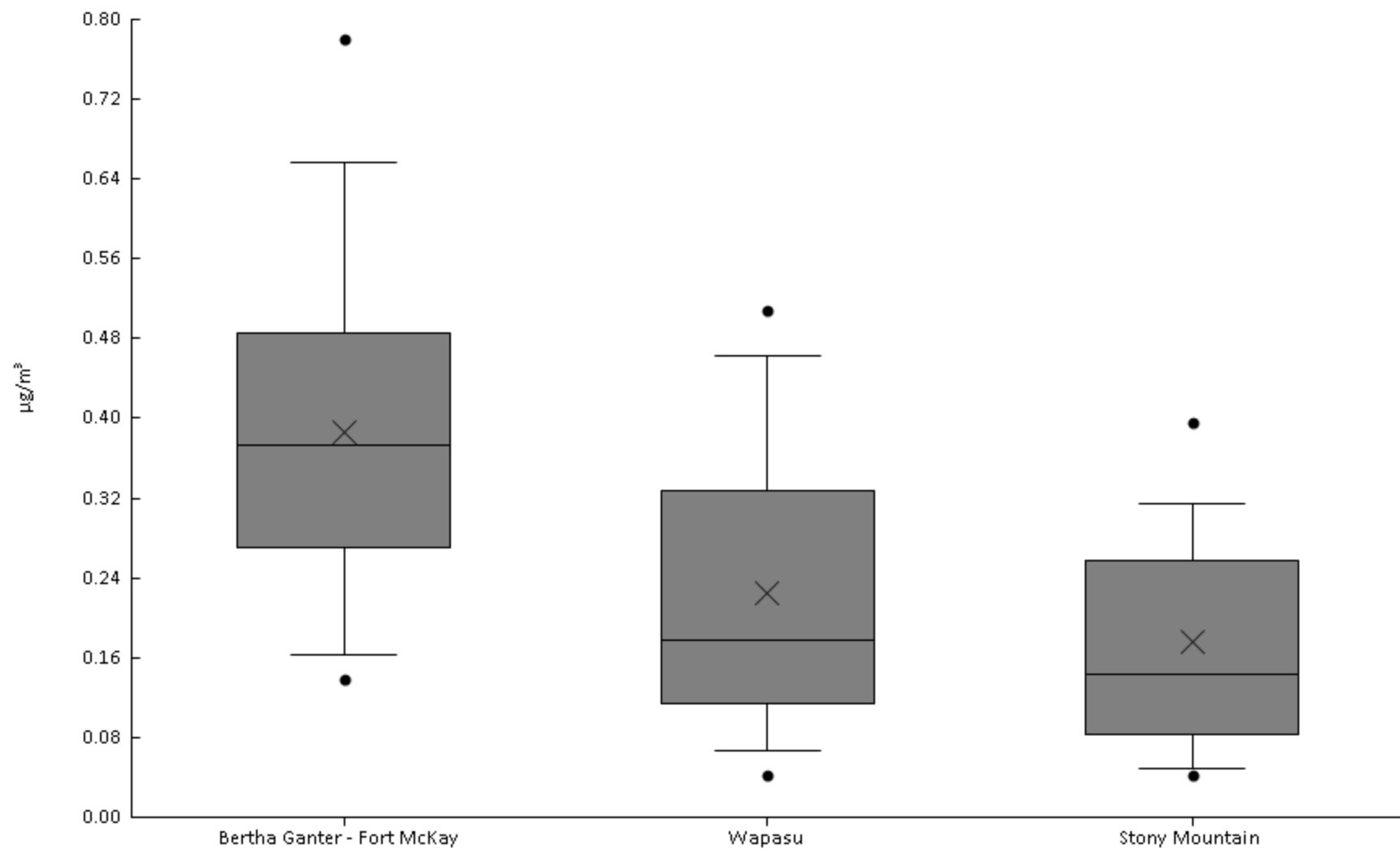
ECOC - Elemental Carbon Fraction 1 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	3.5E-3	0.029	0.04	0.12	0.29	0.77	1.1	1.6	4.6	0.53	0.72
AMS17	Wapasu	61	95%	0	2.1E-3	5E-3	0.041	0.14	0.3	0.71	1	3.4	0.3	0.57
AMS18	Stony Mountain	60	97%	0	1.6E-3	7.9E-3	0.042	0.15	0.31	0.72	1.3	5.6	0.37	0.83



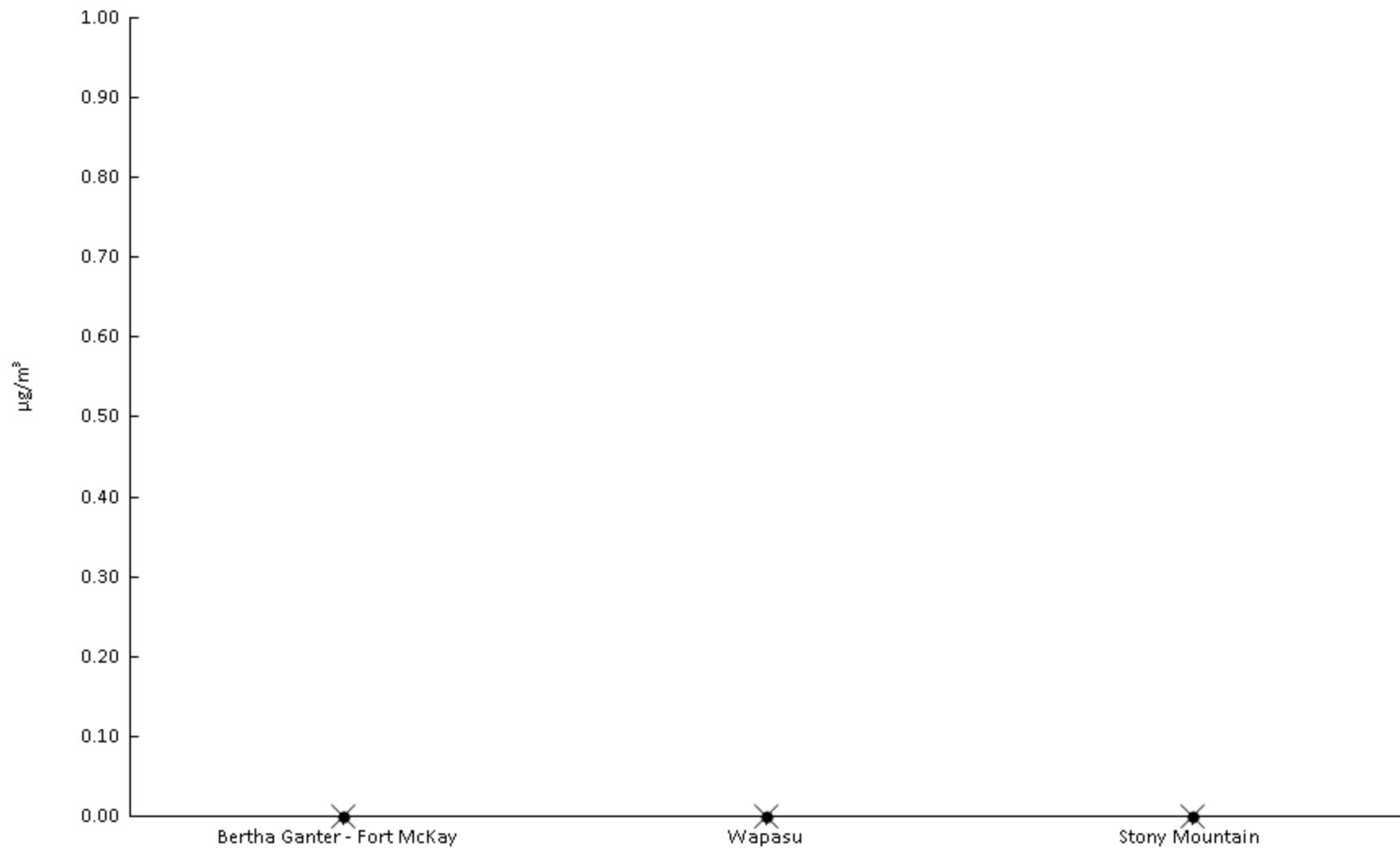
ECOC - Elemental Carbon Fraction 2 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.1	0.14	0.16	0.27	0.37	0.49	0.66	0.78	0.82	0.39	0.18
AMS17	Wapasu	61	100%	0.025	0.042	0.067	0.11	0.18	0.33	0.46	0.51	0.76	0.22	0.15
AMS18	Stony Mountain	60	100%	0.032	0.042	0.048	0.083	0.14	0.26	0.31	0.4	0.77	0.18	0.13



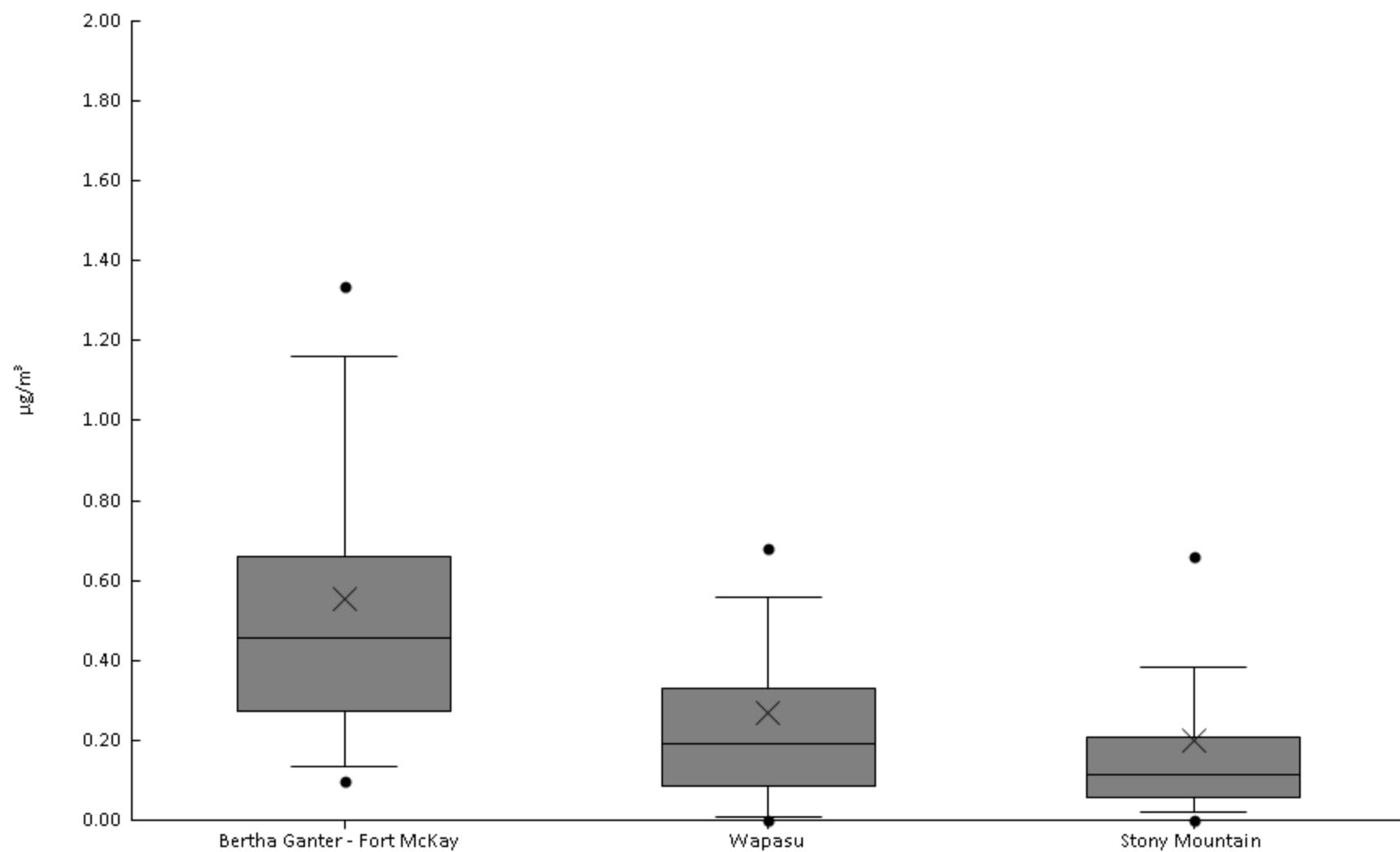
ECOC - Elemental Carbon Fraction 3 concentration ($\mu\text{g}/\text{m}^3$) - 2019

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
AMS17	Wapasu	61	0%	0	0	0	0	0	0	0	0	0	0	0
AMS18	Stony Mountain	60	0%	0	0	0	0	0	0	0	0	0	0	0



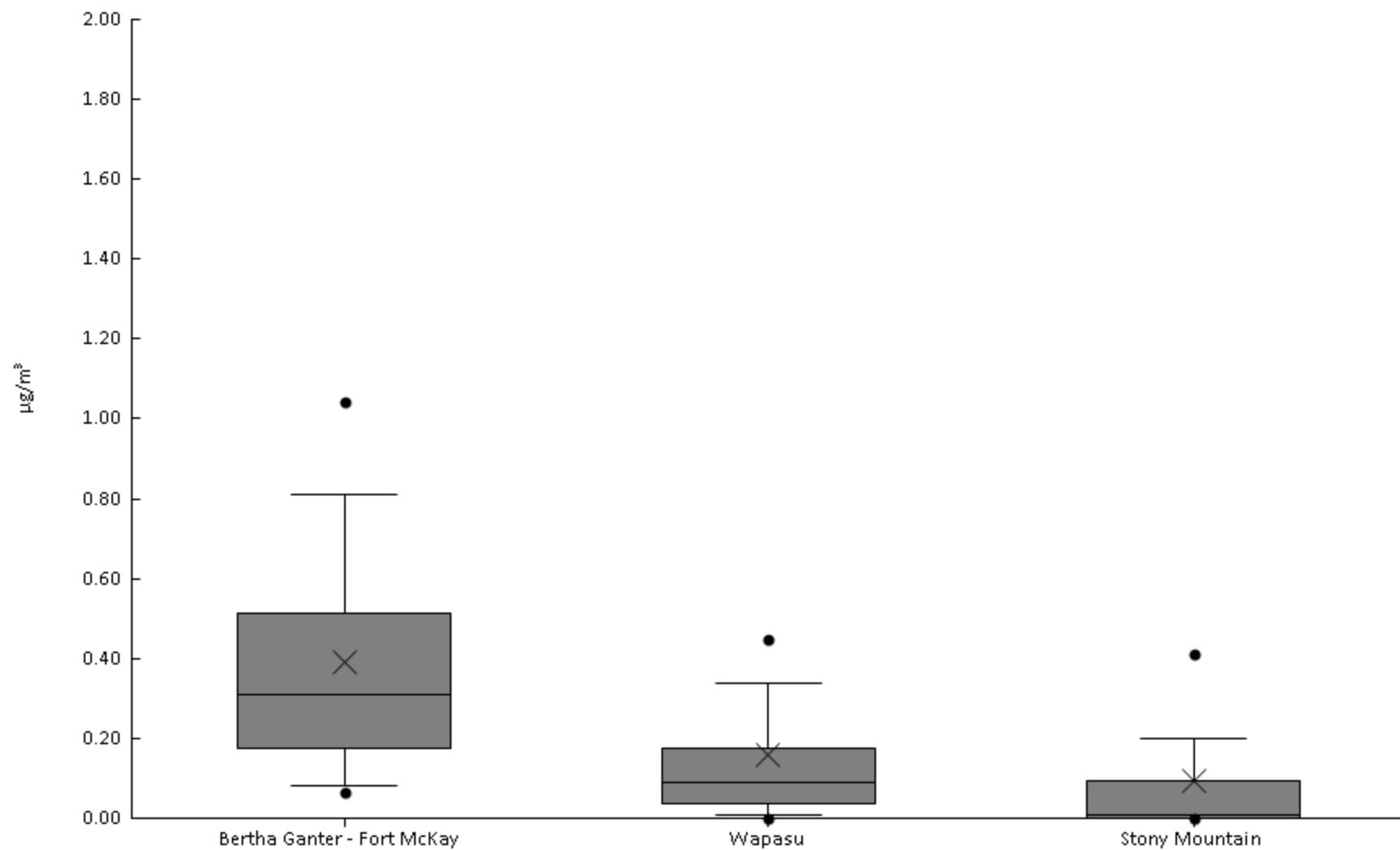
ECOC - Elemental carbon, thermal method, reflectance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	0.098	0.14	0.27	0.46	0.66	1.2	1.3	2.5	0.55	0.43
AMS17	Wapasu	61	92%	0	0	8.9E-3	0.084	0.19	0.33	0.56	0.68	1.7	0.27	0.32
AMS18	Stony Mountain	60	92%	0	0	0.02	0.056	0.11	0.21	0.38	0.66	2.1	0.2	0.31



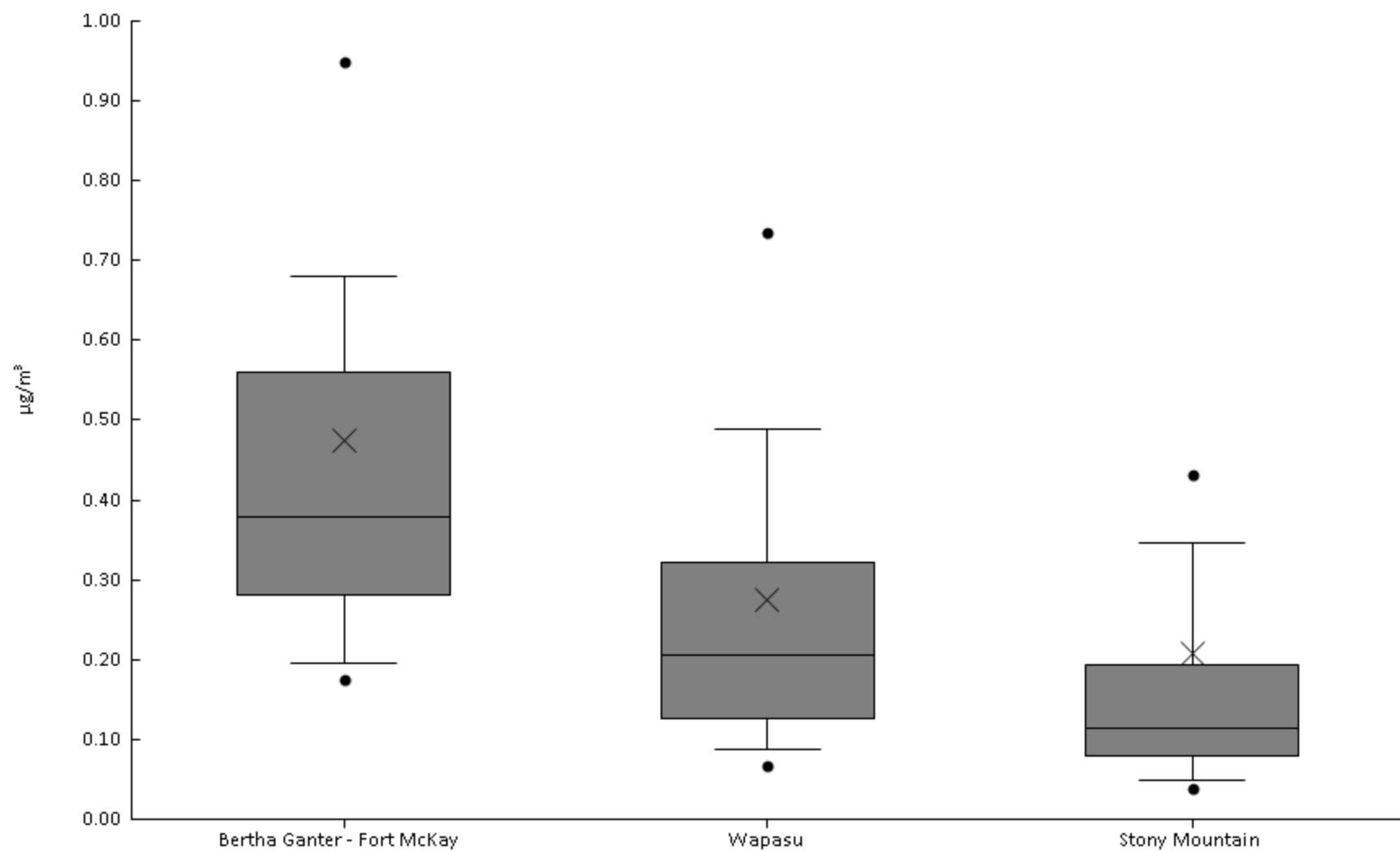
ECOC - Elemental carbon, thermal method, transmittance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	98%	0	0.064	0.082	0.18	0.31	0.52	0.81	1	1.9	0.39	0.34
AMS17	Wapasu	61	90%	0	0	6.7E-3	0.037	0.089	0.18	0.34	0.45	1.3	0.16	0.24
AMS18	Stony Mountain	60	58%	0	0	0	0	9.7E-3	0.092	0.2	0.41	1.6	0.093	0.24



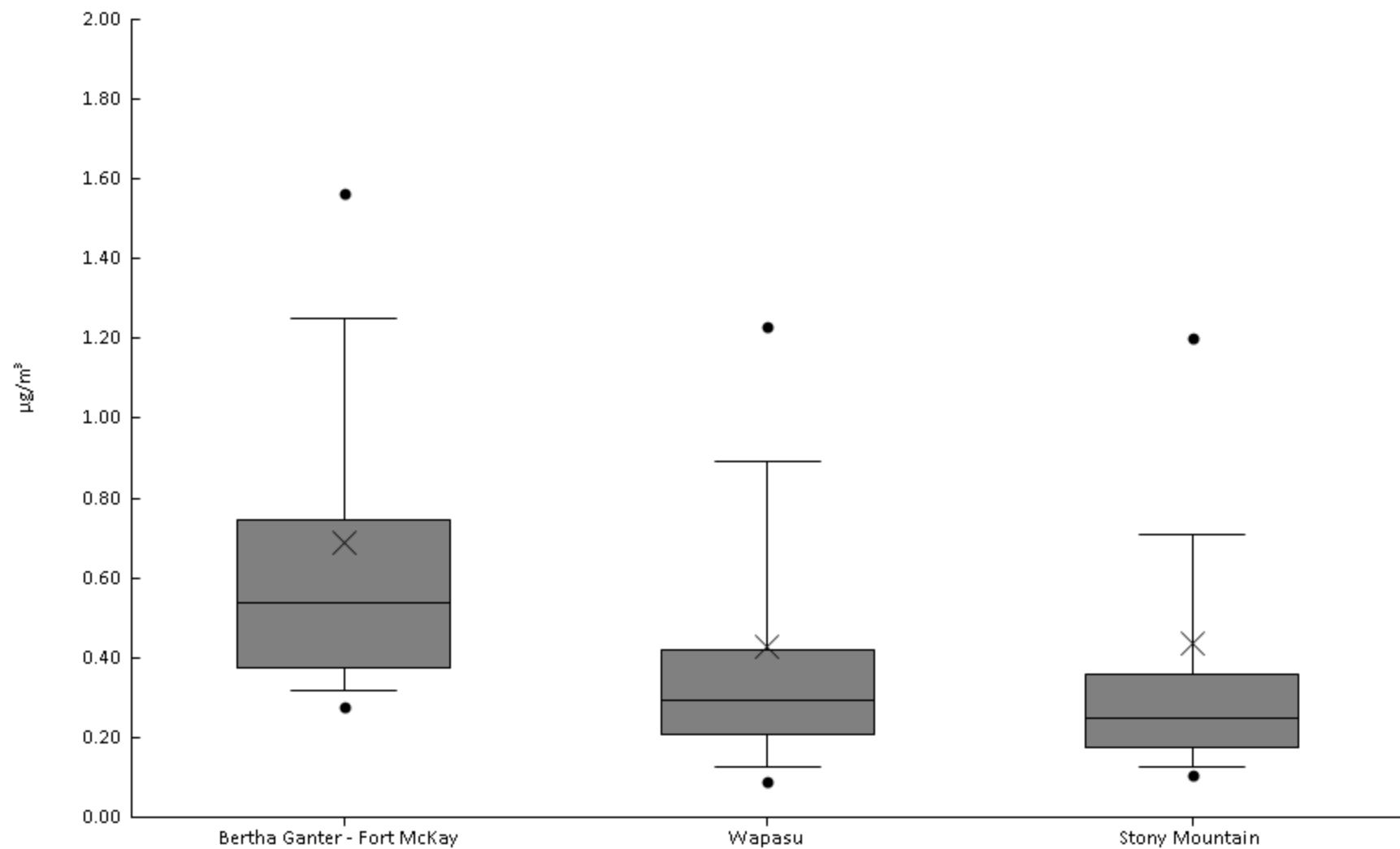
ECOC - Organic Carbon Fraction 1 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.12	0.17	0.2	0.28	0.38	0.56	0.68	0.95	3.2	0.47	0.41
AMS17	Wapasu	61	100%	0.047	0.067	0.087	0.13	0.21	0.32	0.49	0.73	1.8	0.28	0.28
AMS18	Stony Mountain	60	100%	0.028	0.039	0.049	0.08	0.11	0.19	0.35	0.43	3.4	0.21	0.43



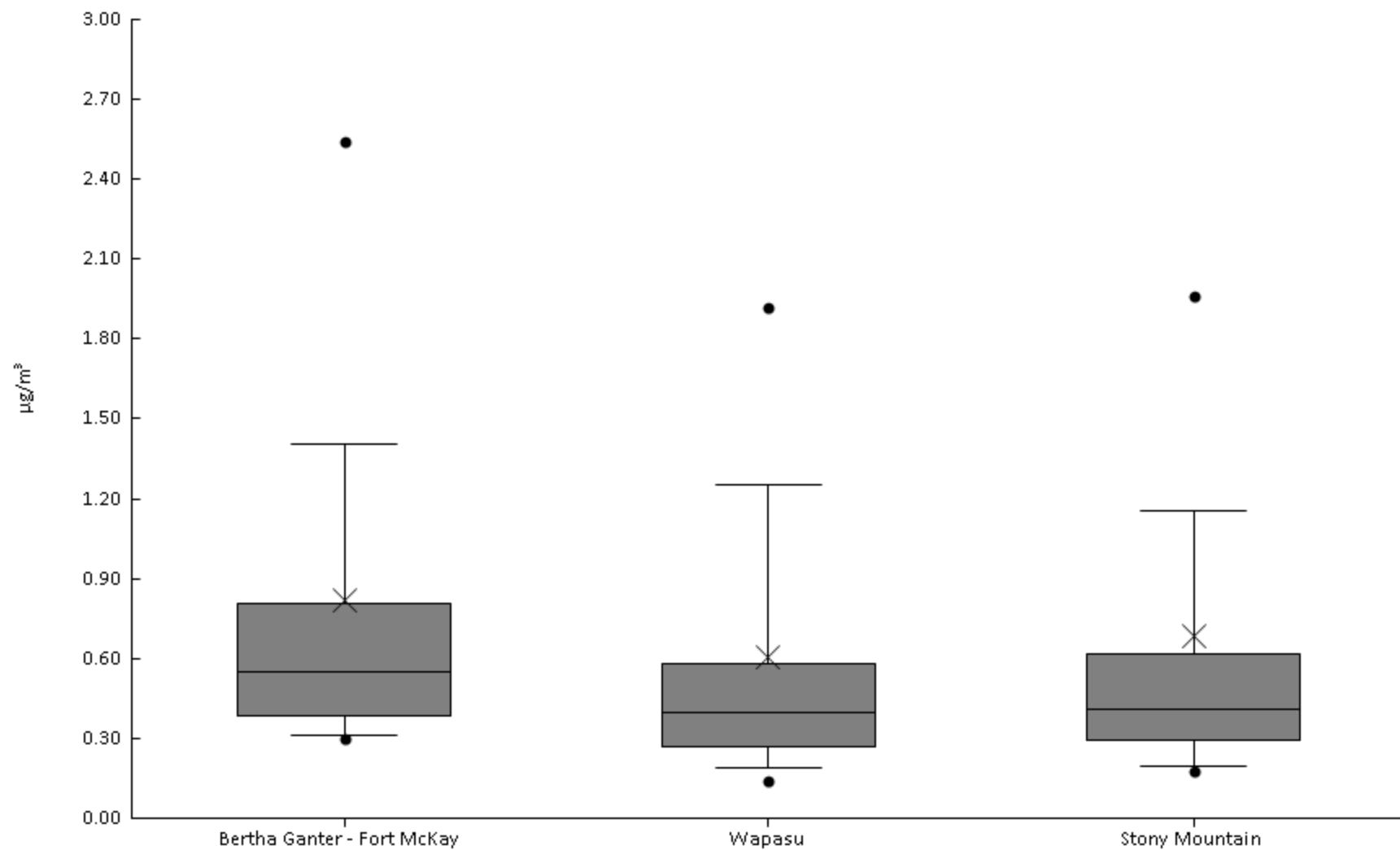
ECOC - Organic Carbon Fraction 2 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.24	0.28	0.32	0.38	0.54	0.75	1.2	1.6	5.5	0.69	0.71
AMS17	Wapasu	61	100%	0.073	0.09	0.13	0.21	0.29	0.42	0.89	1.2	3.3	0.43	0.49
AMS18	Stony Mountain	60	100%	0.088	0.11	0.13	0.17	0.25	0.36	0.71	1.2	5.4	0.43	0.76



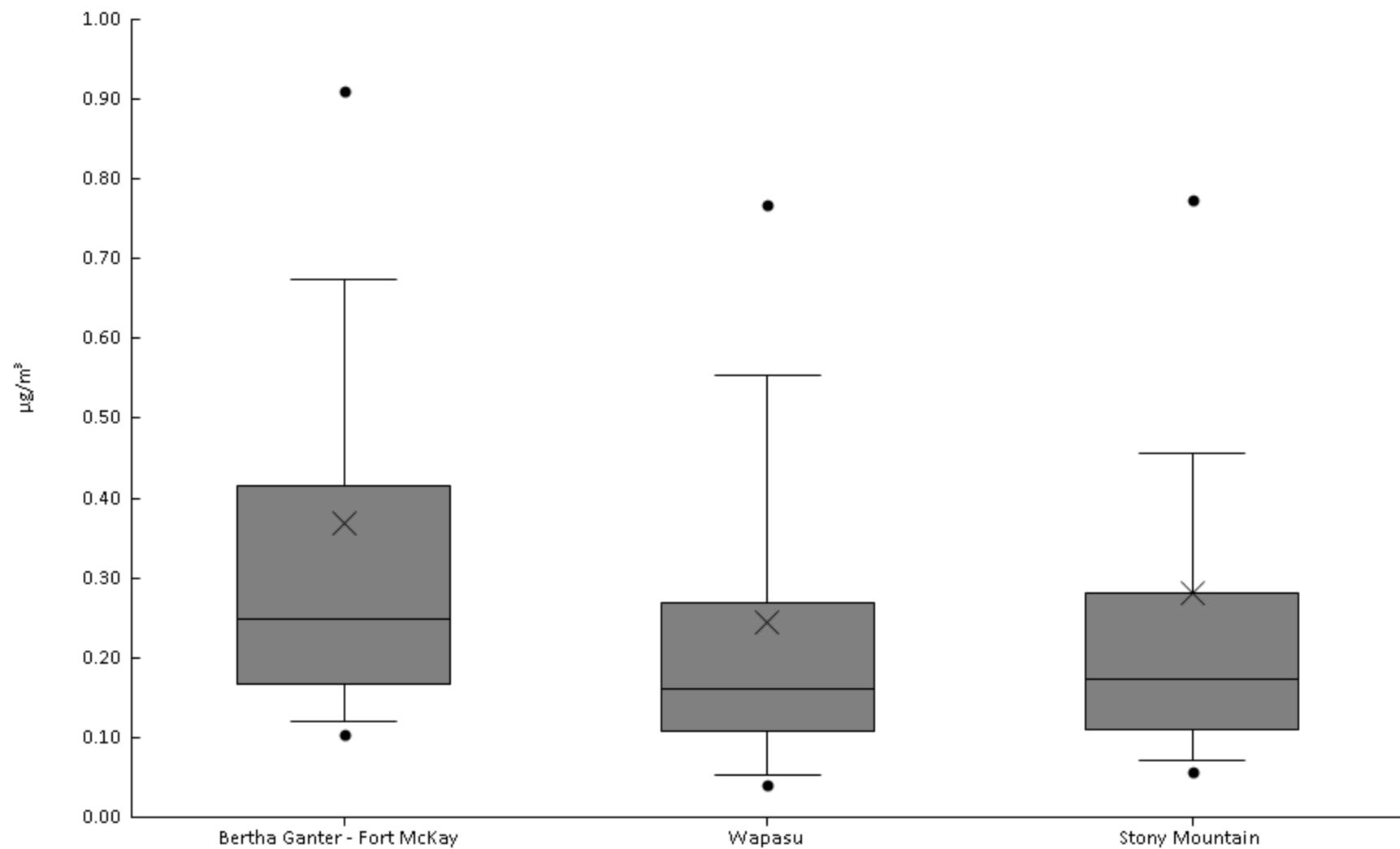
ECOC - Organic Carbon Fraction 3 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.25	0.3	0.31	0.38	0.55	0.81	1.4	2.5	5.8	0.82	0.88
AMS17	Wapasu	61	93%	0.13	0.14	0.19	0.27	0.39	0.58	1.3	1.9	4.8	0.61	0.75
AMS18	Stony Mountain	60	98%	0.14	0.18	0.19	0.29	0.41	0.62	1.2	2	6.8	0.68	1



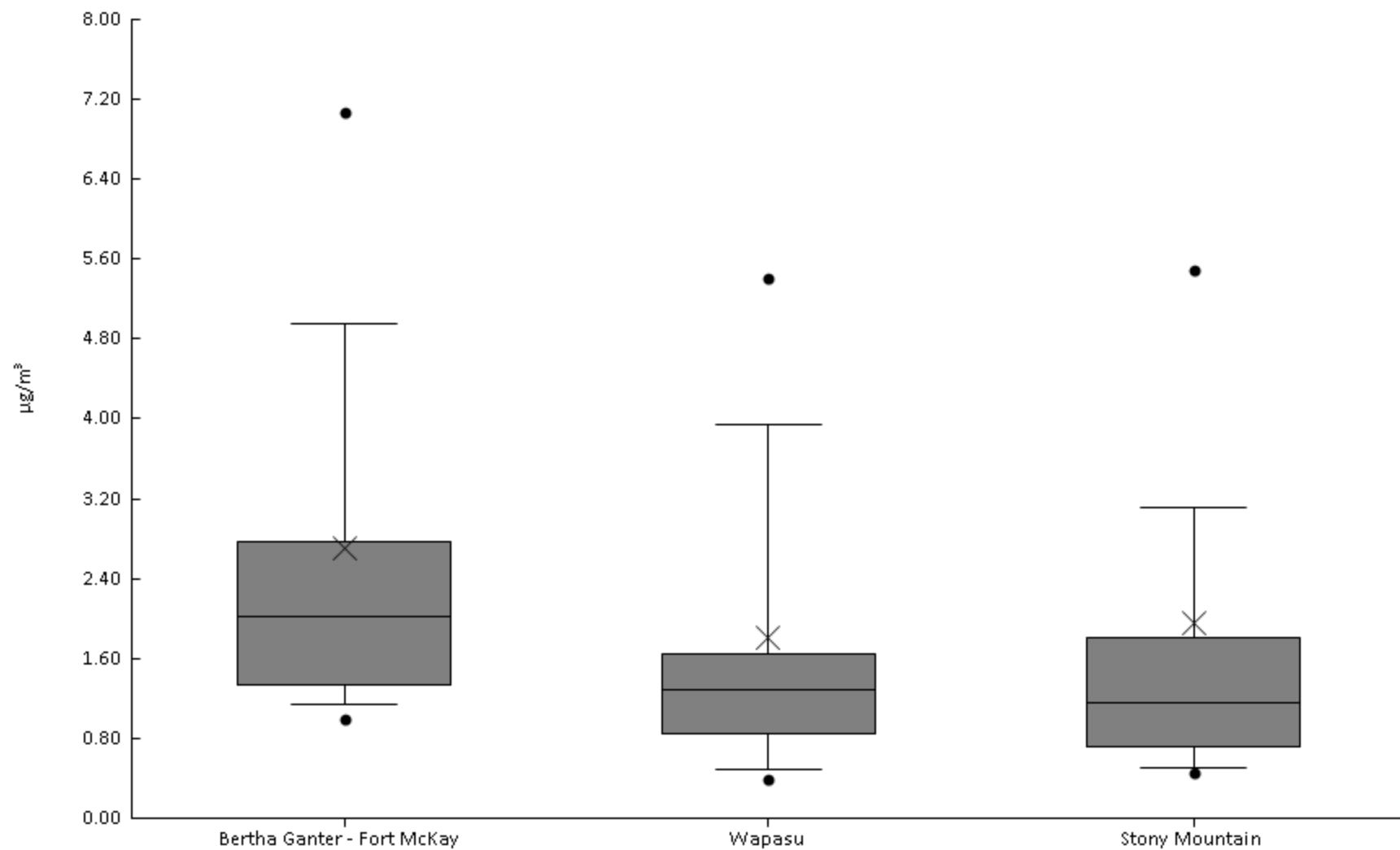
ECOC - Organic Carbon Fraction 4 concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.088	0.1	0.12	0.17	0.25	0.41	0.67	0.91	3.2	0.37	0.44
AMS17	Wapasu	61	100%	0.033	0.04	0.052	0.11	0.16	0.27	0.55	0.77	2	0.25	0.29
AMS18	Stony Mountain	60	100%	0.046	0.057	0.072	0.11	0.17	0.28	0.46	0.77	2.4	0.28	0.41



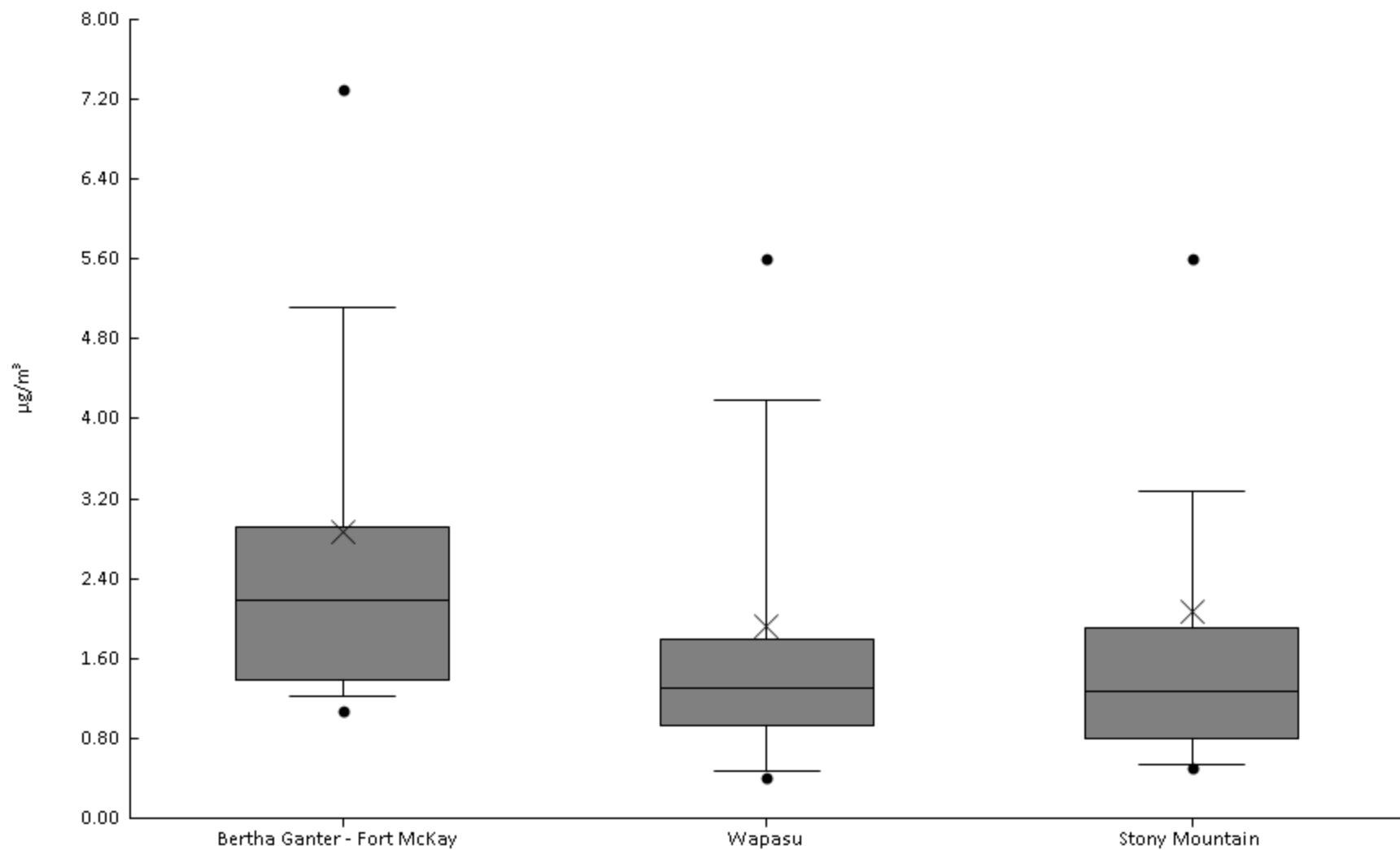
ECOC - Organic carbon, thermal method, reflectance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.9	0.99	1.1	1.3	2	2.8	4.9	7.1	20	2.7	2.8
AMS17	Wapasu	61	100%	0.3	0.4	0.49	0.85	1.3	1.6	3.9	5.4	14	1.8	2.2
AMS18	Stony Mountain	60	100%	0.35	0.45	0.5	0.72	1.2	1.8	3.1	5.5	22	2	3.2



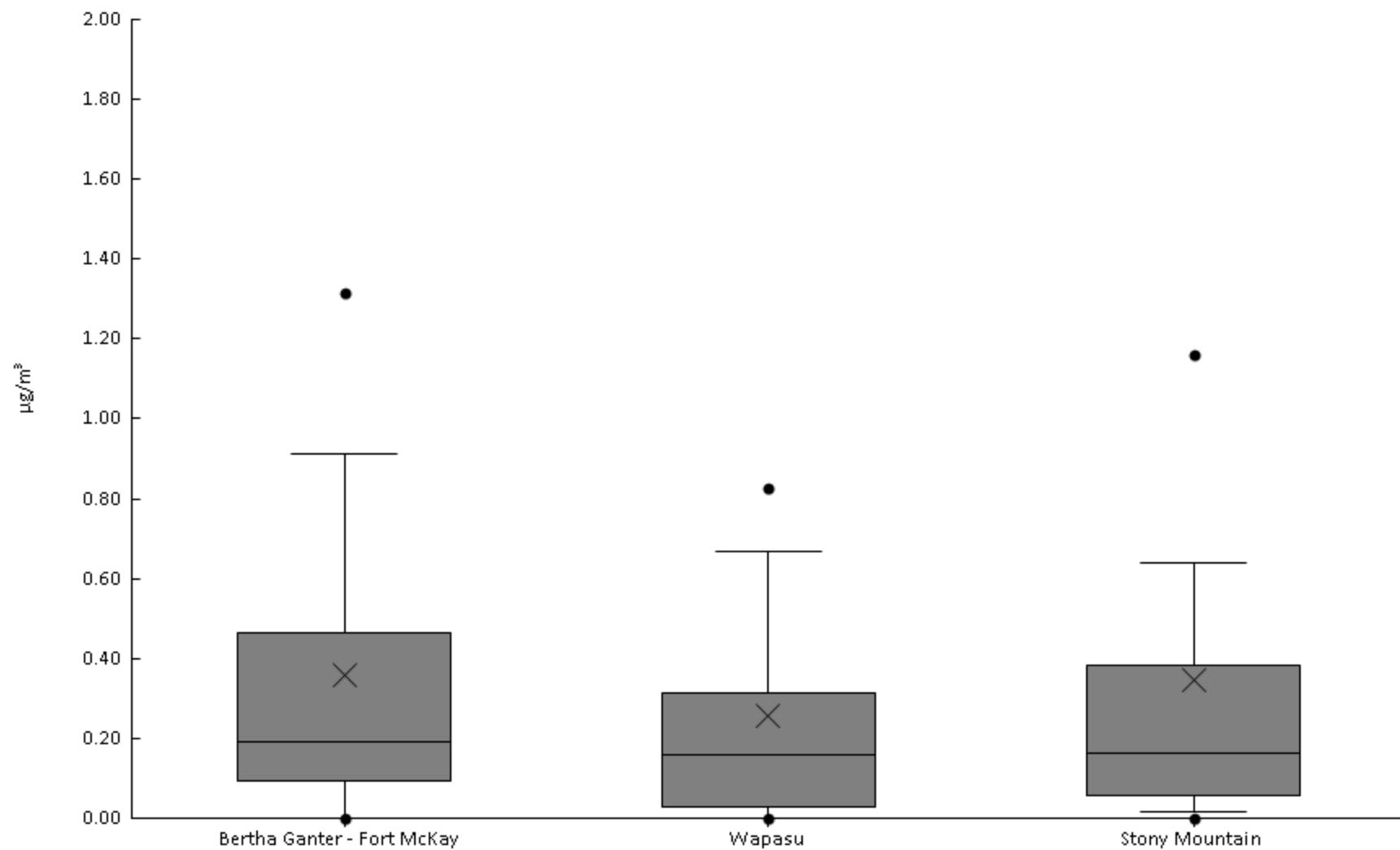
ECOC - Organic carbon, thermal method, transmittance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.97	1.1	1.2	1.4	2.2	2.9	5.1	7.3	21	2.9	2.9
AMS17	Wapasu	61	100%	0.33	0.4	0.48	0.94	1.3	1.8	4.2	5.6	14	1.9	2.2
AMS18	Stony Mountain	60	100%	0.38	0.5	0.54	0.8	1.3	1.9	3.3	5.6	23	2.1	3.3



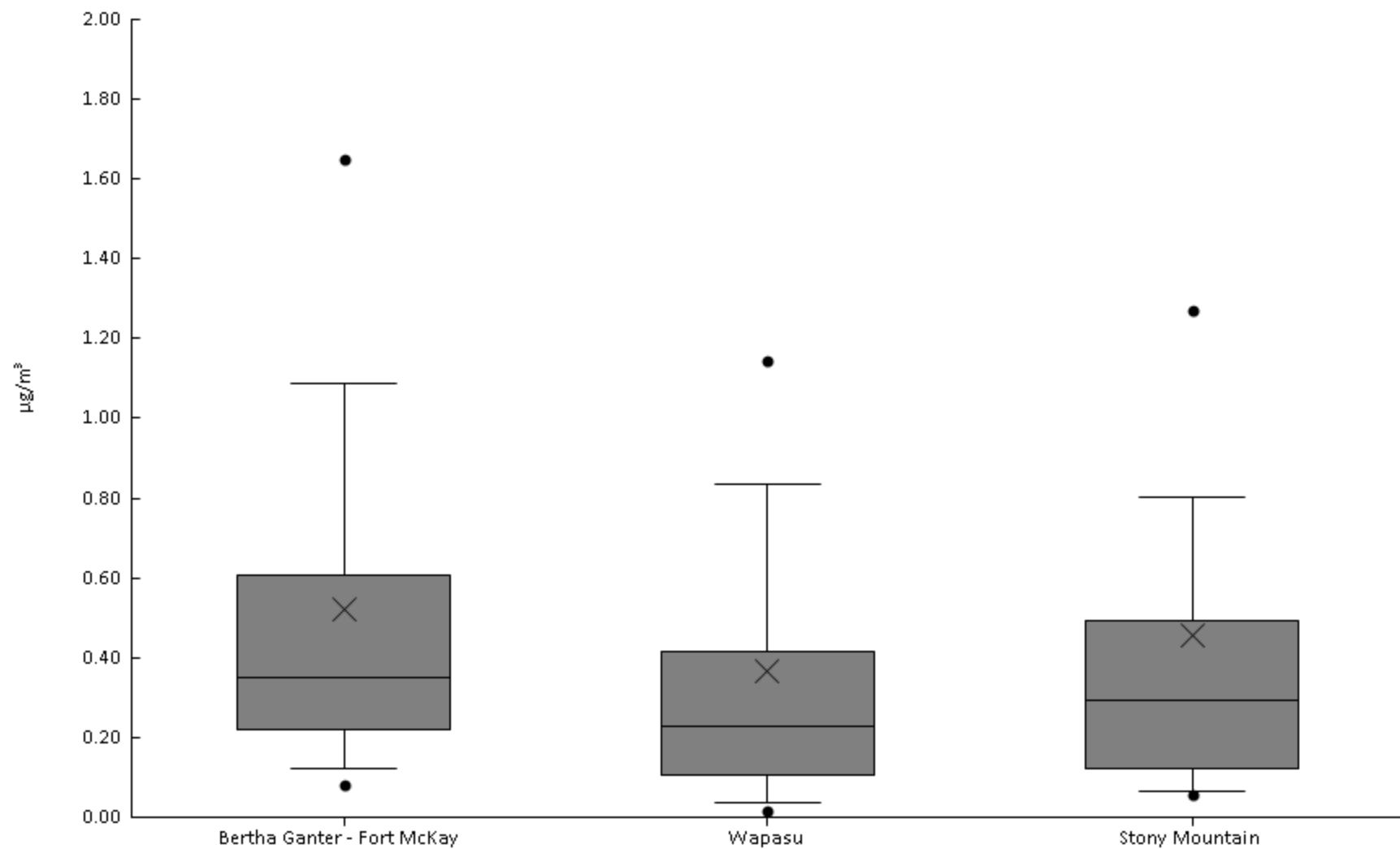
ECOC - Pyrolyzed organic carbon, thermal method,reflectance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	87%	0	0	0	0.092	0.19	0.47	0.91	1.3	2.8	0.36	0.47
AMS17	Wapasu	61	82%	0	0	0	0.03	0.16	0.31	0.67	0.83	2.2	0.26	0.39
AMS18	Stony Mountain	60	92%	0	0	0.017	0.058	0.16	0.38	0.64	1.2	4.3	0.35	0.64



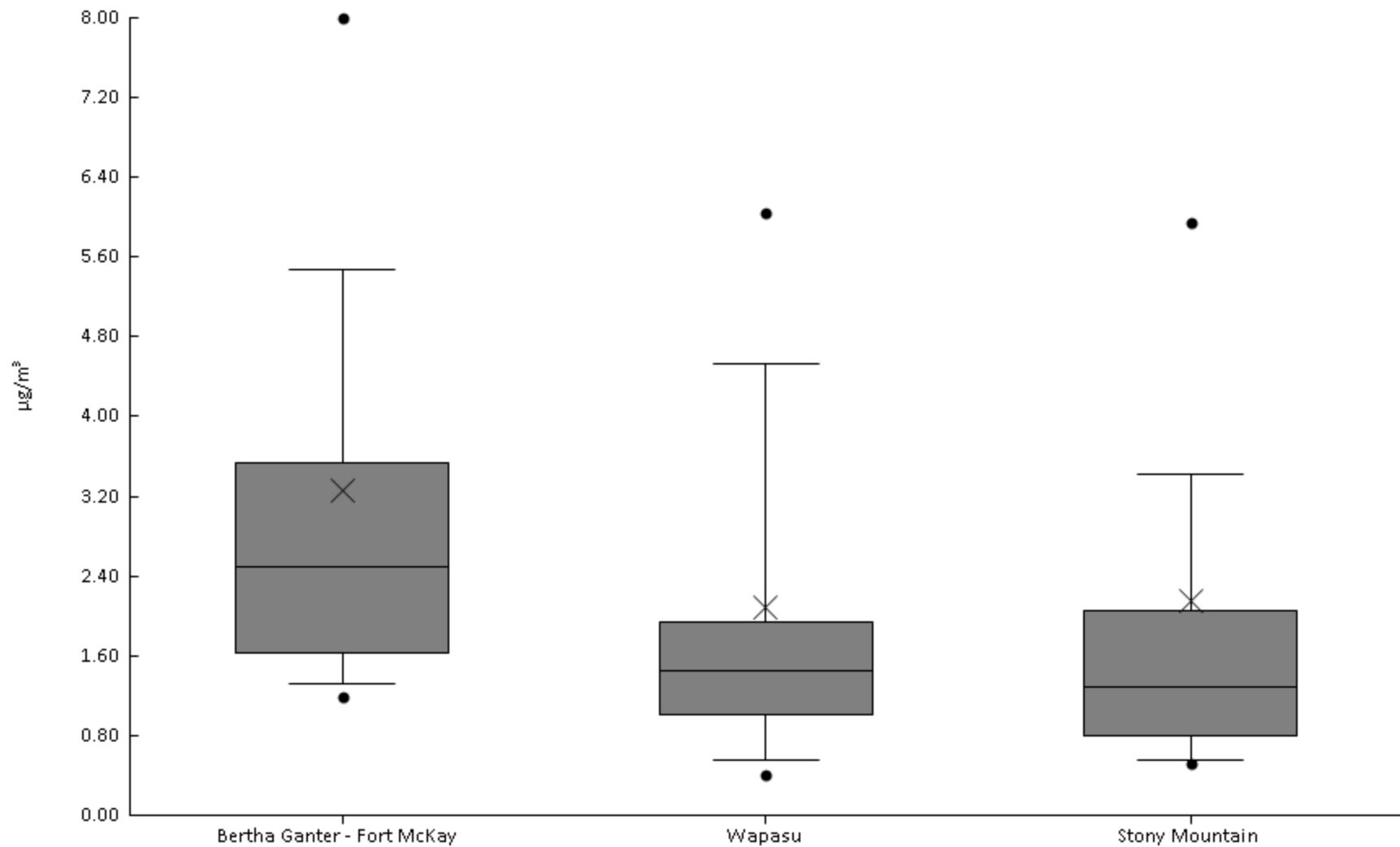
ECOC - Pyrolyzed organic carbon, thermal method, transmittance concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.029	0.081	0.12	0.22	0.35	0.61	1.1	1.6	3.4	0.52	0.55
AMS17	Wapasu	61	97%	0	0.016	0.038	0.11	0.23	0.42	0.83	1.1	2.6	0.37	0.46
AMS18	Stony Mountain	60	100%	0.038	0.057	0.063	0.12	0.29	0.49	0.8	1.3	4.8	0.45	0.7



ECOC - Total Carbon concentration ($\mu\text{g}/\text{m}^3$) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.1	1.2	1.3	1.6	2.5	3.5	5.5	8	23	3.3	3.2
AMS17	Wapasu	61	100%	0.33	0.41	0.55	1	1.4	1.9	4.5	6	16	2.1	2.5
AMS18	Stony Mountain	60	100%	0.38	0.52	0.55	0.8	1.3	2	3.4	5.9	24	2.2	3.5





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

POLYCYCLIC AROMATIC HYDROCARBONS DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

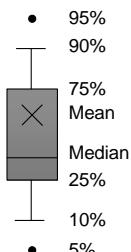
LABORATORY ANALYSIS BY:

Total PAHs: Air Zone One Incorporated
Mississauga, Ontario



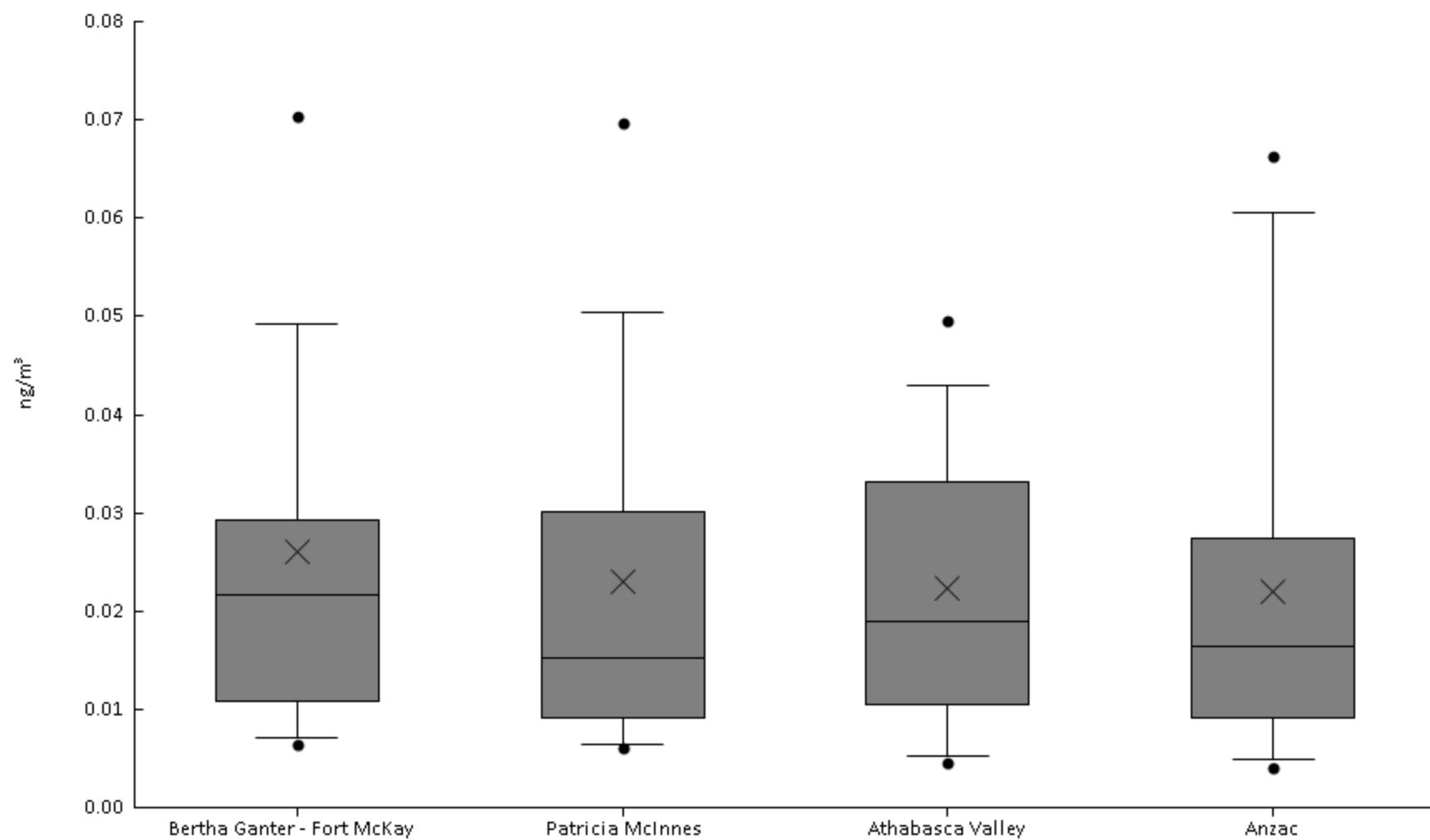
CONTENTS DESCRIPTION	PAH - Speciated PAH Gas + Particle Phase Measurements
SAMPLE PERIOD	24 hour
SAMPLING INTERVAL	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	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.
DATA DISPLAY NOTE	Values containing a less than sign(i.e less than the MDL) are displayed as 0.
USER NOTE 1	Data are recovery corrected and samples are corrected with a lab blank and an internal standard.
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 discontinued 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)
USER NOTE 7	Data qualifies for V4 if greater than a calculated historical maximum. Lab data exempt.
USER NOTE 8	Data is computed on a monthly dataset.
USER NOTE 9	Summary statistics include flags beginning with V.
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



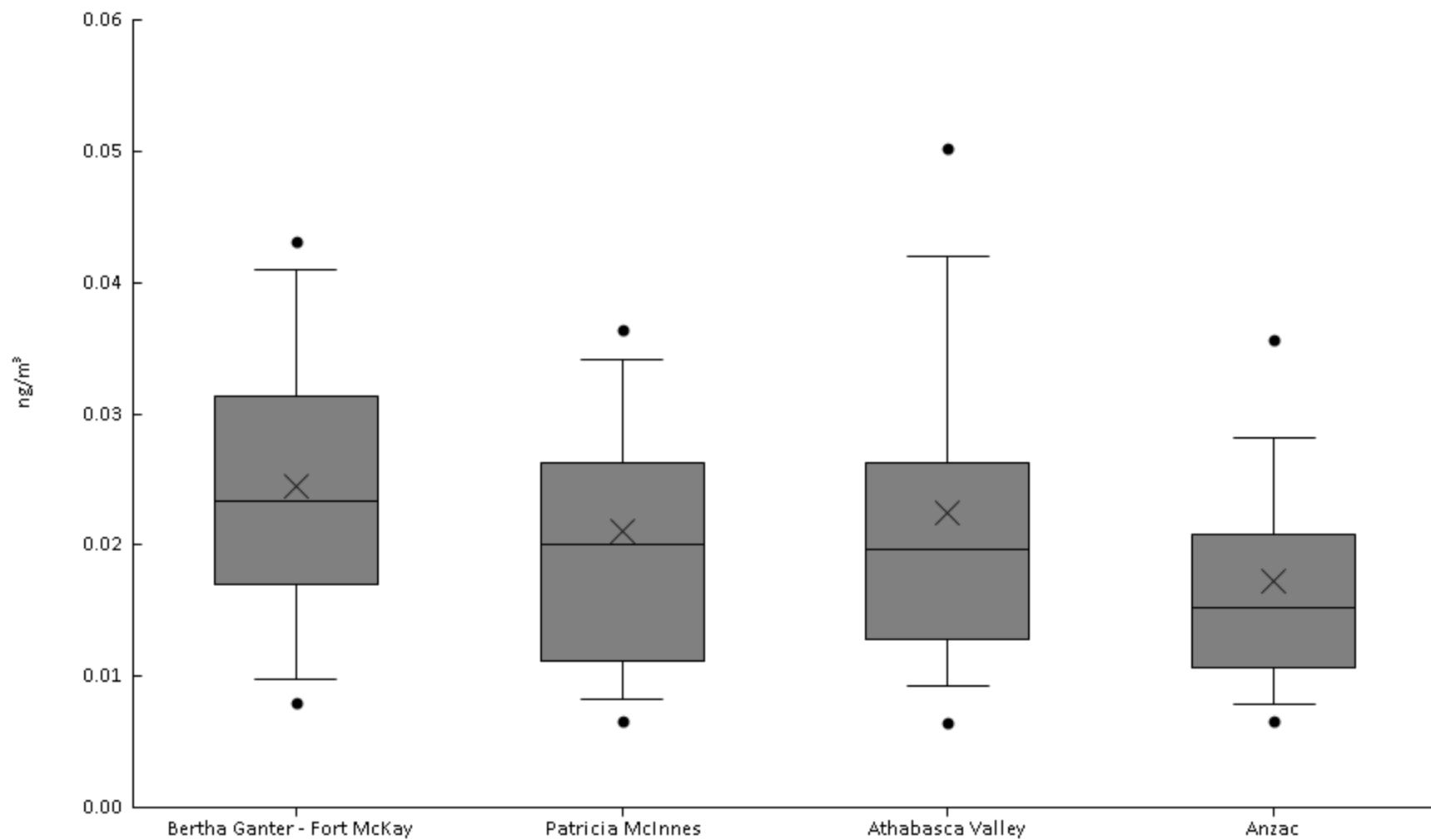
Polycyclic Aromatic Hydrocarbons - 3-Methylcholanthrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	48%	5.1E-3	6.5E-3	7.1E-3	0.011	0.022	0.029	0.049	0.07	0.15	0.026	0.024
AMS06	Patricia McInnes	62	34%	4.8E-3	6E-3	6.5E-3	9.2E-3	0.015	0.03	0.05	0.07	0.087	0.023	0.02
AMS07	Athabasca Valley	59	41%	0	4.6E-3	5.2E-3	0.011	0.019	0.033	0.043	0.05	0.066	0.022	0.015
AMS14	Anzac	60	35%	2.9E-3	4E-3	4.9E-3	9.1E-3	0.016	0.027	0.061	0.066	0.079	0.022	0.019



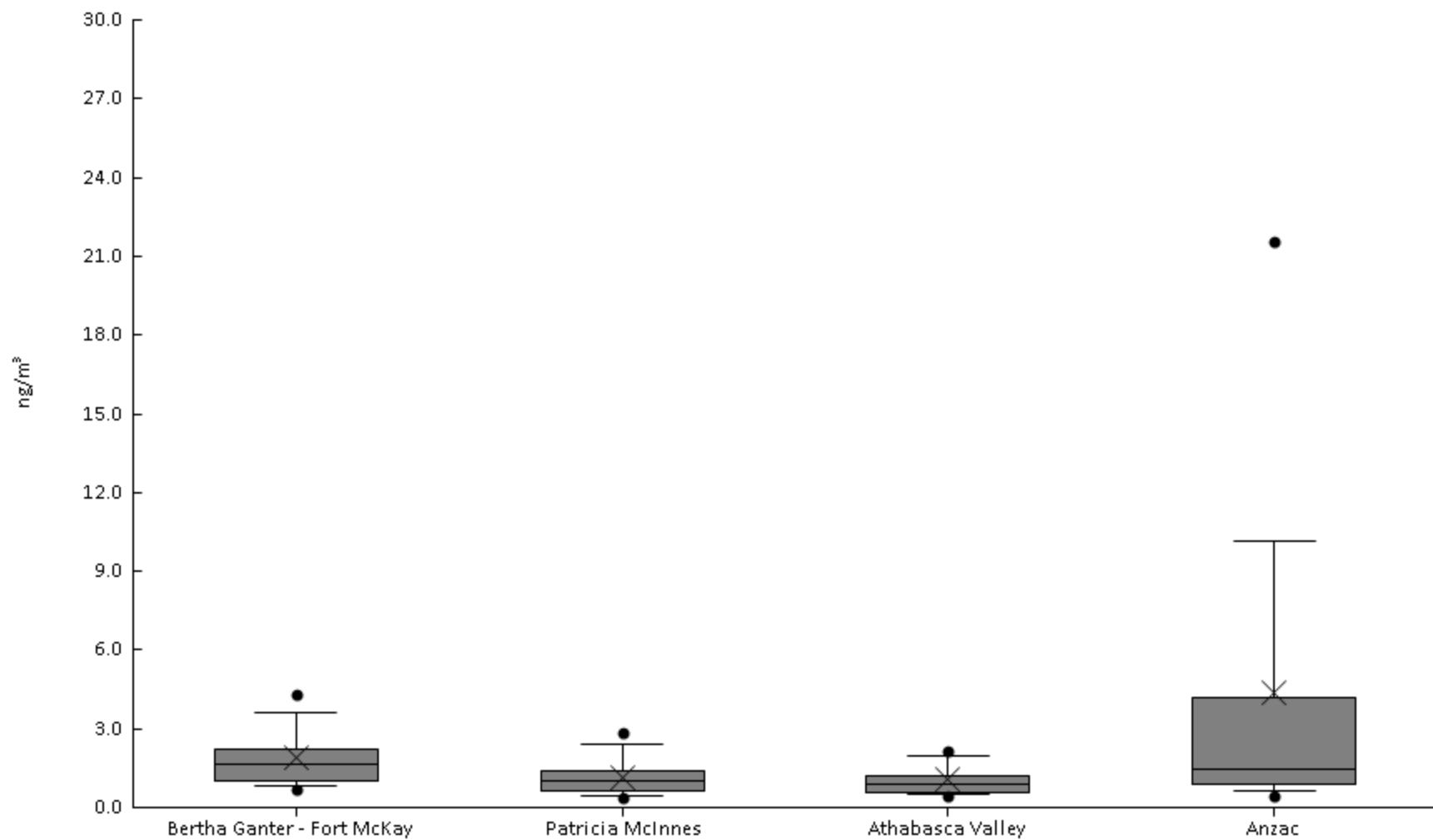
Polycyclic Aromatic Hydrocarbons - 7,12-Dimethylbenz(a)anthracene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	82%	6.5E-3	8E-3	9.8E-3	0.017	0.023	0.031	0.041	0.043	0.054	0.024	0.011
AMS06	Patricia McInnes	62	71%	3.8E-3	6.6E-3	8.2E-3	0.011	0.02	0.026	0.034	0.036	0.088	0.021	0.013
AMS07	Athabasca Valley	59	69%	4E-3	6.4E-3	9.3E-3	0.013	0.02	0.026	0.042	0.05	0.055	0.023	0.013
AMS14	Anzac	60	55%	2.4E-3	6.6E-3	7.8E-3	0.011	0.015	0.021	0.028	0.036	0.083	0.017	0.012



Polycyclic Aromatic Hydrocarbons - Acenaphthene (ng/m³) - 2019

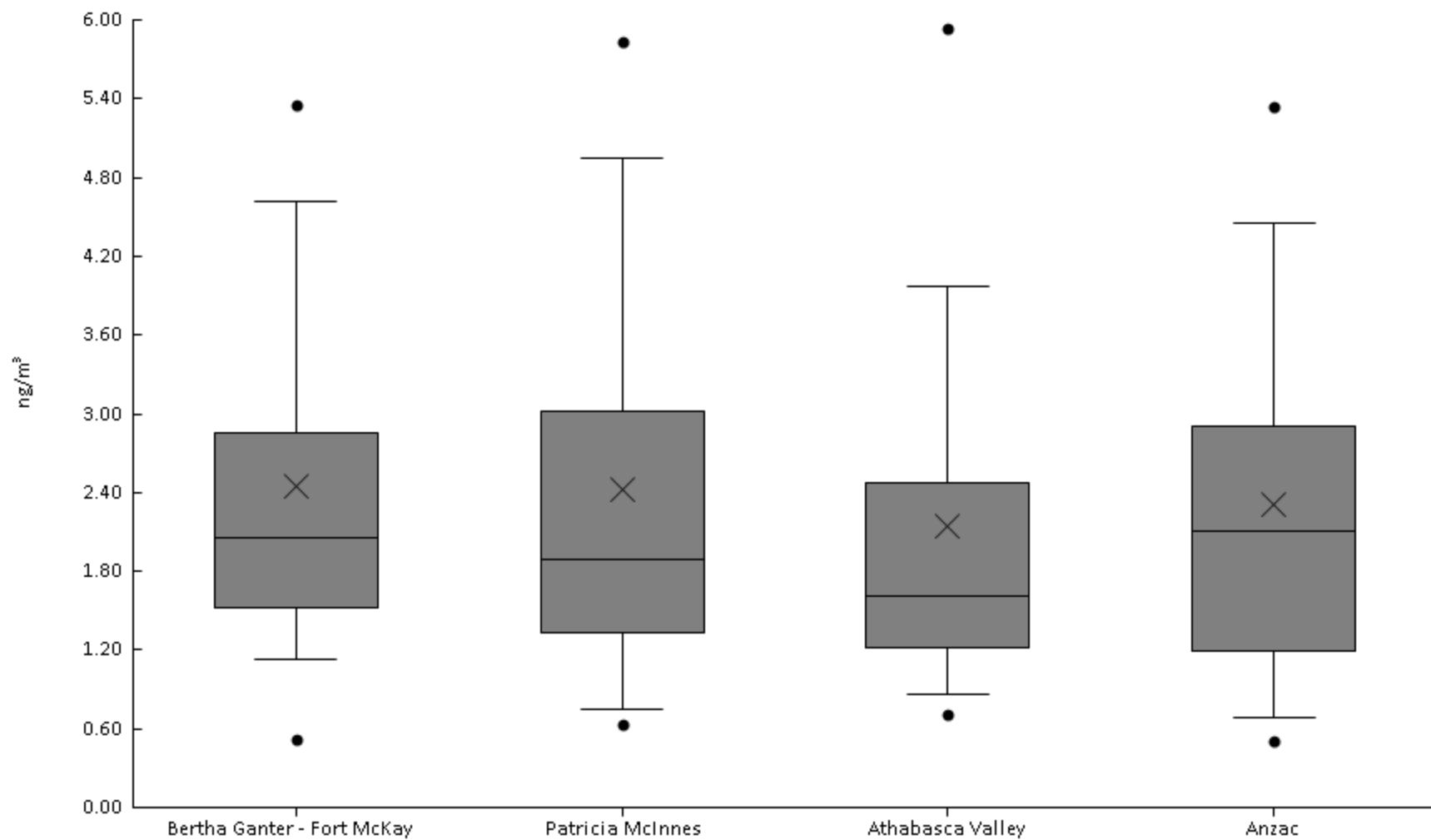
Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.48	0.72	0.83	1	1.7	2.2	3.6	4.3	6.2	1.9	1.1
AMS06	Patricia McInnes	62	100%	0.25	0.37	0.43	0.62	1	1.4	2.4	2.8	3.3	1.2	0.74
AMS07	Athabasca Valley	59	100%	0.24	0.43	0.51	0.6	0.89	1.2	2	2.1	4.7	1.1	0.7
AMS14	Anzac	60	100%	0.29	0.45	0.64	0.87	1.5	4.2	10	22	37	4.4	6.9





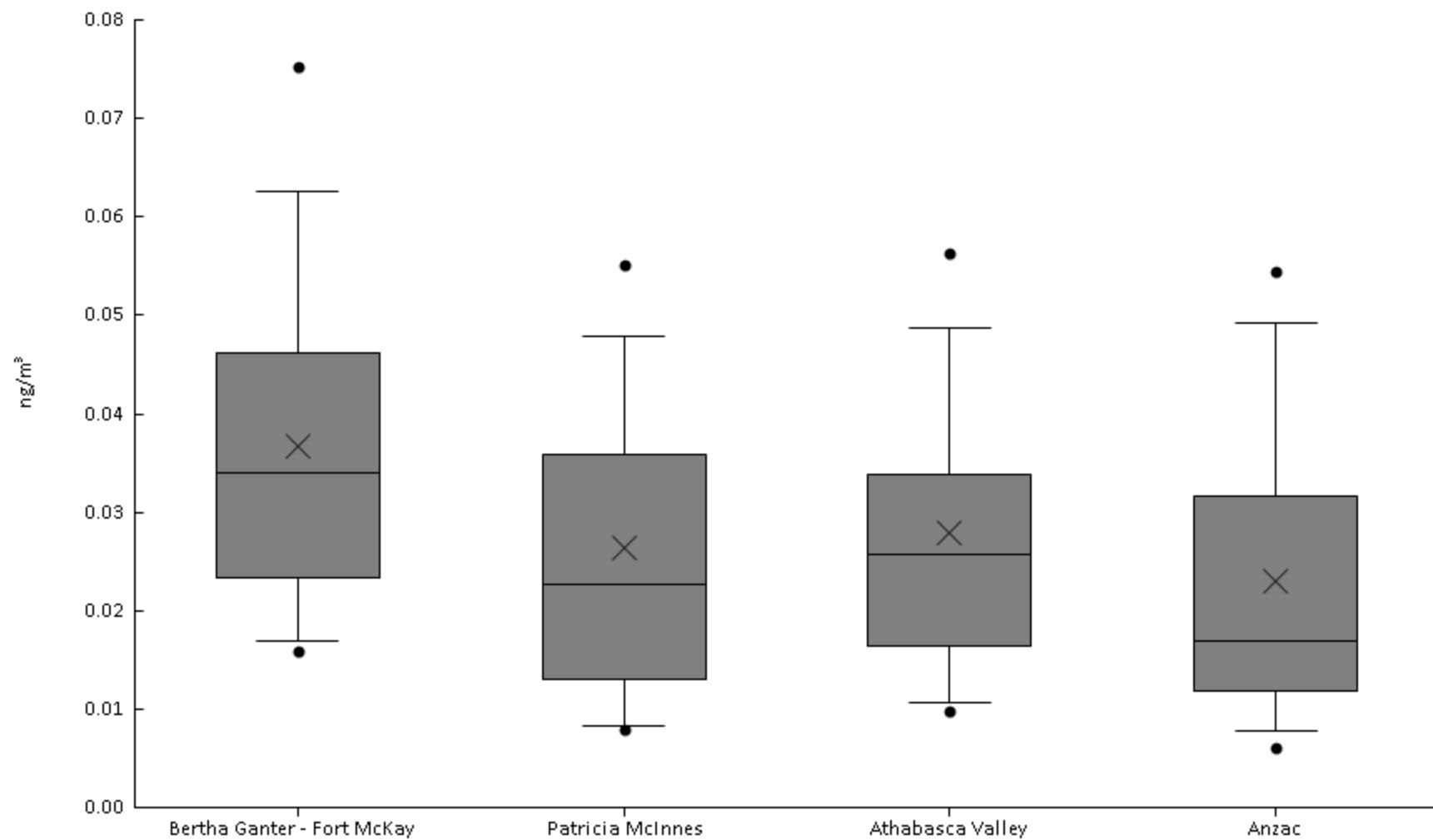
Polycyclic Aromatic Hydrocarbons - Acenaphthylene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.31	0.52	1.1	1.5	2	2.9	4.6	5.4	8.5	2.4	1.5
AMS06	Patricia McInnes	62	100%	0.45	0.64	0.75	1.3	1.9	3	5	5.8	9.5	2.4	1.8
AMS07	Athabasca Valley	59	100%	0.51	0.72	0.87	1.2	1.6	2.5	4	5.9	7.9	2.1	1.5
AMS14	Anzac	60	100%	0.25	0.51	0.69	1.2	2.1	2.9	4.5	5.3	7.5	2.3	1.5



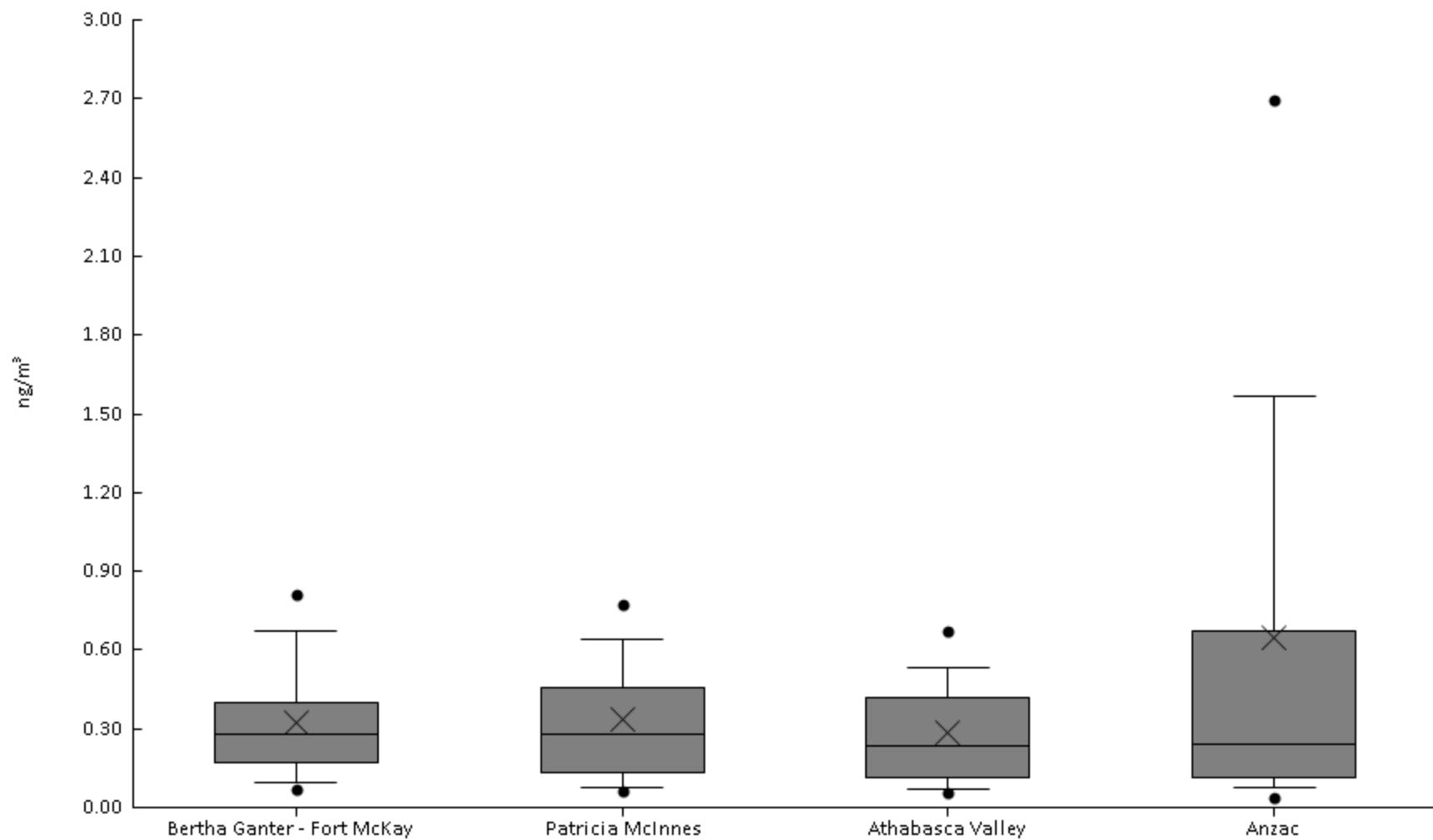
Polycyclic Aromatic Hydrocarbons - Acridine (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	85%	0.015	0.016	0.017	0.023	0.034	0.046	0.063	0.075	0.09	0.037	0.018
AMS06	Patricia McInnes	62	65%	3E-3	8E-3	8.3E-3	0.013	0.023	0.036	0.048	0.055	0.093	0.026	0.016
AMS07	Athabasca Valley	59	66%	1.9E-3	9.9E-3	0.011	0.016	0.026	0.034	0.049	0.056	0.096	0.028	0.017
AMS14	Anzac	60	47%	3.7E-3	6E-3	7.9E-3	0.012	0.017	0.032	0.049	0.054	0.084	0.023	0.016



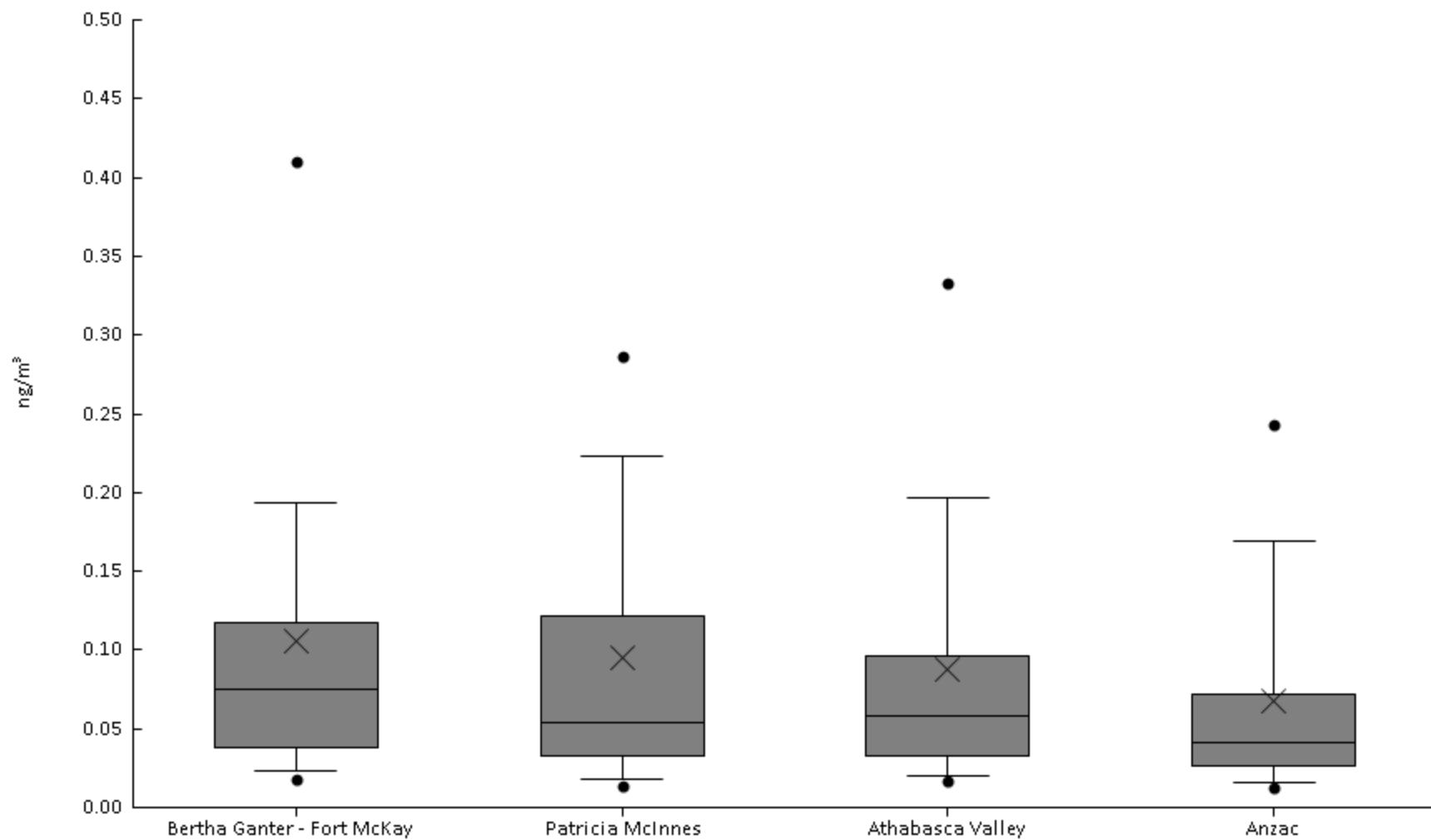
Polycyclic Aromatic Hydrocarbons - Anthracene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.041	0.071	0.092	0.17	0.28	0.4	0.67	0.81	0.95	0.33	0.22
AMS06	Patricia McInnes	62	100%	0.031	0.065	0.075	0.13	0.28	0.46	0.64	0.77	1.4	0.34	0.26
AMS07	Athabasca Valley	59	97%	0.011	0.056	0.069	0.11	0.23	0.42	0.53	0.67	1	0.28	0.21
AMS14	Anzac	60	100%	0.028	0.041	0.073	0.11	0.24	0.67	1.6	2.7	5.8	0.65	1



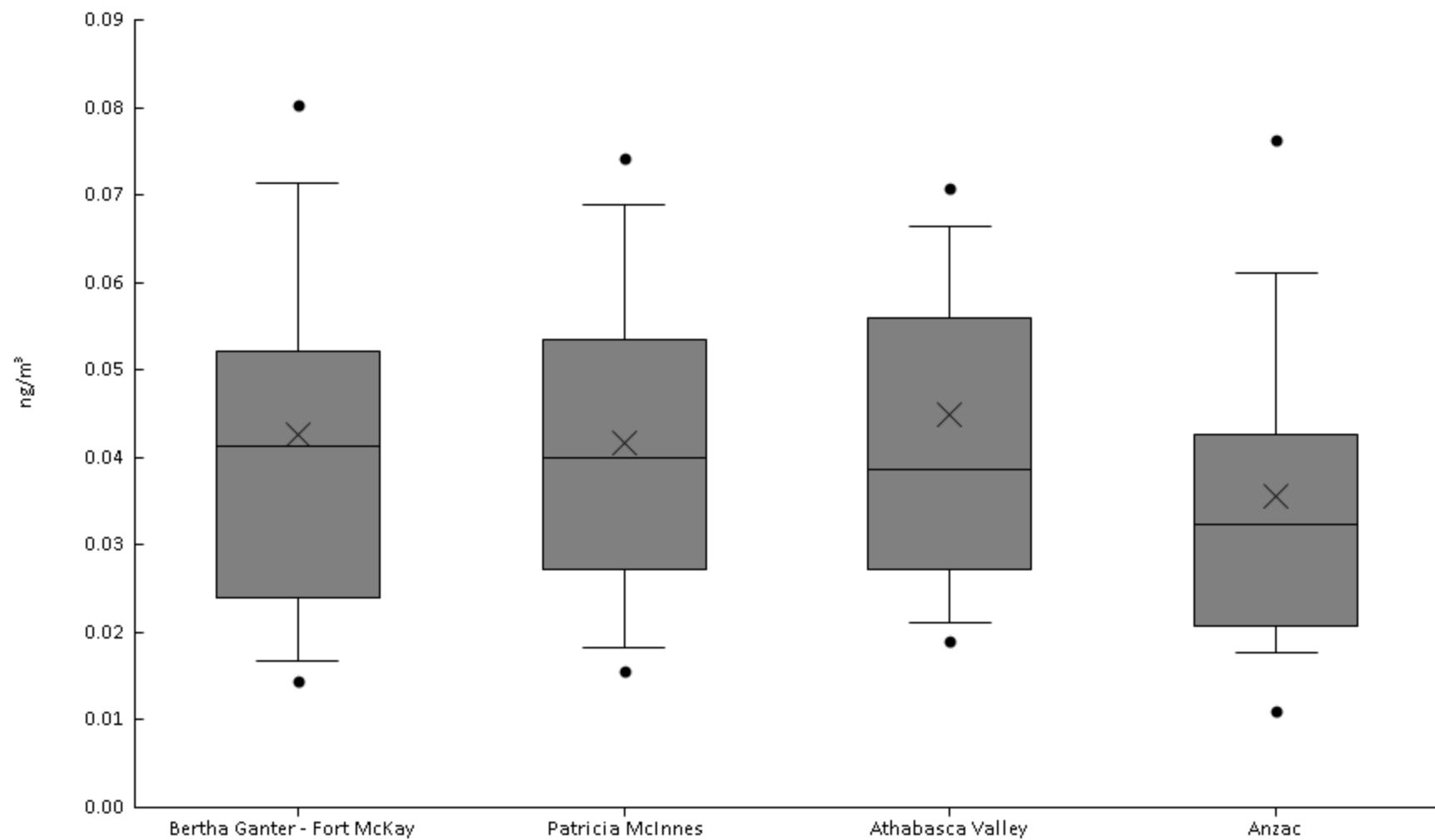
Polycyclic Aromatic Hydrocarbons - Benz(a)anthracene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	97%	5.9E-3	0.018	0.023	0.038	0.075	0.12	0.19	0.41	0.59	0.11	0.11
AMS06	Patricia McInnes	62	95%	0.011	0.014	0.018	0.033	0.054	0.12	0.22	0.29	0.62	0.096	0.11
AMS07	Athabasca Valley	59	98%	7.6E-3	0.017	0.02	0.033	0.058	0.097	0.2	0.33	0.43	0.087	0.093
AMS14	Anzac	60	93%	8.7E-3	0.013	0.016	0.027	0.041	0.072	0.17	0.24	0.31	0.068	0.069



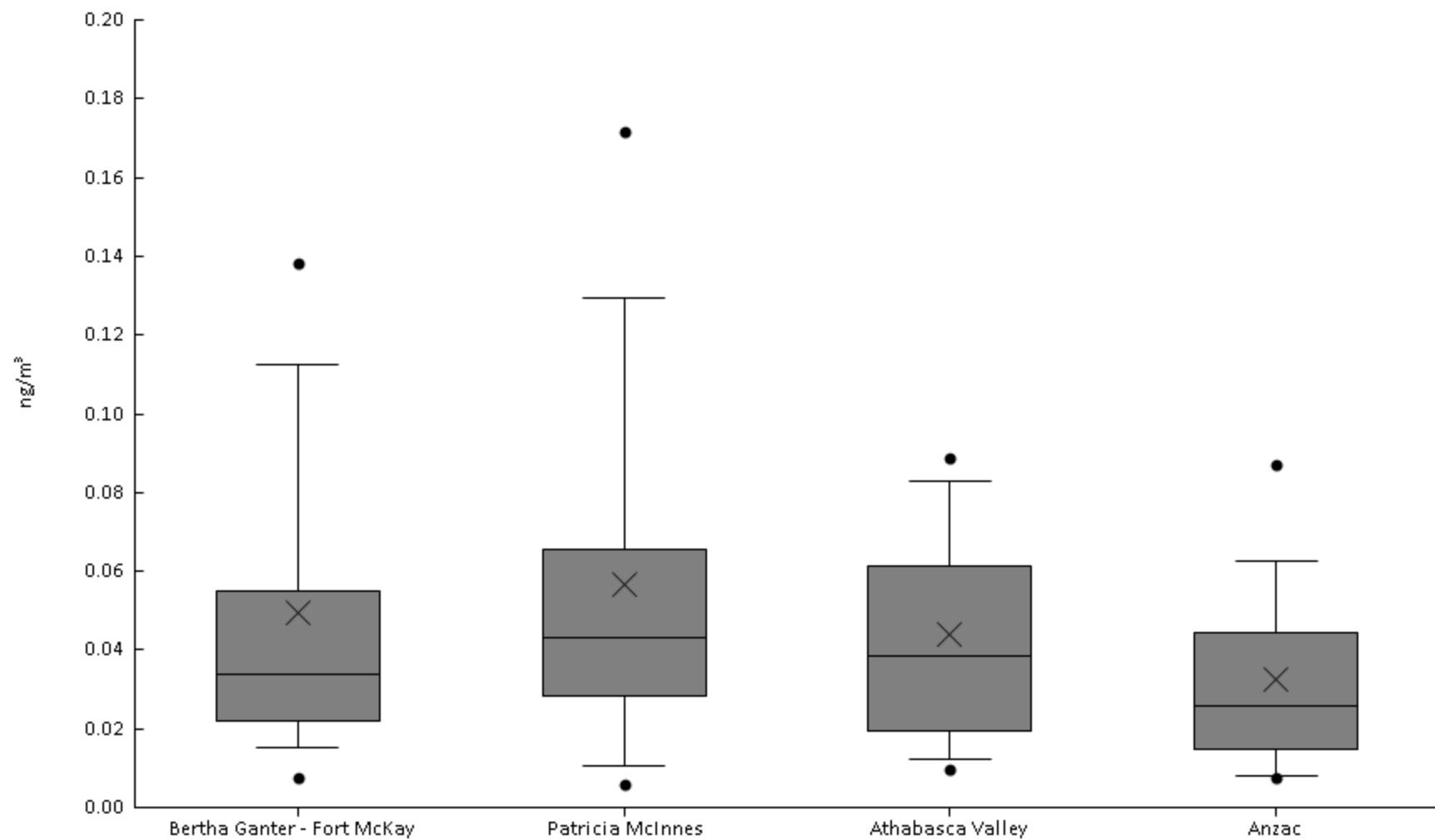
Polycyclic Aromatic Hydrocarbons - Benzo(a)pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	92%	0.013	0.014	0.017	0.024	0.041	0.052	0.071	0.08	0.11	0.043	0.021
AMS06	Patricia McInnes	62	95%	9.8E-3	0.016	0.018	0.027	0.04	0.053	0.069	0.074	0.097	0.042	0.018
AMS07	Athabasca Valley	59	98%	0.013	0.019	0.021	0.027	0.039	0.056	0.066	0.071	0.18	0.045	0.028
AMS14	Anzac	60	92%	6.2E-3	0.011	0.018	0.021	0.032	0.043	0.061	0.076	0.1	0.036	0.019



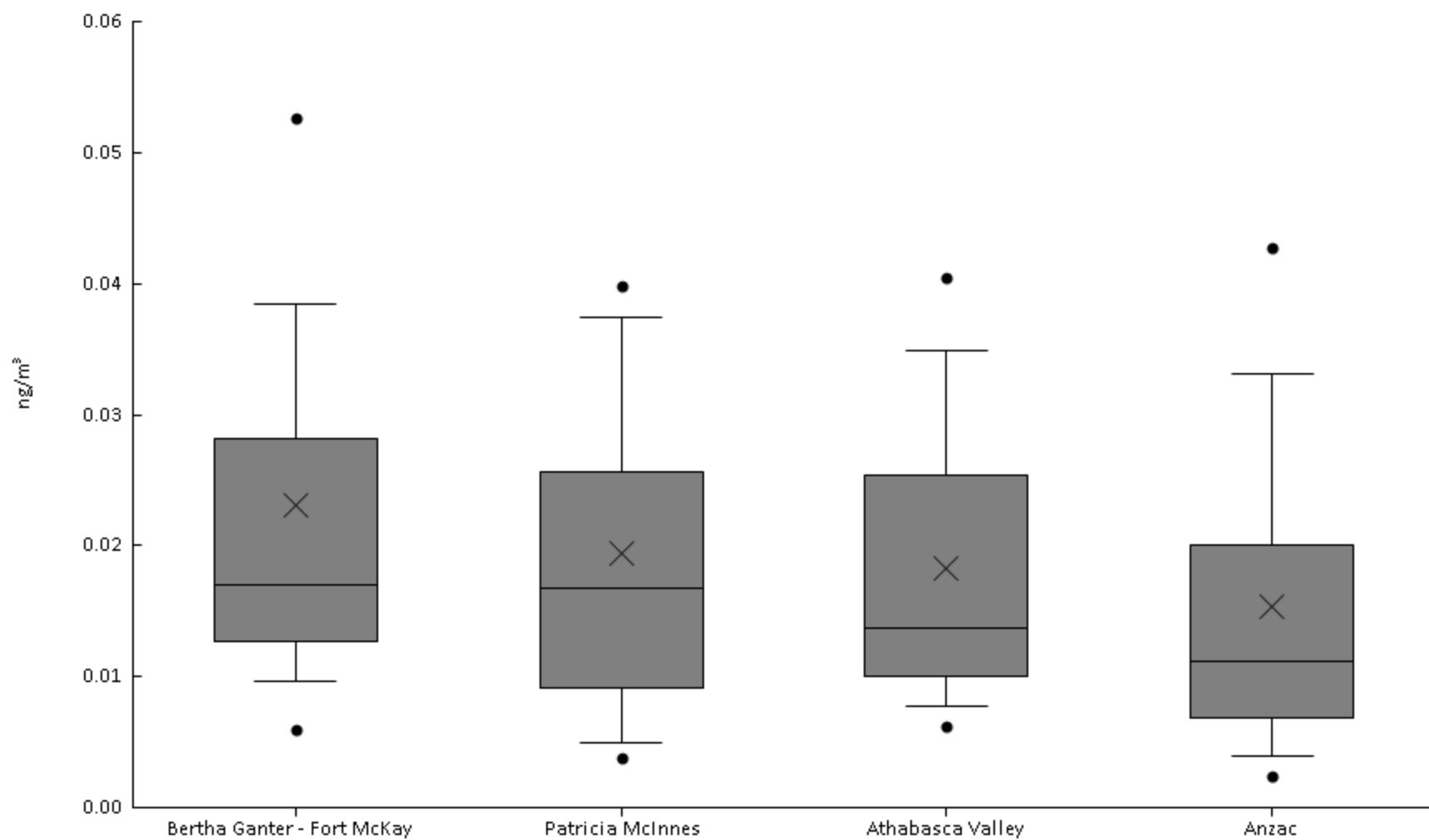
Polycyclic Aromatic Hydrocarbons - Benzo(b)fluoranthene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	82%	4.7E-3	7.5E-3	0.015	0.022	0.034	0.055	0.11	0.14	0.31	0.05	0.048
AMS06	Patricia McInnes	62	84%	2.1E-3	6.1E-3	0.01	0.028	0.043	0.066	0.13	0.17	0.27	0.057	0.051
AMS07	Athabasca Valley	59	75%	7.8E-3	9.7E-3	0.012	0.019	0.038	0.061	0.083	0.089	0.18	0.044	0.032
AMS14	Anzac	60	62%	5.2E-3	7.5E-3	8.2E-3	0.015	0.026	0.044	0.063	0.087	0.15	0.033	0.027



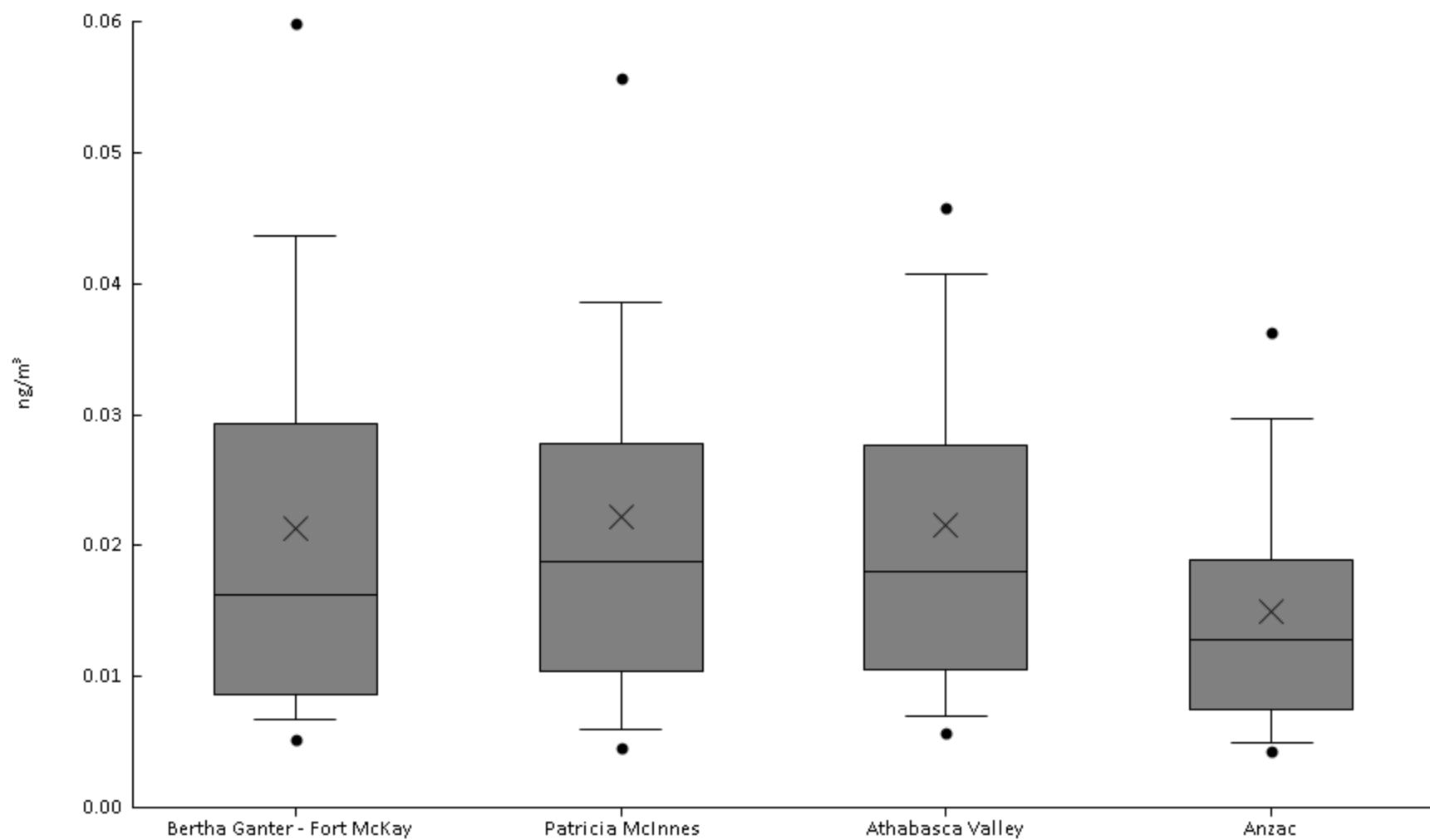
Polycyclic Aromatic Hydrocarbons - Benzo(c)phenanthrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	62%	3.9E-3	5.9E-3	9.6E-3	0.013	0.017	0.028	0.038	0.053	0.12	0.023	0.018
AMS06	Patricia McInnes	62	60%	3E-3	3.9E-3	4.9E-3	9.2E-3	0.017	0.026	0.037	0.04	0.083	0.019	0.014
AMS07	Athabasca Valley	59	46%	4.2E-3	6.2E-3	7.7E-3	0.01	0.014	0.025	0.035	0.04	0.055	0.018	0.011
AMS14	Anzac	60	37%	1.1E-3	2.4E-3	3.9E-3	6.9E-3	0.011	0.02	0.033	0.043	0.067	0.015	0.013



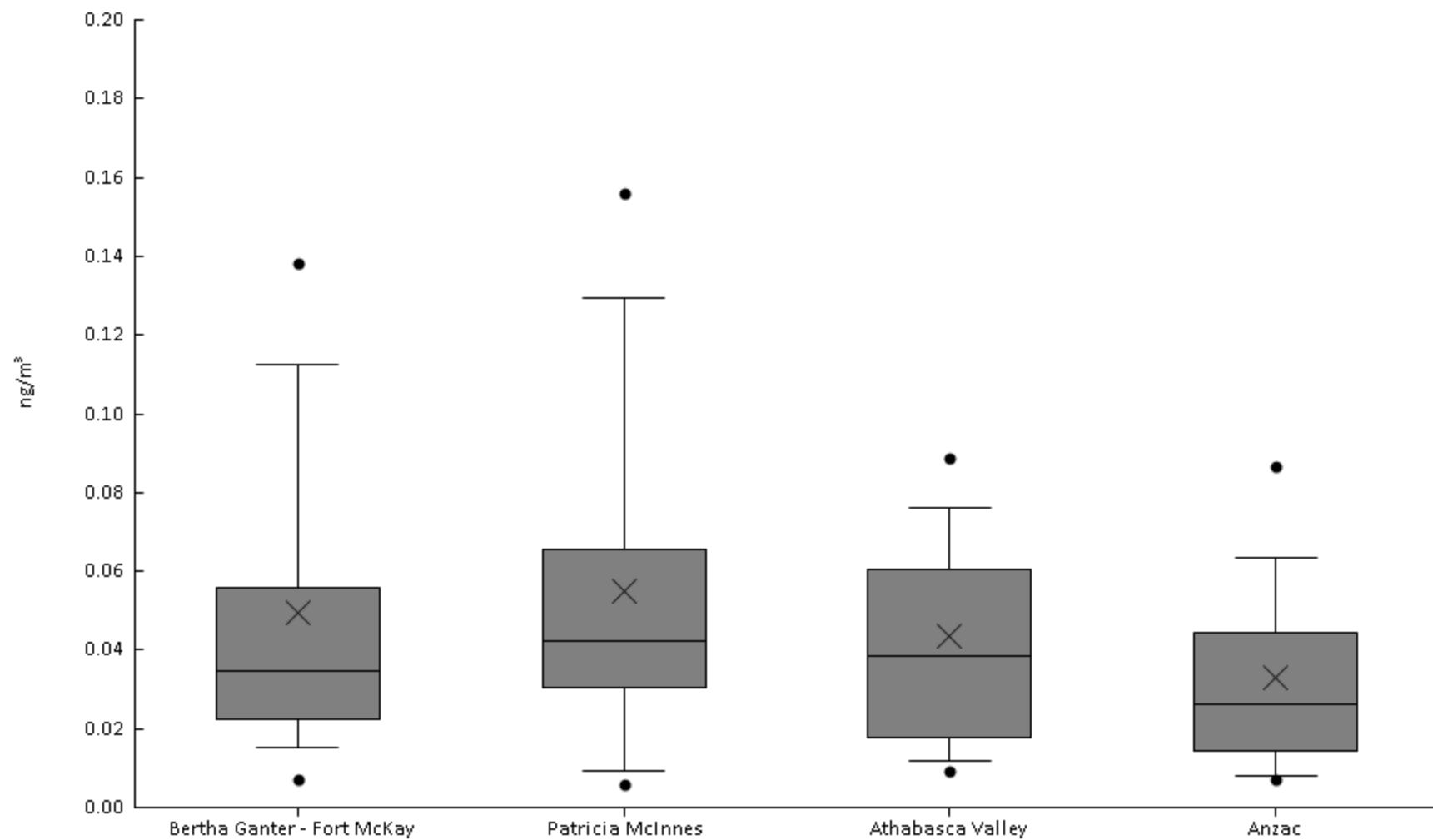
Polycyclic Aromatic Hydrocarbons - Benzo(ghi)perylene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	44%	3.3E-3	5.2E-3	6.8E-3	8.6E-3	0.016	0.029	0.044	0.06	0.075	0.021	0.016
AMS06	Patricia McInnes	62	48%	2.9E-3	4.6E-3	6E-3	0.01	0.019	0.028	0.039	0.056	0.13	0.022	0.019
AMS07	Athabasca Valley	59	47%	2E-3	5.7E-3	6.9E-3	0.011	0.018	0.028	0.041	0.046	0.088	0.022	0.016
AMS14	Anzac	60	23%	1.4E-3	4.4E-3	4.9E-3	7.4E-3	0.013	0.019	0.03	0.036	0.049	0.015	9.8E-3



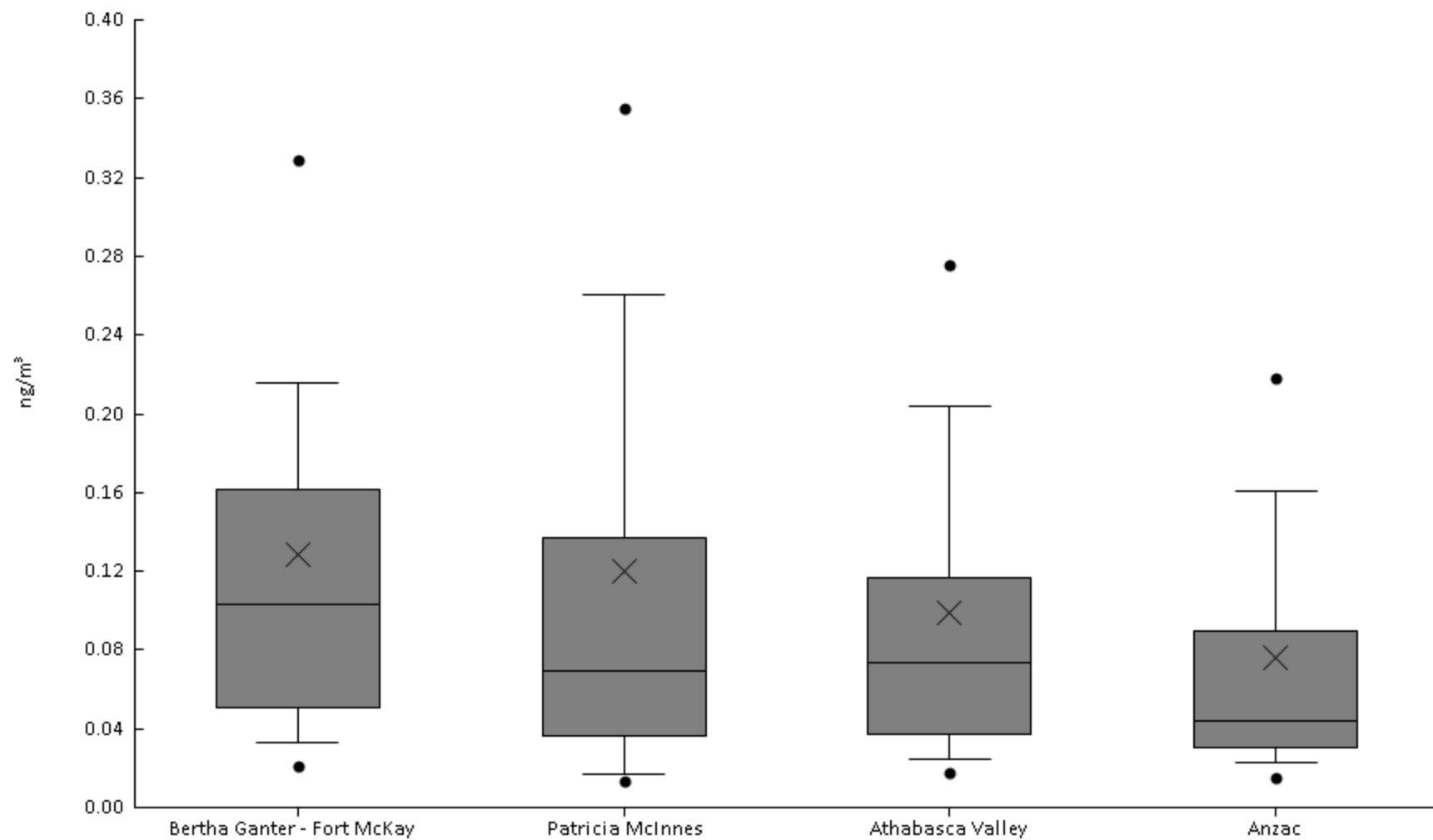
Polycyclic Aromatic Hydrocarbons - Benzo(k)fluoranthene (ng/m³) - 2019

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	7.3E-3	0.015	0.022	0.035	0.056	0.11	0.14	0.31	0.05	0.048
AMS06	Patricia McInnes	62	87%	2.1E-3	6E-3	9.5E-3	0.031	0.042	0.066	0.13	0.16	0.22	0.055	0.045
AMS07	Athabasca Valley	59	88%	7.4E-3	9.5E-3	0.012	0.018	0.038	0.06	0.076	0.089	0.18	0.043	0.031
AMS14	Anzac	60	78%	5.2E-3	7.3E-3	8E-3	0.015	0.026	0.044	0.063	0.087	0.15	0.033	0.027



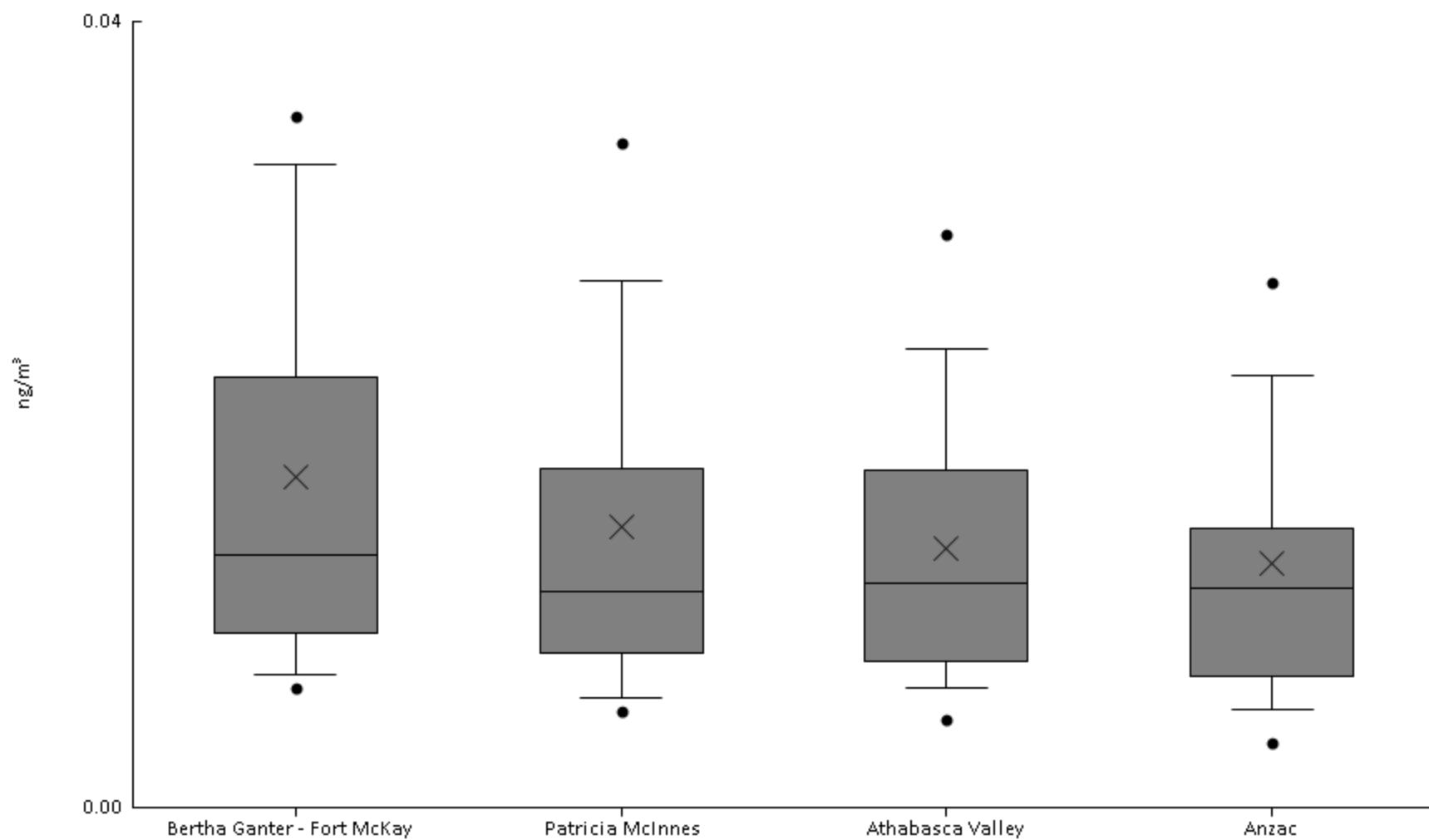
Polycyclic Aromatic Hydrocarbons - Chrysene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.014	0.021	0.033	0.05	0.1	0.16	0.22	0.33	0.86	0.13	0.13
AMS06	Patricia McInnes	62	95%	9.6E-3	0.014	0.017	0.037	0.069	0.14	0.26	0.35	1.1	0.12	0.16
AMS07	Athabasca Valley	59	98%	0.012	0.018	0.025	0.037	0.073	0.12	0.2	0.28	0.53	0.099	0.095
AMS14	Anzac	60	97%	7.8E-3	0.015	0.023	0.031	0.044	0.09	0.16	0.22	0.66	0.076	0.094



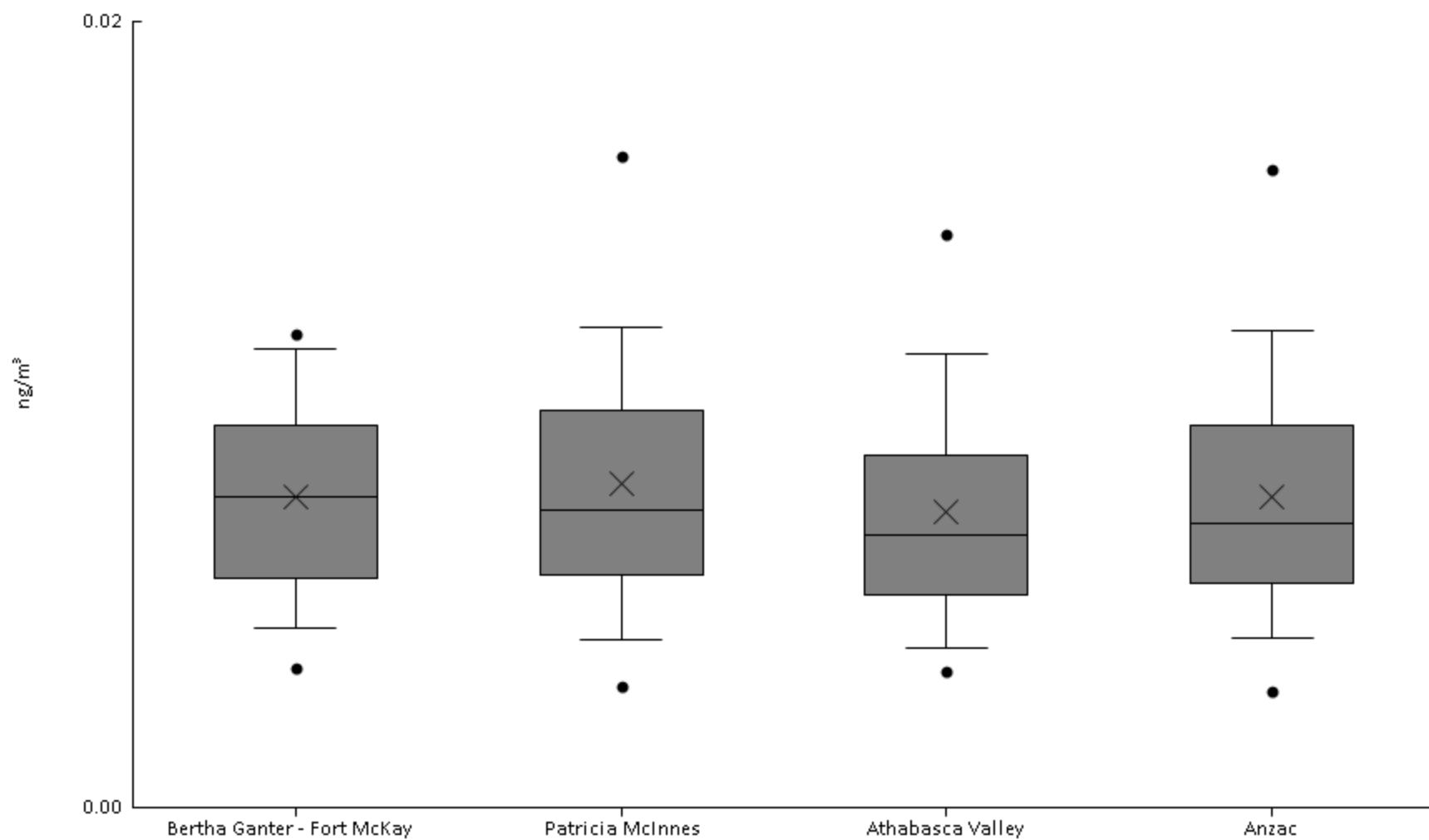
Polycyclic Aromatic Hydrocarbons - Dibenz(a,h)anthracene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	30%	4.5E-3	6.1E-3	6.8E-3	8.9E-3	0.013	0.022	0.033	0.035	0.063	0.017	0.012
AMS06	Patricia McInnes	62	18%	4.5E-3	4.9E-3	5.6E-3	7.9E-3	0.011	0.017	0.027	0.034	0.05	0.014	9.8E-3
AMS07	Athabasca Valley	59	19%	0	4.5E-3	6.1E-3	7.5E-3	0.011	0.017	0.023	0.029	0.032	0.013	7.3E-3
AMS14	Anzac	60	15%	0	3.3E-3	5E-3	6.7E-3	0.011	0.014	0.022	0.027	0.055	0.012	9.1E-3



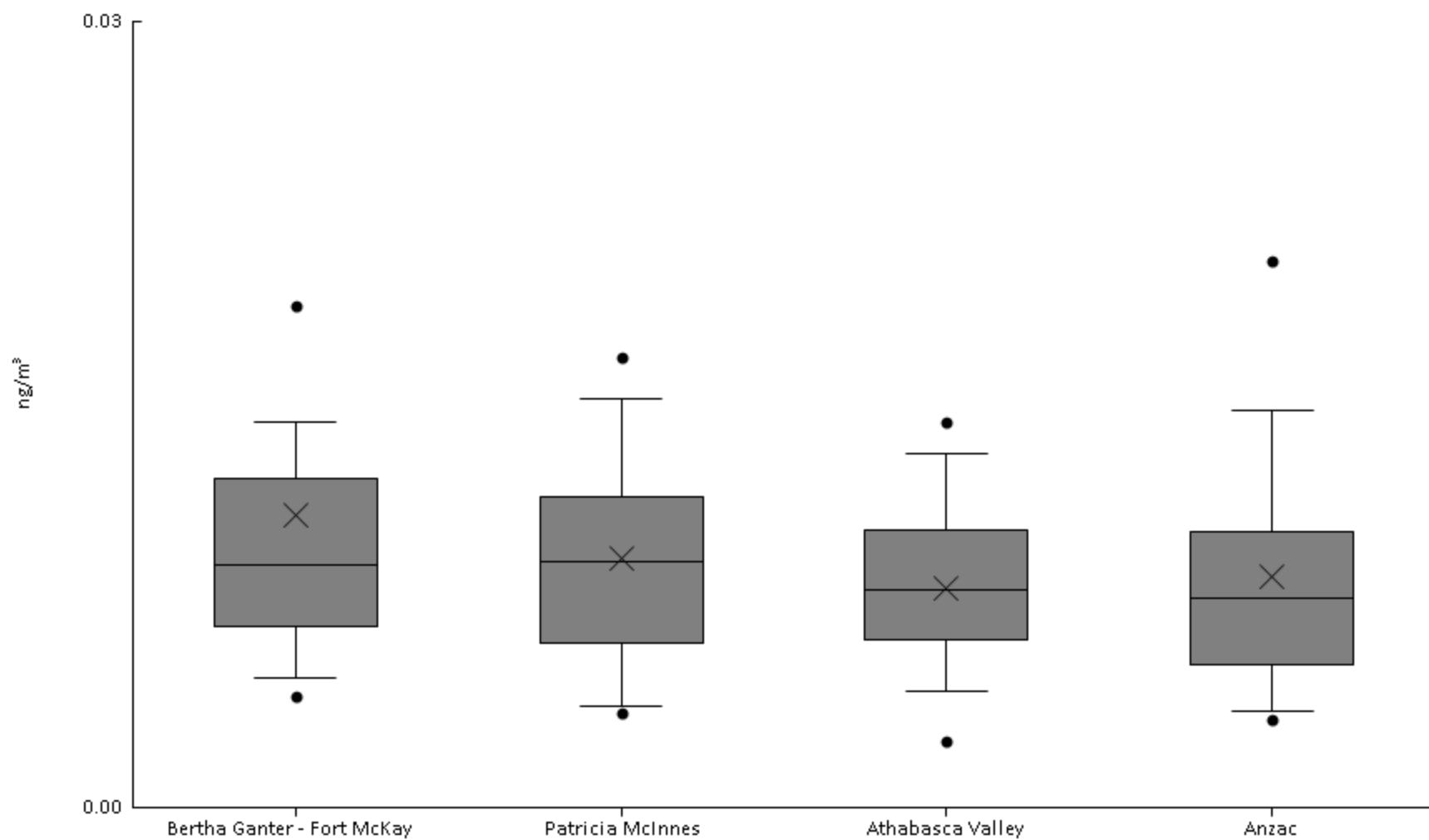
Polycyclic Aromatic Hydrocarbons - Dibenz(a,h)pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	0%	2.3E-3	3.5E-3	4.6E-3	5.8E-3	7.9E-3	9.7E-3	0.012	0.012	0.018	7.9E-3	2.9E-3
AMS06	Patricia McInnes	62	0%	0	3.1E-3	4.3E-3	5.9E-3	7.6E-3	0.01	0.012	0.017	0.02	8.2E-3	3.7E-3
AMS07	Athabasca Valley	59	0%	0	3.5E-3	4.1E-3	5.4E-3	6.9E-3	9E-3	0.012	0.015	0.018	7.5E-3	3.3E-3
AMS14	Anzac	60	2%	0	3E-3	4.3E-3	5.7E-3	7.2E-3	9.7E-3	0.012	0.016	0.028	7.9E-3	4.2E-3



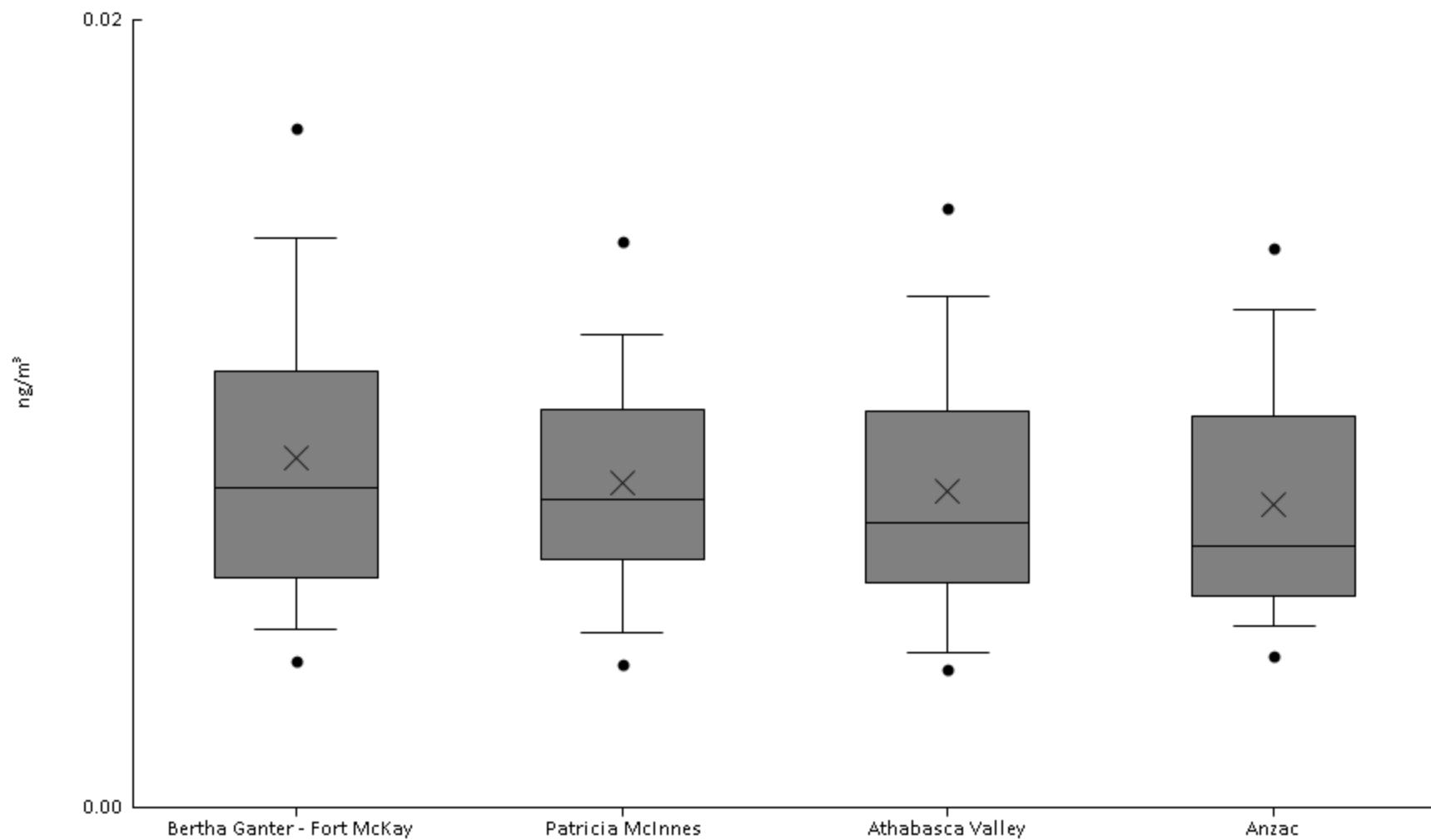
Polycyclic Aromatic Hydrocarbons - Dibenz(a,i)pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	2%	1.9E-3	4.2E-3	4.9E-3	6.9E-3	9.2E-3	0.013	0.015	0.019	0.087	0.011	0.011
AMS06	Patricia McInnes	62	0%	1.6E-3	3.6E-3	3.9E-3	6.3E-3	9.4E-3	0.012	0.016	0.017	0.02	9.5E-3	4.2E-3
AMS07	Athabasca Valley	59	0%	0	2.5E-3	4.4E-3	6.4E-3	8.3E-3	0.011	0.014	0.015	0.019	8.4E-3	3.6E-3
AMS14	Anzac	60	2%	0	3.4E-3	3.7E-3	5.4E-3	8E-3	0.011	0.015	0.021	0.027	8.8E-3	5.1E-3



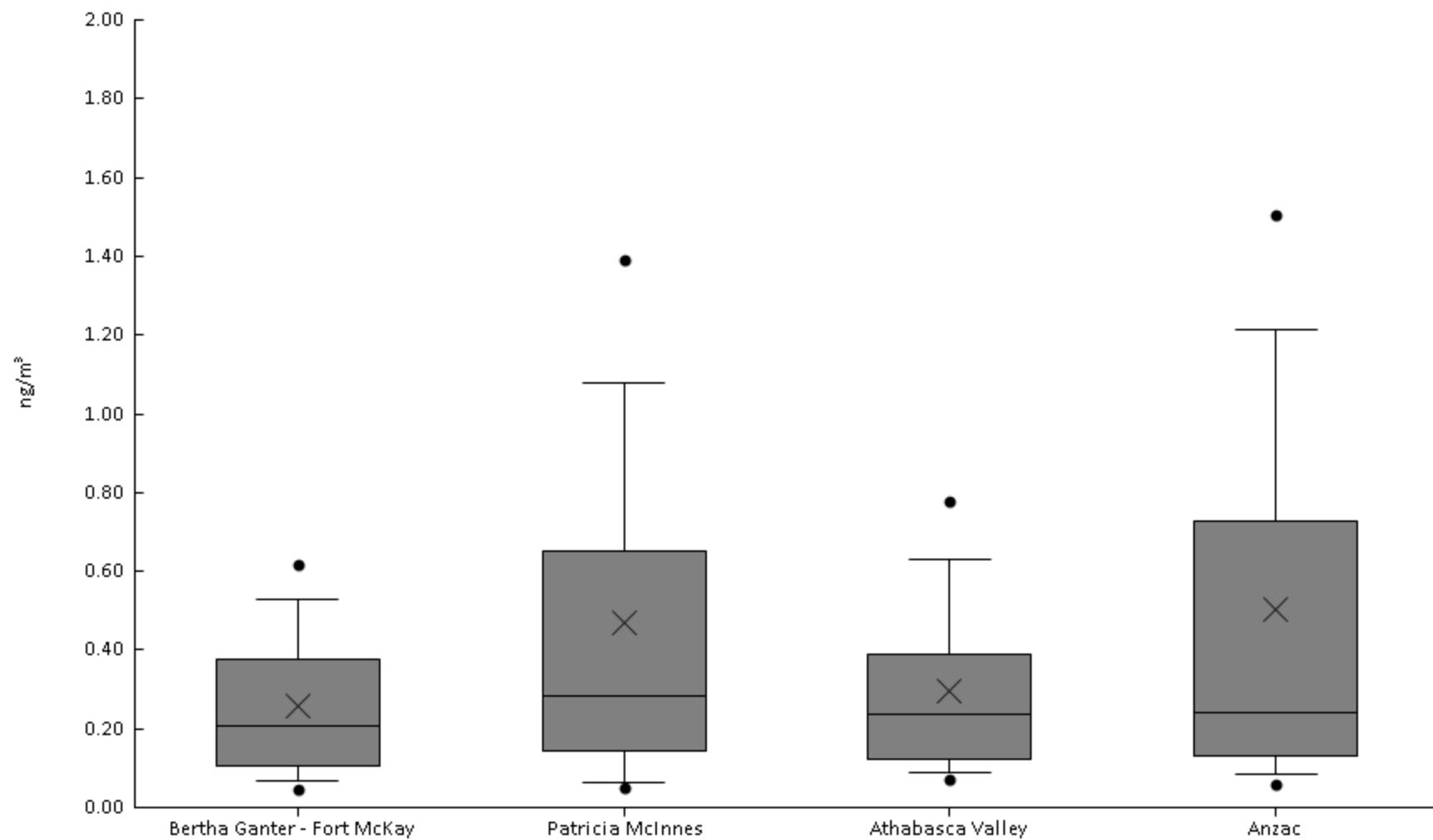
Polycyclic Aromatic Hydrocarbons - Dibenz(a,l)pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	0%	0	3.7E-3	4.5E-3	5.8E-3	8.1E-3	0.011	0.014	0.017	0.022	8.9E-3	4.2E-3
AMS06	Patricia McInnes	62	0%	0	3.6E-3	4.5E-3	6.3E-3	7.8E-3	0.01	0.012	0.014	0.019	8.3E-3	3.4E-3
AMS07	Athabasca Valley	59	0%	1.5E-3	3.5E-3	3.9E-3	5.7E-3	7.2E-3	0.01	0.013	0.015	0.021	8E-3	3.7E-3
AMS14	Anzac	60	0%	0	3.9E-3	4.6E-3	5.4E-3	6.6E-3	9.9E-3	0.013	0.014	0.019	7.7E-3	3.6E-3



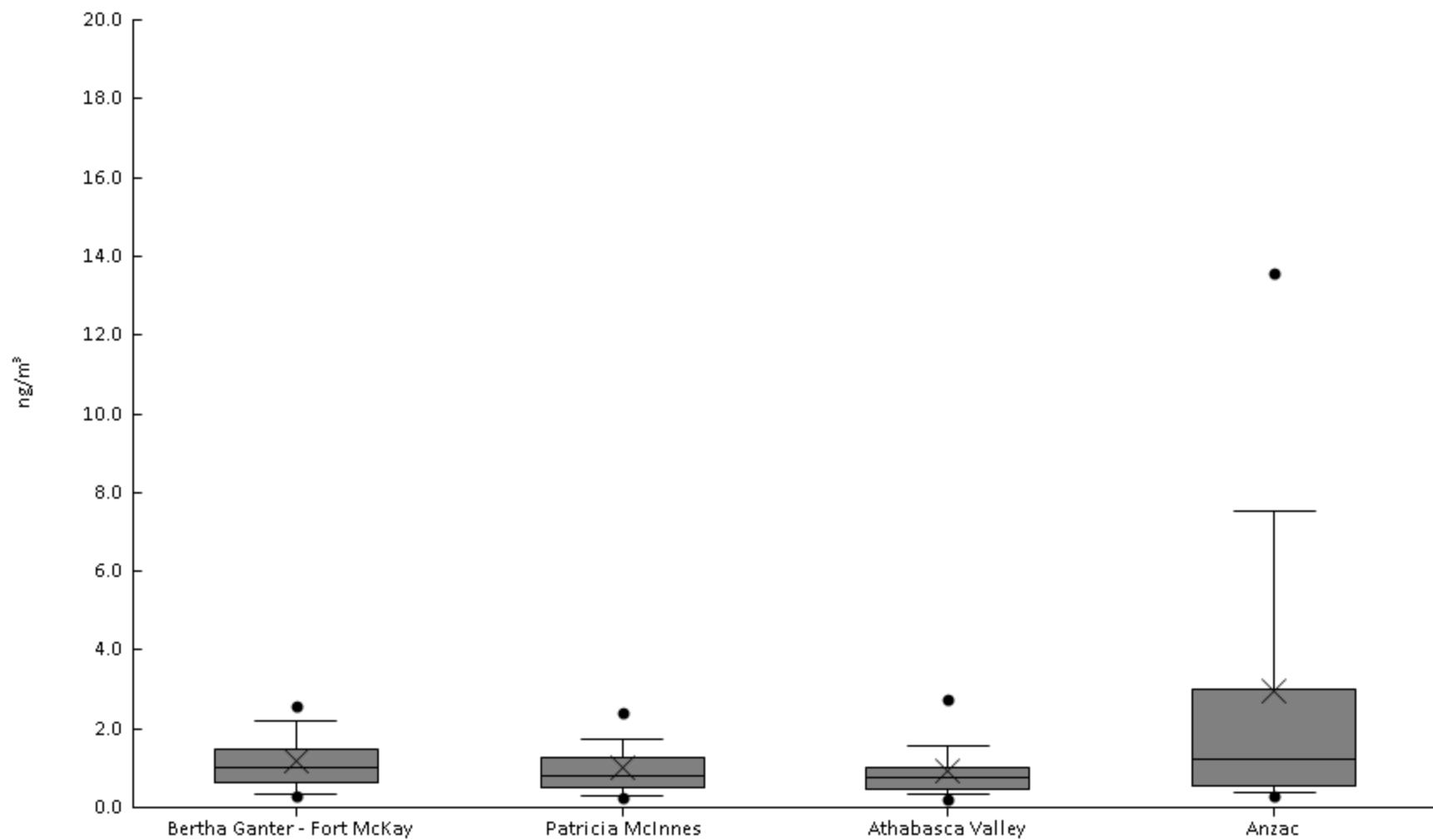
Polycyclic Aromatic Hydrocarbons - Fluoranthene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.026	0.046	0.066	0.11	0.21	0.38	0.53	0.62	1	0.26	0.2
AMS06	Patricia McInnes	62	100%	0.033	0.052	0.065	0.14	0.28	0.65	1.1	1.4	2.4	0.47	0.49
AMS07	Athabasca Valley	59	100%	0.024	0.073	0.088	0.12	0.24	0.39	0.63	0.78	0.92	0.3	0.22
AMS14	Anzac	60	100%	0.05	0.061	0.087	0.13	0.24	0.73	1.2	1.5	3	0.5	0.58



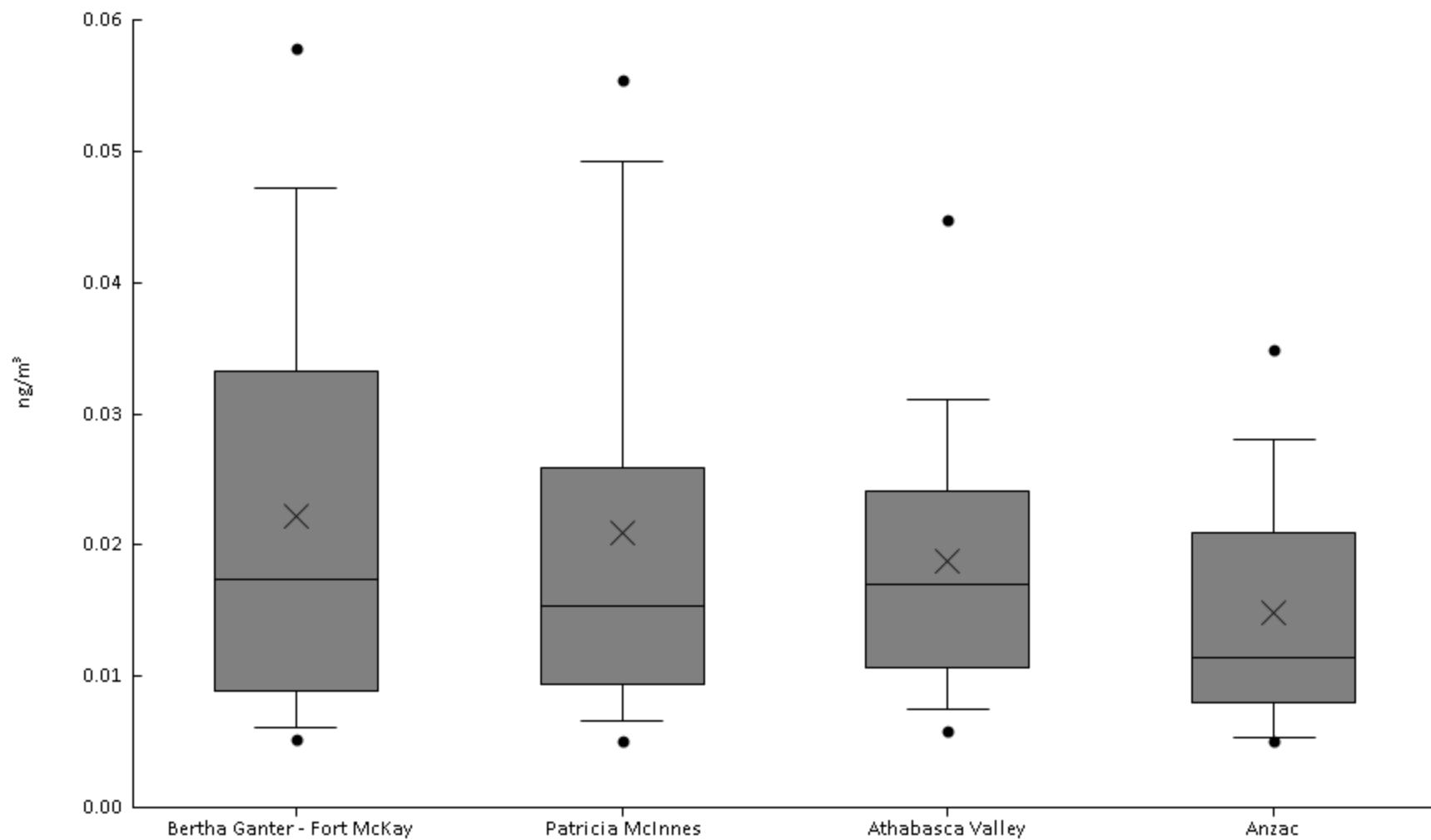
Polycyclic Aromatic Hydrocarbons - Fluorene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.23	0.29	0.35	0.64	1	1.5	2.2	2.6	4.9	1.2	0.81
AMS06	Patricia McInnes	62	100%	0.12	0.24	0.31	0.5	0.82	1.3	1.7	2.4	5	1	0.8
AMS07	Athabasca Valley	59	100%	0.13	0.23	0.32	0.49	0.74	1	1.6	2.8	4.5	0.93	0.84
AMS14	Anzac	60	100%	0.19	0.31	0.37	0.56	1.2	3	7.5	14	26	3	4.7



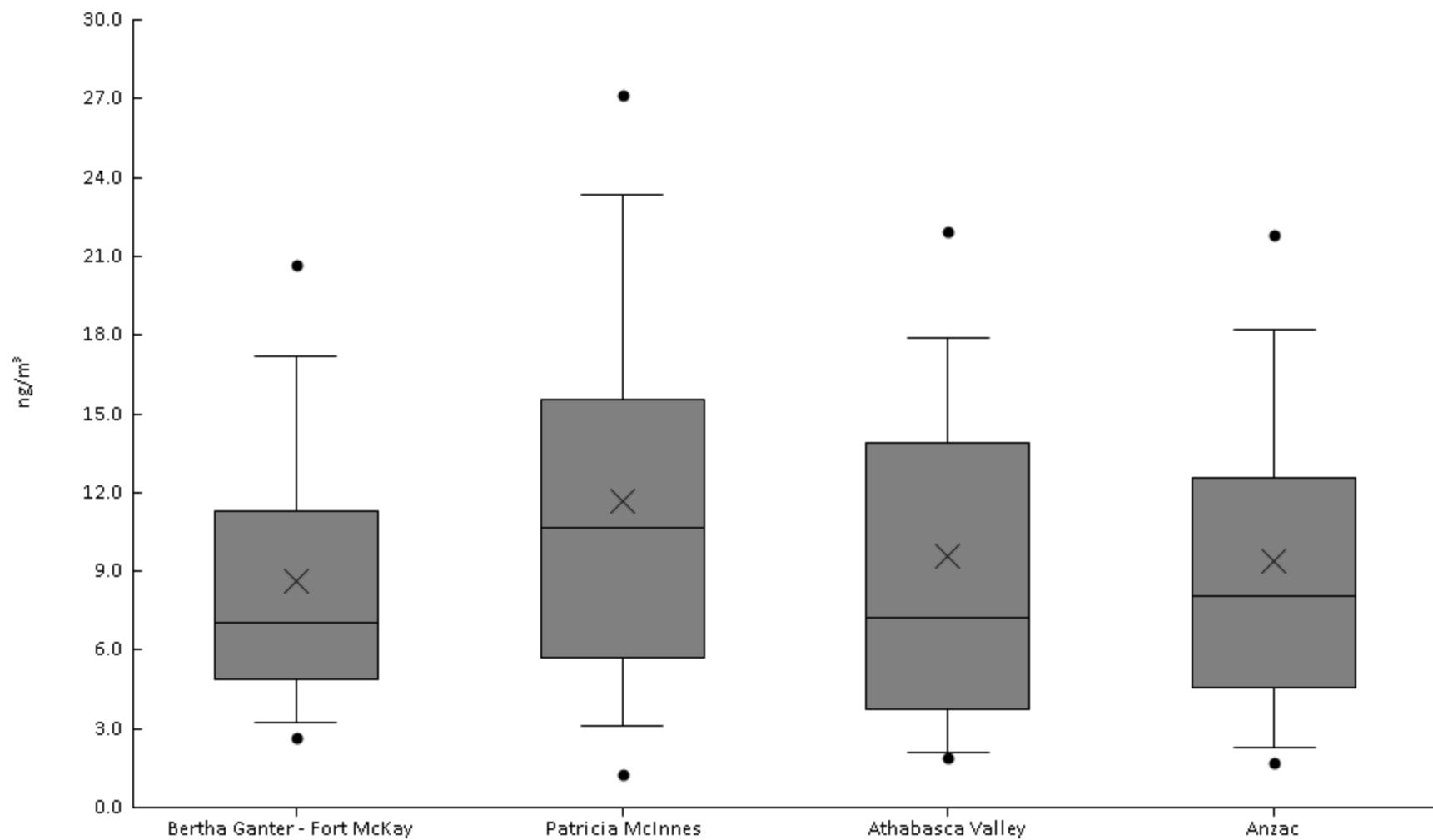
Polycyclic Aromatic Hydrocarbons - Indeno(123-cd)pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	52%	2.4E-3	5.1E-3	6.1E-3	8.9E-3	0.017	0.033	0.047	0.058	0.082	0.022	0.017
AMS06	Patricia McInnes	62	45%	0	5.1E-3	6.6E-3	9.4E-3	0.015	0.026	0.049	0.055	0.078	0.021	0.017
AMS07	Athabasca Valley	59	53%	4.9E-3	5.9E-3	7.5E-3	0.011	0.017	0.024	0.031	0.045	0.06	0.019	0.012
AMS14	Anzac	60	35%	3.2E-3	5E-3	5.3E-3	7.9E-3	0.011	0.021	0.028	0.035	0.047	0.015	9.7E-3



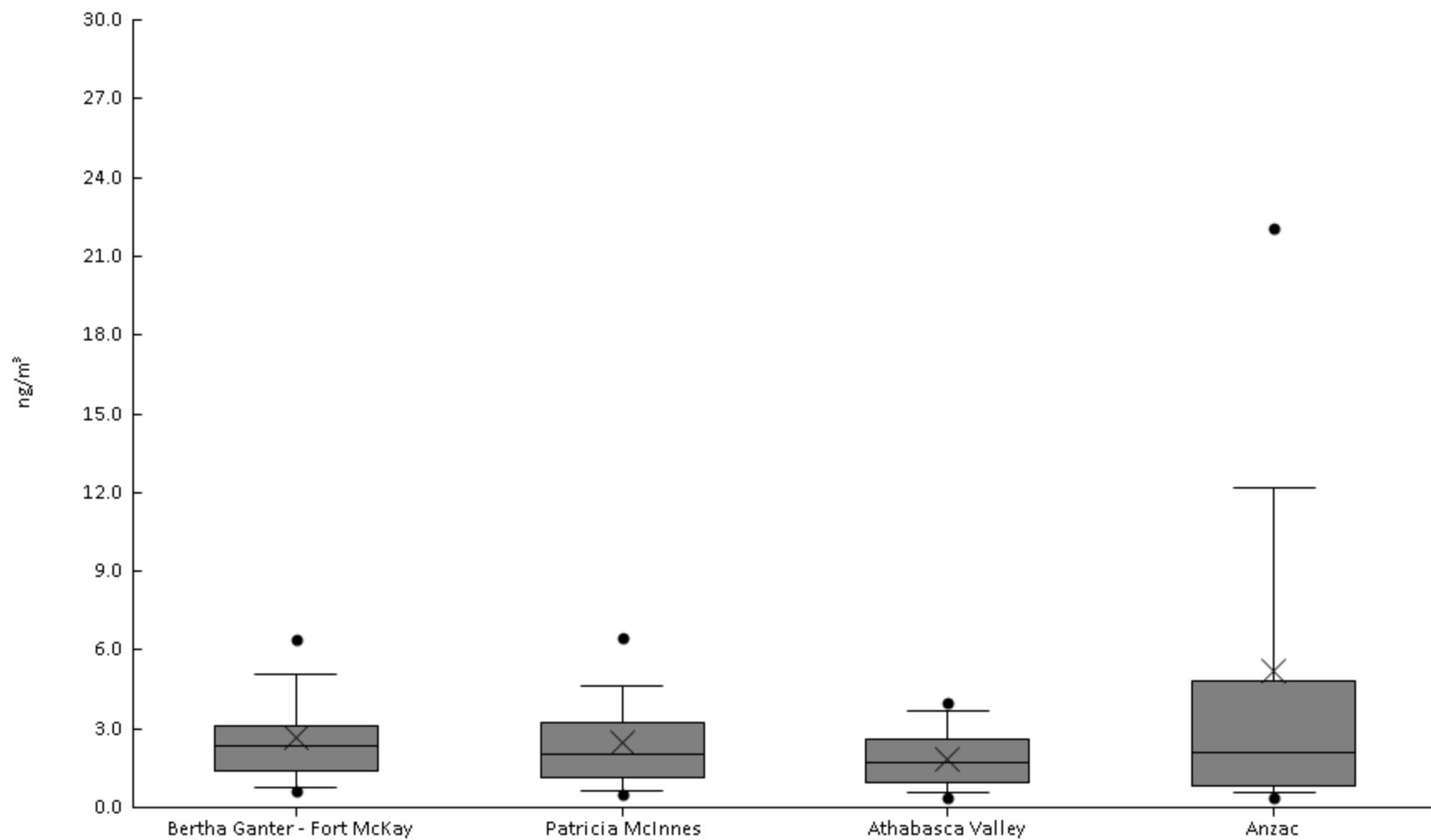
Polycyclic Aromatic Hydrocarbons - Naphthalene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	1.3	2.7	3.2	4.9	7	11	17	21	23	8.6	5.4
AMS06	Patricia McInnes	62	100%	0.7	1.3	3.1	5.7	11	16	23	27	33	12	7.7
AMS07	Athabasca Valley	59	100%	1.4	1.9	2.1	3.8	7.2	14	18	22	29	9.6	6.7
AMS14	Anzac	60	100%	1	1.7	2.3	4.6	8.1	13	18	22	31	9.4	6.4



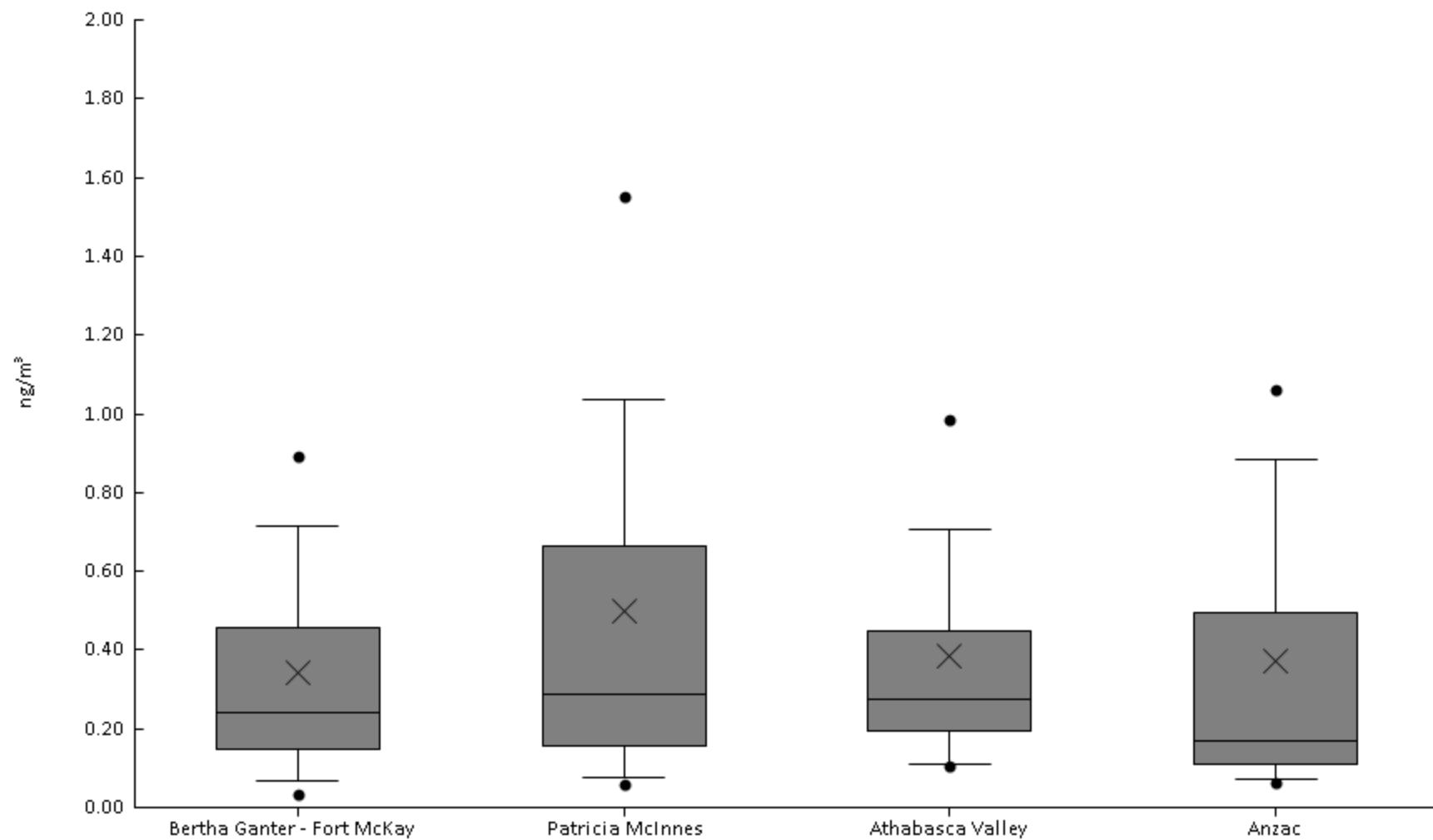
Polycyclic Aromatic Hydrocarbons - Phenanthrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.32	0.66	0.75	1.4	2.4	3.1	5.1	6.4	8.6	2.7	1.7
AMS06	Patricia McInnes	62	100%	0.25	0.49	0.65	1.2	2	3.2	4.7	6.5	9	2.5	1.8
AMS07	Athabasca Valley	59	100%	0.034	0.39	0.58	0.95	1.7	2.6	3.7	4	4.3	1.9	1.1
AMS14	Anzac	60	100%	0.22	0.39	0.6	0.81	2.1	4.8	12	22	45	5.2	8.6



Polycyclic Aromatic Hydrocarbons - Pyrene (ng/m³) - 2019

Station #	Station	#	% ≥ MDL	Min	5%	10%	25%	Med	75%	90%	95%	Max	Ave	Std Dev
AMS01	Bertha Ganter - Fort McKay	61	100%	0.033	0.036	0.069	0.15	0.24	0.46	0.71	0.89	1.5	0.34	0.29
AMS06	Patricia McInnes	62	100%	0.037	0.059	0.075	0.16	0.29	0.66	1	1.6	3.6	0.5	0.57
AMS07	Athabasca Valley	59	100%	0.022	0.1	0.11	0.2	0.28	0.45	0.71	0.99	2.7	0.38	0.4
AMS14	Anzac	60	100%	0.038	0.062	0.072	0.11	0.17	0.49	0.88	1.1	3.5	0.37	0.53





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM ANNUAL REPORT

PRECIPITATION DATA SUMMARY 2019

Prepared
March 2020

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

InnoTech Alberta, Inc.
Vegreville, Alberta

Precipitation: Wisconsin State Laboratory of Hygiene
Madison, WI



FILE CONTENTS DESCRIPTION	Precipitation Measurement of ions, pH and conductivity
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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
USER NOTE 2	Computed on a monthly dataset.
USER NOTE 3	Summary statistics include flags beginning with V.
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

2019

Precipitation Volume Weighted Averages

Bertha Ganter - Fort McKay

Month	Start	End	Total	Volume	Sulfate	Nitrate	Chloride	Potassium	Sodium	Calcium	Magnesium	N-CON
	Date	Date	Precip (mm)	Collected (mL)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Ammonium (mg/L)
January	Jan-02	Jan-31	16.8	816.7	0.59	1.41	0.09	0.03	0.08	1.17	0.16	0.08
February	Jan-31	Feb-25	25.9	325.3	0.80	2.30	0.15	0.08	0.17	2.34	0.34	0.10
March	Feb-25	Apr-02	0.6	131.0	2.08	1.38	0.55	0.10	0.50	5.59	0.42	0.40
April	Apr-02	May-01	7.9	975.3	1.95	0.88	0.15	0.06	0.48	2.33	0.25	0.33
May	May-01	May-28	15.1	813.9	1.31	0.71	0.06	0.04	0.12	0.84	0.11	0.18
June	May-28	Jul-03	106.1	7146.9	0.62	0.67	0.05	0.09	0.04	0.61	0.08	1.08
July	Jul-03	Jul-30	47.5	3295.7	0.60	0.49	0.04	0.01	0.02	0.21	0.03	0.43
August	Jul-30	Sep-03	121.0	6424.9	0.73	0.40	0.03	0.01	0.02	0.22	0.03	0.28
September	Sep-03	Oct-01	22.3	1528.9	0.66	0.39	0.03	0.02	0.02	0.24	0.03	0.16
October	Oct-01	Oct-29	12.1	775.8	0.51	0.29	0.04	0.05	0.06	0.82	0.11	0.09
November	Oct-29	Dec-02	19.5	1467.1	0.47	0.65	0.11	0.05	0.14	2.21	0.16	0.07
December	Dec-02	Jan-02	7.9	552.7	0.60	1.30	0.13	0.05	0.11	1.97	0.20	0.11
Annual VWA	Jan-02-2019	Jan-02-2020	402.7	24254.2	0.72	0.62	0.06	0.05	0.06	0.71	0.08	0.50



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

2019

Precipitation Volume Weighted Averages

Stony Mountain

Month	Start	End	Total	Volume	Sulfate	Nitrate	Chloride	Potassium	Sodium	Calcium	Magnesium	N-CON
	Date	Date	Precip (mm)	Collected (mL)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
April	Apr-24	May-01	0.6	31.7	0.93	0.56	0.14	0.18	0.08	0.83	0.18	0.26
May	May-01	May-29	13.7	953.0	1.75	1.53	0.10	0.05	0.06	0.40	0.08	1.44
June	May-29	Jul-03	123.3	8704.7	0.42	0.46	0.03	0.02	0.01	0.11	0.02	0.20
July	Jul-03	Jul-30	70.5	4210.5	0.47	0.50	0.03	0.01	0.01	0.10	0.02	0.16
August	Jul-30	Sep-03	84.0	5954.1	0.36	0.35	0.03	0.02	0.01	0.10	0.02	0.14
September	Sep-03	Oct-01	24.9	1766.2	0.57	0.60	0.03	0.03	0.01	0.16	0.03	0.21
October	Oct-01	Oct-29	41.2	3055.2	0.47	0.58	0.03	0.03	0.01	0.11	0.02	0.14
November	Oct-29	Dec-03	17.9	1352.0	0.16	0.86	0.05	0.01	0.02	0.10	0.01	0.04
December	Dec-03	Jan-02	6.6	578.1	0.16	0.78	0.08	0.02	0.04	0.11	0.02	0.06
Annual VWA	Apr-24-2019	Jan-02-2020	382.6	26605.5	0.46	0.53	0.04	0.02	0.01	0.12	0.02	0.21



End of Report