

# Appendix I

## *Human Health ProUCL Outputs and Exposure and Risk Calculations*

**Build Nova Scotia**

*Human Health and Ecological Risk Assessment and  
Ancillary Assessment Activities: Lake Enon Former  
Mill Site, Enon, Nova Scotia (FINAL)*

January 24, 2025 - 22-3723



Sr soil data: mg/kg

General Statistics on Uncensored Full Data

Date/Time of Computation ProUCL 5.2 10/25/2023 1:30:17 PM
User Selected Options
From File Worksheet.xls
Full Precision ON

From File: Worksheet.xls

General Statistics for Uncensored Dataset

Table with 11 columns: Variable, NumObs, # Missing, Minimum, Maximum, Mean, Geo-Mean, SD, SEM, MAD/0.67, Skewness, CV. Row for CO shows values: 80, 0, 9.9, 27000, 3193.349, 467.5026, 5588.272, 624.7878, 600.4448, 2.277557, 1.749972.

Percentiles for Uncensored Dataset

Table with 11 columns: Variable, NumObs, # Missing, 10%ile, 20%ile, 25%ile(Q1), 50%ile(Q2), 75%ile(Q3), 80%ile, 90%ile, 95%ile, 99%ile. Row for CO shows values: 80, 0, 27.8, 44.6, 62.25, 430, 3875, 5340, 13100, 16000, 21470.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options
Date/Time of Computation ProUCL 5.2 10/25/2023 1:31:15 PM
From File Worksheet.xls
Full Precision ON
Confidence Coefficient 0.95

CO

Raw Statistics

Table of raw statistics for CO: Number of Valid Observations (80), Number of Distinct Observations (65), Minimum (9.9), Maximum (27000), Mean of Raw Data (3193.349), Standard Deviation of Raw Data (5588.272), Khat (0.349973), Theta hat (9124.555), Kstar (0.345182), Theta star (9251.191), Mean of Log Transformed Data (6.147405), Standard Deviation of Log Transformed Data (2.28772).

Normal GOF Test Results

Table of Normal GOF Test Results: Correlation Coefficient R (0.792314), Approximate Shapiro Wilk Test Statistic (0.634369), Approximate Shapiro Wilk P Value (0), Lilliefors Test Statistic (0.285949), Lilliefors Critical (0.0500000) Value (0.099146), Data not Normal at (0.0500000) Significance Level.

Gamma GOF Test Results

Table of Gamma GOF Test Results: Correlation Coefficient R (0.982762), A-D Test Statistic (2.535337), A-D Critical (0.0500000) Value (0.853409), K-S Test Statistic (0.150738), K-S Critical(0.0500000) Value (0.107595), Data not Gamma Distributed at (0.0500000) Significance Level.

Lognormal GOF Test Results

Table of Lognormal GOF Test Results: Correlation Coefficient R (0.978583), Approximate Shapiro Wilk Test Statistic (0.929271), Approximate Shapiro Wilk P Value (2.08E-04), Lilliefors Test Statistic (0.088878), Lilliefors Critical (0.0500000) Value (0.099146), Data appear Approximate\_Lognormal at (0.0500000) Significance Level.

UCL Statistics for Uncensored Full Data Sets

User Selected Options
Date/Time of Computation ProUCL 5.2 10/25/2023 1:32:15 PM
From File Worksheet.xls
Full Precision ON
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

CO

General Statistics

Summary table for CO: Total Number of Observations (80), Number of Distinct Observations (65), Number of Missing Observations (0), Minimum (9.9), Maximum (27000), SD (5588.272), Coefficient of Variation (1.749972).

Normal GOF Test

Table of Normal GOF Test results: Shapiro Wilk Test Statistic (0.634369), 1% Shapiro Wilk P Value (0), Lilliefors Test Statistic (0.285949), 1% Lilliefors Critical Value (0.114655).

Assuming Normal Distribution

Table of UCLs assuming Normal Distribution: 95% Normal UCL, 95% Student's-t UCL (4233.228), 95% Adjusted-CLT UCL (4391.029), 95% Modified-t UCL (4259.744).

Gamma GOF Test

Table of Gamma GOF Test results: A-D Test Statistic (2.535337), 5% A-D Critical Value (0.853409), K-S Test Statistic (0.150738), 5% K-S Critical Value (0.107595).

Gamma Statistics

Table of Gamma Statistics: k hat (MLE) (0.349973), Theta hat (MLE) (9124.555), nu hat (MLE) (55.9957), MLE Mean (3193.349), Adjusted Level of Significance (0.047).

Assuming Gamma Distribution

Table of UCLs assuming Gamma Distribution: 95% Approximate Gamma UCL (4504.742), 95% Adjusted Gamma UCL (4533.455).

Lognormal GOF Test

Table of Lognormal GOF Test results: Shapiro Wilk Test Statistic (0.929271), 10% Shapiro Wilk P Value (2.08E-04), Lilliefors Test Statistic (0.088878), 10% Lilliefors Critical Value (0.090727).

Lognormal Statistics

Table of Lognormal Statistics: Minimum of Logged Data (2.292535), Maximum of Logged Data (10.20359).

Assuming Lognormal Distribution

Table of UCLs assuming Lognormal Distribution: 95% H-UCL (17119.68), 95% Chebyshev (MVUE) UCL (16174.81), 99% Chebyshev (MVUE) UCL (29558.93).

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

Table of Nonparametric UCLs: 95% CLT UCL (4221.033), 95% Standard Bootstrap UCL (4194.355), 95% Hall's Bootstrap UCL (4424.644), 90% Chebyshev(Mean, Sd) UCL (5067.712), 97.5% Chebyshev(Mean, Sd) UCL (7095.147).

Suggested UCL to Use

95% H-UCL 17119.68

Rejected: data distribution is only approximately lognormal and borderline (1 of 2 GOF tests indicate lognormality at 10% significance level); the suggested lognormal UCL is clearly highly right-skewed and is deemed non-representative of a site soil EPC for Sr.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations. If the data were collected using judgmental or other non-random methods, then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies. However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

The data distribution is not normal or gamma and is only approximately lognormal with high skewness; thus, the data distribution is assumed to be better represented by a non-parametric distribution.

Pb soil data: mg/kg

130  
2400  
300  
170  
260  
3500  
320  
150  
340  
280  
720  
50  
30000  
10000  
3300  
140  
320  
580  
2700  
2500  
6200  
300  
4500  
4000  
1600  
2100  
12000  
1400  
1100  
210  
120  
63  
120  
140  
260  
340  
750  
200  
140  
200  
520  
190  
290  
260  
410  
2200  
890  
970  
1300  
300  
90  
14000  
280  
220  
740  
190  
290  
3100  
2600  
87  
110  
100  
380  
330  
720  
470  
430  
470  
220  
170  
180  
200  
120  
83  
260  
160  
690  
360  
120  
59  
240  
110  
140  
140  
290  
170  
96  
190  
190  
45

General Statistics on Uncensored Full Data  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:25:37 PM  
 User Selected Options  
 From File Worksheet.xls  
 Full Precision ON  
 From File: Worksheet.xls  
 General Statistics for Uncensored Dataset

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.67	Skewness	CV
C0	90	0	45	30000	1445.256	410.4877	3837.409	404.4984	252.0386	5.515376	2.655177

Percentiles for Uncensored Dataset

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
C0	90	0	109	140	162.5	290	747.5	1320	3120	5435	15760

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects  
 User Selected Options  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:27:15 PM  
 From File Worksheet.xls  
 Full Precision ON  
 Confidence Coefficient 0.95

C0  
 Raw Statistics  
 Number of Valid Observations 90  
 Number of Distinct Observations 62  
 Minimum 45  
 Maximum 30000  
 Mean of Raw Data 1445.256  
 Standard Deviation of Raw Data 3837.409  
 Khat 0.50401  
 Theta hat 2867.511  
 Kstar 0.494618  
 Theta star 2921.966  
 Mean of Log Transformed Data 6.017346  
 Standard Deviation of Log Transformed Data 1.375598

Normal GOF Test Results  
 Correlation Coefficient R 0.594318  
 Approximate Shapiro Wilk Test Statistic 0.394832  
 Approximate Shapiro Wilk P Value 0  
 Lilliefors Test Statistic 0.357595  
 Lilliefors Critical (0.0500000) Value 0.093577  
 Data not Normal at (0.0500000) Significance Level

Gamma GOF Test Results  
 Correlation Coefficient R 0.889417  
 A-D Test Statistic 8.060746  
 A-D Critical (0.0500000) Value 0.818041  
 K-S Test Statistic 0.248049  
 K-S Critical(0.0500000) Value 0.099593  
 Data not Gamma Distributed at (0.0500000) Significance Level

Lognormal GOF Test Results  
 Correlation Coefficient R 0.958768  
 Approximate Shapiro Wilk Test Statistic 0.910484  
 Approximate Shapiro Wilk P Value 8.62E-07  
 Lilliefors Test Statistic 0.16558  
 Lilliefors Critical (0.0500000) Value 0.093577  
 Data not Lognormal at (0.0500000) Significance Level

Non-parametric GOF Test Results  
 Data do not follow a discernible distribution at (0.0500000) Level of Significance

UCL Statistics for Uncensored Full Data Sets  
 User Selected Options  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:28:17 PM  
 From File Worksheet.xls  
 Full Precision ON  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

C0  
 General Statistics  
 Total Number of Observations 90 Number of Distinct Observations 62  
 Number of Missing Observations 0  
 Minimum 45 Mean 1445.256  
 Maximum 30000 Median 290  
 SD 3837.409 Std. Error of Mean 404.4984  
 Coefficient of Variation 2.655177 Skewness 5.515376

Normal GOF Test  
 Shapiro Wilk Test Statistic 0.394832 Shapiro Wilk GOF Test  
 1% Shapiro Wilk P Value 0 Data Not Normal at 1% Significance Level  
 Lilliefors Test Statistic 0.357595 Lilliefors GOF Test  
 1% Lilliefors Critical Value 0.108215 Data Not Normal at 1% Significance Level  
 Data Not Normal at 1% Significance Level

Assuming Normal Distribution  
 95% Normal UCL 95% UCLs (Adjusted for Skewness)  
 95% Student's-t UCL 2117.595 95% Adjusted-CLT UCL (Chen-1995) 2361.872  
 95% Modified-t UCL (Johnson-1978) 2156.789

Gamma GOF Test  
 A-D Test Statistic 8.060746 Anderson-Darling Gamma GOF Test  
 5% A-D Critical Value 0.818041 Data Not Gamma Distributed at 5% Significance Level  
 K-S Test Statistic 0.248049 Kolmogorov-Smirnov Gamma GOF Test  
 5% K-S Critical Value 0.099593 Data Not Gamma Distributed at 5% Significance Level  
 Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics  
 k hat (MLE) 0.50401 k star (bias corrected MLE) 0.494618  
 Theta hat (MLE) 2867.511 Theta star (bias corrected MLE) 2921.966  
 nu hat (MLE) 90.72187 nu star (bias corrected) 89.03115  
 MLE Mean (bias corrected) 1445.256 MLE Sd (bias corrected) 2054.991  
 Approximate Chi Square Value (0.05) 68.27659  
 Adjusted Level of Significance 0.047333 Adjusted Chi Square Value 67.982

Assuming Gamma Distribution  
 95% Approximate Gamma UCL 1884.581 95% Adjusted Gamma UCL 1892.747

Lognormal GOF Test  
 Shapiro Wilk Test Statistic 0.910484 Shapiro Wilk Lognormal GOF Test  
 10% Shapiro Wilk P Value 8.62E-07 Data Not Lognormal at 10% Significance Level  
 Lilliefors Test Statistic 0.16558 Lilliefors Lognormal GOF Test  
 10% Lilliefors Critical Value 0.085631 Data Not Lognormal at 10% Significance Level  
 Data Not Lognormal at 10% Significance Level

Lognormal Statistics  
 Minimum of Logged Data 3.806663 Mean of logged Data 6.017346  
 Maximum of Logged Data 10.30895 SD of logged Data 1.375598

Assuming Lognormal Distribution  
 95% H-UCL 1552.935 90% Chebyshev (MVUE) UCL 1637.251  
 95% Chebyshev (MVUE) UCL 1909.374 97.5% Chebyshev (MVUE) UCL 2287.071  
 99% Chebyshev (MVUE) UCL 3028.983

Nonparametric Distribution Free UCL Statistics  
 Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs  
 95% CLT UCL 2110.596 95% BCA Bootstrap UCL 2472.067  
 95% Standard Bootstrap UCL 2102.042 95% Bootstrap-t UCL 2796.393  
 95% Hall's Bootstrap UCL 4368.821 95% Percentile Bootstrap UCL 2138.789  
 90% Chebyshev(Mean, Sd) UCL 2658.751 95% Chebyshev(Mean, Sd) UCL 3208.423  
 97.5% Chebyshev(Mean, Sd) UCL 3971.347 99% Chebyshev(Mean, Sd) UCL 5469.964

Selected UCL is highest of the non-parametric UCL options at a 5% significance level.

Suggested UCL to Use  
 95% Student's-t UCL 2117.595 Rejected as data distribution is non-parametric and student's-t ucl assumes data have a normal distribution.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.  
 Please verify the data were collected from random locations.  
 If the data were collected using judgmental or other non-random methods,  
 then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.  
 Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.  
 However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lake Enon Former Mill Site  
Outdoor Site Visitor All Ages - Multipathway

Hours / day	Days / week	Weeks per year
2	1	26

Receptor Parameters	INFANT	TODDLER	CHILD	TEEN	ADULT	Reference
Parameter						
body weight (kg)	8.2	16.5	32.9	59.7	70.7	Health Canada, 2021
breathing rate (m3/d)	2.2	8.3	14.5	15.6	16.6	Health Canada, 2021
soil ingestion rate (g/d)	0	0.08	0.02	0.02	0.02	Health Canada, 2021
water intake rate (L/d)	0.3	0.6	0.8	1	1.5	Health Canada, 2021
hand surface area (m2)	0.032	0.043	0.059	0.08	0.089	Health Canada, 2021
hand soil adherence factor (g/m2/d)	1	1	1	1	1	Health Canada, 2021
skin surface area other than hands - upper and lower arms and legs (m2)	0.146	0.258	0.455	0.72	0.822	Health Canada, 2021
skin (non-hand) soil adherence factor (g/m2/d)	0.1	0.1	0.1	0.1	0.1	Health Canada, 2021
Age Group Duration	0.5	4.5	7	8	60	Health Canada, 2021

EDIs (ug/kg BW/day)	Lead	Strontium
Receptor		
Infant	0	0
Toddler	0.24	63.5
Child	0.17	43
Teen	0.12	25.5
Adult	0.115	22.5

Exposure Time (outdoors):			
exposure term for soil ingestion & dermal contact pathway (unitless)	0.07143	Assumed	
exposure term for soil inhalation pathway (unitless)	0.00595	Assumed	
exposure term for direct contact pathway (developmental toxicant) (unitless)	0.14286	Assumed	Amortization limited to days/week for developmental toxicants [Lead]
exposure term for inhalation pathway (developmental toxicant) (unitless)	0.01190	Assumed	Amortization limited to days/week for developmental toxicants [Lead]

Environmental Parameters	Value	Reference	
Parameter			
outdoor dust level (g/m3)	0.00025	Health Canada, 2021	assumes vehicle traffic on unpaved roads
Fraction of airborne dust generated from soil	1	Assumed	
Fraction of inside dust from outside dust	0	Assumed	

TRVs (ug/kg BW/day for non-carcinogens), (ug/kg BW/d) <sup>1</sup> for carcinogens					
Parameter		LEAD	Reference	STRONTIUM	Reference
Noncancer (oral + dermal)	ug/kg bw-day	0.5	Health Canada, 2021	1417	Health Canada (GCDWQ), 2019
Noncancer (inhalation)	ug/kg bw-day	-		-	
Cancer (oral + dermal)	(ug/kg bw-day) <sup>1</sup>	-		-	
Cancer (inhalation)	(ug/kg bw-day) <sup>1</sup>	-		-	

RAFs	Exposure Route	LEAD	Reference	STRONTIUM	Reference
Contaminant					
Lead	Dermal	0.006	Health Canada, 2021	0.1	Assumed, MOECC (barium)
	Oral Soil	0.73	Assumed	1	Assumed
	Inhalation	1	Assumed	1	Assumed

-- Select Receptor --

ADULT	=(Cs*Inhalation Rate*Outdoor Dust Level*Fraction*Einh*RAFi)/BW			=(Cs*Soil Ing. Rate*Eting*RAFo)/BW			=(Cs*Ahand*Adherence hand*Elderm*RAFd)/BW			=(Cs*Abody*Adherence body*RAFd*Elderm)/BW			Dietary EDI	Total Soil Oral + Dermal + Diet	Total Soil Dust Inhalation	
Exposure and Risk Calculations (Direct Soil Contact Pathways)	Soil Concentration (ug/g)	Outdoor Dust Inhalation	Indoor Dust Inhalation	Total Dust Inhalation	Outdoor Soil Ingestion	Indoor Dust Ingestion	Total soil/dust ingestion	Outdoor Dermal Contact (hand)	Indoor Dermal Contact (hand)	Total Dermal Contact (hand)	Outdoor Dermal Contact (body)	Indoor Dermal Contact (body)	Total Dermal Contact (body)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)
Contaminant	UCLM95 Concentration	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)	Exposure (ug/kg-d)
LEAD	4369	1.53E-03	0.00E+00	1.53E-03	8.83E-02	0.00E+00	8.83E-02	3.54E-03	0.00E+00	3.54E-03	2.18E-02	0.00E+00	2.18E-02	0.115	2.29E-01	1.53E-03
STRONTIUM	5917	4.13E-03	0.00E+00	4.13E-03	2.39E-01	0.00E+00	2.39E-01	1.60E-01	0.00E+00	1.60E-01	9.83E-01	0.00E+00	9.83E-01	22.50	2.39E+01	4.13E-03

=(Cw*Water Intake Rate*ETing*RAFo)/BW		
Exposure and Risk Calculations (Drinking Water Pathway)	Drinking Water Concentration (ug/L)	Drinking Water Ingestion
Contaminant	Avg Concentration	Exposure (ug/kg-d)
LEAD	1.3	2.88E-03
STRONTIUM	24200	3.67E+01

=(Ca*Inhalation Rate*ETinh*RAFi)/BW		
Exposure and Risk Calculations (Outdoor Air Pathway)	Air Concentration (ug/m <sup>3</sup> )	Outdoor Air Inhalation
Contaminant	NAPS	Exposure (ug/kg-d)
LEAD	0.001	2.80E-06
STRONTIUM	0.0017	2.38E-06

EXPOSURE (BY PATHWAY) FOR THE ADULT	LEAD	STRONTIUM
Total Soil Oral + Dermal + Diet	2.29E-01	2.39E+01
Total Soil Dust Inhalation	1.53E-03	4.13E-03
Outdoor Air Inhalation	2.80E-06	2.38E-06
Drinking Water Ingestion	2.88E-03	3.67E+01
TOTAL EXPOSURE (ALL SITE PATHWAYS) FOR THE ADULT	2.33E-01	6.06E+01

RISK ESTIMATES (BY PATHWAY) FOR THE ADULT		
Non Carcinogenic		
	LEAD	STRONTIUM
Total Soil Oral + Dermal + Diet	4.57E-01	1.69E-02
Total Soil Dust Inhalation	3.05E-03	2.92E-06
Outdoor Air Inhalation	5.59E-06	1.68E-09
Drinking Water Ingestion	5.75E-03	2.59E-02
TOTAL RISK (ALL SITE PATHWAYS) FOR THE ADULT	4.66E-01	4.27E-02

HQ (o+d) = Exposure (ug/kg bw-d) / TRVo (ug/kg bw-d)

<- Click to fill out Summary Table Below

HQ Threshold 0.8

Summary Table - Risk Estimates - All Receptors by Exposure Route	Total Non-Cancer Risk (HQ)									
Receptor	Lead (soil ing-dermal)	Lead (soil inhalation)	Lead (outdoor air)	Lead (water ingestion)	Lead (total)	Strontium (soil ing-dermal)	Strontium (soil inhalation)	Strontium (outdoor air)	Strontium (water ingestion)	Strontium (total)
INFANT	7.11E-02	3.49E-03	6.39E-06	9.92E-03	8.45E-02	1.13E-03	3.33E-06	1.92E-09	4.46E-02	4.58E-02
TODDLER	3.57E+00	6.54E-03	1.20E-05	9.86E-03	3.59E+00	4.87E-02	6.25E-06	3.59E-09	4.44E-02	9.31E-02
CHILD	7.77E-01	5.73E-03	1.05E-05	6.59E-03	7.89E-01	3.16E-02	5.48E-06	3.15E-09	2.97E-02	6.13E-02
TEEN	4.99E-01	3.40E-03	6.22E-06	4.54E-03	5.07E-01	1.90E-02	3.25E-06	1.87E-09	2.04E-02	3.94E-02
ADULT	4.57E-01	3.05E-03	5.59E-06	5.75E-03	4.66E-01	1.69E-02	2.92E-06	1.68E-09	2.59E-02	4.27E-02

# Appendix J

## *Ecological Screening Tables*

**Build Nova Scotia**

*Human Health and Ecological Risk Assessment and  
Ancillary Assessment Activities: Lake Enon Former  
Mill Site, Enon, Nova Scotia (FINAL)*

January 24, 2025 - 22-3723



Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Background Samples										
					Field ID	MW1 SS2	SSS26	SSS33	SSS34	SSS37	SSS38*	SSS39	SSS41	SSS42	SSS43
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal/FD	Normal	Normal	Normal	Normal
					Depth (m)	0.6 - 1.2	0.15 - 0.25	0.1 - 0.15	0.1 - 0.15	0 - 0.12	0.05 - 0.15	0 - 0.10	0.05 - 0.15	0 - 0.15	0.02 - 0.1
Date	5/11/2022	5/19/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022	12/7/2022		
Min	Max														
<b>Metals</b>															
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	13,000	9,700	7,600	4,200	32,000	38,000	18,000	22,000	19,000	5,400	
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	6.2	5.5	<2.0	2.9	3.2	5.5	5.4	5.8	5.1	<2.0	
Barium	mg/kg	2000 <sup>b</sup>	11	1100	400	100	22	11	94	130	150	170	540	14	
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	1.6	1.1	<1.0	
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	2.6	0.72	<0.30	<0.30	1	0.54	0.46	0.63	1.3	<0.30	
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	17	9.8	4.5	3.9	7.9	19	13	21	15	<2.0	
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	9.4	6.1	<1.0	<1.0	3.3	10	6.5	7.8	9.4	<1.0	
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	29	5.3	<2.0	<2.0	7.4	10	11	13	6.3	<2.0	
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	28,000	22,000	1,400	6,400	5,600	31,000	25,000	27,000	28,000	2,000	
Lead	mg/kg	32 <sup>c</sup>	7	170	91	67	11	7	60	63	54	74	98	7.1	
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	17	10	<2.0	2.4	3.9	41	19	23	22	<2.0	
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,300	2,200	28	13	4,000	5,000	520	770	2,800	32	
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.1	<0.10	<0.10	<0.10	0.56	0.23	0.12	0.17	0.17	<0.10	
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	16	6.5	<2.0	<2.0	3.7	12	9.4	11	9.4	<2.0	
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	7.9	6.2	4.3	6.1	5.4	29	14	15	23	8.7	
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	<0.5	<0.5	<0.50	<0.50	14	2.4	0.76	1.4	1.4	<0.50	
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.5	<0.5	<0.50	<0.50	1.1	0.75	1.3	0.59	<0.50	<0.50	
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	37	13	<5.0	<5.0	36	25	73	17	39	<5.0	
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.22	0.13	<0.10	0.14	0.26	0.42	0.15	0.26	0.28	<0.10	
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.93	1.3	0.22	0.17	3.9	1.4	0.94	2.2	1.3	0.29	
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	31	26	8.9	13	7.8	43	31	40	39	8.5	
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	340	170	<5.0	<5.0	45	200	220	300	190	<5.0	

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

<sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health); commercial land use; lower of direct contact pathways.

<sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.

<sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.

<sup>d</sup> NGA indicates no guideline is available.

<sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.

<sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1), LA-UR-17-26376, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>

<sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.

<sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Background Samples													
					Field ID	SSS45	TH47 0-0.15M*	TH48 0-0.15M	TH50 0-0.15M	TH51 0-0.15M	TH52 0-0.15M	TH53 0-0.15M	TH61 0-0.15M	TH72 0-0.15M	TH73 0-0.15M	TP35 0-0.15	TH75 0-0.15	
					Sample Type	Normal	Normal/FD *	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0.02 - 0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15
Date	12/7/2022	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/21/2023	6/21/2023	9/20/2023	9/20/2023			
Min	Max																	
<b>Metals</b>																		
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	13,000	31,000	15,000	3,900	9,500	17,000	20,000	24,000	7,700	6,600	16,000	17,000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	3.3	4.1	5	<2.0	<2.0	6	5.1	3.5	5.2	5.5	5	2.8		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	390	70	470	75	37	350	520	450	16	24	150	110		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	1.4	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	0.61	<0.30	1.4	<0.30	<0.30	2.5	1.9	0.36	<0.30	<0.30	0.31	0.61		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	12	13	11	2.5	5.1	16	17	18	6.7	5.1	17	6		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	6	13	5.4	1	1.3	7	10	4.5	<1.0	<1.0	9	11		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	4.6	6.5	7.9	<2.0	2.5	13	13	5.9	<2.0	<2.0	7.6	10		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	19,000	22,000	26,000	6,000	7,400	24,000	28,000	22,000	7,600	11,000	27,000	9,300		
Lead	mg/kg	32 <sup>c</sup>	7	170	160	64	110	32	18	110	170	93	19	16	63	140		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	15	24	17	<2.0	5.5	22	24	35	4	2.2	22	7		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	790	2,900	2,900	260	91	2,100	5,200	690	19	24	2100	2800		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	0.13	0.39	0.2	0.13	0.16	0.17	0.19	0.29	<0.10	<0.10	0.14	0.45		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	2.3	2.6	<2.0	<2.0	2.1	<2.0		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	5.2	7.1	7.2	<2.0	3.4	11	10	8.7	2.1	<2.0	10	8.3		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	20	18	23	15	12	16	25	28	12	7.9	14	8.1		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.66	3.4	0.8	<0.50	<0.50	1.3	1.9	1.2	<0.50	<0.50	1	2.9		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	0.53	<0.50	<0.50	<0.50	0.54		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	470	44	230	36	19	26	67	66	<5.0	5.8	34.0	70		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.26	0.25	0.22	<0.10	0.11	0.24	0.37	0.38	0.14	0.11	0.21	0.17		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	1.6	<1.0	<1.0	<1.0	1.7		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.98	1.9	1.2	0.48	0.38	1.9	1.8	1.6	0.3	0.24	1.4	0.77		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	38	27	35	10	18	35	43	40	23	26	37	13		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	170	79	220	21	26	320	290	250	8	6.6	240	61		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Site Samples															
					Field ID	Sample Type	Depth (m)	Date	SSS46	MW2 SS2	MW3 SS1	MW4 SS1	MW5 SS1	MW6 SS1*	MW7 SS2	SSS2	SSS12	SSS13	SSS16	
									Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
									0 - 0.15	1.22 - 1.83	0.0 - 0.61	0.0 - 0.61	0.0 - 0.61	0.0 - 0.61	0.0 - 0.61	1.22 - 1.83	0.15 - 0.46	0.15 - 0.3	0.15 - 0.3	0.15 - 0.46
			Min	Max	12/7/2022	5/10/2022	5/10/2022	5/10/2022	5/9/2022	5/10/2022	5/9/2022	5/10/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022				
Metals																				
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	13,000	12,000	4,900	12,000	4,300	6,500	7,400	3,300	8,300	14,000	12,000					
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	4.5	5.3	7.8	7	3.4	3.1	12	7	4.4	7.4	6.2					
Barium	mg/kg	2000 <sup>b</sup>	11	1100	250	320	450	620	400	540	610	600	740	280	660					
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	0.82	1.4	0.76	2.6	7.6	2.4	21	0.71	2.8	1.6	5.7					
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	11	17	11	15	5.9	8.9	21	6.2	13	16	16					
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	6.7	10	6.1	9.7	4.8	5.6	15	4.5	7.1	10	9.8					
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	9.1	19	5.8	26	58	45	53	4.5	38	19	54					
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	24,000	24,000	11,000	22,000	9,600	14,000	23,000	7,200	17,000	23,000	23,000					
Lead	mg/kg	32 <sup>c</sup>	7	170	130	130	2,400	300	170	260	150	3,500	320	150	340					
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	15	23	8.5	20	7.3	11	15	5.6	19	22	21					
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,400	1,200	1,900	2,000	6,900	4,600	5,100	2,000	1,900	1,800	4,300					
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	0.13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10				
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2	<2	<2	<2	<2	5.9	<2	<2	<2	2.2					
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	6.7	20	17	20	7.6	11	18	11	16	19	18					
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	15	9.2	4.2	8.9	3.7	5.1	7.3	2.5	8.9	9.6	9.2					
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.72	<0.5	<0.5	<0.5	0.66	0.66	1.4	<0.50	0.72	<0.50	0.78					
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	0.52	<0.5	0.52	0.64	1	1.3	4.3	0.66	0.93	<0.50	1					
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	130	1,300	640	4,300	3,600	5,000	5,000	65	16,000	91	2,100					
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.21	0.2	0.14	0.44	0.15	0.21	0.44	0.11	0.23	0.23	0.32					
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0				
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.78	1.1	0.43	1.4	4.9	2.8	4.7	0.34	1.3	0.97	2.6					
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	36	28	8.3	22	12	17	57	5.6	18	25	24					
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	220	250	160	480	1,400	500	3,600	150	500	260	860					

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Site Samples															
					Field ID	Sample Type	Depth (m)	Date	SSS17	SSS19	SSS21	SSS27	SSS28	SSS29	SSS30	SSS31	SSS32	SSS35	SSS36	
									Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
									0.15 - 0.3	0.15 - 0.3	0.15 - 0.46	0.0 - 0.15	0.0 - 0.08	0.0 - 0.1	0.0 - 0.15	0.0 - 0.07	0.0 - 0.08	0.05 - 0.15	0.03 - 0.15	
			Min	Max	5/13/2022	5/13/2022	5/13/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/7/2022	12/7/2022				
<b>Metals</b>																				
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	15,000	15,000	4,900	-	-	-	-	-	-	-	-	-				
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	-	-	-	-	-	-				
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	5.8	6.4	<2.0	-	-	-	-	-	-	-	-	-				
Barium	mg/kg	2000 <sup>b</sup>	11	1100	170	290	220	-	-	-	-	-	-	-	-	-				
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-				
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	-	-	-	-	-	-				
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	-	-	-	-	-	-	-	-	-				
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	1.7	0.7	0.74	-	-	-	-	-	-	-	-	-				
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	18	16	4.5	-	-	-	-	-	-	-	-	-				
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	9.4	11	2.9	-	-	-	-	-	-	-	-	-				
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	11	6.8	13	-	-	-	-	-	-	-	-	-				
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	26,000	24,000	8,200	-	-	-	-	-	-	-	-	-				
Lead	mg/kg	32 <sup>c</sup>	7	170	280	720	50	30,000	10,000	3,300	140	320	580	2,700	2,500					
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	21	20	7.5	-	-	-	-	-	-	-	-	-				
Manganese	mg/kg	220 <sup>h</sup>	13	5200	3,400	3,100	360	-	-	-	-	-	-	-	-	-				
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.10	<0.10	<0.10	-	-	-	-	-	-	-	-	-				
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2	<2	<2	-	-	-	-	-	-	-	-	-				
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	14	13	4.9	-	-	-	-	-	-	-	-	-				
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	13	12	3.4	-	-	-	-	-	-	-	-	-				
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	1.3	0.73	<0.50	-	-	-	-	-	-	-	-	-				
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-				
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	1,200	54	500	-	-	-	-	-	-	-	-	-				
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.26	0.22	<0.10	-	-	-	-	-	-	-	-	-				
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-				
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.6	0.87	0.49	-	-	-	-	-	-	-	-	-				
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	33	30	11	-	-	-	-	-	-	-	-	-				
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	380	180	170	-	-	-	-	-	-	-	-	-				

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples															
					Field ID	Sample Type	Depth (m)	Date	SSS40	SSS40 (F/D)	SSS44	TH4 SS1	TH5 SS1	TH6 SS2	TH7 SS1	TH8 SS2	TH9 SS1	TH20 SS1	TH21 SS1	
									Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
									0.0 - 0.15	0.0 - 0.15	0.0 - 0.15	0 - 0.3	0.15 - 0.3	0.3 - 1.25	0.3 - 0.4	0.4 - 0.6	0 - 0.3	0.15 - 0.3	0.15 - 0.3	
									12/7/2022	12/7/2022	12/7/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	-	-	-	3,900	3,300	6,700	3,500	9,300	13,000	14,000	16,000					
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0					
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	-	-	-	12	6.8	6.7	5.3	15	14	7.1	5.2					
Barium	mg/kg	2000 <sup>b</sup>	11	1100	-	-	-	380	550	550	640	700	1,100	990	990					
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	-	-	-	<1.0	<1.0	<1.0	<1.0	1.2	1.7	<1.0	<1.0					
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0					
Boron	mg/kg	120 <sup>c</sup>	<50	<50	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50					
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	-	-	-	0.93	0.72	0.43	<0.30	2.2	2.1	3.3	2.7					
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	-	-	-	8	7.5	14	8	23	32	19	17					
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	-	-	-	4.7	4.5	7.3	4.5	10	13	8	8.1					
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	-	-	-	6.3	4.3	4.6	3.5	11	12	34	14					
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	-	-	-	9,200	7,400	13,000	7,800	18,000	23,000	29,000	26,000					
Lead	mg/kg	32 <sup>c</sup>	7	170	6,200	4,500	300	4,500	4,000	1,600	2,100	12,000	12,000	1,400	1,100					
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	-	-	-	6.8	7.1	13	7.6	16	23	20	21					
Manganese	mg/kg	220 <sup>h</sup>	13	5200	-	-	-	1,500	1,800	1,800	1,400	3,300	3,000	1,800	2,200					
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	0.17					
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	-	-	-	<2	<2	<2	<2	<2	2	<2	<2					
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	-	-	-	11	13	22	13	45	63	15	10					
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	-	-	-	3.6	3.2	5.1	3.1	10	14	13	14					
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.92	1.2					
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	-	-	-	0.87	0.68	<0.50	<0.50	1.9	2	1.5	0.92					
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	-	-	-	110	210	1,200	380	420	290	8,200	8,800					
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	-	-	-	0.2	0.22	0.15	0.14	0.36	0.37	0.31	0.31					
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.1					
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	-	-	-	0.35	0.35	0.46	0.29	1.3	1.4	2.3	1.7					
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	-	-	-	6.3	5.5	11	6.3	15	20	39	39					
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	-	-	-	180	440	140	86	390	440	720	400					

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples												
					Field ID	TH18 6"-12" SS1	TH34 0-0.15M	TH35 0-0.15M	TH36 0.15-0.8M	TH37 0.15-0.85M	TH38 0.15-0.95M	TH39 0.15-0.75M	TH40 0-0.15M	TH40 0.15-0.9M	TH41 0.15-0.75M	TH42 0.15-0.6M	
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0.15 - 0.3	0-0.15	0-0.15	0.15-0.8	0.15-0.85	0.15-0.95	0.15-0.75	0-0.15	0.15-0.9	0.15-0.75	0.15-0.6	
Date	5/13/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022				
<b>Metals</b>																	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	14,000	9,600	8,600	13,000	14,000	13,000	12,000	17,000	11,000	9,800	13,000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	6.4	3.1	3.6	7.2	6.7	6.8	6.2	6.4	7.1	7.2	5.9		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	460	280	550	210	170	270	250	720	610	540	92		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	3.3	0.8	0.7	1.6	2.9	5.2	4.6	12	8.5	5	0.81		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	18	10	9.5	19	18	17	17	18	15	15	17		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	10	5.8	4.5	11	11	11	11	13	11	8.2	6.6		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	23	6.9	11	19	20	26	21	17	33	36	11		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	25,000	14,000	12,000	25,000	24,000	25,000	27,000	21,000	25,000	20,000	25,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	210	120	63	120	140	260	340	750	220	200	140		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	24	18	13	25	25	22	21	21	20	18	20		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,000	550	480	1,000	1,900	2,600	3,300	2,200	3,200	2,400	2,600		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	0.35	<0.10	<0.10	0.12		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2	<2.0	<2.0	<2.0	<2.0	<2.0	2.4	2.7	2.1	<2.0	<2.0		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	21	9.3	8.6	23	24	21	19	14	19	16	11		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	13	10	9.6	11	10	9.2	8.3	18	9.5	8.1	8.5		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	<0.5	1.8	0.9	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	0.5		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	0.6	0.52	<0.50		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	480	1800	1,800	34	13	26	45	1,800	140	140	250		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.26	0.14	0.17	0.31	0.29	0.28	0.23	0.46	0.23	0.27	0.2		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.2	3.6	1.8	0.84	0.74	0.99	1.3	2.9	1.3	1.4	1.3		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	30	20	20	23	26	28	28	37	26	24	32		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	510	180	150	210	290	700	520	690	840	740	340		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples											
					Field ID	TH43 0.15-1.05M	TH43 0.15 1.05M (DUP2 F/D)	TP1 1-2M SS2	TP2 0-1M SS1	TP3 0-1M SS3	TP24 0-1M SS3 (F/D)	TP10 0-1M SS3	TP11 0-1M SS3	TP12 0-1M SS3	TP13 0-1M SS3	
					Sample Type	Normal	Field_D	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	
					Depth (m)	0.15-1.05	0.15-1.05	1.0 - 2.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
					Date	10/18/2022	10/18/2022	5/13/2022	5/13/2022	5/11/2022	5/11/2022	5/11/2022	5/12/2022	5/11/2022	5/11/2022	5/11/2022
<b>Metals</b>																
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	11,000	12,000	11,000	7,600	14,000	13,000	9,200	10,000	7,500	7,100		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	5.9	6.6	5.9	7.6	4.3	3.9	3.9	6.2	5.4	5		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	360	380	870	750	1,000	950	520	680	350	540		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	2.9	2	<2.0	<2.0	<2.0	2.1	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	3.5	3.5	3.2	7	1	0.99	2.1	5.3	2.2	0.54		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	15	16	14	9.6	17	16	11	13	12	10		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	9.2	9.3	8.9	8.3	8.4	8.3	8	8.4	9.8	7.4		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	29	29	66	110	45	48	34	34	38	120		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	24,000	25,000	29,000	20,000	21,000	20,000	16,000	20,000	17,000	16,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	190	200	340	520	190	180	290	260	410	2,200		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	19	18	20	15	27	26	17	19	13	15		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	1,900	2,300	3,300	6,100	1,200	1,200	2,800	3,800	3,600	2,700		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2.0	3.9	2.9	<2	<2	<2	2	2.2	<2		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	16	16	18	13	20	19	14	16	17	12		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	7.4	7.7	10	7.7	16	14	7.7	10	12	6.8		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	<0.50	<0.50	0.77	1.3	<0.5	<0.5	1	0.85	1.2	0.64		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	<0.50	0.86	2.5	0.78	0.69	0.86	1.4	1.5	1.4		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	21	28	7,000	3,800	13,000	10,000	6,200	5,300	3,000	19,000		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.23	0.24	0.28	0.41	0.19	0.19	0.29	0.38	0.52	0.16		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.2	1.1	3.8	5.8	1.6	1.4	2.3	3.4	11	4.1		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	28	28	23	17	22	21	22	21	15	18		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	440	460	830	1,500	410	390	410	1,000	640	390		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples												
					Field ID	TP14 0-1M SS3	TP15 0-1M SS3	TP22 0-1M SS3 (F/D)	TP16 0-1M SS3	TP23 0-1M SS3 (F/D)	TP17 0-1M SS3	TP19 0.3M SS1	TP22 0-0.15M	TP22 0.15-1.0M	TP24 0-0.15M	TP25 0-0.15M	
					Sample Type	Normal	Normal	Field_D	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 0.3	0.0-0.15	0.15-1.0	0-0.15	0-0.15	0-0.15
Date	5/11/2022	5/12/2022	5/12/2022	5/12/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	10/12/2022	10/12/2022	10/12/2022	10/12/2022	10/12/2022				
<b>Metals</b>																	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	6,500	9,600	12,000	3,700	5,200	10,000	11,000	9400	9,500	12,000	18000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	2.2	4.3	6.3	2.2	2.7	4.9	4.3	9.5	8.2	6.3	5.2		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	530	620	750	530	670	680	290	610	570	300	210		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	1.2	4.8	3.6	1.4	1.2	3.5	1.5	5.9	6.1	5.6	1		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	11	14	14	6	7.5	15	16	18	15	14	15		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	4.3	8.2	8.5	3.2	4	8.1	9.6	120	270	11	9.7		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	30	45	32	46	49	47	18	74	100	30	14		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	12,000	18,000	20,000	8,200	10,000	20,000	22,000	49,000	100,000	23,000	24,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	890	970	170	1,100	1,300	300	90	14000	6,500	280	220		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	9.7	19	21	6.6	9.7	20	21	16	18	17	21		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	1,500	2,200	1,600	1,800	1,900	2,100	1,400	1,600	1,800	3,800	1,700		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.23	<0.10	0.16		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2	<2	<2	<2	<2	<2	<2	2.6	4	<2.0	<2.0		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	7.6	17	17	5.9	7.1	16	20	20	25	15	10		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	4	11	12	3.9	5.6	10	9.8	10	14	7.9	10		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	<0.5	0.6	<0.5	<0.5	<0.5	0.68	<0.5	<0.50	0.78	<0.50	0.84		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	0.56	1.3	0.9	0.84	1.5	1.1	<0.5	2.2	1.8	<0.50	1		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	20,000	16,000	8,500	21,000	27,000	15,000	1,200	6300	11000	200	300		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	<0.1	0.3	0.36	<0.1	0.12	0.32	0.2	0.33	0.28	0.31	0.25		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.4	1.9	2	1.6	1.7	2.2	1	1.3	1.8	1.4	1		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	23	16	23	9.7	14	23	25	36	57	31	40		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	260	950	530	300	350	570	260	730	800	530	390		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples												
					Field ID	TP25 0.15-1.0M	TP26 0-0.15M	TP26 1-2M	TP27 0-0.15M	TP28 0-1M	TP29 0-0.15M	TP31 0-0.15M	TP31 0.15-1.0M	TP32 0-0.15M	TH36 0-0.15M	TH37 0-0.15M	
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0.15-1.0	0-0.15	1-2	0-0.15	0-1	0-0.15	0-0.15	0-0.15	0.15-1.0	0-0.15	0-0.15	0-0.15
Date	10/12/2022	10/12/2022	10/12/2022	10/12/2022	10/12/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/18/2022	10/18/2022			
<b>Metals</b>																	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	11,000	18000	13,000	6,600	9,300	4,000	3,900	16,000	10,000	13,000	13,000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	5.3	7.2	6.5	6.8	4.5	4.8	8.7	12	2.9	6.7	5.1		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	700	990	560	670	720	500	960	1100	940	250	73		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	4.3	6.7	4	8.5	3.2	0.66	0.67	1.3	1.3	1.9	<0.30		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	13	21	16	9.7	12	8.6	9.2	34	14	17	15		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	8.4	9.7	9.8	8.6	8.1	5	4.8	14	7.2	10	7.8		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	31	43	32	52	38	4.3	4.1	10	23	17	4.9		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	21,000	28,000	27,000	14,000	17,000	7,800	8,300	26,000	16,000	23,000	19,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	140	740	180	190	290	3100	2600	6,300	87	110	100		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	18	21	20	14	18	6.4	6.7	29	22	21	19		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,100	3,200	2,800	6,500	3,100	1,700	2,300	1,900	1,200	1,700	1,200		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.10	0.17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	2	<2.0	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	15	17	17	14	16	14	15	69	18	22	9.2		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	8	15	7.2	7	8.8	3.6	4.2	15	10	8.6	14		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	<0.50	0.87	<0.50	0.93	0.63	<0.50	<0.50	<0.50	0.69	<0.50	0.67		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	1.8	0.54	2.1	1.1	<0.50	0.63	1.3	0.76	<0.50	<0.50		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	75	5600	320	5,500	7,300	670	240	690	14,000	24	30		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.28	0.34	0.24	0.36	0.31	0.13	0.15	0.36	0.18	0.22	0.17		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	2.7	5.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.2	2.3	1.5	5.8	2.7	0.33	0.48	1.1	1.1	0.93	0.74		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	25	42	35	14	20	7.2	6.8	25	16	25	27		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	670	920	580	1,500	740	130	130	390	310	200	120		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Site Samples											
					Field ID	TH38 0-0.15M	TH39 0-0.15M	TH41 0-0.15M	TH42 0-0.15M	TH43 0-0.15M	TH44 0-0.15M	TH45 0-0.15M	TH45 0-0.15M (F/D)	TH46 0-0.15M	TH47 0-0.15M	TH47 0-0.15M (F/D)
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15
Date	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023				
Min	Max															
<b>Metals</b>																
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	13,000	15,000	18,000	19,000	19,000	12,000	16,000	17,000	15,000	29,000	31,000	
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	6	6	7.4	5.9	4.8	6	5.5	5.3	8.7	4.1	3.9	
Barium	mg/kg	2000 <sup>b</sup>	11	1100	190	260	510	750	610	630	210	230	650	70	59	
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	1.2	2.2	2.1	1.2	1.8	3	1.2	1.3	25	<0.30	<0.30	
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	15	16	23	18	19	16	16	15	16	12	13	
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	9.9	11	11	8.7	9.1	9.9	8.7	8.4	6.9	13	13	
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	9.6	8.4	19	8.3	15	18	12	12	15	6.5	6	
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	22,000	26,000	29,000	30,000	25,000	23,000	24,000	23,000	36,000	20,000	22,000	
Lead	mg/kg	32 <sup>c</sup>	7	170	380	330	720	470	430	470	220	220	170	64	53	
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	18	20	23	19	24	20	21	20	17	22	24	
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,000	4,600	4,500	5,500	2,000	2,300	2,200	2,100	4,400	2,900	2,900	
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	<0.10	0.16	0.27	0.16	0.17	0.14	0.17	0.1	0.17	0.39	0.34	
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2.0	2.3	3.3	<2.0	<2.0	<2.0	<2.0	12	<2.0	<2.0	
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	9.7	13	13	7.4	12	18	11	10	11	7	7.1	
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	13	14	17	26	13	10	14	15	15	16	18	
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.7	0.84	1.6	1	1.1	<0.50	0.93	0.82	0.98	3.4	3.3	
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	<0.50	1.4	0.51	0.8	<0.50	0.72	0.72	<0.50	<0.50	<0.50	
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	47	81	1800	920	480	710	91	120	120	44	29	
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.21	0.26	0.37	0.43	0.37	0.26	0.26	0.27	0.32	0.23	0.25	
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	1.1	1.4	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.83	0.94	3	1.6	1.8	1.2	1.1	1	2.4	1.8	1.9	
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	32	33	41	49	42	27	40	38	73	25	27	
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	290	350	520	250	360	420	400	390	350	78	79	

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples												
					Field ID	TH48 0-0.15M	TH49 0-0.15M	TH50 0-0.15M	TH51 0-0.15M	TH52 0-0.15M	TH53 0-0.15M	TH54 0-0.15M	TH55 0-0.15M	TH55 0-0.15M (F/D)	TH56 0-0.15M	TH57 0-0.15M	
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D (DUP-23C)	Normal	Normal	
					Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15
					Date	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/21/2023	6/21/2023
<b>Metals</b>																	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	15,000	12,000	3,900	9,500	17,000	20,000	11,000	13,000	13,000	3,900	16,000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	5	5	<2.0	<2.0	6	5.1	6.7	4.5	4.4	<2.0	8.3		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	470	1500	75	37	350	520	110	120	110	150	360		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	1.5	1.4	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	1.4	3.4	<0.30	<0.30	2.5	1.9	0.89	0.35	0.37	0.4	1.6		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	11	15	2.5	5.1	16	17	14	13	13	2.7	17		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	5.4	9.3	1	1.3	7	10	11	7.8	8.2	1.3	11		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	7.9	28	<2.0	2.5	13	13	6.6	5.1	5	3	9.5		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	26,000	18,000	6,000	7,400	24,000	28,000	21,000	18,000	18,000	5,600	28,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	110	180	32	18	110	170	200	120	120	83	260		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	17	24	<2.0	5.5	22	24	18	18	16	5	33		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,900	2,700	260	91	2,100	5,200	1,900	1,300	1,400	260	8,900		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	0.2	0.12	0.13	0.16	0.17	0.19	0.12	0.13	0.1	0.13	0.16		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	2.7	2.8	<2.0	<2.0	<2.0	2.3	2.1	<2.0	<2.0	<2.0	3.4		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	7.2	20	<2.0	3.4	11	10	9	7.3	6.7	2.2	12		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	23	13	15	12	16	25	14	15	15	3.9	21		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.8	3.5	<0.50	<0.50	1.3	1.9	0.93	0.91	0.81	<0.50	1.9		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	1.2	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<0.50		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	230	4100	36	19	26	67	130	72	71	230	2600		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.22	0.28	<0.10	0.11	0.24	0.37	0.25	0.23	0.23	<0.10	0.37		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	1.2		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	1.2	6.3	0.48	0.38	1.9	1.8	1.1	0.83	0.8	0.3	8.9		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	35	23	10	18	35	43	27	29	29	9.2	33		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	220	1200	21	26	320	290	200	120	110	78	620		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples												
					Field ID	TH58 0-0.15M	TH59 0-0.15M	TH60 0-0.15M	TH61 0-0.15M	TH62 0-0.15M	TH63 0-0.15M	TH64 0-0.15M	TH65 0-0.15M	TH66 0-0.15M	TH67 0-0.15M	TH68 0-0.15M	
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15
Date	6/21/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/21/2023	6/21/2023	6/21/2023	6/21/2023				
<b>Metals</b>																	
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	12,000	8,100	18,000	24,000	16,000	3,700	13,000	12,000	13,000	20,000	26,000		
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	6.4	3	7	3.5	6	<2.0	4.5	5.8	6.8	8.6	8.1		
Barium	mg/kg	2000 <sup>b</sup>	11	1100	100	600	670	450	680	160	210	54	73	87	94		
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	0.34	1.5	5.9	0.36	1.4	0.33	0.59	<0.30	<0.30	<0.30	<0.30		
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	15	13	19	18	17	5.1	14	14	16	22	24		
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	11	6.2	12	4.5	9.3	<1.0	8.1	11	17	13	39		
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	5.9	27	15	5.9	13	<2.0	9.1	5	6.1	7.1	6.5		
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	21,000	16,000	29,000	22,000	25,000	15,000	21,000	22,000	23,000	34,000	34,000		
Lead	mg/kg	32 <sup>c</sup>	7	170	160	690	360	93	120	59	240	110	140	140	290		
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	15	14	23	35	21	2.4	16	15	12	26	28		
Manganese	mg/kg	220 <sup>h</sup>	13	5200	3,100	1,600	8,700	690	2,600	49	1,600	1,700	2,300	2,300	4,200		
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	0.11	<0.10	0.17	0.29	0.11	<0.10	0.1	0.1	0.15	0.14	0.14		
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2.0	<2.0	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	8.1	11	15	8.7	11	<2.0	6.9	6.9	7.3	11	9.3		
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	16	5.1	20	28	18	7.3	11	13	18	28	28		
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.77	<0.50	1.5	1.2	0.84	<0.50	0.56	0.76	0.84	1	1.2		
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	0.57	0.84	0.53	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50		
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	20	14000	480	66	43	52	140	9.9	13	14	30		
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.25	0.14	0.41	0.38	0.26	<0.10	0.19	0.22	0.26	0.37	0.41		
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	1	<1.0	1.1	1.6	1	<1.0	<1.0	<1.0	1.1	1.2	1.3		
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.92	1.4	2	1.6	1.3	0.46	0.75	0.83	0.8	1	0.85		
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	30	23	40	40	37	26	38	28	34	43	52		
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	120	360	570	250	260	23	240	89	83	120	110		

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022) Min Max		Site Samples					
					Field ID	TH69 0-0.15M	TH70 0-0.15M	TH71 0-0.15M	TH72 0-0.15M	TH73 0-0.15M
					Sample Type	Normal	Normal	Normal	Normal	Normal
					Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15
					Date	6/21/2023	6/21/2023	6/21/2023	6/21/2023	6/21/2023
<b>Metals</b>										
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	15,000	11,000	14,000	7,700	6,600	
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	4.1	5.3	6.7	5.2	5.5	
Barium	mg/kg	2000 <sup>b</sup>	11	1100	170	84	310	16	24	
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Boron	mg/kg	120 <sup>c</sup>	<50	<50	<50	<50	<50	<50	<50	
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	0.46	0.33	1.2	<0.30	<0.30	
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	14	12	21	6.7	5.1	
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	7.5	4.8	12	<1.0	<1.0	
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	5.3	5	19	<2.0	<2.0	
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	18,000	17,000	26,000	7,600	11,000	
Lead	mg/kg	32 <sup>c</sup>	7	170	170	96	190	19	16	
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	23	13	30	4	2.2	
Manganese	mg/kg	220 <sup>h</sup>	13	5200	2,000	680	1,200	19	24	
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	0.14	0.11	<0.10	<0.10	<0.10	
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	8.8	5.7	26	2.1	<2.0	
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	13	12	14	12	7.9	
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	0.73	0.51	<0.50	<0.50	<0.50	
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	41	12	34	<5.0	5.8	
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	0.22	0.17	0.29	0.14	0.11	
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	<1.0	1.1	<1.0	<1.0	<1.0	
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	0.71	0.65	0.91	0.3	0.24	
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	30	30	27	23	26	
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	130	94	230	8	6.6	

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

<sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.

<sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.

<sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.

<sup>d</sup> NGA indicates no guideline is available.

<sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.

<sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>

<sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.

<sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-1: Ecological Health Screening of Soils (0 to 1.5 m Depths)

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>e</sub> )	Background (Dillon 2022)		Summary								
					Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances over Guideline	Number of Exceedances over Guideline and Background
<b>Metals</b>													
Aluminium	mg/kg	NGA <sup>d</sup>	3900	38000	103	0	103	3300	3300	31000	31000	0	0
Antimony	mg/kg	40 <sup>b</sup>	<2.0	<2.0	103	103	0	<2.0	-	<2.0	-	0	0
Arsenic	mg/kg	26 <sup>a</sup>	<2.0	6.2	103	5	98	<2.0	2.2	15	15	0	0
Barium	mg/kg	2000 <sup>b</sup>	11	1100	103	0	103	16	16	1500	1500	0	0
Beryllium	mg/kg	8 <sup>b</sup>	<1.0	1.6	103	95	8	<1.0	1	2	2	0	0
Bismuth	mg/kg	NGA <sup>d</sup>	<2.0	<2.0	103	100	3	<2.0	2	2.9	2.9	0	0
Boron	mg/kg	120 <sup>c</sup>	<50	<50	103	103	0	<50	-	<50	-	0	0
Cadmium	mg/kg	1.9 <sup>c</sup>	<0.30	2.6	103	12	91	<0.30	0.33	25	25	42	33
Chromium (Total, III+VI)	mg/kg	87 <sup>a</sup>	<2.0	21	103	0	103	2.5	2.5	34	34	0	0
Cobalt	mg/kg	180 <sup>c</sup>	<1.0	13	103	3	100	<1.0	1	270	270	1	1
Copper	mg/kg	91 <sup>a</sup>	<2.0	42	103	4	99	<2.0	2.5	120	120	3	3
Iron	mg/kg	NGA <sup>d</sup>	1400	31,000	103	0	103	5600	5600	100000	100000	0	5
Lead	mg/kg	32 <sup>c</sup>	7	170	114	0	114	16	16	30000	30000	110	74
Lithium	mg/kg	350 <sup>f,g</sup>	<2.0	41	103	1	102	<2.0	2.2	35	35	0	0
Manganese	mg/kg	220 <sup>h</sup>	13	5200	103	0	103	19	19	8900	8900	99	6
Mercury	mg/kg	20 <sup>c</sup>	<0.10	0.56	103	60	43	<0.1	0.1	0.39	0.39	0	0
Molybdenum	mg/kg	40 <sup>b</sup>	<2.0	2.7	103	80	23	<2.0	2	12	12	0	0
Nickel	mg/kg	89 <sup>a</sup>	<2.0	18	103	3	100	<2.0	2.1	69	69	0	0
Rubidium	mg/kg	NGA <sup>d</sup>	4.3	29	103	0	103	2.5	2.5	28	28	0	0
Selenium	mg/kg	2.9 <sup>a</sup>	<0.50	14	103	45	58	<0.5	0.5	3.5	3.5	3	0
Silver	mg/kg	40 <sup>b</sup>	<0.50	1.3	103	50	53	<0.5	0.51	4.3	4.3	0	0
Strontium	mg/kg	950 <sup>f,g</sup>	<5.0	470	103	1	102	<5.0	5.8	27000	27000	39	39
Thallium	mg/kg	3.6 <sup>a</sup>	<0.10	0.42	103	6	97	<0.10	0.11	0.52	0.52	0	0
Tin	mg/kg	300 <sup>b</sup>	<1.0	1.7	103	84	19	<1.0	1	5.5	5.5	0	0
Uranium	mg/kg	33 <sup>c</sup>	0.17	3.9	103	0	103	0.24	0.24	11	11	0	0
Vanadium	mg/kg	18 <sup>c</sup>	7.8	43	103	0	103	5.5	5.5	73	73	79	5
Zinc	mg/kg	450 <sup>a</sup>	<5.0	500	103	0	103	6.6	6.6	3600	3600	33	29

Notes

Where applicable, guidelines taken from Atlantic RBCA Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial/Industrial Land Use. Lower of soil contact, and soil and food ingestion PSS (July, 2022). The original source is indicated below.

- <sup>a</sup> Guideline is from CCME Factsheets. SQG<sub>e</sub> (soil quality guideline ecological health): commercial land use; lower of direct contact pathways.
- <sup>b</sup> Alberta Environment Protection (2022) - Surface soil remediation guideline for commercial/industrial land use for direct contact pathway; ecological; coarse/fine-grained soils.
- <sup>c</sup> MECP (2011) Table 3 Soil Components - full depth, non-potable water - institutional land use; lower of coarse and fine-textured soils; lowest of mammals & birds and plants & soil organisms.
- <sup>d</sup> NGA indicates no guideline is available.
- <sup>e</sup> Sample result is the higher of the sample and the field duplicate sample.
- <sup>f</sup> Oregon Department of Environmental Quality (2020) Risk Based Concentrations for Plants, Invertebrates and Wildlife Exposed to Soil. Derived from the LANL (Los Alamos National Laboratory), September 2017. ECORISK Database (Release 4.1). LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538). Lowest of herbivore, omnivore, or mixed diet exposure scenarios. Retrieved from <https://www.oregon.gov/deq/FilterDocs/EcoRiskTablesAppendices.pdf>
- <sup>g</sup> Selected benchmark is the lower of the ground feeding and top consumer mammal risk based concentrations. No vegetation, soil invertebrate or avian values were available.
- <sup>h</sup> US EPA EcoSoil Screening Level (EcoSSL) for manganese (US EPA, 2007). Lower of plant (220 mg/kg), soil invertebrate (450 mg/kg), avian (4300 mg/kg), and mammalian (4000 mg/kg) EcoSSLs. [https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl\\_manganese.pdf](https://www.epa.gov/sites/default/files/2015-09/documents/eco-ssl_manganese.pdf)

Table J-2: Screening of Surface Water Concentrations within the Study Area and in Lake Enon

Sample ID	Sample Type	Date	Background SW1 (BACKGROUND)	Tailings / Settling Pond					Discharge to Lake SW-D		Lake Enon								
				SW4	SW5	SW6	SW7	SW8	SW2	SW3	SW11	SW12	SW14		SW15	SW16	SW17		
				Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	
Parameter	Unit	Surface Water Guideline for Ecological Health	18-May-22	17-May-22	17-May-22	18-May-22	18-May-22	17-May-22	2-Dec-22	12-Jul-23	18-May-22	18-May-22	4-Jul-23	4-Jul-23	4-Jul-23	4-Jul-23	4-Jul-23	4-Jul-23	
<b>Metals</b>																			
Aluminium	mg/L	0.1 <sup>a,d</sup>	0.052	0.055	0.073	0.013	<0.0050	0.1	0.19	0.047	0.047	0.052	0.026	0.024	0.026	0.026	0.029	0.028	0.029
Antimony	mg/L	0.009 <sup>e</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	mg/L	0.005 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium	mg/L	1 <sup>c</sup>	0.082	0.33	0.38	0.31	0.24	0.31	0.43	0.37	0.066	0.069	0.086	0.085	0.084	0.086	0.087	0.088	0.087
Beryllium	mg/L	0.00015 <sup>c</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Boron	mg/L	1.5 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	mg/L	0.00009 <sup>a</sup>	0.000015	0.00011	0.00012	0.000017	<0.000010	0.000039	0.00011	0.000038	<0.000010	0.000011	0.000014	0.000011	0.000015	0.000018	0.000014	0.000014	0.000013
Chromium (Total, III+VI)	mg/L	0.0089 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	0.001 <sup>b</sup>	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Copper	mg/L	0.002 <sup>a</sup>	0.00051	0.00094	0.0011	<0.00050	<0.00050	0.00094	0.00095	0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.3 <sup>a</sup>	<0.05	0.065	0.073	<0.05	<0.05	0.11	0.16	0.059	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	mg/L	0.001 <sup>a</sup>	0.0018	0.0056	0.0071	0.00078	<0.00050	0.0026	0.007	0.002	<0.00050	0.00053	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Manganese	mg/L	0.43 <sup>a</sup>	0.017	0.081	0.08	0.072	0.14	0.036	0.067	0.09	0.014	0.019	0.019	0.023	0.02	0.02	0.02	0.023	0.021
Mercury	mg/L	0.000026 <sup>a</sup>	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	-	-	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013
Molybdenum	mg/L	0.073 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Nickel	mg/L	0.025 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Selenium	mg/L	0.001 <sup>a</sup>	<0.00050	<0.00050	<0.00050	0.00069	<0.00050	0.00054	0.00085	0.00058	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silver	mg/L	0.00025 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	36 <sup>c</sup>	1.8	9.5	11	16	5.3	6.8	10	11	1.8	1.8	2	2.1	2	2	2	2.1	2
Thallium	mg/L	0.0008 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Titanium	mg/L	NGA	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	0.004	0.003	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium	mg/L	0.015 <sup>a</sup>	<0.00010	0.00085	0.00081	0.0015	0.00033	0.00078	0.00085	0.00072	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium	mg/L	0.12 <sup>b</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Zinc	mg/L	0.007 <sup>a</sup>	0.0056	0.016	0.013	0.018	0.0066	0.013	0.028	0.0088	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0091

Notes

NGA denotes no guideline available

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Surface Water - Freshwater, Table 5. The original source is indicated below.

<sup>a</sup> CCME Freshwater Aquatic Life Guidelines; <https://ccme.ca/en/summary-table>

<sup>b</sup>

FEQG (Cited In: NS PSS, 20210 Tier II pathway specific standards for ecological surface water; freshwater aquatic life).

<sup>c</sup> Michigan DEQ, 2008; Final chronic value (Cited In: NS PSS, 2021 Tier II Pathway specific standards for ecological surface water, freshwater aquatic life).

<sup>d</sup> For all surface water samples the pH was >6.5, as such the CCME guideline of 100 ug/L has been applied.

<sup>e</sup> BC CSR (British Columbia Contaminated Sites Regulation); Schedule 3.2 - Generic numerical water standards for Aquatic life (February, 2023).

<sup>f</sup> Michigan Department of Environment. 2019. Final Chronic Value. <https://www.michigan.gov/egle/about/organization/water-resources/assessment-michigan-waters/rule-57-water-quality-values>

Table J-2: Screening of Surface Water Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Surface Water Guideline for Ecological Health	Lake Enon						Summary								
			Sample ID	SW18	SW19	SW20	SW23	SW24	SW25	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal								
<b>Metals</b>																	
Aluminium	mg/L	0.1 <sup>a,d</sup>	0.026	0.026	0.028	0.025	0.028	0.027	22	1	21	<0.0050	0.013	0.19	0.19	1	
Antimony	mg/L	0.009 <sup>e</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	22	22	0	<0.0010	-	<0.0010	-	0	
Arsenic	mg/L	0.005 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	22	22	0	<0.0010	-	<0.0010	-	0	
Barium	mg/L	1 <sup>c</sup>	0.087	0.083	0.087	0.084	0.087	0.086	22	0	22	0.066	0.066	0.43	0.43	0	
Beryllium	mg/L	0.00015 <sup>c</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	22	22	0	<0.00010	-	<0.00010	-	0	
Bismuth	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	22	0	<0.0020	-	<0.0020	-	0	
Boron	mg/L	1.5 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	22	22	0	<0.05	-	<0.05	-	0	
Cadmium	mg/L	0.00009 <sup>a</sup>	0.000014	0.000011	0.000015	0.000017	0.000013	0.000012	22	2	20	<0.000010	0.000011	0.00012	0.00012	3	
Chromium (Total, III+VI)	mg/L	0.0089 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	22	22	0	<0.0010	-	<0.0010	-	0	
Cobalt	mg/L	0.001 <sup>b</sup>	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	22	22	0	<0.00040	-	<0.00040	-	0	
Copper	mg/L	0.002 <sup>a</sup>	0.00067	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	22	16	6	<0.00050	0.00067	0.0013	0.0013	0	
Iron	mg/L	0.3 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	22	17	5	<0.05	0.059	0.16	0.16	0	
Lead	mg/L	0.001 <sup>a</sup>	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	22	15	7	<0.00050	0.00053	0.0071	0.0071	5	
Manganese	mg/L	0.43 <sup>a</sup>	0.021	0.019	0.022	0.02	0.021	0.022	22	0	22	0.014	0.014	0.14	0.14	0	
Mercury	mg/L	0.000026 <sup>a</sup>	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	<0.000013	20	20	0	<0.000013	-	<0.000013	-	0	
Molybdenum	mg/L	0.073 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	22	0	<0.0020	-	<0.0020	-	0	
Nickel	mg/L	0.025 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	22	0	<0.0020	-	<0.0020	-	0	
Selenium	mg/L	0.001 <sup>a</sup>	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	22	18	4	<0.00050	0.00054	0.00085	0.00085	0	
Silver	mg/L	0.00025 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	22	22	0	<0.00010	-	<0.00010	-	0	
Strontium	mg/L	36 <sup>c</sup>	2	2	2	2.1	2	2	22	0	22	1.8	1.8	16	16	0	
Thallium	mg/L	0.0008 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	22	22	0	<0.00010	-	<0.00010	-	0	
Tin	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	22	0	<0.0020	-	<0.0020	-	0	
Titanium	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	19	3	<0.0020	0.0022	0.004	0.004	0	
Uranium	mg/L	0.015 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	22	15	7	<0.00010	0.00033	0.0015	0.0015	0	
Vanadium	mg/L	0.12 <sup>b</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	22	22	0	<0.0020	-	<0.0020	-	0	
Zinc	mg/L	0.007 <sup>a</sup>	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	22	14	8	<0.0050	0.0066	0.028	0.028	7	

Notes

NGA denotes no guideline available

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Table 5. The original source is indicated below.

<sup>a</sup> CCME Freshwater Aquatic Life Guidelines; <https://ccme.ca/en/summary-table>

<sup>b</sup>

FEQG (Cited In: NS PSS, 20210 Tier II pathway specific standards for ecological surface wa

<sup>c</sup> Michigan DEQ, 2008; Final chronic value (Cited In: NS PSS, 2021 Tier II Pathway specific st- water, freshwater aquatic life).

<sup>d</sup> For all surface water samples the pH was >6.5, as such the CCME guideline of 100 ug/L ha

<sup>e</sup> BC CSR (British Columbia Contaminated Sites Regulation); Schedule 3.2 - Generic numeric life (February, 2023).

<sup>f</sup> Michigan Department of Environment. 2019. Final Chronic Value.

<https://www.michigan.gov/egle/about/organization/water-resources/assessment-michigan-quality-values>

Table J-2: Screening of Surface Water Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Surface Water Guideline for Ecological Health	Wetland				Summary								
			WETLAND #1-A	WETLAND #1-B	WETLAND #2	WETLAND #3	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances	
			Normal	Normal	Normal	Normal									
			26-Jul-23	26-Jul-23	26-Jul-23	26-Jul-23									
Aluminium	mg/L	0.1 <sup>a,d</sup>	0.0082	0.13	0.027	0.02	4	0	4	0.0082	0.0082	0.13	0.13	1	
Antimony	mg/L	0.009 <sup>e</sup>	<0.0010	<0.0010	<0.0010	<0.0010	4	4	0	<0.0010	-	<0.0010	-	0	
Arsenic	mg/L	0.005 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	4	4	0	<0.0010	-	<0.0010	-	0	
Barium	mg/L	1 <sup>c</sup>	0.081	0.26	0.89	0.4	4	0	4	0.081	0.081	0.89	0.89	0	
Beryllium	mg/L	0.00015 <sup>c</sup>	<0.00010	<0.00010	<0.00010	<0.00010	4	4	0	<0.00010	-	<0.00010	-	0	
Bismuth	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	4	4	0	<0.0020	-	<0.0020	-	0	
Boron	mg/L	1.5 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	4	4	0	<0.05	-	<0.05	-	0	
Cadmium	mg/L	0.00009 <sup>a</sup>	0.000037	0.00012	0.000052	0.00002	4	0	4	0.00002	0.00002	0.00012	0.00012	1	
Chromium (Total, III+VI)	mg/L	0.0089 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	4	4	0	<0.0010	-	<0.0010	-	0	
Cobalt	mg/L	0.001 <sup>b</sup>	<0.00040	<0.00040	0.00097	0.00045	4	2	2	<0.00040	0.00045	0.00097	0.00097	0	
Copper	mg/L	0.002 <sup>a</sup>	<0.00050	0.00099	0.00069	0.00076	4	1	3	<0.00050	0.00069	0.00099	0.00099	0	
Iron	mg/L	0.3 <sup>a</sup>	<0.05	0.34	1.3	5.5	4	1	3	<0.05	0.34	5.5	5.5	3	
Lead	mg/L	0.001 <sup>a</sup>	0.00056	0.0048	0.033	0.0027	4	0	4	0.00056	0.00056	0.033	0.033	3	
Manganese	mg/L	0.43 <sup>a</sup>	0.023	0.43	7.6	0.87	4	0	4	0.023	0.023	7.6	7.6	2	
Mercury	mg/L	0.000026 <sup>a</sup>	-	-	-	-	0	0	0	0	-	-	-	0	
Molybdenum	mg/L	0.073 <sup>a</sup>	<0.0020	0.0021	0.0026	<0.0020	4	2	2	<0.0020	0.0021	0.0026	0.0026	0	
Nickel	mg/L	0.025 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	4	4	0	<0.0020	-	<0.0020	-	0	
Selenium	mg/L	0.001 <sup>a</sup>	<0.00050	0.0011	<0.00050	<0.00050	4	3	1	<0.00050	0.0011	0.0011	0.0011	1	
Silver	mg/L	0.00025 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	4	4	0	<0.00010	-	<0.00010	-	0	
Strontium	mg/L	36 <sup>c</sup>	19	20	15	6.1	4	0	4	6.1	6.1	20	20	0	
Thallium	mg/L	0.0008 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	4	4	0	<0.00010	-	<0.00010	-	0	
Tin	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	4	4	0	<0.0020	-	<0.0020	-	0	
Titanium	mg/L	NGA	<0.0020	0.0034	<0.0020	<0.0020	4	3	1	<0.0020	0.0034	0.0034	0.0034	0	
Uranium	mg/L	0.015 <sup>a</sup>	0.0011	0.00087	0.0014	<0.00010	4	1	3	<0.00010	0.00087	0.0014	0.0014	0	
Vanadium	mg/L	0.12 <sup>b</sup>	<0.0020	<0.0020	<0.0020	<0.0020	4	4	0	<0.0020	-	<0.0020	-	0	
Zinc	mg/L	0.007 <sup>a</sup>	0.011	0.052	0.0078	0.013	4	0	4	0.0078	0.0078	0.052	0.052	4	

Notes

NGA denotes no guideline available

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Ecological Surface Water (Table 5). The original source is indicated below.

<sup>a</sup> CCME Freshwater Aquatic Life Guidelines; <https://ccme.ca/en/summary-table>

<sup>b</sup>

FEQG (Cited In: NS PSS, 20210 Tier II pathway specific standards for ecological surface wa

<sup>c</sup> Michigan DEQ, 2008; Final chronic value (Cited In: NS PSS, 2021 Tier II Pathway specific standards for ecological surface water, freshwater aquatic life).

<sup>d</sup> For all surface water samples the pH was >6.5, as such the CCME guideline of 100 ug/L ha

<sup>e</sup> BC CSR (British Columbia Contaminated Sites Regulation); Schedule 3.2 - Generic numeric life (February, 2023).

<sup>f</sup> Michigan Department of Environment. 2019. Final Chronic Value. <https://www.michigan.gov/egle/about/organization/water-resources/assessment-michigan-quality-values>

Table J-3: Screening of Surface Water Concentrations within the Study Area and in Lake Enon

Parameter	Sample ID	Background	Tailings/Settling Pond					Drainage Ditch		Lake Enon
		SW1	SW4	SW5	SW6	SW8	SW-D <sup>c</sup>		SW17	
	Date	18-May-22	17-May-22	17-May-22	18-May-22	17-May-22	2-Dec-22	12-Jul-23	4-Jul-23	
<b>Metals</b>										
Hardness as CaCO <sub>3</sub> (Measured)	mg/L	44	110	110	140	96	120		53	
pH	NA	7.48	8.02	8.1	8.15	8.12	8		7.61	
TOC	mg/L	3.7	4	3.6	11	3.3	4.6		3	
Aluminum <sup>a</sup>	mg/L	0.005								
Adjusted Aluminum Guideline (pH) <sup>b</sup>	mg/L	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Sample Concentrations	mg/L	-	0.055	0.073	0.013	0.1	0.19	0.047	0.029	
Cadmium <sup>a</sup>	mg/L	0.00009								
Adjusted Cadmium Guideline (Hardness) <sup>b</sup>	mg/L	-	0.00017	0.00017	-	-	0.00018	0.00018	-	
Sample Concentrations	mg/L	-	0.00011	0.00012	-	-	0.00011	0.000038	-	
Lead <sup>a</sup>	mg/L	0.001								
Adjusted Lead Guideline (Hardness) <sup>b</sup>	mg/L	0.001	0.00359	0.00359	-	0.00302	0.00401	0.00401	-	
Sample Concentrations	mg/L	0.0018	0.0056	0.0071	-	0.0026	0.007	0.002	-	
Zinc <sup>a</sup>	mg/L	0.007								
Adjusted Zinc Guideline (pH, Hardness, DOC) <sup>d</sup>	mg/L	-	0.022	0.02	0.038	0.017	0.026	0.026	0.014	
Sample Concentrations	mg/L	-	0.016	0.013	0.018	0.013	0.028	0.0088	0.0091	

Notes

NGA denotes no guideline available.

Where applicable, guideline source taken from Nova Scotia Tier II Pathway-Specific Standards for Surface Water - Freshwater, Table 5. The original source is indicated below. Guidelines were adjusted for site-specific parameters.

- <sup>a</sup> CCME guideline (not adjusted for site-specific parameters).
- <sup>b</sup> CCME generic guidelines were adjusted using site specific data and equations provided by CCME.
- <sup>c</sup> Assumed hardness, pH and TOC based on data for SW-D December, 2022.
- <sup>d</sup> The CCME zinc guideline was derived for dissolved concentrations. The CCME states that if surface water data is reported as total concentration, the guideline should be compared to the total concentrations first. If exceedances exist, samples should be re-analysed for dissolved concentrations. No DOC was available so TOC was assumed to equal DOC.

Table J-4: Screening of Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>r</sub> )	Background	Tailings / Settling Pond								
			Field ID	SED1	SED4	SED5	SED6	SED7	SED8	SED9	SED10	
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	
			Date	5/18/2022	5/17/2022	5/17/2022	5/18/2022	5/18/2022	5/17/2022	5/17/2022	5/18/2022	
<b>Metals</b>												
Aluminium	mg/kg	NGA	7,800	18,000	12,000	11,000	14,000	12,000	15,000	12,000		
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	mg/kg	17.0 <sup>a</sup>	3.5	7.5	6	5.2	8.6	11	7.7	5.4		
Barium	mg/kg	NGA	230	180	420	540	560	400	440	570		
Beryllium	mg/kg	NGA	<1.0	1.3	<1.0	<1.0	1.4	1.3	1.3	<1.0		
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Boron	mg/kg	NGA	<50	<50	<50	<50	<50	<50	<50	<50		
Cadmium	mg/kg	3.5 <sup>a</sup>	1.2	16	12	6.9	1.3	12	23	7.4		
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	9.3	24	19	16	26	22	22	16		
Cobalt	mg/kg	NGA	5.2	19	17	11	12	35	79	11		
Copper	mg/kg	197 <sup>a</sup>	7.2	120	110	45	16	150	350	48		
Iron	mg/kg	43,766 <sup>b</sup>	13,000	27,000	22,000	20,000	26,000	23,000	24,000	20,000		
Lead	mg/kg	91.3 <sup>a</sup>	71	5,000	3,100	390	1,800	5,700	2,200	390		
Lithium	mg/kg	NGA	11	36	27	25	29	25	29	25		
Manganese	mg/kg	1100 <sup>b</sup>	2,100	1,100	1,900	3,000	1,600	1,900	1,500	2,800		
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	0.3	0.3	<0.10	<0.10	0.12	0.16	<0.10		
Molybdenum	mg/kg	NGA	<2.0	7.5	5.3	3.3	<2.0	3.2	2.1	5.9		
Nickel	mg/kg	75 <sup>b</sup>	9.1	45	29	22	47	51	46	23		
Rubidium	mg/kg	NGA	6.3	19	13	13	16	14	20	14		
Selenium	mg/kg	2.0 <sup>c</sup>	<0.50	8.7	5.5	4.9	<0.50	1.8	2.5	6.7		
Silver	mg/kg	0.5 <sup>b</sup>	<0.50	2.1	1.7	1.7	0.85	2.1	2.8	1.9		
Strontium	mg/kg	NGA	150	3,800	17,000	3,500	600	2,300	1,200	3,200		
Thallium	mg/kg	NGA	0.11	0.82	0.49	0.45	0.42	0.54	0.71	0.53		
Tin	mg/kg	NGA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0		
Uranium	mg/kg	NGA	1.2	6.4	3.8	5.6	1.3	2	2.2	8.2		
Vanadium	mg/kg	NGA	16	32	21	23	24	21	26	24		
Zinc	mg/kg	315 <sup>a</sup>	180	3,100	2,300	2,800	420	1,600	2,800	3,100		
Cyanide, free	mg/kg	NGA	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	<1.0	<1.0		
Cyanide Total	mg/kg	NGA	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	<1.0	<1.0		

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-4: Screening of Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>r</sub> )	Lake Enon								
			Field ID	SED2	SED3	SED11	SED12	SED13	SED14	SED26 (Dup of SED14)	SED15
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal
			Date	5/18/2022	5/18/2022	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023
<b>Metals</b>											
Aluminium	mg/kg	NGA	17,000	19,000	14,000	2,400	7,000	9,500	11,000	19,000	
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Arsenic	mg/kg	17.0 <sup>a</sup>	5.9	5.9	5	<2.0	4.3	4.3	4.9	13	
Barium	mg/kg	NGA	1,100	740	1,600	70	700	600	650	130	
Beryllium	mg/kg	NGA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1	
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Boron	mg/kg	NGA	<50	<50	<50	<50	<50	<50	<50	<50	
Cadmium	mg/kg	3.5 <sup>a</sup>	3.9	6	5.6	<0.30	1.4	2.2	2.4	<0.30	
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	17	21	17	3.1	12	14	14	29	
Cobalt	mg/kg	NGA	11	11	9.5	2	7	8.4	8.9	17	
Copper	mg/kg	197 <sup>a</sup>	17	29	28	<2.0	4.4	6.8	6.8	37	
Iron	mg/kg	43,766 <sup>b</sup>	25,000	25,000	22,000	3,500	15,000	21,000	23,000	34,000	
Lead	mg/kg	91.3 <sup>a</sup>	210	530	430	18	60	73	79	35	
Lithium	mg/kg	NGA	25	29	23	4.3	13	16	18	37	
Manganese	mg/kg	1100 <sup>b</sup>	17,000	1,300	4,300	410	5,500	7,000	7,200	600	
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	0.13	0.11	<0.10	<0.10	<0.10	<0.10	0.12	
Molybdenum	mg/kg	NGA	4.2	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	
Nickel	mg/kg	75 <sup>b</sup>	18	22	19	3.1	8.6	11	12	36	
Rubidium	mg/kg	NGA	14	16	12	<2.0	4.1	5	5.3	17	
Selenium	mg/kg	2.0 <sup>c</sup>	1.2	1.2	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	
Silver	mg/kg	0.5 <sup>b</sup>	0.57	1.1	1	<0.50	<0.50	<0.50	<0.50	<0.50	
Strontium	mg/kg	NGA	400	390	390	32	120	160	170	18	
Thallium	mg/kg	NGA	0.26	0.33	0.25	<0.10	0.13	0.13	0.17	0.16	
Tin	mg/kg	NGA	1.2	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Uranium	mg/kg	NGA	2.5	3.5	3.8	0.27	0.61	0.97	1	1.2	
Vanadium	mg/kg	NGA	34	35	28	5.1	22	28	30	33	
Zinc	mg/kg	315 <sup>a</sup>	560	880	970	49	210	330	360	110	
Cyanide, free	mg/kg	NGA	<1.0	<1.0	-	-	-	-	-	-	
Cyanide Total	mg/kg	NGA	<1.0	<1.0	-	-	-	-	-	-	

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBGA, 2021

Table J-4: Screening of Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>r</sub> )	Lake Enon										
			Field ID	SED16	SED17	SED18	SED19	SED20	SED21	SED22	SED23	SED24	SED25
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			Date	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023	7/4/2023
<b>Metals</b>													
Aluminium	mg/kg	NGA	13,000	22,000	23,000	23,000	15,000	19,000	23,000	10,000	26,000	8,200	
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Arsenic	mg/kg	17.0 <sup>a</sup>	6.3	7.3	7.5	6.4	6.2	5	7.2	3.1	7.8	3.4	
Barium	mg/kg	NGA	1,200	410	630	720	1,200	440	450	440	470	280	
Beryllium	mg/kg	NGA	<1.0	1.1	1.3	1.3	<1.0	1.1	1.3	<1.0	1.3	<1.0	
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Boron	mg/kg	NGA	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
Cadmium	mg/kg	3.5 <sup>a</sup>	6.1	5.3	4.3	5.5	5.6	4.2	5.3	2.4	4.4	2.2	
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	16	22	24	22	15	18	25	11	22	9.1	
Cobalt	mg/kg	NGA	10	11	12	10	9.7	9.4	11	6.1	11	5.2	
Copper	mg/kg	197 <sup>a</sup>	25	23	27	25	14	20	25	8.9	25	6.9	
Iron	mg/kg	43,766 <sup>b</sup>	24,000	25,000	27,000	27,000	25,000	20,000	26,000	17,000	27,000	15,000	
Lead	mg/kg	91.3 <sup>a</sup>	260	280	320	410	170	250	290	120	200	91	
Lithium	mg/kg	NGA	23	32	36	35	21	28	37	15	34	13	
Manganese	mg/kg	1100 <sup>b</sup>	7,200	1,400	1,100	2,100	18,000	1,100	1,400	3,500	1,400	3,500	
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	0.19	0.14	0.14	<0.10	0.18	0.19	<0.10	0.16	<0.10	
Molybdenum	mg/kg	NGA	2.5	2.4	2.2	<2.0	3.6	<2.0	2.4	<2.0	3.6	<2.0	
Nickel	mg/kg	75 <sup>b</sup>	18	24	26	21	16	20	24	9.5	23	7.3	
Rubidium	mg/kg	NGA	10	17	17	14	11	14	17	7.5	18	6.5	
Selenium	mg/kg	2.0 <sup>c</sup>	0.67	1.8	1.7	1.5	0.67	1.3	1.6	0.56	1.7	<0.50	
Silver	mg/kg	0.5 <sup>b</sup>	0.9	0.94	0.99	0.96	0.74	0.79	1	<0.50	1	<0.50	
Strontium	mg/kg	NGA	230	470	450	670	400	400	520	150	490	150	
Thallium	mg/kg	NGA	0.27	0.37	0.43	0.36	0.27	0.32	0.38	0.16	0.38	0.11	
Tin	mg/kg	NGA	<1.0	1.4	1.7	1.2	<1.0	1.4	1.6	<1.0	1.6	<1.0	
Uranium	mg/kg	NGA	1.9	4.1	4.3	4.6	2.5	3.6	3.9	1.6	4.1	1.3	
Vanadium	mg/kg	NGA	28	37	41	41	29	32	40	21	39	21	
Zinc	mg/kg	315 <sup>a</sup>	800	660	770	730	470	570	690	310	600	230	
Cyanide, free	mg/kg	NGA	-	-	-	-	-	-	-	-	-	-	
Cyanide Total	mg/kg	NGA	-	-	-	-	-	-	-	-	-	-	

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-4: Screening of Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>r</sub> )	Summary							
			Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration (mg/kg)	Maximum Detect	Maximum Concentration (mg/kg)	Maximum Detect	Number of Exceedances
<b>Metals</b>										
Aluminium	mg/kg	NGA	25	0	25	2400	2400	26000	26000	0
Antimony	mg/kg	25.0 <sup>d</sup>	25	25	0	<2.0	-	<2.0	-	0
Arsenic	mg/kg	17.0 <sup>a</sup>	25	1	24	<2.0	3.1	13	13	0
Barium	mg/kg	NGA	25	0	25	70	70	1600	1600	0
Beryllium	mg/kg	NGA	25	14	11	<1.0	1	1.4	1.4	0
Bismuth	mg/kg	NGA	25	25	0	<2.0	-	<2.0	-	0
Boron	mg/kg	NGA	25	25	0	<50	-	<50	-	0
Cadmium	mg/kg	3.5 <sup>a</sup>	25	2	23	<0.30	1.3	23	23	17
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	25	0	25	3.1	3.1	29	29	0
Cobalt	mg/kg	NGA	25	0	25	2	2	79	79	0
Copper	mg/kg	197 <sup>a</sup>	25	1	24	<2.0	4.4	350	350	1
Iron	mg/kg	43,766 <sup>b</sup>	25	0	25	3500	3500	34000	34000	0
Lead	mg/kg	91.3 <sup>a</sup>	25	0	25	18	18	5700	5700	19
Lithium	mg/kg	NGA	25	0	25	4.3	4.3	37	37	0
Manganese	mg/kg	1100 <sup>b</sup>	25	0	25	410	410	18000	18000	21
Mercury	mg/kg	0.486 <sup>a</sup>	25	12	13	<0.10	0.11	0.3	0.3	0
Molybdenum	mg/kg	NGA	25	11	14	<2.0	2.1	7.5	7.5	0
Nickel	mg/kg	75 <sup>b</sup>	25	0	25	3.1	3.1	51	51	0
Rubidium	mg/kg	NGA	25	1	24	<2.0	4.1	20	20	0
Selenium	mg/kg	2.0 <sup>c</sup>	25	7	18	<0.50	0.56	8.7	8.7	5
Silver	mg/kg	0.5 <sup>b</sup>	25	7	18	<0.50	0.57	2.8	2.8	18
Strontium	mg/kg	NGA	25	0	25	18	18	17000	17000	0
Thallium	mg/kg	NGA	25	1	24	<0.10	0.11	0.82	0.82	0
Tin	mg/kg	NGA	25	16	9	<1.0	1.1	1.7	1.7	0
Uranium	mg/kg	NGA	25	0	25	0.27	0.27	8.2	8.2	0
Vanadium	mg/kg	NGA	25	0	25	5.1	5.1	41	41	0
Zinc	mg/kg	315 <sup>a</sup>	25	0	25	49	49	3100	3100	20
Cyanide, free	mg/kg	NGA	9	9	0	<1.0	-	<1.0	-	0
Cyanide Total	mg/kg	NGA	9	9	0	<1.0	-	<1.0	-	0

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-4: Screening of Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>r</sub> )	Wetland				Summary								
			Field ID	Wetland #1-A	Wetland #1-B	Wetland #2	Wetland #3	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration (mg/kg)	Minimum Detect	Maximum Concentration (mg/kg)	Maximum Detect	Number of Exceedances
			Sample Type	Normal	Normal	Normal	Normal								
			Date	7/26/2023	7/26/2023	7/26/2023	7/26/2023								
<b>Metals</b>															
Aluminium	mg/kg	NGA	13,000	9,300	12,000	6,200	4	0	4	6200	6200	13000	13000	0	
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	4	4	0	<2.0	-	<2.0	-	0	
Arsenic	mg/kg	17.0 <sup>a</sup>	7.8	4.6	5.8	12	4	0	4	4.6	4.6	12	12	0	
Barium	mg/kg	NGA	74	630	360	900	4	0	4	74	74	900	900	0	
Beryllium	mg/kg	NGA	<1.0	<1.0	<1.0	<1.0	4	4	0	<1.0	-	<1.0	-	0	
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	4	4	0	<2.0	-	<2.0	-	0	
Boron	mg/kg	NGA	<50	<50	<50	<50	4	4	0	<50	-	<50	-	0	
Cadmium	mg/kg	3.5 <sup>a</sup>	0.58	3.8	1.8	1.8	4	0	4	0.58	0.58	3.8	3.8	1	
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	17	12	16	17	4	0	4	12	12	17	17	0	
Cobalt	mg/kg	NGA	6.6	8.5	9.4	8.4	4	0	4	6.6	6.6	9.4	9.4	0	
Copper	mg/kg	197 <sup>a</sup>	11	34	17	7.3	4	0	4	7.3	7.3	34	34	0	
Iron	mg/kg	43,766 <sup>b</sup>	23,000	17,000	21,000	12,000	4	0	4	12000	12000	23000	23000	0	
Lead	mg/kg	91.3 <sup>a</sup>	100	280	120	10000	4	0	4	100	100	10000	10000	4	
Lithium	mg/kg	NGA	23	19	22	13	4	0	4	13	13	23	23	0	
Manganese	mg/kg	1100 <sup>b</sup>	1,700	3,200	1,900	2,600	4	0	4	1700	1700	3200	3200	4	
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	<0.10	0.11	<0.10	4	3	1	<0.10	0.11	0.11	0.11	0	
Molybdenum	mg/kg	NGA	2.1	<2.0	<2.0	<2.0	4	3	1	<2.0	2.1	2.1	2.1	0	
Nickel	mg/kg	75 <sup>b</sup>	13	17	18	30	4	0	4	13	13	30	30	0	
Rubidium	mg/kg	NGA	8.7	8.5	10	6.3	4	0	4	6.3	6.3	10	10	0	
Selenium	mg/kg	2.0 <sup>c</sup>	0.88	0.95	<0.50	<0.50	4	2	2	<0.50	0.88	0.95	0.95	0	
Silver	mg/kg	0.5 <sup>b</sup>	<0.50	1.2	<0.50	1.4	4	2	2	<0.50	1.2	1.4	1.4	2	
Strontium	mg/kg	NGA	420	5,400	140	260	4	0	4	140	140	5400	5400	0	
Thallium	mg/kg	NGA	0.23	0.32	0.24	0.44	4	0	4	0.23	0.23	0.44	0.44	0	
Tin	mg/kg	NGA	<1.0	<1.0	<1.0	<1.0	4	4	0	<1.0	-	<1.0	-	0	
Uranium	mg/kg	NGA	1.5	3.1	0.88	0.64	4	0	4	0.64	0.64	3.1	3.1	0	
Vanadium	mg/kg	NGA	30	20	26	11	4	0	4	11	11	30	30	0	
Zinc	mg/kg	315 <sup>a</sup>	230	770	290	300	4	0	4	230	230	770	770	1	
Cyanide, free	mg/kg	NGA	-	-	-	-	0	0	0	0	-	-	-	0	
Cyanide Total	mg/kg	NGA	-	-	-	-	0	0	0	0	-	-	-	0	

Notes

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<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-5: Ecological Health Screening of Groundwater for Freshwater Aquatic Life

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>E</sub> )	Background	Site Samples										
			MW1	MW2	MW3	MW9 (F/D)	MW4	MW5	MW5	MW5-D	MW7	MW7		MW8
			Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal
			5/17/2022	5/17/2022	5/17/2022	5/17/2022	5/17/2022	5/18/2022	10/21/2022	12/20/2022	5/17/2022	10/18/2022	10/18/2022	5/17/2022
Metals														
Aluminium	mg/L	0.100000 <sup>a</sup>	<0.0050	<0.0050	<0.0050	<0.0050	0.015	0.01	0.0055	0.031	<0.0050	0.015	0.024	<0.0050
Antimony	mg/L	2.0 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0017	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	mg/L	0.005 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium	mg/L	2.9 <sup>a</sup>	0.4	0.26	0.016	0.015	0.12	0.11	0.1	0.17	0.18	0.19	0.17	0.093
Beryllium	mg/L	0.0053 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Boron	mg/L	36000 <sup>b</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.081	<0.05	<0.05	<0.05	<0.05
Cadmium	mg/L	0.000017 <sup>a</sup>	0.00035	0.00093	0.000099	0.000095	0.00046	0.0002	0.00017	0.000055	0.00024	0.000097	0.000083	0.0001
Calcium	mg/L	NGA	28	140	340	330	170	99	94	79	64	75	79	100
Chromium	mg/L	0.0089 <sup>a</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	52 <sup>b</sup>	0.00072	0.00073	0.0053	0.0051	0.0049	0.0011	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Copper	mg/L	0.002 <sup>a</sup>	<0.00050	0.0012	<0.00050	<0.00050	<0.00050	0.035	0.0057	0.00092	0.0011	0.00061	0.0005	<0.00050
Cyanide (free)	mg/L	52 <sup>b</sup>	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	-	<0.0010	-	-	<0.0010
Cyanide (total)	mg/L	NGA	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	<0.0050	-	-	<0.0050
Iron	mg/L	0.3 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.15	0.21	<0.05
Lead	mg/L	0.001 <sup>a</sup>	<0.00050	<0.00050	0.0023	0.0017	<0.00050	0.0048	0.00082	0.0011	<0.00050	<0.00050	0.00065	<0.00050
Magnesium	mg/L	NGA	2.2	18	64	64	28	12	11	16	7.8	8.5	8.8	14
Manganese	mg/L	NGA	0.4	2	3.2	3.1	2.9	0.029	<0.002	0.47	0.28	0.48	0.6	0.08
Mercury	mg/L	0.000026 <sup>a</sup>	<0.000013	-	-	-	-	-	-	-	-	-	-	-
Mercury (filtered)	mg/L	NGA	-	<0.000013	<0.000013	<0.000013	<0.000013	-	-	-	<0.000013	-	-	<0.000013
Molybdenum	mg/L	0.073 <sup>a</sup>	0.007	<0.0020	<0.0020	<0.0020	0.0025	0.018	0.0048	0.026	0.0045	0.0031	0.0033	<0.0020
Nickel	mg/L	0.025 <sup>a</sup>	<0.0020	0.0028	0.045	0.046	0.0036	0.015	0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Potassium	mg/L	NGA	3	0.67	14	13	2.9	4.9	3.4	8	1.8	2.2	2.3	1.4
Selenium	mg/L	0.001 <sup>a</sup>	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0057	0.01	0.00092	0.00079	<0.00050	<0.00050	0.0011
Silver	mg/L	0.0001 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	NGA	14	4.3	5.6	5.5	4.8	9.1	5	14	3.7	3.7	3.5	6.3
Strontium	mg/L	NGA	0.31	11	26	25	37	38	39	13	21	27	28	1.2
Thallium	mg/L	0.0008 <sup>a</sup>	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin	mg/L	NGA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Titanium	mg/L	0.1 <sup>a</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium	mg/L	0.015 <sup>a</sup>	0.00069	0.0013	0.0029	0.0029	0.0083	0.012	0.0071	0.0032	0.003	0.0022	0.0023	0.00076
Vanadium	mg/L	200 <sup>b</sup>	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Zinc	mg/L	0.03 <sup>a</sup>	<0.0050	0.12	0.013	0.013	0.19	0.2	0.18	0.0052	0.032	0.016	0.015	0.019

Notes

<sup>a</sup> FCSAP Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites (FCSAP, 2016). Guidelines for agricultural land use protective of soil organisms direct contact and freshwater aquatic life exposure pathways were applied.

<sup>b</sup> Ontario Ministry of the Environment, Conservation, and Parks (MECP, 2011), Table 6 – Groundwater Shallow Potable (GW3) for coarse-textured soil.

Table J-5: Ecological Health Screening of Groundwater for Freshwater Aquatic Life

Parameter	Unit	Ecological Health-Based Soil Quality Guideline (SQG <sub>E</sub> )	Summary							
			Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration (µg/g)	Minimum Detect	Maximum Concentration (µg/g)	Maximum Detect	Number of Exceedances
<b>Metals</b>										
Aluminium	mg/L	0.100000 <sup>a</sup>	11	5	6	<0.0050	0.0055	0.031	0.031	0
Antimony	mg/L	2.0 <sup>a</sup>	11	10	1	<0.0010	0.0017	0.0017	0.0017	0
Arsenic	mg/L	0.005 <sup>a</sup>	11	9	2	<0.0010	0.002	0.0022	0.0022	0
Barium	mg/L	2.9 <sup>a</sup>	11	0	11	0.015	0.015	0.26	0.26	0
Beryllium	mg/L	0.0053 <sup>a</sup>	11	11	0	<0.00010	-	<0.00010	-	0
Bismuth	mg/L	NGA	11	11	0	<0.0020	-	<0.0020	-	0
Boron	mg/L	36000 <sup>b</sup>	11	10	1	<0.05	0.081	0.081	0.081	0
Cadmium	mg/L	0.000017 <sup>a</sup>	11	0	11	0.000055	0.000055	0.00093	0.00093	11
Calcium	mg/L	NGA	11	0	11	64	64	340	340	0
Chromium	mg/L	0.0089 <sup>a</sup>	11	11	0	<0.0010	-	<0.0010	-	0
Cobalt	mg/L	52 <sup>b</sup>	11	6	5	<0.00040	0.00073	0.0053	0.0053	0
Copper	mg/L	0.002 <sup>a</sup>	11	4	7	<0.00050	0.0005	0.035	0.035	2
Cyanide (free)	mg/L	52 <sup>b</sup>	6	6	0	<0.0010	-	<0.0010	-	0
Cyanide (total)	mg/L	NGA	6	6	0	<0.0050	-	<0.0050	-	0
Iron	mg/L	0.3 <sup>a</sup>	11	9	2	<0.05	0.15	0.21	0.21	0
Lead	mg/L	0.001 <sup>a</sup>	11	5	6	<0.00050	0.00065	0.0048	0.0048	4
Magnesium	mg/L	NGA	11	0	11	7.8	7.8	64	64	0
Manganese	mg/L	NGA	11	1	10	<0.002	0.029	3.2	3.2	0
Mercury	mg/L	0.000026 <sup>a</sup>	0	0	0	-	-	-	-	0
Mercury (filtered)	mg/L	NGA	6	6	0	<0.000013	-	<0.000013	-	0
Molybdenum	mg/L	0.073 <sup>a</sup>	11	4	7	<0.0020	0.0025	0.026	0.026	0
Nickel	mg/L	0.025 <sup>a</sup>	11	5	6	<0.0020	0.002	0.046	0.046	2
Potassium	mg/L	NGA	11	0	11	0.67	0.67	14	14	0
Selenium	mg/L	0.001 <sup>a</sup>	11	6	5	<0.00050	0.00079	0.01	0.01	3
Silver	mg/L	0.0001 <sup>a</sup>	11	11	0	<0.00010	-	<0.00010	-	0
Sodium	mg/L	NGA	11	0	11	3.5	3.5	14	14	0
Strontium	mg/L	NGA	11	0	11	1.2	1.2	39	39	0
Thallium	mg/L	0.0008 <sup>a</sup>	11	11	0	<0.00010	-	<0.00010	-	0
Tin	mg/L	NGA	11	11	0	<0.0020	-	<0.0020	-	0
Titanium	mg/L	0.1 <sup>a</sup>	11	11	0	<0.0020	-	<0.0020	-	0
Uranium	mg/L	0.015 <sup>a</sup>	11	0	11	0.00076	0.00076	0.012	0.012	0
Vanadium	mg/L	200 <sup>b</sup>	11	11	0	<0.0020	-	<0.0020	-	0
Zinc	mg/L	0.03 <sup>a</sup>	11	0	11	0.0052	0.0052	0.2	0.2	5

Notes

<sup>a</sup> FCSAP Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites (FCSAP, 2016). Guidelines for agricultural land use protective of soil organisms direct contact and freshwater aquatic life exposure pathways were applied.

<sup>b</sup> Ontario Ministry of the Environment, Conservation, and Parks (MECP, 2011), Table 6 – Groundwater Shallow Potable (GW3) for coarse-textured soil.

Table J-6: Screening of 2024 Surface Water Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Surface Water Guideline for Ecological Health	Watercourse				Summary - Watercourse							
			WC1	WCDUP	WC2	WC3	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
			Normal	Field_D	Normal	Normal								
Sample ID	Sample Type	Date	18-Apr-24	18-Apr-24	18-Apr-24	18-Apr-24								
<b>Metals</b>														
Aluminium	mg/L	0.1 <sup>a,d</sup>	0.18	0.18	0.18	0.12	4	0	4	0.12	0.12	0.18	0.18	4
Antimony	mg/L	0.009 <sup>e</sup>	<0.001	<0.001	<0.001	<0.001	4	4	0	<0.001	-	<0.001	-	0
Arsenic	mg/L	0.005 <sup>a</sup>	<0.001	<0.001	<0.001	<0.001	4	4	0	<0.001	-	<0.001	-	0
Barium	mg/L	1 <sup>c</sup>	0.097	0.097	0.21	0.22	4	0	4	0.097	0.097	0.22	0.22	0
Beryllium	mg/L	0.00015 <sup>c</sup>	<0.0001	<0.0001	<0.0001	<0.0001	4	4	0	<0.0001	-	<0.0001	-	0
Bismuth	mg/L	NGA	<0.002	<0.002	<0.002	<0.002	4	4	0	<0.002	-	<0.002	-	0
Boron	mg/L	1.5 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	4	4	0	<0.05	-	<0.05	-	0
Cadmium	mg/L	0.00009 <sup>a</sup>	0.00011	0.00011	0.000084	0.000047	4	0	4	0.000047	0.000047	0.00011	0.00011	2
Chromium (Total, III+VI)	mg/L	0.0089 <sup>a</sup>	<0.001	<0.001	<0.001	<0.001	4	4	0	<0.001	-	<0.001	-	0
Cobalt	mg/L	0.001 <sup>b</sup>	<0.0004	<0.0004	<0.0004	<0.0004	4	4	0	<0.0004	-	<0.0004	-	0
Copper	mg/L	0.002 <sup>a</sup>	0.00053	0.00054	0.00075	0.0007	4	0	4	0.00053	0.00053	0.00075	0.00075	0
Iron	mg/L	0.3 <sup>a</sup>	0.18	0.18	0.15	0.099	4	0	4	0.099	0.099	0.18	0.18	0
Lead	mg/L	0.001 <sup>a</sup>	0.0012	0.0013	0.0047	0.0055	4	0	4	0.0012	0.0012	0.0055	0.0055	4
Manganese	mg/L	0.43 <sup>a</sup>	0.05	0.051	0.059	0.088	4	0	4	0.05	0.05	0.088	0.088	0
Mercury	mg/L	0.000026 <sup>a</sup>	-	-	-	-	0	0	0	0	-	-	-	0
Molybdenum	mg/L	0.073 <sup>a</sup>	<0.002	<0.002	<0.002	<0.002	4	4	0	<0.002	-	<0.002	-	0
Nickel	mg/L	0.025 <sup>a</sup>	<0.002	<0.002	<0.002	<0.002	4	4	0	<0.002	-	<0.002	-	0
Selenium	mg/L	0.001 <sup>a</sup>	<0.0005	<0.0005	0.00071	0.00074	4	2	2	<0.0005	0.00071	0.00074	0.00074	0
Silver	mg/L	0.00025 <sup>a</sup>	<0.0001	<0.0001	<0.0001	<0.0001	4	4	0	<0.0001	-	<0.0001	-	0
Strontium	mg/L	36 <sup>c</sup>	2.2	2.2	7.9	6.8	4	0	4	2.2	2.2	7.9	7.9	0
Thallium	mg/L	0.0008 <sup>a</sup>	<0.0001	<0.0001	<0.0001	<0.0001	4	4	0	<0.0001	-	<0.0001	-	0
Tin	mg/L	NGA	<0.002	<0.002	<0.002	<0.002	4	4	0	<0.002	-	<0.002	-	0
Titanium	mg/L	NGA	0.0048	0.0043	0.0049	0.0025	4	0	4	0.0025	0.0025	0.0049	0.0049	0
Uranium	mg/L	0.015 <sup>a</sup>	0.00024	0.00023	0.00074	0.00072	4	0	4	0.00023	0.00023	0.00074	0.00074	0
Vanadium	mg/L	0.12 <sup>b</sup>	<0.002	<0.002	<0.002	<0.002	4	4	0	<0.002	-	<0.002	-	0
Zinc	mg/L	0.007 <sup>a</sup>	0.036	0.036	0.029	0.03	4	0	4	0.029	0.029	0.036	0.036	4

Notes

NGA denotes no guideline available

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Surface Water - Freshwater, Table 5. The original source is indicated below.

a CCME Freshwater Aquatic Life Guidelines; <https://ccme.ca/en/summary-table>

b FEQG (Cited In: NS PSS, 20210 Tier II pathway specific standards for ecological surface water: freshwater aquatic life).

c Michigan DEQ, 2008: Final chronic value (Cited In: NS PSS, 2021 Tier II Pathway specific standards for ecological surface water, freshwater aquatic life).

d For all surface water samples the pH was >6.5, as such the CCME guideline of 100 ug/L has been applied.

e BC CSR (British Columbia Contaminated Sites Regulation); Schedule 3.2 - Generic numerical water standards for Aquatic life (February, 2023).

f Michigan Department of Environment. 2019. Final Chronic Value. <https://www.michigan.gov/egle/about/organization/water-resources/assessment-michigan-waters/rule-57-water-quality-values>

Table J-6: Screening of 2024 Surface Water Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Surface Water Guideline for Ecological Health	Wetland					Summary - Wetland							
			24-WL3-SW1	24-WL3-SW2	24-WL3-SW3	24-WL3-SW4	24-WL3-DUPA	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
			Normal 4-Jul-24	Normal 4-Jul-24	Normal 4-Jul-24	Normal 4-Jul-24	Field_D 4-Jul-24								
Aluminium	mg/L	0.1 <sup>a,d</sup>	<0.005	<0.005	0.0098	0.054	<0.005	5	3	2	<0.005	0.0098	0.054	0.054	0
Antimony	mg/L	0.009 <sup>e</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	5	5	0	<0.001	-	<0.001	-	0
Arsenic	mg/L	0.005 <sup>a</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	5	5	0	<0.001	-	<0.001	-	0
Barium	mg/L	1 <sup>c</sup>	0.37	0.44	0.63	0.4	0.37	5	0	5	0.37	0.37	0.63	0.63	0
Beryllium	mg/L	0.00015 <sup>c</sup>	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	5	5	0	<0.0001	-	<0.0001	-	0
Bismuth	mg/L	NGA	<0.002	<0.002	<0.002	<0.002	<0.002	5	5	0	<0.002	-	<0.002	-	0
Boron	mg/L	1.5 <sup>a</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	5	5	0	<0.05	-	<0.05	-	0
Cadmium	mg/L	0.00009 <sup>a</sup>	0.000018	<0.00001	0.000011	0.00004	0.000017	5	1	4	<0.00001	0.000011	0.00004	0.00004	0
Chromium (Total, III+VI)	mg/L	0.0089 <sup>a</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	5	5	0	<0.001	-	<0.001	-	0
Cobalt	mg/L	0.001 <sup>b</sup>	0.00046	<0.0004	<0.0004	<0.0004	0.00051	5	3	2	<0.0004	0.00046	0.00051	0.00051	0
Copper	mg/L	0.002 <sup>a</sup>	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	5	5	0	<0.0005	-	<0.0005	-	0
Iron	mg/L	0.3 <sup>a</sup>	0.4	0.14	1.1	0.62	0.35	5	0	5	0.14	0.14	1.1	1.1	4
Lead	mg/L	0.001 <sup>a</sup>	<0.0005	0.0017	0.0036	0.008	0.0018	5	1	4	<0.0005	0.0017	0.008	0.008	4
Manganese	mg/L	0.43 <sup>a</sup>	0.76	0.12	0.44	1.6	0.72	5	0	5	0.12	0.12	1.6	1.6	4
Mercury	mg/L	0.000026 <sup>a</sup>	-	-	-	-	-	0	0	0	0	-	-	-	0
Molybdenum	mg/L	0.073 <sup>a</sup>	<0.002	<0.002	<0.002	<0.002	<0.002	5	5	0	<0.002	-	<0.002	-	0
Nickel	mg/L	0.025 <sup>a</sup>	0.0021	<0.002	<0.002	<0.002	0.0021	5	3	2	<0.002	0.0021	0.0021	0.0021	0
Selenium	mg/L	0.001 <sup>a</sup>	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	5	5	0	<0.0005	-	<0.0005	-	0
Silver	mg/L	0.00025 <sup>a</sup>	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	5	5	0	<0.0001	-	<0.0001	-	0
Strontium	mg/L	36 <sup>c</sup>	5.1	3.6	1.3	4.3	5	5	0	5	1.3	1.3	5.1	5.1	0
Thallium	mg/L	0.0008 <sup>a</sup>	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	5	5	0	<0.0001	-	<0.0001	-	0
Tin	mg/L	NGA	<0.002	<0.002	<0.002	<0.002	<0.002	5	5	0	<0.002	-	<0.002	-	0
Titanium	mg/L	NGA	<0.002	<0.002	<0.002	<0.002	<0.002	5	5	0	<0.002	-	<0.002	-	0
Uranium	mg/L	0.015 <sup>a</sup>	0.00017	<0.0001	<0.0001	<0.0001	0.00018	5	3	2	<0.0001	0.00017	0.00018	0.00018	0
Vanadium	mg/L	0.12 <sup>b</sup>	<0.002	<0.002	<0.002	<0.002	<0.002	5	5	0	<0.002	-	<0.002	-	0
Zinc	mg/L	0.007 <sup>a</sup>	0.014	<0.005	<0.005	0.014	0.013	5	2	3	<0.005	0.013	0.014	0.014	3

Notes

NGA denotes no guideline available

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Surface Water - Freshwater, Table 5. The original source is indicated below.

a CCME Freshwater Aquatic Life Guidelines; <https://ccme.ca/en/summary-table>

b FEQG (Cited In: NS PSS, 20210 Tier II pathway specific standards for ecological surface water; freshwater aquatic life).

c Michigan DEQ, 2008: Final chronic value (Cited In: NS PSS, 2021 Tier II Pathway specific standards for ecological surface water, freshwater aquatic life).

d For all surface water samples the pH was >6.5, as such the CCME guideline of 100 ug/L has been applied.

e BC CSR (British Columbia Contaminated Sites Regulation); Schedule 3.2 - Generic numerical water standards for Aquatic life (February, 2023).

f Michigan Department of Environment. 2019. Final Chronic Value. <https://www.michigan.gov/egle/about/organization/water-resources/assessment-michigan-waters/rule-57-water-quality-values>

Table J-7: Screening of 2024 Surface Water Concentrations within the Study Area and in Lake Enon to adjusted ecological health based guidelines.

Parameter	Sample ID	Watercourse				Wetland				
		WC1	WCDUP	WC2	WC3	24-WL3-SW1	24-WL3-SW2	24-WL3-SW3	24-WL3-SW4	24-WL3-DUPA
	Date	18-Apr-24	18-Apr-24	18-Apr-24	18-Apr-24	4-Jul-24	4-Jul-24	4-Jul-24	4-Jul-24	4-Jul-24
<b>Metals</b>										
Hardness as CaCO <sub>3</sub> (Measured)	mg/L	45	44	92	90	160	160	160	150	160
pH	NA	7.58	7.57	7.93	7.93	7.89	7.64	7.74	7.84	8.01
TOC	mg/L	3.5	3.4	3.3	3.1	11	8.3	9.9	8.6	4.6
Aluminum <sup>a</sup>	mg/L	0.1								
Adjusted Aluminum Guideline (pH) <sup>b</sup>	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sample Concentrations	mg/L	0.18	0.18	0.18	0.12	-	-	-	-	-
Cadmium <sup>a</sup>	mg/L	0.00009								
Adjusted Cadmium Guideline (Hardness) <sup>b</sup>	mg/L	8.2E-05	8.0E-05	-	-	-	-	-	-	-
Sample Concentrations	mg/L	0.00011	0.00011	-	-	-	-	-	-	-
Lead <sup>a</sup>	mg/L	0.001								
Adjusted Lead Guideline (Hardness) <sup>b</sup>	mg/L	0.0012	0.0011	0.0029	0.0028	-	0.0058	0.0058	0.0053	0.0058
Sample Concentrations	mg/L	0.0012	0.0013	0.0047	0.0055	-	0.0017	0.0036	0.008	0.0018
Zinc <sup>a</sup>	mg/L	0.007								
Adjusted Zinc Guideline (pH, Hardness, DOC) <sup>c</sup>	mg/L	0.013	0.013	0.019	0.018	0.052	-	-	0.046	0.033
Sample Concentrations	mg/L	0.036	0.036	0.029	0.03	0.014	-	-	0.014	0.013

Notes

NGA denotes no guideline available.

Where applicable, guideline source taken from Nova Scotia Tier II Pathway-Specific Standards for Surface Water - Freshwater, Table 5. The original source is indicated below.

Guidelines were adjusted for site-specific parameters.

<sup>a</sup> CCME guideline (not adjusted for site-specific parameters).

<sup>b</sup> CCME generic guidelines were adjusted using site specific data and equations provided by CCME.

<sup>c</sup> The CCME zinc guideline was derived for dissolved concentrations. The CCME states that if surface water data is reported as total concentration, the guideline should be compared to the total concentrations first. If exceedances exist, samples should be re-analysed for dissolved concentrations. No DOC was available so TOC was assumed to equal DOC.

Table J-8: Screening of 2024 Sediment Concentrations within the Study Area and in Lake Enon

			Lake Enon																	
Field ID			SED 27	SED 28	SED 29	SED 36	SED 37	SED 38	SED 39	SED 40	SED 41	SED 42	SED 43	SED 44	SED30	SED31	SED32	SED35	SED46	SED47
Sample Type			Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Date			5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	5/28/2024	2024/05/30	2024/05/30	2024/05/30	2024/05/30	2024/05/30	2024/05/30
Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>E</sub> )																		
<b>Metals</b>																				
Aluminium	mg/kg	NGA	22,000	25,000	30,000	22,000	16,000	12,000	18,000	16,000	18,000	23,000	20,000	27,000	10000	28000	18000	8200	16000	13000
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	mg/kg	17.0 <sup>a</sup>	8.7	8.7	8.5	7.2	5.8	3.8	8.3	7.1	7	8.9	6.5	8.5	3.5	8.0	7.4	2.7	7.2	3.8
Barium	mg/kg	NGA	700	950	540	370	780	270	2100	900	1800	910	730	540	250	400	720	250	1300	290
Beryllium	mg/kg	NGA	1.1	1.2	1.5	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	1.1	1.3	<1.0	1.4	<1.0	<1.0	<1.0	<1.0
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	mg/kg	NGA	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium	mg/kg	3.5 <sup>a</sup>	5.7	8.4	5.2	6.7	6.7	3.2	2.8	7.2	5.7	7	4.3	6.2	1.8	7.9	6.3	1.3	6.7	4.3
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	20	21	25	19	16	12	22	20	18	27	18	26	11	21	20	9.7	18	11
Cobalt	mg/kg	NGA	12	12	12	12	11	8.5	18	12	11	15	8.6	12	6.6	9.6	11	5.3	11	8
Copper	mg/kg	197 <sup>a</sup>	20	24	28	18	15	9.4	34	33	24	42	18	27	6.5	26	30	5.9	25	7
Iron	mg/kg	43,766 <sup>b</sup>	29,000	30,000	29,000	32,000	21,000	17,000	31,000	26,000	31,000	32,000	28,000	28,000	15,000	20,000	26,000	13,000	28,000	16,000
Lead	mg/kg	91.3 <sup>a</sup>	220	210	220	180	210	130	770	790	490	540	270	290	71	110	450	69	370	59
Lithium	mg/kg	NGA	29	29	40	28	23	17	29	26	28	38	28	39	13	31	30	12	26	16
Manganese	mg/kg	1100 <sup>b</sup>	6,900	23,000	1,500	1,300	6,400	620	4,400	1,300	14,000	2,000	7,900	1,200	2,200	1,200	2,200	1,800	4,200	2,800
Mercury	mg/kg	0.486 <sup>a</sup>	0.15	0.17	0.17	0.11	<0.10	<0.10	<0.10	0.12	0.12	0.11	0.11	0.18	<0.10	0.19	0.12	<0.10	<0.10	<0.10
Molybdenum	mg/kg	NGA	3.1	9.5	4.4	3	3.8	<2.0	4	2.4	4.1	2.5	3	3.2	<2.0	2.9	2.5	<2.0	2.6	<2.0
Nickel	mg/kg	75 <sup>b</sup>	21	24	25	20	20	12	22	22	20	32	16	26	9.8	21	24	9.4	22	12
Rubidium	mg/kg	NGA	17	18	21	15	14	8.2	16	13	14	20	15	20	7.2	16	15	6.2	14	7.5
Selenium	mg/kg	2.0 <sup>c</sup>	1.4	1.6	2.2	1.6	0.82	0.59	1.6	1.2	1.3	1.3	1.1	2	<0.50	2.9	1.2	<0.50	0.84	<0.50
Silver	mg/kg	0.5 <sup>b</sup>	0.85	0.97	1.3	0.96	0.69	0.64	1.4	1.3	1.1	1.6	0.76	1.2	0.71	1.4	1.2	0.51	1	1.1
Strontium	mg/kg	NGA	400	720	600	460	320	170	370	370	440	440	350	510	150	640	7200	110	290	180
Thallium	mg/kg	NGA	0.38	0.42	0.4	0.33	0.26	0.18	0.39	0.33	0.29	0.46	0.28	0.42	0.14	0.36	0.35	0.12	0.33	0.2
Tin	mg/kg	NGA	1.5	1.6	1.9	1.1	1	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	mg/kg	NGA	4	4.9	5	3.4	3	1.8	4.4	3.4	3.9	4	3.9	4.5	1.5	4.9	2.8	1	2.5	1.8
Vanadium	mg/kg	NGA	38	42	43	35	30	24	35	33	33	41	38	43	18	34	34	16	34	22
Zinc	mg/kg	315 <sup>a</sup>	580	640	660	580	470	370	590	1000	760	1300	540	730	240	520	870	240	780	350

Notes  
 Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.  
<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).  
<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.  
<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)  
<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>  
<sup>e</sup> Atlantic RBCA, 2021

Table J-8: Screening of 2024 Sediment Concentrations within the Study Area and in Lake Enon

			Summary - Lake Enon							
Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>E</sub> )	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
<b>Metals</b>										
Aluminium	mg/kg	NGA	18	0	18	8200	8200	30000	30000	0
Antimony	mg/kg	25.0 <sup>d</sup>	18	18	0	<2.0	-	<2.0	-	0
Arsenic	mg/kg	17.0 <sup>a</sup>	18	0	18	2.7	2.7	8.9	8.9	0
Barium	mg/kg	NGA	18	0	18	250	250	2100	2100	0
Beryllium	mg/kg	NGA	18	10	8	<1.0	1.1	1.5	1.5	0
Bismuth	mg/kg	NGA	18	18	0	<2.0	-	<2.0	-	0
Boron	mg/kg	NGA	18	18	0	<50	-	<50	-	0
Cadmium	mg/kg	3.5 <sup>a</sup>	18	0	18	1.3	1.3	8.4	8.4	14
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	18	0	18	9.7	9.7	27	27	0
Cobalt	mg/kg	NGA	18	0	18	5.3	5.3	18	18	0
Copper	mg/kg	197 <sup>a</sup>	18	0	18	5.9	5.9	42	42	0
Iron	mg/kg	43,766 <sup>b</sup>	18	0	18	13000	13000	32000	32000	0
Lead	mg/kg	91.3 <sup>a</sup>	18	0	18	59	59	790	790	15
Lithium	mg/kg	NGA	18	0	18	12	12	40	40	0
Manganese	mg/kg	1100 <sup>b</sup>	18	0	18	620	620	23000	23000	17
Mercury	mg/kg	0.486 <sup>a</sup>	18	7	11	<0.10	0.11	0.19	0.19	0
Molybdenum	mg/kg	NGA	18	4	14	<2.0	2.4	9.5	9.5	0
Nickel	mg/kg	75 <sup>b</sup>	18	0	18	9.4	9.4	32	32	0
Rubidium	mg/kg	NGA	18	0	18	6.2	6.2	21	21	0
Selenium	mg/kg	2.0 <sup>c</sup>	18	3	15	<0.50	0.59	2.9	2.9	2
Silver	mg/kg	0.5 <sup>b</sup>	18	0	18	0.51	0.51	1.6	1.6	18
Strontium	mg/kg	NGA	18	0	18	110	110	7200	7200	0
Thallium	mg/kg	NGA	18	0	18	0.12	0.12	0.46	0.46	0
Tin	mg/kg	NGA	18	11	7	<1.0	1	1.9	1.9	0
Uranium	mg/kg	NGA	18	0	18	1	1	5	5	0
Vanadium	mg/kg	NGA	18	0	18	16	16	43	43	0
Zinc	mg/kg	315 <sup>a</sup>	18	0	18	240	240	1300	1300	16

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-8: Screening of 2024 Sediment Concentrations within the Study Area and in Lake Enon

Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>E</sub> )	Watercourse			Summary - Watercourse								
			Field ID	WC1	WC2	WC3	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
			Sample Type	Normal	Normal	Normal								
			Date	4/18/2024	4/18/2024	4/18/2024								
<b>Metals</b>														
Aluminium	mg/kg	NGA	8,500	8,500	9,600	3	0	3	8500	8500	9600	9600	0	
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	3	3	0	<2.0	-	<2.0	-	0	
Arsenic	mg/kg	17.0 <sup>a</sup>	6.7	21	7.2	3	0	3	6.7	6.7	21	21	1	
Barium	mg/kg	NGA	250	360	620	3	0	3	250	250	620	620	0	
Beryllium	mg/kg	NGA	<1.0	<1.0	<1.0	3	3	0	<1.0	-	<1.0	-	0	
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	3	3	0	<2.0	-	<2.0	-	0	
Boron	mg/kg	NGA	<50	<50	<50	3	3	0	<50	-	<50	-	0	
Cadmium	mg/kg	3.5 <sup>a</sup>	2.4	2	4.4	3	0	3	2	2	4.4	4.4	1	
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	9.7	13	14	3	0	3	9.7	9.7	14	14	0	
Cobalt	mg/kg	NGA	7.3	8.2	11	3	0	3	7.3	7.3	11	11	0	
Copper	mg/kg	197 <sup>a</sup>	21	18	38	3	0	3	18	18	38	38	0	
Iron	mg/kg	43,766 <sup>b</sup>	18,000	20,000	18,000	3	0	3	18000	18000	20000	20000	0	
Lead	mg/kg	91.3 <sup>a</sup>	170	150	270	3	0	3	150	150	270	270	3	
Lithium	mg/kg	NGA	13	14	18	3	0	3	13	13	18	18	0	
Manganese	mg/kg	1100 <sup>b</sup>	2,300	3,000	1,700	3	0	3	1700	1700	3000	3000	3	
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	<0.10	<0.10	3	3	0	<0.10	-	<0.10	-	0	
Molybdenum	mg/kg	NGA	<2.0	<2.0	2	3	2	1	<2.0	2	2	2	0	
Nickel	mg/kg	75 <sup>b</sup>	11	13	21	3	0	3	11	11	21	21	0	
Rubidium	mg/kg	NGA	4.6	4.6	7.8	3	0	3	4.6	4.6	7.8	7.8	0	
Selenium	mg/kg	2.0 <sup>c</sup>	<0.50	0.69	1.1	3	1	2	<0.50	0.69	1.1	1.1	0	
Silver	mg/kg	0.5 <sup>b</sup>	0.71	<0.50	1.6	3	1	2	<0.50	0.71	1.6	1.6	2	
Strontium	mg/kg	NGA	2500	2100	3000	3	0	3	2100	2100	3000	3000	0	
Thallium	mg/kg	NGA	0.36	0.17	0.38	3	0	3	0.17	0.17	0.38	0.38	0	
Tin	mg/kg	NGA	<1.0	<1.0	<1.0	3	3	0	<1.0	-	<1.0	-	0	
Uranium	mg/kg	NGA	1.5	1.3	2.1	3	0	3	1.3	1.3	2.1	2.1	0	
Vanadium	mg/kg	NGA	22	28	18	3	0	3	18	18	28	28	0	
Zinc	mg/kg	315 <sup>a</sup>	480	560	840	3	0	3	480	480	840	840	3	

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

Table J-8: Screening of 2024 Sediment Concentrations within the Study Area and in Lake Enon

Field ID	Sample Type	Date	Wetland						Summary - Wetland							
			WETLAND #3A-0.75M	WETLAND #3B-0.75M	WETLAND #3C-0.55M	WETLAND #3D-0.65M	WETLAND #3E-0.65M	WETLAND #3-DUPA	Number of Samples	Number of Non-Detects	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Exceedances
			Normal	Normal	Normal	Normal	Normal	Field_D								
Parameter	Unit	Ecological Health-Based Sediment Quality Guideline (SedQG <sub>E</sub> )	4/18/2024	4/18/2024	4/18/2024	4/18/2024	4/18/2024	4/18/2024	4/18/2024							
<b>Metals</b>																
Aluminium	mg/kg	NGA	7,300	6,100	11,000	8,800	5,100	7,600	6	0	6	5100	5100	11000	11000	0
Antimony	mg/kg	25.0 <sup>d</sup>	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	6	6	0	<2.0	-	<2.0	-	0
Arsenic	mg/kg	17.0 <sup>a</sup>	14	9.4	15	14	9.2	12	6	0	6	9.2	9.2	15	15	0
Barium	mg/kg	NGA	680	1200	820	910	1100	1100	6	0	6	680	680	1200	1200	0
Beryllium	mg/kg	NGA	<1.0	<1.0	1.4	1.1	<1.0	<1.0	6	4	2	<1.0	1.1	1.4	1.4	0
Bismuth	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	6	6	0	<2.0	-	<2.0	-	0
Boron	mg/kg	NGA	<50	<50	<50	<50	<50	<50	6	6	0	<50	-	<50	-	0
Cadmium	mg/kg	3.5 <sup>a</sup>	2.6	1.1	2.4	2.3	1.3	1.8	6	0	6	1.1	1.1	2.6	2.6	0
Chromium (Total, III+VI)	mg/kg	90 <sup>a</sup>	21	17	29	23	13	20	6	0	6	13	13	29	29	0
Cobalt	mg/kg	NGA	8.6	7.8	11	9.7	6.8	9.1	6	0	6	6.8	6.8	11	11	0
Copper	mg/kg	197 <sup>a</sup>	9.8	5.9	12	9.3	6.1	8.7	6	0	6	5.9	5.9	12	12	0
Iron	mg/kg	43,766 <sup>b</sup>	15,000	13,000	20,000	17,000	11,000	15,000	6	0	6	11000	11000	20000	20000	0
Lead	mg/kg	91.3 <sup>a</sup>	14000	6100	13000	13000	7100	9700	6	0	6	6100	6100	14000	14000	6
Lithium	mg/kg	NGA	14	11	20	16	9.5	14	6	0	6	9.5	9.5	20	20	0
Manganese	mg/kg	1100 <sup>b</sup>	2,800	2,400	3,100	3,000	2,200	2,600	6	0	6	2200	2200	3100	3100	6
Mercury	mg/kg	0.486 <sup>a</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	6	6	0	<0.10	-	<0.10	-	0
Molybdenum	mg/kg	NGA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	6	6	0	<2.0	-	<2.0	-	0
Nickel	mg/kg	75 <sup>b</sup>	27	24	49	45	21	32	6	0	6	21	21	49	49	0
Rubidium	mg/kg	NGA	6.8	4.5	13	8.9	4.3	7.5	6	0	6	4.3	4.3	13	13	0
Selenium	mg/kg	2.0 <sup>c</sup>	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6	6	0	<0.50	-	<0.50	-	0
Silver	mg/kg	0.5 <sup>b</sup>	2	0.92	2.2	1.9	1	1.5	6	0	6	0.92	0.92	2.2	2.2	6
Strontium	mg/kg	NGA	360	240	380	300	220	280	6	0	6	220	220	380	380	0
Thallium	mg/kg	NGA	0.27	0.18	0.39	0.30	0.17	0.25	6	0	6	0.17	0.17	0.39	0.39	0
Tin	mg/kg	NGA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6	6	0	<1.0	-	<1.0	-	0
Uranium	mg/kg	NGA	0.8	0.5	1.4	1	0.49	0.89	6	0	6	0.49	0.49	1.4	1.4	0
Vanadium	mg/kg	NGA	12	9.9	18	14	8.3	12	6	0	6	8.3	8.3	18	18	0
Zinc	mg/kg	315 <sup>a</sup>	420	230	450	400	230	330	6	0	6	230	230	450	450	4

Notes

Where applicable, guidelines taken from Nova Scotia Tier II Pathway-Specific Standards for Sediment - Freshwater, Table 4. The original source is indicated below.

<sup>a</sup> CCME Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life; Probable Effect Levels (PEL).

<sup>b</sup> BC MECCS (2021) British Columbia Working Sediment Quality Guidelines. Upper SWQG for freshwater aquatic life - Table 2.

<sup>c</sup> BC MECCS (2023) British Columbia Approved Water Quality Guidelines for Aquatic Life (selenium, Table 36)

<sup>d</sup> Simpson et al. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. <https://doi.org/10.4225/08/5894c6184320c>

<sup>e</sup> Atlantic RBCA, 2021

## Appendix K

### *Ecological Health ProUCL Outputs and Exposure and Risk Calculations*

**Build Nova Scotia**

*Human Health and Ecological Risk Assessment and  
Ancillary Assessment Activities: Lake Enon Former  
Mill Site, Enon, Nova Scotia (FINAL)*

January 24, 2025 - 22-3723



Sr soil data: mg/kg

General Statistics on Uncensored Full Data

Date/Time of Computation ProUCL 5.2 10/25/2023 1:30:17 PM
User Selected Options
From File Worksheet.xls
Full Precision ON

From File: Worksheet.xls

General Statistics for Uncensored Dataset

Table with 11 columns: Variable, NumObs, # Missing, Minimum, Maximum, Mean, Geo-Mean, SD, SEM, MAD/0.67, Skewness, CV. Row for CO shows values: 80, 0, 9.9, 27000, 3193.349, 467.5026, 5588.272, 624.7878, 600.4448, 2.277557, 1.749972

Percentiles for Uncensored Dataset

Table with 11 columns: Variable, NumObs, # Missing, 10%ile, 20%ile, 25%ile(Q1), 50%ile(Q2), 75%ile(Q3), 80%ile, 90%ile, 95%ile, 99%ile. Row for CO shows values: 80, 0, 27.8, 44.6, 62.25, 430, 3875, 5340, 13100, 16000, 21470

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options
Date/Time of Computation ProUCL 5.2 10/25/2023 1:31:15 PM
From File Worksheet.xls
Full Precision ON
Confidence Coefficient 0.95

CO

Raw Statistics

Table of raw statistics for CO: Number of Valid Observations (80), Number of Distinct Observations (65), Minimum (9.9), Maximum (27000), Mean of Raw Data (3193.349), Standard Deviation of Raw Data (5588.272), Khat (0.349973), Theta hat (9124.555), Kstar (0.345182), Theta star (9251.191), Mean of Log Transformed Data (6.147405), Standard Deviation of Log Transformed Data (2.28772)

Normal GOF Test Results

Table of Normal GOF Test Results: Correlation Coefficient R (0.792314), Approximate Shapiro Wilk Test Statistic (0.634369), Approximate Shapiro Wilk P Value (0), Lilliefors Test Statistic (0.285949), Lilliefors Critical (0.0500000) Value (0.099146), Data not Normal at (0.0500000) Significance Level

Gamma GOF Test Results

Table of Gamma GOF Test Results: Correlation Coefficient R (0.982762), A-D Test Statistic (2.535337), A-D Critical (0.0500000) Value (0.853409), K-S Test Statistic (0.150738), K-S Critical(0.0500000) Value (0.107595), Data not Gamma Distributed at (0.0500000) Significance Level

Lognormal GOF Test Results

Table of Lognormal GOF Test Results: Correlation Coefficient R (0.978583), Approximate Shapiro Wilk Test Statistic (0.929271), Approximate Shapiro Wilk P Value (2.08E-04), Lilliefors Test Statistic (0.088878), Lilliefors Critical (0.0500000) Value (0.099146), Data appear Approximate\_Lognormal at (0.0500000) Significance Level

UCL Statistics for Uncensored Full Data Sets

User Selected Options
Date/Time of Computation ProUCL 5.2 10/25/2023 1:32:15 PM
From File Worksheet.xls
Full Precision ON
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

CO

General Statistics

Summary table for CO: Total Number of Observations (80), Number of Distinct Observations (65), Number of Missing Observations (0), Minimum (9.9), Maximum (27000), SD (5588.272), Coefficient of Variation (1.749972)

Normal GOF Test

Table of Normal GOF Test results: Shapiro Wilk Test Statistic (0.634369), 1% Shapiro Wilk P Value (0), Lilliefors Test Statistic (0.285949), 1% Lilliefors Critical Value (0.114655)

Assuming Normal Distribution

Table of UCLs assuming Normal Distribution: 95% Normal UCL, 95% Student's-t UCL (4233.228), 95% Adjusted-CLT UCL (4391.029), 95% Modified-t UCL (4259.744)

Gamma GOF Test

Table of Gamma GOF Test results: A-D Test Statistic (2.535337), 5% A-D Critical Value (0.853409), K-S Test Statistic (0.150738), 5% K-S Critical Value (0.107595)

Gamma Statistics

Table of Gamma Statistics: k hat (MLE) (0.349973), Theta hat (MLE) (9124.555), nu hat (MLE) (55.9957), MLE Mean (3193.349), Adjusted Level of Significance (0.047)

Assuming Gamma Distribution

Table of UCLs assuming Gamma Distribution: 95% Approximate Gamma UCL (4504.742), 95% Adjusted Gamma UCL (4533.455)

Lognormal GOF Test

Table of Lognormal GOF Test results: Shapiro Wilk Test Statistic (0.929271), 10% Shapiro Wilk P Value (2.08E-04), Lilliefors Test Statistic (0.088878), 10% Lilliefors Critical Value (0.090727)

Lognormal Statistics

Table of Lognormal Statistics: Minimum of Logged Data (2.292535), Maximum of Logged Data (10.20359)

Assuming Lognormal Distribution

Table of UCLs assuming Lognormal Distribution: 95% H-UCL (17119.68), 95% Chebyshev (MVUE) UCL (16174.81), 99% Chebyshev (MVUE) UCL (29558.93)

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

Table of Nonparametric UCLs: 95% CLT UCL (4221.033), 95% Standard Bootstrap UCL (4194.355), 95% Hall's Bootstrap UCL (4424.644), 90% Chebyshev(Mean, Sd) UCL (5067.712), 97.5% Chebyshev(Mean, Sd) UCL (7095.147)

Suggested UCL to Use

95% H-UCL 17119.68

Rejected: data distribution is only approximately lognormal and borderline (1 of 2 GOF tests indicate lognormality at 10% significance level); the suggested lognormal UCL is clearly highly right-skewed and is deemed non-representative of a site soil EPC for Sr.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods, then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Pb soil data: mg/kg

130  
2400  
300  
170  
260  
3500  
320  
150  
340  
280  
720

General Statistics on Uncensored Full Data  
Date/Time of Computation ProUCL 5.2 10/25/2023 3:25:37 PM  
User Selected Options  
From File Worksheet.xls  
Full Precision ON

From File: Worksheet.xls

General Statistics for Uncensored Dataset

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.67	Skewness	CV
C0	90	0	45	30000	1445.256	410.4877	3837.409	404.4984	252.0386	5.515376	2.655177

Percentiles for Uncensored Dataset

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
C0	90	0	109	140	162.5	290	747.5	1320	3120	5435	15760

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options  
Date/Time of Computation ProUCL 5.2 10/25/2023 3:27:15 PM  
From File Worksheet.xls  
Full Precision ON  
Confidence Coefficient 0.95

C0

Raw Statistics

Number of Valid Observations	90
Number of Distinct Observations	62
Minimum	45
Maximum	30000
Mean of Raw Data	1445.256
Standard Deviation of Raw Data	3837.409
Khat	0.50401
Theta hat	2867.511
Kstar	0.494618
Theta star	2921.966
Mean of Log Transformed Data	6.017346
Standard Deviation of Log Transformed Data	1.375598

Normal GOF Test Results

Correlation Coefficient R	0.594318
Approximate Shapiro Wilk Test Statistic	0.394832
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.357595
Lilliefors Critical (0.0500000) Value	0.093577
Data not Normal at (0.0500000) Significance Level	

Gamma GOF Test Results

Correlation Coefficient R	0.889417
A-D Test Statistic	8.060746
A-D Critical (0.0500000) Value	0.818041
K-S Test Statistic	0.248049
K-S Critical(0.0500000) Value	0.099593
Data not Gamma Distributed at (0.0500000) Significance Level	

Lognormal GOF Test Results

Correlation Coefficient R	0.958768
Approximate Shapiro Wilk Test Statistic	0.910484
Approximate Shapiro Wilk P Value	8.62E-07
Lilliefors Test Statistic	0.16558
Lilliefors Critical (0.0500000) Value	0.093577
Data not Lognormal at (0.0500000) Significance Level	

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.0500000) Level of Significance

UCL Statistics for Uncensored Full Data Sets

User Selected Options  
Date/Time of Computation ProUCL 5.2 10/25/2023 3:28:17 PM  
From File Worksheet.xls  
Full Precision ON  
Confidence Coefficient 95%  
Number of Bootstrap Operations 2000

C0

General Statistics

Total Number of Observations	90	Number of Distinct Observations	62
		Number of Missing Observations	0
Minimum	45	Mean	1445.256
Maximum	30000	Median	290
SD	3837.409	Std. Error of Mean	404.4984
Coefficient of Variation	2.655177	Skewness	5.515376

Normal GOF Test

Shapiro Wilk Test Statistic	0.394832	Shapiro Wilk GOF Test	
1% Shapiro Wilk P Value	0	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.357595	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.108215	Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	2117.595	95% Adjusted-CLT UCL (Chen-1995)	2361.872
		95% Modified-t UCL (Johnson-1978)	2156.789

Gamma GOF Test

A-D Test Statistic	8.060746	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.818041	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.248049	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.099593	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.50401	k star (bias corrected MLE)	0.494618
Theta hat (MLE)	2867.511	Theta star (bias corrected MLE)	2921.966
nu hat (MLE)	90.72187	nu star (bias corrected)	89.03115
MLE Mean (bias corrected)	1445.256	MLE Sd (bias corrected)	2054.991
		Approximate Chi Square Value (0.05)	68.27659
Adjusted Level of Significance	0.047333	Adjusted Chi Square Value	67.982

Assuming Gamma Distribution

95% Approximate Gamma UCL	1884.581	95% Adjusted Gamma UCL	1892.747
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Lognormal GOF Test

Shapiro Wilk Test Statistic	0.910484	Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk P Value	8.62E-07	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.16558	Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.085631	Data Not Lognormal at 10% Significance Level	
Data Not Lognormal at 10% Significance Level			

Lognormal Statistics

Minimum of Logged Data	3.806663	Mean of logged Data	6.017346
Maximum of Logged Data	10.30895	SD of logged Data	1.375598

Assuming Lognormal Distribution

95% H-UCL	1552.935	90% Chebyshev (MVUE) UCL	1637.251
95% Chebyshev (MVUE) UCL	1909.374	97.5% Chebyshev (MVUE) UCL	2287.071
99% Chebyshev (MVUE) UCL	3028.983		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2110.596	95% BCA Bootstrap UCL	2472.067	Selected UCL is highest of the non-parametric UCL options at a 5% significance level.
95% Standard Bootstrap UCL	2102.042	95% Bootstrap-t UCL	2796.393	
95% Hall's Bootstrap UCL	4368.821	95% Percentile Bootstrap UCL	2138.789	
90% Chebyshev(Mean, Sd) UCL	2658.751	95% Chebyshev(Mean, Sd) UCL	3208.423	
97.5% Chebyshev(Mean, Sd) UCL	3971.347	99% Chebyshev(Mean, Sd) UCL	5469.964	

Suggested UCL to Use

95% Student's-t UCL 2117.595  
Rejected as data distribution is non-parametric and student's-t ucl assumes data have a normal distribution.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods,

then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Pb soil data excluding soil samples covered by engineered cover: mg/kg

130 General Statistics on Uncensored Full Data

2400 Date/Time of Computation ProUCL 5.2 12/12/2024 10:39:37 AM

300 User Selected Options

170 From File Worksheet.xls

260 Full Precision ON

320 From File: Worksheet.xls

150

340

280 General Statistics for Uncensored Dataset

720

50 Variable NumObs # Missing Minimum Maximum Mean Geo-Mean SD SEM MAD/0.675 Skewness CV

140 Pb\_capped 85 0 45 14000 953.8 350.6558 2163.741 234.6907 222.387 4.558181 2.268548

320

580 Percentiles for Uncensored Dataset

2700

2500 Variable NumObs # Missing 10%ile 20%ile 25%ile(Q1) 50%ile(Q2) 75%ile(Q3) 80%ile 90%ile 95%ile 99%ile

6200 Pb\_capped 85 0 104 140 150 280 690 778 2460 3820 12320

300

4500 Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

4000 User Selected Options

1600 Date/Time of Computation ProUCL 5.2 12/12/2024 10:40:14 AM

2100 From File Worksheet.xls

12000 Full Precision ON

1400 Confidence Coefficient 0.95

1100

210

120 Pb\_capped

63

120 Raw Statistics

140 Number of Valid Observations 85

260 Number of Distinct Observations 57

340 Minimum 45

750 Maximum 14000

200 Mean of Raw Data 953.8

140 Standard Deviation of Raw Data 2163.741

200 Khat 0.615209

520 Theta hat 1550.369

190 Kstar 0.601339

290 Theta star 1586.128

260 Mean of Log Transformed Data 5.859805

410 Standard Deviation of Log Transformed Data 1.22442

890

970 Normal GOF Test Results

1300 Correlation Coefficient R 0.635103

300 Approximate Shapiro Wilk Test Statistic 0.43286

90 Approximate Shapiro Wilk P Value 0

14000 Lilliefors Test Statistic 0.33752

280 Lilliefors Critical (0.0500000) Value 0.096241

220 Data not Normal at (0.0500000) Significance Level

740

190 Gamma GOF Test Results

290 Correlation Coefficient R 0.900754

3100 A-D Test Statistic 7.12647

2600 A-D Critical (0.0500000) Value 0.807008

87 K-S Test Statistic 0.242219

110 K-S Critical(0.0500000) Value 0.101753

100 Data not Gamma Distributed at (0.0500000) Significance Level

380

330 Lognormal GOF Test Results

720 Correlation Coefficient R 0.9615

470 Approximate Shapiro Wilk Test Statistic 0.915648

220 Approximate Shapiro Wilk P Value 6.59E-06

170 Lilliefors Test Statistic 0.157113

180 Lilliefors Critical (0.0500000) Value 0.096241

200 Data not Lognormal at (0.0500000) Significance Level

120

83 Non-parametric GOF Test Results

260

160 Data do not follow a discernible distribution at (0.0500000) Level of Significance

690

360 UCL Statistics for Uncensored Full Data Sets

120

59 User Selected Options

240 Date/Time of Computation ProUCL 5.2 12/12/2024 10:41:04 AM

110 From File Worksheet.xls

140 Full Precision ON

290 Confidence Coefficient 95%

170 Number of Bootstrap Operations 2000

96

190 Pb\_capped

190

45

General Statistics

Total Number of Observations 85 Number of Distinct Observations 57

Minimum 45 Mean 953.8

Maximum 14000 Median 280

SD 2163.741 Std. Error of Mean 234.6907

Coefficient of Variation 2.268548 Skewness 4.558181

Normal GOF Test

Shapiro Wilk Test Statistic 0.43286 Shapiro Wilk GOF Test

1% Shapiro Wilk P Value 0 Data Not Normal at 1% Significance Level

Lilliefors Test Statistic 0.33752 Lilliefors GOF Test

1% Lilliefors Critical Value 0.111296 Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL 95% UCLs (Adjusted for Skewness)

95% Student's-t UCL 1344.137 95% Adjusted-CLT UCL (Chen-1995) 1463.814

95% Modified-t UCL (Johnson-1978) 1363.475

Gamma GOF Test

A-D Test Statistic 7.12647 Anderson-Darling Gamma GOF Test

5% A-D Critical Value 0.807008 Data Not Gamma Distributed at 5% Significance Level

K-S Test Statistic 0.242219 Kolmogorov-Smirnov Gamma GOF Test

5% K-S Critical Value 0.101753 Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE) 0.615209 k star (bias corrected MLE) 0.601339

Theta hat (MLE) 1550.369 Theta star (bias corrected MLE) 1586.128

nu hat (MLE) 104.5855 nu star (bias corrected) 102.2275

MLE Mean (bias corrected) 953.8 MLE Sd (bias corrected) 1229.979

Adjusted Level of Significance 0.047177 Approximate Chi Square Value (0.05) 79.89878

Adjusted Chi Square Value 79.55977

Assuming Gamma Distribution

95% Approximate Gamma UCL 1220.352 95% Adjusted Gamma UCL 1225.552

Lognormal GOF Test

Shapiro Wilk Test Statistic 0.915648 Shapiro Wilk Lognormal GOF Test

10% Shapiro Wilk P Value 6.59E-06 Data Not Lognormal at 10% Significance Level

Lilliefors Test Statistic 0.157113 Lilliefors Lognormal GOF Test

10% Lilliefors Critical Value 0.088069 Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data 3.806663 Mean of logged Data 5.859805

Maximum of Logged Data 9.546813 SD of logged Data 1.22442

Assuming Lognormal Distribution

95% H-UCL 1031.142 90% Chebyshev (MVUE) UCL 1101.885

95% Chebyshev (MVUE) UCL 1269.906 97.5% Chebyshev (MVUE) UCL 1503.112

99% Chebyshev (MVUE) UCL 1961.201

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL 1339.832 95% BCA Bootstrap UCL 1465.965 95% Hall's bootstrap Ucl selected as the highest of non-parametric UCLMs

95% Standard Bootstrap UCL 1343.782 95% Bootstrap-t UCL 1692.581

95% Hall's Bootstrap UCL 2856.241 95% Percentile Bootstrap UCL 1370.047

90% Chebyshev(Mean, Sd) UCL 1657.872 95% Chebyshev(Mean, Sd) UCL 1976.793

97.5% Chebyshev(Mean, Sd) UCL 2419.443 99% Chebyshev(Mean, Sd) UCL 3288.943

Suggested UCL to Use

95% Student's-t UCL 1344.137 Rejected as data are not normally distributed.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods,

then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

V soil data: mg/kg

36  
8.3  
22  
12  
17  
5.6  
18  
25  
24  
33  
30  
11  
6.3  
5.5  
11  
6.3  
20  
39  
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36  
31  
40  
42  
14  
20  
7.2  
6.8  
16  
25  
27  
32  
33  
41  
49  
42  
27  
40  
73  
23  
29  
9.2  
33  
30  
23  
40  
37  
26  
38  
28  
34  
43  
52  
30  
30  
27  
42  
12

General Statistics on Uncensored Full Data  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:38:18 PM  
 User Selected Options  
 From File Worksheet.xls  
 Full Precision ON  
 From File: Worksheet.xls  
 General Statistics for Uncensored Dataset

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.67	Skewness	CV
CO	80	0	5.5	73	26.29	23.17832	12.05025	1.347259	10.37806	0.648346	0.458359

Percentiles for Uncensored Dataset

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
CO	80	0	10.82	16.8	19.5	26	33	36.2	40.1	42.05	56.41

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects  
 User Selected Options  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:38:58 PM  
 From File Worksheet.xls  
 Full Precision ON  
 Confidence Coefficient 0.95

CO

Raw Statistics

Number of Valid Observations	80
Number of Distinct Observations	40
Minimum	5.5
Maximum	73
Mean of Raw Data	26.29
Standard Deviation of Raw Data	12.05025
Khat	4.12848
Theta hat	6.367961
Kstar	3.981995
Theta star	6.602218
Mean of Log Transformed Data	3.143217
Standard Deviation of Log Transformed Data	0.548624

Normal GOF Test Results

Correlation Coefficient R	0.978822
Approximate Shapiro Wilk Test Statistic	0.962531
Approximate Shapiro Wilk P Value	0.071439
Lilliefors Test Statistic	0.066588
Lilliefors Critical (0.0500000) Value	0.099146

Data appear Normal at (0.0500000) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.981701
A-D Test Statistic	1.132279
A-D Critical (0.0500000) Value	0.756072
K-S Test Statistic	0.114365
K-S Critical(0.0500000) Value	0.100185

Data not Gamma Distributed at (0.0500000) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.959668
Approximate Shapiro Wilk Test Statistic	0.913474
Approximate Shapiro Wilk P Value	9.81E-06
Lilliefors Test Statistic	0.149617
Lilliefors Critical (0.0500000) Value	0.099146

Data not Lognormal at (0.0500000) Significance Level

UCL Statistics for Uncensored Full Data Sets

User Selected Options  
 Date/Time of Computation ProUCL 5.2 10/25/2023 3:40:08 PM  
 From File Worksheet.xls  
 Full Precision ON  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations: 2000

CO

General Statistics

Total Number of Observations	80	Number of Distinct Observations	40
Minimum	5.5	Mean	26.29
Maximum	73	Median	26
SD	12.05025	Std. Error of Mean	1.347259
Coefficient of Variation	0.458359	Skewness	0.648346

Normal GOF Test

Shapiro Wilk Test Statistic	0.962531	Shapiro Wilk GOF Test
1% Shapiro Wilk P Value	0.071439	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.066588	Lilliefors GOF Test
1% Lilliefors Critical Value	0.114655	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL	95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	28.53234	95% Adjusted-CLT UCL (Chen-1995) 28.61039 95% Modified-t UCL (Johnson-1978) 28.54862

Gamma GOF Test

A-D Test Statistic	1.132279	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.756072	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114365	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.100185	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.12848	k star (bias corrected MLE)	3.981995
Theta hat (MLE)	6.367961	Theta star (bias corrected MLE)	6.602218
nu hat (MLE)	660.5568	nu star (bias corrected)	637.1193
MLE Mean (bias corrected)	26.29	MLE Sd (bias corrected)	13.17468
Adjusted Level of Significance	0.047	Approximate Chi Square Value (0.05)	579.5626
		Adjusted Chi Square Value	578.5643

Assuming Gamma Distribution

95% Approximate Gamma UCL	28.90087	95% Adjusted Gamma UCL	28.95074
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Lognormal GOF Test

Shapiro Wilk Test Statistic	0.913474	Shapiro Wilk Lognormal GOF Test
10% Shapiro Wilk P Value	9.81E-06	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.149617	Lilliefors Lognormal GOF Test
10% Lilliefors Critical Value	0.090727	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.704748	Mean of logged Data	3.143217
Maximum of Logged Data	4.290459	SD of logged Data	0.548624

Assuming Lognormal Distribution

95% H-UCL	30.27699	90% Chebyshev (MVUE) UCL	32.15131
95% Chebyshev (MVUE) UCL	34.53688	97.5% Chebyshev (MVUE) UCL	37.84796
99% Chebyshev (MVUE) UCL	44.35194		

Nonparametric Distribution Free UCL Statistics  
 Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	28.50604	95% BCA Bootstrap UCL	28.77625
95% Standard Bootstrap UCL	28.49506	95% Bootstrap-t UCL	28.58567
95% Hall's Bootstrap UCL	28.68463	95% Percentile Bootstrap UCL	28.5775
90% Chebyshev(Mean, Sd) UCL	30.33178	95% Chebyshev(Mean, Sd) UCL	32.16257
97.5% Chebyshev(Mean, Sd) UCL	34.70363	99% Chebyshev(Mean, Sd) UCL	39.69506

Suggested UCL to Use  
 95% Student's-t UCL 28.53234 Selected value

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness using results from simulation studies. However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Cd soil data: mg/kg

0.82  
0.76  
2.6  
7.6  
2.4  
0.71  
2.8  
1.6  
5.7  
1.7  
0.7  
0.74  
0.93  
0.72  
0.43  
0.3  
2.1  
3.3  
2.7  
3.3  
0.8  
0.7  
1.6  
2.9  
5.2  
4.6  
12  
5  
0.81  
3.5  
7  
1  
2.1  
5.3  
2.2  
0.54  
1.2  
4.8  
1.4  
3.5  
1.5  
5.9  
5.6  
1  
6.7  
8.5  
3.2  
0.66  
0.67  
1.3  
1.9  
0.3  
1.2  
2.2  
2.1  
1.2  
1.8  
3  
1.3  
25  
3.4  
0.89  
0.37  
0.4  
1.6  
0.34  
1.5  
5.9  
1.4  
0.33  
0.59  
0.3  
0.3  
0.3  
0.46  
0.33  
1.2  
3.1  
0.3

General Statistics on Uncensored Full Data

Date/Time of Computation ProUCL 5.2 10/25/2023 3:43:34 PM  
User Selected Options  
From File WorkSheet.xls  
Full Precision ON

From File: WorkSheet.xls

General Statistics for Uncensored Dataset

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.67	Skewness	CV
CO	80	0	0.3	25	2.58	1.508651	3.395384	0.379616	1.564122	4.151136	1.316041

Percentiles for Uncensored Dataset

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
CO	80	0	0.33	0.646	0.7075	1.5	3.225	3.5	5.72	7.03	14.73

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options  
Date/Time of Computation ProUCL 5.2 10/25/2023 3:44:47 PM  
From File WorkSheet.xls  
Full Precision ON  
Confidence Coefficient 0.95

CO

Raw Statistics

Number of Valid Observations	80
Number of Distinct Observations	57
Minimum	0.3
Maximum	25
Mean of Raw Data	2.58
Standard Deviation of Raw Data	3.395384
Khat	1.067666
Theta hat	2.416485
Kstar	1.035962
Theta star	2.490439
Mean of Log Transformed Data	0.411216
Standard Deviation of Log Transformed Data	1.034799

Normal GOF Test Results

Correlation Coefficient R	0.768795
Approximate Shapiro Wilk Test Statistic	0.629169
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.250951
Lilliefors Critical (0.0500000) Value	0.099146
Data not Normal at (0.0500000) Significance Level	

Gamma GOF Test Results

Correlation Coefficient R	0.930815
A-D Test Statistic	1.208625
A-D Critical (0.0500000) Value	0.780379
K-S Test Statistic	0.098175
K-S Critical(0.0500000) Value	0.102562
Data follow Appr. Gamma Distribution at (0.0500000) Significance Level	

Lognormal GOF Test Results

Correlation Coefficient R	0.987631
Approximate Shapiro Wilk Test Statistic	0.95858
Approximate Shapiro Wilk P Value	0.038673
Lilliefors Test Statistic	0.059625
Lilliefors Critical (0.0500000) Value	0.099146
Data appear Approximate_Lognormal at (0.0500000) Significance Level	

UCL Statistics for Uncensored Full Data Sets

User Selected Options  
Date/Time of Computation ProUCL 5.2 10/25/2023 3:45:56 PM  
From File WorkSheet.xls  
Full Precision ON  
Confidence Coefficient 95%  
Number of Bootstrap Operation: 2000

CO

General Statistics

Total Number of Observations	80	Number of Distinct Observations	57
		Number of Missing Observations	0
Minimum	0.3	Mean	2.58
Maximum	25	Median	1.5
SD	3.395384	Std. Error of Mean	0.379616
Coefficient of Variation	1.316041	Skewness	4.151136

Normal GOF Test

Shapiro Wilk Test Statistic	0.629169	Shapiro Wilk GOF Test	
1% Shapiro Wilk P Value	0	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.250951	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.114655	Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.211821	95% Adjusted-CLT UCL (Chen-1995)	3.392667
		95% Modified-t UCL (Johnson-1978)	3.241185

Gamma GOF Test

A-D Test Statistic	1.208625	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.780379	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.098175	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.102562	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.067666	k star (bias corrected MLE)	1.035962
Theta hat (MLE)	2.416485	Theta star (bias corrected MLE)	2.490439
nu hat (MLE)	170.8266	nu star (bias corrected)	165.754
MLE Mean (bias corrected)	2.58	MLE Sd (bias corrected)	2.534824
		Approximate Chi Square Value (0.05)	136.9849
Adjusted Level of Significance	0.047	Adjusted Chi Square Value	136.5078

Assuming Gamma Distribution

95% Approximate Gamma UCL	3.121843	95% Adjusted Gamma UCL	3.132754
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Lognormal GOF Test

Shapiro Wilk Test Statistic	0.95858	Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk P Value	0.038673	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.059625	Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.090727	Data appear Lognormal at 10% Significance Level	
Data appear Approximate Lognormal at 10% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-1.20397	Mean of logged Data	0.411216
Maximum of Logged Data	3.218876	SD of logged Data	1.034799

Assuming Lognormal Distribution

95% H-UCL	3.369338	90% Chebyshev (MVUE) UCL	3.617985
95% Chebyshev (MVUE) UCL	4.101237	97.5% Chebyshev (MVUE) UCL	4.771973
99% Chebyshev (MVUE) UCL	6.089503		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	3.204412	95% BCA Bootstrap UCL	3.4755
95% Standard Bootstrap UCL	3.195082	95% Bootstrap-t UCL	3.519152
95% Hall's Bootstrap UCL	5.536161	95% Percentile Bootstrap UCL	3.23025
90% Chebyshev(Mean, Sd) UCL	3.718847	95% Chebyshev(Mean, Sd) UCL	4.234706
97.5% Chebyshev(Mean, Sd) UCL	4.950698	99% Chebyshev(Mean, Sd) UCL	6.357127

Suggested UCL to Use

95% Approximate Gamma UCL 3.121843 Selected value

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods, then contact a statistician to correctly calculate UCLs.

When a data set follows an approximate distribution passing only one of the GOF tests, it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

# Snowshoe Hare - Herbivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

- UCLM95 of measured soil concentration (Dillon, 2023)
- Estimated from uptake equations
  - US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - Baes et al., 1984
- Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	1.3	FCSAP, 2012
Average Water Content in Food Items	%	85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.52	FCSAP, 2012. Calculated from the published value of 0.06 kg dry food/kg wet body weight/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	1	FCSAP, 2012
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0	FCSAP, 2012
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.91E-03	FCSAP, 2012. 6.3% of dry food ingestion rate, adjusted for average water content.
Foraging Range	ha	1.6	FCSAP, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_e \cdot IR_{Soil}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	6.92E-02	0	0	1.17E-02	8.09E-02
Lead	1.75E+00	0	0	1.65E+01	1.83E+01
Strontium	5.54E+01	0	0	2.24E+01	7.77E+01
Vanadium	8.44E-03	0	0	1.10E-01	1.18E-01

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	0.77	U.S. EPA, 2005	0.0809	0.105
Lead	4.7	U.S. EPA, 2005	18.3	3.89
Strontium	51.3	CEAEQ, 2012	77.7	1.51
Vanadium	4.16	U.S. EPA, 2005	0.118	0.0284

# Meadow Vole - Herbivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

- UCLM95 of measured soil concentration (Dillon, 2023)
- Estimated from uptake equations
  - US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - Baes et al., 1984
- Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0349	FCSAP, 2012.
Average Water Content in Food Items	%	85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.011517	FCSAP, 2012. Calculated based on provided equation of 0.33 kg wet food/kg of BW
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	1	FCSAP, 2012. Diet consists of majority berries and seeds with grasses and mushrooms making up the remainder of diet.
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0	FCSAP, 2012.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.15E-05	FCSAP, 2012. 2.4% of dry food ingestion rate.
Foraging Range	ha	0.0069	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_e \cdot IR_{Sed}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	5.71E-02	0	0	3.68E-03	6.08E-02
Lead	1.45E+00	0	0	5.19E+00	6.64E+00
Strontium	4.57E+01	0	0	7.03E+00	5.27E+01
Vanadium	6.96E-03	0	0	3.45E-02	4.14E-02

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	0.77	U.S. EPA, 2005	0.0608	0.079
Lead	4.7	U.S. EPA, 2005	6.64	1.41
Strontium	51.3	CEAEQ, 2012	52.7	1.03
Vanadium	4.16	U.S. EPA, 2005	0.0414	0.00995

# Common (Masked) Shrew - Insectivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

- UCLM95 of measured soil concentration (Dillon, 2023)
- Estimated from uptake equations
  - US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - Baes et al., 1984
- Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0041	FCSAP, 2012
Average Water Content in Food Items	%	84.05	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.008628613	FCSAP, 2012. This is based on the allometric equation for total dry food intake for rodents (g/day; $0.621 \cdot BW^{0.564}$ ) divided by the BW, adjusted for average water content
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.05	FCSAP, 2012. 5% of the diet of the shrew consists of smphibians, small mammals and vegetation. Conservatively set this value to 5%
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.95	FCSAP, 2012. Inclusive of insects and larvae as well as terrestrial slugs, snails and earthworms.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.13E-05	3% based on US EA, 2005b using the short-tailed shrew as a surrogate species; No value provided in FCSAP, 2012
Foraging Range	ha	0.6	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_e \cdot IR_{Sed}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	1.82E-02	6.512261338	0	3.12E-02	6.56E+00
Lead	4.61E-01	222.9014288	0	4.40E+01	2.67E+02
Strontium	1.46E+01	172.2438407	0	5.96E+01	2.46E+02
Vanadium	2.22E-03	0.389626088	0	2.92E-01	6.84E-01

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	0.77	U.S. EPA, 2005	6.56	8.52
Lead	4.7	U.S. EPA, 2005	267	56.8
Strontium	51.3	CEAEQ, 2012	246	4.8
Vanadium	4.16	U.S. EPA, 2005	0.684	0.164

# Ermine - Carnivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

- UCLM95 of measured soil concentration (Dillon, 2023)
- Estimated from uptake equations
  - US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - Baes et al., 1984
- Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.089	FCSAP, 2012.
Average Water Content in Food Items	%	68.8	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.031378205	FCSAP, 2012. Calculated from the published value of 0.11 kg dry food/kg wet body weight/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0	FCSAP, 2012
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.05	FCSAP, 2012. 5% other (amphibians, insects, bird eggs)
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0.95	FCSAP, 2012. 50% small mammals, 25% birds, 20% rabbits
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	3.92E-04	4% based on US EA, 2005b using the long-tailed weasel as a surrogate species; No value provided in FCSAP, 2012
Foraging Range	ha	1	FCSAP, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_e \cdot IR_{Soil}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	0.00E+00	0.057419467	0.052027171	1.36E-02	1.23E-01
Lead	0.00E+00	1.965351304	4.709105552	1.92E+01	2.59E+01
Strontium	0.00E+00	1.518696667	0.43282855	2.60E+01	2.80E+01
Vanadium	0.00E+00	0.003435385	0.001605699	1.28E-01	1.33E-01

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	0.77	U.S. EPA, 2005	0.123	0.16
Lead	4.7	U.S. EPA, 2005	25.9	5.51
Strontium	51.3	CEAEQ, 2012	28	0.546
Vanadium	4.16	U.S. EPA, 2005	0.133	0.032

# Ruffed Grouse - Herbivorous Bird Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.552	FCSAP, 2012.
Average Water Content in Food Items	%	84.85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.218613861	FCSAP, 2012. Calculated based on provided equation of 0.06 kg dry food/kg of BW/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.85	FCSAP, 2012. Diet for vegetation includes leaves, and berries.
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.15	FCSAP, 2012. Diet consists primarily of insects.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	3.08E-03	Based on values reported in Beyer et al., 1994; using wild turkey 9.3% as surrogate; No value provided in FCSAP, 2012
Foraging Range	ha	1	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_e \cdot IR_{Soil}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	5.82E-02	0.193499987	0	1.73E-02	2.69E-01
Lead	1.47E+00	6.623110064	0	2.44E+01	3.25E+01
Strontium	4.66E+01	5.117912079	0	3.30E+01	8.47E+01
Vanadium	7.10E-03	0.01157703	0	1.62E-01	1.80E-01

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.1	CEAEO, 2012	0.269	0.128
Lead	1.63	U.S. EPA, 2005	32.5	19.9
Strontium	147	NAS, 2005; Sample et al., 1996	84.7	0.576
Vanadium	0.344	U.S. EPA, 2005	0.18	0.523

# Dark Eyed Junco - Insectivorous Small Bird Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Strontium	5917	$Cp=0.25 \cdot Cs$	138.458	$Ce=0.091 \cdot Cs$	86.152	$Cm=0.00015 \cdot 50 \cdot (0.091 \cdot Cs)$	1.292
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

- UCLM95 of measured soil concentration (Dillon, 2023)
- Estimated from uptake equations
  - US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - Baes et al., 1984
- Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0188	Dunning, 1993
Average Water Content in Food Items	%	84.4	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	0.030888203	Based on US EPA, 1993 and assumed average food item water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.4	Martin et al., 1951
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.6	Martin et al., 1951
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.48E-04	Beyer et al. 1994; 9.3% based on wild turkey as a surrogate, No value provided in FCSAP, 2012
Foraging Range	ha	0.833	Reichard and Ketterson, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_s \cdot IR_{Soil}}{BW}$	$E_{Total} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	1.14E-01	3.210976379	0	7.39E-02	3.40E+00
Lead	2.88E+00	109.9051751	0	1.04E+02	2.17E+02
Strontium	9.10E+01	84.9276273	0	1.41E+02	3.17E+02
Vanadium	1.39E-02	0.19211148	0	6.91E-01	8.97E-01

## Ecological Hazard Quotients (EHQs)

COPC	NOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.1	CEAEO, 2012	3.4	1.62
Lead	1.63	U.S. EPA, 2005	217	133
Strontium	147	NAS, 2005; Sample et al., 1996	317	2.16
Vanadium	0.344	U.S. EPA, 2005	0.897	2.61

# Snowshoe Hare - Herbivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations								
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>			
Cadmium	3.1	ln(Cp)=0.546*ln(Cs)+(-0.475)		0.173	ln(Ce)=0.795*ln(Cs)+2.114		3.257	ln(Cm)=0.4723*ln(Cs)+(-1.2571)	0.155
Lead	4369	ln(Cp)=0.561*ln(Cs)+(-1.328)		4.381	ln(Ce)=0.807*ln(Cs)+(-0.218)		111.489	ln(Cm)=0.4422*ln(Cs)+0.0761	14.060
Vanadium	29	Cp=0.00485*Cs		0.021	Ce=0.042*Cs		0.195	Cm=0.0123*(0.042*Cs)	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68			

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	1.3	FCSAP, 2012
Average Water Content in Food Items	%	85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	5.20E-01	FCSAP, 2012. Calculated from the published value of 0.06 kg dry food/kg wet body weight/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	1	FCSAP, 2012
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0	FCSAP, 2012
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.91E-03	FCSAP, 2012. 6.3% of dry food ingestion rate, adjusted for average water content.
Foraging Range	ha	1.6	FCSAP, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	6.92E-02	0.00E+00	0.00E+00	1.17E-02	8.09E-02
Lead	1.75E+00	0.00E+00	0.00E+00	1.65E+01	1.83E+01
Vanadium	8.44E-03	0.00E+00	0.00E+00	1.10E-01	1.18E-01

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.28	U.S. EPA, 2005	0.0809	0.0355
Lead	35	U.S. EPA, 2005	18.3	0.523
Vanadium	6.7	U.S. EPA, 2005	0.118	0.0176

# Meadow Vole - Herbivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0349	FCSAP, 2012.
Average Water Content in Food Items	%	85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	1.15E-02	FCSAP, 2012. Calculated based on provided equation of 0.33 kg wet food/kg of BW
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	1	FCSAP, 2012. Diet consists of majority berries and seeds with grasses and mushrooms making up the remainder of diet.
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0	FCSAP, 2012.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.15E-05	FCSAP, 2012. 2.4% of dry food ingestion rate.
Foraging Range	ha	0.0069	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	5.71E-02	0.00E+00	0.00E+00	3.68E-03	6.08E-02
Lead	1.45E+00	0.00E+00	0.00E+00	5.19E+00	6.64E+00
Vanadium	6.96E-03	0.00E+00	0.00E+00	3.45E-02	4.14E-02

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.28	U.S. EPA, 2005	0.0608	0.0267
Lead	35	U.S. EPA, 2005	6.64	0.19
Vanadium	6.7	U.S. EPA, 2005	0.0414	0.00618

# Common (Masked) Shrew - Insectivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations								
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>			
Cadmium	3.1	ln(Cp)=0.546*ln(Cs)+(-0.475)		0.173	ln(Ce)=0.795*ln(Cs)+2.114		3.257	ln(Cm)=0.4723*ln(Cs)+(-1.2571)	0.155
Lead	4369	ln(Cp)=0.561*ln(Cs)+(-1.328)		4.381	ln(Ce)=0.807*ln(Cs)+(-0.218)		111.489	ln(Cm)=0.4422*ln(Cs)+0.0761	14.060
Vanadium	29	Cp=0.00485*Cs		0.021	Ce=0.042*Cs		0.195	Cm=0.0123*(0.042*Cs)	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68			

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0041	FCSAP, 2012
Average Water Content in Food Items	%	84.05	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	8.63E-03	FCSAP, 2012. This is based on the allometric equation for total dry food intake for rodents (g/day;(0.621*BW^0.564), adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.05	FCSAP, 2012. 5% of the diet of the shrew consists of amphibians, small mammals and vegetation. Conservatively set this value to 5%
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.95	FCSAP, 2012. Inclusive of insects and larvae as well as terrestrial slugs, snails and earthworms.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.13E-05	3% based on US EPA, 2005b using the short-tailed shrew as a surrogate species; No value provided in FCSAP, 2012
Foraging Range	ha	0.6	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	1.82E-02	6.51E+00	0.00E+00	3.12E-02	6.56E+00
Lead	4.61E-01	2.23E+02	0.00E+00	4.40E+01	2.67E+02
Vanadium	2.22E-03	3.90E-01	0.00E+00	2.92E-01	6.84E-01

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.28	U.S. EPA, 2005	6.56	<b>2.88</b>
Lead	35	U.S. EPA, 2005	267	<b>7.63</b>
Vanadium	6.7	U.S. EPA, 2005	0.684	0.102

# Ermine - Carnivorous Small Mammal Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations								
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>			
Cadmium	3.1	ln(Cp)=0.546*ln(Cs)+(-0.475)		0.173	ln(Ce)=0.795*ln(Cs)+2.114		3.257	ln(Cm)=0.4723*ln(Cs)+(-1.2571)	0.155
Lead	4369	ln(Cp)=0.561*ln(Cs)+(-1.328)		4.381	ln(Ce)=0.807*ln(Cs)+(-0.218)		111.489	ln(Cm)=0.4422*ln(Cs)+0.0761	14.060
Vanadium	29	Cp=0.00485*Cs		0.021	Ce=0.042*Cs		0.195	Cm=0.0123*(0.042*Cs)	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68			

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.089	FCSAP, 2012.
Average Water Content in Food Items	%	68.8	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	3.14E-02	FCSAP, 2012. Calculated from the published value of 0.11 kg dry food/kg wet body weight/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0	FCSAP, 2012
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.05	FCSAP, 2012. 5% other (amphibians, insects, bird eggs)
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0.95	FCSAP, 2012. 50% small mammals, 25% birds, 20% rabbits
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	3.92E-04	4% based on US EA, 2005b using the long-tailed weasel as a surrogate species; No value provided in FCSAP, 2012
Foraging Range	ha	1	FCSAP, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	0.00E+00	5.74E-02	5.20E-02	1.36E-02	1.23E-01
Lead	0.00E+00	1.97E+00	4.71E+00	1.92E+01	2.59E+01
Vanadium	0.00E+00	3.44E-03	1.61E-03	1.28E-01	1.33E-01

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.28	U.S. EPA, 2005	0.123	0.0539
Lead	35	U.S. EPA, 2005	25.9	0.74
Vanadium	6.7	U.S. EPA, 2005	0.133	0.0199

# Dark Eyed Junco - Insectivorous Small Bird Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.0188	Dunning, 1993
Average Water Content in Food Items	%	84.4	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	3.09E-02	Based on US EPA, 1993 and assumed average food item water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.4	Martin et al., 1951
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.6	Martin et al., 1951
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	4.48E-04	Beyer et al. 1994; 9.3% based on wild turkey as a surrogate, No value provided in FCSAP, 2012
Foraging Range	ha	0.833	Reichard and Ketterson, 2012
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	1.14E-01	3.21E+00	0.00E+00	7.39E-02	3.40E+00
Lead	2.88E+00	1.10E+02	0.00E+00	1.04E+02	2.17E+02
Vanadium	1.39E-02	1.92E-01	0.00E+00	6.91E-01	8.97E-01

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.37	CEAEO, 2012	3.4	1.43
Lead	9.9	U.S. EPA, 2005d	217	21.9
Vanadium	1.9	U.S. EPA, 2005e	0.897	0.472

# Ruffed Grouse - Herbivorous Bird Food Chain Modelling

Lake Enon Former Mill Site

## Site Media Exposure Point Concentrations

COPC	COPC Concentrations						
	Soil (Cs) (mg/kg dw) <sup>1</sup>	Terrestrial Plants (Cp) (mg/kg ww) <sup>2</sup>		Terrestrial Invertebrate (Ce) (mg/kg ww) <sup>2</sup>		Terrestrial Mammal (Cm) (mg/kg ww) <sup>2</sup>	
Cadmium	3.1	$\ln(Cp)=0.546 \cdot \ln(Cs)+(-0.475)$	0.173	$\ln(Ce)=0.795 \cdot \ln(Cs)+2.114$	3.257	$\ln(Cm)=0.4723 \cdot \ln(Cs)+(-1.2571)$	0.155
Lead	4369	$\ln(Cp)=0.561 \cdot \ln(Cs)+(-1.328)$	4.381	$\ln(Ce)=0.807 \cdot \ln(Cs)+(-0.218)$	111.489	$\ln(Cm)=0.4422 \cdot \ln(Cs)+0.0761$	14.060
Vanadium	29	$Cp=0.00485 \cdot Cs$	0.021	$Ce=0.042 \cdot Cs$	0.195	$Cm=0.0123 \cdot (0.042 \cdot Cs)$	0.00479
Water Content of Food Items <sup>3</sup>		0.85		0.84		0.68	

### Notes

1. UCLM95 of measured soil concentration (Dillon, 2023)
2. Estimated from uptake equations
  - a) US EPA, 2007; Attachment 4-1 Guidance for Developing ECO SSLs - Table 4a, 4b
  - b) Baes et al., 1984
3. Sample and Suter, 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants

## Receptor and Diet Parameters

Parameter	Units	Value	Reference
Body weight (BW)	kg	0.552	FCSAP, 2012.
Average Water Content in Food Items	%	84.85	Terrestrial Plants: 85%; Terrestrial Invertebrates: 84%; Small Mammals: 68% (Sample & Suter, 1994)
Food Ingestion Rate (IR <sub>Food</sub> )	kg/day ww	2.19E-01	FCSAP, 2012. Calculated based on provided equation of 0.06 kg dry food/kg of BW/day, adjusted for average water content.
Terrestrial Plant Diet Proportion (P <sub>Plant</sub> )	unitless factor	0.85	FCSAP, 2012. Diet for vegetation includes leaves, and berries.
Terrestrial Invertebrate Diet Proportion (P <sub>Inv</sub> )	unitless factor	0.15	FCSAP, 2012. Diet consists primarily of insects.
Terrestrial Small Mammal Diet Proportion (P <sub>Mam</sub> )	unitless factor	0	FCSAP, 2012.
Soil Ingestion Rate (IR <sub>Soil</sub> )	kg/day dw	3.08E-03	Based on values reported in Beyer et al., 1994; using wild turkey 9.3% as surrogate; No value provided in FCSAP, 2012
Foraging Range	ha	1	FCSAP, 2012.
Temporal Use Factor (TUF)	unitless factor	1	Assumed
Site Area (A <sub>site</sub> )	ha	1	Assumed
Residency Factor (R)	unitless factor	1	= A <sub>site</sub> / Foraging Range (Conservatively set to 1; assumes fulltime occupancy)

## COPC Exposures (mg/kg body weight/day)

Exposure Pathway	Terrestrial Plant Ingestion	Terrestrial Invertebrate Ingestion	Terrestrial Small Mammal Ingestion	Soil Ingestion Exposure	Total COPC Exposure
Exposure Equation	$E_{Plant} = \frac{C_p \cdot IR_{Food} \cdot P_{Plant}}{BW}$	$E_{Inv} = \frac{C_e \cdot IR_{Food} \cdot P_{Inv}}{BW}$	$E_{Mam} = \frac{C_f \cdot IR_{Food} \cdot P_{Mam}}{BW}$	$E_{Soil} = \frac{C_{Soil} \cdot IR_{Soil}}{BW}$	$E_{TOTAL} = (E_{Plant} + E_{Inv} + E_{Mam} + E_{Soil}) \cdot TUF \cdot R$
Cadmium	5.82E-02	1.93E-01	0.00E+00	1.73E-02	2.69E-01
Lead	1.47E+00	6.62E+00	0.00E+00	2.44E+01	3.25E+01
Vanadium	7.10E-03	1.16E-02	0.00E+00	1.62E-01	1.80E-01

## Ecological Hazard Quotients (EHQs)

COPC	LOAEL TRV (mg/kg body weight/day)	TRV Reference	Total COPC Exposure	EHQ (Total COPC Exposure/TRV)
Cadmium	2.37	CEAEQ, 2012	0.269	0.114
Lead	9.9	U.S. EPA, 2005d	32.5	3.28
Vanadium	1.9	U.S. EPA, 2005e	0.18	0.0947