

## **ANNUAL REPORT FOR THE KUGAARUK LANDFARM**

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**YEAR BEING REPORTED: 2023**

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 1BR-KRK1929 issued to the Government of Nunavut Department of Community and Government Services.

**a) A summary report of Waste disposal activities including:**

**i. quantity and quality of effluent discharged from Landfarm; and**

600 m<sup>3</sup>

**ii. quantity and characterization of soils placed within the Landfarm for treatment.**

No new soil was placed into the landfarm in 2023.

**b) Quantity of Waste backhauled to an approved facility for disposal;**

There was no waste backhauled to an approved facility for disposal in 2023.

**c) A list of unauthorized discharges and a summary of follow-up actions taken;**

There were no unauthorized discharges in 2023.

**d) Any revisions to the management plans, as required by Part B, Item 6, submitted in the form of an Addendum;**

There were no revisions to the management plans submitted in the form of an Addendum in 2023.

**e) A description of all progressive and/or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;**

There was no progressive and/or final reclamation work undertaken in 2023.

## ANNUAL REPORT FOR THE KUGAARUK LANDFARM

- f) A summary of all information requested and results of the Monitoring Program, an analysis and interpretation of the results, and any follow-up measures that may be required;

**Table 1. Monitoring Program Station SW2 Effluent Results**

Parameter	Maximum Concentration (mg/L)	SW2 June 27 2023
pH	6.5-9	-
TSS	50	-
Oil and Grease	15 and no visible sheen	-
Total Lead	0.001	-
Benzene	0.37	-
Toluene	0.002	-
Ethylbenzene	0.09	-

**Table 2. Monitoring Program Station SW1 Effluent Results**

Parameters	Unit	SW1 June 27 2023
pH	pH	-
TSS	mg/L	-
Chloride	mg/L	-
Nitrate+Nitrite as Nitrogen	mg/L	-
Sulphate	mg/L	-
HC Extractable	mg/L	-
Calcium	mg/L	-
Magnesium	mg/L	-
Potassium	mg/L	-
Sodium	mg/L	-
Benzene	mg/L	-
Ethylbenzene	mg/L	-
Toluene	mg/L	-
Xylenes	mg/L	-
Aluminium	µg/L	-
Arsenic	µg/L	-
Cadmium	µg/L	-
Chromium	µg/L	-
Cobalt	µg/L	-

## ANNUAL REPORT FOR THE KUGAARUK LANDFARM

Copper	µg/L	-
Iron	µg/L	-
Lead	µg/L	-
Manganese	µg/L	-
Mercury	µg/L	-
Nickel	µg/L	-
Zinc	µg/L	-
Total Phenol	mg/L	-
Hardness	mg/L	-
PAH	mg/L	-
Conductivity	mg/L	-
Ammonia Nitrogen	mg/L	-
Oil and grease (visual)	mg/L	-
Alkalinity	mg/L	-
Phosphorous	mg/L	-

**Table 3. Petroleum Hydrocarbon Contaminant Levels at Soil Locations LF1-LF4**

	CCME Guideline for Industrial Land Use	June 27 2023 (ppm)			
Parameter	Coarse (ppm)	LF-1	LF-2	LF-3	LF-4
Benzene	0.03	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	0.37	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	0.082	<0.015	<0.015	<0.015	<0.015
Xylenes	11	<0.050	<0.050	<0.050	<0.050
F1	320	<5	<5	<5	<5
F2	260	409	162	71	81
F3	1700	209	214	131	113
F4	3300	<50	<50	<50	<50
Lead	600	4.66	4.42	6.02	5.25

- Groundwater is not observed within the monitoring wells M1-M6.

## **ANNUAL REPORT FOR THE KUGAARUK LANDFARM**

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- g) A summary, including photographic records before, during and after any relevant construction activities or Modifications and/or major maintenance work carried out on facilities under this Licence and an outline of any work anticipated for the next year;**
- There was no relevant construction activities, modifications and/or major maintenance work carried out on facilities under this licence in 2023 and there is no work anticipated for 2024.
- h) A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;**
- There was no public consultation/participation conducted in 2023.
- i) Any other details on Waste disposal requested by the Board by the 1st November of the year being reported.**
- There were no other details on Waste disposal requested by the Board by the 1<sup>st</sup> of November of 2023.

### **ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:**

- No soil was removed from the landfarm in 2023.
- SW1 & SW2 - decanting cell not planned due to low levels. No samples taken.

### **FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:**

- A CIRNAC inspection did not take place in 2023.

### **List of Appendices**

**Appendix A: Laboratory Certificate of Analysis – June 27 2023 – 14 pages**

**Appendix B: CIRNAC Inspection Report - 1 page**

**ANNUAL REPORT  
FOR THE KUGAARUK LANDFARM**

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Appendix A: Laboratory Certificate of Analysis



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

**Taiga Batch No.:**  
**230949**

**- FINAL REPORT -**

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**Prepared For:** Government of Nunavut - CGS Kugaaruk

**Address:**

Kugaaruk, NU  
X0B 1K0

**Attn:** Madeline Cole

**Facsimile:**

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**Final report has been reviewed and approved by:**

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**Glen Hudy**  
**Quality Assurance Officer**

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**NOTES:**

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Results are based on the specific tests at the time of analysis, does not represent the conditions during sampling and relates only to the items tested.

**Report Date:** July 14, 2023

**Print Date:** *July 14, 2023*

*Page 1 of 14*



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

**Taiga Batch No.:**  
**230949**

## - CERTIFICATE OF ANALYSIS -

**Client Sample ID:** **LF-1**

**Taiga Sample ID:** **001**

**Client Project:**

**Sample Type:** Soil

**Received Date:** 29-Jun-23

**Sampling Date:** 27-Jun-23

**Sampling Time:**

**Location:** Kugaaruk Landfarm

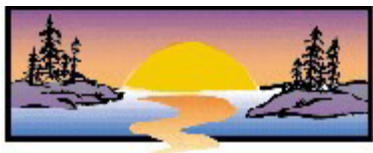
**Report Status:** **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	4980	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.47	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	21.1	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.030	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	11.6	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	3.47	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	4.36	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	10000	50	mg/kg	07-Jul-23	EPA200.2	
Lead	4.66	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	145	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	
Nickel	7.16	0.5	mg/kg	07-Jul-23	EPA200.2	
Zinc	25.1	2	mg/kg	07-Jul-23	EPA200.2	

**Report Date:** July 14, 2023

**Print Date:** July 14, 2023

*Page 2 of 14*



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-1**

Taiga Sample ID: **001**

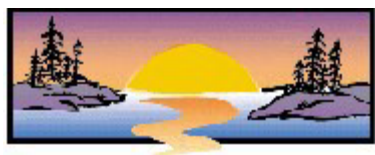
Benzene	< 0.0050	0.005	mg/kg	06-Jul-23	CCME CWS PHC
Ethylbenzene	< 0.015	0.015	mg/kg	06-Jul-23	CCME CWS PHC
F1: C6-C10	< 5	5	mg/kg	06-Jul-23	CCME CWS PHC
F2: C10-C16	409	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	209	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	< 50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 3 of 14*





# Taiga Environmental Laboratory

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## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-2**

Taiga Sample ID: **002**

### Client Project:

Sample Type: Soil

Received Date: 29-Jun-23

Sampling Date: 27-Jun-23

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	6100	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.88	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	23.8	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.023	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	14.1	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	4.00	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	4.75	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	12100	50	mg/kg	07-Jul-23	EPA200.2	
Lead	4.42	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	172	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	
Nickel	7.59	0.5	mg/kg	07-Jul-23	EPA200.2	
Zinc	28.4	2	mg/kg	07-Jul-23	EPA200.2	

### **Subcontracted Organics**

ReportDate: July 14, 2023

Print Date: **July 14, 2023**

Page 4 of 14



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Taiga Batch No.:  
**230949**

## - CERTIFICATE OF ANALYSIS -

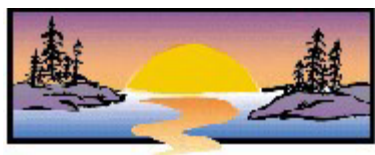
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Benzene	Tel: (867)-767-9235		Fax: (867)-920-8740		CCME CWS PHC
	< 0.0050	0.005	mg/kg	06-Jul-23	
Ethylbenzene	Tel: (867)-767-9235		Fax: (867)-920-8740		CCME CWS PHC
	< 0.015	0.015	mg/kg	06-Jul-23	

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 5 of 14*



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:

230949

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-2**

Taiga Sample ID: **002**

F1: C6-C10	< 5	5	mg/kg	06-Jul-23	CCME CWS PHC
F2: C10-C16	162	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	214	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	< 50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 6 of 14*



# Taiga Environmental Laboratory

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## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-3**

Taiga Sample ID: **003**

### Client Project:

Sample Type: Soil

Received Date: 29-Jun-23

Sampling Date: 27-Jun-23

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	4660	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.80	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	21.5	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.062	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	11.3	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	3.26	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	5.32	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	9890	50	mg/kg	07-Jul-23	EPA200.2	
Lead	6.02	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	141	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	0.0052	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	
Nickel	6.06	0.5	mg/kg	07-Jul-23	EPA200.2	
Zinc	28.1	2	mg/kg	07-Jul-23	EPA200.2	

### **Subcontracted Organics**

ReportDate: July 14, 2023

Print Date: **July 14, 2023**

Page 7 of 14



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

**Taiga Batch No.:**  
**230949**

## - CERTIFICATE OF ANALYSIS -

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Benzene	Tel: (867)-767-9235		Fax: (867)-920-8740		CCME CWS PHC
	< 0.0050	0.005	mg/kg	06-Jul-23	
Ethylbenzene	Tel: (867)-767-9235		Fax: (867)-920-8740		CCME CWS PHC
	< 0.015	0.015	mg/kg	06-Jul-23	

**ReportDate:** July 14, 2023

**Print Date:** *July 14, 2023*

*Page 8 of 14*



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-3**

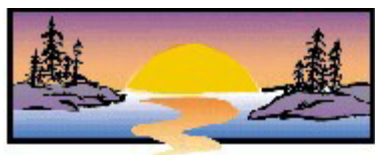
Taiga Sample ID: **003**

F1: C6-C10	< 5	5	mg/kg	06-Jul-23	CCME CWS PHC
F2: C10-C16	71	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	131	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	< 50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 9 of 14*



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-4**

Taiga Sample ID: **004**

### Client Project:

Sample Type: Soil

Received Date: 29-Jun-23

Sampling Date: 27-Jun-23

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	4490	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.64	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	19.9	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.061	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	9.91	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	2.93	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	4.25	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	9000	50	mg/kg	07-Jul-23	EPA200.2	
Lead	5.25	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	130	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	0.0057	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	

ReportDate: July 14, 2023

Print Date: **July 14, 2023**

*Page 10 of*



# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

**Taiga Batch No.:**  
**230949**

## - CERTIFICATE OF ANALYSIS -

Nickel	Tel: (867)-767-9235		Fax: (867)-920-8740		07-Jul-23	EPA200.2
	5.82	0.5	mg/kg			
Zinc	25.3	2	mg/kg		07-Jul-23	EPA200.2
<b><u>Subcontracted Organics</u></b>						
Benzene	< 0.0050	0.005	mg/kg		06-Jul-23	CCME CWS PHC
Ethylbenzene	< 0.015	0.015	mg/kg		06-Jul-23	CCME CWS PHC

**ReportDate:** July 14, 2023

**Print Date:** *July 14, 2023*

*Page 11 of*





# Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

## - CERTIFICATE OF ANALYSIS -

Taiga Batch No.:  
**230949**

Tel: (867)-767-9235 Fax: (867)-920-8740

Client Sample ID: **LF-4**

Taiga Sample ID: **004**

F1: C6-C10	< 5	5	mg/kg	07-Jul-23	CCME CWS PHC
F2: C10-C16	81	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	113	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	< 50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 12 of*



Taiga Environmental Laboratory  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:  
**230949**

**- CERTIFICATE OF ANALYSIS -**

Client Sample ID: **LF-5**

Taiga Sample ID: **005**

**Client Project:**

Sample Type: Soil  
Received Date: 29-Jun-23  
Sampling Date: 27-Jun-23  
Sampling Time:

Location: Kugaaruk Landfarm

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	3850	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.37	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	17.8	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.027	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	11.0	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	2.75	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	3.39	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	7710	50	mg/kg	07-Jul-23	EPA200.2	
Lead	4.46	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	99.7	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	
Nickel	5.39	0.5	mg/kg	07-Jul-23	EPA200.2	
Zinc	19.3	2	mg/kg	07-Jul-23	EPA200.2	
<b><u>Subcontracted Organics</u></b>						
Benzene	< 0.0050	0.005	mg/kg	06-Jul-23	CCME CWS PHC	
Ethylbenzene	< 0.015	0.015	mg/kg	06-Jul-23	CCME CWS PHC	

ReportDate: July 14, 2023

Print Date: **July 14, 2023**

Page 10 of 14



## Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

**230949**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-5**

Taiga Sample ID: **005**

F1: C6-C10	<	5	5	mg/kg	06-Jul-23	CCME CWS PHC
F2: C10-C16	<	25	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	<	50	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	<	50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	<	0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	<	0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC

ReportDate: July 14, 2023

Print Date: *July 14, 2023*

*Page 11 of 14*



## Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

230949

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-6**

Taiga Sample ID: **006**

**Client Project:**

**Sample Type:** Soil

**Received Date:** 29-Jun-23

**Sampling Date:** 27-Jun-23

**Sampling Time:**

**Location:** Kugaaruk Landfarm

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Subcontracted Metals</u></b>						
Aluminum	3890	50	mg/kg	07-Jul-23	EPA200.2	
Arsenic	1.58	0.1	mg/kg	07-Jul-23	EPA200.2	
Barium	17.0	0.5	mg/kg	07-Jul-23	EPA200.2	
Cadmium	0.030	0.02	mg/kg	07-Jul-23	EPA200.2	
Chromium	8.95	0.5	mg/kg	07-Jul-23	EPA200.2	
Cobalt	2.78	0.1	mg/kg	07-Jul-23	EPA200.2	
Copper	3.95	0.5	mg/kg	07-Jul-23	EPA200.2	
Iron	8260	50	mg/kg	07-Jul-23	EPA200.2	
Lead	4.28	0.5	mg/kg	07-Jul-23	EPA200.2	
Manganese	105	1	mg/kg	07-Jul-23	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	07-Jul-23	EPA200.2/6020A	
Nickel	4.77	0.5	mg/kg	07-Jul-23	EPA200.2	
Zinc	18.2	2	mg/kg	07-Jul-23	EPA200.2	
<b><u>Subcontracted Organics</u></b>						
Benzene	< 0.0050	0.005	mg/kg	06-Jul-23	CCME CWS PHC	
Ethylbenzene	< 0.015	0.015	mg/kg	06-Jul-23	CCME CWS PHC	

**ReportDate:** July 14, 2023

**Print Date:** July 14, 2023

Page 12 of 14



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Taiga Batch No.:  
**230949**

**- CERTIFICATE OF ANALYSIS -**

Client Sample ID: **LF-6**

Taiga Sample ID: **006**

F1: C6-C10	< 5	5	mg/kg	06-Jul-23	CCME CWS PHC
F2: C10-C16	29	25	mg/kg	07-Jul-23	CCME CWS PHC
F3: C16-C34	65	50	mg/kg	07-Jul-23	CCME CWS PHC
F4: C34-C50	< 50	50	mg/kg	07-Jul-23	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC
Xylenes	< 0.050	0.05	mg/kg	06-Jul-23	CCME CWS PHC



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**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID:** **LF-6**

**Taiga Sample ID:** **006**

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**\* Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

**ReportDate:** July 14, 2023

**Print Date:** *July 14, 2023*

*Page 14 of 14*

## **ANNUAL REPORT FOR THE KUGAARUK LANDFARM**

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### Appendix B: CIRNAC Inspection Report

The CIRNAC inspection did not take place in 2023.