

## CERTIFICATE OF ANALYSIS

Work Order	: WT2300689	Page	: 1 of 3
Client	: NASITTUQ CORPORATION	Laboratory	: Waterloo - Environmental
Contact	: Alaina Leslie	Account Manager	: Costas Farassoglou
Address	: 275 Slater Street Suite 1600 Ottawa ON Canada K1P 5H9	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 613 223 0629	Telephone	: 613 225 8279
Project	: NWS Sewage FOX-M	Date Samples Received	: 11-Jan-2023 09:10
PO	: ----	Date Analysis Commenced	: 11-Jan-2023
C-O-C number	: ----	Issue Date	: 18-Jan-2023 12:30
Sampler	: CLIENT		
Site	: ----		
Quote number	: Water Testing		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Microbiology, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

Unit	Description
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Qualifiers

Qualifier	Description
BODL	Limit of Reporting for BOD was increased to account for the largest volume of sample tested.
PEHT	Parameter exceeded recommended holding time prior to analysis.



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	XL CYCLE-LET GEN CHEM AND O&G	XL-CYCLE-LET FAECAL A	XL-CYCLE-LET FAECAL B	XL-CYCLE-LET FAECAL C	----
Client sampling date / time						30-Dec-2022 11:00	30-Dec-2022 11:00	30-Dec-2022 11:00	30-Dec-2022 11:00	----
Analyte	CAS Number	Method	LOR	Unit	WT2300689-001	WT2300689-002	WT2300689-003	WT2300689-004	-----	
					Result	Result	Result	Result	----	
<b>Physical Tests</b>										
pH	----	E108	0.10	pH units	8.04	----	----	----	----	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	----	----	----	----	----
<b>Microbiological Tests</b>										
Coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	32	42	Not Detected	----	----
<b>Aggregate Organics</b>										
Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<3.0 <small>BODL PEHT</small>	----	----	----	----	----
Oil & grease (gravimetric)	----	E567	5.0	mg/L	<5.0	----	----	----	----	----
Oil & grease, animal/vegetable (gravimetric)	----	EC567A.SG	5.0	mg/L	<5.0	----	----	----	----	----
Oil & grease, mineral (gravimetric)	----	E567SG	5.0	mg/L	<5.0	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: WT2300689</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	: NASITTUQ CORPORATION	<b>Laboratory</b>	: Waterloo - Environmental
<b>Contact</b>	: Alaina Leslie	<b>Account Manager</b>	: Costas Farassoglou
<b>Address</b>	: 275 Slater Street Suite 1600 Ottawa ON Canada K1P 5H9	<b>Address</b>	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
<b>Telephone</b>	:	<b>Telephone</b>	: 613 225 8279
<b>Project</b>	: NWS Sewage FOX-M	<b>Date Samples Received</b>	: 11-Jan-2023 09:10
<b>PO</b>	: ----	<b>Date Analysis Commenced</b>	: 11-Jan-2023
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 18-Jan-2023 12:29
<b>Sampler</b>	: CLIENT 613 223 0629		
<b>Site</b>	: ----		
<b>Quote number</b>	: Water Testing		
<b>No. of samples received</b>	: 4		
<b>No. of samples analysed</b>	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Microbiology, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
  - DQO = Data Quality Objective.
  - LOR = Limit of Reporting (detection limit).
  - RPD = Relative Percent Difference
  - # = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 799556)											
WT2300656-003	Anonymous	pH	----	E108	0.10	pH units	7.78	7.77	0.129%	4%	----
Physical Tests (QC Lot: 803335)											
WT2300516-001	Anonymous	Solids, total suspended [TSS]	----	E160	15.0	mg/L	<15.0	<15.0	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 800376)											
WT2300735-004	Anonymous	Coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	35	23	41.4%	65%	----
Aggregate Organics (QC Lot: 799324)											
WT2300623-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	3.0	mg/L	<3.0	<3.0	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 803335)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Microbiological Tests (QCLot: 800376)						
Coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 799324)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 801281)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 801282)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 799556)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 803335)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	93.7	85.0	115	----
Aggregate Organics (QCLot: 799324)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	95.5	85.0	115	----
Aggregate Organics (QCLot: 801281)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	108	70.0	130	----
Aggregate Organics (QCLot: 801282)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	99.9	70.0	130	----



## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2300689	Page	: 1 of 6
Client	: NASITTUQ CORPORATION	Laboratory	: Waterloo - Environmental
Contact	: Alaina Leslie	Account Manager	: Costas Farassoglou
Address	: 275 Slater Street Suite 1600 Ottawa ON Canada K1P 5H9	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 613 223 0629	Telephone	: 613 225 8279
Project	: NWS Sewage FOX-M	Date Samples Received	: 11-Jan-2023 09:10
PO	: ----	Issue Date	: 18-Jan-2023 12:28
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: Water Testing		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.

**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

**LOR:** Limit of Reporting (detection limit).

**RPD:** Relative Percent Difference.

### **Workorder Comments**

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### **Summary of Outliers**

#### **Outliers : Quality Control Samples**

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Test sample Surrogate recovery outliers exist.

#### **Outliers: Reference Material (RM) Samples**

- No Reference Material (RM) Sample outliers occur.

#### **Outliers : Analysis Holding Time Compliance (Breaches)**

- Analysis Holding Time Outliers exist - please see following pages for full details.



### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] XL CYCLE-LET GEN CHEM AND O&G	E550	30-Dec-2022	----	----	----		11-Jan-2023	4 days	12 days	✖ EHTR
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) XL CYCLE-LET GEN CHEM AND O&G	E567SG	30-Dec-2022	13-Jan-2023	28 days	14 days	✔	13-Jan-2023	40 days	0 days	✔
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) XL CYCLE-LET GEN CHEM AND O&G	E567	30-Dec-2022	13-Jan-2023	28 days	14 days	✔	13-Jan-2023	40 days	0 days	✔
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) XL-CYCLE-LET FAECAL A	E012.FC	30-Dec-2022	----	----	----		12-Jan-2023	30 hrs	308 hrs	✖ EHTR
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) XL-CYCLE-LET FAECAL B	E012.FC	30-Dec-2022	----	----	----		12-Jan-2023	30 hrs	308 hrs	✖ EHTR
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) XL-CYCLE-LET FAECAL C	E012.FC	30-Dec-2022	----	----	----		12-Jan-2023	30 hrs	308 hrs	✖ EHTR
Physical Tests : pH by Meter										
HDPE [ON MECP] XL CYCLE-LET GEN CHEM AND O&G	E108	30-Dec-2022	11-Jan-2023	----	----		12-Jan-2023	14 days	13 days	✔

Page : 4 of 6  
 Work Order : WT2300689  
 Client : NASITTUQ CORPORATION  
 Project : NWS Sewage FOX-M



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP] XL CYCLE-LET GEN CHEM AND O&G	E160	30-Dec-2022	----	----	----		16-Jan-2023	7 days	17 days	✖ EHTR

**Legend & Qualifier Definitions**

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

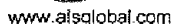
Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	799324	1	13	7.6	5.0	✓
pH by Meter	E108	799556	1	9	11.1	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	800376	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	803335	1	15	6.6	4.7	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	799324	1	13	7.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	801282	1	8	12.5	5.0	✓
Oil & Grease by Gravimetry	E567	801281	1	9	11.1	5.0	✓
pH by Meter	E108	799556	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	803335	1	15	6.6	4.7	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	799324	1	13	7.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	801282	1	8	12.5	5.0	✓
Oil & Grease by Gravimetry	E567	801281	1	9	11.1	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	800376	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	803335	1	15	6.6	4.7	✓



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC  Waterloo - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108  Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160  Waterloo - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Biochemical Oxygen Demand - 5 day	E550  Waterloo - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Oil & Grease by Gravimetry	E567  Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Mineral Oil & Grease by Gravimetry	E567SG  Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG  Waterloo - Environmental	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Oil & Grease Extraction for Gravimetry	EP567  Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.



**Canada Toll Free: 1 800 668 9878**

COC Number:

Environmental Division  
Waterloo  
Work Order Reference  
**WT2300689**



Telephone : +1 518 865 6910

[illegible]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

OGG-357; GC-306; B-396.