



**CLIENT NAME: DEFENCE CONSTRUCTION CANADA  
14 ALERT BLVD, 8 WING TRENTON  
ASTRA, ON K0K3W0  
(613) 392-2811**

**ATTENTION TO: Cameron Chadwick**

**PROJECT: CFS EUREKA**

**AGAT WORK ORDER: 16P108384**

**MICROBIOLOGY ANALYSIS REVIEWED BY: Inesa Alizarchyk, Inorganic Lab Supervisor**

**TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor**

**WATER ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager**

**DATE REPORTED: Jul 11, 2016**

**PAGES (INCLUDING COVER): 18**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*NOTES**

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**



# Certificate of Analysis

AGAT WORK ORDER: 16P108384

PROJECT: CFS EUREKA

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
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## Microbiological Analysis (water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ERK 1	ERK 3	ERK 4	ERK 5
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water
Fecal Coliform	CFU/100mL	G / S	RDL	7662456	7662484	7662514	7662532
		10	ND	100	ND	2	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA - Microbiology

7662456-7662532 RDL >1 indicates dilutions of the sample.

ND - Not Detected.

The time from sample collection to initiation of analysis exceeded 48 hours. Review data with discretion.

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**BTEX - Water (P & T - GC/MS)**

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:	
		SAMPLE TYPE:	ERK 2
		DATE SAMPLED:	Water
		G / S	2016-06-18
		RDL	7662475
Benzene	µg/L	0.20	<0.20
Toluene	µg/L	0.20	<0.20
Ethylbenzene	µg/L	0.10	<0.10
m & p-Xylene	µg/L	0.20	<0.20
o-Xylene	µg/L	0.10	<0.10
Xylene Mixture (Total)	µg/L	0.20	<0.20
Surrogate	Unit	Acceptable Limits	
Toluene-d8	% Recovery	60-130	120
4-Bromofluorobenzene	% Recovery	70-130	90

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662475 Results relate only to the items tested.

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## O. Reg. 153(511) - PHCs F1 - F4 (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ERK 3	ERK 4	ERK 5
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water
				G / S	RDL	2016-06-18
Benzene	µg/L		7662484	0.20	<0.20	<0.20
Toluene	µg/L			0.20	<0.20	<0.20
Ethylbenzene	µg/L			0.10	<0.10	<0.10
Xylene Mixture	µg/L			0.20	<0.20	<0.20
F1 (C6 to C10)	µg/L			25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L			25	<25	<25
F2 (C10 to C16)	µg/L			100	<100	<100
F3 (C16 to C34)	µg/L			100	<100	<100
F4 (C34 to C50)	µg/L			100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L			500	NA	NA
<b>Surrogate</b>	<b>Unit</b>	<b>Acceptable Limits</b>				
Terphenyl	%	60-140		91	95	102

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662484-7662532 The C6-C10 fraction is calculated using Toluene response factor.

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.

Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.

The chromatogram has returned to baseline by the retention time of nC50.

Total C6-C50 results are corrected for BTEX contributions.

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

nC6 and nC10 response factors are within 30% of Toluene response factor.

nC10, nC16 and nC34 response factors are within 10% of their average.

C50 response factor is within 70% of nC10 + nC16 nC34 average.

Linearity is within 15%.

Extraction and holding times were met for this sample.

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.

NA = Not Applicable

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## Oil and Grease (+Total) - water

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ERK 1	ERK 2	ERK 3	ERK 4	ERK 5						
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water	Water						
				G / S	RDL	2016-06-18	7662456	2016-06-18	7662475	2016-06-18	7662484	2016-06-18	7662514	2016-06-18
Oil and Grease (animal/vegetable)	mg/L			0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Oil and Grease (mineral) in water	mg/L			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Oil and Grease (Total) in water	mg/L			0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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## Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ERK 3	ERK 4	ERK 5
		G / S	SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2016-06-18	2016-06-18
1-Methylnaphthalene	ug/L			0.01	0.04	0.01
2-Methylnaphthalene	ug/L			0.01	0.09	0.04
Acenaphthene	ug/L			0.01	<0.01	<0.01
Acenaphthylene	ug/L			0.01	<0.01	<0.01
Acridine	ug/L			0.01	<0.01	<0.01
Anthracene	ug/L			0.012	<0.012	<0.012
Benzo(a)anthracene	ug/L			0.018	<0.018	<0.018
Benzo(a)pyrene	ug/L			0.010	<0.010	<0.010
Benzo(b)fluoranthene	ug/L			0.01	<0.01	<0.01
Benzo(e)pyrene	ug/L			0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/L			0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/L			0.01	<0.01	<0.01
Chrysene	ug/L			0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	ug/L			0.01	<0.01	<0.01
Fluoranthene	ug/L			0.01	0.02	<0.01
Fluorene	ug/L			0.01	0.02	<0.01
Indeno(1,2,3-cd)pyrene	ug/L			0.01	<0.01	<0.01
Naphthalene	ug/L			0.01	0.08	0.05
Perylene	ug/L			0.01	<0.01	<0.01
Phenanthrene	ug/L			0.01	0.06	<0.01
Pyrene	ug/L			0.01	0.01	<0.01
Quinoline	ug/L			0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits				
Nitrobenzene-d5	%	50-140		106	114	68
2-Fluorobiphenyl	%	50-140		120	128	76
Terphenyl-d14	%	50-140		103	104	59

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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## Inorganic Chemistry (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

		SAMPLE DESCRIPTION:		ERK 1
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2016-06-18
Parameter	Unit	G / S	RDL	7662456
BOD (5)	mg/L	5	33	
pH	pH Units	NA	8.83	
Total Suspended Solids	mg/L	10	88	
Chemical Oxygen Demand	mg/L	25	335	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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## Inorganic Chemistry (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ERK 3		ERK 4		ERK 5	
		SAMPLE TYPE:	DATE SAMPLED:	Water		Water		Water	
				G / S	RDL	2016-06-18	7662484	RDL	2016-06-18
BOD (5)	mg/L		5	<5	5	<5		5	<5
Electrical Conductivity	uS/cm		2	524	2	1400		2	2500
pH	pH Units		NA	7.92	NA	7.77		NA	7.75
Total Suspended Solids	mg/L		10	1100	10	<10		10	21
Total Hardness (as CaCO <sub>3</sub> )	mg/L		0.5	136	0.5	359		0.5	582
Alkalinity (as CaCO <sub>3</sub> )	mg/L		5	65	5	52		5	38
Chloride	mg/L		0.20	98.6	0.50	273		1.0	712
Nitrate as N	mg/L		0.10	<0.10	0.25	<0.25		0.5	<0.5
Nitrite as N	mg/L		0.10	<0.10	0.25	<0.25		0.5	<0.5
Sulphate	mg/L		0.20	56.1	0.50	306		1.0	292
Ammonia as N	mg/L		0.02	0.08	0.02	<0.02		0.02	0.03
Chemical Oxygen Demand	mg/L		5	11	5	23		5	44
Phenols	mg/L		0.001	<0.001	0.001	<0.001		0.001	<0.001
Calcium	mg/L		0.05	34.1	0.10	98.4		0.25	125
Magnesium	mg/L		0.05	12.3	0.10	27.4		0.25	65.6
Sodium	mg/L		0.05	45.9	0.10	133		0.25	271
Potassium	mg/L		0.05	2.96	0.10	11.3		0.25	8.19
Total Arsenic	mg/L		0.500	<0.500	0.015	<0.015		0.015	<0.015
Total Cadmium	mg/L		0.10	<0.10	0.010	<0.010		0.010	<0.010
Total Chromium	mg/L		0.15	<0.15	0.015	<0.015		0.015	<0.015
Total Copper	mg/L		0.15	<0.15	0.015	<0.015		0.015	<0.015
Total Iron	mg/L		0.5	44.3	0.05	0.22		0.05	0.25
Total Lead	mg/L		0.10	<0.10	0.010	<0.010		0.010	<0.010
Total Mercury	mg/L		0.000015	0.000030	0.000015	<0.000015		0.000015	<0.000015
Total Nickel	mg/L		0.15	<0.15	0.015	<0.015		0.015	<0.015

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662484-7662532 Elevated RDLs indicate that samples were diluted prior to analyses in order to keep the analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instruments.

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## Lead (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

SAMPLE DESCRIPTION: ERK 2

SAMPLE TYPE: Water

DATE SAMPLED: 2016-06-18

Parameter	Unit	G / S	RDL
Lead	mg/L	0.001	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



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ATTENTION TO: Cameron Chadwick

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### Phenols (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

SAMPLE DESCRIPTION: ERK 2

SAMPLE TYPE: Water

DATE SAMPLED: 2016-06-18

7662475

Parameter

Unit

G / S

RDL

Parameter	Unit	G / S	RDL
Phenols	mg/L	0.001	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



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CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108384

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### Microbiology Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Lower	Upper	Lower		Recovery	Lower	Upper	Lower	Upper	Lower	Recovery	Lower	Upper

**Microbiological Analysis (water)**

Fecal Coliform 7662238 ND ND NA < 1

Comments: ND - Not Detected, NA - % RPD Not Applicable

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AGAT WORK ORDER: 16P108384

PROJECT: CFS EUREKA

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### Trace Organics Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Lower	Upper	

#### Oil and Grease (+Total) - water

Oil and Grease (animal/vegetable)	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	106%	70%	130%	107%	70%	130%	
Oil and Grease (mineral) in water	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	81%	70%	130%	83%	70%	130%	
Oil and Grease (Total) in water	1	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	94%	70%	130%	95%	70%	130%

#### BTEX - Water (P & T - GC/MS)

Benzene	7658536	< 0.20	< 0.20	NA	< 0.20	107%	60%	130%	111%	60%	130%	80%	60%	130%
Toluene	7658536	< 0.20	< 0.20	NA	< 0.20	95%	60%	130%	86%	60%	130%	90%	60%	130%
Ethylbenzene	7658536	< 0.10	< 0.10	NA	< 0.10	80%	60%	130%	92%	60%	130%	80%	60%	130%
m & p-Xylene	7658536	< 0.20	< 0.20	NA	< 0.20	92%	60%	130%	102%	60%	130%	82%	60%	130%
o-Xylene	7658536	< 0.10	< 0.10	NA	< 0.10	86%	60%	130%	96%	60%	130%	81%	60%	130%

#### O. Reg. 153(511) - PHCs F1 - F4 (Water)

Benzene	7660762	< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	100%	60%	130%	95%	50%	140%
Toluene	7660762	< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	104%	60%	130%	98%	50%	140%
Ethylbenzene	7660762	< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	97%	60%	130%	92%	50%	140%
Xylene Mixture	7660762	< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	99%	60%	130%	95%	50%	140%
F1 (C6 to C10)	7660762	< 25	< 25	NA	< 25	72%	60%	140%	77%	60%	140%	85%	60%	140%
F2 (C10 to C16)	7646357	< 100	< 100	NA	< 100	98%	60%	140%	65%	60%	140%	72%	60%	140%
F3 (C16 to C34)	7646357	< 100	< 100	NA	< 100	102%	60%	140%	92%	60%	140%	93%	60%	140%
F4 (C34 to C50)	7646357	< 100	< 100	NA	< 100	86%	60%	140%	71%	60%	140%	101%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.

When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

#### Polycyclic Aromatic Hydrocarbons in Water - (PAH)

1-Methylnaphthalene	1	7648333	0.01	0.02	NA	< 0.01	64%	50%	140%	71%	50%	140%	NA	50%	140%
2-Methylnaphthalene	1	7648333	0.04	0.05	NA	< 0.01	127%	50%	140%	70%	50%	140%	NA	50%	140%
Acenaphthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	124%	50%	140%	72%	50%	140%	NA	50%	140%
Acenaphthylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	119%	50%	140%	69%	50%	140%	NA	50%	140%
Acridine	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	53%	50%	140%	68%	50%	140%	NA	50%	140%
Anthracene	1	7648333	< 0.012	< 0.012	0.0%	< 0.012	116%	50%	140%	73%	50%	140%	NA	50%	140%
Benzo(a)anthracene	1	7648333	< 0.018	< 0.018	0.0%	< 0.018	121%	50%	140%	71%	50%	140%	NA	50%	140%
Benzo(a)pyrene	1	7648333	< 0.010	< 0.010	0.0%	< 0.010	76%	50%	140%	72%	50%	140%	NA	50%	140%
Benzo(b)fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	89%	50%	140%	72%	50%	140%	NA	50%	140%
Benzo(e)pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	89%	50%	140%	74%	50%	140%	NA	50%	140%
Benzo(ghi)perylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	94%	50%	140%	68%	50%	140%	NA	50%	140%
Benzo(k)fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	63%	50%	140%	63%	50%	140%	NA	50%	140%
Chrysene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	118%	50%	140%	70%	50%	140%	NA	50%	140%
Dibenzo(a,h)anthracene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	85%	50%	140%	68%	50%	140%	NA	50%	140%
Fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	127%	50%	140%	66%	50%	140%	NA	50%	140%
Fluorene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	120%	50%	140%	72%	50%	140%	NA	50%	140%
Indeno(1,2,3-cd)pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	80%	50%	140%	88%	50%	140%	NA	50%	140%

#### AGAT QUALITY ASSURANCE REPORT (V1)

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## Quality Assurance

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SAMPLED BY:

### Trace Organics Analysis (Continued)

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Lower	Upper	
Naphthalene	1	7648333	0.05	0.05	0.0%	< 0.01	124%	50%	140%	65%	50%	140%	NA	50%	140%	
Perylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	90%	50%	140%	77%	50%	140%	NA	50%	140%	
Phenanthrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	122%	50%	140%	65%	50%	140%	NA	50%	140%	
Pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	127%	50%	140%	67%	50%	140%	NA	50%	140%	
Quinoline	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	106%	50%	140%	64%	50%	140%	NA	50%	140%	

Comments: Matrix spike not available (NA), results based on blank spike recoveries.

RPD value not available (NA); results of the duplicates are under 5X the RDL and will not be calculated.

**Certified By:**



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108384

PROJECT: CFS EUREKA

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Water Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
							Lower	Upper		Lower	Upper		Lower	Upper	

#### Inorganic Chemistry (Water)

BOD (5) 7661414 <5 <5 NA < 5 101% 75% 125% NA NA

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

#### Phenols (Water)

Phenols 7662475 7662475 <0.001 <0.001 NA < 0.001 106% 90% 110% 102% 90% 110% 97% 80% 120%

#### Lead (Water)

Lead 7661113 <0.001 <0.001 NA < 0.001 96% 90% 110% 100% 90% 110% 99% 70% 130%

#### Inorganic Chemistry (Water)

BOD (5) 7661414 <5 <5 NA < 5 101% 75% 125% NA NA

Electrical Conductivity 7662456 7662456 2680 2690 0.4% < 2 103% 80% 120% NA NA

pH 7662456 7662456 8.83 8.97 1.6% NA 98% 90% 110% NA NA

Total Suspended Solids 7661309 <10 <10 NA < 10 98% 80% 120% NA NA

Alkalinity (as CaCO<sub>3</sub>) 7662456 7662456 144 146 1.4% < 5 94% 80% 120% NA NA

Chloride 7660639 100 97.9 2.1% < 0.50 106% 90% 110% 101% 90% 110% 102% 80% 120%

Nitrate as N 7660639 < 0.25 < 0.25 NA < 0.25 96% 90% 110% 103% 90% 110% 107% 80% 120%

Nitrite as N 7660639 < 0.25 < 0.25 NA < 0.25 NA 90% 110% 100% 90% 110% 97% 80% 120%

Sulphate 7660639 <0.50 <0.50 NA < 0.50 102% 90% 110% 106% 90% 110% 108% 80% 120%

Ammonia as N 7662456 0.05 0.06 NA < 0.02 109% 90% 110% 103% 90% 110% 99% 80% 120%

Chemical Oxygen Demand 7659312 <5 <5 NA < 5 91% 80% 120% 94% 90% 110% 102% 70% 130%

Phenols 7662475 7662475 <0.001 <0.001 NA < 0.001 106% 90% 110% 102% 90% 110% 97% 80% 120%

Calcium 7662484 7662484 34.1 34.1 0.0% < 0.05 100% 90% 110% 101% 90% 110% 100% 70% 130%

Magnesium 7662484 7662484 12.3 12.5 1.6% < 0.05 99% 90% 110% 100% 90% 110% 103% 70% 130%

Sodium 7662484 7662484 45.9 45.2 1.5% < 0.05 100% 90% 110% 101% 90% 110% 101% 70% 130%

Potassium 7662484 7662484 2.96 2.93 1.0% < 0.05 101% 90% 110% 101% 90% 110% 105% 70% 130%

Total Arsenic 7661307 <0.015 <0.015 NA < 0.005 99% 90% 110% 108% 80% 120% 108% 70% 130%

Total Cadmium 7661307 <0.010 <0.010 NA < 0.10 104% 90% 110% 108% 80% 120% 106% 70% 130%

Total Chromium 7661307 <0.015 <0.015 NA < 0.15 100% 90% 110% 111% 80% 120% 110% 70% 130%

Total Copper 7661307 0.023 0.024 NA < 0.15 106% 90% 110% 109% 80% 120% 115% 70% 130%

Total Iron 7661307 7.45 7.90 5.9% < 0.5 94% 90% 110% 111% 80% 120% 123% 70% 130%

Total Lead 7661307 <0.010 <0.010 NA < 0.10 99% 90% 110% 111% 80% 120% 105% 70% 130%

Total Mercury 7662238 <0. <0. NA < 0.000015 100% 90% 110% 102% 90% 110% 98% 80% 120%

Total Nickel 7661307 0.109 0.120 NA < 0.15 102% 90% 110% 113% 80% 120% 114% 70% 130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108384

PROJECT: CFS EUREKA

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Water Analysis (Continued)

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Lower	Upper	

**Certified By:**





## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: CFS EUREKA

SAMPLING SITE:

AGAT WORK ORDER: 16P108384

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Microbiology Analysis</b>			
Fecal Coliform	MIC-93-7000	SM 9222 D	MF/INCUBATOR



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108384

PROJECT: CFS EUREKA

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Trace Organics Analysis</b>			
Benzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Xylene Mixture (Total)	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Oil and Grease (animal/vegetable)	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (mineral) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (Total) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: CFS EUREKA

SAMPLING SITE:

AGAT WORK ORDER: 16P108384

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Water Analysis</b>			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Arsenic	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Cadmium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Chromium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Copper	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Iron	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Lead	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Total Nickel	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

**CLIENT NAME: DEFENCE CONSTRUCTION CANADA  
14 ALERT BLVD, 8 WING TRENTON  
ASTRA, ON K0K3W0  
(613) 392-2811**

**ATTENTION TO: Cameron Chadwick**

**PROJECT: ALERT**

**AGAT WORK ORDER: 16P118076**

**MICROBIOLOGY ANALYSIS REVIEWED BY: Inesa Alizarchyk, Inorganic Lab Supervisor**

**TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor**

**WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst**

**DATE REPORTED: Jul 28, 2016**

**PAGES (INCLUDING COVER): 12**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*NOTES**

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**



# Certificate of Analysis

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY: Kelsey Davidson

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

## Microbiological Analysis (water)

DATE RECEIVED: 2016-07-20

DATE REPORTED: 2016-07-28

SAMPLE DESCRIPTION: ALT 4

SAMPLE TYPE: Water

DATE SAMPLED: 2016-07-18

Parameter	Unit	G / S	RDL
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Fecal Coliform	CFU/100mL	2	16
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Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7720931 RDL >1 indicates dilutions of the sample.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY: Kelsey Davidson

## O. Reg. 153(511) - PHCs F1 - F4 (Water)

DATE RECEIVED: 2016-07-20

DATE REPORTED: 2016-07-28

Parameter	Unit	SAMPLE DESCRIPTION:	
		SAMPLE TYPE:	ALT 4
		DATE SAMPLED:	2016-07-18
		G / S	RDL
Benzene	µg/L	0.20	<0.20
Toluene	µg/L	0.20	<0.20
Ethylbenzene	µg/L	0.10	<0.10
Xylene Mixture	µg/L	0.20	<0.20
F1 (C6 to C10)	µg/L	25	<25
F1 (C6 to C10) minus BTEX	µg/L	25	<25
F2 (C10 to C16)	µg/L	100	<100
F3 (C16 to C34)	µg/L	100	<100
F4 (C34 to C50)	µg/L	100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	NA
<b>Surrogate</b>	<b>Unit</b>	<b>Acceptable Limits</b>	
Terphenyl	%	60-140	83

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7720931

The C6-C10 fraction is calculated using Toluene response factor.

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.

Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.

The chromatogram has returned to baseline by the retention time of nC50.

Total C6-C50 results are corrected for BTEX contributions.

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

nC6 and nC10 response factors are within 30% of Toluene response factor.

nC10, nC16 and nC34 response factors are within 10% of their average.

C50 response factor is within 70% of nC10 + nC16 nC34 average.

Linearity is within 15%.

Extraction and holding times were met for this sample.

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.

NA = Not Applicable

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

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MISSISSAUGA, ONTARIO  
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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY: Kelsey Davidson

## Oil and Grease (+Total) - water

DATE RECEIVED: 2016-07-20

DATE REPORTED: 2016-07-28

SAMPLE DESCRIPTION: ALT 4			
SAMPLE TYPE: Water			
DATE SAMPLED: 2016-07-18			
Parameter	Unit	G / S	RDL
Oil and Grease (animal/vegetable)	mg/L	0.5	<0.5
Oil and Grease (mineral) in water	mg/L	0.5	<0.5
Oil and Grease (Total) in water	mg/L	0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: 

**AGAT**

Laboratories

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

**Certificate of Analysis**

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

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 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

ATTENTION TO: Cameron Chadwick  
 SAMPLED BY:Kelsey Davidson

**Polycyclic Aromatic Hydrocarbons in Water - (PAH)**

DATE RECEIVED: 2016-07-20

DATE REPORTED: 2016-07-28

Parameter	Unit	SAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	ALT 4 Water 2016-07-18
1-Methylnaphthalene	ug/L	0.01	<0.01
2-Methylnaphthalene	ug/L	0.01	<0.01
Acenaphthene	ug/L	0.01	<0.01
Acenaphthylene	ug/L	0.01	<0.01
Acridine	ug/L	0.01	<0.01
Anthracene	ug/L	0.012	<0.012
Benzo(a)anthracene	ug/L	0.018	<0.018
Benzo(a)pyrene	ug/L	0.010	<0.010
Benzo(b)fluoranthene	ug/L	0.01	<0.01
Benzo(e)pyrene	ug/L	0.01	<0.01
Benzo(ghi)perylene	ug/L	0.01	<0.01
Benzo(k)fluoranthene	ug/L	0.01	<0.01
Chrysene	ug/L	0.01	<0.01
Dibenzo(a,h)anthracene	ug/L	0.01	<0.01
Fluoranthene	ug/L	0.01	<0.01
Fluorene	ug/L	0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.01	<0.01
Naphthalene	ug/L	0.01	<0.01
Perylene	ug/L	0.01	<0.01
Phenanthrene	ug/L	0.01	<0.01
Pyrene	ug/L	0.01	<0.01
Quinoline	ug/L	0.01	<0.01
Surrogate	Unit	Acceptable Limits	
Nitrobenzene-d5	%	50-140	91
2-Fluorobiphenyl	%	50-140	82
Terphenyl-d14	%	50-140	68

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

**Certified By:**



CLIENT NAME: DEFENCE CONSTRUCTION CANADA  
SAMPLING SITE:

# Certificate of Analysis

AGAT WORK ORDER: 16P118076  
PROJECT: ALERT

5835 COOPERS AVENUE  
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TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

ATTENTION TO: Cameron Chadwick  
SAMPLED BY:Kelsey Davidson

## Inorganic Chemistry - Surface Water Sample

DATE RECEIVED: 2016-07-20

DATE REPORTED: 2016-07-28

Parameter	Unit	SAMPLE DESCRIPTION:	
		SAMPLE TYPE:	ALT 4
		DATE SAMPLED:	2016-07-18
		G / S	RDL
BOD (5)	mg/L	5	<5
Electrical Conductivity	uS/cm	2	460
pH	pH Units	NA	7.99
Total Suspended Solids	mg/L	10	270
Total Hardness (as CaCO <sub>3</sub> )	mg/L	0.5	151
Alkalinity (as CaCO <sub>3</sub> )	mg/L	5	86
Nitrate as N	mg/L	0.05	1.70
Nitrite as N	mg/L	0.05	<0.05
Sulphate	mg/L	0.10	72.5
Ammonia as N	mg/L	0.02	0.99
Chemical Oxygen Demand	mg/L	5	<5
Phenols	mg/L	0.001	<0.001
Calcium	mg/L	0.05	43.5
Magnesium	mg/L	0.05	10.3
Sodium	mg/L	0.05	20.1
Potassium	mg/L	0.05	3.87
Total Arsenic	mg/L	0.001	0.006
Total Cadmium	mg/L	0.00002	0.00010
Total Chromium	mg/L	0.002	0.009
Total Copper	mg/L	0.002	0.012
Total Iron	mg/L	0.010	7.42
Total Lead	mg/L	0.001	0.007
Total Mercury	mg/L	0.00002	<0.00002
Total Nickel	mg/L	0.003	0.014

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY: Kelsey Davidson

### Microbiology Analysis

RPT Date: Jul 28, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Lower	Upper	Lower		Recovery	Lower	Upper	Lower	Upper	Lower	Recovery	Lower	Upper

**Microbiological Analysis (water)**

Fecal Coliform 7719092 ND ND NA < 1

Comments: ND - Not Detected, NA - % RPD Not Applicable

**Certified By:**



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY: Kelsey Davidson

### Trace Organics Analysis

RPT Date: Jul 28, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower			Lower	Upper

#### Oil and Grease (+Total) - water

Oil and Grease (animal/vegetable)	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	105%	70%	130%	103%	70%	130%
Oil and Grease (mineral) in water	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	78%	70%	130%	77%	70%	130%
Oil and Grease (Total) in water	TW	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	92%	70%	130%	90%	70%	130%

#### O. Reg. 153(511) - PHCs F1 - F4 (Water)

Benzene	7718372	< 0.2	< 0.2	NA	< 0.20	92%	50%	140%	79%	60%	130%	100%	50%	140%
Toluene	7718372	< 0.2	< 0.2	NA	< 0.20	107%	50%	140%	80%	60%	130%	107%	50%	140%
Ethylbenzene	7718372	< 0.1	< 0.1	NA	< 0.10	109%	50%	140%	81%	60%	130%	113%	50%	140%
Xylene Mixture	7718372	< 0.2	< 0.2	NA	< 0.20	112%	50%	140%	77%	60%	130%	113%	50%	140%
F1 (C6 to C10)	7718372	< 25	< 25	NA	< 25	119%	60%	140%	104%	60%	140%	108%	60%	140%
F2 (C10 to C16)	7703296	< 10	< 10	NA	< 100	100%	60%	140%	101%	60%	140%	91%	60%	140%
F3 (C16 to C34)	7703296	< 50	< 50	NA	< 100	103%	60%	140%	89%	60%	140%	97%	60%	140%
F4 (C34 to C50)	7703296	< 50	< 50	NA	< 100	88%	60%	140%	102%	60%	140%	90%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.

When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

#### Polycyclic Aromatic Hydrocarbons in Water - (PAH)

1-Methylnaphthalene	1	7649918	1.71	1.46	15.8%	< 0.01	78%	50%	140%	72%	50%	140%	NA	50%	140%
2-Methylnaphthalene	1	7649918	0.92	0.77	17.8%	< 0.01	124%	50%	140%	69%	50%	140%	71%	50%	140%
Acenaphthene	1	7649918	0.11	0.07	44.4%	< 0.01	126%	50%	140%	71%	50%	140%	72%	50%	140%
Acenaphthylene	1	7649918	0.09	0.07	25.0%	< 0.01	107%	50%	140%	67%	50%	140%	70%	50%	140%
Acridine	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	52%	50%	140%	73%	50%	140%	78%	50%	140%
Anthracene	1	7649918	0.01	0.02	NA	< 0.012	104%	50%	140%	68%	50%	140%	74%	50%	140%
Benzo(a)anthracene	1	7649918	< 0.018	< 0.018	0.0%	< 0.018	93%	50%	140%	69%	50%	140%	80%	50%	140%
Benzo(a)pyrene	1	7649918	< 0.010	< 0.010	0.0%	< 0.010	61%	50%	140%	69%	50%	140%	75%	50%	140%
Benzo(b)fluoranthene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	79%	50%	140%	69%	50%	140%	92%	50%	140%
Benzo(e)pyrene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	84%	50%	140%	70%	50%	140%	79%	50%	140%
Benzo(ghi)perylene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	106%	50%	140%	78%	50%	140%	55%	50%	140%
Benzo(k)fluoranthene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	72%	50%	140%	68%	50%	140%	71%	50%	140%
Chrysene	1	7649918	0.02	0.02	NA	< 0.01	117%	50%	140%	70%	50%	140%	74%	50%	140%
Dibenzo(a,h)anthracene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	84%	50%	140%	85%	50%	140%	75%	50%	140%
Fluoranthene	1	7649918	0.03	0.05	NA	< 0.01	115%	50%	140%	74%	50%	140%	83%	50%	140%
Fluorene	1	7649918	0.07	0.06	15.4%	< 0.01	117%	50%	140%	71%	50%	140%	74%	50%	140%
Indeno(1,2,3-cd)pyrene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	67%	50%	140%	68%	50%	140%	66%	50%	140%
Naphthalene	1	7649918	7.91	5.90	29.1%	< 0.01	124%	50%	140%	66%	50%	140%	71%	50%	140%
Perylene	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	97%	50%	140%	74%	50%	140%	75%	50%	140%
Phenanthrene	1	7649918	0.03	0.04	NA	< 0.01	123%	50%	140%	66%	50%	140%	69%	50%	140%
Pyrene	1	7649918	0.02	0.04	NA	< 0.01	114%	50%	140%	73%	50%	140%	81%	50%	140%
Quinoline	1	7649918	< 0.01	< 0.01	0.0%	< 0.01	111%	50%	140%	78%	50%	140%	78%	50%	140%



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY: Kelsey Davidson

### Trace Organics Analysis (Continued)

RPT Date: Jul 28, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits	Recovery	Acceptable Limits		Recovery	Acceptable Limits		
							Lower	Upper		Lower	Upper		Lower	Upper	

Comments: RPD value not available (NA); results of the duplicates are under 5X the RDL and will not be calculated.

**Certified By:** 



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P118076

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY: Kelsey Davidson

### Water Analysis

RPT Date: Jul 28, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Upper		

#### Inorganic Chemistry - Surface Water Sample

BOD (5)	7721336	107	107	0.0%	< 5	101%	75%	125%	NA			NA		
Electrical Conductivity	7721021	416	413	0.7%	< 2	107%	80%	120%	NA			NA		
pH	7721021	7.63	7.60	0.4%	NA	101%	90%	110%	NA			NA		
Total Suspended Solids	7722637	77	85	9.9%	< 10	100%	80%	120%	NA			NA		
Alkalinity (as CaCO <sub>3</sub> )	7721021	159	150	5.8%	< 5	103%	80%	120%	NA			NA		
Nitrate as N	7723468	<0.5	<0.5	NA	< 0.05	103%	90%	110%	95%	90%	110%	112%	80%	120%
Nitrite as N	7723468	<0.5	<0.5	NA	< 0.05	NA	90%	110%	97%	90%	110%	96%	80%	120%
Sulphate	7723468	114	115	0.9%	< 0.10	99%	90%	110%	105%	90%	110%	107%	80%	120%
Ammonia as N	7726271	0.80	0.80	0.0%	< 0.02	99%	90%	110%	99%	90%	110%	106%	80%	120%
Chemical Oxygen Demand	7722383	96	89	7.6%	< 5	100%	80%	120%	96%	90%	110%	92%	70%	130%
Phenols	7720406	<0.001	<0.001	NA	< 0.001	104%	90%	110%	103%	90%	110%	103%	80%	120%
Calcium	7722526	44.0	44.3	0.7%	< 0.05	103%	90%	110%	101%	90%	110%	101%	70%	130%
Magnesium	7722526	17.4	17.5	0.6%	< 0.05	97%	90%	110%	95%	90%	110%	100%	70%	130%
Sodium	7722526	86.8	86.8	0.0%	< 0.05	103%	90%	110%	103%	90%	110%	108%	70%	130%
Potassium	7722526	23.5	23.5	0.0%	< 0.05	103%	90%	110%	103%	90%	110%	112%	70%	130%
Total Arsenic	7722399	0.004	0.004	NA	< 0.001	103%	90%	110%	100%	80%	120%	104%	70%	130%
Total Cadmium	7722399	<0.00002	<0.00002	NA	< 0.00002	102%	90%	110%	100%	80%	120%	103%	70%	130%
Total Chromium	7722399	<0.002	<0.002	NA	< 0.002	102%	90%	110%	105%	80%	120%	104%	70%	130%
Total Copper	7722399	0.042	0.047	11.2%	< 0.002	103%	90%	110%	102%	80%	120%	106%	70%	130%
Total Lead	7722399	0.003	0.003	NA	< 0.001	109%	90%	110%	108%	80%	120%	110%	70%	130%
Total Mercury	7726271	<0.00002	<0.00002	NA	< 0.00002	102%	90%	110%	101%	90%	110%	100%	80%	120%
Total Nickel	7722399	0.019	0.018	5.4%	< 0.003	101%	90%	110%	103%	80%	120%	98%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Certified By:**



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: ALERT

SAMPLING SITE:

AGAT WORK ORDER: 16P118076

ATTENTION TO: Cameron Chadwick

SAMPLED BY: Kelsey Davidson

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Microbiology Analysis</b>			
Fecal Coliform	MIC-93-7000	SM 9222 D	MF/INCUBATOR
<b>Trace Organics Analysis</b>			
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Oil and Grease (animal/vegetable)	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (mineral) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (Total) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: ALERT

SAMPLING SITE:

AGAT WORK ORDER: 16P118076

ATTENTION TO: Cameron Chadwick

SAMPLED BY: Kelsey Davidson

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Water Analysis</b>			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Arsenic	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Cadmium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Chromium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Copper	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Iron	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Lead	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Total Nickel	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS

**CLIENT NAME: DEFENCE CONSTRUCTION CANADA  
14 ALERT BLVD, 8 WING TRENTON  
ASTRA, ON K0K3W0  
(613) 392-2811**

**ATTENTION TO: Cameron Chadwick**

**PROJECT: CFS ALERT**

**AGAT WORK ORDER: 16P108383**

**MICROBIOLOGY ANALYSIS REVIEWED BY: Inesa Alizarchyk, Inorganic Lab Supervisor**

**TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor**

**WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst**

**DATE REPORTED: Jul 11, 2016**

**PAGES (INCLUDING COVER): 16**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*NOTES**

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## Microbiological Analysis (water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 4	ALT 5	ALT 6
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water
Fecal Coliform	CFU/100mL	G / S	RDL	7662238	7662263	RDL 7662277
				2	ND	ND
					100	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662238-7662277 RDL >1 indicates dilutions of the sample.

ND - Not Detected.

The time from sample collection to initiation of analysis exceeded 48 hours. Review data with discretion.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## BTEX - Water (P & T - GC/MS)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 8	ALT 8.1	ALT 9	ALT 10			
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water			
				G / S	RDL	2016-06-20	7662291	2016-06-20	7662302	2016-06-20
Benzene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	µg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Xylene Mixture (Total)	µg/L			0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits								
Toluene-d8	% Recovery	60-130		114	111	113	114			
4-Bromofluorobenzene	% Recovery	70-130		102	100	98	96			

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662291-7662360 Results relate only to the items tested.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

5835 COOPERS AVENUE  
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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## O. Reg. 153(511) - PHCs F1 - F4 (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 4	ALT 5	ALT 6
		SAMPLE TYPE:		Water	Water	Water
		G / S	RDL	2016-06-20	2016-06-20	2016-06-20
Benzene	µg/L		0.20	<0.20	<0.20	<0.20
Toluene	µg/L		0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L		0.10	<0.10	<0.10	<0.10
Xylene Mixture	µg/L		0.20	<0.20	<0.20	<0.20
F1 (C6 to C10)	µg/L		25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25	<25	<25
F2 (C10 to C16)	µg/L		100	<100	<100	<100
F3 (C16 to C34)	µg/L		100	<100	<100	<100
F4 (C34 to C50)	µg/L		100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA
Surrogate	Unit	Acceptable Limits				
Terphenyl	%	60-140		88	101	74

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662238-7662277 The C6-C10 fraction is calculated using Toluene response factor.

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.

Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.

The chromatogram has returned to baseline by the retention time of nC50.

Total C6-C50 results are corrected for BTEX contributions.

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

nC6 and nC10 response factors are within 30% of Toluene response factor.

nC10, nC16 and nC34 response factors are within 10% of their average.

C50 response factor is within 70% of nC10 + nC16 nC34 average.

Linearity is within 15%.

Extraction and holding times were met for this sample.

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.

NA = Not Applicable

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## Oil and Grease (+Total) - water

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 4	ALT 5	ALT 6	ALT 8	ALT 8.1	ALT 9	ALT 10							
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water	Water	Water	Water							
				G / S	RDL	2016-06-20	7662238	2016-06-20	7662263	2016-06-20	7662277	2016-06-20	7662291	2016-06-20	7662302	2016-06-20	7662310
Oil and Grease (animal/vegetable)	mg/L			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Oil and Grease (mineral) in water	mg/L			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oil and Grease (Total) in water	mg/L			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: 



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

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SAMPLING SITE:

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SAMPLED BY:

## Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 4	ALT 5	ALT 6
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water
				G / S	RDL	2016-06-20
1-Methylnaphthalene	ug/L			0.01	0.02	0.01
2-Methylnaphthalene	ug/L			0.01	0.05	0.04
Acenaphthene	ug/L			0.01	<0.01	<0.01
Acenaphthylene	ug/L			0.01	<0.01	<0.01
Acridine	ug/L			0.01	<0.01	<0.01
Anthracene	ug/L			0.012	<0.012	<0.012
Benzo(a)anthracene	ug/L			0.018	<0.018	<0.018
Benzo(a)pyrene	ug/L			0.010	<0.010	<0.010
Benzo(b)fluoranthene	ug/L			0.01	<0.01	<0.01
Benzo(e)pyrene	ug/L			0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/L			0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/L			0.01	<0.01	<0.01
Chrysene	ug/L			0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	ug/L			0.01	<0.01	<0.01
Fluoranthene	ug/L			0.01	<0.01	<0.01
Fluorene	ug/L			0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/L			0.01	<0.01	<0.01
Naphthalene	ug/L			0.01	0.06	0.05
Perylene	ug/L			0.01	<0.01	<0.01
Phenanthrene	ug/L			0.01	<0.01	<0.01
Pyrene	ug/L			0.01	<0.01	<0.01
Quinoline	ug/L			0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits				
Nitrobenzene-d5	%	50-140	99	90	88	
2-Fluorobiphenyl	%	50-140	112	102	96	
Terphenyl-d14	%	50-140	91	79	74	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: 



**AGAT**

## Laboratories

# Certificate of Analysis

**AGAT WORK ORDER: 16P108383**

## PROJECT: CFS ALERT

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**CLIENT NAME: DEFENCE CONSTRUCTION CANADA**

**SAMPLING SITE:**

**ATTENTION TO: Cameron Chadwick**

**SAMPLED BY:**

## Inorganic Chemistry (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 4	ALT 5	ALT 6
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:	G / S	2016-06-20	2016-06-20	2016-06-20
Parameter	Unit	G / S	RDL	7662238	7662263	7662277
BOD (5)	mg/L		5	<5	<5	<5
Electrical Conductivity	uS/cm		2	230	216	334
pH	pH Units		NA	7.86	7.80	7.83
Total Suspended Solids	mg/L		10	21	16	3110
Total Hardness (as CaCO <sub>3</sub> )	mg/L		0.5	89.8	82.2	98.2
Alkalinity (as CaCO <sub>3</sub> )	mg/L		5	72	59	57
Chloride	mg/L		0.10	13.9	5.48	27.4
Nitrate as N	mg/L		0.05	0.17	<0.05	0.38
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Sulphate	mg/L		0.10	20.2	38.6	66.8
Ammonia as N	mg/L		0.02	<0.02	<0.02	<0.02
Chemical Oxygen Demand	mg/L		5	8	8	8
Phenols	mg/L		0.001	<0.001	<0.001	<0.001
Calcium	mg/L		0.05	29.6	27.1	29.1
Magnesium	mg/L		0.05	3.87	3.52	6.21
Sodium	mg/L		0.05	7.93	7.84	19.3
Potassium	mg/L		0.05	1.59	2.83	10.3
Total Arsenic	mg/L		0.001	0.001	0.001	0.033
Total Cadmium	mg/L		0.00002	<0.00002	0.00010	0.00069
Total Chromium	mg/L		0.002	0.004	<0.002	0.094
Total Copper	mg/L		0.002	0.003	0.004	0.080
Total Iron	mg/L		0.010	0.662	0.865	75.1
Total Lead	mg/L		0.001	0.001	0.001	0.045
Total Mercury	mg/L		0.00002	<0.00002	<0.00002	0.00008
Total Nickel	mg/L		0.003	<0.003	0.003	0.128
Digestion					Y	Y

**Comments:** RDL - Reported Detection Limit; G / S - Guideline / Standard

***Certified By:***

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**EGAT** CERTIFICATE OF ANALYSIS (V1)

*Results relate only to the items tested and to all the items tested*



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

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SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## Lead (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 8	ALT 8.1	ALT 9	ALT 10
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water
Lead	mg/L	G / S	RDL	7662291	7662302	7662310	7662360
Lead	mg/L	0.001		<0.001	<0.001	<0.001	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P108383

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SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## Phenols (Water)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-07-11

Parameter	Unit	SAMPLE DESCRIPTION:		ALT 8	ALT 8.1	ALT 9	ALT 10
		SAMPLE TYPE:	DATE SAMPLED:	Water	Water	Water	Water
Phenols	mg/L	G / S	RDL	7662291	7662302	7662310	7662360
				0.001	<0.001	<0.001	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: 



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Microbiology Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Lower	Upper	Lower		Recovery	Lower	Upper	Lower	Upper	Lower	Recovery	Lower	Upper

**Microbiological Analysis (water)**

Fecal Coliform 7662238 7662238 ND ND NA < 1

Comments: ND - Not Detected, NA - % RPD Not Applicable

**Certified By:**



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Trace Organics Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Lower	Upper	
<b>BTEX - Water (P &amp; T - GC/MS)</b>																
Benzene	7658536		< 0.20	< 0.20	NA	< 0.20	107%	60%	130%	111%	60%	130%	80%	60%	130%	
Toluene	7658536		< 0.20	< 0.20	NA	< 0.20	95%	60%	130%	86%	60%	130%	90%	60%	130%	
Ethylbenzene	7658536		< 0.10	< 0.10	NA	< 0.10	80%	60%	130%	92%	60%	130%	80%	60%	130%	
m & p-Xylene	7658536		< 0.20	< 0.20	NA	< 0.20	92%	60%	130%	102%	60%	130%	82%	60%	130%	
o-Xylene	7658536		< 0.10	< 0.10	NA	< 0.10	86%	60%	130%	96%	60%	130%	81%	60%	130%	
<b>O. Reg. 153(511) - PHCs F1 - F4 (Water)</b>																
Benzene	7660762		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	100%	60%	130%	95%	50%	140%	
Toluene	7660762		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	104%	60%	130%	98%	50%	140%	
Ethylbenzene	7660762		< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	97%	60%	130%	92%	50%	140%	
Xylene Mixture	7660762		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	99%	60%	130%	95%	50%	140%	
F1 (C6 to C10)	7660762		< 25	< 25	NA	< 25	72%	60%	140%	77%	60%	140%	85%	60%	140%	
F2 (C10 to C16)	7646357		< 100	< 100	NA	< 100	98%	60%	140%	65%	60%	140%	72%	60%	140%	
F3 (C16 to C34)	7646357		< 100	< 100	NA	< 100	102%	60%	140%	92%	60%	140%	93%	60%	140%	
F4 (C34 to C50)	7646357		< 100	< 100	NA	< 100	86%	60%	140%	71%	60%	140%	101%	60%	140%	
<b>Oil and Grease (+Total) - water</b>																
Oil and Grease (animal/vegetable)	TW		< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	106%	70%	130%	107%	70%	130%	
Oil and Grease (mineral) in water	TW		< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	81%	70%	130%	83%	70%	130%	
Oil and Grease (Total) in water	TW		< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	94%	70%	130%	95%	70%	130%	
<b>Polycyclic Aromatic Hydrocarbons in Water - (PAH)</b>																
1-Methylnaphthalene	1	7648333	0.01	0.02	NA	< 0.01	64%	50%	140%	71%	50%	140%	NA	50%	140%	
2-Methylnaphthalene	1	7648333	0.04	0.05	NA	< 0.01	127%	50%	140%	70%	50%	140%	NA	50%	140%	
Acenaphthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	124%	50%	140%	72%	50%	140%	NA	50%	140%	
Acenaphthylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	119%	50%	140%	69%	50%	140%	NA	50%	140%	
Acridine	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	53%	50%	140%	68%	50%	140%	NA	50%	140%	
Anthracene	1	7648333	< 0.012	< 0.012	0.0%	< 0.012	116%	50%	140%	73%	50%	140%	NA	50%	140%	
Benzo(a)anthracene	1	7648333	< 0.018	< 0.018	0.0%	< 0.018	121%	50%	140%	71%	50%	140%	NA	50%	140%	
Benzo(a)pyrene	1	7648333	< 0.010	< 0.010	0.0%	< 0.010	76%	50%	140%	72%	50%	140%	NA	50%	140%	
Benzo(b)fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	89%	50%	140%	72%	50%	140%	NA	50%	140%	
Benzo(e)pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	89%	50%	140%	74%	50%	140%	NA	50%	140%	
Benzo(ghi)perylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	94%	50%	140%	68%	50%	140%	NA	50%	140%	
Benzo(k)fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	63%	50%	140%	63%	50%	140%	NA	50%	140%	
Chrysene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	118%	50%	140%	70%	50%	140%	NA	50%	140%	
Dibenzo(a,h)anthracene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	85%	50%	140%	68%	50%	140%	NA	50%	140%	
Fluoranthene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	127%	50%	140%	66%	50%	140%	NA	50%	140%	
Fluorene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	120%	50%	140%	72%	50%	140%	NA	50%	140%	
Indeno(1,2,3-cd)pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	80%	50%	140%	88%	50%	140%	NA	50%	140%	
Naphthalene	1	7648333	0.05	0.05	0.0%	< 0.01	124%	50%	140%	65%	50%	140%	NA	50%	140%	
Perylene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	90%	50%	140%	77%	50%	140%	NA	50%	140%	



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Trace Organics Analysis (Continued)

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Phenanthrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	122%	50%	140%	65%	50%	140%	NA	50%	140%	
Pyrene	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	127%	50%	140%	67%	50%	140%	NA	50%	140%	
Quinoline	1	7648333	< 0.01	< 0.01	0.0%	< 0.01	106%	50%	140%	64%	50%	140%	NA	50%	140%	

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.

When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Matrix spike not available (NA), results based on blank spike recoveries.

RPD value not available (NA); results of the duplicates are under 5X the RDL and will not be calculated.

**Certified By:**



## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108383

PROJECT: CFS ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Water Analysis

RPT Date: Jul 11, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower			Lower	Upper
<b>Lead (Water)</b>																
Lead	7661113		<0.001	<0.001	NA	< 0.001	96%	90%	110%	100%	90%	110%	99%	70%	130%	
<b>Inorganic Chemistry (Water)</b>																
BOD (5)	7663438	13200	13200	0.0%	< 5	101%	75%	125%	NA				NA			
Electrical Conductivity	7664229	649	649	0.0%	< 2	105%	80%	120%	NA				NA			
pH	7664229	6.87	6.86	0.1%	NA	98%	90%	110%	NA				NA			
Total Suspended Solids	7664229	100	106	5.8%	< 10	98%	80%	120%	NA				NA			
Alkalinity (as CaCO <sub>3</sub> )	7664229	46	47	2.2%	< 5	100%	80%	120%	NA				NA			
Chloride	7662484	95.1	103	8.0%	< 0.10	93%	90%	110%	104%	90%	110%	101%	80%	120%		
Nitrate as N	7662484	<0.25	<0.25	NA	< 0.05	94%	90%	110%	95%	90%	110%	103%	80%	120%		
Nitrite as N	7662484	<0.25	<0.25	NA	< 0.05	NA	90%	110%	95%	90%	110%	103%	80%	120%		
Sulphate	7662484	56.7	55.4	2.3%	< 0.10	101%	90%	110%	99%	90%	110%	106%	80%	120%		
Ammonia as N	7664445	0.10	0.09	NA	< 0.02	107%	90%	110%	102%	90%	110%	93%	80%	120%		
Chemical Oxygen Demand	7662263	7662263	8	9	NA	< 5	91%	80%	120%	94%	90%	110%	102%	70%	130%	
Phenols	7662238	7662238	<0.001	<0.001	NA	< 0.001	106%	90%	110%	102%	90%	110%	97%	80%	120%	
Calcium	7662484	34.1	34.1	0.0%	< 0.05	100%	90%	110%	101%	90%	110%	100%	70%	130%		
Magnesium	7662484	12.3	12.5	1.6%	< 0.05	99%	90%	110%	100%	90%	110%	103%	70%	130%		
Sodium	7662484	45.9	45.2	1.5%	< 0.05	100%	90%	110%	101%	90%	110%	101%	70%	130%		
Potassium	7662484	2.96	2.93	1.0%	< 0.05	101%	90%	110%	101%	90%	110%	105%	70%	130%		
Total Arsenic	7661307	0.011	0.011	0.0%	< 0.001	99%	90%	110%	108%	80%	120%	108%	70%	130%		
Total Cadmium	7661307	0.00013	0.00014	7.4%	< 0.00002	104%	90%	110%	108%	80%	120%	106%	70%	130%		
Total Chromium	7661307	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	111%	80%	120%	110%	70%	130%		
Total Copper	7661307	0.022	0.024	8.7%	< 0.002	106%	90%	110%	109%	80%	120%	115%	70%	130%		
Total Iron	7661307	7.45	7.90	5.9%	< 0.010	94%	90%	110%	111%	80%	120%	123%	70%	130%		
Total Lead	7661307	< 0.001	< 0.001	NA	< 0.001	99%	90%	110%	111%	80%	120%	105%	70%	130%		
Total Mercury	7662238	7662238	<0.00002	<0.00002	NA	< 0.00002	100%	90%	110%	102%	90%	110%	98%	80%	120%	
Total Nickel	1	0.109	0.120	9.6%	< 0.003	102%	90%	110%	113%	80%	120%	114%	70%	130%		

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Certified By:**



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: CFS ALERT

SAMPLING SITE:

AGAT WORK ORDER: 16P108383

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Microbiology Analysis</b>			
Fecal Coliform	MIC-93-7000	SM 9222 D	MF/INCUBATOR



## Method Summary

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PROJECT: CFS ALERT

SAMPLING SITE:

AGAT WORK ORDER: 16P108383

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Trace Organics Analysis</b>			
Benzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Xylene Mixture (Total)	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Oil and Grease (animal/vegetable)	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (mineral) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
Oil and Grease (Total) in water	VOL-91- 5011	SM 5520 & EPA SW846 3510C & EPA 1664	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

PROJECT: CFS ALERT

SAMPLING SITE:

AGAT WORK ORDER: 16P108383

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Water Analysis</b>			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Arsenic	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Cadmium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Chromium	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Copper	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Iron	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Lead	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Total Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Total Nickel	MET-93-6103	EPA SW-846 3010A & 6020A	ICP-MS
Digestion	MET-93-6103	EPA SW-846 3010A	SPECTROPHOTOMETER
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



**CLIENT NAME: DEFENCE CONSTRUCTION CANADA  
14 ALERT BLVD, 8 WING TRENTON  
ASTRA, ON K0K3W0  
(613) 392-2811**

**ATTENTION TO: Cameron Chadwick**

**PROJECT: ALERT**

**AGAT WORK ORDER: 16P108381**

**TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist**

**DATE REPORTED: Jun 30, 2016**

**PAGES (INCLUDING COVER): 5**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*NOTES**

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**



# Certificate of Analysis

AGAT WORK ORDER: 16P108381

PROJECT: ALERT

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## BTEX - Soil - (P & T - GC/MS)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-06-30

Parameter	Unit	SAMPLE DESCRIPTION:		NAP-02	NAP-03	NAP-04	NAP-05
		SAMPLE TYPE:	DATE SAMPLED:	Soil	Soil	Soil	Soil
				G / S	RDL	2016-06-18	2016-06-18
Benzene	µg/g			0.002	<0.002	<0.002	<0.002
Toluene	µg/g			0.002	<0.002	<0.002	<0.002
Ethylbenzene	µg/g			0.002	<0.002	<0.002	<0.002
m & p-Xylene	µg/g			0.002	<0.002	<0.002	<0.002
o-Xylene	µg/g			0.002	<0.002	<0.002	<0.002
Xylene Mixture (Total)	µg/g			0.002	<0.002	<0.002	<0.002
Moisture Content	%			0.1	13.2	13.1	15.8
Surrogate	Unit	Acceptable Limits					
Toluene-d8	% Recovery	60-130		101	96	97	96
4-Bromofluorobenzene	% Recovery	70-130		117	96	90	96

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

7662330-7662339 Results are based on the dry weight of the soil.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 16P108381

PROJECT: ALERT

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CANADA L4Z 1Y2  
TEL (905)712-5100  
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<http://www.agatlabs.com>

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

SAMPLING SITE:

ATTENTION TO: Cameron Chadwick

SAMPLED BY:

## PHCs F1 - F4 (Soil)

DATE RECEIVED: 2016-06-23

DATE REPORTED: 2016-06-30

Parameter	Unit	SAMPLE DESCRIPTION:		NAP-01	NAP-02	NAP-03	NAP-04	NAP-05
		SAMPLE TYPE:	DATE SAMPLED:	Soil	Soil	Soil	Soil	Soil
				G / S	RDL	2016-06-18	2016-06-18	2016-06-18
Benzene	µg/g			0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g			0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g			0.05	0.09	<0.05	<0.05	<0.05
Xylene Mixture	µg/g			0.05	0.83	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g			5	81	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g			5	80	<5	<5	<5
F2 (C10 to C16)	µg/g			10	640	<10	53	<10
F3 (C16 to C34)	µg/g			50	<50	59	53	<50
F4 (C34 to C50)	µg/g			50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g			50	NA	NA	NA	NA
Moisture Content	%			0.1	17.2	13.2	13.1	15.8
Surrogate	Unit	Acceptable Limits						
Terphenyl	%	60-140		89	77	110	110	89

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7662303-7662339 Results are based on sample dry weight.

The C6-C10 fraction is calculated using Toluene response factor.

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.

Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.

The chromatogram has returned to baseline by the retention time of nC50.

Total C6 - C50 results are corrected for BTEX contributions.

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

nC6 and nC10 response factors are within 30% of Toluene response factor.

nC10, nC16 and nC34 response factors are within 10% of their average.

C50 response factor is within 70% of nC10 + nC16 + nC34 average.

Linearity is within 15%.

Extraction and holding times were met for this sample.

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

The soil sample was prepared in the lab using the Methanol extraction technique. The sample was not field preserved with methanol and an Encore was not provided for analysis.

Quality Control Data is available upon request.

Certified By:

**AGAT**

Laboratories

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
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FAX (905)712-5122  
<http://www.agatlabs.com>

## Quality Assurance

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108381

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

### Trace Organics Analysis

RPT Date: Jun 30, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Lower	Upper	
<b>PHCs F1 - F4 (Soil)</b>																
Benzene	7657721		< 0.02	< 0.02	NA	< 0.02	109%	60%	130%	118%	60%	130%	129%	60%	130%	
Toluene	7657721		< 0.08	< 0.08	NA	< 0.08	101%	60%	130%	112%	60%	130%	123%	60%	130%	
Ethylbenzene	7657721		< 0.05	< 0.05	NA	< 0.05	90%	60%	130%	105%	60%	130%	113%	60%	130%	
Xylene Mixture	7657721		< 0.05	< 0.05	NA	< 0.05	83%	60%	130%	101%	60%	130%	106%	60%	130%	
F1 (C6 to C10)	7657721		< 5	< 5	NA	< 5	71%	60%	130%	87%	85%	115%	87%	70%	130%	
F2 (C10 to C16)	7661012		< 10	< 10	NA	< 10	98%	60%	130%	99%	80%	120%	95%	70%	130%	
F3 (C16 to C34)	7661012		< 50	< 50	NA	< 50	99%	60%	130%	86%	80%	120%	88%	70%	130%	
F4 (C34 to C50)	7661012		< 50	< 50	NA	< 50	81%	60%	130%	82%	80%	120%	99%	70%	130%	
<b>BTEX - Soil - (P &amp; T - GC/MS)</b>																
Benzene	7662339	7662339	< 0.002	< 0.002	NA	< 0.002	97%	60%	130%	115%	60%	130%	115%	60%	130%	
Toluene	7662339	7662339	< 0.002	< 0.002	NA	< 0.002	103%	60%	130%	118%	60%	130%	120%	60%	130%	
Ethylbenzene	7662339	7662339	< 0.002	< 0.002	NA	< 0.002	106%	60%	130%	103%	60%	130%	117%	60%	130%	
m & p-Xylene	7662339	7662339	< 0.002	< 0.002	NA	< 0.002	111%	60%	130%	110%	60%	130%	124%	60%	130%	
o-Xylene	7662339	7662339	< 0.002	< 0.002	NA	< 0.002	118%	60%	130%	113%	60%	130%	115%	60%	130%	

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

**Certified By:**



## Method Summary

CLIENT NAME: DEFENCE CONSTRUCTION CANADA

AGAT WORK ORDER: 16P108381

PROJECT: ALERT

ATTENTION TO: Cameron Chadwick

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Trace Organics Analysis</b>			
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture (Total)	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Moisture Content		MOE E3139	BALANCE
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID