July 31, 2014

Bhabesh Roy Government of Nunavut PO BOX 379 Pond Inlet, NU X0A 0S0

Dear Bhabesh Roy,

Caduceon Environmental Laboratories looks forward to aiding Hamlet of Pond Inlet in their environmental analysis. The Caduceon staff has reviewed the PDF document entitled "QA/QC for the Wastewater Treatment Facility of Pond Inlet" that was provided to our Ottawa Laboratory.

Our staff has read and understands the requirements found within this document and see no issues with providing you quality service and analysis. In addition, it has been noted that it is necessary all testing be completed under CALA accreditation. Caduceon Environmental Laboratories are accredited for all of the parameters listed within the document.

I believe you have already been provided with our CALA Scopes of Accreditation for your records. Should you require any further information please call either Gord Murphy (Lab Supervisor) or myself (Greg Clarkin, Lab Manager) at the Ottawa office and we will be more than happy to help you out.

Again, thanks for the opportunity to work with the Hamlet of Pond Inlet.

Regards,

Greg Clarkin, Lab Manager - Ottawa District

Caduceon Environmental Laboratories

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E-mail: gclarkin@caduceonlabs.com

cc: Gord Murphy, Lab Supervisor

Damien Gilbert, CEO

Subcontract Laboratory Accreditation & Supporting Documentation



CALA Directory of Laboratories

Membership Number: 2644

Laboratory Name: Caduceon Environmental Laboratories (Ottawa)

Parent Institution: Caduceon Enterprises Inc.

Address: 2378 Holly Lane Ottawa ON K1V 7P1

Contact: Mr. Greg Clarkin Phone: (613) 526-0123 Fax: (613) 526-1244

Email: gclarkin@caduceonlabs.com

Standard: Conforms with requirements of ISO/IEC 17025

Clients Served:

Revised On: May 9, 2013 Valid To: October 25, 2015

Scope of Accreditation

Air (Inorganic)

Metals - Air Filter (012)

D-ICP-02; modified from APHA 3120 B

ICP - DIGESTION

Cadmium

Chromium

Cobalt

Copper

Iron

Lead

Manganese

Molybdenum

Nickel

Zinc

Air (Inorganic)

Total Suspended Particulates - Air Filter (018)

A-TSP-01; modified from MOEE E3288A

GRAVIMETRIC

Total Suspended Particulates

Dustfall

Total/Insoluble Dustfall - Dustfall (020) A-DF-01; modified from MOEE DF-E3043A FILTRATION - GRAVIMETRIC

Insoluble Dustfall
Total Dustfall

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Fluoride Candles
 Fluoride - Candles (019)
A-FISE-01; modified from MOEE FSIE-1983D
        DIGESTION - ISE
        Fluoride
Oil (Organic)
Polychlorinated Biphenyls (PCB) - Oil (040)
C-PCB-01; modified from EPA 8081
        GC/ECD - EXTRACTION
        Aroclor 1242
        Aroclor 1248
        Aroclor 1254
        Aroclor 1260
Solids (Inorganic)
Anions - Soils, Biosolids (069)
A-IC-01; modified from APHA 4110 C
        ION CHROMATOGRAPHY - EXTRACTION
       Chloride
       Nitrate
       Nitrite
       Sulphate
Solids (Inorganic)
Boron (Hot Water Soluble) - Soil (098)
D-ICP-02; MOE-LaSB E3470
       ICP/AES - EXTRACTION
       Boron
Solids (Inorganic)
Conductivity - Soil, Sediments (099)
A-CONDO-03; SM 2510 B & MOE-LaSB E 3138
       CONDUCTIVITY METER - EXTRACTION
       Conductivity
Solids (Inorganic)
Extractable Anions - Leachate (090)
A-IC-01; modified from EPA 1311, APHA 4110-C
       ION CHROMATOGRAPHY - TCLP
       Nitrate
       Nitrite
Solids (Inorganic)
Extractable Metals - Leachate (091)
D-ICP-01; modified from EPA 1311/APHA 3120 B
       ICP/AES - TCLP
       Arsenic
       Barium
       Bervllium
       Boron
       Cadmium
       Chromium
      Lead
      Nickel
      Silver
      Zinc
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Solids (Inorganic)

Extractable Metals - Leachate (092)

D-ICPMS-01; modified from EPA 1311/EPA 200.8

ICP/MS - TCLP

Antimony

Arsenic

Selenium

Uranium

Solids (Inorganic)

Extractable Metals - Leachate (093)

D-HG-02; modified from EPA 1311/SM 3112 B

COLD VAPOUR AA - TCLP

Mercury

Solids (Inorganic)

Flash Point - Soil, Solid Waste (096)

C-FPCC-01; modified FROM ASTM D93-10

CLOSED CUP FLASH POINT TESTER

Flashpoint

Solids (Inorganic)

Hexavalent Chromium - Soil (094)

D-CRVI-02; modified from EPA 3060A EPA 7196 A

COLORIMETRIC - MANUAL

Chromium (VI)

Solids (Inorganic)

Mercury - Soil, Solid Biosolids (017)

D-HG-01; modified from EPA 7471A

COLD VAPOUR AA - DIGESTION

Mercury

Solids (Inorganic)

Metals - Soil, Solid Biosolids (015)

D-ICP-02; modified from EPA 6010 ICP/OES - DIGESTION

Aluminum

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Calcium

Chromium

Cobalt

Copper

Iron

Lead

Magnesium

Manganese

Molybdenum

Nickel

Potassium

Silver

Sodium

Strontium

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Tin
Titanium
Tungsten
Vanadium
Zinc
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Solids (Inorganic)

pH - Soil, Sediment, Solid Sludge (100) A-pH-03; SM 4500 H & MOE-LaSB E3137 pH METER - EXTRACTION

Solids (Inorganic)

Total Metals - Soils, Biosolids (070) D-ICPMS-01; modified from EPA 6020 ICP/MS - DIGESTION

Antimony

Arsenic

Selenium

Silver

Thallium

Uranium

Solids (Organic)

Extractable Volatile Organic Compounds (VOC) - Leachate (089) C-VOC-01; modified from EPA SW-846 METHOD 1311, 5030/8260 GC/MS - PURGE AND TRAP - TCLP

1,1-Dichloroethylene

1,2-Dichlorobenzene

1,2-Dichloroethane

1,4-Dichlorobenzene

Benzene

Carbon tetrachloride

Chlorobenzene

Chloroform

Dichloromethane

Methyl ethyl ketone

Tetrachloroethylene

Trichloroethylene

Vinvl chloride

Solids (Organic)

Petroleum Hydrocarbons (PHC) - Soil (075)

C-PHCS-01; modified from CCME CWS REF. METHOD & MOE E3398

GC/FID - EXTRACTION

F2: C10-C16 F3: C16-C34 F4: C34-C50

Solids (Organic)

Petroleum Hydrocarbons (PHC) - Soil (097)

C-PHCS-01; modified from CCME CWS REF. METHOD & MOE E3398

GRAVIMETRIC F4: Gravimetric

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Solids (Organic)

Polychlorinated Biphenyls (PCB) - Soil (053) C-PCB-02; modified from EPA 8000/8081

GC/ECD - EXTRACTION

Aroclor 1242

Aroclor 1248

Aroclor 1254

Aroclor 1260

Solids (Organic)

Volatile Organic Compounds (VOC) - Soil (063)

C-VOC-02; modified from EPA 8260 GC/MS - PURGE AND TRAP

1,1 - Dichloropropene

1,1-Dichloroethane

1,1-dichloroethylene

1,1,1-Trichloroethane

1,1,1,2 - Tetrachloroethane

1,1,2-Trichloroethane

1.1.2.2-Tetrachloroethane

1,2 - Dibromo - 3 - chloropropane

1,2-dichlorobenzene

1,2-dichloroethane

1,2-Dichloropropane

1,2,3 - Trichlorobenzene

1,2,3 - Trichloropropane

1.2.4 - Trichlorobenzene

1,2,4 - Trimethylbenzene

1,3 - Dichloropropane

1,3-Dichlorobenzene

1,3,5 -Trimethylbenzene

1.4-dichlorobenzene

2 - Chlorotoluene

2 - Hexanone (MBK)

2.2 - Dichloropropane 4 - Chlorotoluene

Acetone (2-Propanone)

Benzene

Bromobenzene

Bromodichloromethane

Bromoform

Bromomethane

Carbon Tetrachloride

Chlorobenzene

Chlorodibromomethane

Chloroethane

Chloroform

Chloromethane

cis-1,2-Dichloroethylene

cis-1,3-Dichloropropene

Dibromomethane

Dichlorodifluoromethane

Dichloromethane

Ethylbenzene

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Ethylene Dibromide

Hexachlorobutadiene

Hexane

Isopropylbenzene

Isopropyltoluene

m/p-xylene

Methyl Ethyl Ketone

Methyl isobutyl Ketone

Methyl t-butyl ether

n - Butylbenzene

Naphthalene

o-xvlene

Propylbenzene

sec - Butylbenzene

Styrene

tert - Butylbenzene

Tetrachloroethylene

Toluene

trans-1,2-Dichloroethylene

trans-1,3-Dichloropropene

Trichloroethylene

Trichlorofluoromethane

Vinyl Chloride

Solids (Organic)

Volatile Petroleum Hydrocarbons (VPH) - Soil (073)

C-GRO-01; modified from CCME CWS REF. METHOD & MOE E3398

GC/FID - PURGE AND TRAP

F1: C6-C10

Water (Inorganic)

Alkalinity - Water (088)

A-ALK-03; modified from APHA 2320 B

AUTO TITRIMETRIC

Alkalinity (pH 4.5)

Water (Inorganic)

Ammonia - Water, Wastewater, Liquid Biosolids (055)

A-NH3-01; modified from MOEE RNDNP-E3364, SDNP-E3366

AUTO COLOR

Ammonia

Ammonia - Nitrogen

Water (Inorganic)

Ammonia - Water, Wastewater, Liquid Biosolids (103)

A-NH3-01; modified from MOEE RNDNP-E3364, SDNP-E3366

COLORIMETRIC - DISCRETE

Ammonia

Water (Inorganic)

Anions - Water, Wastewater, Liquid Biosolids (002)

A-IC-01; modified from APHA 4110 C

ION CHROMATOGRAPHY

Bromide

Chloride

Fluoride

Nitrate

Nitrite

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OSDWA †

OSDWA †

OSDWA †

Sulfate

Magnesium Manganese Molybdenum

Water (Inorganic) OSDWA † Biochemical Oxygen Demand (BOD) - Water (008) C-BOD-01; modified from APHA 5210 B D.O. METER BOD (5 day) CBOD (5 day) Water (Inorganic) OSDWA † Carbon - Water (054) C-OC-01; modified from APHA 5310C, EPA 415.1 IR-UV-PERSULFATE Organic Carbon Water (Inorganic) OSDWA † Chemical Oxygen Demand (COD) - Water (083) C-COD-01; modified from APHA 5220 D COLORIMETRIC COD Water (Inorganic) OSDWA † Colour - Water (027) A-COL-01; modified from APHA 2120 C SPECTROPHOTOMETRIC True Colour Water (Inorganic) OSDWA † Conductivity - Water (003) A-COND-01; modified from APHA 2510 B CONDUCTIVITY METER Conductivity (25°C) Water (Inorganic) OSDWA † Conductivity - Water (087) A-COND-02; modified from APHA 2510 B AUTO CONDUCTIVITY METER Conductivity (25°C) Water (Inorganic) OSDWA † Dissolved and Extractable Metals - Water (004) D-ICP-01; modified from APHA 3120 B Aluminum Barium Beryllium Bismuth Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Lithium

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Nickel

Potassium

Silicon

Silver

Sodium

Strontium

Tin

Titanium

Tungsten

Vanadium

Yttrium

Zinc

Zirconium

Water (Inorganic)

Dissolved Metals - Water (049)

D-TCPMS-01; modified from EPA 200.8

ICP/MS

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium

Cobalt

Copper

Lead

Molybdenum

Selenium

Silver

Thallium

Uranium

Vanadium

Water (Inorganic)

Hexavalent Chromium - Water (095)

D-CRVI-01; modified from MOE - HEXCR-E3056

COLORIMETRIC - MANUAL

Chromium (VI)

Water (Inorganic)

Mercury - Water, Wastewater (025) D-HG-02; modified from APHA 3112 B COLD VAPOUR AA - DIGESTION

Mercury

Water (Inorganic)

Nitrate + Nitrite - Water (102)

A-NO23-01; modified from SM 4500-NO3-F COLORIMETRIC - DISCRETE ANALYZER

Nitrate plus Nitrite

Water (Inorganic)

Nitrite - Water (101)

A-NO2-01; modified from SM 4500-NO2-B

COLORIMETRIC - DISCRETE ANALYZER

Nitrite

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OSDWA †

OSDWA †

Water (Inorganic) Nitrogen - Water, Wastewater, Liquid Biosolids (033) A-TKN-01; modified from MOEE RTNP-E3367 **AUTO COLOR - DIGESTION** Total Kjeldahl Nitrogen Water (Inorganic) Orthophosphate - Water (104) A-PO4-01; modified from MOEE RNDNP-E3364, SDNP-E3366 COLORIMETRIC - DISCRETE Phosphate Water (Inorganic) pH - Water (005) A-pH-01; modified from APHA 4500 H pH METER pH Water (Inorganic) pH - Water (086) A-pH-02; modified from APHA 4500H+ B AUTO - pH METER Water (Inorganic) Phenols - Water (056) C-PHEN-01; modified from MOE ROPHEN-E3179 AUTO, 4-AAP **Total Phenolics** Water (Inorganic) Phosphate - Water (058) A-PO4-01; modified from MOEE RNDNP-E3364, SDNP-E3366 **AUTO COLOR** Phosphate Water (Inorganic) Total Metals - Water, Wastewater, Liquid Biosolids (067) D-ICP-01; modified from APHA 3120 B ICP/AES - DIGESTION Aluminum Antimony Arsenic Barium Beryllium Bismuth Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Lithium Magnesium Manganese Molybdenum

OSDWA †

OSDWA †

OSDWA †

20.0

OSDWA †

OSDWA +

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Nickel

Potassium

Silver

Sodium

Strontium

Tin

Titanium

Tungsten

Vanadium

Yttrium

Zinc

Zirconium

Water (Inorganic)

Total Metals - Water, Wastewater, Liquid Biosolids (071)

D-ICPMS-01; modified from EPA 6020

ICP/MS - DIGESTION

Antimony

Arsenic

Barium

Bervllium

Cadmium

Chromium

Cobalt

Copper

Lead

Molybdenum

Selenium

Silver

Vanadium

Water (Inorganic)

Total Phosphorus - Water, Wastewater, Liquid Biosolids (057)

A-TP-01; modified from MOEE RTNP-E3367

AUTO COLOR - DIGESTION

Total Phosphorus

Water (Inorganic)

Total Suspended Solids (TSS) - Water (009)

A-TSS-01; modified from APHA 2540 D

GRAVIMETRIC

Total Suspended Solids

Water (Inorganic)

Turbidity - Water (026) A-TURB-01; modified from APHA 2130 B

NEPHELOMETRY

Turbidity

Water (Microbiology)

Coliforms - Water (050)

B-ECTC-01; modified from MICROMFDC-E3407

MEMBRANE FILTRATION (DC)

Background Bacteria

Escherichia coli (E. coli)

Total Coliforms

OSDWA †

OSDWA †

OSDWA †

OSDWA †

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Water (Microbiology) OSDWA † Escherichia coli (E. coli) - Water (010) B-MFEC-01; modified from MFMICRO-E3371 MEMBRANE FILTRATION (EC) Escherichia coli (E. coli) Water (Microbiology) OSDWA † Fecal (Thermotolerant) Coliforms - Water (065) B-MFFC-01; modified from MFMICRO-E3371 MEMBRANE FILTRATION (mFC) Fecal (Thermotolerant) Coliforms Water (Microbiology) OSDWA † Heterotrophic Plate Count (HPC) - Water (021) B-HPC-01; modified from APHA 9215 C SPREAD PLATE Heterotrophic Plate Count (HPC) Water (Microbiology) OSDWA † Total Coliforms - Water (066) B-MFTC-01; modified from MFMICRO-E3371 MEMBRANE FILTRATION (mENDO) **Background Counts Total Coliforms** Water (Organic) OSDWA † Glycols - Water (085) C-GLYCOL-01; modified from EPA 8015 B DIRECT INJECTION GC-FID Diethylene Glycol Ethylene Glycol Propylene Glycol Water (Organic) OSDWA † Petroleum Hydrocarbons (PHC) - Water (072) C-GRO-01; modified from MOE E3421 GC/FID - PURGE AND TRAP F1: C6-C10 Water (Organic) OSDWA † Petroleum Hydrocarbons (PHC) - Water (074) C-PHCW-02; modified from MOE E3421 GC/FID - EXTRACTION F2: C10-C16 F3: C16-C34 F4: C34-C50 Water (Organic) OSDWA † Volatile Organic Compounds (VOC) - Water (041) C-VOC-01; modified from EPA 8260 and 5030 GC/MS - PURGE AND TRAP 1,1-Dichloroethane 1,1-dichloroethylene 1,1-Dichloropropene 1.1.1-Trichloroethane 1,1,1,2-Tetrachloroethane

1,1,2-Trichloroethane 1,1,2,2-Tetrachloroethane 1,2-Dibromo-3-chloropropane

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- 1.2-dichlorobenzene
- 1,2-dichloroethane
- 1,2-Dichloropropane
- 1,2,3-Trichlorobenzene
- 1,2,3-Trichloropropane
- 1,2,4-Trichlorobenzene
- 1,2,4-Trimethylbenzene
- 1,3-Dichlorobenzene
- 1,3-Dichloropropane
- 1,3,5-Trimethylbenzene
- 1,4-dichlorobenzene
- 2-Chlorotoluene
- 2-Hexanone (MBK)
- 2,2-Dichloropropane
- 4-Chlorotoluene
- 4-Isopropyl Toluene

Acetone (2-Propanone)

Benzene

Bromobenzene

Bromodichloromethane

Bromoform

Bromomethane

Carbon Tetrachloride

Chlorobenzene

Chlorodibromomethane

Chloroform

Chloromethane

cis-1,2-Dichloroethylene

cis-1,3-Dichloropropene

Dibromomethane

Dichlorodifluoromethane

Dichloromethane

Ethylbenzene

Ethylene Dibromide

Hexachlorobutadiene

Hexane

Isopropyl Benzene

m/p-xylene

Methyl Ethyl Ketone

Methyl isobutyl Ketone

Methyl t-butyl ether

n-Butylbenzene

n-Propylbenzene

Naphthalene

o-xylene

Sec-Butylbenzene

Styrene

tert-Butylbenzene

Tetrachloroethylene

Toluene

trans-1,2-Dichloroethylene

trans-1,3-Dichloropropene

Trichloroethylene

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Trichlorofluoromethane Vinyl Chloride

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