

ANALYSIS REPORT

PROJECT ID:	KS230914
DATE SUBMITTED:	12 September 2023
CLIENT DETAILS:	[REDACTED]
YOUR REFERENCE:	Kelvin Road New Bore, City of Gosnells

Parameter	Units	Kelvin Rd - New Bore
Appearance	-	Colourless, suspended clay and sediment
pH	-	7.7
Electrical Conductivity	mS/cm	1.18
Total Dissolved Solids	mg/L	638
Bicarbonate	mg/L	110
Carbonate	mg/L	<5
Total Alkalinity (to pH 4.5)	mg/L as CaCO ₃	90
Chloride	mg/L	300
Sulphate	mg/L	15
Nitrate (as NO ₃)	mg/L	0.6
Orthophosphate (as P)	mg/L	0.02
Fluoride	mg/L	0.04
Ammonium (as N)	mg/L	<0.1
Sodium	mg/L	170
Potassium	mg/L	7
Calcium	mg/L	24
Magnesium	mg/L	29
Boron	mg/L	0.07
Iron	mg/L	<0.01
Manganese	mg/L	0.1
Silica	mg/L	37
Hardness	mg/L as CaCO ₃	180
Carbon Dioxide	mg/L	4
Cations	meq/L	11.18
Anions	meq/L	10.61
Ionic Balance	%	105
SAR	-	5.5

Analysis performed in accordance with APHA Standard Methods for the Examination of Water and Wastewater.



Comments:

The water contains substantial amount of suspended clay.

pH data indicates the water is slightly alkaline in reaction.

Electrical conductivity and total dissolved solids data show the water has a moderate salinity, however should be suitable for irrigation of most plants with the exception of highly salt sensitive species.

Bicarbonate, total alkalinity and hardness are moderate, therefore potential exists for the formation of calcium carbonate deposits upon evaporation. This may cause fine sprinkler blockages and have a mild alkaline effect on soils irrigated with this water.

Total iron is negligible. Boron is within the safe range for irrigation of most plants. Manganese is marginally elevated and may accumulate to cause some staining on surfaces in continuous contact with the water.

Nutrients data shows trace level of nitrate and negligible ammonium. Reactive phosphorus is within the normal range.

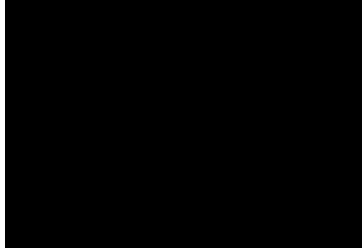
Main mineral components are sodium and chloride, and to a lesser extent calcium, magnesium and bicarbonate. Sodium adsorption ratio, in relation to the electrical conductivity of the sample, is marginally elevated. This is not ideal for long term irrigation of clay and/or fine silt dominant soils with respect to soil structure stability, however this should not be an issue for irrigation of turf and/or ornamental shrubbery grown on sandy soils.

Accompanying report PEI0864 from Envirolab (MPL Laboratories) covers trace organics and heavy metal concentrations. Presence of total recoverable hydrocarbons (volatile and semi volatile) and polycyclic aromatic hydrocarbons was not detected in the submitted sample. Organochlorine and organophosphorus pesticides were not detected in the submitted sample. Heavy metals are all below their respective ANZECC long term and short term irrigation water trigger values (Australian and New Zealand Environment and Conservation Council, October 2000).

Microbiological data in the accompanying BVAQ Microbiology Laboratory report 5408194 shows no presence of E. coli, Thermotolerant coliforms or Salmonella in the submitted sample.

In conclusion, the general water quality indicates it may be suitable for irrigation of turf and ornamental shrubbery. There is no evidence to suggest the water had been contaminated with organic matter breakdown leachates commonly encountered near old rubbish tip sites. It is recommended the water quality be monitored at regular intervals for any changes in general chemistry that may indicate possible contamination.





Chartered Chemist

27 September 2023

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Horvat Analytical – Consulting Chemists
12 Belrose Crescent, Cooloongup WA 6168

ABN: 345 3677 1642

Certificate of Analysis PEI0864

Client Details

Client	Horvat Analytical
Contact	[REDACTED]
Address	12 Belrose Crescent, COOLOONGUP, WA, 6168

Sample Details

Your Reference	Water Analysis
Number of Samples	1 Water
Date Samples Received	13/09/2023
Date Samples Registered	13/09/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date Results Requested by	20/09/2023
Date of Issue	20/09/2023

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Authorisation Details

Results Approved By	[REDACTED] Operations Manager [REDACTED] Inorganics & Metals Supervisor [REDACTED] Organics Supervisor
Laboratory Manager	[REDACTED]

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Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PEI0864-01	KS230914 - Kelvin Rd New	Water	13/09/2023	13/09/2023

Sample Comments

General Comment Preserved vials for volatile TRH not received- lab split from amber bottle.

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Volatile TRH and BTEX (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New 13/09/2023
Date Sampled			
TRH C6-C9	µg/L	10	<10
TRH C6-C10	µg/L	10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0
Benzene	µg/L	1.0	<1.0
Toluene	µg/L	1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0
Total Xylene	µg/L	3.0	<3.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0
<i>Surrogate Dibromofluoromethane</i>	%		<i>94.3</i>
<i>Surrogate Toluene-D8</i>	%		<i>101</i>
<i>Surrogate 4-Bromofluorobenzene</i>	%		<i>101</i>

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Semi-volatile TRH (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New
Date Sampled			13/09/2023
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	100	<100
TRH C29-C36	µg/L	100	<100
Total +ve TRH C10-C36	µg/L	50	<50
TRH >C10-C16	µg/L	50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50
TRH >C16-C34 (F3)	µg/L	100	<100
TRH >C34-C40 (F4)	µg/L	100	<100
Total +ve TRH >C10-C40	µg/L	50	<50
Surrogate <i>o</i> -Terphenyl	%		71.6

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Polycyclic Aromatic Hydrocarbons - Trace Level (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New Date Sampled 13/09/2023
Naphthalene	µg/L	0.020	<0.020
Acenaphthylene	µg/L	0.010	<0.010
Acenaphthene	µg/L	0.010	<0.010
Fluorene	µg/L	0.010	<0.010
Phenanthrene	µg/L	0.010	<0.010
Anthracene	µg/L	0.010	<0.010
Fluoranthene	µg/L	0.010	<0.010
Pyrene	µg/L	0.010	<0.010
Benzo(a)anthracene	µg/L	0.010	<0.010
Chrysene	µg/L	0.010	<0.010
Benzo(b,j,k)fluoranthene	µg/L	0.020	<0.020
Benzo(a)pyrene	µg/L	0.010	<0.010
Indeno(1,2,3-c,d)pyrene	µg/L	0.010	<0.010
Dibenzo(a,h)anthracene	µg/L	0.010	<0.010
Benzo(g,h,i)perylene	µg/L	0.010	<0.010
Total +ve PAH	µg/L	0.010	<0.010
<i>Surrogate p-Terphenyl-D14</i>	%		<i>90.6</i>

Certificate of Analysis PEI0864

Organochlorine Pesticides (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New 13/09/2023
Date Sampled			
alpha-BHC	µg/L	0.20	<0.20
Hexachlorobenzene	µg/L	0.20	<0.20
beta-BHC	µg/L	0.20	<0.20
gamma-BHC	µg/L	0.20	<0.20
delta-BHC	µg/L	0.20	<0.20
Heptachlor	µg/L	0.20	<0.20
Aldrin	µg/L	0.20	<0.20
Heptachlor epoxide	µg/L	0.20	<0.20
trans-Chlordane	µg/L	0.20	<0.20
cis-Chlordane	µg/L	0.20	<0.20
Endosulfan I	µg/L	0.20	<0.20
4,4'-DDE	µg/L	0.20	<0.20
Dieldrin	µg/L	0.20	<0.20
Endrin	µg/L	0.20	<0.20
4,4'-DDD	µg/L	0.20	<0.20
Endosulfan II	µg/L	0.20	<0.20
Endrin aldehyde	µg/L	0.20	<0.20
4,4'-DDT	µg/L	0.20	<0.20
Endosulfan sulfate	µg/L	0.20	<0.20
Endrin ketone	µg/L	0.20	<0.20
Methoxychlor	µg/L	0.20	<0.20
Mirex	µg/L	0.20	<0.20
Total +ve OCP	µg/L	0.20	<0.20
<i>Surrogate 2-Chlorophenol-D4</i>	%		65.7

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Organophosphorus Pesticides (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New 13/09/2023
Date Sampled			
Dichlorvos	µg/L	0.20	<0.20
Dimethoate	µg/L	0.20	<0.20
Diazinon	µg/L	0.20	<0.20
Chlorpyrifos-methyl	µg/L	0.20	<0.20
Ronnel	µg/L	0.20	<0.20
Fenitrothion	µg/L	0.20	<0.20
Malathion	µg/L	0.20	<0.20
Chlorpyrifos	µg/L	0.20	<0.20
Parathion	µg/L	0.20	<0.20
Bromophos-ethyl	µg/L	0.20	<0.20
Ethion	µg/L	0.20	<0.20
Coumaphos	µg/L	0.20	<0.20
Disulfoton	µg/L	0.20	<0.20
Fenamiphos	µg/L	0.20	<0.20
Fenthion	µg/L	0.20	<0.20
Methidathion	µg/L	0.20	<0.20
Mevinphos	µg/L	0.20	<0.20
Parathion-methyl	µg/L	0.20	<0.20
Phorate	µg/L	0.20	<0.20
Phosalone	µg/L	0.20	<0.20
Azinphos-methyl	µg/L	0.20	<0.20
<i>Surrogate 2-Chlorophenol-D4</i>	%		65.7

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Dissolved Low Level Metals (Water)

Envirolab ID Your Reference	Units	PQL	PEI0864-01 KS230914 - Kelvin Rd New 13/09/2023
Aluminium	µg/L	10	<10
Arsenic	µg/L	1.0	<1.0
Boron	µg/L	20	72
Beryllium	µg/L	0.50	<0.50
Cadmium	µg/L	0.10	<0.10
Cobalt	µg/L	1.0	<1.0
Chromium	µg/L	1.0	<1.0
Copper	µg/L	1.0	<1.0
Iron	µg/L	10	<10
Mercury	µg/L	0.050	<0.050
Lithium	µg/L	1.0	12
Manganese	µg/L	1.0	98
Molybdenum	µg/L	1.0	<1.0
Nickel	µg/L	1.0	<1.0
Lead	µg/L	1.0	<1.0
Selenium	µg/L	1.0	<1.0
Uranium	µg/L	1.0	<1.0
Vanadium	µg/L	1.0	11
Zinc	µg/L	1.0	1.9

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Method Summary

Method ID	Methodology Summary
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
ORG-022	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-022_OC	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-025_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.

Certificate of Analysis PEI0864

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PEI0864

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PEI0864

Client Details

Client	Horvat Analytical
Your Reference	Water Analysis
Date Issued	20/09/2023

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	No	Duplicate Outliers Exist - See detailed list below
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PEI0864

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN Water	1	13/09/2023	14/09/2023	15/09/2023	Yes
sTRH Water	1	13/09/2023	15/09/2023	18/09/2023	Yes
PAH TR Water	1	13/09/2023	15/09/2023	19/09/2023	Yes
OCP Water	1	13/09/2023	15/09/2023	19/09/2023	Yes
OPP (21 list) Water	1	13/09/2023	15/09/2023	19/09/2023	Yes
Dissolved Metals (LL) Water	1	13/09/2023	18/09/2023	19/09/2023	Yes
Dissolved Metals (LL)-Hg Water	1	13/09/2023	14/09/2023	18/09/2023	Yes

Outliers: Duplicates

METALS-022 | Dissolved Low Level Metals (Water) | Batch BEI1726

Sample ID	Duplicate ID	Analyte	% Limits	RPD
PEI0864-01	DUP1	Arsenic	20.00	200[2]

Outliers: Matrix Spike

ORG-025_PAH | Polycyclic Aromatic Hydrocarbons - Trace Level (Water) | Batch BEI1589

Sample ID	Analyte	% Limits	% Recovery
BEI1589-MS1#	Benzo(a)pyrene	60 - 140	14.6[1]

Outliers: QC Frequency

ORG-023_F1_TOT | Volatile TRH and BTEX (Water) | Batch BEI1478

Analysis	QC Type	Expected	Reported
vTRH&MBTEXN	Duplicate	2	0
	Matrix Spike	1	0

Quality Control PEI0864

ORG-023_F1_TOT | Volatile TRH and BTEX (Water) | Batch BEI1478

Analyte	Units	PQL	Blank	LCS %
TRH C6-C9	µg/L	10	<10	88.3
TRH C6-C10	µg/L	10	<10	85.2
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	[NA]
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	[NA]
Benzene	µg/L	1.0	<1.0	103
Toluene	µg/L	1.0	<1.0	98.0
Ethylbenzene	µg/L	1.0	<1.0	99.1
meta+para Xylene	µg/L	2.0	<2.0	118
ortho-Xylene	µg/L	1.0	<1.0	102
Total Xylene	µg/L	3.0	<3.0	[NA]
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	[NA]
Surrogate Dibromofluoromethane	%		93.6	98.4
Surrogate Toluene-D8	%		101	99.9
Surrogate 4-Bromofluorobenzene	%		100	99.9

ORG-020 | Semi-volatile TRH (Water) | Batch BEI1611

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %	Spike %
				PEI0864-01 Samp QC RPD %	BEI1611-DUP2# Samp QC RPD %		
TRH C10-C14	µg/L	50	<50	<50 <50 [NA] [2]	<50 <50 [NA]	99.8	93.3
TRH C15-C28	µg/L	100	<100	<100 <100 [NA]	<100 <100 [NA]	113	115
TRH C29-C36	µg/L	100	<100	<100 <100 [NA]	<100 <100 [NA] [2]	119	124
TRH >C10-C16	µg/L	50	<50	<50 <50 [NA] [2]	<50 <50 [NA]	103	97.0
TRH >C16-C34 (F3)	µg/L	100	<100	<100 <100 [NA]	109 <100 32.6	101	105
TRH >C34-C40 (F4)	µg/L	100	<100	<100 <100 [NA]	<100 <100 [NA]	116	112
Surrogate o-Terphenyl	%		91.2	71.6 / 68.3	77.7 / 71.4	118	121

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-025_PAH | Polycyclic Aromatic Hydrocarbons - Trace Level (Water) | Batch BEI1589

Analyte	Units	PQL	Blank	DUP1	LCS %	Spike %
				BEI1589-DUP1# Samp QC RPD %		
Naphthalene	µg/L	0.020	<0.020	<0.020 <0.020 [NA]	103	78.4
Acenaphthylene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Fluorene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	98.8	76.7
Phenanthrene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	91.3	77.1
Anthracene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	100	77.9
Pyrene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	106	74.2
Benzo(a)anthracene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Chrysene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	101	81.3
Benzo(b,j,k)fluoranthene	µg/L	0.020	<0.020	<0.020 <0.020 [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	103	14.6[1]
Indeno(1,2,3-c,d)pyrene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.010	<0.010	<0.010 <0.010 [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	%		99.4	72.0 / 69.8	106	88.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PEI0864

ORG-022_OC | Organochlorine Pesticides (Water) | Batch BEI1611

Analyte	Units	PQL	Blank	DUP1		DUP2		LCS %	Spike %
				PEI0864-01		BEI1611-DUP2#			
				Samp	QC RPD %	Samp	QC RPD %		
alpha-BHC	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	88.5	85.5
Hexachlorobenzene	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
beta-BHC	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	90.1	87.3
gamma-BHC	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
delta-BHC	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Heptachlor	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	81.6	78.6
Aldrin	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	79.2	77.7
Heptachlor epoxide	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	89.6	85.1
trans-Chlordane	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
cis-Chlordane	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Endosulfan I	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
4,4'-DDE	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	82.0	87.6
Dieldrin	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	91.1	88.1
Endrin	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	89.2	98.1
4,4'-DDD	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	88.7	96.0
Endosulfan II	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Endrin aldehyde	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
4,4'-DDT	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Endosulfan sulfate	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	91.8	99.2
Endrin ketone	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Methoxychlor	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Mirex	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Surrogate 2-Chlorophenol-D4	%		72.4		65.7 62.3		67.8 67.7	71.5	68.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-022 | Organophosphorus Pesticides (Water) | Batch BEI1611

Analyte	Units	PQL	Blank	DUP1		DUP2		LCS %	Spike %
				PEI0864-01		BEI1611-DUP2#			
				Samp	QC RPD %	Samp	QC RPD %		
Dichlorvos	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	96.3	97.5
Dimethoate	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Diazinon	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Chlorpyrifos-methyl	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	79.9	76.6
Ronnel	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	77.1	73.6
Fenitrothion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	80.4	85.7
Malathion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	82.6	90.8
Chlorpyrifos	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	82.2	79.5
Parathion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	92.3	99.4
Bromophos-ethyl	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Ethion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	87.2	99.9
Coumaphos	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Disulfoton	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Fenamiphos	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Fenthion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Methodathion	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Mevinphos	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Parathion-methyl	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Phorate	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Phosalone	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Azinphos-methyl	µg/L	0.20	<0.20	<0.20	<0.20 [NA]	<0.20	<0.20 [NA]	[NA]	[NA]
Surrogate 2-Chlorophenol-D4	%		72.4		65.7 62.3		67.8 67.7	71.5	68.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PEI0864

METALS-021 | Dissolved Low Level Metals (Water) | Batch BEI1492

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %	Spike %
				BEI1492-DUP1# Samp QC RPD %	BEI1492-DUP2# Samp QC RPD %		
Mercury	µg/L	0.050	<0.050	<0.050 <0.050 [NA]	<0.050 <0.050 [NA]	96.0	85.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Dissolved Low Level Metals (Water) | Batch BEI1726

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %	Spike %
				PEI0864-01 Samp QC RPD %	BEI1726-DUP2# Samp QC RPD %		
Aluminium	µg/L	10	<10	<10 <10 [NA]	<10 <10 [NA]	92.2	101
Arsenic	µg/L	1.0	<1.0	<1.0 1.85 200 [2]	1.06 1.08 1.41	99.5	104
Beryllium	µg/L	0.50	<0.50	<0.50 <0.50 [NA]	<0.50 <0.50 [NA]	91.3	91.7
Boron	µg/L	20	<20	71.9 78.6 8.93	1530 1680 9.24	98.7	96.0
Cadmium	µg/L	0.10	<0.10	<0.10 <0.10 [NA]	<0.10 <0.10 [NA]	102	102
Chromium	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	20.6 21.7 5.23	100	104
Cobalt	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	85.6 88.0 2.85	102	104
Copper	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	1.54 1.50 2.31	101	101
Iron	µg/L	10	<10	<10 <10 [NA]	33.6 33.3 1.18	94.4	109
Lead	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	<1.0 <1.0 [NA]	95.6	94.5
Lithium	µg/L	1.0	<1.0	12.5 12.5 0.0802	5.10 4.92 3.49	96.3	96.0
Manganese	µg/L	1.0	<1.0	97.7 101 3.06	112 117 4.58	96.9	97.4
Molybdenum	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	<1.0 <1.0 [NA]	98.3	101
Nickel	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	2.39 2.49 4.10	101	102
Selenium	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	4.56 4.52 1.10	103	104
Uranium	µg/L	1.0	<1.0	<1.0 <1.0 [NA]	<1.0 <1.0 [NA]	94.0	94.0
Vanadium	µg/L	1.0	<1.0	11.0 11.4 4.03	12.2 12.3 1.22	101	105
Zinc	µg/L	1.0	<1.0	1.92 1.98 3.08	8.42 9.22 9.07	98.4	99.5

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

QC Comments

Identifier	Description
[1]	Spike recovery is outside routine acceptance criteria (60-140%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[2]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.