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www.phenova.com

March 28, 2019

Ms. Kelley Keenan
Environmental Testing Solutions, Inc.
351 Depot Street
Asheville, NC 28801
USA

Dear Kelley,

Thank you for participating in the WP0219 Water Pollution Proficiency Testing Study. Enclosed is your final report, which has been carefully reviewed by the PT specialists at Phenova. This report presents some additional sections and features which will give you more information on the study data for the standards that were reported by your laboratory and more information regarding the overall performance of your laboratory in relation to other study participants.

The enclosed report is in two sections, the "Evaluation Report" and the "Statistical Report". The "Evaluation Report" contains the evaluation of your reported data as well the reported method, analysis date and analyst. The "Evaluation Report" is an updated and enhanced version of the reports you previously received at the conclusion of our PT studies. The "Statistical Report" contains your passing percentage as well as statistics from the study for the analytes reported by your laboratory.

For any analyte falling outside the established acceptance limits, our PT management staff would like to assist you in determining the most appropriate course of corrective action for your facility. Please contact us at any time if we may be of service to you.

Thank you again for participating in the WP0219 Water Pollution Proficiency Testing Study. We appreciate working with you and look forward to our next study. If you have any questions, please call us at 866-942-2978.



Report Definitions:

Assigned Value

The Assigned Value is determined from the study mean, gravimetric and volumetric true concentration of an analyte to be analyzed, calculation and/or an appropriate reference value as stipulated in the EPA National Standards for Water Proficiency Testing Studies Criteria Document (current version), the National Environmental Laboratory Accreditation Conference Institute (TNI) criteria (ref: TNI FOT tables, TNI PT Committee) and other documents distributed by accrediting agencies as applicable.

Evaluation Limits

Acceptance Limits are derived from fixed limits, coefficients, constants and calculations stipulated in the EPA National Standards for Water Proficiency Testing Studies Criteria Documents (current version), the National Environmental Laboratory Accreditation Conference Institute (TNI) criteria (ref: TNI FOT tables, TNI PT Committee) and other documents distributed by accrediting agencies as applicable.

Evaluation

Acceptable

The reported value falls within the Acceptance Limits.

Not Acceptable

The reported value falls outside the Acceptance Limits.

No Evaluation

The reported value is non-numeric and can not be evaluated.

NR

As required by the TNI standards and requested by state authorities, any analyte purchased but not reported by your facility is listed as NR (Not Reported).

Study Mean and Standard Deviation

The mean and standard deviation are calculated from the study data using robust statistical calculations when possible. Other statistical calculations may be used if robust statistical calculations are not possible. The displayed values are independent of any statistical calculations required for the calculation of the analyte evaluation limits.

This report must not be reproduced except in full, without the written approval of Phenova. Various aspects of Phenova's proficiency testing schemes can from time to time be subcontracted. If subcontracting occurs, it is placed with a competent and qualified subcontractor and Phenova is responsible for all work performed. This report must not be used to claim product certification, approval, or endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the federal government.



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State Regulatory Agency Request(s):

Phenova has been authorized to send a copy of your WP0219 final results to the following state agencies:
KY, NC and SC

Other Regulatory Agency Request(s):

No requests were made to send a copy of your WP0219 final results to an agency.

Third Party Request(s):

No requests were made to send a copy of your WP0219 final results to a third party.

Final Report - Water Pollution Proficiency Testing

Study: WP0219

Opening Date: February 4, 2019 - Closing Date: March 21, 2019

Laboratory: Environmental Testing Solutions, Inc.
351 Depot Street
Asheville, NC 28801
USA

Contact: Ms. Kelley Keenan
828-350-9364

EPA Lab ID: NC01230

Demand (PT-DEM-WP) Lot #: 8197-07

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1530	BOD	2/13/2019	KEK	20135200	SM 5210 B-2011	mg/L	139	110	71.2 - 231	Acceptable
1555	CBOD	2/13/2019	KEK	20135200	SM 5210 B-2011	mg/L	139	107	56.0 - 231	Acceptable
1565	COD	2/13/2019	KEK	60003001	HACH 8000	mg/L	215	204	174 - 248	Acceptable
2040	TOC					mg/L	84.8		71.3 - 97.5	NR

Minerals 1 (PT-MIN1-WP) Lot #: 8197-08

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1505	Total Alkalinity(as CaCO ₃)	2/15/2019	KEK	20045607	SM 2320 B-2011	mg/L	350	343	297 - 402	Acceptable
1540	Bromide					mg/L	9.03		7.71 - 10.4	NR
1575	Chloride	2/15/2019	KEK	20079203	SM 4500-Cl ⁻ C-2011	mg/L	98.6	98	86.5 - 111	Acceptable
1730	Fluoride					mg/L	3.42		2.77 - 3.93	NR
2000	Sulfate	2/22/2019	KEK	20132836	SM 4500-SO ₄ ⁻ E-2011	mg/L	21.0	22	16.5 - 24.5	Acceptable

Additional State Specific Analytes

1813	Total Inorganic Carbon					mg/L	83.5		66.8 - 100	NR
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Minerals 2 - Hardness (PT-MIN2-WP) Lot #: 8197-102

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1035	Calcium					mg/L	57.1		48.5 - 65.6	NR
1550	Calcium Hardness (as CaCO ₃)					mg/L	142		121 - 164	NR
1755	Total Hardness (as CaCO ₃)	2/15/2019	KEK	20047603	SM 2340 C-2011	mg/L	183	168	155 - 210	Acceptable
1085	Magnesium					mg/L	9.74		8.28 - 11.2	NR
1125	Potassium					mg/L	8.26		6.61 - 9.92	NR
1155	Sodium					mg/L	91.0		72.8 - 109	NR

Specific Conductance (PT-COND-WP) Lot #: 8197-72

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1610	Specific Conductance (25°C)	2/12/2019	KEK	20048606	SM 2510 B-2011	µmhos/cm	1070	1080	964 - 1180	Acceptable

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828-350-9364

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Solids (PT-SOL-WP) Lot #: 8197-09

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1955	Total Dissolved Solids at 180° (TFR)	2/11/2019	KEK	20050424	SM 2540 C-2011	mg/L	188	204	143 - 233	Acceptable
1960	Non-Filterable Residue (TSS)	2/13/2019	KEK	20051201	SM 2540 D-2011	mg/L	86.2	81	70.8 - 95.8	Acceptable
1950	Total Solids					mg/L	274		229 - 319	NR

Nutrients 1 - Simple (PT-NUT1-WP) Lot #: 8197-10

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1515	Ammonia as N	2/14/2019	KEK	20109404	SM 4500-NH3 D-2011	mg/L	3.48	3.4	2.63 - 4.40	Acceptable
1810	Nitrate as N					mg/L	19.8		16.5 - 22.9	NR
1820	Nitrate and Nitrite as N					mg/L	19.8		16.6 - 22.8	NR
1870	Orthophosphate as P					mg/L	3.06		2.60 - 3.52	NR

Additional State Specific Analytes

1712	Total Dissolved Phosphorus					mg/L	3.06		2.60 - 3.52	NR
1647	Dissolved Nitrogen					mg/L	23.3		19.5 - 26.9	NR
1827	Total Nitrogen					mg/L	23.3		19.5 - 26.9	NR

pH (PT-PH-WP) Lot #: 8197-15

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1900	pH	2/12/2019	KEK	20105208	SM 4500-H+ B-2011	S.U.	5.19	5.2	4.99 - 5.39	Acceptable
1900	pH	2/12/2019	KEK		SW-846 9040 C (Aqueous)	S.U.	5.19	5.2	4.99 - 5.39	Acceptable
1900	pH	2/12/2019	KEK		SW-846 9045 D (Non-Aqueous)	S.U.	5.19	5.2	4.99 - 5.39	Acceptable

Residual Chlorine Low Level (PT-CLLL-WP) Lot #: 8197-94

NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1940	Total Residual Chlorine	2/26/2019	KEK	60006522	Orion Electrode, 1977 (ORION 77-CL)	µg/L	247	278	187 - 307	Acceptable

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EPA Lab ID: NC01230

Settleable Solids (PT-SSOL-WP)										Lot #: 8197-17
NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
1965	Settleable Solids	2/27/2019	KEK	20052204	SM 2540 F-2011	mL/L	23.2	27	18.7 - 29.7	Acceptable
Turbidity (PT-TURB-WP)										Lot #: 8197-20
NELAC Code	Analyte	Analysis Date	Analyst	Method Code	Method Description	Units	Assigned Value	Result	Acceptance Limits	Evaluation
2055	Turbidity	2/12/2019	KEK	20042802	SM 2130 B-2011	NTU	12.6	13	10.4 - 14.9	Acceptable



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PT Study Score Report

EPA ID: NC01230
 Laboratory: Environmental Testing Solutions, Inc.
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Study Number	Number of Reported Results	Number of Passing Results	Percent Passing
WP0219	17	17	100%

Report Definitions:

- Number of Reported Results** The number of results reported which could be evaluated. Results receiving an evaluation of "NR" or "No Evaluation" are not included.
- Number of Passing Results** The number of results reported receiving an evaluation of "Acceptable" or "Check for Error".
- Percent Passing** The percentage of results reported receiving an evaluation of "Acceptable" or "Check for Error".

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Statistical Summary Report - Water Pollution Proficiency Testing

Opening Date: February 4, 2019 - Closing Date: March 21, 2019

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USA

Contact: Ms. Kelley Keenan
828-350-9364

EPA Lab ID: NC01230

Demand (PT-DEM-WP) Lot #: 8197-07						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1530	BOD	mg/L	136	19.1	51.2	166
1555	CBOD	mg/L	124	27.2	40.3	166
1565	COD	mg/L	210	12.8	80.9	115
2040	TOC	mg/L	84.3	2.66	84.1	115
Minerals 1 (PT-MIN1-WP) Lot #: 8197-08						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1505	Total Alkalinity(as CaCO ₃)	mg/L	337	11.7	84.9	115
1540	Bromide	mg/L	8.93	0.502	85.4	115
1575	Chloride	mg/L	101	4.65	87.7	113
1730	Fluoride	mg/L	3.35	0.126	81.0	115
2000	Sulfate	mg/L	21.0	0.939	78.6	117
Additional State Specific Analytes						
1813	Total Inorganic Carbon	mg/L	36.5	0.00	80.0	120
Minerals 2 - Hardness (PT-MIN2-WP) Lot #: 8197-102						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1035	Calcium	mg/L	56.2	3.53	84.9	115
1550	Calcium Hardness (as CaCO ₃)	mg/L	139	7.39	85.2	115
1755	Total Hardness (as CaCO ₃)	mg/L	178	8.73	84.7	115
1085	Magnesium	mg/L	9.53	0.561	85.0	115
1125	Potassium	mg/L	8.25	0.584	80.0	120
1155	Sodium	mg/L	88.5	6.52	80.0	120
Specific Conductance (PT-COND-WP) Lot #: 8197-72						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1610	Specific Conductance (25°C)	µmhos/cm	1070	17.7	90.1	110
Solids (PT-SOL-WP) Lot #: 8197-09						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1955	Total Dissolved Solids at 180° (TFR)	mg/L	184	18.8	76.1	124
1960	Non-Filterable Residue (TSS)	mg/L	82.2	3.51	82.1	111
1950	Total Solids	mg/L	264	27.4	83.6	116

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Nutrients 1 - Simple (PT-NUT1-WP) Lot #: 8197-10						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1515	Ammonia as N	mg/L	3.43	0.304	75.6	126
1810	Nitrate as N	mg/L	19.8	0.751	83.3	116
1820	Nitrate and Nitrite as N	mg/L	19.9	0.879	83.8	115
1870	Orthophosphate as P	mg/L	3.19	0.126	85.0	115
Additional State Specific Analytes						
1712	Total Dissolved Phosphorus	mg/L	3.44	0.223	85.0	115
1647	Dissolved Nitrogen	mg/L	22.8	0.640	83.7	115
1827	Total Nitrogen	mg/L	22.8	0.538	83.7	115
pH (PT-PH-WP) Lot #: 8197-15						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1900	pH	S.U.	5.21	0.0348	96.1	104
Residual Chlorine Low Level (PT-CLLL-WP) Lot #: 8197-94						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1940	Total Residual Chlorine	µg/L	239	18.4	75.7	124
Settleable Solids (PT-SSOL-WP) Lot #: 8197-17						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
1965	Settleable Solids	mL/L	22.8	2.24	80.6	128
Turbidity (PT-TURB-WP) Lot #: 8197-20						
NELAC Code	Analyte	Units	Study Mean	Study Standard Deviation	Low Acceptance Limit %	High Acceptance Limit %
2055	Turbidity	NTU	11.9	0.915	82.5	118