

# PERFORMANCE EVALUATION

First Choice for Quality |



Quarterly Study

**WP09-1**

21-Jan-2009 through 6-Mar-2009

**RT1068**

RTC Labcode

**WY00006**

US EPA Labcode

Energy Laboratories  
Terry Friedlan  
400 West Boxelder Rd.  
Gillette WY 82718

Thank you for participating in study WP09-1. Additional information about this study may be found online at [www.rt-corp.com](http://www.rt-corp.com). If you have any questions or comments about this study please contact me.

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**This report may contain data that are not covered by the A2LA accreditation.**

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Rucinski", is written over a light blue horizontal line.

Christopher Rucinski  
Quality Director

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Dataset

## WP09-1JLW

**Dataset Analyst**  
Weisz, Julie

### Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

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**206** Edward Mock  
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### Minerals

Analysis

SM 17/18/19/20ED 2510 B - Analyst: J. Weisz

Method Number 20003809

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Specific conductance, Conductivity (25°C) <sup>1, 3, 4</sup> 1610 / I-027-12 - Lot 014344/0 /Analysis Date: 2/3/09	<b>678</b> µmhos/cm	676.00	612 to 740	0.09	<b>Acceptable</b>

### Miscellaneous Analytes



### Miscellaneous Analytes (continued)

Analysis SM/APHA 4500-H+ B 20th ED (1998) - Analyst: J. Weisz Method Number 20104807

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
pH 1, 3, 4 1900 / I-027-3 - Lot 013924 /Analysis Date: 1/29/09	9.39 Units	9.50	9.10 to 9.81	-1.10	<b>Acceptable</b>

End of WP09-1JLW



Dataset

## WP09-1KLR

**Dataset Analyst**  
Ruff, Kasey

### Accreditors

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### Miscellaneous Analytes

Analysis

SM 18/19/20thED 4500-Cl F - Analyst: K. Ruff

Method Number 20015003

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total residual chlorine 1, 3, 4 1940 / I-033 - Lot 014239 /Analysis Date: 3/5/09	<b>1.80</b> mg/L	1.32	0.969 to 1.67	4.10	<b>Not Acceptable</b>



### Miscellaneous Analytes (continued)

Analysis  
SM/APHA 2130 B 19th ED (1995) - Analyst: K. Ruff

Method Number 20042200

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Turbidity 1, 4, 5 2055 / I-250 - Lot 013995 /Analysis Date: 1/29/09	5.5 NTU	5.36	3.85 to 6.88	0.28	<b>Acceptable</b>

End of WP09-1KLR



Dataset

## WP09-1KLS

### Dataset Analyst

Storck, KayCee

### Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

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## Minerals

Analysis

SM 17/18/19/20ED 2510 B - Analyst: K. Storck

Method Number 20003809

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Specific conductance, Conductivity (25°C) <sup>1, 3, 4</sup> <small>1610 / I-027-12 - Lot 014344/0 /Analysis Date: 2/2/09</small>	<b>674</b> µmhos/cm	676.00	612 to 740	-0.09	<b>Acceptable</b>

## Miscellaneous Analytes



### Miscellaneous Analytes (continued)

Analysis  
SM/APHA 4500-H+ B 20th ED (1998) - Analyst: K. Storck Method Number 20104807

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
pH 1, 3, 4 1900 / I-027-3 - Lot 013924 /Analysis Date: 1/29/09	9.39 Units	9.50	9.10 to 9.81	-1.10	<b>Acceptable</b>

End of WP09-1KLS



Dataset

## WP09-1MAV

**Dataset Analyst**  
Voegele, Misty

### Accreditors

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### Miscellaneous Analytes

Analysis  
SM 18/19/20thED 4500-Cl F - Analyst: M. Voegele Method Number 20015003

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total residual chlorine 1, 3, 4 1940 / I-033 - Lot 014239 /Analysis Date: 3/5/09	<b>1.85</b> mg/L	1.32	0.969 to 1.67	4.53	<b>Not Acceptable</b>



### Miscellaneous Analytes (continued)

Analysis  
SM/APHA 2130 B 19th ED (1995) - Analyst: M. Voegele

Method Number 20042200

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Turbidity 1, 4, 5 2055 / I-250 - Lot 013995 /Analysis Date: 1/29/09	5.5 NTU	5.36	3.85 to 6.88	0.28	<b>Acceptable</b>

End of WP09-1MAV



Dataset

## WP09-1MLI

**Dataset Analyst**  
Ingram, Mary

### Accreditors

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### Demands

Analysis  
SM/APHA 5210 B 18th ED (1992) - Analyst: M. Ingram Method Number 20027401

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Biochemical oxygen demand (BOD) <sup>1, 3, 4</sup> <small>1530 / I-026 - Lot 013907 /Analysis Date: 2/11/09</small>	<b>20</b> mg/L	16.90	8.18 to 29.0	1.07	<b>Acceptable</b>

### Minerals



### Minerals (continued)

Analysis  
EPA 300.1 - Analyst: M. Ingram

Method Number 10053404

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Chloride 1, 3, 4 1575 / I-051 - Lot 014307 /Analysis Date: 2/2/09	188 mg/L	199.00	173 to 226	-1.24	Acceptable
Fluoride 1, 3, 4 1730 / I-051 - Lot 014307 /Analysis Date: 2/4/09	1.2 mg/L	1.32	0.735 to 1.90	-0.62	Acceptable
Sulfate 1, 3, 4 2000 / I-051 - Lot 014307 /Analysis Date: 2/4/09	104 mg/L	98.50	83.0 to 114	1.06	Acceptable

Analysis  
SM 18/19/20thED 2320 B - Analyst: M. Ingram

Method Number 20003003

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Alkalinity as CaCO3 1, 3, 4 1505 / I-027-12 - Lot 014344/0 /Analysis Date: 2/2/09	72 mg/L	72.10	63.7 to 80.6	-0.04	Acceptable

### Miscellaneous Analytes

Analysis  
EPA 300.0 - Analyst: M. Ingram

Method Number 10053006

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Bromide 1, 4, 5 1540 / I-051 - Lot 014307 /Analysis Date: 2/4/09	3 mg/L	2.26	1.43 to 3.09	2.68	Acceptable

Analysis  
SM/APHA 2540 D 18th ED (1992) - Analyst: M. Ingram

Method Number 20004802

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Residue-nonfilterable (TSS) 1, 3, 4 1960 / I-079 - Lot 014427 /Analysis Date: 2/5/09	60 mg/L	58.70	35.1 to 82.3	0.17	Acceptable

### Nutrients



## Nutrients (continued)

Analysis  
EPA 300.1 - Analyst: M. Ingram

Method Number 10053404

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Nitrate as N 1, 3, 4 1810 / I-051 - Lot 014307 /Analysis Date: 2/4/09	<b>13.6</b> mg/L	13.10	10.2 to 15.9	0.53	<b>Acceptable</b>
Nitrite as N 1, 4 1840 / I-051 - Lot 014307 /Analysis Date: 2/4/09	<b>1.2</b> mg/L	0.87	0.595 to 1.2	3.54	<b>Acceptable</b>
Orthophosphate as P 1, 3, 4 1870 / I-051 - Lot 014307 /Analysis Date: 2/4/09	<b>2.6</b> mg/L	2.77	2.20 to 3.30	-0.97	<b>Acceptable</b>

End of WP09-1MLI



Dataset

## WP09-1SMR

### Dataset Analyst

Rasmussen, Sheena

### Accreditors

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### Demands

Analysis

Hach 8000 - Analyst: S. Rasmussen

Method Number 60003001

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Chemical oxygen demand (COD) 1, 3, 4 1565 / I-026 - Lot 013907 /Analysis Date: 2/3/09	<b>25</b> mg/L	26.20	15.0 to 37.3	-0.32	<b>Acceptable</b>



### Demands (continued)

Analysis SM/APHA 5210 B 18th ED (1992) - Analyst: S. Rasmussen Method Number 20027401

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Biochemical oxygen demand (BOD) 1, 3, 4 1530 / I-026 - Lot 013907 /Analysis Date: 2/4/09	21 mg/L	16.90	8.18 to 29.0	1.42	Acceptable

### Minerals

Analysis SM 18/19/20thED 2320 B - Analyst: S. Rasmussen Method Number 20003003

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Alkalinity as CaCO3 1, 3, 4 1505 / I-027-12 - Lot 014344/0 /Analysis Date: 2/4/09	73 mg/L	72.10	63.7 to 80.6	0.32	Acceptable

Analysis SM/APHA 2540 C 20th ED (1998) - Analyst: S. Rasmussen Method Number 20050004

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Residue-filterable (TDS) 1, 3, 4 1955 / I-027-12 - Lot 014344/0 /Analysis Date: 2/3/09	408 mg/L	396.00	223 to 569	0.21	Acceptable

Analysis SM/APHA 2540 C 21st ED (2005) - Analyst: S. Rasmussen Method Number 20050208

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Residue-filterable (TDS) 1, 3, 4 1955 / I-079 - Lot 014427 /Analysis Date: 2/3/09	392 mg/L	392.00	298 to 485	0.00	Acceptable

### Miscellaneous Analytes

Analysis SM/APHA 2540 D 18th ED (1992) - Analyst: S. Rasmussen Method Number 20004802

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Residue-nonfilterable (TSS) 1, 3, 4 1960 / I-079 - Lot 014427 /Analysis Date: 2/5/09	61 mg/L	58.70	35.1 to 82.3	0.29	Acceptable

End of WP09-1SMR



Dataset

## WP09-1WET

### Dataset Analyst

Turnbull, William

### Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

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## Miscellaneous Analytes

Analysis

EPA 1664A - Analyst: W. Turnbull

Method Number 10127603

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Oil & Grease 1, 3, 4 1860 / I-029 - Lot 013997 /Analysis Date: 2/2/09	<b>70.0</b> mg/L	70.60	52.0 to 89.1	-0.10	<b>Acceptable</b>

## Petroleum Hydrocarbons in Water



## Petroleum Hydrocarbons in Water (continued)

Analysis  
EPA 1664A (HEM) (1999) - Analyst: W. Turnbull Method Number 10127807

	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total Petroleum Hydrocarbons (TPH), (C6-C35) 1, #050 / O-115 - Lot 014356 /Analysis Date: 2/3/09	<b>58.6</b> mg/L	85.70	41.9 to 129	-1.86	<b>Acceptable</b>

End of WP09-1WET



# Sample Information

## Demand

PEI-026 / Lot 013907

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Biochemical oxygen demand (BOD) 1530 Demands	mg/L	16.90	17.20	2.48	26.4 ± 0.269
Chemical oxygen demand (COD) 1565 Demands	mg/L	26.20	27.70	4.49	27.0

## Minerals

PEI-027-12 / Lot 014344/014345

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Alkalinity as CaCO3 1505 Minerals	mg/L	72.10	72.50	2.19	72.5 ± 0.37
Specific conductance, Conductivity (25°C) 1610 Minerals	µmhos/cm	676.00	676.00	25.90	682 ± 3.48
Residue-filterable (TDS) 1955 Minerals	mg/L	396.00	396.00	57.60	518 ± 2.64

## pH

PEI-027-3 / Lot 013924

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
pH 1900 Miscellaneous Analytes	Units	9.50	9.49	0.10	9.50 ±

## Oil and Grease

PEI-029 / Lot 013997

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Oil & Grease 1860 Miscellaneous Analytes	mg/L	70.60	68.40	7.03	75.5 ± 0.385

## Total Residual Chlorine

PEI-033 / Lot 014239

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Total residual chlorine 1940 Miscellaneous Analytes	mg/L	1.32	1.32	0.12	1.35 ± 0.008

## Anions

PEI-051 / Lot 014307

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Bromide 1540 Miscellaneous Analytes	mg/L	2.26	2.26	0.28	2.32 ± 0.012
Chloride 1575 Minerals	mg/L	199.00	202.00	8.51	200 ± 1.02
Fluoride 1730 Minerals	mg/L	1.32	1.32	0.20	1.54 ± 0.008
Nitrate as N 1810 Nutrients	mg/L	13.10	13.20	1.14	13.2 ± 0.065
Nitrite as N 1840 Nutrients	mg/L	0.87	0.87	0.09	0.917 ±
Orthophosphate as P 1870 Nutrients	mg/L	2.77	2.69	0.22	2.76 ± 0.014
Sulfate 2000 Minerals	mg/L	98.50	102.00	4.70	99.9 ± 0.51

## Residue (Whole-Volume)

PEI-079 / Lot 014427

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Residue-filterable (TDS) 1955 Minerals	mg/L	392.00	392.00	17.60	392 ± 2



**Residue (Whole-Volume)**

PEI-079 / Lot 014427

(continued)

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Residue-nonfilterable (TSS) 1960 Miscellaneous Analytes	mg/L	58.70	58.70	7.87	66.3 ± 0.338

**Turbidity**

PEI-250 / Lot 013995

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Turbidity 2055 Miscellaneous Analytes	NTU	5.36	5.36	0.51	5.09 ± 0.026

**TPH in Water**

PEO-115 / Lot 014356

	Units	Assigned Value	Study Mean	Study Std. Dev.	Gravimetric Value
Total Petroleum Hydrocarbons (TPH), (C6-C35) 2050 Petroleum Hydrocarbons in Water	mg/L	85.70			89.6 ± 0.869

**Definitions:**

**Assigned Value:** Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a give purpose. See ISO Guide 43 for additional information.

**Accept. Window:** The range of values that constitute acceptable performance for a laboratory participation in this PT study.

**Z:** A Z-Score tells how a single data point compares to normal data. A Z-Score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a Z-Score less than |2| is considered to be in control, a Z-Score between |2| and |3| is considered 'Questionable', but still within control and a Z greater than |3| is considered not acceptable and the method is out of control.

**Study Mean:** Statistical study mean calculated using a robust statistical model (RTC employs the 'Biweight Program'). Robust statistical techniques to minimize the influence that extreme results can have on estimates of the mean and standard deviation NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

**Study Std. Dev.:** Standard deviation calculated from study data using robust statisticals (Biweight).

**Gravimetric Value:** The prepared to value, determined by gravimetric means. The uncertainty associated to this value is standard uncertainty and based on RTC's gravimetric tolerances.

Program analyte accrediting footnotes

<sup>1</sup> NELAC

<sup>3</sup> Other

<sup>5</sup> NELAC Experimental

<sup>2</sup> EPA

<sup>4</sup> A2LA