UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Final Analytical Report

Site Name.....	Pavillion GW Investigation
Sample Collection Date(s).....	04/16/12 10:00- 05/01/12 09:55
Contact.....	Rick Wilkin
Report Date.....	06/19/12 14:48
Project #.....	NSF 609
Work Order.....	1204006

Analyses included in this report:

Glycol by HPLC/MS/MS

Approved for Release

OASQA Representative

Site Name: Pavillion GW Investigation	Project #: NSF 609

Report Narrative

Glycols by HPLC/MS/MS Note:

Samples were analyzed for diethylene glycol (DiG) (CAS# 111-46-6), triethylene glycol (TriG) (112-27-6), tetraethylene glycol (TeG) (112-60-7), and 2-butoxyethanol (2-Bu) (111-76-2) by HPLC/MS/MS (inst id: TQD-LCMSMS) on a Waters Atlantis dC18 3um 2.1 x 150mm column.
An HPLC/MS/MS method does not currently exist for these analytes. SOP R3QA239, Analysis of Glycols in Water by Direct Injection HLPC/MS/MS, is in review and is based on ASTM D 7731-11 and EPA SW-846 Methods 8000C and 8321. The referenced methods were followed for method development and QA/QC limits where applicable. All applicable OASQA On Demand QA/QC protocols were followed.

The aqueous samples were injected without extraction onto the HPLC/MS/MS system.

The MS/MSD results for BD21902-MS1/MSD1 (1204006-07MS/MSD) were approximately 10% of the expected value. It is likely that the incorrect spiking mixture was used. QC results are flagged “A”. Results for the other matrix spike sample, BD21902-MS2/MSD2 (1204006-17 MS/MSD) were acceptable. No impact on sample results is expected.

According to OASQA On Demand procedures, a blank spike (BS) should be prepared at the NQL. Due to the varying NQLs, several "low blank spikes" were analyzed. Low BS results are reported as “MRL check” samples in the Element report, with QC limits of 60-140%. Based on low BS percent recoveries, the NQL for some analytes was raised. Refer to the case file notes for affected samples.

Refer to notes in the case file for additional information regarding the analysis.

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ANALYTICAL REPORT FOR SAMPLES

Station ID	Laboratory ID	Matrix	Date Sampled	Date Received
FieldBlk 1	1204006-01	Groundwater	04/16/12 11:00	04/18/12 14:28
EquipBlk 1	1204006-02	Groundwater	04/16/12 10:00	04/18/12 14:28
PGDW20-0412	1204006-03	Groundwater	04/16/12 12:30	04/18/12 14:28
PGDW20d-0412	1204006-04	Groundwater	04/16/12 12:30	04/18/12 14:28
EPAMW02-0412-1	1204006-05	Groundwater	04/16/12 14:50	04/18/12 14:28
PGDW23-0412	1204006-06	Groundwater	04/17/12 11:45	04/18/12 14:28
PGDW30-0412	1204006-07	Groundwater	04/17/12 14:00	04/18/12 14:28
FieldBlk 2	1204006-08	Groundwater	04/18/12 09:00	04/19/12 12:14
EquipBlk 2	1204006-09	Groundwater	04/18/12 10:00	04/19/12 12:14
PGDW05-0412	1204006-10	Groundwater	04/18/12 12:00	04/19/12 12:14
FieldBlk 3	1204006-11	Groundwater	04/22/12 12:00	04/24/12 11:21
PGDW50-0412	1204006-12	Groundwater	04/19/12 12:00	04/24/12 11:21
PGPW02-0412	1204006-13	Groundwater	04/20/12 15:30	04/24/12 11:21
EPAMW02-0412-2	1204006-14	Groundwater	04/22/12 15:45	04/24/12 11:21
FieldBlk 4	1204006-15	Groundwater	04/24/12 10:00	04/26/12 11:10
EquipBlk 4	1204006-16	Groundwater	04/24/12 14:00	04/26/12 11:10
EPAMW01-0412	1204006-17	Groundwater	04/24/12 14:09	04/26/12 11:10
EPAMW01d-0412	1204006-18	Groundwater	04/24/12 14:09	04/26/12 11:10
EPAMW01-0412-4	1204006-19	Groundwater	04/24/12 13:49	04/26/12 11:10
EPAMW01-0412-7	1204006-20	Groundwater	04/24/12 16:28	04/26/12 11:10
EPAMW01-0412-10	1204006-21	Groundwater	04/24/12 18:21	04/26/12 11:10
Riverton WY Truck Water	1204006-22	Groundwater	05/01/12 09:55	05/2/12 12:01

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USEPA, ORD, NRMRL

Sample Analysis Request and Chain of Custody (COC) Record

Page 1 of 1

Project: Pavillion Groundwater, Task# 23993
Location: Pavillion, WY
Project Manager/Phone: Rick Wilkin / 580-436-8874

Lab Name: EPA Region 3 Lab
Address: 701 Mapes Road, Ft. Meade, MD 20755
Contact Name/Phone: Jennie Gundersen / 410-305-2835

Shipping Method: FedEx
Shipping Tracking Number:

Shipping Date: 4/17/12
Total Number of Shipping Containers:

Sample Number	Sample Matrix/Description	Date/Time Collected	Container Type	Preservation	Number of Containers	Requested Parameters: R3/Glycols						Special Instructions
FieldBlk 1	Groundwater	4/16/12 11:00A	40mL glass Amber VOA3	NONE	2	26		1204006-01				NSF 609
EquipBlk 1		4/16/12 10:00A			2	2				-02		
PGDW20-0412		4/16/12 12:30P			2	2				-03		
PGDW20d-0412		4/16/12 12:30P			2	2				-04		
EPAMW02-0412-1		4/16/12 2:50P			6	6				-05		*4 additional samples collected for Time Series 1,2,3,4
PGDW23-0412		4/17/12 11:45A			2	2				-06		
PGDW30-0412		4/17/12 2:00P			2	2				-07		

Relinquished By: Printed name: Rick Wilkin Signature: [signature] Affiliation: USEPA Date: 4/17/12 Time: 4:00 PM
Received By: Printed name: Kevin Martin Signature: [signature] Affiliation: US EPA R3 Lab Date: 4/18/12 Time: 1428
Comments: Temp Blank 2°C

Relinquished By: Printed name: Signature: Affiliation: Date: Time:
Received By: Printed name: Signature: Affiliation: Date: Time:
Comments:

Pink copy - Field Custodian, Yellow copy - Lab Custodian, White copy - Project Manager EPA-442 (CIN) (09/08)

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Address: 701 Mapes Road, Ft. Meade, MD 20755
Contact Name/Phone: Jennie Gundersen / 410-305-2835

Shipping Method: Fed Ex
Shipping Tracking Number:

Shipping Date: 4/18/12
Total Number of Shipping Containers: 1

Sample Number	Sample Matrix/Description	Date/Time Collected	Container Type	Preservation	Number of Containers	Requested Parameters: R3 / Glycols						Special Instructions
FieldBlk 2	Groundwater	4/18/12 9:00A	40mL glass amber VOA's	None	2	26		1204006-08				NSF609
EquipBlk 2	↓	4/18/12 10:00A	↓	↓	2	2				-09		
PGDW05-0412	↓	4/18/12 12:00P	↓	↓	2	2				-10		

Relinquished By: Printed name: Rick Wilkin Signature: [signature] Affiliation: USEPA Date: 4/18/2012 Time: 4:50PM
Received By: Printed name: Kevin Martin Signature: [signature] Affiliation: USEPA R3 Lab Date: 4/19/12 Time: 12:14
Comments: Temp Blank 2°C

Relinquished By: Printed name: Signature: Affiliation: Date: Time:
Received By: Printed name: Signature: Affiliation: Date: Time:
Comments:

Pink copy - Field Custodian, Yellow copy - Lab Custodian, White copy - Project Manager EPA-442 (CIN) (09/08)

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Project: Pavillion Groundwater, Task#23993
Location: Pavillion, WY
Project Manager/Phone: Rick Wilkin / 580-436-8874

Lab Name: EPA Region 3 Lab
Address: 701 Mapes Road, Ft. Meade, MD 20755
Contact Name/Phone: Jennie Gundersen / 410-305-2835

Shipping Method: Fed Ex
Shipping Tracking Number: 8006 5696 5437

Shipping Date: 4/23/12
Total Number of Shipping Containers: 1

Sample Number	Sample Matrix/Description	Date/Time Collected	Container Type	Preservation	Number of Containers	Requested Parameters: R3/Glycols					Special Instructions
FieldBlk 3	Groundwater	4/24/12 12:00 P	40mL glass Amber VOAs	None	2	2G					NSF609
PGDW50-0412		4/19/12 12:00P			2	2		1204006-11			
PGPW02-0412		4/20/12 3:30P			2	2		1204006-12			
EPAMW02-0412-2		4/22/12 3:45P			2	2		1204006-13			
								1204006-14			

Relinquished By: Printed name: Rick Wilkin Signature: [signature] Affiliation: USGS Date: 4/23/2012 Time: 10:00 AM
Received By: Printed name: Kevin Martin Signature: [signature] Affiliation: US EPA R3 Lab Date: 4/24/12 Time: 11:21
Comments: Temp Blank 3°C

Relinquished By: Printed name: Signature: Affiliation: Date: Time:
Received By: Printed name: Signature: Affiliation: Date: Time:
Comments:

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Sample Analysis Request and Chain of Custody (COC) Record

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Project: Pavillion Groundwater, Task # 23993
Location: Pavillion, WY
Project Manager/Phone: Rick Wilkin / 580-436-8874

Lab Name: EPA Region 3 Lab
Address: 701 Mapes Road, Ft. Meade, MD 20755
Contact Name/Phone: Jennie Gundersen / 410-305-2835

Shipping Method: Fed Ex
Shipping Date: 4/25/12
Shipping Tracking Number: 8006 5696 5448
Total Number of Shipping Containers: 1

Sample Number	Sample Matrix/Description	Date/Time Collected	Container Type	Preservation	Number of Containers	Requested Parameters: R3/Glycols					Special Instructions
FieldBlk 4	Groundwater	4/24/12 10:00 A	40 mL glass Amber VOAs	None	2	26	1204006-15				NSF609
EquipBlk 4		4/24/12 2:00 P			2	2			-16		
EPAMW01-0412-[illegible]		4/24/12 2:09 P			2	2			-17		
EPAMW01-0412-[illegible]		4/24/12 2:09 P			2	2			-18		
EPAMW01-0412-4		4/24/12 1:49 P			2	2			-19		
EPAMW01-0412-7		4/24/12 4:28 P			2	2			-20		
EPAMW01-0412-16		4/24/12 6:21 P			2	2			-21		

Relinquished By: Printed name: Rick Wilkin Signature: [signature] Affiliation: USEPA Date: 4/25/12 Time: 9:00 AM
Received By: Printed name: Kevin Martin Signature: [signature] Affiliation: USEPA R3 Lab Date: 4/26/12 Time: 11:10
Comments: Temp Blank 2°C

Relinquished By: Printed name: Signature: Affiliation: Date: Time:
Received By: Printed name: Signature: Affiliation: Date: Time:
Comments:

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Location: Pavillion, WY
Project Manager/Phone: Rick Wilkin / 580-436-8874

Lab Name: EPA Region 3 Lab
Address: 701 Mapes Road, Ft. Meade, MD 20755
Contact Name/Phone: Jennie Gundersen / 410-305-2835

Shipping Method: Fed Ex
Shipping Tracking Number: 8006 5696 5481

Shipping Date: 5/1/12
Total Number of Shipping Containers: 1

Sample Number	Sample Matrix/Description	Date/Time Collected	Container Type	Preservation	Number of Containers	Requested Parameters: R3/Glycols						Special Instructions
RiverstonWY TruckWater	Groundwater	5/1/12 9:55A	40mL glass Amber VOAs	None	2	26		1204006-22				NSF609

Relinquished By: Printed name: Christopher Ryburn Signature: [signature] Affiliation: US EPA Date: 5/1/12 Time: 2:30 PM
Received By: Printed name: Kevin Martin Signature: [signature] Affiliation: US EPA R3 Lab Date: 5/2/12 Time: 1201
Comments: Temp Blank 2°C

Relinquished By: Printed name: Signature: Affiliation: Date: Time:
Received By: Printed name: Signature: Affiliation: Date: Time:
Comments:

Pink copy - Field Custodian, Yellow copy - Lab Custodian, White copy - Project Manager EPA-442 (CIN) (09/08)

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-01								
Station ID: FieldBlk 1								
Sample Matrix: Groundwater								
Collected: 04/16/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 18:43	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 18:43	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 18:43	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 18:43	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-02								
Station ID: EquipBlk 1								
Sample Matrix: Groundwater								
Collected: 04/16/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 19:05	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 19:05	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:05	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:05	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-03								
Station ID: PGDW20-0412								
Sample Matrix: Groundwater								
Collected: 04/16/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 19:26	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 19:26	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:26	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:26	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-04								
Station ID: PGDW20d-0412								
Sample Matrix: Groundwater								
Collected: 04/16/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 19:48	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 19:48	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:48	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 19:48	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-05								
Station ID: EPAMW02-0412-1								
Sample Matrix: Groundwater								
Collected: 04/16/2012								
2-Butoxyethanol	**6.8**		5.0	ug/L	1	04/19/12	04/20/12 20:09	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**1260**	J	25.0	ug/L	5	04/19/12	04/21/12 00:28	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	**22.6**		10.0	ug/L	1	04/19/12	04/20/12 20:09	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**262**		50.0	ug/L	5	04/19/12	04/21/12 00:28	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-06								
Station ID: PGDW23-0412								
Sample Matrix: Groundwater								
Collected: 04/17/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 20:31	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 20:31	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 20:31	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 20:31	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-07								
Station ID: PGDW30-0412								
Sample Matrix: Groundwater								
Collected: 04/17/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 20:52	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 20:52	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 20:52	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 20:52	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-08								
Station ID: FieldBlk 2								
Sample Matrix: Groundwater								
Collected: 04/18/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 21:14	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 21:14	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:14	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:14	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-09								
Station ID: EquipBlk 2								
Sample Matrix: Groundwater								
Collected: 04/18/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 21:35	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 21:35	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:35	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:35	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-10								
Station ID: PGDW05-0412								
Sample Matrix: Groundwater								
Collected: 04/18/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/19/12	04/20/12 21:57	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/19/12	04/20/12 21:57	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:57	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/19/12	04/20/12 21:57	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-11								
Station ID: FieldBlk 3								
Sample Matrix: Groundwater								
Collected: 04/22/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 21:39	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/30/12	05/01/12 21:39	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 21:39	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/30/12	05/01/12 21:39	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-12								
Station ID: PGDW50-0412								
Sample Matrix: Groundwater								
Collected: 04/19/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 22:01	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/30/12	05/01/12 22:01	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 22:01	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/30/12	05/01/12 22:01	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-13								
Station ID: PGPW02-0412								
Sample Matrix: Groundwater								
Collected: 04/20/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 22:22	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/30/12	05/01/12 22:22	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 22:22	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/30/12	05/01/12 22:22	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-14								
Station ID: EPAMW02-0412-2								
Sample Matrix: Groundwater								
Collected: 04/22/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 22:44	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**378**		10.0	ug/L	2	04/30/12	05/02/12 23:20	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	**3.6**	J	10.0	ug/L	1	04/30/12	05/01/12 22:44	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**72.3**		10.0	ug/L	1	04/30/12	05/01/12 22:44	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-15								
Station ID: FieldBlk 4								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 23:05	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/30/12	05/01/12 23:05	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 23:05	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/30/12	05/01/12 23:05	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-16								
Station ID: EquipBlk 4								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/01/12 23:27	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		5.0	ug/L	1	04/30/12	05/01/12 23:27	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 23:27	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		10.0	ug/L	1	04/30/12	05/01/12 23:27	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-17								
Station ID: EPAMW01-0412								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	**3.5**	J	5.0	ug/L	1	04/30/12	05/01/12 23:48	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**53.9**		5.0	ug/L	1	04/30/12	05/01/12 23:48	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/01/12 23:48	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**11.5**		10.0	ug/L	1	04/30/12	05/01/12 23:48	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-18								
Station ID: EPAMW01d-0412								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	**3.0**	J	5.0	ug/L	1	04/30/12	05/02/12 00:10	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**53.9**		5.0	ug/L	1	04/30/12	05/02/12 00:10	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/02/12 00:10	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**11.6**		10.0	ug/L	1	04/30/12	05/02/12 00:10	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-19								
Station ID: EPAMW01-0412-4								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	**5.1**		5.0	ug/L	1	04/30/12	05/02/12 00:32	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**60.0**		5.0	ug/L	1	04/30/12	05/02/12 00:32	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/02/12 00:32	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**12.7**		10.0	ug/L	1	04/30/12	05/02/12 00:32	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-20								
Station ID: EPAMW01-0412-7								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	**1.5**	J	5.0	ug/L	1	04/30/12	05/02/12 00:53	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**34.1**		5.0	ug/L	1	04/30/12	05/02/12 00:53	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/02/12 00:53	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**4.9**	J	10.0	ug/L	1	04/30/12	05/02/12 00:53	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-21								
Station ID: EPAMW01-0412-10								
Sample Matrix: Groundwater								
Collected: 04/24/2012								
2-Butoxyethanol	U		5.0	ug/L	1	04/30/12	05/02/12 02:19	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	**26.4**		5.0	ug/L	1	04/30/12	05/02/12 02:19	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		10.0	ug/L	1	04/30/12	05/02/12 02:19	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	**2.9**	J	10.0	ug/L	1	04/30/12	05/02/12 02:19	SW846 8321/ASTM D773-11 Modified

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1204006-22								
Station ID: Riverton WY Truck Water								
Sample Matrix: Groundwater								
Collected: 05/01/2012								
2-Butoxyethanol	U		5.0	ug/L	1	05/02/12	05/03/12 08:55	SW846 8321/ASTM D773-11 Modified
Diethylene Glycol	U		25.0	ug/L	1	05/02/12	05/03/12 08:55	SW846 8321/ASTM D773-11 Modified
Tetraethylene Glycol	U		25.0	ug/L	1	05/02/12	05/03/12 08:55	SW846 8321/ASTM D773-11 Modified
Triethylene Gycol	U		25.0	ug/L	1	05/02/12	05/03/12 08:55	SW846 8321/ASTM D773-11 Modified

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BD21902 - LC/MS prep										
Blank (BD21902-BLK1)				Prepared: 04/19/12 15:23			Analyzed: 04/20/12 18:22			
2-Butoxyethanol	U	5.0	ug/L							
Diethylene Glycol	U	5.0	"							
Tetraethylene Glycol	U	10.0	"							
Triethylene Gycol	U	10.0	"							
Blank (BD21902-BLK2)				Prepared: 04/19/12 15:23			Analyzed: 04/20/12 23:23			
2-Butoxyethanol	U	5.0	ug/L							
Diethylene Glycol	U	5.0	"							
Tetraethylene Glycol	U	10.0	"							
Triethylene Gycol	U	10.0	"							
Blank (BD21902-BLK3)				Prepared: 04/30/12 09:00			Analyzed: 05/01/12 21:18			
2-Butoxyethanol	U	5.0	ug/L							
Diethylene Glycol	U	5.0	"							
Tetraethylene Glycol	U	10.0	"							
Triethylene Gycol	U	10.0	"							
Blank (BD21902-BLK4)				Prepared: 05/02/12 12:57			Analyzed: 05/02/12 21:32			
2-Butoxyethanol	U	5.0	ug/L							
Diethylene Glycol	U	10.0	"							
Tetraethylene Glycol	U	25.0	"							
Triethylene Gycol	U	25.0	"							
LCS (BD21902-BS1)				Prepared: 04/19/12 15:23			Analyzed: 04/20/12 22:40			
2-Butoxyethanol	118	5.0	ug/L	100.00		118	80-120			
Diethylene Glycol	103	5.0	"	100.00		103	80-120			
Tetraethylene Glycol	108	10.0	"	100.00		108	80-120			
Triethylene Gycol	106	10.0	"	100.00		106	80-120			

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BD21902 - LC/MS prep										
LCS (BD21902-BS2)				Prepared: 04/19/12 15:23			Analyzed: 04/20/12 23:02			
2-Butoxyethanol	50.7	5.0	ug/L	50.000		101	80-120			
Diethylene Glycol	49.5	5.0	"	50.000		99	80-120			
Tetraethylene Glycol	51.0	10.0	"	50.000		102	80-120			
Triethylene Gycol	52.8	10.0	"	50.000		106	80-120			
LCS (BD21902-BS3)				Prepared: 04/30/12 09:00			Analyzed: 05/02/12 01:36			
2-Butoxyethanol	116	5.0	ug/L	100.00		116	80-120			
Diethylene Glycol	108	5.0	"	100.00		108	80-120			
Tetraethylene Glycol	107	10.0	"	100.00		107	80-120			
Triethylene Gycol	111	10.0	"	100.00		111	80-120			
LCS (BD21902-BS4)				Prepared: 04/30/12 09:00			Analyzed: 05/02/12 01:58			
2-Butoxyethanol	48.9	5.0	ug/L	50.000		98	80-120			
Diethylene Glycol	50.0	5.0	"	50.000		100	80-120			
Tetraethylene Glycol	51.3	10.0	"	50.000		103	80-120			
Triethylene Gycol	54.4	10.0	"	50.000		109	80-120			
LCS (BD21902-BS5)				Prepared: 05/02/12 12:57			Analyzed: 05/03/12 09:38			
2-Butoxyethanol	105	5.0	ug/L	100.00		105	80-120			
Diethylene Glycol	98.6	10.0	"	100.00		99	80-120			
Tetraethylene Glycol	108	25.0	"	100.00		108	80-120			
Triethylene Gycol	108	25.0	"	100.00		108	80-120			
LCS (BD21902-BS6)				Prepared: 05/02/12 12:57			Analyzed: 05/10/12 10:00			
2-Butoxyethanol	51.4	5.0	ug/L	50.000		103	80-120			
Diethylene Glycol	48.6	10.0	"	50.000		97	80-120			
Tetraethylene Glycol	48.6	25.0	"	50.000		97	80-120			
Triethylene Gycol	50.9	25.0	"	50.000		102	80-120			

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BD21902 - LC/MS prep										
MRL Check (BD21902-MRL1)				Prepared: 04/19/12 15:23			Analyzed: 04/21/12 01:54			
2-Butoxyethanol	4.5	5.0	ug/L	5.0000		90	60-140			
Diethylene Glycol	3.6	5.0	"	5.0000		72	60-140			
Tetraethylene Glycol	U	10.0	"	5.0000			60-140			A
Triethylene Gycol	1.1	10.0	"	5.0000		22	60-140			A
MRL Check (BD21902-MRL2)				Prepared: 04/19/12 15:23			Analyzed: 04/21/12 01:32			
2-Butoxyethanol	10.4	5.0	ug/L	10.000		104	60-140			
Diethylene Glycol	8.3	5.0	"	10.000		83	60-140			
Tetraethylene Glycol	6.6	10.0	"	10.000		66	60-140			
Triethylene Gycol	6.9	10.0	"	10.000		69	60-140			
MRL Check (BD21902-MRL3)				Prepared: 04/19/12 15:23			Analyzed: 04/21/12 01:11			
2-Butoxyethanol	22.6	5.0	ug/L	25.000		90	60-140			
Diethylene Glycol	25.1	5.0	"	25.000		100	60-140			
Tetraethylene Glycol	24.0	10.0	"	25.000		96	60-140			
Triethylene Gycol	25.6	10.0	"	25.000		102	60-140			
MRL Check (BD21902-MRL4)				Prepared: 04/30/12 09:00			Analyzed: 05/02/12 04:28			
2-Butoxyethanol	4.3	5.0	ug/L	5.0000		86	60-140			
Diethylene Glycol	4.8	5.0	"	5.0000		96	60-140			
Tetraethylene Glycol	U	10.0	"	5.0000			60-140			A
Triethylene Gycol	U	10.0	"	5.0000			60-140			A
MRL Check (BD21902-MRL5)				Prepared: 04/30/12 09:00			Analyzed: 05/02/12 04:07			
2-Butoxyethanol	9.2	5.0	ug/L	10.000		92	60-140			
Diethylene Glycol	10.0	5.0	"	10.000		100	60-140			
Tetraethylene Glycol	6.2	10.0	"	10.000		62	60-140			
Triethylene Gycol	6.5	10.0	"	10.000		65	60-140			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BD21902 - LC/MS prep										
MRL Check (BD21902-MRL6)				Prepared: 04/30/12 09:00			Analyzed: 05/02/12 03:45			
2-Butoxyethanol	26.1	5.0	ug/L	25.000		104	60-140			
Diethylene Glycol	26.5	5.0	"	25.000		106	60-140			
Tetraethylene Glycol	23.1	10.0	"	25.000		92	60-140			
Triethylene Gycol	26.0	10.0	"	25.000		104	60-140			
MRL Check (BD21902-MRL7)				Prepared: 05/02/12 12:57			Analyzed: 05/03/12 11:04			
2-Butoxyethanol	2.6	5.0	ug/L	5.0000		52	60-140			A
Diethylene Glycol	2.9	10.0	"	5.0000		58	60-140			A
Tetraethylene Glycol	U	25.0	"	5.0000			60-140			A
Triethylene Gycol	U	25.0	"	5.0000			60-140			A
MRL Check (BD21902-MRL8)				Prepared: 05/02/12 12:57			Analyzed: 05/03/12 10:43			
2-Butoxyethanol	8.5	5.0	ug/L	10.000		85	60-140			
Diethylene Glycol	8.3	10.0	"	10.000		83	60-140			
Tetraethylene Glycol	3.4	25.0	"	10.000		34	60-140			A
Triethylene Gycol	3.5	25.0	"	10.000		35	60-140			A
MRL Check (BD21902-MRL9)				Prepared: 05/02/12 12:57			Analyzed: 05/03/12 10:21			
2-Butoxyethanol	22.4	5.0	ug/L	25.000		90	60-140			
Diethylene Glycol	23.5	10.0	"	25.000		94	60-140			
Tetraethylene Glycol	23.0	25.0	"	25.000		92	60-140			
Triethylene Gycol	21.5	25.0	"	25.000		86	60-140			
Matrix Spike (BD21902-MS1)		**Source: 1204006-07**		Prepared: 04/19/12 15:23			Analyzed: 04/20/12 23:45			
2-Butoxyethanol	7.5	5.0	ug/L	100.00	0.0	8	70-130			A
Diethylene Glycol	9.9	5.0	"	100.00	0.0	10	70-130			A
Tetraethylene Glycol	4.7	10.0	"	100.00	0.0	5	70-130			A
Triethylene Gycol	6.9	10.0	"	100.00	0.0	7	70-130			A

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Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BD21902 - LC/MS prep										
Matrix Spike (BD21902-MS2)		**Source: 1204006-17**		Prepared: 04/30/12 09:00			Analyzed: 05/02/12 03:02			
2-Butoxyethanol	102	5.0	ug/L	100.00	3.5	98	70-130			
Diethylene Glycol	155	5.0	"	100.00	53.9	101	70-130			
Tetraethylene Glycol	96.5	10.0	"	100.00	0.0	96	70-130			
Triethylene Gycol	121	10.0	"	100.00	11.5	110	70-130			
Matrix Spike Dup (BD21902-MSD1)		**Source: 1204006-07**		Prepared: 04/19/12 15:23			Analyzed: 04/21/12 00:06			
2-Butoxyethanol	5.8	5.0	ug/L	100.00	0.0	6	70-130	26	25	A
Diethylene Glycol	9.4	5.0	"	100.00	0.0	9	70-130	5	25	A
Tetraethylene Glycol	4.8	10.0	"	100.00	0.0	5	70-130	2	25	A
Triethylene Gycol	5.3	10.0	"	100.00	0.0	5	70-130	26	25	A
Matrix Spike Dup (BD21902-MSD2)		**Source: 1204006-17**		Prepared: 04/30/12 09:00			Analyzed: 05/02/12 03:24			
2-Butoxyethanol	107	5.0	ug/L	100.00	3.5	103	70-130	5	25	
Diethylene Glycol	154	5.0	"	100.00	53.9	100	70-130	0.6	25	
Tetraethylene Glycol	98.9	10.0	"	100.00	0.0	99	70-130	2	25	
Triethylene Gycol	119	10.0	"	100.00	11.5	108	70-130	2	25	

Site Name: **Pavillion GW Investigation** **Project #:** **NSF 609**

Notes and Definitions

J The identification of the analyte is acceptable; the reported value is an estimate.

A Quality control value is outside acceptance limits.

%REC Percent Recovery

RPD Relative Percent Difference

U Analyte included in the analysis, but not detected at or above the quantitation limit.

QUANTITATION LIMIT: The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

SOLID SAMPLE RESULTS - REPORTING PROTOCOL: Percent Solids (percent dry wt at 105 degrees C) determinations are routinely performed for most organic and inorganic analyses. Consequently, these samples are analyzed wet and converted to a dry weight result for reporting purposes. If metals and mercury analyses are requested, they are routinely prepared for analyses by an initial drying at 60 degrees C, homogenized prior to digestion, and are analyzed and reported on a dry weight basis. Oil-type samples are analyzed and reported on a wet weight basis for all analyses because of the nature of the sample matrix. Any exceptions to this protocol will be noted in the narrative.

ON-DEMAND: The term 'on-demand' analysis, if noted in the report narrative, refers to Section 13.1.4 in the Region III OASQA Laboratory Quality Manual, which provides procedures for non-routine analyses or analytes.