SAF-RC-240
100N Groundwater Sample Collection Supporting
100-N-85 Characterization Borehole
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 3/9/15
INITIAL/DATE

COMMENTS:

SDG X0095 SAF-RC-240

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: C9410 - I-011 Filtered & Unfiltered

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

March 04, 2015

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354

Re: RC-240 Water
Work Order: 367035
SDG: X0095

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 12, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 1510
Chain of Custody: RC-240-002, RC-240-003, RC-240-004, RC-240-006, RC-240-007 and RC-240-008
Enclosures

Receipt Narrative
for
Eberline
SDG: X0095
Work Order: 367035

March 04, 2015

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 12, 2015 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
367035001	B30C04
367035002	B30C05
367035003	B30C06
367035004	B30C09
367035005	B30C10
367035006	B30C11

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Diesel Range Organics, FID Flame Ionization Detector, GC Volatiles (GRO), GC/MS Volatile, General Chemistry and HPLC Polynuclear Aromatic Hydrocarbon.

Heather Shaffer

Heather Shaffer
Project Manager

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Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-002	PAGE 1 OF 1
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 7K AIR QUALITY ☐	DATA TURNAROUND 15 Days / 45 Days
SAMPLING LOCATION C9410, I-011 FILTERED	PROJECT DESIGNATION 100-N-85 Characterization Borehole - Water		SAF NO. RC-240		
ICE CHEST NO. GWS-060	FIELD LOGBOOK NO. HNF-N-507-~~25~~-69	ACTUAL SAMPLE DEPTH 74.9	COA 303630	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 5409		BILL OF LADING/AIR BILL NO. 7728 8888 5352		

367035

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl or H2SO4 to pH <2/Cool
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs*
NO. OF CONTAINER(S)	4
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C04	WATER	FEB 11 2015	0924	✓

FILTER

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM D.L. Floyd/CHPRC	DATE/TIME FEB 11 2015 1055	RECEIVED BY/STORED IN L.D. Wall CHPRC	DATE/TIME FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM L.D. Wall CHPRC	DATE/TIME FEB 11 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME	RECEIVED BY/STORED IN M Kinslow	DATE/TIME 2-12-15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

761DS

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-003	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 7K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-011 FILTERED	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Water		SAF NO.: RC-240	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GW05-060	FIELD LOGBOOK NO.: HNF-N-507-25.69	ACTUAL SAMPLE DEPTH: 76.5	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5409		BILL OF LADING/AIR BILL NO.: 7728 8888 5352		

367035

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	HCl to pH <2/Cool <=6C	HCl to pH <2/Cool <=6C	HCl to pH <2/Cool <=6C
HOLDING TIME	7/40 Days	14 Days	14/40 Days	14/40 Days
TYPE OF CONTAINER	aG	aGs*	aG	aG
NO. OF CONTAINER(S)	3	4	3	3
VOLUME	1L	40mL	1L	1L
SAMPLE ANALYSIS	PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C05	WATER	FEB 11 2015	0924	✓	✓	✓	✓

FILTER

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 11 2015 1055	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN: M. Kinslow	DATE/TIME: 2/12/15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-004	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 7K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-011 FILTERED	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Water		SAF NO.: RC-240	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-301	FIELD LOGBOOK NO.: HNF-N-507-35-69	ACTUAL SAMPLE DEPTH: 74.9	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5409		BILL OF LADING/AIR BILL NO.: 7728 8888 5720		

367035

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C
HOLDING TIME	48 Hours
TYPE OF CONTAINER	P
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C06	WATER	FEB 11 2015	0924	✓

FILTER

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 11 2015 1055	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FEDEX	DATE/TIME:	RECEIVED BY/STORED IN: M. Kirsbau	DATE/TIME: 2-12-15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016
(1) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate};

TRVL- 15- 016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-008	PAGE 1 OF 1
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 7K AIR QUALITY ☐	DATA TURNAROUND 15 Days / 45 Days
SAMPLING LOCATION C9410, I-011 UNFILTERED	PROJECT DESIGNATION 100-N-85 Characterization Borehole - Water		SAF NO. RC-240		
ICE CHEST NO. GWS-301	FIELD LOGBOOK NO. HNF-N-507-25.69	ACTUAL SAMPLE DEPTH 74.9	COA 303630	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 5409		BILL OF LADING/AIR BILL NO. 7728 88885720		

367035

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C
HOLDING TIME	48 Hours
TYPE OF CONTAINER	P
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C11	WATER	FEB 11 2015	0924	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM D.L. Floyd/CHPRC	DATE/TIME FEB 11 2015 1055	RECEIVED BY/STORED IN L.D. Wall CHPRC	DATE/TIME FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM L.D. Wall CHPRC	DATE/TIME FEB 11 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME	RECEIVED BY/STORED IN M. Kinslow	DATE/TIME 2-12-15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016
(1) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate};

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-006	PAGE 1 OF 1
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 7K AIR QUALITY ☐	DATA TURNAROUND 15 Days / 45 Days
SAMPLING LOCATION C9410, I-011 UNFILTERED	PROJECT DESIGNATION 100-N-85 Characterization Borehole - Water		SAF NO. RC-240		
ICE CHEST NO. GWS-301	FIELD LOGBOOK NO. HNF-N-507-25-69	ACTUAL SAMPLE DEPTH 74.9'	COA 303630	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 5409		BILL OF LADING/AIR BILL NO. 7728 8888 5720		

367035

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl or H2SO4 to pH <2/Cool
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs*
NO. OF CONTAINER(S)	4
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C09	WATER	FEB 11 2015	0924	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM D.L. Floyd/CHPRC	DATE/TIME FEB 11 2015 1055	RECEIVED BY/STORED IN L.D. Wall CHPRC	DATE/TIME FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM L.D. Wall	DATE/TIME FEB 11 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME	RECEIVED BY/STORED IN M. Kinslow	DATE/TIME 2-12-15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

77165

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-240-007	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 7K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-011 UNFILTERED	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Water		SAF NO.: RC-240	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-301	FIELD LOGBOOK NO.: HNF-N-507 25.69	ACTUAL SAMPLE DEPTH: 74.9'	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5409		BILL OF LADING/AIR BILL NO.: 7728 8888 ~~5552~~ 5720		

dw 2/11/15

367035

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION				Cool <=6C	HCl to pH <2/Cool <=6C	HCl to pH <2/Cool <=6C	HCl to pH <2/Cool <=6C
HOLDING TIME				7/40 Days	14 Days	14/40 Days	14/40 Days
TYPE OF CONTAINER				aG	aGs*	aG	aG
NO. OF CONTAINER(S)				3	4	3	3
VOLUME				1L	40mL	1L	1L
SAMPLE ANALYSIS				PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C10	WATER	FEB 11 2015	0924	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 11 2015 1055	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1055
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 11 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN: M. Knislow	DATE/TIME: 2-12-15 0835
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors detected on the Field Sampling Report provided.** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 0956 will not be met.Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: WCHN / CPRC	SDG/AR/COC/Work Order: 367035
Received By: MC	Date Received: 2-12-15

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): cpm 0
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 2C 3C *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130532776 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.	✓			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7728 8888 5720 2C 7728 8715 9603 2C 7728 9096 2940 2C 7728 8988 9814 3C 7728 8888 5352 3C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HS Date 2/12/15 Page 1 of 1

GL-CHL-SR-001

Laboratory Certifications

List of current GEL Certifications as of 04 March 2015

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−15−10
Utah NELAP	SC000122014−16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 8260C
Analytical Batch Number:	1459244

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
367035001	B30C04
367035004	B30C09
1203268728	Method Blank (MB)
1203268729	Laboratory Control Sample (LCS)
1203268980	367035001(B30C04) Post Spike (PS)
1203268981	367035001(B30C04) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification Requirements

All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement
The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 367035001 (B30C04) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement
The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits.

Sample	Analyte	Value
1203268980 (B30C04PS)	2-Butanone	65.7* (70%-130%)
	Acetone	48.3* (70%-130%)
1203268981 (B30C04PSD)	2-Butanone	68.3* (70%-130%)
	Acetone	50* (70%-130%)

Relative Percent Difference (RPD) Statement
The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance
The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications
All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Preservation and Integrity
All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
A data exception report (DER) 1387421 was generated for samples 1203268980 (B30C04PS) and 1203268981 (B30C04PSD) in this SDG/batch.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment
Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments
Additional comments were not required for this SDG.

Residual Chlorine
Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
03-MAR-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
VOA GC/MS	SW846 8260C	Liquid	WCHN
Batch ID:	**Sample Numbers:**		
1459244	See Below		

Potentially affected work order(s)(SDG): 367035(X0095)

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. QC samples 1203268980MS and 1203268981MSD were outside the spike recovery acceptance limits for Acetone and 2-Butanone.	1. The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. 1203268980 (B30C04PS) 2-Butanone [65.7* (70%-130%)], Acetone [48.3* (70%-130%)]. 1203268981 (B30C04PSD) 2-Butanone [68.3* (70%-130%)] and Acetone [50* (70%-130%)].

Originator's Name:

Amy Jamison 03-MAR-15

Data Validator/Group Leader:

Erin Haubert 04-MAR-15

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC−240 Water

The Qualifiers in this report are defined as follows:

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

T Spike and/or spike duplicate sample recovery is outside control limits.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.

RA Indicates that sample is re−analyzed without re−extraction.

RE Indicates that sample is re−extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Erin Haubert **Name: Erin Haubert**

Date: 04 MAR 2015 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-240 Water**

Report Date: March 4, 2015

Client SDG: X0095

Client Sample ID:	B30C04	Project:	WCHN0RC240
Sample ID:	367035001	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics										
Volatiles by SW846 8260C "As Received"										
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	ACJ 02/20/15	1403	1459244	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1				
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1				
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1				
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1				
2-Butanone	TU	3.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone	U	3.00	3.00	10.0	ug/L	1				
Acetone	TU	3.00	3.00	20.0	ug/L	1				
Benzene	U	0.300	0.300	5.00	ug/L	1				
Carbon disulfide	U	1.60	1.60	10.0	ug/L	1				
Carbon tetrachloride	U	0.300	0.300	5.00	ug/L	1				
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1				
Chloroform	J	1.89	0.300	5.00	ug/L	1				
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1				
Methylene chloride	U	1.60	1.60	5.00	ug/L	1				
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1				
Toluene	U	0.300	0.300	5.00	ug/L	1				
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1				
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1				
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1				

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*	*Date Time:*	*02/20/15 14 03*
1,2-Dichloroethane-d4	47.7 ug/L	50.0	95.4	(77%-123%)		
Bromofluorobenzene	47.7 ug/L	50.0	95.4	(80%-120%)		
Toluene-d8	51.1 ug/L	50.0	102	(80%-120%)		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 14 03*
unknown hydrocarbon		4.482	19.7 ug/L	0	J		
unknown siloxane		12.461	9.97 ug/L	0	J		
unknown siloxane		14.82	8.23 ug/L	0	J		
unknown siloxane		16.783	22.5 ug/L	0	J		

The following Analytical Methods were performed

Method	Description	Analyst Comments

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-240 Water**

Report Date: March 4, 2015

Client SDG: X0095

Client Sample ID: B30C04
Sample ID: 367035001

Project: WCHN0RC240
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-240 Water**

Report Date: March 4, 2015

Client SDG: X0095

Client Sample ID:	B30C09	Project:	WCHN0RC240
Sample ID:	367035004	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
Volatiles by SW846 8260C "As Received"											
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	ACJ	02/20/15	1431	1459244	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1					
2-Butanone	TU	3.00	3.00	10.0	ug/L	1					
4-Methyl-2-pentanone	U	3.00	3.00	10.0	ug/L	1					
Acetone	TU	3.00	3.00	20.0	ug/L	1					
Benzene	U	0.300	0.300	5.00	ug/L	1					
Carbon disulfide	U	1.60	1.60	10.0	ug/L	1					
Carbon tetrachloride	U	0.300	0.300	5.00	ug/L	1					
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1					
Chloroform	J	1.91	0.300	5.00	ug/L	1					
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1					
Methylene chloride	U	1.60	1.60	5.00	ug/L	1					
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1					
Toluene	U	0.300	0.300	5.00	ug/L	1					
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1					
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1					
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1					

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*	*Date Time:*	*02/20/15 14 31*
Bromofluorobenzene	47.7 ug/L	50.0	95.4	(80%-120%)		
1,2-Dichloroethane-d4	47.9 ug/L	50.0	95.9	(77%-123%)		
Toluene-d8	50.1 ug/L	50.0	100	(80%-120%)		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 14 31*
unknown hydrocarbon		4.576	54 ug/L	0	J		
unknown siloxane		16.783	10.5 ug/L	0	J		

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: March 4, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1459244										
QC1203268729 LCS										
1,1,1-Trichloroethane	50.0			53.5	ug/L		107	(70%-130%)	ACJ	02/20/15 10:40
1,1,2-Trichloroethane	50.0			51.6	ug/L		103	(70%-130%)		
1,1-Dichloroethane	50.0			51.6	ug/L		103	(70%-130%)		
1,1-Dichloroethylene	50.0			48.6	ug/L		97.1	(70%-130%)		
1,2-Dichloroethane	50.0			47.2	ug/L		94.5	(70%-130%)		
2-Butanone	250			270	ug/L		108	(70%-130%)		
4-Methyl-2-pentanone	250			259	ug/L		104	(70%-130%)		
Acetone	250			291	ug/L		117	(70%-130%)		
Benzene	50.0			52.2	ug/L		104	(70%-130%)		
Carbon disulfide	250			280	ug/L		112	(70%-130%)		
Carbon tetrachloride	50.0			53.8	ug/L		108	(70%-130%)		
Chlorobenzene	50.0			53.5	ug/L		107	(70%-130%)		
Chloroform	50.0			51.7	ug/L		103	(70%-130%)		
Ethylbenzene	50.0			54.7	ug/L		109	(70%-130%)		
Methylene chloride	50.0			51.8	ug/L		104	(70%-130%)		
Tetrachloroethylene	50.0			56.0	ug/L		112	(70%-130%)		
Toluene	50.0			54.1	ug/L		108	(70%-130%)		
Trichloroethylene	50.0			52.8	ug/L		106	(70%-130%)		
Vinyl chloride	50.0			57.6	ug/L		115	(70%-130%)		
Xylenes (total)	150			167	ug/L		111	(70%-130%)		

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1459244											
**1,2-Dichloroethane-d4	50.0			46.9	ug/L		93.8	(77%-123%)	ACJ	02/20/15	10:40
**Bromofluorobenzene	50.0			44.8	ug/L		89.5	(80%-120%)			
**Toluene-d8	50.0			50.5	ug/L		101	(80%-120%)			
QC1203268728 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					02/20/15	13:02
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1459244											
Vinyl chloride				U	0.300	ug/L				ACJ	02/20/15 13:02
Xylenes (total)				U	0.300	ug/L					
**1,2-Dichloroethane-d4	50.0				47.5	ug/L		95.1	(77%-123%)		
**Bromofluorobenzene	50.0				49.5	ug/L		99	(80%-120%)		
**Toluene-d8	50.0				50.1	ug/L		100	(80%-120%)		
QC1203268980 367035001 PS											
1,1,1-Trichloroethane	50.0	U	0.00		48.0	ug/L		96.1	(70%-130%)		02/20/15 17:24
1,1,2-Trichloroethane	50.0	U	0.00		49.2	ug/L		98.4	(70%-130%)		
1,1-Dichloroethane	50.0	U	0.00		48.4	ug/L		96.7	(70%-130%)		
1,1-Dichloroethylene	50.0	U	0.00		44.4	ug/L		88.9	(70%-130%)		
1,2-Dichloroethane	50.0	U	0.00		44.9	ug/L		89.7	(70%-130%)		
2-Butanone	250	TU	0.00	T	164	ug/L		65.7*	(70%-130%)		
4-Methyl-2-pentanone	250	U	0.00		229	ug/L		91.6	(70%-130%)		
Acetone	250	TU	0.00	T	121	ug/L		48.3*	(70%-130%)		
Benzene	50.0	U	0.00		48.7	ug/L		97.4	(70%-130%)		
Carbon disulfide	250	U	0.00		265	ug/L		106	(70%-130%)		
Carbon tetrachloride	50.0	U	0.00		48.5	ug/L		97	(70%-130%)		
Chlorobenzene	50.0	U	0.00		50.5	ug/L		101	(70%-130%)		
Chloroform	50.0	J	1.89		50.2	ug/L		96.5	(70%-130%)		
Ethylbenzene	50.0	U	0.00		51.8	ug/L		104	(70%-130%)		
Methylene chloride	50.0	U	0.00		48.5	ug/L		96.9	(70%-130%)		
Tetrachloroethylene	50.0	U	0.00		52.8	ug/L		106	(70%-130%)		

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1459244											
Toluene	50.0	U	0.00		51.0	ug/L		102	(70%-130%)	ACJ	02/20/15 17:24
Trichloroethylene	50.0	U	0.00		49.3	ug/L		98.5	(70%-130%)		
Vinyl chloride	50.0	U	0.00		59.3	ug/L		119	(70%-130%)		
Xylenes (total)	150	U	0.00		158	ug/L		105	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		47.7		45.5	ug/L		90.9	(77%-123%)		
**Bromofluorobenzene	50.0		47.7		42.3	ug/L		84.6	(80%-120%)		
**Toluene-d8	50.0		51.1		51.1	ug/L		102	(80%-120%)		
QC1203268981 367035001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		48.9	ug/L	1.75	97.8	(0%-20%)		02/20/15 17:53
1,1,2-Trichloroethane	50.0	U	0.00		50.6	ug/L	2.86	101	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		47.9	ug/L	1.04	95.7	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		44.2	ug/L	0.542	88.4	(0%-20%)		
1,2-Dichloroethane	50.0	U	0.00		44.4	ug/L	1.08	88.7	(0%-20%)		
2-Butanone	250	TU	0.00	T	171	ug/L	3.97	68.3*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		236	ug/L	2.87	94.3	(0%-20%)		
Acetone	250	TU	0.00	T	125	ug/L	3.53	50*	(0%-20%)		
Benzene	50.0	U	0.00		48.7	ug/L	0.0822	97.3	(0%-20%)		
Carbon disulfide	250	U	0.00		261	ug/L	1.58	104	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		48.1	ug/L	0.891	96.1	(0%-20%)		
Chlorobenzene	50.0	U	0.00		50.3	ug/L	0.536	101	(0%-20%)		
Chloroform	50.0	J	1.89		50.0	ug/L	0.220	96.3	(0%-20%)		
Ethylbenzene	50.0	U	0.00		50.6	ug/L	2.32	101	(0%-20%)		

QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1459244											
Methylene chloride	50.0	U	0.00		48.4	ug/L	0.227	96.7	(0%-20%)	ACJ	02/20/15 17:53
Tetrachloroethylene	50.0	U	0.00		51.6	ug/L	2.24	103	(0%-20%)		
Toluene	50.0	U	0.00		50.5	ug/L	0.966	101	(0%-20%)		
Trichloroethylene	50.0	U	0.00		48.6	ug/L	1.45	97.1	(0%-20%)		
Vinyl chloride	50.0	U	0.00		62.4	ug/L	5.23	125	(0%-20%)		
Xylenes (total)	150	U	0.00		156	ug/L	1.33	104	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		47.7		45.3	ug/L		90.5	(77%-123%)		
**Bromofluorobenzene	50.0		47.7		42.1	ug/L		84.3	(80%-120%)		
**Toluene-d8	50.0		51.1		50.5	ug/L		101	(80%-120%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

HPLC Polynuclear Aromatic Hydrocarbon Analysis

HPLC Polynuclear Aromatic Hydrocarbon
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Procedure:	**Polynuclear Aromatic Hydrocarbons**
Analytical Method:	SW846 8310
Prep Method:	SW846 3510C
Analytical Batch Number:	1458176
Prep Batch Number:	1458174

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

Sample ID	Client ID
367035002	B30C05
367035005	B30C10
1203265789	MB for batch 1458174
1203265790	Laboratory Control Sample (LCS)
1203265791	367035005(B30C10) Matrix Spike (MS)
1203265792	367035005(B30C10) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 16.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

Initial Calibration
All initial calibration requirements have been met for this SDG.

CCV Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All the surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Client sample 367035005 (B30C10) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPDs between the MS and MSD met the acceptance limits.

Technical Information:

Holding Time Specifications
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required for this SDG.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

Manual Integrations
Some initial calibration standards, and QC samples 1203265790 (LCS), 1203265791 (B30C10MS) and 1203265792 (B30C10MSD) required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

Additional Comments
The Form 8 is used only as a sequence of the analysis.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

Chromatographic Columns

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC−240 Water

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Michael A. Penny Jr. **Name: Michael Penny**

Date: 24 FEB 2015 **Title: Group Leader**

Roadmap for WCHN X0095 HPLC_PAH

This roadmap was analyzed by cww on 02-24-2015, 08:57.
This roadmap was reviewed by map on 02-24-2015, 10:15.
This roadmap was packaged by map on 02-24-2015, 10:40.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p022015.b/ph5b2029.d	367035002	21-FEB-2015	09:24	X0095.sub	B30C05	1	1458176	
■	N	/chem/hplce.i/p022015.b/ph5b2030.d	367035005	21-FEB-2015	10:06	X0095.sub	B30C10	1	1458176	Pass
☐	N	/chem/hplce.i/p022015.b/ph5b2032.d	367035005	21-FEB-2015	11:30	X0095.sub	B30C10	1	1458176	

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p022015.b/ph5b2027.d	1203265789	mb	21-FEB-2015	07:59	X0095.sub	PAHBLK01	1	1458176	
☐	N	/chem/hplce.i/p022015.b/ph5b2028.d	1203265790	lcs	21-FEB-2015	08:41	X0095.sub	PAHBLK01LCS	1	1458176	Pass
☐	N	/chem/hplce.i/p022015.b/ph5b2031.d	1203265791	ms	21-FEB-2015	10:48	X0095.sub	B30C10MS	1	1458176	Pass
■	N	/chem/hplce.i/p022015.b/ph5b2032.d	1203265792	msd	21-FEB-2015	11:30	X0095.sub	B30C10MSD	1	1458176	
☐	N	/chem/hplce.i/p022015.b/ph5b2030.d	1203265792	msd	21-FEB-2015	10:06	X0095.sub	B30C10MSD	1	1458176	Pass

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 24, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-240 Water

Client SDG: X0095

Client Sample ID:	B30C05	Project:	WCHN0RC240
Sample ID:	367035002	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3510 PAH Extend list Liquid "As Received"											
Acenaphthene	U	0.146	0.146	0.485	ug/L	1	CWW	02/21/15	0924	1458176	1
Acenaphthylene	U	0.146	0.146	0.485	ug/L	1					
Anthracene	U	0.146	0.146	0.485	ug/L	1					
Benzo(a)anthracene	U	0.0155	0.0155	0.0485	ug/L	1					
Benzo(a)pyrene	U	0.0155	0.0155	0.0485	ug/L	1					
Benzo(b)fluoranthene	U	0.0155	0.0155	0.0485	ug/L	1					
Benzo(ghi)perylene	U	0.0155	0.0155	0.0485	ug/L	1					
Benzo(k)fluoranthene	U	0.00777	0.00777	0.0243	ug/L	1					
Chrysene	U	0.0155	0.0155	0.0485	ug/L	1					
Dibenzo(a,h)anthracene	U	0.0155	0.0155	0.0485	ug/L	1					
Fluoranthene	U	0.0155	0.0155	0.0485	ug/L	1					
Fluorene	U	0.146	0.146	0.485	ug/L	1					
Indeno(1,2,3-cd)pyrene	U	0.0155	0.0155	0.0485	ug/L	1					
Naphthalene	U	0.146	0.146	0.485	ug/L	1					
Phenanthrene	U	0.177	0.177	0.485	ug/L	1					
Pyrene	U	0.0155	0.0155	0.0485	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510 PAH BY HPLC Prep in liquid	SXS3	02/18/15	0644	1458174

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3510 PAH Extend list Liquid "As Received"	161 ug/L	243	66.4	(21%-92%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: February 24, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-240 Water

Client SDG: X0095

Client Sample ID:	B30C10	Project:	WCHN0RC240
Sample ID:	367035005	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3510 PAH Extend list Liquid "As Received"											
Acenaphthene	U	0.150	0.150	0.500	ug/L	1	CWW	02/21/15	1130	1458176	1
Acenaphthylene	U	0.150	0.150	0.500	ug/L	1					
Anthracene	U	0.150	0.150	0.500	ug/L	1					
Benzo(a)anthracene	U	0.016	0.016	0.050	ug/L	1					
Benzo(a)pyrene	U	0.016	0.016	0.050	ug/L	1					
Benzo(b)fluoranthene	U	0.016	0.016	0.050	ug/L	1					
Benzo(ghi)perylene	U	0.016	0.016	0.050	ug/L	1					
Benzo(k)fluoranthene	U	0.008	0.008	0.025	ug/L	1					
Chrysene	U	0.016	0.016	0.050	ug/L	1					
Dibenzo(a,h)anthracene	U	0.016	0.016	0.050	ug/L	1					
Fluoranthene	U	0.016	0.016	0.050	ug/L	1					
Fluorene	U	0.150	0.150	0.500	ug/L	1					
Indeno(1,2,3-cd)pyrene	U	0.016	0.016	0.050	ug/L	1					
Naphthalene	U	0.150	0.150	0.500	ug/L	1					
Phenanthrene	U	0.182	0.182	0.500	ug/L	1					
Pyrene	U	0.016	0.016	0.050	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510 PAH BY HPLC Prep in liquid	SXS3	02/18/15	0644	1458174

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3510 PAH Extend list Liquid "As Received"	145 ug/L	250	58.2	(21%-92%)

Notes:

QC Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 24, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH										
Batch 1458176										
QC1203265790 LCS										
Acenaphthene	50.0			37.2	ug/L		74.3	(56%-102%)	CWW	02/21/15 08:41
Acenaphthylene	50.0			36.3	ug/L		72.7	(55%-101%)		
Anthracene	50.0			39.6	ug/L		79.1	(70%-123%)		
Benzo(a)anthracene	5.00			3.62	ug/L		72.4	(67%-120%)		
Benzo(a)pyrene	5.00			3.75	ug/L		75	(61%-120%)		
Benzo(b)fluoranthene	5.00			3.61	ug/L		72.2	(60%-119%)		
Benzo(ghi)perylene	5.00			3.60	ug/L		71.9	(35%-94%)		
Benzo(k)fluoranthene	2.50			1.94	ug/L		77.8	(56%-108%)		
Chrysene	5.00			3.61	ug/L		72.1	(72%-124%)		
Dibenzo(a,h)anthracene	5.00			3.37	ug/L		67.5	(33%-113%)		
Fluoranthene	5.00			3.51	ug/L		70.2	(62%-120%)		
Fluorene	50.0			37.9	ug/L		75.7	(59%-106%)		
Indeno(1,2,3-cd)pyrene	5.00			3.79	ug/L		75.8	(60%-120%)		
Naphthalene	50.0			33.2	ug/L		66.4	(46%-92%)		
Phenanthrene	50.0			37.4	ug/L		74.8	(61%-106%)		
Pyrene	5.00			3.48	ug/L		69.7	(65%-120%)		
**Decafluorobiphenyl	250			147	ug/L		58.6	(21%-92%)		
QC1203265789 MB										
Acenaphthene			U	0.150	ug/L					02/21/15 07:59
Acenaphthylene			U	0.150	ug/L					

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1458176											
Anthracene				U	0.150	ug/L					
Benzo(a)anthracene				U	0.016	ug/L				CWW	02/21/15 07:59
Benzo(a)pyrene				U	0.016	ug/L					
Benzo(b)fluoranthene				U	0.016	ug/L					
Benzo(ghi)perylene				U	0.016	ug/L					
Benzo(k)fluoranthene				U	0.008	ug/L					
Chrysene				U	0.016	ug/L					
Dibenzo(a,h)anthracene				U	0.016	ug/L					
Fluoranthene				U	0.016	ug/L					
Fluorene				U	0.150	ug/L					
Indeno(1,2,3-cd)pyrene				U	0.016	ug/L					
Naphthalene				U	0.150	ug/L					
Phenanthrene				U	0.182	ug/L					
Pyrene				U	0.016	ug/L					
**Decafluorobiphenyl	250				181	ug/L		72.3	(21%-92%)		
QC1203265791 367035005 MS											
Acenaphthene	50.0	U	0.150		30.5	ug/L		61	(43%-107%)		02/21/15 10:48
Acenaphthylene	50.0	U	0.150		30.0	ug/L		60	(42%-107%)		
Anthracene	50.0	U	0.150		33.2	ug/L		66.5	(56%-125%)		
Benzo(a)anthracene	5.00	U	0.016		3.03	ug/L		60.7	(51%-116%)		
Benzo(a)pyrene	5.00	U	0.016		3.03	ug/L		60.7	(48%-119%)		
Benzo(b)fluoranthene	5.00	U	0.016		2.91	ug/L		58.2	(45%-120%)		
Benzo(ghi)perylene	5.00	U	0.016		2.89	ug/L		57.9	(34%-115%)		

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1458176											
Benzo(k)fluoranthene	2.50	U	0.008		1.56	ug/L		62.4	(39%-122%)	CWW	02/21/15 10:48
Chrysene	5.00	U	0.016		2.92	ug/L		58.3	(56%-130%)		
Dibenzo(a,h)anthracene	5.00	U	0.016		2.89	ug/L		57.9	(33%-136%)		
Fluoranthene	5.00	U	0.016		2.94	ug/L		58.7	(48%-115%)		
Fluorene	50.0	U	0.150		31.1	ug/L		62.2	(48%-109%)		
Indeno(1,2,3-cd)pyrene	5.00	U	0.016		2.98	ug/L		59.6	(45%-120%)		
Naphthalene	50.0	U	0.150		28.8	ug/L		57.7	(31%-105%)		
Phenanthrene	50.0	U	0.182		31.4	ug/L		62.8	(52%-111%)		
Pyrene	5.00	U	0.016		2.88	ug/L		57.7	(47%-130%)		
**Decafluorobiphenyl	250		145		120	ug/L		48.2	(21%-92%)		
QC1203265792 367035005 MSD											
Acenaphthene	50.0	U	0.150		31.1	ug/L	2.04	62.2	(0%-20%)		02/21/15 10:06
Acenaphthylene	50.0	U	0.150		30.4	ug/L	1.21	60.7	(0%-20%)		
Anthracene	50.0	U	0.150		33.8	ug/L	1.79	67.7	(0%-20%)		
Benzo(a)anthracene	5.00	U	0.016		3.10	ug/L	2.11	62	(0%-20%)		
Benzo(a)pyrene	5.00	U	0.016		3.12	ug/L	2.93	62.5	(0%-20%)		
Benzo(b)fluoranthene	5.00	U	0.016		3.01	ug/L	3.40	60.2	(0%-20%)		
Benzo(ghi)perylene	5.00	U	0.016		3.09	ug/L	6.74	61.9	(0%-20%)		
Benzo(k)fluoranthene	2.50	U	0.008		1.62	ug/L	3.69	64.8	(0%-20%)		
Chrysene	5.00	U	0.016		2.99	ug/L	2.53	59.8	(0%-20%)		
Dibenzo(a,h)anthracene	5.00	U	0.016		3.15	ug/L	8.45	63	(0%-20%)		
Fluoranthene	5.00	U	0.016		3.01	ug/L	2.46	60.2	(0%-20%)		

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QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1458176											
Fluorene	50.0	U	0.150		31.4	ug/L	1.03	62.8	(0%-20%)	CWW	02/21/15 10:06
Indeno(1,2,3-cd)pyrene	5.00	U	0.016		3.13	ug/L	4.75	62.6	(0%-20%)		
Naphthalene	50.0	U	0.150		28.0	ug/L	3.10	55.9	(0%-20%)		
Phenanthrene	50.0	U	0.182		31.6	ug/L	0.558	63.2	(0%-20%)		
Pyrene	5.00	U	0.016		2.93	ug/L	1.62	58.6	(0%-20%)		
**Decafluorobiphenyl	250		145		131	ug/L		52.3	(21%-92%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous Data

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Groundwater, Wastewater, and Other Aqueous Samples

Batch ID: **1458174** **Verified by:** _____

Analyst: **Sequan Smalls**

Method: **SW846 3510C**

Lab SOP: **GL-OA-E-013 REV# 28**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Initial Volume (mL)	Initial pH	Final Volume (mL)	Prepped Factor (mL/mL)
1203265789 MB	18-FEB-2015 06:44:00	1000	7	1	0.001
1203265790 LCS	18-FEB-2015 06:44:00	1000	7	1	0.001
367035002	18-FEB-2015 06:44:00	1030	7	1	0.00097
367035005	18-FEB-2015 06:44:00	1000	7	1	0.001
1203265791 MS (367035005)	18-FEB-2015 06:44:00	1000	7	1	0.001
1203265792 MSD (367035005)	18-FEB-2015 06:44:00	1000	7	1	0.001

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203265790	8310 PAH SPIKE	UE150205-10	1	mL
MS	1203265791	8310 PAH SPIKE	UE150205-10	1	mL
MSD	1203265792	8310 PAH SPIKE	UE150205-10	1	mL
SURR	All	Decafluorobiphenyl 250 mg/L	UE150121-35	1	mL
REGNT	All	Methylene Chloride	2217490-D	180	mL
REGNT	All	Acetonitrile UV 4L	2219831	5	mL
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

Verified By: RLC

Final Solvent: Acetonitrile

Flame Ionization Detector Analysis

Case Narrative

FID Flame Ionization Detector
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Procedure:	**Washington Method for the Determination of Extractable Petroleum Hydrocarbons**
Analytical Method:	WA EPH
Prep Method:	WA EPH
Analytical Batch Number:	1454427
Prep Batch Number:	1454426

Sample Analysis

The following samples were analyzed using the analytical protocol as established in WA EPH:

Sample ID	Client ID
367035002	B30C05
367035005	B30C10
1203255564	MB for batch 1454426
1203255565	Laboratory Control Sample (LCS)
1203264239	367035002(B30C05) Matrix Spike (MS)
1203264240	367035002(B30C05) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-075 REV# 0.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 23.0.

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All calibration verification standards (CVS, ICV, or CCV) requirements have not been met for this SDG. Several

target analytes failed with a positive bias in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of the instrument response increasing after the initial calibration. The target analytes were not detected above the PQL in the associated samples; therefore, the non-compliance has no adverse effects on the data.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries were within the acceptance limits in all samples and quality control samples.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 367035002 (B30C05) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Sample 367035005 (B30C10) was fractionated and the Aliphatic and Aromatic extracts analyzed separately. The Aliphatic analysis failed surrogate recovery limits. The unfractionated extract was then analyzed, and all surrogate recovery limits were met for the unfractionated analysis and there were no target analytes detected in any of the Aliphatic or Aromatic Hydrocarbon ranges. Data for this sample are therefore reported from the unfractionated analysis.

Miscellaneous Information

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations
Certain standards and QC samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak

profiles are included in the raw data section of this fraction.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The GC-FID analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-5MS	30m x 0.25mm, 0.25um(J&W)
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-WAX	30m x 0.53 mm x 1um
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-624	30m x 0.53mm, 3.0um(J&W)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC−240 Water

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Cameron Bearden **Name:** **Cameron Bearden**

Date: **27 FEB 2015** **Title:** **Group Leader**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-240 Water

Client SDG: X0095

Client Sample ID:	B30C05	Project:	WCHN0RC240
Sample ID:	367035002	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Liquid "As Received"											
Aliphatic Hydrocarbons >C10-C12	U	15.0	15.0	40.0	ug/L	1	JMB3	02/16/15	0348	1454427	1
Aliphatic Hydrocarbons >C12-C16	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons >C16-C21	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons >C21-C34	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons C8-C10	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C10-C12	U	15.0	15.0	40.0	ug/L	1	JMB3	02/16/15	0417	1454427	2
Aromatic Hydrocarbons >C12-C16	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C16-C21	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C21-C34	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons C8-C10	U	15.0	15.0	40.0	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Liquids	JMB3	02/13/15	0845	1454426

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Liquid "As Received"	32.6 ug/L	40.0	81.6	(60%-140%)
o-Terphenyl	Washington EPH Liquid "As Received"	31.1 ug/L	40.0	77.8	(60%-140%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0095
Project:	RC-240 Water		

Client Sample ID:	B30C10	Project:	WCHN0RC240
Sample ID:	367035005	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Liquid "As Received"											
Aliphatic Hydrocarbons >C10-C12	U	15.0	15.0	40.0	ug/L	1	JMB3	02/16/15	1014	1454427	1
Aliphatic Hydrocarbons >C12-C16	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons >C16-C21	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons >C21-C34	U	15.0	15.0	40.0	ug/L	1					
Aliphatic Hydrocarbons C8-C10	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C10-C12	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C12-C16	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C16-C21	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons >C21-C34	U	15.0	15.0	40.0	ug/L	1					
Aromatic Hydrocarbons C8-C10	U	15.0	15.0	40.0	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Liquids	JMB3	02/13/15	0845	1454426

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Liquid "As Received"	28.9 ug/L	40.0	72.3	(60%-140%)
o-Terphenyl	Washington EPH Liquid "As Received"	31.5 ug/L	40.0	78.9	(60%-140%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 27, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID										
Batch 1454427										
QC1203255565 LCS										
Aliphatic Hydrocarbons >C10-C12	200			172	ug/L		86	(70%-130%)	JMB3	02/15/15 21:53
Aliphatic Hydrocarbons >C12-C16	200			194	ug/L		96.9	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	200			185	ug/L		92.5	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	200			159	ug/L		79.7	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	200			140	ug/L		70.2	(70%-130%)		02/15/15 22:22
Aromatic Hydrocarbons >C12-C16	200			143	ug/L		71.4	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	400			282	ug/L		70.6	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	400			314	ug/L		78.6	(70%-130%)		
**1-Chlorooctadecane	40.0			35.6	ug/L		89.1	(60%-140%)		02/15/15 21:53
**o-Terphenyl	40.0			29.6	ug/L		74	(60%-140%)		02/15/15 22:22
QC1203255564 MB										
Aliphatic Hydrocarbons >C10-C12			U	15.0	ug/L					02/15/15 20:53
Aliphatic Hydrocarbons >C12-C16			U	15.0	ug/L					
Aliphatic Hydrocarbons >C16-C21			U	15.0	ug/L					
Aliphatic Hydrocarbons >C21-C34			U	15.0	ug/L					
Aliphatic Hydrocarbons C8-C10			U	15.0	ug/L					
Aromatic Hydrocarbons >C10-C12			U	15.0	ug/L					02/15/15 21:23
Aromatic Hydrocarbons >C12-C16			U	15.0	ug/L					
Aromatic Hydrocarbons >C16-C21			U	15.0	ug/L					
Aromatic Hydrocarbons >C21-C34			U	15.0	ug/L					

QC Summary

Workorder: 367035 **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID											
Batch 1454427											
Aromatic Hydrocarbons C8-C10				U	15.0	ug/L					
**1-Chlorooctadecane	40.0				34.8	ug/L		86.9	(60%-140%)	JMB3	02/15/15 20:53
**o-Terphenyl	40.0				32.7	ug/L		81.8	(60%-140%)		02/15/15 21:23
QC1203264239 367035002 MS											
Aliphatic Hydrocarbons >C10-C12	400	U	15.0		362	ug/L		90.5	(70%-130%)		02/16/15 04:47
Aliphatic Hydrocarbons >C12-C16	400	U	15.0		400	ug/L		99.9	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	400	U	15.0		390	ug/L		97.5	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	400	U	15.0		337	ug/L		84.3	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	400	U	15.0		351	ug/L		87.8	(70%-130%)		02/16/15 05:16
Aromatic Hydrocarbons >C12-C16	400	U	15.0		354	ug/L		88.6	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	800	U	15.0		713	ug/L		89.2	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	800	U	15.0		775	ug/L		96.8	(70%-130%)		
**1-Chlorooctadecane	80.0		32.6		76.9	ug/L		96.1	(60%-140%)		02/16/15 04:47
**o-Terphenyl	80.0		31.1		74.4	ug/L		93	(60%-140%)		02/16/15 05:16
QC1203264240 367035002 MSD											
Aliphatic Hydrocarbons >C10-C12	400	U	15.0		354	ug/L	2.31	88.4	(0%-20%)		02/16/15 05:46
Aliphatic Hydrocarbons >C12-C16	400	U	15.0		394	ug/L	1.45	98.5	(0%-20%)		
Aliphatic Hydrocarbons >C16-C21	400	U	15.0		386	ug/L	0.979	96.5	(0%-20%)		
Aliphatic Hydrocarbons C8-C10	400	U	15.0		331	ug/L	1.72	82.8	(0%-20%)		
Aromatic Hydrocarbons >C10-C12	400	U	15.0		357	ug/L	1.69	89.3	(0%-20%)		02/16/15 06:15
Aromatic Hydrocarbons >C12-C16	400	U	15.0		364	ug/L	2.57	90.9	(0%-20%)		
Aromatic Hydrocarbons >C16-C21	800	U	15.0		759	ug/L	6.18	94.8	(0%-20%)		
Aromatic Hydrocarbons >C21-C34	800	U	15.0		842	ug/L	8.32	105	(0%-20%)		
**1-Chlorooctadecane	80.0		32.6		73.6	ug/L		92	(60%-140%)		02/16/15 05:46

QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
GC-FID											
Batch 1454427											
**o-Terphenyl	80.0	31.1		77.6	ug/L		97.1	(60%-140%)	JMB3	02/16/15	06:15

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Prep Logbook

Washington Method for the Determination of Extractable Petroleum Hydrocarbons

Batch ID: 1454426 **Verified by:** _____

Analyst: Josh Brooks

Method: WA EPH

Lab SOP: GL-OA-E-075 REV# 0

Instrument: Volatiles Manual Instrument

Sample ID	Run Date	Initial Volume (mL)	Ph 1	Ph 2	Final Volume (mL)	Prepped Factor (mL/mL)
1203255564 MB	13-FEB-2015 08:45:00	1000	7	<2	2	0.002
1203255565 LCS	13-FEB-2015 08:45:00	1000	7	<2	2	0.002
365490001	13-FEB-2015 08:45:00	1000	7	<2	2	0.002
365490002	13-FEB-2015 08:45:00	990	7	<2	2	0.00202
367035002	13-FEB-2015 08:45:00	1000	<2		2	0.002
1203264239 MS (367035002)	13-FEB-2015 08:45:00	500	<2		2	0.004
1203264240 MSD (367035002)	13-FEB-2015 08:45:00	500	<2		2	0.004
367035005	13-FEB-2015 08:45:00	1000	<2		2	0.002

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203255565	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MS	1203264239	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MSD	1203264240	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
RGNT	All	B&J Hexane for Trace GC, filtered through silica	100214EPH	100	mL
SURR	All	EPH Extraction Surrogates #1	UE140929-02	1	mL
REGNT	All	40:60 Pentane:Dichloromethane for WA EPH fractionation	082014WA	14	mL
REGNT	All	B&J Hexane for Trace GC, filtered through silica	100214EPH	100	mL
REGNT	All	Methylene Chloride	2211177-D	180	mL
REGNT	All	1:1 sulfuric acid	2216034	2	mL
REGNT	All	Pentane 4L bottle	CI2163102	12	mL
REGNT	All	5g/25mL Isolute SPE Column for EPH Fractionation	EPH141104A	5	g
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

365490001: 1.0mL PT diluted to 1000mL (effective "initial volume" = 1000mL)
365490002: 0.990mL PT diluted to 990mL (effective "initial volume" = 990mL).

Silica cleanup on 2/15/15 by Josh Brooks

FID Diesel Range Organics Analysis

Case Narrative

Diesel Range Organics
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx
Prep Method:	SW846 3535A
Analytical Batch Number:	1458169
Prep Batch Number:	1458166

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx:

Sample ID	Client ID
367035002	B30C05
367035005	B30C10
1203265767	MB for batch 1458166
1203265768	Laboratory Control Sample (LCS)
1203265769	367035002(B30C05) Matrix Spike (MS)
1203265770	367035002(B30C05) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-003 REV# 25.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS/LCSD) Recovery
The LCS/LCSD spike recoveries met the acceptance limits.

QC Sample Designation
Sample 367035002 (B30C05) was selected for the MS and MSD analyses.

Matrix Spike (MS/MSD) Recovery Statement
The MS/MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Package Comment

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for this SDG in this batch.

Manual Integrations
Certain standards and samples may have required manual integration to correctly position the baseline as set in

the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC-240 Water

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Jimin Cao **Name: Jimin Cao**

Date: 24 FEB 2015 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 23, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0095
Project:	RC-240 Water		

Client Sample ID:	B30C05	Project:	WCHN0RC240
Sample ID:	367035002	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW846 3535A/NWTPH-Dx DRO "As Received"											
Diesel Range Organics (C10-C20)	U	50.0	50.0	500	ug/L	1	BYT1	02/19/15	2328	1458169	1
Motor Oil (C20-C36)	U	50.0	50.0	500	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	3535A DRO IN LIQ PREP	SXS3	02/18/15	0635	1458166

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW846 3535A/NWTPH-Dx DRO "As Received"	15.8 ug/L	20.0	79.1	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 23, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0095
Project:	RC-240 Water		

Client Sample ID:	B30C10	Project:	WCHN0RC240
Sample ID:	367035005	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW846 3535A/NWTPH-Dx DRO "As Received"											
Diesel Range Organics (C10-C20)	U	47.6	47.6	500	ug/L	1	BYT1	02/20/15	0124	1458169	1
Motor Oil (C20-C36)	U	47.6	47.6	500	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	3535A DRO IN LIQ PREP	SXS3	02/18/15	0635	1458166

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW846 3535A/NWTPH-Dx DRO "As Received"	13.7 ug/L	19.0	71.9	(50%-150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 23, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics										
Batch 1458169										
QC1203265768 LCS										
Diesel Range Organics (C10-C20)	2000			1510	ug/L		75.6	(70%-130%)	BYT1	02/19/15 22:50
Motor Oil (C20-C36)	2000			1700	ug/L		85.1	(70%-130%)		
**o-Terphenyl	20.0			16.1	ug/L		80.3	(50%-150%)		
QC1203265767 MB										
Diesel Range Organics (C10-C20)			U	50.0	ug/L					02/19/15 22:11
Motor Oil (C20-C36)			U	50.0	ug/L					
**o-Terphenyl	20.0			16.3	ug/L		81.5	(50%-150%)		
QC1203265769 367035002 MS										
Diesel Range Organics (C10-C20)	2000 U	50.0		1750	ug/L		87.7	(70%-130%)		02/20/15 00:07
Motor Oil (C20-C36)	2000 U	50.0		1930	ug/L		96.4	(70%-130%)		
**o-Terphenyl	20.0	15.8		18.1	ug/L		90.6	(50%-150%)		
QC1203265770 367035002 MSD										
Diesel Range Organics (C10-C20)	2000 U	50.0		1670	ug/L	4.97	83.5	(0%-20%)		02/20/15 00:46
Motor Oil (C20-C36)	2000 U	50.0		1870	ug/L	3.13	93.4	(0%-20%)		
**o-Terphenyl	20.0	15.8		17.3	ug/L		86.4	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

P	Aroclor target analyte with greater than 25% difference between column analyses.
T	Spike and/or spike duplicate sample recovery is outside control limits.
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
o	Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Groundwater, Wastewater, and Other Aqueous Samples

Batch ID: **1458166** **Verified by:** _____

Analyst: **Sequan Smalls**

Method: **SW846 3535A**

Lab SOP: **GL-OA-E-013 REV# 28**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Initial Volume (mL)	Ph 1	Ph 2	Final Volume (mL)	Prepped Factor (mL/mL)
1203265767 MB	18-FEB-2015 06:35:00	1000	7	1	1	0.001
1203265768 LCS	18-FEB-2015 06:35:00	1000	7	1	1	0.001
367035002	18-FEB-2015 06:35:00	1000	5	1	1	0.001
1203265769 MS (367035002)	18-FEB-2015 06:35:00	1000	5	1	1	0.001
1203265770 MSD (367035002)	18-FEB-2015 06:35:00	1000	5	1	1	0.001
367035005	18-FEB-2015 06:35:00	1050	5	1	1	0.00095

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203265768	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
MS	1203265769	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
MSD	1203265770	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
SURR	All	20 ppm surrogate	WE150212-04	1	mL
REGNT	All	1:1 sulfuric acid	2216014	15	mL
REGNT	All	Methylene Chloride	2217490-D	180	mL
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

Final Solvent:CH2CL2
Verified By:RLC

GC Volatiles (GRO) Analysis

Case Narrative

GC Volatiles (GRO)
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Procedure:	**Volatile Total Petroleum Hydrocarbons by Flame Ionization Detector**
Analytical Method:	NWTPH-Gx
Analytical Batch Number:	1459770

Sample Analysis

The following client and quality control samples were analyzed to complete this sample delivery group/work order using the methods referenced in the Analysis Information section:

Sample ID	Client ID
367035002	B30C05
367035005	B30C10
1203270127	MB for batch 1459770
1203270128	Laboratory Control Sample (LCS)
1203270129	367035005(B30C10) Post Spike (PS)
1203270130	367035005(B30C10) Post Spike Duplicate (PSD)

The samples in this SDG were analyzed on an "as received" basis.

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-004 REV# 25.

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG). See the calibration history report for a list of data files that were used to generate the initial calibration curve in the Standard Data Section of this data package.

CCV Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries, in all samples and quality control samples, were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 367035005 (B30C10) was selected for analysis as the matrix spike.

Spike Recovery Statement
The GRO recovery was within the acceptance limits.

Relative Percent Difference (RPD) Statement
The RPD between the matrix spike pair met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check(s), and samples may have been manually integrated to correct misidentification of peaks by the integration software.

Additional Comments
Additional comments were not required for this SDG.

System Configuration

The GRO Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOC4A.I	Agilent 6890N GC/FID w/ OI 4560/Archon Autosampler	HP6890N GC/FID	DB-624	0.53mm x 3.0u x 15m	OI #10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC−240 Water

The Qualifiers in this report are defined as follows:

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.

RA Indicates that sample is re−analyzed without re−extraction.

RE Indicates that sample is re−extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Erin Haubert **Name: Erin Haubert**

Date: 04 MAR 2015 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 4, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0095
Project:	RC-240 Water		

Client Sample ID:	B30C05	Project:	WCHN0RC240
Sample ID:	367035002	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO Liquid "As Received"											
Gasoline Range Organics (C6 - C10)	U	16.7	16.7	500	ug/L	1	ACJ	02/24/15	1619	1459770	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO Liquid "As Received"	45.8 ug/L	50.0	91.7	(50%-150%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 4, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0095
Project:	RC-240 Water		

Client Sample ID:	B30C10	Project:	WCHN0RC240
Sample ID:	367035005	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	11-FEB-15 09:24		
Receive Date:	12-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO Liquid "As Received"											
Gasoline Range Organics (C6 - C10)	U	16.7	16.7	500	ug/L	1	ACJ	02/24/15	1647	1459770	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO Liquid "As Received"	44.1 ug/L	50.0	88.3	(50%-150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: March 4, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatiles GRO Organics											
Batch 1459770											
QC1203270128 LCS											
Gasoline Range Organics (C6 - C10)	500			J	425	ug/L		85.1	(70%-130%)	ACJ	02/24/15 10:25
**Bromofluorobenzene	50.0				40.1	ug/L		80.1	(50%-150%)		
QC1203270127 MB											
Gasoline Range Organics (C6 - C10)				U	16.7	ug/L					02/24/15 11:21
**Bromofluorobenzene	50.0				49.0	ug/L		98	(50%-150%)		
QC1203270129 367035005 PS											
Gasoline Range Organics (C6 - C10)	500	U	15.3	J	469	ug/L		90.6	(70%-130%)		02/24/15 17:15
**Bromofluorobenzene	50.0		44.1		47.6	ug/L		95.3	(50%-150%)		
QC1203270130 367035005 PSD											
Gasoline Range Organics (C6 - C10)	500	U	15.3	J	457	ug/L	2.52	88.3	(0%-20%)		02/24/15 17:43
**Bromofluorobenzene	50.0		44.1		44.6	ug/L		89.1	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
Eberline (WCHN)
SDG #: X0095
Work Order #: 367035

Method/Analysis Information

Product:	**Ion Chromatography**		
Analytical Batch:	1457492	**Method:**	9056_ANIONS_IC: COMMON and COMMON (Add-on)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	**Client ID**
367035003	B30C06
367035006	B30C11
1203264176	Method Blank (MB)
1203264177	Laboratory Control Sample (LCS)
1203264178	367035003(B30C06) Sample Duplicate (DUP)
1203264179	367035003(B30C06) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration
All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule
The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
Sample367035003 (B30C06) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203264179 (B30C06PS).

Duplicate Relative Percent Difference (RPD) Statement
The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times
All samples in this SDG met the specified holding time.

Sample Dilutions
The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203264178 (B30C06DUP), 1203264179 (B30C06PS), 367035003 (B30C06) and 367035006 (B30C11).

Analyte	367035			
	003	006		
Chloride	50X	50X		
Nitrate	10X	10X		
Sulfate	10X	10X		

Sample Re-analysis
The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced

SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations
Samples 1203264178 (B30C06DUP), 367035003 (B30C06) and 367035006 (B30C11) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments
Additional comments were not required for this SDG.

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0095 GEL Work Order: 367035 Project: RC-240 Water

The Qualifiers in this report are defined as follows:

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

D Results are reported from a diluted aliquot of sample.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Tom Lewis, Jr **Name: Thomas Lewis**

Date: 03 MAR 2015 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 3, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-240 Water

Client SDG: X0095

Client Sample ID: B30C06
Sample ID: 367035003
Matrix: WATER
Collect Date: 11-FEB-15 09:24
Receive Date: 12-FEB-15
Collector: Client

Project: WCHN0RC240
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON, COMMON (Add-on) "As Received"											
Bromide		0.300	0.067	0.250	mg/L	1	MXL2	02/12/15	1900	1457492	1
Fluoride	B	0.164	0.033	0.500	mg/L	1					
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P	U	0.067	0.067	0.500	mg/L	1					
Nitrate-N	D	13.8	0.330	1.00	mg/L	10	MXL2	02/12/15	2212	1457492	2
Sulfate	D	113	1.33	4.00	mg/L	10					
Chloride	D	168	3.35	10.0	mg/L	50	MXL2	02/13/15	0435	1457492	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	
3	SW846 9056A	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 3, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-240 Water
Client SDG: X0095

Client Sample ID: B30C11
Sample ID: 367035006
Matrix: WATER
Collect Date: 11-FEB-15 09:24
Receive Date: 12-FEB-15
Collector: Client
Project: WCHN0RC240
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON, COMMON (Add-on) "As Received"											
Bromide		0.261	0.067	0.250	mg/L	1	MXL2	02/12/15	2036	1457492	1
Fluoride	B	0.163	0.033	0.500	mg/L	1					
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P	U	0.067	0.067	0.500	mg/L	1					
Nitrate-N	D	13.9	0.330	1.00	mg/L	10	MXL2	02/12/15	2348	1457492	2
Sulfate	D	113	1.33	4.00	mg/L	10					
Chloride	D	168	3.35	10.0	mg/L	50	MXL2	02/13/15	0610	1457492	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	
3	SW846 9056A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: March 3, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%		REC%	Range	Anlst	Date Time
Ion Chromatography												
Batch 1457492												
QC1203264178 367035003 DUP												
Bromide			0.300		0.266	mg/L	12.0	^		(+/-0.250)	MXL2	02/12/15 19:32
Chloride		D	168	D	169	mg/L	0.470			(0%-20%)		02/13/15 05:07
Fluoride		B	0.164	B	0.160	mg/L	1.91	^		(+/-0.500)		02/12/15 19:32
Nitrate-N		D	13.8	D	13.8	mg/L	0.145			(0%-20%)		02/12/15 22:44
Nitrite-N		U	0.038	U	0.038	mg/L	N/A					02/12/15 19:32
O-Phosphate as P		U	0.067	U	0.067	mg/L	N/A					
Sulfate		D	113	D	113	mg/L	0.114			(0%-20%)		02/12/15 22:44
QC1203264177 LCS												
Bromide	1.25				1.29	mg/L			103	(90%-110%)		02/12/15 21:40
Chloride	5.00				4.85	mg/L			97.1	(90%-110%)		
Fluoride	2.50				2.47	mg/L			98.9	(90%-110%)		
Nitrate-N	2.50				2.48	mg/L			99.3	(90%-110%)		
Nitrite-N	2.50				2.50	mg/L			99.9	(90%-110%)		
O-Phosphate as P	1.25				1.26	mg/L			101	(90%-110%)		
Sulfate	10.0				10.0	mg/L			100	(90%-110%)		
QC1203264176 MB												
Bromide				U	0.067	mg/L						02/12/15 21:08
Chloride				U	0.067	mg/L						
Fluoride				U	0.033	mg/L						
Nitrate-N				U	0.033	mg/L						
Nitrite-N				U	0.038	mg/L						

GEL LABORATORIES LLC

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QC Summary

Workorder: **367035** **Client SDG:** X0095 **Project Description:** RC-240 Water

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography											
Batch 1457492											
O-Phosphate as P				U	0.067	mg/L				MXL2	02/12/15 21:08
Sulfate				U	0.133	mg/L					
QC1203264179 367035003 PS											
Bromide	1.25		0.300		1.51	mg/L		96.9	(90%-110%)		02/12/15 20:04
Chloride	5.00	D	3.36	D	8.62	mg/L		105	(90%-110%)		02/13/15 05:38
Fluoride	2.50	B	0.164		2.64	mg/L		99	(90%-110%)		02/12/15 20:04
Nitrate-N	2.50	D	1.38	D	3.95	mg/L		103	(90%-110%)		02/12/15 23:16
Nitrite-N	2.50	U	0.00		2.45	mg/L		97.9	(90%-110%)		02/12/15 20:04
O-Phosphate as P	1.25	U	0.00		0.975	mg/L		78*	(90%-110%)		
Sulfate	10.0	D	11.3	D	22.1	mg/L		108	(90%-110%)		02/12/15 23:16

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.