HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 19, 2019

Vernon Marcum
MARATHON
92 Giant Crossing Rd
Gallup, NM 87301
TEL:
FAX:

RE: Carbon Canister OrderNo.: 1912625

Dear Vernon Marcum:

Hall Environmental Analysis Laboratory received 2 sample(s) on 12/12/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1912625**
Date Reported: **12/19/2019**

CLIENT: MARATHON
Client Sample ID: North Carbon Canister
Project: Carbon Canister
Collection Date: 12/11/2019 7:15:00 AM
Lab ID: 1912625-001
Matrix: AQUEOUS
Received Date: 12/12/2019 9:15:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **BRM**	
Diesel Range Organics (DRO)	4.8	0.71	1.0		mg/L	1	12/16/2019 1:44:33 PM	49337
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/16/2019 1:44:33 PM	49337
Surr: DNOP	106	0	70-130		%Rec	1	12/16/2019 1:44:33 PM	49337
EPA METHOD 300.0: ANIONS							Analyst: **CAS**	
Fluoride	4.2	0.23	1.0	*	mg/L	10	12/13/2019 8:47:38 PM	A65202
Chloride	150	2.5	5.0		mg/L	10	12/13/2019 8:47:38 PM	A65202
Bromide	ND	0.50	1.0		mg/L	10	12/13/2019 8:47:38 PM	A65202
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	12/13/2019 8:47:38 PM	A65202
Sulfate	370	2.5	5.0	*	mg/L	10	12/13/2019 8:47:38 PM	A65202
Nitrate+Nitrite as N	ND	0.24	2.0		mg/L	10	12/13/2019 9:26:13 PM	A65202
EPA METHOD 200.7: METALS							Analyst: **bcv**	
Calcium	77	0.062	1.0		mg/L	1	12/17/2019 12:41:35 P	49357
Magnesium	33	0.050	1.0		mg/L	1	12/17/2019 12:41:35 P	49357
Potassium	20	0.16	1.0		mg/L	1	12/17/2019 12:41:35 P	49357
Sodium	190	2.4	5.0		mg/L	5	12/17/2019 1:59:55 PM	49357
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **JMR**	
Benzene	ND	3.3	10		µg/L	20	12/13/2019 6:10:37 PM	SL6518
Toluene	ND	7.0	20		µg/L	20	12/13/2019 6:10:37 PM	SL6518
Ethylbenzene	ND	2.6	20		µg/L	20	12/13/2019 6:10:37 PM	SL6518
Methyl tert-butyl ether (MTBE)	ND	9.1	20		µg/L	20	12/13/2019 6:10:37 PM	SL6518
Xylenes, Total	ND	9.1	30		µg/L	20	12/13/2019 6:10:37 PM	SL6518
Surr: 1,2-Dichloroethane-d4	110	0	70-130		%Rec	20	12/13/2019 6:10:37 PM	SL6518
Surr: 4-Bromofluorobenzene	100	0	70-130		%Rec	20	12/13/2019 6:10:37 PM	SL6518
Surr: Dibromofluoromethane	109	0	70-130		%Rec	20	12/13/2019 6:10:37 PM	SL6518
Surr: Toluene-d8	106	0	70-130		%Rec	20	12/13/2019 6:10:37 PM	SL6518
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **JRR**	
Conductivity	2600	5.0	5.0		µmhos/c	1	12/12/2019 7:09:39 PM	R65144
SM4500-H+B / 9040C: PH							Analyst: **JRR**	
pH	8.47			H	pH units	1	12/12/2019 7:09:39 PM	R65144

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: MARATHON
Client Sample ID: North Carbon Canister
Project: Carbon Canister
Collection Date: 12/10/2019 8:00:00 AM
Lab ID: 1912625-002
Matrix: AQUEOUS
Received Date: 12/12/2019 9:15:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	0.71	1.0		mg/L	1	12/16/2019 1:53:42 PM	49337
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/16/2019 1:53:42 PM	49337
Surr: DNOP	99.4	0	70-130		%Rec	1	12/16/2019 1:53:42 PM	49337
EPA METHOD 300.0: ANIONS							Analyst: **CAS**	
Fluoride	11	0.23	1.0	*	mg/L	10	12/13/2019 9:51:59 PM	A65202
Chloride	150	2.5	5.0		mg/L	10	12/13/2019 9:51:59 PM	A65202
Bromide	ND	0.50	1.0		mg/L	10	12/13/2019 9:51:59 PM	A65202
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	12/13/2019 9:51:59 PM	A65202
Sulfate	430	2.5	5.0	*	mg/L	10	12/13/2019 9:51:59 PM	A65202
Nitrate+Nitrite as N	ND	0.24	2.0		mg/L	10	12/13/2019 10:30:35 P	A65202
EPA METHOD 200.7: METALS							Analyst: **bcv**	
Calcium	66	0.062	1.0		mg/L	1	12/17/2019 12:50:00 P	49357
Magnesium	11	0.050	1.0		mg/L	1	12/17/2019 12:50:00 P	49357
Potassium	37	0.16	1.0		mg/L	1	12/17/2019 12:50:00 P	49357
Sodium	180	2.4	5.0		mg/L	5	12/17/2019 2:02:06 PM	49357
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **JMR**	
Benzene	ND	3.3	10		µg/L	20	12/13/2019 6:39:16 PM	SL6518
Toluene	ND	7.0	20		µg/L	20	12/13/2019 6:39:16 PM	SL6518
Ethylbenzene	ND	2.6	20		µg/L	20	12/13/2019 6:39:16 PM	SL6518
Methyl tert-butyl ether (MTBE)	ND	9.1	20		µg/L	20	12/13/2019 6:39:16 PM	SL6518
Xylenes, Total	ND	9.1	30		µg/L	20	12/13/2019 6:39:16 PM	SL6518
Surr: 1,2-Dichloroethane-d4	112	0	70-130		%Rec	20	12/13/2019 6:39:16 PM	SL6518
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	20	12/13/2019 6:39:16 PM	SL6518
Surr: Dibromofluoromethane	108	0	70-130		%Rec	20	12/13/2019 6:39:16 PM	SL6518
Surr: Toluene-d8	111	0	70-130		%Rec	20	12/13/2019 6:39:16 PM	SL6518
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **JRR**	
Conductivity	2700	5.0	5.0		µmhos/c	1	12/12/2019 7:13:33 PM	R65144
SM4500-H+B / 9040C: PH							Analyst: **JRR**	
pH	6.76			H	pH units	1	12/12/2019 7:13:33 PM	R65144

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912625**

19-Dec-19

Client: MARATHON

Project: Carbon Canister

Sample ID: **MB-49357**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **49357**	RunNo: **65246**
Prep Date: **12/16/2019**	Analysis Date: **12/17/2019**	SeqNo: **2240430** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LLLCS-49357**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **49357**	RunNo: **65246**
Prep Date: **12/16/2019**	Analysis Date: **12/17/2019**	SeqNo: **2240431** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.51	1.0	0.5000	0	101	50	150			J
Magnesium	0.50	1.0	0.5000	0	99.3	50	150			J
Potassium	0.49	1.0	0.5000	0	98.4	50	150			J
Sodium	0.55	1.0	0.5000	0	109	50	150			J

Sample ID: **LCS-49357**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **49357**	RunNo: **65246**
Prep Date: **12/16/2019**	Analysis Date: **12/17/2019**	SeqNo: **2240432** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	97.4	85	115			
Magnesium	49	1.0	50.00	0	97.1	85	115			
Potassium	48	1.0	50.00	0	95.9	85	115			
Sodium	48	1.0	50.00	0	95.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912625**

19-Dec-19

Client: MARATHON

Project: Carbon Canister

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A65202**	RunNo: **65202**
Prep Date:	Analysis Date: **12/13/2019**	SeqNo: **2238027** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A65202**	RunNo: **65202**
Prep Date:	Analysis Date: **12/13/2019**	SeqNo: **2238028** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	101	90	110			
Chloride	4.6	0.50	5.000	0	92.3	90	110			
Bromide	2.4	0.10	2.500	0	94.2	90	110			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	91.4	90	110			
Sulfate	9.4	0.50	10.00	0	93.5	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	96.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912625**

19-Dec-19

Client: MARATHON

Project: Carbon Canister

Sample ID: **LCS-49337** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range**

Client ID: **LCSW** Batch ID: **49337** RunNo: **65199**

Prep Date: **12/13/2019** Analysis Date: **12/16/2019** SeqNo: **2238587** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.3	1.0	5.000	0	106	71.8	135			
Surr: DNOP	0.49		0.5000		97.0	70	130			

Sample ID: **MB-49337** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range**

Client ID: **PBW** Batch ID: **49337** RunNo: **65199**

Prep Date: **12/13/2019** Analysis Date: **12/16/2019** SeqNo: **2238588** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.2		1.000		121	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912625**

19-Dec-19

Client: MARATHON

Project: Carbon Canister

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL65186**	RunNo: **65186**
Prep Date:	Analysis Date: **12/13/2019**	SeqNo: **2237459** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.3	70	130			
Toluene	19	1.0	20.00	0	96.2	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		112	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.9	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID: **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL65186**	RunNo: **65186**
Prep Date:	Analysis Date: **12/13/2019**	SeqNo: **2237484** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		113	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.6	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1912625**
19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: **lcs-1 99.9uS eC** SampType: **lcs** TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW** Batch ID: **R65144** RunNo: **65144**
Prep Date: Analysis Date: **12/12/2019** SeqNo: **2235503** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	99	5.0	99.90	0	99.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **MARATHON GALLUP** Work Order Number: **1912625** RcptNo: **1**

Received By: **Yazmine Garduno** **12/12/2019 9:15:00 AM**

Completed By: **Yazmine Garduno** **12/12/2019 10:15:24 AM**

Reviewed By: YG 12/12/19

Chain of Custody

1. Is Chain of Custody sufficiently complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 4 (<2 or >12 unless noted)
Adjusted? NO
Checked by: JR 12/12/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.5	Good				

Chain-of-Custody Record

Client: MARATHON

Gallup Refinery

Mailing Address:

92 GIANT CROSSING RD, GALLUP, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-863-0930

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation:

☐ NELAP ☐ Other_____

☐ EDD (Type) _____

Turn-Around Time:

☐ Standard Rush: [redacted]

Project Name:

CARBON CANISTER

Project #:

WWTP - BWON

Project Manager:

VMARCUM@MARATHONPETROLEUM.COM

Sampler: C JOHNSON

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.8 - 0.3 = 2.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1912025	8260+MTBE (SHORT LIST)	SPEC COND; Ph	8015B (DRO)	CATIONS	ANIONS	Air Bubbles (Y or N)
12/11/19	0715	Aqueous	North Carbon Canister	MISC	MISC	-001	X	X	X	X	X	
12/10/19	0800	Aqueous	North Carbon Canister	MISC	MISC	-002	X	X	X	X	X	
		Aqueous	_____ Carbon Canister	MISC	MISC		X	X	X	X	X	
		Aqueous	_____ Carbon Canister	MISC	MISC							

Date:	Time:	Relinquished by:	Received by:	Date	Time
12-11-19	11:00				
Date:	Time:	Relinquished by:	Received by:	Date	Time
			Courier	12/12/19	0915

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.