

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

July 24, 2018

Matt Buckles Mack Energy Corp 11344 Lovington Highway Artesia, NM 88210 TEL: (575) 748-1288 FAX

RE: Nosler 12 Fed Tank Battery

OrderNo.: 1807A35

Dear Matt Buckles:

Hall Environmental Analysis Laboratory received 4 sample(s) on 7/19/2018 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 <u>www.hallenvironmental.com</u> 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,

ander

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

**Analytical Report** Lab Order 1807A35

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 7/24/2018

CLIENT:Mack Energy CorpProject:Nosler 12 Fed Tank Battery1007425 001	N A CON		ient Sample II Collection Dat	e: 7/	16/2018	
Lab ID: 1807A35-001	Matrix: SOIL				19/2018 8:45:00 AM	
Analyses	Result	PQL	Qual Units	DF	<b>Date Analyzed</b>	Batch
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	том
Diesel Range Organics (DRO)	ND	10	mg/Kg	1	7/20/2018 11:25:49 PM	39312
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	7/20/2018 11:25:49 PM	39312
Surr: DNOP	103	70-130	%Rec	1	7/20/2018 11:25:49 PM	39312
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst	NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	7/20/2018 11:58:05 AM	39306
Surr: BFB	95.2	15-316	%Rec	1	7/20/2018 11:58:05 AM	39306
EPA METHOD 8021B: VOLATILES					Analyst	NSB
Benzene	ND	0.024	mg/Kg	1	7/20/2018 11:58:05 AM	39306
Toluene	ND	0.048	mg/Kg	1	7/20/2018 11:58:05 AM	39306
Ethylbenzene	ND	0.048	mg/Kg	1	7/20/2018 11:58:05 AM	39306
Xylenes, Total	ND	0.096	mg/Kg	1	7/20/2018 11:58:05 AM	39306
Surr: 4-Bromofluorobenzene	105	80-120	%Rec	1	7/20/2018 11:58:05 AM	39306

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

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix D
- Н
- Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 1 of 5 J
- Р Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

**Analytical Report** Lab Order 1807A35 Date Reported: 7/24/2018

7/20/2018 1:08:41 PM

7/20/2018 1:08:41 PM

39306

39306

### Hall Environmental Analysis Laboratory, Inc.

v						10
CLIENT: Mack Energy Corp		C	lient Sample II	D: SI	P-4 0-1	
<b>Project:</b> Nosler 12 Fed Tank Battery		(	Collection Dat	<b>e:</b> 7/	16/2018	
Lab ID: 1807A35-003	Matrix: SOIL		<b>Received Dat</b>	<b>e:</b> 7/	19/2018 8:45:00 AM	
Analyses	Result	PQL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANG	GE ORGANICS				Analyst	: том
Diesel Range Organics (DRO)	150	9.9	mg/Kg	1	7/23/2018 7:50:36 PM	39312
Motor Oil Range Organics (MRO)	110	50	mg/Kg	1	7/23/2018 7:50:36 PM	39312
Surr: DNOP	103	50.6-138	%Rec	1	7/23/2018 7:50:36 PM	39312
EPA METHOD 8015D: GASOLINE RAN	IGE				Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	7/20/2018 1:08:41 PM	39306
Surr: BFB	96.7	15-316	%Rec	1	7/20/2018 1:08:41 PM	39306
EPA METHOD 8021B: VOLATILES					Analyst	: NSB
Benzene	ND	0.025	mg/Kg	1	7/20/2018 1:08:41 PM	39306
Toluene	ND	0.049	mg/Kg	1	7/20/2018 1:08:41 PM	39306
Ethylbenzene	ND	0.049	mg/Kg	1	7/20/2018 1:08:41 PM	39306

ND

108

0.099

80-120

mg/Kg

%Rec

1

1

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

**Oualifiers:** 

Xylenes, Total

Surr: 4-Bromofluorobenzene

- \* Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix
- Н
- 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
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 2 of 5 J
- Р Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified W

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#:	1807A35
	24. Jul. 18

	nergy Corp 2 Fed Tank Battery								
Sample ID LCS-39312	SampType: LCS	6	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID: LCSS	Batch ID: 393	12	R	anNo: 5	2847				
Prep Date: 7/19/2018	Analysis Date: 7/2	0/2018	S	SeqNo: 1	738036	Units: mg/K	g		
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46 10	50.00	0	91.8	70	130			
Surr: DNOP	4.1	5.000		82.5	70	130			
Sample ID MB-39312	SampType: <b>MB</b>	LK	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID: PBS	Batch ID: 393	12	R	RunNo: <b>5</b> 2	2847				
Prep Date: 7/19/2018	Analysis Date: 7/2	0/2018	S	SeqNo: 1	738037	Units: mg/K	g		
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND 10								
Notor Oil Range Organics (MRO)	ND 50								
Surr: DNOP	9.5	10.00		95.4	70	130			
Sample ID LCS-39336	SampType: LCS	6	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID: LCSS	Batch ID: 393	36	R	anNo: 5	2903				
Prep Date: 7/23/2018	Analysis Date: 7/2	3/2018	S	SeqNo: 1	738189	Units: %Red	;		
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.3	5.000		86.2	70	130			
Sample ID MB-39336	SampType: MB	LK	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID: PBS	Batch ID: 393	36	R	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	2903				
Prep Date: 7/23/2018	Analysis Date: 7/2	3/2018	S	SeqNo: 1	738190	Units: %Red	;		
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.8	10.00		88.0	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 Detection Limit
- W Sample container temperature is out of limit as specified
- Page 3 of 5

	Energy Corp 12 Fed Tank		y							
Sample ID MB-39306	SampT	Type: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: PBS	Batcl	h ID: 39	306	R	lunNo: 5	2899				
Prep Date: 7/19/2018	Analysis D	Date: 7/	20/2018	S	SeqNo: 1	737983	Units: <b>mg/k</b>	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		94.8	15	316			
Sample ID LCS-39306	SampT	Type: LC	S	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: LCSS	Batcl	h ID: 39	306	R	anNo: 5	2899				
Prep Date: 7/19/2018	Analysis E	Date: 7/	20/2018	S	SeqNo: 1	737984	Units: <b>mg/k</b>	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	113	75.9	131			
Surr: BFB	1000		1000		104	15	316			

#### **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 Detection Limit
- W Sample container temperature is out of limit as specified

Page 4 of 5

÷	vironment			Laborat	ory, Inc.					WO#:	1807A3 24-Jul-18
Client: Project:		nergy Corp 12 Fed Tanl		у							
Sample ID	MB-39306	Samp	Гуре: <b>МЕ</b>	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batc	h ID: 39	306	F	RunNo: 5	2899				
Prep Date:	7/19/2018	Analysis [	Date: 7/	20/2018	S	SeqNo: 1	737999	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene Toluene Ethylbenzene Xylenes, Total		ND ND ND ND	0.025 0.050 0.050 0.10								
	ofluorobenzene	1.1		1.000		106	80	120			
Sample ID	LCS-39306	Samp	Гуре: <b>LC</b>	s	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batc	h ID: 39	306	F	RunNo: <b>5</b>	2899				
Prep Date:	7/19/2018	Analysis [	Date: 7/	20/2018	S	SeqNo: 1	738000	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.95	0.025	1.000	0	94.8	77.3	128			
Toluene		0.98	0.050	1.000	0	98.4	79.2	125			
Ethylbenzene		0.95	0.050	1.000	0	95.4	80.7	127			
Xylenes, Total Surr: 4-Brom	ofluorobenzene	3.0 1.1	0.10	3.000 1.000	0	99.0 107	81.6 80	129 120			
	1807A35-001AM	S Samo	Гуре: М		Tes	tCode: F	PA Method	8021B: Volat	tiles		
Client ID:	SP-2 0-1		h ID: 39			RunNo: 5			liico		
Prep Date:	7/19/2018	Analysis [				SeqNo: 1		Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.96	0.024	0.9747	0	98.1	68.5	133			
Toluene		1.0	0.049	0.9747	0	103	75	130			
Ethylbenzene		0.99	0.049	0.9747	0	102	79.4	128			
Xylenes, Total		3.1	0.097	2.924	0	105	77.3	131			
Surr: 4-Brom	ofluorobenzene	1.0		0.9747		105	80	120			
Sample ID	1807A35-001AM	SD Samp	Гуре: <b>М</b>	SD	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	SP-2 0-1	Batc	h ID: 39	306	F	RunNo: 5	2899				
Prep Date:	7/19/2018	Analysis [	Date: 7/	20/2018	S	SeqNo: 1	738006	Units: mg/k	٢g		
Analyte		Result	PQL		SPK Ref Val		LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.98	0.024	0.9560	0	102	68.5	133	2.49	20	
Toluene		1.0	0.048	0.9560	0	108	75	130	3.18	20	
Ethylbenzene		1.0	0.048	0.9560	0	105	79.4	128	1.51	20	
Xylenes, Total	offuere here	3.1	0.096	2.868	0	108	77.3	131	1.08	20	
Surr: 4-Brom	ofluorobenzene	1.0		0.9560		108	80	120	0	0	

#### **Qualifiers:**

\* Value exceeds Maximum Contaminant Level.

**OC SUMMARY REPORT** 

- 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 Detection Limit
- W Sample container temperature is out of limit as specified

Page 5 of 5

ANAL	RONMENTAL YSIS RATORY	Hall Environmen A TEL: 505-345-35 Website: www	4901 Ibuquerqu 975 FAX: 5	Hawkins NE e, NM 87109 05-345-4107	San	nple Log-In C	heck List
Client Name:	MACK ENERGY CORP	Work Order Numb	er: 1807/	<b>\</b> 35		RcptNo:	1
Received By:	Erin Melendrez	7/19/2018 8:45:00 A	м	Ű	and and	<del>.</del>	
Completed By: Reviewed By:	Isaiah Ortiz 5743 07/19/18	7/19/2018 10:10:38	AM	エ		2008anan Se	
LB: W Chain of Cus	W 7/19/18						
	ustody complete?		Yes	<b>v</b> 1	No 🗌	Not Present	
2. How was the	sample delivered?		<u>Courie</u>	er			
<u>Log In</u> 3. Was an atten	npt made to cool the samples?		Yes	<b>v</b>	No 🗌	NA 🗌	
4. Were all sam	ples 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 sam	nple volume for indicated test(s	;)?	Yes	<b>Z</b> N	lo 🗌		
	except VOA and ONG) proper		-	_	lo 🗌		
8. Was preserva	tive added to bottles?		Yes [	N	lo 🗹	NA 🗌	
9. VOA vials hav	e zero headspace?		Yes [	<b>N</b>	io 🗌	No VOA Vials 🗹	
10. Were any sar	nple containers received broke	en?	Yes [	N	lo 🗹	# of preserved	118
	ork match bottle labels? ancies on chain of custody)		Yes	e n	lo 🗆	bottles checked for pH:	12 Unless noted)
12. Are matrices of	correctly identified on Chain of	Custody?	Yes	2 N	•	Adjusted?	
	t analyses were requested?		Yes		lo 🗌	1100	
	ng times able to be met? ustomer for authorization.)		Yes	n N	o []	Checked by:	·
Special Handl	ing (if applicable)						
15. Was client no	tified of all discrepancies with	this order?	Yes	N	10 🗆	NA 🔽	
Person	Notified:	Date:					
By Who	om:	Via:	🗌 eMai	Phone	🗌 Fax	In Person	
Regard	ing:						
Client Ir	nstructions:					······	
16. Additional ren	marks:						
17. <u>Cooler Infor</u> Cooler No 1		eal Infact Seal No	Seal Dat	e Signe	d By		

2			เรเบนy กะบบเน							1 1				1		1	
Client	Mack Energy	nergy		Chandord								HALL ENVIRONMENTAL			Z	Y	. = . 4
			وبالمحافظة والمحافظة									ANALYSIS LABORATORY	AB	N N		Ř	>
Mailing	Mailing Addrace.								:	WWW	lallenvi	www.hallenvironmental.com	tal.con	~			
Rulification		e. A reining and a second	یوندهای برای میکند. بروی ماریخ میکند با این میکند میکند میکند. این ماریخ میکند میکند میکند میکند.	Nosler 12 Fed	d Tank Battery			4901	Haw	4901 Hawkins NE -	- Albi	Albuquerque, NM 87109	le, NM	87105	-		
P.O. Bo	x 188 Lc	peo Hills, I	P.O. Box 188 Loco Hills, NM 88255	Project #:				Ē	605-3	Tel. 505-345-3975	· •	Fax 505	505-345-4107	107			
Phone #:		432-425-2891	-2691	1							Analysis	sis Req	Request				
email or Fax#:	Fax#:	<b>ititsworth</b>	ltitswarth@burnettoll.com	Project Manager:	ger:		·										
QA/QC Package:	ackage:		•	Matt Buckles	mattbuckles@mec.com	s@mec.com		-									
□ Standard	Jard		Level 4 (Full Validation)	Johnny Titsworth	orth												
Accreditation:	ation:			Sampler:	Jameson	Holt											
D NELAP	Ъ	Other		On Ice:	l⊉ Yes	D No											
	EDD (Type)			Sample Temperature: L	Ĵ.												
Date    Time	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL Ng -1 (m) which	abinoin	MB108 HC	11208 X31							<u></u>	
7/31/10/18		soil	52-2 0-1	4 oz.	lcě	-00-1	2										-
		soil	522 12	4 02.	lce	e VO-		<u> </u>									1
		soil	68-4 0-1	4 oz.	es I	- 83		X									-
P		soil	67-4 1'-2'	4 oz.	Ice	-004											1
÷		soil		4 02	lce												1
	4.	soil		4 oz.	lce												1
		soil		4 oz.	lce												
		soil		4 oz.	69												
		soil		4 oz.	loe											/ · ·	
		soil		4 oz.	ee Ice												
		soil		4 02.	<u>cě</u>											7 2	<u> </u>
		soil		4 oz	lce		· · · · · · · ·										
Bull 1/2/18	Time: 7,30	Relinquished by	ad by	Received by:		7/18/18 ONS	Rema If tota	arks: I BTE	lf total EX exc	TPH e eeds 5	xceeds 0 mg/k	Remarks: If total TPH exceeds 5,000 mg/kg - run deeper sample If total BTEX exceeds 50 mg/kg - run deeper sample If tota	ng/kg - leeper	run di sampi	eeper	sample If tota	ple ple
Date.	Time:	Relinquished by	ed by:	Received by:	CULITIEN	Time	add N	ene Aatt B	xceed	s to rep	g/kg - r ort ≕ma	benzene exceeds 10 mg/kg - run deeper sample add Matt Buckles to report ≕mattbuckles@mec.com	es@me	aple Bc.com	-		
1/18/12	J.			R A		7/19/19 0845											
<b>4</b>	necessary,	santiples subn	If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited taboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.	contracted to other ac	credited laboratories	<ol> <li>This serves as notice of this</li> </ol>	possibil	(uv . An)	/ sub-cor	tracted da	ta will be c	slearly nota	ted on the	analytics	al report		