May 6, 2019

Paul Grimm
Avery Laboratories
2720 Gregory St.
Unit 200
Savannah, GA 31404

RE: Mayors Point

Pace Analytical received 1 sample on April 17, 2019 for analysis labeled HA-05A. Per client request, the following analyses were performed:

1. (C3-C12) Quantitative Molecular Characterization by GC/MS - full scan mode
2. (C8-C40) Semi-Quantitative Molecular Characterization by GC/MS - full scan mode

The sample analysis was performed under laboratory number **30044**.

Please call the lab at 412-826-5245, or you may email any questions or concerns to ruth.welsh@pacelabs.com regarding any analytical data reports.

Respectfully submitted,

Ruth Welsh

Ruth Welsh
Customer Service

(C3-C12) Quantitative Molecular Characterization by GC/MS - full scan mode

PIANO, Oxygenated Blending Agents, Lead Scavengers, MMT & Thiophenes

Pace Analytical® Energy Services™

Paul Grimm
Avery Lab
2720 Gregory St, Unit 200
Savannah, GA 31404

Lab ID: 30044-1
Collected: 4/12/2019
Received: 4/17/2019
Matrix: Soil

Client ID: HA-05A

Project: Mayors Point
Project #:
Collected by:

Analyzed: 4/19/2019
Q Method: 040819.M

CONSTITUENTS	CLASS	ABBR.	ssRL ug/kg	RESULT ug/kg	QUALIFIER
Isopentane (2-Methylbutane)	I	IP	19.9	19.9	U
1-Pentene	O	1P	19.9	19.9	U
2-Methyl-1-butene	O	2M1B	19.9	19.9	U
Pentane (nC5)	P	C5	19.9	19.9	U
trans-2-pentene	O	T2P	19.9	19.9	U
cis-2-pentene	O	C2P	19.9	19.9	U
2-Methyl-2-butene	O	2M2B	19.9	19.9	U
2,2-Dimethylbutane	I	22DMB	19.9	19.9	U
Cyclopentane	N	CYP	19.9	19.9	U
2,3-Dimethylbutane	I	23DMB	19.9	19.9	U
2-Methylpentane	I	2MP	19.9	19.9	U
Methyl-tert-butyl ether (MTBE)	ADD	MTBE	15.0	15.0	U
3-Methylpentane	I	3MP	19.9	19.9	U
1-Hexene	O	1HX	19.9	19.9	U
Hexane (nC6)	P	C6	19.9	19.9	U
Di-isopropyl ether (DIPE)	ADD	DIPE	15.0	15.0	U
trans-2-hexene	O	T2HE	19.9	19.9	U
2-Methyl-2-pentene	O	2M2P	19.9	19.9	U
cis-2-hexene	O	C2HE	19.9	19.9	U
cis-3-Methyl-2-pentene	O	C3M2P	19.9	19.9	U
Ethyl-tert-butyl ether (ETBE)	ADD	ETBE	15.0	15.0	U
2,2-Dimethylpentane	I	22DMP	19.9	19.9	U
Methylcyclopentane	N	MCYP	19.9	19.9	U
2,4-Dimethylpentane	I	24DMP	19.9	19.9	U
1,2-Dichloroethane (EDC)	ADD	EDC	15.0	15.0	U
Benzene	A	B	19.9	19.9	U
3,3-Dimethylpentane	I	33DMP	19.9	19.9	U
Thiophene	S	THIO	15.0	15.0	U
Cyclohexane	N	CYH	19.9	19.9	U
2-Methylhexane	I	2MH	19.9	19.9	U
2,3-Dimethylpentane	I	23DMP	19.9	19.9	U

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Client ID: HA-05A

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Project #:
Collected by:

Analyzed: 4/19/2019
Q Method: 040819.M

CONSTITUENTS	CLASS	ABBR.	ssRL ug/kg	RESULT ug/kg	QUALIFIER
Tert-amyl methyl ether (TAME)	ADD	TAME	15.0	15.0	U
3-Methylhexane	I	3MH	19.9	19.9	U
trans-1,3-Dimethylcyclopentane	N	T13DMCYP	19.9	19.9	U
cis-1,3-Dimethylcyclopentane	N	C13DMCYP	19.9	19.9	U
trans-1,2-Dimethylcyclopentane	N	T12DMCYP	19.9	19.9	U
2,2,4-Trimethylpentane (isooctane)	I	224TMP	19.9	35.4	J
1-Heptene	O	1HP	19.9	19.9	U
Heptane (nC7)	P	C7	19.9	27.8	J
trans-2-heptene	O	T2HP	19.9	19.9	U
Methylcyclohexane	N	MCYH	19.9	19.9	U
2,5-Dimethylhexane	I	25DMH	59.8	59.8	U
2,2,3-Trimethylpentane	I	233TMP	19.9	19.9	U
2,4-Dimethylhexane	I	24DMH	19.9	19.9	U
2,3,4-Trimethylpentane	I	234TMP	19.9	27.8	J
2,3,3-Trimethylpentane	I	233TMP	19.9	33.4	J
Toluene	A	T	19.9	19.9	U
2-Methylthiophene	S	2MTHIO	15.0	15.0	U
2,3-Dimethylhexane	I	23DMH	19.9	19.9	U
3-Methylthiophene	S	3MTHIO	15.0	15.0	U
2-Methylheptane	I	2MHP	19.9	46.8	J
4-Methylheptane	I	4MHP	19.9	19.9	U
3-Methylheptane	I	3MHP	19.9	43.8	J
3-Ethylhexane	I	3EHX	39.9	39.9	U
1,2-Dibromoethane (EDB)	ADD	EDB	19.9	19.9	U
1-Octene	O	1O	19.9	19.9	U
Octane (nC8)	P	C8	19.9	99.4	
2,4-Dimethylheptane	I	24DMHP	19.9	58.0	J
2,5-Dimethylheptane	I	25DMHP	19.9	81.6	
Ethylbenzene	A	EB	19.9	229.3	
2-Ethylthiophene	S	2ETHIO	15.0	15.0	U
2,3-Dimethylheptane	I	23DMHP	19.9	117.3	

Pace Analytical® Energy Services™

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Avery Lab
2720 Gregory St, Unit 200
Savannah, GA 31404

Lab ID: 30044-1
Collected: 4/12/2019
Received: 4/17/2019
Matrix: Soil

Client ID: HA-05A

Project: Mayors Point
Project #:
Collected by:

Analyzed: 4/19/2019
Q Method: 040819.M

CONSTITUENTS	CLASS	ABBR.	ssRL ug/kg	RESULT ug/kg	QUALIFIER
m-Xylene	A	MX	19.9	100.6	
p-Xylene	A	PX	19.9	322.2	
4-Methyloctane	I	4MO	19.9	102.0	
2-Methyloctane	I	2MO	19.9	122.3	
3-Methyloctane	I	3MO	19.9	240.6	
Styrene	A	STRE	19.9	19.9	U
o-Xylene	A	OX	19.9	43.8	J
1-Nonene	O	1N	59.8	59.8	U
Nonane (nC9)	P	C9	39.9	684.7	
Isopropylbenzene (cumene)	A	IPROPB	19.9	72.7	
n-Propylbenzene	A	NPRPPB	19.9	384.9	
1-Methyl-3-ethylbenzene	A	1M3EB	19.9	45.6	J
1-Methyl-4-ethylbenzene	A	1M4EB	39.9	634.7	D
1,3,5-Trimethylbenzene (mesitylene)	A	135TMB	39.9	706.4	D
1-Methyl-2-ethylbenzene	A	1M2EB	39.9	521.3	D
1,2,4-Trimethylbenzene	A	124TMB	39.9	3451.3	D
1-Decene	O	1D	59.8	59.8	U
Decane (nC10)	P	C10	59.8	902.4	
sec-Butylbenzene	A	SBUB	19.9	68.1	
1-Methyl-3-isopropylbenzene (m-cymene)	A	1M3IPROPB	19.9	52.6	J
1-Methyl-4-isopropylbenzene (p-cymene)	A	1M4IPROPB	19.9	76.8	
Indane	A	IA	19.9	459.3	
Indene	A	IE	19.9	47.5	J
1-Methyl-2-isopropybenzene (o-cymene)	A	1M2IPROPB	19.9	19.9	U
1-Methyl-3-propylbenzene	A	1M3PROPB	19.9	135.2	
1-Methyl-4-propylbenzene	A	1M4PROPB	19.9	394.5	
n-Butylbenzene	A	NBB	19.9	243.6	
1,3-Dimethyl-5-ethylbenzene	A	13DM5EB	39.9	710.1	D
1,2,diethylbenzene	A	12DEB	19.9	19.9	U
1-Methyl-2-propylbenzene	A	1M2PROPB	19.9	341.3	
1,4-Dimethyl-2-ethylbenzene	A	14DM2EB	39.9	687.3	D

Pace Analytical® Energy Services™

Paul Grimm
Avery Lab
2720 Gregory St, Unit 200
Savannah, GA 31404

Lab ID: 30044-1
Collected: 4/12/2019
Received: 4/17/2019
Matrix: Soil

Client ID: HA-05A

Project: Mayors Point
Project #:
Collected by:

Analyzed: 4/19/2019
Q Method: 040819.M

CONSTITUENTS	CLASS	ABBR.	ssRL ug/kg	RESULT ug/kg	QUALIFIER
1,3-Dimethyl-4-ethylbenzene	A	13DM4EB	39.9	601.1	D
1,2-Dimethyl-4-ethylbenzene	A	12DM4EB	39.9	1139.2	D
1,2-Dimethyl-3-ethylbenzene	A	12DM3EB	19.9	146.1	
Undecane (nC11)	P	C11	59.8	507.9	
1,2,4,5-Tetramethylbenzene	A	1245TMB	39.9	723.1	D
1,2,3,5-Tetramethylbenzene	A	1235TMB	39.9	1121.1	D
n-Pentylbenzene	A	NPYB	19.9	122.6	
Naphthalene	A	N	39.9	637.3	D
Benzothiophene	S	BTHIO	15.0	15.0	U
Dodecane (nC12)	P	C12	39.9	344.1	
1,2,3,4-Tetramethylbenzene	A	1234TMB	19.9	438.8	
MMT	ADD	MMT	15.0	15.0	U
2-Methylnaphthalene	A	2MN	39.9	879.4	D
1-Methylnaphthalene	A	1MN	19.9	437.0	

Benzene d-6 (RS)	94.53	%
Toluene-d8 (RS)	99.17	%
Ethylbenzene d10 (RS)	99.38	%

ssRL - Sample Specific Reporting Limit
Results listed as U would have been reported if present at or above the listed ssRL
J - Values greater than the ssRL but less than the PQL (3 x ssRL).
D - Secondary dilution perfomed
Q - Surrogate recovery limit exceedance
I - Matrix Interference
NC - Not calibrated
Note: Extracted by EPA 5030 (Purge and Trap).

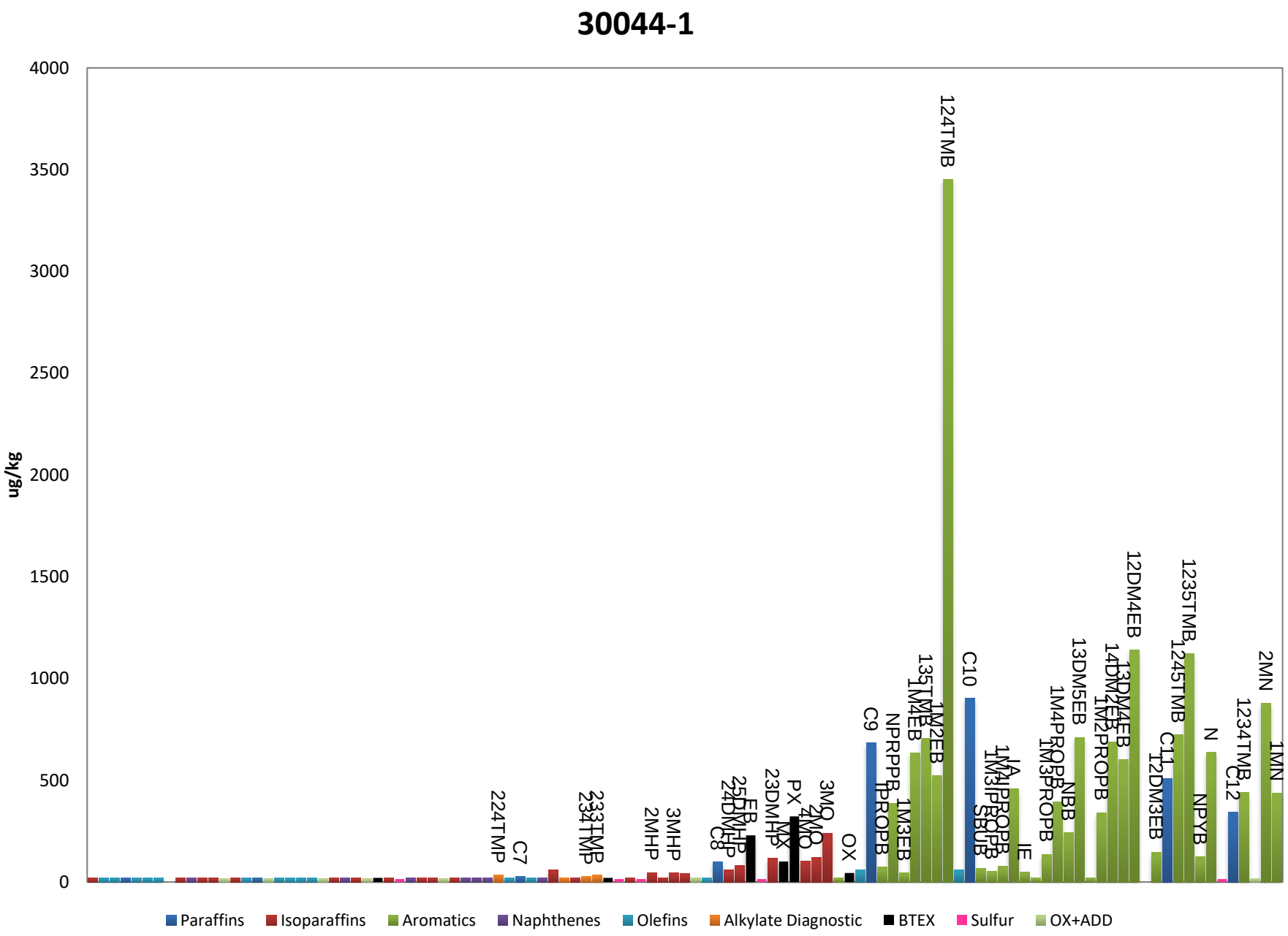
US631

041719-SOIL1.D & dilution 042419-SOIL1.D

Submitted by,
Pace Energy Services, LLC

PAES ID	**30044-1**
Sample ID	**HA-05A**
Evaporation	
n-Pentane / (n-Pentane+n-Heptane)	NR
2-Methylpentane / (2-Methylpentane+2-Methylheptane)	NR
Waterwashing	
Benzene / (Benzene+Cyclohexane)	
Toluene / (Toluene+Methylcyclohexane)	NR
Aromatics / Total Paraffins (n+iso+cyc)	4.60
Aromatics / Naphthenes	NR
wt% < o-xylene	8.68
Biodegradation	
(C4-C8 Para +Isopara) / C4-C8 Olefins	NR
3-Methylhexane / n-Heptane	NR
Methylcyclohexane / n-Heptane	NR
Isoparaffins + Naphthenes / Paraffins	0.35
Diagnostic Ratios (Refining Properties)	
2,2,4-Trimethylpentane / (2,2,4-Trimethylpentane+Methylcyclohexane)	NR
2,2,4-Trimethylpentane / Total TMPs	0.37
nC9 / Isopropylbenzene	9.42
nC10 / 1-Methyl-2-ethylbenzene	1.73
nC11 / 1,4-Dimethyl-2-ethylbenzene	0.74
iC5 / (iC5+nC5)	NR
(2-methylhexane + 2,3dimethylpentane) / (3-methylhexane + 2,4 dimethylpentane)	NR
Naphthalene / (Naphthalene+nC12)	0.65
Methylcyclohexane/(Methylcyclohexane+Toluene)	NR
Toluene/n-Octane	NR
Oxygenates & Other (ug/kg)	
Methyl-tert-butyl ether (MTBE)	U
Di-isopropyl ether (DIPE)	U
Ethyl-tert-butyl ether (ETBE)	U
Tert-amyl methyl ether (TAME)	U
MMT	U
Lead Scavengers (ug/kg)	
1,2-Dichloroethane (EDC)	U
1,2-Dibromoethane (EDB)	U
Sulfur containing HCs (ug/kg)	
Thiophene	U
2-Methylthiophene	U
3-Methylthiophene	U
2-Ethylthiophene	U
Benzothiophene	U
Relative Percentages	
% Paraffinic	13.2
% Isoparaffinic	4.7
% Aromatic	82.1
% Naphthenic	0.0
% Olefinic	0.0

SAMPLE HISTOGRAM



Supporting Quality Control Results

Paul Grimm		**Lab ID:**	**042419-BLK.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**Method Blank**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	ssRL ug/L	RESULT ug/L	QUAL
Isopentane (2-Methylbutane)	1.0	1.0	U
1-Pentene	1.0	1.0	U
2-Methyl-1-butene	2.0	2.0	U
Pentane (nC5)	2.0	2.0	U
trans-2-pentene	1.0	1.0	U
cis-2-pentene	1.0	1.0	U
2-Methyl-2-butene	2.0	2.0	U
2,2-Dimethylbutane	2.0	2.0	U
Cyclopentane	2.0	2.0	U
2,3-Dimethylbutane	2.0	2.0	U
2-Methylpentane	2.0	2.0	U
Methyl-tert-butyl ether (MTBE)	0.8	0.8	U
3-Methylpentane	2.0	2.0	U
1-Hexene	1.0	1.0	U
Hexane (nC6)	1.0	1.0	U
Di-isopropyl ether (DIPE)	0.8	0.8	U
trans-2-hexene	1.0	1.0	U
2-Methyl-2-pentene	2.0	2.0	U
cis-2-hexene	1.0	1.0	U
cis-3-Methyl-2-pentene	2.0	2.0	U
Ethyl-tert-butyl ether (ETBE)	0.8	0.8	U
2,2-Dimethylpentane	1.0	1.0	U
Methylcyclopentane	1.0	1.0	U
2,4-Dimethylpentane	1.0	1.0	U
1,2-Dichloroethane (EDC)	0.8	0.8	U
Benzene	2.0	2.0	U
3,3-Dimethylpentane	1.0	1.0	U
Thiophene	0.8	0.8	U
Cyclohexane	1.0	1.0	U
2-Methylhexane	1.0	1.0	U
2,3-Dimethylpentane	1.0	1.0	U

Paul Grimm		**Lab ID:**	**042419-BLK.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**Method Blank**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	ssRL ug/L	RESULT ug/L	QUAL
Tert-amyl methyl ether (TAME)	0.8	0.8	U
3-Methylhexane	1.0	1.0	U
trans-1,3-Dimethylcyclopentane	1.0	1.0	U
cis-1,3-Dimethylcyclopentane	1.0	1.0	U
trans-1,2-Dimethylcyclopentane	1.0	1.0	U
2,2,4-Trimethylpentane (isooctane)	3.0	3.0	U
1-Heptene	1.0	1.0	U
Heptane (nC7)	1.0	1.0	U
trans-2-heptene	1.0	1.0	U
Methylcyclohexane	1.0	1.0	U
2,5-Dimethylhexane	3.0	3.0	U
2,2,3-Trimethylpentane	1.0	1.0	U
2,4-Dimethylhexane	1.0	1.0	U
2,3,4-Trimethylpentane	1.0	1.0	U
2,3,3-Trimethylpentane	1.0	1.0	U
Toluene	1.0	1.0	U
2-Methylthiophene	0.8	0.8	U
2,3-Dimethylhexane	1.0	1.0	U
3-Methylthiophene	0.8	0.8	U
2-Methylheptane	1.0	1.0	U
4-Methylheptane	1.0	1.0	U
3-Methylheptane	2.0	2.0	U
3-Ethylhexane	2.0	2.0	U
1,2-Dibromoethane (EDB)	1.0	1.0	U
1-Octene	1.0	1.0	U
Octane (nC8)	1.0	1.0	U
2,4-Dimethylheptane	1.0	1.0	U
2,5-Dimethylheptane	1.0	1.0	U
Ethylbenzene	1.0	1.0	U
2-Ethylthiophene	0.8	0.8	U
2,3-Dimethylheptane	1.0	1.0	U

Paul Grimm		**Lab ID:**	**042419-BLK.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**Method Blank**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	ssRL ug/L	RESULT ug/L	QUAL
m-Xylene	1.0	1.0	U
p-Xylene	1.0	1.0	U
4-Methyloctane	1.0	1.0	U
2-Methyloctane	1.0	1.0	U
3-Methyloctane	1.0	1.0	U
Styrene	1.0	1.0	U
o-Xylene	1.0	1.0	U
1-Nonene	3.0	3.0	U
Nonane (nC9)	2.0	2.0	U
Isopropylbenzene (cumene)	1.0	1.0	U
n-Propylbenzene	2.0	2.0	U
1-Methyl-3-ethylbenzene	1.0	1.0	U
1-Methyl-4-ethylbenzene	1.0	1.0	U
1,3,5-Trimethylbenzene (mesitylene)	2.0	2.0	U
1-Methyl-2-ethylbenzene	2.0	2.0	U
1,2,4-Trimethylbenzene	1.0	1.0	U
1-Decene	3.0	3.0	U
Decane (nC10)	3.0	3.0	U
sec-Butylbenzene	1.0	1.0	U
1-Methyl-3-isopropylbenzene (m-cymene)	1.0	1.0	U
1-Methyl-4-isopropylbenzene (p-cymene)	1.0	1.0	U
Indane	1.0	1.0	U
Indene	2.0	2.0	U
1-Methyl-2-isopropybenzene (o-cymene)	1.0	1.0	U
1-Methyl-3-propylbenzene	2.0	2.0	U
1-Methyl-4-propylbenzene	1.0	1.0	U
n-Butylbenzene	1.0	1.0	U
1,3-Dimethyl-5-ethylbenzene	1.0	1.0	U
1,2,diethylbenzene	1.0	1.0	U
1-Methyl-2-propylbenzene	1.0	1.0	U
1,4-Dimethyl-2-ethylbenzene	1.0	1.0	U

Paul Grimm		**Lab ID:**	**042419-BLK.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**Method Blank**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	ssRL ug/L	RESULT ug/L	QUAL
1,3-Dimethyl-4-ethylbenzene	2.0	2.0	U
1,2-Dimethyl-4-ethylbenzene	1.0	1.0	U
1,2-Dimethyl-3-ethylbenzene	2.0	2.0	U
Undecane (nC11)	3.0	3.0	U
1,2,4,5-Tetramethylbenzene	1.0	1.0	U
1,2,3,5-Tetramethylbenzene	1.0	1.0	U
n-Pentylbenzene	1.0	1.0	U
Naphthalene	1.0	1.0	U
Benzothiophene	0.8	0.8	U
Dodecane (nC12)	2.0	2.0	U
1,2,3,4-Tetramethylbenzene	1.0	1.0	U
2-Methylnaphthalene	1.0	1.0	U
1-Methylnaphthalene	2.0	2.0	U
Benzene d-6 (RS)		113	
Toluene-d8 (RS)		99	
Ethylbenzene d10 (RS)		105	

ssRL - Sample Specific Reporting Limit
Results listed as U would have been reported if present at or above the listed ssRL
B - Exceeds PQL - 3 x ssRL
Q - Surrogate recovery limit exceedance
NC - Not calibrated
J - Values greater than the ssRL but less than the PQL.
Note: Extracted by EPA 5030 (Purge and Trap).

US631
042419-BLK.D

Submitted by,
Pace Energy Services, LLC

Paul Grimm		**Lab ID:**	**042419-LCS.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**LCS**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	RESULT ug/L	Recovery %	Spike Conc. ug/L	QUAL
1-Pentene	42.5	84.4	50.4	
Pentane (nC5)	61.2	121.3	50.5	
Cyclopentane	28.0	55.8	50.1	
1-Hexene	44.6	89.1	50.1	
Hexane (nC6)	51.5	102.7	50.1	
Di-isopropyl ether (DIPE)	46.6	185.5	25.1	LQ
Ethyl-tert-butyl ether (ETBE)	20.5	81.6	25.1	
2,4-Dimethylpentane	55.2	110.4	50.0	
Benzene	23.5	93.2	25.2	
Cyclohexane	46.6	92.8	50.3	
Tert-amyl methyl ether (TAME)	18.2	72.0	25.2	
2,2,4-Trimethylpentane (isooctane)	51.3	102.4	50.1	
Heptane (nC7)	63.3	125.7	50.4	
Toluene	26.9	107.9	25.0	
Octane (nC8)	56.8	113.4	50.1	
Ethylbenzene	26.0	103.8	25.1	
m-Xylene	26.4	104.9	25.2	
p-Xylene	26.4	104.6	25.2	
o-Xylene	26.1	104.1	25.1	
Nonane (nC9)	81.6	108.8	75.0	
n-Propylbenzene	27.6	110.2	25.1	
1,3,5-Trimethylbenzene (mesitylene)	27.3	108.0	25.3	
1-Decene	76.3	101.8	75.0	
Decane (nC10)	76.8	102.0	75.3	
n-Butylbenzene	21.4	85.7	25.0	
n-Pentylbenzene	23.6	93.5	25.2	
Dodecane (nC12)	61.1	121.3	50.4	
Benzene d-6 (RS)		90		
Toluene-d8 (RS)		102		
Ethylbenzene d10 (RS)		101		

ssRL - Sample Specific Reporting Limit
Q - Surrogate recovery limit exceedance
I - Matrix Interference
NC - Not calibrated
LQ - Percent difference exceedance (50 - 160)
Note: Extracted by EPA 5030 (Purge and Trap).

US631
042419-LCS.D

Submitted by,
Pace Energy Services, LLC

Paul Grimm		**Lab ID:**	**042419-LCSD.D**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	
Project:	**Mayor Point**	**QC type:**	**LCSD**
Project #:		**Analyzed:**	**4/24/2019**
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	RESULT ug/L	Recovery %	Spike Conc. ug/L	RPD %	QUAL
1-Pentene	43.0	85.3	50.4	1.1	
Pentane (nC5)	60.8	120.5	50.5	0.7	
Cyclopentane	28.7	57.2	50.1	2.5	
1-Hexene	45.1	90.1	50.1	1.1	
Hexane (nC6)	51.3	102.3	50.1	0.4	
Di-isopropyl ether (DIPE)	48.1	191.6	25.1	3.2	
Ethyl-tert-butyl ether (ETBE)	20.5	81.7	25.1	0.1	
2,4-Dimethylpentane	55.4	110.8	50.0	0.3	
Benzene	23.5	93.3	25.2	0.0	
Cyclohexane	47.3	94.2	50.3	1.5	
Tert-amyl methyl ether (TAME)	17.1	67.9	25.2	5.8	
2,2,4-Trimethylpentane (isooctane)	52.9	105.5	50.1	2.9	
Heptane (nC7)	63.1	125.3	50.4	0.3	
Toluene	26.7	107.1	25.0	0.7	
Octane (nC8)	58.1	115.9	50.1	2.2	
Ethylbenzene	26.2	104.3	25.1	0.5	
m-Xylene	26.4	104.6	25.2	0.2	
p-Xylene	24.5	97.3	25.2	7.2	
o-Xylene	25.9	103.4	25.1	0.7	
Nonane (nC9)	78.9	105.2	75.0	3.3	
n-Propylbenzene	27.6	110.1	25.1	0.0	
1,3,5-Trimethylbenzene (mesitylene)	27.2	107.6	25.3	0.4	
1-Decene	74.8	99.7	75.0	2.1	
Decane (nC10)	74.2	98.6	75.3	3.4	
n-Butylbenzene	21.9	87.8	25.0	2.4	
n-Pentylbenzene	25.2	100.0	25.2	6.8	
Dodecane (nC12)	60.3	119.8	50.4	1.2	
Benzene d-6 (RS)		89			
Toluene-d8 (RS)		103			
Ethylbenzene d10 (RS)		102			

ssRL - Sample Specific Reporting Limit
Q - Surrogate recovery limit exceedance
I - Matrix Interference

NC - Not calibrated
RQ - Percent difference exceeded (15)
LQ - Percent difference exceedance (50 - 160)
Note: Extracted by EPA 5030 (Purge and Trap).

US631
042419-LCSD.D

Submitted by,
Pace Energy Services, LLC

Pace Analytical® Energy Services™

Paul Grimm
Avery Labs
2720 Gregory St, Unit 200
Savannah, GA 31404

Lab ID: **042419-SRM.D**
Collected:
Received:
Matrix: **Product/Soil**

Project: **Mayor Point**
Project #:
Collected by:

QC type: **NIST SRM 2295**
Q Method: **040819.M**

CONSTITUENTS	RESULT mg/kg	ssRL mg/kg	D Flag	NIST Result mg/kg	Passing Diff. %	Actual Diff. %	QUAL
1-Pentene	5358.4	434.0		7400.0	45	32.0	
Pentane (nC5)	27302.9	434.0		35700.0	45	26.7	
Methyl-tert-butyl ether (MTBE)	27182.3	3472.2	D	145400.0	45	137.0	SQ
Hexane (nC6)	32116.3	434.0		37000.0	45	14.1	
2,4-Dimethylpentane	79608.0	434.0		79000.0	45	0.8	
Benzene	8489.3	434.0		9900.0	45	15.3	
Thiophene	222.3	434.0		260.0	45	15.6	
Cyclohexane	67348.7	434.0		88400.0	45	27.0	
2,2,4-Trimethylpentane (isooctane)	133567.1	434.0		118000.0	45	12.4	
1-Heptene	21305.5	434.0		15000.0	45	34.7	
Heptane (nC7)	99894.1	434.0		77700.0	45	25.0	
Toluene	68363.2	434.0		78900.0	45	14.3	
3-Methylthiophene	317.1	434.0		300.0	45	5.5	
Octane (nC8)	100239.3	434.0		79800.0	45	22.7	
Ethylbenzene	21344.1	434.0		19600.0	45	8.5	
m,p-Xylenes	44122.8	434.0		58700.0	45	28.4	
o-Xylene	22435.7	434.0		19700.0	45	13.0	
1,3,5-Trimethylbenzene (mesitylene)	22636.4	434.0		19700.0	45	13.9	
1,2,4-Trimethylbenzene	23113.3	434.0		20010.0	45	14.4	
Decane (nC10)	12987.7	434.0		41400.0	45	104.5	SQ
1,2,4,5-Tetramethylbenzene	10144.0	434.0		9600.0	45	5.5	
Naphthalene	11695.2	434.0		11500.0	45	1.7	
Benzothiophene	459.9	434.0		440.0	45	4.4	
Benzene d-6 (RS)	82						
Toluene-d8 (RS)	103						
Ethylbenzene d10 (RS)	101						

ssRL - Sample Specific Reporting Limit
D - Secondary dilution perfomed
Q - Surrogate recovery limit exceedance
SQ - SRM percent difference exceeded
I - Matrix Interference
NC - Not calibrated
Note: Extracted by EPA 5030 (Purge and Trap).

US631
042419-SRM.D

Submitted by,
Pace Energy Services, LLC

Paul Grimm		**Lab ID:**	**10ppb C3-C12 CCV**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	**Water**
Project:	**Mayor Point**	**QC type:**	**CCV**
Project #:			
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	AMOUNT ng/ml	Calc. ng/ml	Dev. %	RRF Q
Isopentane (2-Methylbutane)	24.2	20.4	19.0	
1-Pentene	24.1	21.4	13.0	
2-Methyl-1-butene	24.1	20.9	15.5	
Pentane (nC5)	36.2	32.1	12.7	
trans-2-pentene	24.2	21.6	12.2	
cis-2-pentene	36.3	32.3	12.5	
Cyclopentane	12.1	10.9	11.0	
2,3-Dimethylbutane	12.0	10.9	10.9	
2-Methylpentane	24.1	22.7	6.3	
Methyl-tert-butyl ether (MTBE)	12.0	10.2	17.8	
3-Methylpentane	36.3	34.2	6.2	
1-Hexene	36.0	32.8	9.7	
Hexane (nC6)	36.0	36.1	0.2	
Di-isopropyl ether (DIPE)	24.1	21.9	9.7	
Ethyl-tert-butyl ether (ETBE)	12.1	10.3	17.9	
Methylcyclopentane	24.0	25.6	6.2	
2,4-Dimethylpentane	36.2	39.2	7.5	
1,2-Dichloroethane (EDC)	36.2	32.5	11.2	
Benzene	24.0	21.6	11.2	
Thiophene	36.1	31.1	16.3	
Cyclohexane	36.1	31.7	13.9	
2-Methylhexane	36.2	39.8	9.1	
2,3-Dimethylpentane	36.3	38.9	6.6	
Tert-amyl methyl ether (TAME)	24.2	19.4	24.5	
3-Methylhexane	35.9	39.5	9.1	
2,2,4-Trimethylpentane (isooctane)	36.1	38.5	6.2	
1-Heptene	36.2	40.3	10.3	
Heptane (nC7)	36.1	42.0	14.0	
Methylcyclohexane	36.2	39.6	8.5	
2,5-Dimethylhexane	36.2	47.4	23.7	
2,2,3-Trimethylpentane	12.0	13.7	11.8	
2,4-Dimethylhexane	30.0	33.1	9.3	
2,3,4-Trimethylpentane	36.1	35.8	0.7	

Paul Grimm		**Lab ID:**	**10ppb C3-C12 CCV**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	**Water**
Project:	**Mayor Point**	**QC type:**	**CCV**
Project #:			
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	AMOUNT ng/ml	Calc. ng/ml	Dev. %	RRF Q
2,3,3-Trimethylpentane	36.2	38.2	5.1	
Toluene	12.1	13.1	7.6	
2-Methylthiophene	36.2	40.5	10.7	
2,3-Dimethylhexane	37.0	39.6	6.5	
3-Methylthiophene	36.1	41.1	12.2	
2-Methylheptane	36.2	40.9	11.6	
3-Methylheptane	36.2	50.1	27.8	
3-Ethylhexane	36.1	43.0	16.2	
1,2-Dibromoethane (EDB)	36.1	39.6	8.7	
1-Octene	36.1	40.7	11.3	
Octane (nC8)	36.2	38.6	6.3	
Ethylbenzene	12.0	12.4	3.1	
2-Ethylthiophene	24.2	26.3	7.8	
m-Xylene	12.0	11.9	1.3	
p-Xylene	12.1	14.4	16.2	
Styrene	12.0	11.9	1.0	
o-Xylene	12.1	12.8	5.8	
1-Nonene	36.2	44.8	19.2	
Nonane (nC9)	36.1	46.5	22.3	
Isopropylbenzene (cumene)	12.1	12.4	2.1	
n-Propylbenzene	12.0	12.4	3.1	
1-Methyl-3-ethylbenzene	12.0	12.8	5.5	
1-Methyl-4-ethylbenzene	12.0	13.1	8.3	
1,3,5-Trimethylbenzene (mesitylene)	12.0	13.0	7.3	
1-Methyl-2-ethylbenzene	12.0	12.7	5.5	
1,2,4-Trimethylbenzene	12.0	12.5	3.3	
1-Decene	36.1	47.2	23.7	
Decane (nC10)	36.1	37.3	3.2	
sec-Butylbenzene	12.0	12.6	4.3	
1-Methyl-3-isopropylbenzene (m-cymene)	12.0	12.1	0.3	
1-Methyl-4-isopropylbenzene (p-cymene)	12.0	12.3	2.0	

Paul Grimm		**Lab ID:**	**10ppb C3-C12 CCV**
Avery Labs		**Collected:**	
2720 Gregory St, Unit 200		**Received:**	
Savannah, GA 31404		**Matrix:**	**Water**
Project:	**Mayor Point**	**QC type:**	**CCV**
Project #:			
Collected by:		**Q Method:**	**040819.M**

CONSTITUENTS	AMOUNT ng/ml	Calc. ng/ml	Dev. %	RRF Q
Indane	12.0	12.0	0.2	
Indene	12.0	11.3	6.9	
1-Methyl-2-isopropybenzene (o-cymene)	12.0	12.3	2.5	
1-Methyl-3-propylbenzene	12.0	12.3	1.7	
1-Methyl-4-propylbenzene	12.1	12.9	6.7	
n-Butylbenzene	12.0	13.3	9.3	
1,3-Dimethyl-5-ethylbenzene	12.0	12.9	7.0	
1,2,diethylbenzene	12.0	12.7	5.4	
1-Methyl-2-propylbenzene	12.1	12.7	4.9	
1,4-Dimethyl-2-ethylbenzene	12.1	12.4	2.6	
1,3-Dimethyl-4-ethylbenzene	12.0	13.0	7.9	
1,2-Dimethyl-4-ethylbenzene	12.1	12.8	5.8	
1,2-Dimethyl-3-ethylbenzene	12.1	13.1	7.6	
Undecane (nC11)	24.1	23.1	4.3	
1,2,4,5-Tetramethylbenzene	12.0	12.4	3.0	
n-Pentylbenzene	12.1	12.4	2.6	
Naphthalene	12.1	12.4	2.1	
Benzothiophene	12.0	12.7	4.9	
Dodecane (nC12)	24.2	23.9	1.1	
2-Methylnaphthalene	12.0	12.6	4.2	
1-Methylnaphthalene	12.1	13.2	8.5	
Benzene d-6 (RS)	20.0	17.5	14.4	
Toluene-d8 (RS)	20.0	21.5	6.9	
Ethylbenzene d10 (RS)	20.0	20.0	0.1	

CQ - Continuing calibration % difference exceeded
Note: Extracted by EPA 5030 (Purge and Trap).

US631
042419-CCV1.D

Submitted by,
Pace Energy Services, LLC

(C8-C40) Semi-Quantitative Molecular Characterization
by GC/MS - full scan mode
TIC, n-Alkanes, Iso-Alkanes, Isoprenoids, Alkylcyclohexanes,
C4-monoaromatics, Bicyclanes, Terpanes, Steranes

C8-C40 - Semi Quantitative Hydrocarbons Characterization
by GC/MS - full scan mode

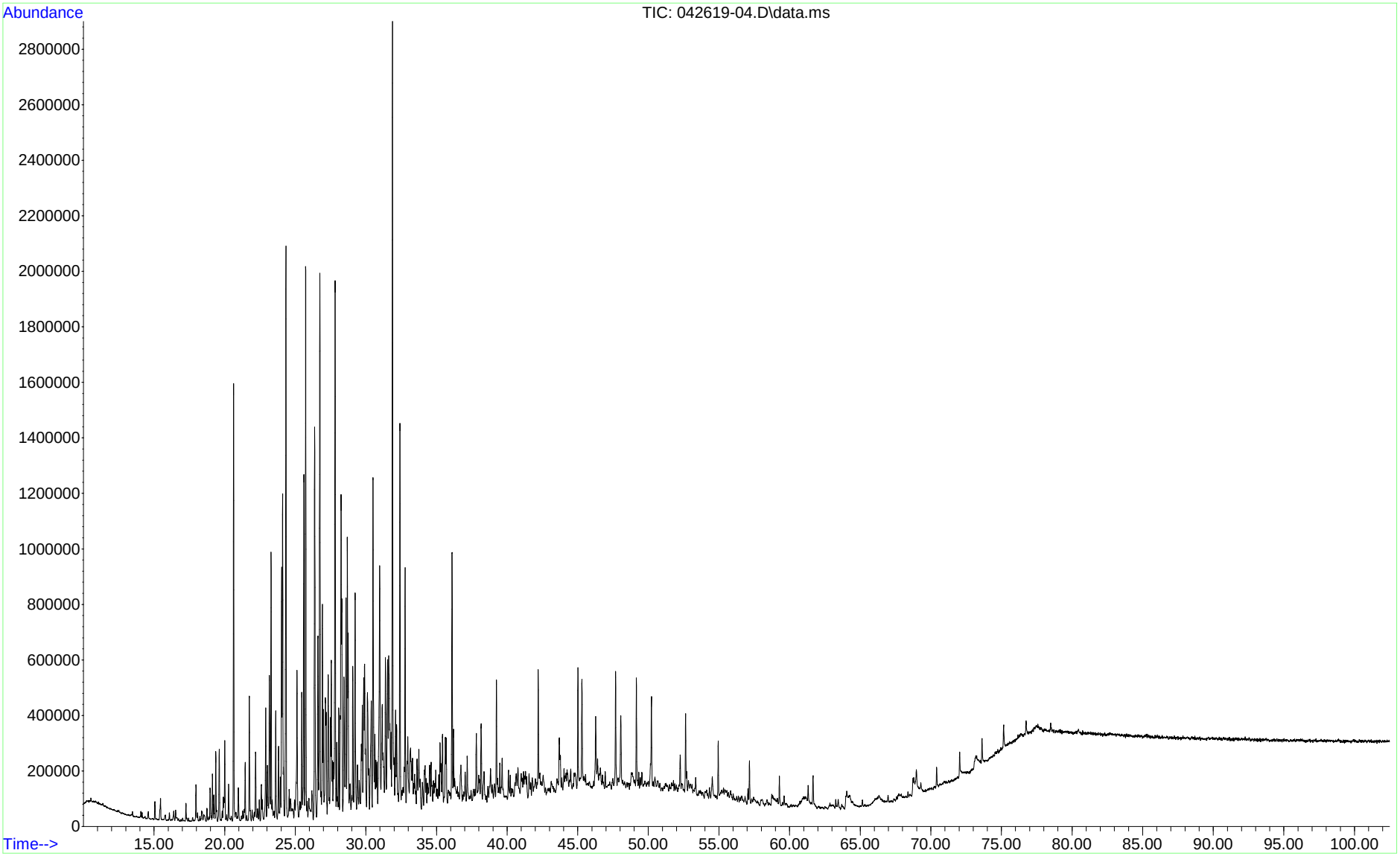
Mass Chromatograms

ION (m/z)	COMPOUND CLASS
TIC	All Compounds
85	n-Paraffins
113	Isoparaffins
83	Alkylcyclohexanes
134	C3-C4 Monoaromatics
123	Bicyclanes
191	Terpanes
217	Steranes
253	Monoaromatice Steranes
231	Triaromatic Steranes
Bar Diagram	Monoaromatic and Polyaromatic Hydrocarbon Distribution

note: Chromatograms and data follow this cover page.

Submitted by,
Pace Analytical Energy Services

Acquired : 26 Apr 2019 19:26 using AcqMethod FOREN4LA_RTL.M
Sample Name: 30044-1 [HA-05A] 1/10



Chromatogram Key & Numerical Results: 85 m/z n-Paraffins

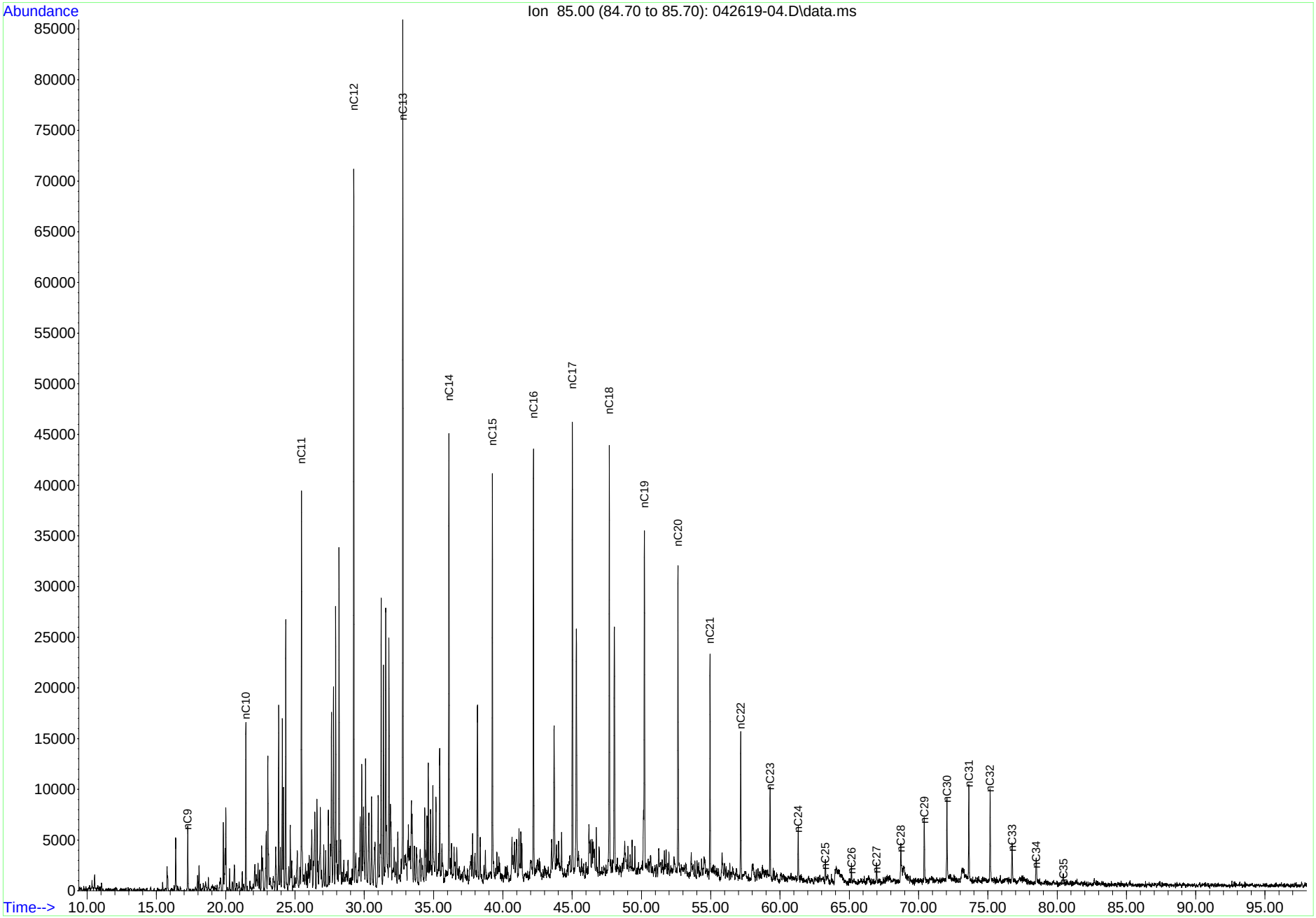
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (85 m/z)
n-Octane	nC8	85	ND	ND	ND
n-Nonane	nC9	85	17.3	6302.0	1.1%
n-Decane	nC10	85	21.5	16600.0	2.8%
n-Undecane	nC11	85	25.5	38794.0	6.5%
n-Dodecane	nC12	85	29.2	70501.0	11.8%
n-Tridecane	nC13	85	32.8	84410.0	14.2%
n-Tetradecane	nC14	85	36.1	43587.0	7.3%
n-Pentadecane	nC15	85	39.2	39965.0	6.7%
n-Hexadecane	nC16	85	42.2	42119.0	7.1%
n-Heptadecane	nC17	85	45.0	44294.0	7.4%
n-Octadecane	nC18	85	47.7	42027.0	7.1%
n-Nonadecane	nC19	85	50.2	33256.0	5.6%
n-icosane	nC20	85	52.6	30334.0	5.1%
n-Henicosane	nC21	85	55.0	22248.0	3.7%
n-Docosane	nC22	85	57.2	14627.0	2.5%
n-Tricosane	nC23	85	59.3	9210.0	1.5%
n-Tetracosane	nC24	85	61.3	5434.0	0.9%
n-Pentacosane	nC25	85	63.3	2422.0	0.4%
n-Hexacosane	nC26	85	65.2	1990.0	0.3%
n-Heptacosane	nC27	85	67.0	2110.0	0.4%
n-Octacosane	nC28	85	68.7	3940.0	0.7%
n-Nonacosane	nC29	85	70.4	6424.0	1.1%
n-Triacontane	nC30	85	72.1	8230.0	1.4%
n-Hentriacontane	nC31	85	73.6	9329.0	1.6%
n-Dotriacontane	nC32	85	75.2	9130.0	1.5%
n-Tritriacontane	nC33	85	76.8	3987.0	0.7%
n-Tetratriacontane	nC34	85	78.5	2582.0	0.4%
n-Pentatriacontane	nC35	85	80.4	1143.0	0.2%
n-Hexatriacontane	nC36	85	ND	ND	ND
n -Heptatriacontane	nC37	85	ND	ND	ND
n -Octatriacontane	nC38	85	ND	ND	ND
n -Nonatriacontane	nC39	85	ND	ND	ND
n-Tetracontane	nC40	85	ND	ND	ND

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 113 m/z Isoparaffins

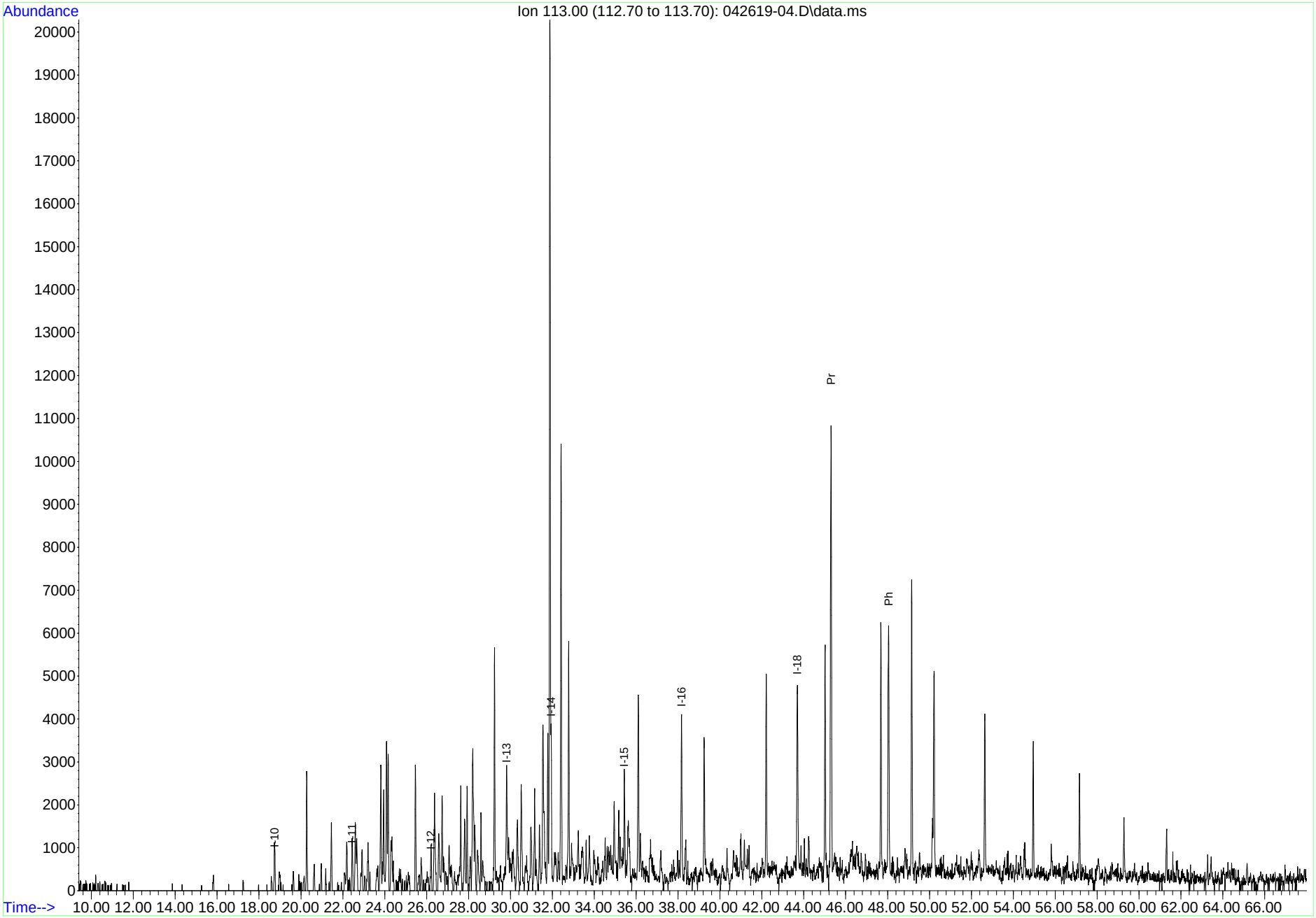
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (113 m/z)
Iso-alkane w/ 9 Carbon Atoms	I-9	113	ND	ND	ND
Iso-alkane w/ 10 Carbon Atoms	I-10	113	18.7	1129.0	3.1%
Iso-alkane w/ 11 Carbon Atoms	I-11	113	22.4	1223.0	3.3%
Iso-alkane w/ 12 Carbon Atoms	I-12	113	26.2	1075.0	2.9%
Iso-alkane w/ 13 Carbon Atoms	I-13	113	29.8	2831.0	7.7%
Iso-alkane w/ 14 Carbon Atoms	I-14	113	31.9	3545.0	9.6%
Farnesane (Isoprenoid - C15)	I-15	113	35.4	2529.0	6.8%
Iso-alkane w/ 16 Carbon Atoms	I-16	113	38.2	3879.0	10.5%
Iso-alkane w/ 18 Carbon Atoms	I-18	113	43.7	4437.0	12.0%
Pristane (Isoprenoid - C19)	Pr	113	45.3	10507.0	28.4%
Phytane (Isoprenoid - C20)	Ph	113	48.1	5791.0	15.7%

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 83 m/z Alkylcyclohexanes

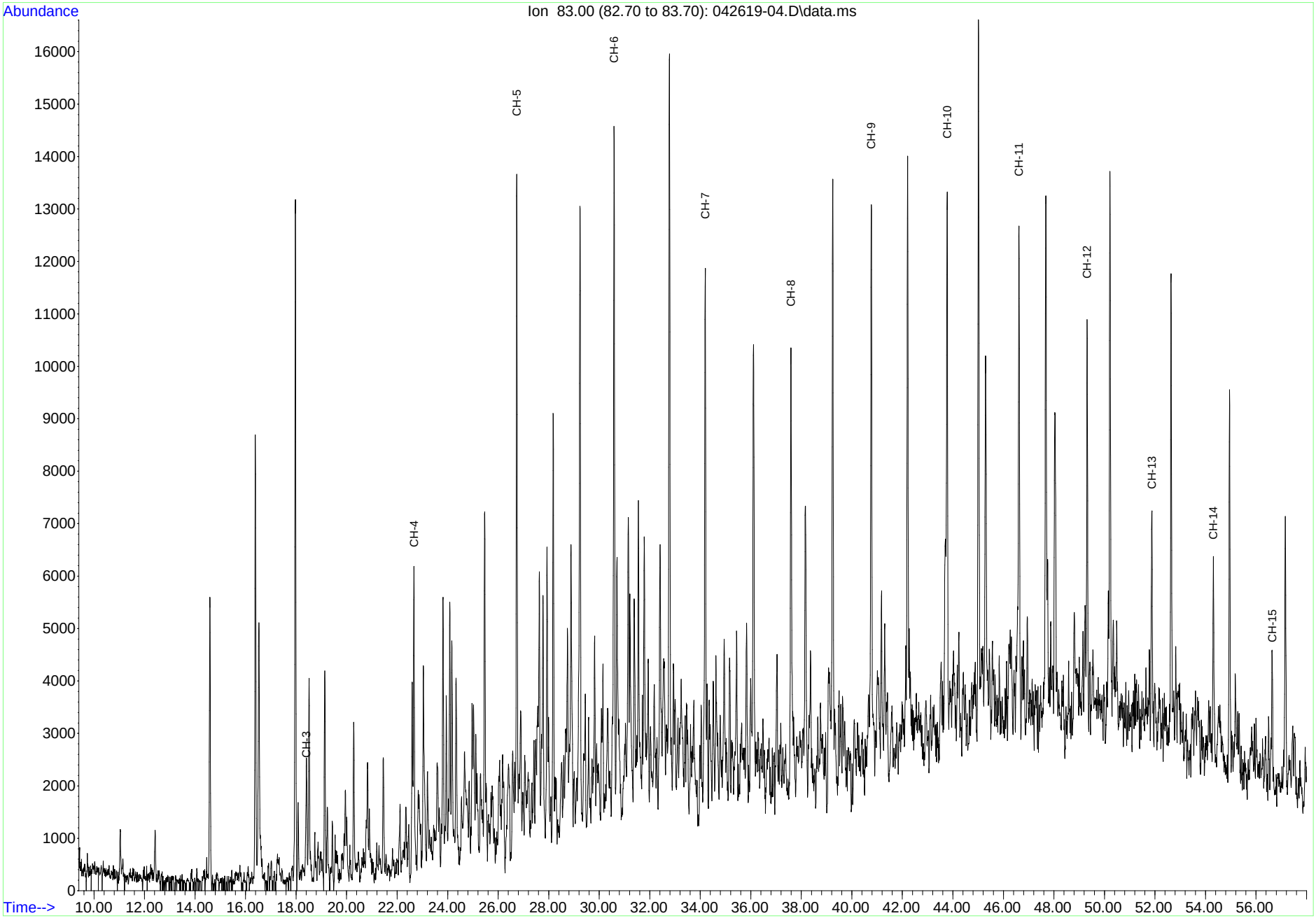
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (83 m/z)
Methylcyclohexane	CH-1	83	ND	ND	ND
Ethylcyclohexane	CH-2	83	ND	ND	ND
Propylcyclohexane	CH-3	83	18.4	2251.0	2.3%
Butylcyclohexane	CH-4	83	22.7	5692.0	5.8%
Pentylcyclohexane	CH-5	83	26.7	12584.0	12.8%
Hexylcyclohexane	CH-6	83	30.6	12735.0	13.0%
Heptylcyclohexane	CH-7	83	34.2	10148.0	10.3%
Octylcyclohexane	CH-8	83	37.6	8614.0	8.8%
Nonylcyclohexane	CH-9	83	40.8	9993.0	10.2%
Decylcyclohexane	CH-10	83	43.8	10257.0	10.4%
Undecylcyclohexane	CH-11	83	46.6	9791.0	10.0%
Dodecylcyclohexane	CH-12	83	49.3	7861.0	8.0%
Tridecylcyclohexane	CH-13	83	51.9	4385.0	4.5%
Tetradecylcyclohexane	CH-14	83	54.3	3941.0	4.0%

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 134 m/z C3-C4 Monoaromatics

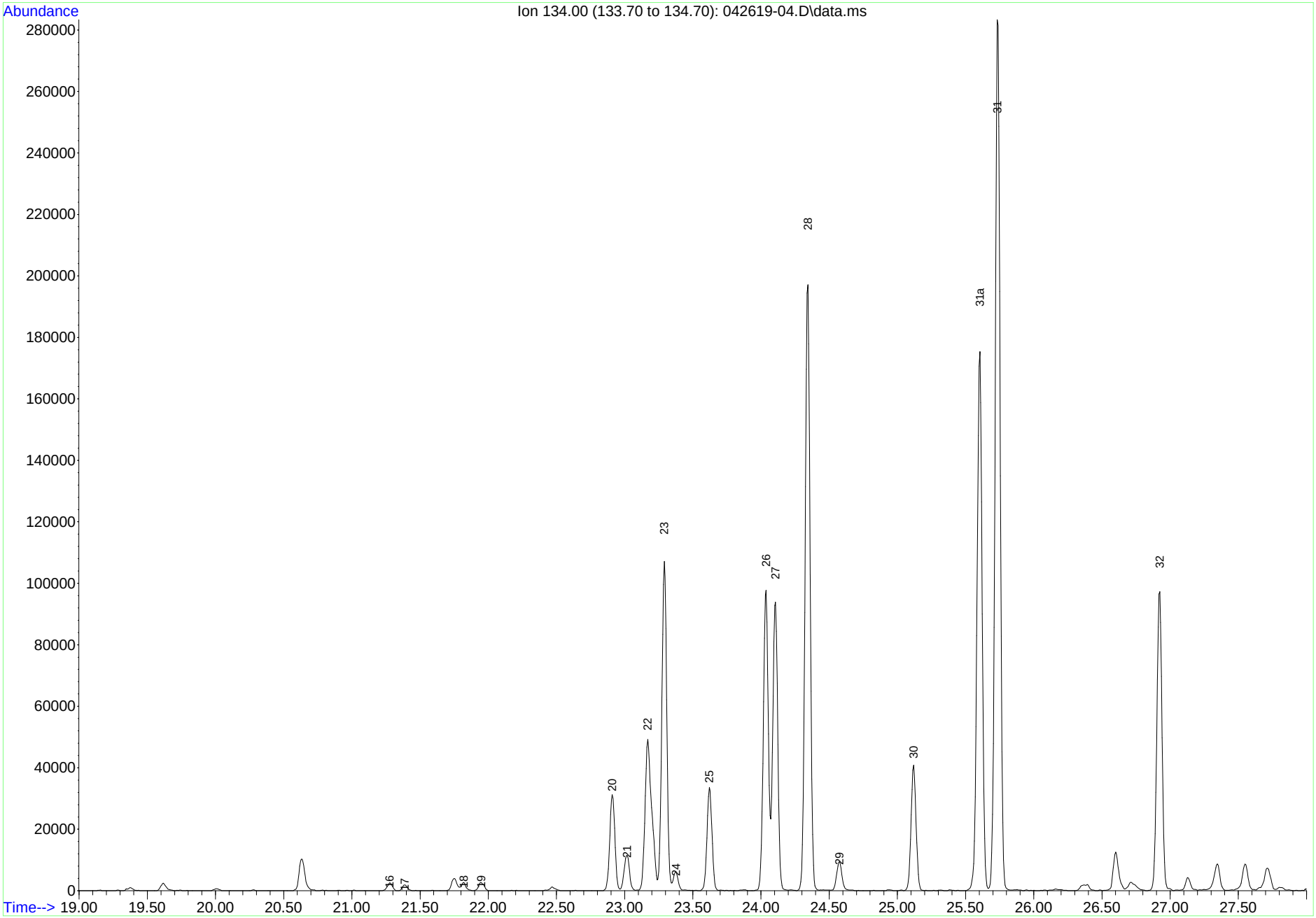
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (134 m/z)
Sec-Butylbenzene	16	134	21.3	2631.0	0.2%
1-Methyl-3-Isopropylbenzene	17	134	21.4	1924.0	0.2%
1-Methyl-4-Isopropylbenzene	18	134	21.8	2674.0	0.2%
1-Methyl-2-Isopropylbenzene	19	134	22.0	2704.0	0.2%
1,3-Diethylbenzene	20	134	22.9	31240.0	2.5%
1-Methyl-3-Propylbenzene	21	134	23.0	11326.0	0.9%
Butylbenzene	22	134	23.2	49134.0	4.0%
1,3-Diethyl-5-Ethylbenzene	23	134	23.3	106942.0	8.6%
1,2-Diethylbenzene	24	134	23.4	5982.0	0.5%
1-Methyl-2-Propylbenzene	25	134	23.6	33664.0	2.7%
1,4-Dimethyl-2-Ethylbenzene	26	134	24.0	97736.0	7.9%
1,3-Dimethyl-4-Ethylbenzene	27	134	24.1	93721.0	7.5%
1,2-Dimethyl-4-Ethylbenzene	28	134	24.3	197184.0	15.9%
1,3-Dimethyl-2-Ethylbenzene	29	134	24.6	9302.0	0.7%
1,2-Dimethyl-3-Ethylbenzene	30	134	25.1	40896.0	3.3%
1,2,4,5-Tetramethylbenzene	31a	134	25.6	175424.0	14.1%
1,2,3,5-Tetramethylbenzene	31	134	25.7	283148.0	22.8%
1,2,3,4-Tetramethylbenzene	32	134	26.9	97288.0	7.8%

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 123 m/z Bicyclanes

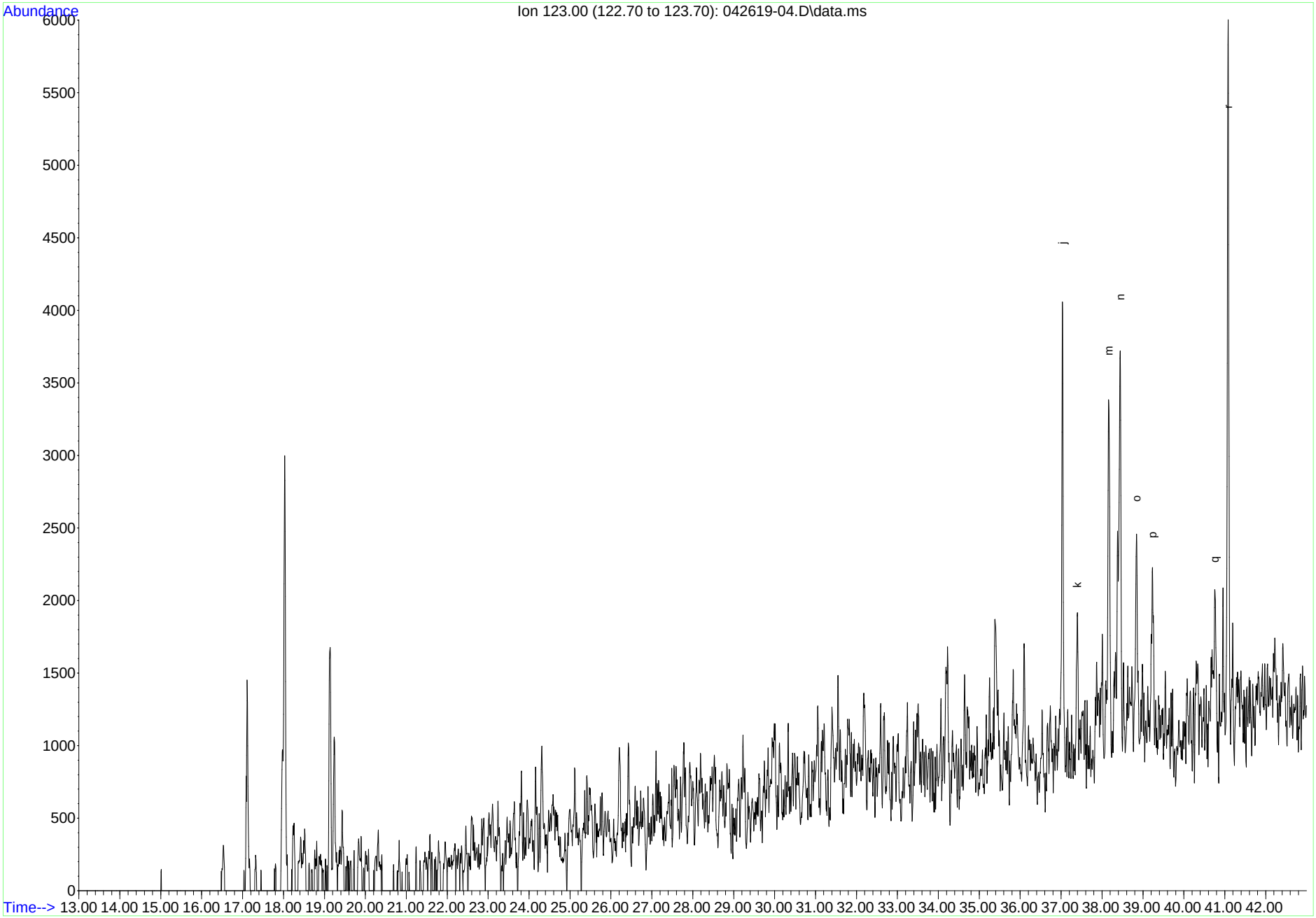
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (123 m/z)
2,2,3-Trimethylbicycloheptane	a	123	ND	ND	ND
C_{10} bicycloalkane	b	123	ND	ND	ND
3,3,7-Trimethylbicycloheptane	c	123	ND	ND	ND
C_{11} Decalin	d	123	ND	ND	ND
Nordrimane	f	123	ND	ND	ND
Nordrimane	g	123	ND	ND	ND
Rearranged drimane	h	123	ND	ND	ND
Rearranged drimane	j	123	37.0	3261.0	17.6%
Isomer of Eudesmane	k	123	37.4	1045.0	5.7%
4β (H) Eudesmane	l	123	ND	ND	ND
C_{15} Bicyclic Sesquiterpane	m	123	38.2	2467.0	13.3%
8β (H) Drimane	n	123	38.4	2779.0	15.0%
C_{15} Bicyclic Sesquiterpane	o	123	38.8	1499.0	8.1%
C_{16} Bicyclic Sesquiterpane	p	123	39.2	1269.0	6.9%
C_{16} Bicyclic Sesquiterpane	q	123	40.8	1150.0	6.2%
8β (H) Homodrimane	r	123	41.1	5017.0	27.1%

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 191 m/z Terpanes

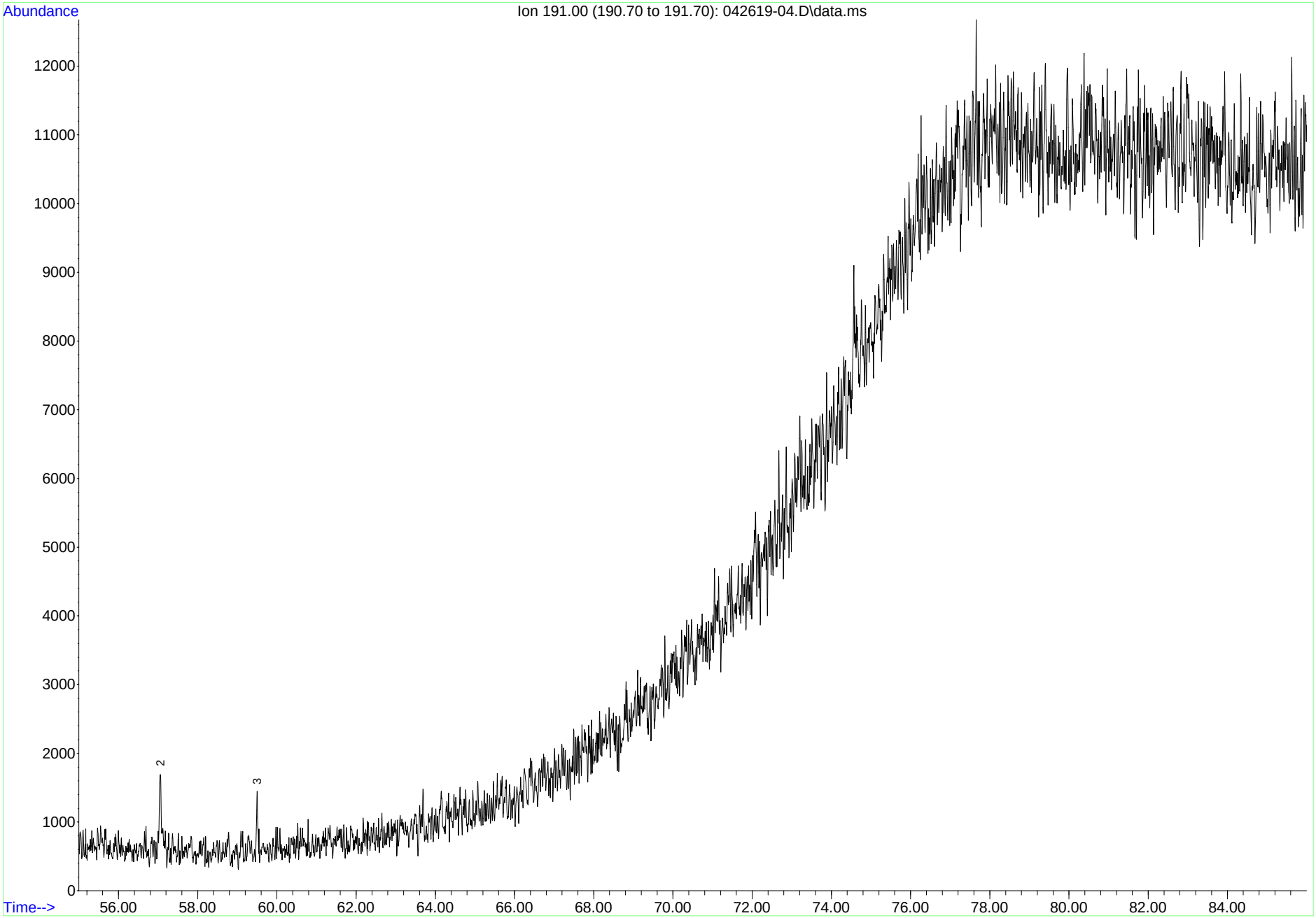
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (191 m/z)
C_{21}-Tricyclic Terpane	1	191	ND	ND	ND
C_{22}-Tricyclic Terpane	2	191	57.1	1019.0	28.3%
C_{23}-Tricyclic Terpane	3	191	59.5	2588.0	71.7%
C_{24}-Tricyclic Terpane	4	191	ND	ND	ND
C_{25}-Tricyclic Terpane	5(S+R)	191	ND	ND	ND
C_{24}-Tetracyclic Terpane	Z4	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6a*	191	ND	ND	ND
C_{26}-Tricyclic Terpane	6b	191	ND	ND	ND
C_{28}-Tricyclic Terpane #1	A	191	ND	ND	ND
C_{28}-Tricyclic Terpane #2	B	191	ND	ND	ND
C_{29}-Tricyclic Terpane #1	C	191	ND	ND	ND
C_{29}-Tricyclic Terpane #2	D	191	ND	ND	ND
18 α-22,29,30-Trisnorneohopane (Ts)	E	191	ND	ND	ND
17 α-22,29,30-Trisnorhopane (Tm)	F	191	ND	ND	ND
C_{30}-Tricyclic Terpane #1	10a*	191	ND	ND	ND
C_{30}-Tricyclic Terpane #2	10b	191	ND	ND	ND
17 α-28,30 Bisnorhopane	I	191	ND	ND	ND
C_{31}-Tricyclic Terpane #1	11a*	191	ND	ND	ND
17α-25-Norhopane	J	191	ND	ND	ND
C_{31}-Tricyclic Terpane #2	11b	191	ND	ND	ND
17 α,21β-30-Norhopane	K	191	ND	ND	ND
18α-30-Norneohopane	C29Ts	191	ND	ND	ND
17α-Diahopane	C30*	191	ND	ND	ND
17β-21α-30-Normoretane	L	191	ND	ND	ND
18α+18β-Oleanane	Ma+Mb	191	ND	ND	ND
17α-21β-Hopane	N	191	ND	ND	ND
17β-21α-Moretane	O	191	ND	ND	ND
22S-17α,21β-30-Homohopane	P	191	ND	ND	ND
22R-17α,21β-30-Homohopane	Q	191	ND	ND	ND
Gammacerane	R	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	T	191	ND	ND	ND
22R-17α,21β-30-Bishomohopane	U	191	ND	ND	ND
22S-17α,21β-30-Bishomohopane	WS	191	ND	ND	ND
22R-17α,21β-Trishomohopane	WR	191	ND	ND	ND
22S-17α,21β-Tetrahomohopane	XS	191	ND	ND	ND
22R-17α,21β-Tetrahomohopane	XR	191	ND	ND	ND
22S-17α,21β-Pentahomohopane	YS	191	ND	ND	ND
22R-17α,21β-Pentahomohopane	YR	191	ND	ND	ND

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 217 m/z Steranes

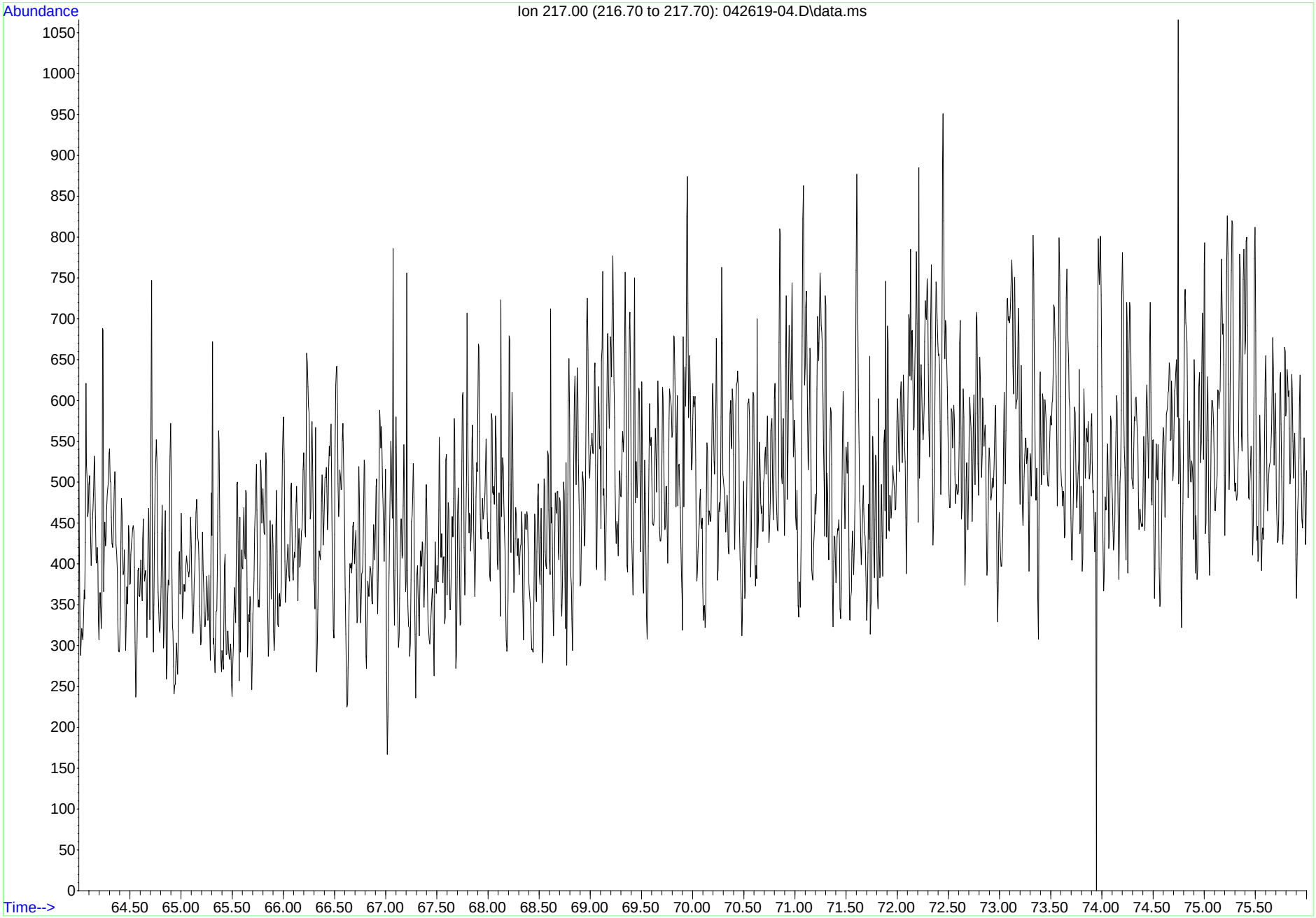
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (217 m/z)
13β, 17α-Diacholestane (20S)	1	217	ND	ND	ND
13β, 17α-Diacholestane (20R)	2	217	ND	ND	ND
13α, 17β-Diacholestane (20S)	3	217	ND	ND	ND
13α, 17β-Diacholestane (20R)	4	217	ND	ND	ND
24-methyl-13β,17α-Diacholestane (20S)	5	217	ND	ND	ND
24-methyl-13β,17α-Diacholestane (20S)	6	217	ND	ND	ND
24-methyl-13α,17β-Diacholestane (20S)	7D	217	ND	ND	ND
14α,17α-Cholestane (20S)	7	217	ND	ND	ND
24-ethyl-13β, 17α-Diacholestane (20S)+	8+8D	217			
14β,17β-Cholestane (20R)			ND	ND	ND
14β,17β-Cholestane (20S)	9	217	ND	ND	ND
24-methyl-13α,17β-Diacholestane (20R)	9D	217	ND	ND	ND
14α,17α-Cholestane (20R)	10	217	ND	ND	ND
24-ethyl-13β, 17α-Diacholestane (20R)	11	217	ND	ND	ND
24-ethyl-13α, 17β-Diacholestane (20S)	12	217	ND	ND	ND
24-ethyl-13α, 17α-Diacholestane (20S)	13	217	ND	ND	ND
24-methyl-14β, 17β-Cholestane (20R)	14	217	ND	ND	ND
24-methyl-14β, 17β-Cholestane (20S)	15	217	ND	ND	ND
24-methyl-14α, 17α-Cholestane (20R)	16	217	ND	ND	ND
24-ethyl-14α-Cholestane (20S)	17	217	ND	ND	ND
24-ethyl-14β, 17β-Cholestane (20R)	18	217	ND	ND	ND
24-ethyl-14β, 17β-Cholestane (20S)	19	217	ND	ND	ND
24-ethyl-14α, 17α-Cholestane (20R)	20	217	ND	ND	ND

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 253 m/z Monoaromatic Steranes

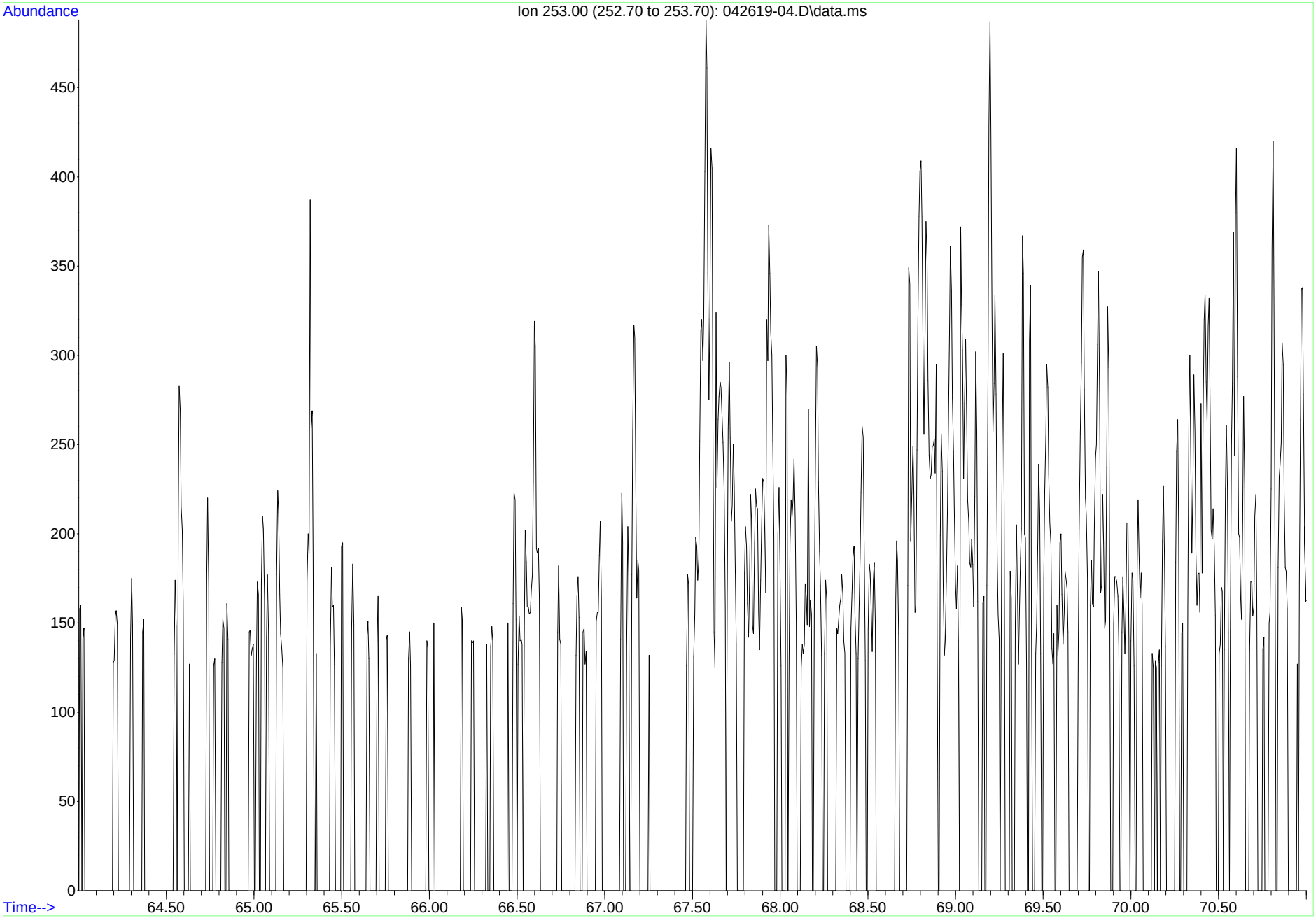
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (253 m/z)
20S, 5β C27-MAS	a	253	ND	ND	ND
20S, dia C27-MAS	b	253	ND	ND	ND
20R, 5β C27-MAS + 20R C27 dia MAS	c	253	ND	ND	ND
20S, 5α C27-MAS	d	253	ND	ND	ND
20R, 5β C28-MAS + 20S C28 dia MAS	e	253	ND	ND	ND
20R, 5α C27-MAS	f	253	ND	ND	ND
20S, 5α C28-MAS	g	253	ND	ND	ND
20R, 5β C28-MAS + 20R C28 dia MAS	h	253	ND	ND	ND
20S, 5β C29-MAS + 20S C29 dia MAS	i	253	ND	ND	ND
20S, 5α C29-MAS	J lower case	253	ND	ND	ND
20R, 5α C28-MAS	k	253	ND	ND	ND
20R, 5β C29-MAS + 20R C29 dia MAS	L lower case	253	ND	ND	ND
20R, 5α C29-MAS	m	253	ND	ND	ND

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Chromatogram Key & Numerical Results: 231 m/z Triaromatic Steranes

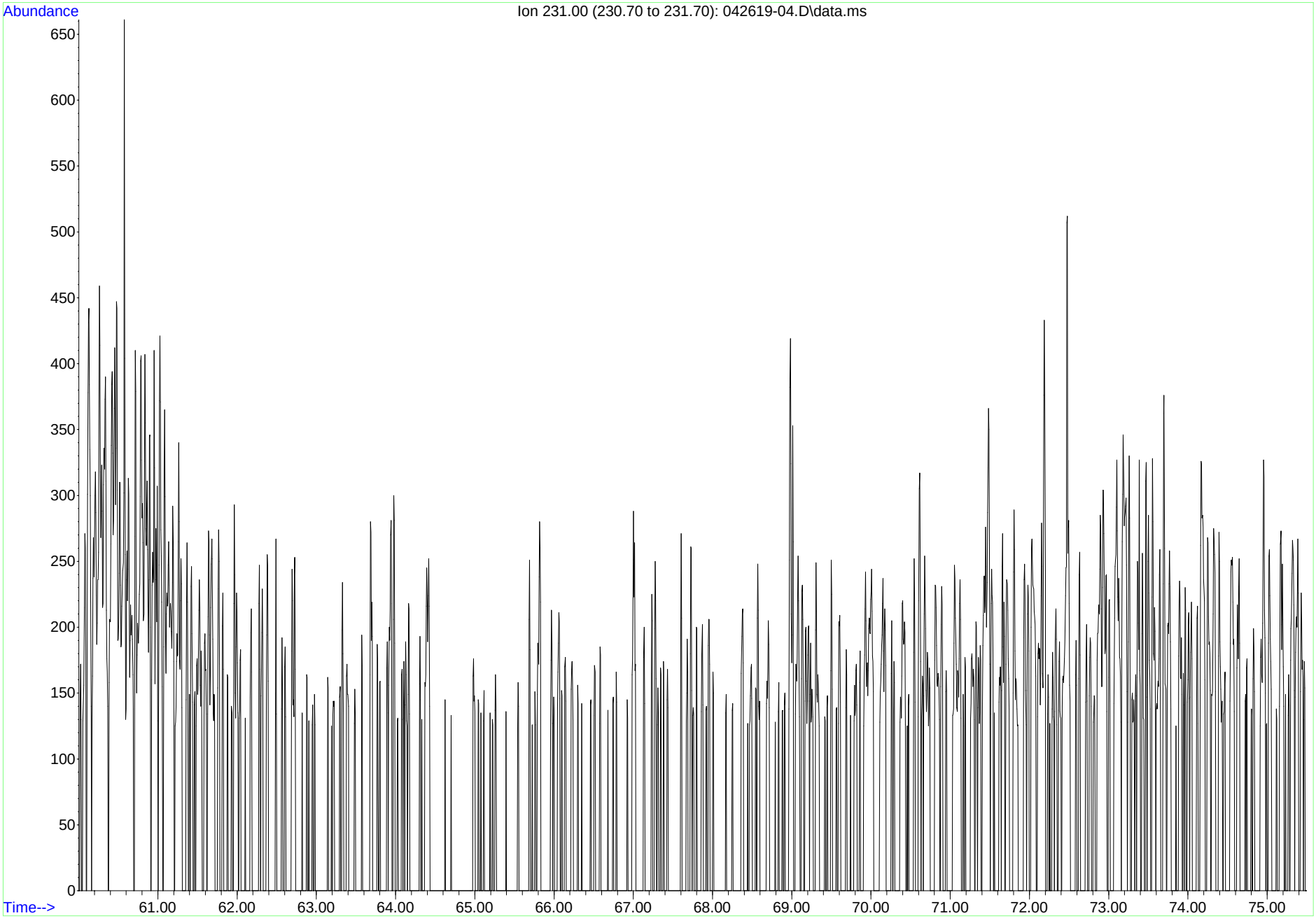
Project Manager:	Paul Grimm	Lab ID:	30044-1
Client:	Avery Laboratories	Collected:	4/12/2019
Address:	2720 Gregory St., Unit 200 Savannah, GA 31404	Received:	4/17/2019
		Matrix:	PRODUCT
Project:	Mayors Point	Client ID:	HA-05A
Project #:		Analyzed:	4/26/2019
Collected by:		Q Method:	FSRTL042619.M

Identity	Symbol	Ion (m/z)	Retention Time	Peak Height	Rel. Height % (231 m/z)
C_{20} Triaromatic Sterane	T1	231	ND	ND	ND
C_{21} Triaromatic Sterane	T2	231	ND	ND	ND
20S C_{26} Triaromatic Sterane	T3	231	ND	ND	ND
20R C_{26} + 20S C_{27} Triaromatic Steranes	T4	231	ND	ND	ND
20S C_{28} Triaromatic Sterane	T5	231	ND	ND	ND
20R C_{27} Triaromatic Sterane	T6	231	ND	ND	ND
20R C_{28} Triaromatic Sterane	T7	231	ND	ND	ND

25.05g->1.0mL
FOREN4LA_RTL.M

Submitted by,
Pace Energy Services, LLC

30044-1 [HA-05A] 1/10
25.05g->1.0mL



Key for Identifying Aromatic Hydrocarbons

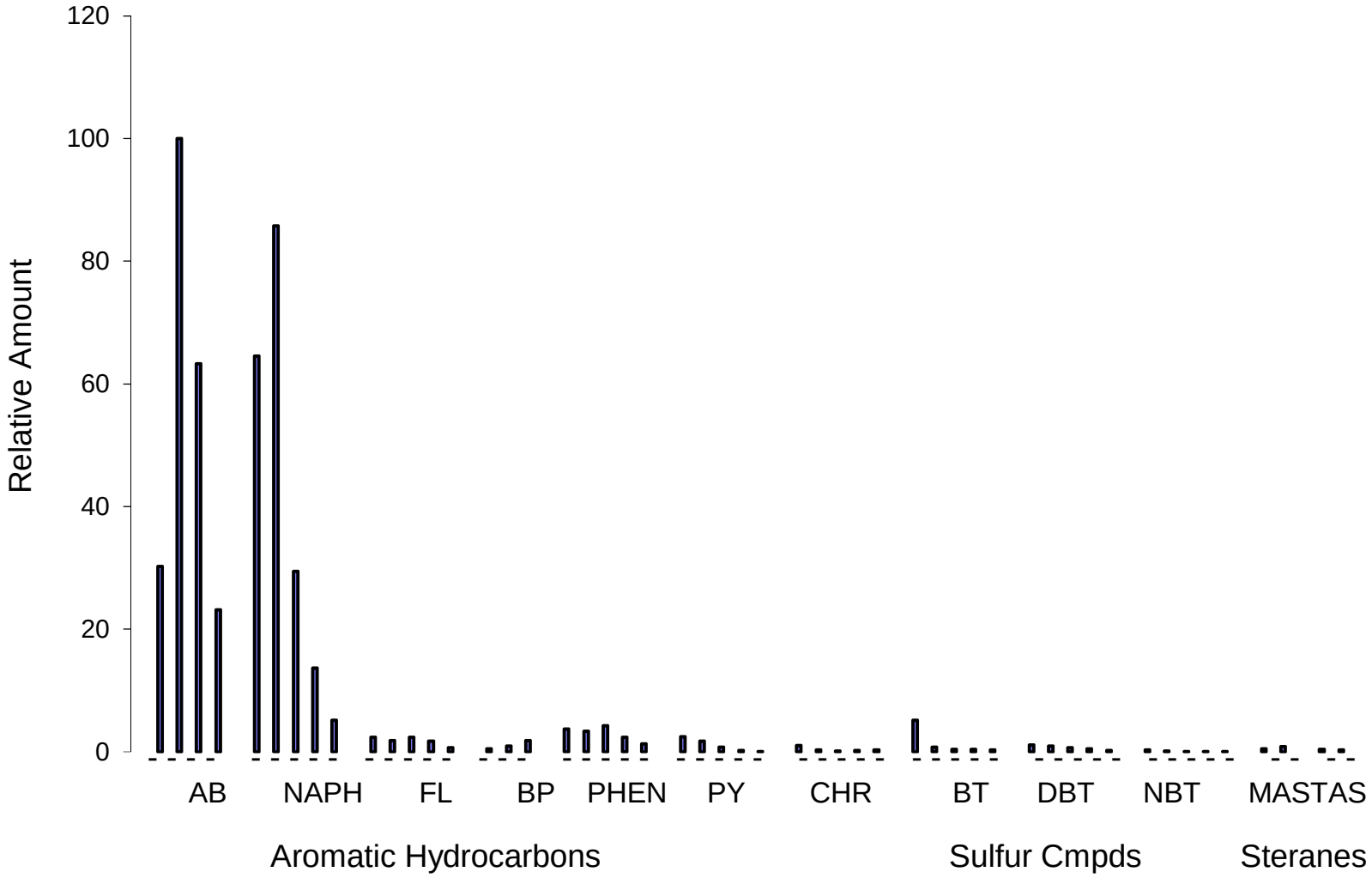
No	m/z	Abbreviation	Compound
1	120	AB	C_3-alkylbenzenes
2	134		C_4-alkylbenzenes
3	148		C_5-alkylbenzenes
4	162		C_6-alkylbenzenes
5	128	NAPH	C_0-naphthalene
6	142		C_1-naphthalenes
7	156		C_2-naphthalenes
8	170		C_3-naphthalenes
9	184		C_4-naphthalenes
10	166	FL	C_0-fluorene
11	180		C_1-fluorenes
12	194		C_2-fluorenes
13	208		C_3-fluorenes
14	222		C_4-fluorenes
15	154	BP	C_0-biphenyl
16	168		C_1-biphenyls + dibenzofuran
17	182		C_2-biphenyls + C1 Dibenzofuran
18	178	PHEN	C_0-phenanthrene
19	192		C_1-phenanthrenes
20	206		C_2-phenanthrenes
21	220		C_3-phenanthrenes
22	234		C_4-phenanthrenes
23	202	PY	C_0-pyrene/fluoranthene
24	216		C_1-pyrenes/fluoranthenes
25	230		C_2-pyrenes/fluoranthenes
26	244		C_3-pyrenes/fluoranthenes
27	258		C_4-pyrenes/fluoranthenes
28	228	CHR	C_0-chrysene
29	242		C_1-chrysenes
30	256		C_2-chrysenes
31	270		C_3-chrysenes
32	284		C_4-chrysenes
33	148	BT	C_1-benzothiophenes
34	162		C_2-benzothiophenes
35	176		C_3-benzothiophenes
36	190		C_4-benzothiophenes
37	204		C_5-benzothiophenes

Key for Identifying Aromatic Hydrocarbons – Cont.

No	m/z	Abbreviation	Compound
38	184	DBT	C_0-dibenzothiophene
39	198		C_1-dibenzothiophenes
40	212		C_2-dibenzothiophenes
41	226		C_3-dibenzothiophenes
42	240		C_4-dibenzothiophenes
43	234	NBT	C_0-naphthobenzthiophene
44	248		C_1-naphthobenzthiophenes
45	262		C_2-naphthobenzthiophenes
46	276		C_3-naphthobenzthiophenes
47	290		C_4-naphthobenzthiophenes
48	253	MAS	Monoaromatic steranes
49	267		Monoaromatic steranes
50	239		Monoaromatic steranes
51	231	TAS	Triaromatic steranes
52	245		Triaromatic steranes

Aromatic Hydrocarbon Distribution

30044-1 [HA-05A] 1/10



Serial Number: 78665

Avery Laboratories & Environmental Services, LLC

300044

Ship To: 2720 Gregory St. , Unit 200 Savannah, Ga. 31404
T 912 944-3748 F 912 234-9294
email: pgrimm@averylab.com

LAB NUMBER

Client Information	
Customer:	Terracon
Address:	2201 Rowland Ave
City/State/Zip:	Savannah, GA
Contact:	
Phone:	
Email:	SSJohnson@terracon.com
Purchase Order #:	
Project Manager:	J. Johnson

Page 1 of 1

Sampler:

Turn Around Time (Place X below)

24 Hours	
48 Hours	
72 Hours	
5 Working Days	
7 Working Days	X
Other:	

Project Name: Mayors Point

Project Number:

State where work originated: GA

Subcontract Laboratory

Name / Address/ Phone

N

A

P

Preservative

Sample Identification	Date	Time	Matrix	# of Containers	Fingerprinting	PAS	Remarks
HA-05A	4/12/19	1100	S	4	X	X	

Matrix Type: A = Air W = Water S= Solid N = Nonaqueous (solvent, acid, etc.)

Preservative: 1= None 2 = H2SO4 3 = HN03 4 = HCL 5 = MeOH 6 = NAHSO4 7 = Water 8 = Sodium Bisulfate 9 = Other

Instructions or Special Requirements:

Temperature:

Custody Seals: Yes No

Custody Seals Intact: Yes No

Relinquished by:	Date/Time:	Received by:	Date/Time:
	4/12/19 1320		4-12-19 1320
	4-15-19 12:55	Leo PAS	4.17.19 1130

F86-02

Effective Date: 09.15.15

Cooler Receipt Form

Client Name: Avery Project: Mayors Point Lab Work Order: 30044

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ Air bill Present: Yes No

Tracking Number: 4638 0195 9094

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None Ice Intact: Yes Melted

Cooler Temperature: 1.9°C Radiation Screened: Yes No Chain of Custody Present: Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags			✓	
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used			✓	
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?			✓	

Comments:_____

Cooler contents examined/received by : LJ Date: 4.17.19

Project Manager Review : [illegible] Date: 4/17/19