

# Energy Laboratories Inc

# ANALYTICAL RUN Summary

20-Sep-21

Run ID FID-HEADSPACE\_210120A

Run Start Date: 1/20/2021  
 Analyst: Jeff Whitmer  
 Ical:  
 Column ID: porapak Q  
 Comments: thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188877	MBLK	HC-METHANE-	MBLK		1/20/2021 11:50:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	mg/L		0			0	0	0.00031	0.001	0	0%	0	0	0%	
Ethene	A	mg/L		0			0	0	0.00023	0.001	0	0%	0	0	0%	
Methane	A	mg/L		0			0	0	0.000704	0.001	0	0%	0	0	0%	
Ethylene	X	mg/L		0			0	0	0.001	0.001	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188879	Cal1	HC-METHANE-	CAL1		1/20/2021 11:54:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		2.66692829		2.5	0	0	2	2	0	107%	50	150	0%	
Ethene	A	ppm		2.68217219		2.5	0	0	2	2	0	107%	50	150	0%	
Methane	A	ppm		2.9330938		2.5	0	0	2	2	0	117%	50	150	0%	
Ethylene	X	ppm		2.68217219		1000	0	0	2	2	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188881	Cal2	HC-METHANE-	CAL2		1/20/2021 12:00:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

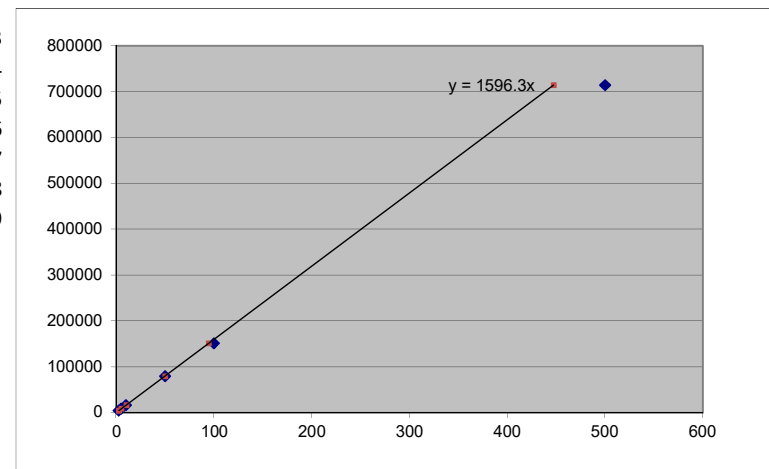
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188881	Cal2	HC-METHANE-	CAL2		1/20/2021 12:00:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		5.15876183		5	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		5.18455183		5	0	0	2	2	0	104%	85	115	0%	
Methane	A	ppm		5.47590194		5	0	0	2	2	0	110%	85	115	0%	
Ethylene	X	ppm		5.18455183		1000	0	0	2	2	0	1%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188883	Cal3	HC-METHANE-	CAL3		1/20/2021 12:04:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		10.3740375		10	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		10.2107455		10	0	0	2	2	0	102%	85	115	0%	
Methane	A	ppm		10.5521213		10	0	0	2	2	0	106%	85	115	0%	
Ethylene	X	ppm		10.2107455		1000	0	0	2	2	0	1%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188885	Cal4	HC-METHANE-	CAL4		1/20/2021 12:09:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		50.4828227		50	0	0	2	2	0	101%	85	115	0%	
Ethene	A	ppm		50.7731613		50	0	0	2	2	0	102%	85	115	0%	
Methane	A	ppm		49.9741048		50	0	0	2	2	0	100%	85	115	0%	
Ethylene	X	ppm		50.7731613		1000	0	0	2	2	0	5%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188887	Cal5	HC-METHANE-	CAL5		1/20/2021 12:14:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		96.640217		100	0	0	2	2	0	97%	85	115	0%	
Ethene	A	ppm		96.3665695		100	0	0	2	2	0	96%	85	115	0%	
Methane	A	ppm		94.8118498		100	0	0	2	2	0	95%	85	115	0%	
Ethylene	X	ppm		96.3665695		1000	0	0	2	2	0	10%	0	0	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188889	Cal6	HC-METHANE-	CAL6		1/20/2021 12:22:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		444.006974		500	0	0	2	2	0	89%	85	115	0%	
Ethene	A	ppm		445.008645		500	0	0	2	2	0	89%	85	115	0%	
Methane	A	ppm		447.326874		500	0	0	2	2	0	89%	85	115	0%	
Ethylene	X	ppm		445.008645		1000	0	0	2	2	0	45%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188891	Cal7	HC-METHANE-	CAL7		1/20/2021 12:31:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		834.11562		1000	0	0	2	2	0	83%	85	115	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188893	LCS	HC-METHANE-	CCV		1/20/2021 12:36:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		97.2572953		100	0	0	2	2	0	97%	85	115	0%	
Ethene	A	ppm		97.1407652		100	0	0	2	2	0	97%	85	115	0%	
Methane	A	ppm		96.8898234		100	0	0	2	2	0	97%	85	115	0%	
Ethylene	X	ppm		97.1407652		1000	0	0	2	2	0	10%	85	115	0%	S

Inst ID FID-HeadSpace

Curve Data for samples analyzed after 1/29/2021

Blank,cts	STD ID					
0	#12173	1000000				
Decimal	Sample	Response	Date/Time	Run Id		
Amnt, Injtd	Conc ppm	Area				
Equivalent		Counts				
300ul						
0.0000025	2.5	4682	1872.8	1/21/2021 11:54	16483	
0.000005	5	8741	1748.2	1/21/2021 12:00	16484	
0.00001	10	16844	1684.4	1/21/2021 12:04	16485	
0.00005	50	79772	1595.44	1/21/2021 12:09	16486	
0.0001	100	151345	1513.45	1/21/2021 12:14	16487	
0.0005	500	714053	1428.106	1/21/2021 12:22	16488	
0.001	1000	1331471	1331.471	1/21/2021 12:31	16489	



		StdDev	188.2268
Methane	MW= 16.04	Avg RF	1596.267
		%RSD	11.79169

Calculated Recoveries			
[PPM]	Area Cnts	PPM	% recovery
2.5	4682	2.933094	1.1732375
5	8741	5.475902	1.0951804
10	16844	10.55212	1.0552121
50	79772	49.9741	0.9994821
100	151345	94.81185	0.9481185
500	714053	447.3269	0.8946537
1000	1331471	834.1156	0.8341156

Sample	Area Count	Dilution	Temperature (°C)	Concentration ppm and mg/L	Date and Time	Analyst	Sample	Test Code	Analyte
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Methane
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Ethane
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Ethene
Cal1	4682	1	20	2.9330938	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Methane
Cal1	8164	1	20	2.66692829	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Ethane
Cal1	8384	1	20	2.68217219	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Ethene
Cal2	8741	1	20	5.47590194	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Methane
Cal2	15792	1	20	5.15876183	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Ethane
Cal2	16206	1	20	5.18455183	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Ethene
Cal3	16844	1	20	10.5521213	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Methane
Cal3	31757	1	20	10.37403746	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Ethane
Cal3	31917	1	20	10.21074545	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Ethene
Cal4	79772	1	20	49.97410476	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Methane
Cal4	154538	1	20	50.48282269	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Ethane
Cal4	158708	1	20	50.7731613	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Ethene
Cal5	151345	1	20	94.81184983	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Methane
Cal5	295835	1	20	96.64021698	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Ethane
Cal5	301225	1	20	96.3665695	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Ethene
Cal6	714053	1	20	447.3268744	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Methane
Cal6	1359194	1	20	444.0069737	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Ethane
Cal6	1391019	1	20	445.0086452	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Ethene
Cal7	1331471	1	20	834.11562	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Methane
LCS	154662	1	20	96.88982337	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Methane
LCS	297724	1	20	97.25729532	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Ethane
LCS	303645	1	20	97.1407652	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Ethene

Calibration  
Methane, Ethane,  
Ethene  
JOW  
1/20/2021

\*ID MB

\* RUN #16482      JAN 20, 2021    11:50:13  
START

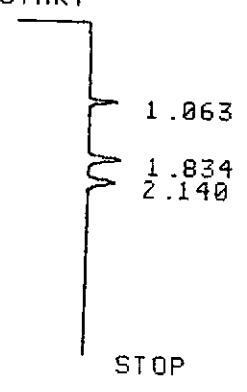


RUN# 16482      JAN 20, 2021    11:50:13

IDENTIFIER : MB  
NO RUN PERKS STORED

\*ID CAL1-2.5PPM

\* RUN #16483      JAN 20, 2021    11:54:22  
START



RUN# 16483      JAN 20, 2021    11:54:22

IDENTIFIER : CAL1-2.5PPM  
AREA%

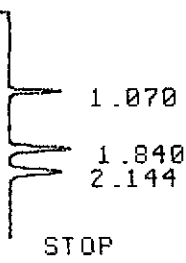
RT	AREA	TYPE	WIDTH	AREA%
1.063	4682	PP	.048	22.05370
1.834	8384	PV	.078	39.49128
2.140	8164	UP	.087	38.45502

TOTAL AREA= 21230  
MUL FACTOR=1.0000E+00

\*ID CAL2-5PPM

\* RUN #16484 JAN 20, 2021 12:00:03

START



RUN# 16484 JAN 20, 2021 12:00:03

IDENTIFIER : CAL2-5PPM

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	8741	UP	.049	21.45610
1.840	16206	PU	.076	39.78006
2.144	15792	UU	.088	38.76384

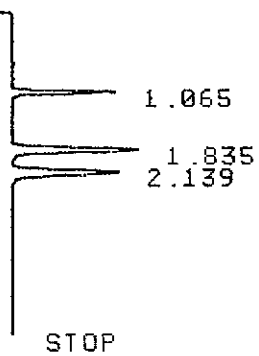
TOTAL AREA= 40739

MUL FACTOR=1.0000E+00

\*ID CAL3-10PPM

\* RUN #16485 JAN 20, 2021 12:04:08

START



RUN# 16485 JAN 20, 2021 12:04:08

IDENTIFIER : CAL3-10PPM

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	16844	PU	.047	20.91955
1.835	31917	UP	.074	39.63958
2.139	31757	PU	.087	39.44088

TOTAL AREA= 80518

MUL FACTOR=1.0000E+00

\*ID CAL4-50PPM

\* RUN #16486 JAN 20, 2021 12:09:55

START



RUN# 16486 JAN 20, 2021 12:09:55

IDENTIFIER : CAL4-50PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	79772	PB	.046	20.29729
1.840	158708	PB	.075	40.38187
2.145	154538	BB	.087	39.32085

TOTAL AREA= 393018  
MUL FACTOR=1.0000E+00

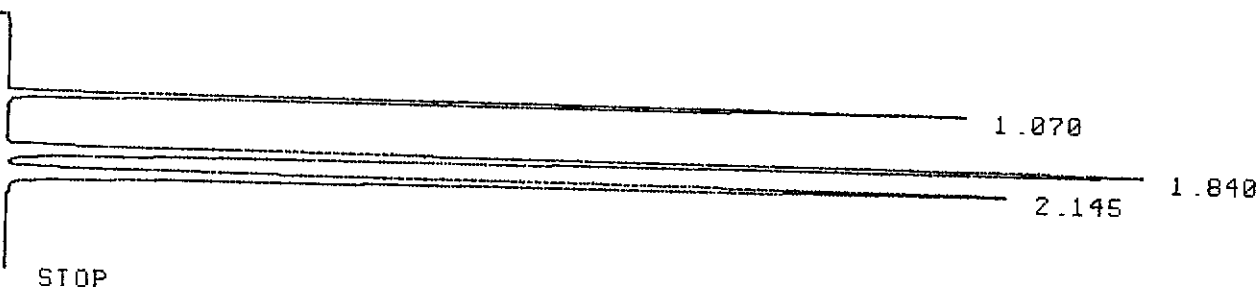
\*CAL5-100PPM

INVALID SYSTEM COMMAND

\*ID CAL5-100PPM

\* RUN #16487 JAN 20, 2021 12:14:46

START



RUN# 16487 JAN 20, 2021 12:14:46

IDENTIFIER : CAL5-100PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	151345	PB	.047	20.22234
1.840	301225	PB	.075	40.24893
2.145	295835	BB	.088	39.52874

TOTAL AREA= 748405  
MUL FACTOR=1.0000E+00



\*ID CAL6-500PPM

\* RUN #16488      JAN 20, 2021    12:22:48  
START



RUN# 16488      JAN 20, 2021    12:22:48

IDENTIFIER : CAL6-500PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	714053	PB	.047	20.61195
1.838	1391019	PB	.077	40.15334
2.141	1359194	BB	.090	39.23469

TOTAL AREA=3464266  
MUL FACTOR=1.0000E+00

\*ID CAL7-1000PPM

\* RUN #16489      JAN 20, 2021    12:31:25  
START



RUN# 16489      JAN 20, 2021    12:31:25

IDENTIFIER : CAL7-1000PPM  
AREA%

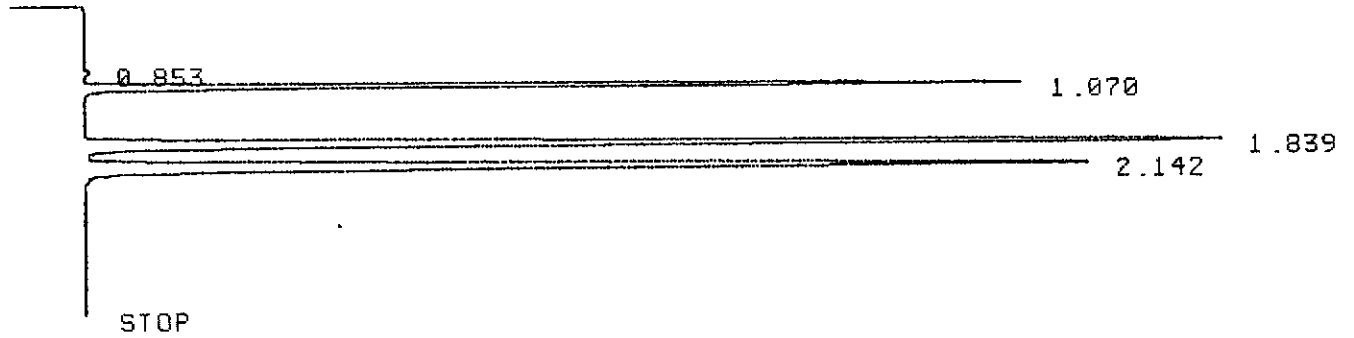
RT	AREA	TYPE	WIDTH	AREA%
1.070	1331471	PB	.049	21.86052

2.139 2333118 UB .095 37.95542  
2.999 795 PP .068 .01293

TOTAL AREA=6146995  
MUL FACTOR=1.0000E+00

\*ID 10711-LCS

\* RUN #16490 JAN 20, 2021 12:36:18  
START



RUN# 16490 JAN 20, 2021 12:36:18

IDENTIFIER : 10711-LCS  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.853	1141	PU	.054	.15069
1.070	154662	BB	.049	20.42627
1.839	303645	BU	.075	40.10251
2.142	297724	UU	.088	39.32053

TOTAL AREA= 757172  
MUL FACTOR=1.0000E+00

\*

# Energy Laboratories Inc

# ANALYTICAL RUN Summary

05-Jan-22

Run ID FID-HEADSPACE\_211228A

**Run Start Date:** 12/28/2021  
**Analyst:** Jeff Whitmer  
**Ical:**  
**Column ID:** porapak Q  
**Comments:** See Preservation Comment column for sample pH; thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951873	CCV	HC-METHANE-	CCV		12/28/2021 9:04:	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		96.8772941		100	0	0	2	2	0	97%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951874	LCS	HC-METHANE-	LCS		12/28/2021 9:09:	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		95.7872507		100	0	0	2	2	0	96%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951875	LCSD	HC-METHANE-	LCSD		12/28/2021 10:4	1	R372437		0	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		95.1676801		100	0	95.787251	2	2	0	95%	85	115	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951876	MBLK	HC-METHANE-	MBLK		12/28/2021 10:4	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.001	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951877	B21121957-001	HC-METHANE-	SAMP		12/28/2021 10:5	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951878	B21121957-005	HC-METHANE-	SAMP		12/28/2021 10:5	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951879	B21121959-001I	HC-METHANE-	SAMP		12/28/2021 11:1	77	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		2.85135805			0	0	0.054208	0.154	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951880	B21121959-001I	HC-METHANE-	DUP		12/28/2021 11:2	77	R372437		0	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		2.84094506			0	2.8513580	0.054208	0.154	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951881	B21121959-005	HC-METHANE-	SAMP		12/28/2021 11:4	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951882	B21121961-001I	HC-METHANE-	SAMP		12/28/2021 12:0	78	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.49438783			0	0	0.054912	0.156	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951883	B21121961-005	HC-METHANE-	SAMP		12/28/2021 12:1	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951884	B21121965-001I	HC-METHANE-	SAMP		12/28/2021 12:2	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951885	B21121965-006	HC-METHANE-	SAMP		12/28/2021 12:3	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951886	B21121981-001I	HC-METHANE-	SAMP		12/28/2021 12:3	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951887	B21121981-001I	HC-METHANE-	DUP		12/28/2021 12:4	1	R372437		0	1E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951888	B21121981-003I	HC-METHANE-	SAMP		12/28/2021 12:4	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00163668			0	0	0.000704	0.002	0	0%	0	0	0%	J
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951889	B21121981-004I	HC-METHANE-	SAMP		12/28/2021 12:5	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00185194			0	0	0.000704	0.002	0	0%	0	0	0%	J
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951890	B21121981-006	HC-METHANE-	SAMP		12/28/2021 1:07:	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951891	B21121981-010	HC-METHANE-	SAMP		12/28/2021 1:12:	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14951892	CCV	HC-METHANE-	CCV		12/28/2021 1:20:	1	R372437		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		96.9111231		100	0	0	2	2	0	97%	85	115	0%	

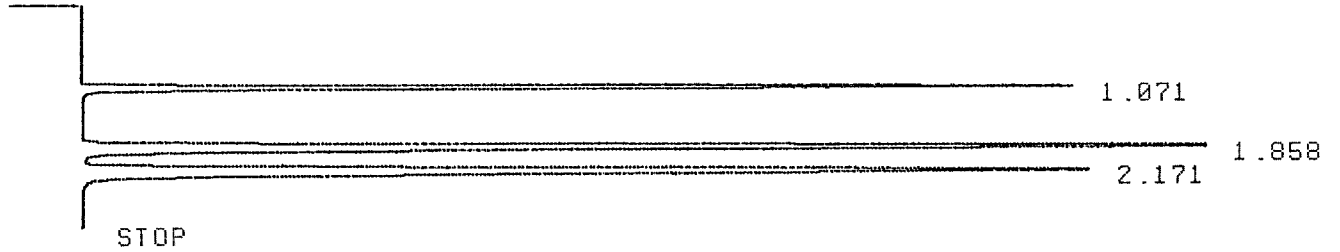
Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	154642	1	19.5	96.87729414	12/28/2021 9:04	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	152902	1	19.5	95.78725073	12/28/2021 9:09	jdw	LCS	HC-METHANE-CCV	Methane		
LCS	151913	1	19.5	95.16768009	12/28/2021 10:40	jdw	LCS	HC-METHANE-CCV	Methane		
MBLK	936	1	19.5	0.000136694	12/28/2021 10:48	jdw	MBLK	HC-METHANE-W	Methane	10	32
B21121957-001F	1029	1	19.5	1.35818E-05	12/28/2021 10:52	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121957-005A	1102	1	19.5	2.42427E-05	12/28/2021 10:58	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121959-001I	254500	77	19.5	2.851358046	12/28/2021 11:18	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121959-001IDUP	253574	77	19.5	2.840945063	12/28/2021 11:28	jdw	DUP	HC-METHANE-W	Methane	10	32
B21121959-005A	1143	1	19.5	3.02304E-05	12/28/2021 11:41	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121961-001I	44337	78	19.5	0.494387834	12/28/2021 12:09	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121961-005A	1260	1	19.5	4.73171E-05	12/28/2021 12:19	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121965-001I	3643	1	19.5	0.000395332	12/28/2021 12:25	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121965-006A	1374	1	19.5	6.39658E-05	12/28/2021 12:31	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121981-001I	732	1	19.5	-2.97923E-05	12/28/2021 12:36	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121981-001IDUP	551	1	19.5	-5.62256E-05	12/28/2021 12:42	jdw	DUP	HC-METHANE-W	Methane	10	32
B21121981-003I	12143	1	19.5	0.001636676	12/28/2021 12:49	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121981-004I	13617	1	19.5	0.00185194	12/28/2021 12:57	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121981-006A	1108	1	19.5	2.5119E-05	12/28/2021 13:07	jdw	SAMP	HC-METHANE-W	Methane	10	32
B21121981-010A	965	1	19.5	4.23518E-06	12/28/2021 13:12	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	154696	1	19.5	96.91112307	12/28/2021 13:20	jdw	CCV	HC-METHANE-CCV	Methane		

JDW  
12/28/2021

\*ID 12173-500X-CCU

\* RUN #18778      DEC 28, 2021    09:04:17

START



RUN# 18778              DEC 28, 2021    09:04:17

IDENTIFIER : 12173-500X-C

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	154642	PB	.046	20.11481
1.858	309927	UU	.075	40.31325
2.171	304228	UB	.088	39.57197

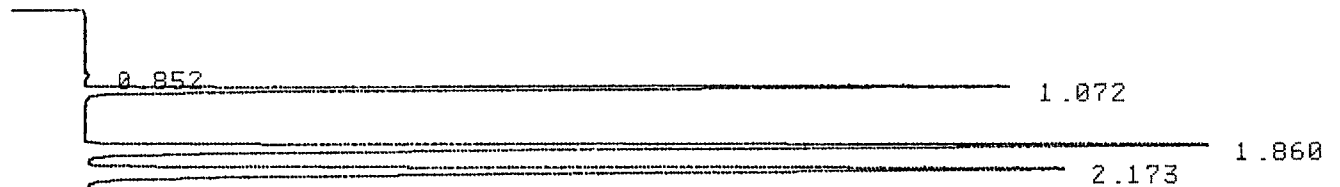
TOTAL AREA= 768797

MUL FACTOR=1.0000E+00

\*ID 10711-LCS

\* RUN #18779      DEC 28, 2021    09:09:05

START





STOP

RUN# 18779                    DEC 28, 2021   09:09:05

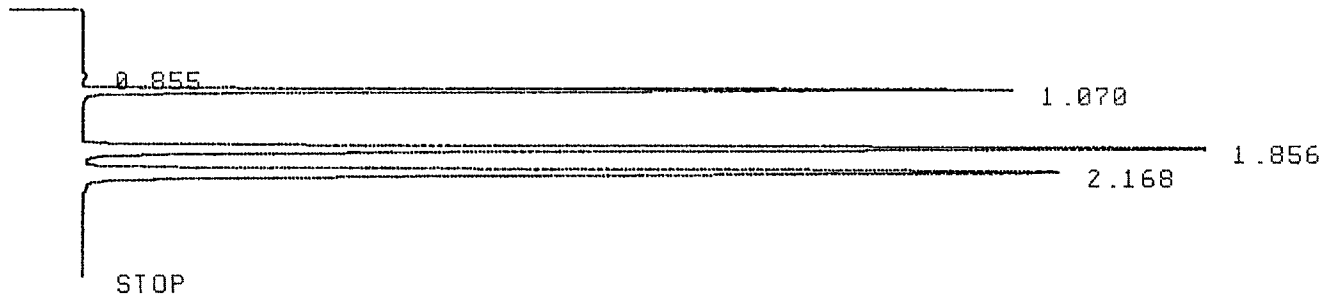
IDENTIFIER : 10711-LCS  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.852	944	BP	.056	.12501
1.072	152902	PB	.048	20.24892
1.860	303704	PB	.076	40.21973
2.173	297562	BB	.089	39.40634

TOTAL AREA= 755112  
MUL FACTOR=1.0000E+00

\*ID LCSD

\* RUN #18780                    DEC 28, 2021   10:40:15  
START



RUN# 18780                    DEC 28, 2021   10:40:15

IDENTIFIER : LCSD  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.855	1032	PP	.061	.13764
1.070	151913	PB	.048	20.26161
1.856	301582	PV	.076	40.22390
2.168	295231	UB	.089	39.37683

TOTAL AREA= 749758  
MUL FACTOR=1.0000E+00

\*

\*ID MB

\* RUN #18781        DEC 28, 2021 10:48:09  
START

┌───┐  
│    │  
│    │ } 1.068  
│    │  
└───┘ : 21070

RUN# 18781            DEC 28, 2021 10:48:09

IDENTIFIER : MB  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	936	UP	.064	100.00000

TOTAL AREA= 936  
MUL FACTOR=1.0000E+00

\*ID 1957-1F

\* RUN #18782        DEC 28, 2021 10:52:41  
START

┌───┐  
│    │  
│    │ } 1.073  
│    │  
└───┘ : 21041

RUN# 18782            DEC 28, 2021 10:52:41

IDENTIFIER : 1957-1F  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.073	1029	PP	.047	74.34970
2.441	355	PU	.040	25.65030

TOTAL AREA= 1384  
MUL FACTOR=1.0000E+00

\*



\* PLOT

STOP

\* PLOT

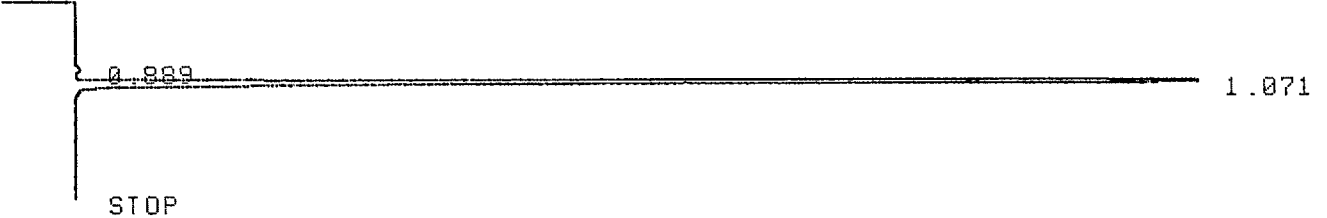
STOP

*77 304 12/28/2021*

\*ID 1959-1I-~~28X~~

\* RUN #18785      DEC 28, 2021    11:18:37

START



RUN# 18785      DEC 28, 2021    11:18:37

IDENTIFIER : 1959-1I-~~28X~~

*77 304 12/28/2021*

AREA%

RT	AREA	TYPE	WIDTH	AREA%
.889	1249	PP	.067	.48837
1.071	254500	PB	.048	99.51162

TOTAL AREA= 255749

MUL FACTOR=1.0000E+00

\* PLOT

STOP

\* PLOT

STOP

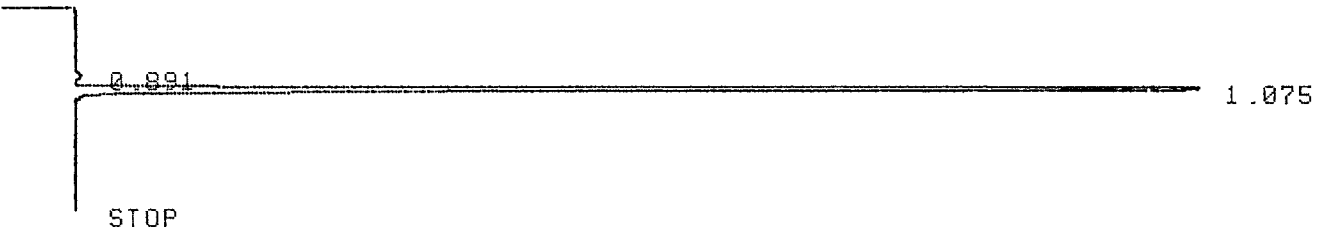
\* PLOT

STOP

\*ID 1959-11-28XDUP *77 30W 12/28/2021*

\* RUN #18786 DEC 28, 2021 11:28:54

START



RUN# 18786 DEC 28, 2021 11:28:54

IDENTIFIER : 1959-11-28XD *77 30W 12/28/2021*

RT	AREA	TYPE	WIDTH	AREA%
.891	1810	PP	.076	.70874
1.075	253574	PB	.048	99.29126

TOTAL AREA= 255384  
MUL FACTOR=1.0000E+00

\* PLOT

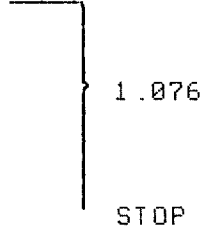
STOP

\* PLOT

STOP

\*ID 1959-5A

\* RUN #18787            DEC 28, 2021  11:41:40  
START



RUN# 18787                    DEC 28, 2021  11:41:40

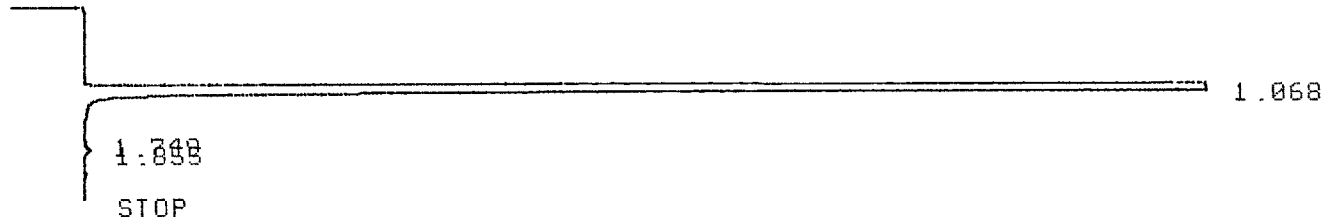
IDENTIFIER : 1959-5A  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.076	1143	PP	.060	100.00000

TOTAL AREA= 1143  
MUL FACTOR=1.0000E+00

\*ID 1961-1I

\* RUN #18788            DEC 28, 2021  11:47:53  
START



RUN# 18788                    DEC 28, 2021  11:47:53

IDENTIFIER : 1961-1I  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	2761734	PB	.053	99.88790
1.749	563	PU	.046	.02036
1.855	2536	UU	.098	.09172

TOTAL AREA=2764834  
MUL FACTOR=1.0000E+00

\* PLOT



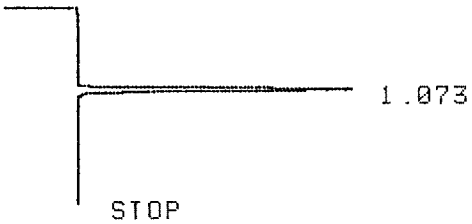
\* PLOT



\*ID 1961-1I-78X

\* RUN #18789      DEC 28, 2021    12:09:23

START



RUN# 18789              DEC 28, 2021    12:09:23

IDENTIFIER : 1961-1I-78X

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.073	44337	PB	.047	100.00000

TOTAL AREA= 44337

MUL FACTOR=1.0000E+00

\* PLOT



STOP

\* PLOT

STOP

\*ID 1961-5A

\* RUN #18790            DEC 28, 2021  12:19:47

START

1.066

1.702

STOP

RUN# 18790            DEC 28, 2021  12:19:47

IDENTIFIER : 1961-5A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.066	1260	BP	.055	69.88352
1.702	543	PV	.036	30.11647

TOTAL AREA= 1803

MUL FACTOR=1.0000E+00

\*ID 1965-1I

\* RUN #18791            DEC 28, 2021  12:25:39

START

1.070

STOP

RUN# 18791            DEC 28, 2021  12:25:39

IDENTIFIER : 1965-1I

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	3643	UP	.047	100.00000



\*ID 1965-6A

\* RUN #18792            DEC 28, 2021  12:31:32

START

```
┌───┐
│   │
│   │ 1.071
│   │ 1.765
│   │
└───┘
STOP
```

RUN# 18792            DEC 28, 2021  12:31:32

IDENTIFIER : 1965-6A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	1374	UU	.069	100.00000

TOTAL AREA= 1374  
MUL FACTOR=1.0000E+00

\*ID 1981-1I

\* RUN #18793            DEC 28, 2021  12:36:47

START

```
┌───┐
│   │
│   │ 1.083
│   │
└───┘
STOP
```

RUN# 18793            DEC 28, 2021  12:36:47

IDENTIFIER : 1981-1I

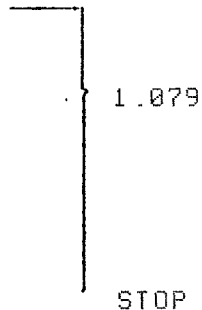
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.083	732	UP	.052	100.00000

TOTAL AREA= 732  
MUL FACTOR=1.0000E+00

\*ID 1981-1I-DUP

\* RUN #18794      DEC 28, 2021 12:42:28  
START



RUN# 18794              DEC 28, 2021 12:42:28

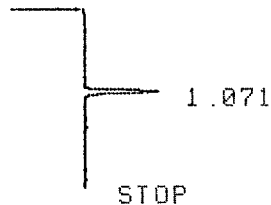
IDENTIFIER : 1981-1I-DUP  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.079	551	UP	.052	100.00000

TOTAL AREA= 551  
MUL FACTOR=1.0000E+00

\*ID 1981-3I

\* RUN #18795      DEC 28, 2021 12:49:05  
START



RUN# 18795              DEC 28, 2021 12:49:05

IDENTIFIER : 1981-3I  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	12143	PU	.048	100.00000

TOTAL AREA= 12143  
MUL FACTOR=1.0000E+00

\* PLOT



STOP

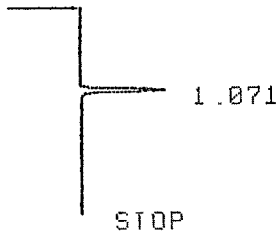
\* PLOT

STOP

\*ID 1981-4A

\* RUN #18796      DEC 28, 2021 12:57:17

START



RUN# 18796      DEC 28, 2021 12:57:17

IDENTIFIER : 1981-4A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	13617	UU	.047	100.00000

TOTAL AREA= 13617

MUL FACTOR=1.0000E+00

\* PLOT

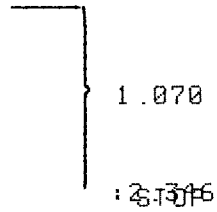
STOP

\* PLOT

STOP

\* RUN #18797            DEC 28, 2021  13:07:24

START



RUN# 18797                    DEC 28, 2021  13:07:24

IDENTIFIER : 1981-6A

AREA%

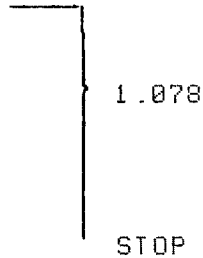
RT	AREA	TYPE	WIDTH	AREA%
1.070	1108	PU	.053	100.00000

TOTAL AREA= 1108  
MUL FACTOR=1.0000E+00

\*ID 1981-10A

\* RUN #18798            DEC 28, 2021  13:12:39

START



RUN# 18798                    DEC 28, 2021  13:12:39

IDENTIFIER : 1981-10A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.078	965	PU	.063	100.00000

TOTAL AREA= 965  
MUL FACTOR=1.0000E+00

\*ID 12173-500X-CCU

\* RUN #18799            DEC 28, 2021  13:20:15

START



	1.068	
		1.849
	2.158	

STOP

RUN# 18799                    DEC 28, 2021 13:20:15

IDENTIFIER : 12173-500X-C  
 AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	154696	BB	.046	20.14426
1.849	309030	PB	.075	40.24138
2.158	304215	BB	.088	39.61438

TOTAL AREA= 767941  
 MUL FACTOR=1.0000E+00

\*

# Energy Laboratories Inc

# Spike LOG

Standard ID: 12173  
 Standard Name: HC-Methane-W-CCV  
 Date Prepared: 11/22/2019  
 Date Expires: 11/23/2023  
 Department: GAS  
 Vendor: Matheson  
 Lot Number: 109-96-04454  
 Balance ID:

Type: Primary  
 BY:  
 Status: New

Comments: CCV Gas Standard for Methane, Ethene, Ethane: 50000ppm stock diluted from 100 - 500ppm with Helium for CCV. Diluted from 2.5ppm - 1000ppm with Helium for Calibration.

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	12173		mL	11/23

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

MATHESON TRI-GAS INC  
1650 Enterprise Pkwy  
Twinsburg, OH 44087  
1-215-648-4000

## CERTIFICATE OF ANALYSIS

Energy Laboratories Inc  
1120 South 27th Street  
Billings, MT 59101

Ref Po# 3008099

### 14 LITER DISPOSABLE

LOT NUMBER: 109-96-04454

COMPONENT

CONCENTRATION

methane	50010	ppm
ethane	50030	ppm
ethylene	50030	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2685284TC

CGA: 160

PSIG: 240

FILL DATE: 11/22/19

EXPIRATION DATE: 11/23/23

ID #: 12173

Opened: \_\_\_\_\_

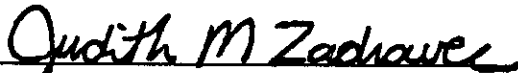
3 Multi-Component Gas Standard in Nitrogen

Expires: 11/23/2023

Rec'd: 12/3/2019

Energy Laboratories Inc 1120 So. 27th Street  
Billings MT 59107

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is  $\pm 2\%$ . NIST traceable by weights or gaseous standards.



Judy Zadravec, Chemist

10/19/2018

DATE

# Energy Laboratories Inc

# Spike LOG

Standard ID: 10711  
 Standard Name: HC-Methane-W-CCV  
 Date Prepared: 8/8/2018  
 Date Expires: 8/9/2022  
 Department: GAS  
 Vendor: Matheson  
 Lot Number: 109-86-03507  
 Balance ID:

Type: Primary  
 BY:  
 Status: New

Comments: LCS Gas Standard for Methane, Ethene, Ethane: 100ppm per standard used undiluted for LCS

---

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	10711		mL	8/9/2022

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL



MATHESON TRI-GAS INC  
1650 Enterprise Pkwy  
Twinsburg, OH 44087  
1-215-648-4000

## CERTIFICATE OF ANALYSIS

Energy Laboratories Inc  
1120 South 27th Street  
Billings, MT 59101

Ref Po# 3005062

### 14 LITER DISPOSABLE

LOT NUMBER: 109-86-03507

**COMPONENT**

**CONCENTRATION**

methane	100.0	ppm
ethane	100.0	ppm
ethylene	100.0	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2677328TC

CGA: 160

PSIG: 240

FILL DATE: 08/08/18

EXPIRATION DATE: 08/09/22

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is  $\pm 2\%$ . NIST traceable by weights or gaseous standards.

*Judith M Zadravec*

Judy Zadravec, Chemist

8/14/2018

DATE

ID #: 10711  
Opened: \_\_\_\_\_  
3 Multi-Component Gas Standard in Nitrogen  
Expires: 8/9/2022  
Rec'd: 8/27/2018  
Energy Laboratories Inc 1120 So. 27th Street  
Billings MT 59107