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**erthwrks**

AIR EMISSIONS TESTING FOR INDUSTRY

*Relative Accuracy Test Audit*

*for*

**Marathon Petroleum Company LP**

*at the*

**Marathon Detroit Refinery in Detroit, MI**

*on the*

**West Plant H<sub>2</sub>S Fuel Gas**

*subject to*

**40CFR60, Appendix F**

**Permit No. MI-ROP-A9831-2012c**

*prepared for*



**Marathon  
Petroleum Company LP**

**Test Date: June 2, 2022**

**Erthwrks Project No. 9049.1.B3**

A9831-test-20220602



## Endorsement Page

This report was developed in accordance with the requirements designated in the applicable regulatory permit(s) and or regulatory rules. To the best of my knowledge the techniques, instrumentation, and calculations presented in this report will serve to accurately and efficiently detail the results of the test campaign requirements.

### Erthwrks, Inc.

Name: Jason Dunn

Title: QC Specialist

Signature: 

This report has been reviewed for accuracy and completeness. The actions presented in this report are, to the best of my knowledge, an accurate representation of the results and findings of the test campaign. Erthwrks, Inc. operates in conformance with the requirements on ASTM D7036-04 Standard Practice for Competence of Air Emission Testing Bodies and is accredited as such by the Stack Testing Accreditation Council (STAC) and the American Association for Laboratory Accreditation (A2LA).

### Erthwrks, Inc.

Name: Luke Morrison

Title: Project Manager

Signature: 



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- A. Detailed Results of Emissions Test
- B. Sampling and Analysis Worksheets
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## 1.0 INTRODUCTION

### 1.1 Identification, location and dates of tests

Erthwrks, Inc. was contracted to conduct a relative accuracy test audit (RATA) on the continuous emissions monitoring system (CEMS) associated with the West Plant Fuel Gas system. The CEMS measures hydrogen sulfide (H<sub>2</sub>S) concentration of the fuel gas. The CEMS is in operation at the Marathon Detroit Refinery, located in Detroit, MI. The RATA test was conducted on June 2, 2022.

### 1.2 Purpose of Testing

This CEMS RATA program was conducted to demonstrate the accuracy and reliability of the CEMS used to demonstrate the continuous emission compliance of each unit. All testing and audit procedures were conducted in accordance with the requirements set forth in the USEPA Title 40, Code of Federal Regulations (CFR), Part 60, Appendix B and F, which defines the CEMS performance specifications and testing procedures.

The following methods were utilized during this test program:

-EPA Method 15 for H<sub>2</sub>S concentration

### 1.3 Contact Information

#### **Marathon Petroleum Company LP**

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Michigan Refining Division  
330-479-5662 office  
419-306-5162 cell  
akoerner@marathonpetroleum.com

#### **Erthwrks, Inc.**

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#### **Erthwrks, Inc.**

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Quality Specialist  
P.O. Box 150549  
Austin, TX 78745  
614-565-9177 office  
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jdunn@erthwrks.com

#### **Facility Location:**

1300 South Fort Street  
Detroit, MI 48217

## 2.0 SUMMARY OF RESULTS

**Table 2.1: West Plant Fuel Gas H<sub>2</sub>S Analyzer RATA Results**

Pollutant Measured	Performance Specification	Relative Accuracy	Applicable Limit	Pass/Fail
H <sub>2</sub> S (ppmv)	Performance Spec. 7	1.0% <i>RA<sub>AS</sub></i>	<10%	<i>Pass</i>

## 3.0 SOURCE DESCRIPTION

**Table 3.1: West Plant Fuel Gas H<sub>2</sub>S Analyzer Description**

Pollutant Measured	Analyzer Manufacturer	Analyzer Model	Detection Principle	Serial Number
H <sub>2</sub> S	ABB	PGC2000	GC FPD	US4080110400003009

### 3.1 Applicable permit and source designation

The Marathon Detroit Refinery operates the West Plant Fuel Gas H<sub>2</sub>S analyzer under the 40CFR Part 60, Appendix F. Under these regulations, the refinery is required to conduct an annual RATA to demonstrate the relative accuracy of the CEMS associated with this unit.

### 3.2 Type and quantity of materials processed during tests

During the emission testing on June 2, 2022, at the Marathon Detroit Refinery, the West Plant H<sub>2</sub>S Fuel Gas was tested while operating at normal operations.

## 4.0 SAMPLING AND ANALYTICAL PROCEDURES

### 4.1 Description of sampling and field procedures

Erthwrks completed this CEMS audit project utilizing all applicable test methods specified in 40 CFR Part 60, Appendix A and B. Specifically, this emission testing program entailed the execution of the 40 CFR Part 60, Appendix B, Performance Specifications 7. These documents define the specifications and test procedures for H<sub>2</sub>S CEMS. The RATA required by these regulations was conducted utilizing a mobile emission testing laboratory.

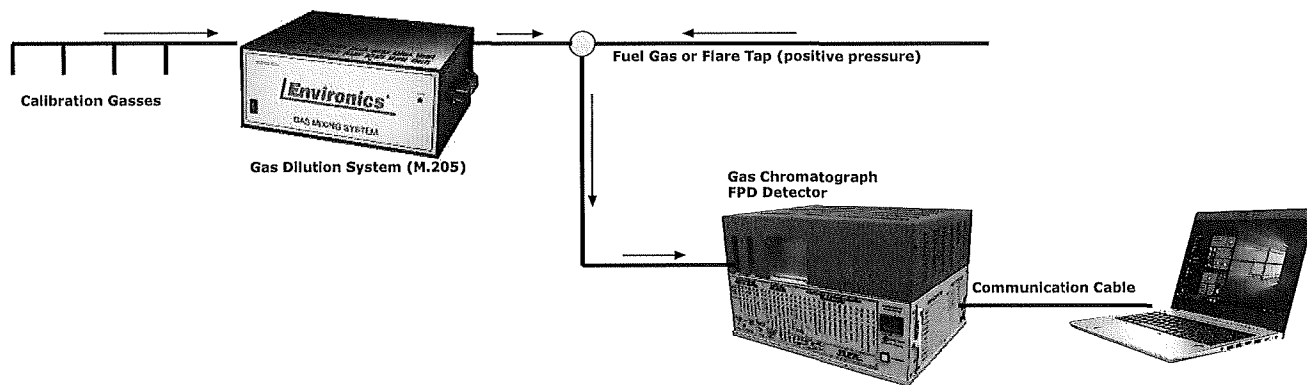
The RATA test is a direct comparison of the CEMS monitoring data with that data collected from an independently operated EPA reference method tests for each pollutant, following

all the quality assurance and quality control procedures as required in the method. The analysis of the sample stream was conducted following all procedures as specified in USEPA Method 15. For this, Erthwrks utilized an SRI Model 8610 Gas Chromatograph (GC) equipped with an FPD detector. This instrumentation is able to separate and analyze separately each individual component. Three calibration gas concentrations, using a calibration gas dilution system, were sent to the GC and analyzed in triplicate. These triplicate values were recorded and averaged. A graphical plot of concentration versus the calibration area values was created and used to calculate the concentration of the sample. All data from this analysis and all raw gas chromatograph shots are found in Attachment B. Post-test analysis of the mid-calibration standard was performed and found to be within 5% of the original curve, therefore no additional quality assurance measurements were necessary.

The calibration gases were generated using a gas dilution system following all QAQC procedures of EPA Method 205. These activities are documented in Attachment B.

As required by the RATA test procedures, a minimum of nine (9) EPA reference method tests were conducted for each pollutant monitored by the CEMS system. Each of these test runs were conducted for minimum duration of thirty (30) minutes. The results of these reference method tests were compared to CEMS measurement data from the facility data acquisition and handling system DAHS system from the same time periods to determine the relative accuracy of the CEMS. The results of the RATA test are considered acceptable if the calculated relative accuracy when compared directly to the reference method does not exceed 20.0%. Alternatively, for affected units where the average of the reference method measurements is less than 50% of the emission standard, as in this case, the relative accuracy should not exceed 10% with respect to the applicable standard.

The figure below summarizes the Erthwrks GC Sampling System:



#### 4.2 Discussion of sampling procedure or operational variances

Erthwrks, Inc. conducted the emission testing with no sampling or procedural variances.

**Attachment A**  
**Detailed Results of Emission Test**

## Erthwrks Relative Accuracy Test Audit--H<sub>2</sub>S RATA Performance Specification 7

West Plant Fuel Gas	H <sub>2</sub> S RATA--Performance Specification 7
---------------------	--

Test Run	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9
Date	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022
Start Time	13:10	13:40	14:10	14:40	15:10	15:40	16:10	16:40	17:10
End Time	13:39	14:09	14:39	15:09	15:39	16:09	16:39	17:09	17:39
RM H <sub>2</sub> S (ppmvw)	<b>2.93</b>	<b>2.82</b>	<b>3.10</b>	<b>3.09</b>	<b>3.22</b>	<b>3.17</b>	<b>3.12</b>	<b>3.28</b>	<b>3.19</b>
CEMS H <sub>2</sub> S (ppmvw)	<b>4.45</b>	<b>4.31</b>	<b>4.46</b>	<b>4.68</b>	<b>4.56</b>	<b>4.72</b>	<b>4.71</b>	<b>4.93</b>	<b>4.95</b>
Abs. Diff.	-1.52	-1.49	-1.36	-1.59	-1.34	-1.55	-1.59	-1.65	-1.76
<i>Accept or Reject</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>

Applicable Standard (ppmv)  
 Mean of the Difference (d<sub>avg</sub>)  
 Standard Deviation (S<sub>d</sub>)  
 Confidence Coefficient (CC)  
**Relative Accuracy via AS, RA<sub>AS</sub>**

160
-1.54
0.13
0.10
<b>1.03%</b>

← Pass

†RA<sub>AS</sub> (Applicable Standard) must be less than 10%



**Attachment B**  
**Sampling and Analysis Worksheets**

## Erthwrks GC Calibration and Analysis Data

### Initial Calibration

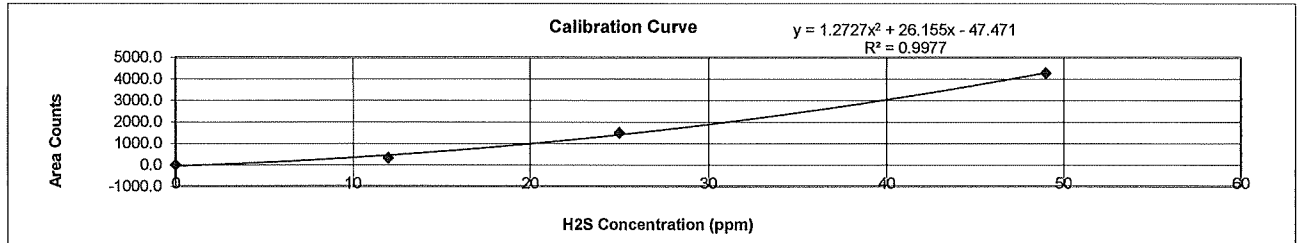
H2S Concentration	0				
GC Results	0.4013	0.8268	0.3514	0.6058	0.3734
Average Response	0.51				
Standard Deviation	0.20				
MDL (3 times standard deviation)	0.61				

H2S Concentration	12		
GC Results	333.3	322.2	326.8
% Diff	-1.80%	1.59%	0.20%
Average Response	327.46		

H2S Concentration	25		
GC Results	1487.6	1490.8	1498.5
% Diff	0.32%	0.10%	-0.41%
Average Response	1492.28		

H2S Concentration	49		
GC Results	4274.2	4263.9	4283.0
% Diff	-0.01%	0.23%	-0.22%
Average Response	4273.69		

Sample Line Loss	24.95		
GC Results	1558.9	1559.3	1576.4
% Diff	0.38%	0.36%	-0.74%
Average Response	1564.87		
<20% of Direct	-4.86%		



#### Data from Calibration Curve

a:	1.2727	0.61 MDL
b:	26.1550	
R <sup>2</sup> :	0.9977	
c:	-47.471	

### Test Runs

	<b>START</b>	<b>END</b>	
Run 1 Time	13:10	13:39	
Run 1 GC Response	39.4	44.0	36.9
Average Response	40.1		
Run Result	2.9 ppm		2.9 ppm

	<b>START</b>	<b>END</b>	
Run 2 Time	13:40	14:09	
Run 2 GC Response	36.8	34.2	38.7
Average Response	36.6		
Run Result	2.8 ppm		2.8 ppm

	<b>START</b>	<b>END</b>	
Run 3 Time	14:10	14:39	
Run 3 GC Response	46.4	43.6	47.7
Average Response	45.9		
Run Result	3.1 ppm		3.1 ppm

## Erthwrks GC Calibration and Analysis Data

	<i>START</i>	<i>END</i>	
Run 4 Time	14:40	15:09	
Run 4 GC Response	46.0	44.8	45.5
Average Response	45.4		
<b>Run Result</b>	<b>3.1 ppm</b>		<b>3.1 ppm</b>

	<i>START</i>	<i>END</i>	
Run 5 Time	15:10	15:39	
Run 5 GC Response	46.4	49.0	54.4
Average Response	50.0		
<b>Run Result</b>	<b>3.2 ppm</b>		<b>3.2 ppm</b>

	<i>START</i>	<i>END</i>	
Run 6 Time	15:40	16:09	
Run 6 GC Response	51.9	48.4	44.7
Average Response	48.3		
<b>Run Result</b>	<b>3.2 ppm</b>		<b>3.2 ppm</b>

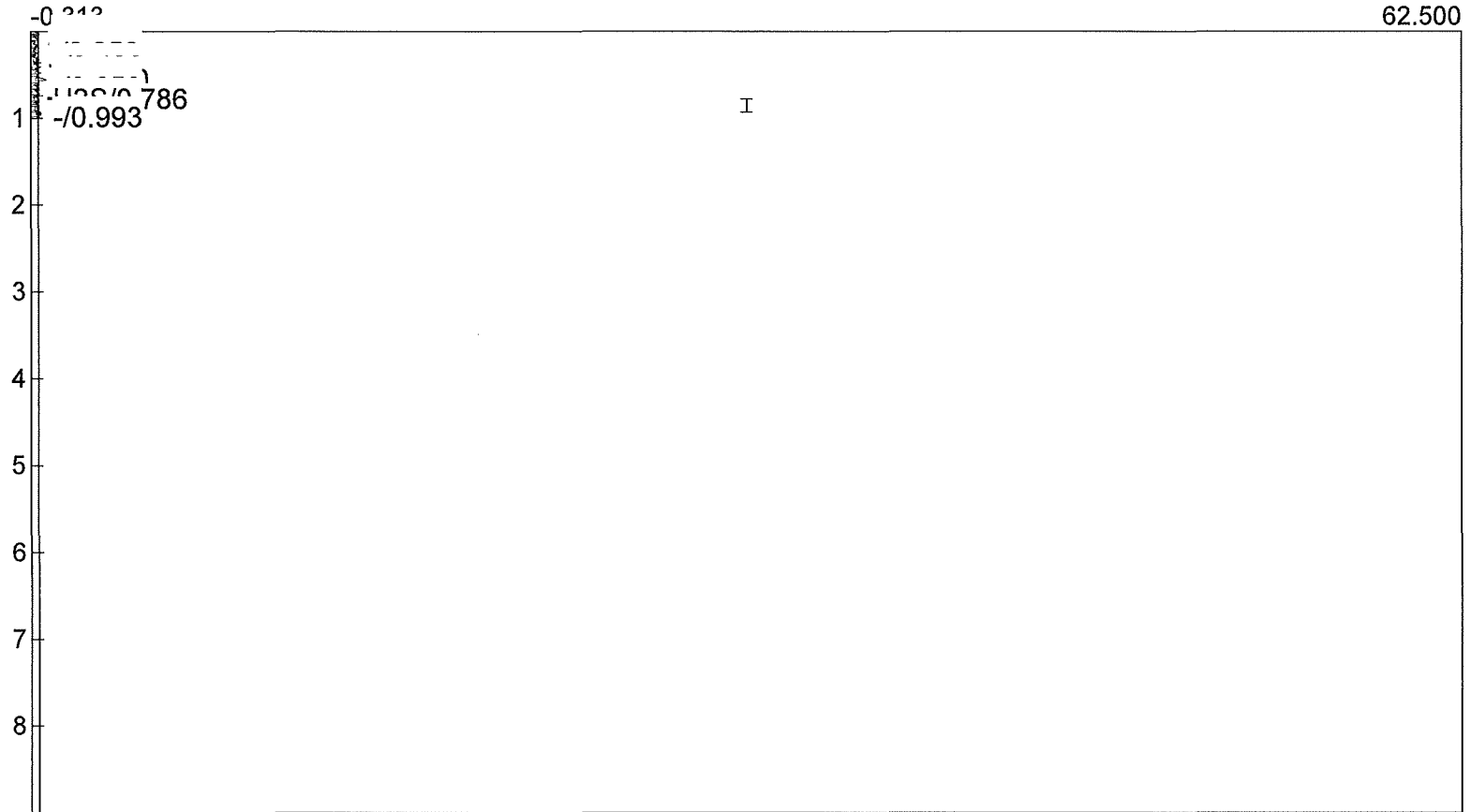
	<i>START</i>	<i>END</i>	
Run 7 Time	16:10	16:39	
Run 7 GC Response	45.8	43.6	50.4
Average Response	46.6		
<b>Run Result</b>	<b>3.1 ppm</b>		<b>3.1 ppm</b>

	<i>START</i>	<i>END</i>	
Run 8 Time	16:40	17:09	
Run 8 GC Response	55.3	51.7	49.2
Average Response	52.1		
<b>Run Result</b>	<b>3.3 ppm</b>		<b>3.3 ppm</b>

	<i>START</i>	<i>END</i>	
Run 9 Time	17:10	17:39	
Run 9 GC Response	51.8	48.9	45.9
Average Response	48.9		
<b>Run Result</b>	<b>3.2 ppm</b>		<b>3.2 ppm</b>

Post Cal GC Response	1525.36	1516.94	1476.34
Average Response	1506		
<b>% Difference</b>	<b>-0.93%</b>		<b>PASS Post Test Calibration Check</b>

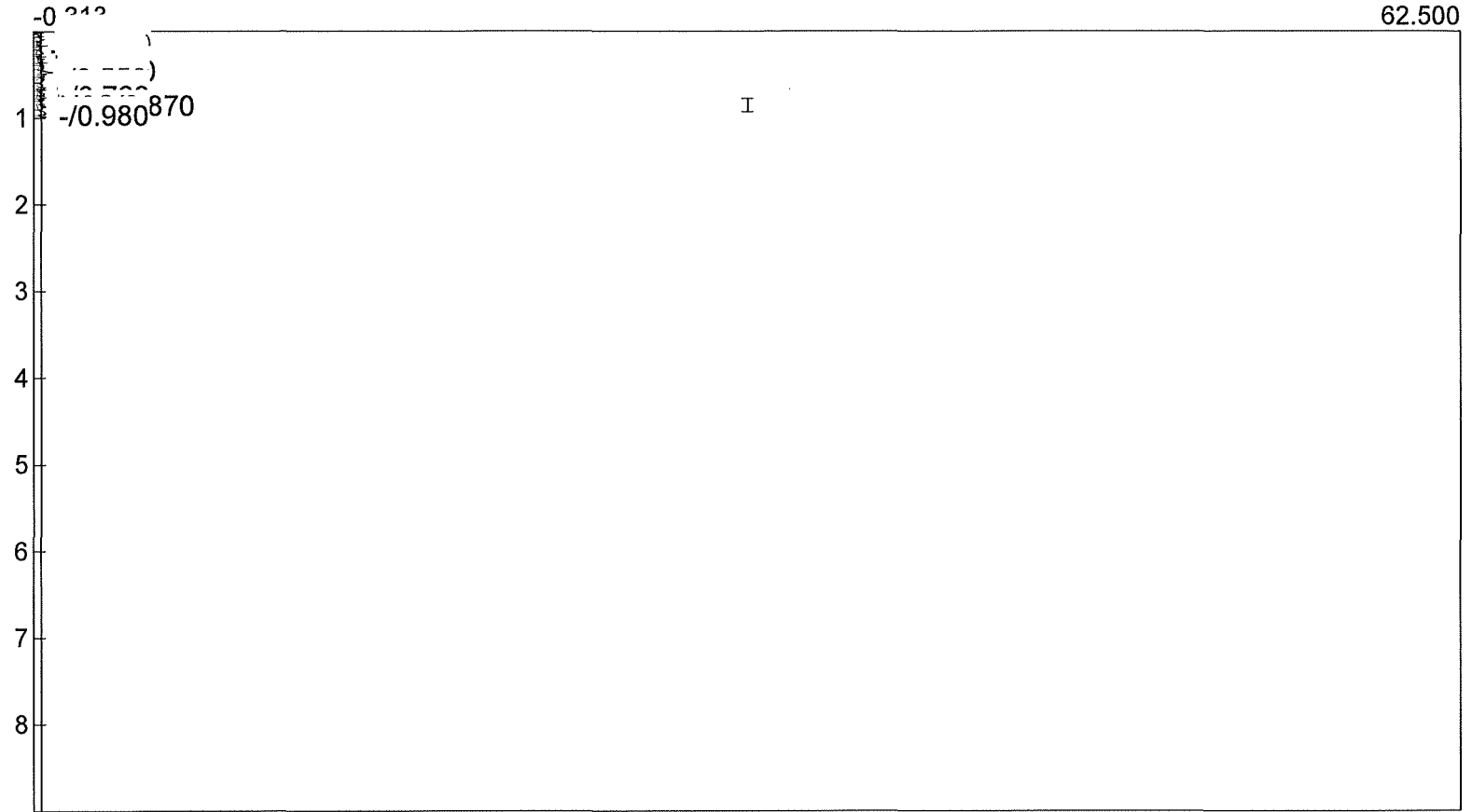
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 12:55:40  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.786	0.4013
		0.4013

# Calibration Chromatogram

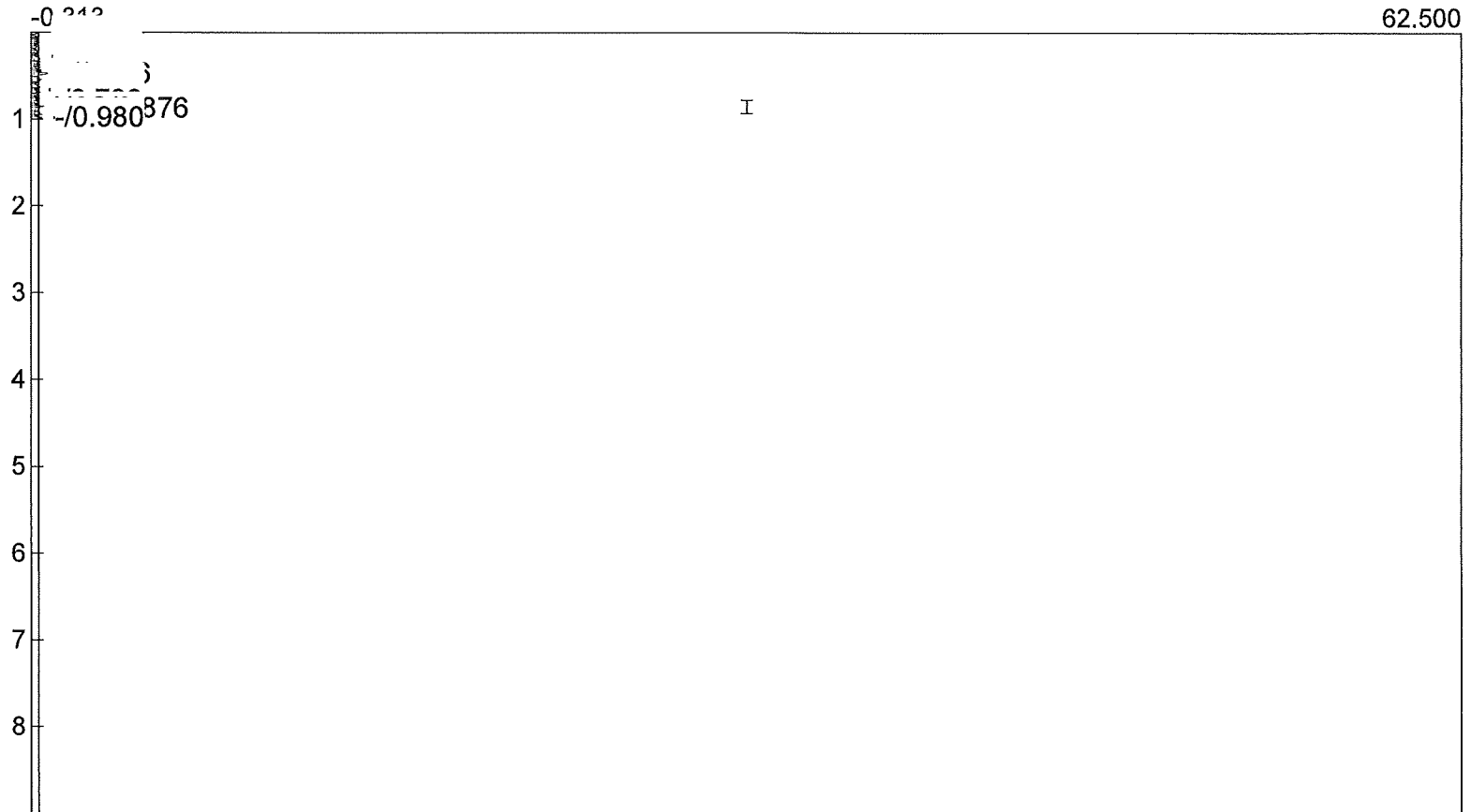
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 12:57:46  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.870	0.8268
		0.8268

# Calibration Chromatogram

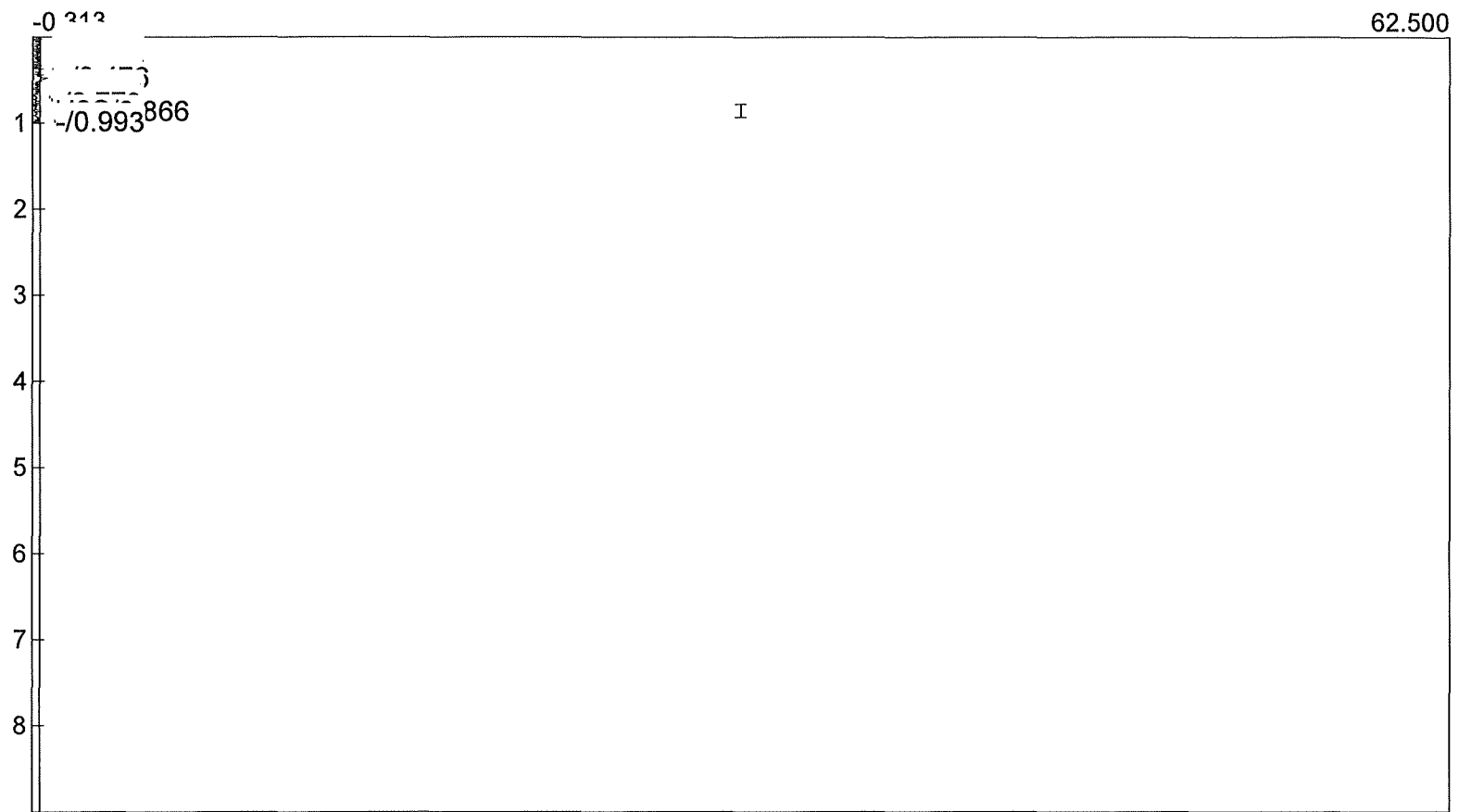
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 Client: Marathon Detroit  
 Analysis date: 06/02/2022 12:59:52  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.876	0.3514
		0.3514

# Calibration Chromatogram

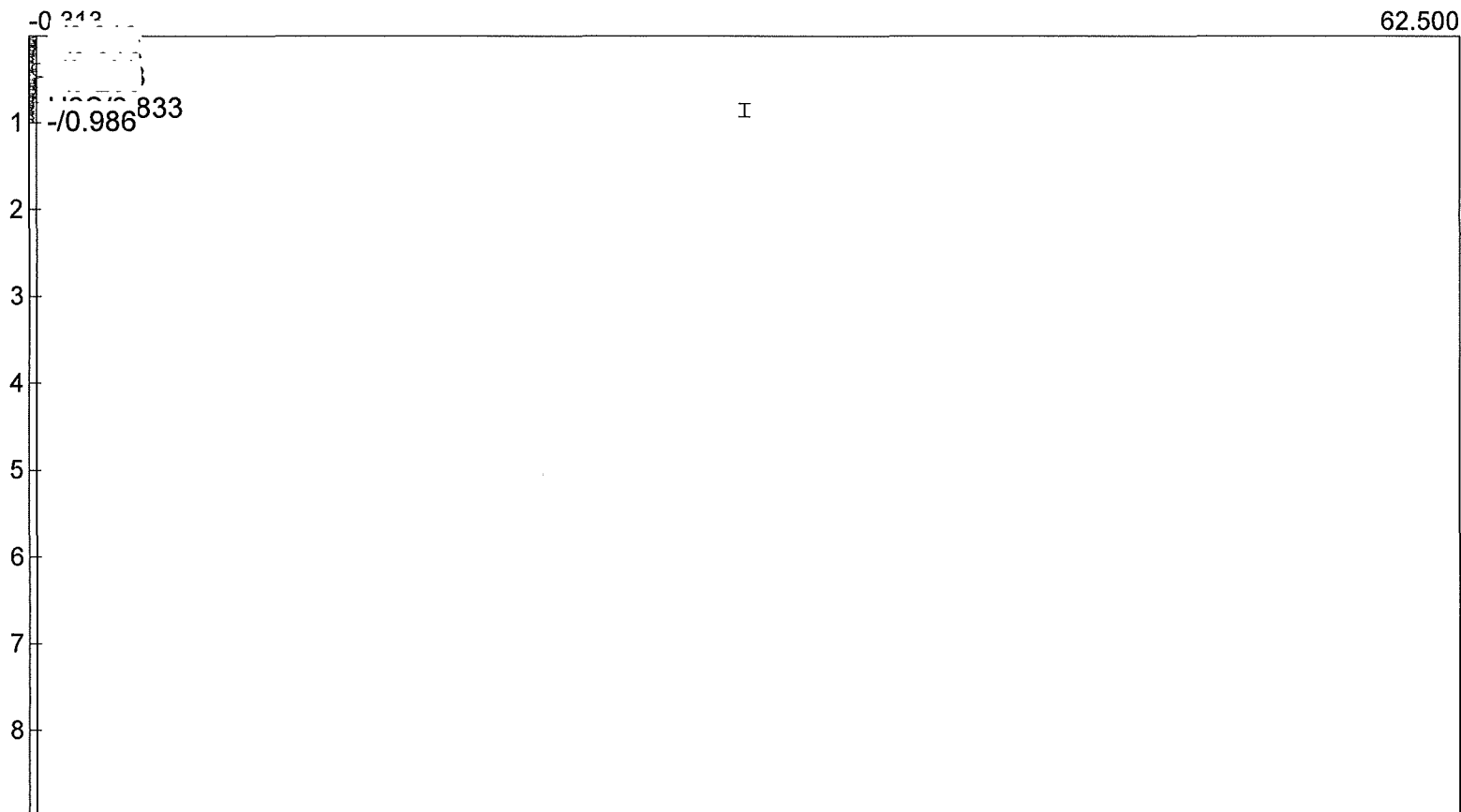
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 Client: Marathon Detroit  
 Analysis date: 06/02/2022 13:01:57  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.866	0.6058
		0.6058

# Calibration Chromatogram

Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 13:04:03  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison

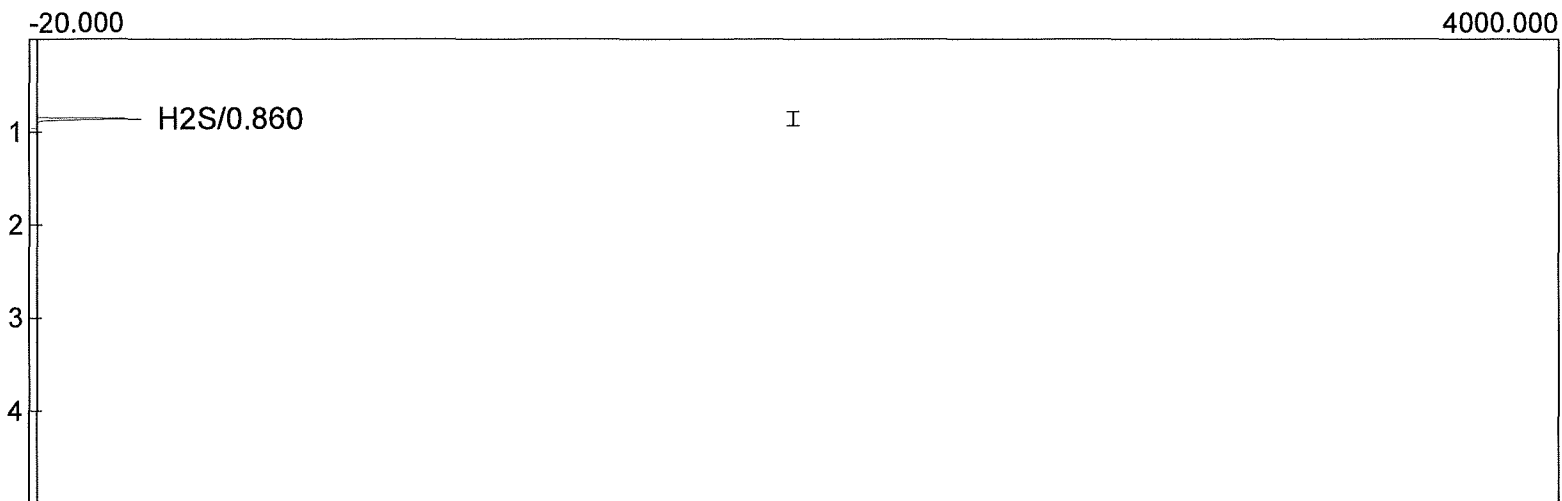


Component	Retention	Area
H2S	0.833	0.3734
		0.3734

# Calibration Chromatogram



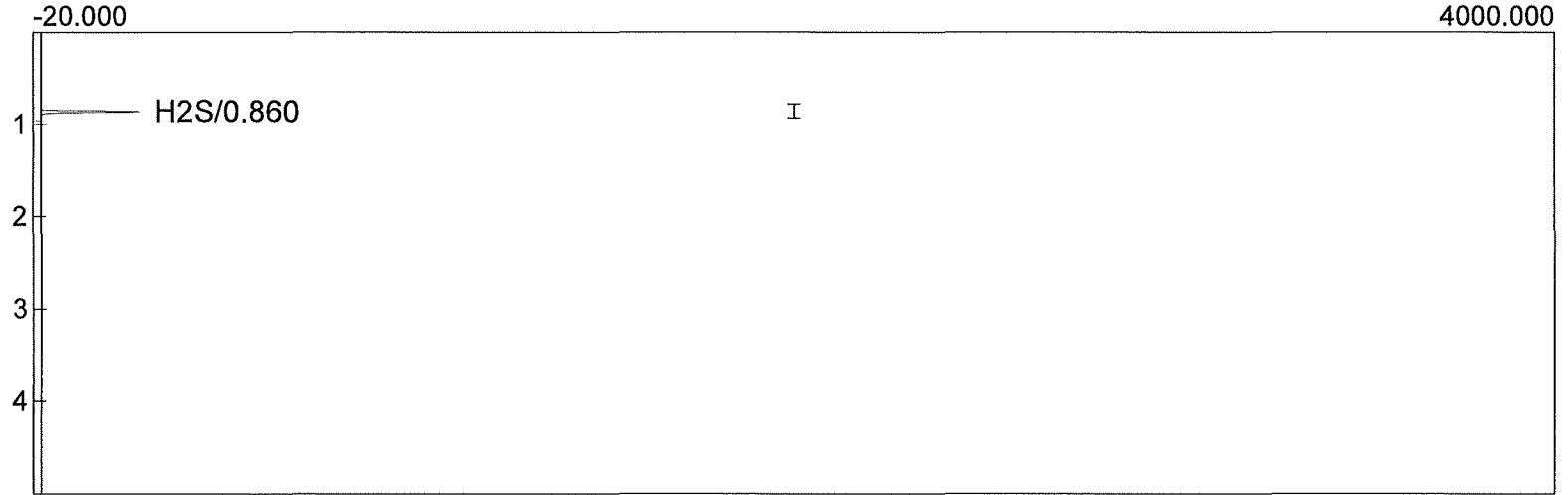
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:19:48  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.860	333.3414
		333.3414

# Calibration Chromatogram

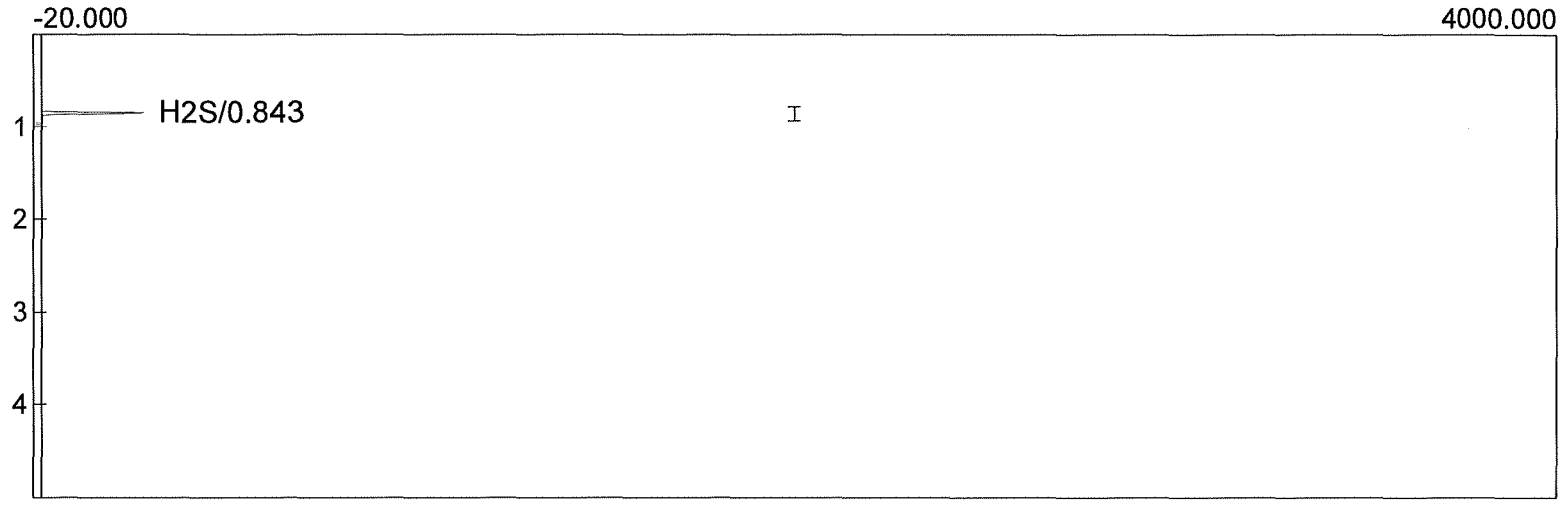
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Client: Marathon Detroit  
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Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.860	322.2428
		322.2428

# Calibration Chromatogram

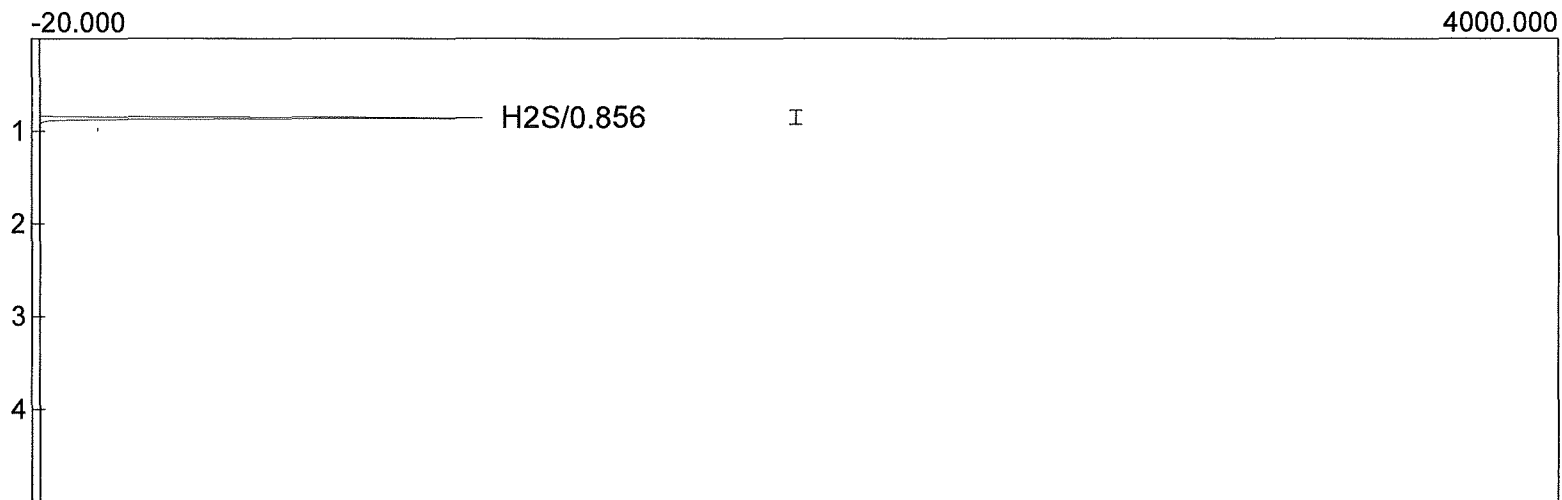
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:24:46  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.843	326.7950
		326.7950

# Calibration Chromatogram

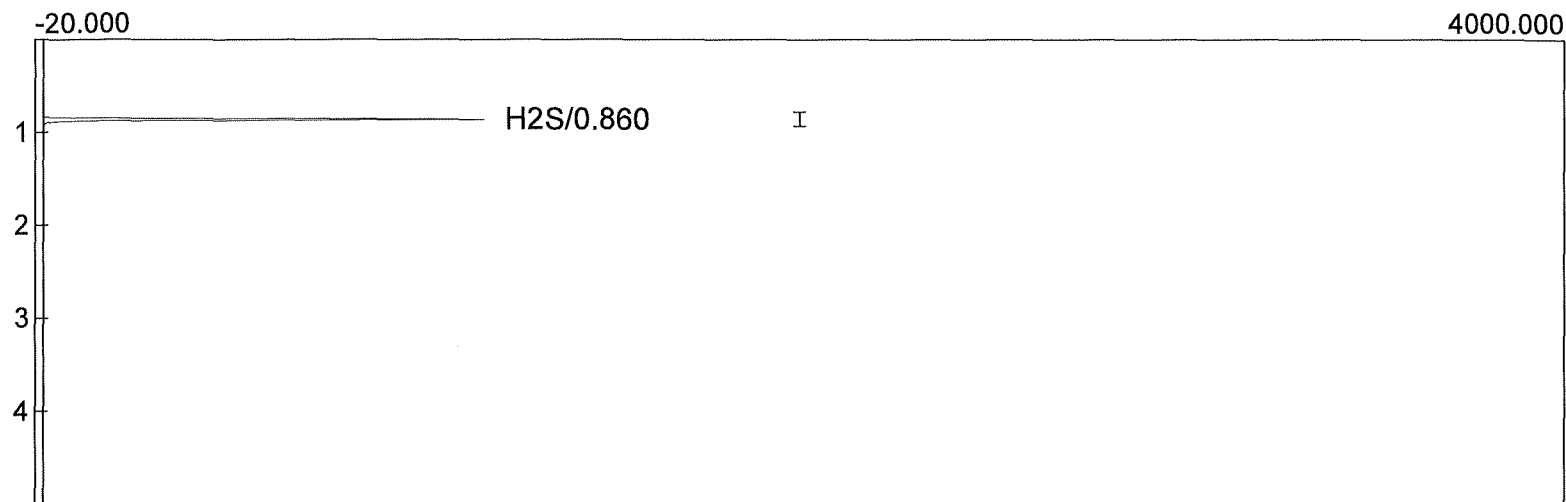
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:11:24  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.856	1487.5668
		1487.5668

# Calibration Chromatogram

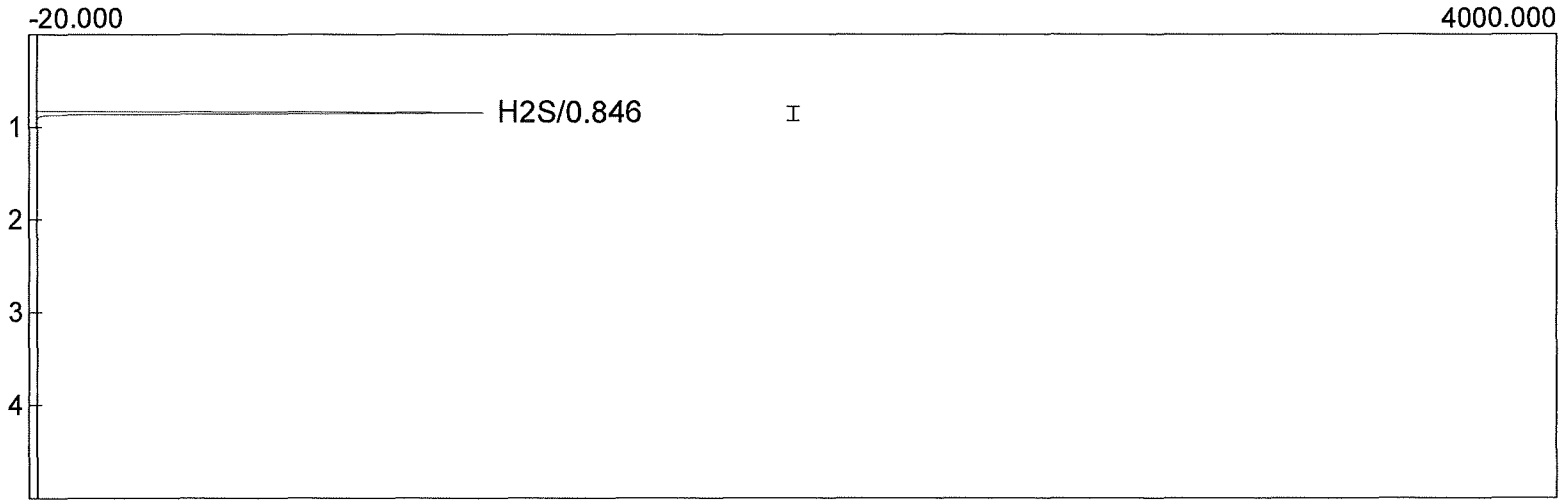
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:13:30  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.860	1490.7994
		1490.7994

# Calibration Chromatogram

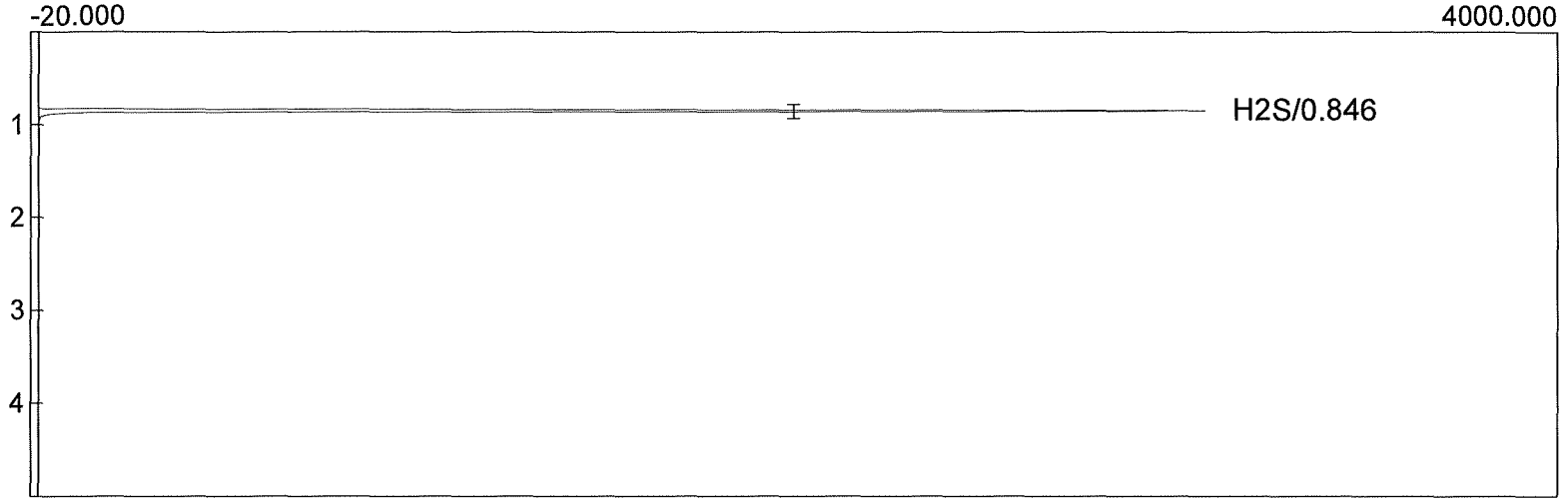
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Client: Marathon Detroit  
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Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	1498.4793
		1498.4793

# Calibration Chromatogram

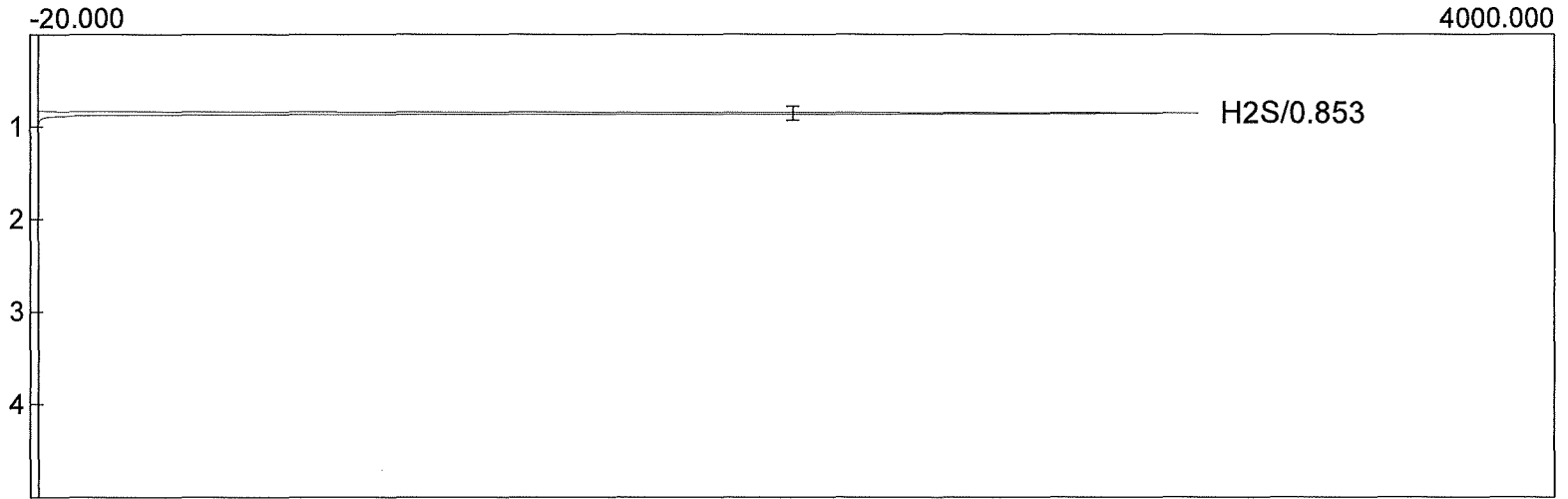
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 12:04:46  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	4274.1680
		4274.1680

# Calibration Chromatogram

Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 12:06:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison

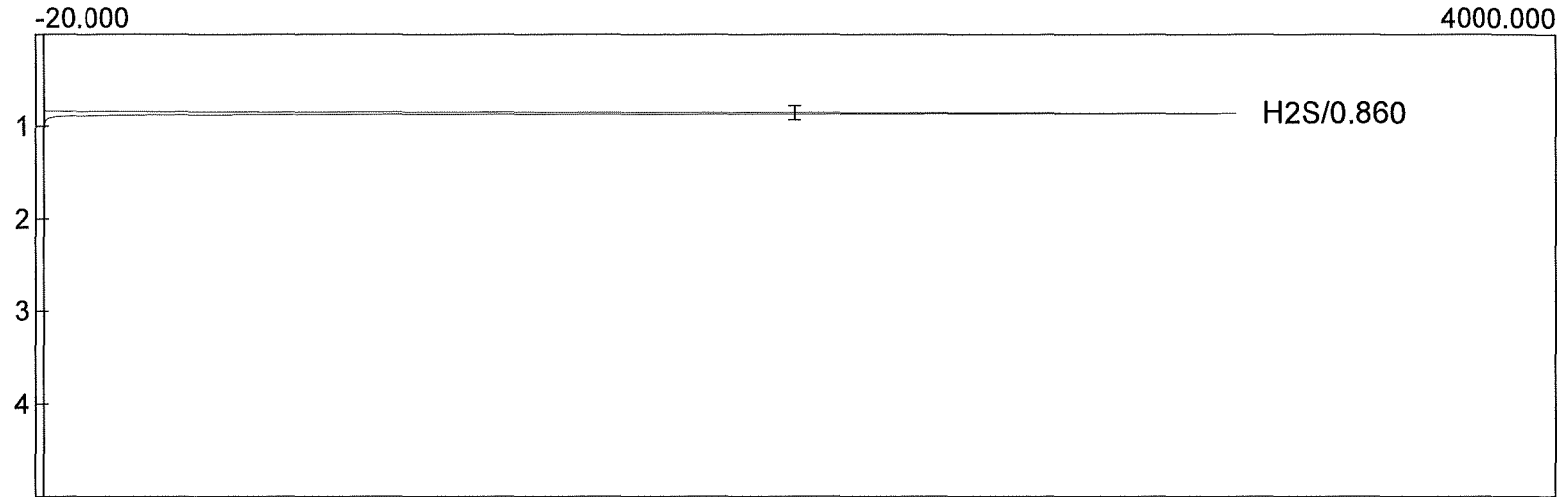


Component	Retention	Area
H2S	0.853	4263.9304
		4263.9304

# Calibration Chromatogram



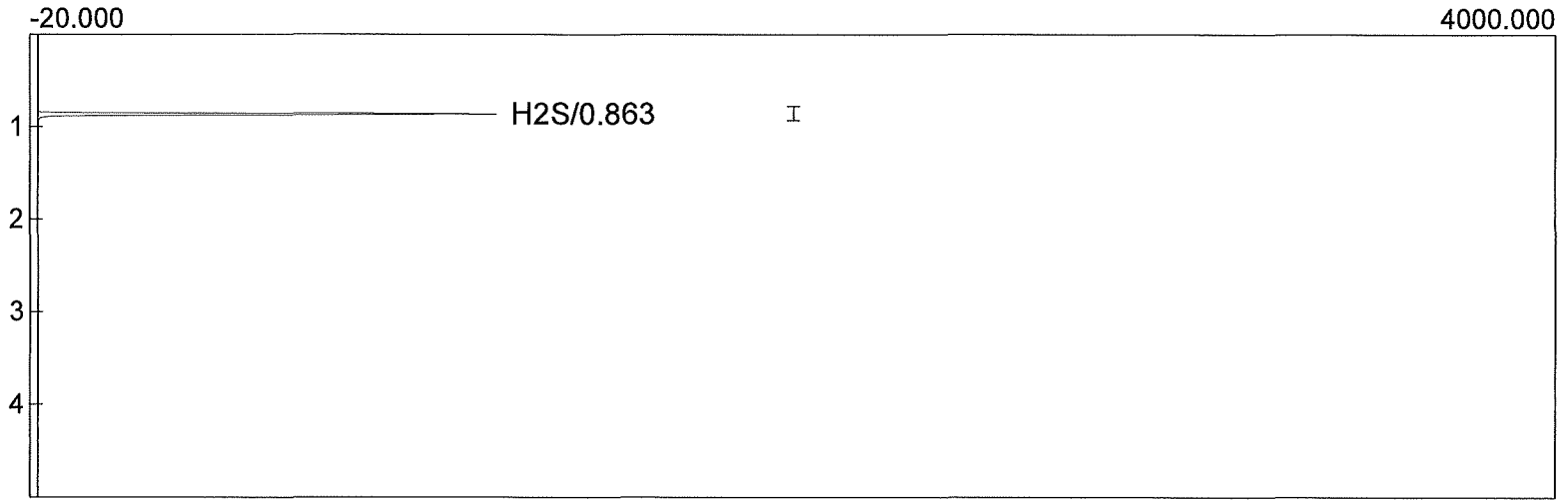
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:08:58  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.860	4282.9623
		4282.9623

# Calibration Chromatogram

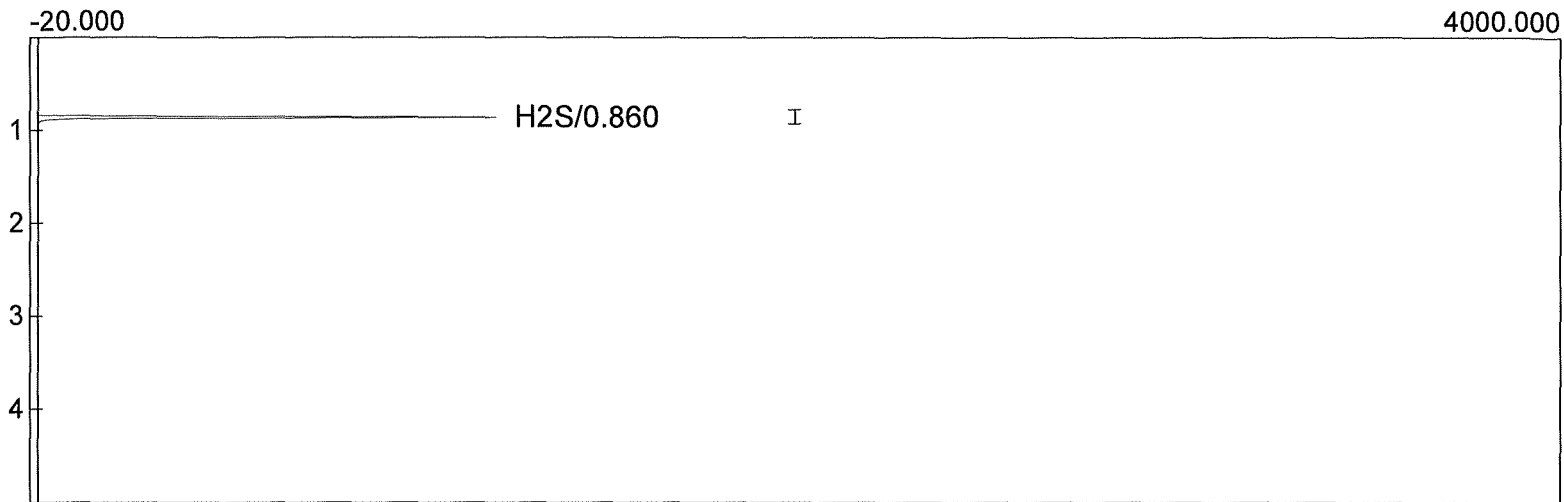
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:41:02  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.863	1558.9204
		1558.9204

# Calibration Chromatogram

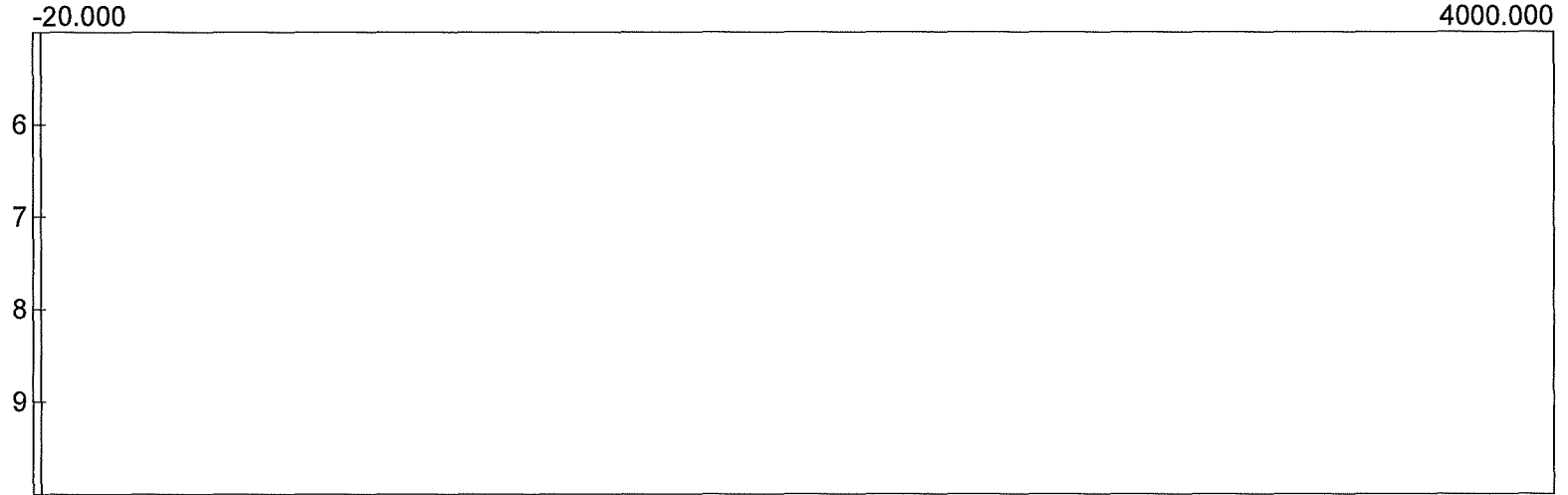
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Client: Marathon Detroit  
Analysis date: 06/02/2022 12:46:12  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.860	1559.3041
		1559.3041

# Calibration Chromatogram

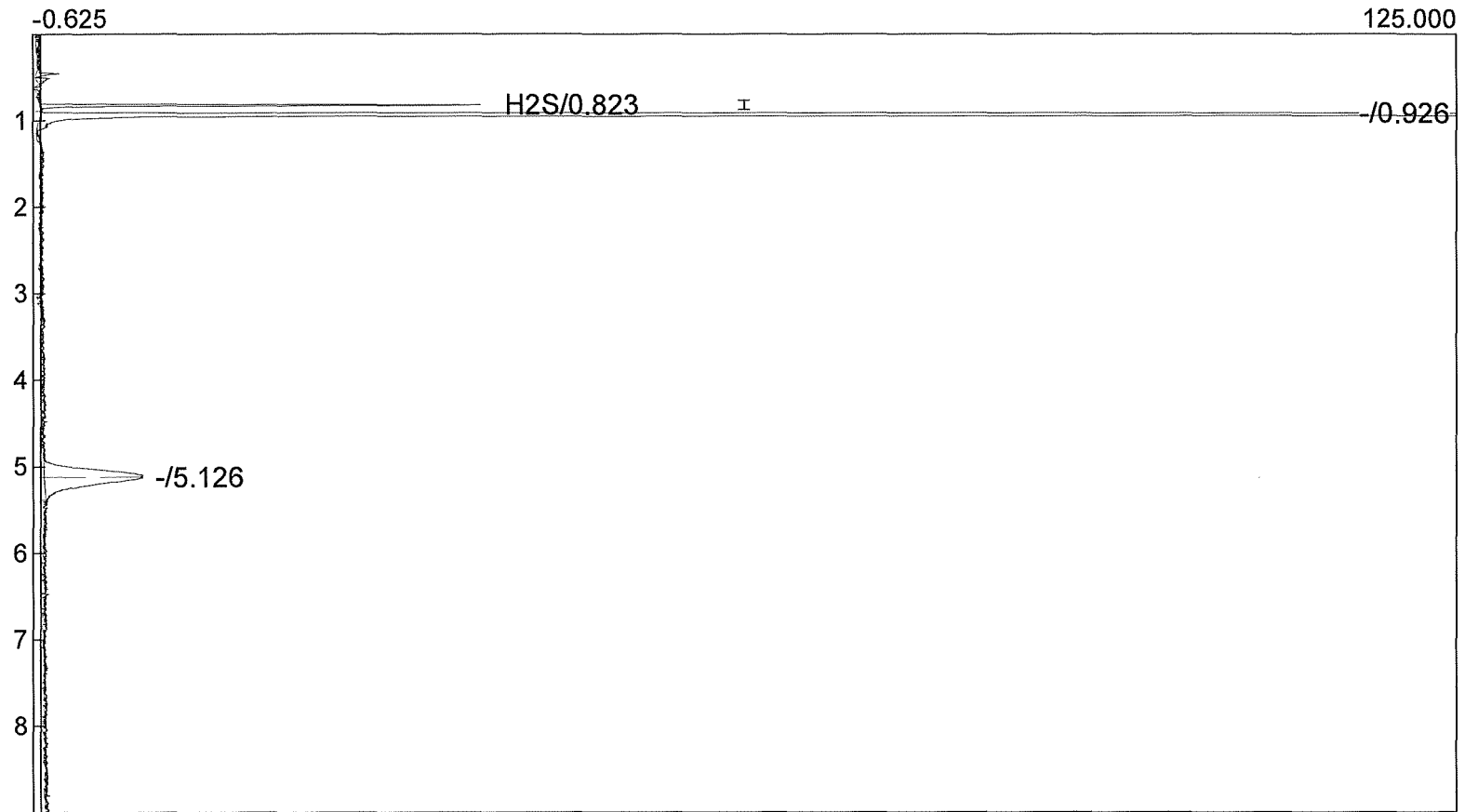
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 12:48:18  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	1576.3666
		1576.3666

# Calibration Chromatogram

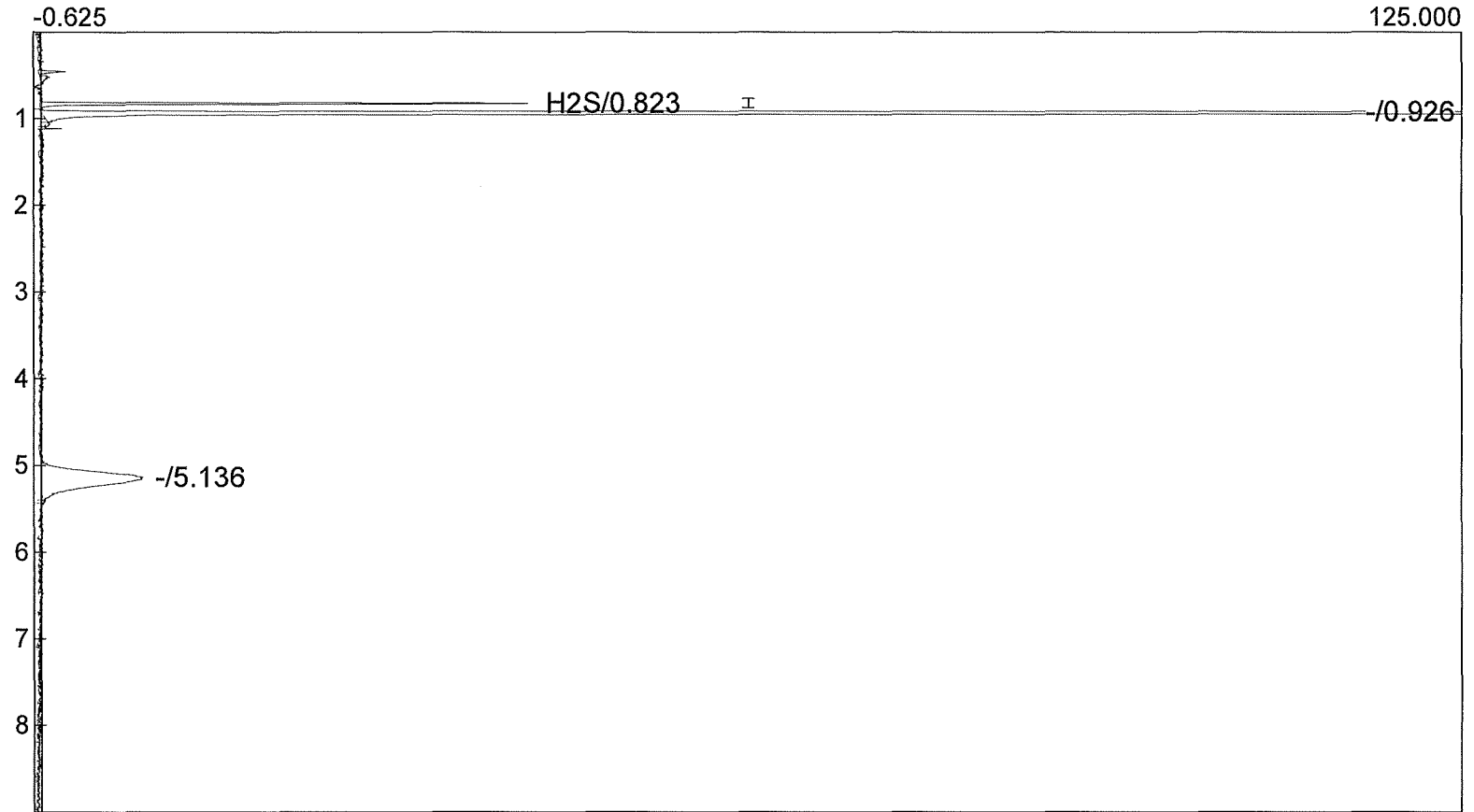
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 13:10:51  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.823	39.3853
		39.3853

# Run Chromatogram

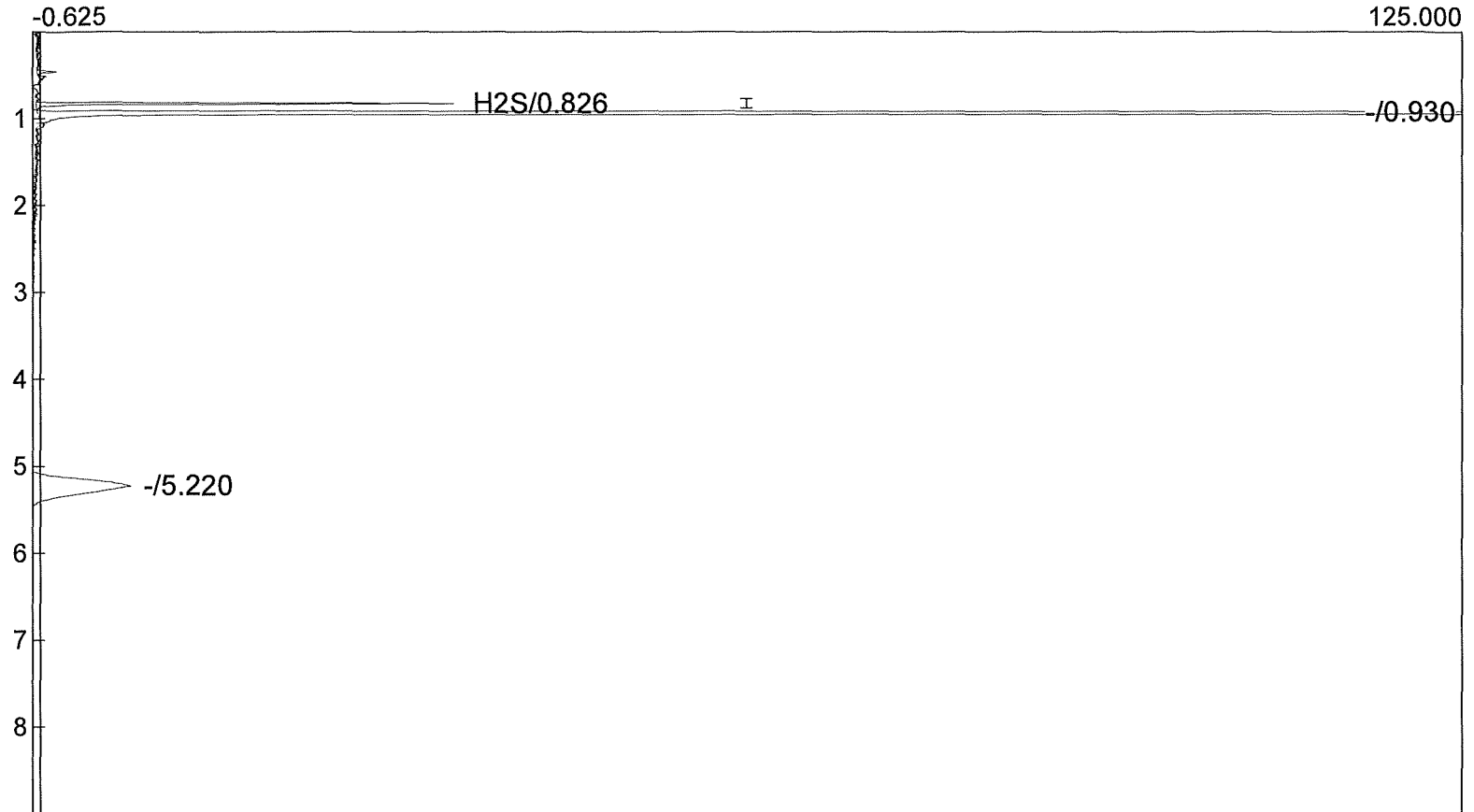
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 13:20:51  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.823	43.9941
		43.9941

# Run Chromatogram

Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 13:30:51  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.826	36.8562
		36.8562

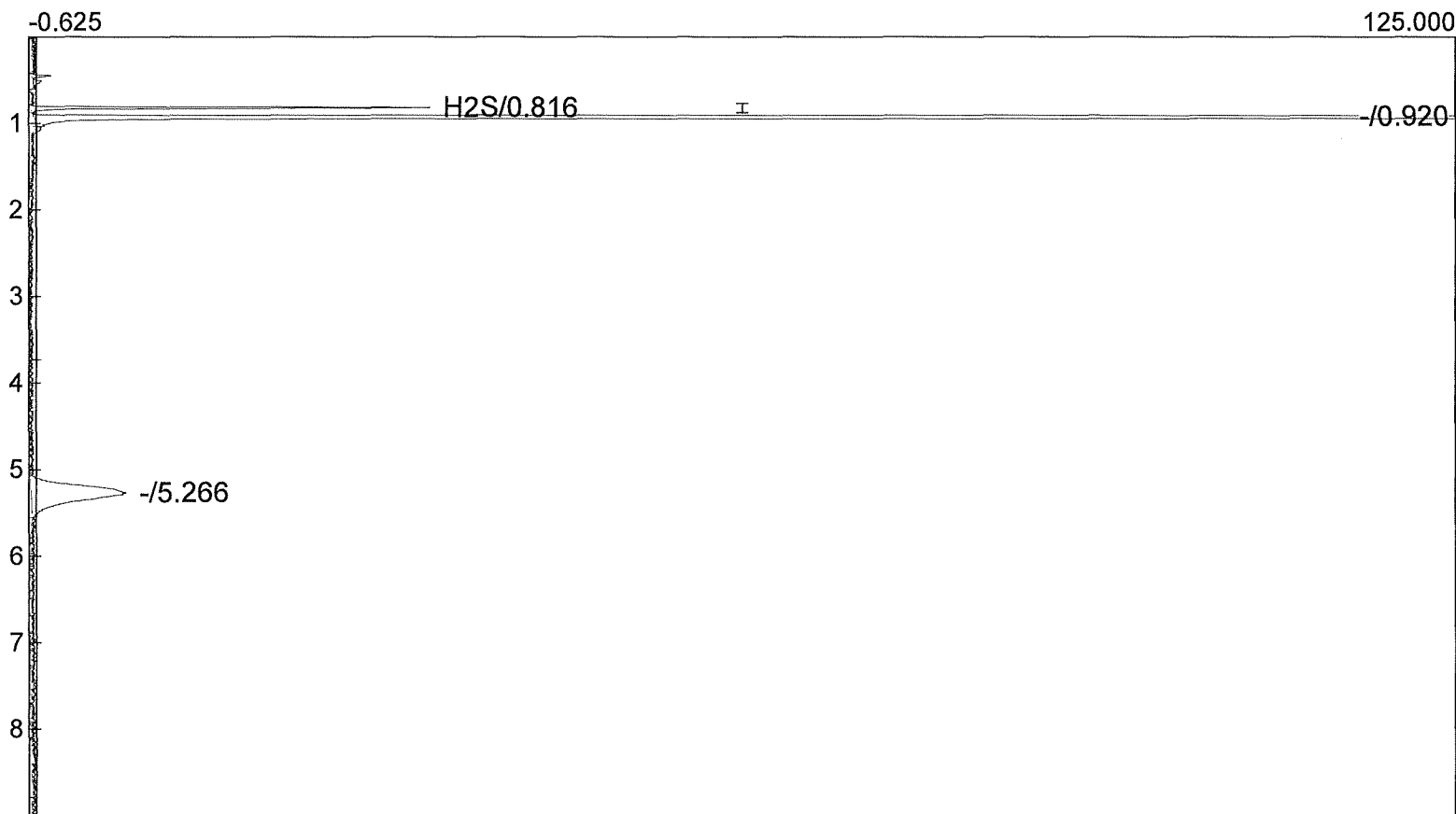
# Run Chromatogram

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Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 13:40:51  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison

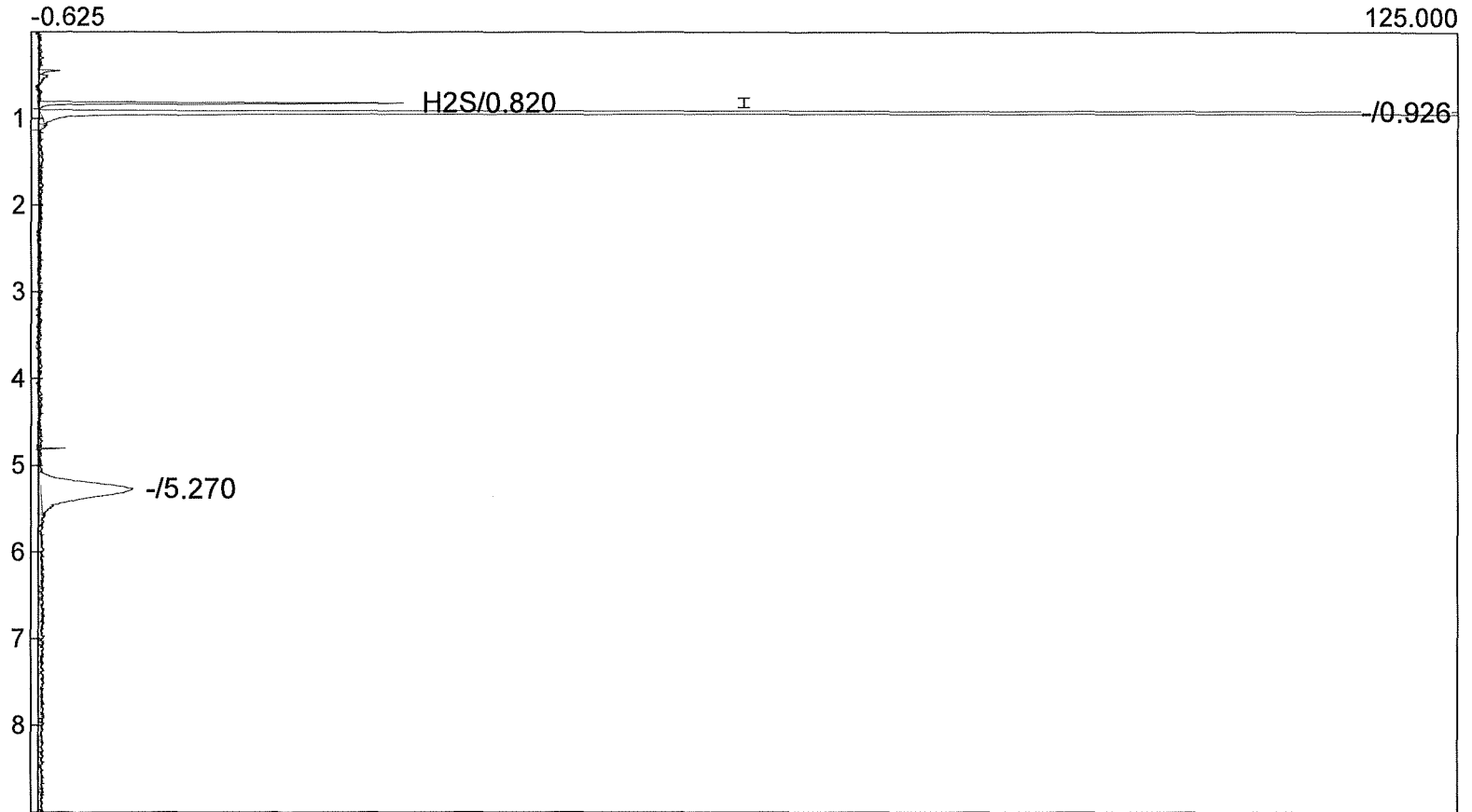


Component	Retention	Area
H2S	0.816	36.7914
		36.7914

# Run Chromatogram



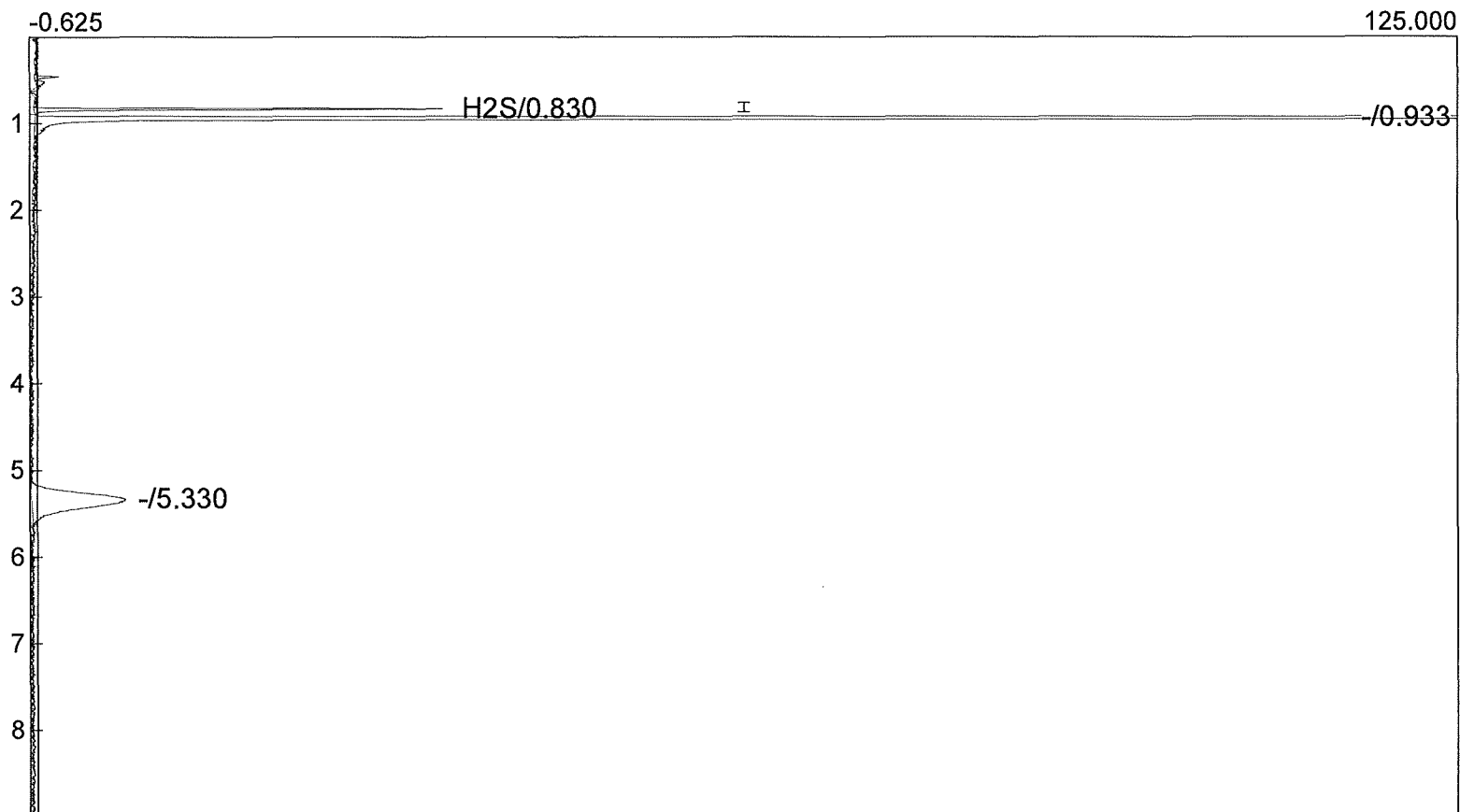
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 13:50:51  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.820	34.2047
		34.2047

# Run Chromatogram

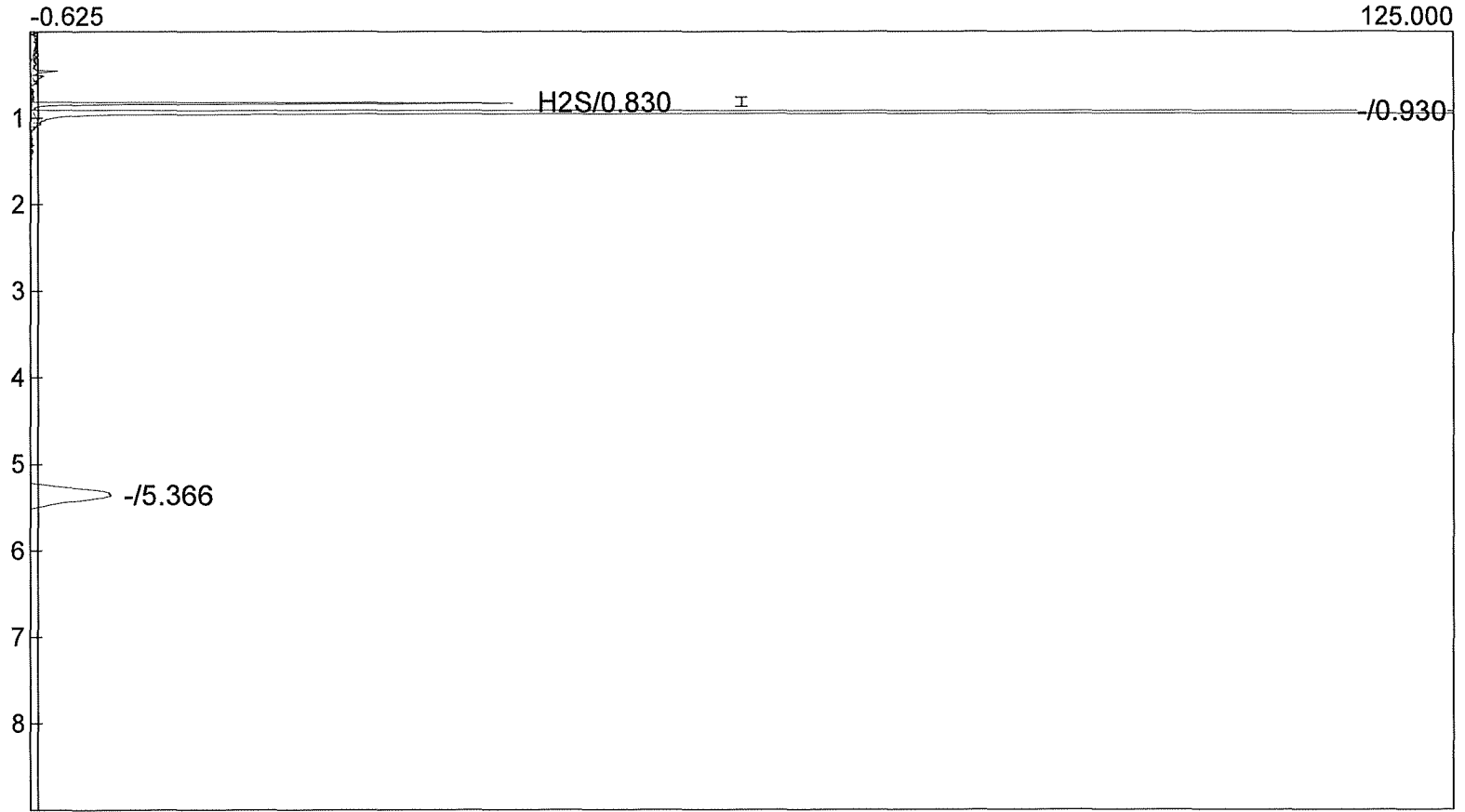
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 14:00:51  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.830	38.6702
		38.6702

# Run Chromatogram

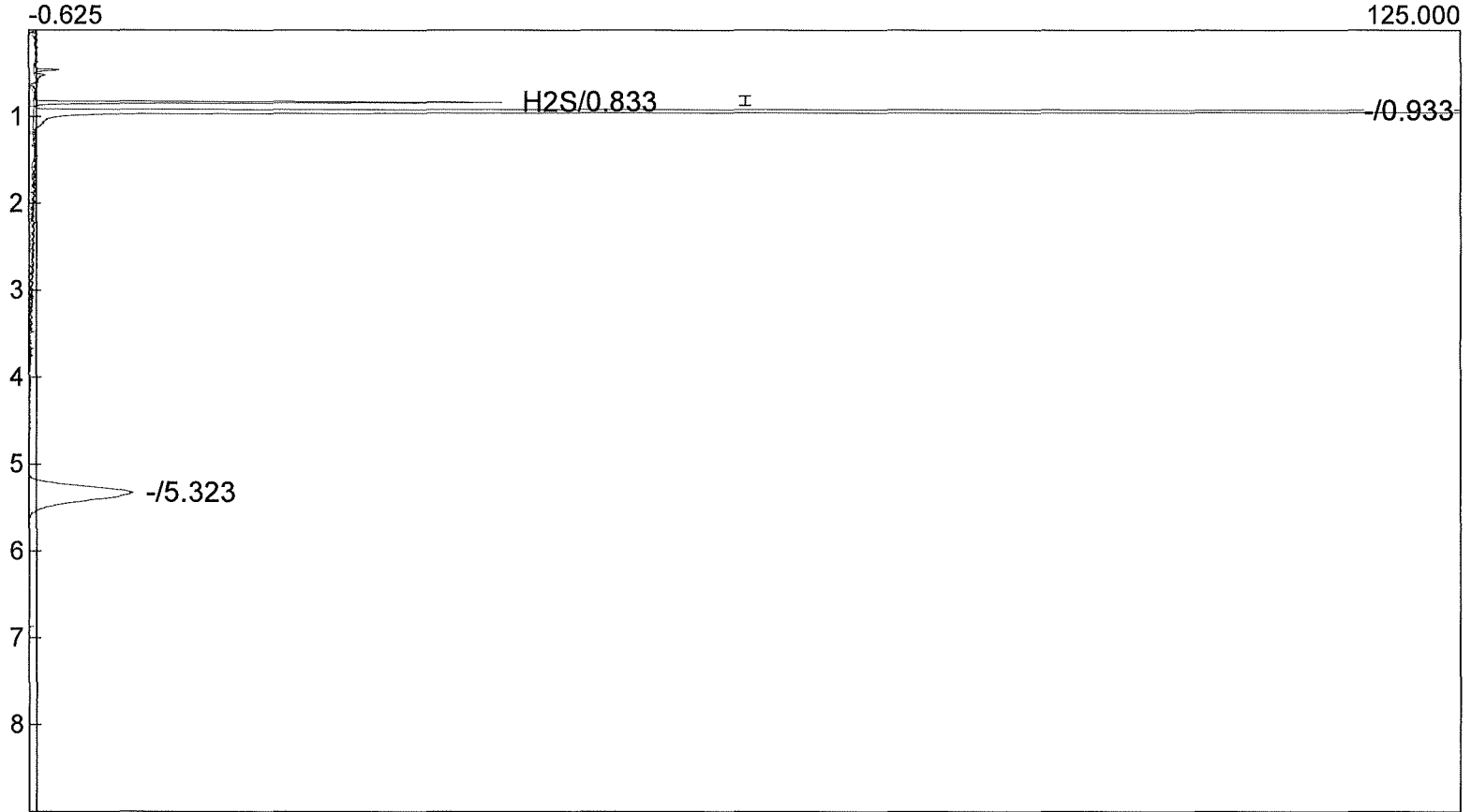
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 14:10:51  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.830	46.3492
		46.3492

# Run Chromatogram

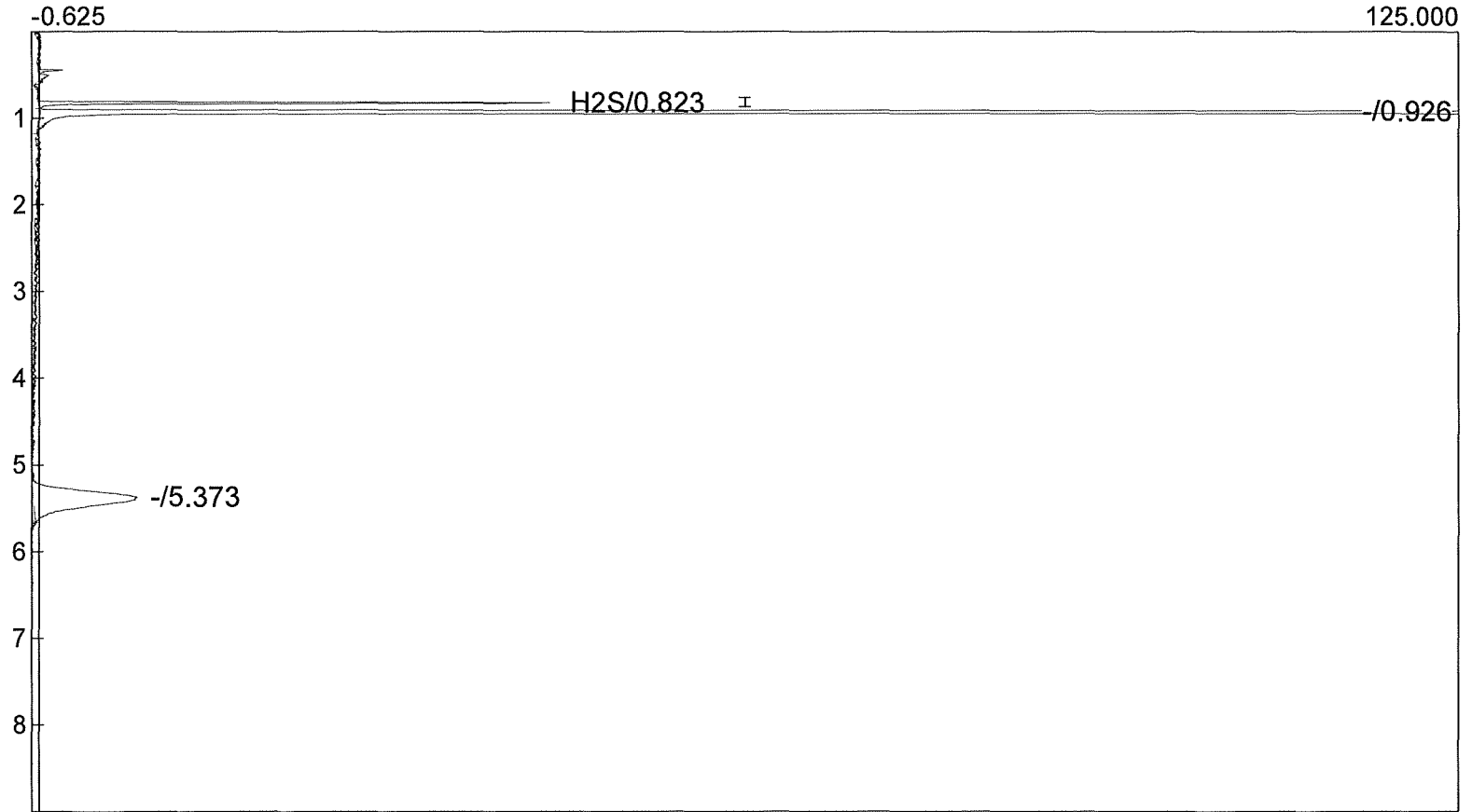
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 14:20:51  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.833	43.6246
		43.6246

# Run Chromatogram

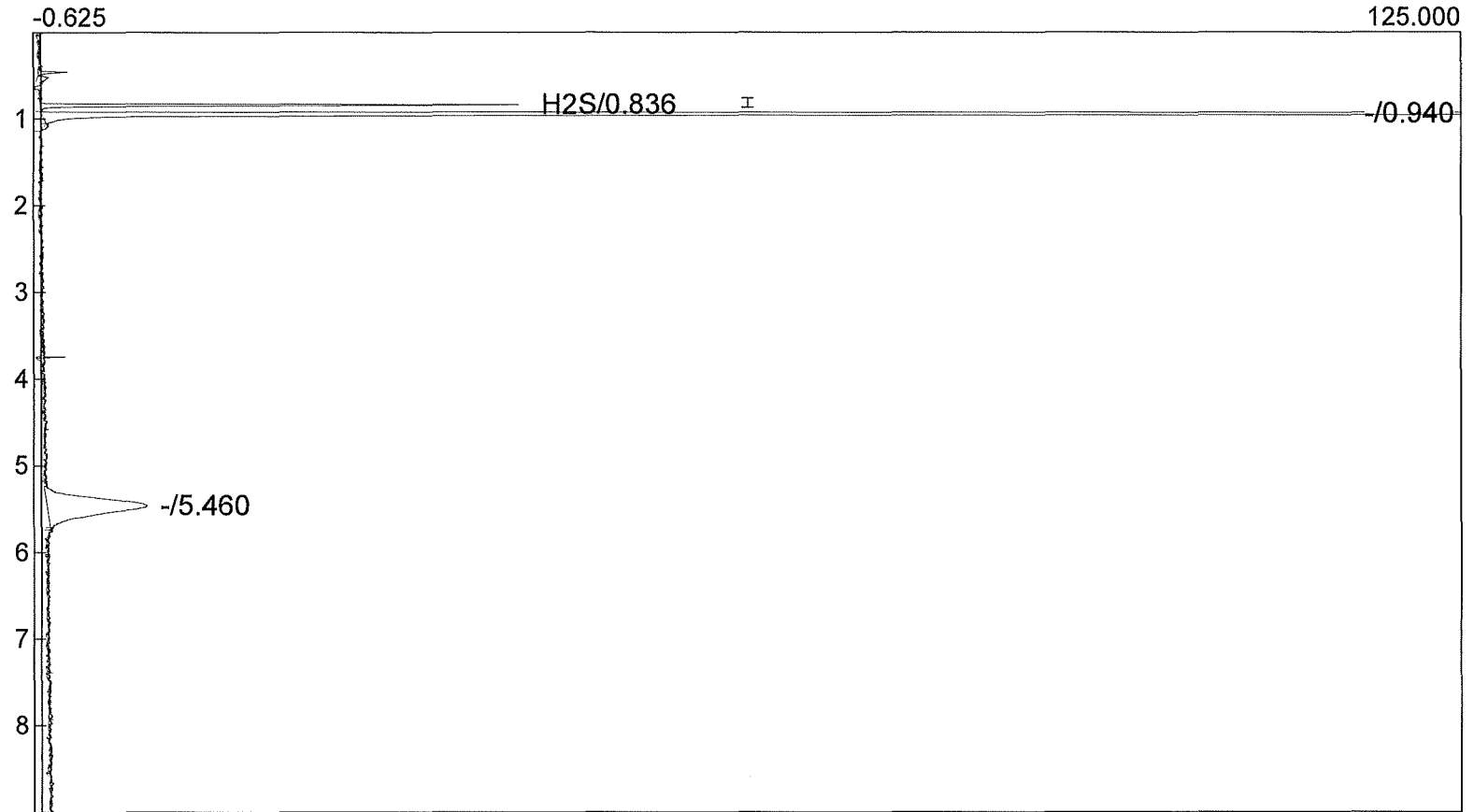
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 14:30:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.823	47.7296
		47.7296

# Run Chromatogram

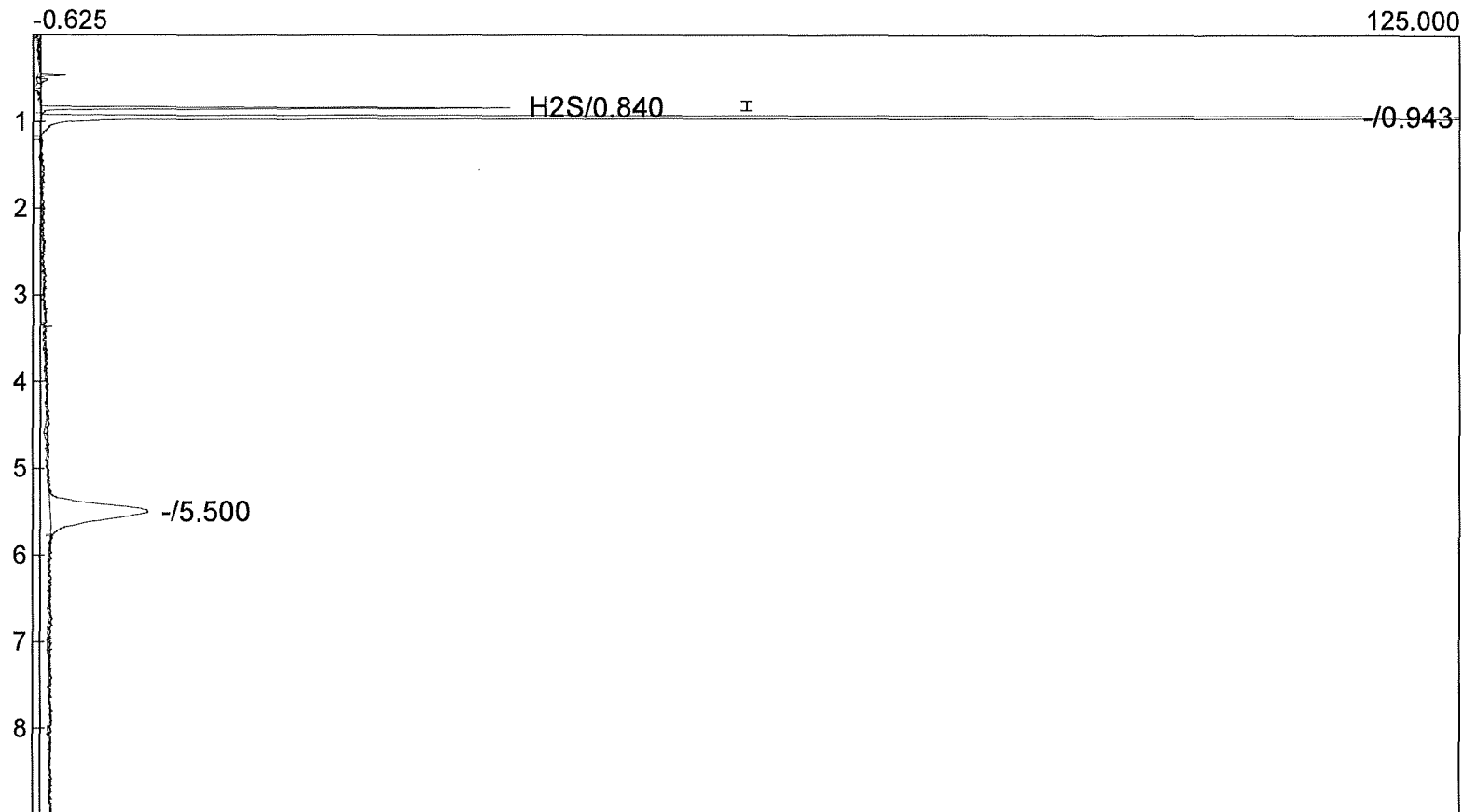
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 14:40:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.836	45.9904
		45.9904

# Run Chromatogram

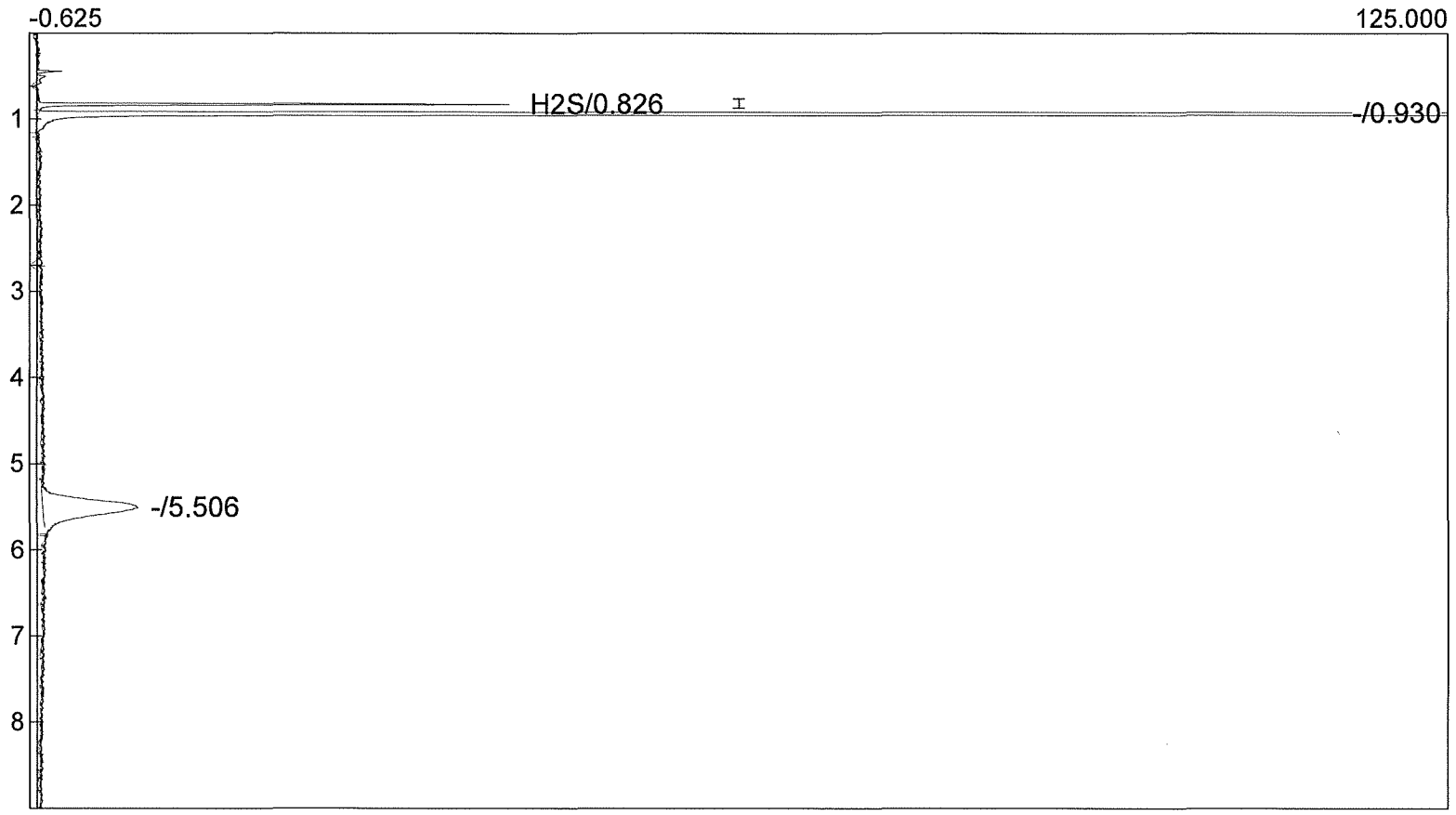
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 14:50:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.840	44.7815
		44.7815

# Run Chromatogram

Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 15:00:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison

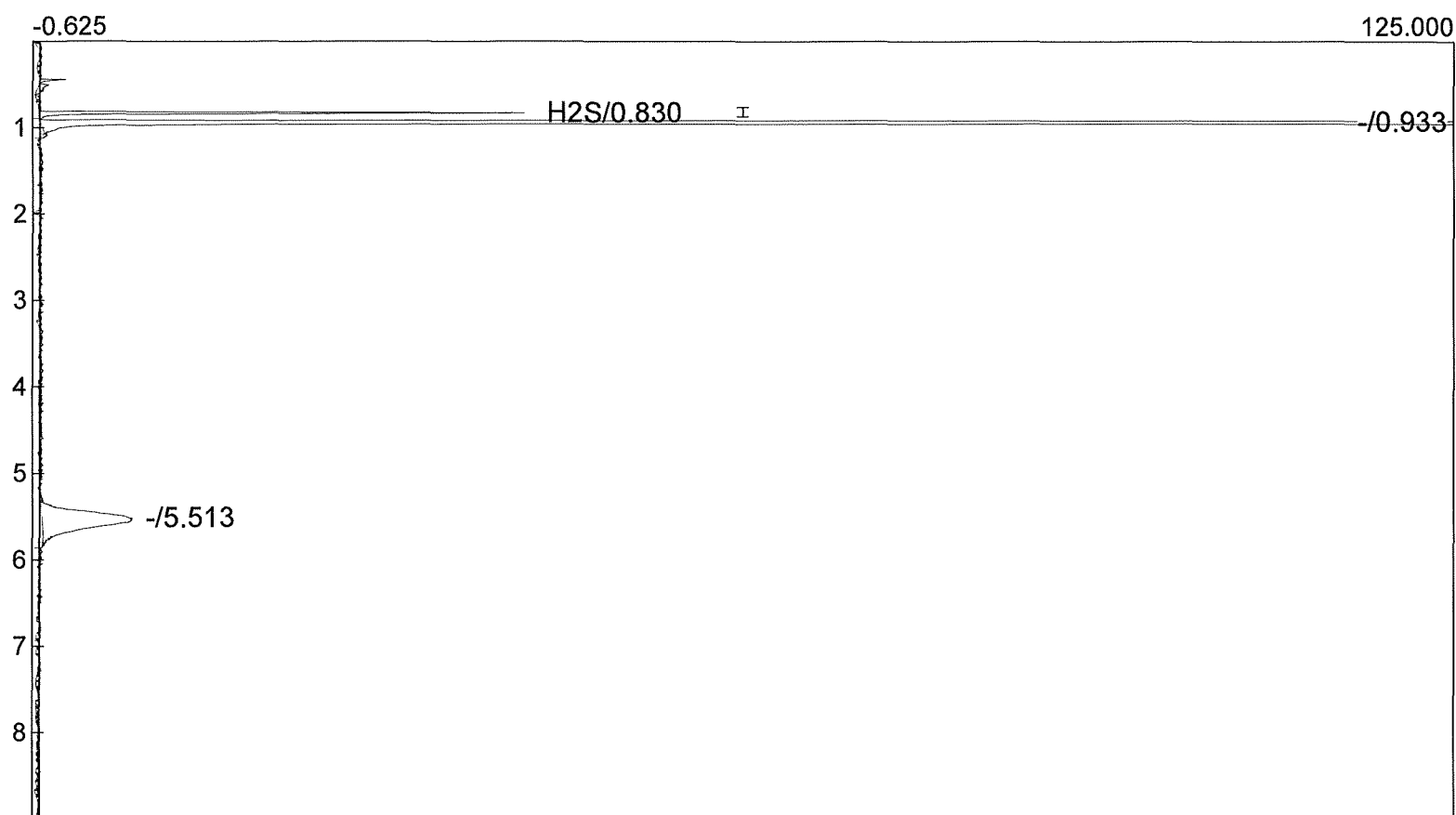


Component	Retention	Area
H2S	0.826	45.4500
		45.4500

# Run Chromatogram



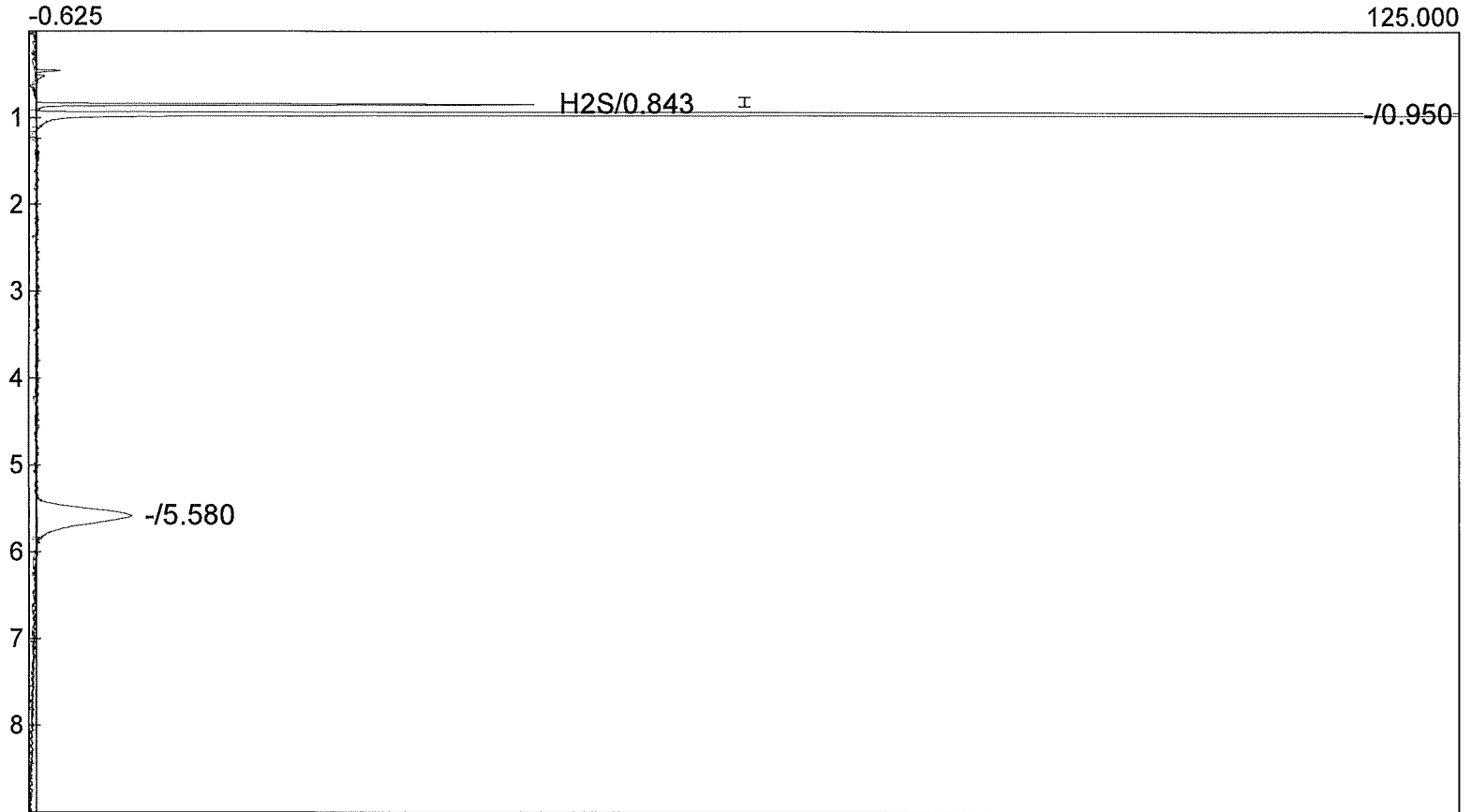
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 15:10:52  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.830	46.4418
		46.4418

# Run Chromatogram

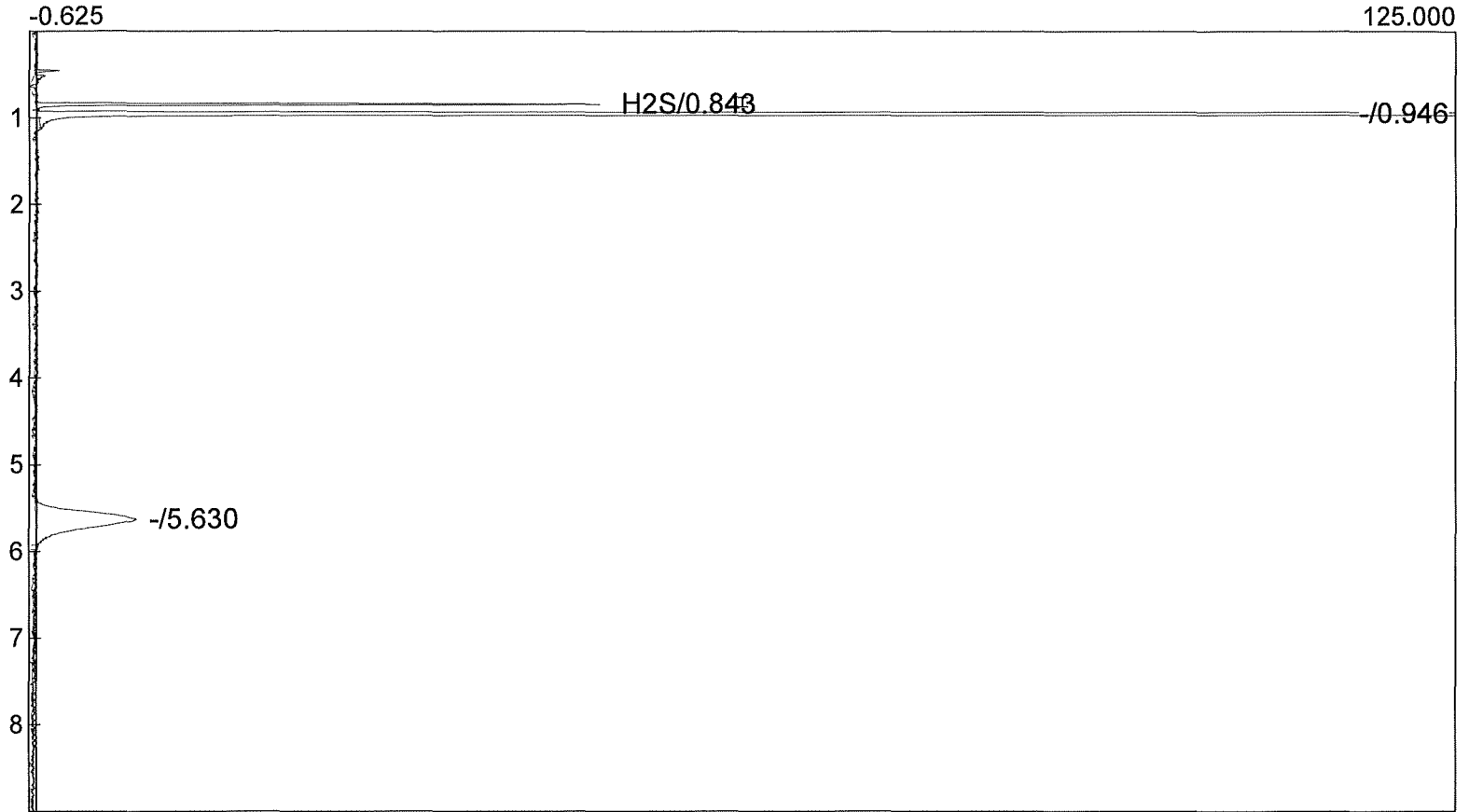
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 15:20:52  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.843	49.0118
		49.0118

# Run Chromatogram

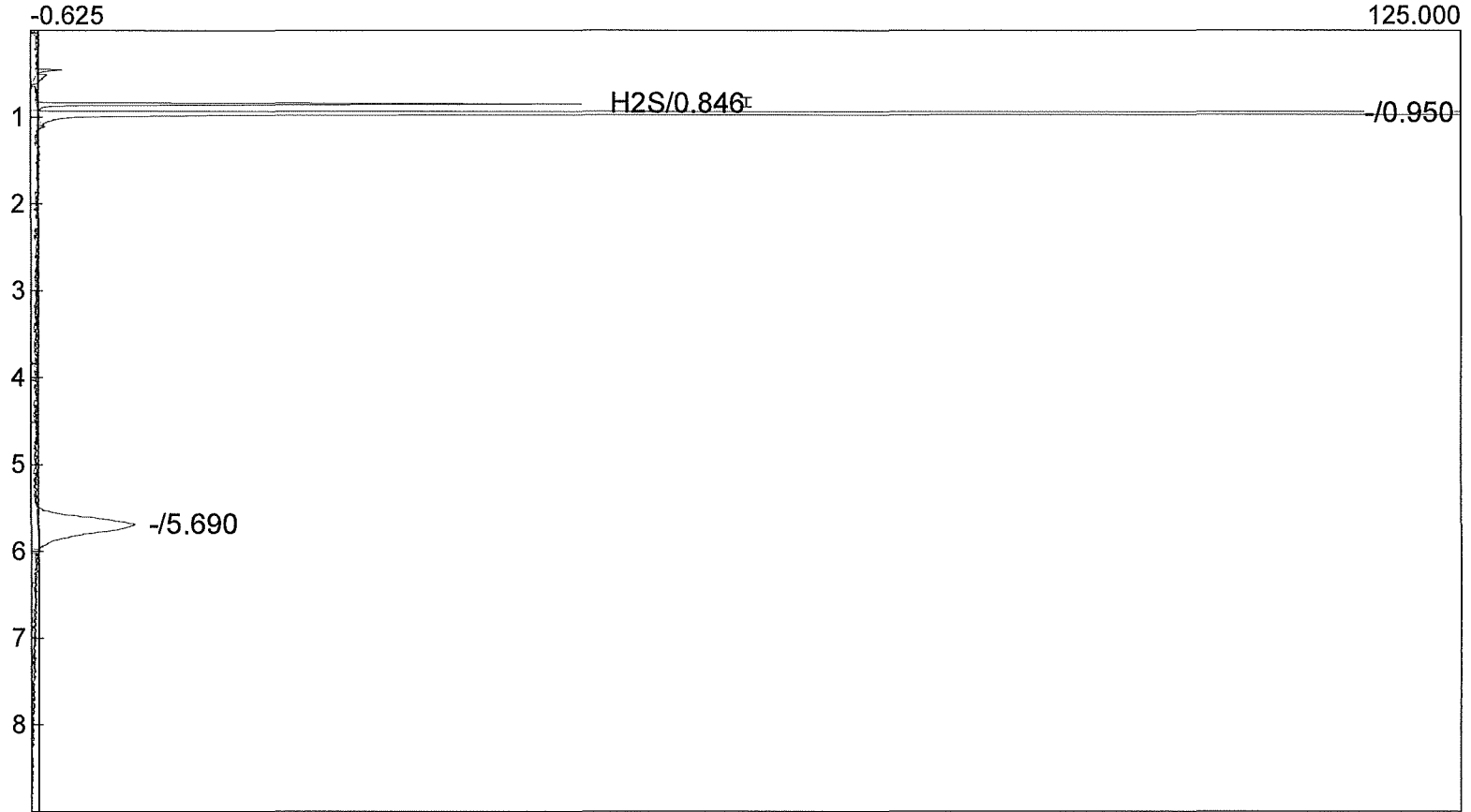
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 15:30:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.843	54.4402
		54.4402

# Run Chromatogram

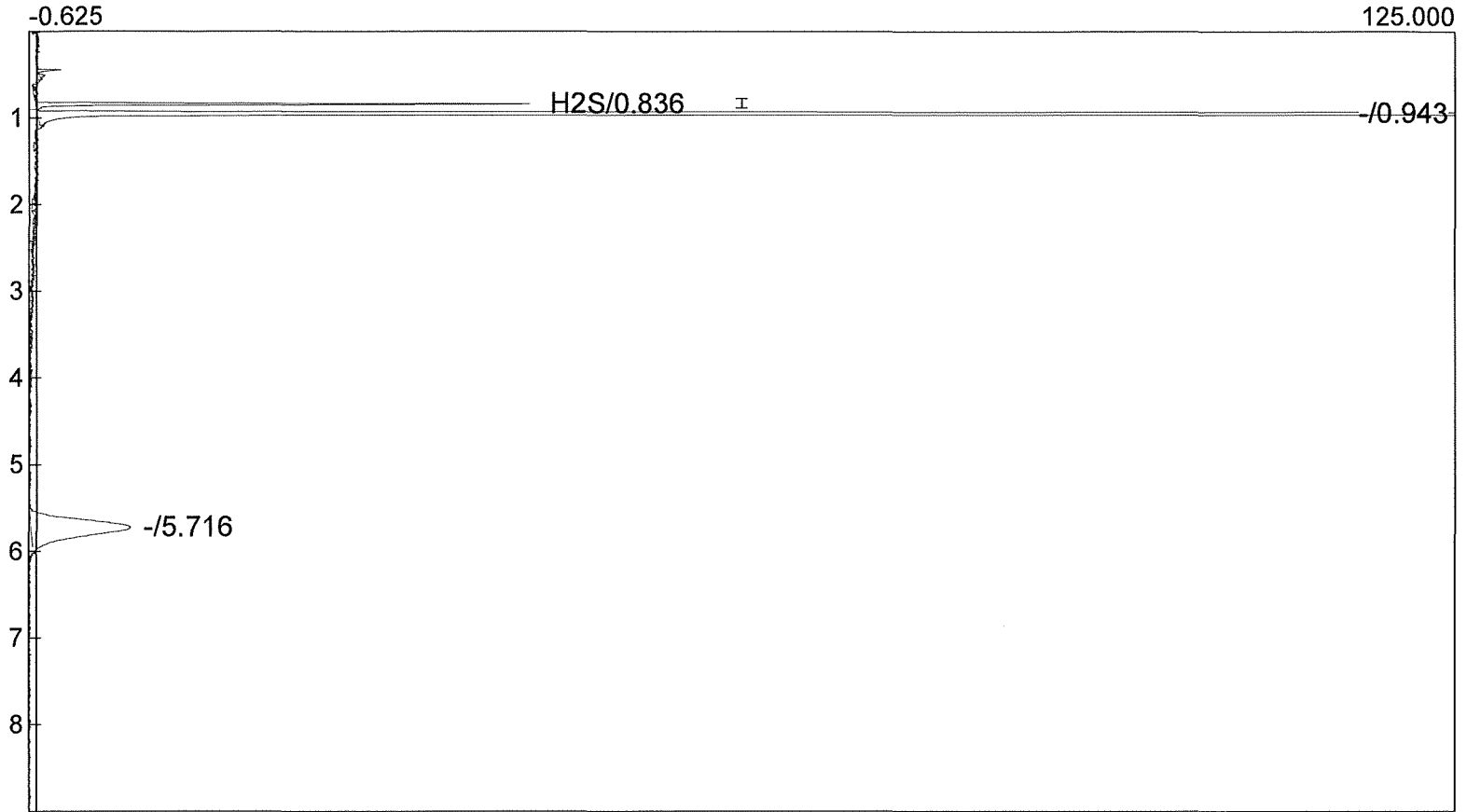
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 15:40:52  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	51.8529
		51.8529

# Run Chromatogram

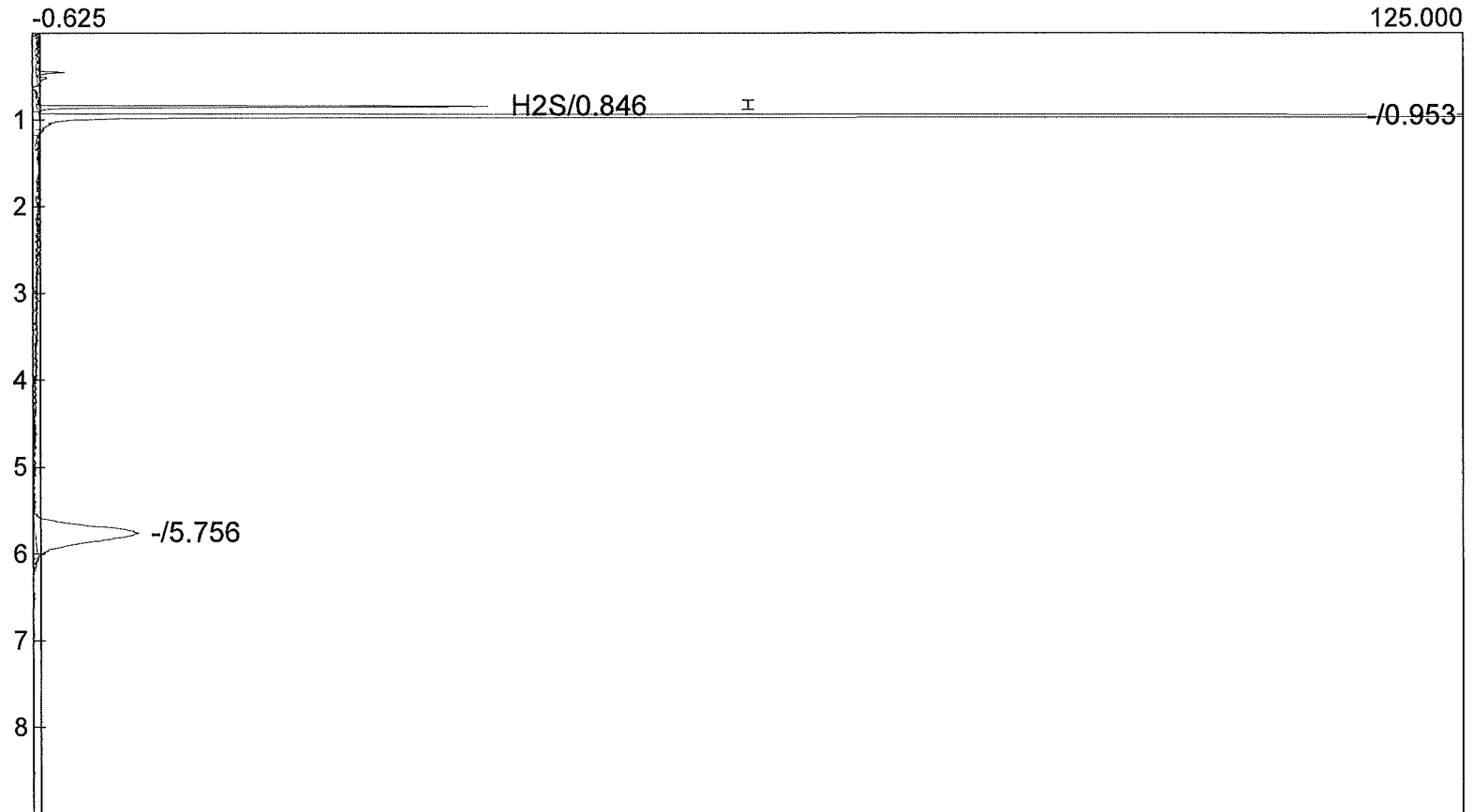
Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 15:50:52  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.836	48.4417
		48.4417

# Run Chromatogram

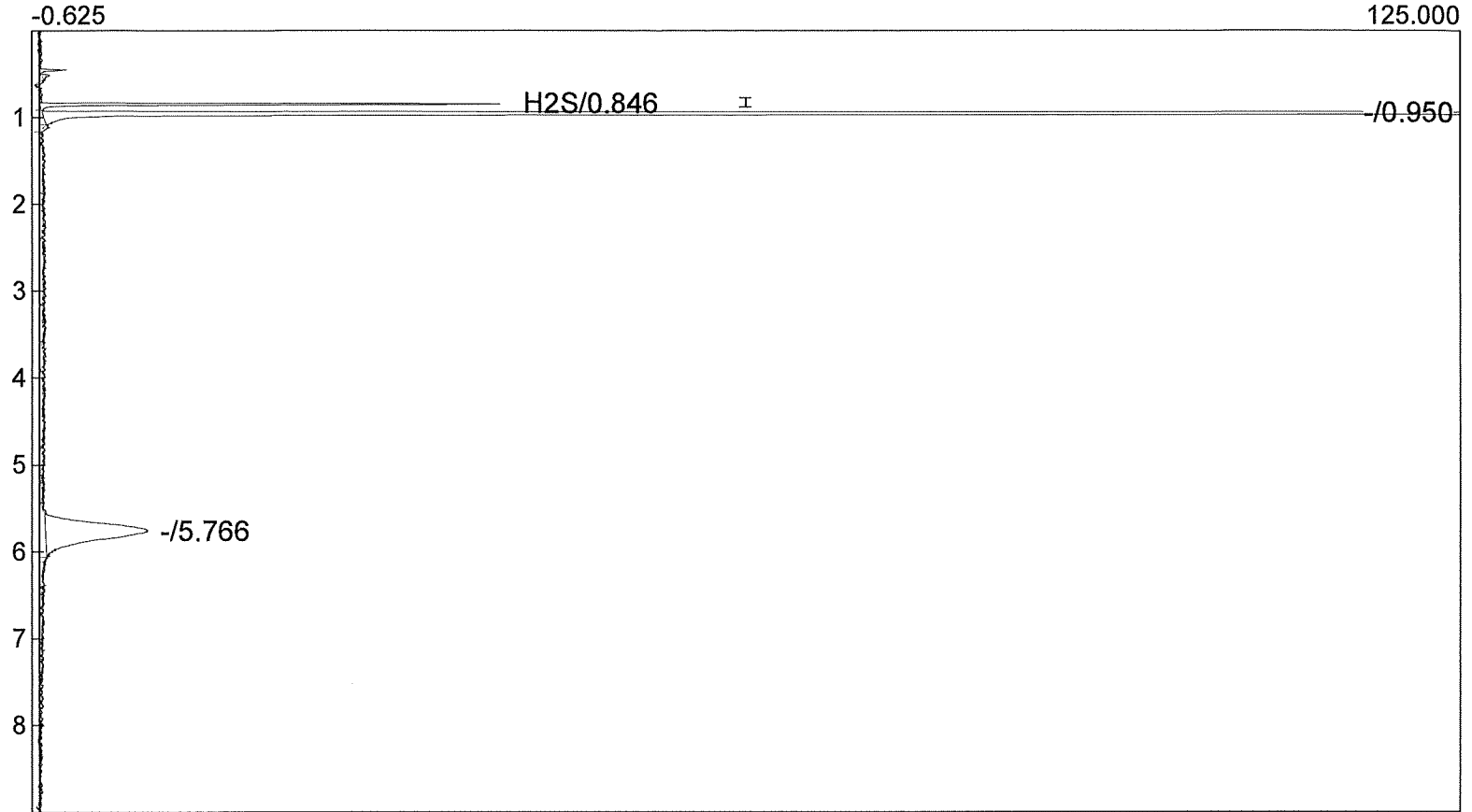
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 16:00:53  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	44.6750
		44.6750

# Run Chromatogram

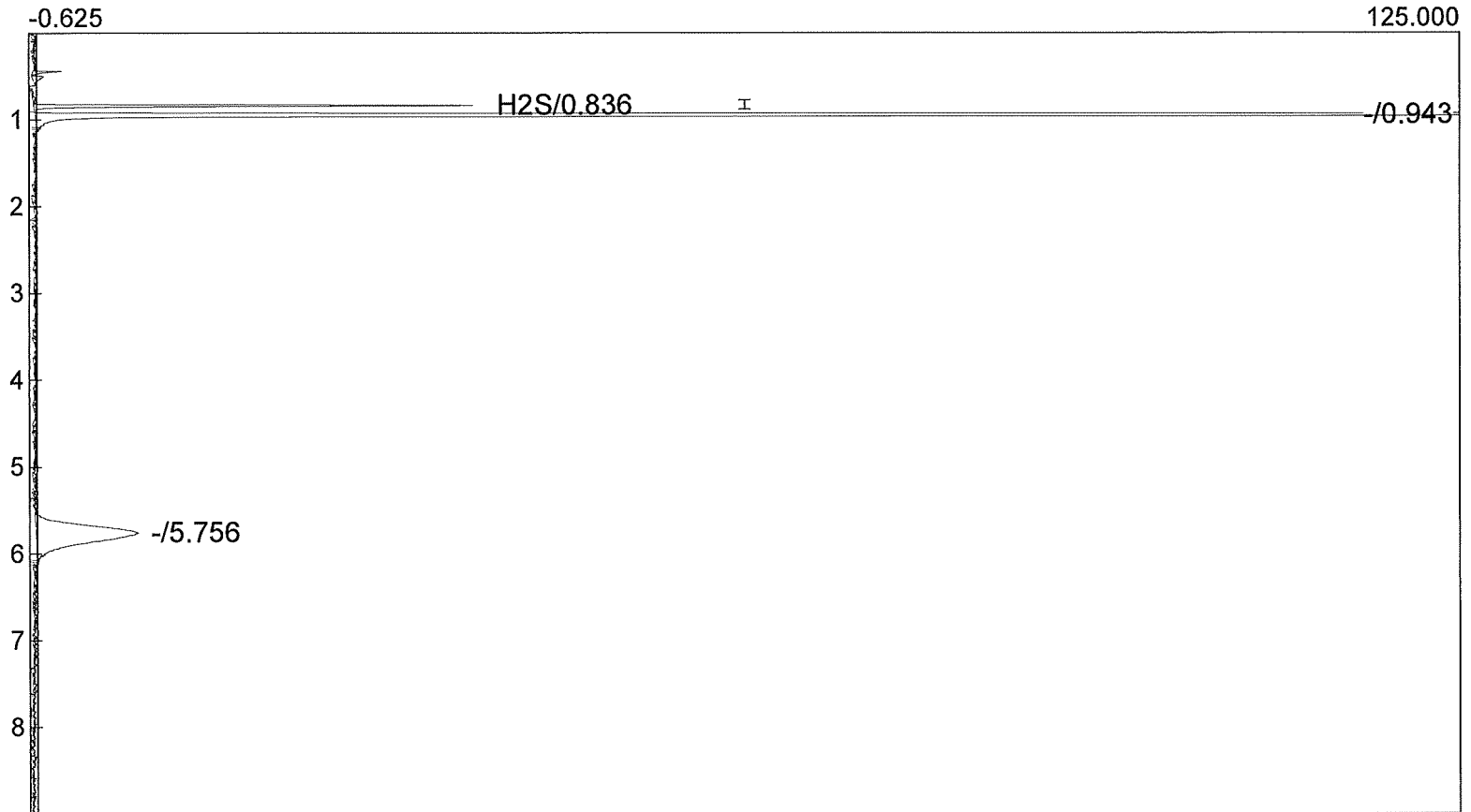
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 16:10:53  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.846	45.7573
		45.7573

# Run Chromatogram

Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 16:20:53  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison

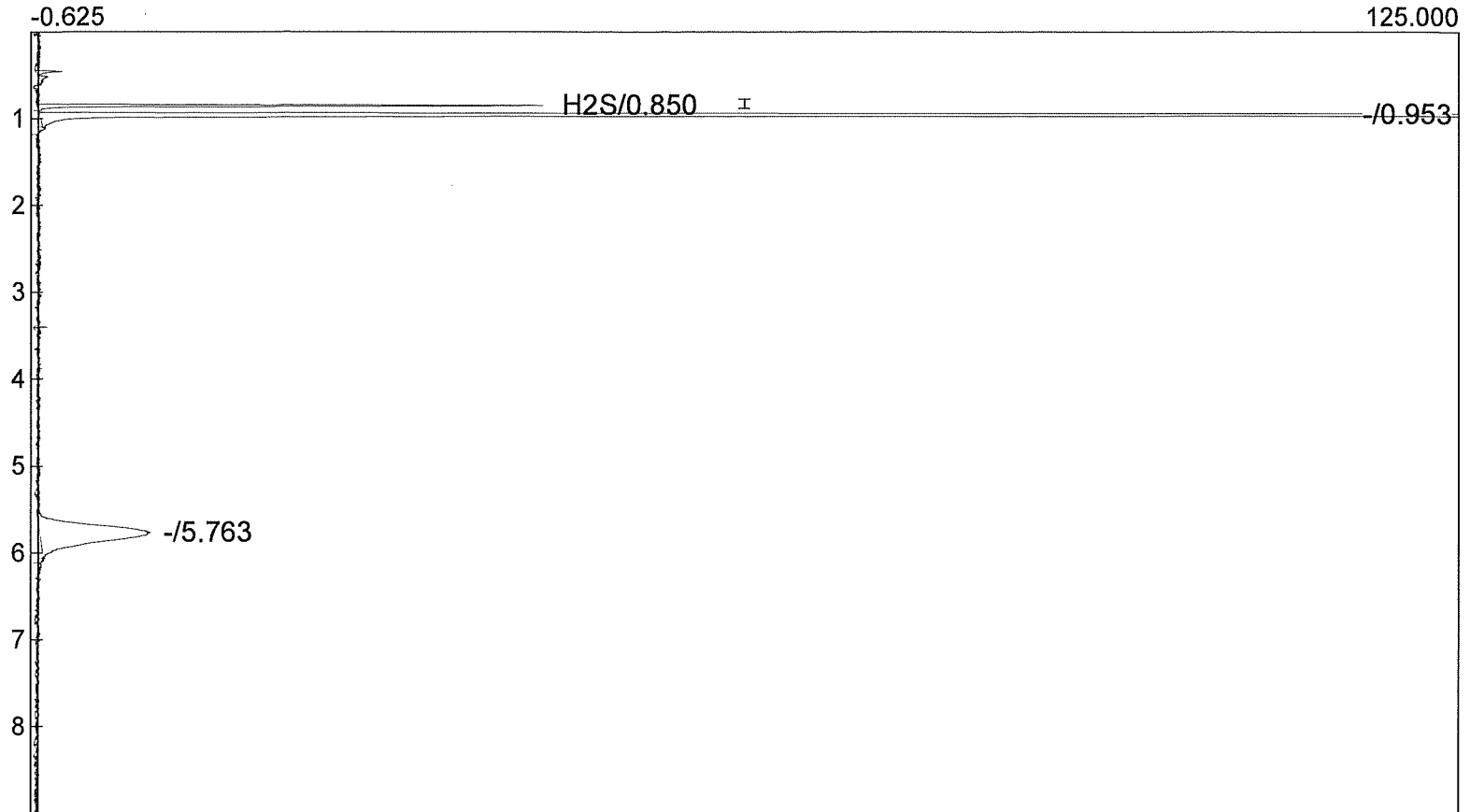


Component	Retention	Area
H2S	0.836	43.5892
		43.5892

# Run Chromatogram



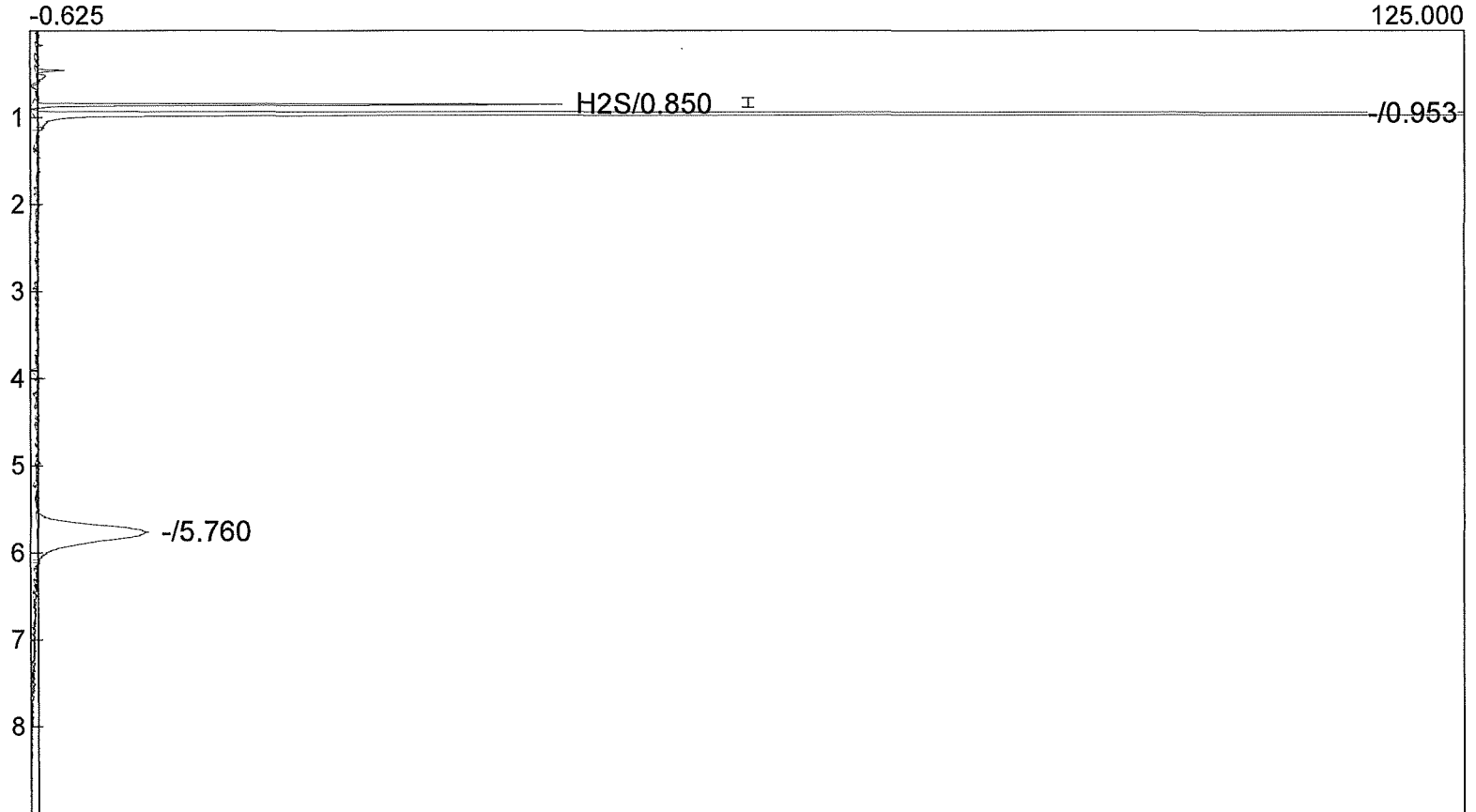
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 16:30:53  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.850	50.3577
		50.3577

# Run Chromatogram

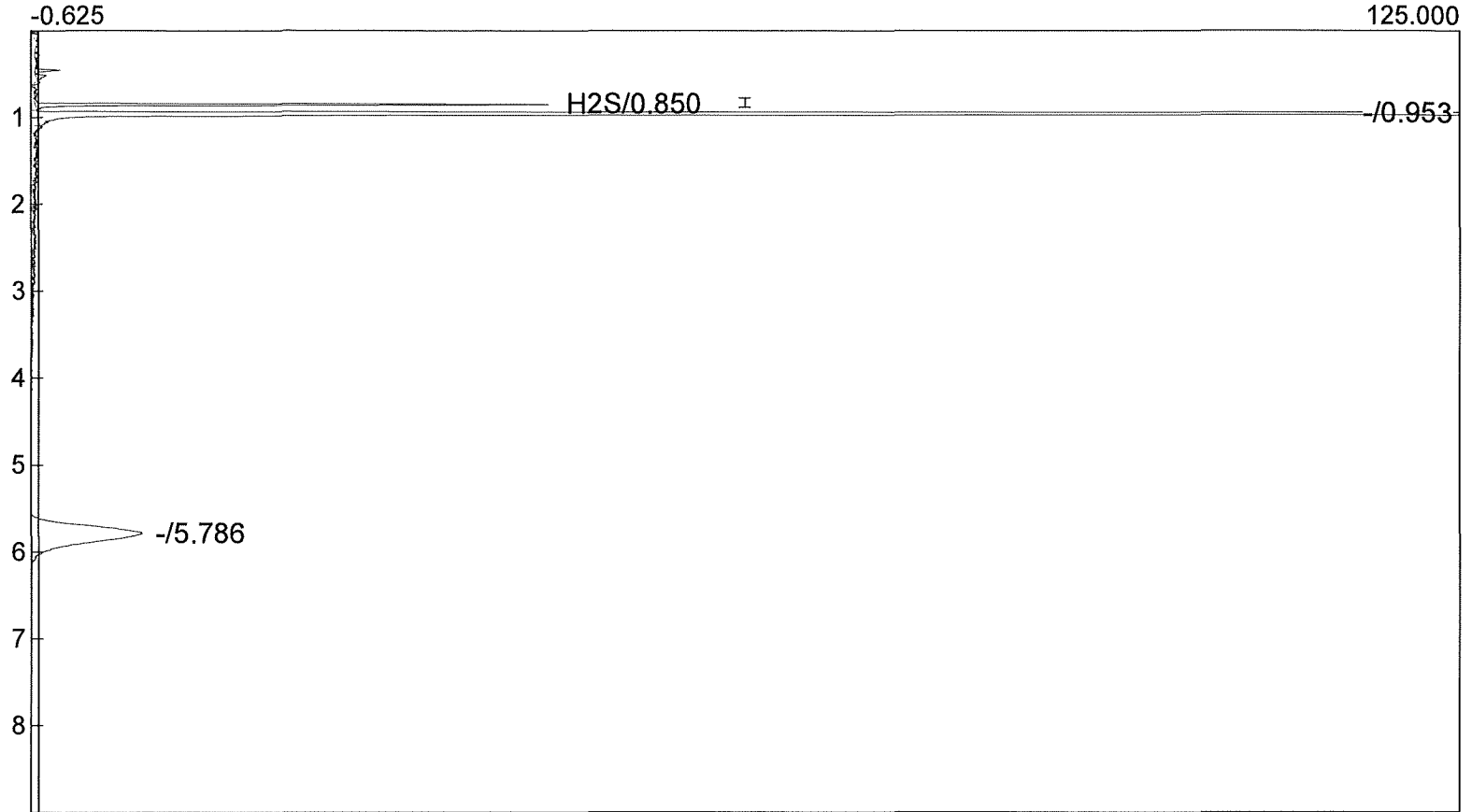
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 16:40:53  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.850	55.2954
		55.2954

# Run Chromatogram

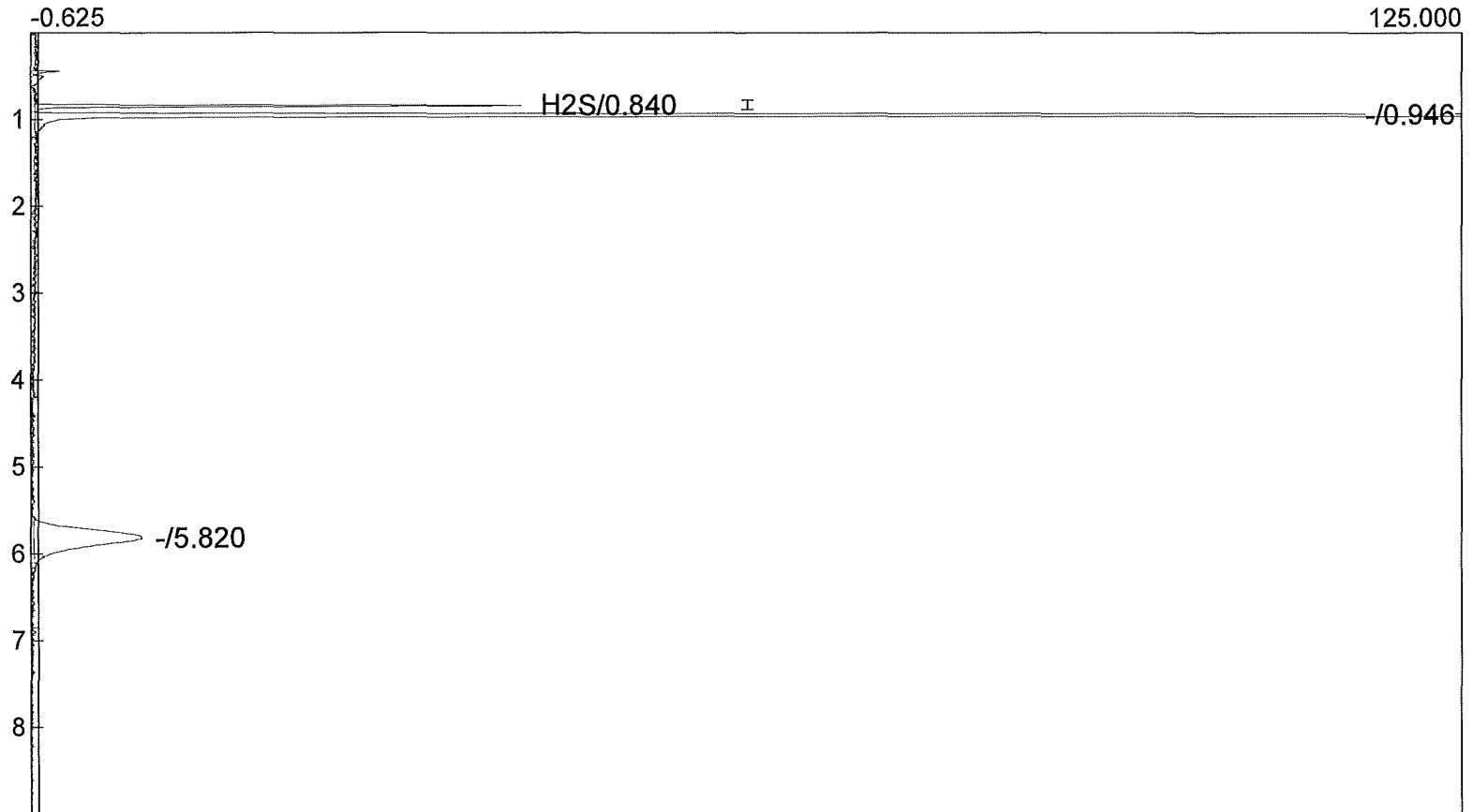
Lab name: Erthwrks  
Client: Marathon Detroit  
Analysis date: 06/02/2022 16:50:53  
Method: Direct Injection  
Description: 9049.1.B3  
Column: 30RTU-Bond+60MTX  
Carrier: H2@25 psi  
Sample: West Plant FG  
Operator: Luke Morrison



Component	Retention	Area
H2S	0.850	51.7154
		51.7154

# Run Chromatogram

Lab name: Erthwrks  
 Client: Marathon Detroit  
 Analysis date: 06/02/2022 17:00:53  
 Method: Direct Injection  
 Description: 9049.1.B3  
 Column: 30RTU-Bond+60MTX  
 Carrier: H2@25 psi  
 Sample: West Plant FG  
 Operator: Luke Morrison



Component	Retention	Area
H2S	0.840	49.2182
		49.2182

# Run Chromatogram