

9/11/15

Mr. Craig Snyder
Mr. Mitch Little
Hellman & Associates
11913 W Interstate 70 Frontage Rd N
Wheat Ridge, CO 80033

H2S Analysis by GC-FPD

Dear Mr. Little & Mr. Snyder,

APT Laboratory Services was delivered three gas phase samples in foil lined Tedlar bags on September 4, 2015. An H2S analysis was performed by APT on September 8, 2015, utilizing a modified ASTM Method D5504. A three-point calibration was performed on a HP 5890 gas chromatograph equipped with a flame photometric detector. Samples were analyzed in triplicate for hydrogen sulfide and a post calibration check was performed to show the stability of the instrument. All calibrations and sample results are enclosed. A summary of the results is shown below.

Hellman & Associates – H2S by GC-FPD, September 8, 2015	
Sample	H2S Conc. (ppm)
Wildhorse 16-42H Wellhead 090215	11.8
Two Mile 15-1033H Heater Treater 090315	40.8
Two Mile 15-1033H Wellhead 090315	123.3

Modified ASTM D5504 Results

We look forward to being of service to Hellman & Associates in the future. Please call me with any questions or comments at (303) 420-5949 or (800) 268-6213.

Regards,



Daniel Williams
Asst Director of Laboratory Services

APT Project: LWTO5110

Hellman & Associates
Wheat Ridge, CO
9/8/2015

EPA Method 18: Determination of Gaseous Organic Compounds using Gas Chromatography

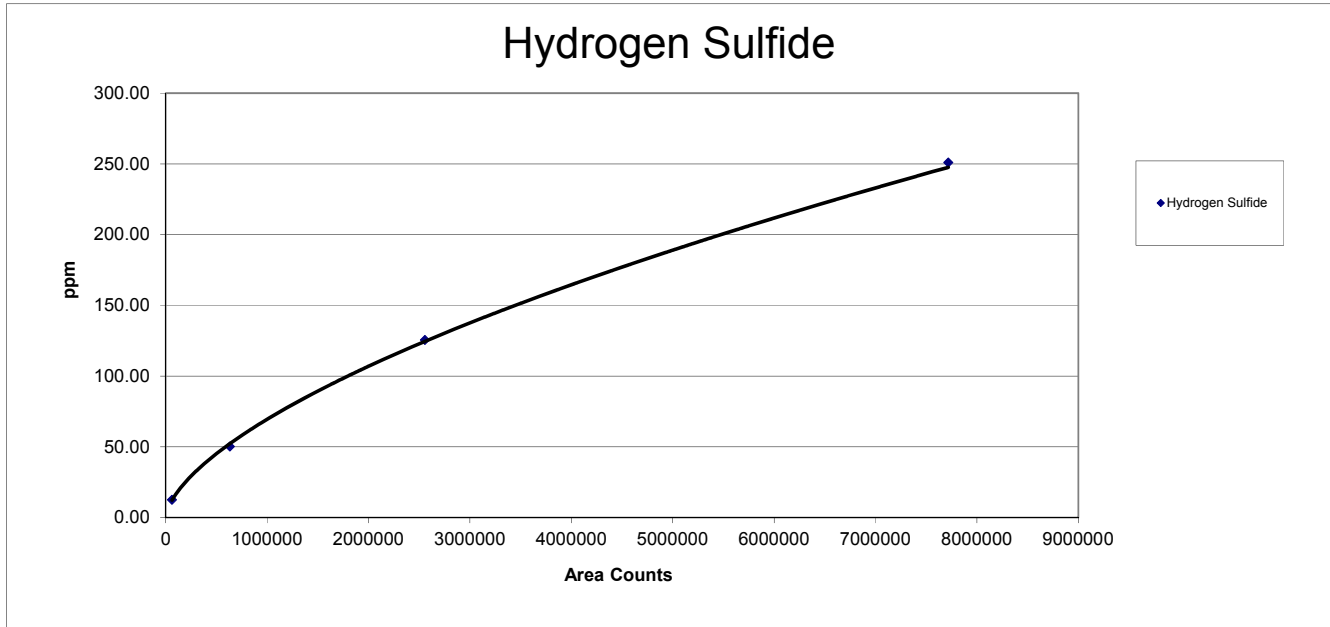
Initial Three-Point Calibration											
Low Level Calibration Standard											
Cpd ID	Conc. (ppm)	Inj. 1		Inj. 2		Inj. 3		Average		OK?	
		RT	AC	RT	AC	RT	AC	RT	AC		
Hydrogen Sulfide	12.55	2.466	62335.8	2.469	63329.9	2.458	59382.3	2.464	61683	Y	
Low-Mid Level Calibration Standard											
Cpd ID	Conc. (ppm)	Inj. 1		Inj. 2		Inj. 3		Average		OK?	
		RT	AC	RT	AC	RT	AC	RT	AC		
Hydrogen Sulfide	50.20	2.456	652270.0	2.457	622394.7	2.463	623235.3	2.459	632633	Y	
High-Mid Level Calibration Standard											
Cpd ID	Conc. (ppm)	Inj. 1		Inj. 2		Inj. 3		Average		OK?	
		RT	AC	RT	AC	RT	AC	RT	AC		
Hydrogen Sulfide	125.50	2.441	2463766.0	2.447	2538200	2.45	2663821.8	2.446	2555263	Y	
High Level Calibration Standard											
Cpd ID	Conc. (ppm)	Inj. 1		Inj. 2		Inj. 3		Average		OK?	
		RT	AC	RT	AC	RT	AC	RT	AC		
Hydrogen Sulfide	251.00	2.431	7374626.5	2.439	7655709	2.439	8121704.0	2.436	7717347	Y	

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Power Regression Calculations
conc = A * area^B

Hydrogen Sulfide					
Certified ppm	Average AC	Power Regression Statistics			ppm from curve
		R ²	A	B	
12.55	61683	0.9999	0.012975	0.6215	12.31
50.20	632633				52.30
125.50	2555263				124.55
251.00	7717347				247.55





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Sample Analysis										
Wildhorse 16-42H Wellhead 090215										
Cpd ID	Inj. 1		Inj. 2		Inj. 3		Average			
	RT	AC	RT	AC	RT	AC	RT	AC	OK?	ppm
Hydrogen Sulfide	2.479	56666.3	2.481	60121.8	2.47	54894.9	2.477	57228	Y	11.75
Two Mile 15-1033H Heater Treater 090315										
Cpd ID	Inj. 1		Inj. 2		Inj. 3		Average			
	RT	AC	RT	AC	RT	AC	RT	AC	OK?	ppm
Hydrogen Sulfide	2.480	427178.7	2.483	439725.6	2.487	406554.5	2.483	424486	Y	40.82
Two Mile 15-1033H Wellhead 090315										
Cpd ID	Inj. 2		Inj. 3		Inj. 4		Average			
	RT	AC	RT	AC	RT	AC	RT	AC	OK?	ppm
Hydrogen Sulfide	2.492	2505512.7	2.49	2550973	2.488	2487482	2.490	2514656	Y	123.31



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Quality Assurance														
Recovery / Spike (mid-level calibration gas to the sample probe)														
Cpd ID	Conc. (ppm)	Inj. 1		Inj. 2		Inj. 3		Average			Triplicate OK?	Recovery OK?	Audit OK?	
		RT	AC	RT	AC	RT	AC	RT	AC	ppm				
Hydrogen Sulfide	50.20	2.488	679359.5	2.496	698221.8	2.496	680063.5	2.493	685882	55.00	Y	Y	Y	

