



dig
Dolan Integration Group

Geochemistry for Energy

11025 Dover Street Unit 800
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p: 303.531.2030

Hydrocarbon Gas Composition and Stable Isotopes Data and Interpretation

Job #: 240912516
Lab #: DIG-037188
Client: Olsson
Well Name: SCMW_092624
API #:

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SAMPLE INFORMATION						COMPLETE GAS ANALYSIS														HYDROCARBON GAS ANALYSIS (normalized to total HC content)										BTU CONTENT*
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	GC Date	N ₂ ppm	O ₂ + Ar ppm	CO ₂ ppm	C ₁ ppm	C ₂ ppm	C ₃ ppm	iC ₄ ppm	nC ₄ ppm	iC ₅ ppm	nC ₅ ppm	C ₆ + ppm	C ₂ H ₄ ppm	He ppm	H ₂ ppm	C ₁ mol%	C ₂ mol%	C ₃ mol%	iC ₄ mol%	nC ₄ mol%	iC ₅ mol%	nC ₅ mol%	C ₆ + mol%	Total Gas BTU/ft ³	
240912516	DIG-037188	SCMW_092624 Gas	Gas	09/26/24	10:30	10/4/2024	409495	108635	1385	372603	58789	25511	3425	6348	1373	974	199			41270	79.4	12.53	5.44	0.73	1.35	0.29	0.21	0.04	594	

SAMPLE INFORMATION						HYDROCARBON RATIOS				STABLE ISOTOPE ANALYSIS										Comments
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	Total HC ppm	Wetness % C ₂ to C ₆	C ₁ /C ₂ +C ₃ mol/mol	Balance Ratio C ₁ +C ₂ /C ₁ -C ₂	Mass Spec Date	δ ¹³ C ₁ ‰ VPDB	δ ¹³ C ₂ ‰ VPDB	δ ¹³ C ₃ ‰ VPDB	δ ¹³ iC ₄ ‰ VPDB	δ ¹³ nC ₄ ‰ VPDB	δ ¹³ iC ₅ ‰ VPDB	δ ¹³ nC ₅ ‰ VPDB	δ ¹³ CO ₂ ‰ VPDB	δD ‰ VSMOW	
240912516	DIG-037188	SCMW_092624 Gas	Gas	09/26/24	10:30	469222	20.6	4.4	11.5	10/5/2024	-46.6	-32.5	-28.9	-27.2						-257

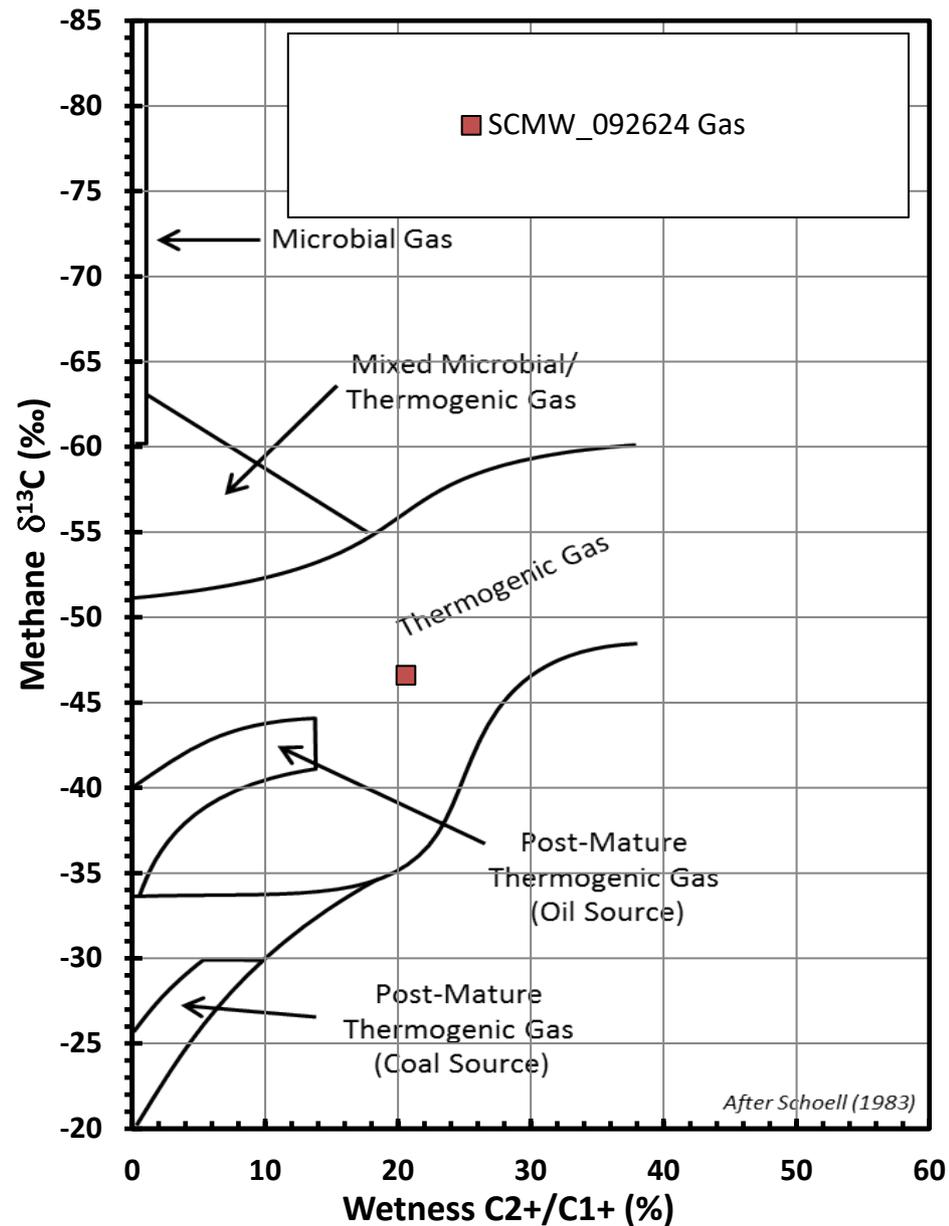
Stable isotope results based on multi-point laboratory calibration
 Values in red represent low signal; interpret with caution
 Precision δ13C < 0.5 ‰
 Precision δD < 5 ‰

SPECIFIC GRAVITY*	
Total Gas Spec Grav	0.860
HCs only Spec Grav	0.708

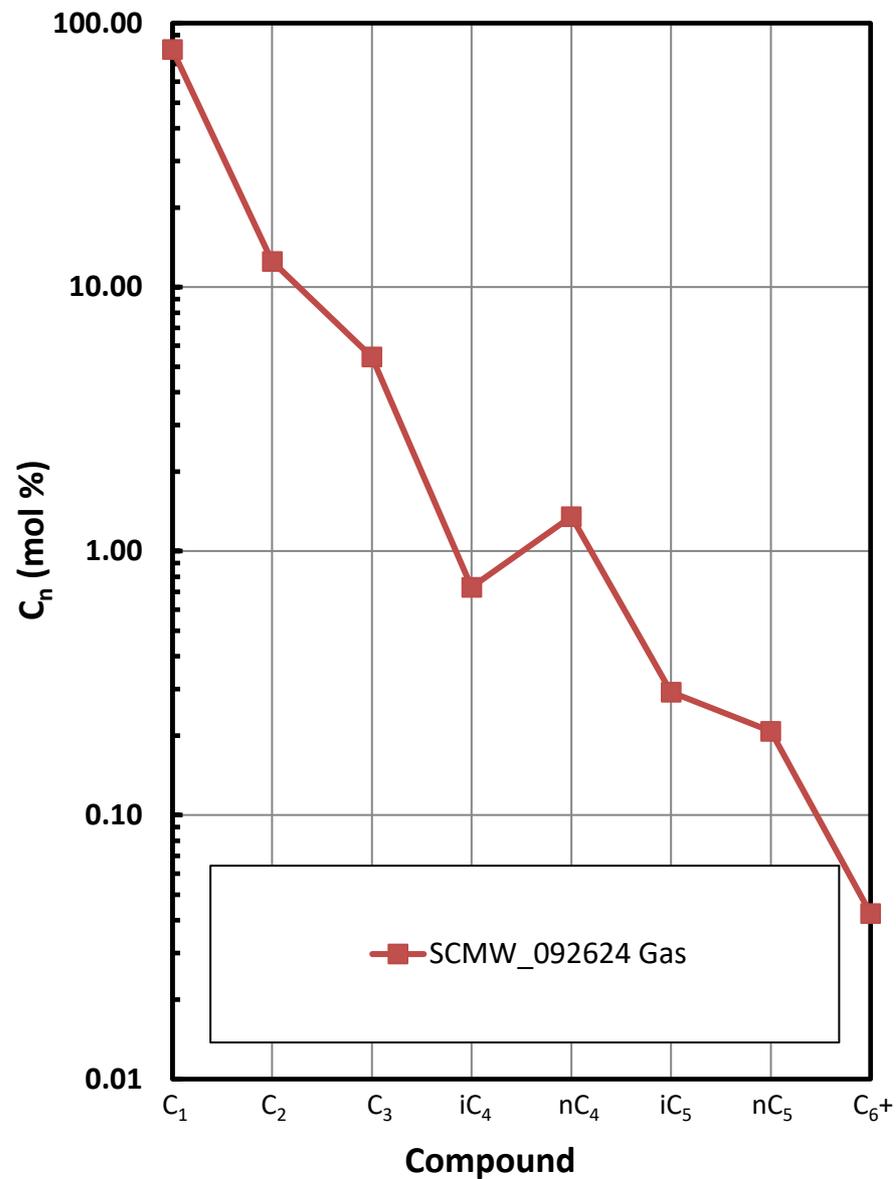
* As ideal gas, with gas concentrations normalized to 100%; calculations based on GPA 2145-09 physical constants.

INTERPRETIVE PLOTS

Methane $\delta^{13}\text{C}$ vs Wetness Genetic Classification Plot

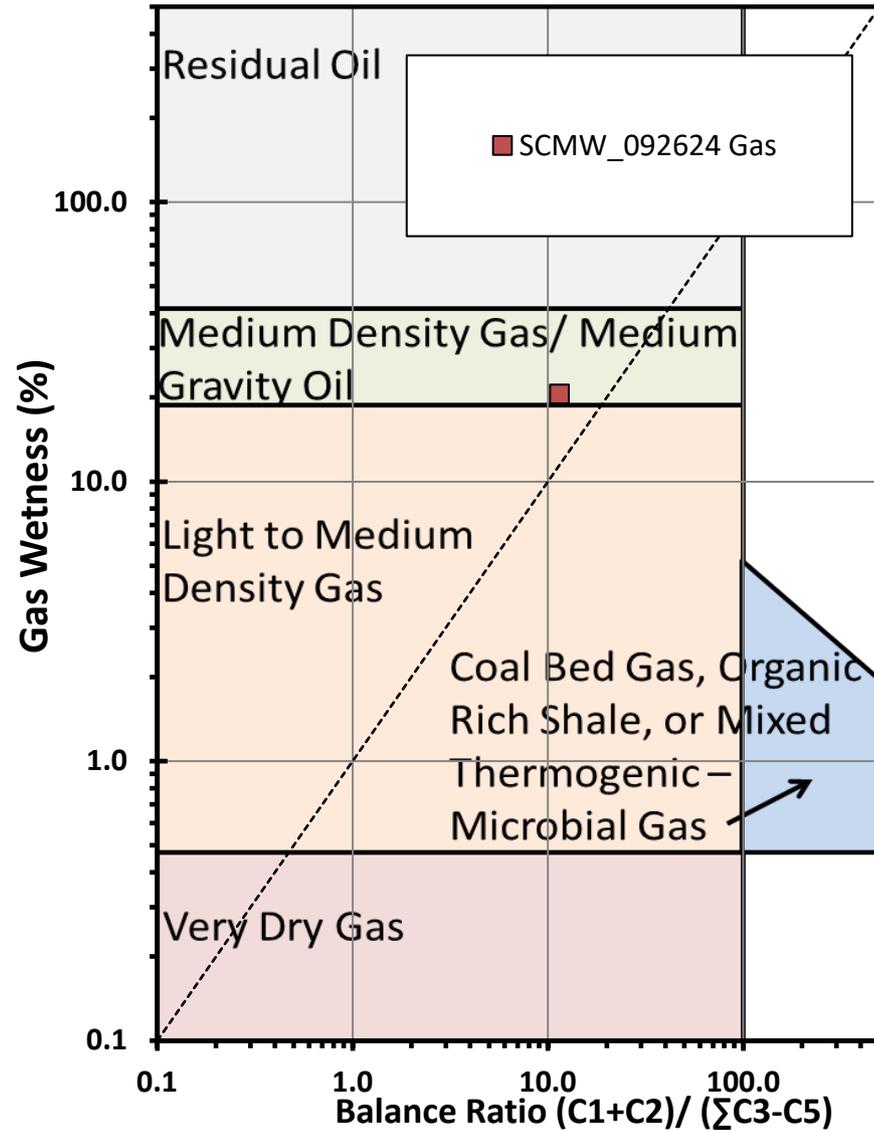


Hydrocarbon Composition Plot

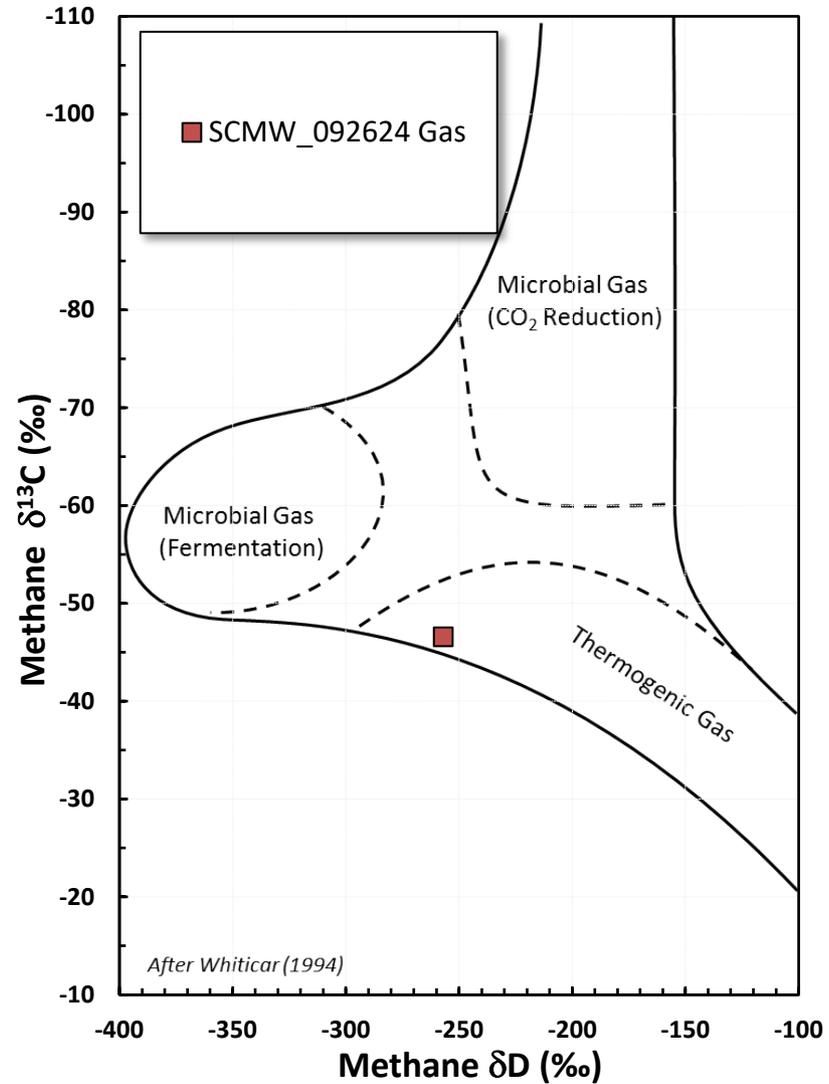


INTERPRETIVE PLOTS

Haworth Ratio Plot - Characterization of Hydrocarbon Type

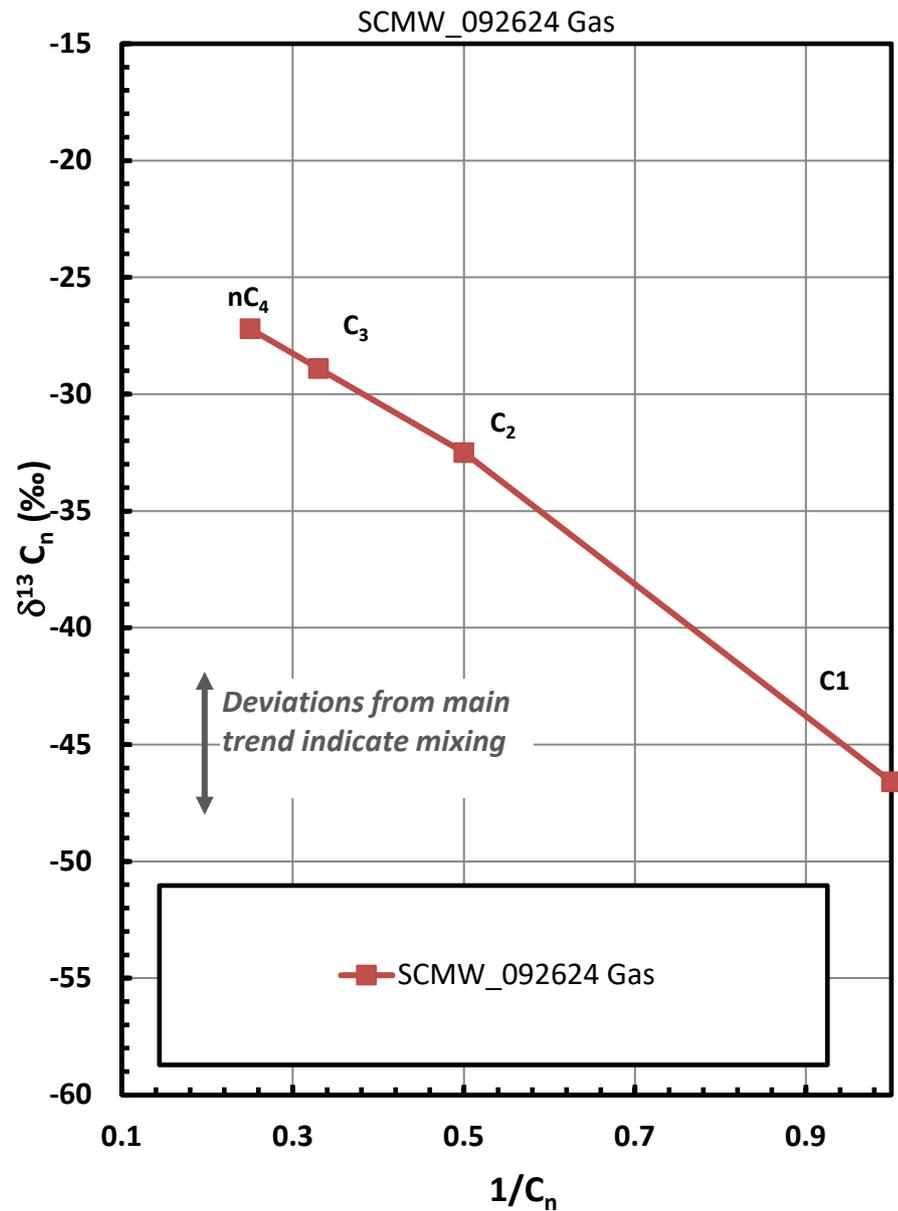


Methane $\delta^{13}\text{C}$ vs δD Genetic Classification Plot

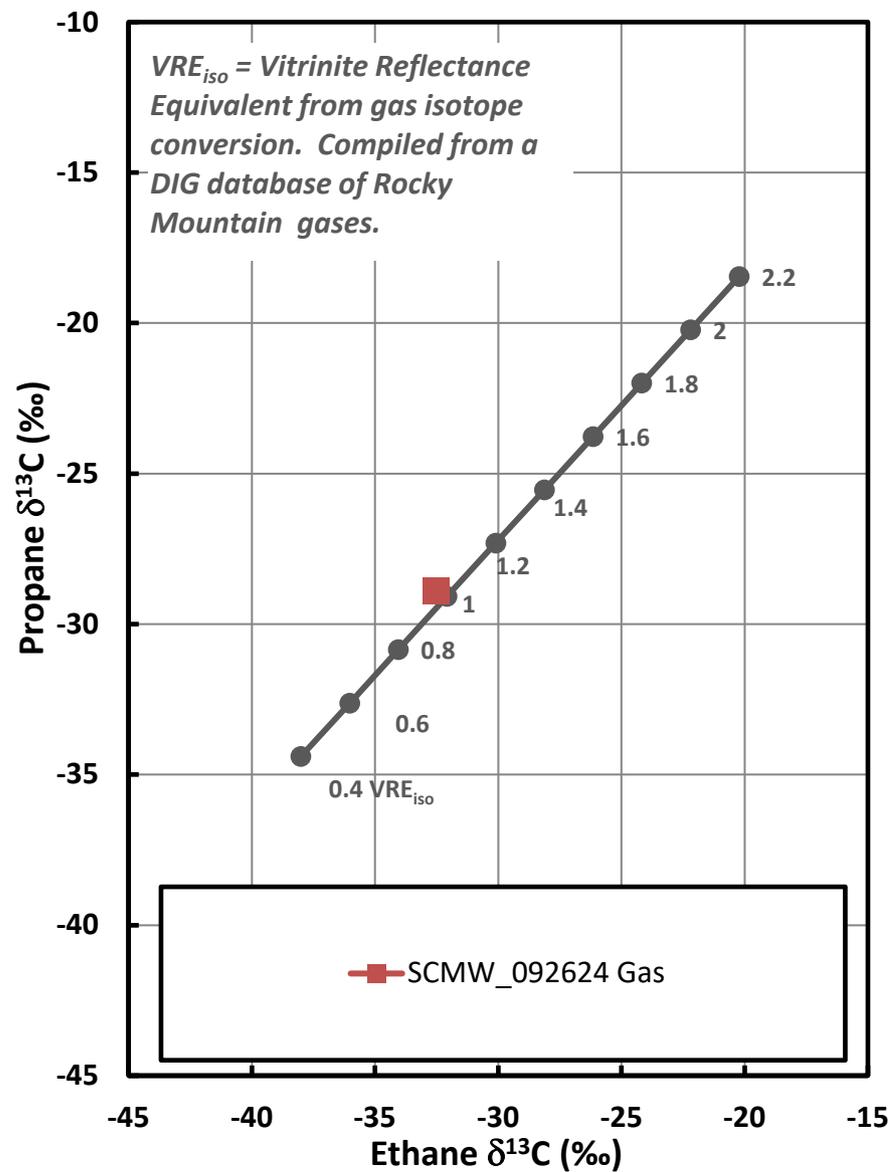


INTERPRETIVE PLOTS

Mixing Plot

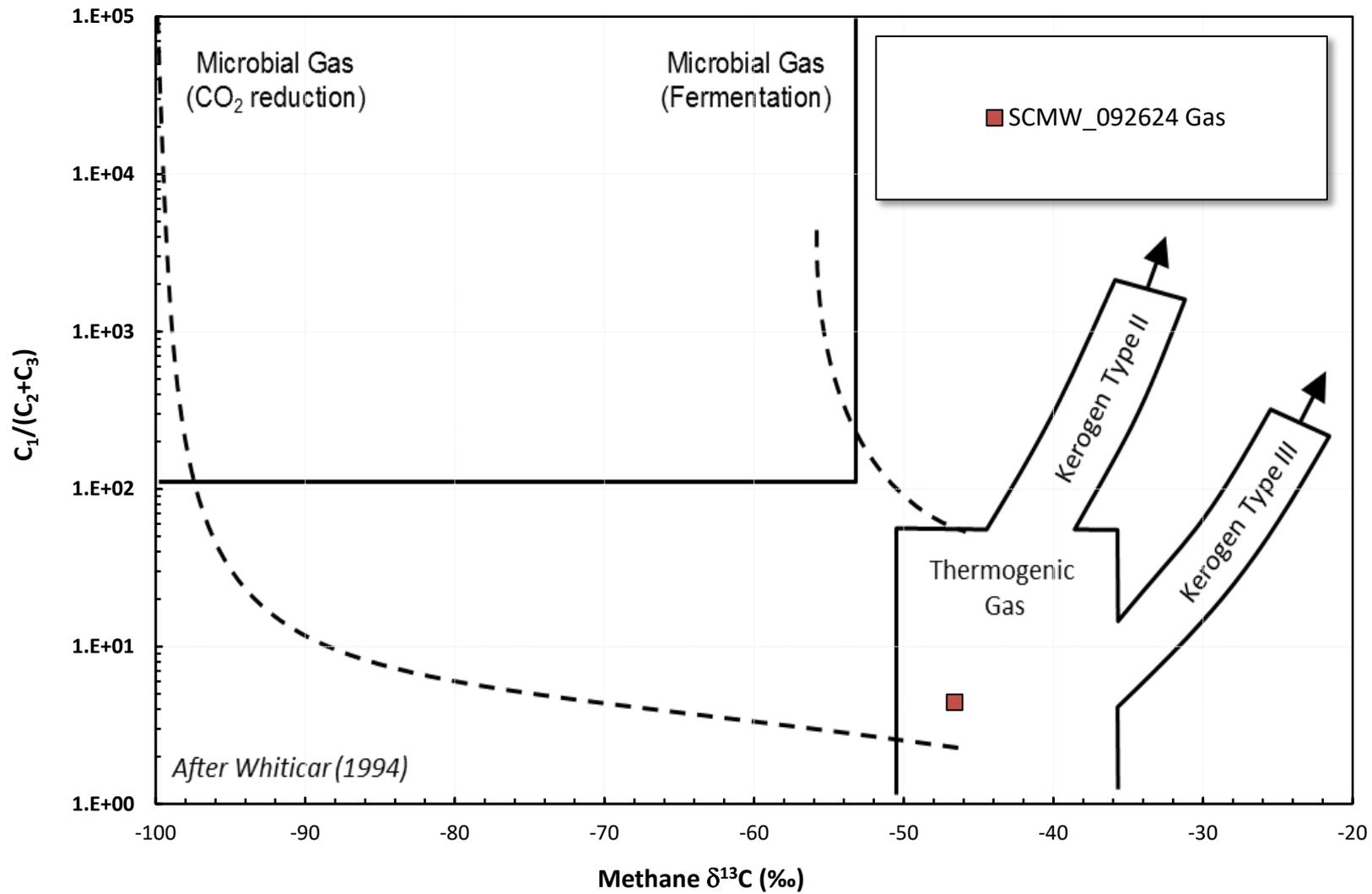


Ethane - Propane Maturity Plot



INTERPRETIVE PLOTS

Methane $\delta^{13}\text{C}$ vs $\text{C}_1/(\text{C}_2+\text{C}_3)$ Genetic Classification Plot





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Send Data to:	Send Invoice to (if different):	Additional Information:
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Address: 1525 Raleigh Street, Suite 400	Address:	PO #:
City, State: Denver, CO 80203	City, State:	Location: Greeley, CO
Phone: 303-503-5140	Phone:	Sampled By: TWatne
Email: twatne@olsson.com	Email:	API #:

Turnaround Time**:

Standard (≤ 10 Business days)
 Rush (≤ 5 Business days)
 Expedited Rush (≤ 3 Business days)

Container Number	Sample Identification	Date Sampled	Time	Sample Type*	Gas Composition	d13C of Methane (C1)	d13C of Ethane (C2)	d13C of Propane+ (C3+)	d13C of Carbon Dioxide (CO2)	dD of Methane (C1)	Whole Oil Gas Chromatography	d18O and dD Isotopes of Water	RSK-175 Dissolved Gas Quantification
	SCMW 092624	09/26/24		Other	<input checked="" type="checkbox"/>								
				Other									
				Other									
				Other									
				Other									
				Other									
				Other									
				Other									
				Other									

Chain of Custody Record

Comments:

Relinquished by Signature	Company	Date	Time	Received by Signature	Company	Date	Time
<i>Trent Watne</i>	Olsson	9/27/24	1113	<i>[Signature]</i>	DIG	9/27/24	1113

*Gas composition vs RSK-175 - Gas composition is a basic analysis of the concentration (ppm) of gases within the headspace of the sample (headspace is created at the lab). RSK-175 is a specific analysis technique combined with calculations to give the total dissolved gas of each species in the water sample (mg/L). Why one or the other? Gas composition gives us a quick, general look at relative concentrations and ratios (e.g., gas wetness). RSK-175 gives us an exact total of gas present in the sample (headspace and dissolved in the water). Questions? Give us a call at 303-531-2030.

** Rush and Expedited Rush turnaround time analysis will incur additional costs at 2x and 3x the standard turnaround time pricing.