
Well Inspection Report

Instructions

- Complete all pages.
- Sign and submit electronically within 30 days of the well inspection to orogo@gov.nt.ca.
- If you wish to submit a hard copy, please use the courier address at www.orogo.gov.nt.ca/contact-us.
- Refer to the [Well Suspension and Abandonment Guidelines and Interpretation Notes](#) (May 2022) for details on well inspection requirements.
- Report in metric units.

Required attachments:

- Photos of wellhead and well site (*Include descriptions*)
of photos attached: 4 (in GCHEM Report)
- Wellhead schematic
- Wellbore schematic

Well Information

Well name: L-44-60-10-117-15

4 digit WID: 1743

OROGO risk level: Level 2

Wellhead? Yes No

Pressure rating of all wellhead components:
900/1500 Ansi

Pumpjack? Yes No

Operator: Alvarez & Marsal Canada Inc., in its capacity as receiver of Strategic Oil & Gas's NWT Property
Well status: Suspended

Coordinates (*In decimal degrees; verified onsite*)
Datum: NAD 27 NAD 83 Unknown
Lat: Not Taken
Long: Not Taken

Completed in H₂S zone? Yes
 Estimated % of H₂S: ~2 or
 Measured % of H₂S: 0

Inspection Date and Contact Information

Date of inspection: 2022-09-15

Date of previous inspection: Unknown

Inspection conducted by:

Name: Brad Johnson
Company: G-Chem
Phone: 780-808-1927
Email: brad.johnson@gchem.ca

Environmental or Safety Concerns

(Report all incidents as required under section 75 of the Oil and Gas Drilling and Production Regulations)

Environmental or safety concerns? Yes No

If yes, provide details: [Click or tap here to enter text.](#)

Inspection Results

Site

Well site accessible for inspection and monitoring? Yes No

Equipment or debris on site? Yes No

Additional clean up required? Yes No

Provide details of all site accessibility concerns: This site is accessible with heavy equipment by winter access roads only. Year round access by Helicopter.

Brush cleared 25 m around wellhead?
 Yes No

Wind indicator present and functional?
 Yes No

Wellhead

Wellhead accessible for inspection and monitoring? Yes No

Valves chained and locked? Yes No

Valves operate freely? Yes No

Pressure test well head seal assembly?

Yes No

(If yes, provide details in comments section with supporting documentation)

Surface casing vent open, operable and accessible in all seasons? Yes No

Pumpjack secure? Yes No N/A

Visible marker or fence in place? Yes No
4-digit Well ID, operator and contact information up to date? Yes No

Date of previous well head seal assembly pressure test: Unknown

Surface Casing Vent Flow (SCVF) / Gas Migration (GM) testing

Evidence of SCVF? Yes No

SCVF test conducted? Yes No

(If yes, provide details in comments section with supporting documentation)

Signs of GM? Yes No

GM test conducted? Yes No

(If yes, provide details in comments section with supporting documentation)

Gas samples taken? Yes No
(If yes, provide details in comments section identifying location and anticipated date of submission of analysis to OROGO)

Shut-in pressures

Production casing pressure (kPa):
Not Taken for this Inspection

Intermediate casing pressure (kPa):
Not Taken for this Inspection

Production tubing pressures (kPa):
Not Taken for this Inspection

Any other readings taken:
[Click or tap here to enter text.](#)

Comments

- Details of: SCVF/ GM testing (*Include source: SCV, wellbore or soil vapour*)
 Shut-in pressures (*Include equipment used, results, any changes from previous inspections and previous inspection dates*)
 Seal assembly testing (*Include maximum pressure tested and duration of test*)
 Other comments

This inspection was specific to Gas Migration and SCVF testing; this was not a full wellsite inspection completed by A&M personnel.

Additional supporting documentation attached? Yes No

If yes, list attached documentation: GCHEM Report, Wellbore & Wellhead Schematic

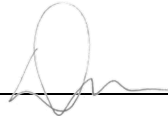
I certify based on personal knowledge of well inspection operations undertaken at the above named well that the above information is accurate.

Responsible Officer:

Date: 2022-11-15

Name: Duncan MacRae
Title: Vice President
Operator: Alvarez & Marsal Canada Inc., in its
capacity as receiver of Strategic Oil & Gas's
NWT Property

Signature:



Heli Source Ltd.

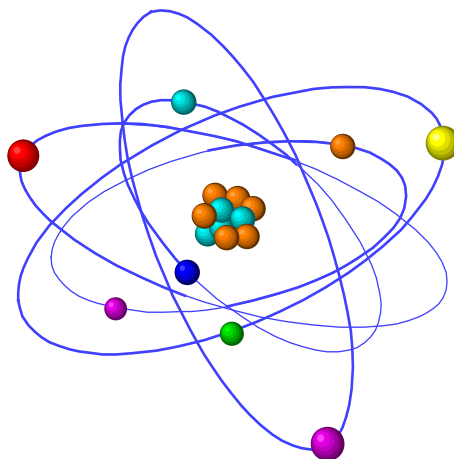
Work Order-Ref #: 22324

Vapor Intrusion Assessment (VIA)

Surface Casing Vent (SCV) Flow Test

Cameron Hills L-44

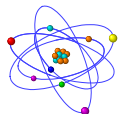
September 15, 2022



GCHEM Ltd.

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FORENSIC SOLUTIONS FOR ENERGY CHALLENGES

**1.0 Vapor Intrusions Assessment (VIA) Summary**

Operating Company: Not Provided
Well Name: L-44
UWI: 60-10N 117-30W

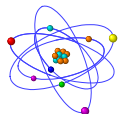
License Number: 1743
Test Date: September 15, 2022
GCHEM Project Number: 22324

1.1 Production Casing Assessment Summary Table

Combustible Gas (CH₄) (%LEL)	nm		
Hydrogen Sulphide (H₂S) Gas (ppm v/v)	nm		
PC Flow Rate (m³/day)	nm		
P-T Date Logger Installed	nm		
P-T Data Logger Removed	nm		
P-T Data Logger Test Duration	nm		
MAX Pressure (kPa)	nm		
Gas Spl. Collection-Measurement	Total Collected	Analysis Requested*	Classification**
PC Samples (Total)	0		
PC Combustible Gas Class. Level-1 (Chemical)		NA	NA
PC Combustible Gas Class. Level-2 (δ¹³C)		NA	NA
PC Combustible Gas Class. Level-3 (δD)		NA	NA
PC Combustible Gas Class. Level-4 (¹⁴C)		NA	NA

1.2 Surface Casing Vent Flow (SCVF) Assessment Summary Table

SCV Ten-Minute Bubble Test Result	PASS		
SCV Flow Rate (m³/day)	0		
SCV Pressure-Temp Logger Installed	NA		
SCV Pressure-Temp Data Logger Removed	NA		
SCV Shut-In Time (hrs)	NA		
SCV MAX-Recorded Build Up Pressure (kPa)	NA		
SCV Stabilized Build-up Pressure (kPa):	NA		
SCV Stabilized Build-up Time (hours)	NA		
SCV Standpipe Max CH₄ Content (ppm v/v):	1		
SCV Standpipe Max H₂S Content	<1		
SCV Gas Spl. Collection-Measurement	Total Collected	Analysis Requested*	Classification**
SCV Samples (Total)	1		
SCV Combustible Gas Class. Level-1 (Chemical)		1	NON-IMPACTED
SCV Combustible Gas Class. Level-2 (δ¹³C)		NA	NA
SCV Combustible Gas Class. Level-3 (δD)		NA	NA
SCV Combustible Gas Class. Level-4 (¹⁴C)		NA	NA



1.3 Soils Outside Casing (AGM) Assessment Summary Tables

A) Non-Intrusive CH₄ Surface Soil Scan (PMD) (Figure-1 and Table-1)

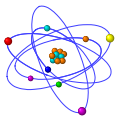
Well Casing Surface CH ₄ Test Sites	28
MAX Surface CH ₄ Reading	39 ppm v/v
MAX H ₂ S Well Soil Reading (ppm v/v)	<1
Number of Background Sites	1
MAX Background CH ₄ (ppm v/v)	1
Max H ₂ S BKG Soil Reading (ppm v/v)	<1
<hr/>	
Surface CH ₄ -PMD Gas Classification	NON-IMPACTED

B) Non-Intrusive Surface Enclosed Soil Vapor FLUX Chamber Test

Surface SV-FC CH ₄ Test Sites	nm		
MAX SV-FC CH ₄ Reading	nm		
<hr/>			
SV-FC Gas Spl. Collection-Measurement	Total Collected	Analysis Requested*	Test Site
SV-FC Samples (Total)	0		
SV-FC & Sites Requested for Level-1 Analysis		NA	NA
Combustible Gas Classification Level-1 (Chem.)		NA	
SV-FC & Sites Requested for Level-2 Analysis		NA	NA
Combustible Gas Classification Level-2 (δ ¹³ C)		NA	
SV-FC & Sites Requested for Level-3 Analysis		NA	NA
Combustible Gas Classification Level-3 (δD)		NA	
SV-FC & Sites Requested for Level-4 Analysis		NA	NA
Combustible Gas Classification Level-4 (¹⁴ C)		NA	

C) Intrusive Auger Test Holes with Soil Vapor Probes (Figure 2 and Table 2)

Number Soil Vapor Probe (SVP) Test Sites	14		
MAX SVP CH ₄ Reading (ppm v/v)	115000		
Max H ₂ S SVP Field Reading (ppm v/v)	<1		
Number SVP BKG Test Sites	1		
MAX SVP CH ₄ BKG Test Sites (ppm v/v)	134		
<hr/>			
SVPs Gas Spl. Collection & Measurement	Total Collected	Analysis Requested*	Test Site
Soil Vapor Probes (SVPs) AGM (Total)	4		
SVP & Sites Requested for Level-1 Analysis		4	N3, N5, S5 & W0.5
Combustible Gas Classification Level-1 (Chem.)		NON-IMPACTED	
SVP & Sites Requested for Level-2 Analysis		0	NA
Combustible Gas Classification Level-2 (δ ¹³ C)		NA	
SVP & Sites Requested for Level-3 Analysis		0	NA
Combustible Gas Classification Level-3 (δD)		NA	
SVP & Sites Requested for Level-4 Analysis		0	NA
Combustible Gas Classification Level-4 (¹⁴ C)		NA	



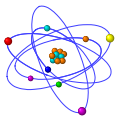
BKG Gas Spl. Collection-Measurement	Total Collected	Analysis Requested*	Test Site
BKG Soil Vapor Probe (SVPs) (Total)	1		
BKG & Sites Requested for Level-1 Analysis		1	BKG NW20
Combustible Gas Classification Level-1 (Chem.)			BASELINE
BKG & Sites Requested for Level-2 Analysis		0	NA
Combustible Gas Classification Level-2 ($\delta^{13}\text{C}$)			NA
BKG & Sites Requested for Level-3 Analysis		0	NA
Combustible Gas Classification Level-3 (δD)			NA
BKG & Sites Requested for Level-4 Analysis		0	NA
Combustible Gas Classification Level-4 (^{14}C)			NA

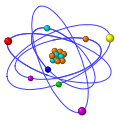
* Sample selection for chemical and isotope analysis (geochemical analytical suite) selected by client/operator.

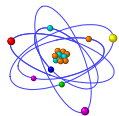
1.4 Interpreted Source of Migrating Gases

Sample Point	Geologic Formation	Depth Range	Source Depth
No samples submitted for stable isotope composition analysis.			







**3.0 Vapor Intrusion and Surface Casing Vent Flow Testing and Sampling Comments****Assessment-Collection Date: September 15, 2022**

- 1) The Surface Casing Vent passed the ten-minute bubble test (1 ppm v/v methane).
- 2) A surface combustible gas scan was performed near the wellbore using a Sensit Portable Methane Detector (PMD). Most readings were low, but some were elevated (i.e. up to 39 ppm v/v methane at N3) compared to background (1 ppm v/v) established 20m northwest from the wellbore (Figure 1, Table 1).
- 3) An intrusive soil gas migration test was then performed by drilling test holes and inserting Soil Vapor Probes (SVPs). Combustible gas readings in the SVPs were elevated (up to 11500 ppm v/v at N5), compared to the background probe (1 ppm v/v methane) installed approximately 20m northwest of the wellbore to establish background levels in the area and for comparison to other samples collected during this investigation (Figure 2, Table 2).
- 4) Four soil gas samples from SVPs (N3, N5, S5 & W0.5) and gases from background (BKG NW20) were collected, contained, and preserved for geochemical analysis and characterization, classification, geologic origin (source) and depth measured from the KB (Table 3).
- 5) C₂ + light alkane gas levels in soil gases collected near the wellbore are low, comparable to background established 20m east of the wellbore (Figure 3). Elevated combustible gas readings in the soils are the result of the presence of biogenic methane (swamp gas).
- 6) C₆₊ contents in the soil samples are low and comparable to background levels (Figure 4).
- 7) This well does not contain evidence of SCVF or gas migration at the time of this investigation.

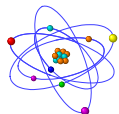


Figure 1. AGM Non-Intrusive Surface PMD

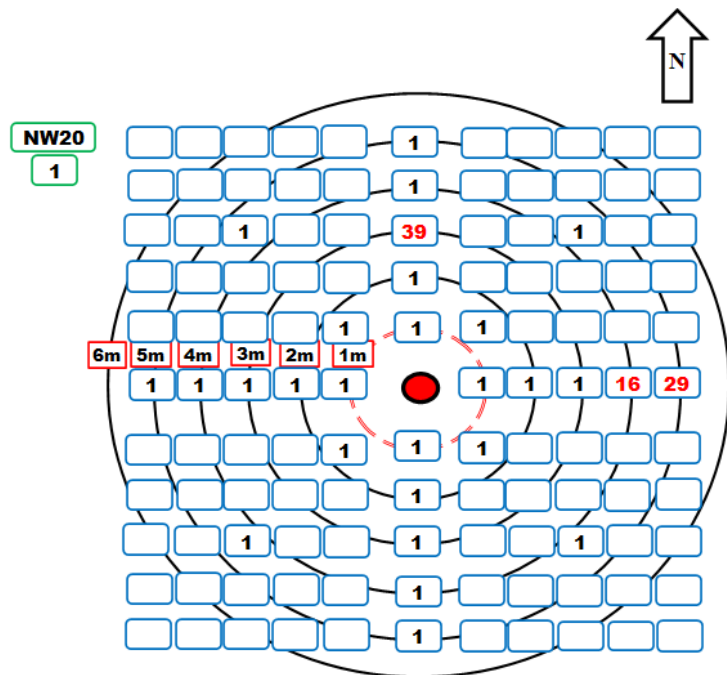


Figure 1A. Non-Intrusive CH₄ Surface Well Casing Detail VIEW

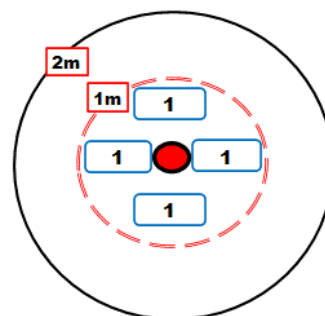


Table 1. AGM Non-Intrusive Surface PMD

WELL CASING (AGM) Non-Intrusive Surface PMD (CH ₄) Soil Scan											
Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (% Vol)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (% Vol)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (% Vol)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (% Vol)
N.5	1		E.5	1		S.5	1		W.5	1	
N1	1		E1	1		S1	1		W1	1	
N2	1		E2	1		S2	1		W2	1	
N3	39		E3	1		S3	1		W3	1	
N4	1		E4	16		S4	1		W4	1	
N5	1		E5	29		S5	1		W5	1	
N5-E1			E5-S1			S5-W1			W5-N1		
N4-E1			E5-S2			S4-W1			W5-N2		
N3-E1			E5-S3			S3-W1			W5-N3		
N2-E1			E5-S4			S2-W1			W5-N4		
N1-E1	1		E5-S5			S1-W1	1		W5-N5		
N1-E2			E4-S5			S1-W2			W4-N5		
N2-E2			E4-S4			S2-W2			W4-N4		
N3-E2			E4-S3			S3-W2			W4-N3		
N4-E2			E4-S2			S4-W2			W4-N2		
N5-E2			E4-S1			S5-W2			W4-N1		
N5-E3			E3-S1			S5-W3			W3-N1		
N4-E3			E3-S2			S4-W3			W3-N2		
N3-E3	1		E3-S3	1		S3-W3	1		W3-N3	1	
N2-E3			E3-S4			S2-W3			W3-N4		
N1-E3			E3-S5			S1-W3			W3-N5		
N1-E4			E2-S5			S1-W4			W2-N5		
N2-E4			E2-S4			S2-W4			W2-N4		
N3-E4			E2-S3			S3-W4			W2-N3		
N4-E4			E2-S2			S4-W4			W2-N2		
N5-E4			E2-S1			S5-W4			W2-N1		
N5-E5			E1-S1	1		S5-W5			W1-N1	1	
N4-E5			E1-S2			S4-W5			W1-N2		
N3-E5			E1-S3			S3-W5			W1-N3		
N2-E5			E1-S4			S2-W5			W1-N4		
N1-E5			E1-S5			S1-W5			W1-N5		

BACKGROUND Non-Intrusive Surface PMD (CH ₄) Soil Scan											
Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (%)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (%)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (%)	Test Site (m)	PMD CH ₄ (ppm v/v)	PMD CH ₄ (%)
NW20	1										

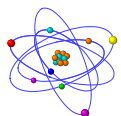


Figure 2. AGM Intrusive SVPs-

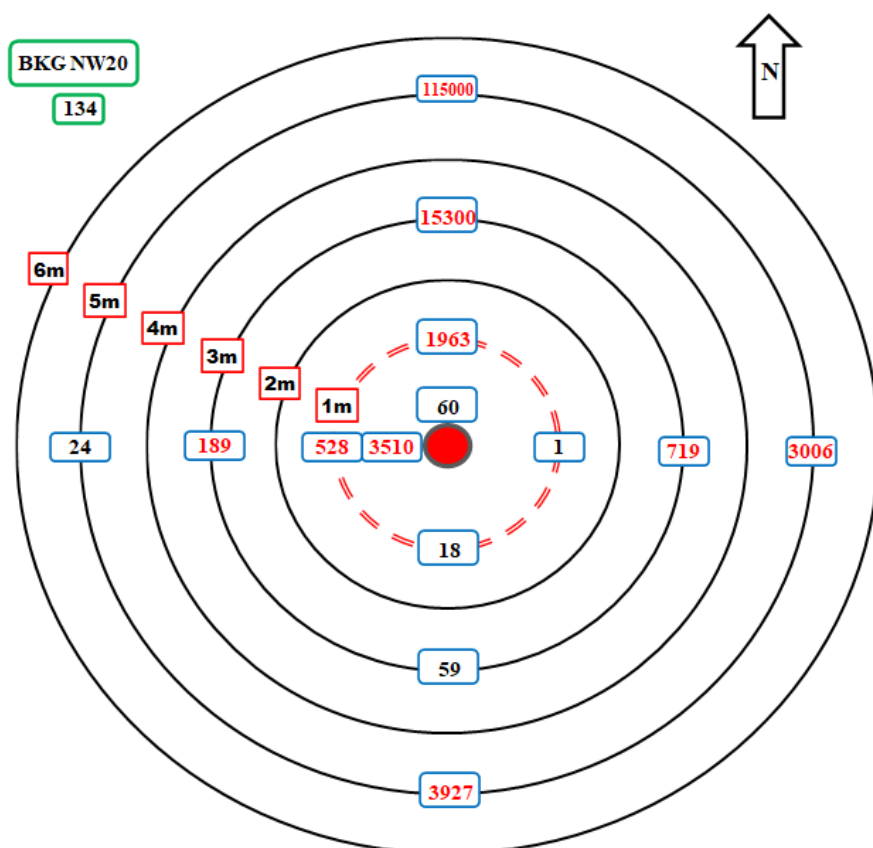


Table 2. AGM Intrusive SVPs

Intrusive AGM -Test Hole-Install Soil Vapor Probes (SVPs) ATM-Isolated

Test Site (m)	Soil Vapor Probes		Soil Parameters			Gas Sample (Y-N)
	IR-CH ₄ (ppm v/v)	H ₂ S (ppm v/v)	Type	Moist. (1-5)	HC-CONT (Y-N)	
N0.5	60	<1.0	Silt / Clay	5	Yes	No
N1	1963	<1.0	Silt / Clay	4	No	No
N3	15300	<1.0	Silt / Clay	4	No	Yes
N5	115000	<1.0	Silt / Clay	4	No	Yes
E1	1	<1.0	Silt / Clay	4	No	No
E2	719	<1.0	Silt / Clay	4	No	No
E3	3006	<1.0	Silt / Clay	4	No	No
S1	18	<1.0	Silt / Clay	4	No	No
S3	59	<1.0	Silt / Clay	3	No	No
S5	3927	<1.0	Silt / Clay	3	No	Yes
W0.5	3510	<1.0	Silt / Clay	5	Yes	Yes
W1	528	<1.0	Silt / Clay	4	No	No
W3	189	<1.0	Silt / Clay	3	No	No
W5	24	<1.0	Silt / Clay	3	No	No

Test Site (m)	Soil Vapor Probes		Soil Parameters			Gas Sample (Y-N)
	IR-CH ₄ (ppm v/v)	H ₂ S (ppm v/v)	Type	Moist. (1-5)	HC-CONT (Y-N)	
BKG NW20	134	<1.0	Silt / Clay	5	No	Yes

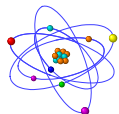


Table 3: High resolution molecular compositions of gas samples collected as part of the VIA Heli Source L-44.

Sample Point Date Collected	SCV Sept. 15-22 ppm v/v	N3 Sept. 15-22 ppm v/v	N5 Sept. 15-22 ppm v/v	W0.5 Sept. 15-22 ppm v/v	S5 Sept. 15-22 ppm v/v	BKG E Sept. 15-22 ppm v/v
Gas Component						
Neon	23.48	22.76	23.47	<0.5	<0.5	22.98
Hydrogen	671.5	769.5	898.2	2961	2176	518.1
Helium	3.73	3.47	3.48	<0.5	<0.5	4.96
Nitrogen	777806	773029	772887	774824	773159	775480
Oxygen	220042	222195	222654	220930	220070	222564
Carbon Dioxide	1450	3177	2918	905.1	4437	1401
Methane	2.79	802.6	614.2	378.8	155.7	3.83
Ethane	<0.01	<0.01	<0.01	<0.01	<0.01	0.12
Ethene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propane	<0.01	<0.01	0.20	<0.01	0.45	0.13
Propene	<0.01	<0.01	<0.01	<0.01	<0.01	0.11
iso-Butane	<0.01	<0.01	0.43	<0.01	0.44	0.44
n-Butane	<0.01	<0.01	0.15	0.21	0.28	1.43
iso-Pentane	<0.01	<0.01	0.18	0.14	0.19	0.51
n-Pentane	<0.01	<0.01	<0.01	0.20	<0.01	0.71
C6+	0.63	0.22	0.22	0.57	0.10	1.72
C1 Index (C1/ΣC2+)						
	N/A	N/A	1731	920.6	214.8	1.60
C2 Index (C2/ΣC3+)						
	N/A	N/A	N/A	N/A	N/A	0.05
C3 Index (C3/ΣC4+)						
	N/A	N/A	1.35	N/A	1.61	0.06
C4 Index (C4/C5)						
	N/A	N/A	N/A	1.02	N/A	2.03
ΣC2+						
	N/A	N/A	0.35	0.41	0.72	2.39
ATM Ratio (N2/O2)						
	3.53	3.48	3.47	3.51	3.51	3.48
Vol % CO2 of TG						
	0.14	0.32	0.29	0.09	0.44	0.14
Vol % Lt. Alk. of TG						
	0.00	0.08	0.06	0.04	0.02	0.00
Vol % Lt. Alk. CH4						
	100.0	100.0	99.84	99.86	99.14	52.63
Vol % Lt. Alk. C2+						
	0.00	0.00	0.16	0.14	0.86	47.37
Vol % C2+ of TG						
	0.00	0.00	0.00	0.00	0.00	0.00
Stable Carbon Isotope Compositions (‰ VPDB)						
d13C CH4	nm	nm	nm	nm	nm	nm
d13C C2H6	nm	nm	nm	nm	nm	nm
d13C C2H4	nm	nm	nm	nm	nm	nm
d13C C3H8	nm	nm	nm	nm	nm	nm
d13C C3H6	nm	nm	nm	nm	nm	nm
d13C i-C4H10	nm	nm	nm	nm	nm	nm
d13C n-C4H10	nm	nm	nm	nm	nm	nm
d13C i-C5H12	nm	nm	nm	nm	nm	nm
d13C n-C5H12	nm	nm	nm	nm	nm	nm
d13C CO2	nm	nm	nm	nm	nm	nm
Stable Hydrogen Isotopic Compositions (‰ VSMOW)						
dD H2	nm	nm	nm	nm	nm	nm
dD CH4	nm	nm	nm	nm	nm	nm
dD C2H6	nm	nm	nm	nm	nm	nm
dD C3H8	nm	nm	nm	nm	nm	nm
dD i-C4H10	nm	nm	nm	nm	nm	nm
dD n-C4H10	nm	nm	nm	nm	nm	nm
14C Concentration (pMC)						
	nm	nm	nm	nm	nm	nm

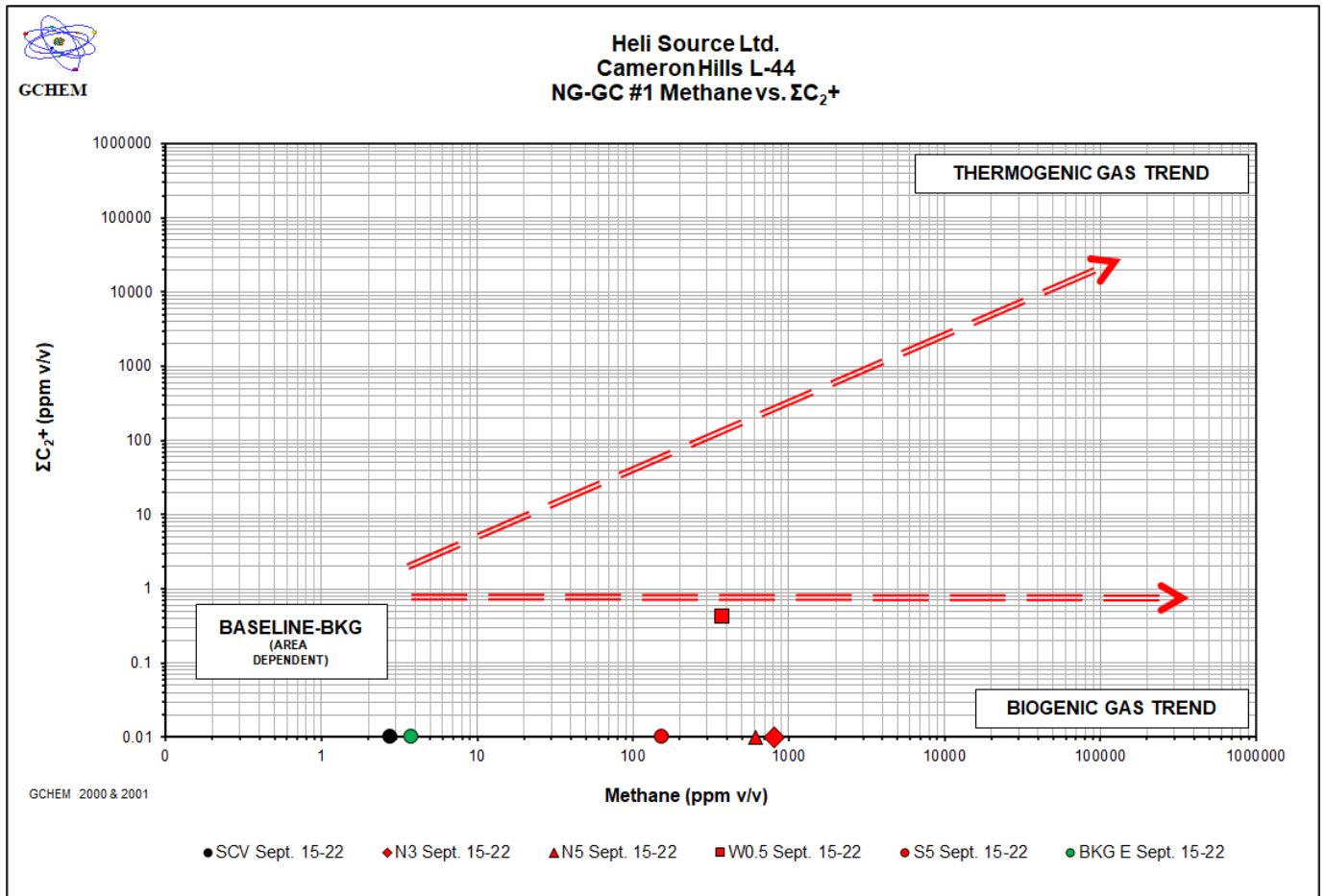
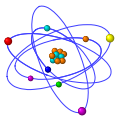


Figure 3: ΣC_2+ vs Methane. Combustible gases detected in soils and SCVs at a wellhead may result from several origins. Natural gases indicative of SCVF or AGM are thermogenic in origin (natural gas in deep reservoirs), contain high methane and C_2+ contents and plot in the Upper RH Quadrant. Low natural gas levels in background, off lease areas are naturally present in soils, vary from region to region and plot in the Lower LH Quadrant. Biogenic gases (swamp-gas) are produced by bacteria, are comprised of predominantly methane and plot in Lower RH Quadrant. Samples plotting in the Lower LH and RH do not contain SCVF or AGM and would not require down-hole remediation

NG-GC-1 Comments

NG-GC-1 Comments

- 1) Natural gases in the SCV and soils near the wellbore contain low levels of C_2+ gases indicating that this well is not impacted with leaking thermogenic natural gases.

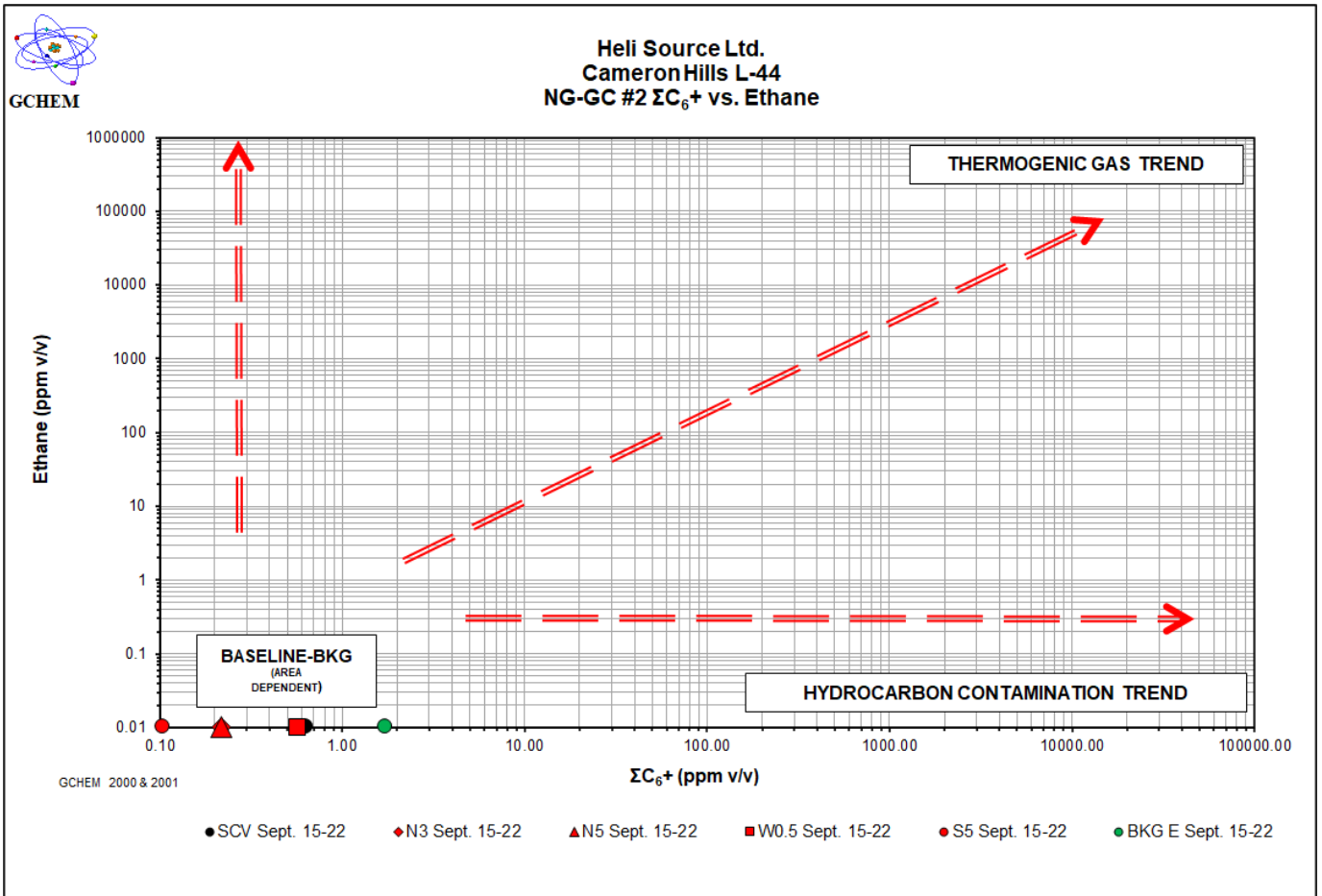
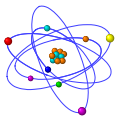


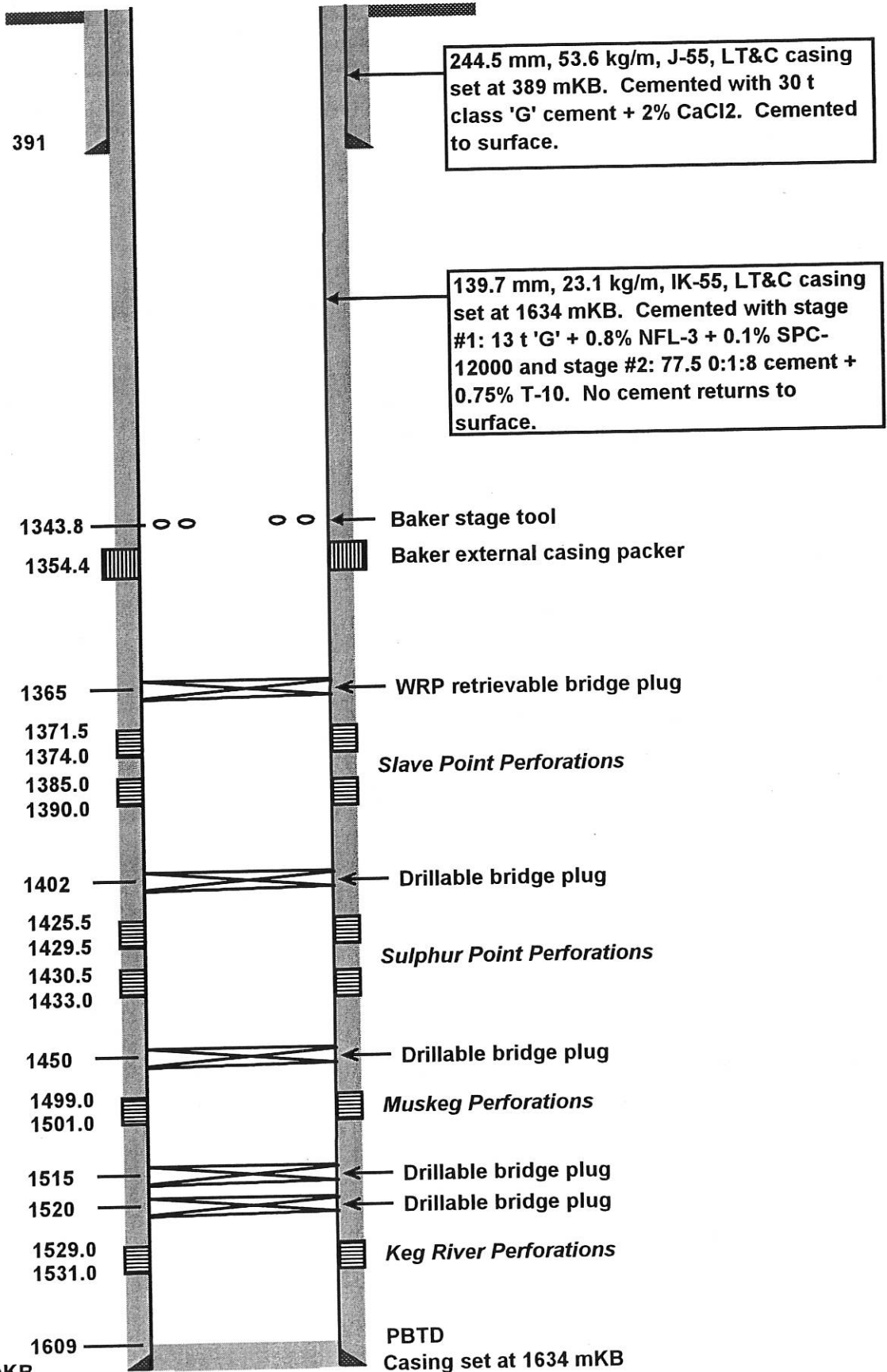
Figure 4: ΣC_6+ vs Ethane. C_6+ gases are relatively large molecules that do not readily or easily migrate in large quantities from depth upwards through subsurface fractures or micro-fractures to surface. Contamination by oil spills, fuels, and solvents is indicated by soil vapor samples that have high contents of C_6+ compounds and plot in the Lower RH Quadrant. Samples plotting in the Lower LH and RH Quadrants do not contain evidence of either SCVF or AGM and would not require downhole repair operations.

NG-GC-2 Comments

- 1) C_6+ contents of the SCV and soil gas samples are low and are similar to expected baseline readings. Measured combustible gas levels are not the result of near surface hydrocarbon or chemical contamination.

PARAMOUNT ET AL CAMERON L-44
 60° 10' N, 117° 30' W
 Bottom Hole Diagram (as of March 16, 1990)

KB: 749.10 m
 GL: 745.40 m



244.5 mm, 53.6 kg/m, J-55, LT&C casing set at 389 mKB. Cemented with 30 t class 'G' cement + 2% CaCl₂. Cemented to surface.

139.7 mm, 23.1 kg/m, IK-55, LT&C casing set at 1634 mKB. Cemented with stage #1: 13 t 'G' + 0.8% NFL-3 + 0.1% SPC-12000 and stage #2: 77.5 0:1:8 cement + 0.75% T-10. No cement returns to surface.

Baker stage tool
 Baker external casing packer

WRP retrievable bridge plug

Slave Point Perforations

Drillable bridge plug

Sulphur Point Perforations

Drillable bridge plug

Muskeg Perforations

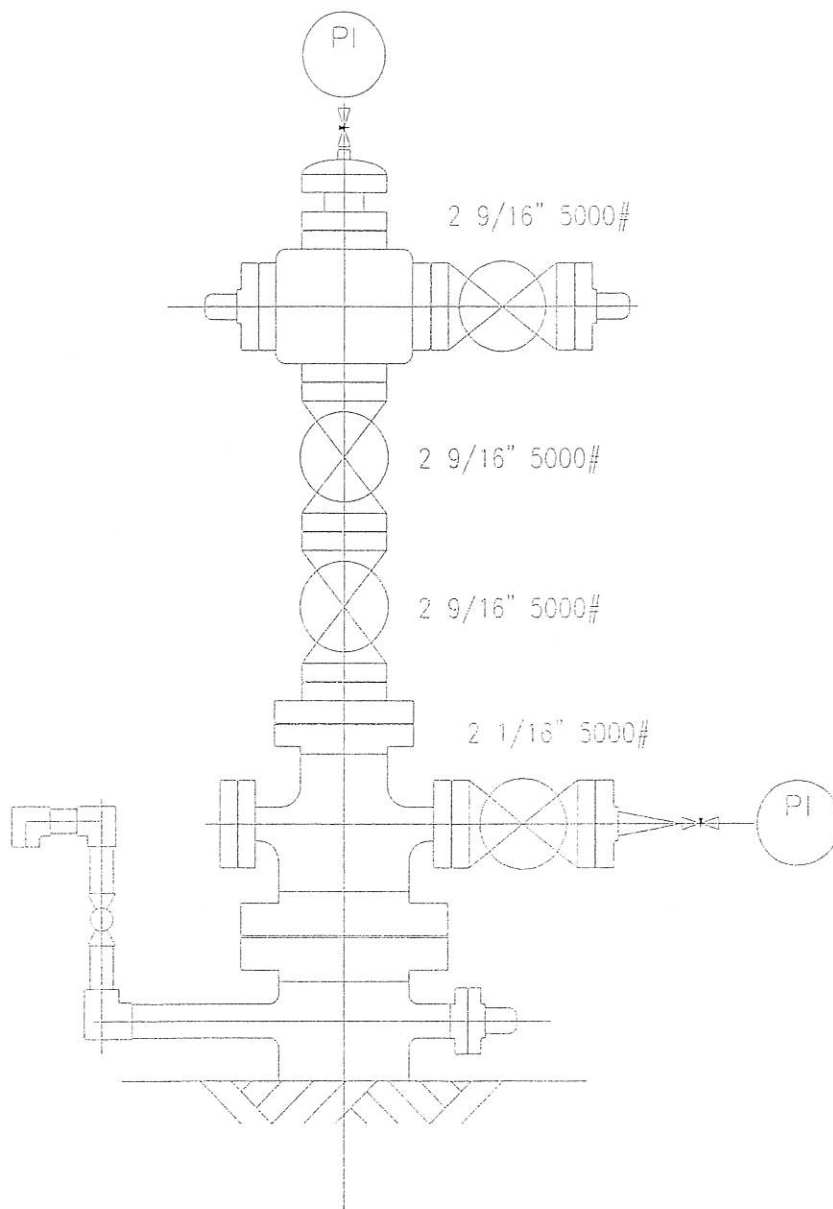
Drillable bridge plug

Drillable bridge plug

Keg River Perforations

PBTD
 Casing set at 1634 mKB

Total depth = 1634 mKB



WELLHEAD DETAILS



WELL NAME _____
 LOCATION L-44

Date: 090908
 By: KW
 Rev: A FOR INFO.

Wellhead
 Last Review Date