Review of Dr. G. Thyne Report

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On behalf of EnCana Oil and Gas (USA), Inc.

REPORT BASED ON SELECTIVE DATA ANALYSIS AND/OR INACCURATE PREMISES

- Premise 1: Methane >1 mg/L in groundwater is sourced from Williams Fork development drilling impacts
- Premise 2: Elevated chloride in groundwater is sourced from Williams Fork development drilling impacts
- Premise 3: Spatial correlation between URS lineaments, persistent bradenhead measurements, groundwater with high chloride and methane is meaningful
  - They allow fluids to migrate into water wells

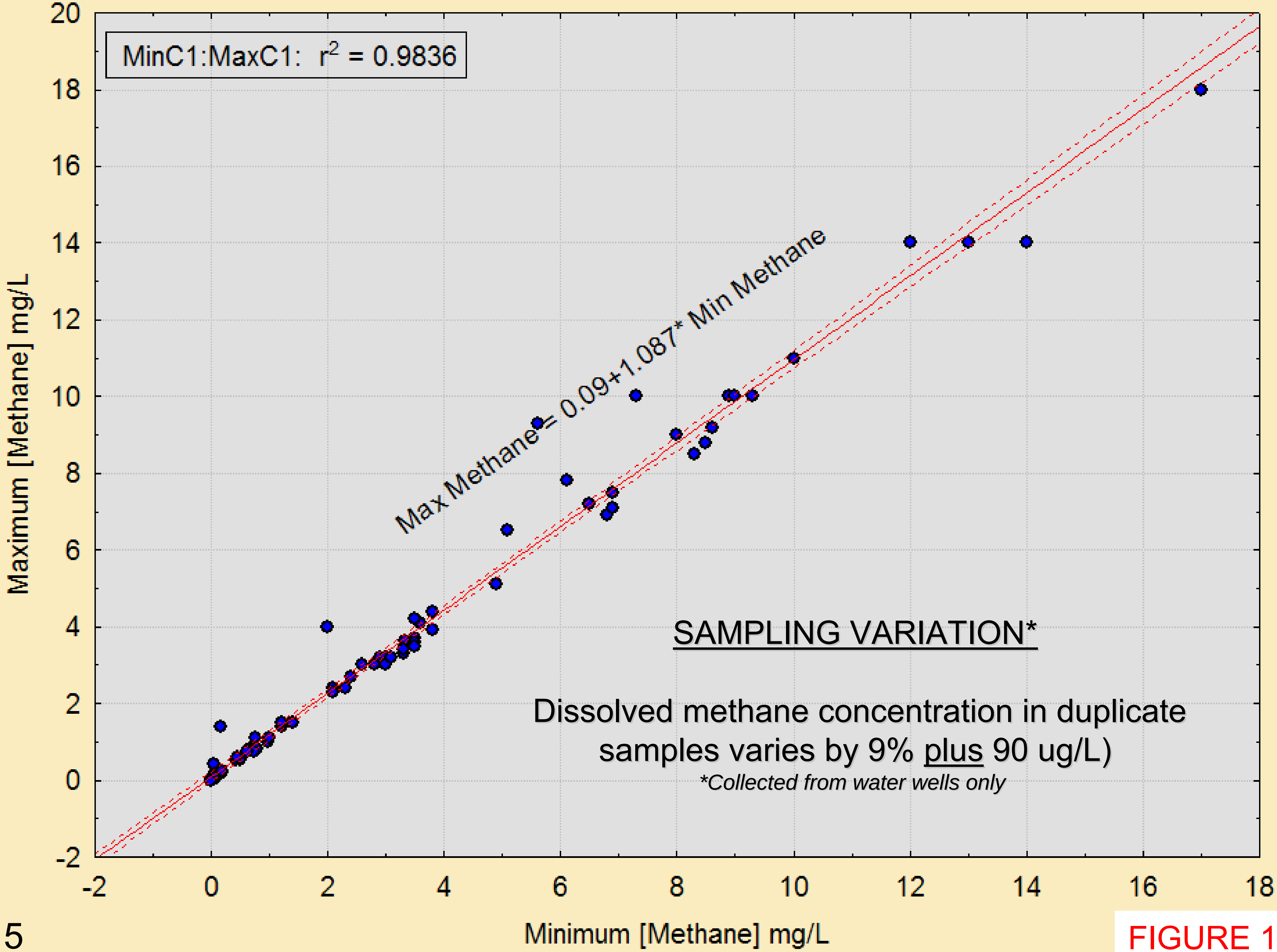
PREMISE 1: Methane >1 mg/L is sourced from Williams Fork development drilling impacts

BASED ON THE FOLLOWING TO BE REBUTTED:

A. There is a correlation between increasing methane concentration and increased drilling (p.11)
B. Methane isotope data that plot in the CO_2 reduction zone are derived from CO_2 in Williams Fork gases (Albrecht thesis p. 73-74, Thyne p.11)
C. The only source of thermogenic gas in groundwater is from Williams Fork production (implied throughout)
D. Pre drilling baseline dissolved methane concentration in groundwater was less than 1 mg/L (Thyne p. 9)

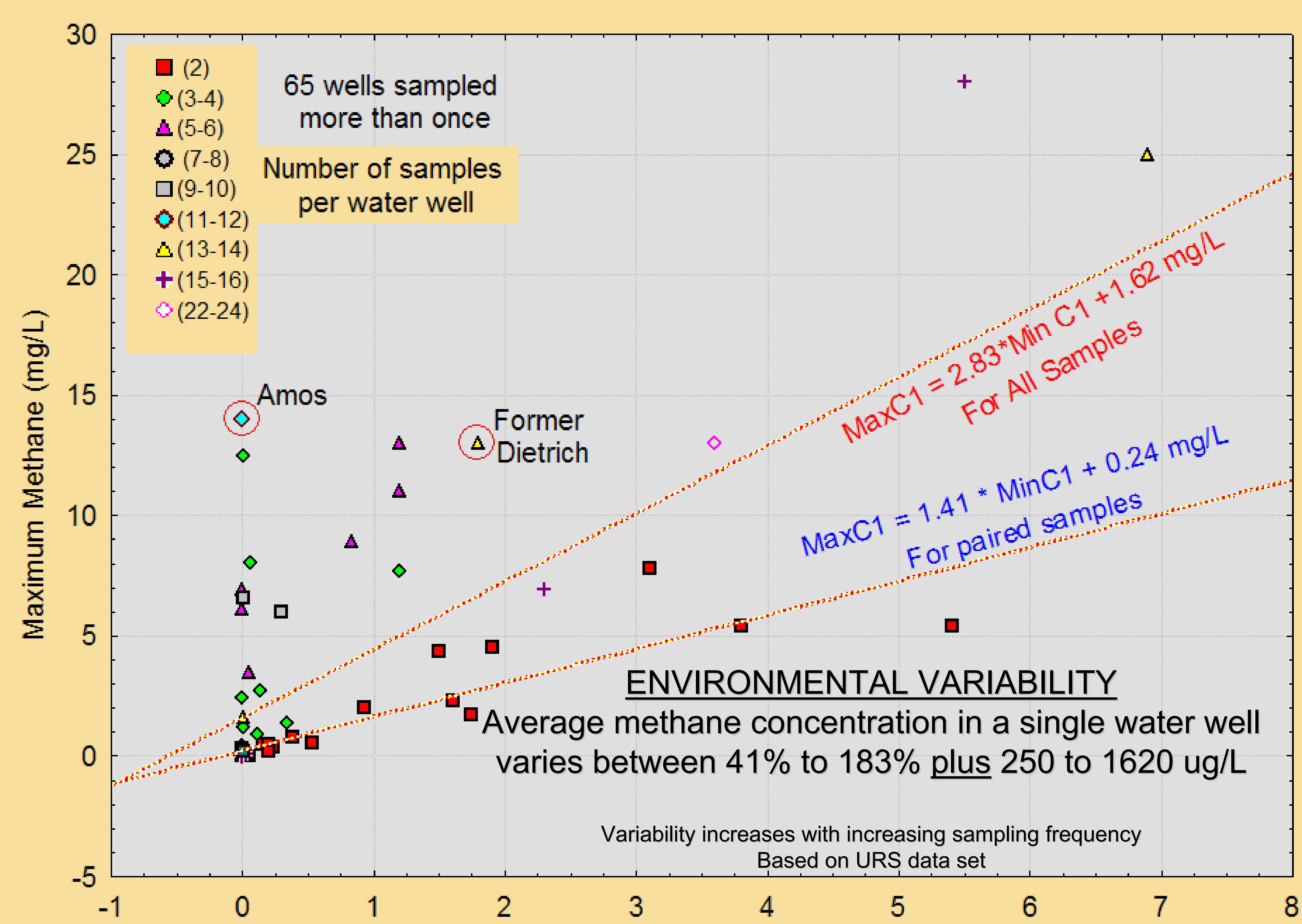
1A. THERE IS NO CORRELATION BETWEEN INCREASING METHANE CONCENTRATION AND DRILLING

- The graphs on the Thyne report (p. 9) and Albrecht thesis are not statistically significant
  - Results of duplicate analyses and multiple samples from single sites taken at different times were not included in the analysis
  - The range of values shown on Y axis (35 ug/L) is less than normal sampling plus analytical error
    - The minimum variability of methane concentration among duplicate samples is more than 90 ug/L (Figure 1)
    - The minimum variability methane concentration among wells sampled more than once is between 250 and 1620 ug/L (Figure 2)
      - 25 wells sampled more than once had methane either detected or not detected at one time or another
  - Among wells where multiple samples were taken over a long period of time, there is no observable increase or decrease in dissolved methane with time


MinC1:MaxC1: r2 = 0.9836
Max Methane = 0.09+1.087* Min Methane
SAMPLING VARIATION*
Dissolved methane concentration in duplicate samples varies by 9% plus 90 ug/L)
*Collected from water wells only
Maximum [Methane] mg/L
Minimum [Methane] mg/L
20
18
16
14
12
10
8
6
4
2
0
-2
-2
0
2
4
6
8
10
12
14
16
18

5

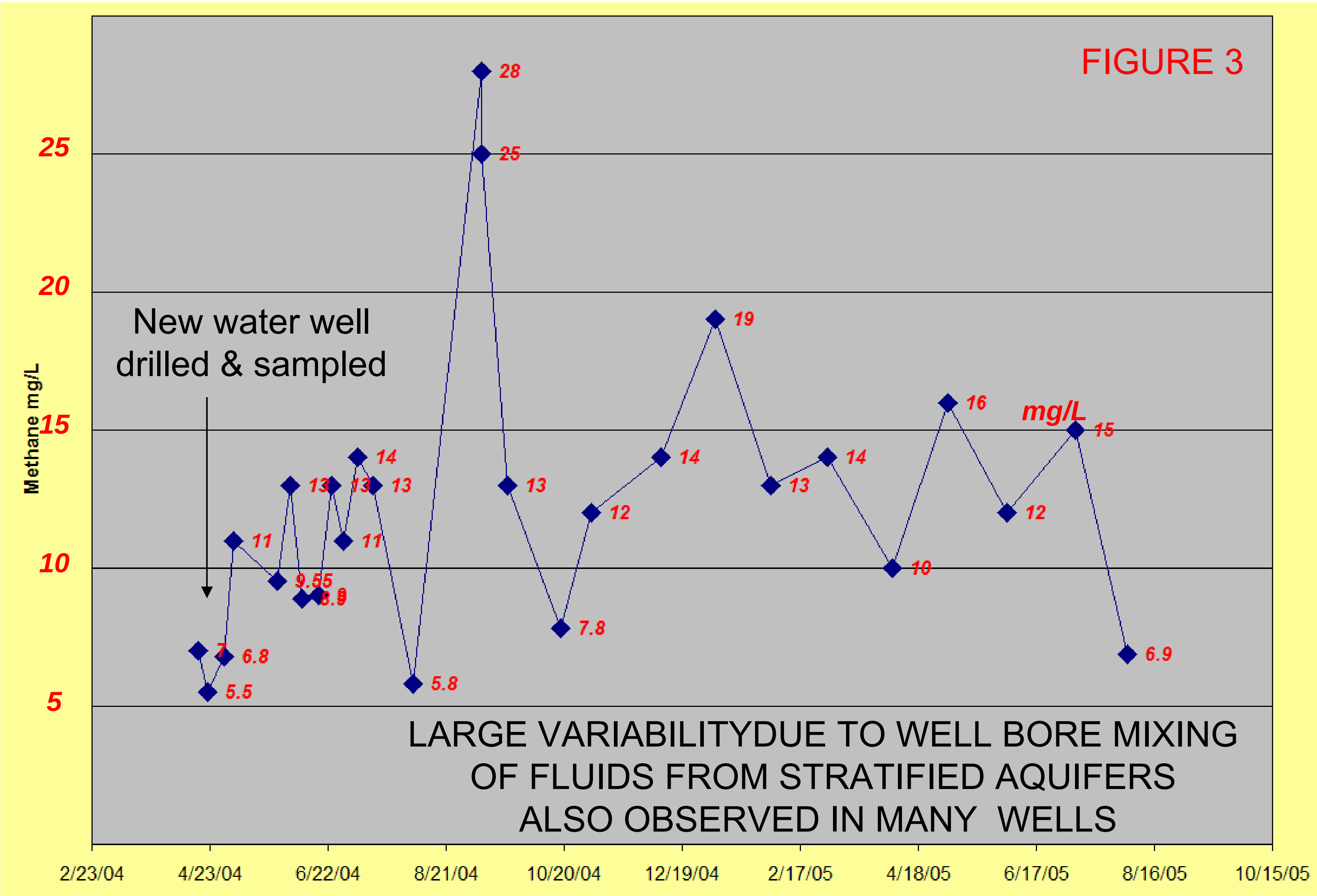
FIGURE 1



65 wells sampled more than once
Number of samples per water well
(2)
(3-4)
(5-6)
(7-8)
(9-10)
(11-12)
(13-14)
(15-16)
(22-24)
Amos
Former Dietrich
MaxC1 = 2.83*Min C1 +1.62 mg/L
For All Samples
MaxC1 = 1.41 * MinC1 + 0.24 mg/L
For paired samples
ENVIRONMENTAL VARIABILITY
Average methane concentration in a single water well varies between 41% to 183% plus 250 to 1620 ug/L
Variability increases with increasing sampling frequency
Based on URS data set
Maximum Methane (mg/L)
Minimum Methane (mg/L)

FIGURE 2

1A. VARIABILITY IN DISSOLVED METHANE CONCENTRATION AT ONE WELL WITH HIGH C_1



1B. METHANE SAMPLES WITH ISOTOPE DATA THAT PLOT IN THE CO_2 REDUCTION ZONE CANNOT BE DERIVED FROM WILLIAMS FORK THERMOGENIC GAS

- Produced gases in this area have maximum CO_2 < 3.5% by volume (Table 1), not 22%
- Methane/CO_2 ratios in produced gases from this area have a minimum value of 33:1 and a maximum value of 195:1 (Table 1)
  - Any CO_2 converted to biogenic methane would be swamped by mixing with thermogenic methane signature (Jenden et al.,1993 Prinzhofer and Pernaton, 1997)
- Williams Fork thermogenic gas contains methane homologs in C_3-C_5 range (Table 2). These gases would have to be present along with CO_2-converted methane (Table 2)
- Thyne/Albrecht analysis and interpretation does not include gas composition data

MAMM CREEK FIELD PRODUCED GAS COMPOSITION

Sample Name	He %	H2 %	Ar %	O2 %	CO2 %	N2 %
33-10A2 G33NE Production (Papadop)	0.0040	0.0010	ND	ND	3.50	0.072
Arbaney 3-16C Production	0.0042	ND	0.0169	0.3280	1.23	1.440
Boulton 33-10 Production (Papadop)	0.0053	0.0036	ND	ND	0.62	0.110
Boulton 33-15 Production COGCC	0.0025	ND	0.0457	1.1100	1.30	3.350
Boulton 33-2 Production COGCC	0.0047	0.0766	0.0367	0.8360	0.02	2.870
Boulton 33-7 Production COGCC	0.0027	ND	0.0345	0.8220	0.49	2.580
Boulton 33-8 Production	0.0040	0.0018	ND	0.0195	0.53	0.230
Boulton 33-9 Production	0.0034	ND	0.0400	1.3900	0.40	2.150
Boulton 33-9 Production COGCC	0.0056	ND	0.0154	0.2830	0.57	1.060
Brown 11-2C Production	0.0183	0.0109	0.0080	0.0108	ND	1.130
K19BNE ALP 19-14 Production	0.0026	0.0017	0.0210	0.4320	2.45	1.870
K19BNE ALP 19-16 Production	0.0029	0.0015	ND	0.0077	2.16	0.160
Magic 10-1 P3 Production (Papadop)	0.0055	ND	ND	0.0244	1.43	0.210
Magnall 34-12 (L34) Magnall Production (Papadop)	0.0047	0.0014	ND	0.0059	1.62	0.130
Schwartz 2-15B Production	0.0154	0.0322	0.0069	0.0172	ND	0.670
Schwartz 2-15B Production	0.0031	ND	0.0087	0.1130	0.53	0.650
Twin Creek 1-15B Production	0.0024	ND	0.0182	0.3830	0.36	1.440

d13 C1 per mil	dD C1 per mil	d13 C2 per mil	d13 C3 per mil	d13 CO2
-41.39	-191.6			
-40.99	-196.2	-28.28	-25.28	
-41.67	-199.1			
-41.57	-201.1			-5.31
-41.13	-196.3			
-41.52	-201.7			-6.1
-41.62	-200.4	-28.85	-25.88	
-41.82	-203.6	-29.21	-26.1	
-41.7	-201.9			-17.26
-41.69	-200	-28.78	-25.79	
-40.12	-196.2	-28.16	-25.19	
-40.99	-194.6	-28.32	-25.32	
-41.49	-195.5			
-41.8	-197.7			
-41.36	-197.6	-28.97	-26.07	
-41.95	-202.5	-29.08	-26.2	
-42.02	-197.3			

Sample Name	C1 %	C2 %	C2H4 %	C3 %	iC4 %	nC4 %	iC5 %	nC5 %	C6+ %
33-10A2 G33NE Production (Papadop)	84.3	7.22	ND	2.68	0.68	0.701	0.263	0.2	0.383
Arbaney 3-16C Production	84.3	8.44	ND	2.72	0.575	0.528	0.176	0.122	0.115
Boulton 33-10 Production (Papadop)	83.12	9.52	ND	4.02	0.859	0.89	0.291	0.226	0.331
Boulton 33-15 Production COGCC	78.82	9.21	ND	3.56	0.771	0.844	0.342	0.254	0.388
Boulton 33-2 Production COGCC	80.75	8.74	ND	3.9	0.925	0.947	0.323	0.274	0.297
Boulton 33-7 Production COGCC	80.74	9.5	ND	3.69	0.774	0.796	0.232	0.168	0.169
Boulton 33-8 Production	81.86	10.24	ND	4.39	0.96	0.993	0.322	0.243	0.203
Boulton 33-9 Production	78.37	10.23	ND	4.47	0.924	0.981	0.445	0.315	0.277
Boulton 33-9 Production COGCC	82.04	9.54	ND	4.07	0.831	0.866	0.273	0.215	0.235
Brown 11-2C Production	83.94	9.15	ND	3.71	0.807	0.755	0.21	0.14	0.107
K19BNE ALP 19-14 Production	82.24	8.42	ND	2.83	0.627	0.616	0.207	0.148	0.138
K19BNE ALP 19-16 Production	83.23	9.22	ND	3.21	0.719	0.72	0.238	0.166	0.164
Magic 10-1 P3 Production (Papadop)	84.81	8.38	ND	3	0.667	0.68	0.237	0.184	0.369
Magnall 34-12 (L34) Magnall Production (Papadop)	83.99	8.94	ND	3.43	0.704	0.689	0.197	0.131	0.155
Schwartz 2-15B Production	81.22	10.65	ND	4.8	0.963	0.872	0.294	0.239	0.217
Schwartz 2-15B Production	82.19	9.97	ND	4.2	0.915	0.899	0.259	0.162	0.105
Twin Creek 1-15B Production	82.03	9.47	ND	3.78	0.879	0.851	0.292	0.208	0.289

Average CO_2 = 0.84% (max 3.5%)
Average CO_2/CH_4 = 115 (min 34)
Average C_1/C_2 = 22 (max 31)
Average C_2/C_3 = 2.5 (max 3.1)

Table 1

138 WELL SAMPLES (from 25 water wells) ANALYZED FOR GAS COMPOSITION

Facility_id	CL mg/L	C1 mg/L	C1%	C2%	C3%	iC4%	nC4%	iC5%	nC5%	C6+%	δ13C C1‰	δDC1‰	C1/C2
703230			76.59	5.9200	1.8600	0.3700	0.2700	0.0690	0.0340	0.0210	-41.11	-194.5	13
703899	100.0	12	80.37	8.5000	3.1400	0.5800	0.6310	0.1600	0.1200	0.0935	-42.16	-191.3	9
704203	1880.0	13	72.58	0.0384	0.0089	0.0031	0.0059	0.0030	0.0026	0.0059	-76.06	-199.5	1890
703996	143.0	6.1	43.10	0.3480	0.0014	0.0024					-41.69	-176.3	124
704012	171.0	3.5	23.95	0.0230	0.0056						-75.74	-217.3	1041
704023	110.0	1.6	12.27	0.3420	0.0055						-36.97	-119.6	36
704151	231.0	6.1	65.80	0.0870							-40.99	-182.6	756
704073	250.0	0.3	16.01	0.0085							-60.68	-126.1	1884
703943			96.03	0.0316							-58.41	-223.2	3039
703920	1670.0	13	76.65	0.0379							-73.33	-191.6	2022
703928	9.3	0.054	42.03	0.0113						0.0020	-57.08	-216.5	3719
703938			58.04	0.0233							-56.09	-235.8	2491
703943	1770.0	28	94.40	0.0300						0.0053	-57.65	-221.2	3147
703947	360.0	3.9	36.13	0.0107							-72.17	-199.7	3377
703983	203.0	3.93	63.30	0.0211							-64.91	-236.5	3000
703934	231.0	0.26	1.64	0.0041									400
704330			93.31	0.05							-44.68	-203.5	1932
704050	210.0	0.063	1.52										
704076	111.0	1.9	19.68								-39.27	-167.8	
704409	53.0	0.77									-40.75	-189.2	
703254		0.02	0.15										
703866	27.5	0.017	0.06										
703901			0.05							0.0083			
703912			0.18										
704074	10.6	0.005	0.00										

AMONG WELLS SAMPLED MORE THAN ONCE, SAMPLES WITH HIGHEST TOTAL EXTRACTED HYDROCARBON CONCENTRATIONS SHOWN

Blue sites from Papadopulos Report

Table 2

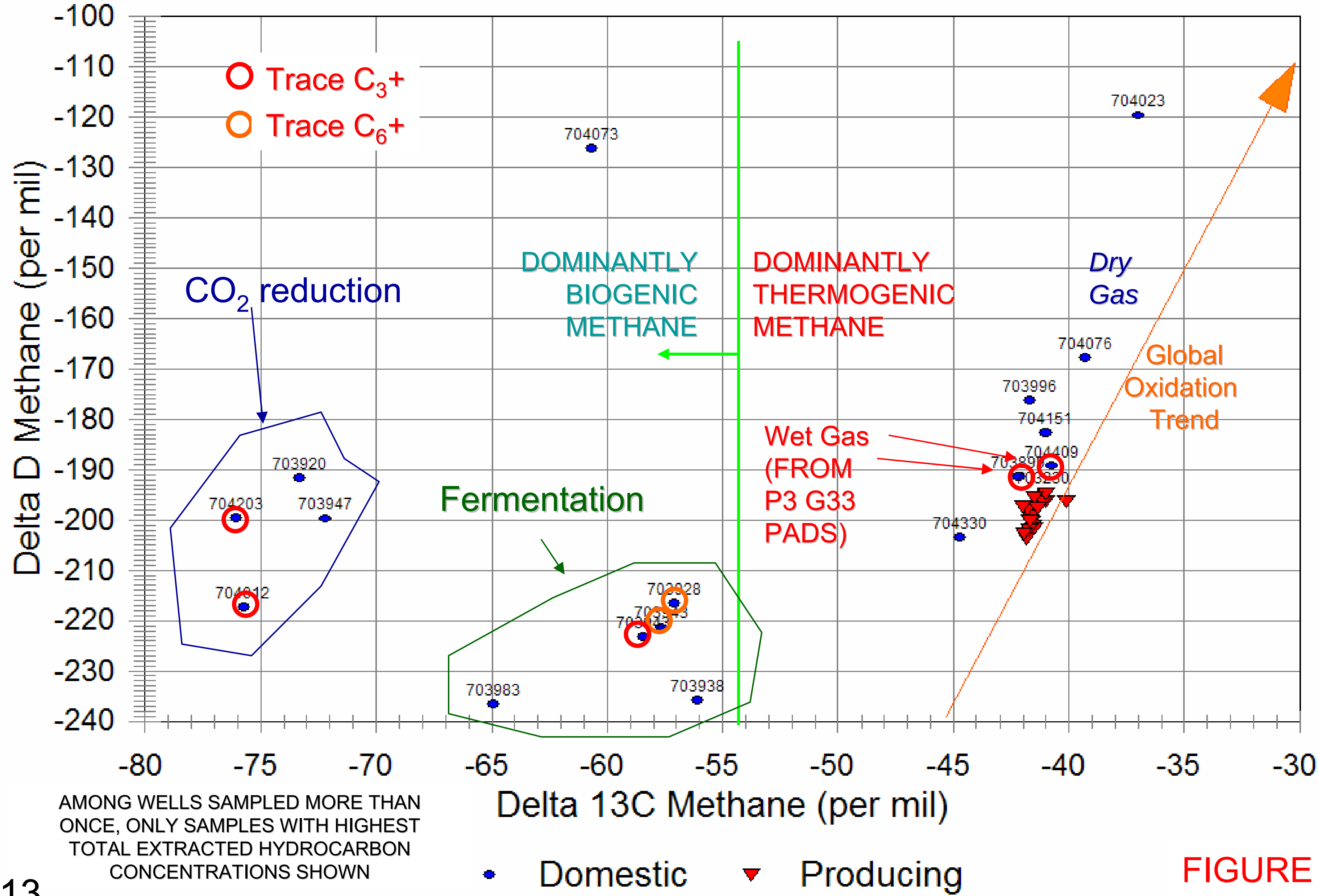
1C. THERE ARE AT LEAST 4 SOURCES OF GAS DETECTED IN WATER WELLS

- 17 of 226 sampled water wells have sufficient dissolved methane for gas chemistry analysis
  - 2 of those wells are known to be impacted by Wasatch gas from wells on G33 and P3 pads (Figure 4)
  - 5 wells contain thermogenic methane and ethane only, NOT from the Williams Fork (no propane+ fraction Table 1, Table 2, Figure 4)
  - 5 wells contain biogenic gas
    - 2 wells from fermentation
    - 3 wells from CO_2 reduction in bedrock aquifers
  - 5 wells contain dominantly biogenic gas mixed with a trace of thermogenic gas components in the C_3+ range
  - Differences in gas composition and stable isotope data were not included in the Thyne report

1C. THERE ARE AT LEAST 4 SOURCES OF GAS IN MEASURED WATER WELLS

- Table 2 and Figure 4 show there are at least 2 sources of thermogenic gas in water wells
  - Wet thermogenic gas with C3+ components, $C_1/C_2<20$
  - Dry thermogenic gas C_1 and C_2 only, trace hexanes$C_1/C_2<2000$
- Table 2 and Figure 4 show there are at least 2 sources of biogenic gas in water wells
  - Stable carbon isotopes with $\delta_{13}C_{Methane}$ near -60 per mil $C_1/C_2>2000$
  - Stable carbon isotopes with $\delta_{13}C_{Methane}$ near -75 per mil $C_1/C_2>2000$
- Stable isotopes of methane in gas mixtures are dominated by the primary source of methane, biogenic or thermogenic

17 WATER WELLS ANALYZED FOR METHANE ISOTOPES



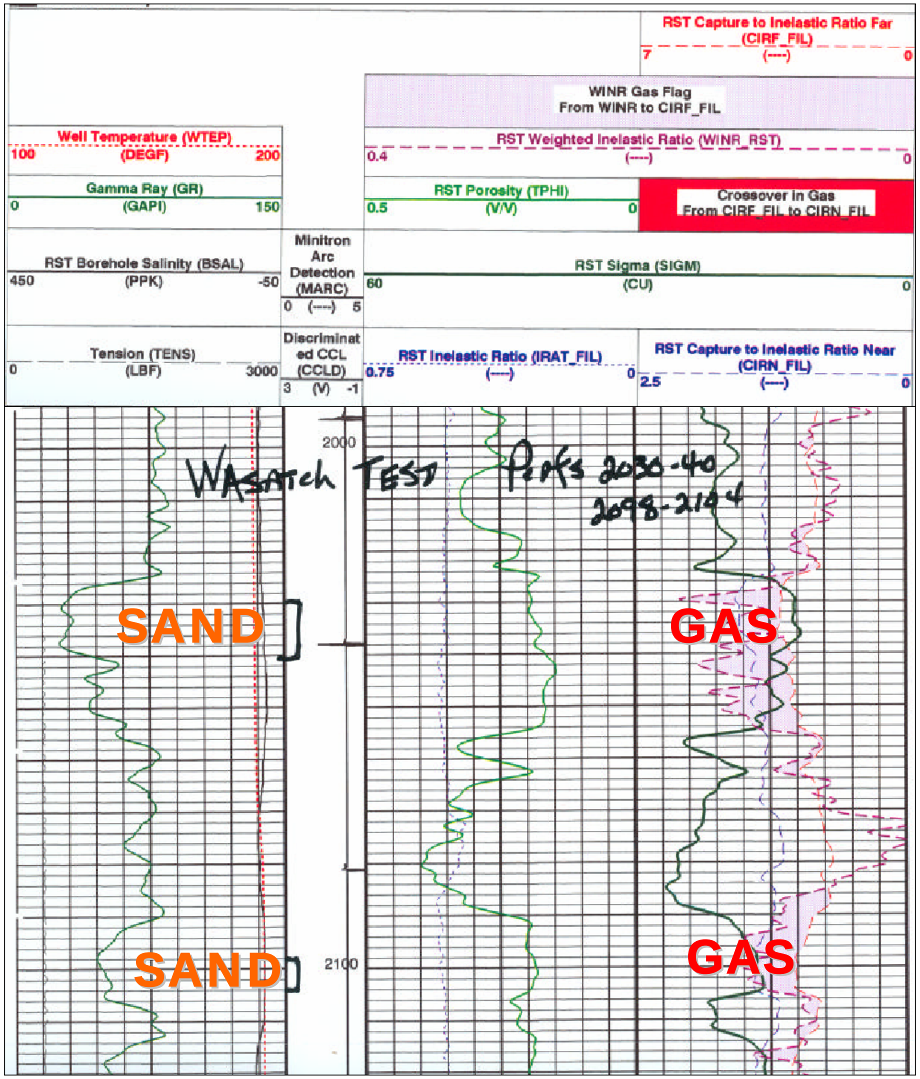
AMONG WELLS SAMPLED MORE THAN ONCE, ONLY SAMPLES WITH HIGHEST TOTAL EXTRACTED HYDROCARBON CONCENTRATIONS SHOWN

FIGURE 4

1C. THERE ARE AT LEAST 4 SOURCES OF GAS IN MEASURED WATER WELLS

- Logging has identified naturally occurring shallow gas sands throughout area (Figure 5 example)
- Bradenhead gas samples can differ in composition from underlying Williams Fork samples (Figures 6 & 7)
- Commercial gas in Wasatch Fm. Rulison Field also differs in composition from underlying Williams Fork samples (Figure 8)

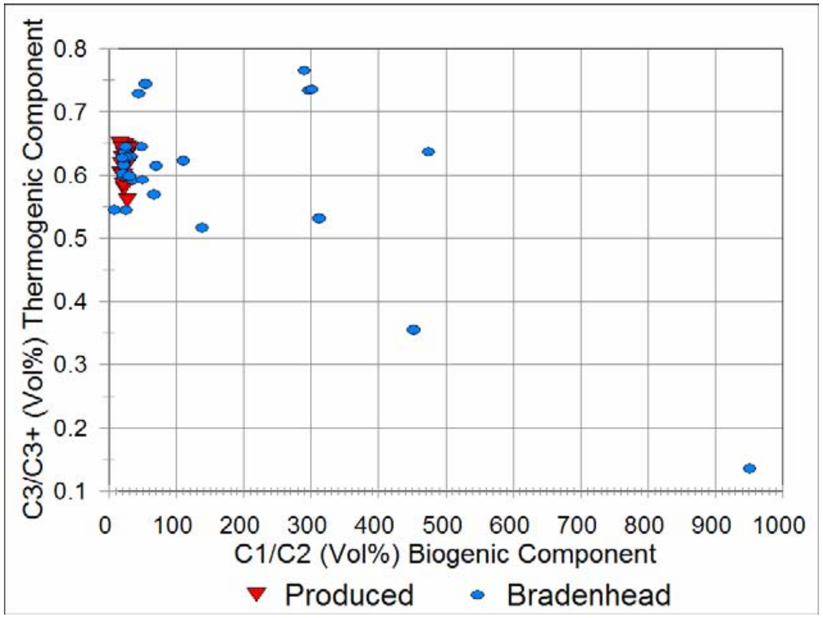
FIGURE 5



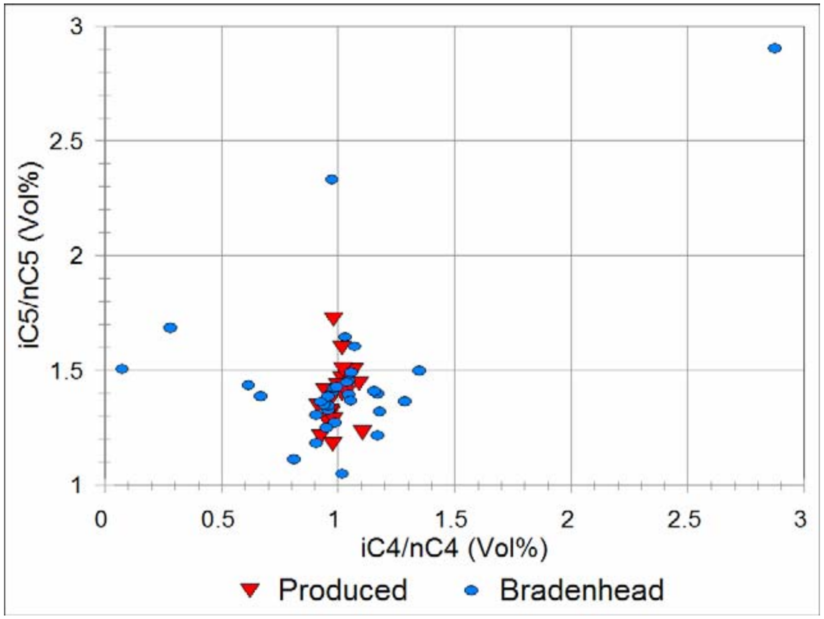
SHALLOW GAS WIRELINE LOG G33 PAD WITH THERMOGENIC GAS COMPOSITION TABLE

Sample Name	C1 %	C2 %	C3 %	iC4 %	nC4 %	iC5 %	nC5 %	C6+ %
Boulton 33-8A Swab 655'	1.25	0.104	0.0477	0.0103	0.0105	0.0031	0.0018	0.0021
Boulton 33-8A 352-356'	1.34	0.0971	0.0495	0.0115	0.0124	0.0046	0.0038	0.0066
Moore 33-10A 636-644'	52.41	4.73	2.01	0.437	0.43	0.12	0.0819	0.0412
Moore 33-10A 636-644'	49.26	4.36	1.87	0.414	0.407	0.121	0.0852	0.0451

BRADENHEAD GAS SANDS IN MAMM CREEK FIELD CAN DIFFER FROM UNDERLYING WILLIAMS FORK



LARGEST DIFFERENCES BETWEEN BRADENHEAD AND WILLIAMS FORK DUE TO MIXED WASATCH SOURCE OF METHANE AND ETHANE



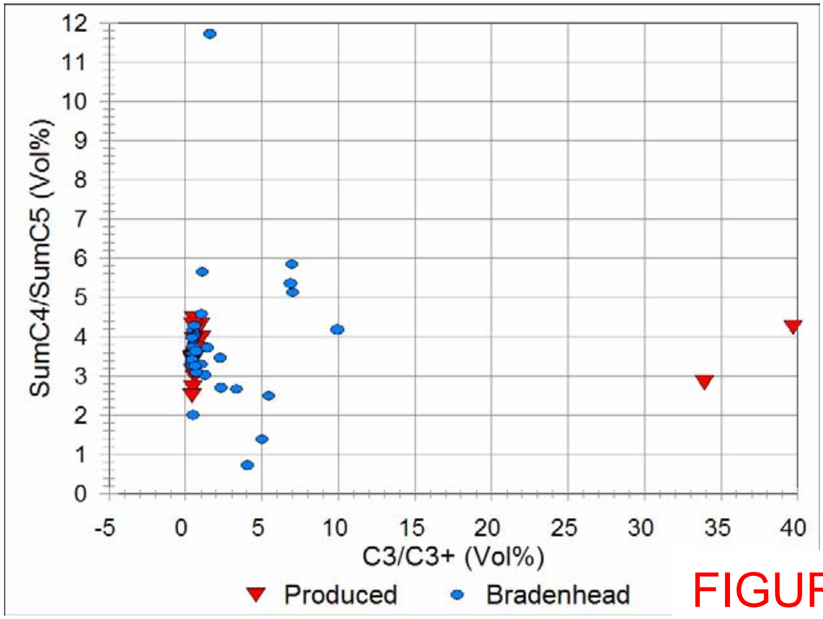


FIGURE 6

MAMM CREEK FIELD BRADENHEAD GASES CAN DIFFER FROM UNDERLYING WILLIAMS FORK

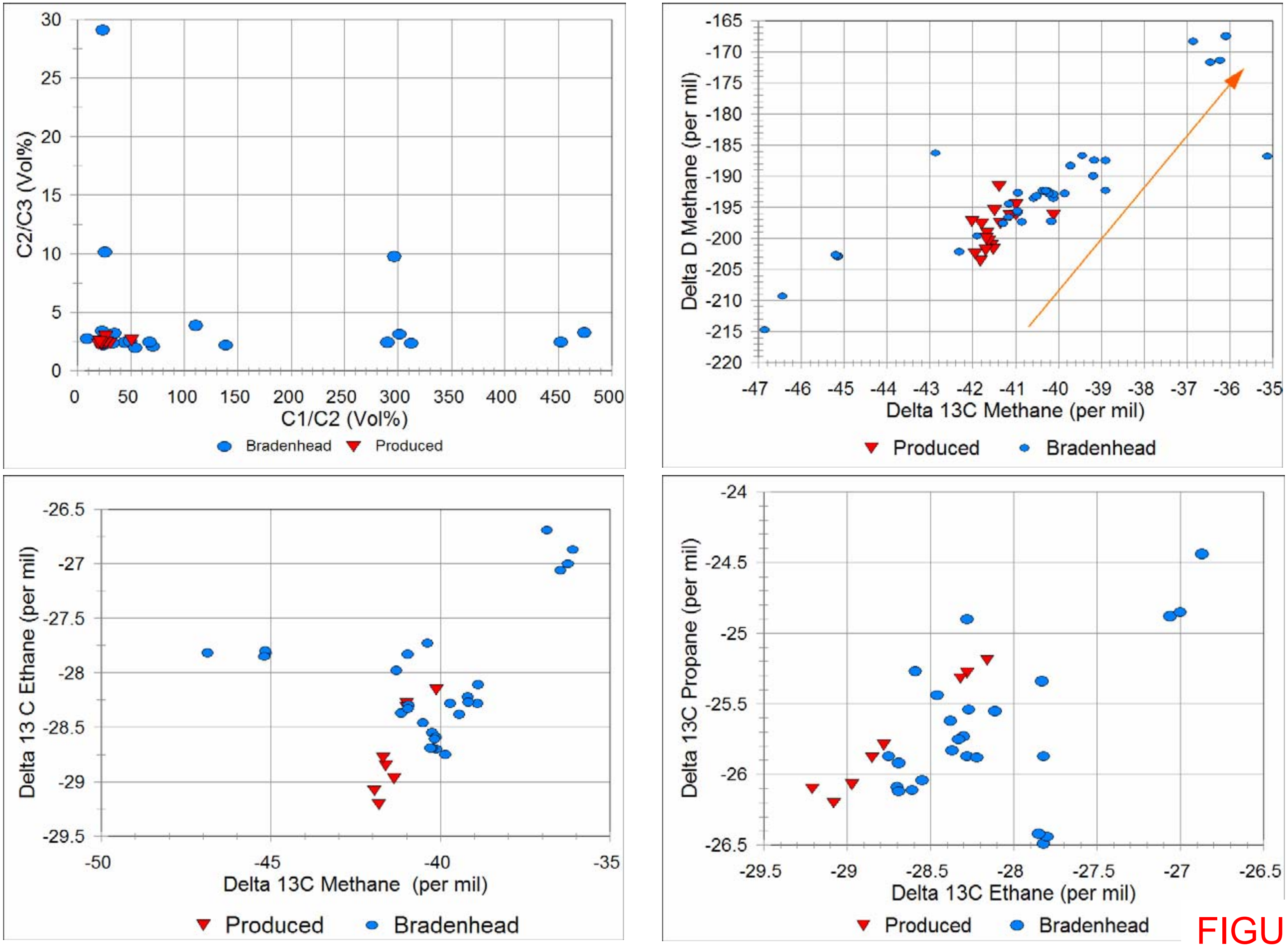


FIGURE 7

SHALLOW COMMERCIAL GAS SANDS IN RULISON FIELD ALSO DIFFER FROM UNDERLYING WILLIAMS FORK

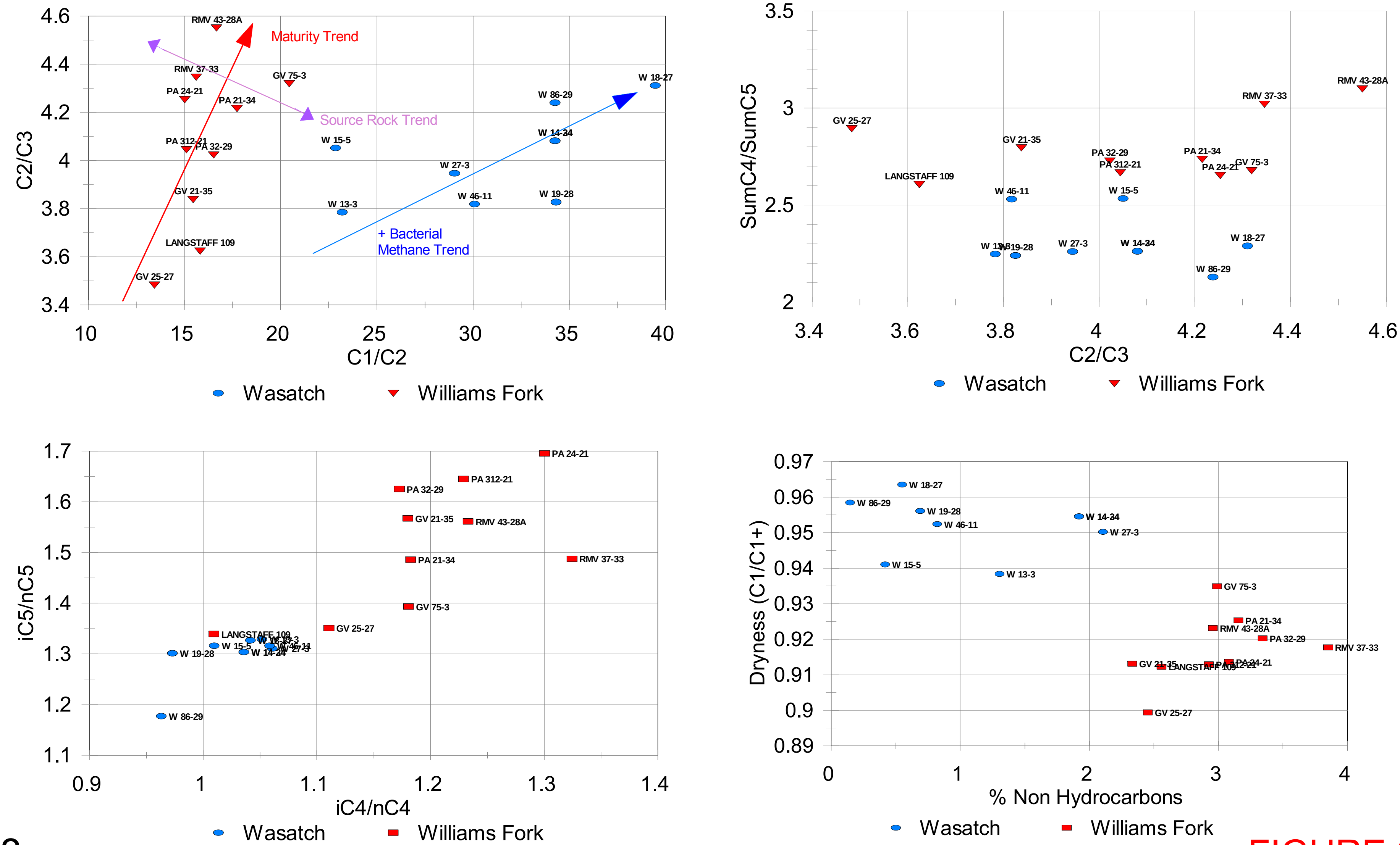


FIGURE 8

1D. THERE IS NO BASIS FOR STATING PRE DRILLING BASELINE DISSOLVED METHANE CONCENTRATION IN GROUNDWATER WAS LESS THAN 1 mg/L

- Statistics of Mamm Creek data set
  - 228 water wells sampled for dissolved methane
    - 731 samples analyzed for dissolved methane (excludes duplicate and split samples and redundant records)
    - 120 wells (52%) had one or more samples without any detected methane
    - 108 wells (47%) had one or more samples with detectable methane
      - 25 wells sampled multiple times *sometimes* contain measurable dissolved methane
      - 83 wells with one or more samples consistently containing measurable dissolved methane
      - 36 wells (not know to be impacted with thermogenic methane) have at least one sample of dissolved C_1 >1 mg/L (16% of total)
      - 4 wells (2%) with C1>10 mg/L
- San Juan Basin data set
  - 1134 water wells sampled
    - 536 (47%) did not contain detectable methane
    - 598 (53%) contained detectable methane
      - 181 (16%) contained > 2 mg/L
      - 83 (7.3%) contained > 10 mg/L
- Raton Basin data set
  - 246 water wells sampled
    - 132 (56%) did not contain detectable quantities of dissolved methane
    - 146 (46%) contained detectable methane
      - 15% contain > 2 mg/L methane
      - 8% contain > 10 mg/L methane

MAMM CREEK GROUNDWATER STATISTICS ARE SIMILAR TO THOSE FROM OTHER SEMI ARID BASINS

PREMISE 2:
ELEVATED CHLORIDE IN GROUNDWATER IS SOURCED FROM WILLIAMS FORK DEVELOPMENT DRILLING IMPACTS

BASED ON THE FOLLOWING TO BE REBUTTED:

A. There is an average increase in chloride concentration with time corresponding to an increase in drilling activity (p. 10, Fig. 7)
B. More than 250 mg/L of chloride in groundwater indicates a Williams Fork produced water source (Thyne p. 9, Figure 7)
C. There is no other source for chloride in groundwater other than Williams Fork production (Albrecht pp.44 & 48, Thyne p. 15)

2A. THERE IS NO AVERAGE INCREASE IN CHLORIDE CONCENTRATION AMONG WATER WELLS WITH TIME

- The chloride vs. time graph on Thyne report p.10 appears to be in error
  - Only 28 of 230 wells sampled from 2001 to 2005 contain more than 250 mg/L of chloride (12% of wells, Table below)
  - Numbers in tally below differ than those shown on Thyne p. 10 figure axis
  - Thyne/Albrecht analysis seems to include sampling bias introduced by multiple samples from wells, duplicates, splits, and redundant data

NEW WELLS SAMPLED EACH YEAR FOR CHLORIDE WITH Cl<250 mg/l or Cl>250 mg/L

YEAR	New Wells <250 mg/L	New Wells >250 mg/L	%>250 mg/L Each Year	Cum <250 mg/L	Cum >250	% Cumulative > 250
2001	17	3	15.0%	17	3	15.0%
2002	40	3	7.0%	57	6	9.5%
2003	59	6	9.2%	116	12	9.4%
2004	53	11	17.2%	169	23	12.0%
2005	33	5	13.2%	202	28	12.2%
TOTALS	202	28				

WATER WELL SAMPLES ANALYZED FOR CHLORIDE EACH YEAR

Duplicates, Splits, Redundant Records not included

YEAR	<250 mg/L	>250 mg/L	Yearly TOTAL	Cumulative	<250CUM	>250CUM	% Samples >250 mg/L
2001	21	3	24	24	21	3	12.5%
2002	47	2	49	73	68	5	6.8%
2003	93	10	103	176	161	15	9.3%
2004	262	50	312	488	423	65	15.4%
2005	175	27	202	690	598	92	15.4%

2A. THERE IS NO AVERAGE INCREASE IN CHLORIDE CONCENTRATION IN WATER WELLS WITH TIME

- Thyne/Albrecht discussion fails to consider large temporal changes in water quality observable among sites sampled multiple times
  - 8 of 28 water wells with samples had variable chloride concentrations above and below >250 mg/L chloride
    - Figure 9 shows a cross plot of minimum chloride values vs maximum chloride recorded values in wells sampled multiple times
  - Among wells with the longest sampling history, chloride concentrations decrease with time (Figure 10)

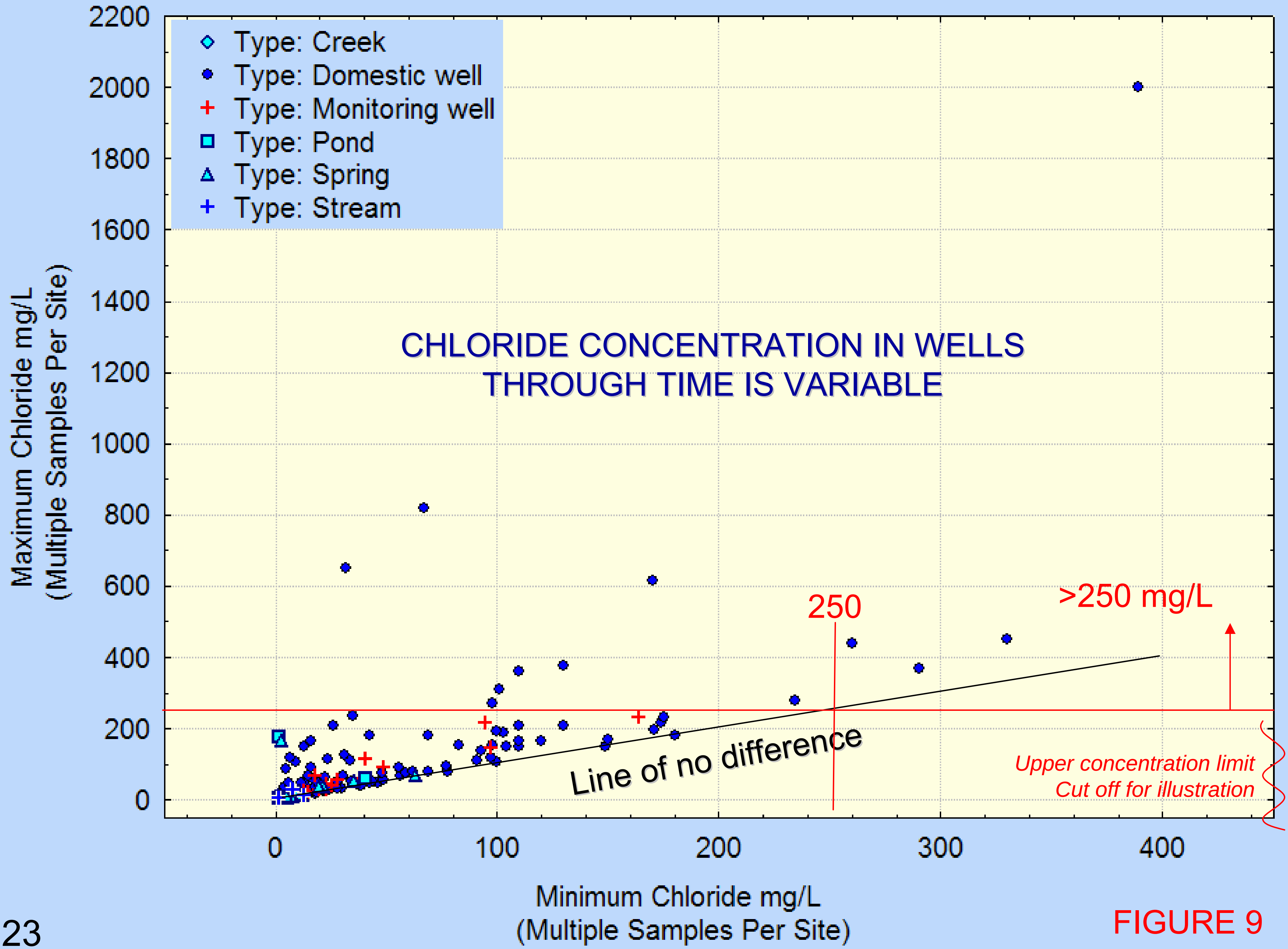
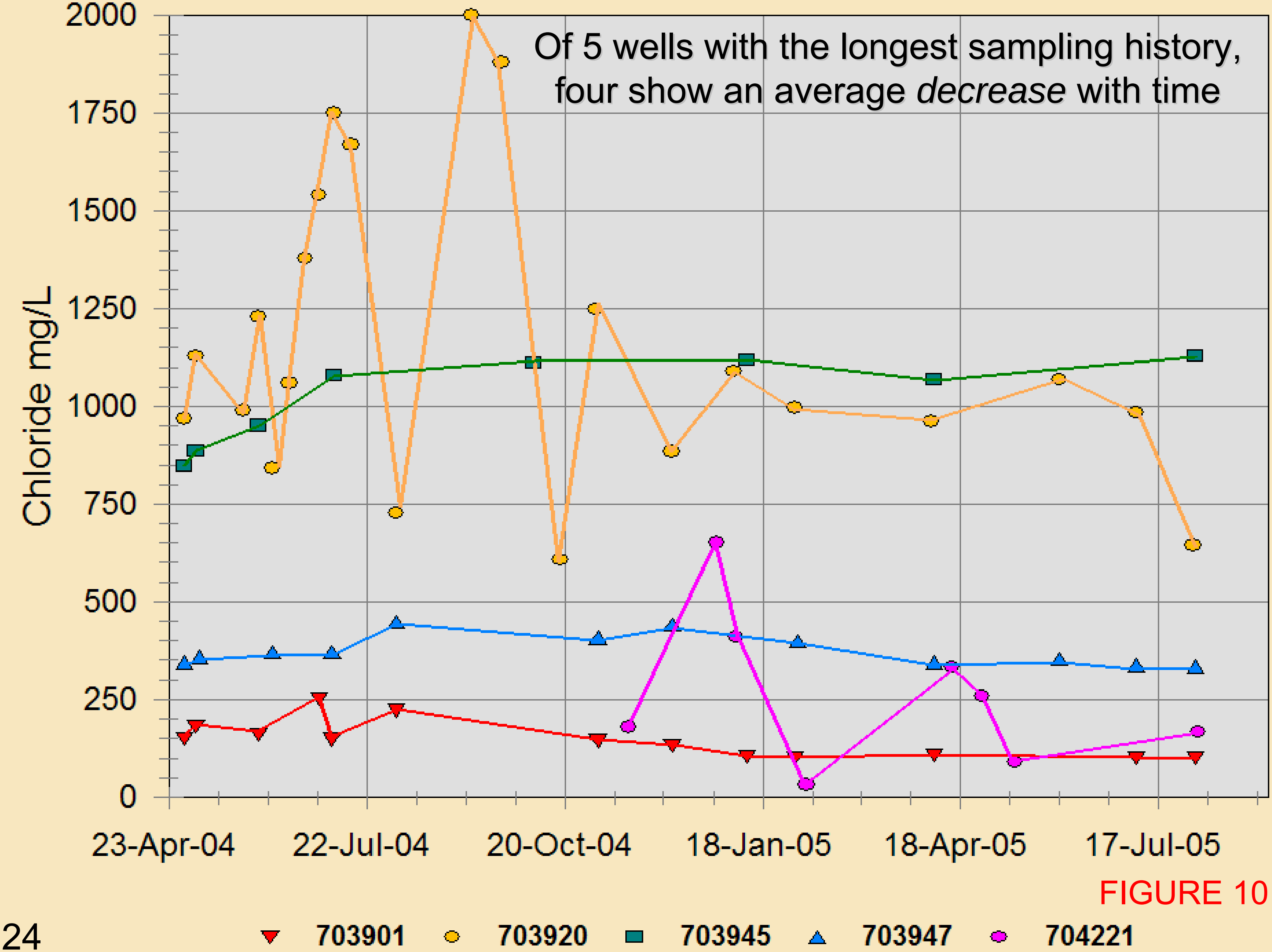

Type: Creek
Type: Domestic well
Type: Monitoring well
Type: Pond
Type: Spring
Type: Stream
CHLORIDE CONCENTRATION IN WELLS
THROUGH TIME IS VARIABLE
250
>250 mg/L
Line of no difference
Upper concentration limit
Cut off for illustration
Maximum Chloride mg/L
(Multiple Samples Per Site)
Minimum Chloride mg/L
(Multiple Samples Per Site)
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
100
200
300
400

FIGURE 9



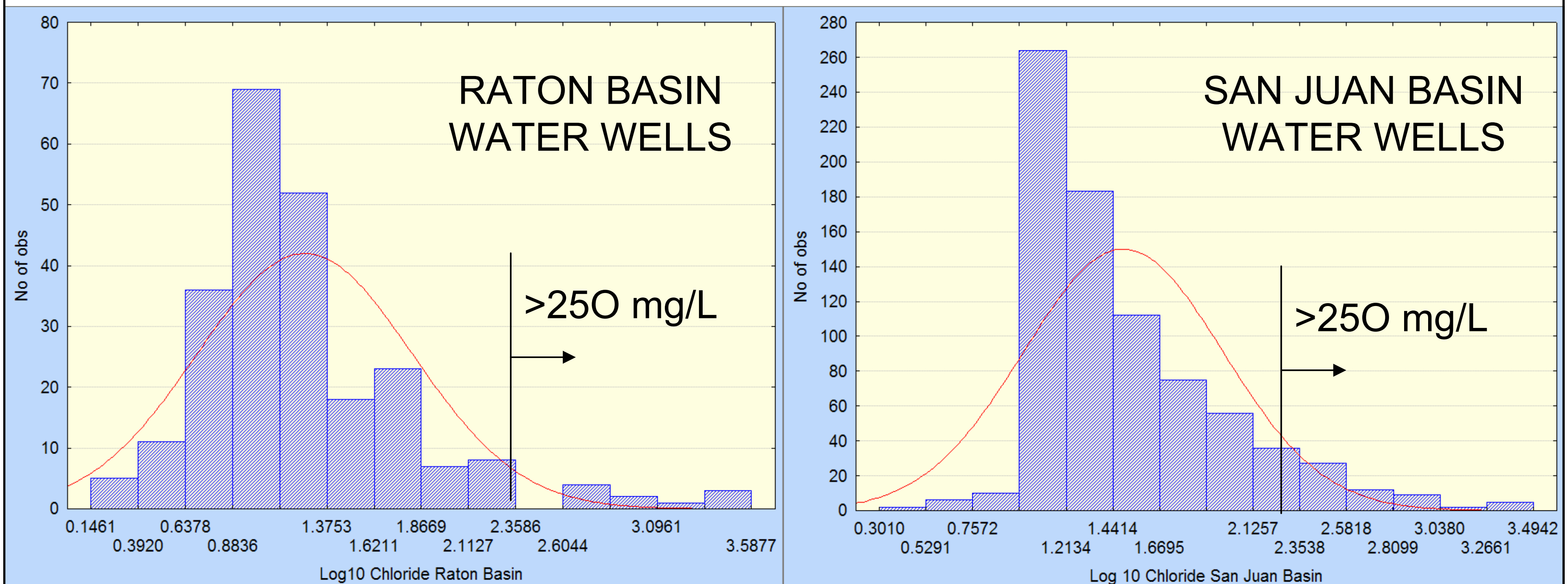
Of 5 wells with the longest sampling history,
four show an average *decrease* with time
Chloride mg/L
2000
1750
1500
1250
1000
750
500
250
0
23-Apr-04
22-Jul-04
20-Oct-04
18-Jan-05
18-Apr-05
17-Jul-05
703901
703920
703945
703947
704221

FIGURE 10

2B. WATER WELLS WITH >250 mg/l CHLORIDE ARE UBIQUITOUS IN SEMI ARID BASINS

- 12% of 226 Mamm Creek water wells contain >250 mg/L dissolved chloride
- 6.2% of 799 sampled San Juan Basin water wells contain >250 mg/L dissolved chloride (maximum 3120 mg/L)
- 4.2% of 239 sampled Raton Basin water wells contain >250 mg/L chloride (maximum 3870 mg/L)
- 13.5% of 37 wells sampled in the Laramie Fox Hills aquifer (Wattenberg Field 318A baseline data) contain >250 mg/L (maximum 594 mg/L)

SODIUM CHLORIDE GROUNDWATER IS COMMON IN ROCKY MTN. BASINS



	Mean	Geometric Mean	Median	Minimum	Maximum
799 San Juan Basin	79 mg/L	31 mg/L	23 mg/L	2 mg/L	3120 mg/L
239 Raton Basin	90 mg/L	18 mg/L	13 mg/L	1.4 mg/L	3870 mg/L
226 Piceance (Max)	166 mg/L	50 mg/L	49 mg/L	3.6 mg/L	3500 mg/L
226 Piceance (Min)	117 mg/L	35 mg/L	31 mg/L	1.9 mg/L	3500 mg/L

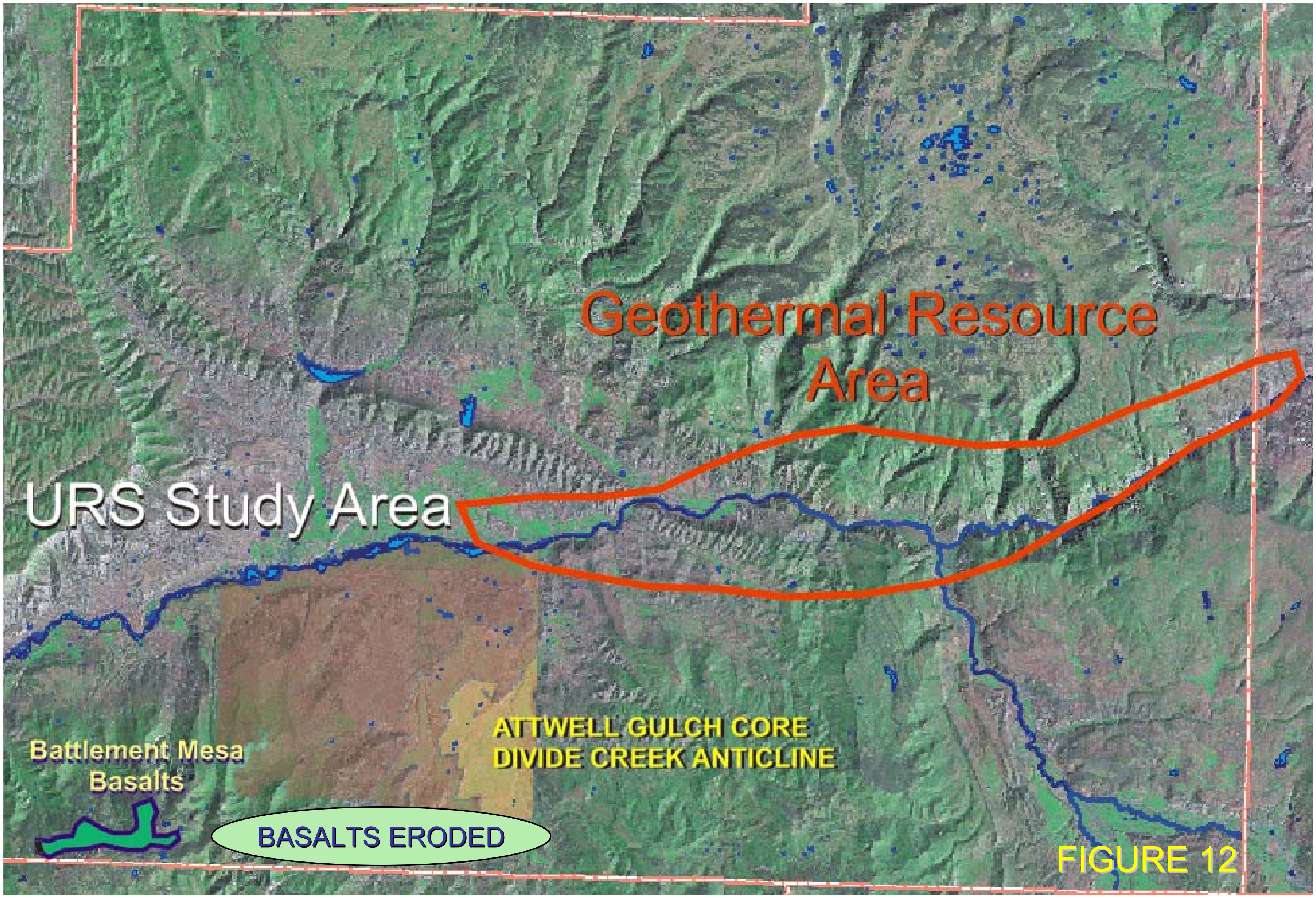
Chloride concentrations always increase with increasing depth of screened interval

FIGURE 11

2C. THERE ARE SOURCES FOR CHLORIDE OTHER THAN PRODUCED WATER

- A diverse geologic history and setting in this area was not considered
  - Atwell Gulch Late Paleocene 55 mya, Molina early Eocene, Shire mid to late Early Eocene 48 mya
    - Dissolved chloride concentrations from younger evaporite deposits in overlying, younger, Green River and Uinta Formations contain several hundred mg/L of chloride measured prior to any oil and gas development (Taylor 1987)
    - Regional intrusive basalts and hydrothermal fluids were emplaced throughout the area between Glenwood Springs and Battlement Mesa prior to Colorado River erosion 25 to 7 mya (Battlement Mesa basalts 10 mya)
- Study area intersects geothermal resource area identified by INEEL (Figure 12)

ADAPTED FROM INEEL 2003 MAP



2C. THERE ARE SOURCES FOR CHLORIDE OTHER THAN PRODUCED WATER

- NaCl is common in groundwater, with multiple sources that cannot be differentiated solely on the basis of chemical formula
  - Thyne illustration on page 18 not definitive
    - NaCl-bearing fluids from any elevated sodium chloride water source less concentrated than produced water would fall on the same mixing line
  - NaCl is not a geochemical tracer compound (Thyne p. 15)
    - Review of the Papadopulos report covers this subject adequately. Report concludes that no correlation between groundwater and produced water is possible with the analyte data set available
- Stable water isotope tracer compounds demonstrate multiple chloride sources
  - Stable isotope data available in URS data base not considered
  - Samples with high chloride >250 mg/L are present in water with signature of modern precipitation and no evidence of mixing with extraneous water sources (Figures 13 & 14)

2C. THERE ARE SOURCES FOR CHLORIDE OTHER THAN PRODUCED WATER

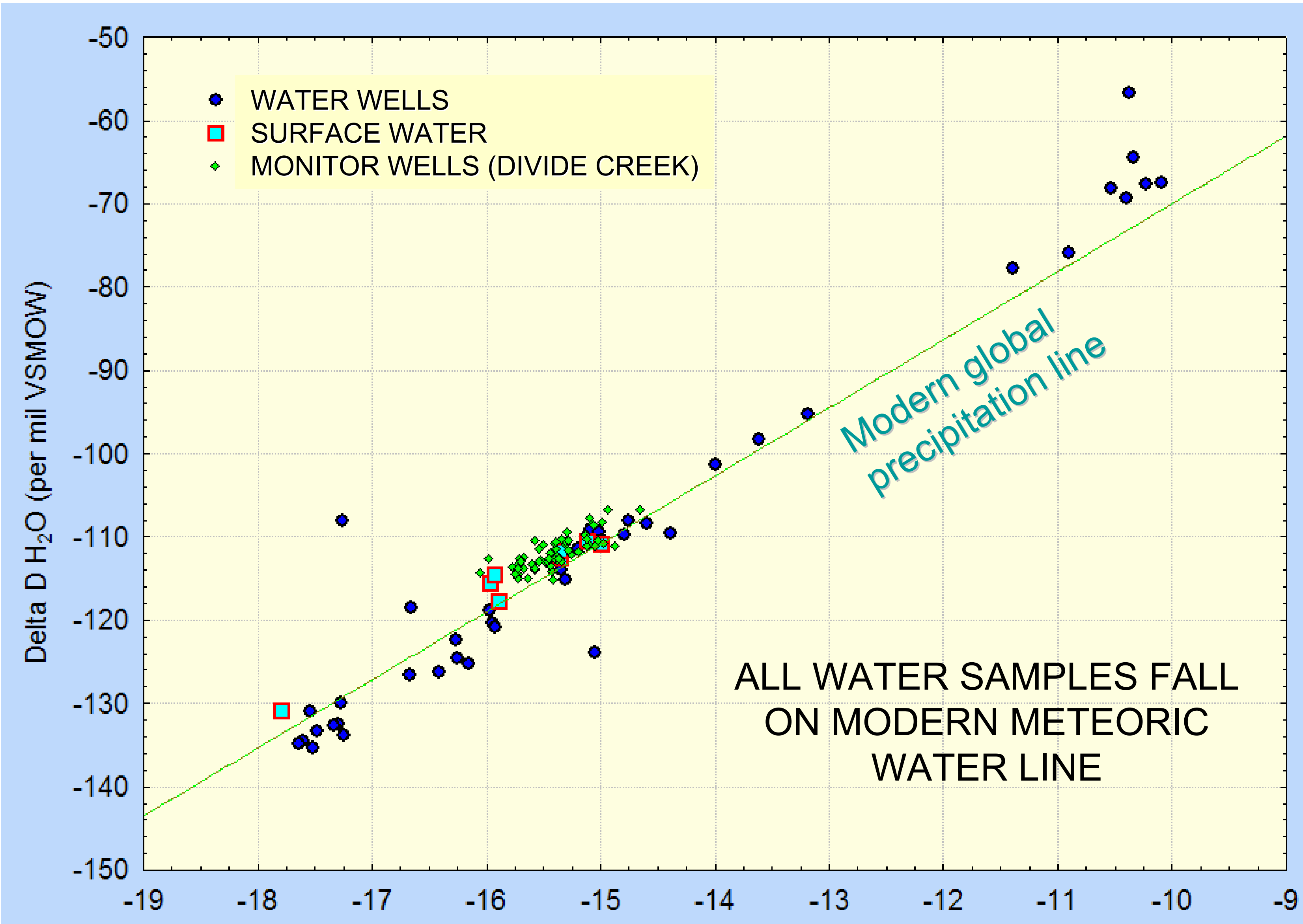


FIGURE 13

2C. THERE ARE SOURCES FOR CHLORIDE OTHER THAN PRODUCED WATER

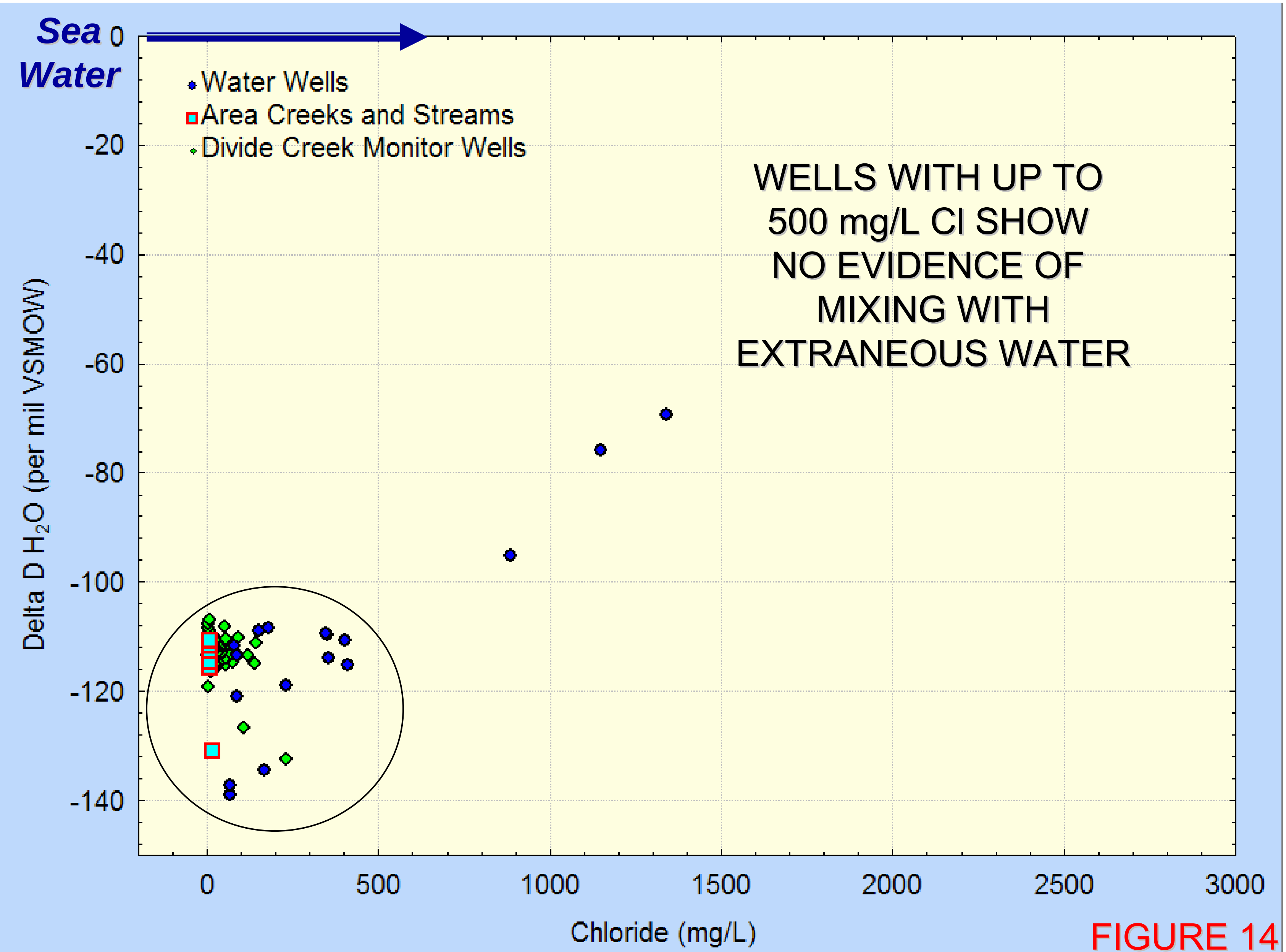


FIGURE 14

PREMISE 3: SPATIAL CORRELATION BETWEEN URS LINEAMENTS, PERSISTENT BRADENHEAD MEASUREMENTS, AND GROUNDWATER WITH HIGH CHLORIDE IS MEANINGFUL

A. Linear features on URS map represent major faults and fractures (Thyne Figure 2)
B. URS "major faults and fractures" intersect the surface and account high TDS groundwater
C. Distribution of initial bradenhead pressures is the result of intersection with URS map major faults and fractures
D. Distribution of water wells with high chloride and dissolved methane coincides with surface expression of URS map of major faults and fractures

3A. URS MAP DOES NOT REPRESENT THE DISTRIBUTION OF FAULTS AND FRACTURES IN THE SUBSURFACE

- URS specifies that their geologic structure is interpreted and based solely on aeromagnetic lineations
  - Thyne reports addresses these features as “faults and fractures”
- URS does not claim that deep, intermediate, or shallow depth aeromagnetic lineaments are faults that propagate to the surface (URS 2-16, 2-18)
  - URS report specifies a relationship between overall *orientation* of mapped aeromagnetic lineaments and mapped surface lineaments which they attribute to regional stress (URS 2-16, 2-18)
- Correlation between URS lineaments and aeromagnetic gradient map is broadly interpretative (Figure 15)
- There is no correlation between URS lineaments and faults mapped on the Rollins horizon based on seismic and geologic data (Figure 16)

ALIGNMENT OF URS LINEAMENTS WITH AEROMAGNETIC GRADIENT MAP IS IMPRECISE AND BROADLY INTERPRETATIVE

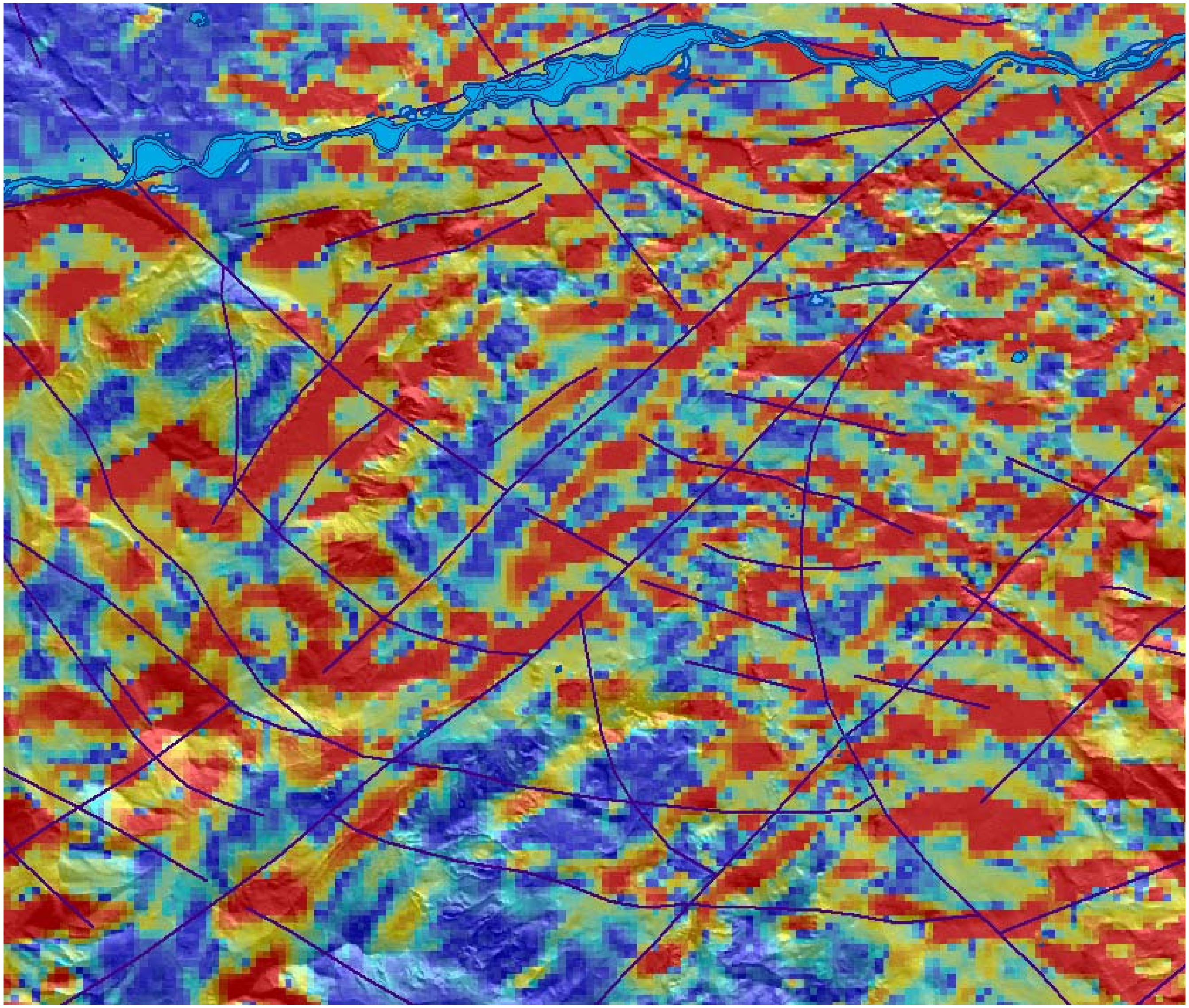
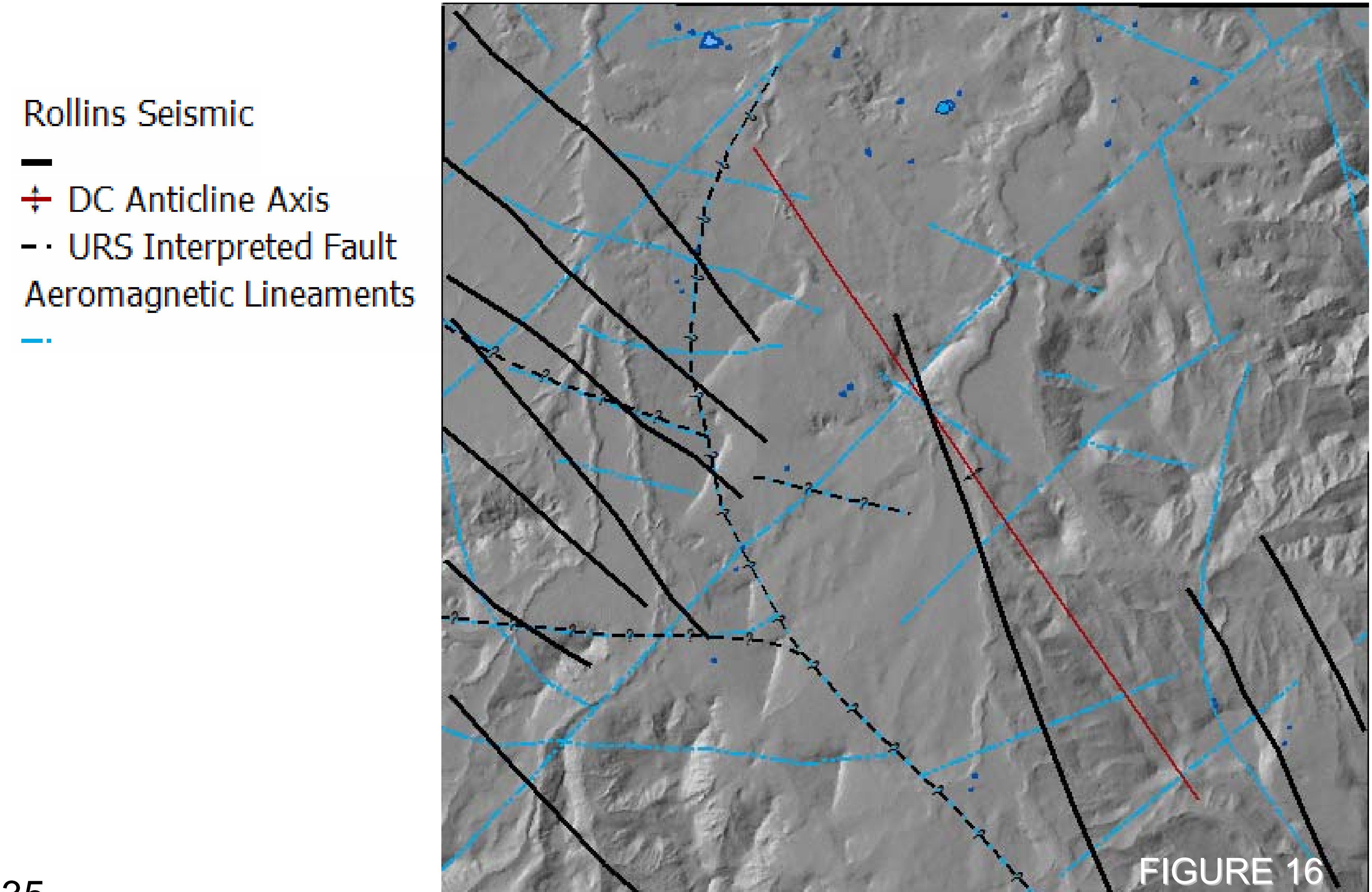


FIGURE 15

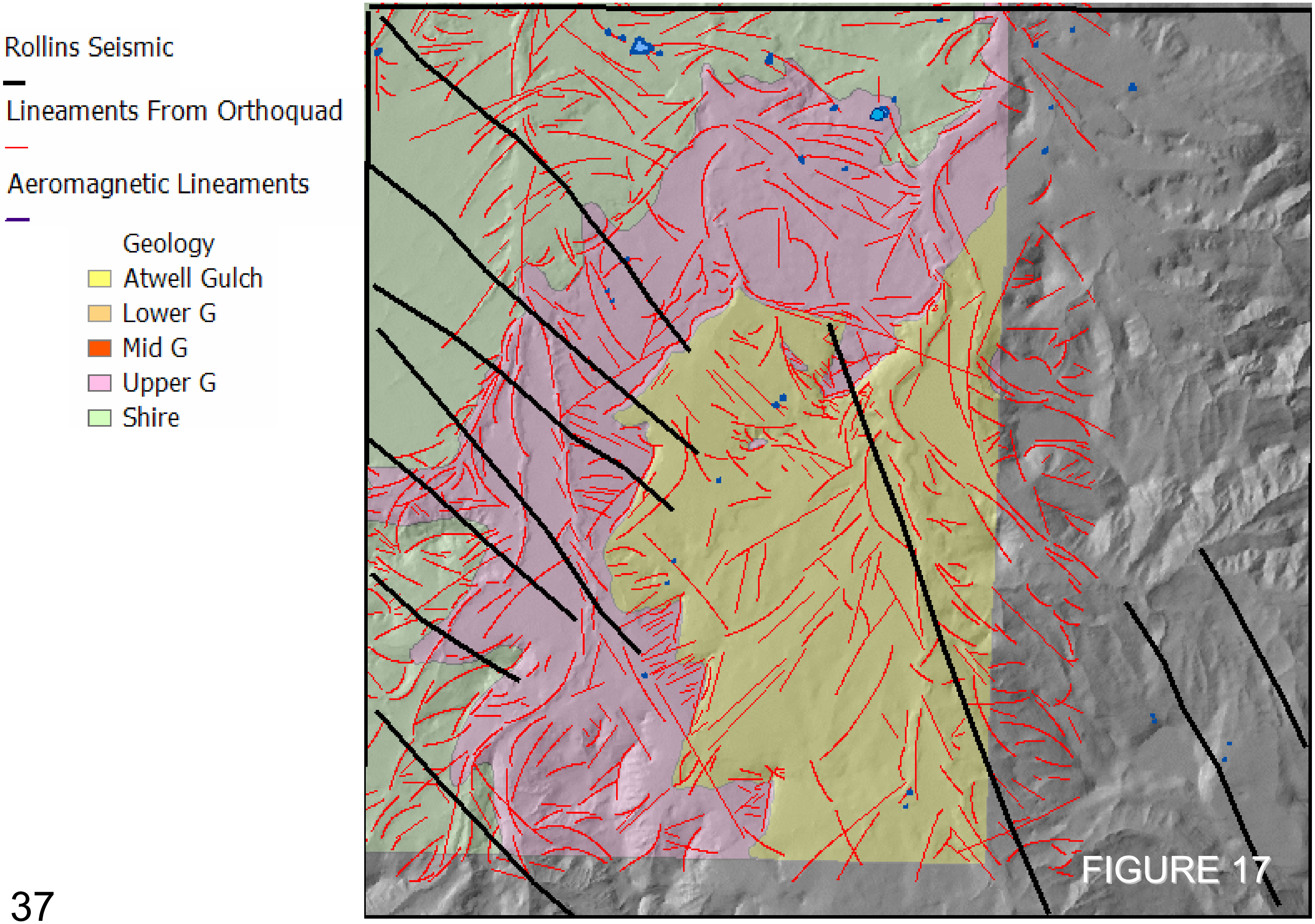
NO COINCIDENCE WITH URS LINEAMENTS AND FAULTS IN THE ROLLINS MAPPED ON SEISMIC & WELL DATA



3B. URS "MAJOR FAULTS AND FRACTURES" INTERSECT THE SURFACE AND ACCOUNT FOR HIGH TDS GROUNDWATER

- Mapped aeromagnetic URS lineaments do not coincide with faults mapped on the basis of seismic data and geologic control
  - Faults mapped on the basis of interpreted seismic data have not been observed to propagate to the surface
  - Structural traces of any kind are rarely vertical
- Mapped orthoquad URS lineaments do not coincide with Rollins faults mapped on the basis of interpreted seismic data (Figure 17)
- URS mapping of Wasatch Fm. bedrock did not identify any faults at the surface
- USGS has not mapped any surface faults in the area

THE LOCATIONS OF MAPPED SURFACE LINEAMENTS, SURFACE GEOLOGY, AND SEISMIC INTERPRETED ROLLINS FAULTS DO NOT COINCIDE



CONCLUSIONS

- There has not been any pervasive impact on groundwater resources due to gas operations in this area
  - Stated increases in methane and dissolved chloride concentration in groundwater are artifacts of improperly managed statistical analyses and selectively ignored data
  - High TDS chloride-rich fluids in deep Wasatch bedrock aquifers, associated with high concentrations of biogenic methane, represent baseline conditions
- The majority of dissolved methane in groundwater here is biogenic, not thermogenic
  - Thermogenic gas is known to occur in the Wasatch FM
  - Both chromatography and stable isotopic analysis of un-weathered gas samples categorically allow Wasatch and Williams Fork sources to be differentiated
- No credible evidence has been provided to demonstrate a produced water source for chloride
  - High chloride groundwater is common in aquifers within semi arid basins
  - Other naturally occurring chloride sources have not been excluded

CONCLUSIONS

- Uncemented annuli have allowed thermogenic Wasatch gas to locally migrate into shallow aquifers
  - Thermogenic gas in the Amos and former Dietrich wells has been observed to originate from shallow gas in the G33 and P3 pads and has been mitigated with remedial cement jobs
- Locally high fracture density swarms along the flanks and nose of the Divide Creek anticline allow fluids to migrate in Wasatch sandstones
  - Otherwise, the formation is largely impermeable and not susceptible to wide-scale contamination
  - Risk for shallow gas migration diminishes rapidly away from the anticline
- Areas of high fracture density pose a challenge to cement jobs and account for persistent bradenhead pressures
  - Both Wasatch and Williams Fork gas sands can account for persistent bradenhead pressures

ENCANA'S RISK MITIGATION

- Bradenhead pressures are routinely monitored and vented as needed to prevent fluid invasion into shallow aquifers
  - Persistent bradenhead pressure buildup is addressed with remedial cementing
- New technology cements are dramatically improving the quality of cement bonding in fractured formations
- In this area, EnCana now uses gas detectors while drilling to identify zones with Wasatch gas
  - Results are used to decide on staged cementing practices that cover the zones in question with cement or intermediate casing
- Baseline measurement and monitoring of water wells prior to and after drilling new wells is effective in mitigating risk to health environment and safety

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