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## **Vista Geoscience Project 10022**

### **WEST PEETZ FIELD WATER AND GAS BASELINE ENVIRONMENTAL SURVEY REPORT, LOGAN COUNTY, COLORADO**

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## Executive Summary

A baseline water and gas environmental survey was carried out over the West Peetz oil field in the northwest part of Logan County, Colorado on behalf of Merchant Energy Partners, LLC (Figure 1). The survey was done to document environmental conditions prior to development of the East Cheyenne Gas Storage Facility in D- and J-sandstone reservoirs. The survey consisted of the following phases:

- (1) Checking 22 plugged and abandoned oil and gas wells for gas leaks prior to re-plugging of the wells.
- (2) Sample, analyze and document water quality in seven, 180 to 1,160 foot deep domestic water wells over and off the West Peetz field.
- (3) Isotopic fingerprinting of hydrocarbon gases from the Fox Hills aquifer and deeper productive intervals of the Dakota D- and J-sandstone.

Gas seeps (methane and heavier hydrocarbons) were not detected within a 150-foot radius of the recently excavated P&A wells. Anomalous methane concentrations, however, were detected in three (i.e. Williams and Nelson deep wells and Williams shallow well) of the seven water wells sampled and Williams Deep well contained over 9 parts per million of dissolved methane. While the methane concentration in the Williams Deep well is under-saturated, potentially explosive levels can build-up in the pressure tank, which feeds water directly into the residence. Mr. Williams was notified of this potential hazard and was provided with suggestions for venting the methane before it reaches his residence.

Carbon and deuterium isotopes indicate that the methane in the Williams Deep well was formed through carbon dioxide reduction. Carbon and deuterium isotopes of the methane from the Williams Deep water well are considerably lighter than those in thermogenic methane from D- and J-sand produced gas samples, thereby ruling out produced gas as a potential source of the methane in the water wells. The water wells contain only trace amounts of C<sub>2</sub>+ alkanes and BTEX compounds (benzene, ethylbenzene, toluene, and xylenes) were not detected in any of the wells.

The shallow wells (<680 feet) contain “hard to very hard” Ca-Mg-HCO<sub>3</sub> water, which is consistent with Ogallala “High Plains” aquifer water chemistry. The deep wells cased in the Fox Hills aquifer, contain “soft” Na-HCO<sub>3</sub> type water. Total Dissolved Solids (TDS), which represents the relative amounts of inorganic salts and organic matter in water, are above the secondary drinking water standard (500 mg/L) in the deep Williams and Nelson wells (i.e. high levels of Na and HCO<sub>3</sub>) and the shallow Williams well (i.e. high levels of Ca, Mg and Cl).

The manganese concentration in the Williams shallow well is higher than the secondary drinking water standard. The water well is not a current source of potable water, so removal of the

manganese through ion exchange, oxidation or sequestration techniques is not necessary at this time. Boron is particularly concentrated (~1.8 ppm) in the Williams Deep well, but US Environmental Protection Agency (EPA) does not report drinking water standards for Boron.

Fluoride concentrations in the Williams shallow and deep wells equal or slightly exceed secondary drinking water standards of 2 mg/L. Chloride concentrations are particularly anomalous in the shallow Williams and Ron Gillam wells, but they do not exceed the secondary drinking water standard of 250 mg/L. Nitrate was detected in all of the shallow wells (<680 feet), and concentrations in the Wood well are slightly above the EPA primary drinking water standard. Nitrate was not detected in the 1,160-foot deep Williams well suggesting no mixing between the shallow Ogallala and deeper Fox Hills aquifers.

Slime-forming bacteria (SLYM) are concentrated in the shallow Rich Gillam, Ron Gillam and Williams water wells and the deep Williams well. Iron-related bacteria (IRB) are most concentrated in the Ron Gillam well. Sulfur-reducing bacteria (SRB) are present at low levels in the deep Williams and shallow Wood wells.

## **Summary**

Groundwater in the shallow Ogallala aquifer over and off the West Peetz field contains “hard to very hard” Ca-Mg-HCO<sub>3</sub> water with detectable nitrate. For the most part, the wells sampled contain potable water, but the Williams shallow well has TDS and manganese that exceed secondary drinking water standards. The well does not require filtering out of manganese, as the well is not a current source of potable water. Slime-forming bacteria, which can plug wells and lower water yield, are particularly concentrated in the Rich Gillam, Ron Gillam and Williams wells over the West Peetz field. The Ron Gillam well has been fouled by iron-related bacteria, which is evident in the rusty-pitted well casing.

The deeper Fox Hills aquifer contains “soft” Na-HCO<sub>3</sub> with no detectable nitrate, and TDS exceeds secondary drinking water standards in both the Williams and Nelson wells. The Williams deep well contains high concentrations of dissolved microbial methane formed through carbon dioxide reduction as opposed to thermogenic processes, which formed methane in deeper productive intervals of the Dakota D- and J-sandstone. Mr. Williams has been notified of the potential explosive hazard from methane entering his residence and recommendations for venting the methane at the water well have been provided. Boron, slime-forming bacteria and fluoride are also concentrated in the Williams deep well. The boron and fluoride are probably derived from the Fox Hills aquifer host rocks.

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## **1.0 Introduction**

Merchant Energy Partners, LLC contracted Vista Geoscience of Golden, Colorado to perform a baseline water and gas environmental survey over the West Peetz field in Logan County, Colorado (Figure 1). The objective of the survey was to document baseline environmental conditions before development of the East Cheyenne natural gas storage facility. A total of 22 P&A wells were checked for hydrocarbon gas leaks and water quality was documented in 7 water wells over and off the field. In this report, the methodology for gas leak detection, water well sampling and analytical procedures is described in Section 2.0. This is followed by presentation of the results of the baseline survey in Section 3 followed by conclusions in Section 4.0.

## **2.0 Methodology**

### **2.1 Field Procedures**

A total of 22, recently excavated P&A wells were checked for hydrocarbon gas leaks within a 150-foot radius using a portable Foxboro TVA 1000B flame ionization detector (Figures 2 and 3). The instrument, which is equipped with both flame and photo ionization detectors (FID/PID) has detection limits of 1 part per million (ppm) methane and 0.1 ppm aromatic hydrocarbons (e.g. benzene). The data were collected in an ArcPad-Trimble system with sub-foot accuracy. The gas detection and sample and data collection procedures are described in more detail in Appendix 1.

National Water Quality Assessment (NAWQA) protocols were used for sampling the water wells (Koterba et al., 1995). Six of the seven well water samples were collected from hydrants off the domestic wells after purging 1.5 well volumes and stabilization of water quality parameters (Figures 4 and 5; Table 1). Pump rates ranged from 6.6 to 15 gallons per minute (Table 1). The pump on the Ron Gillam well was inoperable, so the well was purged and sampled using a submersible pump and down-hole tubing (Figure 6). The water well sampling procedures are described in more detail in Appendix 2.

### **2.2 Laboratory Analytical Procedures**

The water was analyzed for dissolved C<sub>1</sub>-C<sub>6</sub> hydrocarbons and BTEX (benzene, ethylbenzene, toluene and xylenes), total dissolved solids, alkalinity, pH, conductivity, and slime-forming, iron-related and sulfur-reducing bacteria (BART test) at Vista Geoscience (Appendix 2). Dissolved cations and anions were analyzed at Pace Analytical Services in Lexena, Kansas and Test America in Arvada, Colorado (Appendix 2). Accutest laboratories analyzed the Nelson well water for BTEX, total dissolved solids, sulfate and chloride, and these data were extracted for interpretation and plotting from the ERM water quality report by Paul Stefan (April 8, 2010). Other cations and anions necessary for derivation of water hardness (i.e. Ca and Mg) and water type (calcium, sodium, potassium magnesium and bicarbonate) were not analyzed by Accutest, and these results are therefore not presented in this report for the Nelson well. The analytical



methods are summarized in Table 1. The data quality is good based on laboratory duplicates, method blanks and spikes (Table 1). Vista's laboratory manager reviewed the analytical results from Vista Geoscience, Pace Analytical Services and Test America, and the quality control and sample data are provided in Appendix 2.

## **2.2 Interpretation and Mapping Procedures**

Tracks from the gas leak survey around P&A wells were plotted on a topographic background with the location of all wells. The organic and inorganic data from the domestic well water analyses were evaluated in Excel spreadsheets. Water types in shallow and deep aquifers in the survey area are represented in a Piper diagram. Breakpoints between background and anomalous concentrations of compound and element concentrations were selected on histograms in ArcGIS 9.3 software. The concentration data were plotted as proportional symbols on a topographic background with the locations of P&A wells.

## **3.0 Results**

Results of the West Peetz baseline environmental survey are summarized as follows:

### **3.1 Hydrocarbons Seeps at P&A Wells and in Domestic Well Water**

Gas seeps (methane and heavier hydrocarbons) were not detected within a 150-foot radius of the recently excavated P&A wells (Figure 7). Anomalous methane concentrations, were, however, detected in three of the seven water wells sampled and Williams Deep well contained over 9 parts per million of dissolved methane (Table 3; Figure 8). While the methane concentration in the Williams deep well is under-saturated (saturation is ~24 ppm under ambient conditions), potentially explosive levels can build-up in the pressure tank, which feeds water directly into the residence (Figure 9). Merchant Energy Partners notified Mr. Williams of the potential hazard and methods were recommended for venting the methane at the water well.

Carbon and deuterium isotopes indicate that dissolved methane in the Williams deep well is of microbial (biogenic) origin, and it was formed through carbon dioxide reduction (Figures 10 and 11). Carbon and deuterium isotopes of the methane from the Williams Deep water well are considerably lighter than those in thermogenic methane from D- and J-sand produced gas samples (Figures 10 and 11; Tables 3 and 4), thereby ruling out produced gas as a source of the methane in the water wells. The water wells contain only trace amounts of C<sub>2</sub>+ alkanes (Figure 12; Table 3) and BTEX compounds (benzene, ethylbenzene, toluene, and xylenes) were not detected in any of the wells (Appendix 2).

### **3.2 Water Type, Hardness and Total Dissolved Solids (TDS) in Domestic Well Water**

The shallow wells (<680 feet) contain "hard to very hard" Ca-Mg-HCO<sub>3</sub> water (Tables 5 and 6; Figures 13, 14 and 15), which is consistent with the chemistry of the Tertiary Ogallala Formation



“High Plains Aquifer” elsewhere in Colorado (Weist, 1965 and Project No. 22239415: “Ogallala Aquifer Baseline Study Report” for COGCC by URS, July 2007). The Williams deep well contain “soft” Na-HCO<sub>3</sub> type water (Tables 5 and 6; Figures 13, 14 and 15).

Total Dissolved Solids (TDS), which represents the relative amounts of inorganic salts and organic matter in water, are above the secondary drinking water standard (500 mg/L) in the deep Williams and Nelson wells (i.e. high levels of Na and HCO<sub>3</sub>) and the shallow Williams well (i.e. high levels of Ca, Mg and Cl) – see Table 5 and Figure 16. Possible sources of elevated TDS include mineral springs, carbonate deposits, salt deposits, seawater intrusion, road de-icing salts, drinking water treatment chemicals (e.g. KCl) and storm water and agricultural run-off.

### **3.3 Metals in Domestic Well Water**

The manganese concentration in the Williams shallow well is higher than the secondary drinking water standard (Table 6; Figure 17). Potential sources of manganese include chemical fertilizers and/or livestock feed. The water well is not a current source of potable water, so removal of the manganese through ion exchange, oxidation or sequestration techniques is not necessary at this time.

Boron is particularly concentrated in the Williams Deep well (~1.8 mg/L) and potential sources include the Fox Hills aquifer host rocks, chemical fertilizers and pesticides and/or household detergents (Table 6; Figure 18). The US EPA does not report drinking water standards for Boron.

### **3.4 Anions in Domestic Well Water**

Fluoride concentrations in the Williams shallow and deep wells equal or slightly exceed secondary drinking water standards of 2 mg/L (Table 7; Figure 19). Possible sources of the fluoride include leaching from Fox Hills aquifer source rocks and/or runoff and infiltration from chemical fertilizers. Chloride concentrations are particularly anomalous in the shallow Williams and Ron Gillam wells, but they do not exceed the secondary drinking water standard of 250 mg/L (Table 7; Figure 20). The anomalous chloride contents may reflect the salt pellets that are sometimes used to soften water. Nitrate was detected in all of the shallow wells (<680 feet), and the concentration in the Wood well water (10.9 mg/L) is slightly above the EPA primary drinking water standard (Table 7). Nitrate was not detected in the deeper Fox Hills aquifer (i.e. 1,160-foot deep Williams well – Table 7).

### **3.5 Non-Pathogenic Bacteria in Domestic Well Water**

Slime-forming bacteria (SLYM) are concentrated in water wells situated over the West Peetz field (i.e. Rich Gillam, Ron Gillam and Williams shallow and deep water wells) see Table 8 and Figure 21). These fast-growing, aerobic microorganisms form slime on the interior of well casing that can trap debris and cause plugging problems. The reason for the prevalence of these bacteria in groundwater over the West Peetz field is unknown. Iron-related bacteria (IRB) are most

concentrated in the Ron Gillam well (Table 8; Figure 22). These bacteria oxidize soluble ferrous ( $\text{Fe}^{2+}$ ) iron to insoluble ferric ( $\text{Fe}^{3+}$ ) iron leading to fouling of water and plugging, corrosion, pitting and iron staining of well casing (see Ron Gillam's stained well casing in Figure 6). Sulfur-reducing bacteria (SRB) are present at low levels in the deep Williams and shallow Wood wells (Table 8; Figure 23). These bacteria can cause odor problems and pitting of well casing.

#### **4.0 Conclusions and Recommendations**

The following conclusions are drawn from the baseline environmental survey over the West Peetz field in Logan County, Colorado:

- (1) With the exception of the Williams deep well, the other 6 wells contain non-detectable to trace amounts of C1-C6 hydrocarbons and no detectable BTEX compounds. Anomalous methane (~ 9 ppm) in the Williams deep well water represents a potential explosive hazard to the Williams resident and methods have been suggested for venting the methane at the water well. The microbial methane was derived through carbon dioxide reduction rather than thermogenic processes, which formed the methane in productive intervals of the Dakota D-sand and J-sandstone.
- (2) Groundwater in the shallow Ogallala High Plains Aquifer is hard to very hard Ca-Mg- $\text{HCO}_3$  water with detectable nitrate and TDS generally less than the secondary drinking water standard. The only exception is the Williams shallow well with TDS of 665 mg/L. Manganese concentrations in the Williams shallow well are 17 times greater than the secondary drinking water standard and there are also elevated levels of fluoride and chloride in the water. Filtering out the manganese is not necessary because the well is not currently being used for potable water. Possible sources of the manganese could be chemical fertilizers and/or livestock feed. Nitrate, which is probably derived through runoff and infiltration of chemical fertilizers, was detected in all shallow (<650 feet) wells tested and the Wood well contains slightly more than primary drinking water standard. Slime-Forming Bacteria (SLYM) are concentrated in shallow (<680 feet) well water over the West Peetz field (i.e. Ron Gillam, Rich Gillam and Williams wells) and the Ron Gillam well contains anomalous iron-related bacteria (IRB). The SLYM bacteria trap debris leading to plugging, which can reduce water yield over time. IRB bacteria can also cause plugging and corrosion, pitting and staining of well casing.
- (3) Groundwater in the deeper Fox Hills aquifer is soft Na- $\text{HCO}_3$  water with no detectable nitrate and TDS that exceeds the secondary drinking water standard of 500 mg/L. The lack of nitrate in the deeper Fox Hills aquifer suggests no mixing with groundwater in the shallow Ogallala High Plains aquifer. Elevated boron and fluoride in the Williams deep well are probably derived from the Fox Hills aquifer host rocks. The Williams deep well contains a higher concentration of slime-forming bacteria than the Williams shallow well (66,500 versus 12,500 cfu).

## References

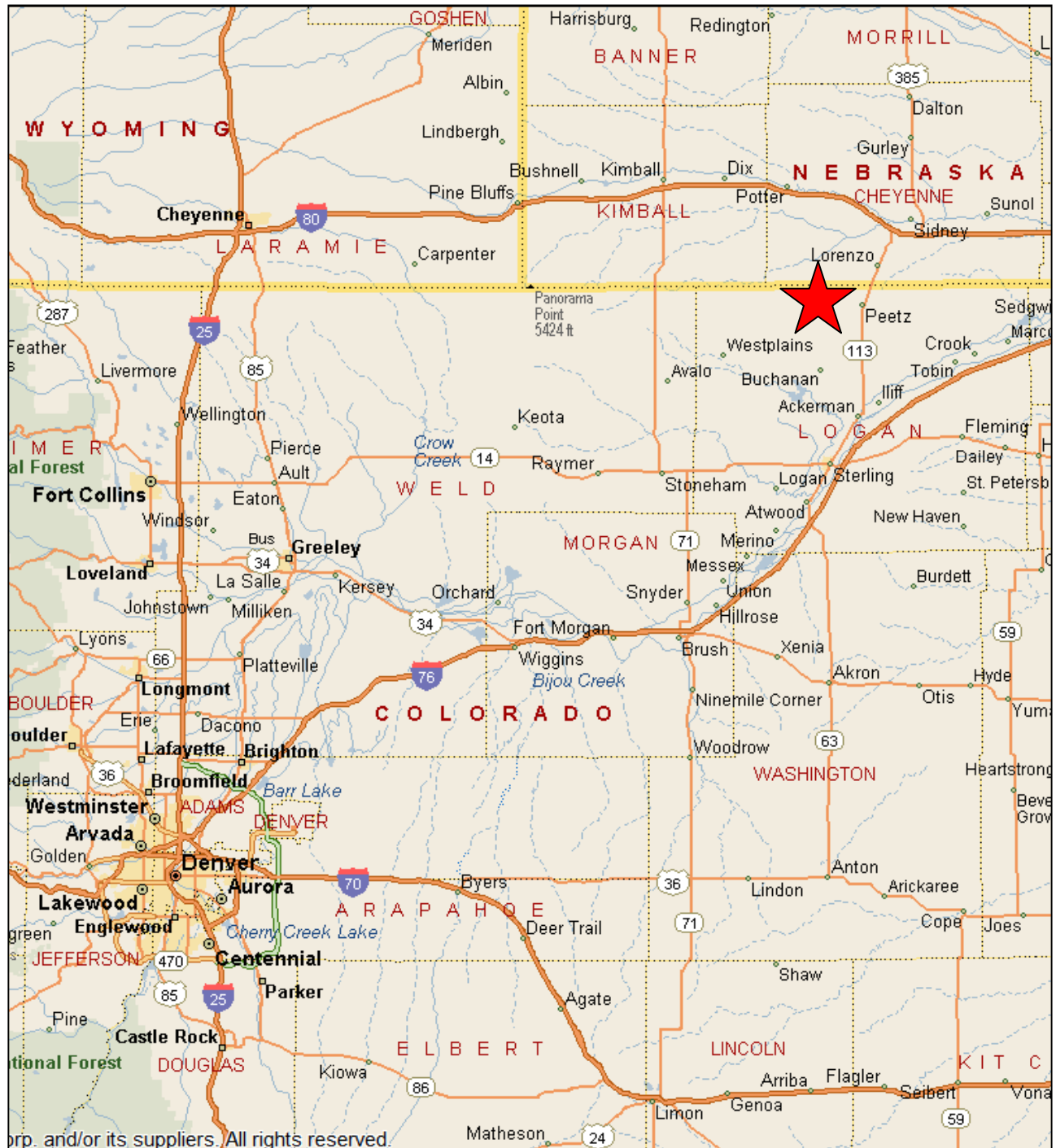
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**Figure 1.** Location of the West Peetz baseline survey in Logan County, Colorado.

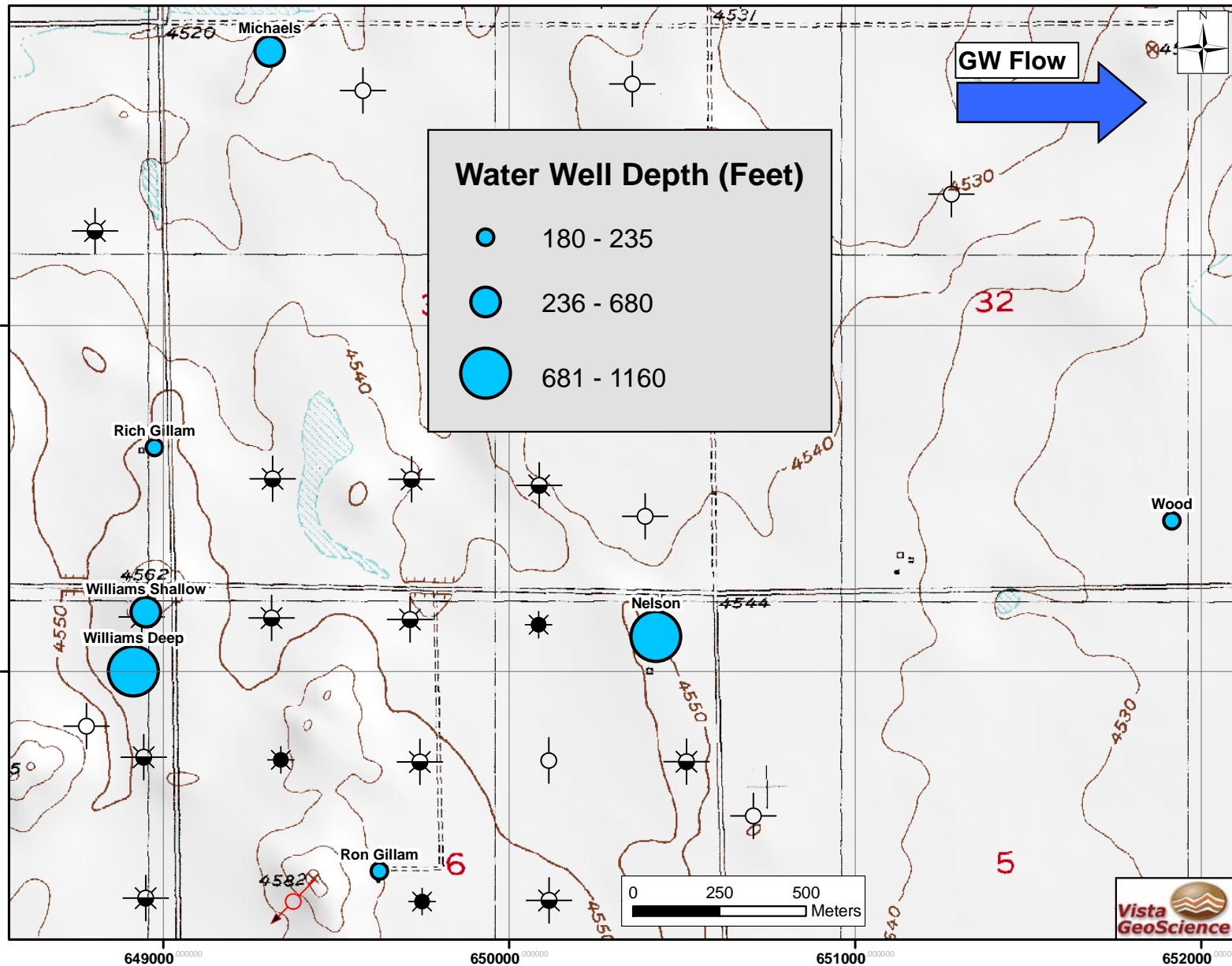




**Figure 2.** A Foxborough TVA 1000 flame/photo ionization detector (FID/PID) was used to check around plugged and abandoned wells for oil and gas seeps. The instrument was calibrated with ambient air (0 ppm) and 100, 1,000, 10,000 and 50,000-ppm standards. The PID was calibrated with ambient air a 100-ppm isobutylene standard. Instrument checks were repeated several times a day to monitor for drift.



**Figure 3.** Excavated well market at the Boyle #1 P&A well. The well marker and an area within a 150-foot radius around the marker were checked with the FID/PID for gas leaks.



**Figure 4.** Distribution and depth of seven water wells tested in the West Peetz baseline survey. Five wells over the West Peetz field and two wells off the field were sampled for water quality analysis. Approximately 1.5 volumes of water were purged from the wells and water was collected only after water quality parameters (pH, temperature, conductivity and dissolved oxygen) has stabilized (see Table 1). Groundwater flow in the High Plains Aquifer is from west to east in this area (Gutentag and Weeks, 1980).





**Figure 5.** Hydrants off the water wells were tapped for purging and water sample collection.



**Figure 6.** Down-hole photograph of Ron Gillam's water well. The pump was inoperable on this well so a submersible pump with white plastic tubing was used for purging and water sample collection.



**Table 1.** Attributes of the seven water wells sampled over and off the West Peetz Field..

Well ID	Well Coordinates		PLSS	Well depth and pump rate		Water Quality Parameters (measured in the field)				
	Longitude	Latitude		Well Depth (feet)	Pump Rate (gal/min)	Clarity	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (°C)
Michaels-043010	-103.22531	40.97765	NWNW-31-12N-52W	435	6.6	Good	7.62	0.728	8.83	11.68
RichGilliam-050110	-103.22954	40.96740	SESE-36-12N-53W	180	15	Good	7.4	0.92	7.24	12.93
WilliamsS-050110	-103.22995	40.96312	NENE-1-11N-53W	680	14	Good	8.17	1.941	0.44	15.61
WilliamsD-050110	-103.23042	40.96158	NENE-1-11N-53W	1160	14	Good (bubbles)	9.05	2.107	0.27	21.64
WilliamsD-050110-DUP	-103.23042	40.96158	NENE-1-11N-53W	1160	14	Good (bubbles)	9.05	2.107	0.27	21.64
Ron Gillam-051710 (submersible pump)	-103.22212	40.95625	NESW-6-11N-52W	200	1.75	Good	7.78	0.571	6.25	14.36
Nelson-051710	-103.21246	40.96220	NENE-6-11N-52W	1020	8.57	Good (bubbles)	8.49	1.233	0.09	21.52
Wood-061510	-103.19466	40.96494	SESE-32-12N-52W	235	10	Good	7.04	0.386	10.58	13.81
Wood-061510-Dup	-103.19466	40.96494	SESE-32-12N-52W	235	10	Good	7.04	0.386	10.58	13.81

**Table 2.** Analytical methods and quality control comments.

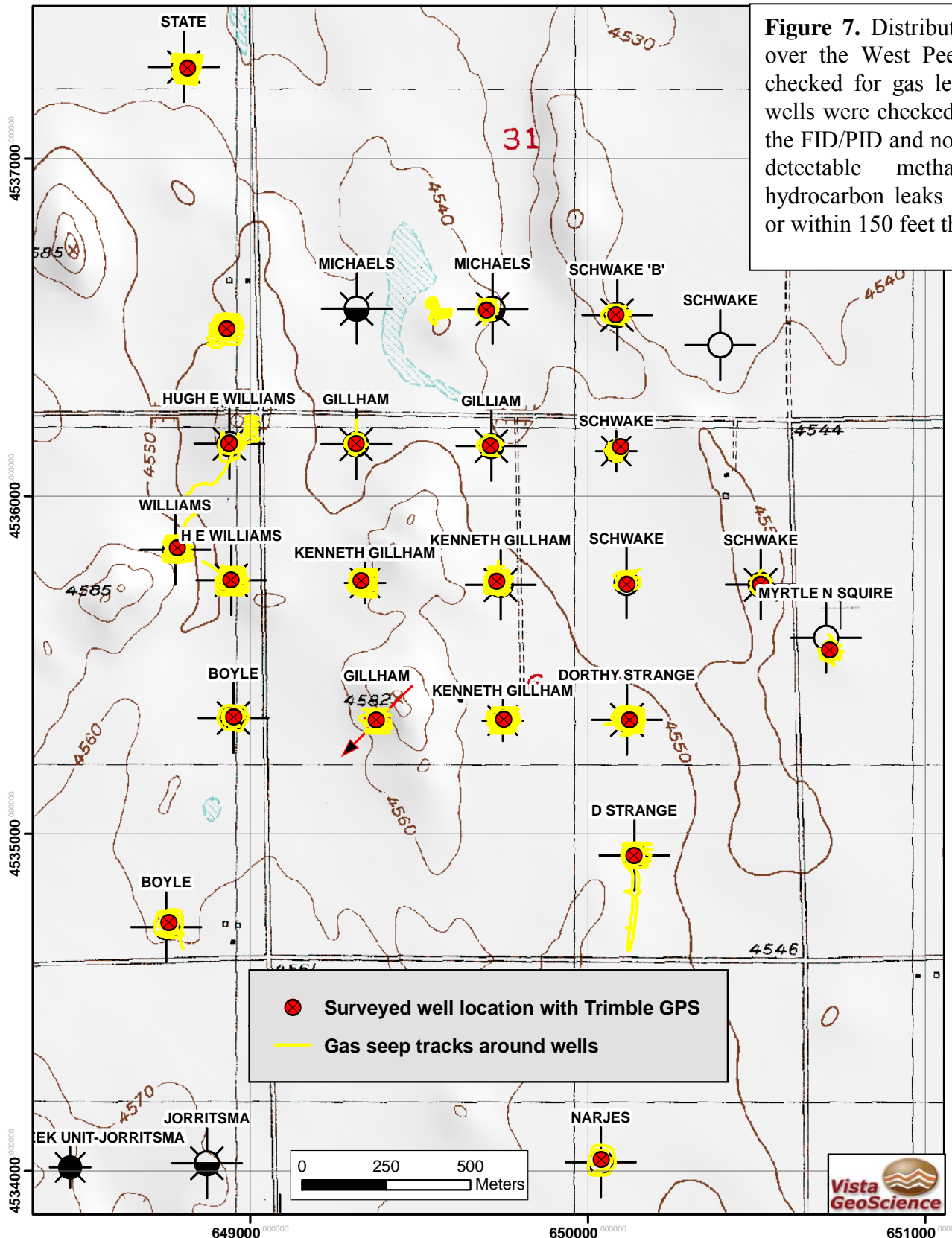
Analyte	Method	Quality Control
C1-C6	RSK-175 Mod	MB-good, 0.0% RPD between Field duplicates.
BTEX	EPA 8260	MB,LCS-good, 0.0% RPD between Field duplicates. RPD between MS/MSD at 10.1 or below.
TDS	EPA 160.1	MB-Good, 1.6% RPD between Duplicates or less
TSS	EPA 160.2	MB-Good, RPD between duplicates good 0.0%
Alkalinity	EPA 310.1	1.8% or less RPD between duplicates good
pH	EPA 150.1	0.65% or less RPD between duplicates good
Conductivity	EPA 120.1	2.4 % or less RPD between duplicates good
Anions	EPA 300 and 365.1	MB, LCS-Good, 4% RPD or less between MS/MSD
Metals	EPA 6010	MB, LCS-Good, 2% RPD or less between MS/MSD

**MB = Method Blank**

**LCS = Laboratory Control Spike**

**RPD = Relative Percent Difference**

**MS/MSD = Matrix Spike/Matrix Spike Duplicate**



**Figure 7.** Distribution of P&A wells over the West Peetz field that were checked for gas leaks. A total of 22 wells were checked for gas leaks with the FID/PID and none of them showed detectable methane or heavier hydrocarbon leaks at the well marker or within 150 feet the well.

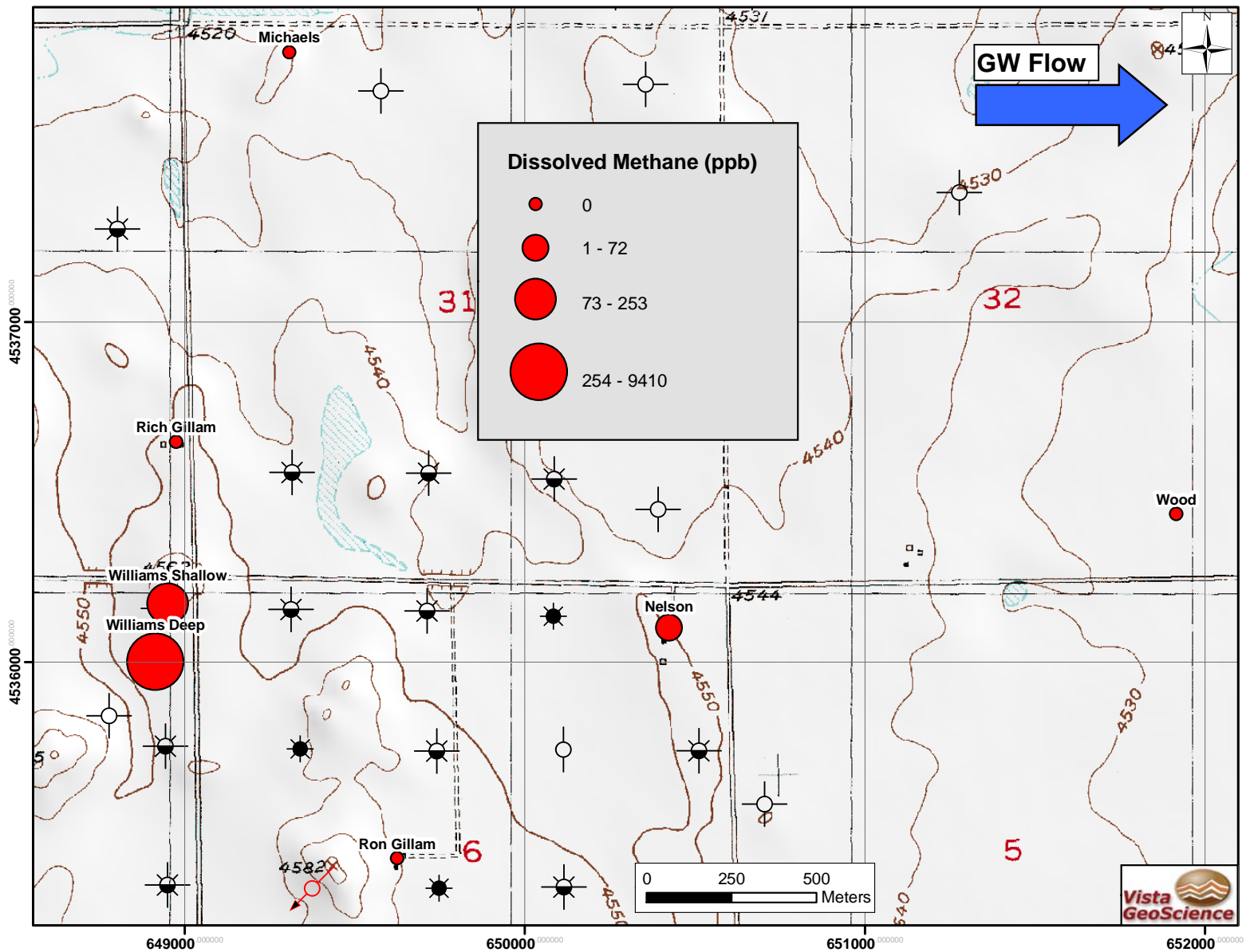
**Table 3.** Dissolved C<sub>1</sub>-C<sub>6</sub> hydrocarbon and isotopic composition of well water samples.

		Dissolved C1-C6 Hydrocarbons (ug/L)															
Sample	Well Depth (feet)	Methane	Ethane	Ethylene	Propane	Propene	I-Butane	N-Butane	Butene	I-Pentane	N-Pentane	Pentene	I-Hexane	N-Hexane	δ <sup>13</sup> C C <sub>1</sub>	δD C <sub>1</sub>	
Michaels-043010	435	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
RichGilliam-050110	180	ND	0.0320	ND	0.882	ND	0.0250	ND	ND	0.0370	ND	ND	0.0420	ND			
WilliamsS-050110	680	253	0.474	ND	0.0340	ND	ND	ND	ND	ND	ND	ND	0.405	0.0830			
WilliamsD-050110	1160	9410	21.9	ND	0.138	0.273	ND	ND	ND	ND	ND	ND	ND	ND	-73.39	-256.1	
WilliamsD-050110-DUP	1160	9170	21.6	ND	0.140	0.257	ND	ND	ND	ND	ND	ND	ND	ND			
Ron Gillam-051710	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Nelson-051710 (BTEX by Accutest C1-C6 by Vista)	1020	71.5	0.154	0.0260	0.0480	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Wood-061510	235	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Wood-061510-Dup	235	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Trip Blank		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			

ND = Not detected

**Table 4.** Hydrocarbon and isotopic composition of D- and J-sand produced gas from the West Peetz field.

Produced Gas Sample	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	iC <sub>4</sub>	nC <sub>4</sub>	iC <sub>5</sub>	nC <sub>5</sub>	C <sub>6+</sub>	Gas Wetness (C <sub>2+</sub> /C <sub>1</sub> )	$\delta^{13}\text{C}_1$	$\delta\text{DC}_1$	$\delta^{13}\text{C}_2$	$\delta^{13}\text{C}_3$
	%	%	%	%	%	%	%	%	%	‰	‰	‰	‰
Michaels No.1 (J-sand)	81.929	6.704	6.394	0.850	2.303	0.571	0.591	0.659	18	-56.97	-234.3	-35.52	-32.61
Gilliam #3 (D-sand)	82.724	6.249	6.145	0.794	2.162	0.572	0.542	0.813	17	-57.02	-233.5	-35.7	-32.77

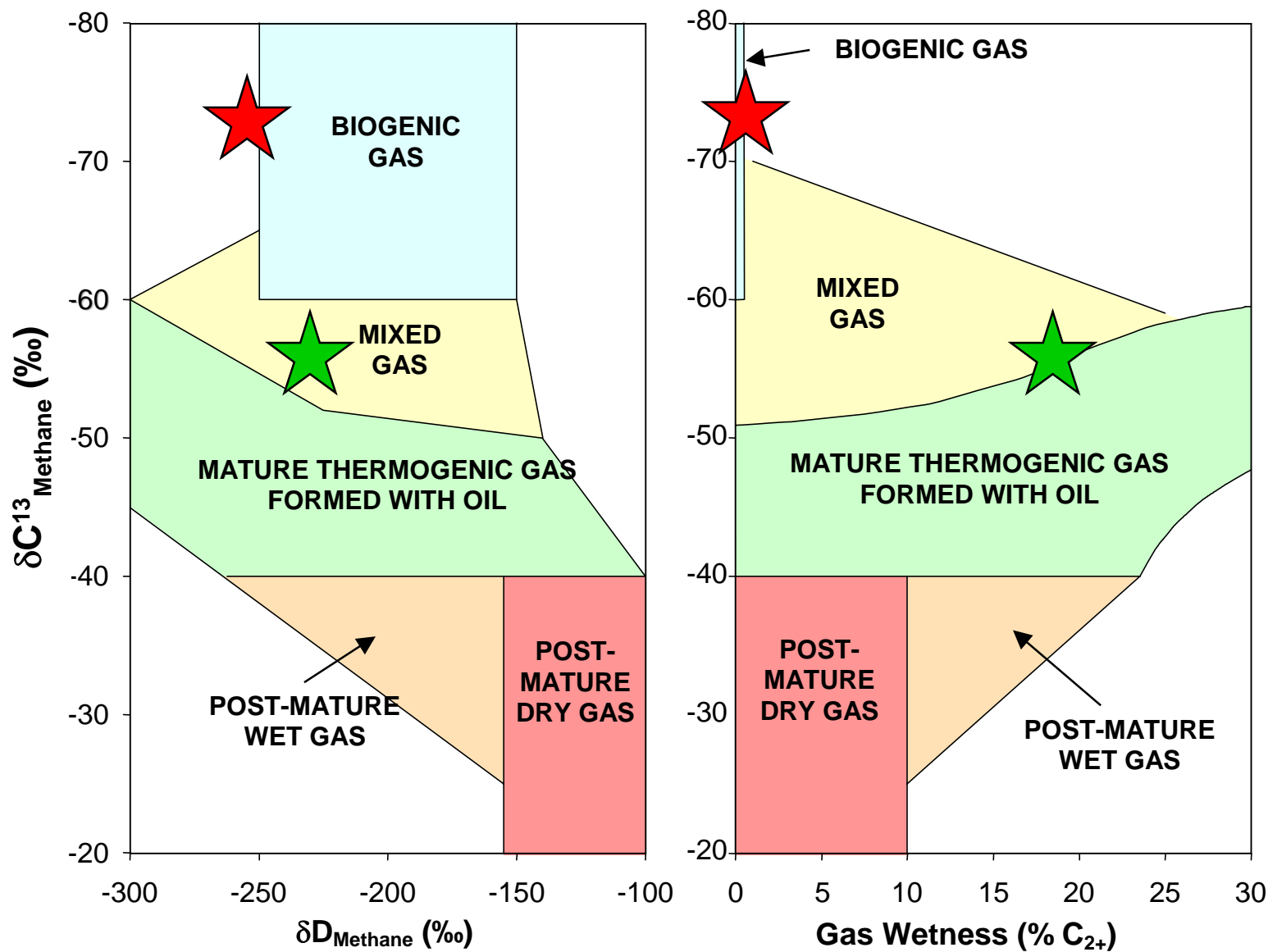


**Figure 8.** Distribution of dissolved methane in the seven water wells tested. The Williams shallow (680-foot) and deep (1,160-foot) wells and the Nelson deep (1,020-foot) well have anomalous dissolved methane concentrations. The Williams deep well, in particular, has over 9 ppm dissolved methane (Table 3), which can lead to accumulation of explosive levels of methane in confined spaces (i.e. water tanks, residence). Mr. Williams was notified of this potential hazard, and methods for venting the methane before water enters his pressure tanks were



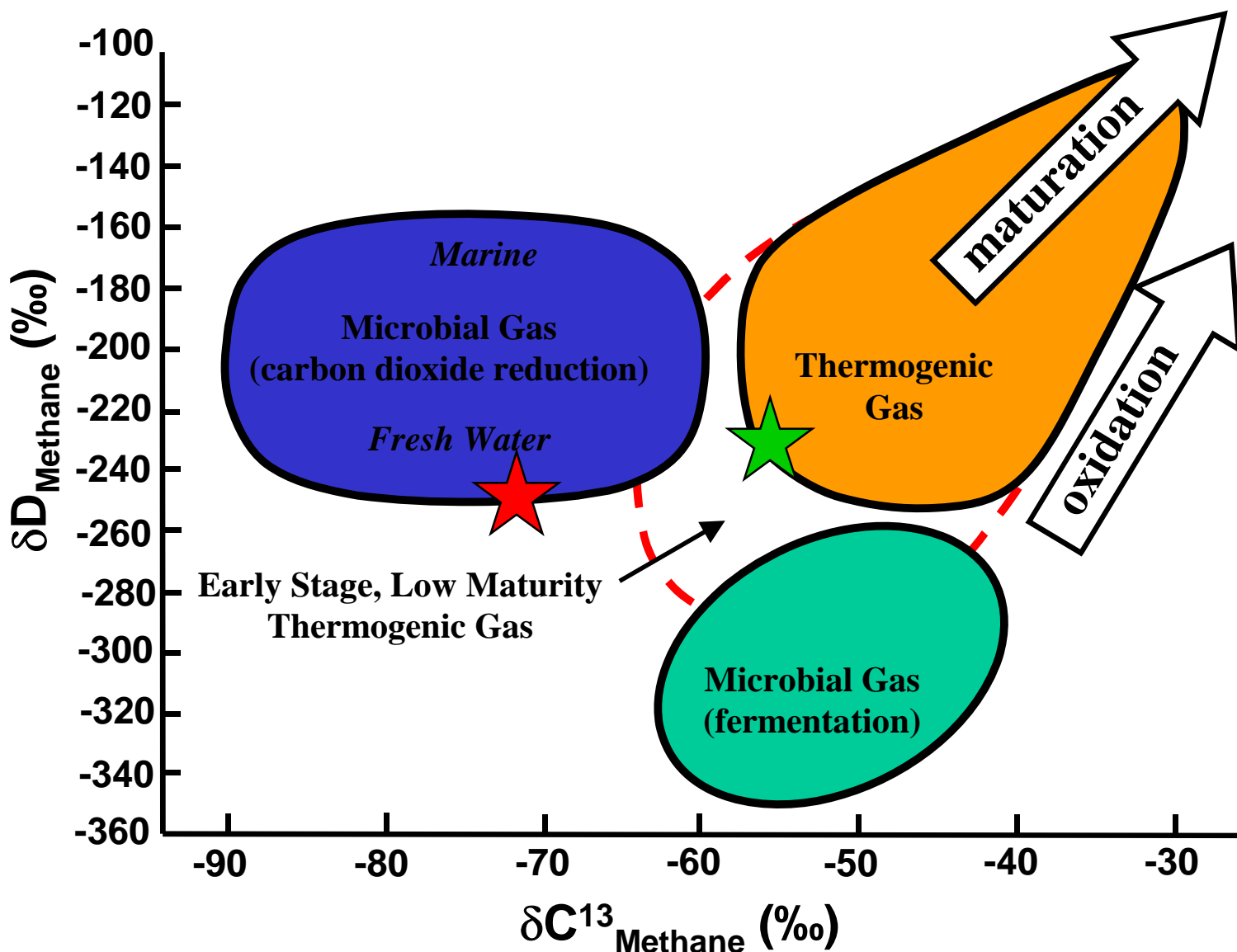


**Figure 9.** Photograph of pressure tank in Mr. William's dugout outside his house. Well water with high dissolved methane concentration (~9 ppm) is fed directly into the tank without venting. The methane will exolve from the water and build-up to explosive levels (5% by volume) in the tank and then be released into the residence when taps are turned on.

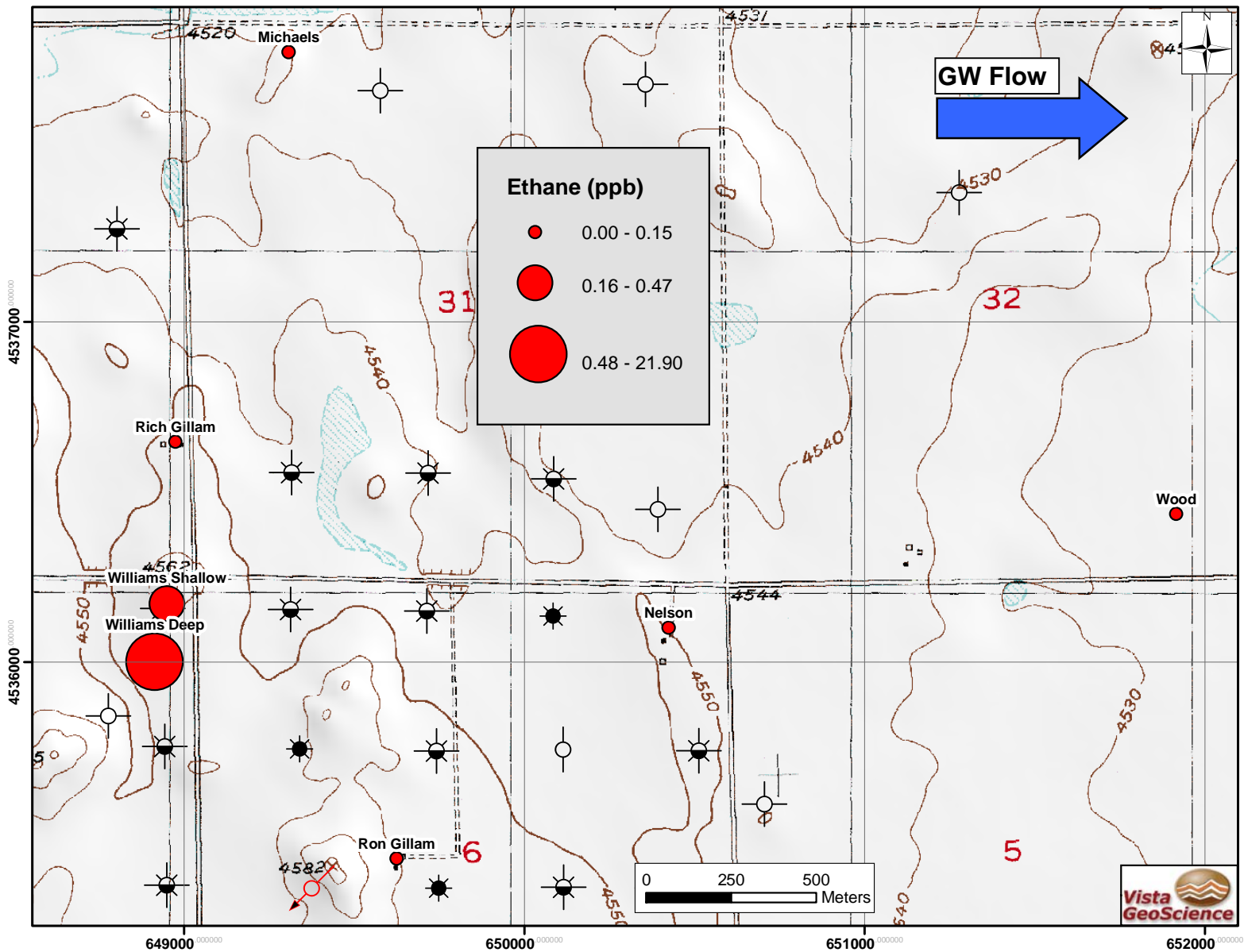


**Figure 10.** Plot of  $\delta C^{13}_{\text{Methane}}$  vs.  $\delta D_{\text{Methane}}$  and gas wetness % $C_{2+}$ . The dissolved methane from the William's deep water well (**red star**) plots in the biogenic field whereas produced gas from the Gilliam#3 D-Sand and Michaels-1 J-Sand wells (**green star**) plots in the mixed gas field.





**Figure 11.** Plot of  $\delta D_{\text{Methane}}$  vs.  $\delta C^{13}_{\text{Methane}}$ . The dissolved methane from the William's deep water well (**red star**) plots into the microbial gas field and was probably produced by reduction of carbon dioxide. produced gas from the Gilliam#3 D-Sand and Michaels-1 J-Sand wells (**green star**) plots in the thermogenic gas field.



**Figure 12.** Distribution of dissolved ethane in the seven water wells tested. The Williams deep well contains minor amounts of ethane (~21 ppb) and the Williams shallow and Nelson deep wells contain trace amounts of ethane (Table 3).

**Table 5.** Alkalinity, pH, Conductivity and TDS in seven water wells over and off the West Peetz field.

Sample	Well Depth (feet)	EPA 300.1 (mg/L)	SW-846 9045 (ph units)	EPA 120.1 (uhos/cm)	EPA 160.1 (mg/L)
		Alkalinity, Total (As CaCO <sub>3</sub> )	pH	Conductivity	Total Dissolved Solids
Michaels-043010	435	170	6.79	425	352
RichGilliam-050110	180	210	6.61	516	426
WilliamsS-050110	680	350	6.95	909	665
WilliamsD-050110	1160	550	8.15	1010	735
WilliamsD-050110-DUP	1160	540	8.16	1000	742
Ron Gillam-051710	200	172	7.39	664	466
Nelson-051710 (Accutest 4/8/2010) -ERM Report	1020	NA	NA	NA	850
Wood-061510	235	180	7.26	410	367
Wood-061510-Dup	235	180	7.3	420	361
Secondary Drinking water STD (mg/L)			6.5-8.5		500

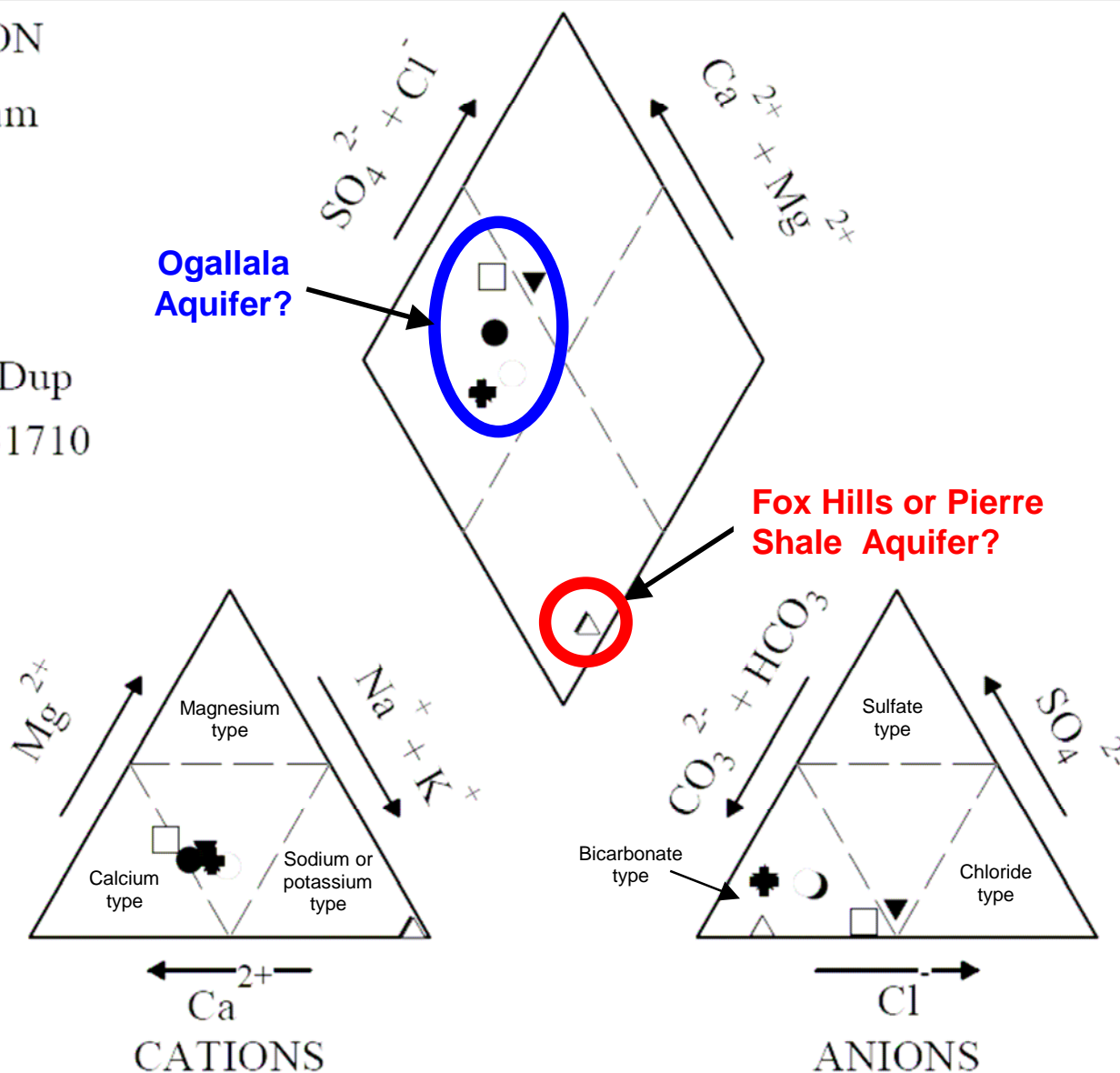
**Table 6.** Dissolved metals in seven water wells over and off the West Peetz field.

NA = Not analyzed  
ND = Not detected

Sample	Well Depth (feet)	EPA 6010 (mg/L) - Dissolved Metals										Water Hardness	
		Arsenic	Boron	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Potassium	Sodium	Water Hardness (CaCO <sub>3</sub> in mg/L)	Classification
Michaels-043010	435	0.02	0.106	41.2	ND	ND	ND	12.5	ND	8.55	40.8	154	Hard
RichGilliam-050110	180	0.0182	0.111	60.7	ND	ND	ND	16.6	ND	8.77	36.0	220	Very Hard
WilliamsS-050110	680	0.0181	0.313	120	ND	ND	ND	38.9	0.845	11.8	46.7	459	Very Hard
WilliamsD-050110	1160	0.011	1.81	8.48	ND	ND	0.125	3.22	0.0113	6.06	246	34.4	Soft
WilliamsD-050110-DUP	1160	ND	1.80	8.39	ND	ND	0.124	3.19	0.0108	6.02	260	34.1	Soft
Ron Gillam-051710	200	ND	0.102	57.2	ND	ND	ND	20.4	ND	11.1	40.7	227	Very hard
Nelson-051710 (Accutest 4/8/2010) -ERM Report	1020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wood-061510	235	ND	0.125	47	ND	ND	ND	14.3	ND	9.82	37.2	176	Hard
Wood-061510-Dup	235	ND	0.124	46.6	ND	ND	ND	14.1	ND	9.69	36.7	174	Hard
EPA Primary Drinking Water STD (mg/L)		0.05			0.1								
Secondary Drinking water STD (mg/L)							0.3		0.05			19	

## EXPLANATION

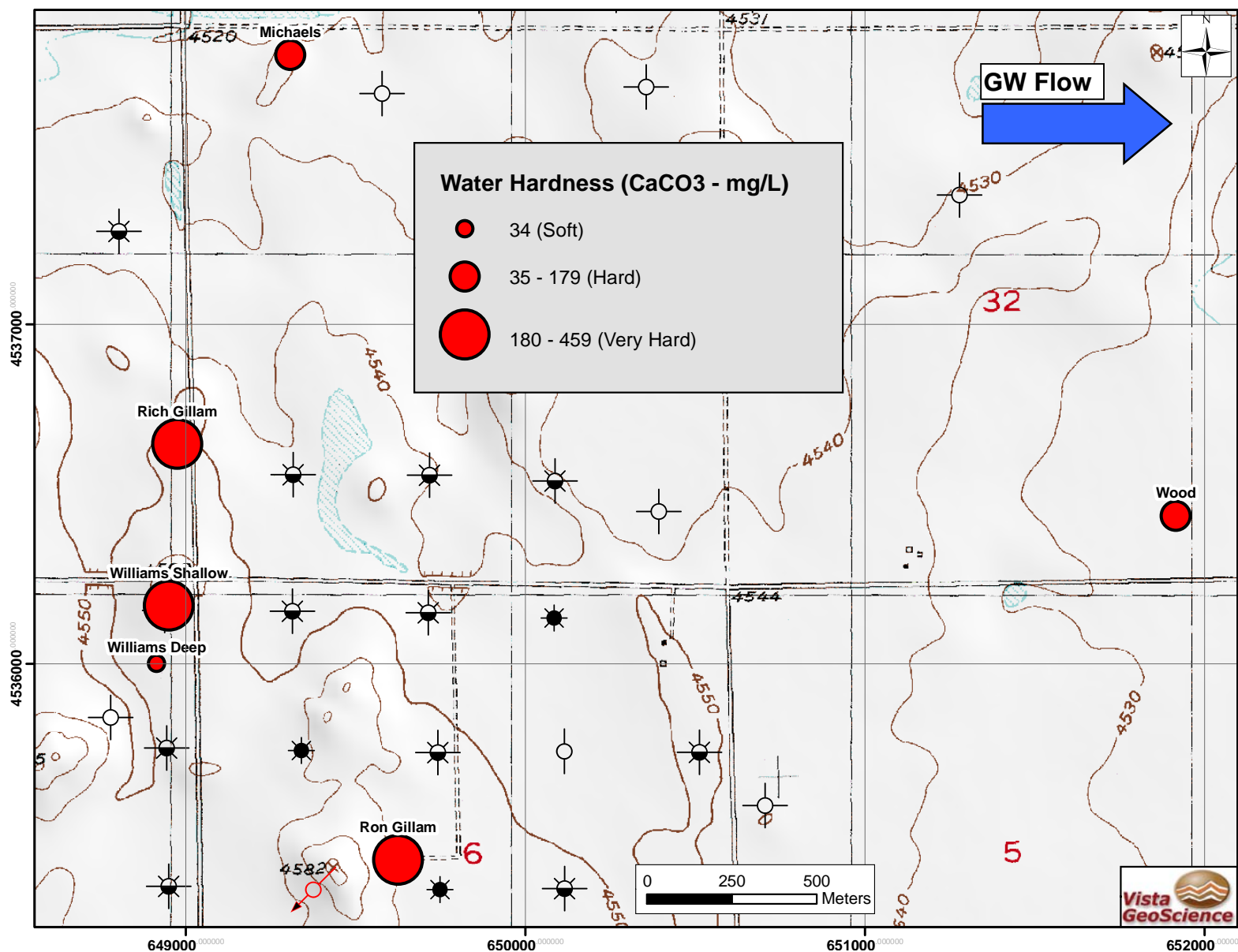
- Rich Gilliam
- Michaels
- WilliamS
- ▲ WilliamD
- △ WilliamD Dup
- ▼ Gilliam-051710
- ★ Wood
- ✚ Wood-dup



**Figure 13.** Piper diagram showing relative percentages of cations and anions in well water samples. The shallow well water (<680 feet) fall into the calcium-magnesium bicarbonate field, whereas the deeper (1,160-feet) Williams water is classified as sodium bicarbonate water. The shallow and deep waters have distinctly different compositions suggesting residence in separate unconnected aquifers.

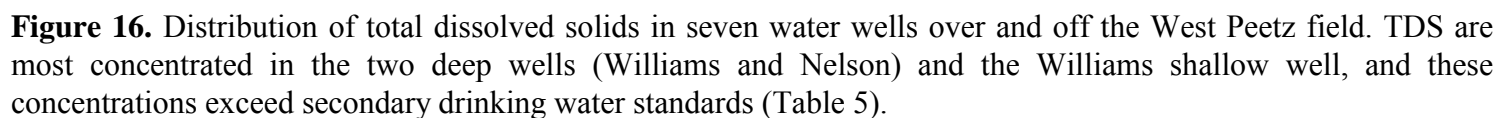
Generalized Time & Rock Stratgraphic Column West Peetz & Lewis Creek Fields				
ERA	Period	GEOLOGIC EPOCH/AGE	FORMATION NAME	TYPE WELL M. Segelke # 1 NENE Sec. 27 T11N R53W API 05-075-09050
Recent		Holocene Pleistocene	Alluvial & Dune Sand	0 - 50 ft
TERTIARY		Pliocene	Ogallaha	0 - 180 ft
		Miocene	Arikaree	0 - 80 ft (Not present in area)
		Lower Oligocene	White River	25 - 100 ft
MESOZOIC	CRETACEOUS	Late Maestrichtian	Laramie Fox Hills	400 - 550 ft
		Maestrichtian Campanian	Pierre	3150 ft
		Campanian Coniacian	Niobrara & Fort Hays	350 ft
		Turonian	Carlile	195 ft
		Cenomanian	Greenhorn Graneros Shale	250 ft (Storage Caprock)
		Albian	Dakota "D"	50 ft (Storage Zone)
			Huntsman	65 ft
		Aptian	Dakota "J"	104 ft (Storage Zone)
			Skull Creek	115 ft
			Lytle	104 ft
		Jurassic	Morrison	420 ft
PALEOZOIC	PERMIAN	Guadalupian	Cedar Hills - Blaine	205
		Leonardian	Stone Corral	104 ft
			Lyons	46 ft
			Wellington - Lower Satanka	44 ft
	Wolfcampian	Wolfcamp	328 ft	
	PENNSYLVANIAN	Virgilian	Virgil	352 ft
		Missourian	Missouri	135 ft
		Desmoinesian	Marmaton Cherokee	165 ft
		Atokan	Atoka	200 ft
		Morrowan	Morrow	165 ft
Precambrian			Precambrian	Unknown

**Figure 14.** Stratigraphic column developed by Greg Francis (MEP) for the West Peetz and Lewis Creek fields. This would place the shallow water wells (Michaels, Rich Gillam, Williams shallow, Ron Gillam and Wood) in the Tertiary High Plains aquifer and the deeper wells (Williams deep and Nelson) in the Fox Hills aquifer.

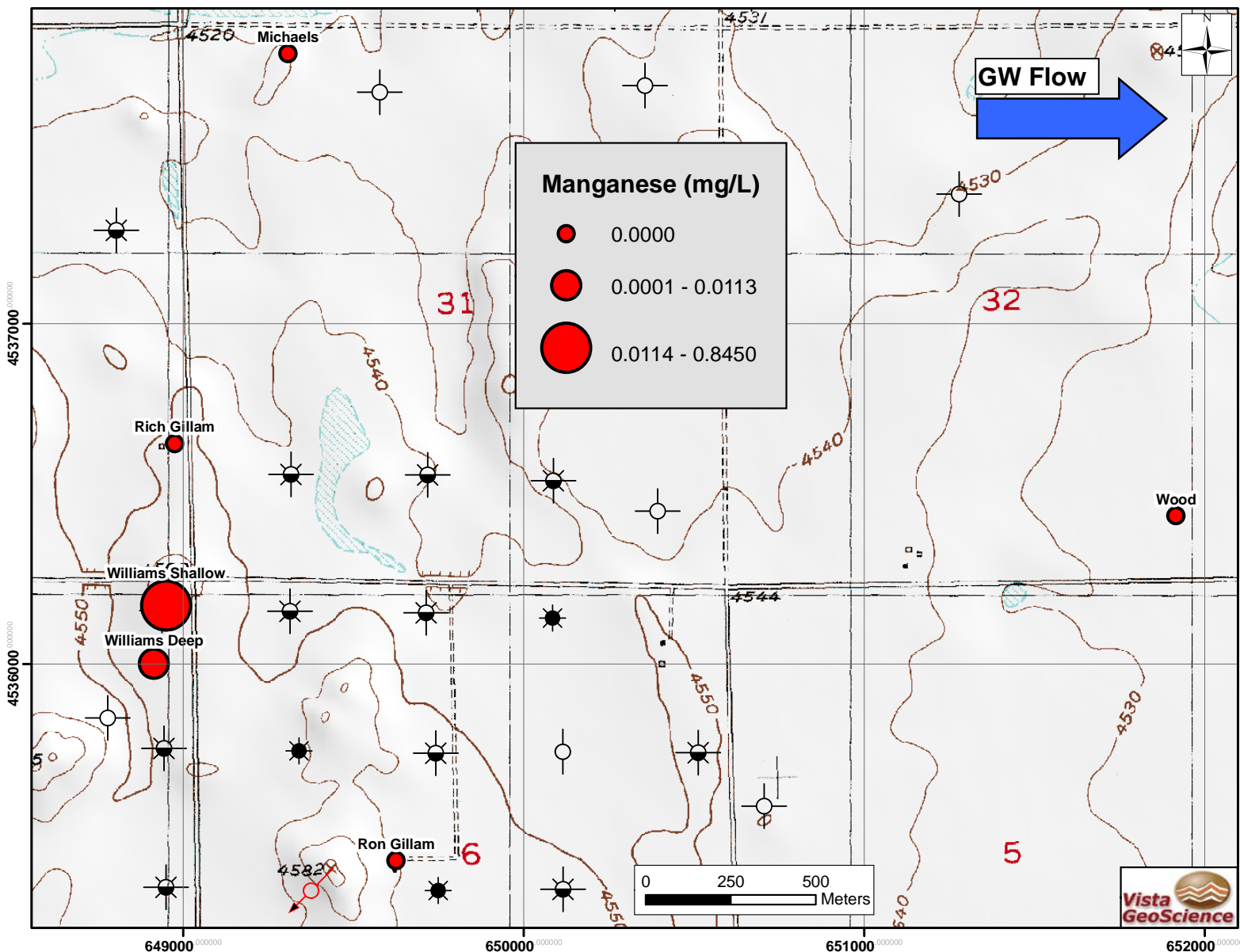


**Figure 15.** Distribution of water hardness (Ca and Mg ion concentration) in seven water wells over and off the West Peetz field. All wells cased in the Ogallala Aquifer contain hard (Wood, Michaels) or very hard water (Rich Gillam, Williams shallow and Ron Gillam), whereas the deeper Williams well contains soft water. Water hardness could not be calculated for the Nelson well because the water was not analyzed for calcium and magnesium (see ERM water quality report).

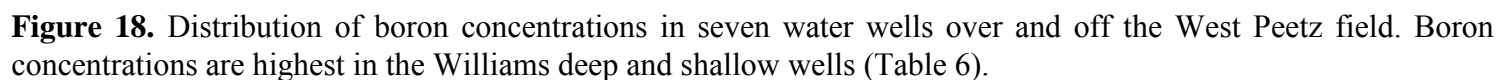






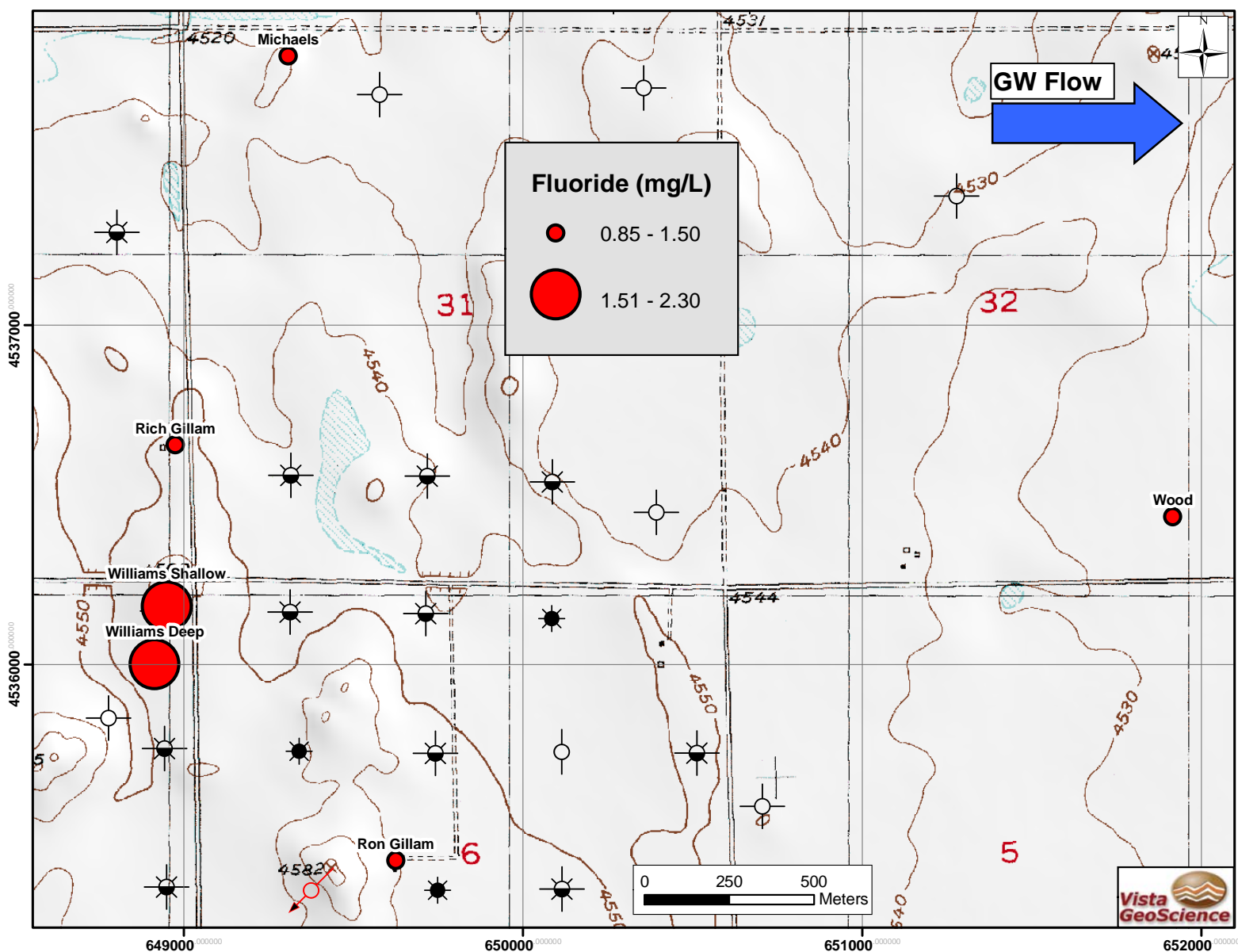


**Figure 17.** Distribution of manganese concentrations in seven water wells over and off the West Peetz field. The Williams shallow and deep wells contain anomalous levels of manganese, and manganese levels in the shallow well are higher than secondary drinking water standard (Table 6).

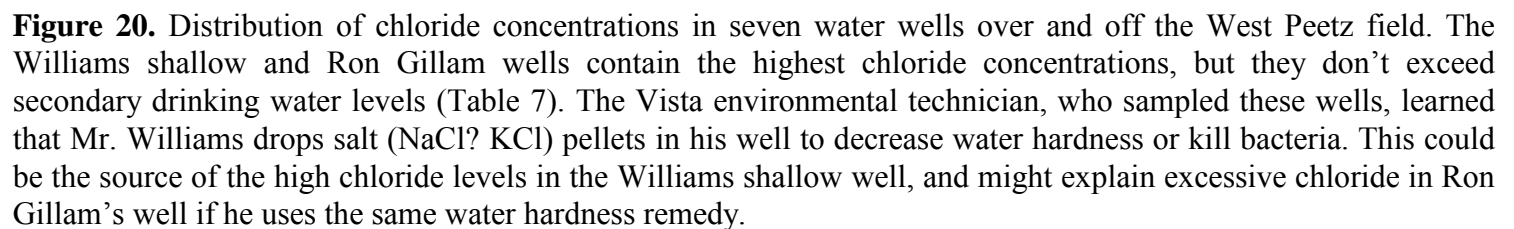


**Table 7.** Dissolved anions in seven water wells over and off the West Peetz field.

	<b>EPA 300.0 (mg/L) - Dissolved Anions</b>								
Sample	Well Depth (feet)	Ion Balance %	Bromide	Chloride	Fluoride	Nitrate	Nitrite	Phosphate	Sulfate
Michaels-043010	435	13.1	ND	30.2	0.950	4.90	ND	ND	32.2
RichGillam-050110	180	9.5	ND	42.4	0.870	8.50	0.110	ND	38.6
WilliamsS-050110	680	10.5	ND	144	2.00	0.8	ND	ND	21.9
WilliamsD-050110	1160	4.6	ND	58.3	2.30	ND	ND	0.14	11.8
WilliamsD-050110-DUP	1160	11.2	ND	57.9	2.30	ND	ND	0.1	12.5
Ron Gillam-051710	200	5.2	ND	99.0	0.960	2.40	ND	ND	26.2
Nelson-051710 (Accutest 4/8/2010) -ERM Report	1020	NA	NA	47	NA	NA	NA	NA	172
Wood-061510	235	25.4	ND	12.1	0.85	10.9	ND	ND	32
Wood-061510-Dup	235	25.1	ND	12.2	0.86	10.9	ND	ND	30
EPA Primary Drinking Water STD (mg/L)					4	10	1		
Secondary Drinking water STD (mg/L)				250	2				250



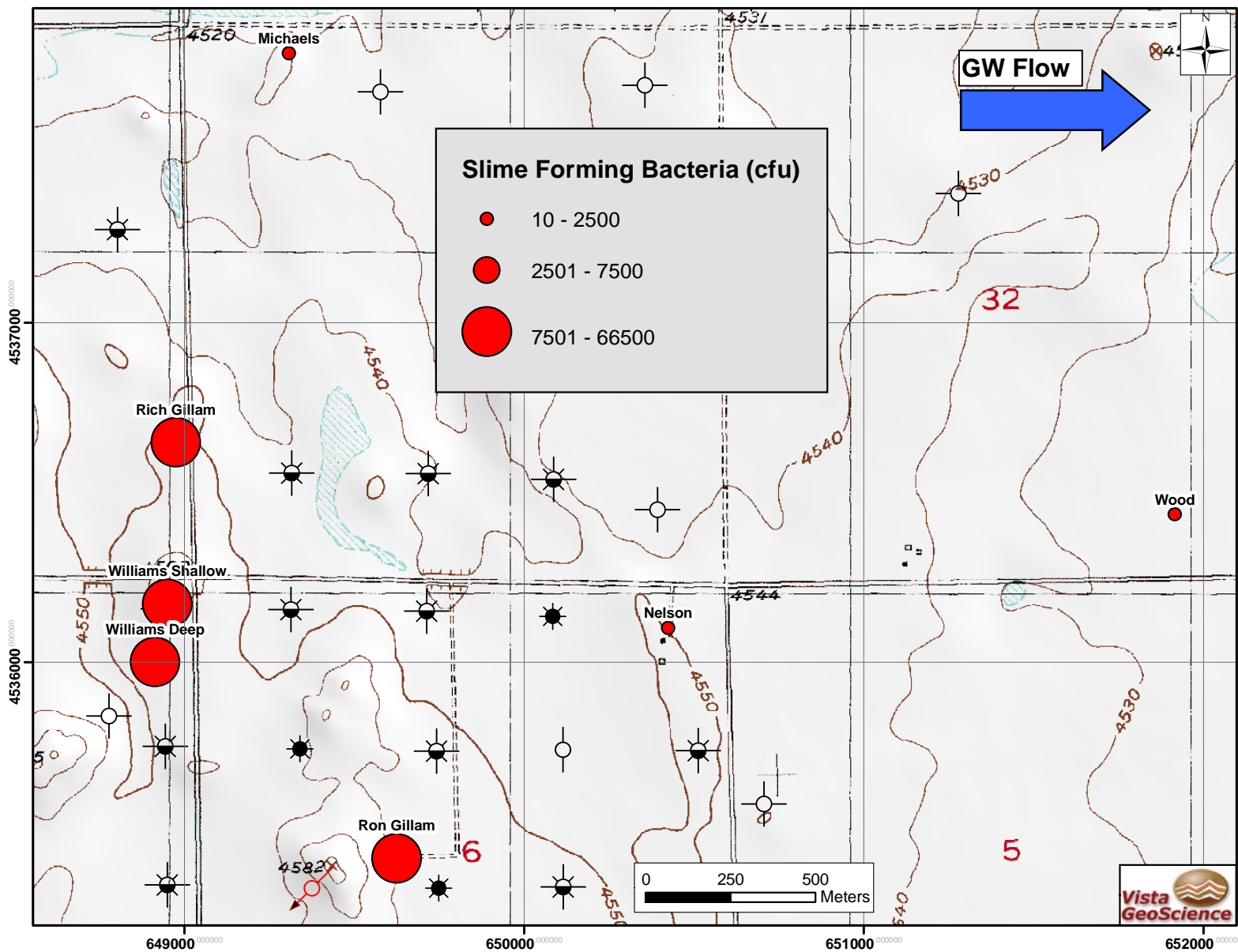
**Figure 19.** Distribution of fluoride concentrations in seven water wells over and off the West Peetz field. The Williams shallow and deep wells contain anomalous levels of fluoride that equal or exceed secondary drinking water standards (Table 7).



**Table 8. Bacteria concentrations (colony forming units) in seven water wells over and off the West Peetz field.**

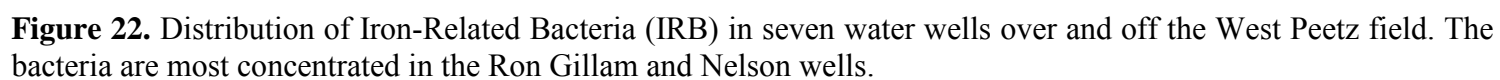
		Biological Activity Reaction Test (colony forming units - cfu)		
Sample	Well Depth (feet)	Iron Reducing Bacteria - IRB	Slime Forming Bacteria - SLYM	Sulfate Reducing Bacteria - SRB
Michaels-043010	435	ND	10.0	ND
RichGilliam-050110	180	2300	66500	ND
WilliamsS-050110	680	2300	12500	ND
WilliamsD-050110	1160	ND	66500	200
WilliamsD-050110-DUP	1160	ND	66500	1200
Ron Gillam-051710	200	18000	66500	ND
Nelson-051710	1020	5000	2500	ND
Wood-061510	235	2300	2500	500
Wood-061510-Dup	235	2300	2500	500

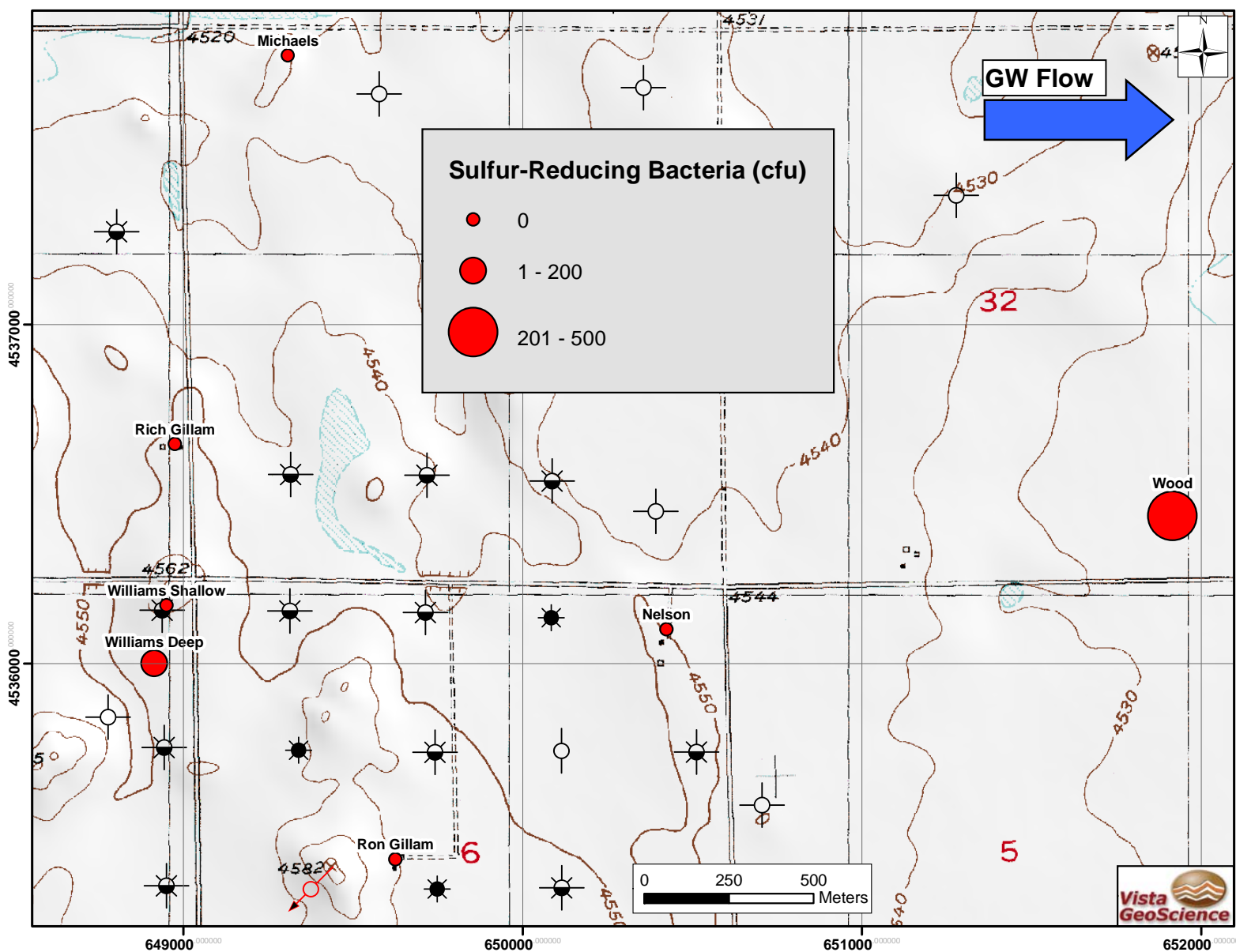




**Figure 21.** Distribution of Slime-Forming Bacteria (SLYM) in seven water wells over and off the West Peetz field. The bacteria are most concentrated in wells over the field (Ron Gillam, Williams Shallow and Deep, and Rich Gillam).







**Figure 23.** Distribution of Sulfur Reducing Bacteria (SRB) in seven water wells over and off the West Peetz field. The bacteria are most concentrated in the Wood well, albeit at low concentration (i.e. 500 cfu).

## **Appendix 1. Field Procedures**

## **Foxboro TVA Gas Detection System**

A Foxboro TVA-1000 intrinsically safe FID/PID gas detection system is used to identify surface soil gas seeps, ambient air drifting gas readings, infrastructure leaks and collected gas sample verification. The instrument's FID detector employs a multiple point calibration (similar to EPA SW-846 environmental lab methods) with methane calibration gas at 100ppm, 1,000ppm, 10,000ppm (1%), and 50,000ppm (5%), to improve the accuracy of methane detections. The PID detector (10.2eV) is calibrated using a single point of 100ppm iso-butylene. Both instrument's zero points are calibrated relative to ambient air, so the normal ambient levels of methane (1-3ppm) are removed from the readings and all FID readings are equivalent to ppm methane above ambient. The calibration of the TVA 1000 is performed daily and as needed during daily operations. Additional "checks" are performed during the day including "butane" checks, which are recorded by the operator.

The FID detects any flammable gases in an oxygenated atmosphere and the PID detects other non-methane compounds and is especially sensitive to aromatic hydrocarbons, such as benzene, toluene, etc., and therefore will detect poly-aromatic hydrocarbons if crude oil or "wetter" petroleum gases are present. The instrument can detect 1ppm of methane over ambient air on the FID, 0.1ppm of aromatic hydrocarbons on the PID. If the heavier hydrocarbons are present in the gas, the FID readings will be biased high relative to methane. The internal sample pump draws 1-liter of air per minute, and device is attached to an instrument intake, which is placed at ground level allowing the operator to collect gas sample at the soil/air interface. This eliminates the need for plunger-bar holes to be created to measure the soil gas and removes the risk of damaging buried utilities. If soil gas samples are collected, they can be screened using the instrument and concentrations up to 100% can be measured using a field dilution method or our Gem 500 Landtec. The infrared gas meter is calibrated daily with methane, CO<sub>2</sub> and O<sub>2</sub> standards.

Based on comparisons from other soil gas surveys, the soil gas at the soil surface/air interface is generally about 1/10<sup>th</sup> the concentration of the soil gas (using sealed probe methods) and is much more sensitive than the plunger bar/multi-gas meter method. Gas readings are made continuously along a slow walking path, about 1 mile/hour pace, so that gas readings are taken at the surface approximately every 3-5' along the traverse and the TVA has 5 seconds of collection time per contact. Where gas is detected, the operator marks the location on the GPS system and records the values in the attribute data for the point.

## **ArcPad GIS Data Acquisition System**

Vista GeoScience has developed an ESRI ArcPad software based field data acquisition system that significantly reduces data acquisition time, transcription errors, and data compilation time over conventional data collection methods. A Geodatabase is created using ArcGIS/ArcEditor software, and is operated in the field using the ArcPad software on a Trimble GeoXH or equivalent PDA-GPS handheld field computer. The Trimble GPS system used is a sub-foot

accuracy system using the real-time differentially corrected for sub-foot accuracy collection parameters (in accordance with COGCC Rule 215 requirements) that allows direct entry of data points, tracing of feature shapes and lines directly into the Geodatabase without manual data entry or drafting. The GPS units have the ability to include “go-to” targets from those requested by client, air-photo interpretations, topography maps and air photos making it easier to find and map these features. The path of the operators traverse with the TVA is continuously recorded into the GPS data system at any desired grid interval. This system allows the operator to easily find and record the extent and concentration of a seep area and create a “zero” line where no gas is detected. Photographs and videos are taken to document all features of interest linked to the locations recorded in the Geodatabase, including photo direction. Descriptions and attributes for all the features to be recorded are selected from standardized pick lists and additional comments are entered directly into the GPS-PDA. The attribute data for each feature mapped are linked together and can be easily queried. At the end of the day, each of the GPS/PDA units and camera are downloaded directly to the computer network in the Vista GeoScience office. The main Geodatabase and all of its features are instantly updated so they can be viewed at the office almost as the data is collected.

Features that are commonly mapped in the field with this system include (but are not limited to):

- FID/PID survey walking tracks
- Outlines of gas seep areas (>1ppm outline)
- Outlines of stressed vegetation, and/or salt crust/seep features
- Outlines of other anomalous features
- FID (ppm) values at selected points
- PID (ppm) values at selected points
- Ambient air gas detections (FID/PID) including wind direction and speed
- Springs and other water features
- Oil and Gas infrastructure leaks
- Photo or video locations of surveyed features, including direction
- Other points or features of interest

## **Water Well Sampling**

Six of the seven well water samples were collected using the native pumps from hydrants off the domestic wells after purging 1.5 well volumes and stabilization of water quality parameters. Pump rates ranged from 6.6 to 15 gallons per minute. The pump on the Ron Gillam well was inoperable, so the well was purged and sampled using a submersible pump and down-hole tubing.

Prior to sampling a water-well, Vista GeoScience ensured that the working environment near the sampling site is safe. Often wells within oil and gas fields have water various levels of dissolved methane, and the headspace below the sanitary seal in these wells may become sufficiently



saturated with methane to reach the lower explosive limit (LEL) for methane of 5% by volume in air (50,000 ppm). This potential hazard is monitored with the Foxboro TVA 1000 or a combustible gas detector to guide decisions that help mitigate any risk of danger and to measure any changes in the volume and concentration during the well development process. Hydrogen sulfide is also monitored at each site and levels recorded before, during and after the well development process.

Vista water well sampling protocols require purging a minimum of three well bore volumes of water and parameter stabilization prior to collecting water samples. Because there are numerous low yield domestic water wells in Rocky Mountain basins, it is often prudent to take a conservative approach to well development. All of the specific water-well data is researched including previous yield measurements, and the well owners are questioned prior to sampling a well. When the yields are low, it is not be possible to properly purge the well. Vista GeoScience uses the National Water Quality Assessment (NAWQA) protocols for low flow sampling. Under ideal conditions, where the flow rate of a submersible pump can be adjusted, and when the pump is placed adjacent to a well's perforations, a flow rate is set to be low enough so that the static water level does not drop significantly while sampling. In such low flow cases, field parameter data is used to establish entry of fresh aquifer water into the well in lieu of multiple well volumes. Laminar flow conditions are maintained as best as is practical while purging and sampling a well. A clean white five gallon bucket is used to determine flow rates, and it allows the observer to accurately monitor water color, odor, sediment and bubbles while the well is purged.

Vista field parameter measurements must become stable during the purging process. These parameters include: pH, temperature (T), conductivity (SC), resistivity, dissolved oxygen (DO), total dissolved solids (TDS), oxygen reducing potential (ORP) and salinity. In accordance to USGS NAWQA protocols (Koterba et al., 1995), stability is demonstrated when there is no significant change in measured parameters for duration of five consecutive measurements separated by 3 to 5 minute intervals. These field parameters are measured using a daily-calibrated YSI-556 set into a flow-through cell. A "Y" connection is used at the closest, unaltered raw water output of the well with one small volume line to the YSI flow-through cell system and the other larger line is for the remaining discharge volumes. Using the flow-thru cell ensures that the groundwater parameters are unaltered from those conditions at depth.

After field parameters become stable and the well volumes have been adequately purged, the flow rate is reduced to a rate that is just high enough to prevent the pump from surging. Collecting samples at low flow rates insures more representative measurements collected, especially those of dissolved gas and other volatile constituent concentrations.

A sulfide measurement was also collected using the Hach Method 8131 (methylene blue) with a Hach DR850 spectrometer. This method is USEPA approved for reporting wastewater analysis and is equivalent to Standard Method 4500-S2-D. This can be used as an indicator for the potential influence of H<sub>2</sub>S gas forming or entering the well or aquifer.

Vista GeoScience applies the standard water sampling protocols published in the USGS NAWQA protocols (Koterba et al. 1995) and the American Society for Testing and Materials (ASTM). These methods are used to insure quality and to monitor quality control.

Water quality parameters are observed again after sampling is completed and recorded with the sampling notes to ensure conditions remained the same during the sampling collection. The YSI is checked as well using the calibration solutions to ensure the instrument was operating correctly and any differences recorded as well.

## **Appendix 2. Laboratory Analytical Report and Data**

Thursday, February 24, 2011

Greg Francis  
Merchant Energy Partners, LLC  
10901 West Toller Drive, Suite 200  
Littleton, CO 80127

**RE:** Project #10022 East Cheyenne Gas Storage Baseline  
Order Nos.: 1005001, 1005002, 1006001

Dear Greg:

Vista GeoScience received 6 samples on 5/3/2010 (Rich Gillam, Michaels, Williams shallow and deep), 2 samples on 5/18/2010 (Nelson and Ron Gillam), and 1 sample on 6/16/2010 (Wood) for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

Samples were received on 5/3/10, 5/18/10, and 6/16/10 from Vista field personnel and were accompanied by a chain of custody form. The samples and their containers appeared to be in good condition and the chain of custody form was complete and accurate.

Samples were analyzed using the methods outlined in the following references:  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition and  
EPA Methods for Chemical Analysis of Water and Wastes (MCAWW).

Calibration - The laboratory instruments are calibrated using method appropriate standards. On each day project samples are analyzed the instrument calibration is verified using a mid level Continuing Calibration Verification (CCV). Calculations are carried out by the data system to compute the actual concentration of analyte in the original sample.

Method Blanks, Trip Blanks and Instrument Blanks - Blanks are analyzed after each initial calibration, continuing calibration verification, and after samples determined to have high concentrations of analytes to verify system cleanliness. Method blanks are analyzed to verify the cleanliness of procedures requiring sample preparation prior to analysis. Trip blanks are prepared by the laboratory and accompany the samples to verify that there was no contamination during transport.

Surrogate Recoveries - Some methods require the addition of surrogate compounds and are monitored to determine the efficacy of the analyte recovery from the sample matrix. In cases where multiple surrogates are added at least one must be recovered within Quality Control limits for the data to be accepted.

Batch QC - Prior to analysis, the project samples are associated with a QC batch. This batch is then prepared and analyzed along with QC samples prepared at the same time and using the same reagents and standards. The QC samples associated with a sample batch may include Method Blanks (MB), Laboratory Control Samples (LCS), Sample Duplicates (DUP), and Matrix Spikes (MS). The results of the batch QC samples are included in the QC section of the report.

**Analyst Comments:**

Cation and anion analyses were performed by Pace Analytical Services Inc. (Rich Gillam, Michaels, Williams shallow and deep, Ron Gillam) and Test America (Wood). BTEX, dissolved C1-C6, alkalinity, pH, conductivity and

Regarding the samples received on 5/3/2010 (Rich Gillam, Michaels, Williams shallow and deep): The samples were received outside hold time for pH, nitrate, nitrite and orthophosphate. The matrix spike duplicate (MSD) recovery for this sample batch m,p-Xylenes exceeded the upper control limit.

Regarding the sample received on 5/18/2010 (Nelson and Ron Gillam): The MS and MSD recoveries for m,p-Xylenes exceeded the upper control limit for this sample batch.

Regarding the sample received on 6/16/2010 (Wood): The dissolved nitrate and nitrite and pH were analyzed outside of hold time. The LCS, MS and MSD recoveries for m,p-Xylenes exceeded the upper control limit for this water sample.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Roger Bain  
Senior Chemist



**Vista GeoScience**

**Date:** 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** RichGilliam-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-001A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	117	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	96.6	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	105	70-130		%REC	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** RichGilliam-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-001B **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>	<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	ND	0.068	µg/L	1	5/3/2010	
Ethane	0.032	0.013	µg/L	1	5/3/2010	
Ethylene	ND	0.012	µg/L	1	5/3/2010	
Propane	0.882	0.018	µg/L	1	5/3/2010	
Propene	ND	0.018	µg/L	1	5/3/2010	
I-Butane	0.025	0.024	µg/L	1	5/3/2010	
N-Butane	ND	0.024	µg/L	1	5/3/2010	
Butene	ND	0.023	µg/L	1	5/3/2010	
I-Pentane	0.037	0.030	µg/L	1	5/3/2010	
N-Pentane	ND	0.030	µg/L	1	5/3/2010	
Pentene	ND	0.029	µg/L	1	5/3/2010	
I-Hexane	0.042	0.018	µg/L	1	5/3/2010	
N-Hexane	ND	0.036	µg/L	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** RichGilliam-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-001C **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit Qual Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>		Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	2300	25.0	CFU/mL	1	5/3/2010
Slime Forming Bacteria - SLYM66500		10.0	CFU/mL	1	5/3/2010
Sulfate Reducing Bacteria - SRB	ND	200	CFU/mL	1	5/3/2010

IRB-Moderate Aggressive

SLYM-Aggressive

SRB- Normal Background Levels

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-001D

**Date Received:** 5/3/2010

**Client Sample** RichGilliam-050110

**Tag Number:**

**Collection** 5/1/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst: <b>RB</b>
Conductivity by EPA 120.1	516	2.0		µmhos/cm	1	5/4/2010
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst: <b>RB</b>
pH by SW-846 9045C	6.61	0.10		pH Units	1	5/4/2010
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst: <b>RB</b>
Total Dissolved Solids (Residue, Filterable)	426	20		mg/L	1	5/4/2010
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst: <b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/4/2010
<b>ALKALINITY (AS MG/L CaCO<sub>3</sub>), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst: <b>RB</b>
Alkalinity, Total (As CaCO <sub>3</sub> )	210	10.0		mg/L	1	5/4/2010
Bicarbonate	210	10.0		mg/L	1	5/4/2010
Carbonate	ND	10.0		mg/L	1	5/4/2010
Hydroxide	ND	10.0		mg/L	1	5/4/2010
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst: <b>Admin</b>
Fluoride	0.810	0.200		mg/L	1	5/6/2010
Chloride	42.3	5.00		mg/L	5	5/13/2010
Nitrite	0.130	0.100		mg/L	1	5/6/2010
Bromide	ND	1.00		mg/L	1	5/6/2010
Nitrate	8.40	0.100		mg/L	1	5/6/2010
Phosphate, Dissolved	ND	0.100		mg/L	1	5/6/2010
Orthophosphate						
Sulfate	38.5	5.00		mg/L	5	5/13/2010

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** RichGilliam-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-001E **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>			Analyst:	<b>Admin</b>
Arsenic	ND	0.01		mg/L	1	5/18/2010	
Boron	0.11	0.10		mg/L	1	5/18/2010	
Calcium	60.7	0.10		mg/L	1	5/18/2010	
Chromium	ND	0.005		mg/L	1	5/18/2010	
Cobalt	ND	0.005		mg/L	1	5/18/2010	
Iron	ND	0.05		mg/L	1	5/18/2010	
Magnesium	16.6	0.05		mg/L	1	5/18/2010	
Manganese	ND	0.005		mg/L	1	5/18/2010	
Potassium	8.77	0.50		mg/L	1	5/18/2010	
Sodium	36.0	0.50		mg/L	1	5/18/201	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported



Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** RichGilliam-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-001G **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.870	0.200		mg/L	1	5/6/2010	
Chloride	42.4	5.00		mg/L	5	5/13/2010	
Nitrite	0.110	0.100		mg/L	1	5/6/2010	
Bromide	ND	1.00		mg/L	1	5/6/2010	
Nitrate	8.50	0.100		mg/L	1	5/6/2010	
Phosphate, Dissolved	ND	0.100		mg/L	1	5/6/2010	
Orthophosphate							
Sulfate	38.6	5.00		mg/L	5	5/13/201	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Michaels-043010

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 4/30/2010

**Lab ID:** 1005001-002A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	114	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	93.9	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	104	70-130		%REC	1	5/3/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Michaels-043010

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 4/30/2010

**Lab ID:** 1005001-002B **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>	<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	ND	0.068	µg/L	1	5/3/2010	
Ethane	ND	0.013	µg/L	1	5/3/2010	
Ethylene	ND	0.012	µg/L	1	5/3/2010	
Propane	ND	0.018	µg/L	1	5/3/2010	
Propene	ND	0.018	µg/L	1	5/3/2010	
I-Butane	ND	0.024	µg/L	1	5/3/2010	
N-Butane	ND	0.024	µg/L	1	5/3/2010	
Butene	ND	0.023	µg/L	1	5/3/2010	
I-Pentane	ND	0.030	µg/L	1	5/3/2010	
N-Pentane	ND	0.030	µg/L	1	5/3/2010	
Pentene	ND	0.029	µg/L	1	5/3/2010	
I-Hexane	ND	0.018	µg/L	1	5/3/2010	
N-Hexane	ND	0.036	µg/L	1	5/3/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** Michaels-043010  
**Lab Order:** 1005001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 4/30/2010  
**Lab ID:** 1005001-002C **Date Received:** 5/3/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	ND	25.0		CFU/mL	1	5/3/2010	
Slime Forming Bacteria - SLYM	10.0	10.0		CFU/mL	1	5/3/2010	
Sulfate Reducing Bacteria - SRB	ND	200		CFU/mL	1	5/3/2010	

IRB-Normal Background Levels

SLYM-Normal Background Levels

SRB- Normal Background Levels

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

* Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-002D

**Date Received:** 5/3/2010

**Client Sample** Michaels-043010

**Tag Number:**

**Collection** 4/30/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst: <b>RB</b>
Conductivity by EPA 120.1	425	2.0		µmhos/cm	1	5/4/2010
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst: <b>RB</b>
pH by SW-846 9045C	6.79	0.10		pH Units	1	5/4/2010
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst: <b>RB</b>
Total Dissolved Solids (Residue, Filterable)	352	20		mg/L	1	5/4/2010
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst: <b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/4/2010
<b>ALKALINITY (AS MG/L CaCO<sub>3</sub>), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst: <b>RB</b>
Alkalinity, Total (As CaCO <sub>3</sub> )	170	10.0		mg/L	1	5/4/2010
Bicarbonate	170	10.0		mg/L	1	5/4/2010
Carbonate	ND	10.0		mg/L	1	5/4/2010
Hydroxide	ND	10.0		mg/L	1	5/4/2010
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst: <b>Admin</b>
Fluoride	0.950	0.200		mg/L	1	5/6/2010
Chloride	30.2	5.00		mg/L	5	5/13/2010
Nitrite	ND	0.100		mg/L	1	5/6/2010
Bromide	ND	1.00		mg/L	1	5/6/2010
Nitrate	4.90	0.100		mg/L	1	5/6/2010
Phosphate, Dissolved	ND	0.100		mg/L	1	5/6/2010
Orthophosphate						
Sulfate	32.2	5.00		mg/L	5	5/13/2010



Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Michaels-043010

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 4/30/2010

**Lab ID:** 1005001-002E **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>			Analyst:	<b>Admin</b>
Arsenic	ND	0.01		mg/L	1	5/18/2010	
Boron	0.11	0.10		mg/L	1	5/18/2010	
Calcium	41.2	0.10		mg/L	1	5/18/2010	
Chromium	ND	0.005		mg/L	1	5/18/2010	
Cobalt	ND	0.005		mg/L	1	5/18/2010	
Iron	ND	0.05		mg/L	1	5/18/2010	
Magnesium	12.5	0.05		mg/L	1	5/18/2010	
Manganese	ND	0.005		mg/L	1	5/18/2010	
Potassium	8.55	0.50		mg/L	1	5/18/2010	
Sodium	40.8	0.50		mg/L	1	5/18/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsS-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-003A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	119	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	90.7	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	96.7	70-130		%REC	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsS-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-003B **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	253	0.068		µg/L	1	5/3/2010	
Ethane	0.474	0.013		µg/L	1	5/3/2010	
Ethylene	ND	0.012		µg/L	1	5/3/2010	
Propane	0.034	0.018		µg/L	1	5/3/2010	
Propene	ND	0.018		µg/L	1	5/3/2010	
I-Butane	ND	0.024		µg/L	1	5/3/2010	
N-Butane	ND	0.024		µg/L	1	5/3/2010	
Butene	ND	0.023		µg/L	1	5/3/2010	
I-Pentane	ND	0.030		µg/L	1	5/3/2010	
N-Pentane	ND	0.030		µg/L	1	5/3/2010	
Pentene	ND	0.029		µg/L	1	5/3/2010	
I-Hexane	0.405	0.018		µg/L	1	5/3/2010	
N-Hexane	0.083	0.036		µg/L	1	5/3/2010	

**Qualifiers:** \* Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** WilliamsS-050110  
**Lab Order:** 1005001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 5/1/2010  
**Lab ID:** 1005001-003C **Date Received:** 5/3/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	2300	25.0		CFU/mL	1	5/3/2010	
Slime Forming Bacteria - SLYM	12500	10.0		CFU/mL	1	5/3/2010	
Sulfate Reducing Bacteria - SRB	ND	200		CFU/mL	1	5/3/2010	

IRB-Moderate Aggressive

SLYM-Aggressive

SRB- Normal Background Levels

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

* Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-003D

**Date Received:** 5/3/2010

**Client Sample** WilliamsS-050110

**Tag Number:**

**Collection** 5/1/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst: <b>RB</b>
Conductivity by EPA 120.1	909	2.0		µmhos/cm	1	5/4/2010
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst: <b>RB</b>
pH by SW-846 9045C	6.95	0.10		pH Units	1	5/4/2010
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst: <b>RB</b>
Total Dissolved Solids (Residue, Filterable)	665	20		mg/L	1	5/4/2010
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst: <b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/4/2010
<b>ALKALINITY (AS MG/L CaCO<sub>3</sub>), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst: <b>RB</b>
Alkalinity, Total (As CaCO <sub>3</sub> )	350	10.0		mg/L	1	5/4/2010
Bicarbonate	350	10.0		mg/L	1	5/4/2010
Carbonate	ND	10.0		mg/L	1	5/4/2010
Hydroxide	ND	10.0		mg/L	1	5/4/2010
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst: <b>Admin</b>
Fluoride	0.560	0.200		mg/L	1	5/6/2010
Chloride	134	20.0		mg/L	20	5/13/2010
Nitrite	ND	0.100		mg/L	1	5/6/2010
Bromide	ND	1.00		mg/L	1	5/6/2010
Nitrate	0.12	0.100		mg/L	1	5/6/2010
Phosphate, Dissolved	ND	0.100		mg/L	1	5/6/2010
Orthophosphate						
Sulfate	18.0	1.00		mg/L	1	5/6/2010

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsS-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-003E **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>			Analyst:	<b>Admin</b>
Arsenic	ND	0.01		mg/L	1	5/18/2010	
Boron	0.31	0.10		mg/L	1	5/18/2010	
Calcium	120	0.10		mg/L	1	5/18/2010	
Chromium	ND	0.005		mg/L	1	5/18/2010	
Cobalt	ND	0.005		mg/L	1	5/18/2010	
Iron	ND	0.05		mg/L	1	5/18/2010	
Magnesium	38.9	0.05		mg/L	1	5/18/2010	
Manganese	0.84	0.005		mg/L	1	5/18/2010	
Potassium	11.8	0.50		mg/L	1	5/18/2010	
Sodium	46.7	0.50		mg/L	1	5/18/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported



Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsS-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-003G **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	2.00	0.200		mg/L	1	5/6/2010	
Chloride	144	20.0		mg/L	20	5/13/2010	
Nitrite	ND	0.100		mg/L	1	5/6/2010	
Bromide	ND	1.00		mg/L	1	5/6/2010	
Nitrate	204	2.00		mg/L	1	5/6/2010	
Phosphate, Dissolved	ND	0.100		mg/L	1	5/6/2010	
Orthophosphate							
Sulfate	21.9	5.00		mg/L	5	5/6/2010	

**Qualifiers:**

\*Value exceeds Maximum Contaminant Level

E Value above quantitation range

J Analyte detected below quantitation limits

S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-004A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	119	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	91.5	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	99.2	70-130		%REC	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-004B **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	9410	0.068		µg/L	1	5/3/2010	
Ethane	21.9	0.013		µg/L	1	5/3/2010	
Ethylene	ND	0.012		µg/L	1	5/3/2010	
Propane	0.138	0.018		µg/L	1	5/3/2010	
Propene	0.273	0.018		µg/L	1	5/3/2010	
I-Butane	ND	0.024		µg/L	1	5/3/2010	
N-Butane	ND	0.024		µg/L	1	5/3/2010	
Butene	ND	0.023		µg/L	1	5/3/2010	
I-Pentane	ND	0.030		µg/L	1	5/3/2010	
N-Pentane	ND	0.030		µg/L	1	5/3/2010	
Pentene	ND	0.029		µg/L	1	5/3/2010	
I-Hexane	ND	0.018		µg/L	1	5/3/2010	
N-Hexane	ND	0.036		µg/L	1	5/3/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

BAnalyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** WilliamsD-050110  
**Lab Order:** 1005001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 5/1/2010  
**Lab ID:** 1005001-004C **Date Received:** 5/3/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	ND	25.0		CFU/mL	1	5/3/2010	
Slime Forming Bacteria - SLYM66500		10.0		CFU/mL	1	5/3/2010	
Sulfate Reducing Bacteria - SRB	200	200		CFU/mL	1	5/3/2010	

IRB-Normal Background Levels

SLYM-Aggressive

SRB- Moderately Aggressive

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits	NR	Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-004D **Date Received:** 5/3/2010

**Client Sample** WilliamsD-050110

**Tag Number:**

**Collection** 5/1/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst: <b>RB</b>
Conductivity by EPA 120.1	1010	2.0		µmhos/cm	1	5/4/2010
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst: <b>RB</b>
pH by SW-846 9045C	8.15	0.10		pH Units	1	5/4/2010
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst: <b>RB</b>
Total Dissolved Solids (Residue, Filterable)	735	20		mg/L	1	5/4/2010
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst: <b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/4/2010
<b>ALKALINITY (AS MG/L CaCO<sub>3</sub>), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst: <b>RB</b>
Alkalinity, Total (As CaCO <sub>3</sub> )	550	10.0		mg/L	1	5/4/2010
Bicarbonate	550	10.0		mg/L	1	5/4/2010
Carbonate	ND	10.0		mg/L	1	5/4/2010
Hydroxide	ND	10.0		mg/L	1	5/4/2010
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst: <b>Admin</b>
Fluoride	2.20	0.200		mg/L	1	5/6/2010
Chloride	58.5	5.00		mg/L	5	5/13/2010
Nitrite	ND	0.100		mg/L	1	5/6/2010
Bromide	ND	1.00		mg/L	1	5/6/2010
Nitrate	ND	0.100		mg/L	1	5/6/2010
Phosphate, Dissolved	0.14	0.100		mg/L	1	5/6/2010
Orthophosphate						
Sulfate	11.2	1.00		mg/L	1	5/6/2010

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-004E **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>			Analyst:	<b>Admin</b>
Arsenic	0.011	0.01		mg/L	1	5/18/2010	
Boron	1.81	0.10		mg/L	1	5/18/2010	
Calcium	8.48	0.10		mg/L	1	5/18/2010	
Chromium	ND	0.005		mg/L	1	5/18/2010	
Cobalt	ND	0.005		mg/L	1	5/18/2010	
Iron	0.12	0.05		mg/L	1	5/18/2010	
Magnesium	3.22	0.05		mg/L	1	5/18/2010	
Manganese	0.01	0.005		mg/L	1	5/18/2010	
Potassium	6.06	0.50		mg/L	1	5/18/2010	
Sodium	246	25.0		mg/L	50	5/18/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported



Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-004G **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>	<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	2.30	0.200	mg/L	1	5/6/2010	
Chloride	58.3	5.00	mg/L	5	5/13/2010	
Nitrite	ND	0.100	mg/L	1	5/6/2010	
Bromide	ND	1.00	mg/L	1	5/6/2010	
Nitrate	ND	0.100	mg/L	1	5/6/2010	
Phosphate, Dissolved	ND	0.100	mg/L	1	5/6/2010	
Orthophosphate						
Sulfate	11.8	1.00	mg/L	1	5/6/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110-DUP

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/10/2010

**Lab ID:** 1005001-005A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	110	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	92.2	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	97.2	70-130		%REC	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110-DUP

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/10/2010

**Lab ID:** 1005001-005B **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	9170	0.068		µg/L	1	5/3/2010	
Ethane	21.6	0.013		µg/L	1	5/3/2010	
Ethylene	ND	0.012		µg/L	1	5/3/2010	
Propane	0.140	0.018		µg/L	1	5/3/2010	
Propene	0.257	0.018		µg/L	1	5/3/2010	
I-Butane	ND	0.024		µg/L	1	5/3/2010	
N-Butane	ND	0.024		µg/L	1	5/3/2010	
Butene	ND	0.023		µg/L	1	5/3/2010	
I-Pentane	ND	0.030		µg/L	1	5/3/2010	
N-Pentane	ND	0.030		µg/L	1	5/3/2010	
Pentene	ND	0.029		µg/L	1	5/3/2010	
I-Hexane	ND	0.018		µg/L	1	5/3/2010	
N-Hexane	ND	0.036		µg/L	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** WilliamsD-050110-DUP  
**Lab Order:** 1005001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 5/10/2010  
**Lab ID:** 1005001-005C **Date Received:** 5/3/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>			Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	ND	25.0	CFU/mL	1	5/3/2010	
Slime Forming Bacteria - SLYM66500		10.0	CFU/mL	1	5/3/2010	
Sulfate Reducing Bacteria - SRB1200		200	CFU/mL	1	5/3/2010	

IRB-Normal Background Levels

SLYM-Aggressive

SRB- Moderately Aggressive

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

* Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-005D

**Date Received:** 5/3/2010

**Client Sample** WilliamsD-050110-DUP

**Tag Number:**

**Collection** 5/10/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst: <b>RB</b>
Conductivity by EPA 120.1	1000	2.0		µmhos/cm	1	5/4/2010
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst: <b>RB</b>
pH by SW-846 9045C	8.16	0.10		pH Units	1	5/4/2010
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst: <b>RB</b>
Total Dissolved Solids (Residue, Filterable)	742	20		mg/L	1	5/4/2010
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst: <b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/4/2010
<b>ALKALINITY (AS MG/L CaCO<sub>3</sub>), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst: <b>RB</b>
Alkalinity, Total (As CaCO <sub>3</sub> )	540	10.0		mg/L	1	5/4/2010
Bicarbonate	540	10.0		mg/L	1	5/4/2010
Carbonate	ND	10.0		mg/L	1	5/4/2010
Hydroxide	ND	10.0		mg/L	1	5/4/2010
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst: <b>Admin</b>
Fluoride	2.50	0.200		mg/L	1	5/6/2010
Chloride	58.6	5.00		mg/L	5	5/13/2010
Nitrite	ND	0.100		mg/L	1	5/6/2010
Bromide	ND	1.00		mg/L	1	5/6/2010
Nitrate	ND	0.100		mg/L	1	5/6/2010
Phosphate, Dissolved	0.10	0.100		mg/L	1	5/6/2010
Orthophosphate						
Sulfate	12.2	1.00		mg/L	1	5/6/2010

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110-DUP

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/10/2010

**Lab ID:** 1005001-005E **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>			Analyst:	<b>Admin</b>
Arsenic	0.01	0.01		mg/L	1	5/18/2010	
Boron	1.80	0.10		mg/L	1	5/18/2010	
Calcium	8.39	0.10		mg/L	1	5/18/2010	
Chromium	ND	0.005		mg/L	1	5/18/2010	
Cobalt	ND	0.005		mg/L	1	5/18/2010	
Iron	0.12	0.05		mg/L	1	5/18/2010	
Magnesium	3.19	0.05		mg/L	1	5/18/2010	
Manganese	0.01	0.005		mg/L	1	5/18/2010	
Potassium	6.02	0.50		mg/L	1	5/18/2010	
Sodium	260	25.0		mg/L	50	5/18/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported



Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** WilliamsD-050110-DUP

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/10/2010

**Lab ID:** 1005001-005G **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>	<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	2.30	0.200	mg/L	1	5/6/2010	
Chloride	57.9	5.00	mg/L	5	5/13/2010	
Nitrite	ND	0.100	mg/L	1	5/6/2010	
Bromide	ND	1.00	mg/L	1	5/6/2010	
Nitrate	ND	0.100	mg/L	1	5/6/2010	
Phosphate, Dissolved	0.10	0.100	mg/L	1	5/6/2010	
Orthophosphate						
Sulfate	12.5	1.00	mg/L	1	5/6/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Trip Blank

**Lab Order:** 1005001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/1/2010

**Lab ID:** 1005001-006A **Date Received:** 5/3/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>							
		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/3/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/3/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/3/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/3/2010	
o-Xylene	ND	0.50		µg/L	1	5/3/2010	
Toluene	ND	0.50		µg/L	1	5/3/2010	
Surr: 4-Bromofluorobenzene	118	70-130		%REC	1	5/3/2010	
Surr: Dibromofluoromethane	93.3	70-130		%REC	1	5/3/2010	
Surr: Toluene-d8	102	70-130		%REC	1	5/3/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

## Vista GeoScience

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC

**Lab Order:** 1005001

**Project:** East Cheyenne Gas Storage Baseline

**Lab ID:** 1005001-006B

**Date Received:** 5/3/2010

**Client Sample** Trip Blank

**Tag Number:**

**Collection** 5/1/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst: RB
Methane	ND	0.068		µg/L	1	5/3/2010
Ethane	ND	0.013		µg/L	1	5/3/2010
Ethylene	ND	0.012		µg/L	1	5/3/2010
Propane	ND	0.018		µg/L	1	5/3/2010
Propene	ND	0.018		µg/L	1	5/3/2010
I-Butane	ND	0.024		µg/L	1	5/3/2010
N-Butane	ND	0.024		µg/L	1	5/3/2010
Butene	ND	0.023		µg/L	1	5/3/2010
I-Pentane	ND	0.030		µg/L	1	5/3/2010
N-Pentane	ND	0.030		µg/L	1	5/3/2010
Pentene	ND	0.029		µg/L	1	5/3/2010
I-Hexane	ND	0.018		µg/L	1	5/3/2010
N-Hexane	ND	0.036		µg/L	1	5/3/2010

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Nelson-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-001A **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	71.5	0.068		µg/L	1	5/19/2010	
Ethane	0.154	0.013		µg/L	1	5/19/2010	
Ethylene	0.026	0.012		µg/L	1	5/19/2010	
Propane	0.048	0.018		µg/L	1	5/19/2010	
Propene	ND	0.018		µg/L	1	5/19/2010	
I-Butane	ND	0.024		µg/L	1	5/19/2010	
N-Butane	ND	0.024		µg/L	1	5/19/2010	
Butene	ND	0.023		µg/L	1	5/19/2010	
I-Pentane	ND	0.030		µg/L	1	5/19/2010	
N-Pentane	ND	0.030		µg/L	1	5/19/2010	
Pentene	ND	0.029		µg/L	1	5/19/2010	
I-Hexane	ND	0.018		µg/L	1	5/19/2010	
N-Hexane	ND	0.036		µg/L	1	5/19/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** Nelson-051710  
**Lab Order:** 1005002 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 5/17/2010  
**Lab ID:** 1005002-001B **Date Received:** 5/18/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	5000	25.0		CFU/mL	1	5/18/2010	
Slime Forming Bacteria - SLYM	2500	10.0		CFU/mL	1	5/18/2010	
Sulfate Reducing Bacteria - SRB	ND	200		CFU/mL	1	5/18/2010	

IRB-Aggressive  
 SLYM-Moderately aggressive  
 SRB- Normal Background Levels

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:** \* Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002A **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	ND	0.068		µg/L	1	5/19/2010	
Ethane	ND	0.013		µg/L	1	5/19/2010	
Ethylene	ND	0.012		µg/L	1	5/19/2010	
Propane	ND	0.018		µg/L	1	5/19/2010	
Propene	ND	0.018		µg/L	1	5/19/2010	
I-Butane	ND	0.024		µg/L	1	5/19/2010	
N-Butane	ND	0.024		µg/L	1	5/19/2010	
Butene	ND	0.023		µg/L	1	5/19/2010	
I-Pentane	ND	0.030		µg/L	1	5/19/2010	
N-Pentane	ND	0.030		µg/L	1	5/19/2010	
Pentene	ND	0.029		µg/L	1	5/19/2010	
I-Hexane	ND	0.018		µg/L	1	5/19/2010	
N-Hexane	ND	0.036		µg/L	1	5/19/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported



Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002B **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	5/25/2010	
Ethylbenzene	ND	0.50		µg/L	1	5/25/2010	
m,p-Xylene	ND	1.00		µg/L	1	5/25/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	5/25/2010	
o-Xylene	ND	0.50		µg/L	1	5/25/2010	
Toluene	ND	0.50		µg/L	1	5/25/2010	
Surr: 4-Bromofluorobenzene	117	70-130		%REC	1	5/25/2010	
Surr: Dibromofluoromethane	92.4	70-130		%REC	1	5/25/2010	
Surr: Toluene-d8	100	70-130		%REC	1	5/25/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC **Client Sample** Gillam-051710  
**Lab Order:** 1005002 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection** 5/17/2010  
**Lab ID:** 1005002-002C **Date Received:** 5/18/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	18000	25.0		CFU/mL	1	5/18/2010	
Slime Forming Bacteria - SLYM66500		10.0		CFU/mL	1	5/18/2010	
Sulfate Reducing Bacteria - SRB	ND	200		CFU/mL	1	5/18/2010	

IRB-Aggressive  
 SLYM-Aggressive  
 SRB- Normal Background Levels

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers: \***

Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002D **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst:	<b>RB</b>
Conductivity by EPA 120.1	664	2.0		µmhos/cm	1	5/19/2010	
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst:	<b>RB</b>
pH by SW-846 9045C	7.39	0.10		pH Units	1	5/18/2010	
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst:	<b>RB</b>
Total Dissolved Solids (Residue, Filterable)	466	10		mg/L	1	5/19/2010	
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst:	<b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	5/19/2010	
<b>ALKALINITY (AS MG/L CaCO3), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst:	<b>RB</b>
Alkalinity, Total (As CaCO3)	172	10.0		mg/L	1	5/19/2010	
Bicarbonate	172	10.0		mg/L	1	5/19/2010	
Carbonate	ND	10.0		mg/L	1	5/19/2010	
Hydroxide	ND	10.0		mg/L	1	5/19/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
E Value above quantitation range  
J Analyte detected below quantitation limits

B Analyte detected in the associated Method Blank  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
S Spike Recovery outside accepted recovery limits  
NR Analyte Not Reported

**Vista GeoScience**

**Date:** 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002E **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>		<b>(SW3005A)</b>		Analyst:	<b>Admin</b>
Arsenic	ND	0.20		mg/L	1	5/20/2010	
Boron	0.10	0.01		mg/L	1	5/20/2010	
Calcium	57.2	0.50		mg/L	1	5/20/2010	
Chromium	ND	0.01		mg/L	1	5/20/2010	
Cobalt	ND	0.02		mg/L	1	5/20/2010	
Iron	ND	0.20		mg/L	1	5/20/2010	
Magnesium	20.4	0.50		mg/L	1	5/20/2010	
Manganese	ND	0.02		mg/L	1	5/20/2010	
Potassium	11.1	5.00		mg/L	1	5/20/2010	
Sodium	40.7	5.00		mg/L	1	5/20/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002F **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>	<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.890	0.400	mg/L	1	5/19/2010	
Chloride	96.7	10.0	mg/L	1	5/19/2010	
Nitrite	ND	0.100	mg/L	1	5/19/2010	
Bromide	ND	2.00	mg/L	1	5/19/2010	
Nitrate	2.40	0.100	mg/L	1	5/19/2010	
Phosphate, Dissolved	ND	0.100	mg/L	1	5/19/2010	
Orthophosphate						
Sulfate	25.9	2.00	mg/L	1	5/19/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample** Gillam-051710

**Lab Order:** 1005002

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection** 5/17/2010

**Lab ID:** 1005002-002G **Date Received:** 5/18/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>	<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.960	0.400	mg/L	1	5/19/2010	
Chloride	99.0	10.0	mg/L	1	5/19/2010	
Nitrite	ND	0.100	mg/L	1	5/19/2010	
Bromide	ND	2.00	mg/L	1	5/19/2010	
Nitrate	2.40	0.100	mg/L	1	5/19/2010	
Phosphate, Dissolved	ND	0.100	mg/L	1	5/19/2010	
Orthophosphate						
Sulfate	26.2	2.00	mg/L	1	5/19/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported



**Vista GeoScience**

**Date:** 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC      **Client Sample ID:** Wood-061510  
**Lab Order:** 1006001      **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline      **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-001A **Date Received:** 6/16/2010      **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	6/18/2010	
Ethylbenzene	ND	0.50		µg/L	1	6/18/2010	
m,p-Xylene	ND	1.00		µg/L	1	6/18/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	6/18/2010	
o-Xylene	ND	0.50		µg/L	1	6/18/2010	
Toluene	ND	0.50		µg/L	1	6/18/2010	
Surr: 4-Bromofluorobenzene	120	70-130		%REC	1	6/18/2010	
Surr: Dibromofluoromethane	101	70-130		%REC	1	6/18/2010	
Surr: Toluene-d8	102	70-130		%REC	1	6/18/2010	

**Qualifiers:**      \*Value exceeds Maximum Contaminant Level  
E    Value above quantitation range  
J    Analyte detected below quantitation limits  
S    Spike Recovery outside accepted recovery limits

B    Analyte detected in the associated Method Blank  
H    Holding times for preparation or analysis exceeded  
ND   Not Detected at the Reporting Limit  
NR   Analyte Not Reported

Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample ID:** Wood-061510

**Lab Order:** 1006001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection Date:** 6/15/2010

**Lab ID:** 1006001-001B **Date Received:** 6/16/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	ND	0.0680		µg/L	1	6/17/2010	
Ethane	ND	0.0130		µg/L	1	6/17/2010	
Ethylene	ND	0.0120		µg/L	1	6/17/2010	
Propane	ND	0.0180		µg/L	1	6/17/2010	
Propene	ND	0.0180		µg/L	1	6/17/2010	
I-Butane	ND	0.0240		µg/L	1	6/17/2010	
N-Butane	ND	0.0240		µg/L	1	6/17/2010	
Butene	ND	0.0230		µg/L	1	6/17/2010	
I-Pentane	ND	0.0300		µg/L	1	6/17/2010	
N-Pentane	ND	0.0300		µg/L	1	6/17/2010	
Pentene	ND	0.0290		µg/L	1	6/17/2010	
I-Hexane	ND	0.0180		µg/L	1	6/17/2010	
N-Hexane	ND	0.0360		µg/L	1	6/17/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC **Client Sample ID:** Wood-061510  
**Lab Order:** 1006001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-001D **Date Received:** 6/16/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst:	<b>RB</b>
Conductivity by EPA 120.1	410	2.0		µmhos/cm	1	6/18/2010	
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst:	<b>RB</b>
pH by SW-846 9045C	7.26	0.10	H	pH Units	1	6/17/2010	
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst:	<b>RB</b>
Total Dissolved Solids (Residue, Filterable)	367	10		mg/L	1	6/18/2010	
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst:	<b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	6/18/2010	
<b>ALKALINITY (AS MG/L CaCO3), TITRATION</b>		<b>E310.1</b>		<b>(E310.1)</b>		Analyst:	<b>RB</b>
Alkalinity, Total (As CaCO3)	177	10.0		mg/L	1	6/17/2010	
Bicarbonate	177	10.0		mg/L	1	6/17/2010	
Carbonate	ND	10.0		mg/L	1	6/17/2010	
Hydroxide	ND	10.0		mg/L	1	6/17/2010	

**Qualifiers:** \*Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 NR Analyte Not Reported

**Vista GeoScience**

**Date:** 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC      **Client Sample ID:** Wood-061510  
**Lab Order:** 1006001      **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline      **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-001E      **Date Received:** 6/16/2010      **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>		<b>(SW3005A)</b>		Analyst:	<b>Admin</b>
Arsenic	ND	0.20		mg/L	1	6/23/2010	
Boron	0.12	0.01		mg/L	1	6/23/2010	
Calcium	47.0	0.50		mg/L	1	6/23/2010	
Chromium	ND	0.01		mg/L	1	6/23/2010	
Cobalt	ND	0.02		mg/L	1	6/23/2010	
Iron	ND	0.20		mg/L	1	6/23/2010	
Magnesium	14.3	0.50		mg/L	1	6/23/2010	
Manganese	ND	0.02		mg/L	1	6/23/2010	
Potassium	9.82	5.00		mg/L	1	6/23/2010	
Sodium	37.2	5.00		mg/L	1	6/23/2010	

**Qualifiers:**      \*Value exceeds Maximum Contaminant Level  
E    Value above quantitation range  
J    Analyte detected below quantitation limits  
S    Spike Recovery outside accepted recovery limits

B    Analyte detected in the associated Method Blank  
H    Holding times for preparation or analysis exceeded  
ND   Not Detected at the Reporting Limit  
NR   Analyte Not Reported

**Vista GeoScience**

**Date:** 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC      **Client Sample ID:** Wood-061510  
**Lab Order:** 1006001      **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline      **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-001G **Date Received:** 6/16/2010      **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.850	0.200		mg/L	1	6/17/2010	
Chloride	12.1	1.00		mg/L	1	6/17/2010	
Nitrite	ND	0.100		mg/L	1	6/17/2010	
Bromide	ND	1.00		mg/L	1	6/17/2010	
Nitrate	10.9	0.100		mg/L	1	6/17/2010	
Phosphate, Dissolved	ND	0.100		mg/L	1	6/17/2010	
Orthophosphate							
Sulfate	32.0	2.00		mg/L	1	6/17/2010	

**Qualifiers:**

*Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample ID:** Wood-061510-dup

**Lab Order:** 1006001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection Date:** 6/15/2010

**Lab ID:** 1006001-002A **Date Received:** 6/16/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BTEX/MTBE BY 8260B</b>							
		<b>SW8260B</b>	<b>(5030B)</b>			Analyst:	<b>RB</b>
Benzene	ND	0.50		µg/L	1	6/18/2010	
Ethylbenzene	ND	0.50		µg/L	1	6/18/2010	
m,p-Xylene	ND	1.00		µg/L	1	6/18/2010	
Methyl tert-butyl ether	ND	0.50		µg/L	1	6/18/2010	
o-Xylene	ND	0.50		µg/L	1	6/18/2010	
Toluene	ND	0.50		µg/L	1	6/18/2010	
Surr: 4-Bromofluorobenzene	107	70-130		%REC	1	6/18/2010	
Surr: Dibromofluoromethane	102	70-130		%REC	1	6/18/2010	
Surr: Toluene-d8	104	70-130		%REC	1	6/18/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported



Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample ID:** Wood-061510-dup

**Lab Order:** 1006001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection Date:** 6/15/2010

**Lab ID:** 1006001-002B **Date Received:** 6/16/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>C1-C6 HYDROCARBONS, DISSOLVED</b>		<b>NLAG108</b>		<b>(NLAG108)</b>		Analyst:	<b>RB</b>
Methane	ND	0.0680		µg/L	1	6/17/2010	
Ethane	ND	0.0130		µg/L	1	6/17/2010	
Ethylene	ND	0.0120		µg/L	1	6/17/2010	
Propane	ND	0.0180		µg/L	1	6/17/2010	
Propene	ND	0.0180		µg/L	1	6/17/2010	
I-Butane	ND	0.0240		µg/L	1	6/17/2010	
N-Butane	ND	0.0240		µg/L	1	6/17/2010	
Butene	ND	0.0230		µg/L	1	6/17/2010	
I-Pentane	ND	0.0300		µg/L	1	6/17/2010	
N-Pentane	ND	0.0300		µg/L	1	6/17/2010	
Pentene	ND	0.0290		µg/L	1	6/17/2010	
I-Hexane	ND	0.0180		µg/L	1	6/17/2010	
N-Hexane	ND	0.0360		µg/L	1	6/17/2010	

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC **Client Sample ID:** Wood-061510-dup  
**Lab Order:** 1006001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-002C **Date Received:** 6/16/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>BACTERIOLOGICAL TESTING</b>		<b>BART</b>				Analyst:	<b>RB</b>
Iron Reducing Bacteria - IRB	2300	25.0		CFU/mL	1	6/16/2010	
Slime Forming Bacteria - SLYM	2500	10.0		CFU/mL	1	6/16/2010	
Sulfate Reducing Bacteria - SRB	500	200		CFU/mL	1	6/16/2010	

IRB-Moderately Aggressive  
 SLYM- Moderately Aggressive  
 SRB- Moderately Aggressive

1. Very Aggressive (treatment should be started as early as convenient)
2. Aggressive (treatment should be considered in the near future before the condition degenerates further)
3. Moderately Aggressive (treatment may not be required but vigilance through ongoing testing should be practiced)
4. Normal Background Levels (routine testing is recommended)

**Qualifiers:**

*Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC **Client Sample ID:** Wood-061510-dup  
**Lab Order:** 1006001 **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-002D **Date Received:** 6/16/2010 **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>CONDUCTIVITY BY EPA 120.1</b>		<b>E120.1</b>		<b>(E120.1)</b>		Analyst:	<b>RB</b>
Conductivity by EPA 120.1	420	2.0		µmhos/cm	1	6/18/2010	
<b>PH IN WATER BY EPA 150.1</b>		<b>E150.1</b>		<b>(E150.1)</b>		Analyst:	<b>RB</b>
pH by SW-846 9045C	7.30	0.10	H	pH Units	1	6/17/2010	
<b>TOTAL DISSOLVED SOLIDS (TDS) BY EPA 160.1</b>		<b>E160.1</b>		<b>(E160.1)</b>		Analyst:	<b>RB</b>
Total Dissolved Solids (Residue, 361 Filterable)		10		mg/L	1	6/18/2010	
<b>TOTAL SUSPENDED SOLIDS (TSS) BY EPA 160.2</b>		<b>E160.2</b>		<b>(E160.2)</b>		Analyst:	<b>RB</b>
Residue, Suspended (TSS)	ND	10		mg/L	1	6/18/2010	
<b>ALKALINITY (AS MG/L CaCO3), TITRATION E310.1</b>				<b>(E310.1)</b>		Analyst:	<b>RB</b>
Alkalinity, Total (As CaCO3)	177	10.0		mg/L	1	6/17/2010	
Bicarbonate	177	10.0		mg/L	1	6/17/2010	
Carbonate	ND	10.0		mg/L	1	6/17/2010	
Hydroxide	ND	10.0		mg/L	1	6/17/2010	

## Vista GeoScience

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC

**Client Sample ID:** Wood-061510-dup

**Lab Order:** 1006001

**Tag Number:**

**Project:** East Cheyenne Gas Storage Baseline

**Collection Date:** 6/15/2010

**Lab ID:** 1006001-002E

**Date Received:** 6/16/2010

**Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>ICP METALS, DISSOLVED</b>		<b>SW6010B</b>	<b>(SW3005A)</b>	Analyst: Admin		
Arsenic	ND	0.20		mg/L	1	6/23/2010
Boron	0.12	0.01		mg/L	1	6/23/2010
Calcium	46.6	0.50		mg/L	1	6/23/2010
Chromium	ND	0.01		mg/L	1	6/23/2010
Cobalt	ND	0.02		mg/L	1	6/23/2010
Iron	ND	0.20		mg/L	1	6/23/2010
Magnesium	14.1	0.50		mg/L	1	6/23/2010
Manganese	ND	0.02		mg/L	1	6/23/2010
Potassium	9.69	5.00		mg/L	1	6/23/2010
Sodium	36.7	5.00		mg/L	1	6/23/2010

**Qualifiers:**

- \*Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- NR Analyte Not Reported

**Vista GeoScience**

**Date:** 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC      **Client Sample ID:** Wood-061510-dup  
**Lab Order:** 1006001      **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline      **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-002F      **Date Received:** 6/16/2010      **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Total)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.840	0.200		mg/L	1	6/17/2010	
Chloride	12.2	1.00		mg/L	1	6/17/2010	
Nitrite	ND	0.100		mg/L	1	6/17/2010	
Bromide	ND	1.00		mg/L	1	6/17/2010	
Nitrate	11.0	0.100		mg/L	1	6/17/2010	
Phosphate, Dissolved	ND	0.100		mg/L	1	6/17/2010	
Orthophosphate							
Sulfate	31.4	2.00		mg/L	1	6/17/2010	

**Qualifiers:**

*Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E Value above quantitation range	H	Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR	Analyte Not Reported

**Vista GeoScience**

**Date:** 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC      **Client Sample ID:** Wood-061510-dup  
**Lab Order:** 1006001      **Tag Number:**  
**Project:** East Cheyenne Gas Storage Baseline      **Collection Date:** 6/15/2010  
**Lab ID:** 1006001-002G **Date Received:** 6/16/2010      **Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
<b>ANIONS SCAN BY 9056 (Dissolved)</b>		<b>9056 Mod.</b>		<b>(9056 MOD.)</b>		Analyst:	<b>Admin</b>
Fluoride	0.860	0.200		mg/L	1	6/17/2010	
Chloride	12.2	1.00		mg/L	1	6/17/2010	
Nitrite	ND	0.100		mg/L	1	6/17/2010	
Bromide	ND	1.00		mg/L	1	6/17/2010	
Nitrate	10.9	0.100		mg/L	1	6/17/2010	
Phosphate, Dissolved	ND	0.100		mg/L	1	6/17/2010	
Orthophosphate							
Sulfate	30.0	2.00		mg/L	1	6/17/2010	

**Qualifiers:**

*Value exceeds Maximum Contaminant Level	B Analyte detected in the associated Method Blank
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits	NR Analyte Not Reported

## Vista GeoScience

21-May-10

**Lab Order:** 1005001

**Client:** Merchant Energy Partners, LLC

**Project:** East Cheyenne Gas Storage

## DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1005001-001A	RichGilliam-050110	5/1/2010	Water	BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-001B				C1-C6 Hydrocarbons, Dissolved		5/3/2010	5/3/2010
1005001-001C				Bacteriological Testing			5/3/2010
1005001-001D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/4/2010	5/4/2010
				Anions Scan by 9056		5/6/2010	5/6/2010
				Conductivity by EPA 120.1		5/4/2010	5/4/2010
				pH in Water by EPA 150.1		5/4/2010	5/4/2010
				Total Dissolved Solids (TDS) by EPA		5/4/2010	5/4/2010
				Total Suspended Solids (TSS) by EPA		5/4/2010	5/4/2010
1005001-001E				ICP METALS, Dissolved		5/11/2010	5/18/2010
1005001-001G	Michaels-043010	4/30/2010		Anions Scan by 9056		5/6/2010	5/6/2010
1005001-002A				BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-002B				C1-C6 Hydrocarbons, Dissolved		5/3/2010	5/3/2010
1005001-002C				Bacteriological Testing			5/3/2010
1005001-002D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/4/2010	5/4/2010
				Anions Scan by 9056		5/6/2010	5/6/2010
				Conductivity by EPA 120.1		5/4/2010	5/4/2010
				pH in Water by EPA 150.1		5/4/2010	5/4/2010
				Total Dissolved Solids (TDS) by EPA		5/4/2010	5/4/2010
				Total Suspended Solids (TSS) by EPA		5/4/2010	5/4/2010
1005001-002E	WilliamsS-050110	5/1/2010		ICP METALS, Dissolved		5/11/2010	5/18/2010
1005001-003A				BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-003B				C1-C6 Hydrocarbons, Dissolved		5/3/2010	5/3/2010
1005001-003C				Bacteriological Testing			5/3/2010
1005001-003D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/4/2010	5/4/2010
				Anions Scan by 9056		5/6/2010	5/6/2010
				Conductivity by EPA 120.1		5/4/2010	5/4/2010
				pH in Water by EPA 150.1		5/4/2010	5/4/2010



## Vista GeoScience

21-May-10

**Lab Order:** 1005001

**Client:** Merchant Energy Partners, LLC

**Project:** East Cheyenne Gas Storage

## DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1005001-003D	WilliamsS-050110	5/1/2010	Water	Total Dissolved Solids (TDS) by EPA		5/4/2010	5/4/2010
				Total Suspended Solids (TSS) by EPA		5/4/2010	5/4/2010
1005001-003E				ICP METALS, Dissolved		5/11/2010	5/18/2010
1005001-003G				Anions Scan by 9056		5/6/2010	5/6/2010
1005001-004A	WilliamsD-050110			BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-004B				C1-C6 Hydrocarbons, Dissolved		5/3/2010	5/3/2010
1005001-004C				Bacteriological Testing			5/3/2010
1005001-004D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/4/2010	5/4/2010
				Anions Scan by 9056		5/6/2010	5/6/2010
				Conductivity by EPA 120.1		5/4/2010	5/4/2010
				pH in Water by EPA 150.1		5/4/2010	5/4/2010
				Total Dissolved Solids (TDS) by EPA		5/4/2010	5/4/2010
				Total Suspended Solids (TSS) by EPA		5/4/2010	5/4/2010
1005001-004E				ICP METALS, Dissolved		5/11/2010	5/18/2010
1005001-004G				Anions Scan by 9056		5/6/2010	5/6/2010
1005001-005A	WilliamsD-050110-DUP	5/10/2010		BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-005B				C1-C6 Hydrocarbons, Dissolved		5/3/2010	5/3/2010
1005001-005C				Bacteriological Testing			5/3/2010
1005001-005D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/4/2010	5/4/2010
				Anions Scan by 9056		5/6/2010	5/6/2010
				Conductivity by EPA 120.1		5/4/2010	5/4/2010
				pH in Water by EPA 150.1		5/4/2010	5/4/2010
				Total Dissolved Solids (TDS) by EPA		5/4/2010	5/4/2010
				Total Suspended Solids (TSS) by EPA		5/4/2010	5/4/2010
1005001-005E				ICP METALS, Dissolved		5/11/2010	5/18/2010
1005001-005G				Anions Scan by 9056		5/6/2010	5/6/2010
1005001-006A	Trip Blank	5/1/2010		BTEX/MTBE by 8260B		5/3/2010	5/3/2010
1005001-006B	C1-C6 Hydrocarbons, Dissolved	5/3/2010 5/3/2010					

## Vista GeoScience

03-Jun-10

**Lab Order:** 1005002  
**Client:** Merchant Energy Partners, LLC  
**Project:** East Cheyenne Gas Storage

## DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1005002-001A	Nelson-051710	5/17/2010	Water	C1-C6 Hydrocarbons, Dissolved		5/19/2010	5/19/2010
1005002-001B				Bacteriological Testing			5/18/2010
1005002-002A	Gillam-051710			C1-C6 Hydrocarbons, Dissolved		5/19/2010	5/19/2010
1005002-002B				BTEX/MTBE by 8260B		5/25/2010	5/25/2010
1005002-002C				Bacteriological Testing			5/18/2010
1005002-002D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		5/19/2010	5/19/2010
				Conductivity by EPA 120.1		5/19/2010	5/19/2010
				pH in Water by EPA 150.1		5/18/2010	5/18/2010
				Total Dissolved Solids (TDS) by EPA		5/19/2010	5/19/2010
				Total Suspended Solids (TSS) by EPA		5/19/2010	5/19/2010
1005002-002E				ICP METALS, Dissolved		5/20/2010	5/20/2010
1005002-002F				Anions Scan by 9056		5/19/2010	5/19/2010
1005002-002G				Anions Scan by 9056		5/19/2010	5/19/2010

## Vista GeoScience

23-Feb-11

**Lab Order:** 1006001  
**Client:** Merchant Energy Partners, LLC  
**Project:** East Cheyenne Gas Storage

## DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1006001-001A	Wood-061510	6/15/2010	Water	BTEX/MTBE by 8260B		6/18/2010	6/18/2010
1006001-001B				C1-C6 Hydrocarbons, Dissolved		6/17/2010	6/17/2010
1006001-001C				Bacteriological Testing			6/16/2010
1006001-001D				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		6/17/2010	6/17/2010
				Conductivity by EPA 120.1		6/18/2010	6/18/2010
				pH in Water by EPA 150.1		6/17/2010	6/17/2010
				Total Dissolved Solids (TDS) by EPA		6/18/2010	6/18/2010
				Total Suspended Solids (TSS) by EPA		6/18/2010	6/18/2010
				ICP METALS, Dissolved		6/21/2010	6/23/2010
1006001-001E				Anions Scan by 9056		6/17/2010	6/17/2010
1006001-001F				Anions Scan by 9056		6/17/2010	6/17/2010
1006001-001G				BTEX/MTBE by 8260B		6/18/2010	6/18/2010
1006001-002A	Wood-061510-dup			C1-C6 Hydrocarbons, Dissolved		6/17/2010	6/17/2010
1006001-002B				Bacteriological Testing			6/16/2010
1006001-002C				Alkalinity (as mg/L CaCO <sub>3</sub> ), Titration		6/17/2010	6/17/2010
1006001-002D				Conductivity by EPA 120.1		6/18/2010	6/18/2010
				pH in Water by EPA 150.1		6/17/2010	6/17/2010
				Total Dissolved Solids (TDS) by EPA		6/18/2010	6/18/2010
				Total Suspended Solids (TSS) by EPA		6/18/2010	6/18/2010
				ICP METALS, Dissolved		6/21/2010	6/23/2010
1006001-002E				Anions Scan by 9056		6/17/2010	6/17/2010
1006001-002F				Anions Scan by 9056		6/17/2010	6/17/2010
1006001-002G							

Date: 21-May-10

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 160.1**

Sample <b>MB-1292</b>	SampType <b>MBLK</b>	TestCode: <b>160.1</b>	Units: <b>mg/L</b>	Prep Date: <b>5/4/2010</b>	RunNo: <b>1475</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>1292</b>	TestNo: <b>E160.1</b>	<b>(E160.1)</b>	Analysis <b>5/4/2010</b>	SeqNo: <b>15938</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Total Dissolved Solids (Residue,	ND	20.0			

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 160.2**

Sample <b>MB-1293</b>	SampType <b>MBLK</b>	TestCode: <b>160.2</b>	Units: <b>mg/L</b>	Prep Date: <b>5/4/2010</b>	RunNo: <b>1471</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>1293</b>	TestNo: <b>E160.2</b>	<b>(E160.2)</b>	Analysis <b>5/4/2010</b>	SeqNo: <b>15906</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Residue, Suspended (TSS)	ND	10.0			

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	MB-1288	SampType	MBLK	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/3/2010	RunNo:	1466			
Client ID:	ZZZZZ	Batch ID:	1288	TestNo:	SW8260B		(5030B)	Analysis	5/3/2010	SeqNo:	15869			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		ND		0.500										
Ethylbenzene		ND		0.500										
m,p-Xylene		ND		1.00										
Methyl tert-butyl ether		ND		0.500										
o-Xylene		ND		0.500										
Toluene		ND		0.500										
Surr: 4-Bromofluorobenzene		11.19		0	10	0		112	70	130				
Surr: Dibromofluoromethane		9.518		0	10	0		95.2	70	130				
Surr: Toluene-d8		10.16		0	10	0		102	70	130				

Sample	LCS-1288	SampType	LCS	TestCode: 8260B_BTEX Units: µg/L			Prep Date: 5/3/2010			RunNo: 1466		
Client ID:	ZZZZZ	Batch ID:	1288	TestNo: SW8260B (5030B)			Analysis 5/3/2010			SeqNo: 15870		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		9.590	0.500	10	0	95.9	70	130				
Ethylbenzene		9.512	0.500	10	0.0716	94.4	70	130				
m,p-Xylene		24.60	1.00	20	0.2984	122	70	130				
Methyl tert-butyl ether		8.980	0.500	10	0	89.8	70	130				
o-Xylene		9.812	0.500	10	0.0514	97.6	70	130				
Toluene		9.960	0.500	10	0.0754	98.8	70	130				
Surr: 4-Bromofluorobenzene		9.632	0	10	0	96.3	70	130				
Surr: Dibromofluoromethane		9.203	0	10	0	92.0	70	130				
Surr: Toluene-d8		9.984	0	10	0	99.8	70	130				

Sample	1005001-002AMS	SampType	MS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/3/2010	RunNo:	1466			
Client ID:	Michaels-043010	Batch ID:	1288	TestNo:	SW8260B		(5030B)	Analysis	5/3/2010	SeqNo:	15877			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		10.30		0.500	10	0		103	70	130				
Ethylbenzene		9.379		0.500	10	0		93.8	70	130				

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	1005001-002AMS	SampType	MS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/3/2010	RunNo:	1466
Client ID:	Michaels-043010	Batch ID:	1288	TestNo:	SW8260B	(5030B)		Analysis	5/3/2010	SeqNo:	15877
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	24.18	1.00	20	0	121	70	130				
Methyl tert-butyl ether	10.50	0.500	10	0	105	70	130				
o-Xylene	9.915	0.500	10	0.0227	98.9	70	130				
Toluene	10.53	0.500	10	0	105	70	130				
Surr: 4-Bromofluorobenzene	9.782	0	10	0	97.8	70	130				
Surr: Dibromofluoromethane	9.156	0	10	0	91.6	70	130				
Surr: Toluene-d8	10.01	0	10	0	100	70	130				

Sample	1005001-002AMSD	SampType	MSD	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/3/2010	RunNo:	1466
Client ID:	Michaels-043010	Batch ID:	1288	TestNo:	SW8260B	(5030B)		Analysis	5/3/2010	SeqNo:	15878
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	10.24	0.500	10	0	102	70	130	10.3	0.575	30	
Ethylbenzene	10.01	0.500	10	0	100	70	130	9.379	6.48	30	
m,p-Xylene	26.30	1.00	20	0	132	70	130	24.18	8.44	30	S
Methyl tert-butyl ether	9.639	0.500	10	0	96.4	70	130	10.5	8.54	30	
o-Xylene	10.43	0.500	10	0.0227	104	70	130	9.915	5.04	30	
Toluene	10.41	0.500	10	0	104	70	130	10.53	1.16	30	
Surr: 4-Bromofluorobenzene	10.43	0	10	0	104	70	130	0	0	0	
Surr: Dibromofluoromethane	8.984	0	10	0	89.8	70	130	0	0	0	
Surr: Toluene-d8	9.974	0	10	0	99.7	70	130	0	0	0	

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** C1\_C6\_DISSW

Sample	MB-1289	SampType	MBLK	TestCode:	C1_C6_DISS	Units:	µg/L	Prep Date:	5/3/2010	RunNo:	1467			
Client ID:	ZZZZZ	Batch ID:	1289	TestNo:	NLAG108		(NLAG108)	Analysis	5/3/2010	SeqNo:	15885			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane		ND		0.0680										
Ethane		ND		0.0130										
Ethylene		ND		0.0120										
Propane		ND		0.0180										
Propene		ND		0.0180										
I-Butane		ND		0.0240										
N-Butane		ND		0.0240										
Butene		ND		0.0230										
I-Pentane		ND		0.0300										
N-Pentane		ND		0.0300										
Pentene		ND		0.0290										
I-Hexane		ND		0.0180										
N-Hexane		ND		0.0360										

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits



**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** ICP\_DW

Sample	<b>MB-1297</b>	SampType	<b>MBLK</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/11/2010</b>	RunNo:	<b>1477</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1297</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>5/18/2010</b>	SeqNo:	<b>15948</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0100									
Boron	ND	0.100									
Calcium	ND	0.100									
Chromium	ND	0.00500									
Cobalt	ND	0.00500									
Iron	ND	0.0500									
Magnesium	ND	0.0500									
Manganese	ND	0.00500									
Potassium	ND	0.500									
Sodium	ND	0.500									

Sample	<b>LCS-1297</b>	SampType	<b>LCS</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/11/2010</b>	RunNo:	<b>1477</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1297</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>5/18/2010</b>	SeqNo:	<b>15949</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.020	0.0100	1	0	102	80	120				
Boron	0.9970	0.100	1	0	99.7	80	120				
Calcium	10.20	0.100	10	0	102	80	120				
Chromium	1.000	0.00500	1	0	100	80	120				
Cobalt	1.000	0.00500	1	0	100	80	120				
Iron	10.00	0.0500	10	0	100	80	120				
Magnesium	9.760	0.0500	10	0	97.6	80	120				
Manganese	1.010	0.00500	1	0	101	80	120				
Potassium	9.330	0.500	10	0	93.3	80	120				
Sodium	8.900	0.500	10	0	89.0	80	120				

**Qualifiers:** E Value above quantitation range    H Holding times for preparation or analysis exceeded    J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit    R RPD outside accepted recovery limits    S Spike Recovery outside accepted recovery limits

Date: 03-Jun-10

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 120.1

Sample	<b>1005002-002DDUP</b>	SampType	<b>DUP</b>	TestCode:	<b>120.1</b>	Units:	<b>µmhos/cm</b>	Prep Date:	<b>5/19/2010</b>	RunNo:	<b>1479</b>		
Client ID:	<b>Gillam-051710</b>	Batch ID:	<b>1299</b>	TestNo:	<b>E120.1</b>		<b>(E120.1)</b>	Analysis	<b>5/19/2010</b>	SeqNo:	<b>15960</b>		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity by EPA 120.1		670.0		2.00						664	0.900	0	

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 150.1

Sample	<b>1005002-002DDUP</b>	SampType	<b>DUP</b>	TestCode:	<b>150.1</b>	Units:	<b>pH Units</b>	Prep Date:	<b>5/18/2010</b>	RunNo:	<b>1478</b>		
Client ID:	<b>Gillam-051710</b>	Batch ID:	<b>1298</b>	TestNo:	<b>E150.1</b>		<b>(E150.1)</b>	Analysis	<b>5/18/2010</b>	SeqNo:	<b>15958</b>		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH by SW-846 9045C		7.420		0.100	7.39	0.405	20						

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 160.1

Sample	MB-1300	SampType	MBLK	TestCode: 160.1		Units: mg/L		Prep Date: 5/19/2010			RunNo: 1481		
Client ID:	ZZZZZ	Batch ID:	1300	TestNo: E160.1		(E160.1)		Analysis 5/19/2010			SeqNo: 15965		
Analyte			Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue,			ND	10.0									
Sample	1005002-002DDUP	SampType	DUP	TestCode: 160.1		Units: mg/L		Prep Date: 5/19/2010			RunNo: 1481		
Client ID:	Gillam-051710	Batch ID:	1300	TestNo: E160.1		(E160.1)		Analysis 5/19/2010			SeqNo: 15964		
Analyte			Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue,			462.0	10.0	466	0.862	20						

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 160.2

Sample	MB-1302	SampType	MBLK	TestCode: 160.2		Units: mg/L		Prep Date: 5/19/2010			RunNo: 1482		
Client ID:	ZZZZZ	Batch ID:	1302	TestNo: E160.2		(E160.2)		Analysis 5/19/2010			SeqNo: 15968		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Suspended (TSS)		ND		10.0									
Sample	1005002-002DDUP	SampType	DUP	TestCode: 160.2		Units: mg/L		Prep Date: 5/19/2010			RunNo: 1482		
Client ID:	Gillam-051710	Batch ID:	1302	TestNo: E160.2		(E160.2)		Analysis 5/19/2010			SeqNo: 15967		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Suspended (TSS)		ND		10.0	0	0	20						

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 310.1\_W\_C/BC

Sample	1005002-002DDUP	SampType	DUP	TestCode:	310.1_W_C/	Units:	mg/L	Prep Date:	5/19/2010	RunNo:	1480			
Client ID:	Gillam-051710	Batch ID:	1303	TestNo:	E310.1		(E310.1)	Analysis	5/19/2010	SeqNo:	15962			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)		172.5		10.0							172.5	0	20	
Bicarbonate		172.5		10.0							172.5	0	20	
Carbonate		ND		10.0							0	0	20	
Hydroxide		ND		10.0							0	0	20	

**Qualifiers:** E Value above quantitation range      H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit      R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	MB-1305	SampType	MBLK	TestCode: 8260B_BTEX Units: µg/L			Prep Date: 5/25/2010			RunNo: 1484			
Client ID:	ZZZZZ	Batch ID:	1305	TestNo: SW8260B (5030B)			Analysis 5/25/2010			SeqNo: 15973			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		ND		0.500									
Ethylbenzene		ND		0.500									
m,p-Xylene		ND		1.00									
Methyl tert-butyl ether		ND		0.500									
o-Xylene		ND		0.500									
Toluene		ND		0.500									
Surr: 4-Bromofluorobenzene		10.76		0	10	0	108	70	130				
Surr: Dibromofluoromethane		9.835		0	10	0	98.3	70	130				
Surr: Toluene-d8		10.64		0	10	0	106	70	130				

Sample	LCS-1305	SampType	LCS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/25/2010	RunNo:	1484			
Client ID:	ZZZZZ	Batch ID:	1305	TestNo:	SW8260B		(5030B)	Analysis	5/25/2010	SeqNo:	15974			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		10.25		0.500	10	0.046		102	70	130				
Ethylbenzene		9.573		0.500	10	0.0856		94.9	70	130				
m,p-Xylene		26.33		1.00	20	0.3285		130	70	130				
Methyl tert-butyl ether		9.285		0.500	10	0		92.9	70	130				
o-Xylene		10.34		0.500	10	0.0633		103	70	130				
Toluene		10.19		0.500	10	0.082		101	70	130				
Surr: 4-Bromofluorobenzene		9.653		0	10	0		96.5	70	130				
Surr: Dibromofluoromethane		9.952		0	10	0		99.5	70	130				
Surr: Toluene-d8		9.635		0	10	0		96.4	70	130				

Sample	1005002-002BMS	SampType	MS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/25/2010	RunNo:	1484			
Client ID:	Gillam-051710	Batch ID:	1305	TestNo:	SW8260B		(5030B)	Analysis	5/25/2010	SeqNo:	15976			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		10.25		0.500	10	0		102	70	130				
Ethylbenzene		10.73		0.500	10	0		107	70	130				

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	1005002-002BMS	SampType	MS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/25/2010	RunNo:	1484
Client ID:	Gillam-051710	Batch ID:	1305	TestNo:	SW8260B	(5030B)		Analysis	5/25/2010	SeqNo:	15976
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	28.42	1.00	20	0.1111	142	70	130				S
Methyl tert-butyl ether	9.948	0.500	10	0	99.5	70	130				
o-Xylene	10.92	0.500	10	0.0384	109	70	130				
Toluene	10.59	0.500	10	0.0517	105	70	130				
Surr: 4-Bromofluorobenzene	9.957	0	10	0	99.6	70	130				
Surr: Dibromofluoromethane	9.492	0	10	0	94.9	70	130				
Surr: Toluene-d8	10.38	0	10	0	104	70	130				
Sample	1005002-002BMSD	SampType	MSD	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	5/25/2010	RunNo:	1484
Client ID:	Gillam-051710	Batch ID:	1305	TestNo:	SW8260B	(5030B)		Analysis	5/25/2010	SeqNo:	15977
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	10.33	0.500	10	0	103	70	130	10.25	0.778	30	
Ethylbenzene	10.46	0.500	10	0	105	70	130	10.73	2.51	30	
m,p-Xylene	28.21	1.00	20	0.1111	140	70	130	28.42	0.750	30	S
Methyl tert-butyl ether	9.652	0.500	10	0	96.5	70	130	9.948	3.01	30	
o-Xylene	11.58	0.500	10	0.0384	115	70	130	10.92	5.89	30	
Toluene	10.75	0.500	10	0.0517	107	70	130	10.59	1.57	30	
Surr: 4-Bromofluorobenzene	10.05	0	10	0	101	70	130	0	0	0	
Surr: Dibromofluoromethane	10.05	0	10	0	101	70	130	0	0	0	
Surr: Toluene-d*	10.17	0	10	0	102	70	130	0	0	0	

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 9056 M**

Sample	<b>MB-1306</b>	SampType	<b>MBLK</b>	TestCode:	<b>9056 M</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/19/2010</b>	RunNo:	<b>1486</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1306</b>	TestNo:	<b>9056 Mod. (9056 Mod.)</b>			Analysis	<b>5/19/2010</b>	SeqNo:	<b>15982</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.200									
Chloride	ND	1.00									
Nitrite	ND	0.100									
Bromide	ND	1.00									
Nitrate	ND	0.100									
Phosphate, Dissolved	ND	0.100									
Sulfate	ND	1.00									

Sample	<b>LCS-1306</b>	SampType	<b>LCS</b>	TestCode:	<b>9056 M</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/19/2010</b>	RunNo:	<b>1486</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1306</b>	TestNo:	<b>9056 Mod. (9056 Mod.)</b>			Analysis	<b>5/19/2010</b>	SeqNo:	<b>15983</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	4.900	0.200	5	0	98.0	80	120				
Chloride	4.800	1.00	5	0	96.0	80	120				
Nitrite	4.700	0.100	5	0	94.0	80	120				
Bromide	5.000	1.00	5	0	100	80	120				
Nitrate	5.000	0.100	5	0	100	80	120				
Phosphate, Dissolved	1.900	0.100	2	0	95.0	80	120				
Sulfate	5.000	1.00	5	0	100	80	120				

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits



**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** C1\_C6\_DISSW

Sample	<b>MB-1304</b>	SampType	<b>MBLK</b>	TestCode:	<b>C1_C6_DISS</b>	Units:	<b>µg/L</b>	Prep Date:	<b>5/19/2010</b>	RunNo:	<b>1483</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1304</b>	TestNo:	<b>NLAG108</b>		<b>(NLAG108)</b>	Analysis	<b>5/19/2010</b>	SeqNo:	<b>15972</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.0680									
Ethane	ND	0.0130									
Ethylene	ND	0.0120									
Propane	ND	0.0180									
Propene	ND	0.0180									
I-Butane	ND	0.0240									
N-Butane	ND	0.0240									
Butene	ND	0.0230									
I-Pentane	ND	0.0300									
N-Pentane	ND	0.0300									
Pentene	ND	0.0290									
I-Hexane	ND	0.0180									
N-Hexane	ND	0.0360									

Sample	<b>1005002-001ADUP</b>	SampType	<b>DUP</b>	TestCode:	<b>C1_C6_DISS</b>	Units:	<b>µg/L</b>	Prep Date:	<b>5/19/2010</b>	RunNo:	<b>1483</b>
Client ID:	<b>Nelson-051710</b>	Batch ID:	<b>1304</b>	TestNo:	<b>NLAG108</b>		<b>(NLAG108)</b>	Analysis	<b>5/19/2010</b>	SeqNo:	<b>15970</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	72.40	0.0680						71.5	1.25	30	
Ethane	0.1560	0.0130						0.154	1.29	30	
Ethylene	0.02500	0.0120						0.026	3.92	30	
Propane	0.04700	0.0180						0.048	2.11	30	
Propene	ND	0.0180						0	0	30	
I-Butane	ND	0.0240						0	0	30	
N-Butane	ND	0.0240						0	0	30	
Butene	ND	0.0230						0	0	30	
I-Pentane	ND	0.0300						0	0	30	
N-Pentane	ND	0.0300						0	0	30	
Pentene	ND	0.0290						0	0	30	
I-Hexane	ND	0.0180						0	0	30	
N-Hexane	ND	0.0360						0	0	30	

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1005002  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** ICP\_DW

Sample	<b>MB-1307</b>	SampType	<b>MBLK</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/20/2010</b>	RunNo:	<b>1487</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1307</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>5/20/2010</b>	SeqNo:	<b>15985</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.200									
Boron	ND	0.0100									
Calcium	ND	0.500									
Chromium	ND	0.0100									
Cobalt	ND	0.0200									
Iron	ND	0.200									
Magnesium	ND	0.500									
Manganese	ND	0.0200									
Potassium	ND	5.00									
Sodium	ND	5.00									
Sample	<b>LCS-1307</b>	SampType	<b>LCS</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>5/20/2010</b>	RunNo:	<b>1487</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1307</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>5/20/2010</b>	SeqNo:	<b>15986</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.030	0.200	1	0	103	80	120				
Boron	0.9780	0.0100	1	0	97.8	80	120				
Calcium	9.430	0.500	10	0	94.3	80	120				
Chromium	0.9810	0.0100	1	0	98.1	80	120				
Cobalt	1.030	0.0200	1	0	103	80	120				
Iron	9.800	0.200	10	0	98.0	80	120				
Magnesium	9.430	0.500	10	0	94.3	80	120				
Manganese	0.9710	0.0200	1	0	97.1	80	120				
Potassium	9.890	5.00	10	0	98.9	80	120				
Sodium	10.10	5.00	10	0	101	80	120				

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

Date: 23-Feb-11

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 160.1**

Sample <b>MB-1313</b>	SampTyp <b>MBLK</b>	TestCode: <b>160.1</b>	Units: <b>mg/L</b>	Prep Date: <b>6/18/2010</b>	RunNo: <b>1494</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>1313</b>	TestNo: <b>E160.1</b>	<b>(E160.1)</b>	Analysis <b>6/18/2010</b>	SeqNo: <b>16007</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Total Dissolved Solids (Residue,	ND	10.0			

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 160.2**

Sample <b>MB-1312</b>	SampTyp <b>MBLK</b>	TestCode: <b>160.2</b>	Units: <b>mg/L</b>	Prep Date: <b>6/18/2010</b>	RunNo: <b>1493</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>1312</b>	TestNo: <b>E160.2</b>	<b>(E160.2)</b>	Analysis <b>6/18/2010</b>	SeqNo: <b>16004</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Residue, Suspended (TSS)	ND	10.0			

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	MB-1314	SampTyp	MBLK	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	6/18/2010	RunNo:	1492			
Client ID:	ZZZZZ	Batch ID:	1314	TestNo:	SW8260B	(5030B)		Analysis:	6/18/2010	SeqNo:	15996			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		ND		0.500										
Ethylbenzene		ND		0.500										
m,p-Xylene		ND		1.00										
Methyl tert-butyl ether		ND		0.500										
o-Xylene		ND		0.500										
Toluene		ND		0.500										
Surr: 4-Bromofluorobenzene		11.07		0	10	0		111	70	130				
Surr: Dibromofluoromethane		9.457		0	10	0		94.6	70	130				
Surr: Toluene-d8		9.584		0	10	0		95.8	70	130				

Sample	LCS-1314	SampTyp	LCS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	6/18/2010	RunNo:	1492			
Client ID:	ZZZZZ	Batch ID:	1314	TestNo:	SW8260B		(5030B)	Analysis	6/18/2010	SeqNo:	15997			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		10.66		0.500	10	0.0852		106	70	130				
Ethylbenzene		10.62		0.500	10	0.0755		105	70	130				
m,p-Xylene		29.37		1.00	20	0.2925		145	70	130				S
Methyl tert-butyl ether		10.19		0.500	10	0		102	70	130				
o-Xylene		11.09		0.500	10	0.0852		110	70	130				
Toluene		10.60		0.500	10	0.2546		103	70	130				
Surr: 4-Bromofluorobenzene		9.679		0	10	0		96.8	70	130				
Surr: Dibromofluoromethane		9.931		0	10	0		99.3	70	130				
Surr: Toluene-d8		9.799		0	10	0		98.0	70	130				

Sample	1006001-001AMS	SampTyp	MS	TestCode:	8260B_BTEX	Units:	µg/L	Prep Date:	6/18/2010	RunNo:	1492			
Client ID:	Wood-061510	Batch ID:	1314	TestNo:	SW8260B		(5030B)	Analysis	6/18/2010	SeqNo:	16000			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene		10.79		0.500	10	0.0569		107	70	130				
Ethylbenzene		10.63		0.500	10	0.0401		106	70	130				

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 8260B\_BTEX\_W

Sample	<b>1006001-001AMS</b>	SampTyp	<b>MS</b>	TestCode:	<b>8260B_BTEX</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/18/2010</b>	RunNo:	<b>1492</b>
Client ID:	<b>Wood-061510</b>	Batch ID:	<b>1314</b>	TestNo:	<b>SW8260B</b>		<b>(5030B)</b>	Analysis	<b>6/18/2010</b>	SeqNo:	<b>16000</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	28.46	1.00	20	0.1996	141	70	130				S
Methyl tert-butyl ether	9.475	0.500	10	0	94.8	70	130				
o-Xylene	11.52	0.500	10	0.0627	115	70	130				
Toluene	11.03	0.500	10	0.1885	108	70	130				
Surr: 4-Bromofluorobenzene	10.41	0	10	0	104	70	130				
Surr: Dibromofluoromethane	10.46	0	10	0	105	70	130				
Surr: Toluene-d8	10.34	0	10	0	103	70	130				

Sample	<b>1006001-001AMSD</b>	SampTyp	<b>MSD</b>	TestCode:	<b>8260B_BTEX</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/18/2010</b>	RunNo:	<b>1492</b>
Client ID:	<b>Wood-061510</b>	Batch ID:	<b>1314</b>	TestNo:	<b>SW8260B</b>		<b>(5030B)</b>	Analysis	<b>6/18/2010</b>	SeqNo:	<b>16001</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	11.15	0.500	10	0.0569	111	70	130	10.79	3.25	30	
Ethylbenzene	10.63	0.500	10	0.0401	106	70	130	10.63	0.0357	30	
m,p-Xylene	28.26	1.00	20	0.1996	140	70	130	28.46	0.714	30	S
Methyl tert-butyl ether	10.49	0.500	10	0	105	70	130	9.475	10.1	30	
o-Xylene	11.51	0.500	10	0.0627	114	70	130	11.52	0.0669	30	
Toluene	11.86	0.500	10	0.1885	117	70	130	11.03	7.27	30	
Surr: 4-Bromofluorobenzene	10.32	0	10	0	103	70	130	0	0	0	
Surr: Dibromofluoromethane	10.57	0	10	0	106	70	130	0	0	0	
Surr: Toluene-d8	10.51	0	10	0	105	70	130	0	0	0	

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 9056 M**

Sample	<b>MB-1358</b>	SampTyp	<b>MBLK</b>	TestCode:	<b>9056 M</b>	Units:	<b>mg/L</b>	Prep Date:	<b>6/17/2010</b>	RunNo:	<b>1532</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1358</b>	TestNo:	<b>9056 Mod. (9056 Mod.)</b>			Analysis	<b>6/17/2010</b>	SeqNo:	<b>16168</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.200									
Chloride	ND	1.00									
Nitrite	ND	0.100									
Bromide	ND	1.00									
Nitrate	ND	0.100									
Phosphate, Dissolved	ND	0.100									
Sulfate	ND	2.00									

Sample	<b>LCS-1358</b>	SampTyp	<b>LCS</b>	TestCode:	<b>9056 M</b>	Units:	<b>mg/L</b>	Prep Date:	<b>6/17/2010</b>	RunNo:	<b>1532</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1358</b>	TestNo:	<b>9056 Mod. (9056 Mod.)</b>			Analysis	<b>6/17/2010</b>	SeqNo:	<b>16169</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	5.100	0.200	5	0	102	80	120				
Chloride	5.000	1.00	5	0	100	80	120				
Nitrite	5.200	0.100	5	0	104	80	120				
Bromide	5.300	1.00	5	0	106	80	120				
Nitrate	5.400	0.100	5	0	108	80	120				
Phosphate, Dissolved	2.000	0.100	2	0	100	80	120				
Sulfate	5.200	2.00	5	0	104	80	120				

**Qualifiers:** E Value above quantitation range H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** C1\_C6\_DISSW

Sample	<b>MB-1311</b>	SampTyp	<b>MBLK</b>	TestCode:	<b>C1_C6_DISS</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/17/2010</b>	RunNo:	<b>1488</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1311</b>	TestNo:	<b>NLAG108</b>		<b>(NLAG108)</b>	Analysis	<b>6/17/2010</b>	SeqNo:	<b>15989</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.0680									
Ethane	ND	0.0130									
Propane	ND	0.0180									
Propene	ND	0.0180									
I-Butane	ND	0.0240									
N-Butane	ND	0.0240									
Butene	ND	0.0230									
I-Pentane	ND	0.0300									
N-Pentane	ND	0.0300									
Pentene	ND	0.0290									
I-Hexane	ND	0.0180									
N-Hexane	ND	0.0360									

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits



**CLIENT:** Merchant Energy Partners, LLC  
**Work Order:** 1006001  
**Project:** East Cheyenne Gas Storage Baseline

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** ICP\_DW

Sample	<b>MB-1359</b>	SampTyp	<b>MBLK</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>6/21/2010</b>	RunNo:	<b>1533</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1359</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>6/23/2010</b>	SeqNo:	<b>16170</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.200									
Boron	ND	0.0100									
Calcium	ND	0.500									
Chromium	ND	0.0100									
Cobalt	ND	0.0200									
Iron	ND	0.200									
Magnesium	ND	0.500									
Manganese	ND	0.0200									
Potassium	ND	5.00									
Sodium	ND	5.00									

Sample	<b>LCS-1359</b>	SampTyp	<b>LCS</b>	TestCode:	<b>ICP_DW</b>	Units:	<b>mg/L</b>	Prep Date:	<b>6/21/2010</b>	RunNo:	<b>1533</b>
Client ID:	<b>ZZZZZ</b>	Batch ID:	<b>1359</b>	TestNo:	<b>SW6010B</b>		<b>(SW3005A)</b>	Analysis	<b>6/23/2010</b>	SeqNo:	<b>16171</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.020	0.200	1	0	102	80	120				
Boron	1.070	0.0100	1	0	107	80	120				
Calcium	9.830	0.500	10	0	98.3	80	120				
Chromium	1.020	0.0100	1	0	102	80	120				
Cobalt	1.070	0.0200	1	0	107	80	120				
Iron	10.00	0.200	10	0	100	80	120				
Magnesium	10.20	0.500	10	0	102	80	120				
Manganese	1.040	0.0200	1	0	104	80	120				
Potassium	10.80	5.00	10	0	108	80	120				
Sodium	10.40	5.00	10	0	104	80	120				

**Qualifiers:** E Value above quantitation range  
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits

J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits