

# 2008 FRUITLAND OUTCROP MONITORING REPORT

## ARCHULETA COUNTY, COLORADO



**FEBRUARY 2009**



**Prepared For:**

**ELM RIDGE RESOURCES, INC.**  
Dallas, Texas

**And**

**PETROX RESOURCES, INC.**  
Meeker, Colorado



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## EXECUTIVE SUMMARY

At the request of Elm Ridge Resources, Inc. and Petrox Resources, Inc., the majority lease holders in the eastern half of the northern rim of the San Juan Basin in Archuleta County, Colorado, LT Environmental, Inc. (LTE) conducted a monitoring program for methane seepage from the Fruitland Formation (Kf) outcrop in Archuleta County.

The monitoring program was designed to meet requirements 1, 2, and 6 of the Conditions for Approval for the Pargin Mountain 10U #3 production well permit (permit), issued by the Colorado Oil and Gas Conservation Commission (COGCC, 2005). These permit requirements include a Kf outcrop reconnaissance, a natural spring survey, and a soil gas survey of the Big Horn-Schomburg #1 abandoned well site. The monitoring program also includes a survey of Kf methane emissions where drainages transect the outcrop.

The project area extends approximately 18 miles along the Kf outcrop, starting at the La Plata County – Archuleta County boundary, and running southeast to the Southern Ute Indian Tribe Reservation boundary near the confluence of the Piedra River and Stollsteimer Creek.

This report presents the results of the fifth monitoring program conducted in the project area. LTE conducted the initial monitoring of the Kf outcrop in Archuleta County in September 2004. A similar program has been underway along the Kf outcrop in La Plata County, Colorado since 1997.

## MONITORING RESULTS

The 2008 monitoring event consisted of four main components:

- Drainage transects survey;
- Big Horn-Schomburg #1 abandoned well site survey;
- Natural springs survey; and
- Regional reconnaissance survey.

### Drainage Transects Survey

The drainage transects survey was subdivided into two portions, surface water inspections and soil gas flux surveys. Inspections at six locations where surface drainages transect the Kf outcrop revealed no methane discharge from surface water bodies. Previous annual inspections revealed a biogenic source of methane (swamp gas) and a possible natural gas pipeline leak at two of the drainage transects.

The concentrations of methane seeping from the ground surface at the six surface drainage transects was measured using a West Systems<sup>®</sup> soil gas flux meter. Methane was detected at very low concentrations at 290 of 982 sample locations. The maximum methane flux rate recorded was 0.33 moles per square meter per day (moles/m<sup>2</sup>-day), which equates to 0.39 cubic feet per

square meter per day ( $\text{ft}^3/\text{m}^2\cdot\text{day}$ ), and is similar to the 2007 maximum volume value of  $0.34 \text{ ft}^3/\text{m}^2\cdot\text{day}$ .

### **Big Horn-Schomburg #1 Abandoned Well Site Survey**

LTE collected soil gas flux measurements and measured subsurface soil gas concentrations at the Big Horn-Schomburg #1 abandoned production well site. The well was drilled and abandoned in 1961. Methane was not detected in subsurface soil gas in 2008. Similarly, no subsurface soil methane was detected during surveys in 2005, 2006 and 2007.

Very low fluxes of methane were detected at two of nine locations using the soil gas flux meter, with a maximum value  $0.07 \text{ moles}/\text{m}^2\cdot\text{day}$ . In 2007, methane flux was detected at all five sampled locations, with a maximum methane flux measurement of  $0.24 \text{ moles}/\text{m}^2\cdot\text{day}$ .

### **Natural Springs Survey**

LTE collected and analyzed water samples from ten natural springs on or near the Kf outcrop in 2008. Dissolved methane was detected above the detection limit of 0.02 milligrams per liter (mg/L) in three water samples at very low concentrations between 0.02 mg/L and 0.05 mg/L. The detected concentrations are less than the COGCC threshold limit of 2 mg/L for methane in domestic water systems.

Natural springs were sampled for the first time for standard water chemistry analysis. Classification using major ion analysis shows that 9 of 10 natural springs produce calcium bicarbonate water. One natural spring produces calcium sulfate water.

Groundwater discharge rates were measured at eight natural springs in October 2008. Flows were not discernable at four natural springs. Of the four natural springs with discernable flows, the maximum flow observed was 0.9 gallons per minute (gpm). This compares to a maximum natural spring flow of 0.4 gpm in October 2007.

Subsurface soil gas was measured at 14 natural springs for the first time in 2008. Subsurface soil methane was detected at only two locations at low concentrations (500 parts per million [ppm]). Subsurface soil gas methane was not detected at the three natural springs where methane was detected in spring water.

### **Regional Reconnaissance Survey**

The Kf outcrop was flown and photographed using an infrared camera. LTE reviewed the infrared aerial images and identified 59 suspect areas of stressed vegetation or other image anomaly. Stressed vegetation may indicate the presence of subsurface soil methane.

In 2008, 42 suspect areas were accessible and inspected for the presence or absence of subsurface methane. Of the 171 subsurface soil gas measurements, methane was not detected at any location.

During the previous regional reconnaissance survey in 2005, LTE identified 36 suspect areas using aerial infrared imagery. No subsurface soil methane was detected at the 156 measurement

locations. Stressed vegetation in 2005 was attributed to drought, pine beetle infestation, senescence, and poor soil conditions.

## **RECOMMENDATIONS**

LTE recommends continuing the annual inspections for methane seeps at the six drainage transects across the Kf outcrop in Archuleta County. Inspection should include observations for methane bubbles in watercourses and measurements for soil gas seeps from the adjacent land areas.

Continuing monitoring of the Big Horn-Schomburg #1 well site in 2009, is required under Section 6 of the permit's Conditions of Approval.

LTE recommends continuing the annual water quality surveying of the natural springs located on the Kf outcrop. Annual surveying should include measuring discharge rates and analyses for methane. General water chemistry analyses should be performed again in 2011.

LTE recommends continuing the scheduled outcrop monitoring using infrared imagery acquisition and field verification of suspect area on a three year interval. The next regional reconnaissance event should be scheduled for 2011.

## SECTION 1.0

### INTRODUCTION

This Fruitland Formation (Kf) Outcrop Monitoring Report has been prepared at the request of Elm Ridge Resources, Inc. (Elm Ridge) and Petrox Resources, Inc. (Petrox). Elm Ridge and Petrox are the majority lease holders in the eastern half of the northern rim of the San Juan Basin (SJB) in Archuleta County, Colorado. This monitoring program meets requirements 1, 2 and 6 of the Conditions of Approval for the Pargin Mountain 10U #3 production well permit, issued by the COGCC. These requirements include a Kf outcrop reconnaissance, a natural spring survey, and a soil gas survey of the Big Horn-Schomburg #1 abandoned well site, respectively. The monitoring program also included a survey of Kf methane emissions where drainages transect the outcrop.

#### 1.1 PROJECT AREA DESCRIPTION

The project area includes approximately 18 miles of Kf outcrop starting on the west end at the La Plata County – Archuleta County boundary near Beaver Creek and extending southeast along the outcrop to the Southern Ute Indian Tribe (SUIT) Reservation boundary near the confluence of the Piedra River and Stollsteimer Creek. Figure 1A illustrates the project area. A detailed project area map is included as Figure 1B.

#### 1.2 BACKGROUND

In July 2006, the United States Forest Service (USFS) and the Bureau of Land Management (BLM) issued the Final Northern San Juan Basin Coal Bed Methane Project Environmental Impact Statement (FEIS) pertaining to the oil and gas industry's request to conduct coal bed methane (CBM) development on Federal lands within the northern rim of the San Juan Basin (USFS/BLM, 2006). One of the potential impacts identified in the FEIS is methane seepage at the outcrop of the Fruitland Formation (Kf), a phenomenon already observed in the western half of the northern rim in La Plata County (LTE, 2008). The FEIS recommends surveys of the Kf outcrop to monitor the potential for methane seepage and document changes over time and space.

As stated in the FEIS, methane seeps have been observed and reported in the SJB, particularly from the outcrop of the coal beds in the Kf since the late 1800s. While there are conflicting data regarding the cause of methane seepage, and changes in seepage over time, seeps may be monitored through detailed mapping, subsurface and surface methane measurements, natural springs survey, and reconnaissance along the outcrop looking for areas of stressed and dead vegetation.

Since 1997, LTE has conducted methane seep monitoring on the Kf outcrop in La Plata County, Colorado. The monitoring program in Archuleta County has been modeled after the La Plata County monitoring program.

In September 2004, LTE conducted the initial investigation of the Kf outcrop in Archuleta County (LTE, 2004). The scope of the initial investigation included an aerial fly-over

reconnaissance of the entire outcrop followed by field inspection of identified suspect areas. Suspect areas are areas of stressed and dead vegetation on the Kf outcrop. Additionally, areas where surface water bodies, namely rivers and streams, transect the Kf outcrop were investigated. Using traditional subsurface soil gas sampling techniques, no methane seep activity was noted during the 2004 investigation. Areas of dead and stressed vegetation appeared to have been the result of the drought conditions and/or pine beetle infestation.

In September 2005, LTE conducted a second investigation of the Kf outcrop in Archuleta County (LTE, 2006a). The scope of the second investigation included aerial imagery acquisition using an infrared (IR) camera to identify suspect areas on the Kf outcrop. LTE visited each accessible suspect area, collected shallow subsurface gas concentration measurements, and inspected the vegetation to identify potential causes of mortality. LTE also performed the first survey of natural springs located on the outcrop in order to provide a baseline of spring water conditions on the outcrop. Results of the 2005 monitoring event indicated that methane was not detected in the shallow subsurface soil sample locations in Archuleta County. Relatively low concentrations of dissolved methane were detected in several of the natural springs sampled in the project area during the 2005 monitoring event.

In 2006, LTE conducted a third investigation of the Kf outcrop in Archuleta County (LTE, 2006b). This investigation included surface water inspections of seven drainages along the Kf outcrop, sampling natural springs identified by LTE and the BLM during past surveys, collecting subsurface gas measurements from four permanent gas monitoring probe lines, and conducting soil gas surveys on the Candelaria Ranch and the Big Horn-Schomburg #1 abandoned well site. Results of the 2006 monitoring event were similar to the results of the 2005 monitoring event. Methane was not detected in the shallow subsurface soil in Archuleta County with the exception of a low concentration (20 parts per million [ppm]) recorded at one sample point in Pole Gulch. Low concentrations of dissolved methane were detected in several of the natural springs sampled during the 2006 investigation.

In 2007, LTE conducted the fourth investigation of the Kf outcrop in Archuleta County (LTE, 2008a). The scope of work included surface water inspections and soil gas surveys of six water courses along the outcrop, conducting a soil gas survey in at the Big Horn-Schomburg #1 abandoned well site, and sampling natural springs. This was the first year that advanced soil gas flux measuring equipment was used to detect methane seeps. Methane was detected at two water courses, although one was determined to be swamp gas, and the other was likely associated with an underground natural gas pipeline leak. Low levels of methane were detected at Big Horn-Schomburg #1 abandoned well site. Low concentrations of dissolved methane were detected in four natural springs.

Equipment capable of detecting very low concentrations of methane seepage became available for the 2007 investigation. This equipment, which measures methane flux from the ground surface was again used in 2008 at the Big Horn-Schomburg #1 abandoned well site and land on the Kf outcrop at drainage transects. Traditional subsurface gas detection techniques used in these areas prior to 2007 were not capable of detecting methane at the low levels subsequently observed in 2007 and 2008. Therefore, the presence of methane observed using flux equipment during the 2007 and 2008 investigations at locations where methane had not been detected prior



to 2007 using subsurface gas detection equipment does not necessarily represent an increase in methane seep conditions.

### **1.3 SCOPE OF WORK**

The investigation scope of work included the following tasks: 1) obtaining permission to access private properties, 2) Kf outcrop inspections at six drainage transects, 3) measuring soil gas at the Big Horn-Schomburg #1 abandoned well site, 4) surveying natural springs, 5) identifying areas of distressed vegetation by aerial IR reconnaissance and measuring soil gas concentrations in those areas, and 6) preparing this report.

### **1.4 PROPERTY ACCESS**

Prior to conducting 2008 field activities, LTE acquired land information from the Archuleta County Assessor's Office. LTE cross-referenced parcel data and the Kf outcrop geometry to identify owners of parcels located on the Kf outcrop. Much of the outcrop land is federal land with unrestricted access. LTE attempted to contact private landowners along the Kf outcrop in Archuleta County. LTE was denied access to several properties; therefore, no investigation activities were conducted on these properties during the 2008 monitoring event. The 2008 status of access to parcels is presented in Table 1 and shown on Figure 2.

### **1.5 PROJECT OBJECTIVES**

The objectives of the monitoring program meet requirements 1, 2, and 6 of the *Conditions for Approval for the Pargin Mountain 10U #3* production well permit (permit), issued by the Colorado Oil and Gas Conservation Commission (COGCC, 2005). These permit requirements include a Kf outcrop reconnaissance, a natural spring survey, and a soil gas survey of the Big Horn-Schomburg #1 abandoned well site. The monitoring program also includes a survey of Kf methane emissions where drainages transect the outcrop.

The Kf outcrop reconnaissance includes low altitude, high-resolution infrared aerial imagery to map the vegetation along the outcrop, identifying suspect areas for further field investigation, and surveying for the presence or absence of methane, carbon monoxide, and hydrogen sulfide in those suspect areas. The data are used to quantify changes in the amount of methane seepage, if any, over time along the Kf outcrop in Archuleta County.

The natural spring survey includes visiting the springs annually at approximately the same time of year, measuring spring flow, and sampling and analyzing for water chemistry and methane. The data collected may be used to document changes to water quality and quantity over time. The data may also be useful in various aspects of the Kf reservoir engineering models.

The Big Horn-Schomburg #1 survey requires an annual soil gas survey around the abandoned well and monitoring the permanent soil monitoring probe.

In total, the scope of work provides an efficient and accurate means to characterize subsurface gas seepage, if any, in the project area by inspecting those areas with the greatest potential for seeps based on geological characteristics identified similar monitoring of the Kf outcrop in La Plata County.

## **1.6 ORGANIZATION OF REPORT**

This report is organized into five sections including this introduction as Section 1.0. The field methods are described in Section 2.0. Section 3.0 presents the results of the investigation. The conclusions and recommendations are summarized in Section 4.0. Section 5.0 presents references. Figures, tables, and appendices follow the text in separate sections.



## SECTION 2.0

### DATA COLLECTION METHODS

This section describes the data collection methods used to conduct surface water inspections, soil gas flux surveys, subsurface soil gas surveys, global positioning system sample locating and logging, the natural spring surveys, and reconnaissance of suspect areas of stressed vegetation.

#### 2.1 SURFACE WATER INSPECTIONS AND SAMPLING

As a component of the drainage transects survey, LTE walked the drainages transecting the Kf outcrop by foot, visually checking for locations where methane may be bubbling to the surface of the water. No visible methane bubbles were observed at any of the six drainages. Therefore, no surface water samples were collected.

Areas adjacent to the drainages were surveyed using the soil gas flux equipment described below.

#### 2.2 SOIL GAS SURVEYS

LTE collected surface soil gas flux and subsurface gas concentration measurements during soil gas surveys. The following section describes the equipment and methodology used to collect both types of gas measurements.

##### 2.2.1 Soil Gas Flux Measurements

The flux of soil gases moving across the soil surface to the atmosphere were measured using a West Systems portable gas flux meter. The flux meter measures three gases, methane, hydrogen sulfide, and carbon dioxide, by employing individual gas-specific sensors. The flux meter records the increases, if any, of gas concentrations over time for a given surface area. These increases are proportional to the flux of each gas. The result for each gas is reported as the mass flux in units of moles per square meter per day ( $\text{moles/m}^2\text{-day}$ ). Volumetric flux can be calculated based on the molecular weight and density of the gas. Information on the West Systems portable gas flux meter is provided in Appendix A.

The flux meter components include an accumulation chamber connected by circulation tubes to the gas detector unit. At each sampling point, the accumulation chamber was placed on the ground surface to capture gas seeping from the ground. To ensure a proper seal between the ground surface and the chamber, LTE personnel chose relatively flat surfaces where possible and placed soil around the base of the chamber to reduce the potential for gas to seep out the base of the chamber. LTE attempted to minimize ground disturbance during the measurement process in order to maintain the natural seep conditions. A fan in the chamber continuously mixes the gases in the chamber during the measurement process.

A pump moves gases in the accumulation chamber to the detector unit. After passing through the detector unit, gases are returned to the chamber. This closed loop process allows soil gases discharging to the chamber to increase over time as increases in concentration are measured and

recorded automatically. No gas is allowed to escape the system. A vacuum is not created during the process. This enables measurement of natural seep conditions, if present.

The methane sensor has a full-scale range of 50,000 parts per million (ppm), with a detection limit of 60 ppm. The flux meter methane measurement range is 0.2 to 10 moles/m<sup>2</sup>·day, at an accuracy of ±25%. Methane fluxes below 0.2 moles/m<sup>2</sup>·day (typical for Archuleta County Kf outcrop emissions) are detectable and reported, although with decreased accuracy.

The hydrogen sulfide detector has a full-scale range of 20 ppm and a flux measurement range of 0.0025 to 0.5 moles/m<sup>2</sup>·day at an accuracy of ±25%. The sensor is an electrochemical cell that measures hydrogen sulfide through a chemical oxidation process. The sensing process consumes a small amount of the hydrogen sulfide, which is not returned to the West System's accumulation chamber. Therefore, flux meter will underestimate hydrogen sulfide flux by as much as 10%.

The carbon dioxide sensor has a full-scale range of 20,000 ppm by volume (ppmV) and flux measurement range of 0 to 600 moles/m<sup>2</sup>·day at an accuracy of ±25%.

During the measurement process, gas concentrations are recorded at one-second intervals and directly downloaded via Bluetooth<sup>®</sup> connection to the Trimble GeoXT<sup>®</sup> global positioning system (GPS) unit (described below). Other measurements recorded include barometric pressure, temperature, date, and time.

Integrated West Systems Flux Manager<sup>®</sup> software on the GPS unit recorded the gas measurement data. The software plots the curve of gas concentration versus time for each measurement collected. LTE selected the best-fit line for the curve generated. The slope of the best-fit line is proportional to the flux at the measurement point.

The flux meter was used at six drainage transects surveys: Beaver Creek, Little Squaw Creek, Peterson Gulch, Pole Gulch, Stollsteimer Creek, and Squaw Creek. Additionally, the flux meter was used at the Big Horn-Schomburg #1 abandoned well site.

### **2.2.2 Subsurface Soil Gas Measurement**

LTE used a Mine Safety Appliances (MSA) Gasport<sup>®</sup> multi-gas meter to measure the concentrations of methane, carbon monoxide, hydrogen sulfide, and oxygen in subsurface soil gas. The MSA Gasport<sup>®</sup> is capable of detecting methane in concentrations from 0 to 100%. Oxygen concentrations are measureable from 0 to 25%, and carbon monoxide from 0 to 1,000 ppm. Hydrogen sulfide concentrations are detectable from 0 to 100 ppm. Specifications for the meter are included in Appendix A.

Subsurface soil gas measurements were collected using a hand-driven slide hammer to drive a ½-inch diameter steel rod into the ground surface to depths ranging from 1 foot below ground surface (bgs) to 3 feet bgs. The rod was removed from the ground and ¼-inch diameter polyethylene tubing was inserted into the borehole. The tubing was perforated at the bottom 6-inches to allow soil gas to enter the tubing. Once the temporary tubing was in place and the borehole was sealed with native soil, LTE attached the MSA Gasport<sup>®</sup> to the tubing. The meter's internal pump pulled gas from the soil, through the tubing, and into the meter's gas sensors. This

method is referred to as the traditional method of soil gas monitoring and was the only method used prior to 2007 to measure soil gas.

LTE recorded the maximum concentrations of methane, carbon monoxide, and hydrogen sulfide; and the minimum concentration of oxygen at each sampling location. Data were recorded within in the Trimble GeoXT<sup>®</sup> GPS equipment.

In 2008, subsurface gas measurements were collected next to natural springs, at the Big Horn-Schomburg #1 abandoned well site (along with flux measurements), at natural spring locations, and at suspect areas of stressed vegetation during the regional reconnaissance survey.

## **2.3 GLOBAL POSITIONING SYSTEM DATA MANAGEMENT**

LTE used a Trimble GeoXT<sup>®</sup> Global Positioning System (GPS) unit to locate and record field measurement locations. Specifications of the unit are included in Appendix A. Soil gas sampling grid point locations were pre-loaded into the GPS unit so LTE field personnel could quickly and accurately position detection equipment. Soil gas measurements and other relevant field data were then stored as attributes in the GPS unit along with the associated location data. The data stored in the GPS unit were later downloaded for processing and reporting.

The GPS unit location data were collected in the World Geodetic System 1984 (WGS 84) and projected in Universal Transverse Mercator (UTM) Zone 13 North, North American Datum 1983 (NAD 83) for use in an ArcView<sup>®</sup> project file. At a minimum, 25 GPS log points were collected for each point feature in order to obtain more accurate positioning.

## **2.4 RECONNAISSANCE OF STRESSED VEGETATION SUSPECT AREAS**

IR imagery was used to assist in reconnaissance monitoring of the Kf outcrop to identify changes in methane seepage over time and space. While the imagery cannot identify specific seeps, it can be useful in identifying areas of dead and/or stressed vegetation that may or may not be attributable to methane seepage.

Suspect areas are defined as areas observed within the IR image that appear anomalous when compared to the surrounding areas. For example, a light gray area surrounded by bright red areas would be considered a suspect area. The natural features that often produce such suspect areas include areas of dead vegetation, shadows, rock outcrops, exposed surface soil, water bodies, and patches of stressed vegetation.

### **2.4.1 Aerial Infrared Imagery**

Imagery acquisition by Agro Engineering (Agro) of Alamosa, Colorado, was selected based on image quality, availability, logistical considerations, and cost. Agro conducted the image flights on June 10 and June 16, 2008. This time of year was selected to provide the greatest potential for healthy vegetation conditions with minimal influence from drought and/or senescence. Agro was able to accurately and completely follow the GPS flight path supplied by LTE.

The photo-mission traversed the Kf outcrop from the boundary of the Southern Ute Indian Tribe (SUIT) Reservation in Archuleta County, through La Plata County and the SUIT Reservation, to



the New Mexico state line. There were two flights at two different elevations and two different resolutions. On June 10, 2008, 144 IR images were acquired at the flight elevation of 14,500 feet above sea level, with an approximate resolution of 1.5 meters. Ninety-eight of these images were provided for La Plata and Archuleta Counties, and 47 images for the SUIT Reservation. There was one image common to both counties. On June 16, 2008, 433 IR images were acquired at the elevation of 11,000 feet with an approximate resolution of 0.75 meters. La Plata and Archuleta Counties were covered in 303 images, and 132 images for the SUIT reservation. There were two images common to the counties and the reservation.

The flight elevations were over rugged terrain with surface elevations between 6,400 to 8,400 feet. The interpretation and analysis for the entire outcrop was performed using the 1.5 meter resolution images since they were determined to be useful for identifying suspect areas and also require fewer images to rectify and evaluate across the entire outcrop area. Agro geo-referenced the 1.5 meter resolution photos for La Plata County and Archuleta County by creating mosaics forming two large format images.

The accuracy of a georectified base map is proportional to the number of control points available and the time and effort exerted during the rectification process. Digital Ortho Quarter Quads (DOQQs) were used as the reference map and the IR image was rectified to the DOQQ. Therefore, the accuracy of the IR base map image is limited but still provides a frame of reference for the field mapping data. In some cases the IR image is accurate to within one meter of the actual location because a control point is available nearby. In certain portions of the same image, accuracy can be skewed as much as 10 meters to 15 meters due to lack of a control point. When viewing the data presented in this report, note that GPS data are accurate to within one meter and the actual position of the feature mapped should be trusted over the position of the features observed within the IR image. Ultimately, this approach allows LTE to provide the required accuracy to perform the field verification while controlling project costs.

#### **2.4.2 Imagery Review**

The images acquired within the study area were evaluated by LTE using visual observations. Based on professional experience in evaluating IR imagery and knowledge gained during previous regional reconnaissance surveys in La Plata County and Archuleta County, LTE identified suspect areas along the 18-mile Kf outcrop that appeared to contain vegetation mortality or, in some cases, stressed vegetation. Suspect areas were delineated as polygons and uploaded to the GPS unit for field locating and inspection.

#### **2.4.3 Field Inspection and Verification**

Upon completion of the imagery review activities, LTE initiated field inspection of suspect areas with the goal of identifying the presence or absence of methane in subsurface soil gas. A majority of the land intersecting the Kf outcrop in Archuleta County is federal land. Due to private property considerations, not all areas of the outcrop could be inspected on foot because landowners did not grant access to their properties. The 2008 status of access is presented on Figure 2.

The field verification was conducted from October 2 through October 22, 2008. The LTE field crews were equipped with the aerial photographs, topographic maps, digital camera, sampling equipment (slide-hammer and probe), a Trimble GeoXT<sup>®</sup> global positioning system device (GPS), and an MSA Gasport<sup>®</sup> unit. LTE visited each of the accessible suspect areas, and collected subsurface soil gas measurements. LTE also photographed the suspect areas and described the features observed.



## SECTION 3.0

### MONITORING RESULTS

This section describes the results of the field activities conducted within the project area during the period from September 26, 2008 through November 05, 2008.

#### 3.1 DRAINAGE TRANSECTS SURVEY

LTE conducted inspections at six locations where surface water drainages transect the Kf outcrop in Archuleta County (Figure 1B):

- Beaver Creek;
- Squaw Creek;
- Little Squaw Creek;
- Pole Gulch;
- Peterson Gulch; and
- Stollsteimer Creek.

##### 3.1.1 Water Surface Inspections

Methane was not observed to be discharging as bubbles on the water surface at any of the six streams inspected during the 2008 investigation.

##### 3.1.2 Soil Gas Flux Measurement Surveys

Using the flux meter, LTE collected soil gas flux measurements at the six drainage transects during the 2008 investigation. A total of 982 gas flux measurements were collected within the six drainage transects. Methane flux was recorded at 59 of the 982 sample locations. Detected methane flux values ranged from 0.0002 moles/m<sup>2</sup>·day (at all six drainages) to 0.3440 moles/m<sup>2</sup>·day (at Stollsteimer Creek). The average methane flux value of all detections was 0.0203 moles/m<sup>2</sup>·day. The soil gas flux measurement survey results for the six drainages are presented on Figures 3 through 8. Minimum and maximum methane flux values by drainage are summarized in Table 2. Appendix B contains the gas flux measurement results for each sample location.

Many flux measurements fell below the lower limit of the flux meter's operating range of 0.2 moles/m<sup>2</sup>·day. According to the manufacturer, these low measurements fall outside of the stated ±25% accuracy value. Of the 982 methane samples, 962 (99.3%) reported methane flux values below the lower limit of the operating range of the flux meter. Therefore, the methane flux values recorded during 2008 are considered low.

Results of the soil gas flux measurement surveys indicate that methane is present at the ground surface along the Kf outcrop in Archuleta County. However, the methane flux values are relatively low. For a better perspective of the methane flux rates, LTE converted the mass flux measurements into volumetric flux. The unit conversion is based on the molecular weight and density of methane at approximately 7,000 feet above mean sea level. The calculation is as follows:

$$\frac{\text{mol CH}_4}{\text{m}^2 \cdot \text{day}} \times \frac{16.04276 \text{ g CH}_4}{\text{mol CH}_4} \times \frac{0.0698 \text{ ft}^3 \text{ CH}_4}{\text{g CH}_4} = \frac{\text{ft}^3 \text{ CH}_4}{\text{m}^2 \cdot \text{day}}$$

The maximum methane flux rate recorded in Archuleta County during the 2008 soil gas survey was 0.3852 cubic feet per square meter per day (ft<sup>3</sup>/m<sup>2</sup>·day).

### 3.1.3 Total Methane Flux Volume Estimations

LTE also estimated the total flux of methane at each drainage transect using data collected with the flux meter. Flux data were interpolated and gridded at each of the six drainage transect areas, then contoured and processed to estimate total flux. The results were converted to units common to the natural gas production industry, thousands of cubic feet per day (MCFD). A discussion of the methods and calculations used to determine total methane flux is presented in Appendix C. Methane emission contour maps of each drainage transect are presented in Figures 9 through 14. Total methane flux volumes are summarized Table 3.

The estimated total methane flux volumes ranged from a low of 1.5 MCFD at Yellow Jacket Pass, to a high of 9.3 MCFD at Stollsteimer Creek. The value at Stollsteimer Creek is three orders of magnitude less than the maximum total methane flux measured on the Kf outcrop in La Plata County, Colorado in 2007 (LTE, 2008b).

## 3.2 BIG HORN-SCHOMBURG #1 ABANDONED WELL SITE SURVEY

LTE conducted a soil gas flux measurement survey and measured the soil gas concentrations at two soil gas probes at the Big Horn-Schomburg #1 abandoned production well. The well is located in the southeast quarter, southeast quarter, Section 14U, T34N, R5W (Figure 15). The well was drilled and abandoned in 1961. Reference information indicates that the Kf is close to, or outcrops, at this location (USFS/BLM, 2006). Geologic maps from the FEIS indicate that the well is located in the transition zone between the Kf and the Kirtland Formation (Kk). LTE conducted an initial subsurface soil gas survey and installed a permanent gas monitoring probe in the vicinity of the abandoned well in September 2005. LTE also surveyed the abandoned well site in May 2006 and October 2007.

LTE conducted the most recent survey on November 5, 2008. LTE collected nine gas flux measurements, one subsurface gas measurement from a temporary monitoring probe, and one subsurface gas measurement from a permanent monitoring probe. Methane was not detected in the temporary monitoring probe or the permanent monitoring probe. Methane was detected at two of nine points using the flux meter. The maximum flux measurement was 0.0661 moles/m<sup>2</sup>·day, which is considered very low. The gas flux measurement results are presented in



Table 3. Figure 15 presents the results of the Big Horn-Schomburg #1 abandoned well site soil gas survey.

### **3.3 NATURAL SPRING SURVEY**

#### **3.3.1 Sampling Status**

During LTE's previous literature and interview research, a total of 26 potential natural springs were identified on the Kf outcrop in Archuleta County. All 26 natural springs were located in physically accessible areas. In 2008, an additional natural spring, High Watson Spring, was identified near Watson Well Spring. The locations of natural springs are presented on Figure 16. Detailed maps showing the spring locations are presented on Figure 16A through Figure 16F. A summary of 2008 natural springs sampled, along with past sampling status, is presented in Table 4.

LTE was unable to field-locate three of the natural springs (Corrigan Spring, Waypoint 0003 Spring, and Thick Spring).

Six springs were not sampled due to access restrictions. Denial of access to the Candelaria Property in 2008 prevented sampling of four natural springs (Section 10U Spring, Spring 1212, Spring 3424, Candelaria A Spring, and Candelaria B Spring). LTE was not granted access to the Vaughn Spring property during 2008. LTE was denied access to the Grassy Spring located on the Security National Funding Trust property.

Six springs (Ramona Spring, Townsend Spring, Walt Spring #1, Big Hole Spring, Wood Spring, and Seep Spring) were located by LTE during the 2008 field activities. However, the springs were dry and not sampled.

The natural spring identified as Miser Spring and Pipeline was field-verified by LTE in 2006 and appears to be a hand-dug well used as a water supply for the residence located nearby. The spring was inaccessible due to surrounding infrastructure and was not sampled in 2008.

LTE was able to collect water samples from 10 of the natural springs in 2008:

- Ramona Leonard Spring;
- Beaver Creek Spring;
- Watson Well Spring;
- Crain Spring;
- Vance Spring #1;
- Vance Meadow Spring;
- Willow Spring;
- Section 14 Spring;

- NW John Grub Spring; and
- SE John Grub Spring.

### **3.3.2 Field Observations and Measurements**

Field observations and measurements of temperature, pH, conductivity, oxidation reduction potential (ORP), and total dissolved solids (TDS), were collected at all sampled natural springs. One additional natural spring, the High Watson Spring was identified by LTE field personnel. Only field parameters were recorded at this location; no water sample was collected.

The 2008 field observations and measurements for all natural springs, including historical measurements, are summarized in Table 5. Photographs of several natural springs sampled in 2008 are included as Appendix D.

Natural spring discharge rates were measured at 8 of the 10 water sampling locations. Measurements were calculated by dividing the known volume of a container by the time required to fill the container. Watson Well Spring, where water collected and discharged through a domestic system was not measured. The Beaver Creek location is at the confluence of the Corrigan Spring discharge (not located) and Beaver Creek discharge was therefore not measured.

Natural spring discharge rates, including historical data, are presented in Table 6. At four natural springs, Vance Spring #1, Vance Meadow Spring, Section 14 Spring, and SE John Grub Spring, no flow was apparent. At natural springs with measureable flow, the maximum flow measured was 0.9 gallons per minute (gpm) at NW John Grub Spring. The flow rates observed in 2008 are similar to the low flow rates observed historically in the Archuleta County Kf outcrop monitoring.

### **3.3.3 Natural Springs Sampling and Analysis**

In 2008, natural spring water samples were collected and submitted to Four Corners Geoscience, Inc. for analysis of dissolved methane. Samples were also submitted to Green Analytical Laboratories for general water chemistry analysis for the first time. Analytical results are presented in Appendix E.

Laboratory analytical results for methane dissolved in natural springs' waters, including historical results, are summarized in Table 7. In 2008, dissolved methane was detected in three natural springs' samples: Section 14 Spring [Reich] (0.02 mg/L), Vance #1 Spring (0.05 mg/L), and NW John Grub Spring (0.03 mg/L). The two former springs are located on the Kf outcrop.

When comparing 2008 methane detections in natural springs' waters, we note that all 10 sampled springs had been sampled in previous years. Three springs where methane was not detected had no previous detections of methane (Ramona Leonard Spring, Beaver Creek, and Willow Spring). The methane detection at Section 14 Spring was the same from 2007 to 2008 (0.02 mg/L). Five springs show a decline in methane concentrations from the previous sampling event (Watson Well Spring, Crain Spring, Vance Meadow Spring, NW John Grub Spring and SE John Grub Spring). Only Vance Spring #1 exhibited an increase in methane from 2007 to 2008.

The COGCC uses 2 mg/L as the threshold limit for methane in domestic water systems. The COGCC holds that water systems containing dissolved methane concentrations above 2 mg/L have an increased risk of desorption from the water and create potentially explosive conditions in confined spaces. No detected methane concentrations from the natural springs tested have ever exceeded the 2 mg/L threshold.

Major ion chemistry of the natural springs' samples is summarized in Table 8 and presented graphically as tri-linear diagram in Figure 17. Tri-linear diagrams are a useful tool for classifying water by major ionic species.

The water at the Ramona Leonard Spring exhibits a predominant calcium sulfate signature. All other wells sampled show a calcium bicarbonate character.

### **3.3.4 Subsurface Soil Gas Measurements**

One set of subsurface soil gas measurements were collected at each of nine of the sampled springs using the MSA Gasport<sup>®</sup> meter. The property owner of Watson Well Spring and High Watson Spring (spring water not sampled) did not allow subsurface soil gas measurements. Subsurface soil gas measurements were also collected at five dry, accessible spring locations:

- Ramona Spring;
- Seep Spring;
- Walt Spring #1;
- Townsend Spring; and
- Big Hole Spring.

The results of the subsurface soil gas measurements are summarized in Table 9. Methane was detected at both Seep Spring and Walt Spring #1 at a concentration of 1% of the lower explosive limit (LEL), equivalent to 500 ppm. Subsurface soil methane was not detected at the three natural springs where methane was detected in spring water (Section 14 Spring [Reich]), Vance #1 Spring, and NW John Grub Spring.)

## **3.4 REGIONAL RECONNAISSANCE SURVEY**

This section describes the results of the aerial IR imagery reconnaissance observations and the field investigation activities conducted within the project area during the period from October 2 to 16, 2008. A key map of the aerial images is presented in Figure 18. Detailed locations of suspect areas identified on the aerial photographs, and subsurface soil methane concentration measurements are illustrated on Figures 18A through 18L.

### **3.4.1 IR Imagery Acquisition and Review**

Low altitude IR aerial imagery was captured on June 10 and 16, 2008. The imagery acquired covers approximately 125 square miles in Archuleta County. The Kf outcrop covers approximately 6,400 acres in the study area.

During the imagery evaluation phase of the project, LTE identified 59 suspect areas based on the IR imagery from the Kf outcrop. During the period from October 1 through 16, 2008, LTE conducted the field inspection of verification of 42 of the 59 suspect areas. Seventeen locations that were not inspected were inaccessible.

### **3.4.2 Field Verification Activities**

Field inspection observations, including vegetation type, health and coverage, degree of slope, ground conditions, and general observations are summarized in Table 10. Photographs of most of the suspect areas taken during field verification activities are presented in Appendix F.

LTE collected 171 subsurface gas concentration measurements in 41 suspect areas using the MSA GasPort<sup>®</sup> meter. Methane was not detected at any measurement location. Oxygen concentrations were reported ranging from 19.7 to 21.5%. Carbon monoxide was detected at 12 measurement points. A maximum concentration of 12 parts per million (ppm) was reported at suspect area 34. Hydrogen sulfide was detected at a suspect area at 10 measurement locations at a concentration of 1 ppm.

Generally, poor vegetation health in suspect areas is a function of surface physical conditions, such as poor soil development on coal and rock outcrops and/or steep slopes.

The IR aerial imagery review and field verification tasks are conducted on a three-year schedule. The previous IR aerial images were collected in June 2005, and covered approximately the same area as in June 2008. Following the 2005 flight, LTE identified 46 suspect areas, of which 36 were accessible and inspected in September 2005. Thirty-one inspected areas were on the Kf outcrop. Vegetation mortality was attributed to pine beetle infestation, drought, and/or normal die-back of Gamble oak.

In 2005, LTE measured soil gas concentrations at 154 points in the 36 suspect areas. Methane was not detected at any areas. Oxygen concentrations ranged from 19% to 21%. Carbon monoxide was detected at 17 locations at ranges from 1 ppm to 16 ppm. Hydrogen sulfide was also not detected at any areas.

## SECTION 4.0

### CONCLUSIONS AND RECOMMENDATIONS

#### 4.1 CONCLUSIONS

##### 4.1.1 Drainage Transects Survey

###### Surface Water Inspections

Surface water inspections were performed at six locations where drainages transect the Kf outcrop. Methane was not observed seeping as bubbles on the water surface at any of the six streams inspected. Therefore, no stream water samples were collected for methane analysis.

In previous years, methane bubbles were observed at Squaw Creek and Stollsteimer Creek. In 2006, methane analysis determined that the Squaw Creek methane was near-surface microbial gas (swamp gas). Methane observed in 2007 and 2008 near Stollsteimer Creek coincided with the location of an underground natural gas pipeline. The methane source, potentially the pipeline, near-surface swamp gas or the Kf outcrop, was undeterminable. However, pipeline representatives inspected the area and concluded that it was likely not related to a leaking pipeline due to the limited flow observed.

###### Methane Flux Measurements

2008 was the second year that methane flux measurements were collected. Table 2 presents the distribution of methane flux values within the six drainages in 2007 and 2008. The number of flux points increased from 84 to 983, and the locations where methane was detected increased from 59 to 289. The average methane flux value (computed from all detections at six survey locations) decreased from 0.085 to 0.0203 moles/m<sup>2</sup>·day from 2007 to 2008. The decrease in flux rates is most likely due to the increase in sample population rather than a decrease in seepage rates. Maximum values as well as average values indicate that the methane seepage is low and is not changing along the Kf outcrop in Archuleta County.

##### 4.1.2 Big Horn-Schomburg #1 Abandoned Well Site Survey

While the number of soil gas methane flux measurement points increased from five to nine from 2007 to 2008, the number of sample points where methane flux was detected dropped from five to two. The average of values where methane flux was detected dropped from 0.1295 to 0.0353 moles/m<sup>2</sup>·day from 2007 to 2008.

The 2008 subsurface soil gas survey included one subsurface gas measurement from a temporary monitoring probe, and one subsurface gas measurement from a permanent monitoring probe. Methane was not detected in either probe. In sum, methane seepage remains very low at the Big Horn-Schomburg #1 abandoned well site.

### **4.1.3 Natural Spring Survey**

Discharge rates from eight natural springs were measured in 2008. Flows were discernable at four of the natural springs, at rates of 0.9 gpm or less. Low flow rates have been typically measured in previous years.

Ten natural springs were sampled in 2008, all of which had been sampled in previous years. Methane was detected at very low concentrations (0.05 mg/L or less) in water from only three natural springs. The detected concentrations were below the 2 mg/L threshold limit for water systems established by the COGCC. Methane detections in previous years had also been well below the COGCC threshold.

General water chemistry of natural springs, including major ion concentrations, was analyzed for the first time in 2008. Nine of the 10 natural springs sampled show a calcium bicarbonate signature, while the tenth natural spring is a calcium sulfate water.

Subsurface soil gas was measured adjacent to 14 natural springs. Methane was detected at two springs, at the same very low concentration (500 ppm), although the detections were not at the three springs where methane was detected in water.

### **4.1.4 Regional Reconnaissance Survey**

Aerial IR imagery was collected and reviewed for suspect areas indicated by stressed vegetation on the Kf outcrop. Forty-two of 59 suspect areas were accessible for field inspection. Stressed vegetation was the result of physical conditions such as steep slopes and/or poorly developed soil.

Subsurface soil gas concentrations were measured at 41 suspect areas. Methane was not detected at any suspect area. Similarly, no methane was detected in 2005 during the previous monitoring event.

## **4.2 RECOMMENDATIONS**

In order to maintain compliance with sections 1, 2 and 6 of the COGCC Conditions of Approval for the Pargin Mountain 10U #3 production well drilling permit, LTE makes the following recommendations.

### **4.2.1 Drainage Transects Survey**

LTE recommends the continued annual monitoring at the six drainage transects for discharges of methane gas in watercourses and subsurface soil. LTE recommends collecting a gas sample from the seepage observed in Stollsteimer Creek and analyzing the sample for mercaptan. This analysis is the only means by which to differentiate the Fruitland methane gas carried within the pipeline and any potential seeps of methane gas from the Kf outcrop.

#### **4.2.2 Big Horn-Schomburg #1 Abandoned Well Site Survey**

LTE recommends the continued annual monitoring of the Big Horn-Schomburg #1 abandoned well site as required under section 6 of the permit's Conditions of Approval.

#### **4.2.3 Natural Spring Survey**

Annual monitoring of natural springs on the Kf outcrop is required under section 2 of the permit's Conditions of Approval. Monitoring should include calculations of flow rate and methane analyses. At least one set of subsurface soil gas data should continue to be collected annually at each natural spring. LTE recommends that major ion analysis be conducted every three years, occurring next during the 2011 event.

#### **4.2.4 Regional Reconnaissance Survey**

The regional reconnaissance survey and field verification activity is required every three years. The next survey should be performed in 2011.

## SECTION 5.0

### REFERENCES

Armstrong, M and N. Champigny. 1988. *A Study on Kriging Small Blocks*.

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----- 2006a. *Fruitland Outcrop Monitoring Report, Archuleta County, Colorado*. January 2006.

----- 2006b. *Fruitland Outcrop Monitoring Report, Archuleta County, Colorado*. October 2006.

----- 2008a. *2007 Fruitland Outcrop Monitoring Report, Archuleta County, Colorado*. March 2008.

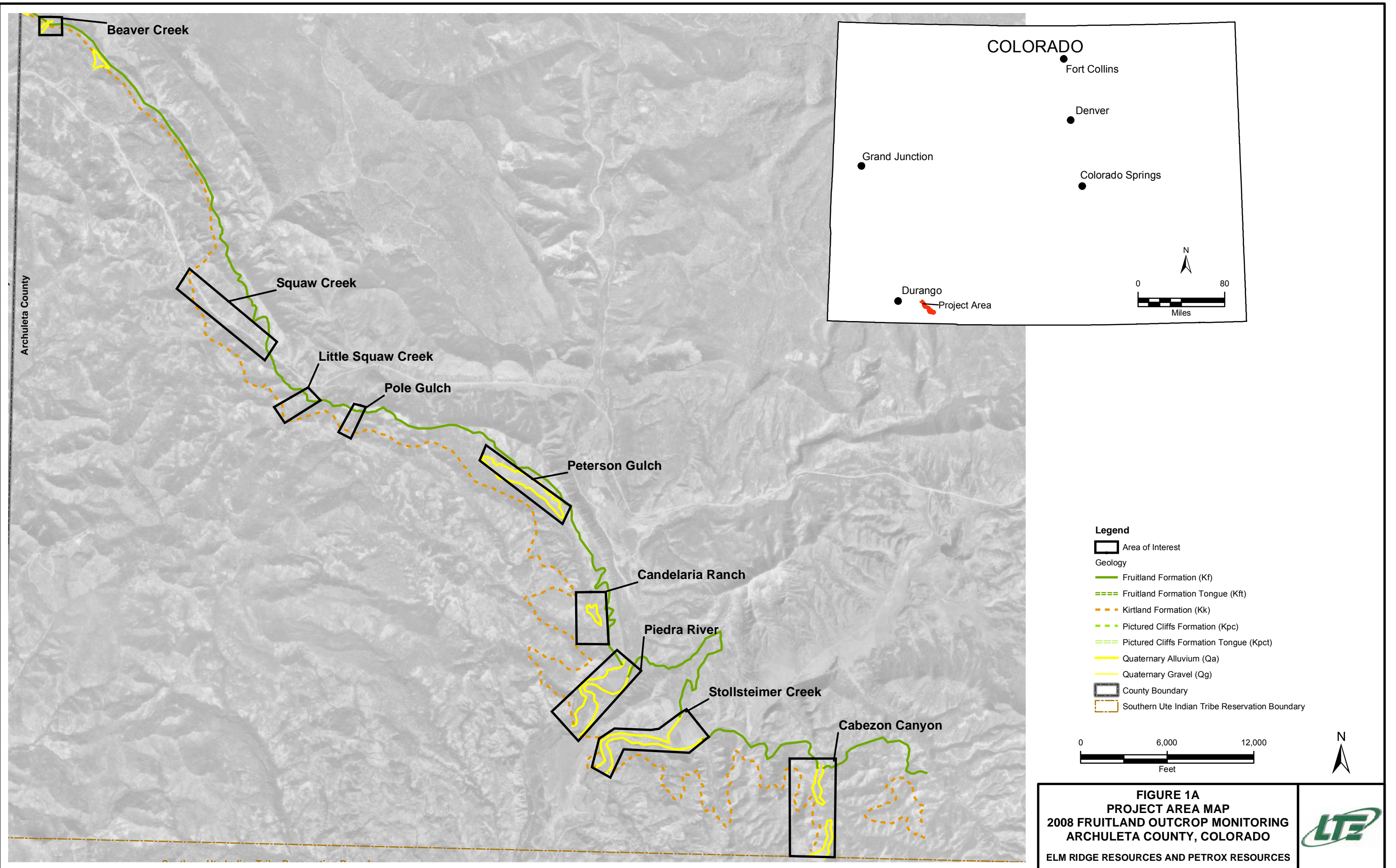
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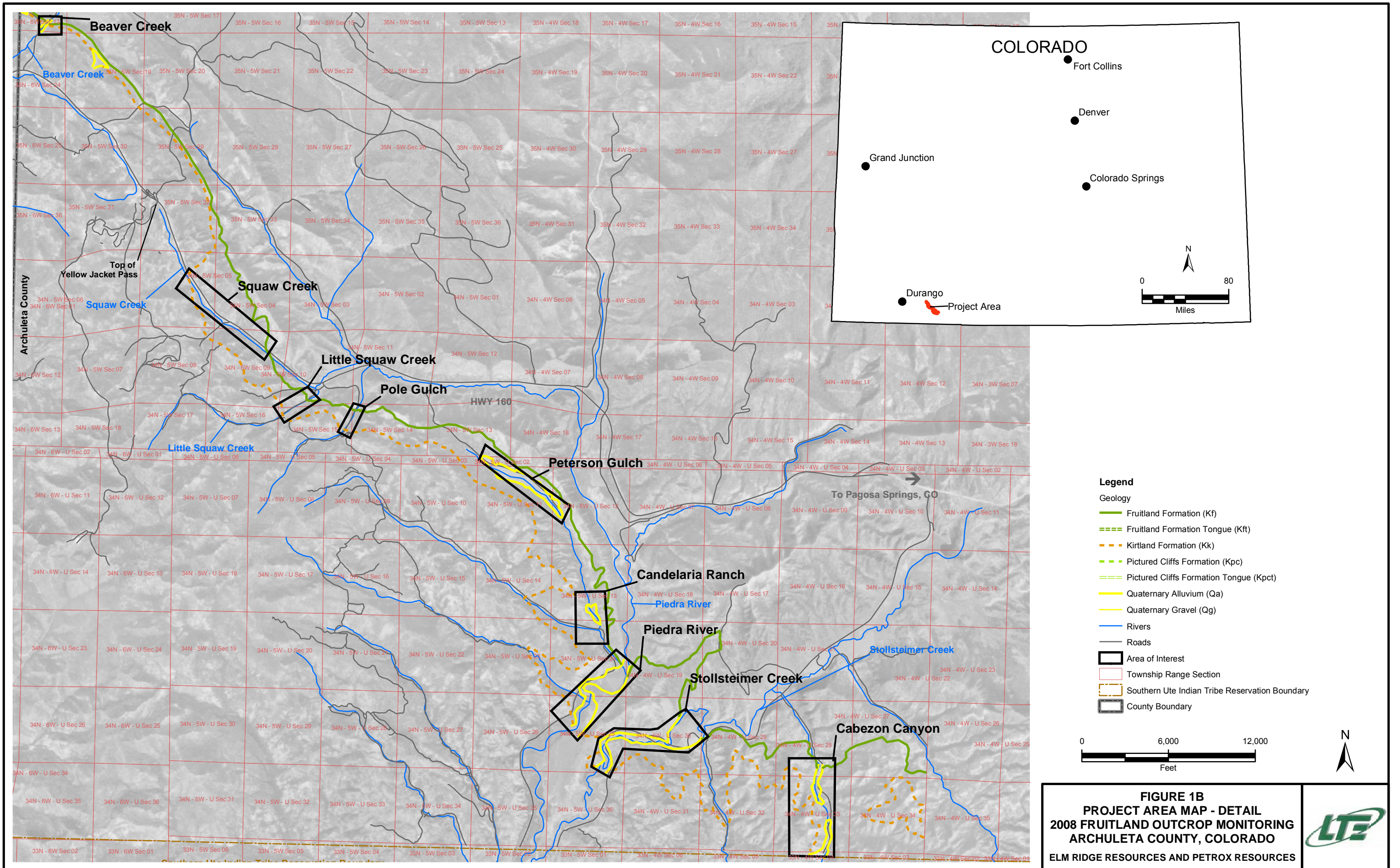
U.S. Forest Service and Bureau of Land Management (USFS/BLM). 2006. *Final Environmental Impact Statement, Northern San Juan Basin Coal Bed Methane Project*. July 2006.



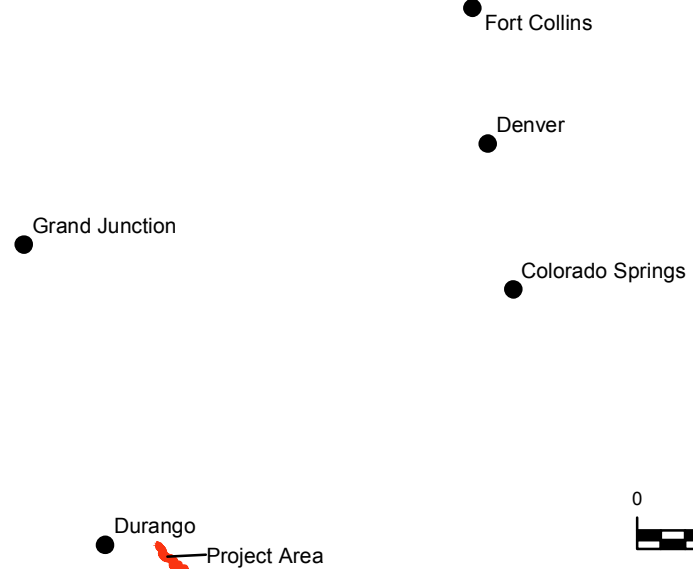
## FIGURES





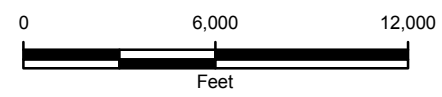


**COLORADO**



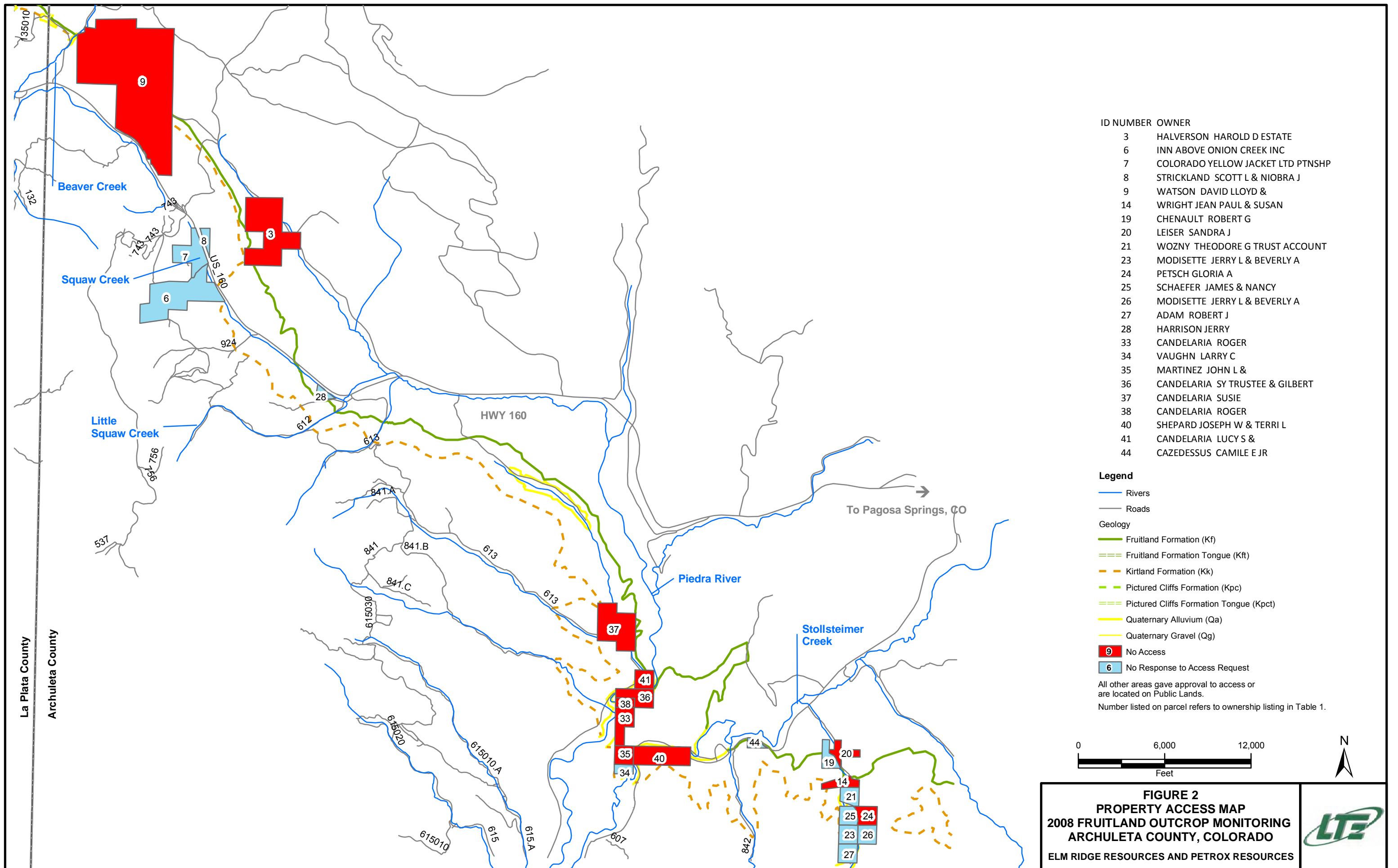
**Legend**

- Geology
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Rivers
- Roads
- ▭ Area of Interest
- ▭ Township Range Section
- - - Southern Ute Indian Tribe Reservation Boundary
- ▭ County Boundary



**FIGURE 1B**  
**PROJECT AREA MAP - DETAIL**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





ID NUMBER	OWNER
3	HALVERSON HAROLD D ESTATE
6	INN ABOVE ONION CREEK INC
7	COLORADO YELLOW JACKET LTD PTNSHP
8	STRICKLAND SCOTT L & NIOBRA J
9	WATSON DAVID LLOYD &
14	WRIGHT JEAN PAUL & SUSAN
19	CHENAULT ROBERT G
20	LEISER SANDRA J
21	WOZNY THEODORE G TRUST ACCOUNT
23	MODISETTE JERRY L & BEVERLY A
24	PETSCH GLORIA A
25	SCHAEFER JAMES & NANCY
26	MODISETTE JERRY L & BEVERLY A
27	ADAM ROBERT J
28	HARRISON JERRY
33	CANDELARIA ROGER
34	VAUGHN LARRY C
35	MARTINEZ JOHN L &
36	CANDELARIA SY TRUSTEE & GILBERT
37	CANDELARIA SUSIE
38	CANDELARIA ROGER
40	SHEPARD JOSEPH W & TERRI L
41	CANDELARIA LUCY S &
44	CAZEDESSUS CAMILE E JR

**Legend**

- Rivers
- Roads
- Geology
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- 9 No Access
- 6 No Response to Access Request

All other areas gave approval to access or are located on Public Lands.  
 Number listed on parcel refers to ownership listing in Table 1.



**FIGURE 2**  
**PROPERTY ACCESS MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
 ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

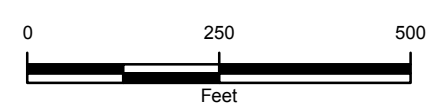
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 3**  
**METHANE FLUX MEASUREMENTS**  
**BEAVER CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All unlabeled subsurface methane measurements had concentrations of 0 ppm.

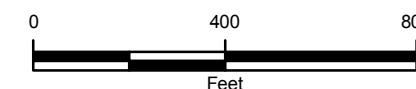
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

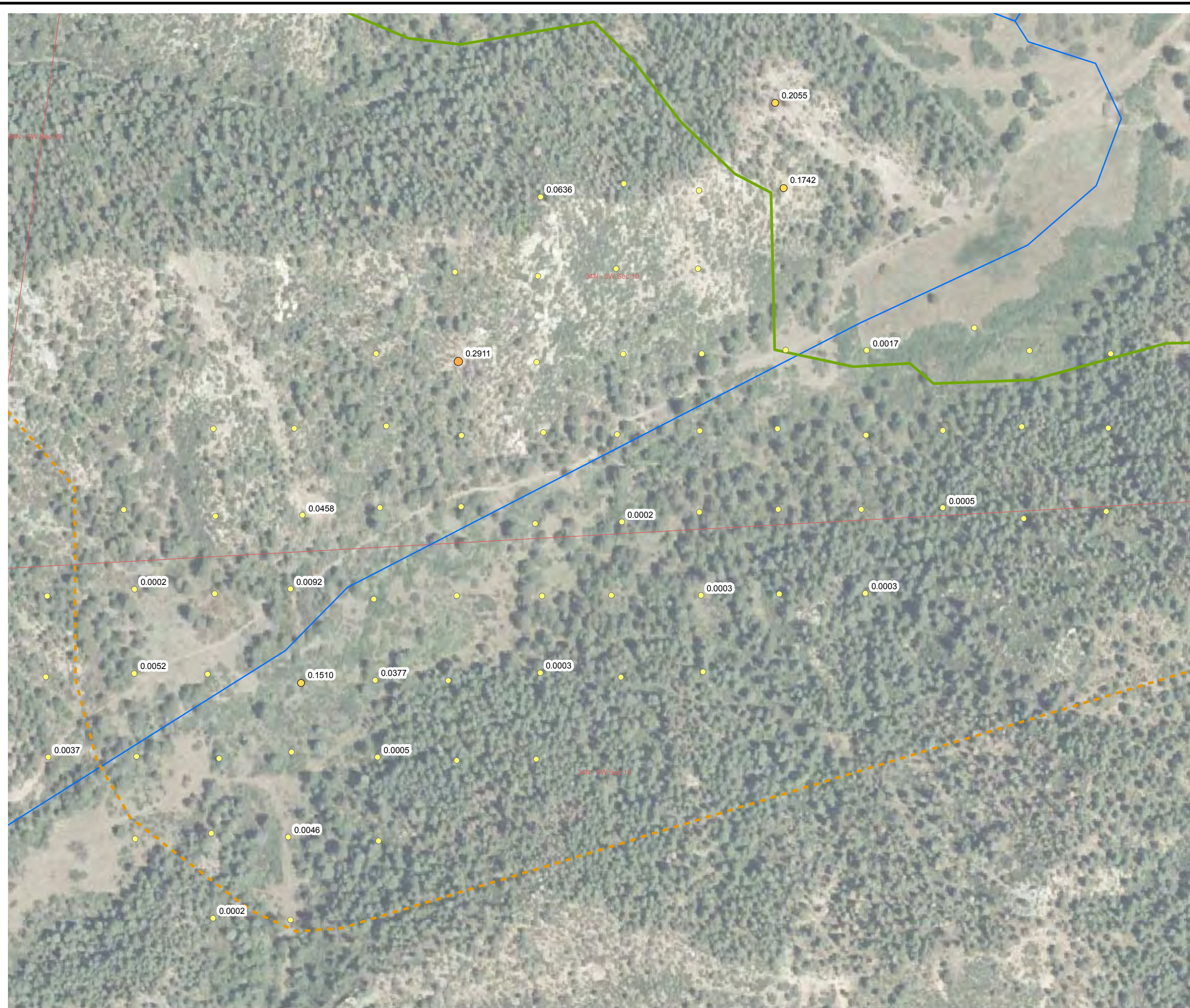
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 4**  
**METHANE FLUX MEASUREMENTS**  
**SQUAW CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day

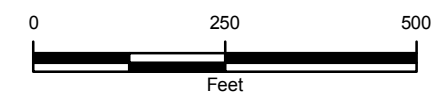
Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

— Rivers

**Geology**

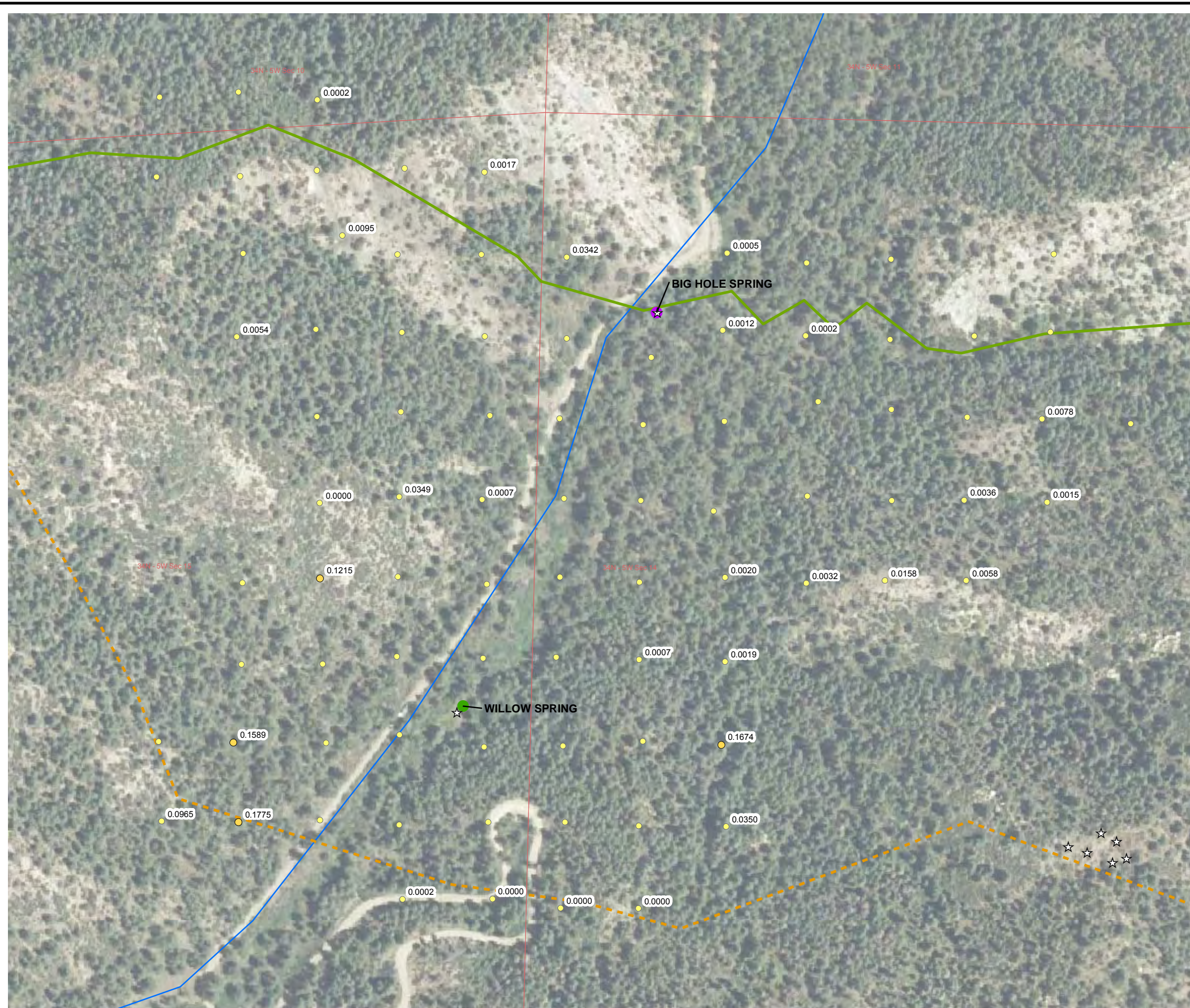
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 5**  
**METHANE FLUX MEASUREMENTS**  
**LITTLE SQUAW CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

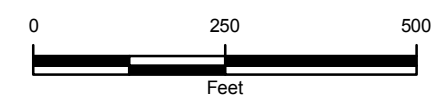
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

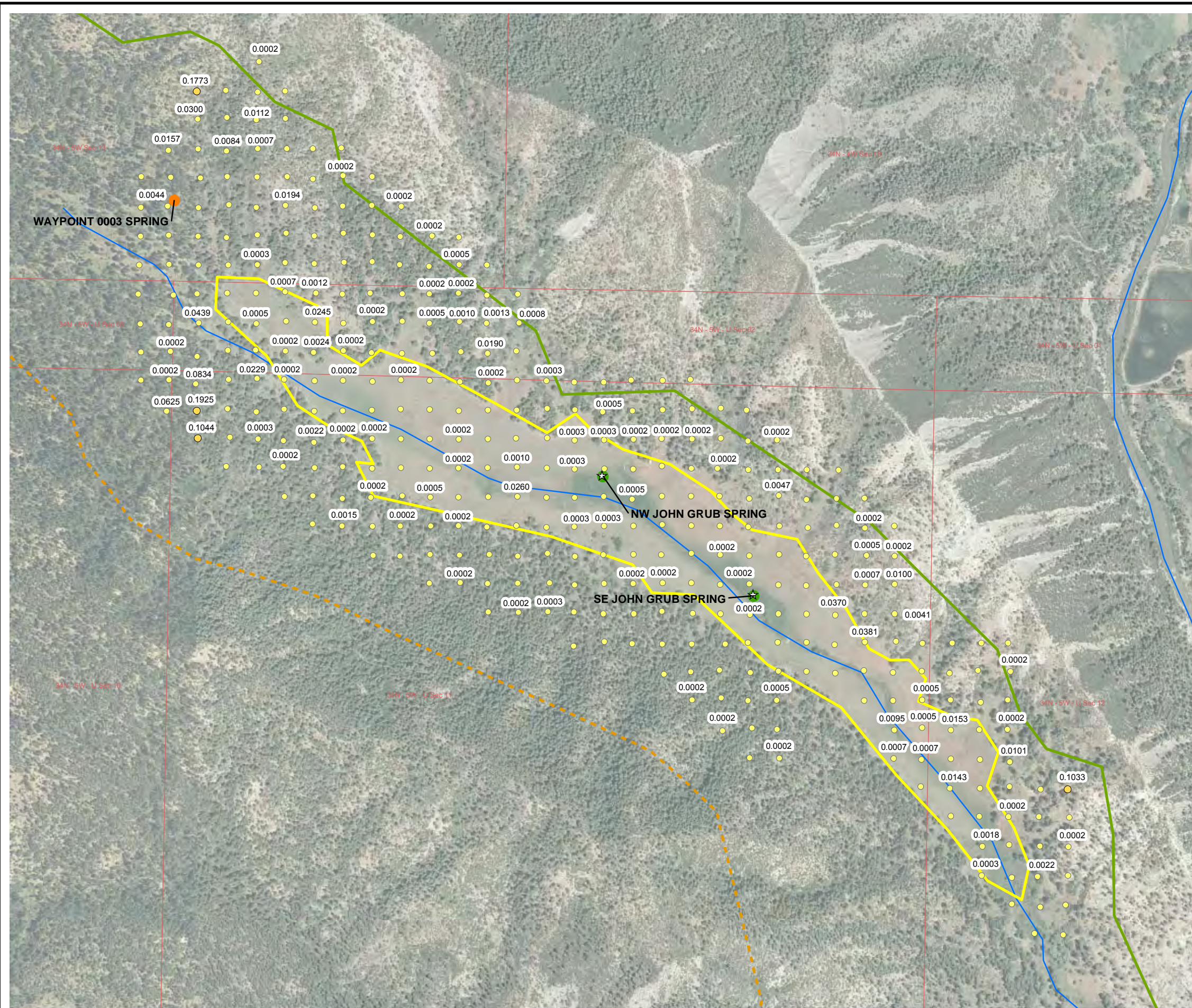
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 6**  
**METHANE FLUX MEASUREMENTS**  
**POLE GULCH**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

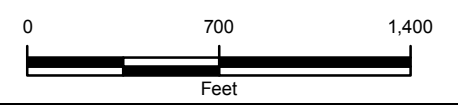
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

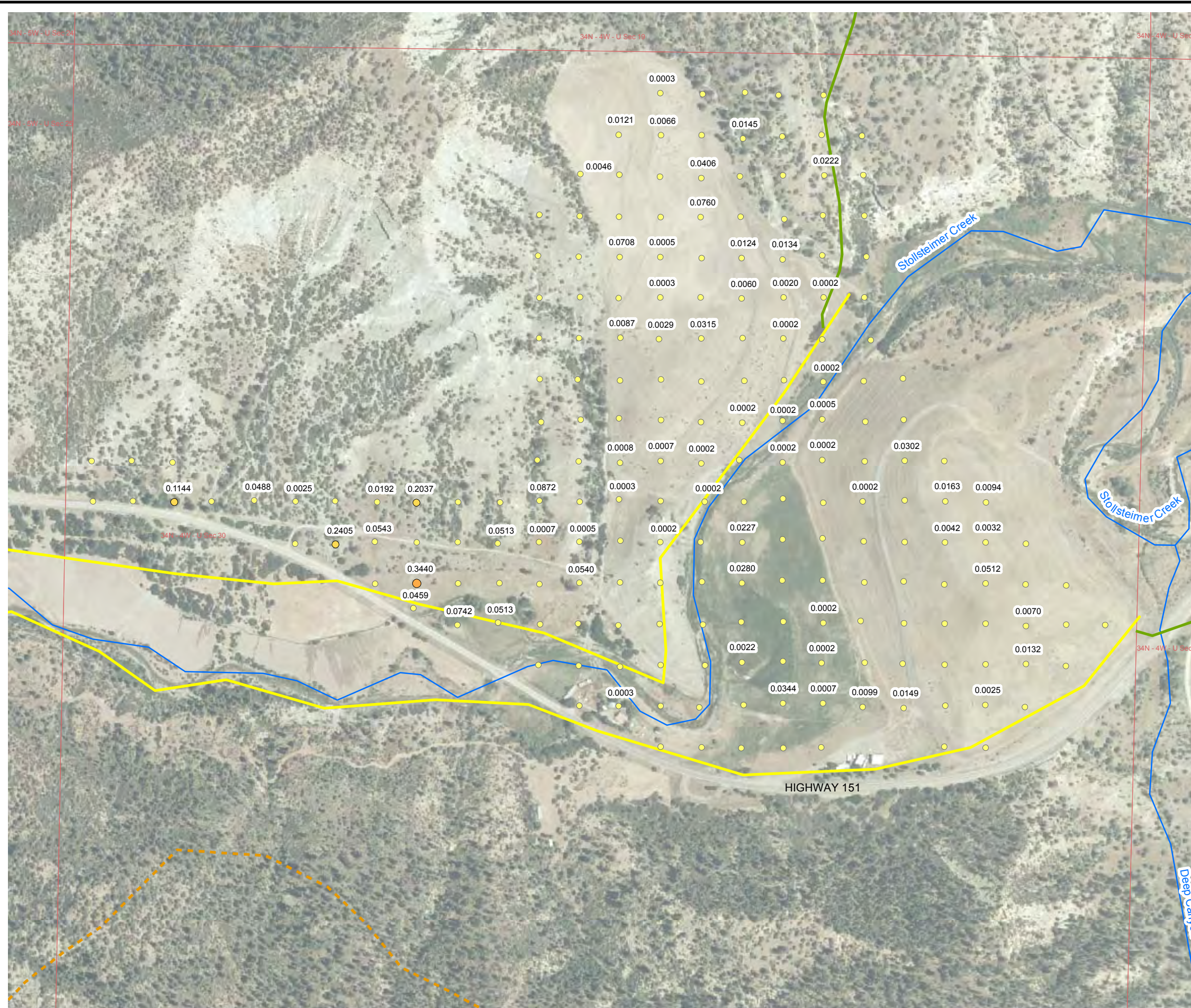
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 7**  
**METHANE FLUX MEASUREMENTS**  
**PETERSON GULCH**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





- Legend**
- Methane Flux Measurements (mol/m<sup>2</sup> day)**
- 0.000 - 0.100
  - 0.101 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 5.00
  - 5.01 - 10.00
  - 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
 Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

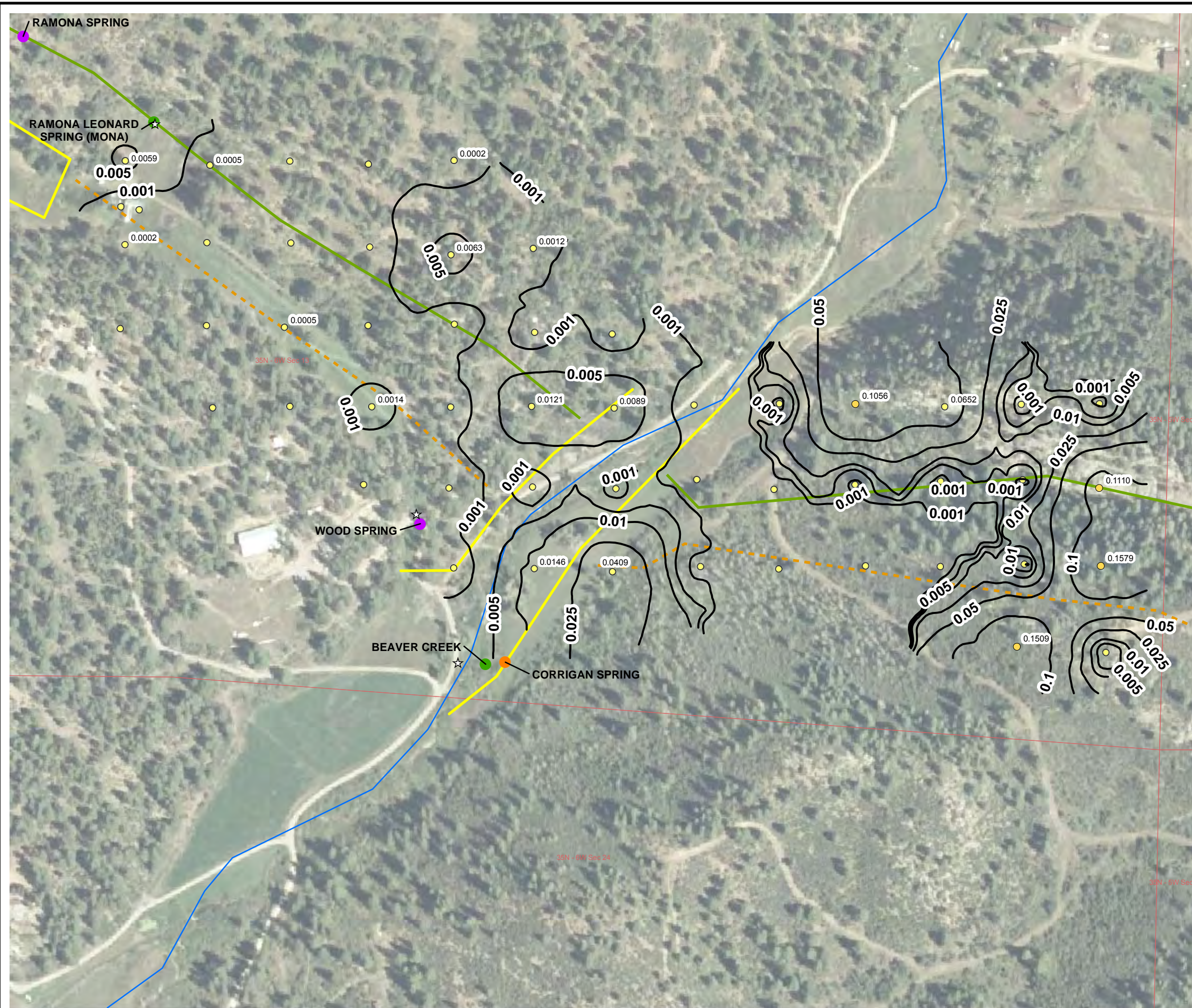
- Geology**
- Fruitland Formation (Kf)
  - Fruitland Formation Tongue (Kft)
  - Kirtland Formation (Kk)
  - Pictured Cliffs Formation (Kpc)
  - Pictured Cliffs Formation Tongue (Kpct)
  - Quaternary Alluvium (Qa)
  - Quaternary Gravel (Qg)
  - Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005

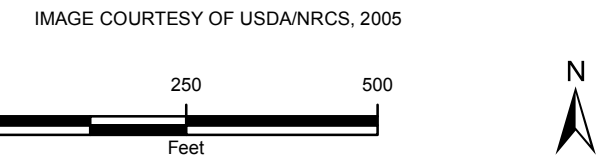


**FIGURE 8**  
**METHANE FLUX MEASUREMENTS**  
**STOLLSTEIMER CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**



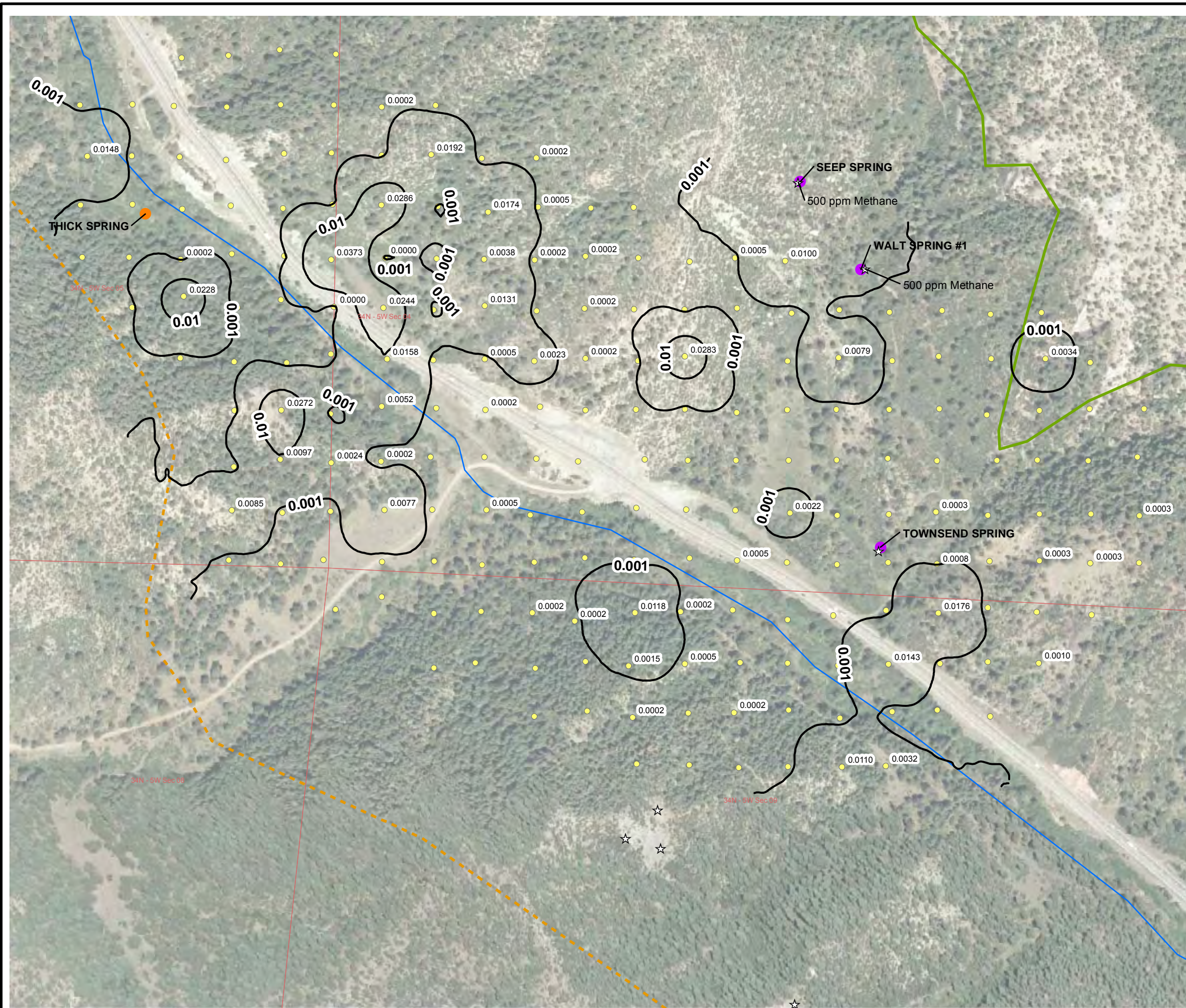


- Legend**
- ☆ Subsurface Methane Measurement
  - NATURAL SPRING LOCATION**
  - SAMPLED
  - FIELD PARAMETERS ONLY
  - DRY
  - NOT LOCATED
  - NO ACCESS
  - Methane Flux Measurements (mol/m<sup>2</sup> day)**
  - 0.000 - 0.100
  - 0.101 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 5.00
  - 5.01 - 10.00
  - 10.01 - 30.00
  - Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)
  - mol/m<sup>2</sup> day - moles per square meter per day
  - ppm - parts per million
  - Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane
  - All subsurface methane measurements shown had concentrations of 0 ppm.
  - \* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.
  - Rivers
  - Geology**
  - Fruitland Formation (Kf)
  - Fruitland Formation Tongue (Kft)
  - Kirtland Formation (Kk)
  - Pictured Cliffs Formation (Kpc)
  - Pictured Cliffs Formation Tongue (Kpct)
  - Quaternary Alluvium (Qa)
  - Quaternary Gravel (Qg)
  - Township Range Section



**FIGURE 9**  
**METHANE FLUX CONTOURS**  
**BEAVER CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

— Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All unlabeled subsurface methane measurements had concentrations of 0 ppm.

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

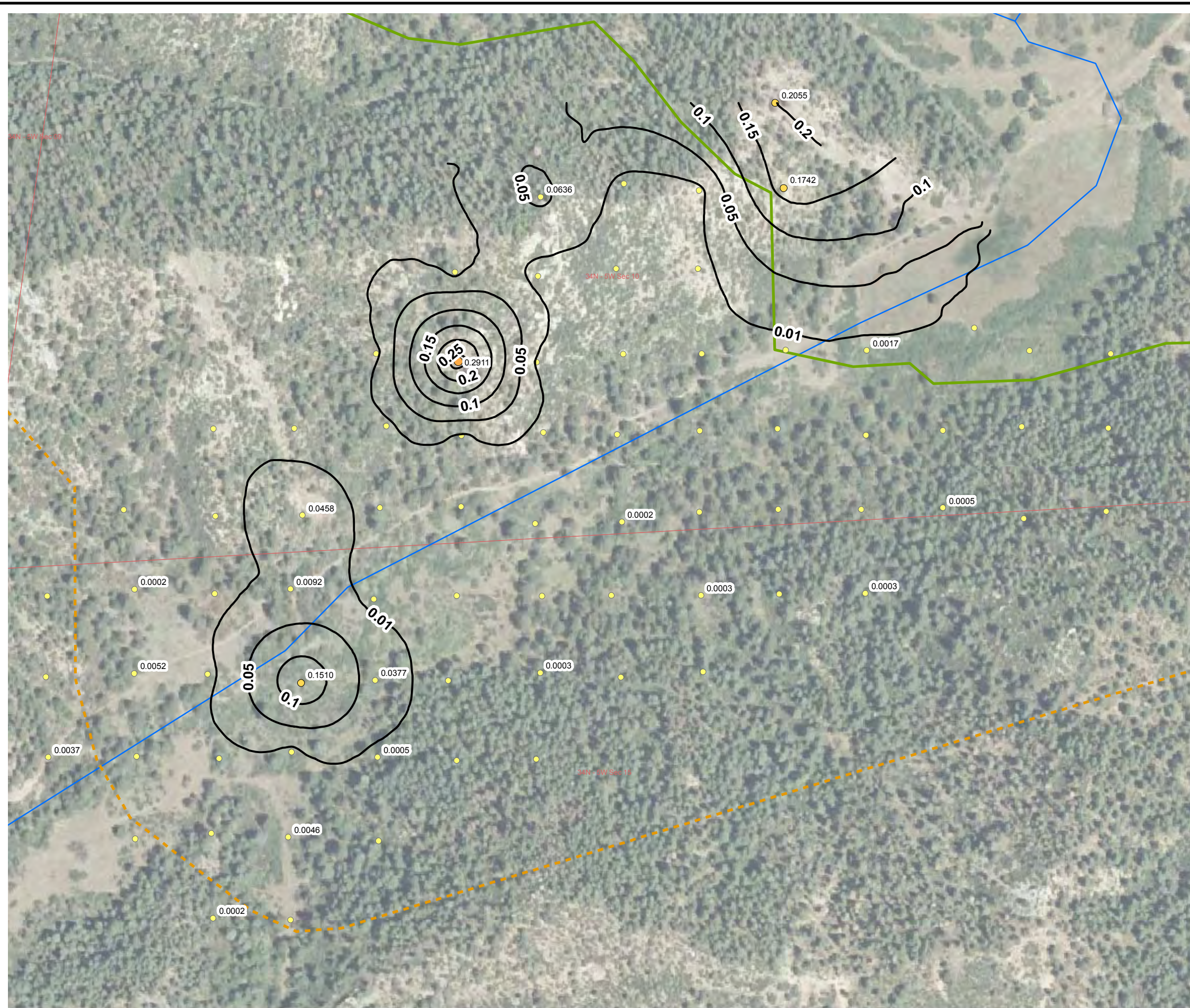
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005

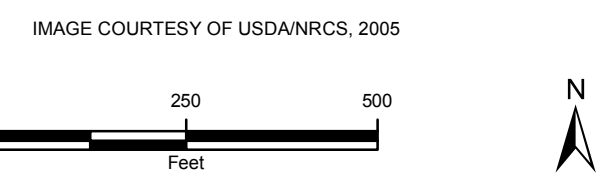


**FIGURE 10**  
**METHANE FLUX CONTOURS**  
**SQUAW CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**



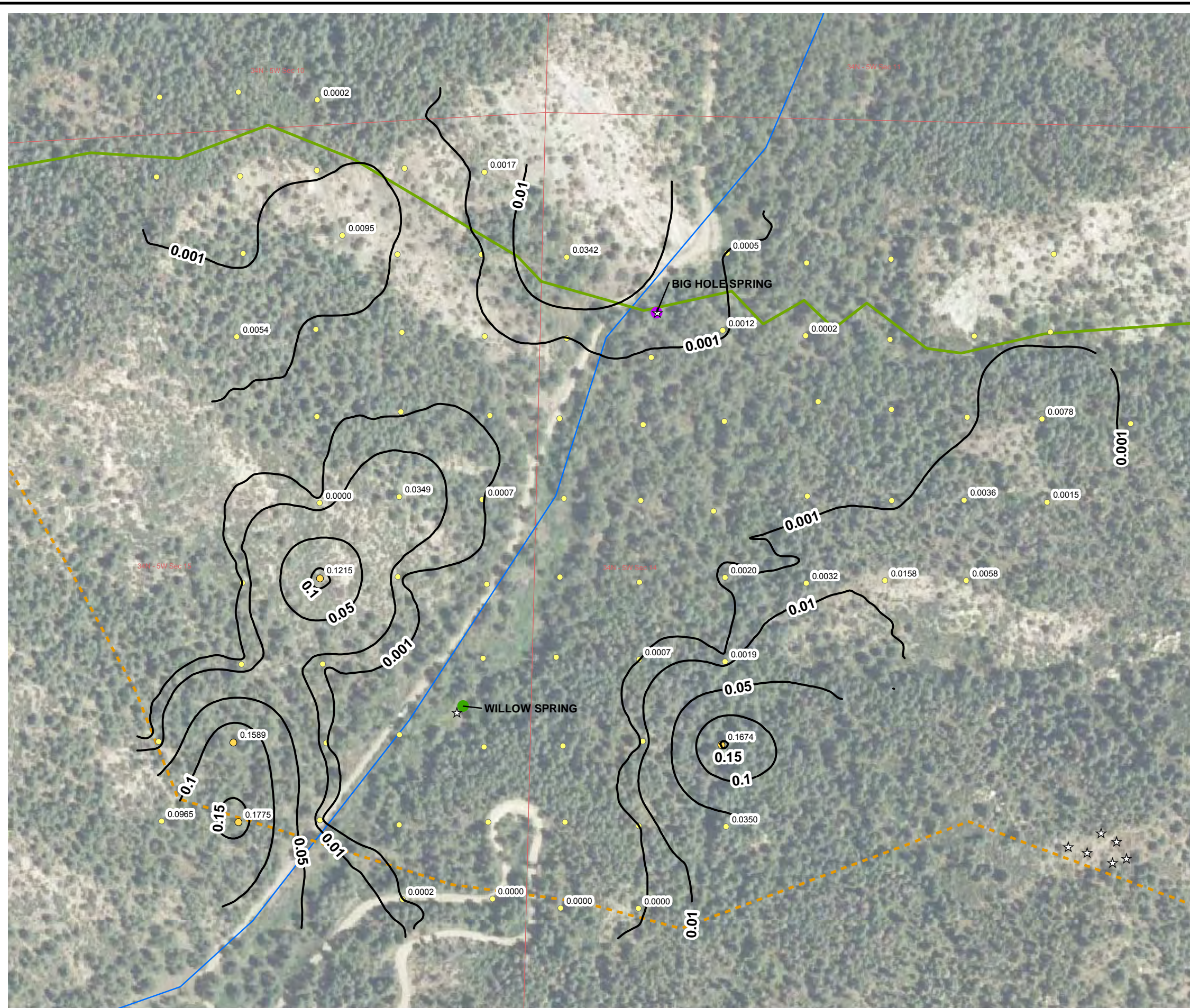


- Legend**
- Methane Flux Measurements (mol/m<sup>2</sup> day)**
- 0.000 - 0.100
  - 0.101 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 5.00
  - 5.01 - 10.00
  - 10.01 - 30.00
- Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)
- mol/m<sup>2</sup> day - moles per square meter per day
- Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane
- Rivers
- Geology**
- Fruitland Formation (Kf)
  - Fruitland Formation Tongue (Kft)
  - Kirtland Formation (Kk)
  - Pictured Cliffs Formation (Kpc)
  - Pictured Cliffs Formation Tongue (Kpct)
  - Quaternary Alluvium (Qa)
  - Quaternary Gravel (Qg)
  - Township Range Section



**FIGURE 11**  
**METHANE FLUX CONTOURS**  
**LITTLE SQUAW CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

— Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

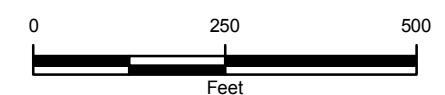
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

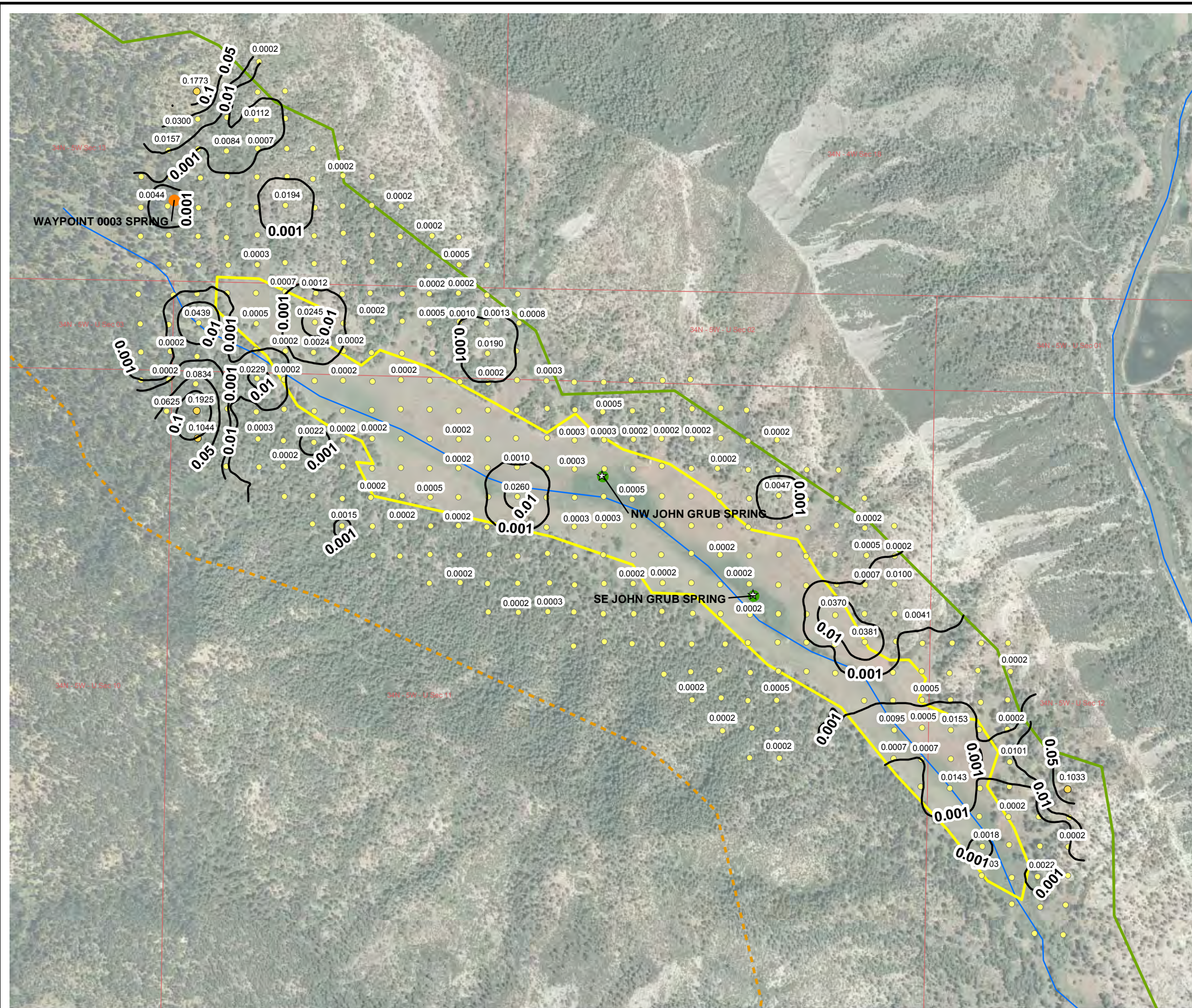
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 12**  
**METHANE FLUX CONTOURS**  
**POLE GULCH**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





**Legend**

- ☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

— Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

**Geology**

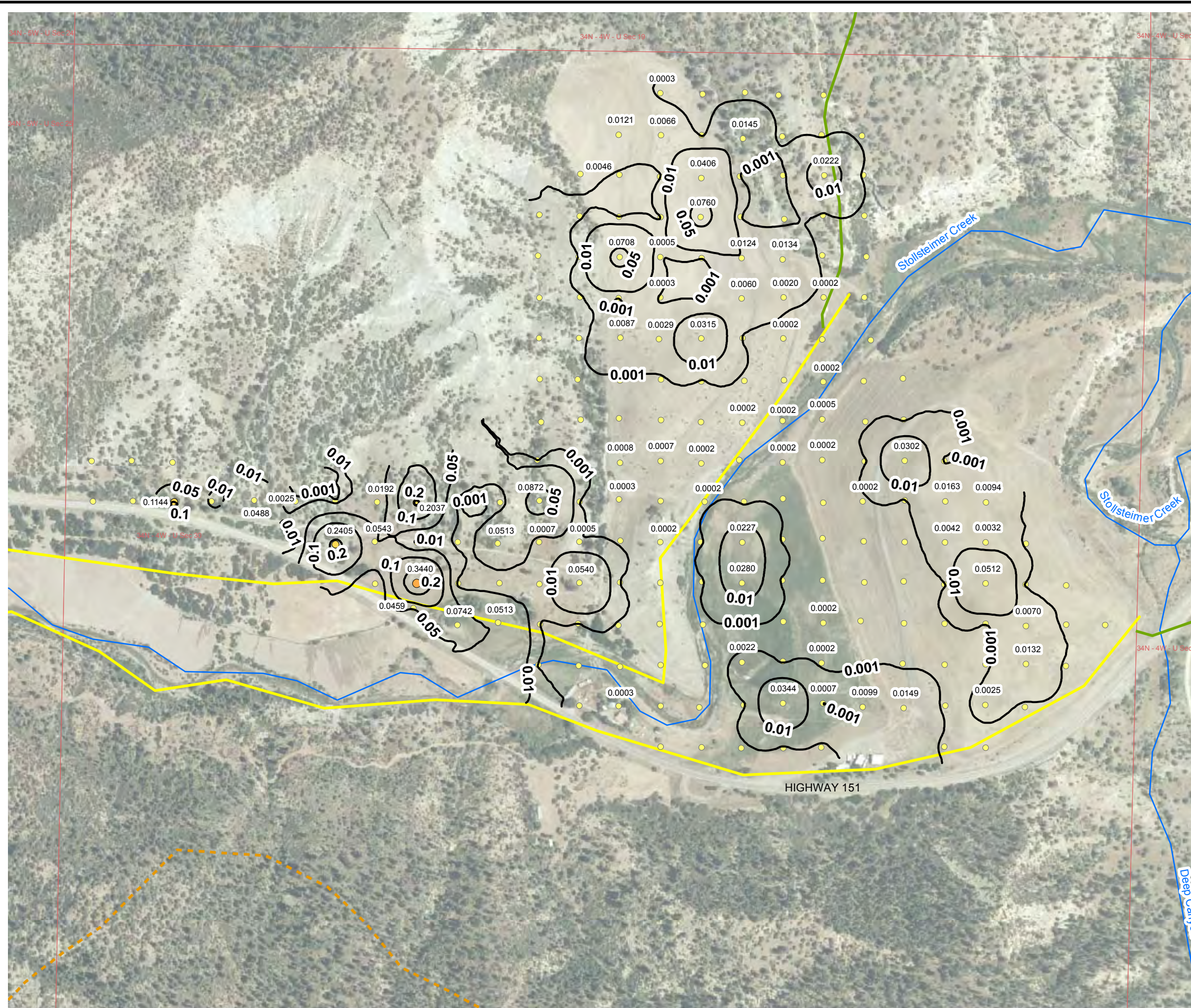
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Township Range Section

IMAGE COURTESY OF USDA/NRCS, 2005

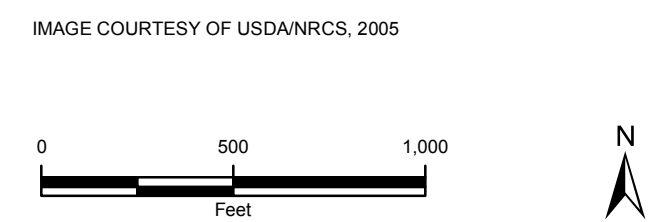


**FIGURE 13**  
**METHANE FLUX CONTOURS**  
**PETERSON GULCH**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





- Legend**
- Methane Flux Measurements (mol/m<sup>2</sup> day)**
- 0.000 - 0.100
  - 0.101 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 5.00
  - 5.01 - 10.00
  - 10.01 - 30.00
- Methane Flux Contour in mol/m<sup>2</sup> day (Variable Interval)
- mol/m<sup>2</sup> day - moles per square meter per day
- Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane
- Rivers
- Geology**
- Fruitland Formation (Kf)
  - Fruitland Formation Tongue (Kft)
  - Kirtland Formation (Kk)
  - Pictured Cliffs Formation (Kpc)
  - Pictured Cliffs Formation Tongue (Kpct)
  - Quaternary Alluvium (Qa)
  - Quaternary Gravel (Qg)
  - Township Range Section



**FIGURE 14**  
**METHANE FLUX CONTOURS**  
**STOLLSTEIMER CREEK**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
**ELM RIDGE RESOURCES AND PETROX RESOURCES**





IMAGE COURTESY OF USDA/NRCS, 2005

**Legend**

- + Permanent Monitoring Probe
- ☆ Subsurface Methane Measurement
- ⊘ Abandoned Oil and Gas Well

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

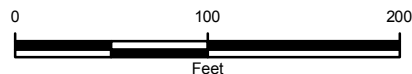
- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm.

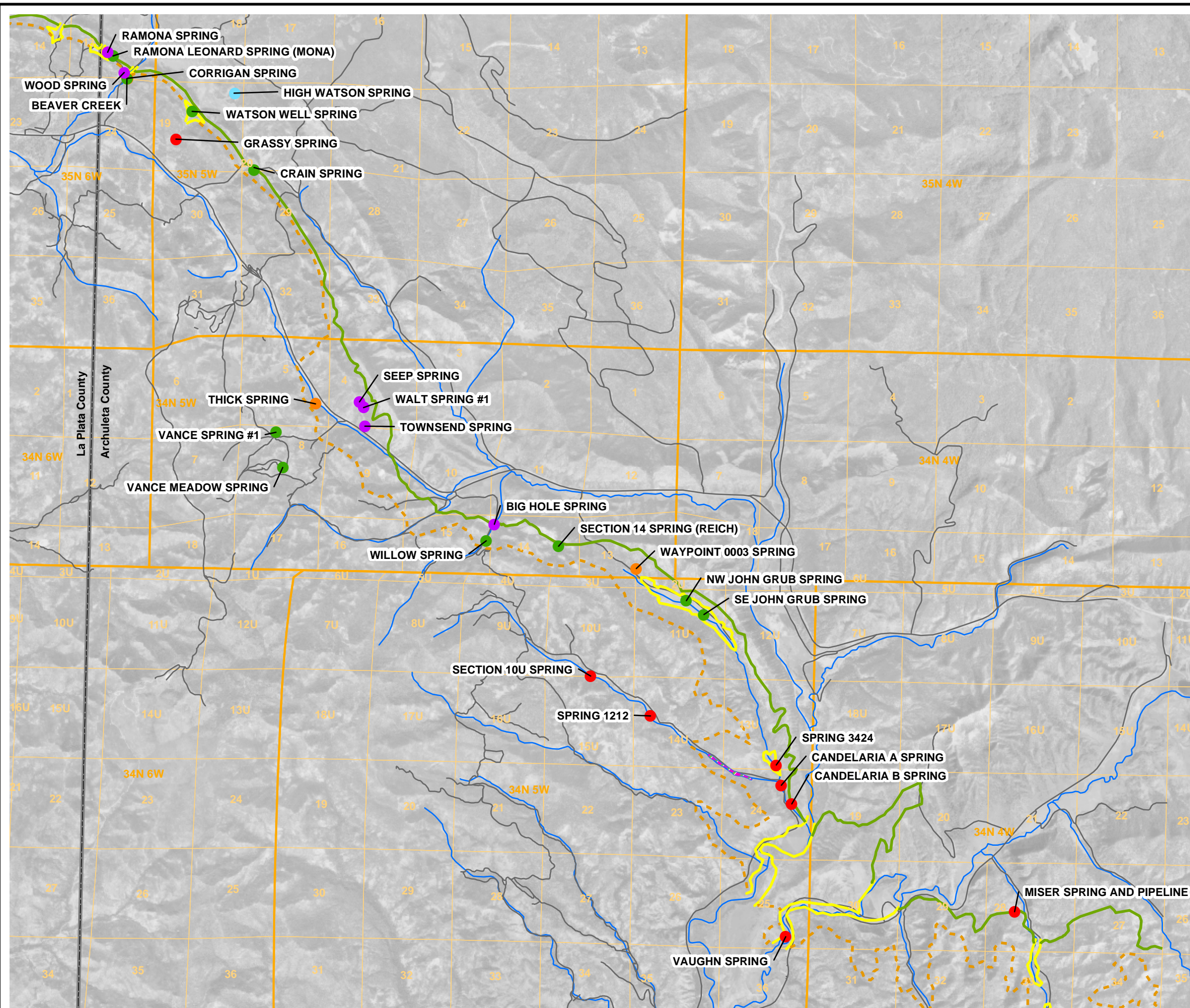
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.



**FIGURE 15**  
**BIG HORN-SCHOMBURG #1 ABANDONED WELL SITE**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

ELM RIDGE RESOURCES AND PETROX RESOURCES



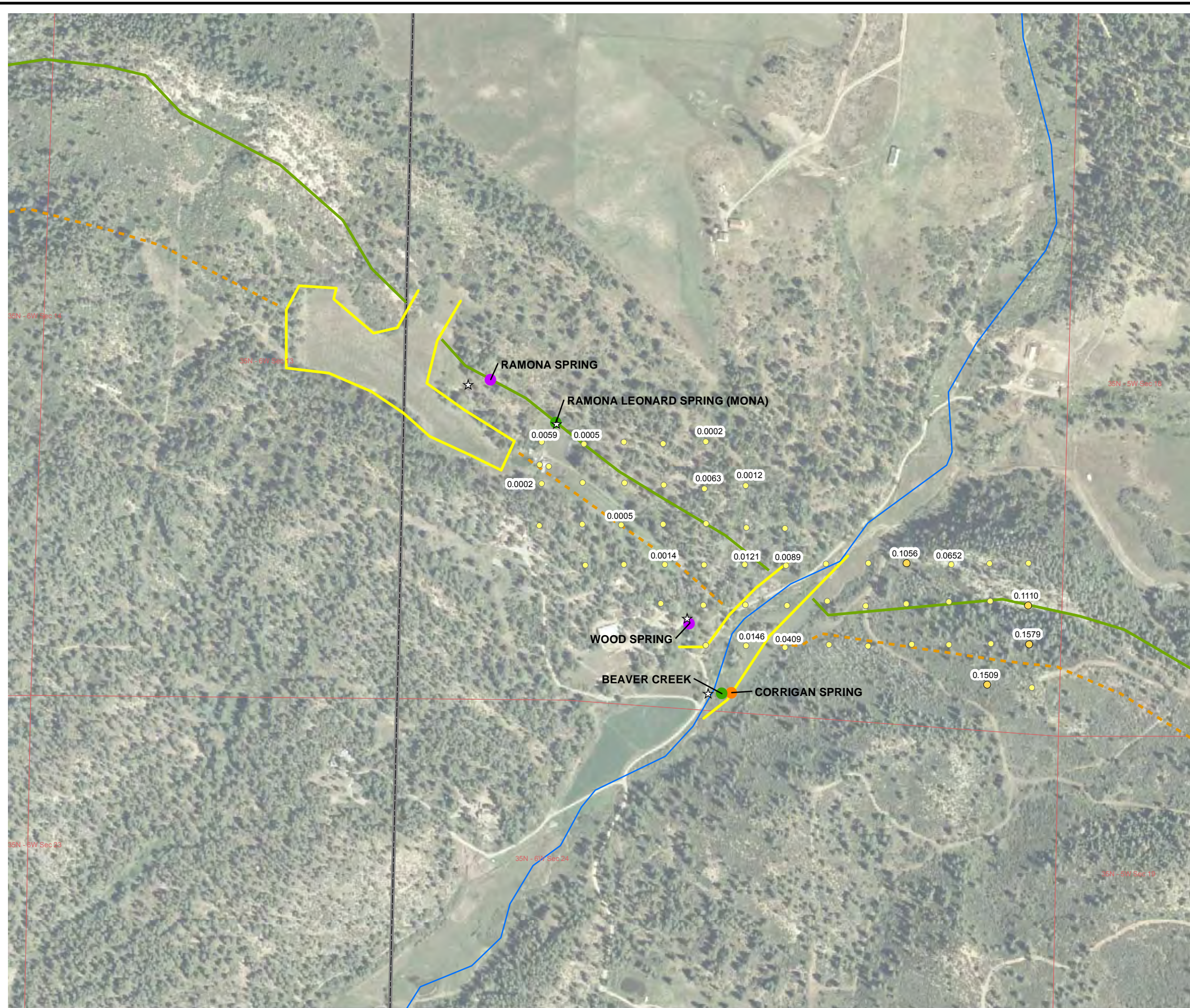


- Legend**
- NATURAL SPRING LOCATION**
- SAMPLED
  - FIELD PARAMETERS ONLY
  - DRY
  - NOT LOCATED
  - NO ACCESS
- Roads
- Rivers
- ▨ Wetland Area, No Channel Flow
- ▭ County Boundary
- ▭ Southern Ute Indian Tribe Reservation Boundary
- ▭ Township and Ranges Lines
- ▭ Section
- Geology**
- Fruitland Formation (Kf)
  - Fruitland Formation Tongue (Kft)
  - Kirtland Formation (Kk)
  - Pictured Cliffs Formation (Kpc)
  - Pictured Cliffs Formation Tongue (Kpct)
  - Quaternary Alluvium (Qa)
  - Quaternary Gravel (Qg)



**FIGURE 16**  
**NATURAL SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

☆ Subsurface Methane Measurement

**NATURAL SPRING LOCATION**

- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

**Methane Flux Measurements (mol/m<sup>2</sup> day)**

- 0.000 - 0.100
- 0.101 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 30.00

mol/m<sup>2</sup> day - moles per square meter per day  
ppm - parts per million

Points not labeled are 0.0000 mol/m<sup>2</sup> day Methane

All subsurface methane measurements shown had concentrations of 0 ppm

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

— Rivers

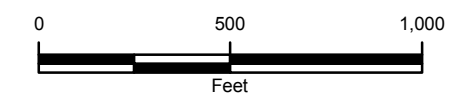
▭ County Boundary

▭ Township Range Section

**Geology**

- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16A**  
**DETAILED SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

- ☆ Subsurface Methane Measurement
- NATURAL SPRING LOCATION**
- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

ppm - parts per million

All subsurface methane measurements shown had concentrations of 0 ppm.

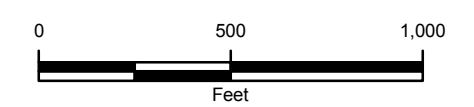
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

□ Township Range Section

**Geology**

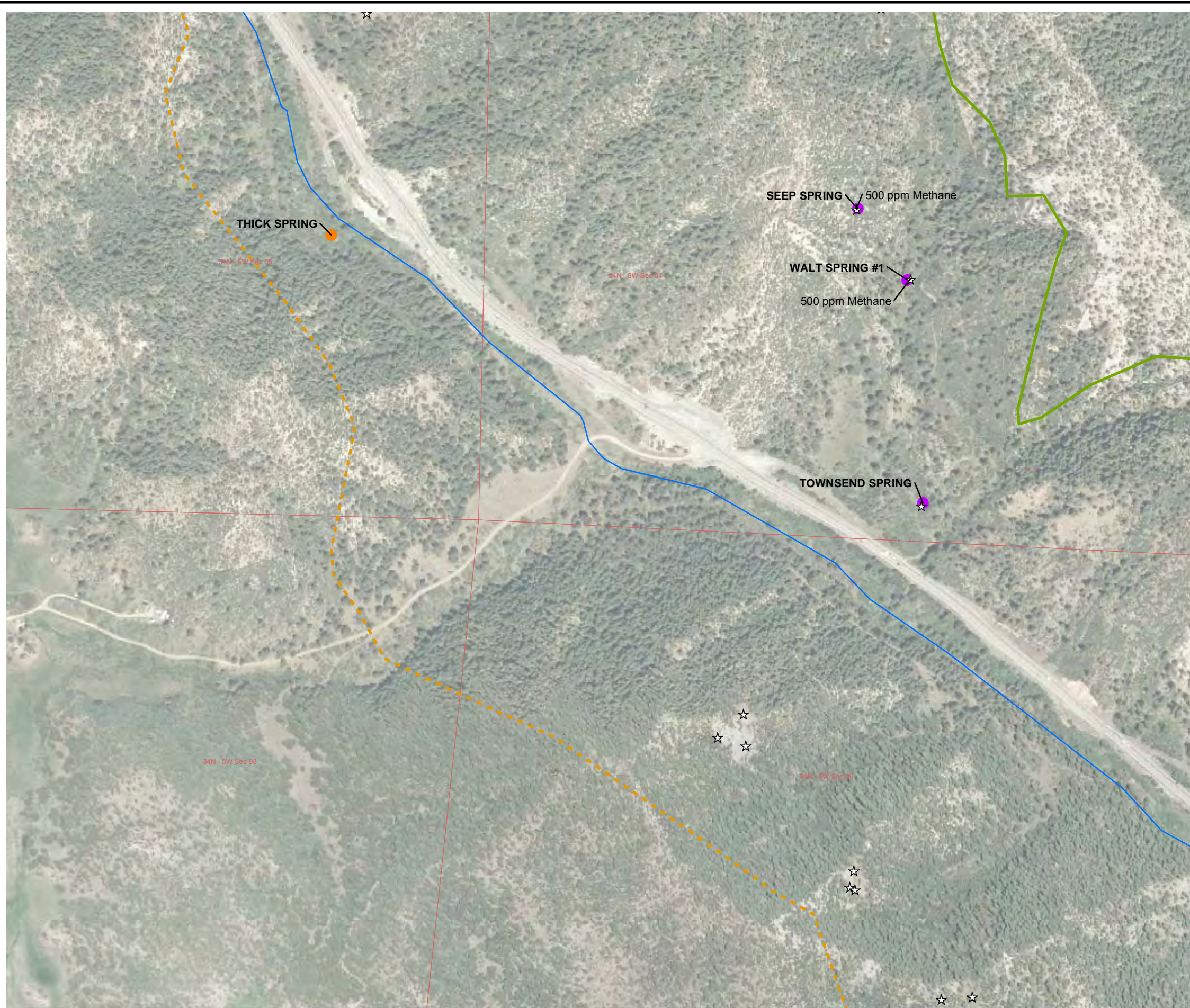
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16B**  
**DETAILED SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

- ☆ Subsurface Methane Measurement
- NATURAL SPRING LOCATION**
- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

ppm - parts per million

All unlabeled subsurface methane measurements had concentrations of 0 ppm.

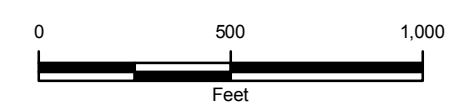
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

□ Township Range Section

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16C**  
**DETAILED SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

- ☆ Subsurface Methane Measurement
- NATURAL SPRING LOCATION**
- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

ppm - parts per million

All subsurface methane measurements shown had concentrations of 0 ppm.

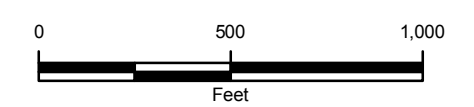
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

□ Township Range Section

**Geology**

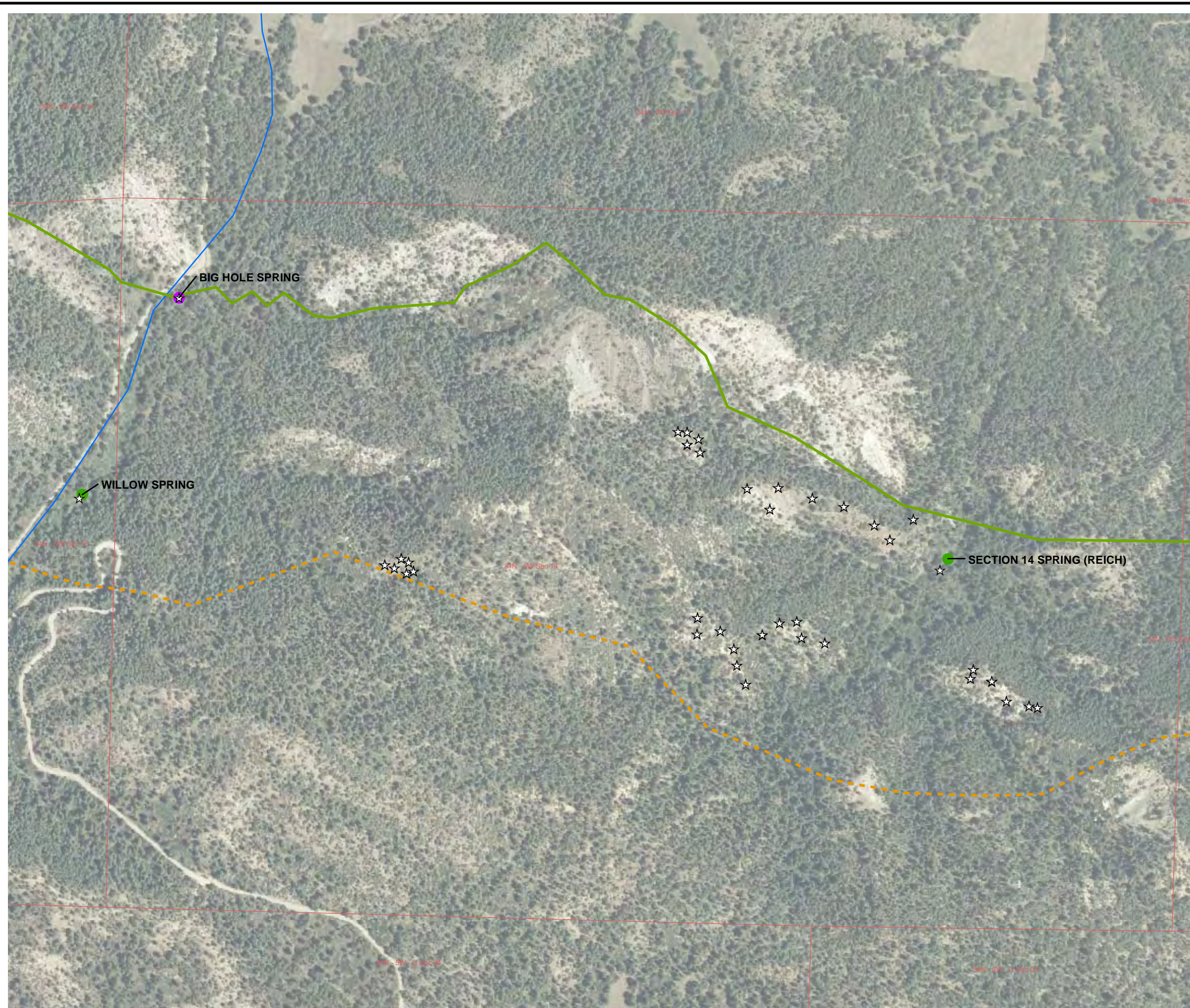
- Fruitland Formation (Kf)
- == Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- == Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16D**  
**DETAILED SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

- ☆ Subsurface Methane Measurement
- NATURAL SPRING LOCATION**
- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

ppm - parts per million

All subsurface methane measurements shown had concentrations of 0 ppm.

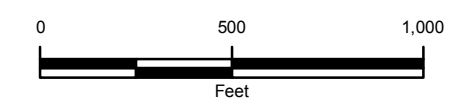
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

□ Township Range Section

**Geology**

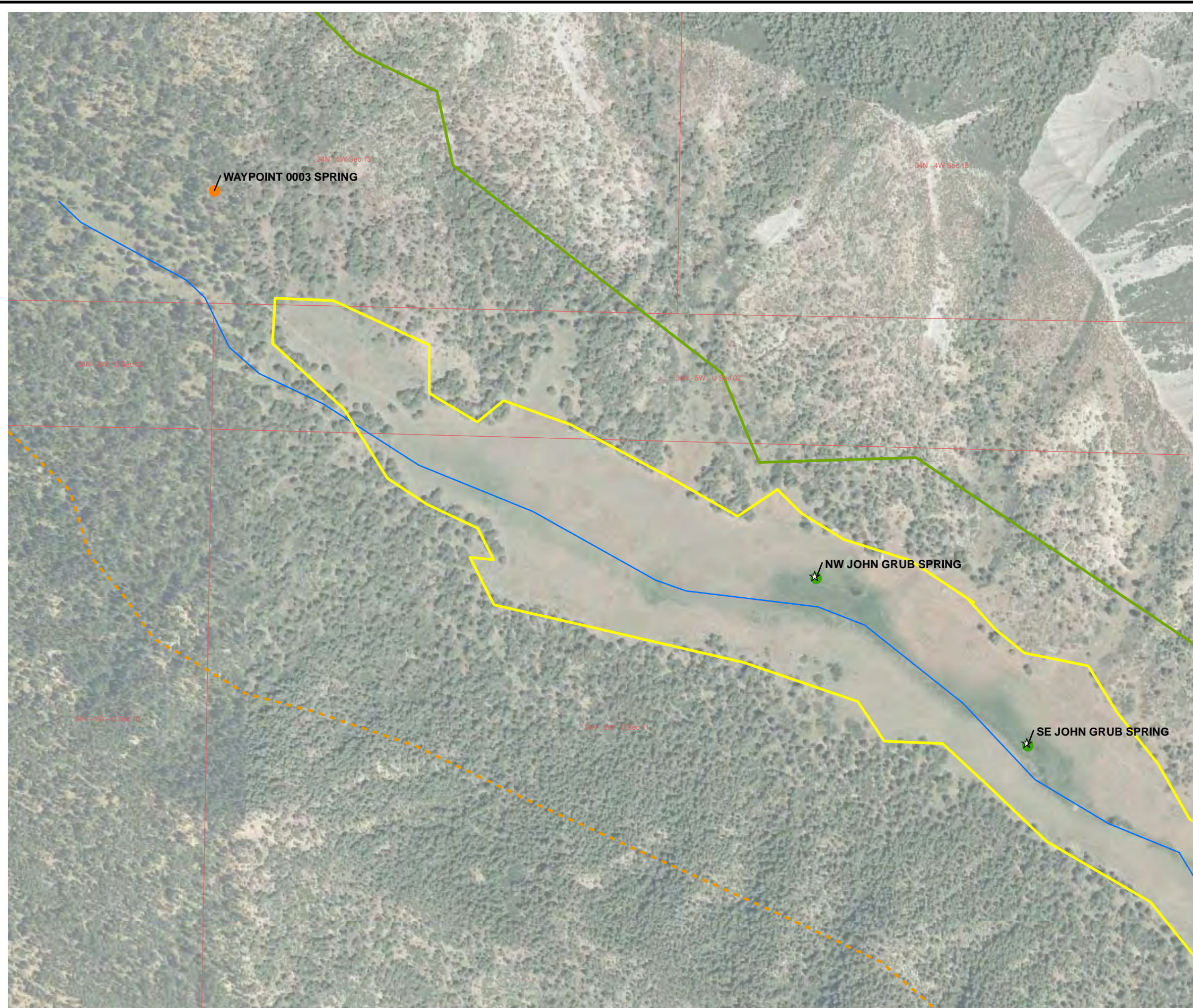
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16E**  
**DETAILED SPRING LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

- ☆ Subsurface Methane Measurement
- NATURAL SPRING LOCATION**
- SAMPLED
- FIELD PARAMETERS ONLY
- DRY
- NOT LOCATED
- NO ACCESS

ppm - parts per million

All subsurface methane measurements shown had concentrations of 0 ppm.

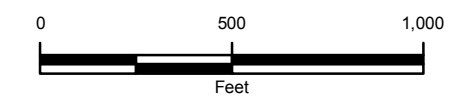
\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

□ Township Range Section

**Geology**

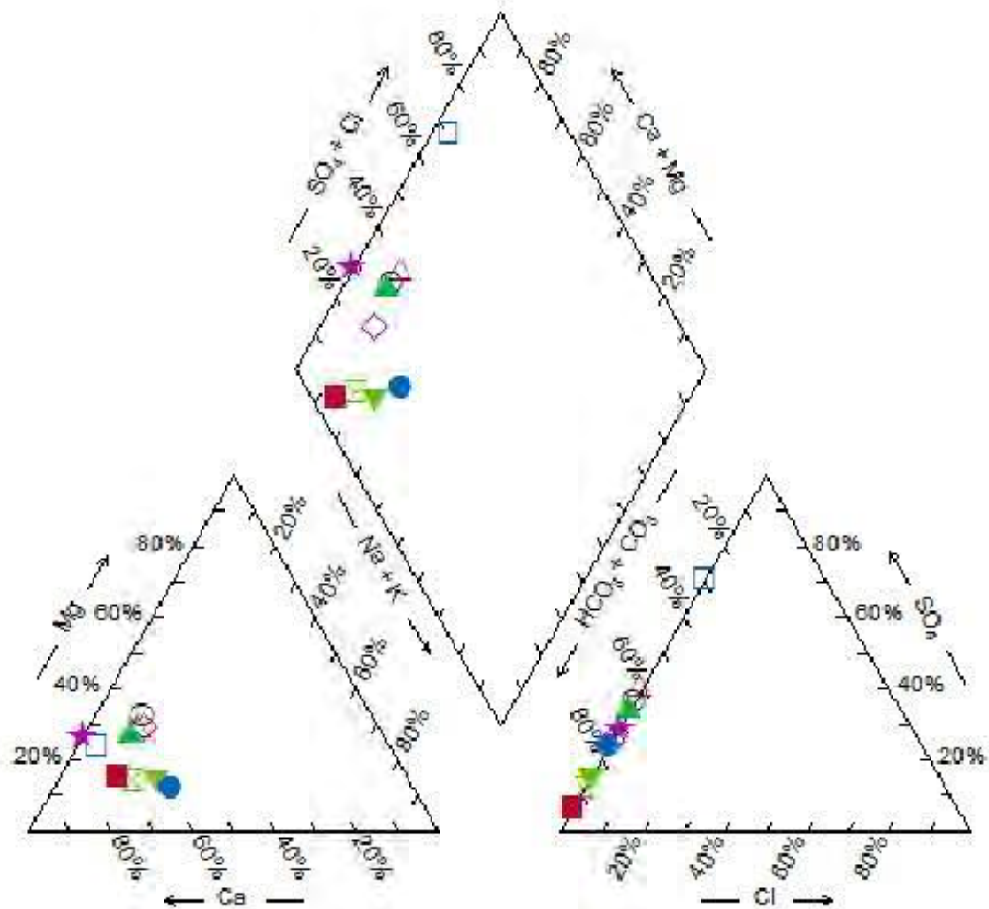
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

IMAGE COURTESY OF USDA/NRCS, 2005



**FIGURE 16F**  
**DETAILED SPRINGS LOCATION MAP**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





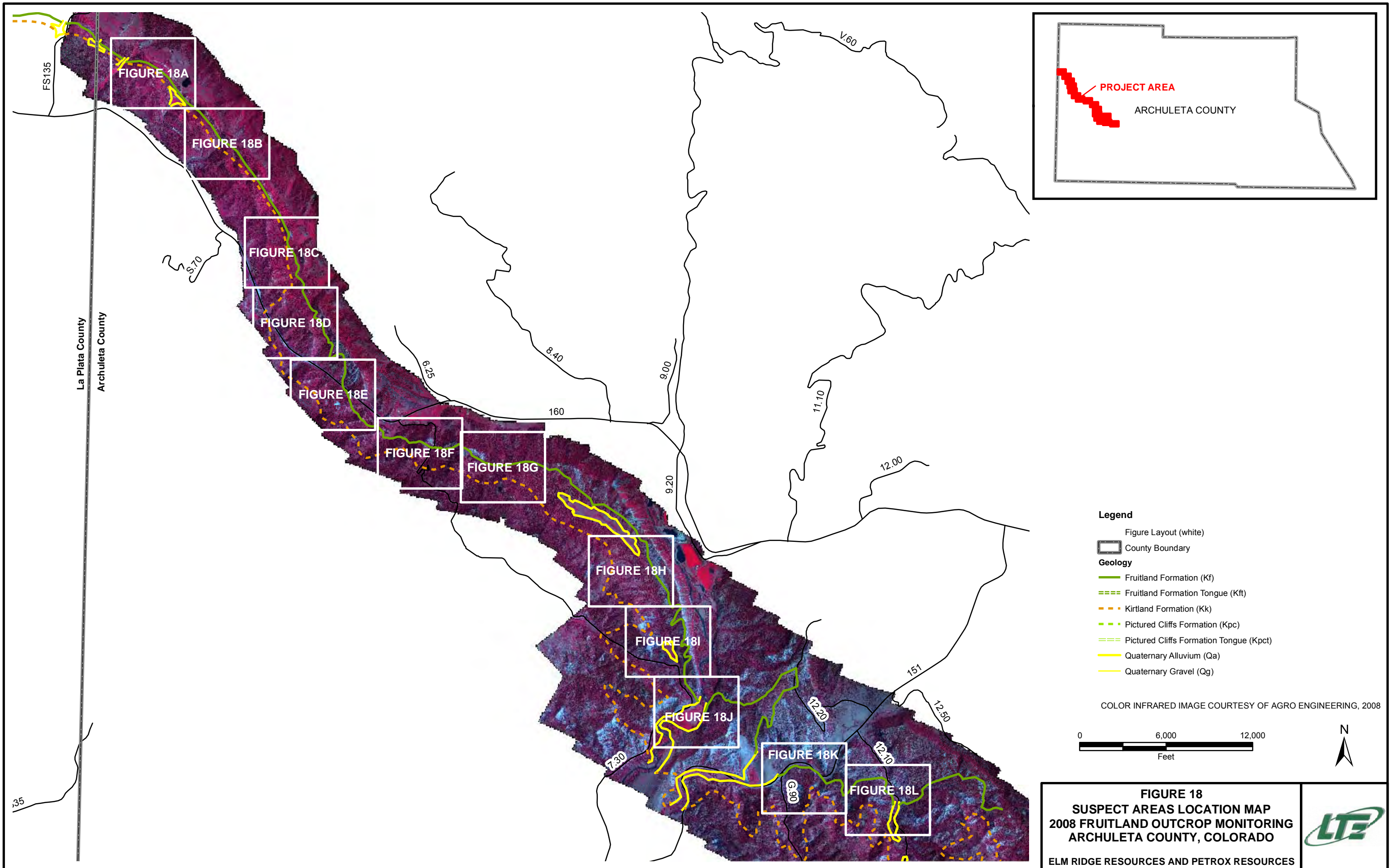
**LEGEND**

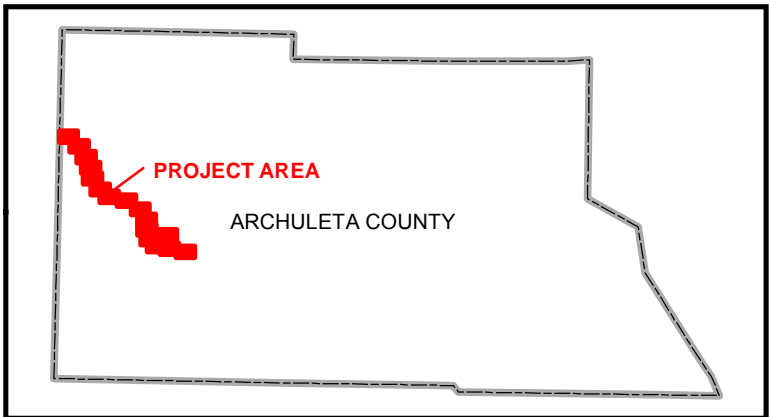
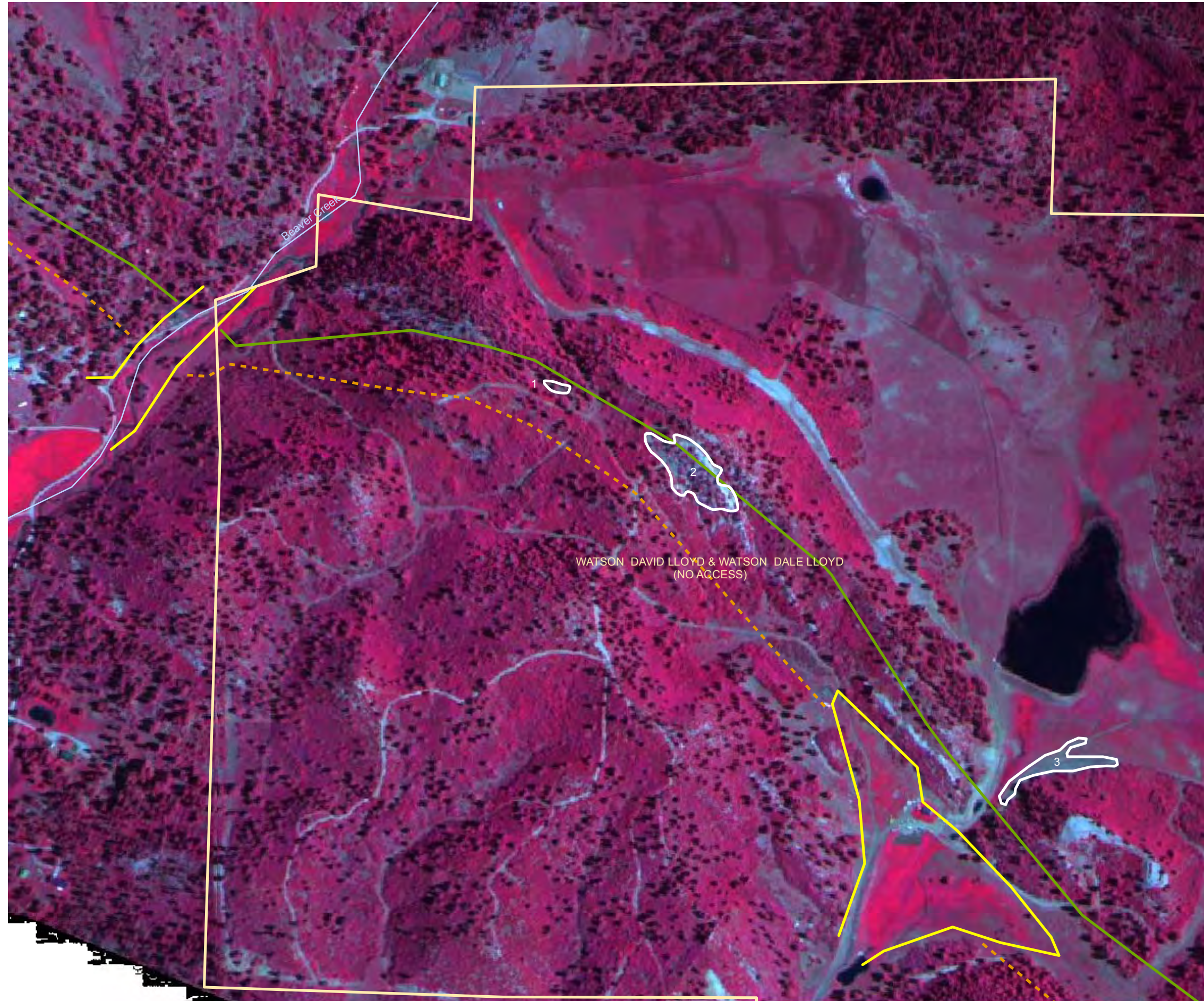
- RAMONA LEONARD SPRING (MONA)
- ◇ BEAVER CREEK
- WATSON WELL SPRING
- △ CRAIN SPRING
- ⊗ VANCE SPRING #1
- VANCE MEADOW SPRING
- ▼ WILLOW SPRING
- SECTION 14 SPRING (REICH)
- ★ NW JOHN GRUB SPRING
- ▲ SE JOHN GRUB SPRING

**FIGURE 17**  
**TRI-LINEAR DIAGRAM OF NATURAL SPRINGS WATERS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

ELM RIDGE RESOURCES AND PETROX RESOURCES







**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

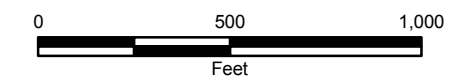
- Parcel Boundary
- Suspect Area

- ✚ BLM Probes

**Geology**

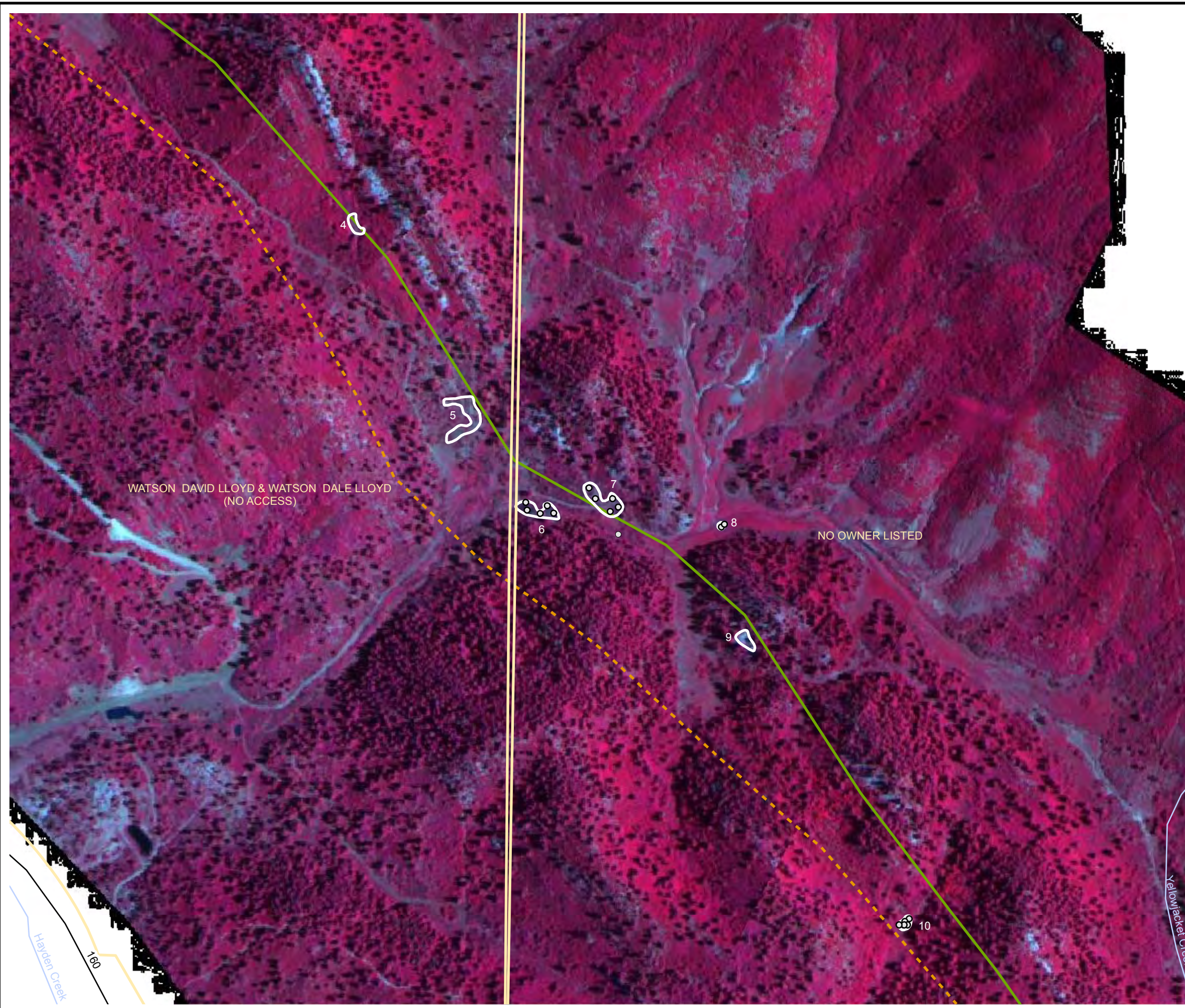
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- · - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18A**  
**SUSPECT AREAS 1-3**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

Parcel Boundary

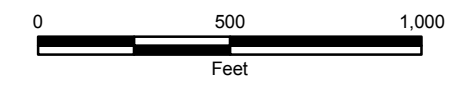
Suspect Area

BLM Probes

**Geology**

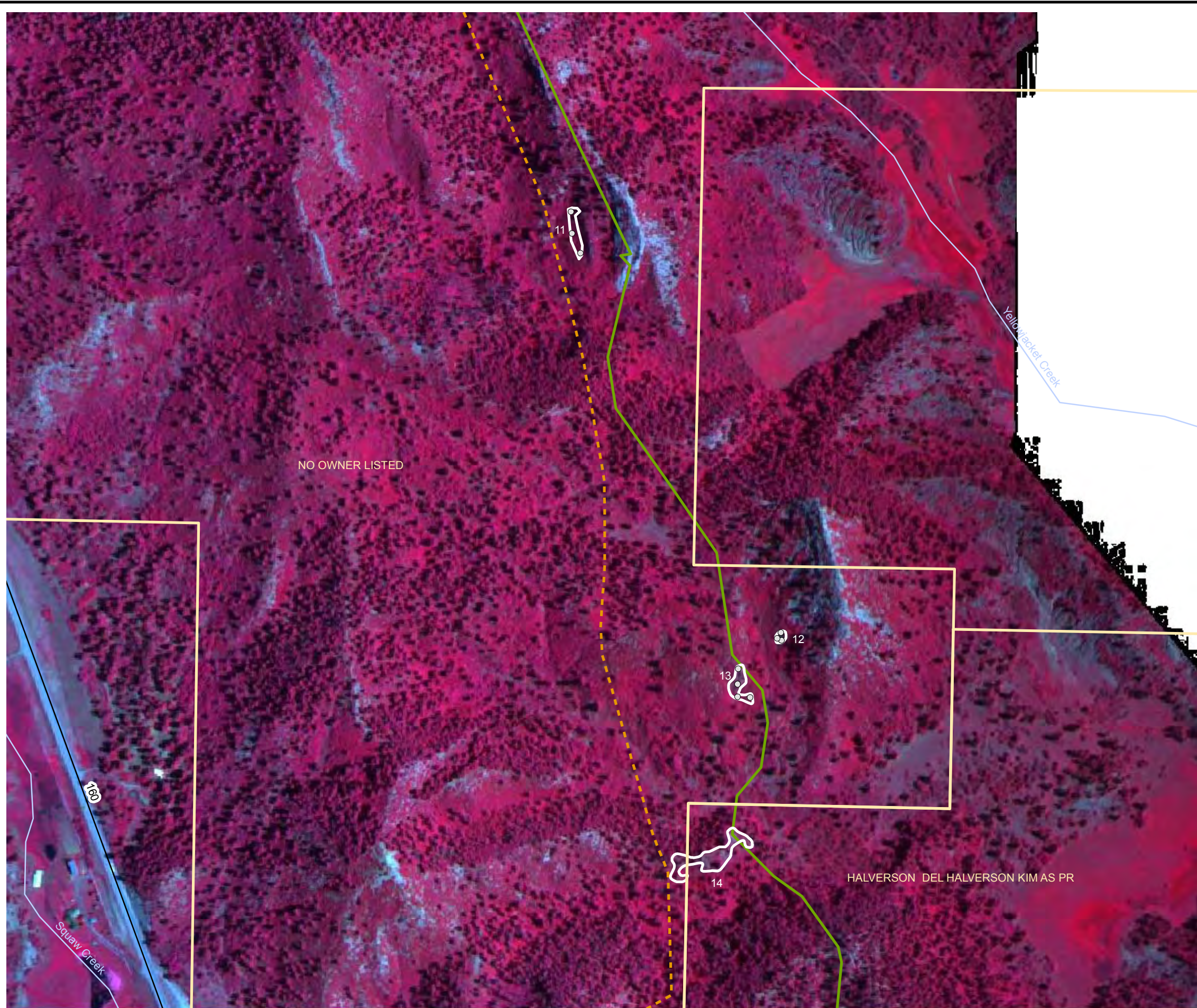
- Fruitland Formation (Kf)
- === Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- == Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18B**  
**SUSPECT AREAS 4-10**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

Parcel Boundary

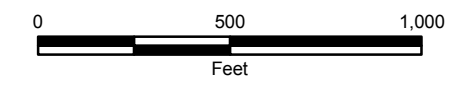
Suspect Area

BLM Probes

**Geology**

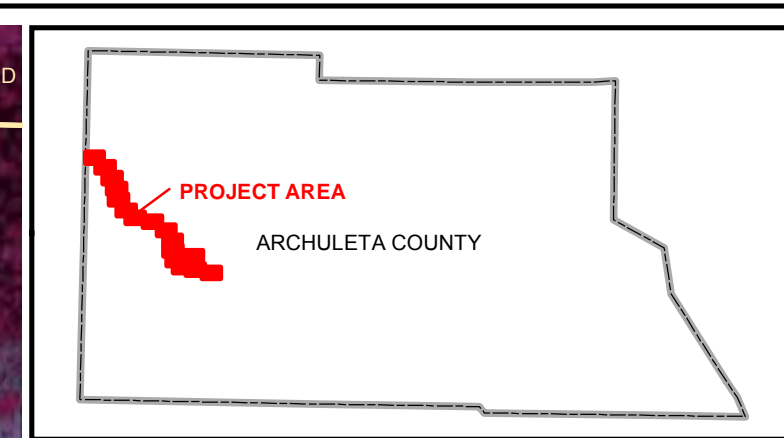
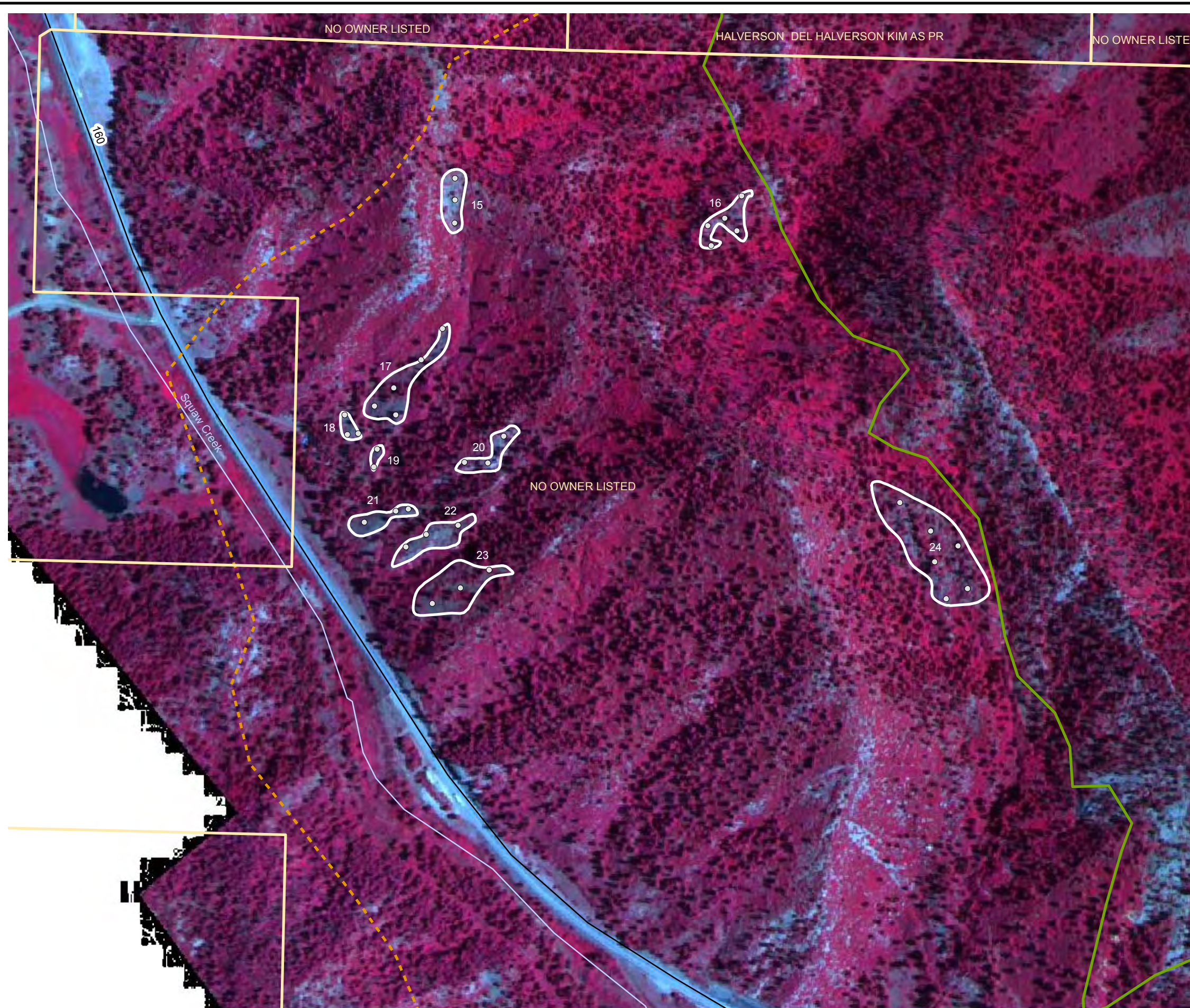
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

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**FIGURE 18C**  
**SUSPECT AREAS 11-14**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

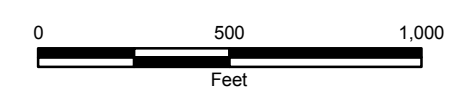
- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

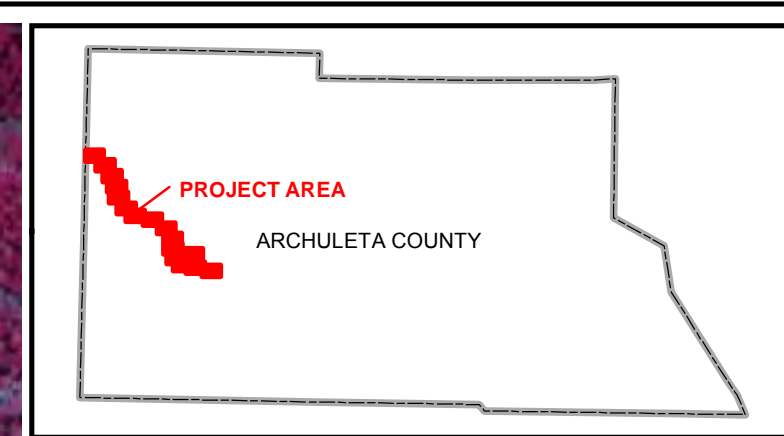
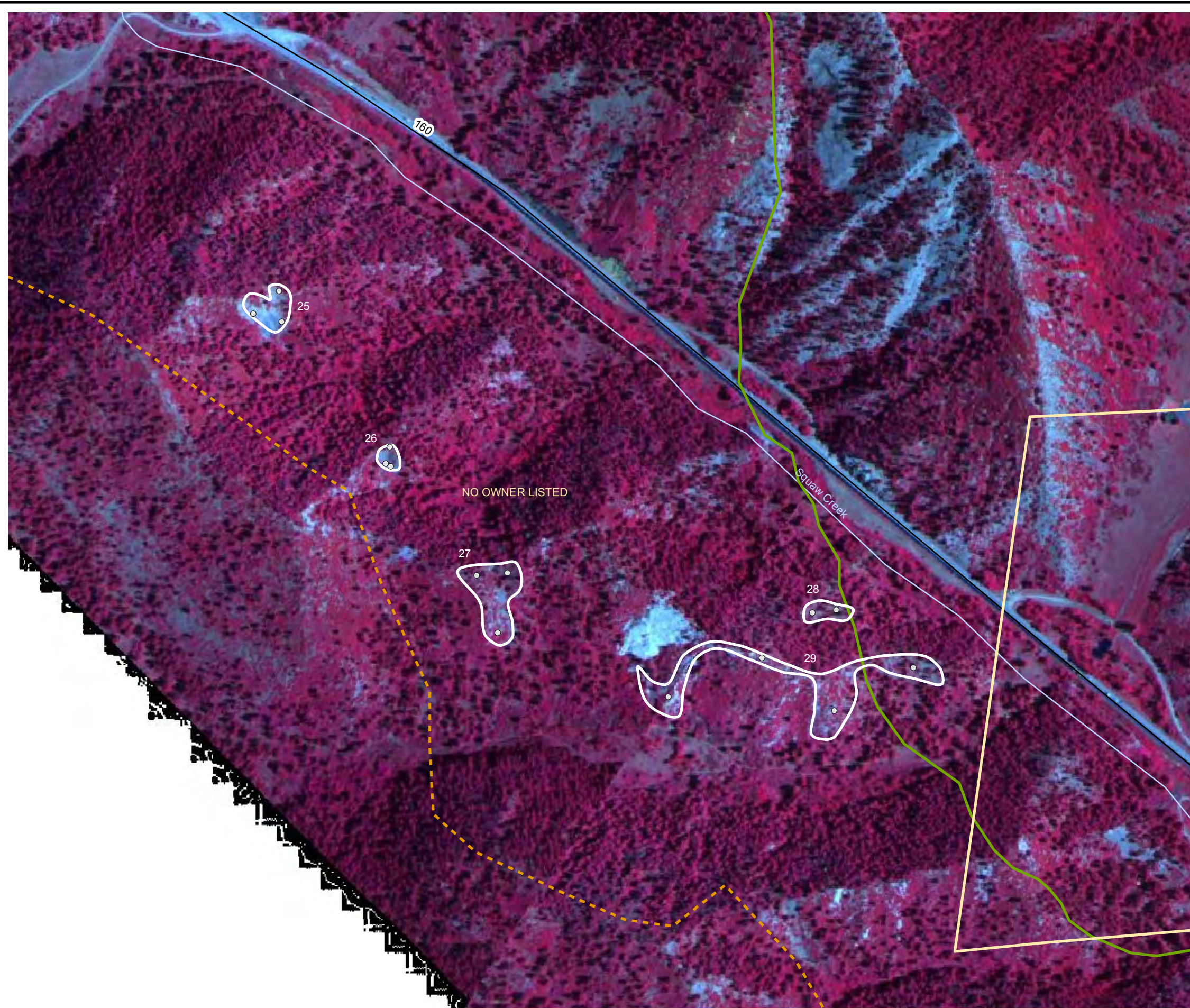
- ▭ Parcel Boundary
- ▭ Suspect Area
- ✚ BLM Probes
- Geology**
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- · - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18D**  
**SUSPECT AREAS 15-24**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

- Parcel Boundary
- Suspect Area

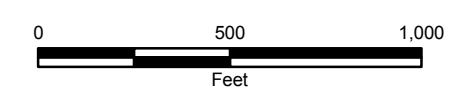
+

BLM Probes

**Geology**

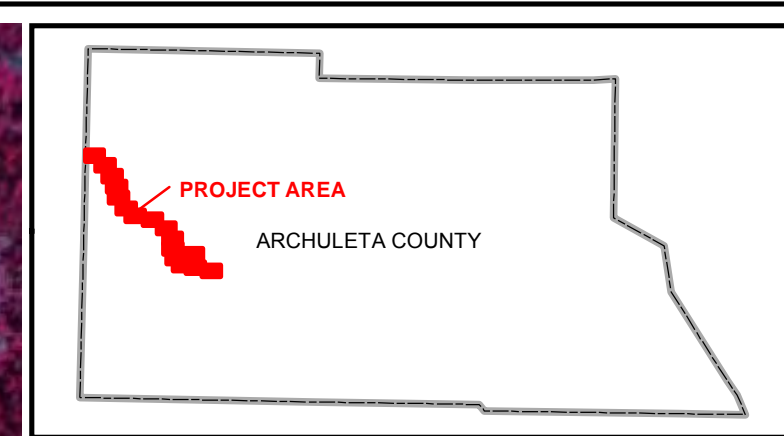
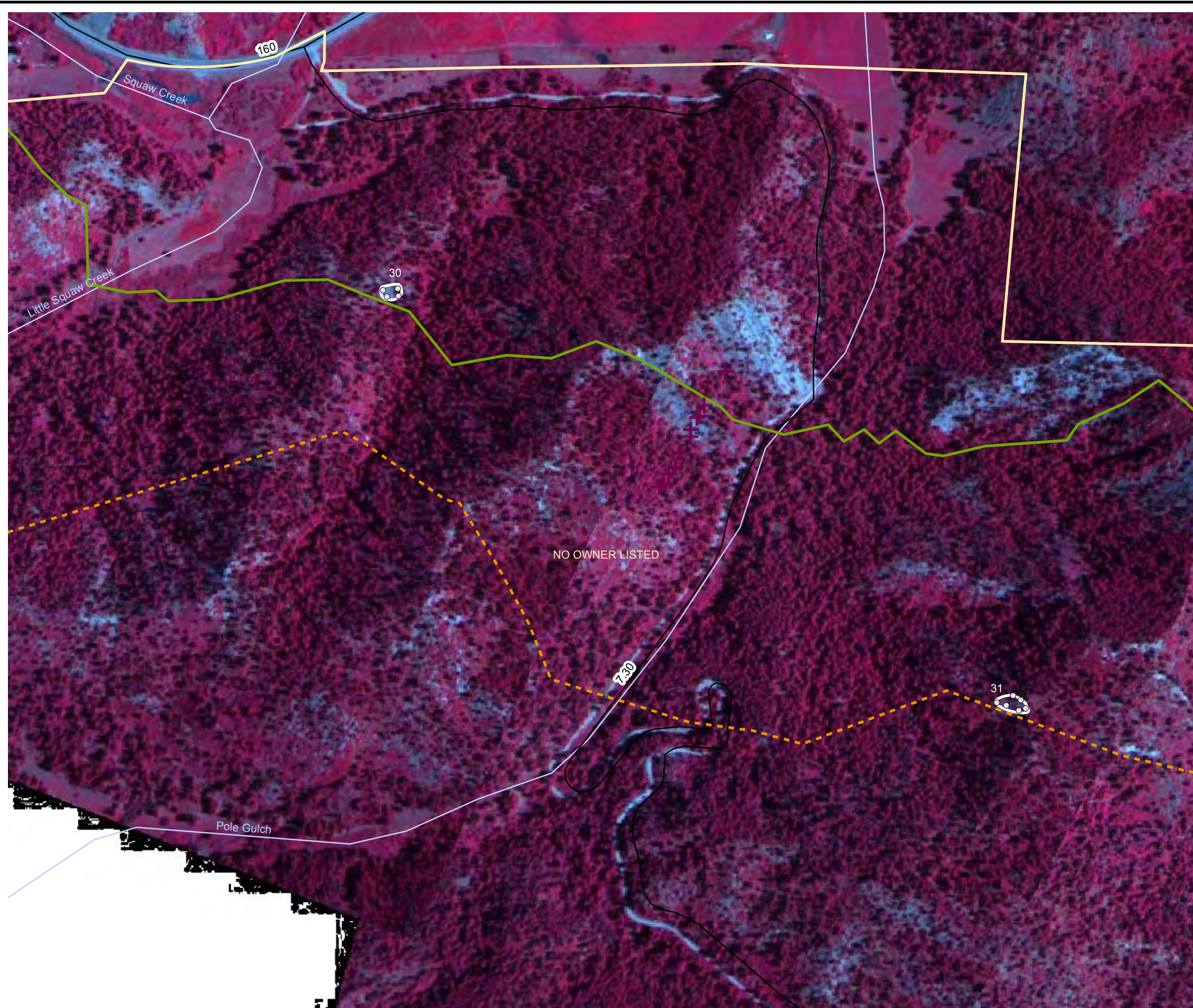
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- · - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

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**FIGURE 18E**  
**SUSPECT AREAS 25-29**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

- ▭ Parcel Boundary
- ▭ Suspect Area

- ✚ BLM Probes

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

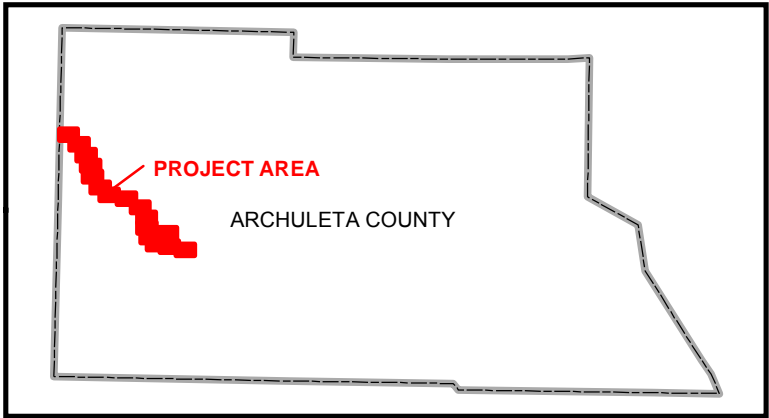
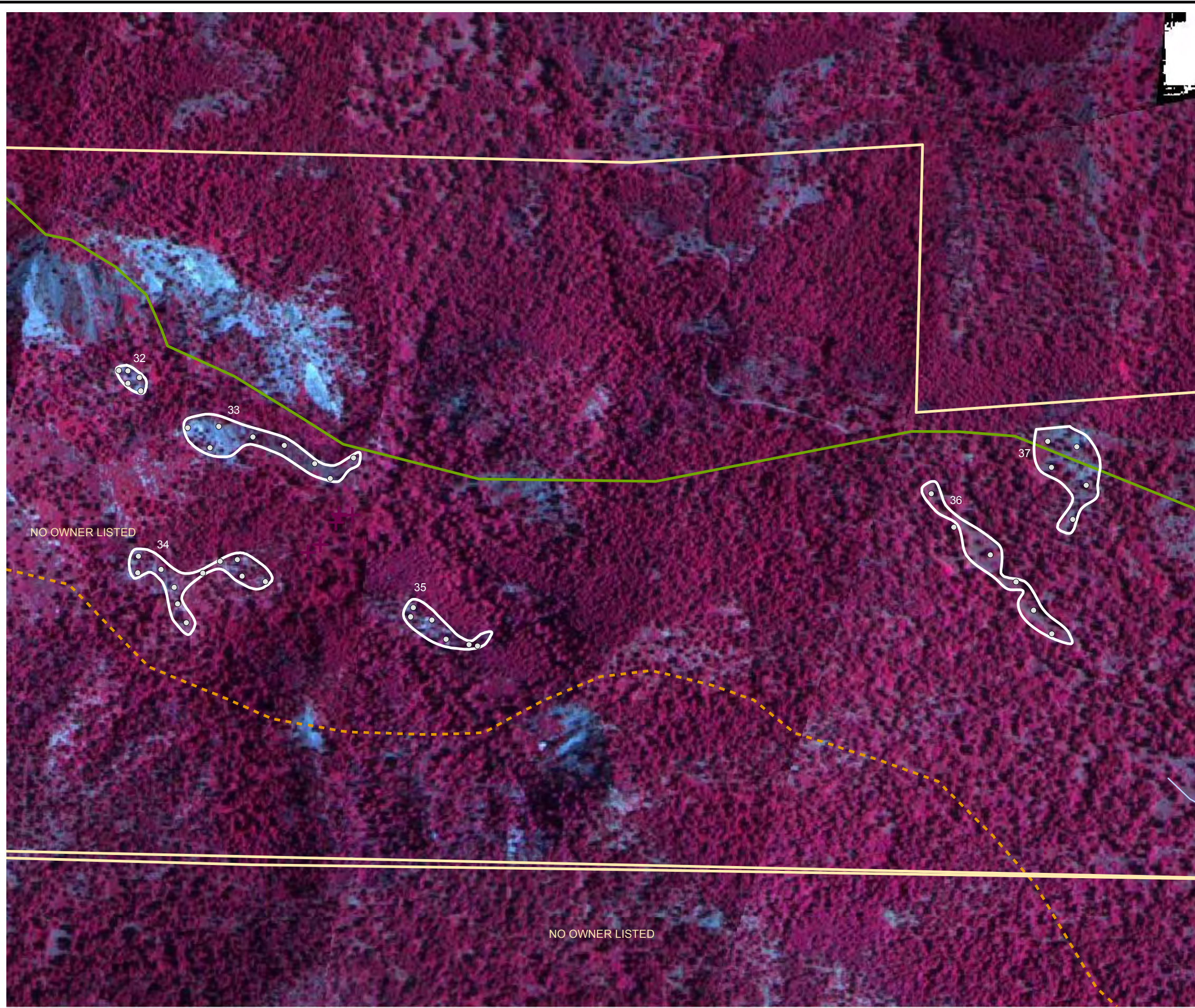
COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18F**  
**SUSPECT AREAS 30-31**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**



ELM RIDGE RESOURCES AND PETROX RESOURCES



**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

Parcel Boundary

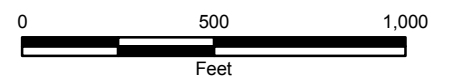
Suspect Area

BLM Probes

**Geology**

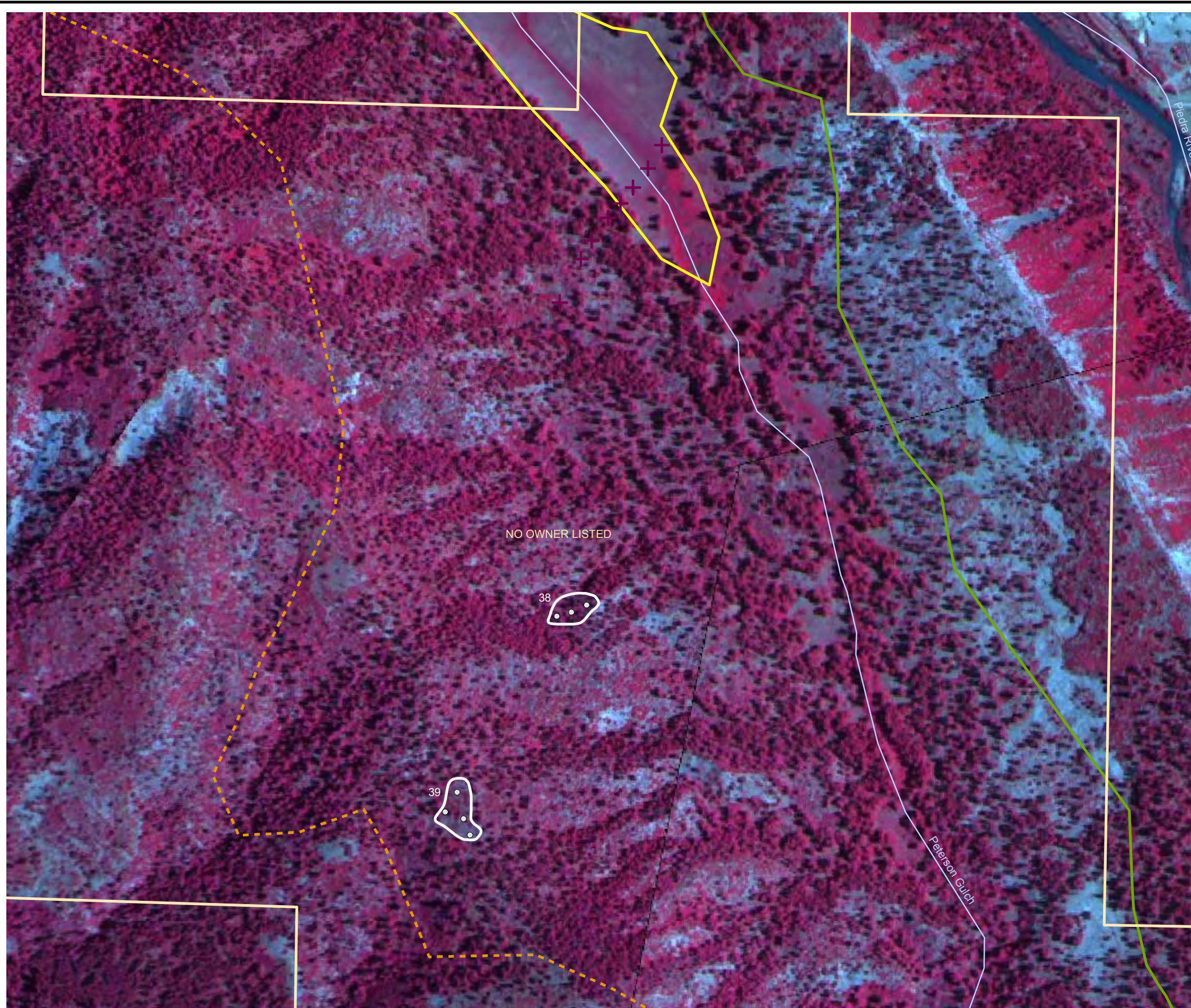
- Fruitland Formation (Kf)
- - - Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18G**  
**SUSPECT AREAS 32-37**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

Parcel Boundary

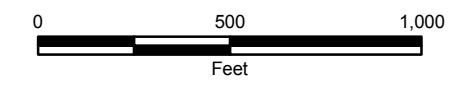
Suspect Area

BLM Probes

**Geology**

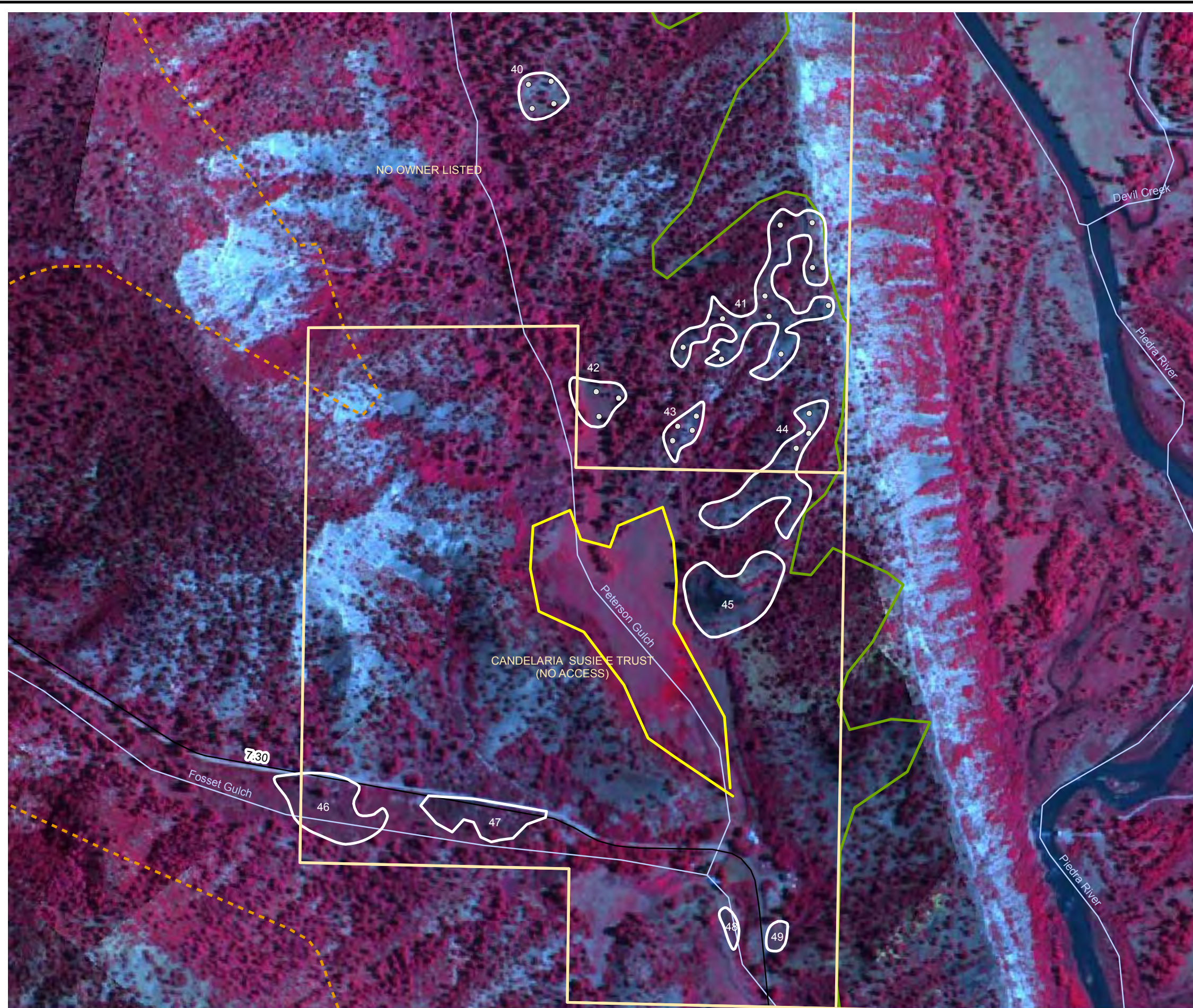
- Fruitland Formation (Kf)
- === Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- == Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18H**  
**SUSPECT AREAS 38-39**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

- ▭ Parcel Boundary
- ▭ Suspect Area

- ✚ BLM Probes

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- · - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

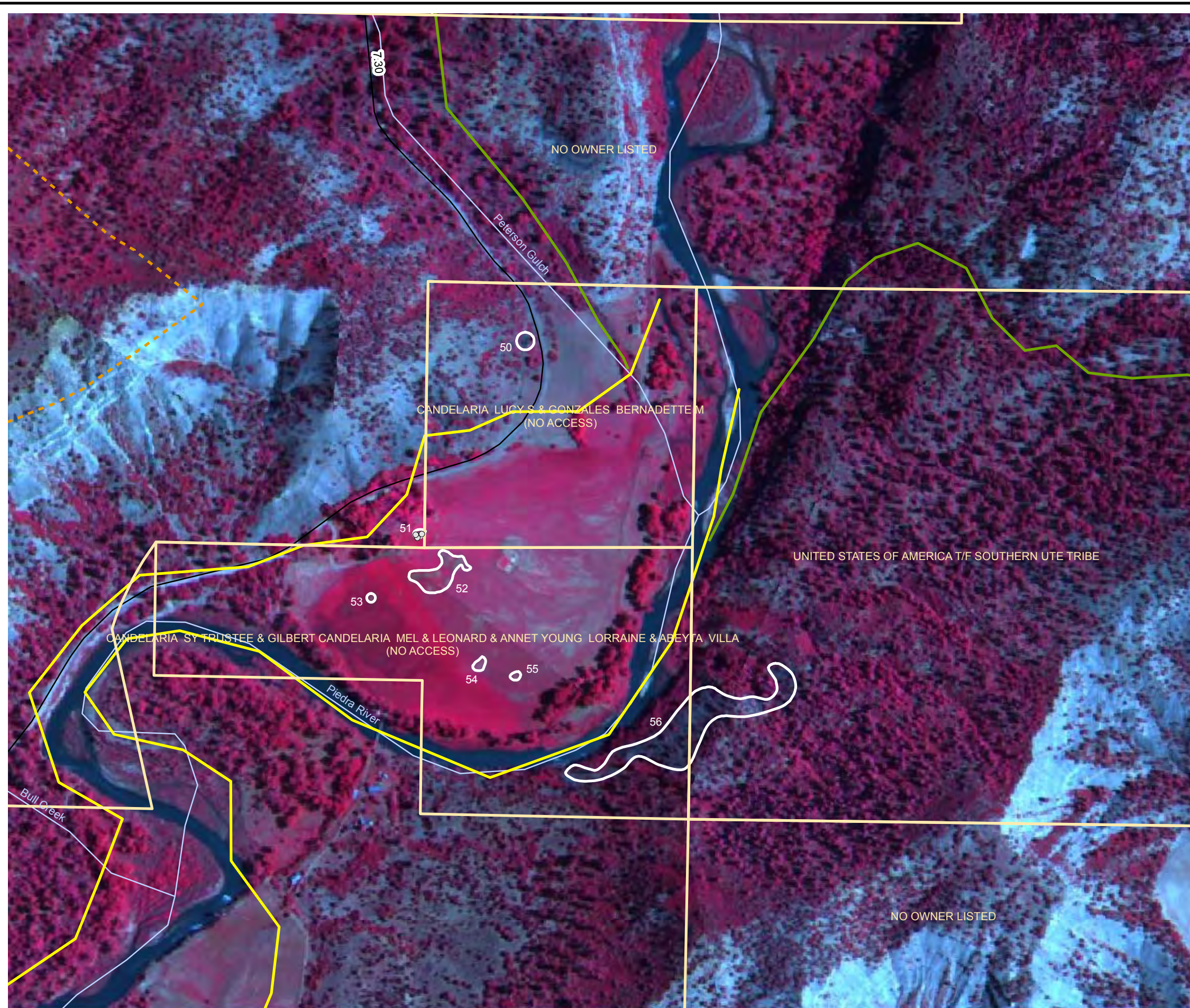
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18I**  
**SUSPECT AREAS 40-49**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

- Parcel Boundary
- Suspect Area

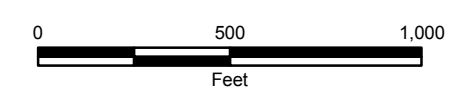
+

BLM Probes

**Geology**

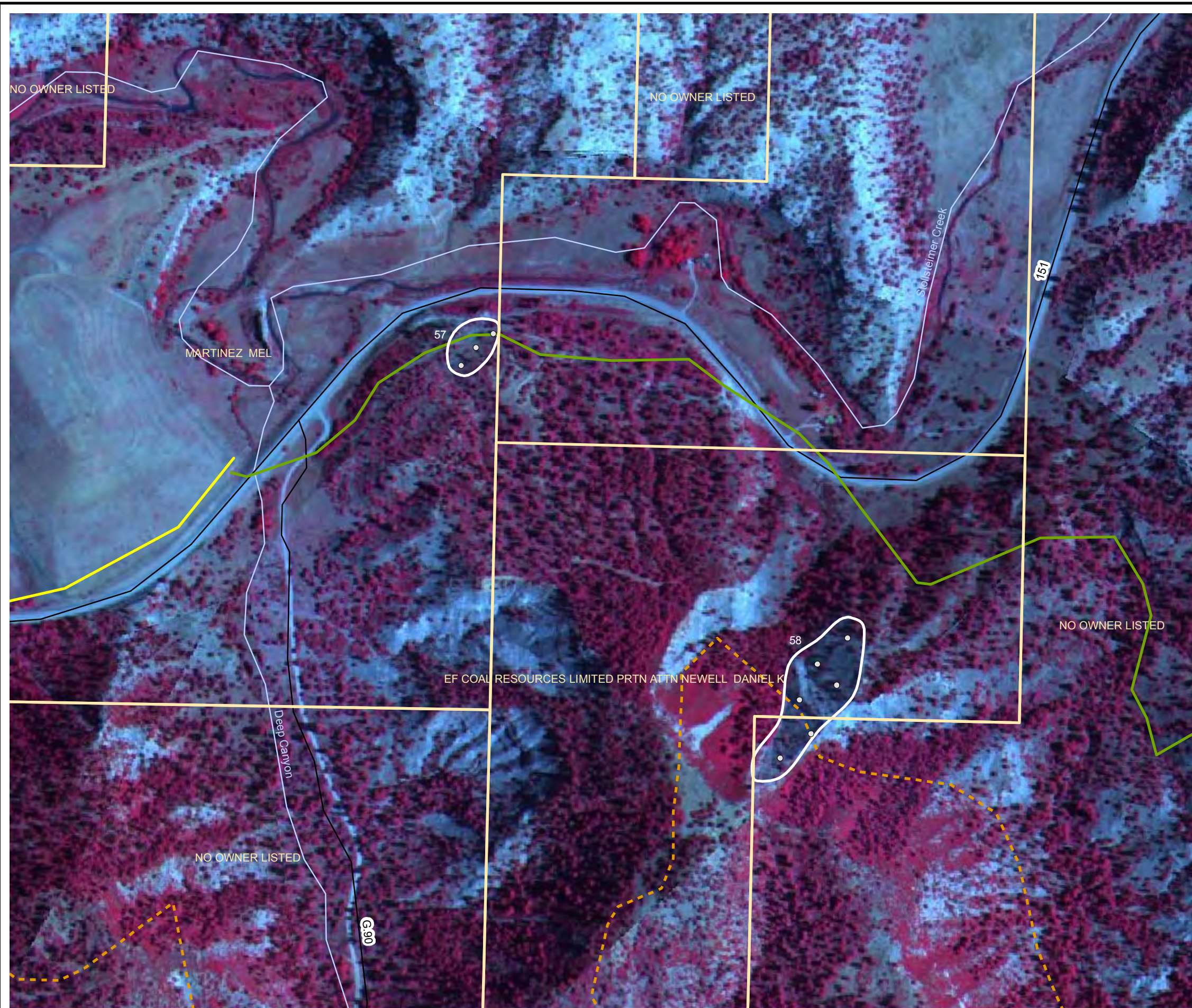
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18J**  
**SUSPECT AREAS 50-56**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

- ▭ Parcel Boundary
- Suspect Area

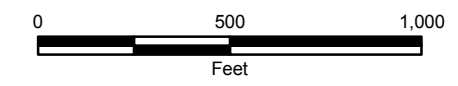
+

BLM Probes

**Geology**

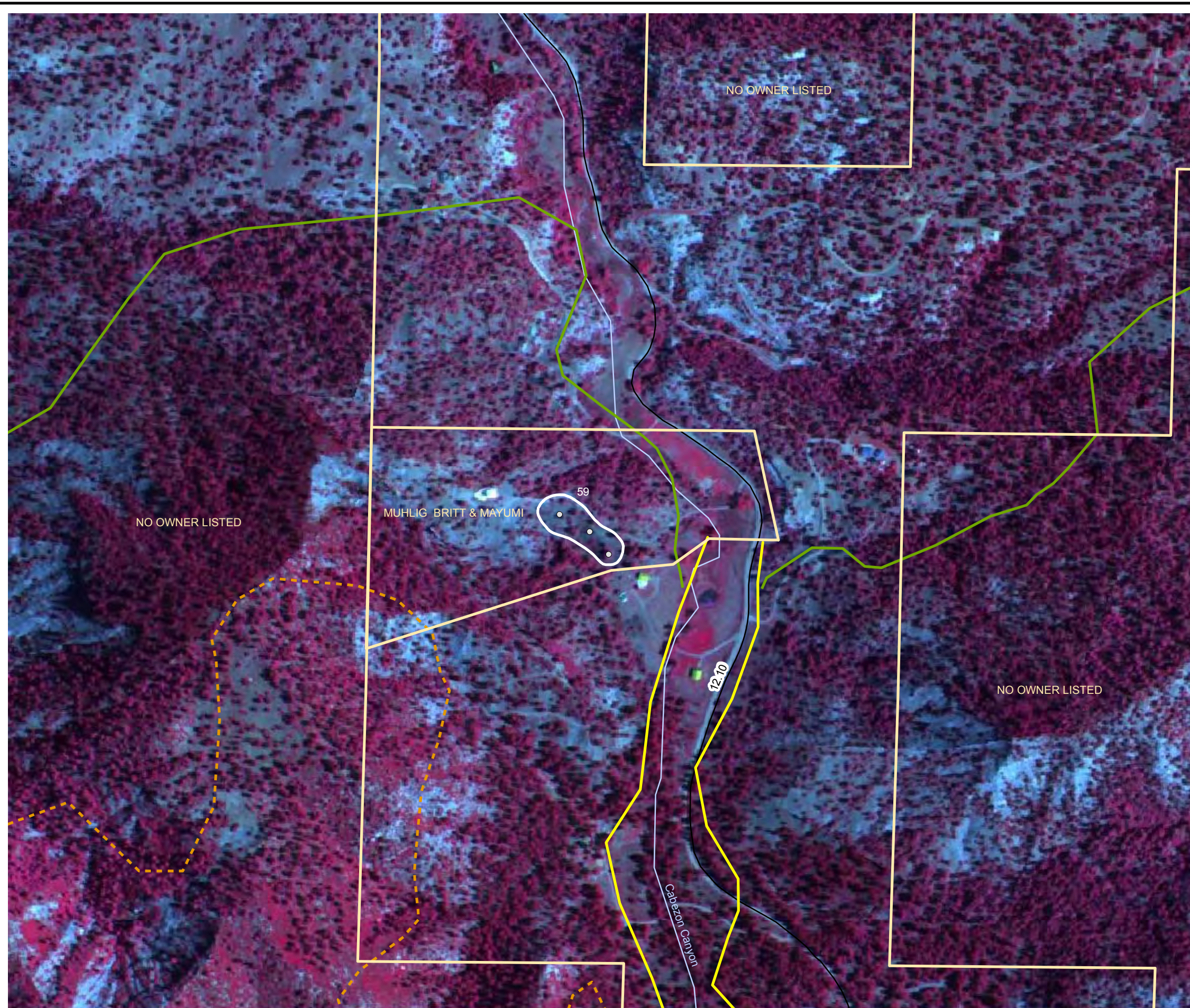
- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- - - Pictured Cliffs Formation (Kpc)
- - - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18K**  
**SUSPECT AREAS 57-58**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES





**Legend**

**Subsurface Methane Measurement**

- 0 ppm
- 1ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%

ppm - parts per million

\* Subsurface methane measurements collected from temporary soil probes advanced with slide hammer.

Parcel Boundary

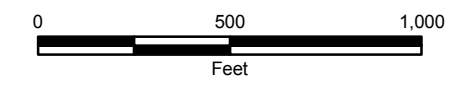
Suspect Area

BLM Probes

**Geology**

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- - - Kirtland Formation (Kk)
- · - Pictured Cliffs Formation (Kpc)
- · - Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)
- Road
- River

COLOR INFRARED IMAGE COURTESY OF AGRO ENGINEERING, 2008



**FIGURE 18L**  
**SUSPECT AREA 59**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**  
 ELM RIDGE RESOURCES AND PETROX RESOURCES



## **TABLES**



**TABLE 1**  
**PROPERTY OWNER AND ACCESS INFORMATION**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

ID Number	Parcel Number	LTE Access	Physical Address	Owner Name	Mailing Address	Mailing City	Mailing State and Zip	Legal Description	Parcel Size (Acres)	Latitude/Longitude
1	56830100001	YES		Federal					0.000	
2	56850100001	YES		Federal					0.000	
3	56833200010	NO	W HIGHWAY 160 X ESMT	HALVERSON HAROLD D ESTATE	23541 COUNTY RD S	DOLORES	CO 81323**	35-5W SEC 33	278.913	107.4276285W 37.2588724N
4	56851030009	YES	W HIGHWAY 160 26410	EDWARDS DURWOOD	710 E HOLLAND	ALPINE	TX 79830	34-5W SEC 10	12.495	107.4170414W 37.2288842N
5	568505100016	YES	W HIGHWAY 160 28061	WEISS GRETCHEN A	874 LOGGERHEAD LANE	SUMMERLAND KEY	FL 33042	34-5W SEC 5	8.277	107.4397366W 37.2475521N
6	568505200020	NO RESPONSE	W HIGHWAY 160 28444	INN ABOVE ONION CREEK INC	4444 HWY 150 WEST	KYLE	TX 78640	34-5W SEC 5	245.669	107.4488552W 37.2467916N
7	56833200040	NO RESPONSE	W HIGHWAY 160 28644	COLORADO YELLOW JACKET LTD P/NSHP	PO BOX 774525	STEAMBOAT SPRINGS	CO 80477	34-5W SEC 5	91.258	107.4471289W 37.2545177N
8	56833200009	NO RESPONSE	W HIGHWAY 160 28945	STRICKLAND SCOTT L & NIOBRA J	28945 E US HWY 160	BAYFIELD	CO 81122	35-5W SEC 32	16.709	107.4437199W 37.2564906N
9	56831020034	NO	W HIGHWAY 160 30301 A	WATSON DAVID LLOYD &	30901 US HWY 160	BAYFIELD	CO 81122	35-5W SEC 19	1064.422	107.4633723W 37.2839146N
10	567913300015	YES	W HIGHWAY 160 31861M	LEONARD RAMONA	PO BOX 207	MAYER	AZ 86333	35-6W SEC 13	26.772	107.4807203W 37.2986948N
11	567913400016	YES	W HIGHWAY 160 31861B	PEINADO EMILIO JR & KAREN R	PO BOX 706	BAYFIELD	CO 81122	35-6W SEC 13	40.098	107.4751287W 37.2974749N
12	567913400017	YES	W HIGHWAY 160 31861L	WOOD LEE THOMAS & PEGGY DARLENE	31861 L W HWY 160	BAYFIELD	CO 81122	35-6W SEC 13	37.432	107.4772925W 37.2954878N
13	589701400003	YES		Federal					0.000	
14	589528400043	NO	COUNTY RD 917 1023	WRIGHT JEAN PAUL & SUSAN	1023 COUNTY ROAD 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	35.213	107.2895008W 37.1560879N
15	589528400051	YES	COUNTY RD 917 1000A	SCHUCHARDT JOSEPH III & SIRI	511 STEVENS CIR	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	39.470	107.2827076W 37.1606722N
16	589511200003	NO	HIGHWAY 151 368	UNITED STATES OF AMERICA T/F	PO BOX 737	IGNACIO	CO 81137	34U-4W	3505.197	107.2846571W 37.1913186N
17	589528400042	YES	COUNTY RD 917 1000	HALLOCK JAMES & NORA	1000 COUNTY RD 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	35.086	107.2871869W 37.1588274N
18	589528400049	YES	COUNTY RD 917 1019	MUHLIG BRITT & MAYUMI	1019 COUNTY RD 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	34.963	107.2905460W 37.1573476N
19	589528300041	NO RESPONSE	COUNTY RD 917 1001	CHENAULT ROBERT G	1001 COUNTY RD 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	34.960	107.2917877W 37.1615535N
20	589528300050	NO	COUNTY RD 917 1000	LEISER SANDRA J	RR 1 BOX 100	MADISON	KS 66860	34U-4W SEC 28	35.036	107.2886180W 37.1615376N
21	589528400053	NO RESPONSE	COUNTY RD 917	WOZNY THEODORE G TRUST ACCOUNT	1601 COUNTY RD 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 28	35.375	107.2872467W 37.1534398N
22	589532000046	YES	COUNTY RD 917 1601	LEON EUGENIA &	1601 A CR 917	PAGOSA SPRINGS	CO 81147	34U-4W SEC 33	41.103	107.2902055W 37.1534003N
23	589533400048	NO RESPONSE	COUNTY RD 917 1859	MODISSETTE JERRY L & BEVERLY A	17110 CYPRESS ROSE HILL DR	CYPRESS	TX 77429	34U-4W SEC 33	39.371	107.2873806W 37.1462336N
24	589533100045	NO	COUNTY RD 917 1590	PETSCH GLORIA A	1168 BEUCLER LANE	PAGOSA SPRINGS	CO 81147	34U-4W SEC 33	42.697	107.28333805W 37.1498740N
25	589533100047	NO RESPONSE	COUNTY RD 917 1589	SCHAEFER JAMES & NANCY	2754 S LAS PALMAS	MESA	AZ 85202	34U-4W SEC 33	36.129	107.2874029W 37.1498359N
26	589533400033	NO RESPONSE	COUNTY RD 917 1818	MODISSETTE JERRY L & BEVERLY A	17110 CYPRESS ROSE HILL RD	CYPRESS	TX 77429	34U-4W SEC 33	39.329	107.2828948W 37.1462775N
27	589533400034	NO RESPONSE	COUNTY RD 917 2255	ADAM ROBERT J	12611 JONES RD STE #200	HOUSTON	TX 77070	34U-4W SEC 33	39.331	107.2874383W 37.1426306N
28	568510300010	NO RESPONSE	W HIGHWAY 160 26260	HARRISON JERRY	PO BOX 611	BEACH GROVE	IN 46107-0611	34-5W SEC 10	17.346	107.4141421W 37.2285446N
29	589712400002	YES	COUNTY RD 175 2117 & 2119 & 2121	RAFTER T LLC/RAFTER T LLC	340 SEABREEZE DR.	MARCO ISLAND	FL 34145	34U-5W SEC 12	792.487	107.3344796W 37.1930959N
30	589529300027	YES	HIGHWAY 151 X	EF COAL RESOURCES LIMITED PR/NTN	PO BOX 773457	STEAMBOAT SPRINGS	CO 80477	34U-4W SEC 29	157.152	107.3074462W 37.1570456N
31	589725400016	YES	HIGHWAY 151 6971	MARTINEZ AMOS MEL	2400 COUNTY RD 329	IGNACIO	CO 81137	34U-5W SEC 25	19.762	107.3412769W 37.1560602N
32	589711200001	YES	W HIGHWAY 160 24160	GRUBB JOHN W & PAMELA K	8325 OLD AZTEC HWY	FLORA VISTA	NM 87415	34U-5W SEC 11	159.274	107.3596091W 37.2093422N
33	589725100011	NO	COUNTY RD 193 5801	CANDELARIA ROGER	9105 SIXTH ST	LANHAM	MD 20706	34U-5W SEC 25	60.135	107.3412773W 37.1659743N
34	589725400015	NO RESPONSE	HIGHWAY 151 6505A	VAUGHN LARRY C	6505A HWY 151	PAGOSA SPRINGS	CO 81147	34U-5W SEC 25	19.762	107.3412769W 37.1578502N
35	589725400013	NO	HIGHWAY 151 X	MARTINEZ JOHN L &	5768 HANSEN CIR	MURRAY	UT 84107	34U-5W SEC 25	39.823	107.3412770W 37.1605367N
36	589724400008	NO	COUNTY RD 193 X	CANDELARIA SY TRUSTEE & GILBERT	PO BOX 1771	ARBOLLES	CO 81121	34U-5W SEC 24	59.991	107.3390038W 37.1713890N
37	589713300006	NO	COUNTY RD 193 6551	CANDELARIA SUSIE	PO BOX 1764	ARBOLLES	CO 81121	34U-5W SEC 13	160.288	107.3436380W 37.1849042N
38	589724400010	NO	COUNTY RD 193 5801A	CANDELARIA ROGER	9105 SIXTH ST	LANHAM	MD 20706	34U-5W SEC 24	19.859	107.3412824W 37.1704889N
39	589726400024	YES		Federal					0.000	
40	589725400033	NO	HIGHWAY 151 X	SHEPARD JOSEPH W & TERRIL	10338 W EARL DR	AYONDALE	AZ 85323	34U-5W SEC 25	107.950	107.3322900W 37.1605486N
41	589724400097	NO	COUNTY RD 193 5879	CANDELARIA LUCY S &	PO BOX 1812	ARBOLLES	CO 81121	34U-5W SEC 24	39.283	107.3367599W 37.1750192N
42	589530100039	YES	HIGHWAY 151 5461	MARTINEZ MEL	5671 STATE HWY 151	PAGOSA SPRINGS	CO 81147	34U-4W SEC 30	79.285	107.3163700W 37.1642304N
43	589530100039	YES	HIGHWAY 151 5671	MARTINEZ MEL	5671 STATE HWY 151	PAGOSA SPRINGS	CO 81147	34U-4W SEC 30	248.000	107.3175202W 37.1642058N
44	589529100026	NO RESPONSE	HIGHWAY 151 X	CAZEDESSUS CAMILE E JR	PO BOX 2340	PAGOSA SPRINGS	CO 81147-2340	34U-4W SEC 29	15.997	107.3094626W 37.1633518N
45	589725100012	YES		Federal					0.000	

Notes:  
NO Indicates property access was denied.  
NO RESPONSE Indicates landowner did not respond to access request.

**TABLE 2**  
**METHANE FLUX VALUES AT THE SIX DRAINAGE TRANSECTS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Drainage Area	Total Number of Sample Points		Number of Sample Points w/ Methane		Methane Flux (moles/m <sup>2</sup> ·day)					
					Minimum		Maximum		Average	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Beaver Creek	14	53	9	17	0.05	0.0002	0.2	0.1579	0.13	0.0402
Little Squaw Creek	21	77	20	20	0.002	0.0002	0.23	0.2911	0.08	0.0498
Yellow Jacket Pass/ Squaw Creek	10	208	3	54	0.02	0.0002	0.07	0.0373	0.05	0.0070
Pole Gulch	10	86	7	26	0.02	0.0002	0.3	0.1775	0.09	0.0342
Peterson Gulch	18	357	14	105	0.009	0.0002	0.23	0.1925	0.08	0.0108
Stollsteimer Creek	11	201	6	68	0.02	0.0002	0.15	0.3440	0.07	0.0289
<b>TOTAL</b>	84	982	59	290	0.002	0.0002	0.3	0.344	0.085	0.0203

Notes:

moles/m<sup>2</sup>·day - moles per meter squared per day

**TABLE 3**  
**METHANE VOLUMETRIC FLUX VALUES AT THE SIX DRAINAGE TRANSECTS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

<b>Drainage Area</b>	<b>Methane Flux Area (feet<sup>2</sup>)</b>	<b>Total Number of Sample Point</b>	<b>Methane Volume (moles/day)</b>	<b>Methane Volume (MCFD)</b>
Beaver Creek	2,299,298	53	2,958	3.5
Little Squaw Creek	2,500,373	77	5,108	6.1
Yellow Jacket Pass/Squaw Creek	6,375,567	208	1,273	1.5
Pole Gulch	2,368,305	86	3,832	4.6
Peterson Gulch	10,358,485	357	4,637	5.6
Stollsteimer Creek	5,672,637	201	7,768	9.3

Notes:

MCFD - thousand cubic feet per day

**TABLE 4**  
**METHANE FLUX VALUES AT THE BIG HORN-SCHOMBURG #1 ABANDONED WELL SITE**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

<b>METHANE FLUX VALUES AT BIG HORN SCHOMBURG #1 SITE</b>									
<b>Total Number of Sample Points</b>		<b>Number of Sample Points w/ Methane</b>		<b>Measurable Methane (moles/m<sup>2</sup>·day)</b>					
				<b>Minimum</b>		<b>Maximum</b>		<b>Average</b>	
<b>2007</b>	<b>2008</b>	<b>2007</b>	<b>2008</b>	<b>2007</b>	<b>2008</b>	<b>2007</b>	<b>2008</b>	<b>2007</b>	<b>2008</b>
5	9	5	2	0.0338	0.0045	0.2364	0.0661	0.1295	0.0353

Notes:

moles/m<sup>2</sup>·day - moles per meter squared per day

**TABLE 5**  
**SAMPLING STATUS OF NATURAL SPRINGS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

NATURAL SPRING NAME	DETAILED FIGURE REFERENCE	YEAR			
		2005	2006	2007	2008
Ramona Spring	16A				Dry
Ramona Leonard Spring	16A		Sampled	Sampled	Sampled
Wood Spring	16A				Dry
Beaver Creek	16A				Sampled
Corrigan Spring	16A				Not Located
Watson Well Spring	16B		Sampled		Sampled
High Watson Spring	16B				Field Param. Only
Grassy Spring	16B		Sampled	Sampled	No Access
Crain Spring	16B		Sampled		Sampled
Thick Spring	16C		Sampled	Sampled	Not Located
Seep Spring	16C				Dry
Walt Spring #1	16C		Sampled		Dry
Townsend Spring	16C				Dry
Vance Spring #1	16D		Sampled	Sampled	Sampled
Vance Meadow Spring	16D		Sampled	Sampled	Sampled
Willow Spring	16E		Sampled	Sampled	Sampled
Big Hole Spring	16E		Sampled		Dry
Section 14 (Reich) Spring	16E	Sampled	Sampled	Sampled	Sampled
Waypoint 0003 Spring	16E				Not Located
NW John Grubb Spring	16E	Sampled	Sampled	Sampled	Sampled
SE John Grubb Spring	16E	Sampled	Sampled	Sampled	Sampled
Section 10U Spring	Not Shown	Sampled	Sampled		No Access
Spring 1212	Not Shown	Sampled	Sampled		No Access
Spring 3424	Not Shown	Sampled	Sampled		No Access
Candelaria A Spring	Not Shown				No Access
Candelaria B Spring	Not Shown		Sampled		No Access
Vaughn Spring	Not Shown				No Access
Miser Spring & Pipeline	Not Shown				No Access

**Notes:**

2005 through 2007 notations indicate only the natural springs that were sampled.  
2008 notations indicate the full status of the natural springs.

**TABLE 6**  
**NATURAL SPRINGS FIELD OBSERVATIONS AND MEASUREMENTS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Natural Spring Name	2008 Field Observations / Notes	Inspection Date	Water Quality Field Measurements				
			Conductivity (µS)	Ph (Units)	ORP (mV)	Temperature (°C)	TDS (ppm)
Ramona Leonard Spring (Mona)	Spring on Ramona Leonard property, on outcrop near county border.	9/19/2005					
		6/1/2006	768.4	6.35	107	13.5	522.4
		10/13/2007	793.5	7.68	42	11.8	413.4
		10/16/2008	879	6.99	185.6	9.67	571
Ramona Spring	Spring dry.	6/1/2006					
		10/14/2007					
		10/16/2008					
Wood Spring	Spring dry.	6/1/2006					
		10/14/2008					
		10/16/2008					
Corrigan Spring	Spring discharge not located.	6/1/2006	170.3	6.08	122	17.7	109.7
		10/13/2007					
		10/16/2008					
Beaver Creek	Sample taken below confluence of Corrigan Spring drainage and Beaver Creek because Corrigan Spring was not located.	10/13/2007	286.6	8.00	21	10.0	146.6
		10/16/2008	303.0	7.40	166.0	5.80	197
Watson Well Spring	Spring located and sampled. Owner would not allow a soil gas measurement.	6/1/2006	745.5	7.29	34	13.0	507.7
		10/14/2007					
		10/16/2008	869.0	6.9	273.20	13.90	565
High Watson Spring	Spring located uphill from Watson Well Spring. Field parameters measured. No sample collected. Owner would not allow a soil gas measurement.	10/16/2008	743	7.25	159.5	10.98	483
Grassy Spring	No access to spring.	6/1/2006	570.3	7.5	-115	29.1	375.3
		10/14/2007	88.37	8.18	16	8.6	44.32
Crain Spring	Wooden fence around spring with some infrastructure.	6/1/2006	570.3	7.5	-115	29.1	375.3
		10/14/2007					
		10/16/2008	526.0	7.47	273.00	8.80	342
Seep Spring	Spring located. Dry.	5/24/2006					
		10/14/2007					
		10/17/2008					
Walt Spring #1	Spring located. Dry.	5/24/2006	524	7.9	86	12.1	345.4
		10/14/2007					
		10/17/2008					
Townsend Spring	Spring pipe and trough located. Spring is dry	5/24/2006					
		10/14/2007					
		10/17/2008					
Thick Spring	Could not locate spring.	5/24/2006	325.6	7.80	120	11.7	214.6
		10/13/2007	376.5	7.74	32	12.9	192.2
		10/16/2008					
Vance Spring #1	Spring located and sampled.	5/26/2006	404	7.75	-12	11.6	269.6
		10/14/2007	417.1	7.34	519	9.6	213.2
		10/16/2008	464.0	7.2	120.30	7.20	302
Vance Meadow Spring	Spring located and sampled.	6/6/2006	459.9	7.2	-60	16.5	310.9
		10/14/2007	389.8	7.2	-67	12.2	195.1
		10/16/2008	476.0	7.9	249.60	8.00	308
Big Hole Spring	Spring located. Dry.	5/24/2006	365.5	7.27	141	11.7	249.1
		10/13/2007					
		10/18/2008					

**TABLE 6 (continued)**  
**NATURAL SPRINGS FIELD OBSERVATIONS AND MEASUREMENTS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Natural Spring Name	2008 Field Observations / Notes	Inspection Date	Water Quality Field Measurements				
			Conductivity (µS)	Ph (Units)	ORP (mV)	Temperature (°C)	TDS (ppm)
Willow Spring	Spring located and sampled.	5/24/2006	252.9	7.39	122	14.0	178.7
		10/13/2007	318.3	7.42	508	13.9	161.4
		10/18/2008	325.0	7.09	243.40	6.60	211
Section 14 Spring (Reich)	Spring located. Flow is directed through piping. Sample collected from adjacent pond.	9/19/2005	412.2	7.93		20.2	277.5
		5/24/2006	372.9	7.48	79	13.3	251.5
		10/14/2007	394.7	7.92	0	10.7	198.7
		10/18/2008	445.0	7.09	45.00	8.61	290
Waypoint 0003 Spring	Could not locate spring.	5/26/2006					
		10/14/2007					
		10/18/2008					
NW John Grub Spring	Spring located and sampled.	9/19/2005	415.8	6.97		15.8	282.3
		5/26/2006	421.7	7.83	108	27	275.9
		10/14/2007	292.2	7.28	-162	17.1	254.8
		10/18/2008	425	7.07	-15	15.68	276
SE John Grub Spring	Spring located and sampled.	9/19/2005	524.5	7.04		15.6	358.5
		5/26/2006	509.5	7.86	-49	24.4	336.9
		10/14/2007	980.1	7.29	-68	18.4	513
		10/18/2008	528	7.18	63.5	12.37	342
Section 10U Spring	No access to spring.	9/19/2005	458.1	7.27	131	10.9	314.7
		6/6/2006	489.9	7.18	521	20.0	328.2
		10/14/2007					
Spring 1212	No access to spring.	10/7/2005	420	6.59		9.1	
		6/6/2006	356.6	7.29	75	15.3	243.9
		10/14/2007					
Spring 3424	No access to spring.	9/14/2005	725.2	6.86	71	16.5	504
		5/26/2006	641.5	7.97	-98	17.3	436.7
		10/14/2007					
Candelaria A Spring	No access to spring.	5/26/2006					
		10/14/2007					
Candelaria B Spring	No access to spring.	5/26/2006					
		10/14/2007					
Vaughn Spring	No access to spring.	6/6/2006	730.7	7.55	521	20.1	509.5
		10/14/2007					
Miser Spring and Pipeline	No access to spring.	6/6/2006					
		10/14/2007					

**Notes:**

Blank cells indicate no measurement.

µS - microSiemens

ORP - oxidation reduction potential

mV - millivolts

°C - degrees celsius

TDS - total dissolved solids

ppm - parts per million

**TABLE 7**  
**NATURAL SPRINGS DISCHARGES**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

NATURAL SPRING	FLOW RATES (Gallons/Minute)			
	YEAR			
	2005	2006	2007	2008
Ramona Leonard Spring		0.6	0.4	0.75
Beaver Creek			7	
Corrigan Spring		1		
Grassy Spring			<0.25	
Crain Spring				0.2
Walt Spring #1			<1	
Thick Spring		2	<1	
Vance Spring #1		1	<0.5	0
Vance Meadow Spring		<0.5	<0.5	0
Big Hole Spring		<1		
Willow Spring		1	<0.25	0.03
Section 14 Spring		<1	<0.5	0
NW John Grub Spring	0.1	<1	<0.5	0.9
SE John Grub Spring	0.25	<1	<0.25	0
Section 10U Spring	0.9	1		
Spring 1212		5.28		
Spring 3424	1	1		
Vaughn Spring		<1		

**Notes:**

Only springs with measured flow are shown; empty cells indicate no measurement during corresponding year.

**TABLE 8**  
**NATURAL SPRINGS ANALYTICAL RESULTS - DISSOLVED METHANE**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

NATURAL SPRING	METHANE CONCENTRATIONS (mg/L)			
	YEAR			
	2005	2006	2007	2008
Ramona Leonard Spring	<0.0005	<0.001	<0.02	<0.02
Beaver Creek			<0.02	<0.02
Corrigan Spring		<0.001		
Watson Well Spring		0.016		<0.02
Grassy Spring			<0.02	
Crain Spring		0.0067		<0.02
Walt Spring #1		<0.001		
Thick Spring		<0.001	<0.02	
Vance Spring #1		0.022	<0.02	0.05
Vance Meadow Spring		0.011	0.06	<0.02
Big Hole Spring		0.001		
Willow Spring		<0.001	<0.02	<0.02
Section 14 Spring	0.0006	<0.001	0.02	0.02
NW John Grub Spring	0.015	0.0016	0.30	0.03
SE John Grub Spring	<0.0005	0.0025	0.65	<0.02
Section 10U Spring	<0.0005	0.0062		
Section 12U Spring	<0.0005			
Spring 1212	0.0005	<0.001		
Spring 3424	0.0017	0.023		
Vaughn Spring		0.0037		

**Notes:**

Only springs sampled and analyzed for methane are shown; empty cells indicate no sample during corresponding year.

mg/L - milligrams per liter

Values preceded by "<" indicate not detected at the respective detection limits

**TABLE 9**  
**NATURAL SPRINGS ANALYTICAL RESULTS - MAJOR IONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Natural Spring	Cations				Anions			
	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)
Ramona Leonard Spring	138	27.7	9.6	1.6	<10	200	340	<10
Beaver Creek	35.0	10.7	8.6	1.9	<10	128	33	<10
Watson Well Spring	109	38.7	25.5	2.4	<10	394	134	<10
Crain Spring	65.6	18.8	15.2	1.6	<10	214	98	<10
Vance Spring #1	52.5	6.6	13.1	5.9	<10	182	19	<10
Vance Meadow Spring	68.3	9.0	14.4	2.6	<10	244	11	<10
Willow Spring	39.3	5.8	16.5	1.4	<10	157	19	<10
Section 14 Spring	48.8	6.0	27.0	0.6	<10	189	43	<10
NW John Grub Spring	59.1	12.8	<0.5	0.6	<10	187	54	<10
SE John Grub Spring	65.3	16.9	14.0	0.7	<10	214	78	<10

**Note:**

(mg/L) - milligrams per liter

**TABLE 10**  
**SUBSURFACE SOIL GAS MEASUREMENTS AT NATURAL SPRINGS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

NATURAL SPRING	SUBSURFACE SOIL GAS CONCENTRATIONS			
	Methane (ppm)	Oxygen (%)	Hydrogen Sulfide (ppm)	Carbon Monoxide (ppm)
Ramona Leonard Spring	0	18.5	0	8
Ramona Spring	0	18.6	0	0
Beaver Creek	0	19.4	0	1
Crain Spring	0	18.8	0	4
Seep Spring	500	20.8	0	7
Walt Spring #1	500	20	0	12
Townsend Spring	0	22.0	0	1
Vance Spring #1	0	20.0	0	20
Vance Meadow Spring	0	21.0	0	4
Big Hole Spring	0	20.7	0	0
Willow Spring	0	20.4	0	0
Section 14 Spring	0	20.6	0	0
NW John Grub Spring	0	20.8	0	0
SE John Grub Spring	0	20.7	0	0

**Notes:**

ppm - parts per million

% - percent

**TABLE 11**  
**REGIONAL RECONNAISSANCE SURVEY - SUSPECT AREAS FIELD OBSERVATIONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Suspect Area No.	Date Inspected	Vegetation Coverage (%)	Vegetation Type	Ground Surface Slope (%)	General Comments	Subsurface Soil Gas Measurements	Subsurface Soil Methane Detected
1	Properties Not Accessable						
2							
3							
4							
5							
6	10/15/08	Not Recorded	Vegetation is sparse, but appears healthy.	Not Recorded	Coal outcrop and tailings, wooden debris.	5	No
7	10/15/08	Not Recorded	Low grasses and vegetation, shrubs are interspersed, healthy. Vegetation looks washed by overland water flow.	Not Recorded	Some wood, metal and glass debris present.	5	No
8	10/16/08	0	No vegetation, polygon is a man-made pond.	0	Not Recorded	1	No
9	10/16/08	0	No vegetation.	Not Recorded	Suspect area is a rock outcrop.	0	Not Measured
10	10/14/08	90	Grasses tall and healthy, shrubs are scattered, but healthy. Ferns present but either dead or dormant.	Not Recorded	Area is located in a gully.	5	No
11	10/08/08	Not Recorded	Scrub oak, juniper, heavily vegetated, healthy.	80	Very steep, rock outcrop, scarce very rocky soil.	3	No
12	10/08/08	Not Recorded	Scrub oak, thick deadfall, dead fallen trees.	10	Rocky soil, near outcrop (further up slope) in wash.	3	No
13	10/08/08	90	Predominantly scrub oak, few juniper, healthy.	60	Rocky soil, steep slope.	4	No
14	Property Not Accessable						
15	10/09/08	20	Some scrub oak, juniper, low grasses, healthy.	40	A small gully/washout, very rocky soil, some outcrops.	3	No

**TABLE 11 (continued)**  
**REGIONAL RECONNAISSANCE SURVEY - SUSPECT AREAS FIELD OBSERVATIONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Suspect Area No.	Date Inspected	Vegetation Coverage (%)	Vegetation Type	Ground Surface Slope (%)	General Comments	Subsurface Soil Gas Measurements	Subsurface Soil Methane Detected
16	10/09/08	30	Mainly scrub oak, some junipers and ponderosa pines. Some deadfall, but overall healthy.	10-30	Rocky soils on slopes, some outcrops.	5	No
17	10/03/08	50	Mixed scrub oak and grasses (50/50), healthy.	40	Rock outcrops and very rocky soil.	5	No
18	10/03/08	60	Grasses.	30	Some rock outcrop, fractured rocky soil.	3	No
19	10/03/08	20	Grasses, scrub oak, one noble fir. Healthy.	30	Very rocky, mostly exposed outcrop with a few inches of soil on parts. Very hard to get deep enough (bore) hole.	2	No
20	10/03/08	Not Recorded	Mainly scrub oak, all healthy, few junipers, ponderosa pines, and spruce.	60	Rock outcrops, rocky, thin soil cover, mostly a ravine.	3	No
21	10/03/08	Not Recorded	Mainly scrub oak with a few ponderosa pines, healthy to ok.	50	Rock outcrops, rocks, with some soil, thin soil layer.	3	No
22	10/03/08	Not Recorded	Mainly scrub oak with some grasses, healthy.	60	Very rocky soil, some small outcrops, thin soil layer.	3	No
23	10/03/08	50	Mainly grasses, some scrub oak, all healthy.	40	Rocky soil.	3	No
24	10/03/08	Not Recorded	Scrub oak, occasional spruce, some small cacti. Healthy.	30-60	Rock outcrops, rocky soil, coal beds.	6	No
25	10/02/08	<5	Few scrubby bushes and grasses, healthy.	60	Rocky outcrop, fractured rock, very rocky, little soil.	3	No

**TABLE 11 (continued)**  
**REGIONAL RECONNAISSANCE SURVEY - SUSPECT AREAS FIELD OBSERVATIONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Suspect Area No.	Date Inspected	Vegetation Coverage (%)	Vegetation Type	Ground Surface Slope (%)	General Comments	Subsurface Soil Gas Measurements	Subsurface Soil Methane Detected
26	10/02/08	10	Few low bushes and grasses, healthy.	40	Predominantly rock outcrop, very rocky, fractured soils.	3	No
27	10/02/08	60	Predominantly scrub oak, also juniper, ponderosa pines, all are healthy.	30-50	Very rock soil, rock outcrops, sparse vegetation.	3	No
28	10/02/08	20	Scrub oak, ponderosa pines, fir, healthy.	45	Rocky soil, along ridge line, sparse vegetation in polygon, outside of	2	No
29	10/02/08	50	Predominantly scrub oak, also junipers and ponderosa pines, healthy.	50-70	Rocky soil, rock outcrops, sparse vegetation in polygon, denser outside due to soil.	4	No
30	10/06/08	70	Mainly scrub oak, ponderosa pines, and occasional fir. Healthy.	30	Rocky soil, some rock.	4	No
31	10/06/08	80	Predominantly scrub oak, some ponderosa pines and firs. Scrub oak healthy.	50	Rocky soil with rock outcrops.	5	No
32	10/06/08	60	Scrub oak, juniper, fir, short bushes.	30	Rocky soil, some rock outcrops.	5	No
33	10/06/08	35	Scrub oak, junipers, ponderosa pines, healthy.	40	Rocky outcrop with thin rocky soil.	8	No
34	10/06/08	80	Predominantly scrub oak, some ponderosa pines, firs, junipers, healthy.	30	Rocky soil with rock outcrops.	11	No
35	10/06/08	40	Scrub oak, ponderosa pine, fir. Healthy, some dying pine.	20-60	Rocky soil and rock outcrops.	6	No

**TABLE 11 (continued)**  
**REGIONAL RECONNAISSANCE SURVEY - SUSPECT AREAS FIELD OBSERVATIONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Suspect Area No.	Date Inspected	Vegetation Coverage (%)	Vegetation Type	Ground Surface Slope (%)	General Comments	Subsurface Soil Gas Measurements	Subsurface Soil Methane Detected
36	10/07/08	90	Predominantly low grasses, some scrub oak and ponderosa pines, healthy.	0-5	Mainly a meadow.	5	No
37	10/07/08	90	Mainly low grasses with ponderosa pines, spruce and scrub oak, all healthy.	5-10	Mainly a meadow, some bare rock.	5	No
38	10/07/08	20	Mainly ponderosa pine and juniper. Lots of dead fall, remaining trees look healthy.	60	Steep slope with lots of deadfall, forested.	3	No
39	10/07/08	50	Mainly scrub oak and low bushes, some grasses.	5-20	Moderate sloping, south-facing, rocky soil.	4	No
40	10/07/08	20	Mainly short grasses, some scrub oak and ponderosa pines. Healthy.	5-10	Rock soiled meadow.	4	No
41	10/07/08	10	Some scrub oak, healthy.	10-30	Exposed coal bed, some thin soil.	10	No
42	10/07/08	20	Mainly short grasses, some juniper, small bushes, ponderosa pines. Healthy.	5	Meadow that sees a lot of cattle traffic.	3	No
43	10/07/08	10	Mainly scrub oak, one or two firs. Healthy.	0-30	Exposed coal bed, very thin soil.	4	No
44 <sup>[1]</sup>	10/07/08	10	Mainly scrub oak, healthy.	10-30	Exposed coal bed, some thin soils.	3	No
45	Properties Not Accessible						
46							
47							
48							
49							
50							
51	10/04/08	100	Vegetated with green grass and clover, healthy (field).	0	Moist, firm soil, very tight.	2	No
52							

**TABLE 11 (continued)**  
**REGIONAL RECONNAISSANCE SURVEY - SUSPECT AREAS FIELD OBSERVATIONS**  
**2008 FRUITLAND OUTCROP MONITORING**  
**ARCHULETA COUNTY, COLORADO**

Suspect Area No.	Date Inspected	Vegetation Coverage (%)	Vegetation Type	Ground Surface Slope (%)	General Comments	Subsurface Soil Gas Measurements	Subsurface Soil Methane Detected
53	Properties Not Accessable						
54							
55							
56							
57	10/09/08	30	Mainly scrub oak, some juniper, healthy.	30	Very rock soils and some outcrops.	3	No
58	10/09/08	5	Some short bushes, few ponderosa pines and scrub oak. Healthy.	70	A steep, unconsolidated rock outcrop.	6	No
59	10/09/08	10	Scrub oak, one ponderosa pine, healthy.	10-20	Rocky soil, loosely consolidated.	3	No

**Notes:**

<sup>[1]</sup> Only north part of suspect area inspected due to access limitation.

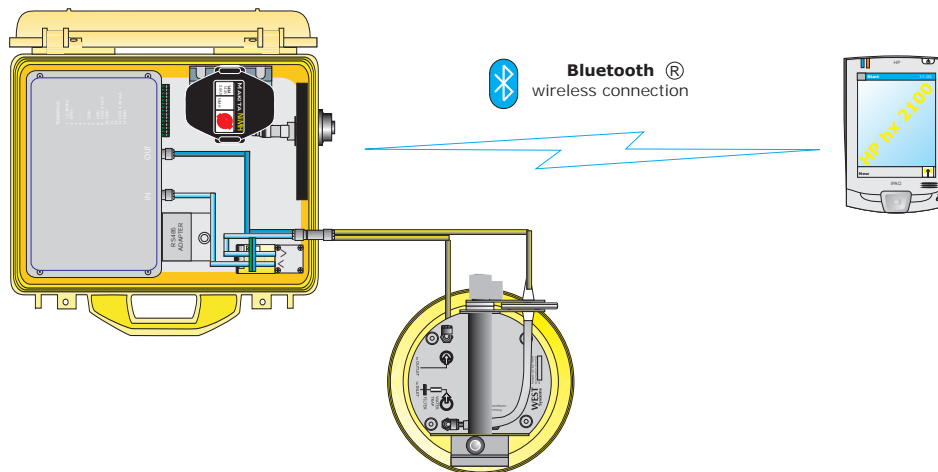
% - percent

**APPENDIX A**  
**EQUIPMENT SPECIFICATIONS**



# WEST Systems portable soil flux meter for Carbon dioxide, Methane and Hydrogen sulfide fluxes

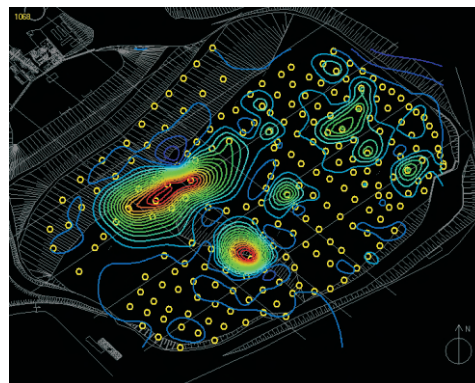
The WEST Systems Fluxmeter is a portable instrument for the measurement of soil gas diffuse degassing phenomena that uses the accumulation chamber method.



This method studied for soil respiration in agronomy (Parkinson) and for soil degassing in volcanic areas (R. Cioni et al.), has been designed by WEST Systems to obtain a portable instrument that allows the performance of measurements with very good accuracy in a short time. The instrument allows a wide range evaluation of the amount of soil gas flux and can be utilized for the evaluation of biogas degassing (landfills), for the survey of non visible degassing phenomena in volcanic and geothermal areas as well as soil respiration rate in agronomy. In the picture below, the results of the degassing survey of a landfill.



Portable fluxmeter



Methane flux contour lines



a group of researchers during a flux mapping fieldwork, using the WS-LI820 flux meter  
Courtesy of United States Geological Survey

# Portable soil flux meter

## Common physical characteristics:

Total Weight = 8.3 Kg/16 lbs. to be carried on the back using the backpack-like support vest. The field operator will also have to carry one of the accumulation chambers and the palmtop:

## Warm Up

Only at instrument cold start-up a warm-up time of 20 minutes is required. The typical measurement time ranges from 2 to 4 minutes and the autonomy of the instrument is about 4 hours with a single NiMH 14.4 Volts, 2.6 A/h battery. The instrument comes with two interchangeable batteries.

## Accumulation Chamber specifications:

- Accumulation chamber A diameter : 200 mm / Height: 100 mm / weight: 1.5 Kg/3.3 lbs
- Accumulation chamber B diameter : 200 mm / Height: 200mm / weight : 2.2 Kg /4.84 lbs

**Palm top computer:** PocketPC Color Display based on Windows Mobile operating system.

- PalmTop with cables, 0.3 Kg/0.7 lbs.
- Size 125mm (4.8") x 82mm (3.2") \* 25 mm (1").

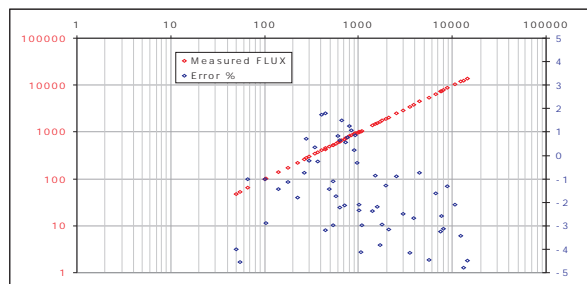
**Software** The instrument is supplied with a custom software, FluxManager, which allows recording and visualization of the increase in concentration of the target gas in the accumulation chamber, and then the flux calculations. The obtained measurements can be saved on the palmtop computer and then transferred to a desktop PC with a USB connection or using a SD card.

## The instrument is supplied complete with:

- backpack-like support vest
- Carrying case for transport and storage
- 2 batteries NiMH 14.4 Volts 2.6 A/h and 1 NiMH battery charger Accumulation chamber A and B
- Palmtop Pocket PC
- User Manual, in English
- FLUX Manager Software for Windows Mobile, in English

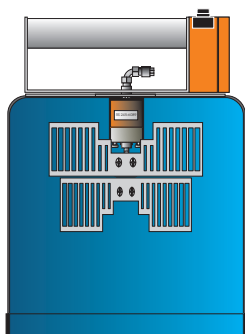
The standard flux meter configuration is supplied with a single gas detector, normally the carbon dioxide detector. The fluxmeter can host two sensors by the way special releases, based on specific customer request, it can be supplied with a maximum of 3 sensors.

Finally we improved the connection between the instrument and the palmtop that now is based on BlueTooth wireless embedded device.



The measured carbon dioxide flux vs imposed flux (grams  $m^{-2} day^{-1}$ );  
The error % vs imposed flux (in blue).

The instrument is extremely versatile and allows measurement of flux in 2/4 minutes. In the picture: Soil bio-gas flux monitoring in a landfill.

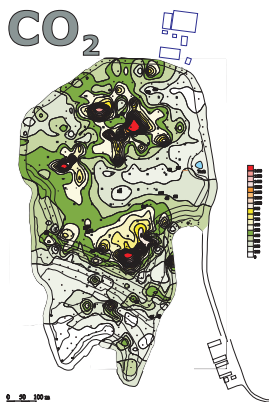


Accumulation Chamber Type B

## The accumulation chambers

In the normal use of instrument only the chamber B is used. To extend the instrument sensitivity to very low fluxes the accumulation chamber A is supplied.

	Type A	Type B
net area $m^2$	0.0314	
net volume $m^3$	0.003	0.006



## CO<sub>2</sub> - LI820

### LI820 based Carbon dioxide fluxmeter

The CO<sub>2</sub> Fluxmeter is equipped with the LICOR LI-820 the most accurate and reliable portable carbon dioxide detector. The LI-820 is a double beam infrared sensor compensated for temperature variation in the range from -10 to 45°C and for atmospheric pressure variation in the range 660-1060 hPa. Accuracy 2% repeatability ±5ppm. The full scale range can be set to 1000, 2000, 5000 or 20000 ppmV of carbon dioxide. The characteristics of precision refer to the sensor set to a full scale range of 20000 ppmV. If a very high sensitivity is required, the detector can be set to 1000 or 2000 ppm full scale value to measure with very high precision fluxes in the range from 0 to 10 moles m<sup>-2</sup> day<sup>-1</sup>

#### CO<sub>2</sub> FLUX Measurement range:

from 0 up 600 moles m<sup>-2</sup> day<sup>-1</sup>

The accuracy depends on the measured flux:

0 to 0.5 moles m <sup>-2</sup> day <sup>-1</sup>	25% (Acc.ch.A)
0.5 to 1 moles m <sup>-2</sup> day <sup>-1</sup>	15% (Acc.ch.A or B)
1 to 150 moles m <sup>-2</sup> day <sup>-1</sup>	10% (Acc.ch.B)
150 to 300 moles m <sup>-2</sup> day <sup>-1</sup>	10% (Acc.ch.B)
300 to 600 moles m <sup>-2</sup> day <sup>-1</sup>	20% (Acc.ch.B)

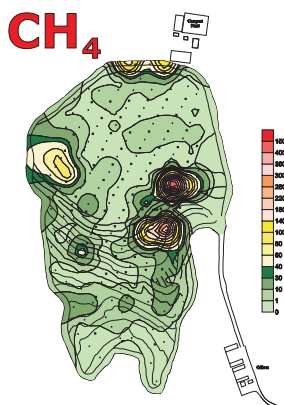
## WS-DRAGER CO<sub>2</sub>

### WS-DRAGER: CO<sub>2</sub> Flux measurement:

A double beam infrared sensor compensated for temperature variation in the range from -20 to 65°C. Accuracy 3%. The full scale value can be set from 2,000 to 300,000 ppm of carbon dioxide. Carbon Dioxide flux measurement range from 0.5 to 1500 moles/m<sup>2</sup> per day.

The precision depends on the measured flux:

range: 0.5 – 5 moles/m <sup>2</sup> per day	25% (Acc. chamber A)
5-350 moles/m <sup>2</sup> /day	10% (Acc. chamber B)
350-600 moles/m <sup>2</sup> /day	25% (Acc. chamber B)
600-1500 moles/m <sup>2</sup> /day	25% (Acc. Ch.B / F.S. = 10%)



## WS-HC CH<sub>4</sub>

### Methane fluxmeter

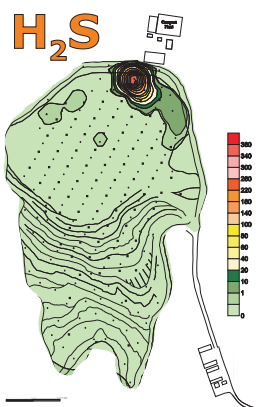
The methane sensor is an IR spectrometer. The full-scale range is 50000ppm, accuracy of 5% of reading, and repeatability is 2% of span. Detection limit 60 ppm, resolution 22 ppm. The detector was designed to measure the not controlled emissions of landfill, but it can be used to detect methane emission from coal or wherever the 0.2 moles/m<sup>2</sup>/day detection limit is acceptable.

#### Methane Flux measurement range

from 0.2 up 300 moles m<sup>-2</sup> day<sup>-1</sup>

The fluxmeter is provided with 2 accumulation chambers and the accuracy depends on the measured flux:

0.2 to 10 moles m <sup>-2</sup> day <sup>-1</sup>	25% (Acc.Ch.A)
10 to 150 moles m <sup>-2</sup> day <sup>-1</sup>	15% (Acc.Ch.A)
150 to 300 moles m <sup>-2</sup> day <sup>-1</sup>	20% (Acc.Ch.B)



## H<sub>2</sub>S - WEST

### Hydrogen sulfide

The hydrogen sulphide detector is an electrochemical cell with the following specifications:

The full-scale range is 20ppm, with a precision of 3% of reading, and the repeatability is 1.5% of span with a zero offset of 0.3%.

H<sub>2</sub>S Flux measurement range: from 0.0025 to 0.5 moles/m<sup>2</sup> per day.

The precision depends on the measured flux:

0.0025 – 0.05 moles/m <sup>2</sup> per day	25% (Acc. Chamber A)
0.05 – 0.5 moles/m <sup>2</sup> per day	10% (Acc. Chamber B)

NOTE: The hydrogen sulphide flux evaluation can be affected by the presence of large quantities of water in both liquid and vapour phases.

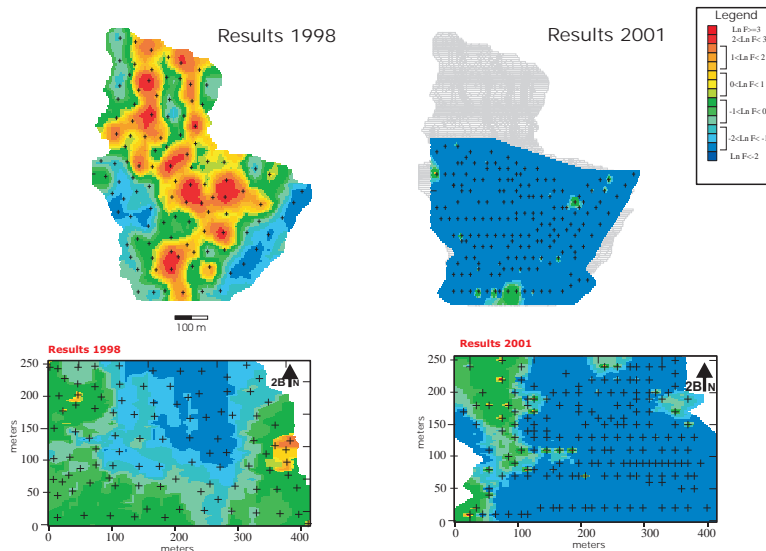
We thanks to N.Lima et al. for the maps.

## Application on a landfill: mapping the biogas non controlled emissions.

The figure shows the compare between the results of the measurement regime of a land/fill undertaken in 1998 and 2001: the mapping performed in 1998 gave clear indications of the areas which required intervention to improve the cover and the capture system.

The interventions were performed only where necessary with a significant economic savings.

The measurement regime of 2001 indicates without any doubt that the interventions were efficient and state-of-the-art.



The obtained results:

- Minor atmospheric emissions;
- Higher quantity and better quality of biogas for cogeneration;
- Optimisation of management costs.

## Continuous soil flux monitoring

WEST Systems produces a soil gas station for the continuous monitoring of carbon dioxide and hydrogen sulfide flux, soil temperature, soil water content, soil pressure gradient, soil heat flux and meteorological parameters.

For more information contact your local representative, visit our web site or e-mail to: [g.virgili@westsystems.com](mailto:g.virgili@westsystems.com)

Local sales representative

**H.Q.**

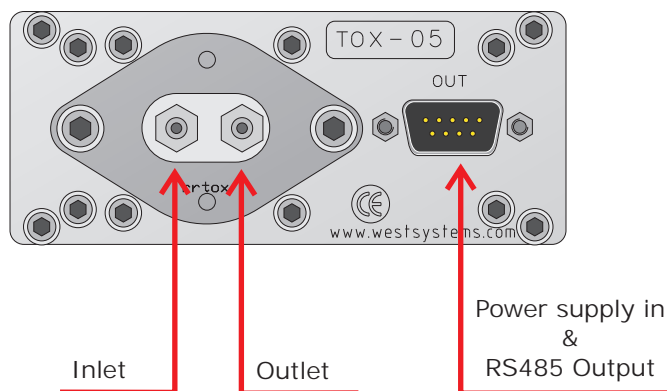
### West Systems Srl

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 Phone +39 0587 294216 [www.westsystems.com](http://www.westsystems.com) (or .it)  
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 7-13,1-chome, Shibakoen, Minato-ku Tokyo  
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 TEL : 03-3459-5106 FAX : 03-3459-5081  
 WEB SITE <http://www.shoko.co.jp>  
 e-mail [s-isotope@shoko.co.jp](mailto:s-isotope@shoko.co.jp)

# Hydrogen Sulfide Detector



Pin	Signal
1	Gnd
2	+VDC
3	Gnd
4	RS485-B
5	RS485-A
6	Gnd
7	+12V
8	Gnd
9	RS485-B

## Legenda

**Gnd:** Ground reference for power supply and RS485

**+VDC:** 10-28 Volts Power supply input

**RS485-A:** Digital signal output A

**RS485-B:** Digital signal output B

## Sensor specifications

Ambient conditions:

Air temperature -40°C to 65 °C

Air pressure 700 hPa to 1300 hPa

Air RH 5% - 95% non condensating.

Expected sensor life > 24 months.

Chemical cell order code: WEST H2S-BH

Detector order code: WEST TOX-05-H2S-BH

Factory calibration : 20 ppm

RMS Noise <= 0.02 ppm

Zero Offset <= 0.2 ppm

Max Overrange >= 200 ppm

The chemical cell reaction is:



the gas sample specific consumption is very low:

$2.5 \times 10^{-10}$  moles/Sec per ppm

Due to this consumption the H<sub>2</sub>S flux is methodically underestimated by a -10% with the Accumulation Chamber A and by a -5% when using the accumulation chamber B. Then we advise to use the accumulation chamber B except when the flux is very very low.

## WS-HC detector

### WS-HC Hydrocarbon Flux measurement:

The HydroCarbon detector is based on a double beam infrared spectrometer able to detect methane, hexane, propane and other molecules with HC linkages. The instrument comes calibrated for the methane. *The instrument requires a frequent **zero base-line** calibration that will be done using atmospheric air. The calibration requires 20 second.*

### Detector specifications:

Accuracy 5%

Repeatability 2%

Resolution 22 ppm (Methane equivalent)

Full scale range is 50000 ppm of methane.

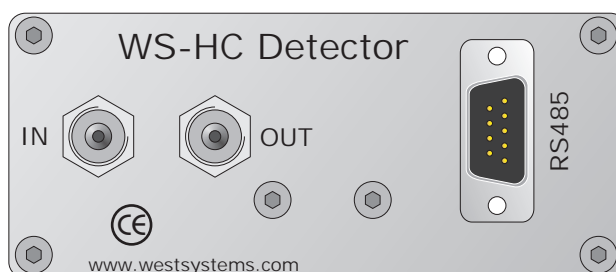
Detection limit 60 ppm.

Methane flux measurement range from 0.1 to 150 moles/m<sup>2</sup> per day.

The precision depends on the measured flux:

range 0.1 - 5	moles/ m <sup>2</sup> per day ±25%
5 - 150	moles/ m <sup>2</sup> per day ±10%

The measurement of very low fluxes (< 0.1 moles/m<sup>2</sup>/day) is possible but the error will increase due to the low detector sensitivity.



### RS485 Connector DB9 Male panel

Pin 1	Gnd
Pin 2	+Power supply
Pin 3	Gnd
Pin 4	RS485 B
Pin 5	RS485 A
Pin 6	Gnd
Pin 7	+Power supply
Pin 8	Gnd
Pin 9	RS485 B

The gas fittings can be used with rilsan 6x4 mm tubes or silicon 5x3.2 tubes. Please respect inlet and outlet ports.

# LI-820 Specifications

## CO<sub>2</sub> Specifications

**Measurement Range:** 0-1000 ppm, 0-2000 ppm with 14 cm bench; 0-5000 ppm, 0-20000 ppm with 5 cm bench

**Accuracy:** < 2.5% of reading with 14 cm bench; 4% of reading with 5 cm bench

### Calibration Drift

<sup>1</sup>**Zero Drift:** < 0.15 ppm / °C

<sup>2</sup>**Span Drift at 370 ppm:** < 0.03% / °C

<sup>3</sup>**Total Drift at 370 ppm:** < 0.4 ppm / °C

**RMS Noise at 370 ppm with 1 sec Signal Filtering:** < 1 ppm

<sup>1</sup> Zero drift is the change with temperature at 0 concentration

<sup>2</sup> Span drift is the change after re-zeroing following a temperature change

<sup>3</sup> Total drift is the change with temperature without re-zeroing or re-spanning

**Measurement Principle:** Non-Dispersive Infrared

**Traceability:** Traceable gases to WMO standards from 0-3000 ppm. Traceable gases to EPA protocol gases from 3000 to 20000 ppm

**Pressure Compensation Range:** 15 kPa-115 kPa

**Maximum Gas Flow Rate:** 1 liter/minute

**Output Signals:** Two Analog Voltage (0-2.5 V or 0-5 V) and Two Current (4-20 mA)  
Digital: TTL (0-5 V) or Open Collector

**DAC Resolution:** 14-bits across user-specified range

**Source Life:** 18000 hours

**Power Requirements:** Input Voltage 12-30 VDC  
1.2A @ 12V (14 W) maximum during warm-up with heaters on  
0.3 A @ 12 V (3.6 W) average after warm-up with heaters on

**Supply Operating Range:** 12-30 VDC

**Operating Temperature Range:** -20 to 45 °C

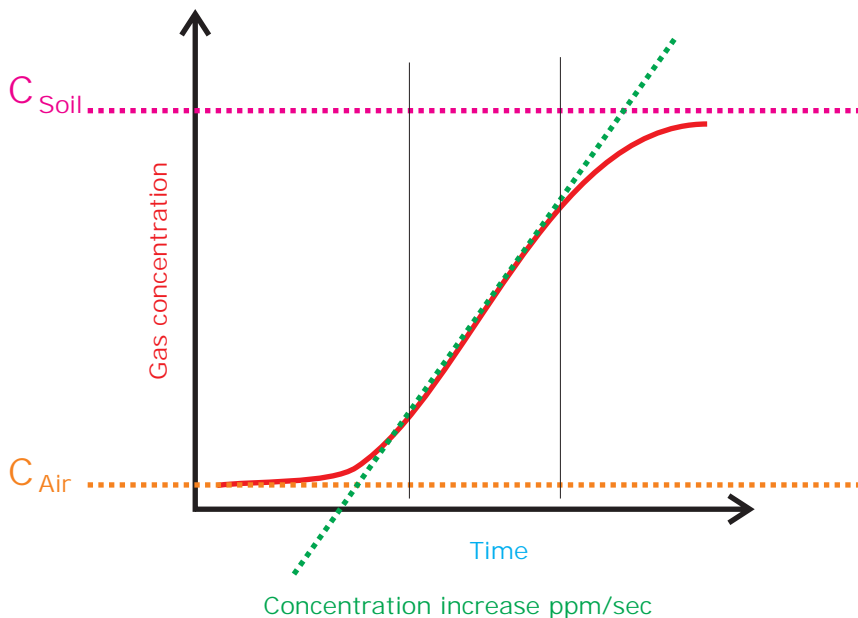
**Relative Humidity Range:** 0 to 95% RH, Non-Condensing

**Dimensions:** 8.75" x 6" x 3" (22.23 x 15.25 x 7.62 cm)

**Weight:** 2.2 lbs (1 kg)

## Quantifying the flux

How explained in the chapter 3 the flux is proportional to the concentration increase ratio ppm/sec. The proportionality factor depends on the chamber volume/surface ratio as well as the barometric pressure and the air temperature inside the accumulation chamber.



There are two methods to carry out the field work, in both cases for each measurement you have to record the type of accumulation chamber used, the barometric pressure, and the air temperature.

The variation of few mBar of the pressure and or few degrees of temperature do not affect the evaluation of flux very much, then you can use a mean value for both parameters. Of course that depends on the accuracy you want to reach for the evaluation of flux.

The instrument measures the barometric pressure, using the embedded pressure sensor of the LICOR, with a good accuracy. A platinum Pt100 or a thermo-couple thermometer can be used to measure the air temperature as well as the soil temperature.

### Choosing the flux measurement unit

The first measurements made, 10 years ago, with the accumulation chamber was expressed in cm/sec which is a speed, the speed of carbon dioxide flowing out from the soil. During the last ten years several units have been used by volcanologist and by geochemistry researchers. The most common unit is grams/squaremeter per day, but using the same instrument for two gas species to express the flux using this unit means to have two different conversion factors. Actually we use the unit **moles/squaremeter per day** that has two advantages: A single conversion factor for every gas specie and an easy conversion of the flux in grams/sm per day simply multiplying the result expressed in moles/sm per day for the molecular weight of the target gas.



From the [tools][settings] menu you can set the accumulation chamber factor in the "A.c.K." field.

If this factor is set to 1 the instrument will give you results expressed in ppm/sec, that's simply the slope of the curve in the selected interval.

If you set the A.c.K to a value different from 1 the instrument will give you the results expressed in moles per square meter per day.

Please see next page.

## Quantifying the flux

### Method 1: Measuring the slope

Set the Accumulation Chamber factor to 1 in order to have the flux measurement expressed in the slope unit "ppm/sec" and translate it in the desired unit with a post processing.

Using this method you can focus only on the accumulation chamber interfacing with the soil, the flux curve shape and the other aspects of the measurement, putting off choosing the correct accumulation chamber factor.

### Method 2: Measuring the flux directly in moles/sm/day.

To get the results directly in moles/sm/day you have to set the Accumulation Chamber factor to the correct value, taking it from the tables.

For each measurement, if there are variations in the air temperature, or of the barometric pressure, or if you changed the accumulation chamber you have to select the [tools][settings] menu and put the correct accumulation chamber factor in the "A.c.K." field. This operation can be "critical". In any case on the saved files you'll find the results of flux evaluation expressed in both units, the raw ppm/sec and the moles/sm/day computed with the A.c.K. you set.

### The accumulation chamber factors

Here following the formula used to compute the A.c.K.:

$$K = \frac{86400 \cdot P}{10^6 \cdot R \cdot T_k} \cdot \frac{V}{A}$$

Where

- **P** is the barometric pressure expressed in mBar (HPa)
- **R** is the gas constant 0.08314510 bar L K<sup>-1</sup> mol<sup>-1</sup>
- **T<sub>k</sub>** is the air temperature expressed in Kelvin degree
- **V** is the chamber net volume in cubic meters
- **A** is the chamber inlet net area in square meters.

The dimensions of the A.c.K. are

$$K = \frac{\text{moles} \cdot \text{meter}^{-2} \cdot \text{day}^{-1}}{\text{ppm} \cdot \text{sec}^{-1}}$$

In the table the conversion factors vs temperature and barometric pressure for the Accumulation Chamber Type A and B are reported.

### An example:

You're using the accumulation chamber B, the slope of the flux curve is 2.5 ppm/sec, the barometric pressure is 1008 mBar (HPa) and the air temperature is 22 °C.

From the table B get the value that correspond to the barometric pressure and temperature. In this case I get the value computed for 25°C and 1013 mBar : 0.696.

Then the flux is: 2.5 x 0.696 = 1.74 moles per square meter per day.

The Gasport Gas Tester is designed for gas utility workers to detect methane and certain toxic gases. It is a reliable, simple, versatile tool to help your service technicians get the job done quickly! With multiple ranges and sensing capabilities built into one rugged housing, the Gasport Tester simplifies your work by reducing the number of meters you have to carry on the job.



## Applications

The Gasport Tester's poison-tolerant methane sensor provides three measurement ranges for your daily service needs:

- Open air, safety sampling
- Small, in-home leak detection
- Street/outdoor service line leak detection



## Features and Benefits

- **Proven in field use—rugged and reliable**  
Less costly to maintain, less time in repair
- **Multiple functions in one instrument**  
No need to buy, carry & maintain multiple instruments
- **New, poison-tolerant combustible gas sensor**  
Reduces meter ownership costs
- **User-selectable, “silent” operation mode**  
Reduces customer disturbances and worries
- **Fast warm up time**  
Fastest warm up time in industry saves time
- **Can monitor up to four gases at a time**  
Fewer instruments to carry
- **Show all gas concentrations simultaneously**  
Eliminates guesswork on what reading is displayed
- **Autoranging methane sensor**  
Automatically switches between 0-5% and 5-100% methane ranges
- **Gas readings recorded for later retrieval**  
Can double check readings after job is done
- **Simple manual or automated calibration options**  
Reduces training time and helps ensure accuracy
- **Intrinsically safe**  
Meets safety standards for work in hazardous areas
- **Lifetime warranty on case and electronics**  
Reduced maintenance and lifetime costs

## Specifications

Gas	Range	Resolution
Methane	0–5000 ppm	50 ppm
Methane	0–100% LEL or 0–5% CH <sub>4</sub>	1 % LEL or 0.1% CH <sub>4</sub>
Methane	5–100% CH <sub>4</sub>	1% CH <sub>4</sub>
Oxygen	0–25%	0.1%
Carbon Monoxide	0–1000 ppm	1 ppm
Hydrogen Sulfide	0–100 ppm	1 ppm

- Battery types:** NiCd and Alkaline
- Case material:** Impact resistant, stainless-steel-fiber-filled polycarbonate
- Operating temperature:** normal -10 to 40°C; extended -20 to 50°C
- Operating humidity:** Continuous: 15-95% RH, non-condensing  
Intermittent duty: 5-95% RH, non condensing
- Warm up time:** Less than 20 seconds to initial readings
- Datalog capacity:** 12 hours
- Input:** 3 clearly marked, metal domed keys
- Warranty:** Case and Electronics: Lifetime  
Sensors and consumable parts: 1 year

**The answer for gas utilities' gas detection needs**

# Ordering Information

## Battery Chargers

Part No.	Description
494716	Omega 120 VAC 50/60Hz
495965	Omega 220 VAC 50/60Hz
801759	Omega 110/220 VAC, Five Unit, 50/60Hz
800525	Omega 8 - 24VDC for vehicle use

## Battery Packs

Part No.	Description
496990	Standard NiCd Rechargeable
800526	Alkaline, Type C
711041	Alkaline, with Thumbscrews
800527	Heavy Duty NiCd Rechargeable

## Sensors

Part No.	Description
813693	Combustible Gas
480566	O <sub>2</sub>
812389	CO
812390	H <sub>2</sub> S

## Protective Boots

Part No.	Description
804955	Black, for NiCd Battery Packs
802806	Orange, for NiCd Battery Packs
806751	Black, for Alkaline Battery Packs
806750	Orange, for Alkaline Battery Packs
806749	Black, for HD NiCd Battery Packs
806748	Orange, for HD NiCd Battery Packs
812833	Yellow Soft Carrying Case with Harness
711022	Black padded Vinyl Carrying Case with Harness

## Sampling Equipment

Part No.	Description
800332	Probe - 1 ft., plastic
800333	Probe - 3 ft., plastic
803561	Probe - 3 ft., plastic (holes 2" from end) (bar hole probe)
803962	Probe - 3 ft., plastic (holes 2" from handle) (solid probe)
803848	Probe - Hot Gas Sampler
710465	Sampling Line - 5 ft., coiled
497333	Sampling Line - 10 ft.
497334	Sampling Line - 15 ft.
497335	Sampling Line - 25 ft.

## Sampling Accessories

Part No.	Description
801582	Replacement Filter, Probe, pkg. of 10
801291	External Filter Holder
014318	Charcoal Filter
711039	Line Scrubber Filter Holder
711059	Line Scrubber Replacement Cartridges, Box of 12
808935	Dust Filter, Pump Module
802897	Water Trap (Teflon) Filter, Pump Module

## Calibration Check Equipment

Part No.	Description
477149	Calibration Kit Model RP with 0.25 lpm Regulator
491041	Calibration Gas - methane, 2.5%
473180	Calibration Gas - 300 ppm CO
813718	Calibration Gas - methane, 2.5% oxygen, 15% 60 ppm CO
813720	Calibration Gas - methane, 2.5% oxygen, 15% 300 ppm CO 10 ppm H <sub>2</sub> S
710288	Gasmiser™ Demand Regulator 0 - 3.0 lpm

## Accessories

Part No.	Description
804679	Data Docking Module Kit. Includes the Data Docking Module, MSA Link Software and Instruction Manual

# Approvals

The Gasport Gas Tester has been designed to meet intrinsic safety testing requirements in certain hazardous atmospheres.

The Gasport Gas Tester is approved by MET (an OSHA Nationally Recognized Testing Laboratory [NRTL]) for use in Class I, Division I, Groups A, B, C, D; Class II, Division I, Groups E, F, G; and Class III Hazardous locations. Gasport tGas Testers sold in Canada are approved by CSA for use in Class I, Division I, Groups A, B, C, and D locations.

Contact MSA at 1-800-MSA-2222 for more information or with questions regarding the status of approvals.

## Gasport Gas Tester Kits

	LEL Display	O <sub>2</sub>	CO	H <sub>2</sub> S	Alarms Always	Alarms Optional	Leak Detect Page Peak	Alkaline Battery	NiCd Battery	5ft Coiled Line	1ft Probe	Part No.
4-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	711489
4-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	711490
3-Gas, Selectable, NiCd	•	•	•		•	•	•	•	•	•	•	711493
3-Gas, Selectable, Alkaline	•	•	•		•	•	•	•	•	•	•	711494
2-Gas, Selectable, NiCd	•		•		•	•	•	•	•	•	•	711495
2-Gas, Selectable, Alkaline	•		•		•	•	•	•	•	•	•	711496
4-Gas, Alarms On, NiCd	•	•	•	•	•	•	•	•	•	•	•	711491
4-Gas, Alarms On, Alkaline	•	•	•	•	•	•	•	•	•	•	•	711492

## Assemble-to-Order (ATO) System: You Make the Choices

The ATO System makes it easy to "custom order" the Gasport Gas Tester, configured exactly the way you want it. You can choose from an extensive line of base instrument components and accessories. To obtain a copy of the "ATO System and Price Information for the Gasport Gas Tester," call toll-free 1-800-MSA-2222, and request Bulletin 0804-28. To obtain a copy of the ATO via FAX, call MSA QuickLit Information Service at 1-800-672-9010. At the prompt, request QuickLit Document #2345 (ATO for Gasport Gas Tester).

**Note:** This Data Sheet contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

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For further information:



# GeoXT

## The total GPS platform for all your GIS field requirements

The GeoXT™ handheld, from the GeoExplorer® series, is an essential tool for maintaining your GIS. It's all you need to collect location data, keep existing GIS information up to date, and even mobilize your GIS.

The unique GeoExplorer series combines a Trimble® GPS receiver with a rugged field-ready handheld computer running the Microsoft® Windows Mobile™ 2003 software for Pocket PCs. Plus there's an internal battery that easily lasts for a whole day of GPS operation. The result is tightly integrated, tough, and incredibly powerful.

### High-accuracy integrated GPS

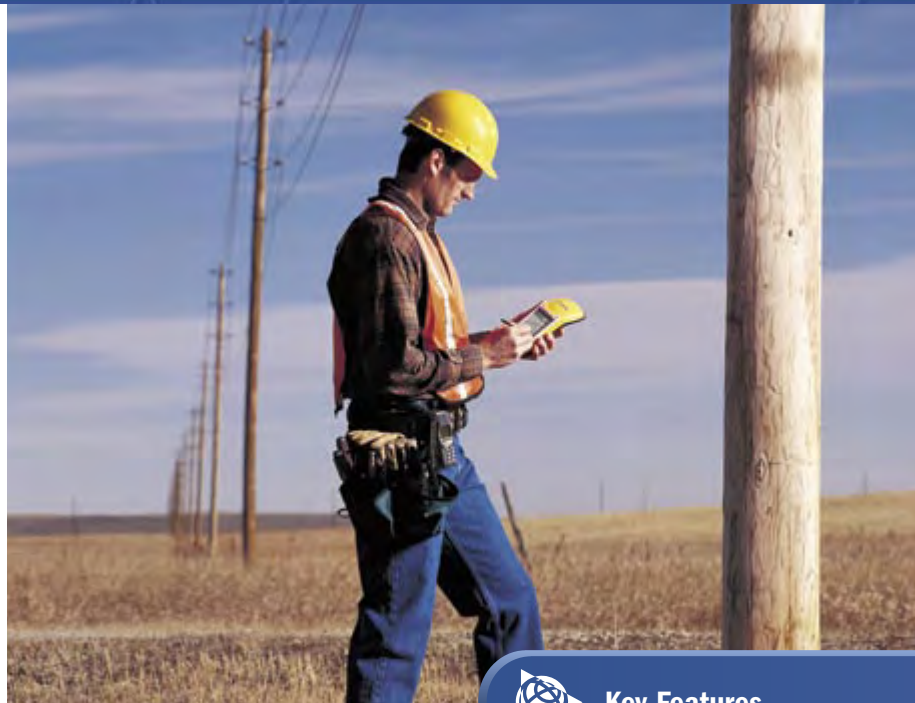
The GeoXT is optimized to provide the reliable, high-accuracy location data you need. Advanced features like EVEREST™ multipath rejection technology let you work under canopy, in urban canyons, or anywhere where accuracy is crucial.

Need submeter accuracy in real-time? Use corrections from a satellite-based augmentation system (SBAS) like WAAS<sup>1</sup> or EGNOS<sup>2</sup>. Want to get that extra edge in precision? Collect data with Trimble's TerraSync™ or GPSCorrect™ software, and then postprocess back in the office.

Because the GPS receiver and antenna are built into the handheld computer, it's never been easier to use GPS in your application. The system is more than just cable-free: it's a totally integrated solution.

### Optimized productivity

Take advantage of the power and flexibility of Windows Mobile software for Pocket PCs by choosing from the most comprehensive range of field software available—whether off-the-shelf or purpose-built. Whatever your needs, Windows



### Key Features

- High-performance submeter GPS with integrated WAAS/EGNOS
- Windows Mobile 2003 software for Pocket PCs, allowing maximum flexibility in software choice
- Rugged handheld with all-day battery
- Advanced color TFT display with backlight
- Integrated Bluetooth for wireless connectivity

Mobile lets you choose a software solution to match your workflow.

Windows Mobile includes familiar Microsoft productivity tools, including Pocket Word, Pocket Excel, and Pocket Outlook®. Pocket Outlook lets you synchronize e-mails, contacts, appointments, and data with your office computer, so whether you're in the office or in the field, you're always up to date.

Go wireless with integrated Bluetooth®\* for connection to other Bluetooth-enabled devices, including cell phones and PCs. You also have the option to use the USB support module to connect to a desktop computer, or use the optional serial clip for cabled connections in the field.

Receive a free copy of Microsoft Streets & Trips\*\* 2004 software with your GeoXT handheld, and take advantage of comprehensive map and travel information for easy navigation and route planning.

### All the memory you need

There's plenty of storage space in the GeoXT for all your GIS data. The fast processor and large memory mean even big graphics files load quickly—and they're crisp and crystal-clear on the advanced TFT outdoor color screen.

From data collection to data maintenance, to mobile GIS and beyond ... the GeoXT is the handheld of choice.

\* Bluetooth type approvals are country specific. GeoExplorer series handhelds are approved for use with Bluetooth in the USA. For a complete list of other countries with Bluetooth approval please refer to:

www.trimble.com/geo\_bluetooth.html.  
\*\* Microsoft Streets & Trips 2004 software available in US/Canada; Microsoft AutoRoute® 2004 in Europe.



## The total GPS platform for all your GIS field requirements

### Standard features

#### System

- Microsoft Windows Mobile 2003 software for Pocket PCs
- 206 MHz Intel StrongARM processor
- 512 MB non-volatile Flash data storage
- Outdoor color display
- Ergonomic cable-free handheld
- Rugged and water-resistant design
- All-day internally rechargeable battery
- Bluetooth wireless

#### GPS

- Submeter accuracy
- Integrated WAAS<sup>1</sup>/EGNOS<sup>2</sup>
- RTCM real-time correction support
- NMEA and TSIP protocol support
- EVEREST multipath rejection technology

#### Software

- GPS Controller for control of integrated GPS and in-field mission planning
- GPS Connector for connecting integrated GPS to external ports
- File Explorer, Internet Explorer, Pocket Outlook (Inbox, Calendar, Contacts, Tasks, Notes), Sprite Pocket Backup, Transcriber, Pocket Word, Pocket Excel, Pictures, Windows<sup>®</sup> Media Player, Bluetooth File Transfer, Calculator, ActiveSync<sup>®</sup>
- Microsoft Streets & Trips/AutoRoute 2004 software

#### Accessories

- Support module with power supply and USB data cable
- Getting Started Guide
- Companion CD includes Outlook 2002 and ActiveSync 3.7.1
- Hand strap
- Pouch
- Stylus

### Optional Features

#### Software

- TerraSync
- GPScorrect for ESRI<sup>®</sup> ArcPad<sup>®</sup>
- GPS Pathfinder<sup>®</sup> Tools Software Development Kit (SDK)
- GPS Pathfinder Office
- Trimble GPS Analyst extension for ArcGIS<sup>®</sup>

#### Accessories

- Serial clip for field data and power input
- Vehicle power adaptor<sup>3</sup>
- Portable power kit<sup>3</sup>
- Hurricane antenna
- External patch antenna
- Pole-mountable ground plane
- Baseball cap with antenna sleeve
- Beacon-on-a-Belt (BoB<sup>™</sup>) differential correction receiver<sup>3</sup>
- Hard carry case
- Null modem cable<sup>3</sup>
- Backpack kit

### Technical specifications

#### Physical

Size	21.5 cm × 9.9 cm × 7.7 cm (8.5 in × 3.9 in × 3.0 in)
Weight	0.72 kg (1.59 lb) with battery
Processor	206 MHz Intel StrongARM SA-1110
Memory	64 MB RAM and 512 MB internal Flash disk
Power	
Low (no GPS)	0.6 Watts
Normal (with GPS)	1.4 Watts
High (with GPS, backlight, and Bluetooth)	2.5 Watts
Battery	Internal lithium-ion, rapidly rechargeable in unit, 21 Watt-hours

#### Environmental

Temperature	
Operating	-10 °C to +50 °C (14 °F to 122 °F)
Storage	-20 °C to +70 °C (-4 °F to 158 °F)
Humidity	99% non-condensing
Casing	Wind-driven rain and dust-resistant per IP 54 standard Slip-resistant grip, shock- and vibration-resistant

#### Input/output

Communications	Bluetooth for wireless connectivity USB via support module, serial via optional DE9 serial clip adaptor
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#### Bluetooth

Certification	Bluetooth type approvals are country specific. GeoExplorer series handhelds are approved for use with Bluetooth in the USA. For a complete list of other countries with Bluetooth approval please refer to <a href="http://www.trimble.com/geoxt_ts.asp">www.trimble.com/geoxt_ts.asp</a> .
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#### Profiles

Both client and host support	Serial Port, File Transfer (using OBEX)
Client support only	Dial-Up Networking, Lan Access
Host support only	Basic Imaging, Object Push
Display	Advanced outdoor TFT, 240 × 320 pixel, 65,536 colors, with backlight
Audio	Microphone and half duplex speaker, record and playback utilities
Interface	Anti-glare coated touch screen, Soft Input Panel (SIP) virtual keyboard 2 hardware control keys plus 4 programmable permanent touch buttons
Handwriting recognition software, Audio system events, warnings, and notifications	

#### GPS

Channels	12
Integrated real-time	WAAS <sup>1</sup> or EGNOS <sup>2</sup>
Update rate	1 Hz
Time to first fix	30 sec (typical)
Protocols	NMEA (GGA, VTG, GLL, GSA, ZDA, GSV, RMC), TSIP (Trimble Standard Interface Protocol)

#### Accuracy (RMS)<sup>4</sup> after differential correction

Postprocessed <sup>5</sup>	Submeter
Carrier postprocessed <sup>6</sup>	
With 10 minutes tracking satellites	30 cm
Real-time	Submeter

<sup>1</sup> WAAS (Wide Area Augmentation System). Available in North America only.  
For more information, see <http://gps.faa.gov/programs/index.htm>.

<sup>2</sup> EGNOS (European Geostationary Navigation Overlay System). Available in Europe only.  
For more information, see <http://www.esa.int/export/esaSA/navigation.html>.

<sup>3</sup> Serial clip also required.

<sup>4</sup> Horizontal accuracy. Requires data to be collected with minimum of 4 satellites, maximum PDOP of 6, minimum SNR of 4, minimum elevation of 15 degrees, and reasonable multipath conditions. Ionospheric conditions, multipath signals or obstruction of the sky by buildings or heavy tree canopy may degrade precision by interfering with signal reception. Accuracy varies with proximity to base station by +1 ppm for postprocessing and real-time, and by +5 ppm for carrier postprocessing.

<sup>5</sup> Postprocessing with GPS Pathfinder Office software or GPS Analyst extension for ArcGIS.

<sup>6</sup> Requires collection of carrier data. (Only available with the GPS Pathfinder Office software).

Specifications subject to change without notice.

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**APPENDIX B**

**SOIL GAS FLUX MEASUREMENTS AT DRAINAGES TRANSECTING THE KF  
OUTCROP**



Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
arch092608_01	1,234,755.416	2,424,978.072	9/26/2008	0.0000000000	0.0000000000	0.0718295000	782.2	21.2	26-09-2008 09:32:21	0.0000	-0.0010	0.2890	Beaver Creek
arch092608_02	1,234,753.663	2,425,176.171	9/26/2008	0.0146042000	0.0007425850	0.1433190000	783.5	22.9	26-09-2008 09:40:25	0.0590	0.0030	0.5790	Beaver Creek
arch092608_03	1,234,746.004	2,425,368.803	9/26/2008	0.0408744000	0.0007386940	0.2223470000	781.5	23.7	26-09-2008 09:44:23	0.1660	0.0030	0.9030	Beaver Creek
arch092608_04	1,234,758.360	2,425,585.458	9/26/2008	0.0000000000	0.0001744400	0.1365990000	781.5	24.9	26-09-2008 09:52:12	0.0000	0.0060	0.5570	Beaver Creek
arch092608_05	1,234,752.855	2,425,778.137	9/26/2008	0.0000000000	0.00097811200	0.2890320000	780.8	25.5	26-09-2008 09:57:07	0.0000	0.0040	1.1820	Beaver Creek
arch092608_06	1,234,760.096	2,425,992.374	9/26/2008	0.0000000000	0.0000000000	0.1226030000	779.6	26.0	26-09-2008 10:01:47	-0.0360	0.0000	0.5030	Beaver Creek
arch092608_07	1,234,758.336	2,426,176.585	9/26/2008	0.0000000000	0.00072827100	0.0827801000	778.0	26.6	26-09-2008 10:08:22	-0.4130	0.0030	0.3410	Beaver Creek
arch092608_08	1,234,764.263	2,426,382.945	9/26/2008	0.0000000000	0.00048282600	0.2182370000	775.5	27.3	26-09-2008 10:15:16	-0.4490	0.0020	0.9040	Beaver Creek
arch092608_09	1,234,562.036	2,426,364.512	9/26/2008	0.1508970000	0.00048133100	0.0813450000	774.9	28.0	26-09-2008 10:22:35	0.6270	0.0020	0.3380	Beaver Creek
arch092608_10	1,234,547.929	2,426,584.045	9/26/2008	0.0000000000	0.0000000000	0.0933966000	774.6	28.6	26-09-2008 10:29:43	0.0000	0.0000	0.3890	Beaver Creek
arch092608_11	1,234,760.508	2,426,571.631	9/26/2008	0.1578910000	0.00215306000	0.1681780000	773.6	29.3	26-09-2008 10:37:23	0.6600	0.0090	0.7030	Beaver Creek
arch092608_12	1,234,951.500	2,426,567.128	9/26/2008	0.1109720000	0.00143189000	0.0534574000	773.0	29.8	26-09-2008 10:42:51	0.4650	0.0060	0.2240	Beaver Creek
arch092608_13	1,235,159.478	2,426,568.075	9/26/2008	0.0000000000	0.00071745900	0.1052270000	775.4	30.1	26-09-2008 10:47:32	-0.5380	0.0030	0.4400	Beaver Creek
arch092608_14	1,235,157.531	2,426,375.663	9/26/2008	0.0000000000	0.00095221600	0.0856995000	772.6	30.4	26-09-2008 10:51:41	0.0000	0.0040	0.3600	Beaver Creek
arch092608_15	1,234,971.718	2,426,379.021	9/26/2008	0.0000000000	0.00095354800	0.1868950000	774.7	30.8	26-09-2008 10:57:37	-0.5380	0.0040	0.7840	Beaver Creek
arch092608_16	1,234,968.255	2,426,177.051	9/26/2008	0.0000000000	0.00095482100	0.0658827000	776.5	31.1	26-09-2008 11:03:08	-0.0130	0.0040	0.2760	Beaver Creek
arch092608_17	1,235,151.625	2,426,187.509	9/26/2008	0.0652076000	0.00167199000	0.0281707000	777.5	31.3	26-09-2008 11:09:01	0.2730	0.0070	0.9550	Beaver Creek
arch092608_18	1,235,158.846	2,425,967.774	9/26/2008	0.1056210000	0.00071526800	0.0293260000	776.6	31.5	26-09-2008 11:13:46	0.4430	0.0030	0.1230	Beaver Creek
arch092608_19	1,234,959.883	2,425,966.212	9/26/2008	0.0000000000	0.00071616900	0.0537127000	778.6	31.9	26-09-2008 11:19:09	0.0000	0.0030	0.2250	Beaver Creek
arch092608_20	1,234,948.493	2,425,766.814	9/26/2008	0.0000000000	0.00047701100	0.0498476000	778.4	32.1	26-09-2008 11:23:02	-1.3660	0.0020	0.2090	Beaver Creek
arch092608_21	1,235,159.401	2,425,779.876	9/26/2008	0.0000000000	0.00047761700	0.0637619000	779.9	32.3	26-09-2008 11:28:11	-0.0030	0.0020	0.2670	Beaver Creek
arch092608_22	1,235,155.855	2,425,570.263	9/26/2008	0.0000000000	0.00143236000	0.2363400000	780.4	32.6	26-09-2008 11:31:38	0.0000	0.0060	0.9900	Beaver Creek
arch092608_23	1,234,972.464	2,425,576.572	9/26/2008	0.0000000000	0.00119286000	0.0966213000	780.4	32.8	26-09-2008 11:35:17	-0.0530	0.0050	0.4050	Beaver Creek
arch092608_24	1,234,950.568	2,425,377.282	9/26/2008	0.0000000000	0.00381340000	0.6165790000	780.4	33.1	26-09-2008 11:40:09	0.0000	0.0160	2.5870	Beaver Creek
arch092608_25	1,234,954.167	2,425,172.399	9/26/2008	0.0000000000	0.00047629700	0.0862098000	780.8	33.5	26-09-2008 11:44:32	0.0000	0.0020	0.3620	Beaver Creek
arch092608_26	1,234,952.044	2,424,966.920	9/26/2008	0.0000000000	0.00047592000	0.0818583000	781.2	33.9	26-09-2008 11:48:32	-0.0010	0.0020	0.3440	Beaver Creek
arch092608_27	1,234,960.285	2,424,756.529	9/26/2008	0.0000000000	0.00071153400	0.0576342000	779.9	34.4	26-09-2008 11:53:18	-0.0160	0.0030	0.2430	Beaver Creek
arch092608_28	1,235,643.784	2,424,159.188	9/26/2008	0.0000000000	0.00235437000	0.1473840000	777.7	35.8	26-09-2008 12:18:26	0.0000	0.0100	0.6260	Beaver Creek
arch092608_29	1,235,636.142	2,424,204.130	9/26/2008	0.0000000000	0.00380570000	0.1791060000	786.2	36.0	26-09-2008 12:20:47	0.0000	0.0160	0.7530	Beaver Creek
arch092608_30	1,235,755.825	2,424,170.034	9/26/2008	0.0058821000	0.00070585200	0.0689382000	778.2	36.2	26-09-2008 12:23:41	0.0250	0.0030	0.2930	Beaver Creek
arch092608_31	1,235,745.077	2,424,378.550	9/26/2008	0.00046944700	0.00140834000	0.0551601000	777.1	36.5	26-09-2008 12:26:39	0.0020	0.0060	0.2350	Beaver Creek
arch092608_32	1,235,755.282	2,424,575.042	9/26/2008	0.0000000000	0.00234617000	0.1388930000	777.5	36.8	26-09-2008 12:30:27	0.0000	0.0100	0.5920	Beaver Creek
arch092608_33	1,235,747.725	2,424,767.881	9/26/2008	0.0000000000	0.00140481000	0.0868638000	776.4	37.0	26-09-2008 12:33:12	0.0000	0.0060	0.3710	Beaver Creek
arch092608_34	1,235,756.938	2,424,978.851	9/26/2008	0.00023413400	0.00163894000	0.1304130000	776.9	37.2	26-09-2008 12:36:06	0.0010	0.0070	0.5570	Beaver Creek
arch092608_35	1,235,540.858	2,425,174.085	9/26/2008	0.00117074000	0.00140489000	0.0913180000	777.7	37.5	26-09-2008 12:40:00	0.0050	0.0060	0.3900	Beaver Creek
arch092608_36	1,235,525.009	2,424,971.543	9/26/2008	0.00632485000	0.00257679000	0.1246230000	778.8	37.8	26-09-2008 12:44:18	0.0270	0.0110	0.5320	Beaver Creek
arch092608_37	1,235,543.987	2,424,771.214	9/26/2008	0.0000000000	0.00140155000	0.0901666000	777.6	38.2	26-09-2008 12:49:02	0.0000	0.0060	0.3860	Beaver Creek
arch092608_38	1,235,554.751	2,424,577.679	9/26/2008	0.0000000000	0.00140092000	0.1148760000	777.5	38.3	26-09-2008 12:51:43	0.0000	0.0060	0.4920	Beaver Creek
arch092608_39	1,235,555.404	2,424,370.800	9/26/2008	0.0000000000	0.00209977000	0.0620598000	777.4	38.5	26-09-2008 12:54:46	0.0000	0.0090	0.2660	Beaver Creek
arch092608_40	1,235,549.988	2,424,169.201	9/26/2008	0.00023335300	0.00163347000	0.1108420000	777.8	38.6	26-09-2008 12:59:23	0.0010	0.0070	0.4750	Beaver Creek
arch092608_41	1,235,343.733	2,424,157.590	9/26/2008	0.0000000000	0.00093269200	0.1107570000	777.7	38.8	26-09-2008 13:03:28	0.0000	0.0040	0.4750	Beaver Creek
arch092608_42	1,235,350.944	2,424,369.715	9/26/2008	0.0000000000	0.00069870900	0.1287950000	776.8	38.8	26-09-2008 13:06:25	0.0000	0.0030	0.5530	Beaver Creek
arch092608_43	1,235,347.063	2,424,561.964	9/26/2008	0.00046613700	0.00139841000	0.1372770000	777.6	38.9	26-09-2008 13:09:10	0.0020	0.0060	0.5890	Beaver Creek
arch092608_44	1,235,351.013	2,424,767.437	9/26/2008	0.0000000000	0.00139913000	0.3600430000	778.5	39.1	26-09-2008 13:12:41	0.0000	0.0060	1.5440	Beaver Creek
arch092608_45	1,235,354.096	2,424,979.511	9/26/2008	0.0000000000	0.00139904000	0.0949017000	778.7	39.2	26-09-2008 13:15:57	0.0000	0.0060	0.4070	Beaver Creek
arch092608_46	1,235,334.767	2,425,177.267	9/26/2008	0.0000000000	0.00162876000	0.1151770000	777.3	39.3	26-09-2008 13:19:24	0.0000	0.0070	0.4950	Beaver Creek
arch092608_47	1,235,330.146	2,425,368.380	9/26/2008	0.0000000000	0.00162971000	0.1257200000	778.0	39.4	26-09-2008 13:22:29	0.0000	0.0070	0.5400	Beaver Creek
arch092608_48	1,235,148.190	2,425,372.877	9/26/2008	0.0088521000	0.00279540000	0.2706880000	778.7	39.5	26-09-2008 13:26:45	0.0380	0.0120	1.1620	Beaver Creek
arch092608_49	1,235,152.809	2,425,170.113	9/26/2008	0.0121126000	0.00442577000	0.1546690000	778.9	39.6	26-09-2008 13:30:32	0.0520	0.0190	0.6640	Beaver Creek
arch092608_50	1,235,151.033	2,424,970.399	9/26/2008	0.0000000000	0.00279290000	0.1273100000	778.5	39.7	26-09-2008 13:33:57	-0.0140	0.0120	0.5470	Beaver Creek
arch092608_51	1,235,151.757	2,424,776.850	9/26/2008	0.00139555000	0.00279110000	0.3788920000	778.0	39.7	26-09-2008 13:36:51	0.0060	0.0120	1.6290	Beaver Creek
arch092608_52	1,235,152.612	2,424,575.221	9/26/2008	0.0000000000	0.00209346000	0.3310000000	778.3	39.8	26-09-2008 13:40:09	-0.0600	0.0090	1.4230	Beaver Creek
arch092608_53	1,235,149.006	2,424,384.955	9/26/2008	0.0000000000	0.00232428000	0.1536350000	777.7	39.8	26-09-2008 13:43:31	0.0000	0.0100	0.6610	Beaver Creek
lsc092708_01	1,209,532.624	2,443,357.755	9/28/2008	0.2054680000	0.00025272800	0.0459964000	790.5	19.4	28-09-2008 11:51:36	0.8130	0.0010	0.1820	LITTLE SQUAW CREEK
lsc092708_02	1,209,323.657	2,443,378.832	9/28/2008	0.1742310000	0.00276159000	0.1167400000	790.9	21.5	28-09-2008 11:57:14	0.6940	0.0110	0.4650	LITTLE SQUAW CREEK
lsc092708_03	1,208,925.562	2,443,383.696	9/28/2008	0.0000000000	0.00098950000	0.1531250000	792.8	26.6	28-09-2008 12:20:51	0.0000	0.0040	0.6190	LITTLE SQUAW CREEK
lsc092708_04	1,208,924.401	2,443,583.511	9/28/2008	0.00172415000	0.00221676000	0.1876860000	792.8	27.9	28-09-2008 12:26:49	0.0070	0.0090	0.7620	LITTLE SQUAW CREEK
lsc092708_05	1,208,916.395	2,443,177.302	9/28/2008	0.0000000000	0.00049092800	0.0471291000	793.5	29.2	28-09-2008 12:33:24	-0.0210	0.0020	0.1920	LITTLE SQUAW CREEK
lsc092708_06	1,209,125.671	2,443,168.104	9/28/2008	0.0000000000	0.00122179000	0.0408079000	792.8	30.3	28-09-2008 12:40:13	0.0000	0.0050	0.1670	LITTLE SQUAW CREEK
lsc092708_07	1,												

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
lsc092708_14	1,208,717.827	2,442,968.273	9/28/2008	0.0000000000	0.00072760200	0.06014840000	794.4	33.2	28-09-2008 14:17:18	0.0000	0.0030	0.2480	LITTLE SQUAW CREEK
lsc092708_15	1,208,723.094	2,442,787.165	9/28/2008	0.0000000000	0.00000000000	0.04726330000	794.4	33.4	28-09-2008 14:18:30	0.0000	-0.0010	0.1950	LITTLE SQUAW CREEK
lsc092708_16	1,208,895.021	2,442,770.494	9/28/2008	0.0000000000	0.00000000000	0.02058180000	794.4	33.7	28-09-2008 14:19:37	0.0000	0.0000	0.0850	LITTLE SQUAW CREEK
lsc092708_17	1,208,896.736	2,442,577.569	9/28/2008	0.29110300000	0.00000000000	0.00467030000	794.4	33.9	28-09-2008 14:20:50	1.2030	0.0000	0.1970	LITTLE SQUAW CREEK
lsc092708_18	1,208,916.031	2,442,375.198	9/28/2008	0.0000000000	0.00000000000	0.03482260000	794.4	34.1	28-09-2008 14:22:00	0.0000	0.0000	0.1440	LITTLE SQUAW CREEK
lsc092708_19	1,208,738.338	2,442,400.033	9/28/2008	0.0000000000	0.00000000000	0.02682490000	794.4	34.3	28-09-2008 14:23:08	0.0000	0.0000	0.1110	LITTLE SQUAW CREEK
lsc092708_20	1,208,715.432	2,442,584.954	9/28/2008	0.0000000000	0.00000000000	0.00000000000	794.4	34.4	28-09-2008 14:24:19	0.0000	-0.0020	-0.8670	LITTLE SQUAW CREEK
lsc092708_21	1,208,915.887	2,444,184.115	9/29/2008	0.0000000000	0.00076214300	0.12194300000	794.9	19.5	29-09-2008 08:39:30	0.0000	0.0030	0.4800	LITTLE SQUAW CREEK
lsc092708_22	1,208,733.748	2,444,178.224	9/29/2008	0.0000000000	0.00000000000	0.04771960000	803.3	19.7	29-09-2008 08:46:35	0.0000	0.0000	0.1860	LITTLE SQUAW CREEK
lsc092708_23	1,208,528.722	2,444,173.385	9/29/2008	0.0000000000	0.00000000000	0.00912207000	794.2	20.0	29-09-2008 08:56:13	0.0000	0.0000	0.0360	LITTLE SQUAW CREEK
lsc092708_24	1,208,511.081	2,443,969.937	9/29/2008	0.0000000000	0.00201537000	0.17332100000	790.4	20.3	29-09-2008 09:02:24	0.0000	0.0080	0.6880	LITTLE SQUAW CREEK
lsc092708_25	1,208,537.439	2,443,771.213	9/29/2008	0.00050339100	0.000201356000	0.08834510000	790.5	20.6	29-09-2008 09:09:23	0.0020	0.0080	0.3510	LITTLE SQUAW CREEK
lsc092708_26	1,208,533.522	2,443,570.560	9/29/2008	0.0000000000	0.00126101000	0.21361500000	792.9	20.9	29-09-2008 09:15:53	0.0000	0.0050	0.8470	LITTLE SQUAW CREEK
lsc092708_27	1,208,326.852	2,443,580.486	9/29/2008	0.00025231700	0.00075695000	0.13978300000	793.8	21.1	29-09-2008 09:20:41	0.0010	0.0030	0.5540	LITTLE SQUAW CREEK
lsc092708_28	1,208,325.673	2,443,367.580	9/29/2008	0.0000000000	0.00100697000	0.06948080000	792.8	21.4	29-09-2008 09:28:53	0.0000	0.0040	0.2760	LITTLE SQUAW CREEK
lsc092708_29	1,208,321.679	2,443,174.922	9/29/2008	0.00025157100	0.00251571000	0.26238900000	792.8	21.6	29-09-2008 09:32:53	0.0010	0.0100	1.0430	LITTLE SQUAW CREEK
lsc092708_30	1,208,134.771	2,443,180.431	9/29/2008	0.0000000000	0.00075524800	0.16615500000	793.9	21.8	29-09-2008 09:38:00	0.0000	0.0030	0.6600	LITTLE SQUAW CREEK
lsc092708_31	1,208,120.989	2,442,977.961	9/29/2008	0.0000000000	0.00250765000	0.34104000000	791.6	22.1	29-09-2008 09:42:42	0.0000	0.0100	1.3600	LITTLE SQUAW CREEK
lsc092708_32	1,208,132.025	2,442,779.042	9/29/2008	0.00025043600	0.00225392000	0.18407000000	791.9	22.6	29-09-2008 09:48:20	0.0010	0.0090	0.7350	LITTLE SQUAW CREEK
lsc092708_33	1,207,919.049	2,442,769.772	9/29/2008	0.0000000000	0.00000000000	0.02246050000	788.6	22.4	29-09-2008 10:07:42	0.0000	0.0000	0.0900	LITTLE SQUAW CREEK
lsc092708_34	1,207,916.068	2,442,573.621	9/29/2008	0.0000000000	0.000049827900	1.31222000000	788.6	22.9	29-09-2008 10:13:33	0.0000	0.0020	5.2670	LITTLE SQUAW CREEK
lsc092708_35	1,207,718.316	2,442,380.935	9/29/2008	0.0000000000	0.00100190000	0.10795500000	794.7	23.6	29-09-2008 10:20:19	0.0000	0.0040	0.4310	LITTLE SQUAW CREEK
lsc092708_36	1,207,524.779	2,442,164.598	9/29/2008	0.0000000000	0.00224010000	0.78453200000	791.3	24.2	29-09-2008 10:26:48	0.0000	0.0090	3.1520	LITTLE SQUAW CREEK
lsc092708_37	1,207,528.870	2,441,973.998	9/29/2008	0.00024869100	0.00472513000	0.04650520000	791.7	24.6	29-09-2008 10:33:47	0.0010	0.0190	0.1870	LITTLE SQUAW CREEK
lsc092708_38	1,207,723.210	2,441,781.750	9/29/2008	0.0000000000	0.000049636000	0.00496360000	791.4	25.1	29-09-2008 10:40:49	0.0000	0.0020	0.0200	LITTLE SQUAW CREEK
lsc092708_39	1,207,924.086	2,441,567.456	9/29/2008	0.00371992000	0.00000000000	0.18252400000	792.4	25.7	29-09-2008 10:47:55	0.0150	0.0000	0.7360	LITTLE SQUAW CREEK
lsc092708_40	1,208,122.244	2,441,562.197	9/29/2008	0.0000000000	0.00395647000	0.08011840000	791.7	26.3	29-09-2008 10:52:33	0.0000	0.0160	0.3240	LITTLE SQUAW CREEK
lsc092708_41	1,208,319.962	2,441,565.223	9/29/2008	0.0000000000	0.00148015000	0.09645620000	791.4	26.9	29-09-2008 10:57:30	0.0000	0.0060	0.3910	LITTLE SQUAW CREEK
lsc092708_42	1,208,532.478	2,441,753.218	9/29/2008	0.0000000000	0.00172029000	0.14278400000	790.5	27.7	29-09-2008 11:03:09	0.0000	0.0070	0.5810	LITTLE SQUAW CREEK
lsc092708_43	1,208,337.346	2,441,780.279	9/29/2008	0.00024531700	0.00367975000	0.20851900000	790.4	28.2	29-09-2008 11:06:23	0.0010	0.0150	0.8500	LITTLE SQUAW CREEK
lsc092708_44	1,208,130.574	2,441,779.674	9/29/2008	0.00516003000	0.00196573000	0.21745900000	793.0	28.7	29-09-2008 11:09:36	0.0210	0.0080	0.8850	LITTLE SQUAW CREEK
lsc092708_45	1,207,925.931	2,441,784.883	9/29/2008	0.0000000000	0.00318540000	0.13084700000	792.1	29.2	29-09-2008 11:13:07	0.0000	0.0130	0.5340	LITTLE SQUAW CREEK
lsc092708_46	1,207,736.528	2,441,969.713	9/29/2008	0.0000000000	0.00195800000	0.10255000000	792.5	29.7	29-09-2008 11:17:37	0.0000	0.0080	0.4190	LITTLE SQUAW CREEK
lsc092708_47	1,207,921.007	2,441,988.660	9/29/2008	0.0000000000	0.00073202200	0.09931100000	791.4	30.2	29-09-2008 11:23:26	0.0000	0.0030	0.4070	LITTLE SQUAW CREEK
lsc092708_48	1,207,936.930	2,442,167.128	9/29/2008	0.0000000000	0.00391031000	1.06043000000	793.7	30.6	29-09-2008 11:27:03	0.0000	0.0160	4.3390	LITTLE SQUAW CREEK
lsc092708_49	1,207,924.396	2,442,378.879	9/29/2008	0.00048749400	0.00170623000	0.10554200000	792.9	31.1	29-09-2008 11:31:42	0.0020	0.0070	0.4330	LITTLE SQUAW CREEK
lsc092708_50	1,207,728.099	2,442,158.561	9/29/2008	0.00462126000	0.00048644800	0.00000000000	792.5	31.6	29-09-2008 12:06:22	0.0190	0.0020	-0.0220	LITTLE SQUAW CREEK
lsc092708_51	1,208,128.600	2,441,960.454	9/29/2008	0.0000000000	0.00145813000	0.04714620000	792.1	31.7	29-09-2008 12:12:01	0.0000	0.0060	0.1940	LITTLE SQUAW CREEK
lsc092708_52	1,208,325.762	2,441,977.756	9/29/2008	0.0000000000	0.00048603100	0.05370640000	792.6	31.9	29-09-2008 12:16:17	0.0000	0.0020	0.2210	LITTLE SQUAW CREEK
lsc092708_53	1,208,517.235	2,441,979.579	9/29/2008	0.0000000000	0.00242409000	0.00048481900	791.4	32.2	29-09-2008 12:21:24	-0.1560	0.0100	0.0020	LITTLE SQUAW CREEK
lsc092708_54	1,208,731.635	2,441,974.788	9/29/2008	0.0000000000	0.00120863000	0.00386760000	790.2	32.6	29-09-2008 12:25:31	-0.8310	0.0050	0.0160	LITTLE SQUAW CREEK
lsc092708_55	1,208,732.773	2,442,173.757	9/29/2008	0.0000000000	0.00120375000	0.04839080000	788.3	33.1	29-09-2008 12:29:17	-0.7460	0.0050	0.2010	LITTLE SQUAW CREEK
lsc092708_56	1,208,519.096	2,442,193.500	9/29/2008	0.04578050000	0.00265045000	0.02722730000	790.5	33.7	29-09-2008 12:33:04	0.1900	0.0110	0.1130	LITTLE SQUAW CREEK
lsc092708_57	1,208,337.405	2,442,164.015	9/29/2008	0.00915557000	0.00192749000	0.08288200000	792.0	34.3	29-09-2008 12:37:47	0.0380	0.0080	0.3440	LITTLE SQUAW CREEK
lsc092708_58	1,208,107.342	2,442,190.446	9/29/2008	0.15098300000	0.00456796000	0.32240200000	792.1	35.0	29-09-2008 12:42:42	0.6280	0.0190	1.3410	LITTLE SQUAW CREEK
lsc092708_59	1,208,113.567	2,442,372.364	9/29/2008	0.03773220000	0.00384532000	0.28094900000	793.1	35.5	29-09-2008 12:46:29	0.1570	0.0160	1.1690	LITTLE SQUAW CREEK
lsc092708_60	1,208,113.138	2,442,552.812	9/29/2008	0.0000000000	0.00143917000	0.05780680000	793.6	36.3	29-09-2008 12:54:03	0.0000	0.0060	0.2410	LITTLE SQUAW CREEK
lsc092708_61	1,208,312.623	2,442,369.668	9/29/2008	0.0000000000	0.00215341000	0.10384200000	792.4	36.6	29-09-2008 12:58:48	-0.0010	0.0090	0.4340	LITTLE SQUAW CREEK
lsc092708_62	1,208,537.760	2,442,384.581	9/29/2008	0.0000000000	0.00215543000	0.09771290000	793.4	36.7	29-09-2008 13:02:39	-0.1810	0.0090	0.4080	LITTLE SQUAW CREEK
lsc092708_63	1,208,540.640	2,442,584.134	9/29/2008	0.0000000000	0.00167452000	0.09209870000	793.0	36.9	29-09-2008 13:06:42	-0.1340	0.0070	0.3850	LITTLE SQUAW CREEK
lsc092708_64	1,208,321.267	2,442,573.878	9/29/2008	0.0000000000	0.00286803000	0.12189100000	792.8	37.1	29-09-2008 13:10:59	-0.0020	0.0120	0.5100	LITTLE SQUAW CREEK
lsc092708_65	1,208,320.003	2,442,783.199	9/29/2008	0.0000000000	0.00167248000	0.05399720000	792.8	37.2	29-09-2008 13:14:23	-0.0710	0.0070	0.2260	LITTLE SQUAW CREEK
lsc092708_66	1,208,322.331	2,442,954.717	9/29/2008	0.0000000000	0.00167204000	0.07930230000	793.1	37.4	29-09-2008 13:17:28	-0.0920	0.0070	0.3320	LITTLE SQUAW CREEK
lsc092708_67	1,208,498.313	2,442,766.641	9/29/2008	0.0000000000	0.00262381000	0.09660380000	792.5	37.6	29-09-2008 13:21:36	-0.1480	0.0110	0.4050	LITTLE SQUAW CREEK
lsc092708_68	1,208,502.984	2,442,979.857	9/29/2008	0.00023858500	0.00262440000	0.13289200000	793.2	37.8	29-09-2008 13:25:29	0.0010	0.0110	0.5570	LITTLE SQUAW CREEK
lsc092708_69	1,208,526.649	2,443,170.968	9/29/2008	0.0000000000	0.00167040000	0.08447450000	793.6	37.9	29-09-2008 13:28:48	-0.0350	0.0070	0.3540	LITTLE SQUAW CREEK
lsc092708_70	1,208,533.662	2,443,365.467	9/29/2008	0.0000000000	0.00286174000	0.13784000000	793.1	37.9	29-09-2008 13:32:08	-0.0350	0.0120	0.5780	LITTLE SQUAW CREEK
lsc092708_71	1,208,727.004	2,443,172.040	9/29/2008	0.0000000000	0.00166956000								

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet101908_03	1,204,718.756	2,454,979.816	10/19/2008	0.0000000000	0.00148023000	0.15271100000	789.6	26.2	19-10-2008 11:51:17	0.0000	0.0060	0.6190	PETERSON GULCH
pet101908_04	1,204,922.872	2,454,965.659	10/19/2008	0.0000000000	0.00172849000	0.13605700000	791.1	26.5	19-10-2008 11:54:20	0.0000	0.0070	0.5510	PETERSON GULCH
pet101908_05	1,205,124.559	2,454,972.367	10/19/2008	0.0000000000	0.00221703000	0.16603100000	790.0	26.8	19-10-2008 11:56:52	0.0000	0.0090	0.6740	PETERSON GULCH
pet101908_06	1,205,321.263	2,454,980.792	10/19/2008	0.0000000000	0.00049228300	0.22423500000	789.9	27.0	19-10-2008 11:59:58	0.0000	0.0020	0.9110	PETERSON GULCH
pet101908_07	1,205,521.574	2,454,983.521	10/19/2008	0.0000000000	0.00122979000	0.07181970000	790.1	27.3	19-10-2008 12:02:48	0.0000	0.0050	0.2920	PETERSON GULCH
pet101908_08	1,205,732.180	2,454,986.213	10/19/2008	0.0000000000	0.00245258000	0.05665460000	788.9	27.7	19-10-2008 12:05:58	0.0000	0.0100	0.2310	PETERSON GULCH
pet101908_09	1,205,912.652	2,455,173.205	10/19/2008	0.01567570000	0.00024493200	0.13030400000	788.9	28.1	19-10-2008 12:09:38	0.0640	0.0010	0.5320	PETERSON GULCH
pet101908_10	1,205,727.545	2,455,187.629	10/19/2008	0.0000000000	0.00073264900	0.18096400000	787.9	28.6	19-10-2008 12:13:42	0.0000	0.0030	0.7410	PETERSON GULCH
pet101908_100	1,204,328.931	2,456,376.193	10/21/2008	0.00024654400	0.00123272000	0.02810600000	790.4	26.7	21-10-2008 10:06:20	0.0010	0.0050	0.1140	PETERSON GULCH
pet101908_101	1,204,321.310	2,456,579.776	10/21/2008	0.0000000000	0.00123168000	0.04581860000	790.0	26.8	21-10-2008 10:08:39	0.0000	0.0050	0.1860	PETERSON GULCH
pet101908_102	1,204,533.209	2,456,379.880	10/21/2008	0.00024631700	0.00147790000	0.04877080000	790.2	26.9	21-10-2008 10:11:25	0.0010	0.0060	0.1980	PETERSON GULCH
pet101908_103	1,204,519.059	2,456,572.713	10/21/2008	0.0000000000	0.00073799200	0.00491994000	789.7	27.1	21-10-2008 10:14:41	0.0000	0.0030	0.0200	PETERSON GULCH
pet101908_104	1,204,514.485	2,456,782.613	10/21/2008	0.0000000000	0.00073759400	0.03343760000	789.8	27.3	21-10-2008 10:17:24	0.0000	0.0030	0.1360	PETERSON GULCH
pet101908_105	1,204,332.028	2,456,776.130	10/21/2008	0.00024586500	0.00098345800	0.02556990000	789.8	27.3	21-10-2008 10:20:55	0.0010	0.0040	0.1040	PETERSON GULCH
pet101908_106	1,204,131.757	2,456,773.863	10/21/2008	0.0000000000	0.00122923000	0.05039820000	790.0	27.4	21-10-2008 10:23:11	0.0000	0.0050	0.2050	PETERSON GULCH
pet101908_107	1,203,926.833	2,456,774.773	10/21/2008	0.0000000000	0.00221429000	0.08045240000	790.6	27.4	21-10-2008 10:25:30	0.0000	0.0090	0.3270	PETERSON GULCH
pet101908_108	1,203,727.401	2,456,776.461	10/21/2008	0.0000000000	0.00245876000	0.05458450000	790.1	27.4	21-10-2008 10:27:59	0.0000	0.0100	0.2220	PETERSON GULCH
pet101908_109	1,203,533.815	2,456,784.516	10/21/2008	0.0000000000	0.00073787400	0.05042140000	790.1	27.3	21-10-2008 10:30:31	0.0000	0.0030	0.2050	PETERSON GULCH
pet101908_11	1,205,530.507	2,455,168.699	10/19/2008	0.00440045000	0.00073340800	0.10610000000	789.5	28.9	19-10-2008 12:17:03	0.0180	0.0030	0.4340	PETERSON GULCH
pet101908_110	1,203,328.020	2,456,770.724	10/21/2008	0.00024605100	0.00024605100	0.09620610000	790.4	27.3	21-10-2008 10:33:32	0.0010	0.0010	0.3910	PETERSON GULCH
pet101908_111	1,203,118.664	2,456,768.518	10/21/2008	0.0000000000	0.00123057000	0.03347150000	790.6	27.3	21-10-2008 10:36:03	0.0000	0.0050	0.1360	PETERSON GULCH
pet101908_112	1,202,931.805	2,456,970.788	10/21/2008	0.0000000000	0.00122833000	0.13634500000	788.9	27.2	21-10-2008 10:39:26	0.0000	0.0050	0.5550	PETERSON GULCH
pet101908_113	1,203,132.121	2,456,977.079	10/21/2008	0.0000000000	0.00147617000	0.07995920000	789.8	27.1	21-10-2008 10:42:47	0.0000	0.0060	0.3250	PETERSON GULCH
pet101908_114	1,203,326.287	2,456,979.660	10/21/2008	0.0000000000	0.00122868000	0.07986430000	788.6	27.0	21-10-2008 10:46:00	0.0000	0.0050	0.3250	PETERSON GULCH
pet101908_115	1,203,526.065	2,456,977.610	10/21/2008	0.00049197100	0.00147591000	0.03222410000	789.4	27.0	21-10-2008 10:49:44	0.0220	0.0060	0.1310	PETERSON GULCH
pet101908_116	1,203,724.486	2,456,974.699	10/21/2008	0.0000000000	0.00245471000	0.07849930000	789.7	27.0	21-10-2008 10:51:59	0.0000	0.0090	0.3190	PETERSON GULCH
pet101908_117	1,203,925.853	2,456,974.938	10/21/2008	0.0000000000	0.00344527000	0.07997950000	790.0	27.1	21-10-2008 10:54:16	0.0000	0.0140	0.3250	PETERSON GULCH
pet101908_118	1,204,128.953	2,456,974.201	10/21/2008	0.0000000000	0.00295360000	0.07260930000	790.4	27.2	21-10-2008 10:56:35	0.0000	0.0120	0.2950	PETERSON GULCH
pet101908_119	1,204,328.631	2,456,974.306	10/21/2008	0.0000000000	0.00196667000	0.08235420000	789.7	27.3	21-10-2008 10:58:47	0.0000	0.0080	0.3350	PETERSON GULCH
pet101908_12	1,205,328.646	2,455,174.342	10/19/2008	0.0000000000	0.00170786000	0.13345700000	788.7	29.2	19-10-2008 12:19:58	0.0000	0.0070	0.5470	PETERSON GULCH
pet101908_120	1,204,319.539	2,457,182.066	10/21/2008	0.0000000000	0.00073639200	0.12052300000	789.3	27.6	21-10-2008 11:02:58	0.0000	0.0030	0.4910	PETERSON GULCH
pet101908_121	1,204,121.009	2,457,173.682	10/21/2008	0.0000000000	0.00122179000	0.05449170000	789.4	29.0	21-10-2008 11:30:59	0.0000	0.0050	0.2230	PETERSON GULCH
pet101908_122	1,203,925.257	2,457,173.516	10/21/2008	0.00024440000	0.00268840000	0.03055010000	789.8	29.1	21-10-2008 11:33:17	0.0010	0.0110	0.1250	PETERSON GULCH
pet101908_123	1,203,726.949	2,457,172.504	10/21/2008	0.00024408400	0.00073225300	0.02001490000	789.3	29.3	21-10-2008 11:35:36	0.0010	0.0030	0.0820	PETERSON GULCH
pet101908_124	1,203,525.337	2,457,172.906	10/21/2008	0.0000000000	0.00170889000	0.01122980000	789.7	29.4	21-10-2008 11:38:01	0.0000	0.0070	0.0460	PETERSON GULCH
pet101908_125	1,203,330.467	2,457,171.477	10/21/2008	0.00024394200	0.00097576700	0.23955100000	789.1	29.4	21-10-2008 11:40:21	0.0010	0.0040	0.9820	PETERSON GULCH
pet101908_126	1,203,125.686	2,457,178.520	10/21/2008	0.0000000000	0.00048790800	0.13393100000	789.4	29.5	21-10-2008 11:43:28	0.0000	0.0020	0.5490	PETERSON GULCH
pet101908_127	1,202,938.503	2,457,182.741	10/21/2008	0.00024379900	0.00073139800	0.03331567000	788.9	29.5	21-10-2008 11:47:08	0.0010	0.0030	0.1360	PETERSON GULCH
pet101908_128	1,202,931.495	2,457,372.752	10/21/2008	0.0000000000	0.00097420800	0.07793660000	788.1	29.5	21-10-2008 11:50:48	0.0000	0.0040	0.3200	PETERSON GULCH
pet101908_129	1,202,733.648	2,457,378.380	10/21/2008	0.0000000000	0.00097383700	0.10006200000	787.8	29.5	21-10-2008 11:53:56	0.0000	0.0040	0.4110	PETERSON GULCH
pet101908_13	1,205,128.804	2,455,176.579	10/19/2008	0.0000000000	0.00146428000	0.27992100000	789.7	29.5	19-10-2008 12:22:41	0.0000	0.0060	1.1470	PETERSON GULCH
pet101908_130	1,203,131.950	2,457,384.795	10/21/2008	0.0000000000	0.00146031000	0.13118500000	787.3	29.4	21-10-2008 11:59:22	0.0000	0.0060	0.5390	PETERSON GULCH
pet101908_131	1,203,320.904	2,457,368.310	10/21/2008	0.0000000000	0.00097445500	0.16541400000	788.3	29.5	21-10-2008 12:02:32	0.0000	0.0040	0.6790	PETERSON GULCH
pet101908_132	1,203,527.721	2,457,376.479	10/21/2008	0.0000000000	0.00170746000	0.05073600000	789.3	29.5	21-10-2008 12:04:58	0.0000	0.0070	0.2080	PETERSON GULCH
pet101908_133	1,203,727.790	2,457,373.581	10/21/2008	0.0000000000	0.00341379000	0.05730290000	789.3	29.6	21-10-2008 12:07:36	0.0000	0.0140	0.2350	PETERSON GULCH
pet101908_134	1,203,927.394	2,457,374.957	10/21/2008	0.0000000000	0.00097549300	0.06901610000	789.4	29.6	21-10-2008 12:10:01	0.0000	0.0040	0.2830	PETERSON GULCH
pet101908_135	1,204,126.316	2,457,375.217	10/21/2008	0.0000000000	0.00170577000	0.06920550000	789.3	29.8	21-10-2008 12:12:37	0.0000	0.0070	0.2840	PETERSON GULCH
pet101908_136	1,204,312.265	2,457,377.761	10/21/2008	0.00024353900	0.00073061800	0.12371800000	789.1	29.9	21-10-2008 12:14:59	0.0010	0.0030	0.5080	PETERSON GULCH
pet101908_137	1,204,331.445	2,457,576.271	10/21/2008	0.0000000000	0.00145794000	0.05418680000	788.1	30.2	21-10-2008 12:18:54	0.0000	0.0060	0.2230	PETERSON GULCH
pet101908_138	1,204,125.717	2,457,574.561	10/21/2008	0.0000000000	0.00097193600	0.06609160000	788.6	30.4	21-10-2008 12:21:36	-0.0030	0.0040	0.2720	PETERSON GULCH
pet101908_139	1,203,931.338	2,457,569.551	10/21/2008	0.0000000000	0.00169955000	0.05050100000	788.5	30.6	21-10-2008 12:23:57	-0.0120	0.0070	0.2080	PETERSON GULCH
pet101908_14	1,204,915.203	2,455,206.817	10/19/2008	0.0000000000	0.00048783200	0.17830300000	789.8	29.7	19-10-2008 12:25:40	0.0000	0.0020	0.7310	PETERSON GULCH
pet101908_140	1,203,732.748	2,457,575.967	10/21/2008	0.00097114900	0.00194230000	0.04734350000	789.0	30.8	21-10-2008 12:26:12	0.0040	0.0080	0.1950	PETERSON GULCH
pet101908_141	1,203,530.826	2,457,577.637	10/21/2008	0.02599600000	0.00437316000	0.06729810000	789.8	30.9	21-10-2008 12:28:28	0.1070	0.0180	0.2770	PETERSON GULCH
pet101908_142	1,203,330.218	2,457,571.337	10/21/2008	0.0000000000	0.00169969000	0.04734840000	789.6	31.0	21-10-2008 12:31:12	0.0000	0.0070	0.1950	PETERSON GULCH
pet101908_143	1,203,120.705	2,457,580.450	10/21/2008	0.0000000000	0.00218337000	0.03299320000	788.9	31.0	21-10-2008 12:33:43	0.0000	0.0090	0.1360	PETERSON GULCH
pet101908_144	1,202,932.571	2,457,581.500	10/21/2008	0.0000000000	0.00121197000	0.11271300000	788.5	31.1	21-10-2008 12:36:35	0.0000	0.0050	0.4650	PETERSON GULCH
pet101908_145	1,202,732.919	2,457,585.505	10/21/2008	0.00024204300	0.00145226000	0.06728810000	787.1	31.0	21-10-2008 12:41:01	0.0010			

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet101908_153	1,202,935.110	2,457,800.949	10/22/2008	0.0000000000	0.00151920000	0.04810790000	793.6	20.0	22-10-2008 10:40:06	0.0000	0.0060	0.1900	PETERSON GULCH
pet101908_154	1,202,735.772	2,457,788.548	10/22/2008	0.00025289900	0.00075869800	0.07991620000	793.2	20.2	22-10-2008 10:43:59	0.0010	0.0030	0.3160	PETERSON GULCH
pet101908_155	1,202,735.224	2,457,967.568	10/22/2008	0.00000000000	0.00151439000	0.07849600000	791.9	20.3	22-10-2008 10:47:42	0.0000	0.0060	0.3110	PETERSON GULCH
pet101908_156	1,202,500.770	2,457,965.436	10/22/2008	0.00000000000	0.00176880000	0.05432740000	792.8	20.3	22-10-2008 10:50:16	0.0000	0.0070	0.2150	PETERSON GULCH
pet101908_157	1,202,921.983	2,457,972.220	10/22/2008	0.00000000000	0.00100874000	0.08574300000	791.5	20.4	22-10-2008 10:54:09	0.0000	0.0040	0.3400	PETERSON GULCH
pet101908_158	1,203,116.928	2,457,975.785	10/22/2008	0.00000000000	0.00117702000	0.07308420000	793.7	20.4	22-10-2008 10:57:10	-0.0090	0.0070	0.2890	PETERSON GULCH
pet101908_159	1,203,323.724	2,457,969.477	10/22/2008	0.00025301400	0.00126507000	0.03365080000	794.1	20.4	22-10-2008 10:59:38	0.0010	0.0050	0.1330	PETERSON GULCH
pet101908_16	1,204,528.587	2,455,186.527	10/19/2008	0.00024352600	0.00243526000	0.13637500000	790.1	30.3	19-10-2008 12:31:30	0.0010	0.0100	0.5600	PETERSON GULCH
pet101908_160	1,203,523.629	2,457,973.079	10/22/2008	0.00000000000	0.00151776000	0.07462300000	794.2	20.5	22-10-2008 11:01:56	-0.0020	0.0060	0.2950	PETERSON GULCH
pet101908_161	1,203,719.107	2,457,973.313	10/22/2008	0.00025320100	0.00177241000	0.05089340000	795.5	20.7	22-10-2008 11:04:11	0.0010	0.0070	0.2010	PETERSON GULCH
pet101908_162	1,203,918.073	2,457,971.933	10/22/2008	0.00025255200	0.00151531000	0.05530880000	794.0	20.9	22-10-2008 11:06:30	0.0010	0.0060	0.2190	PETERSON GULCH
pet101908_163	1,204,126.752	2,457,975.855	10/22/2008	0.00000000000	0.00075653100	0.05825290000	793.9	21.3	22-10-2008 11:09:29	0.0000	0.0030	0.2310	PETERSON GULCH
pet101908_164	1,204,315.539	2,457,969.786	10/22/2008	0.00000000000	0.00151120000	0.02317170000	794.0	21.7	22-10-2008 11:12:11	0.0000	0.0060	0.0920	PETERSON GULCH
pet101908_165	1,204,316.963	2,458,172.918	10/22/2008	0.00000000000	0.00075264100	0.00000000000	792.5	22.3	22-10-2008 11:16:21	0.0000	0.0030	0.0000	PETERSON GULCH
pet101908_166	1,204,112.738	2,458,167.186	10/22/2008	0.00050329400	0.00251647000	0.10493700000	792.5	21.4	22-10-2008 11:36:44	0.0020	0.0100	0.4170	PETERSON GULCH
pet101908_167	1,203,920.359	2,458,174.622	10/22/2008	0.00025097500	0.00175683000	0.09286080000	792.8	22.3	22-10-2008 11:40:20	0.0010	0.0070	0.3700	PETERSON GULCH
pet101908_168	1,203,721.810	2,458,178.498	10/22/2008	0.00000000000	0.00301104000	0.07653070000	793.7	22.7	22-10-2008 11:42:37	0.0000	0.0120	0.3050	PETERSON GULCH
pet101908_169	1,203,530.210	2,458,173.681	10/22/2008	0.00000000000	0.00125296000	0.05838790000	794.0	23.2	22-10-2008 11:46:13	0.0000	0.0050	0.2330	PETERSON GULCH
pet101908_17	1,204,332.729	2,455,176.961	10/19/2008	0.00024333500	0.00097334100	0.13407800000	790.0	30.5	19-10-2008 12:34:46	0.0010	0.0040	0.5510	PETERSON GULCH
pet101908_170	1,203,328.320	2,458,175.930	10/22/2008	0.00025033800	0.00125169000	0.01226660000	794.0	23.5	22-10-2008 11:48:30	0.0010	0.0050	0.0490	PETERSON GULCH
pet101908_171	1,203,129.495	2,458,171.451	10/22/2008	0.00000000000	0.00125038000	0.06376910000	793.7	23.7	22-10-2008 11:50:55	0.0000	0.0050	0.2550	PETERSON GULCH
pet101908_172	1,202,929.920	2,458,176.180	10/22/2008	0.00000000000	0.00274747000	0.07343250000	793.0	23.8	22-10-2008 11:53:40	0.0000	0.0110	0.2940	PETERSON GULCH
pet101908_173	1,202,722.254	2,458,171.933	10/22/2008	0.00000000000	0.00124749000	0.06012890000	792.4	23.9	22-10-2008 11:56:29	0.0000	0.0050	0.2410	PETERSON GULCH
pet101908_174	1,202,531.893	2,458,178.061	10/22/2008	0.00000000000	0.00049863800	0.15407900000	792.1	24.0	22-10-2008 11:59:26	0.0000	0.0020	0.6180	PETERSON GULCH
pet101908_175	1,202,518.480	2,458,368.162	10/22/2008	0.00000000000	0.00099563900	0.10877400000	790.8	24.0	22-10-2008 12:02:48	0.0000	0.0040	0.4370	PETERSON GULCH
pet101908_176	1,202,722.767	2,458,380.158	10/22/2008	0.00000000000	0.00074742200	0.09766320000	791.8	24.1	22-10-2008 12:05:48	0.0000	0.0030	0.3920	PETERSON GULCH
pet101908_177	1,202,931.199	2,458,376.261	10/22/2008	0.00024948700	0.00299384000	0.18836300000	792.9	24.1	22-10-2008 12:08:40	0.0010	0.0120	0.7550	PETERSON GULCH
pet101908_178	1,203,130.534	2,458,378.139	10/22/2008	0.00000000000	0.00124854000	0.00549356000	793.6	24.1	22-10-2008 12:11:15	-0.0800	0.0050	0.0220	PETERSON GULCH
pet101908_179	1,203,327.166	2,458,377.639	10/22/2008	0.00000000000	0.00199648000	0.07386980000	793.4	24.2	22-10-2008 12:13:59	0.0000	0.0080	0.2960	PETERSON GULCH
pet101908_18	1,204,118.669	2,455,161.749	10/19/2008	0.06249120000	0.00048631300	0.12522600000	790.2	30.8	19-10-2008 12:38:44	0.2570	0.0020	0.5150	PETERSON GULCH
pet101908_180	1,203,512.102	2,458,369.511	10/22/2008	0.00049920400	0.00224642000	0.07213500000	793.8	24.3	22-10-2008 12:16:09	0.0020	0.0090	0.2890	PETERSON GULCH
pet101908_181	1,203,718.540	2,458,376.832	10/22/2008	0.00000000000	0.00098981000	0.06886410000	794.3	24.6	22-10-2008 12:19:17	0.0000	0.0040	0.2760	PETERSON GULCH
pet101908_182	1,203,924.941	2,458,378.168	10/22/2008	0.00024904700	0.00049809500	0.00000000000	793.9	25.0	22-10-2008 12:22:21	0.0010	0.0020	-0.1660	PETERSON GULCH
pet101908_183	1,204,120.553	2,458,370.346	10/22/2008	0.00000000000	0.00123910000	0.02874710000	792.9	26.1	22-10-2008 12:59:41	0.0000	0.0050	0.1160	PETERSON GULCH
pet101908_184	1,204,331.682	2,458,361.742	10/22/2008	0.00000000000	0.00048631300	0.03856410000	791.2	26.2	22-10-2008 13:03:48	-0.3440	0.0130	0.1560	PETERSON GULCH
pet101908_185	1,204,327.600	2,458,578.434	10/22/2008	0.00000000000	0.00221933000	0.07866280000	789.5	26.3	22-10-2008 13:06:49	0.0000	0.0090	0.3190	PETERSON GULCH
pet101908_186	1,204,335.790	2,458,770.254	10/22/2008	0.00000000000	0.00098595900	0.06236190000	789.7	26.5	22-10-2008 13:09:29	-0.0030	0.0040	0.2530	PETERSON GULCH
pet101908_187	1,204,135.349	2,458,781.594	10/22/2008	0.00000000000	0.00172638000	0.10703600000	790.4	26.6	22-10-2008 13:12:02	-0.0160	0.0070	0.4340	PETERSON GULCH
pet101908_188	1,204,128.217	2,458,578.109	10/22/2008	0.00000000000	0.00094787000	0.04145270000	791.3	26.8	22-10-2008 13:15:11	0.0000	0.0160	0.1680	PETERSON GULCH
pet101908_189	1,203,929.087	2,458,573.250	10/22/2008	0.00024637900	0.00039138000	0.08031970000	790.4	26.9	22-10-2008 13:17:49	0.0010	0.0030	0.3260	PETERSON GULCH
pet101908_19	1,203,930.784	2,455,376.339	10/19/2008	0.10442800000	0.00072856600	0.22002700000	790.0	31.1	19-10-2008 12:43:34	0.4300	0.0030	0.9060	PETERSON GULCH
pet101908_190	1,203,740.357	2,458,574.982	10/22/2008	0.00000000000	0.00296267000	0.07875770000	792.3	27.0	22-10-2008 13:20:36	0.0000	0.0120	0.3190	PETERSON GULCH
pet101908_191	1,203,531.421	2,458,575.528	10/22/2008	0.00000000000	0.00197595000	0.04174200000	792.9	27.1	22-10-2008 13:23:02	0.0000	0.0080	0.1690	PETERSON GULCH
pet101908_192	1,203,336.056	2,458,575.679	10/22/2008	0.00000000000	0.00320985000	0.06962910000	792.9	27.2	22-10-2008 13:25:17	0.0000	0.0130	0.2820	PETERSON GULCH
pet101908_193	1,203,128.749	2,458,569.671	10/22/2008	0.00000000000	0.00197604000	0.03260470000	793.2	27.2	22-10-2008 13:27:48	0.0000	0.0080	0.1320	PETERSON GULCH
pet101908_194	1,202,935.717	2,458,579.268	10/22/2008	0.00024667400	0.00148004000	0.01208700000	792.4	27.3	22-10-2008 13:30:14	0.0010	0.0060	0.0490	PETERSON GULCH
pet101908_195	1,202,739.783	2,458,574.008	10/22/2008	0.00000000000	0.00098657200	0.09668400000	792.3	27.3	22-10-2008 13:34:07	0.0000	0.0040	0.3920	PETERSON GULCH
pet101908_196	1,202,724.579	2,458,787.070	10/22/2008	0.00000000000	0.00221810000	0.06309280000	791.7	27.3	22-10-2008 13:37:49	0.0000	0.0090	0.2560	PETERSON GULCH
pet101908_197	1,202,934.944	2,458,777.187	10/22/2008	0.00000000000	0.00295897000	0.03822000000	792.1	27.3	22-10-2008 13:42:21	0.0000	0.0120	0.1550	PETERSON GULCH
pet101908_198	1,203,137.152	2,458,777.616	10/22/2008	0.00000000000	0.00271285000	0.03748670000	792.5	27.4	22-10-2008 13:45:06	0.0000	0.0110	0.1520	PETERSON GULCH
pet101908_199	1,203,329.640	2,458,777.549	10/22/2008	0.00000000000	0.00123317000	0.02934950000	792.8	27.5	22-10-2008 13:47:23	0.0000	0.0050	0.1190	PETERSON GULCH
pet101908_20	1,204,121.185	2,455,369.538	10/19/2008	0.19254400000	0.00096999600	0.17872200000	789.1	31.2	19-10-2008 12:46:48	0.7940	0.0040	0.7370	PETERSON GULCH
pet101908_200	1,203,533.368	2,458,775.562	10/22/2008	0.00000000000	0.00369256000	0.09428350000	792.1	27.8	22-10-2008 13:50:17	0.0000	0.0150	0.3830	PETERSON GULCH
pet101908_201	1,203,724.541	2,458,778.324	10/22/2008	0.00000000000	0.00049182900	0.07082330000	791.8	28.0	22-10-2008 13:52:47	0.0000	0.0020	0.2880	PETERSON GULCH
pet101908_202	1,203,927.535	2,458,782.194	10/22/2008	0.00024581300	0.00024581300	0.06858190000	792.0	28.2	22-10-2008 13:55:17	0.0010	0.0010	0.2790	PETERSON GULCH
pet101908_203	1,204,138.684	2,458,979.450	10/22/2008	0.00000000000	0.00195984000	0.10338100000	790.1	28.5	22-10-2008 13:58:50	0.0000	0.0080	0.4220	PETERSON GULCH
pet101908_204	1,204,126.152	2,459,157.412	10/22/2008	0.00000000000	0.00122446000	0.02742780000	790.6	28.8	22-10-2008 14:01:48	0.0000	0.0050	0.1120	PETERSON GULCH
pet101908_205	1,203,931.930	2,458,979.709	10/22/2008	0.00000000000	0.00269465000	0.06467150000	789.8						

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet101908_213	1,202,927.331	2,459,176.197	10/22/2008	0.00024633500	0.00320235000	0.07981240000	792.1	27.6	22-10-2008 15:04:29	0.0010	0.0130	0.3240	PETERSON GULCH
pet101908_214	1,203,121.788	2,459,176.167	10/22/2008	0.00000000000	0.00172535000	0.05102110000	792.3	27.5	22-10-2008 15:06:36	0.0000	0.0070	0.2070	PETERSON GULCH
pet101908_215	1,203,320.233	2,459,170.385	10/22/2008	0.00000000000	0.00073925000	0.03326620000	792.1	27.5	22-10-2008 15:08:49	0.0000	0.0030	0.1350	PETERSON GULCH
pet101908_216	1,203,516.685	2,459,175.993	10/22/2008	0.00000000000	0.00098554200	0.002931990000	792.0	27.5	22-10-2008 15:11:34	0.0000	0.0040	0.1190	PETERSON GULCH
pet101908_217	1,203,714.776	2,459,170.079	10/22/2008	0.00000000000	0.00049198500	0.03320900000	791.0	27.6	22-10-2008 15:14:10	0.0000	0.0020	0.1350	PETERSON GULCH
pet101908_218	1,203,919.943	2,459,368.157	10/22/2008	0.00024536300	0.00073608900	0.00245363000	789.5	27.8	22-10-2008 15:17:12	0.0010	0.0030	0.0100	PETERSON GULCH
pet101908_219	1,203,913.912	2,459,166.757	10/22/2008	0.00000000000	0.00073451700	0.01052810000	788.6	28.1	22-10-2008 15:20:07	0.0000	0.0030	0.0430	PETERSON GULCH
pet101908_22	1,204,494.681	2,455,370.187	10/19/2008	0.00000000000	0.00097000000	0.21776500000	790.4	31.7	19-10-2008 12:53:24	0.0000	0.0040	0.8980	PETERSON GULCH
pet101908_23	1,204,725.988	2,455,381.922	10/19/2008	0.04390030000	0.00048508600	0.24036000000	790.8	31.8	19-10-2008 12:56:47	0.1810	0.0020	0.9910	PETERSON GULCH
pet101908_24	1,204,926.609	2,455,369.830	10/19/2008	0.00000000000	0.00217898000	0.19126600000	789.9	32.0	19-10-2008 12:59:39	0.0000	0.0090	0.7900	PETERSON GULCH
pet101908_25	1,205,122.983	2,455,379.616	10/19/2008	0.00000000000	0.00096811600	0.19265500000	789.9	32.1	19-10-2008 13:02:39	0.0000	0.0040	0.7960	PETERSON GULCH
pet101908_26	1,205,321.176	2,455,378.873	10/19/2008	0.00000000000	0.00024162600	0.17082900000	789.1	32.3	19-10-2008 13:06:10	0.0000	0.0010	0.7070	PETERSON GULCH
pet101908_27	1,205,519.190	2,455,379.495	10/19/2008	0.00000000000	0.000144723000	0.13652200000	788.5	32.6	19-10-2008 13:10:40	0.0000	0.0060	0.5660	PETERSON GULCH
pet101908_28	1,205,722.743	2,455,393.617	10/19/2008	0.00000000000	0.00072327200	0.18636300000	788.9	32.9	19-10-2008 13:13:46	0.0000	0.0030	0.7730	PETERSON GULCH
pet101908_29	1,205,923.024	2,455,378.145	10/19/2008	0.00000000000	0.00192611000	0.06091310000	788.6	33.2	19-10-2008 13:17:09	0.0000	0.0080	0.2530	PETERSON GULCH
pet101908_30	1,206,126.661	2,455,374.655	10/19/2008	0.02999730000	0.00095991400	0.07967290000	786.8	33.5	19-10-2008 13:20:26	0.1250	0.0040	0.3320	PETERSON GULCH
pet101908_31	1,206,319.191	2,455,369.568	10/19/2008	0.17726300000	0.00167681000	0.14732000000	786.4	33.9	19-10-2008 13:25:14	0.7400	0.0070	0.6150	PETERSON GULCH
pet101908_32	1,206,325.137	2,455,568.723	10/19/2008	0.00000000000	0.000191094000	0.18631700000	785.2	34.3	19-10-2008 13:30:36	0.0000	0.0080	0.7800	PETERSON GULCH
pet101908_33	1,206,138.147	2,455,576.395	10/19/2008	0.00000000000	0.00286580000	0.22066700000	785.8	34.6	19-10-2008 13:34:01	-0.0070	0.0120	0.9240	PETERSON GULCH
pet101908_34	1,205,907.068	2,455,573.966	10/19/2008	0.00835789000	0.00023879700	0.63758800000	786.5	34.9	19-10-2008 13:38:15	0.0350	0.0010	2.6700	PETERSON GULCH
pet101908_35	1,205,732.756	2,455,578.201	10/19/2008	0.00000000000	0.00358211000	0.24310600000	787.3	35.2	19-10-2008 13:40:57	0.0000	0.0150	1.0180	PETERSON GULCH
pet101908_36	1,205,539.469	2,455,589.862	10/19/2008	0.00000000000	0.00286565000	0.11128300000	787.8	35.4	19-10-2008 13:44:24	0.0000	0.0120	0.4660	PETERSON GULCH
pet101908_37	1,205,313.247	2,455,572.752	10/19/2008	0.00000000000	0.00190909000	0.30163600000	787.5	35.5	19-10-2008 13:47:47	0.0000	0.0080	1.2640	PETERSON GULCH
pet101908_38	1,205,123.412	2,455,586.053	10/19/2008	0.00000000000	0.00071667500	0.16053500000	788.6	35.6	19-10-2008 13:51:28	0.0000	0.0030	0.6720	PETERSON GULCH
pet101908_39	1,204,930.868	2,455,578.150	10/19/2008	0.00000000000	0.00310852000	0.20683600000	789.6	35.7	19-10-2008 13:54:21	0.0000	0.0130	0.8650	PETERSON GULCH
pet101908_40	1,204,731.985	2,455,585.295	10/20/2008	0.00000000000	0.000511536000	0.16855100000	792.9	16.8	20-10-2008 09:12:01	0.0000	0.0020	0.6590	PETERSON GULCH
pet101908_41	1,204,535.459	2,455,582.025	10/20/2008	0.00000000000	0.000254255000	0.21840500000	791.2	17.9	20-10-2008 09:16:17	0.0000	0.0010	0.8590	PETERSON GULCH
pet101908_42	1,204,334.871	2,455,587.293	10/20/2008	0.00000000000	0.00050735400	0.08396710000	791.3	18.6	20-10-2008 09:18:54	0.0000	0.0020	0.3310	PETERSON GULCH
pet101908_43	1,204,134.327	2,455,581.663	10/20/2008	0.00000000000	0.000253115000	0.21160400000	790.9	19.1	20-10-2008 09:21:57	0.0000	0.0010	0.8360	PETERSON GULCH
pet101908_44	1,203,938.297	2,455,596.975	10/20/2008	0.00000000000	0.000505621000	0.24067600000	791.3	19.6	20-10-2008 09:24:58	0.0000	0.0020	0.9520	PETERSON GULCH
pet101908_45	1,203,737.109	2,455,572.012	10/20/2008	0.00000000000	0.000252338000	0.10169200000	790.9	20.0	20-10-2008 09:28:14	0.0000	0.0010	0.4030	PETERSON GULCH
pet101908_46	1,203,734.198	2,455,798.043	10/20/2008	0.00000000000	0.000503626000	0.23821500000	790.6	20.5	20-10-2008 09:33:52	0.0000	0.0020	0.9460	PETERSON GULCH
pet101908_47	1,203,926.168	2,455,791.048	10/20/2008	0.00025133300	0.00025133300	0.14577300000	789.9	20.8	20-10-2008 09:37:53	0.0010	0.0010	0.5800	PETERSON GULCH
pet101908_48	1,204,114.186	2,455,780.092	10/20/2008	0.00000000000	0.00100571000	0.19158700000	791.0	21.1	20-10-2008 09:41:44	0.0000	0.0040	0.7620	PETERSON GULCH
pet101908_49	1,204,343.094	2,455,784.026	10/20/2008	0.02288160000	0.000251446000	0.09127500000	791.6	21.3	20-10-2008 09:44:52	0.0910	0.0010	0.3630	PETERSON GULCH
pet101908_50	1,204,537.105	2,455,774.578	10/20/2008	0.00000000000	0.000753922000	0.25784100000	791.7	21.5	20-10-2008 09:48:03	0.0000	0.0030	1.0260	PETERSON GULCH
pet101908_51	1,204,719.781	2,455,779.235	10/20/2008	0.00050202000	0.00075303000	0.07856610000	791.3	21.7	20-10-2008 09:50:29	0.0020	0.0030	0.3130	PETERSON GULCH
pet101908_52	1,204,930.305	2,455,776.281	10/20/2008	0.00000000000	0.000752265000	0.10958000000	791.3	22.0	20-10-2008 09:53:31	0.0000	0.0030	0.4370	PETERSON GULCH
pet101908_53	1,205,126.859	2,455,786.956	10/20/2008	0.00025074300	0.00100297000	0.10857200000	791.8	22.2	20-10-2008 09:55:59	0.0010	0.0040	0.4330	PETERSON GULCH
pet101908_54	1,205,331.903	2,455,785.625	10/20/2008	0.00000000000	0.000750138000	0.077776430000	790.4	22.5	20-10-2008 09:59:10	0.0000	0.0030	0.3110	PETERSON GULCH
pet101908_55	1,205,519.974	2,455,778.808	10/20/2008	0.00000000000	0.000498869000	0.21825500000	789.8	23.0	20-10-2008 10:03:45	0.0000	0.0020	0.8750	PETERSON GULCH
pet101908_56	1,205,730.937	2,455,782.877	10/20/2008	0.00000000000	0.000249067000	0.002241600000	789.7	23.4	20-10-2008 10:07:22	0.0000	0.0010	0.0090	PETERSON GULCH
pet101908_57	1,205,924.589	2,455,789.498	10/20/2008	0.00074502700	0.00074502700	0.08567810000	788.2	23.7	20-10-2008 10:11:24	0.0030	0.0030	0.3450	PETERSON GULCH
pet101908_58	1,206,122.956	2,455,778.326	10/20/2008	0.01115040000	0.000247788000	0.13430100000	787.5	24.1	20-10-2008 10:16:13	0.0450	0.0010	0.5420	PETERSON GULCH
pet101908_59	1,206,314.824	2,455,788.425	10/20/2008	0.00000000000	0.000222606000	0.09374200000	787.4	24.6	20-10-2008 10:21:13	0.0000	0.0090	0.3790	PETERSON GULCH
pet101908_60	1,206,523.621	2,455,796.881	10/20/2008	0.00024656900	0.00073970800	0.04561530000	786.0	25.0	20-10-2008 10:25:00	0.0010	0.0030	0.1850	PETERSON GULCH
pet101908_61	1,206,321.539	2,455,976.352	10/20/2008	0.00000000000	0.000492079000	0.03961230000	785.1	25.3	20-10-2008 10:28:44	0.0000	0.0020	0.1610	PETERSON GULCH
pet101908_62	1,206,132.231	2,455,979.634	10/20/2008	0.00000000000	0.000491898000	0.06812780000	785.6	25.6	20-10-2008 10:33:02	0.0000	0.0020	0.2770	PETERSON GULCH
pet101908_63	1,205,923.586	2,455,988.820	10/20/2008	0.00000000000	0.001720490000	0.10568700000	785.6	25.8	20-10-2008 10:36:32	0.0000	0.0070	0.4300	PETERSON GULCH
pet101908_64	1,205,733.548	2,455,992.330	10/20/2008	0.00000000000	0.000490912000	0.04663660000	785.6	26.2	20-10-2008 10:42:48	0.0000	0.0020	0.1900	PETERSON GULCH
pet101908_65	1,205,534.996	2,455,980.168	10/20/2008	0.01941350000	0.000737222000	0.05455440000	787.3	26.5	20-10-2008 10:46:35	0.0790	0.0030	0.2220	PETERSON GULCH
pet101908_66	1,205,343.326	2,455,984.104	10/20/2008	0.00000000000	0.000984100000	0.11760000000	789.0	26.8	20-10-2008 10:50:09	0.0000	0.0040	0.4780	PETERSON GULCH
pet101908_67	1,205,140.425	2,455,976.344	10/20/2008	0.00000000000	0.000986979000	0.04416730000	792.1	27.1	20-10-2008 10:54:01	-0.0050	0.0040	0.1790	PETERSON GULCH
pet101908_68	1,204,939.807	2,455,977.321	10/20/2008	0.000737628000	0.001475260000	0.06220670000	790.1	27.4	20-10-2008 10:57:27	0.0030	0.0060	0.2530	PETERSON GULCH
pet101908_69	1,204,735.731	2,455,983.403	10/20/2008	0.00000000000	0.000983473000	0.15932300000	790.6	27.6	20-10-2008 11:00:53	0.0000	0.0040	0.6480	PETERSON GULCH
pet101908_70	1,204,531.606	2,455,979.865	10/20/2008	0.00024582900	0.00198663000	0.26869100000	791.0	27.8	20-10-2008 11:03:47	0.0010	0.0080	1.0930	PETERSON GULCH
pet101908_71	1,204,334.298	2,455,970.322	10/20/2008	0.00024593400	0.001721540000	0.14952800000	791.6	27.9	20-10-2008 11:06:51	0.0010	0.0070	0.6080	PETERSON GULCH
pet101908_72	1,204,132.405	2,455,971.258	10/20/2008	0.00000000000	0.000982710000	0.11841700000	791.3	28.1					

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet101908_81	1,204,729.460	2,456,183.250	10/20/2008	0.02446720000	0.00048934300	0.05529580000	791.2	29.3	20-10-2008 11:55:18	0.1000	0.0020	0.2260	PETERSON GULCH
pet101908_82	1,204,931.132	2,456,188.871	10/20/2008	0.00122203000	0.00048881100	0.06134570000	790.6	29.4	20-10-2008 11:59:50	0.0050	0.0020	0.2510	PETERSON GULCH
pet101908_83	1,205,132.127	2,456,177.128	10/20/2008	0.00000000000	0.00195173000	0.09173120000	789.7	29.6	20-10-2008 12:03:35	0.0000	0.0080	0.3760	PETERSON GULCH
pet101908_84	1,205,325.063	2,456,177.468	10/20/2008	0.00000000000	0.00024388500	0.01731590000	789.7	29.7	20-10-2008 12:07:08	0.0000	0.0010	0.0710	PETERSON GULCH
pet101908_85	1,205,517.965	2,456,181.797	10/20/2008	0.00000000000	0.00073054400	0.06112220000	788.5	29.7	20-10-2008 12:10:23	0.0000	0.0030	0.2510	PETERSON GULCH
pet101908_86	1,205,716.606	2,456,168.771	10/20/2008	0.00000000000	0.00097287300	0.06129100000	787.8	29.8	20-10-2008 12:14:48	0.0000	0.0040	0.2520	PETERSON GULCH
pet101908_87	1,204,326.338	2,456,179.765	10/21/2008	0.00000000000	0.00074827200	0.04564460000	790.3	23.2	21-10-2008 09:21:25	0.0000	0.0030	0.1830	PETERSON GULCH
pet101908_88	1,204,119.390	2,456,178.569	10/21/2008	0.00000000000	0.00074228800	0.10119900000	789.8	25.4	21-10-2008 09:31:49	-0.0110	0.0030	0.4090	PETERSON GULCH
pet101908_89	1,204,121.301	2,456,374.588	10/21/2008	0.00000000000	0.00024926800	0.05409110000	797.8	26.2	21-10-2008 09:35:43	0.0000	0.0100	0.2170	PETERSON GULCH
pet101908_90	1,203,919.486	2,456,375.822	10/21/2008	0.00024681300	0.00049362600	0.06565230000	791.0	26.6	21-10-2008 09:38:23	0.0010	0.0020	0.2660	PETERSON GULCH
pet101908_91	1,203,736.530	2,456,375.265	10/21/2008	0.00000000000	0.00024639900	0.15055000000	790.2	26.8	21-10-2008 09:41:34	0.0000	0.0010	0.6110	PETERSON GULCH
pet101908_92	1,203,515.917	2,456,372.936	10/21/2008	0.00000000000	0.00049222100	0.09967470000	789.8	27.0	21-10-2008 09:44:12	0.0000	0.0020	0.4050	PETERSON GULCH
pet101908_93	1,203,327.185	2,456,370.276	10/21/2008	0.00147648000	0.00024607900	0.22467000000	789.7	27.0	21-10-2008 09:46:43	0.0060	0.0010	0.9130	PETERSON GULCH
pet101908_94	1,203,125.192	2,456,583.559	10/21/2008	0.00000000000	0.00024589200	0.08581640000	789.1	27.0	21-10-2008 09:50:50	0.0000	0.0010	0.3490	PETERSON GULCH
pet101908_95	1,203,325.835	2,456,579.496	10/21/2008	0.00000000000	0.00049194800	0.08043360000	789.1	26.9	21-10-2008 09:53:16	0.0000	0.0020	0.3270	PETERSON GULCH
pet101908_96	1,203,523.058	2,456,568.136	10/21/2008	0.00024618100	0.00024618100	0.14869300000	789.5	26.8	21-10-2008 09:56:12	0.0010	0.0010	0.6040	PETERSON GULCH
pet101908_97	1,203,724.236	2,456,578.132	10/21/2008	0.00000000000	0.00147814000	0.03153360000	789.8	26.7	21-10-2008 09:58:41	0.0000	0.0060	0.1280	PETERSON GULCH
pet101908_98	1,203,928.410	2,456,576.526	10/21/2008	0.00024645000	0.00073935100	0.03376370000	790.1	26.7	21-10-2008 10:01:15	0.0010	0.0030	0.1370	PETERSON GULCH
pet101908_99	1,204,126.108	2,456,573.671	10/21/2008	0.00000000000	0.00172595000	0.02465640000	790.2	26.6	21-10-2008 10:03:41	0.0000	0.0070	0.1000	PETERSON GULCH
pg100308_01	1,206,934.526	2,445,978.399	10/3/2008	0.00000000000	0.00074482400	0.04891010000	784.8	22.5	03-10-2008 10:27:29	0.0000	0.0030	0.1970	POLE GULCH
pg100308_02	1,207,125.020	2,445,994.132	10/3/2008	0.00000000000	0.00024902400	0.15688500000	789.3	23.3	03-10-2008 10:32:55	0.0000	0.0010	0.6300	POLE GULCH
pg100308_03	1,207,319.167	2,445,985.312	10/3/2008	0.00000000000	0.00098720400	0.04294340000	784.1	24.0	03-10-2008 10:37:40	0.0000	0.0040	0.1740	POLE GULCH
pg100308_04	1,206,929.603	2,445,778.228	10/9/2008	0.17745200000	0.00266300000	0.28711900000	781.3	28.7	09-10-2008 12:32:28	0.7330	0.0110	1.1860	POLE GULCH
pg100308_05	1,206,932.162	2,445,589.192	10/9/2008	0.09650280000	0.00264721000	0.27940100000	781.3	30.5	09-10-2008 12:38:31	0.4010	0.0110	1.1610	POLE GULCH
pg100308_06	1,207,128.364	2,445,581.308	10/9/2008	0.00000000000	0.00033488500	0.10333600000	779.4	31.6	09-10-2008 12:45:50	0.0000	0.0140	0.4320	POLE GULCH
pg100308_07	1,207,125.458	2,445,765.706	10/9/2008	0.15888500000	0.00263213000	0.18137800000	781.2	32.2	09-10-2008 12:52:48	0.6640	0.0110	0.7580	POLE GULCH
pg100308_08	1,207,317.859	2,445,785.409	10/9/2008	0.00000000000	0.00026286500	0.23442800000	779.4	31.9	09-10-2008 13:04:58	-0.0870	0.0110	0.9810	POLE GULCH
pg100308_09	1,207,518.411	2,445,787.906	10/9/2008	0.00000000000	0.00238533000	0.08277100000	779.0	32.3	09-10-2008 13:13:11	-0.0070	0.0100	0.3470	POLE GULCH
pg100308_10	1,207,529.065	2,445,978.621	10/9/2008	0.12153200000	0.00667237000	0.12915800000	779.0	32.6	09-10-2008 13:21:05	0.5100	0.0280	0.5420	POLE GULCH
pg100308_11	1,207,714.873	2,445,977.852	10/9/2008	0.00000000000	0.00033205000	0.03581120000	776.8	33.2	09-10-2008 13:28:29	0.0000	0.0140	0.1510	POLE GULCH
pg100308_12	1,207,927.477	2,445,971.222	10/9/2008	0.00000000000	0.00188687000	0.13561900000	774.3	33.9	09-10-2008 13:36:38	0.0000	0.0080	0.5750	POLE GULCH
pg100308_13	1,208,141.239	2,445,969.032	10/9/2008	0.00000000000	0.00212530000	0.28164800000	776.5	34.4	09-10-2008 13:43:18	0.0000	0.0090	1.1080	POLE GULCH
pg100308_14	1,208,123.541	2,445,773.793	10/9/2008	0.00544246000	0.00236629000	0.23473600000	778.6	34.6	09-10-2008 13:51:02	0.0230	0.0100	0.9920	POLE GULCH
pg100308_15	1,208,328.329	2,445,789.928	10/9/2008	0.00000000000	0.00028460000	0.10003800000	774.0	34.4	09-10-2008 13:58:03	-0.0020	0.0120	0.4250	POLE GULCH
pg100308_16	1,208,517.964	2,445,781.732	10/9/2008	0.00000000000	0.00071295200	0.02376510000	781.2	34.3	09-10-2008 14:04:05	-0.2910	0.0030	0.1000	POLE GULCH
pg100308_17	1,208,516.225	2,445,576.706	10/9/2008	0.00000000000	0.00030679100	0.08684550000	775.5	34.2	09-10-2008 14:09:33	0.0000	0.0130	0.3680	POLE GULCH
pg100308_18	1,208,712.655	2,445,583.828	10/9/2008	0.00000000000	0.00236009000	0.29831600000	775.3	34.1	09-10-2008 14:17:10	0.0000	0.0100	1.2640	POLE GULCH
pg100308_19	1,208,724.532	2,445,777.828	10/9/2008	0.00000000000	0.00142191000	0.09195030000	778.0	33.9	09-10-2008 14:25:41	0.0000	0.0060	0.3880	POLE GULCH
pg100308_20	1,208,705.514	2,445,972.501	10/9/2008	0.00023760000	0.00261359000	0.19839600000	779.0	33.5	09-10-2008 14:42:36	0.0010	0.0110	0.8350	POLE GULCH
pg100308_21	1,208,532.121	2,445,971.695	10/9/2008	0.00000000000	0.00213428000	0.06047120000	777.5	33.5	09-10-2008 14:47:48	0.0000	0.0090	0.2550	POLE GULCH
pg100308_22	1,208,372.119	2,446,033.938	10/9/2008	0.00946803000	0.00544412000	0.28167400000	775.8	33.4	09-10-2008 14:58:10	0.0400	0.0230	1.1900	POLE GULCH
pg100308_23	1,208,325.480	2,446,170.033	10/9/2008	0.00000000000	0.00593624000	0.18046200000	778.0	33.3	09-10-2008 15:04:50	0.0000	0.0250	0.7600	POLE GULCH
pg101008_01	1,208,318.633	2,446,586.683	10/10/2008	0.03420980000	0.00073834000	0.11739600000	780.6	23.5	10-10-2008 10:58:26	0.1390	0.0030	0.4770	POLE GULCH
pg101008_02	1,208,528.400	2,446,383.800	10/10/2008	0.00171816000	0.00196361000	0.11806200000	780.6	24.3	10-10-2008 11:07:11	0.0070	0.0080	0.4810	POLE GULCH
pg101008_03	1,208,536.901	2,446,187.456	10/10/2008	0.00000000000	0.00073227300	0.02221230000	778.1	25.0	10-10-2008 11:13:30	0.0000	0.0030	0.0910	POLE GULCH
pg101008_04	1,208,133.745	2,446,180.786	10/10/2008	0.00000000000	0.00145507000	0.13071400000	775.4	25.9	10-10-2008 11:20:38	0.0000	0.0060	0.5390	POLE GULCH
pg101008_05	1,207,939.120	2,446,178.133	10/10/2008	0.00000000000	0.00218537000	0.17580100000	778.2	26.6	10-10-2008 11:25:36	-0.0060	0.0090	0.7240	POLE GULCH
pg101008_07	1,207,533.042	2,446,170.815	10/10/2008	0.00000000000	0.00217470000	0.13362300000	777.5	27.8	10-10-2008 11:37:57	0.0000	0.0090	0.5530	POLE GULCH
pg101008_08	1,207,337.502	2,446,167.607	10/10/2008	0.00000000000	0.00337614000	0.18327600000	777.5	28.4	10-10-2008 11:43:45	0.0000	0.0140	0.7600	POLE GULCH
pg101008_09	1,207,145.085	2,446,174.414	10/10/2008	0.00000000000	0.00145318000	0.09591000000	777.5	27.1	10-10-2008 11:30:23	0.0000	0.0060	0.3960	POLE GULCH
pg101008_10	1,206,923.061	2,446,174.147	10/10/2008	0.00000000000	0.00143908000	0.19499500000	779.7	30.9	10-10-2008 12:12:44	0.0000	0.0060	0.8130	POLE GULCH
pg101008_11	1,206,740.374	2,446,181.828	10/10/2008	0.00023927600	0.00191421000	0.12729500000	778.1	31.0	10-10-2008 12:16:18	0.0010	0.0080	0.5320	POLE GULCH
pg101008_12	1,206,741.638	2,446,403.424	10/10/2008	0.00000000000	0.00167225000	0.87506500000	776.6	30.9	10-10-2008 12:22:40	0.0000	0.0070	3.6630	POLE GULCH
pg101008_13	1,206,930.155	2,446,392.768	10/10/2008	0.00000000000	0.00167139000	0.18218200000	776.2	30.9	10-10-2008 12:27:55	0.0000	0.0070	0.7630	POLE GULCH
pg101008_14	1,207,114.520	2,446,382.826	10/10/2008	0.00000000000	0.00167172000	0.21493600000	776.1	30.8	10-10-2008 12:33:58	0.0000	0.0070	0.9000	POLE GULCH
pg101008_15	1,207,333.090	2,446,380.653	10/10/2008	0.00000000000	0.00239402000	0.12496800000	778.0	30.8	10-10-2008 12:40:13	0.0000	0.0100	0.5220	POLE GULCH
pg101008_16	1,207,515.087	2,446,389.608	10/10/2008	0.00000000000	0.00264053000	0.08737770000	780.1	30.8	10-10-2008 12:44:21	0.0000	0.0110	0.3640	POLE GULCH
pg101008_17	1,207,723.237	2,446,378.271	10/10/2008	0.00072004100	0.00192011000	0.06792390000	780.5	31.0	10-10-2008 12:49:28	0.0030	0.0080	0.2830	POLE GUL

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pg101008_26	1,208,124.523	2,447,590.751	10/10/2008	0.00000000000	0.00167436000	0.10428800000	778.6	31.3	10-10-2008 13:53:14	0.0000	0.0070	0.4360	POLE GULCH
pg101008_27	1,208,116.262	2,447,383.234	10/10/2008	0.00000000000	0.00143311000	0.18558800000	778.0	31.5	10-10-2008 14:00:25	0.0000	0.0060	0.7770	POLE GULCH
pg101008_28	1,208,125.839	2,447,174.535	10/10/2008	0.00023934400	0.00167541000	0.12996400000	779.6	31.5	10-10-2008 14:06:09	0.0010	0.0070	0.5430	POLE GULCH
pg101008_29	1,208,139.128	2,446,970.876	10/10/2008	0.00119749000	0.00167350000	0.15735000000	780.1	31.5	10-10-2008 14:11:04	0.0050	0.0070	0.6570	POLE GULCH
pg101008_30	1,208,072.527	2,446,794.711	10/10/2008	0.00000000000	0.00096776200	0.19379400000	787.8	31.4	10-10-2008 14:17:56	0.0000	0.0040	0.8010	POLE GULCH
pg101008_31	1,208,118.881	2,446,586.156	10/10/2008	0.00000000000	0.00038332700	0.08217580000	779.6	31.2	10-10-2008 14:25:50	0.0000	0.0160	0.3430	POLE GULCH
pg101008_32	1,207,922.151	2,446,568.924	10/10/2008	0.00000000000	0.00028686400	0.16183900000	778.4	31.4	10-10-2008 14:34:30	0.0000	0.0120	0.6770	POLE GULCH
pg101008_33	1,207,725.829	2,446,579.975	10/10/2008	0.00000000000	0.00215105000	0.13695000000	778.5	31.5	10-10-2008 14:44:15	0.0000	0.0090	0.5730	POLE GULCH
pg101008_34	1,207,532.398	2,446,569.505	10/10/2008	0.00000000000	0.00119503000	0.12141500000	778.5	31.5	10-10-2008 14:50:04	0.0000	0.0050	0.5080	POLE GULCH
pg101008_35	1,207,335.424	2,446,560.701	10/10/2008	0.00000000000	0.00167712000	0.07259550000	780.4	31.5	10-10-2008 14:55:39	0.0000	0.0070	0.3030	POLE GULCH
pg101008_36	1,206,718.843	2,446,571.360	10/11/2008	0.00000000000	0.00073720700	0.12188500000	777.3	22.7	11-10-2008 08:51:14	0.0000	0.0030	0.4960	POLE GULCH
pg101008_37	1,206,717.890	2,446,763.330	10/11/2008	0.00000000000	0.00048759900	0.18650700000	773.0	23.4	11-10-2008 09:03:07	0.0000	0.0020	0.7650	POLE GULCH
pg101008_38	1,206,920.767	2,446,764.184	10/11/2008	0.00000000000	0.00049035900	0.16525100000	777.9	23.6	11-10-2008 09:09:53	0.0000	0.0020	0.6740	POLE GULCH
pg101008_39	1,206,919.292	2,446,978.838	10/11/2008	0.03503286000	0.00048656400	0.21871100000	772.4	23.8	11-10-2008 09:15:19	0.1440	0.0020	0.8990	POLE GULCH
pg101008_40	1,207,120.128	2,446,966.795	10/11/2008	0.16741000000	0.00024403800	0.35507500000	774.8	23.8	11-10-2008 09:21:52	0.6860	0.0010	1.4550	POLE GULCH
pg101008_41	1,206,929.674	2,446,582.218	10/11/2008	0.00000000000	0.00049119500	0.15767400000	776.6	22.6	11-10-2008 09:58:36	0.0000	0.0020	0.6420	POLE GULCH
pg101008_42	1,207,119.979	2,446,577.381	10/11/2008	0.00000000000	0.00048920000	0.15743300000	775.1	23.4	11-10-2008 10:04:12	0.0000	0.0020	0.6440	POLE GULCH
pg101008_43	1,207,128.620	2,446,773.432	10/11/2008	0.00000000000	0.00048793600	0.12052000000	775.1	24.0	11-10-2008 10:10:08	0.0000	0.0020	0.4940	POLE GULCH
pg101008_44	1,207,329.577	2,446,764.936	10/11/2008	0.00072903500	0.00024301200	0.15091000000	773.1	24.4	11-10-2008 10:16:57	0.0030	0.0010	0.6210	POLE GULCH
pg101008_45	1,207,324.737	2,446,976.727	10/11/2008	0.00194857000	0.00024357100	0.42454400000	775.4	24.6	11-10-2008 10:21:55	0.0080	0.0010	1.7430	POLE GULCH
pg101008_46	1,207,531.698	2,446,976.382	10/11/2008	0.00195027000	0.00024378400	0.18088800000	776.6	24.8	11-10-2008 10:26:24	0.0080	0.0010	0.7420	POLE GULCH
pg101008_47	1,207,517.574	2,447,176.561	10/11/2008	0.00317180000	0.00048796900	0.17859700000	777.5	24.9	11-10-2008 10:31:20	0.0130	0.0020	0.7320	POLE GULCH
pg101008_48	1,207,523.643	2,447,370.668	10/11/2008	0.01580270000	0.00048623700	0.03403660000	775.0	25.0	11-10-2008 10:36:50	0.0650	0.0020	0.1400	POLE GULCH
pg101008_49	1,207,524.042	2,447,570.641	10/11/2008	0.00581288000	0.00024220300	0.05013610000	772.6	25.2	11-10-2008 10:41:59	0.0240	0.0010	0.2070	POLE GULCH
pg101008_50	1,207,721.810	2,447,565.288	10/11/2008	0.00362666000	0.00024177700	0.17698100000	771.5	25.3	11-10-2008 10:50:29	0.0150	0.0010	0.7320	POLE GULCH
pg101008_51	1,207,716.699	2,447,769.811	10/11/2008	0.00145401000	0.00024233600	0.14685500000	773.8	25.5	11-10-2008 10:56:04	0.0060	0.0010	0.6060	POLE GULCH
pg101008_52	1,207,921.099	2,447,756.15000	10/11/2008	0.00775615000	0.00072713900	0.19390400000	774.2	25.6	11-10-2008 11:01:24	0.0320	0.0030	0.8000	POLE GULCH
pg101008_53	1,207,910.163	2,447,975.206	10/11/2008	0.00000000000	0.00048509800	0.23187700000	775.0	25.7	11-10-2008 11:06:30	0.0000	0.0020	0.9560	POLE GULCH
pg101008_54	1,207,925.745	2,447,573.046	10/11/2008	0.00000000000	0.00024196200	0.17227700000	773.9	26.0	11-10-2008 11:19:59	0.0000	0.0010	0.7120	POLE GULCH
pg101008_55	1,207,944.774	2,447,386.291	10/11/2008	0.00000000000	0.00048488700	0.10643300000	775.7	26.1	11-10-2008 11:26:18	0.0000	0.0020	0.4390	POLE GULCH
pg101008_56	1,207,964.185	2,447,205.549	10/11/2008	0.00000000000	0.00024265700	0.17835300000	776.9	26.3	11-10-2008 11:31:18	0.0000	0.0010	0.7350	POLE GULCH
pg101008_57	1,207,720.579	2,447,387.382	10/11/2008	0.00000000000	0.00024295000	0.02453800000	778.1	26.4	11-10-2008 11:37:24	0.0000	0.0010	0.1010	POLE GULCH
pg101008_58	1,207,731.883	2,447,179.000	10/11/2008	0.00000000000	0.00048405300	0.44774900000	775.4	26.5	11-10-2008 11:42:40	0.0000	0.0020	1.8500	POLE GULCH
pg101008_59	1,207,694.726	2,446,948.083	10/11/2008	0.00000000000	0.00000000000	0.21372600000	776.6	26.6	11-10-2008 11:48:35	0.0000	0.0000	0.8820	POLE GULCH
pg101008_60	1,207,915.702	2,446,974.924	10/11/2008	0.00000000000	0.00072770900	0.14626900000	777.4	26.6	11-10-2008 11:53:34	0.0000	0.0030	0.6030	POLE GULCH
pg101008_61	1,207,906.916	2,446,774.457	10/11/2008	0.00000000000	0.00048553900	0.13935000000	778.3	26.7	11-10-2008 11:57:36	0.0000	0.0020	0.5740	POLE GULCH
pg101008_62	1,207,720.681	2,446,768.778	10/11/2008	0.00000000000	0.00024298800	0.10399900000	779.0	26.7	11-10-2008 12:02:55	0.0000	0.0010	0.4280	POLE GULCH
pg101008_63	1,207,519.566	2,446,765.669	10/11/2008	0.00000000000	0.00072647500	0.21019400000	776.6	26.8	11-10-2008 12:06:25	0.0000	0.0030	0.8680	POLE GULCH
sc093008_01	1,185,122.703	2,467,976.985	9/30/2008	0.00000000000	0.00000000000	0.06785450000	817.5	18.7	30-09-2008 09:23:31	-0.1570	-0.0020	0.2590	STOLLSTEIMER CREEK
sc093008_02	1,185,323.666	2,467,775.163	9/30/2008	0.00000000000	0.00026365900	0.12022800000	826.1	19.9	30-09-2008 09:28:46	-0.3670	0.0010	0.4560	STOLLSTEIMER CREEK
sc093008_03	1,185,530.921	2,467,577.092	9/30/2008	0.05127540000	0.00078084300	0.09422170000	818.3	20.9	30-09-2008 09:33:31	0.1970	0.0030	0.3620	STOLLSTEIMER CREEK
sc093008_04	1,185,520.173	2,467,376.506	9/30/2008	0.07420210000	0.00181614000	0.14529100000	817.9	21.7	30-09-2008 09:36:41	0.2860	0.0070	0.5600	STOLLSTEIMER CREEK
sc093008_05	1,185,723.578	2,467,177.635	9/30/2008	0.34397700000	0.00180905000	0.14937600000	818.3	23.0	30-09-2008 09:41:53	1.3310	0.0070	0.5780	STOLLSTEIMER CREEK
sc093008_06	1,185,721.209	2,466,971.945	9/30/2008	0.00000000000	0.00103804000	0.11833700000	824.2	23.9	30-09-2008 09:45:19	0.0000	0.0040	0.4560	STOLLSTEIMER CREEK
sc093008_07	1,185,600.927	2,467,160.642	9/30/2008	0.04594670000	0.00077005700	0.12628900000	817.7	24.8	30-09-2008 09:49:21	0.1790	0.0030	0.4920	STOLLSTEIMER CREEK
sc093008_08	1,185,913.840	2,466,776.730	9/30/2008	0.24048600000	0.00076669300	0.15333900000	818.5	26.4	30-09-2008 09:55:47	0.9410	0.0030	0.6000	STOLLSTEIMER CREEK
sc093008_09	1,185,917.607	2,466,577.856	9/30/2008	0.00000000000	0.00101717000	0.13324900000	816.6	27.2	30-09-2008 09:58:54	0.0000	0.0040	0.5240	STOLLSTEIMER CREEK
sc093008_10	1,186,125.549	2,466,580.176	9/30/2008	0.00253588600	0.00101434000	0.07075040000	816.5	28.0	30-09-2008 10:02:11	0.0100	0.0040	0.2790	STOLLSTEIMER CREEK
sc093008_100	1,187,327.335	2,469,390.325	10/1/2008	0.00000000000	0.00024648100	0.02563410000	812.6	35.2	01-10-2008 11:19:50	0.0000	0.0010	0.1040	STOLLSTEIMER CREEK
sc093008_101	1,187,529.574	2,469,380.903	10/1/2008	0.00000000000	0.00123186000	0.26608100000	812.5	35.3	01-10-2008 11:23:29	0.0000	0.0050	1.0800	STOLLSTEIMER CREEK
sc093008_102	1,186,921.870	2,469,171.164	10/1/2008	0.00000000000	0.00073775900	0.12689500000	811.8	35.6	01-10-2008 11:29:48	0.0000	0.0030	0.5160	STOLLSTEIMER CREEK
sc093008_103	1,186,925.649	2,468,981.115	10/1/2008	0.00024583200	0.00147499000	0.06637470000	812.3	35.9	01-10-2008 11:33:01	0.0010	0.0060	0.2700	STOLLSTEIMER CREEK
sc093008_104	1,186,928.175	2,468,780.866	10/1/2008	0.00000000000	0.00098075700	0.06571070000	810.7	36.1	01-10-2008 11:36:10	-0.0060	0.0040	0.2680	STOLLSTEIMER CREEK
sc093008_105	1,186,925.755	2,468,576.684	10/1/2008	0.03153640000	0.00048893700	0.22026600000	809.1	36.4	01-10-2008 11:39:19	0.1290	0.0020	0.9010	STOLLSTEIMER CREEK
sc093008_106	1,186,922.150	2,468,368.600	10/1/2008	0.00292774000	0.00048795700	0.06758200000	808.0	36.6	01-10-2008 11:41:53	0.0120	0.0020	0.2770	STOLLSTEIMER CREEK
sc093008_107	1,186,724.384	2,468,378.101	10/1/2008	0.00000000000	0.00097516300	1.59220000000	807.9	36.8	01-10-2008 11:44:55	-0.0310	0.0040	6.5310	STOLLSTEIMER CREEK
sc093008_108	1,186,526.548	2,468,379.329	10/1/2008	0.00000000000	0.00146234000	0.01340480000	808.2	37.0	01-10-2008 11:47:50	0.0000	0.0060	0.0550	STOLLSTEIMER CREEK
sc093008_109	1,186,324.488	2,468,377.424	10/1/2008	0.00073350300	0.00073350300	0.11638300000	811.3	37.2	01-10-20				

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
sc093008_117	1,184,918.598	2,468,579.483	10/2/2008	0.0000000000	0.00228878000	0.17725300000	810.4	24.9	02-10-2008 09:32:31	0.0000	0.0090	0.6970	STOLLSTEIMER CREEK
sc093008_118	1,185,125.698	2,468,784.796	10/2/2008	0.0000000000	0.00050827700	0.19899000000	810.4	25.1	02-10-2008 09:35:30	0.0000	0.0020	0.7830	STOLLSTEIMER CREEK
sc093008_119	1,184,914.412	2,468,772.989	10/2/2008	0.0000000000	0.00152418000	0.11329800000	810.6	25.3	02-10-2008 09:37:58	0.0000	0.0060	0.4460	STOLLSTEIMER CREEK
sc093008_12	1,186,125.483	2,466,167.657	9/30/2008	0.0000000000	0.00050507100	0.11667200000	816.9	29.4	30-09-2008 10:09:11	-0.0710	0.0020	0.4620	STOLLSTEIMER CREEK
sc093008_120	1,184,914.311	2,468,980.029	10/2/2008	0.0000000000	0.00126772000	0.13184200000	810.4	25.8	02-10-2008 09:45:36	0.0000	0.0050	0.5200	STOLLSTEIMER CREEK
sc093008_121	1,184,917.771	2,469,167.739	10/2/2008	0.0000000000	0.00050670300	0.01900140000	810.6	26.1	02-10-2008 09:48:36	0.0000	0.0020	0.0750	STOLLSTEIMER CREEK
sc093008_122	1,185,111.600	2,469,371.404	10/2/2008	0.00986716000	0.00050600800	0.20037900000	810.3	26.4	02-10-2008 09:52:40	0.0390	0.0020	0.7920	STOLLSTEIMER CREEK
sc093008_123	1,185,111.911	2,469,573.171	10/2/2008	0.01490550000	0.00025263600	0.00960015000	810.2	26.8	02-10-2008 09:57:32	0.0590	0.0010	0.0380	STOLLSTEIMER CREEK
sc093008_124	1,184,921.791	2,469,774.444	10/2/2008	0.0000000000	0.00125927000	0.06346710000	808.5	27.1	02-10-2008 10:01:19	0.0000	0.0050	0.2520	STOLLSTEIMER CREEK
sc093008_125	1,184,915.411	2,469,977.160	10/2/2008	0.0000000000	0.00100762000	0.06801400000	809.2	27.3	02-10-2008 10:03:54	0.0000	0.0040	0.2700	STOLLSTEIMER CREEK
sc093008_126	1,185,116.314	2,470,170.126	10/2/2008	0.0000000000	0.00050253900	0.06231490000	807.7	27.5	02-10-2008 10:07:06	0.0000	0.0020	0.2480	STOLLSTEIMER CREEK
sc093008_127	1,185,317.585	2,470,371.752	10/2/2008	0.0000000000	0.00050164600	0.03662010000	806.8	27.7	02-10-2008 10:10:23	0.0000	0.0020	0.1460	STOLLSTEIMER CREEK
sc093008_128	1,185,520.212	2,470,565.622	10/2/2008	0.0000000000	0.00050089700	0.04558170000	806.4	28.0	02-10-2008 10:13:50	0.0000	0.0020	0.1820	STOLLSTEIMER CREEK
sc093008_129	1,185,713.282	2,470,372.830	10/2/2008	0.0000000000	0.00225338000	0.02954430000	806.7	28.2	02-10-2008 10:16:56	0.0000	0.0090	0.1180	STOLLSTEIMER CREEK
sc093008_13	1,186,122.075	2,465,983.557	9/30/2008	0.11442400000	0.00126018000	0.08896870000	816.9	30.0	30-09-2008 10:12:36	0.4540	0.0050	0.3530	STOLLSTEIMER CREEK
sc093008_130	1,185,521.715	2,470,373.857	10/2/2008	0.0000000000	0.00049957000	0.02948570000	805.9	28.5	02-10-2008 10:19:37	0.0000	0.0020	0.1180	STOLLSTEIMER CREEK
sc093008_131	1,185,327.272	2,470,174.779	10/2/2008	0.01322600000	0.00074864300	0.04641590000	805.9	28.9	02-10-2008 10:22:37	0.0530	0.0030	0.1860	STOLLSTEIMER CREEK
sc093008_132	1,185,514.040	2,470,175.949	10/2/2008	0.00697896000	0.00224324000	0.15553100000	806.0	29.3	02-10-2008 10:25:26	0.0280	0.0090	0.6240	STOLLSTEIMER CREEK
sc093008_133	1,185,717.998	2,470,173.144	10/2/2008	0.0000000000	0.00174042000	0.40626400000	805.6	29.9	02-10-2008 10:28:52	0.0000	0.0070	1.6340	STOLLSTEIMER CREEK
sc093008_134	1,185,917.808	2,470,174.812	10/2/2008	0.0000000000	0.00227502000	0.10057800000	804.0	30.4	02-10-2008 10:31:28	0.0000	0.0110	0.4060	STOLLSTEIMER CREEK
sc093008_135	1,186,121.796	2,469,978.952	10/2/2008	0.00940916000	0.00173327000	2.25523000000	805.2	31.0	02-10-2008 10:35:05	0.0380	0.0070	9.1800	STOLLSTEIMER CREEK
sc093008_136	1,185,925.218	2,469,977.084	10/2/2008	0.00321030000	0.00222520000	0.45166500000	804.1	31.4	02-10-2008 10:37:27	0.0130	0.0090	1.8290	STOLLSTEIMER CREEK
sc093008_137	1,185,723.191	2,469,976.923	10/2/2008	0.05122560000	0.00172394000	0.04482240000	803.5	32.0	02-10-2008 10:40:16	0.2080	0.0070	0.1820	STOLLSTEIMER CREEK
sc093008_138	1,185,526.459	2,469,977.319	10/2/2008	0.0000000000	0.00172034000	3.57487000000	803.4	32.6	02-10-2008 10:43:08	0.0000	0.0070	14.5460	STOLLSTEIMER CREEK
sc093008_139	1,185,326.465	2,469,976.920	10/2/2008	0.0000000000	0.00227035600	0.11084600000	804.5	33.0	02-10-2008 10:45:56	0.0000	0.0110	0.4510	STOLLSTEIMER CREEK
sc093008_14	1,186,317.959	2,465,974.610	9/30/2008	0.0000000000	0.00106030000	0.04602580000	816.8	30.6	30-09-2008 10:16:24	0.0000	0.0040	0.1830	STOLLSTEIMER CREEK
sc093008_140	1,185,125.859	2,469,976.110	10/2/2008	0.00246006000	0.00147604000	0.03493290000	806.3	33.4	02-10-2008 10:48:24	0.0100	0.0060	0.1420	STOLLSTEIMER CREEK
sc093008_141	1,185,123.626	2,469,778.943	10/2/2008	0.0000000000	0.00147617000	0.10136400000	806.9	33.6	02-10-2008 10:50:56	0.0000	0.0060	0.4120	STOLLSTEIMER CREEK
sc093008_142	1,185,325.139	2,469,774.804	10/2/2008	0.0000000000	0.00221182000	0.06881230000	806.8	33.9	02-10-2008 10:53:31	0.0000	0.0090	0.2800	STOLLSTEIMER CREEK
sc093008_143	1,185,525.936	2,469,775.567	10/2/2008	0.0000000000	0.00220847000	0.11115900000	806.1	34.1	02-10-2008 10:56:23	0.0000	0.0090	0.4530	STOLLSTEIMER CREEK
sc093008_144	1,185,718.055	2,469,773.839	10/2/2008	0.0000000000	0.00244902000	1.17137000000	805.3	34.4	02-10-2008 10:59:04	0.0000	0.0100	4.7830	STOLLSTEIMER CREEK
sc093008_145	1,185,923.896	2,469,777.160	10/2/2008	0.00415444000	0.00122182000	1.73142000000	804.1	34.6	02-10-2008 11:01:40	0.0170	0.0050	7.0850	STOLLSTEIMER CREEK
sc093008_146	1,186,126.212	2,469,778.605	10/2/2008	0.01633910000	0.00097546900	0.11437400000	803.2	34.9	02-10-2008 11:04:22	0.0670	0.0040	0.4690	STOLLSTEIMER CREEK
sc093008_147	1,186,325.052	2,469,773.788	10/2/2008	0.0000000000	0.00121745000	0.28634500000	803.0	35.3	02-10-2008 11:07:13	0.0000	0.0050	1.1760	STOLLSTEIMER CREEK
sc093008_148	1,186,730.248	2,469,569.781	10/2/2008	0.0000000000	0.00169518000	0.15135500000	803.3	37.1	02-10-2008 11:20:01	0.0000	0.0070	0.6250	STOLLSTEIMER CREEK
sc093008_149	1,186,527.664	2,469,574.038	10/2/2008	0.0000000000	0.00291615000	0.13948900000	807.4	37.6	02-10-2008 11:23:22	0.0000	0.0120	0.5740	STOLLSTEIMER CREEK
sc093008_15	1,186,326.476	2,465,774.424	9/30/2008	0.0000000000	0.00150472000	0.05868410000	815.8	31.9	30-09-2008 10:19:40	0.0000	0.0060	0.2340	STOLLSTEIMER CREEK
sc093008_150	1,186,326.867	2,469,578.587	10/2/2008	0.03023080000	0.00145108000	0.45104300000	804.3	37.9	02-10-2008 11:26:19	0.1250	0.0060	1.8650	STOLLSTEIMER CREEK
sc093008_151	1,186,131.450	2,469,579.002	10/2/2008	0.0000000000	0.00265761000	0.73398200000	804.0	38.1	02-10-2008 11:28:54	0.0000	0.0110	3.0380	STOLLSTEIMER CREEK
sc093008_152	1,185,926.469	2,469,578.740	10/2/2008	0.0000000000	0.00241265000	0.25525900000	803.4	38.3	02-10-2008 11:31:41	0.0000	0.0100	1.0580	STOLLSTEIMER CREEK
sc093008_153	1,185,733.438	2,469,574.059	10/2/2008	0.0000000000	0.00290038000	0.11577300000	805.1	38.4	02-10-2008 11:34:25	0.0000	0.0120	0.4790	STOLLSTEIMER CREEK
sc093008_154	1,185,528.463	2,469,575.395	10/2/2008	0.0000000000	0.00096835300	0.06851100000	806.4	38.4	02-10-2008 11:37:01	0.0000	0.0040	0.2830	STOLLSTEIMER CREEK
sc093008_155	1,185,330.043	2,469,569.373	10/2/2008	0.0000000000	0.00242490000	0.12995200000	807.6	38.4	02-10-2008 11:39:22	0.0000	0.0100	0.5360	STOLLSTEIMER CREEK
sc093008_156	1,185,333.724	2,469,381.301	10/2/2008	0.0000000000	0.00121164000	0.05379690000	807.2	38.4	02-10-2008 11:44:38	0.0000	0.0050	0.2220	STOLLSTEIMER CREEK
sc093008_157	1,185,540.376	2,469,361.208	10/2/2008	0.0000000000	0.00267024000	0.16798200000	808.6	38.4	02-10-2008 11:47:01	0.0000	0.0110	0.6920	STOLLSTEIMER CREEK
sc093008_158	1,185,737.292	2,469,174.306	10/2/2008	0.0000000000	0.00121230000	0.13529300000	807.9	38.5	02-10-2008 11:49:52	0.0000	0.0050	0.5580	STOLLSTEIMER CREEK
sc093008_159	1,185,944.461	2,469,173.343	10/2/2008	0.0000000000	0.00096958100	0.01478610000	808.2	38.7	02-10-2008 11:52:12	0.0000	0.0040	0.0610	STOLLSTEIMER CREEK
sc093008_16	1,186,324.127	2,465,577.588	9/30/2008	0.0000000000	0.00075450300	0.06840830000	819.2	31.5	30-09-2008 10:22:39	0.0000	0.0030	0.2720	STOLLSTEIMER CREEK
sc093008_160	1,185,530.330	2,469,176.417	10/2/2008	0.00024251000	0.00266761000	0.14987100000	809.1	38.9	02-10-2008 11:55:28	0.0010	0.0110	0.6180	STOLLSTEIMER CREEK
sc093008_161	1,185,333.048	2,469,167.836	10/2/2008	0.00024223500	0.00169564000	0.16157000000	808.7	39.1	02-10-2008 11:57:45	0.0010	0.0070	0.6670	STOLLSTEIMER CREEK
sc093008_162	1,185,134.830	2,469,175.406	10/2/2008	0.00072620200	0.00169447000	0.21229300000	808.4	39.2	02-10-2008 12:00:05	0.0030	0.0070	0.8770	STOLLSTEIMER CREEK
sc093008_163	1,185,134.784	2,468,978.841	10/2/2008	0.03436430000	0.00193602000	0.20715400000	808.7	39.4	02-10-2008 12:02:26	0.1420	0.0080	0.8560	STOLLSTEIMER CREEK
sc093008_164	1,185,341.450	2,468,978.745	10/2/2008	0.0000000000	0.00411882000	0.16693300000	809.9	39.5	02-10-2008 12:05:18	0.0000	0.0170	0.6890	STOLLSTEIMER CREEK
sc093008_165	1,185,535.872	2,468,980.243	10/2/2008	0.0000000000	0.00483396000	0.30985700000	808.2	39.6	02-10-2008 12:07:28	0.0000	0.0200	1.2820	STOLLSTEIMER CREEK
sc093008_166	1,185,738.478	2,468,975.571	10/2/2008	0.0000000000	0.00120840000	0.08555480000	808.4	39.6	02-10-2008 12:09:46	0.0000	0.0050	0.3540	STOLLSTEIMER CREEK
sc093008_167	1,185,939.728	2,468,976.636	10/2/2008	0.0000000000	0.00120748000	0.10529200000	808.3	39.9	02-10-2008 12:12:10	0.0000	0.0050	0.4360	STOLLSTEIMER CREEK
sc093008_168	1,186,139.395	2,468,977.830	10/2/2008	0.0000000000	0.00168993000	0.15354200000	808.3	40.0	02-10-2008 12:14:28	0.0000	0.0070	0.6360	STOLLSTEIMER CREEK
sc093008_169	1,186,124.807	2,468,787.121	10/2/2008	0.0000000000	0.00337837000	0.16167							

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
sc093008_177	1,186,119.312	2,469,177.412	10/2/2008	0.0000000000	0.00144411000	1.8251100000	807.9	40.8	02-10-2008 12:42:10	0.0000	0.0060	7.5830	STOLLSTEIMER CREEK
sc093008_178	1,185,727.083	2,469,380.195	10/2/2008	0.0000000000	0.00216168000	0.02269090000	807.0	41.1	02-10-2008 12:58:19	0.0000	0.0090	0.1120	STOLLSTEIMER CREEK
sc093008_179	1,185,929.833	2,469,376.338	10/2/2008	0.0000000000	0.00407581000	0.12203500000	805.8	41.2	02-10-2008 13:00:51	0.0000	0.0170	0.5090	STOLLSTEIMER CREEK
sc093008_18	1,186,128.171	2,465,779.767	9/30/2008	0.0000000000	0.00100055000	0.15933800000	816.9	32.3	30-09-2008 10:29:00	0.0000	0.0040	0.6370	STOLLSTEIMER CREEK
sc093008_180	1,186,125.716	2,469,372.193	10/2/2008	0.00023946900	0.00335257000	0.11494500000	805.1	41.3	02-10-2008 13:03:29	0.0010	0.0140	0.4800	STOLLSTEIMER CREEK
sc093008_181	1,186,323.572	2,469,381.310	10/2/2008	0.0000000000	0.00143539000	0.50166700000	804.3	41.3	02-10-2008 13:05:50	0.0000	0.0060	2.0970	STOLLSTEIMER CREEK
sc093008_182	1,186,517.359	2,469,384.525	10/2/2008	0.0000000000	0.00095566900	0.15051800000	803.5	41.4	02-10-2008 13:08:17	0.0000	0.0040	0.6300	STOLLSTEIMER CREEK
sc093008_183	1,186,716.959	2,469,376.956	10/2/2008	0.0000000000	0.00335335000	0.11114000000	805.8	41.5	02-10-2008 13:10:56	0.0000	0.0140	0.4640	STOLLSTEIMER CREEK
sc093008_184	1,186,918.665	2,469,412.578	10/2/2008	0.0000000000	0.00119941000	0.34471000000	807.0	41.5	02-10-2008 13:13:33	0.0000	0.0050	1.4370	STOLLSTEIMER CREEK
sc093008_185	1,186,530.002	2,469,172.217	10/2/2008	0.00047976300	0.00095952600	0.06548770000	807.0	41.5	02-10-2008 13:17:02	0.0020	0.0040	0.2730	STOLLSTEIMER CREEK
sc093008_186	1,186,329.688	2,469,172.368	10/2/2008	0.00023962700	0.00143776000	0.04576880000	806.4	41.6	02-10-2008 13:20:40	0.0010	0.0060	0.1910	STOLLSTEIMER CREEK
sc093008_187	1,186,317.889	2,468,977.325	10/2/2008	0.00023962700	0.00167739000	0.16486300000	806.4	41.6	02-10-2008 13:23:06	0.0010	0.0070	0.6880	STOLLSTEIMER CREEK
sc093008_188	1,186,124.391	2,468,594.146	10/2/2008	0.00023980500	0.00119930000	0.00719416000	807.0	41.6	02-10-2008 13:29:07	0.0010	0.0050	0.0300	STOLLSTEIMER CREEK
sc093008_189	1,186,313.623	2,468,576.590	10/2/2008	0.00023971600	0.00143830000	0.33943800000	806.7	41.6	02-10-2008 13:32:37	0.0010	0.0060	1.4160	STOLLSTEIMER CREEK
sc093008_19	1,186,128.129	2,466,775.939	9/30/2008	0.0000000000	0.00074868800	0.04541920000	816.6	32.9	30-09-2008 10:36:02	-0.8450	0.0030	0.1820	STOLLSTEIMER CREEK
sc093008_190	1,186,515.656	2,468,575.554	10/2/2008	0.0000000000	0.00097174500	0.03204630000	804.8	41.6	02-10-2008 13:35:07	0.0000	0.0030	0.1340	STOLLSTEIMER CREEK
sc093008_191	1,186,713.845	2,468,577.130	10/2/2008	0.0000000000	0.00025452000	0.12170100000	803.3	41.7	02-10-2008 13:37:36	0.0000	0.0040	0.5100	STOLLSTEIMER CREEK
sc093008_192	1,186,718.440	2,468,789.101	10/2/2008	0.0000000000	0.00071543600	0.43426900000	803.3	41.9	02-10-2008 13:39:58	0.0000	0.0030	1.8210	STOLLSTEIMER CREEK
sc093008_193	1,186,720.997	2,468,983.410	10/2/2008	0.0000000000	0.00119380000	0.08308820000	804.5	42.0	02-10-2008 13:42:31	0.0000	0.0050	0.3480	STOLLSTEIMER CREEK
sc093008_194	1,186,712.392	2,469,176.635	10/2/2008	0.00023893400	0.00035840100	0.16223600000	805.6	42.2	02-10-2008 13:46:19	0.0010	0.0150	0.6790	STOLLSTEIMER CREEK
sc093008_195	1,186,522.827	2,468,977.617	10/2/2008	0.00023915500	0.00239155000	0.14325400000	806.6	42.3	02-10-2008 13:49:59	0.0010	0.0100	0.5990	STOLLSTEIMER CREEK
sc093008_196	1,186,512.229	2,468,778.410	10/2/2008	0.00023942100	0.00263364000	0.04046220000	807.5	42.3	02-10-2008 13:53:40	0.0010	0.0110	0.1690	STOLLSTEIMER CREEK
sc093008_197	1,186,329.982	2,468,762.833	10/2/2008	0.0000000000	0.00190873000	0.02362050000	804.7	42.3	02-10-2008 13:56:52	0.0000	0.0080	0.0990	STOLLSTEIMER CREEK
sc093008_198	1,185,323.330	2,468,376.888	10/2/2008	0.0000000000	0.00215121000	0.04923870000	805.9	42.2	02-10-2008 14:05:01	0.0000	0.0090	0.2060	STOLLSTEIMER CREEK
sc093008_199	1,185,120.783	2,468,376.828	10/2/2008	0.0000000000	0.00119511000	0.07098980000	805.9	42.2	02-10-2008 14:07:23	-0.0000	0.0050	0.2970	STOLLSTEIMER CREEK
sc093008_20	1,186,122.880	2,466,982.612	9/30/2008	0.01918290000	0.00099651400	0.06377690000	816.0	33.2	30-09-2008 10:39:25	0.0770	0.0040	0.2560	STOLLSTEIMER CREEK
sc093008_200	1,185,114.831	2,468,566.667	10/2/2008	0.0000000000	0.00130944000	0.14757900000	806.2	42.1	02-10-2008 14:10:21	0.0000	0.0130	0.6170	STOLLSTEIMER CREEK
sc093008_201	1,185,320.735	2,468,595.472	10/2/2008	0.0000000000	0.00119810000	0.13059300000	807.4	42.0	02-10-2008 14:12:41	0.0000	0.0050	0.5450	STOLLSTEIMER CREEK
sc093008_21	1,185,928.552	2,466,969.666	9/30/2008	0.05430560000	0.00074732500	0.13900200000	816.2	33.3	30-09-2008 10:42:11	0.2180	0.0030	0.5580	STOLLSTEIMER CREEK
sc093008_22	1,185,923.929	2,467,177.002	9/30/2008	0.0000000000	0.00074674600	0.08761820000	816.1	33.5	30-09-2008 10:45:48	-0.0500	0.0030	0.3520	STOLLSTEIMER CREEK
sc093008_23	1,186,118.939	2,467,175.701	9/30/2008	0.20367900000	0.00224097000	0.13719700000	816.9	33.7	30-09-2008 10:49:46	0.8180	0.0090	0.5510	STOLLSTEIMER CREEK
sc093008_24	1,185,722.745	2,467,379.616	9/30/2008	0.0000000000	0.00347588000	0.13407000000	815.6	34.1	30-09-2008 10:56:29	0.0000	0.0140	0.5400	STOLLSTEIMER CREEK
sc093008_25	1,185,723.954	2,467,583.114	9/30/2008	0.0000000000	0.00198744000	0.11229000000	816.9	34.4	30-09-2008 10:59:28	0.0000	0.0080	0.4520	STOLLSTEIMER CREEK
sc093008_26	1,185,522.411	2,467,783.581	9/30/2008	0.0000000000	0.00173724000	0.10200100000	816.6	34.6	30-09-2008 11:02:49	0.0000	0.0070	0.4110	STOLLSTEIMER CREEK
sc093008_27	1,185,720.344	2,467,780.461	9/30/2008	0.0000000000	0.00173675000	0.10321300000	816.9	34.8	30-09-2008 11:05:45	-0.0020	0.0070	0.4160	STOLLSTEIMER CREEK
sc093008_28	1,185,925.591	2,467,378.796	9/30/2008	0.0000000000	0.00123812000	0.08617290000	816.1	35.1	30-09-2008 11:11:08	-0.0130	0.0050	0.3480	STOLLSTEIMER CREEK
sc093008_29	1,186,122.204	2,467,380.849	9/30/2008	0.0000000000	0.00123676000	0.10660900000	816.0	35.4	30-09-2008 11:14:03	-0.1090	0.0050	0.4310	STOLLSTEIMER CREEK
sc093008_30	1,186,121.399	2,467,587.001	9/30/2008	0.0000000000	0.00296111000	0.15595200000	815.1	35.8	30-09-2008 11:17:50	-0.0110	0.0120	0.6320	STOLLSTEIMER CREEK
sc093008_31	1,185,919.666	2,467,575.046	9/30/2008	0.05130130000	0.00098656400	0.17141600000	815.5	36.1	30-09-2008 11:21:11	0.2080	0.0040	0.6950	STOLLSTEIMER CREEK
sc093008_32	1,185,926.518	2,467,778.722	9/30/2008	0.00073929700	0.00098572900	0.08477270000	815.6	36.4	30-09-2008 11:24:16	0.0030	0.0040	0.3440	STOLLSTEIMER CREEK
sc093008_33	1,186,129.778	2,467,779.853	9/30/2008	0.08719530000	0.00270946000	0.22931900000	816.0	36.7	30-09-2008 11:27:52	0.3540	0.0110	0.9310	STOLLSTEIMER CREEK
sc093008_34	1,186,329.842	2,467,771.045	9/30/2008	0.0000000000	0.00049124000	0.02701820000	813.7	36.7	30-09-2008 11:34:01	-0.0360	0.0020	0.1100	STOLLSTEIMER CREEK
sc093008_35	1,186,515.421	2,467,789.354	9/30/2008	0.0000000000	0.00270215000	0.28667400000	813.8	36.7	30-09-2008 11:37:38	0.0000	0.0110	1.1670	STOLLSTEIMER CREEK
sc093008_36	1,186,725.973	2,467,782.126	9/30/2008	0.0000000000	0.00196433000	0.02823720000	813.7	36.8	30-09-2008 11:41:01	0.0000	0.0080	0.1150	STOLLSTEIMER CREEK
sc093008_37	1,186,928.540	2,467,778.442	9/30/2008	0.0000000000	0.00269523000	0.00000000000	812.5	37.0	30-09-2008 11:44:16	0.0000	0.0110	-0.2410	STOLLSTEIMER CREEK
sc093008_38	1,187,126.748	2,467,780.770	9/30/2008	0.0000000000	0.00171159000	0.03178670000	811.6	37.3	30-09-2008 11:48:09	-0.0010	0.0070	0.1300	STOLLSTEIMER CREEK
sc093008_39	1,187,333.576	2,467,773.962	9/30/2008	0.0000000000	0.00341735000	0.16037100000	811.0	37.6	30-09-2008 11:51:40	0.0000	0.0140	0.6570	STOLLSTEIMER CREEK
sc093008_40	1,187,534.702	2,467,779.737	9/30/2008	0.0000000000	0.00267982000	0.13204200000	810.2	37.9	30-09-2008 11:55:41	0.0000	0.0110	0.5420	STOLLSTEIMER CREEK
sc093008_41	1,187,735.197	2,467,981.191	9/30/2008	0.00461656000	0.00170084000	0.05758550000	809.1	38.3	30-09-2008 12:00:17	0.0190	0.0070	0.2370	STOLLSTEIMER CREEK
sc093008_42	1,187,527.753	2,467,978.923	9/30/2008	0.0000000000	0.00145358000	0.00000000000	807.5	38.6	30-09-2008 12:03:51	-0.4240	0.0060	-0.2520	STOLLSTEIMER CREEK
sc093008_43	1,187,327.266	2,467,973.296	9/30/2008	0.0000000000	0.00145391000	0.03586300000	808.2	38.8	30-09-2008 12:07:06	-0.0020	0.0060	0.1480	STOLLSTEIMER CREEK
sc093008_44	1,187,129.624	2,467,980.282	9/30/2008	0.0000000000	0.00339472000	0.03152240000	809.0	38.9	30-09-2008 12:10:24	-0.7170	0.0140	0.1300	STOLLSTEIMER CREEK
sc093008_45	1,186,928.316	2,467,976.026	9/30/2008	0.0000000000	0.00291602000	0.09598550000	811.0	39.0	30-09-2008 12:14:13	-0.0970	0.0120	0.3950	STOLLSTEIMER CREEK
sc093008_46	1,186,724.953	2,467,969.464	9/30/2008	0.0000000000	0.00267460000	0.09263830000	812.0	39.2	30-09-2008 12:19:00	0.0000	0.0110	0.3810	STOLLSTEIMER CREEK
sc093008_47	1,186,527.560	2,467,983.554	9/30/2008	0.0000000000	0.00291753000	0.04886860000	812.2	39.3	30-09-2008 12:22:15	-1.5170	0.0120	0.2010	STOLLSTEIMER CREEK
sc093008_48	1,186,323.022	2,467,973.456	9/30/2008	0.0000000000	0.00388755000	0.11516900000	812.2	39.5	30-09-2008 12:25:41	0.0000	0.0160	0.4740	STOLLSTEIMER CREEK
sc093008_49	1,186,123.789	2,467,978.504	9/30/2008	0.0000000000	0.00291667000	0.10013900000	813.0	39.7	30-09-2008 12:28:55	0.0000	0.0120	0.4120	STOLLSTEIMER CREEK
sc093008_50	1,185,927.464	2,467,976.816	9/30/2008	0.00048592000	0.00364440000	0.16497000000	813.2	39.9					

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
sc093008_59	1,186,535.370	2,468,171.862	10/1/2008	0.00000000000	0.00051437600	0.12216400000	812.7	22.4	01-10-2008 09:04:14	0.0000	0.0020	0.4750	STOLLSTEIMER CREEK
sc093008_60	1,186,719.813	2,468,176.681	10/1/2008	0.00000000000	0.00000000000	0.11546800000	812.2	22.9	01-10-2008 09:07:19	-0.0020	0.0000	0.4500	STOLLSTEIMER CREEK
sc093008_61	1,186,928.715	2,468,178.042	10/1/2008	0.00070389000	0.00051199400	0.63640800000	811.4	23.3	01-10-2008 09:10:13	0.0340	0.0020	2.4860	STOLLSTEIMER CREEK
sc093008_62	1,187,124.415	2,468,170.935	10/1/2008	0.00000000000	0.00051003200	0.23079000000	810.2	24.0	01-10-2008 09:14:54	0.0000	0.0020	0.9050	STOLLSTEIMER CREEK
sc093008_63	1,187,325.774	2,468,175.790	10/1/2008	0.07076420000	0.00025454800	0.10436400000	809.8	24.4	01-10-2008 09:17:51	0.2780	0.0010	0.4100	STOLLSTEIMER CREEK
sc093008_64	1,187,523.885	2,468,171.941	10/1/2008	0.00000000000	0.00101532000	0.14645900000	808.6	24.8	01-10-2008 09:20:31	0.0000	0.0040	0.5770	STOLLSTEIMER CREEK
sc093008_65	1,187,731.482	2,468,173.861	10/1/2008	0.00000000000	0.00101342000	0.15733300000	807.9	25.1	01-10-2008 09:23:05	0.0000	0.0040	0.6210	STOLLSTEIMER CREEK
sc093008_66	1,187,925.781	2,468,170.681	10/1/2008	0.01214020000	0.00202337000	0.19677300000	807.6	25.5	01-10-2008 09:25:48	0.0480	0.0080	0.7780	STOLLSTEIMER CREEK
sc093008_67	1,188,130.692	2,468,375.250	10/1/2008	0.00025248900	0.00000000000	0.09948060000	807.3	25.9	01-10-2008 09:29:00	0.0010	0.0000	0.3940	STOLLSTEIMER CREEK
sc093008_68	1,187,923.965	2,468,378.169	10/1/2008	0.00657381000	0.00126419000	0.09582590000	809.5	26.3	01-10-2008 09:31:44	0.0260	0.0050	0.3790	STOLLSTEIMER CREEK
sc093008_69	1,187,721.982	2,468,374.016	10/1/2008	0.00000000000	0.00075759800	0.11667000000	809.6	26.7	01-10-2008 09:34:55	0.0000	0.0030	0.4620	STOLLSTEIMER CREEK
sc093008_70	1,187,523.232	2,468,377.336	10/1/2008	0.00000000000	0.00100850000	0.18077300000	809.1	27.0	01-10-2008 09:37:38	0.0000	0.0040	0.7170	STOLLSTEIMER CREEK
sc093008_71	1,187,326.502	2,468,375.022	10/1/2008	0.00050337200	0.00151012000	0.16032400000	808.5	27.3	01-10-2008 09:40:20	0.0020	0.0060	0.6370	STOLLSTEIMER CREEK
sc093008_72	1,187,127.789	2,468,374.710	10/1/2008	0.00025181800	0.00075545300	0.14681000000	810.0	27.7	01-10-2008 09:42:59	0.0010	0.0030	0.5830	STOLLSTEIMER CREEK
sc093008_73	1,187,128.002	2,468,574.450	10/1/2008	0.00000000000	0.00050282300	0.85882200000	809.5	28.0	01-10-2008 09:45:51	-0.6530	0.0020	3.4160	STOLLSTEIMER CREEK
sc093008_74	1,187,321.947	2,468,578.892	10/1/2008	0.00000000000	0.00200855000	0.65152200000	809.2	28.3	01-10-2008 09:48:19	0.0000	0.0080	2.5950	STOLLSTEIMER CREEK
sc093008_75	1,187,522.079	2,468,574.211	10/1/2008	0.07597290000	0.00120441000	0.09828830000	809.2	28.7	01-10-2008 09:50:57	0.3030	0.0060	0.3920	STOLLSTEIMER CREEK
sc093008_76	1,187,714.815	2,468,576.598	10/1/2008	0.04058540000	0.00075158200	0.14505500000	809.6	29.1	01-10-2008 09:53:34	0.1620	0.0030	0.5790	STOLLSTEIMER CREEK
sc093008_77	1,187,923.904	2,468,578.605	10/1/2008	0.00000000000	0.00100079000	0.20366000000	809.6	29.5	01-10-2008 09:56:38	0.0000	0.0040	0.8140	STOLLSTEIMER CREEK
sc093008_78	1,188,125.542	2,468,583.180	10/1/2008	0.00000000000	0.00075098700	0.12491400000	811.1	29.9	01-10-2008 09:59:28	0.0000	0.0030	0.4990	STOLLSTEIMER CREEK
sc093008_79	1,188,134.841	2,468,791.605	10/1/2008	0.00000000000	0.00099736000	0.07857170000	809.8	30.5	01-10-2008 10:04:26	0.0000	0.0040	0.3150	STOLLSTEIMER CREEK
sc093008_80	1,187,908.606	2,468,781.820	10/1/2008	0.01444990000	0.00024913700	0.16492800000	809.9	30.9	01-10-2008 10:08:11	0.0580	0.0010	0.6620	STOLLSTEIMER CREEK
sc093008_81	1,187,722.881	2,468,767.698	10/1/2008	0.00000000000	0.00024925000	0.08424630000	810.8	31.1	01-10-2008 10:11:20	-0.0010	0.0010	0.3380	STOLLSTEIMER CREEK
sc093008_82	1,187,524.073	2,468,770.409	10/1/2008	0.00000000000	0.00348821000	0.11909700000	811.3	31.4	01-10-2008 10:14:24	0.0000	0.0140	0.4780	STOLLSTEIMER CREEK
sc093008_83	1,187,321.453	2,468,774.541	10/1/2008	0.01243690000	0.00049747600	0.12436900000	810.2	31.5	01-10-2008 10:17:22	0.0500	0.0020	0.5000	STOLLSTEIMER CREEK
sc093008_84	1,187,123.443	2,468,775.883	10/1/2008	0.00596432000	0.00372770000	0.28181400000	810.0	31.7	01-10-2008 10:20:07	0.0240	0.0150	1.1340	STOLLSTEIMER CREEK
sc093008_85	1,187,127.259	2,468,981.915	10/1/2008	0.00198558000	0.00040963900	0.08140870000	809.5	31.9	01-10-2008 10:22:56	0.0080	0.0020	0.3280	STOLLSTEIMER CREEK
sc093008_86	1,187,314.563	2,468,977.665	10/1/2008	0.01344130000	0.00049782600	0.08313690000	812.1	32.0	01-10-2008 10:25:52	0.0540	0.0020	0.3340	STOLLSTEIMER CREEK
sc093008_87	1,187,512.127	2,468,985.058	10/1/2008	0.00000000000	0.00049715300	0.01740040000	811.8	32.3	01-10-2008 10:30:02	0.0000	0.0020	0.0700	STOLLSTEIMER CREEK
sc093008_88	1,187,727.055	2,468,979.434	10/1/2008	0.00000000000	0.00124304000	0.11162500000	812.7	32.6	01-10-2008 10:33:28	0.0000	0.0050	0.4490	STOLLSTEIMER CREEK
sc093008_89	1,187,917.998	2,468,975.070	10/1/2008	0.00000000000	0.00074289200	0.09434730000	810.3	32.9	01-10-2008 10:36:29	0.0000	0.0030	0.3810	STOLLSTEIMER CREEK
sc093008_90	1,188,120.686	2,468,956.595	10/1/2008	0.00000000000	0.00024705200	0.11413800000	809.2	33.2	01-10-2008 10:39:42	0.0000	0.0010	0.4620	STOLLSTEIMER CREEK
sc093008_91	1,188,121.163	2,469,178.819	10/1/2008	0.00000000000	0.00049337700	0.22300700000	808.8	33.5	01-10-2008 10:42:54	-0.0470	0.0020	0.9040	STOLLSTEIMER CREEK
sc093008_92	1,187,926.306	2,469,169.144	10/1/2008	0.00000000000	0.00049387000	0.13927100000	810.4	33.8	01-10-2008 10:46:27	0.0000	0.0020	0.5640	STOLLSTEIMER CREEK
sc093008_93	1,187,920.968	2,469,369.189	10/1/2008	0.00000000000	0.00098519300	0.15738500000	809.1	34.1	01-10-2008 10:51:17	0.0000	0.0040	0.6390	STOLLSTEIMER CREEK
sc093008_94	1,187,729.358	2,469,375.129	10/1/2008	0.00000000000	0.00024632000	0.00418764000	810.0	34.4	01-10-2008 10:57:13	-0.0570	0.0010	0.0170	STOLLSTEIMER CREEK
sc093008_95	1,187,727.174	2,469,181.206	10/1/2008	0.02216370000	0.00049252600	0.08372940000	810.3	34.6	01-10-2008 11:03:10	0.0900	0.0020	0.3400	STOLLSTEIMER CREEK
sc093008_96	1,187,531.718	2,469,175.044	10/1/2008	0.00000000000	0.00172158000	0.02533180000	809.5	34.7	01-10-2008 11:06:26	0.0000	0.0070	0.1030	STOLLSTEIMER CREEK
sc093008_97	1,187,334.470	2,469,172.504	10/1/2008	0.00000000000	0.00049180300	0.03344260000	809.9	34.9	01-10-2008 11:09:43	0.0000	0.0020	0.1360	STOLLSTEIMER CREEK
sc093008_98	1,187,127.272	2,469,178.412	10/1/2008	0.00024624700	0.00073874000	0.17754400000	811.3	35.0	01-10-2008 11:12:43	0.0010	0.0030	0.7210	STOLLSTEIMER CREEK
sc093008_99	1,187,127.692	2,469,379.596	10/1/2008	0.00000000000	0.00073904700	0.16727100000	811.9	35.1	01-10-2008 11:16:47	0.0000	0.0030	0.6790	STOLLSTEIMER CREEK
yjp101208_01	1,214,326.436	2,438,380.795	10/12/2008	0.00000000000	0.00122831000	0.07197870000	774.7	21.8	12-10-2008 09:14:49	0.0000	0.0050	0.2930	YELLOW JACKET PASS
yjp101208_02	1,214,528.989	2,438,369.102	10/12/2008	0.00000000000	0.00195672000	0.31234200000	774.2	22.9	12-10-2008 09:20:50	0.0000	0.0080	1.2770	YELLOW JACKET PASS
yjp101208_03	1,214,736.198	2,438,369.323	10/12/2008	0.02827970000	0.00219412000	0.23160100000	776.1	24.6	12-10-2008 09:38:13	0.1160	0.0090	0.9500	YELLOW JACKET PASS
yjp101208_04	1,214,922.343	2,438,367.541	10/12/2008	0.00000000000	0.00218666000	0.16715800000	775.8	25.5	12-10-2008 09:44:37	0.0000	0.0090	0.6880	YELLOW JACKET PASS
yjp101208_05	1,215,110.832	2,438,387.761	10/12/2008	0.00000000000	0.00119597000	0.05429680000	765.3	26.1	12-10-2008 09:50:37	0.0000	0.0050	0.2270	YELLOW JACKET PASS
yjp101208_06	1,215,126.128	2,438,567.938	10/12/2008	0.00047693000	0.00095386000	0.26803500000	764.5	26.7	12-10-2008 10:00:56	0.0020	0.0040	1.1240	YELLOW JACKET PASS
yjp101208_07	1,215,114.273	2,438,766.111	10/12/2008	0.01008900000	0.00095322400	0.08483690000	764.5	26.9	12-10-2008 10:08:54	0.0420	0.0040	0.3560	YELLOW JACKET PASS
yjp101208_08	1,214,927.174	2,438,575.052	10/12/2008	0.00000000000	0.00168485000	0.08135420000	771.9	26.8	12-10-2008 10:15:22	0.0000	0.0070	0.3380	YELLOW JACKET PASS
yjp101208_09	1,214,715.482	2,438,560.452	10/12/2008	0.00000000000	0.00168260000	0.13196400000	770.1	26.5	12-10-2008 10:22:18	0.0000	0.0070	0.5490	YELLOW JACKET PASS
yjp101208_10	1,214,514.892	2,438,574.039	10/12/2008	0.00000000000	0.00120534000	0.04098160000	771.3	26.1	12-10-2008 10:28:24	0.0000	0.0050	0.1700	YELLOW JACKET PASS
yjp101208_100	1,214,538.137	2,437,796.252	10/13/2008	0.00000000000	0.00479051000	0.02538970000	778.4	30.8	13-10-2008 13:47:44	0.0000	0.0200	0.1060	YELLOW JACKET PASS
yjp101208_101	1,214,524.633	2,437,975.281	10/13/2008	0.00000000000	0.00599165000	0.05032980000	778.6	30.7	13-10-2008 13:51:38	0.0000	0.0250	0.2100	YELLOW JACKET PASS
yjp101208_102	1,214,527.393	2,438,175.388	10/13/2008	0.00000000000	0.00575124000	0.06062770000	778.5	30.7	13-10-2008 13:55:28	0.0000	0.0240	0.2530	YELLOW JACKET PASS
yjp101208_103	1,214,329.770	2,438,210.177	10/13/2008	0.00000000000	0.00095553100	0.03798230000	775.8	30.6	13-10-2008 14:01:41	0.0000	0.0040	0.1590	YELLOW JACKET PASS
yjp101208_104	1,214,717.595	2,437,773.046	10/15/2008	0.00226823000	0.00000000000	0.08367240000	784.8	18.1	15-10-2008 09:04:28	0.0090	-0.0010	0.3320	YELLOW JACKET PASS
yjp101208_105	1,214,916.644	2,437,782.792	10/15/2008	0.00000000000	0.00000000000	0.02832170000	789.6	18.9	15-10-2008 09:09:19	0.0000	-0.0010	0.1120	YELLOW JACKET PASS
yjp101208_106	1,215,118.235	2,437,773.931	10/15/2008	0.00024937100	0.00074811200	0.07206820000	780.0	19.4	15-10-				

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
yjp101208_114	1,214,923.274	2,438,168.338	10/15/2008	0.0000000000	0.00124388000	0.05348690000	780.8	20.4	15-10-2008 09:45:15	0.0000	0.0050	0.2150	YELLOW JACKET PASS
yjp101208_115	1,215,126.331	2,438,184.756	10/15/2008	0.0000000000	0.00123894000	0.02626560000	777.7	20.4	15-10-2008 09:49:28	0.0000	0.0050	0.1060	YELLOW JACKET PASS
yjp101208_116	1,215,325.981	2,438,165.978	10/15/2008	0.0000000000	0.00024723800	0.15353500000	776.5	20.6	15-10-2008 09:52:51	0.0000	0.0010	0.6210	YELLOW JACKET PASS
yjp101208_117	1,214,137.603	2,438,177.274	10/15/2008	0.0000000000	0.00073670900	0.12474900000	775.2	22.1	15-10-2008 10:30:20	0.0000	0.0030	0.5080	YELLOW JACKET PASS
yjp101208_118	1,214,332.022	2,437,781.275	10/15/2008	0.0000000000	0.00248686000	0.04998590000	786.1	22.5	15-10-2008 10:35:34	0.0000	0.0100	0.2010	YELLOW JACKET PASS
yjp101208_119	1,214,338.946	2,437,576.025	10/15/2008	0.0000000000	0.00347423000	0.13996200000	785.5	22.9	15-10-2008 10:39:23	0.0000	0.0140	0.5640	YELLOW JACKET PASS
yjp101208_12	1,214,128.382	2,438,568.682	10/12/2008	0.0000000000	0.00242236000	0.12693200000	774.0	25.7	12-10-2008 10:36:43	0.0000	0.0100	0.5240	YELLOW JACKET PASS
yjp101208_120	1,214,526.079	2,437,580.175	10/15/2008	0.00024776200	0.00247762000	0.09390190000	785.3	23.3	15-10-2008 10:42:09	0.0010	0.0100	0.3790	YELLOW JACKET PASS
yjp101208_121	1,214,532.098	2,437,385.582	10/15/2008	0.0000000000	0.00371031000	0.08558460000	784.8	23.6	15-10-2008 10:44:57	0.0000	0.0150	0.3460	YELLOW JACKET PASS
yjp101208_122	1,214,726.130	2,437,190.468	10/15/2008	0.01581080000	0.00148226000	0.05854940000	785.4	24.2	15-10-2008 10:49:11	0.0640	0.0060	0.2370	YELLOW JACKET PASS
yjp101208_123	1,214,932.155	2,436,979.907	10/15/2008	0.0000000000	0.00416751000	0.14684300000	785.4	26.5	15-10-2008 11:16:15	0.0000	0.0170	0.5990	YELLOW JACKET PASS
yjp101208_124	1,215,133.409	2,436,783.651	10/15/2008	0.0000000000	0.00366390000	0.35442100000	783.6	26.9	15-10-2008 11:19:17	0.0000	0.0150	1.4510	YELLOW JACKET PASS
yjp101208_125	1,215,332.168	2,436,571.478	10/15/2008	0.0000000000	0.00195048000	0.09825540000	783.2	27.3	15-10-2008 11:22:10	0.0000	0.0080	0.4030	YELLOW JACKET PASS
yjp101208_126	1,215,524.673	2,436,369.200	10/15/2008	0.0000000000	0.00365440000	0.16177000000	783.4	27.6	15-10-2008 11:25:01	0.0000	0.0150	0.6640	YELLOW JACKET PASS
yjp101208_127	1,215,732.835	2,436,182.619	10/15/2008	0.0000000000	0.00219199000	0.10594600000	784.2	28.0	15-10-2008 11:28:21	-0.0770	0.0090	0.4350	YELLOW JACKET PASS
yjp101208_128	1,215,729.911	2,435,974.989	10/15/2008	0.0000000000	0.00242716000	0.10800900000	782.8	28.5	15-10-2008 11:32:21	0.0000	0.0100	0.4450	YELLOW JACKET PASS
yjp101208_129	1,215,527.416	2,436,004.071	10/15/2008	0.01478420000	0.00242364000	0.15632500000	782.7	28.9	15-10-2008 11:36:26	0.0610	0.0100	0.6450	YELLOW JACKET PASS
yjp101208_13	1,214,117.994	2,438,784.454	10/12/2008	0.00218395000	0.00072798500	0.19995300000	775.1	25.6	12-10-2008 10:40:59	0.0090	0.0030	0.8240	YELLOW JACKET PASS
yjp101208_130	1,215,334.991	2,435,976.634	10/15/2008	0.0000000000	0.00072674100	0.15164700000	783.1	29.2	15-10-2008 11:39:56	0.0000	0.0030	0.6260	YELLOW JACKET PASS
yjp101208_131	1,215,128.493	2,435,983.674	10/15/2008	0.0000000000	0.00048443200	0.04020790000	783.0	29.2	15-10-2008 11:46:54	0.0000	0.0020	0.1660	YELLOW JACKET PASS
yjp101208_132	1,215,127.887	2,436,169.363	10/15/2008	0.0000000000	0.00048351500	0.01015380000	781.0	29.0	15-10-2008 11:53:02	0.0000	0.0020	0.0420	YELLOW JACKET PASS
yjp101208_133	1,214,929.304	2,436,181.324	10/15/2008	0.0000000000	0.00097642200	0.00979343000	781.8	26.4	15-10-2008 12:20:58	0.0000	0.0040	0.3250	YELLOW JACKET PASS
yjp101208_134	1,214,729.546	2,436,371.898	10/15/2008	0.0000000000	0.00170744000	0.02463600000	778.6	25.4	15-10-2008 12:40:43	0.0000	0.0070	0.1010	YELLOW JACKET PASS
yjp101208_135	1,213,929.896	2,438,575.684	10/15/2008	0.00049548400	0.00644129000	0.34460900000	785.5	23.4	15-10-2008 13:08:25	0.0020	0.0260	1.3910	YELLOW JACKET PASS
yjp101208_136	1,213,713.070	2,438,956.640	10/15/2008	0.0000000000	0.00221771000	0.10497200000	785.5	25.0	15-10-2008 13:13:18	0.0000	0.0090	0.4260	YELLOW JACKET PASS
yjp101208_137	1,213,520.367	2,439,175.657	10/15/2008	0.01427910000	0.00615477000	0.19276800000	786.9	25.8	15-10-2008 13:16:19	0.0580	0.0250	0.7830	YELLOW JACKET PASS
yjp101208_138	1,213,332.810	2,439,190.549	10/15/2008	0.0000000000	0.00122435000	0.22483500000	786.5	27.2	15-10-2008 13:23:51	0.0000	0.0050	0.9180	YELLOW JACKET PASS
yjp101208_139	1,213,118.367	2,439,165.651	10/15/2008	0.00318300000	0.00073453900	0.03036100000	788.1	27.9	15-10-2008 13:29:55	0.0130	0.0030	0.1240	YELLOW JACKET PASS
yjp101208_14	1,214,325.419	2,438,779.537	10/12/2008	0.0000000000	0.00218243000	0.16950200000	774.3	25.5	12-10-2008 10:45:06	0.0000	0.0090	0.6990	YELLOW JACKET PASS
yjp101208_140	1,213,114.270	2,438,992.358	10/15/2008	0.01098060000	0.00146408000	0.03660190000	786.2	28.2	15-10-2008 13:35:51	0.0450	0.0060	0.1500	YELLOW JACKET PASS
yjp101208_141	1,213,115.307	2,438,776.380	10/15/2008	0.0000000000	0.00038916900	0.09534650000	784.2	28.4	15-10-2008 13:41:03	0.0000	0.0160	0.3920	YELLOW JACKET PASS
yjp101208_142	1,213,110.589	2,438,582.186	10/15/2008	0.0000000000	0.00048390800	0.16065700000	780.6	28.6	15-10-2008 13:47:02	0.0000	0.0020	0.6640	YELLOW JACKET PASS
yjp101208_143	1,213,122.179	2,438,386.749	10/15/2008	0.0000000000	0.00072418800	0.07145320000	778.8	28.6	15-10-2008 14:03:19	0.0000	0.0030	0.2960	YELLOW JACKET PASS
yjp101208_144	1,213,328.969	2,438,564.109	10/15/2008	0.00024080700	0.00072242100	0.06285060000	776.9	28.6	15-10-2008 14:12:20	0.0010	0.0030	0.2610	YELLOW JACKET PASS
yjp101208_145	1,214,129.273	2,437,583.708	10/16/2008	0.00050452700	0.00000000000	0.72172600000	787.7	18.9	16-10-2008 09:59:56	0.0020	0.0000	2.8610	YELLOW JACKET PASS
yjp101208_146	1,213,911.999	2,437,566.431	10/16/2008	0.00000000000	0.00050269800	0.07113180000	787.8	20.0	16-10-2008 10:03:38	0.0000	0.0020	0.2830	YELLOW JACKET PASS
yjp101208_147	1,213,728.392	2,437,562.391	10/16/2008	0.00000000000	0.00025023000	0.09533760000	786.7	20.9	16-10-2008 10:07:59	0.0000	0.0010	0.3810	YELLOW JACKET PASS
yjp101208_148	1,213,525.514	2,437,539.446	10/16/2008	0.00000000000	0.00049836100	0.04684600000	785.0	21.5	16-10-2008 10:12:39	-0.0010	0.0020	0.1880	YELLOW JACKET PASS
yjp101208_149	1,213,505.282	2,437,376.335	10/16/2008	0.00000000000	0.00000000000	0.02135410000	783.3	21.9	16-10-2008 10:18:44	0.0000	0.0000	0.0860	YELLOW JACKET PASS
yjp101208_15	1,214,525.830	2,438,774.713	10/12/2008	0.00000000000	0.00218316000	0.16737600000	774.3	25.4	12-10-2008 10:50:42	0.0000	0.0090	0.6900	YELLOW JACKET PASS
yjp101208_150	1,213,721.002	2,437,375.508	10/16/2008	0.00000000000	0.00000000000	0.00371728000	782.3	22.1	16-10-2008 10:24:01	0.0000	0.0000	0.0150	YELLOW JACKET PASS
yjp101208_151	1,213,926.503	2,437,376.441	10/16/2008	0.00000000000	0.00000000000	0.07341810000	785.9	22.2	16-10-2008 10:27:36	0.0000	0.0000	0.2950	YELLOW JACKET PASS
yjp101208_152	1,214,130.649	2,437,368.952	10/16/2008	0.00000000000	0.00174641000	0.03393030000	788.1	22.3	16-10-2008 10:30:13	0.0000	0.0070	0.1360	YELLOW JACKET PASS
yjp101208_153	1,214,339.717	2,437,362.737	10/16/2008	0.00000000000	0.00074725900	0.08344400000	787.1	22.4	16-10-2008 10:34:47	0.0000	0.0030	0.3350	YELLOW JACKET PASS
yjp101208_154	1,214,538.839	2,437,169.255	10/16/2008	0.00522022000	0.00099432700	0.11956800000	787.1	23.0	16-10-2008 10:42:04	0.0210	0.0040	0.4810	YELLOW JACKET PASS
yjp101208_155	1,214,745.844	2,436,968.246	10/16/2008	0.00000000000	0.00099470900	0.15194200000	788.2	23.3	16-10-2008 10:46:40	0.0000	0.0040	0.6110	YELLOW JACKET PASS
yjp101208_156	1,214,959.869	2,436,770.347	10/16/2008	0.00000000000	0.00148639000	0.19323100000	786.0	23.6	16-10-2008 10:50:34	0.0000	0.0060	0.7800	YELLOW JACKET PASS
yjp101208_157	1,215,141.298	2,436,575.987	10/16/2008	0.00000000000	0.00024737700	0.09425050000	785.4	23.8	16-10-2008 10:55:11	0.0000	0.0010	0.3810	YELLOW JACKET PASS
yjp101208_158	1,215,120.171	2,436,372.915	10/16/2008	0.00024757700	0.00074273000	0.25698500000	786.3	23.9	16-10-2008 11:01:05	0.0010	0.0030	1.0380	YELLOW JACKET PASS
yjp101208_159	1,215,319.539	2,436,379.619	10/16/2008	0.00000000000	0.00123501000	0.15338800000	785.0	24.1	16-10-2008 11:08:10	0.0000	0.0050	0.6210	YELLOW JACKET PASS
yjp101208_16	1,214,717.690	2,438,775.599	10/12/2008	0.00000000000	0.00218102000	0.21640600000	773.8	25.5	12-10-2008 10:53:44	0.0000	0.0090	0.8930	YELLOW JACKET PASS
yjp101208_160	1,215,338.461	2,436,182.289	10/16/2008	0.00000000000	0.00098709000	0.22357800000	785.6	24.6	16-10-2008 11:18:15	0.0000	0.0040	0.9060	YELLOW JACKET PASS
yjp101208_161	1,215,527.895	2,436,180.188	10/16/2008	0.00000000000	0.00147897000	0.19596400000	785.5	24.9	16-10-2008 11:20:57	0.0000	0.0060	0.7950	YELLOW JACKET PASS
yjp101208_162	1,214,973.475	2,436,384.935	10/16/2008	0.02282160000	0.00073618000	0.67556800000	785.4	26.2	16-10-2008 11:32:23	0.0930	0.0030	2.7530	YELLOW JACKET PASS
yjp101208_163	1,214,929.970	2,436,597.810	10/16/2008	0.00000000000	0.00097744100	0.18766900000	783.4	26.7	16-10-2008 12:03:40	0.0000	0.0040	0.7680	YELLOW JACKET PASS
yjp101208_164	1,214,714.565	2,436,584.600	10/16/2008	0.00000000000	0.00146747000	0.21938700000	784.1	26.7	16-10-2008 12:07:10	0.0000	0.0060	0.8970	YELLOW JACKET PASS
yjp101208_165	1,214,523.282	2,436,586.903	10/16/2008	0.00000000000	0.00366522000	0.20403100000	783.1	26.6	16-10-2008 12:11:53	0.0000	0.0150	0.8350	YELLOW JACKET PASS
yjp101208_166	1,214,300.346	2,436,583.600	10/16/2008	0.00000000000	0.00170651000	0.21233800000	781.3	26.6	16-10-2008 12:16:54	0.0000	0.0070	0.8710	YELLOW JACKET PASS

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
yjp101208_174	1,214,509.257	2,436,965.798	10/16/2008	0.0000000000	0.00241834000	0.04473930000	782.8	29.6	16-10-2008 12:54:10	0.0000	0.0100	0.1850	YELLOW JACKET PASS
yjp101208_175	1,214,316.374	2,436,969.392	10/16/2008	0.00241842000	0.00604604000	0.08561200000	783.6	29.9	16-10-2008 12:57:41	0.0100	0.0250	0.3540	YELLOW JACKET PASS
yjp101208_176	1,214,123.934	2,436,966.252	10/16/2008	0.0000000000	0.00241731000	0.13947900000	783.5	30.0	16-10-2008 13:01:24	0.0000	0.0100	0.5770	YELLOW JACKET PASS
yjp101208_177	1,214,322.063	2,437,167.020	10/16/2008	0.00024192900	0.00483858000	0.10040100000	784.4	30.1	16-10-2008 13:04:45	0.0010	0.0200	0.4150	YELLOW JACKET PASS
yjp101208_178	1,214,129.447	2,437,179.064	10/16/2008	0.00766809000	0.00455293000	0.13539000000	783.6	32.7	16-10-2008 13:32:36	0.0320	0.0190	0.5650	YELLOW JACKET PASS
yjp101208_179	1,213,925.033	2,437,171.015	10/16/2008	0.0000000000	0.00648004600	0.24865800000	785.9	33.1	16-10-2008 13:36:25	0.0000	0.0270	1.0360	YELLOW JACKET PASS
yjp101208_18	1,214,919.958	2,438,981.324	10/12/2008	0.0000000000	0.00260600000	0.06843620000	773.2	25.9	12-10-2008 11:02:29	0.0000	0.0110	0.2830	YELLOW JACKET PASS
yjp101208_180	1,213,785.471	2,437,168.743	10/16/2008	0.0000000000	0.00167719000	0.10686100000	785.3	33.4	16-10-2008 13:43:09	0.0000	0.0070	0.4460	YELLOW JACKET PASS
yjp101208_181	1,213,736.133	2,436,986.621	10/16/2008	0.0000000000	0.00263421000	0.13266800000	785.4	33.6	16-10-2008 13:47:55	0.0000	0.0110	0.5540	YELLOW JACKET PASS
yjp101208_182	1,213,932.415	2,436,938.549	10/16/2008	0.0000000000	0.00478120000	0.11307500000	784.3	33.7	16-10-2008 13:50:46	0.0000	0.0200	0.4730	YELLOW JACKET PASS
yjp101208_183	1,214,110.046	2,437,757.516	10/17/2008	0.0000000000	0.00000000000	0.06515650000	789.3	23.7	17-10-2008 09:25:13	0.0000	0.0000	0.2620	YELLOW JACKET PASS
yjp101208_184	1,214,121.645	2,437,962.482	10/17/2008	0.0000000000	0.00025136700	0.12291800000	797.8	23.7	17-10-2008 09:33:43	0.0000	0.0010	0.4890	YELLOW JACKET PASS
yjp101208_185	1,213,932.203	2,438,169.694	10/17/2008	0.0000000000	0.00049886900	0.27338000000	790.6	23.3	17-10-2008 09:40:47	0.0000	0.0020	1.0960	YELLOW JACKET PASS
yjp101208_186	1,213,939.201	2,438,388.248	10/17/2008	0.0000000000	0.00074767200	0.03613750000	789.4	23.1	17-10-2008 09:47:01	0.0000	0.0030	0.1450	YELLOW JACKET PASS
yjp101208_187	1,213,733.661	2,438,557.867	10/17/2008	0.0000000000	0.00000000000	0.15759200000	790.8	23.0	17-10-2008 09:51:26	0.0000	0.0000	0.6310	YELLOW JACKET PASS
yjp101208_188	1,213,696.032	2,438,775.813	10/17/2008	0.0000000000	0.00099744300	0.17056300000	790.1	23.2	17-10-2008 09:58:20	0.0000	0.0040	0.6840	YELLOW JACKET PASS
yjp101208_189	1,213,515.287	2,438,975.710	10/17/2008	0.0000000000	0.00149692000	0.20333200000	791.3	23.5	17-10-2008 10:03:49	0.0000	0.0060	0.8150	YELLOW JACKET PASS
yjp101208_19	1,214,911.519	2,439,179.675	10/12/2008	0.0000000000	0.00168670000	0.09903320000	771.2	26.2	12-10-2008 11:07:24	0.0000	0.0070	0.4110	YELLOW JACKET PASS
yjp101208_190	1,213,306.977	2,438,984.034	10/17/2008	0.0000000000	0.00049853300	0.09048370000	791.4	23.8	17-10-2008 10:11:25	0.0000	0.0020	0.3630	YELLOW JACKET PASS
yjp101208_191	1,213,339.627	2,438,780.151	10/17/2008	0.0000000000	0.00009526200	0.16396900000	790.5	24.0	17-10-2008 10:16:32	0.0000	0.0040	0.6590	YELLOW JACKET PASS
yjp101208_192	1,213,524.378	2,438,775.057	10/17/2008	0.0000000000	0.00099308200	0.20829900000	789.3	24.2	17-10-2008 10:21:45	0.0000	0.0040	0.8390	YELLOW JACKET PASS
yjp101208_193	1,213,526.704	2,438,587.763	10/17/2008	0.0000000000	0.00049731800	0.12333500000	790.8	24.3	17-10-2008 10:26:54	0.0000	0.0020	0.4960	YELLOW JACKET PASS
yjp101208_194	1,213,327.270	2,438,381.963	10/17/2008	0.0000000000	0.00074406100	0.00000000000	789.3	24.5	17-10-2008 10:37:09	0.0000	0.0030	-0.7090	YELLOW JACKET PASS
yjp101208_195	1,213,125.520	2,438,178.550	10/17/2008	0.0000000000	0.00123325000	0.19830600000	785.2	24.6	17-10-2008 10:46:27	0.0000	0.0050	0.8040	YELLOW JACKET PASS
yjp101208_196	1,213,309.974	2,438,162.703	10/17/2008	0.00024539300	0.00098157100	0.09275840000	781.2	24.6	17-10-2008 10:51:05	0.0010	0.0040	0.3780	YELLOW JACKET PASS
yjp101208_197	1,213,335.185	2,437,982.116	10/17/2008	0.0000000000	0.00073819200	0.07111250000	783.6	24.7	17-10-2008 10:56:44	0.0000	0.0030	0.2890	YELLOW JACKET PASS
yjp101208_198	1,213,313.555	2,437,772.893	10/17/2008	0.0000000000	0.00073547300	0.15690100000	781.5	25.0	17-10-2008 11:02:01	0.0000	0.0030	0.6400	YELLOW JACKET PASS
yjp101208_199	1,213,504.402	2,437,776.532	10/17/2008	0.0000000000	0.00098227700	0.18294900000	783.6	25.3	17-10-2008 11:08:06	0.0000	0.0040	0.7450	YELLOW JACKET PASS
yjp101208_20	1,214,917.688	2,439,387.320	10/12/2008	0.0000000000	0.00120320000	0.16171000000	770.7	26.4	12-10-2008 11:14:15	0.0000	0.0050	0.6720	YELLOW JACKET PASS
yjp101208_200	1,213,531.506	2,437,976.125	10/17/2008	0.0000000000	0.00098437500	0.27021100000	785.8	25.5	17-10-2008 11:13:53	0.0000	0.0040	1.0980	YELLOW JACKET PASS
yjp101208_201	1,213,513.646	2,438,146.279	10/17/2008	0.00147306000	0.00147306000	0.31155300000	784.2	25.6	17-10-2008 11:17:23	0.0060	0.0060	1.2690	YELLOW JACKET PASS
yjp101208_202	1,213,522.285	2,438,369.360	10/17/2008	0.00049058300	0.00539641000	0.04562420000	783.5	25.6	17-10-2008 11:22:23	0.0020	0.0220	0.1860	YELLOW JACKET PASS
yjp101208_203	1,213,727.470	2,438,352.323	10/17/2008	0.00024609700	0.00172268000	0.34896600000	786.6	25.8	17-10-2008 11:27:28	0.0010	0.0070	1.4180	YELLOW JACKET PASS
yjp101208_204	1,213,722.519	2,438,171.419	10/17/2008	0.01183740000	0.00147967000	0.27078000000	789.3	26.2	17-10-2008 11:35:34	0.0480	0.0060	1.0980	YELLOW JACKET PASS
yjp101208_205	1,213,690.744	2,437,933.627	10/17/2008	0.00024569800	0.00122849000	0.16142300000	786.9	26.4	17-10-2008 11:39:54	0.0010	0.0050	0.6570	YELLOW JACKET PASS
yjp101208_206	1,213,722.762	2,437,765.088	10/17/2008	0.00024552200	0.00122761000	0.22759900000	786.6	26.5	17-10-2008 11:43:51	0.0010	0.0050	0.9270	YELLOW JACKET PASS
yjp101208_207	1,213,923.672	2,437,772.660	10/17/2008	0.0000000000	0.00073684800	0.17782600000	786.9	26.5	17-10-2008 11:47:58	0.0000	0.0030	0.7240	YELLOW JACKET PASS
yjp101208_208	1,213,940.568	2,437,972.788	10/17/2008	0.0000000000	0.00245928000	0.09763340000	787.9	26.5	17-10-2008 11:51:59	0.0000	0.0100	0.3970	YELLOW JACKET PASS
yjp101208_21	1,214,903.089	2,439,579.445	10/12/2008	0.0000000000	0.00240060000	0.10418600000	769.1	26.5	12-10-2008 11:19:00	0.0000	0.0100	0.4340	YELLOW JACKET PASS
yjp101208_22	1,214,909.718	2,439,781.317	10/12/2008	0.0000000000	0.00191709000	0.27342500000	768.0	26.6	12-10-2008 11:25:18	0.0000	0.0080	1.1410	YELLOW JACKET PASS
yjp101208_23	1,214,712.342	2,439,974.393	10/12/2008	0.0000000000	0.00191246000	0.10375100000	766.4	26.7	12-10-2008 11:33:04	0.0000	0.0080	0.4340	YELLOW JACKET PASS
yjp101208_24	1,214,727.195	2,439,796.795	10/12/2008	0.00335205000	0.00000000000	0.07470280000	767.6	26.7	12-10-2008 11:41:27	0.0140	0.0000	0.3120	YELLOW JACKET PASS
yjp101208_25	1,214,726.873	2,439,582.004	10/12/2008	0.0000000000	0.00095970800	0.03430960000	769.7	26.9	12-10-2008 11:50:31	0.0000	0.0040	0.1430	YELLOW JACKET PASS
yjp101208_26	1,214,736.270	2,439,374.146	10/12/2008	0.0000000000	0.00239833000	0.01582900000	769.4	26.9	12-10-2008 11:54:50	0.0000	0.0100	0.0660	YELLOW JACKET PASS
yjp101208_27	1,214,718.678	2,439,190.077	10/12/2008	0.0000000000	0.00192127000	0.12512300000	770.7	27.0	12-10-2008 11:58:16	0.0000	0.0080	0.5210	YELLOW JACKET PASS
yjp101208_28	1,214,730.504	2,438,978.568	10/12/2008	0.00794271000	0.00144413000	0.08014920000	772.4	27.0	12-10-2008 12:04:09	0.0330	0.0060	0.3330	YELLOW JACKET PASS
yjp101208_29	1,214,526.747	2,438,969.069	10/12/2008	0.0000000000	0.00144346000	0.07313540000	772.3	27.1	12-10-2008 12:07:46	0.0000	0.0060	0.3040	YELLOW JACKET PASS
yjp101208_30	1,214,527.519	2,439,178.116	10/12/2008	0.0000000000	0.00168818000	0.14687200000	774.2	27.1	12-10-2008 12:11:42	0.0000	0.0070	0.6090	YELLOW JACKET PASS
yjp101208_31	1,214,529.554	2,439,376.595	10/12/2008	0.0000000000	0.00216547000	0.04403130000	772.4	27.1	12-10-2008 12:14:59	0.0000	0.0090	0.1830	YELLOW JACKET PASS
yjp101208_32	1,214,505.342	2,439,564.851	10/12/2008	0.0000000000	0.00168295000	0.12213400000	771.8	27.1	12-10-2008 12:21:31	0.0000	0.0070	0.5080	YELLOW JACKET PASS
yjp101208_33	1,214,523.301	2,439,773.039	10/12/2008	0.0000000000	0.00144055000	0.03817460000	771.0	27.2	12-10-2008 12:28:19	0.0000	0.0060	0.1590	YELLOW JACKET PASS
yjp101208_34	1,214,529.916	2,439,971.351	10/12/2008	0.0000000000	0.00192109000	0.01993130000	771.4	27.3	12-10-2008 12:33:15	0.0000	0.0080	0.0830	YELLOW JACKET PASS
yjp101208_35	1,214,529.513	2,440,188.177	10/12/2008	0.0000000000	0.00143333000	0.03750540000	767.9	27.5	12-10-2008 12:38:27	0.0000	0.0060	0.1570	YELLOW JACKET PASS
yjp101208_36	1,214,339.245	2,440,160.474	10/12/2008	0.0000000000	0.00143323000	0.17987000000	768.1	27.6	12-10-2008 12:45:33	0.0000	0.0060	0.7530	YELLOW JACKET PASS
yjp101208_37	1,214,324.227	2,439,966.960	10/12/2008	0.0000000000	0.00119608000	0.14616100000	768.7	27.4	12-10-2008 12:51:18	0.0000	0.0050	0.6110	YELLOW JACKET PASS
yjp101208_38	1,214,326.694	2,439,764.990	10/12/2008	0.0000000000	0.00192298000	0.14037700000	771.9	27.2	12-10-2008 12:56:29	0.0000	0.0080	0.5840	YELLOW JACKET PASS
yjp101208_39	1,214,325.462	2,439,605.189	10/12/2008	0.0000000000	0.00192540000	0.16799100000	772.1	26.9	12-10-2008 13:02:41	0.0000	0.0080	0.6980	YELLOW JACKET PASS
yjp101208_40	1,214,324.378	2,439,367.537	10/12/2008	0.0000000000	0.00144547000	0.08431890000	772.6	26.8	12-10-2008 13:06:39	0.0000	0.0060	0.3500	YELLOW JACKET PASS
yjp101208_41	1,214,334.293	2,											

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
yjp101208_49	1,214,106.778	2,440,168.754	10/13/2008	0.00025013400	0.00075040300	0.07504030000	774.9	16.6	13-10-2008 09:16:13	0.0010	0.0030	0.3000	YELLOW JACKET PASS
yjp101208_50	1,213,920.230	2,440,167.762	10/13/2008	0.00000000000	0.00099907500	0.03371880000	773.5	16.5	13-10-2008 09:19:37	0.0000	0.0040	0.1350	YELLOW JACKET PASS
yjp101208_51	1,213,918.986	2,439,973.880	10/13/2008	0.00025012400	0.00100050000	0.02826400000	774.6	16.5	13-10-2008 09:23:33	0.0010	0.0040	0.1130	YELLOW JACKET PASS
yjp101208_52	1,213,928.992	2,439,772.522	10/13/2008	0.00025090900	0.00050181800	0.02484000000	777.3	16.6	13-10-2008 09:28:04	0.0010	0.0020	0.0990	YELLOW JACKET PASS
yjp101208_53	1,213,921.790	2,438,772.557	10/13/2008	0.00000000000	0.00049955400	0.05320250000	778.6	18.4	13-10-2008 09:50:11	0.0000	0.0020	0.2130	YELLOW JACKET PASS
yjp101208_54	1,213,913.413	2,438,972.188	10/13/2008	0.00000000000	0.00125497000	0.06475660000	783.2	18.7	13-10-2008 09:53:35	0.0000	0.0050	0.2580	YELLOW JACKET PASS
yjp101208_55	1,213,921.587	2,439,174.865	10/13/2008	0.00000000000	0.00050079000	0.10116000000	782.4	19.1	13-10-2008 09:57:39	-0.0020	0.0020	0.4040	YELLOW JACKET PASS
yjp101208_56	1,213,916.597	2,439,367.294	10/13/2008	0.00075038300	0.00050025500	0.09079640000	782.1	19.3	13-10-2008 10:00:51	0.0030	0.0020	0.3630	YELLOW JACKET PASS
yjp101208_57	1,213,926.679	2,439,576.084	10/13/2008	0.00000000000	0.00100030000	0.03901160000	782.2	19.4	13-10-2008 10:04:46	-0.0040	0.0040	0.1560	YELLOW JACKET PASS
yjp101208_58	1,213,725.912	2,439,762.830	10/13/2008	0.00000000000	0.00124723000	0.02369730000	780.5	19.5	13-10-2008 10:09:16	-0.0040	0.0050	0.0950	YELLOW JACKET PASS
yjp101208_59	1,213,715.759	2,439,979.355	10/13/2008	0.00000000000	0.00049806000	0.80810200000	779.2	19.5	13-10-2008 10:14:28	-0.0220	0.0020	3.2450	YELLOW JACKET PASS
yjp101208_60	1,213,525.077	2,439,769.895	10/13/2008	0.00099539600	0.00124424000	0.03757620000	778.9	19.6	13-10-2008 10:19:10	0.0040	0.0050	0.1510	YELLOW JACKET PASS
yjp101208_61	1,213,529.752	2,439,569.250	10/13/2008	0.00000000000	0.00156956000	0.04170550000	702.3	19.8	13-10-2008 10:22:55	-0.0090	0.0070	0.1860	YELLOW JACKET PASS
yjp101208_62	1,213,743.116	2,439,569.434	10/13/2008	0.00000000000	0.00100859000	0.09480710000	790.3	20.0	13-10-2008 10:27:32	-0.1440	0.0040	0.3760	YELLOW JACKET PASS
yjp101208_63	1,213,722.357	2,439,372.664	10/13/2008	0.01764280000	0.00024848900	0.11629300000	779.9	20.4	13-10-2008 10:33:20	0.0710	0.0010	0.4680	YELLOW JACKET PASS
yjp101208_64	1,213,732.032	2,439,166.729	10/13/2008	0.00000000000	0.00049804200	0.07719640000	782.1	20.6	13-10-2008 10:37:36	-0.0150	0.0020	0.3100	YELLOW JACKET PASS
yjp101208_65	1,213,523.363	2,439,379.539	10/13/2008	0.00000000000	0.00099735700	0.02119380000	783.9	20.9	13-10-2008 10:43:54	0.0000	0.0040	0.0850	YELLOW JACKET PASS
yjp101208_66	1,213,339.076	2,439,368.753	10/13/2008	0.00000000000	0.00099545100	0.11422800000	783.2	21.2	13-10-2008 10:50:07	0.0000	0.0040	0.4590	YELLOW JACKET PASS
yjp101208_67	1,213,314.374	2,439,578.400	10/13/2008	0.00000000000	0.00074722400	0.03113430000	784.4	21.4	13-10-2008 10:54:24	0.0000	0.0030	0.1250	YELLOW JACKET PASS
yjp101208_68	1,214,131.157	2,438,374.138	10/13/2008	0.00000000000	0.00074614800	0.01865370000	784.6	21.9	13-10-2008 11:02:50	0.0000	0.0030	0.0750	YELLOW JACKET PASS
yjp101208_69	1,214,321.745	2,437,946.816	10/13/2008	0.00000000000	0.00147368000	0.15424500000	781.9	24.6	13-10-2008 11:18:06	0.0000	0.0060	0.6280	YELLOW JACKET PASS
yjp101208_70	1,214,721.685	2,437,372.449	10/13/2008	0.00000000000	0.00171239000	0.03131220000	781.9	25.8	13-10-2008 11:25:13	0.0000	0.0070	0.1280	YELLOW JACKET PASS
yjp101208_71	1,214,928.750	2,437,175.716	10/13/2008	0.02437810000	0.00341293000	0.08556710000	780.5	26.3	13-10-2008 11:28:15	0.1000	0.0140	0.3510	YELLOW JACKET PASS
yjp101208_72	1,215,119.656	2,436,968.448	10/13/2008	0.03725350000	0.00292184000	0.04674950000	780.6	26.7	13-10-2008 11:31:37	0.1530	0.0120	0.1920	YELLOW JACKET PASS
yjp101208_73	1,215,321.155	2,436,777.747	10/13/2008	0.00000000000	0.00038701000	0.03133910000	780.4	27.3	13-10-2008 11:36:26	0.0000	0.0160	0.1290	YELLOW JACKET PASS
yjp101208_74	1,215,512.767	2,436,552.465	10/13/2008	0.00000000000	0.00218018000	0.02810010000	779.2	27.7	13-10-2008 11:40:04	-0.0010	0.0090	0.1160	YELLOW JACKET PASS
yjp101208_75	1,215,726.160	2,436,346.876	10/13/2008	0.00000000000	0.00217829000	0.09439250000	779.3	28.0	13-10-2008 11:43:47	0.0000	0.0090	0.3900	YELLOW JACKET PASS
yjp101208_76	1,215,722.053	2,436,555.207	10/13/2008	0.00000000000	0.00169042000	0.10891100000	779.1	28.6	13-10-2008 11:50:01	0.0000	0.0070	0.4510	YELLOW JACKET PASS
yjp101208_77	1,215,917.026	2,436,376.928	10/13/2008	0.00000000000	0.00337297000	0.53702400000	777.8	28.8	13-10-2008 11:55:18	0.0000	0.0140	2.2290	YELLOW JACKET PASS
yjp101208_78	1,215,925.474	2,436,562.793	10/13/2008	0.00000000000	0.00069806000	0.11577300000	777.3	28.9	13-10-2008 12:00:19	0.0000	0.0290	0.4810	YELLOW JACKET PASS
yjp101208_79	1,215,948.012	2,436,765.357	10/13/2008	0.00000000000	0.00216471000	0.12507200000	776.5	28.8	13-10-2008 12:05:39	-0.0020	0.0090	0.5200	YELLOW JACKET PASS
yjp101208_80	1,215,730.793	2,436,768.554	10/13/2008	0.00000000000	0.00240462000	0.22579300000	776.3	28.8	13-10-2008 12:09:38	0.0000	0.0100	0.9390	YELLOW JACKET PASS
yjp101208_81	1,215,537.786	2,436,782.517	10/13/2008	0.00000000000	0.00408153000	0.10708000000	775.1	28.8	13-10-2008 12:12:52	0.0000	0.0170	0.4460	YELLOW JACKET PASS
yjp101208_82	1,215,337.171	2,436,975.003	10/13/2008	0.00000000000	0.00673912000	0.09410700000	776.5	28.6	13-10-2008 12:18:11	0.0000	0.0280	0.3910	YELLOW JACKET PASS
yjp101208_83	1,215,541.066	2,436,970.629	10/13/2008	0.00000000000	0.00289377000	0.04292430000	778.0	28.6	13-10-2008 12:24:06	0.0000	0.0120	0.1780	YELLOW JACKET PASS
yjp101208_84	1,215,730.392	2,436,979.352	10/13/2008	0.00000000000	0.00264065000	0.09290280000	775.0	28.8	13-10-2008 12:27:37	0.0000	0.0110	0.3870	YELLOW JACKET PASS
yjp101208_85	1,215,931.464	2,436,988.122	10/13/2008	0.00000000000	0.00407597000	0.10573500000	774.3	28.9	13-10-2008 12:31:49	0.0000	0.0170	0.4410	YELLOW JACKET PASS
yjp101208_86	1,215,721.828	2,437,169.250	10/13/2008	0.00023968300	0.00239683000	0.16394300000	774.3	29.0	13-10-2008 12:35:32	0.0010	0.0100	0.6840	YELLOW JACKET PASS
yjp101208_87	1,215,531.425	2,437,169.145	10/13/2008	0.00000000000	0.00502360000	0.08707570000	772.8	29.0	13-10-2008 12:39:06	0.0000	0.0210	0.3640	YELLOW JACKET PASS
yjp101208_88	1,215,334.506	2,437,167.893	10/13/2008	0.02855180000	0.00599827000	0.08853450000	775.1	29.0	13-10-2008 12:46:26	0.1190	0.0250	0.3690	YELLOW JACKET PASS
yjp101208_89	1,215,126.426	2,437,182.776	10/13/2008	0.00000000000	0.00648638000	0.18330000000	776.6	29.2	13-10-2008 12:52:15	0.0000	0.0270	0.7630	YELLOW JACKET PASS
yjp101208_90	1,214,920.943	2,437,373.771	10/13/2008	0.00000000000	0.00265091000	0.05591010000	779.3	29.3	13-10-2008 12:57:40	0.0000	0.0110	0.2320	YELLOW JACKET PASS
yjp101208_91	1,215,123.563	2,437,386.249	10/13/2008	0.00000000000	0.00409363000	0.10474900000	779.2	29.5	13-10-2008 13:02:38	0.0000	0.0170	0.4350	YELLOW JACKET PASS
yjp101208_92	1,215,330.414	2,437,392.245	10/13/2008	0.00000000000	0.00528870000	0.03822290000	778.4	29.7	13-10-2008 13:07:38	0.0000	0.0220	0.1590	YELLOW JACKET PASS
yjp101208_93	1,215,533.670	2,437,365.187	10/13/2008	0.01915550000	0.00694388000	0.28206500000	776.6	30.2	13-10-2008 13:16:02	0.0800	0.0290	1.1780	YELLOW JACKET PASS
yjp101208_94	1,215,728.677	2,437,382.746	10/13/2008	0.00000000000	0.00715364000	0.10372800000	773.9	30.4	13-10-2008 13:19:42	0.0000	0.0300	0.4350	YELLOW JACKET PASS
yjp101208_95	1,215,518.796	2,437,565.677	10/13/2008	0.00000000000	0.00261346000	0.09954890000	772.1	30.8	13-10-2008 13:25:07	0.0000	0.0110	0.4190	YELLOW JACKET PASS
yjp101208_96	1,215,307.728	2,437,590.284	10/13/2008	0.01737510000	0.00261816000	0.03594030000	774.0	31.0	13-10-2008 13:30:58	0.0730	0.0110	0.1510	YELLOW JACKET PASS
yjp101208_97	1,215,119.920	2,437,573.798	10/13/2008	0.00381168000	0.00333522000	0.10958600000	774.7	31.0	13-10-2008 13:35:24	0.0160	0.0140	0.4600	YELLOW JACKET PASS
yjp101208_98	1,214,936.585	2,437,576.975	10/13/2008	0.01312130000	0.00548708000	0.10497000000	775.8	31.0	13-10-2008 13:39:00	0.0550	0.0230	0.4400	YELLOW JACKET PASS
yjp101208_99	1,214,725.652	2,437,577.029	10/13/2008	0.00047895500	0.00574746000	0.13051500000	778.5	30.9	13-10-2008 13:43:11	0.0020	0.0240	0.5450	YELLOW JACKET PASS
pet101908_220	1,204,532.082	2,457,571.956	10/24/2008	0.00000000000	0.00076195400	0.00000000000	789.0	17.4	24-10-2008 09:31:28	0.0000	0.0030	-0.5690	PETERSON GULCH
pet101908_221	1,204,724.177	2,457,589.567	10/24/2008	0.00076581400	0.00076581400	0.00178690000	796.0	18.5	24-10-2008 09:34:11	0.0030	0.0030	0.0070	PETERSON GULCH
pet101908_222	1,204,923.761	2,457,579.829	10/24/2008	0.00000000000	0.00050398500	0.17387500000	788.2	19.4	24-10-2008 09:36:33	0.0000	0.0020	0.6900	PETERSON GULCH
pet101908_223	1,205,124.864	2,457,368.150	10/24/2008	0.00000000000	0.00050171500	0.00727486000	787.6	20.5	24-10-2008 09:40:26	0.0000	0.0020	0.0290	PETERSON GULCH
pet101908_224	1,204,916.638	2,457,367.512	10/24/2008	0.00000000000	0.00075084700	0.00000000000	787.4	21.1	24-10-2008 09:43:11	-0.3760	0.0030	-0.0880	PETERSON GULCH
pet101908_225	1,204,723.702	2,457,366.825	10/24/2008	0.00124976000	0.00000000000	0.00724863000	787.7	21.6	24-10-2008 09:45:44	0.0050	0.0000	0.0290	PETERSON GULCH
pet101908_226	1,204,514.200	2,457,373.744	10/24/2008	0.01899160000	0.00074966700	0.01624280000	788.3	21.9	24-10-2008 09:48:42	0.0760	0.0030	0.0650	PETERSON GULCH
pet101908_22													

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet101908_235	1,205,740.311	2,456,375.920	10/24/2008	0.00024803400	0.00024803400	0.05010280000	785.1	22.9	24-10-2008 10:17:19	0.0010	0.0010	0.2020	PETERSON GULCH
pet101908_236	1,205,929.941	2,456,364.395	10/24/2008	0.00000000000	0.000099146600	0.02478660000	785.1	23.1	24-10-2008 10:20:43	0.0000	0.0040	0.1000	PETERSON GULCH
pet101908_237	1,205,924.760	2,456,169.398	10/24/2008	0.00000000000	0.000494452000	0.05537860000	783.6	23.3	24-10-2008 10:24:24	0.0000	0.0020	0.2240	PETERSON GULCH
pet101908_238	1,205,529.859	2,456,374.929	10/24/2008	0.00000000000	0.001233520000	0.08906010000	783.0	23.7	24-10-2008 10:30:06	0.0000	0.0050	0.3610	PETERSON GULCH
pet101908_239	1,205,343.957	2,456,377.790	10/24/2008	0.00000000000	0.000495028000	0.01163310000	786.1	23.9	24-10-2008 10:33:05	0.0000	0.0020	0.0470	PETERSON GULCH
pet101908_240	1,205,534.130	2,456,574.553	10/24/2008	0.00000000000	0.000495009000	0.09553680000	786.6	24.1	24-10-2008 10:36:31	-0.0020	0.0020	0.3860	PETERSON GULCH
pet101908_241	1,205,331.741	2,456,578.807	10/24/2008	0.00000000000	0.000247610000	0.05794080000	787.2	24.2	24-10-2008 10:39:12	-0.0100	0.0010	0.2340	PETERSON GULCH
pet101908_242	1,205,319.691	2,456,770.087	10/24/2008	0.00000000000	0.000990736000	0.00000000000	787.7	24.3	24-10-2008 10:42:17	0.0000	0.0040	-0.0230	PETERSON GULCH
pet101908_243	1,205,115.581	2,456,968.800	10/24/2008	0.00000000000	0.001731150000	0.05564400000	786.5	24.3	24-10-2008 10:46:35	0.0000	0.0070	0.2250	PETERSON GULCH
pet101908_244	1,205,126.796	2,456,765.007	10/24/2008	0.00000000000	0.000742486000	0.00000000000	787.1	24.3	24-10-2008 10:49:48	0.0000	0.0030	-0.6180	PETERSON GULCH
pet101908_245	1,205,147.002	2,456,576.800	10/24/2008	0.00000000000	0.000247653000	0.08865960000	787.6	24.3	24-10-2008 10:52:26	0.0000	0.0010	0.3580	PETERSON GULCH
pet101908_246	1,205,142.614	2,456,383.356	10/24/2008	0.00000000000	0.000495054000	0.11213000000	787.2	24.3	24-10-2008 10:55:13	0.0000	0.0020	0.4530	PETERSON GULCH
pet101908_247	1,204,922.223	2,456,371.796	10/24/2008	0.00000000000	0.001731450000	0.00865723000	786.9	24.4	24-10-2008 10:57:54	0.0000	0.0070	0.0350	PETERSON GULCH
pet101908_248	1,204,929.064	2,456,562.014	10/24/2008	0.00000000000	0.000494847000	0.07076310000	787.4	24.5	24-10-2008 11:01:19	0.0000	0.0020	0.2860	PETERSON GULCH
pet101908_250	1,204,926.156	2,456,784.202	10/24/2008	0.00000000000	0.000494995000	0.05840940000	787.9	24.6	24-10-2008 11:06:02	0.0000	0.0020	0.2360	PETERSON GULCH
pet101908_251	1,204,925.057	2,456,971.444	10/24/2008	0.000247414000	0.001731900000	0.07966740000	787.9	24.7	24-10-2008 11:09:06	0.0010	0.0070	0.3220	PETERSON GULCH
pet101908_252	1,204,723.705	2,456,972.282	10/24/2008	0.000494766000	0.000494766000	0.04700270000	787.8	24.7	24-10-2008 11:11:25	0.0020	0.0020	0.1900	PETERSON GULCH
pet101908_253	1,204,736.741	2,456,784.707	10/24/2008	0.00000000000	0.001732200000	0.11011800000	788.3	24.8	24-10-2008 11:13:40	0.0000	0.0070	0.4450	PETERSON GULCH
pet101908_254	1,204,734.284	2,456,578.652	10/24/2008	0.000247468000	0.000494936000	0.04751380000	788.6	24.9	24-10-2008 11:16:08	0.0010	0.0020	0.1920	PETERSON GULCH
pet101908_255	1,204,723.082	2,456,378.266	10/24/2008	0.00000000000	0.000247197000	0.01779820000	788.0	25.0	24-10-2008 11:18:46	0.0000	0.0010	0.0720	PETERSON GULCH
pet101908_256	1,204,515.092	2,456,993.006	10/24/2008	0.00000000000	0.000247302000	0.02250450000	788.6	25.1	24-10-2008 11:23:26	0.0000	0.0010	0.0910	PETERSON GULCH
pet101908_257	1,203,713.709	2,459,375.533	10/24/2008	0.00000000000	0.000738395000	0.07162430000	787.5	26.1	24-10-2008 11:47:21	0.0000	0.0030	0.2910	PETERSON GULCH
pet101908_258	1,203,536.530	2,459,379.568	10/24/2008	0.00471020000	0.000495811000	0.00644554000	794.5	26.6	24-10-2008 11:50:41	0.0190	0.0020	0.0260	PETERSON GULCH
pet101908_259	1,203,326.344	2,459,383.804	10/24/2008	0.00000000000	0.000983070000	0.03588210000	788.7	27.0	24-10-2008 11:54:04	0.0000	0.0040	0.1460	PETERSON GULCH
pet101908_260	1,203,132.157	2,459,381.175	10/24/2008	0.00000000000	0.000984206000	0.00615129000	790.4	27.3	24-10-2008 11:56:35	0.0000	0.0040	0.0250	PETERSON GULCH
pet101908_261	1,202,921.915	2,459,377.088	10/24/2008	0.00000000000	0.002212430000	0.12192900000	790.2	27.5	24-10-2008 11:59:06	-0.0380	0.0090	0.4960	PETERSON GULCH
pet101908_262	1,202,724.015	2,459,377.100	10/24/2008	0.00000000000	0.001722900000	0.07186950000	791.7	27.7	24-10-2008 12:01:27	-0.1200	0.0070	0.2920	PETERSON GULCH
pet101908_263	1,202,526.177	2,459,372.634	10/24/2008	0.00000000000	0.001229610000	0.03393730000	791.3	27.8	24-10-2008 12:04:09	-0.0310	0.0050	0.1380	PETERSON GULCH
pet101908_264	1,202,328.683	2,459,377.730	10/24/2008	0.00000000000	0.000491371000	0.06338680000	790.8	27.9	24-10-2008 12:06:25	0.0000	0.0020	0.2580	PETERSON GULCH
pet101908_265	1,202,128.137	2,459,365.640	10/24/2008	0.000490835000	0.000736252000	0.09104980000	790.2	28.0	24-10-2008 12:10:06	0.0020	0.0030	0.3710	PETERSON GULCH
pet101908_266	1,201,928.343	2,459,367.011	10/24/2008	0.00000000000	0.000735786000	0.03580830000	789.7	28.0	24-10-2008 12:12:58	0.0000	0.0030	0.1460	PETERSON GULCH
pet101908_267	1,201,728.509	2,459,383.338	10/24/2008	0.000245138000	0.000490276000	0.05417550000	789.3	28.0	24-10-2008 12:15:25	0.0010	0.0020	0.2210	PETERSON GULCH
pet101908_268	1,201,731.306	2,459,178.412	10/24/2008	0.00000000000	0.000979510000	0.18194400000	788.2	27.9	24-10-2008 12:18:49	-0.1780	0.0040	0.7430	PETERSON GULCH
pet101908_269	1,201,937.631	2,459,193.987	10/24/2008	0.00000000000	0.001223090000	0.13160400000	787.1	27.8	24-10-2008 12:21:42	0.0000	0.0050	0.5380	PETERSON GULCH
pet101908_270	1,201,918.887	2,458,992.572	10/24/2008	0.000245009000	0.000980037000	0.01372050000	788.1	27.7	24-10-2008 12:25:53	0.0010	0.0040	0.0560	PETERSON GULCH
pet101908_271	1,202,143.281	2,458,983.596	10/24/2008	0.00000000000	0.000734002000	0.13163100000	787.0	27.7	24-10-2008 12:28:48	0.0000	0.0030	0.5380	PETERSON GULCH
pet101908_272	1,202,129.188	2,458,781.192	10/24/2008	0.000245165000	0.000980659000	0.07624620000	788.6	27.7	24-10-2008 12:31:59	0.0010	0.0040	0.3110	PETERSON GULCH
pet101908_273	1,202,324.781	2,458,773.738	10/24/2008	0.00000000000	0.000978047000	0.08435660000	786.5	27.7	24-10-2008 12:34:52	0.0000	0.0040	0.3450	PETERSON GULCH
pet101908_274	1,202,308.365	2,458,587.862	10/24/2008	0.00000000000	0.000735270000	0.08259560000	788.1	27.6	24-10-2008 12:38:03	-0.0040	0.0030	0.3370	PETERSON GULCH
pet101908_275	1,202,515.783	2,458,576.862	10/24/2008	0.00000000000	0.000734806000	0.06686730000	787.6	27.6	24-10-2008 12:42:37	0.0000	0.0030	0.2730	PETERSON GULCH
pet101908_276	1,202,515.169	2,458,780.114	10/24/2008	0.00000000000	0.000735365000	0.05098530000	788.2	27.6	24-10-2008 12:46:30	0.0000	0.0030	0.2080	PETERSON GULCH
pet101908_277	1,202,514.669	2,459,009.768	10/24/2008	0.00000000000	0.000735983000	0.02085290000	788.6	27.5	24-10-2008 12:50:19	0.0000	0.0030	0.0850	PETERSON GULCH
pet101908_278	1,202,334.696	2,458,970.606	10/24/2008	0.00000000000	0.000983846000	0.03468060000	790.9	27.6	24-10-2008 12:52:59	0.0000	0.0040	0.1410	PETERSON GULCH
pet101908_279	1,202,125.989	2,459,167.872	10/24/2008	0.00000000000	0.000490057000	0.04091980000	787.9	27.6	24-10-2008 12:56:08	-0.0030	0.0020	0.1670	PETERSON GULCH
pet101908_280	1,202,320.132	2,459,183.337	10/24/2008	0.00000000000	0.000735552000	0.09978990000	788.4	27.6	24-10-2008 12:58:49	0.0000	0.0030	0.4070	PETERSON GULCH
pet101908_281	1,202,523.416	2,459,167.828	10/24/2008	0.00000000000	0.000736392000	0.07314820000	789.3	27.6	24-10-2008 13:01:41	0.0000	0.0030	0.2980	PETERSON GULCH
pet102408_01	1,203,119.327	2,459,568.924	10/24/2008	0.00000000000	0.000984257000	0.67643100000	788.6	26.6	24-10-2008 14:16:22	0.0000	0.0040	2.7490	PETERSON GULCH
pet102408_02	1,202,916.397	2,459,569.476	10/24/2008	0.00000000000	0.003192340000	0.06630250000	789.1	27.4	24-10-2008 14:19:11	0.0000	0.0130	0.2700	PETERSON GULCH
pet102408_03	1,202,719.818	2,459,570.933	10/24/2008	0.00000000000	0.001224880000	0.01420860000	789.3	28.2	24-10-2008 14:21:40	0.0000	0.0050	0.0580	PETERSON GULCH
pet102408_04	1,202,526.458	2,459,570.379	10/24/2008	0.00000000000	0.001712500000	0.02813400000	789.8	28.8	24-10-2008 14:23:58	0.0000	0.0070	0.1150	PETERSON GULCH
pet102408_05	1,202,326.349	2,459,570.146	10/24/2008	0.00000000000	0.000489158000	0.00000000000	790.9	29.3	24-10-2008 14:26:16	0.0000	0.0020	-0.0630	PETERSON GULCH
pet102408_06	1,202,315.543	2,459,768.960	10/24/2008	0.00000000000	0.000975294000	0.04876470000	789.5	29.7	24-10-2008 14:28:48	0.0000	0.0040	0.2000	PETERSON GULCH
pet102408_07	1,202,509.660	2,459,763.989	10/24/2008	0.00000000000	0.000487596000	0.06899490000	790.2	30.0	24-10-2008 14:31:11	0.0000	0.0020	0.2830	PETERSON GULCH
pet102408_08	1,202,713.762	2,459,768.685	10/24/2008	0.03700200000	0.001217170000	0.04333120000	789.8	30.3	24-10-2008 14:33:32	0.1520	0.0050	0.1780	PETERSON GULCH
pet102408_09	1,202,723.275	2,459,972.868	10/24/2008	0.00000000000	0.000729063000	0.04277170000	789.5	30.7	24-10-2008 14:36:19	-0.7370	0.0030	0.1760	PETERSON GULCH
pet102408_10	1,202,530.297	2,459,974.754	10/24/2008	0.03810700000	0.000728160000	0.06888970000	789.3	31.0	24-10-2008 14:38:40	0.1570	0.0030	0.2830	PETERSON GULCH
pet102408_11	1,202,332.935	2,459,968.403	10/24/2008	0.00000000000	0.000970219000	0.02474060000	789.8	31.4	24-10-2008 14:41:05	0.0000	0.0040	0.1020	PETERSON GULCH
pet102408_12	1,202,126.236	2,459,968.660	10/24/2008	0.									

Site Point Identification	Northing	Easting	Date	CH4 Flux	H2S Flux	CO2 Flux	Pressure	Temperature (DegC)	Date & Time of Measurement	CH4 Slope	H2S Slope	CO2 Slope	Location
pet102408_21	1,203,131.281	2,459,765.723	10/27/2008	0.000000000000	0.00122941000	0.02286710000	800.9	31.5	27-10-2008 12:10:13	0.0000	0.0050	0.0930	PETERSON GULCH
pet102408_22	1,202,922.817	2,459,777.450	10/27/2008	0.000000000000	0.00073876300	0.05245220000	802.9	31.8	27-10-2008 12:12:48	0.0000	0.0030	0.2130	PETERSON GULCH
pet102408_23	1,202,922.084	2,459,977.906	10/27/2008	0.00073855500	0.00123092000	0.05613020000	803.2	32.0	27-10-2008 12:15:24	0.0030	0.0050	0.2280	PETERSON GULCH
pet102408_24	1,203,124.169	2,459,986.593	10/27/2008	0.00049094500	0.00122736000	0.01595570000	801.4	32.2	27-10-2008 12:18:43	0.0020	0.0050	0.0650	PETERSON GULCH
pet102408_25	1,203,312.705	2,459,974.393	10/27/2008	0.00024498700	0.00048997300	0.03552310000	800.6	32.5	27-10-2008 12:22:49	0.0010	0.0020	0.1450	PETERSON GULCH
pet102408_26	1,203,518.767	2,459,971.309	10/27/2008	0.000000000000	0.00122205000	0.03104010000	799.5	32.8	27-10-2008 12:26:29	0.0000	0.0050	0.1270	PETERSON GULCH
pet102408_27	1,203,326.236	2,460,176.307	10/27/2008	0.000000000000	0.00024505000	0.03466090000	799.5	33.2	27-10-2008 12:30:43	0.0000	0.0050	0.1420	PETERSON GULCH
pet102408_28	1,203,120.385	2,460,180.379	10/27/2008	0.00024351700	0.00097406700	0.03944970000	798.4	33.5	27-10-2008 12:35:03	0.0010	0.0040	0.1620	PETERSON GULCH
pet102408_29	1,202,925.378	2,460,180.680	10/27/2008	0.00999642000	0.00073144500	0.03072070000	799.9	33.7	27-10-2008 12:38:00	0.0010	0.0030	0.1260	PETERSON GULCH
pet102408_30	1,202,723.767	2,460,178.810	10/27/2008	0.00414734000	0.00121980000	0.05415930000	800.9	33.9	27-10-2008 12:41:11	0.0170	0.0050	0.2220	PETERSON GULCH
pet102408_31	1,202,533.064	2,460,188.424	10/27/2008	0.000000000000	0.00097564800	0.02365950000	801.0	34.0	27-10-2008 12:44:43	0.0000	0.0040	0.0970	PETERSON GULCH
pet102408_32	1,201,923.241	2,460,177.089	10/27/2008	0.00952847000	0.00122160000	0.03466090000	802.6	34.1	27-10-2008 12:50:02	0.0390	0.0050	0.7650	PETERSON GULCH
pet102408_33	1,201,726.168	2,460,171.978	10/27/2008	0.00073335900	0.00122227000	0.01931180000	803.3	34.2	27-10-2008 12:52:55	0.0030	0.0050	0.0790	PETERSON GULCH
pet102408_34	1,201,718.907	2,460,364.028	10/27/2008	0.00073335900	0.00122227000	0.00831141000	803.3	34.2	27-10-2008 12:56:29	0.0030	0.0050	0.0340	PETERSON GULCH
pet102408_35	1,201,533.378	2,460,359.156	10/27/2008	0.000000000000	0.00146763000	0.05454700000	803.8	34.2	27-10-2008 12:59:12	0.0000	0.0060	0.2230	PETERSON GULCH
pet102408_36	1,201,938.420	2,460,368.390	10/27/2008	0.00048921100	0.00122303000	0.03473400000	803.8	34.2	27-10-2008 13:02:34	0.0020	0.0050	0.1420	PETERSON GULCH
pet102408_37	1,202,130.760	2,460,369.305	10/27/2008	0.00048856500	0.00219854000	0.16293600000	803.0	34.3	27-10-2008 13:04:54	0.0020	0.0090	0.6670	PETERSON GULCH
pet102408_38	1,202,328.152	2,460,367.181	10/27/2008	0.000000000000	0.00048834500	0.08057690000	802.9	34.4	27-10-2008 13:07:33	0.0000	0.0020	0.3300	PETERSON GULCH
pet102408_39	1,202,518.900	2,460,371.895	10/27/2008	0.000000000000	0.00024378300	0.03193550000	802.4	34.7	27-10-2008 13:11:21	0.0000	0.0010	0.1310	PETERSON GULCH
pet102408_40	1,202,521.895	2,460,576.134	10/27/2008	0.000000000000	0.00024336300	0.06278770000	801.8	35.0	27-10-2008 13:14:29	0.0000	0.0010	0.2580	PETERSON GULCH
pet102408_41	1,202,314.721	2,460,558.542	10/27/2008	0.000000000000	0.00170282000	0.02262320000	802.5	35.4	27-10-2008 13:17:49	0.0000	0.0070	0.0930	PETERSON GULCH
pet102408_42	1,202,130.211	2,460,565.117	10/27/2008	0.000000000000	0.00097039900	0.02547300000	801.1	35.7	27-10-2008 13:20:42	-0.0020	0.0040	0.1050	PETERSON GULCH
pet102408_43	1,201,921.528	2,460,566.601	10/27/2008	0.01529870000	0.00097134500	0.05560950000	802.4	35.9	27-10-2008 13:23:56	0.0630	0.0040	0.2290	PETERSON GULCH
pet102408_44	1,201,724.976	2,460,566.682	10/27/2008	0.000000000000	0.00315899000	0.02697300000	803.2	36.0	27-10-2008 13:26:29	-0.0030	0.0130	0.1110	PETERSON GULCH
pet102408_45	1,201,521.554	2,460,560.527	10/27/2008	0.01433950000	0.00145825000	0.04228930000	803.6	36.1	27-10-2008 13:28:57	0.0590	0.0060	0.1740	PETERSON GULCH
pet102408_46	1,201,328.885	2,460,566.090	10/27/2008	0.000000000000	0.00121521000	0.02697770000	803.6	36.1	27-10-2008 13:31:17	-0.0090	0.0050	0.1110	PETERSON GULCH
pet102408_47	1,201,327.458	2,460,763.755	10/27/2008	0.000000000000	0.00121657000	0.06545150000	804.5	36.1	27-10-2008 13:34:19	0.0000	0.0050	0.2690	PETERSON GULCH
pet102408_48	1,201,520.414	2,460,766.642	10/27/2008	0.000000000000	0.00024310300	0.08095310000	803.8	36.1	27-10-2008 13:36:45	0.0000	0.0010	0.3330	PETERSON GULCH
pet102408_49	1,201,720.470	2,460,768.144	10/27/2008	0.000000000000	0.00048599900	0.05127290000	803.2	36.0	27-10-2008 13:39:18	0.0000	0.0020	0.2110	PETERSON GULCH
pet102408_50	1,201,925.109	2,460,763.879	10/27/2008	0.000000000000	0.00072885400	0.03692860000	803.3	36.1	27-10-2008 13:42:18	0.0000	0.0030	0.1520	PETERSON GULCH
pet102408_51	1,202,114.961	2,460,771.803	10/27/2008	0.000000000000	0.00097040200	0.03275110000	802.4	36.2	27-10-2008 13:45:09	0.0000	0.0040	0.1350	PETERSON GULCH
pet102408_52	1,202,332.068	2,460,753.897	10/27/2008	0.000000000000	0.00096897900	0.04287730000	802.0	36.5	27-10-2008 13:48:53	0.0000	0.0040	0.1770	PETERSON GULCH
pet102408_53	1,202,522.574	2,460,777.249	10/27/2008	0.000000000000	0.00024185900	0.00749764000	801.5	36.8	27-10-2008 13:51:46	0.0000	0.0010	0.0310	PETERSON GULCH
pet102408_54	1,202,523.332	2,460,961.042	10/27/2008	0.000000000000	0.00024129400	0.02992040000	800.4	37.1	27-10-2008 13:54:43	0.0000	0.0010	0.1240	PETERSON GULCH
pet102408_55	1,202,326.021	2,460,977.105	10/27/2008	0.00024110800	0.00120554000	0.06751030000	800.3	37.3	27-10-2008 14:20:01	0.0010	0.0050	0.2800	PETERSON GULCH
pet102408_56	1,202,130.761	2,460,959.078	10/27/2008	0.000000000000	0.00120750000	0.02125200000	801.6	37.3	27-10-2008 14:22:41	0.0000	0.0050	0.0880	PETERSON GULCH
pet102408_57	1,201,927.119	2,460,956.572	10/27/2008	0.00024125900	0.00120629000	0.02412590000	800.8	37.3	27-10-2008 14:25:30	0.0010	0.0050	0.1000	PETERSON GULCH
pet102408_58	1,201,703.720	2,460,973.805	10/27/2008	0.01014500000	0.00096619100	0.01666680000	801.5	37.2	27-10-2008 14:28:11	0.0420	0.0040	0.0690	PETERSON GULCH
pet102408_59	1,201,533.262	2,460,971.721	10/27/2008	0.000000000000	0.00072541900	0.04086530000	802.1	37.1	27-10-2008 14:31:00	-0.0100	0.0030	0.1690	PETERSON GULCH
pet102408_60	1,201,324.663	2,460,963.194	10/27/2008	0.00024197500	0.00096790000	0.05928380000	802.4	37.0	27-10-2008 14:33:48	0.0010	0.0040	0.2450	PETERSON GULCH
pet102408_61	1,201,134.973	2,460,969.241	10/27/2008	0.000000000000	0.00193666000	0.18737200000	802.5	36.9	27-10-2008 14:37:20	0.0000	0.0080	0.7740	PETERSON GULCH
pet102408_62	1,200,921.403	2,460,780.334	10/28/2008	0.00025448500	0.00076345600	0.04733430000	802.8	21.9	28-10-2008 11:47:50	0.0010	0.0030	0.1860	PETERSON GULCH
pet102408_63	1,201,122.617	2,460,783.874	10/28/2008	0.00177598000	0.00152227000	0.12533300000	802.8	22.8	28-10-2008 11:51:14	0.0070	0.0060	0.4940	PETERSON GULCH
pet102408_64	1,201,123.911	2,461,179.730	10/28/2008	0.000000000000	0.00252684000	0.06696120000	803.6	24.3	28-10-2008 11:57:03	0.0000	0.0100	0.2650	PETERSON GULCH
pet102408_65	1,201,325.053	2,461,174.782	10/28/2008	0.000000000000	0.00201221000	0.01358240000	801.8	25.0	28-10-2008 11:59:52	0.0000	0.0080	0.0540	PETERSON GULCH
pet102408_66	1,201,515.104	2,461,185.022	10/28/2008	0.000000000000	0.00200574000	0.02808040000	801.1	25.7	28-10-2008 12:02:40	0.0000	0.0080	0.1120	PETERSON GULCH
pet102408_67	1,201,513.494	2,461,371.851	10/28/2008	0.10332600000	0.00175129000	0.03777780000	801.0	26.3	28-10-2008 12:05:57	0.4130	0.0070	0.1510	PETERSON GULCH
pet102408_68	1,201,321.072	2,461,383.835	10/28/2008	0.000000000000	0.00099773700	0.02419510000	800.2	26.9	28-10-2008 12:08:51	0.0000	0.0040	0.0970	PETERSON GULCH
pet102408_69	1,201,119.471	2,461,376.818	10/28/2008	0.00024929900	0.00099719700	0.00249299000	801.1	27.4	28-10-2008 12:11:31	0.0010	0.0040	0.0100	PETERSON GULCH
pet102408_70	1,200,922.328	2,461,374.515	10/28/2008	0.000000000000	0.00099541700	0.00000000000	801.0	27.9	28-10-2008 12:14:34	0.0000	0.0040	-0.0370	PETERSON GULCH
pet102408_71	1,200,719.591	2,461,358.900	10/28/2008	0.000000000000	0.00174126000	0.06019790000	802.0	28.4	28-10-2008 12:17:39	0.0000	0.0070	0.2420	PETERSON GULCH
pet102408_72	1,200,512.271	2,461,342.876	10/28/2008	0.000000000000	0.00074508100	0.11474200000	801.8	28.8	28-10-2008 12:21:01	0.0000	0.0030	0.4620	PETERSON GULCH
pet102408_73	1,200,522.528	2,461,142.817	10/28/2008	0.000000000000	0.00099294000	0.03919560000	802.2	29.3	28-10-2008 12:25:45	0.0000	0.0040	0.1580	PETERSON GULCH
pet102408_74	1,200,724.511	2,460,987.344	10/28/2008	0.000000000000	0.00297369000	0.09837960000	802.4	29.7	28-10-2008 12:29:08	0.0000	0.0120	0.3970	PETERSON GULCH
pet102408_75	1,200,704.148	2,461,182.110	10/28/2008	0.000000000000	0.00123719000	0.18013500000	802.0	30.0	28-10-2008 12:32:00	0.0000	0.0050	0.7280	PETERSON GULCH
pet102408_76	1,200,915.502	2,461,165.551	10/28/2008	0.00222346000	0.00123526000	0.11537300000	801.8	30.4	28-10-2008 12:35:08	0.0090	0.0050	0.4670	PETERSON GULCH
pet102408_77	1,200,908.017	2,460,987.042	10/28/2008	0.000000000000	0.00320413000	0.19643800000	801.5	31.0	28-10-2008 12:39:20	0.0000	0.0130	0.7970	PETERSON GULCH
pg101008_06	1,207,729.529	2,446,173.967	10/10/2008	0.03487630000	0.00242197000	0.24147000000	777.5	27.1	10-				

**APPENDIX C**

**VOLUMETRIC METHANE FLUX CALCULATIONS**



## **VOLUMETRIC FLUX CALCULATIONS**

### **HOMOGENEOUS POROUS MEDIA FLOW**

Since the field mapping incorporated a grid network for sampling, LTE assumed that the gas flow is through a porous medium. Given the various hypotheses that suggest methane may also migrate up-dip from within the basin toward the outcrop along pathways of preferential flow, for example in coal cleats and fracture systems, the assumption of gas flow through a porous medium may not be valid.

However, the spatial distribution of data suggests that the flow may mimic a homogeneous medium on a large scale because we observe relatively large areas containing contiguous sampling points that exhibit similar methane flux. If the system is fracture-dominated, we might expect to see more discontinuous areas of flux or a spatial component distributing gas flow in the direction of the predominant fracture system which is in the direction of the formation dip. This type of spatial distribution is not readily observed in the data set. Rather, a spatial component to the data set in the direction of bedding (parallel to strike) is apparent.

Therefore, when looking at gas flux on a large scale, the grid spacing appears adequate to identify the extent of seepage and provide an estimate of total flux from the project area.

LTE's experience has found that a smaller grid will likely identify discontinuities within a given seep area and that these discontinuities are likely related to stratigraphy of individual coal beds and/or subsurface structure patterns.

### **VARIABLE FLOW OVER TIME**

Previous work by LTE has documented both daily and seasonal changes in flow rate over time. It is not feasible to collect gas flux data from all the data points at the same time of day or within a period of one day. Therefore, there will be variations in the flow rate among each of the sampling points. In order to calculate a flux from the project area, LTE assumed that all measurements were collected at the same time.

The 2008 methane seep mapping occurred in October 2008. It is important to recognize that the estimated flux from this sampling event is for a given time period and may vary throughout the year. Determining seasonal variation may be important in estimating total annual methane flux from the Kf outcrop.

### **ESTIMATION METHOD**

The flux estimation method used by LTE is comprised of six steps, including data processing, grid interpolation, grid math, contouring, volume calculations, and the resultant total flux calculation. Each step involved in the method is described below.

## Data Processing

The Flux Manager<sup>®</sup> data files for each sample point were processed in order to determine the flux of each sample point. As previously mentioned, the slope of the flux curve created in the Flux Manager<sup>®</sup> software is proportional to the flux of the sample point. The flux of each sample point, measured in moles/m<sup>2</sup>•day, was calculated using the following formula:

$$\text{Flux of Sample Point} = S \times K$$

where,

S = slope of flux curve (ppm/second)

K = accumulation chamber factor

The accumulation chamber factor (K) incorporates the air temperature, barometric pressure, volume of the accumulation chamber, and surface area of the inlet to the accumulation chamber. The accumulation factor was calculated using the following formula:

$$K = \frac{86,400 \times P}{10^6 \times R \times T_K} \times \frac{V}{A}$$

where,

K = accumulation factor

P = barometric pressure (mBar)

V = net volume of the accumulation chamber (m<sup>3</sup>)

R = gas constant (0.08314510 bar LK<sup>-1</sup> mol<sup>-1</sup>)

T<sub>K</sub> = air temperature (Kelvin)

A = net area of inlet to the accumulation chamber (m<sup>2</sup>)

By applying the aforementioned formulas to each data file, the flux of methane was calculated for each sample point.

## Interpolation Gridding – Kriging Method

LTE interpolated the data using the Kriging method. The interpolation was performed using Surfer<sup>®</sup> version 8.0 by Golden Software, Inc. Surfer<sup>®</sup> is a grid-based graphics program that interpolates irregularly spaced data with Cartesian coordinated into a regulatory spaced grid.

The Kriging method is a popular geostatistical gridding method. LTE utilized this method to interpolate a grid of methane flux and carbon dioxide flux at each of the seep areas using each of the measurement points. Detailed explanation of this statistical method is described by Cressie (1993) and Armstrong and Champigny (1988).

In general, Kriging is a regression technique used in geostatistics to approximate or interpolate data. LTE utilized the Kriging defaults in Surfer<sup>®</sup> to generate grids. The Kriging algorithm can result in negative value in the regions beyond the areas where data were collected. Negative values were excluded from the maps and the area and volume calculations.

### Contouring

Once the grids of methane flux were generated, LTE exported the positive contours from Surfer<sup>®</sup> to ArcMap to generate the contour maps of methane flux areas.

### Total Flux Calculations

In order to estimate the total flux of each seep area, the grid volume capability in Surfer<sup>®</sup> was utilized. The Surfer<sup>®</sup> Grid Volume output files, presenting the volume estimates for each seep area, are included as Attachment C-1. Under the heading “Cut & Fill Volumes”, the “Positive Volume [Cut]” represents the volume between the contoured surface and the zero plane. The units of the contoured values are in moles/m<sup>2</sup>•day. Since the units for the X and Y coordinates were feet, a z-scale factor of 0.0929 m<sup>2</sup>/ft<sup>2</sup> was used, such that the resulting volume has units of moles/m<sup>2</sup>•day x m<sup>2</sup>/ft<sup>2</sup>. When the resulting volume is multiplied by the area of seepage (ft<sup>2</sup>), these units are equal to moles/day.

For a better perspective of the methane flux rates, LTE converted the mass flux values into volumetric flux units of cubic feet per day (CFD), assuming equal areas. The unit conversion is based on the molecular weight of the gas and the density of the gas at approximately 7,000 feet above mean sea level. For methane flux, the calculation is as follows:

$$\frac{\text{mol CH}_4}{\text{day}} \times \frac{16.04276\text{g CH}_4}{\text{mol CH}_4} \times \frac{0.0698 \text{ ft}^3 \text{ CH}_4}{\text{g CH}_4} = \frac{\text{ft}^3 \text{ CH}_4}{\text{day}}$$

For example,

$$1.0 \text{ mole/day CH}_4 = 1.12 \text{ CFD CH}_4$$

**ATTACHEMENT C-1**

**SURFER<sup>®</sup> GRID VOLUME OUTPUT FILES**

## **Grid Volume Computations - Beaver Creek**

Mon Feb 09 15:25:44 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed Mapping\Surfer\ARCHInvDist.grd  
Grid Size: 50 rows x 100 columns

X Minimum: 2424057.59  
X Maximum: 2426684.04  
X Spacing: 26.5297979798

Y Minimum: 1234447.92  
Y Maximum: 1235856.93  
Y Spacing: 28.755306122449

Z Minimum: 0  
Z Maximum: 0.14998499668686

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 2958.200586619  
Simpson's Rule: 2963.1871194386  
Simpson's 3/8 Rule: 2948.8512821304

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 2958.2252220641  
Negative Volume [Fill]: 0  
Net Volume [Cut-Fill]: 2958.2252220641

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 2299297.6012995  
Negative Planar Area [Fill]: 0  
Blanked Planar Area: 1401396.7132008  
Total Planar Area: 3700694.3145003

#### **Surface Areas**

Positive Surface Area [Cut]: 2299297.6019918  
Negative Surface Area [Fill]: 0

## **Grid Volume Computations – Little Squaw Creek**

Mon Feb 09 15:37:50 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed  
Mapping\Surfer\LSC.grd  
Grid Size: 77 rows x 100 columns

X Minimum: 2441562.19  
X Maximum: 2444184.11  
X Spacing: 26.48404040404

Y Minimum: 1207524.77  
Y Maximum: 1209532.62  
Y Spacing: 26.41907894737

Z Minimum: -0.049324125934773  
Z Maximum: 0.2730998925021

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 4721.340638351  
Simpson's Rule: 4744.5393695466  
Simpson's 3/8 Rule: 4729.5272918462

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 5108.2703617324  
Negative Volume [Fill]: 386.93858115808  
Net Volume [Cut-Fill]: 4721.3317805744

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 2500372.8117306  
Negative Planar Area [Fill]: 1432900.5372524  
Blanked Planar Area: 1331148.723017  
Total Planar Area: 5264422.0720001

#### **Surface Areas**

Positive Surface Area [Cut]: 2500372.8132141  
Negative Surface Area [Fill]: 1432900.5373907

## **Grid Volume Computations-Yellow Jacket Pass/Squaw Creek**

Mon Feb 09 16:52:30 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed  
Mapping\Surfer\YJP.grd  
Grid Size: 110 rows x 160 columns  
  
X Minimum: 2435874.98  
X Maximum: 2440288.17  
X Spacing: 27.755911949685  
  
Y Minimum: 1213010.58  
Y Maximum: 1216048.01  
Y Spacing: 27.866330275229  
  
Z Minimum: -0.0045819874162106  
Z Maximum: 0.027266834537526

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 1179.0205071141  
Simpson's Rule: 1179.2695443195  
Simpson's 3/8 Rule: 1178.9649045186

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 1273.4883539431  
Negative Volume [Fill]: 94.467846828933  
Net Volume [Cut-Fill]: 1179.0205071141

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 6375567.0627785  
Negative Planar Area [Fill]: 3933433.3624769  
Blanked Planar Area: 3095755.2764441  
Total Planar Area: 13404755.7017

#### **Surface Areas**

Positive Surface Area [Cut]: 6375567.0628151  
Negative Surface Area [Fill]: 3933433.3624795

## **Grid Volume Computations – Pole Gulch**

Mon Feb 09 17:00:33 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed Mapping\Surfer\PoleG.grd  
Grid Size: 84 rows x 100 columns

X Minimum: 2445476.7  
X Maximum: 2448075.2  
X Spacing: 26.247474747475

Y Minimum: 1206617.89  
Y Maximum: 1208824.53  
Y Spacing: 26.586024096387

Z Minimum: -0.020568051424681  
Z Maximum: 0.16527327992359

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 3696.7163692052  
Simpson's Rule: 3695.2275298492  
Simpson's 3/8 Rule: 3696.4601399168

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 3832.4135671047  
Negative Volume [Fill]: 135.69719789945  
Net Volume [Cut-Fill]: 3696.7163692052

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 2368305.4365338  
Negative Planar Area [Fill]: 1356636.3506783  
Blanked Planar Area: 2009012.2527882  
Total Planar Area: 5733954.0400003

#### **Surface Areas**

Positive Surface Area [Cut]: 2368305.437251  
Negative Surface Area [Fill]: 1356636.3506889

## **Grid Volume Computations – Peterson Gulch**

Mon Feb 09 15:47:55 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed  
Mapping\Surfer\PET.grd  
Grid Size: 94 rows x 100 columns  
  
X Minimum: 2454865.65  
X Maximum: 2461483.83  
X Spacing: 66.850303030305  
  
Y Minimum: 1200412.27  
Y Maximum: 1206623.62  
Y Spacing: 66.78870967742  
  
Z Minimum: -0.00462700521989  
Z Maximum: 0.16000536271863

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 4540.9866391689  
Simpson's Rule: 4599.8574976119  
Simpson's 3/8 Rule: 4668.2699381647

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 4636.8975407372  
Negative Volume [Fill]: 95.910901568263  
Net Volume [Cut-Fill]: 4540.9866391689

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 10358484.673233  
Negative Planar Area [Fill]: 4647860.9882015  
Blanked Planar Area: 26101486.681567  
Total Planar Area: 41107832.343002

#### **Surface Areas**

Positive Surface Area [Cut]: 10358484.673788  
Negative Surface Area [Fill]: 4647860.9882047

## **Grid Volume Computations – Stollsteimer Creek**

Mon Feb 09 17:04:37 2009

### **Upper Surface**

Grid File Name: P:\Archuleta County\2008 Monitoring\2008\_Archuleta Detailed  
Mapping\Surfer\SC.grd  
Grid Size: 130 rows x 200 columns  
  
X Minimum: 2465477.58  
X Maximum: 2470665.62  
X Spacing: 26.070552763819  
  
Y Minimum: 1184814.31  
Y Maximum: 1188234.48  
Y Spacing: 26.512945736434  
  
Z Minimum: -0.010786901906658  
Z Maximum: 0.31409267811203

### **Lower Surface**

Level Surface defined by  $Z = 0$

### **Volumes**

Z Scale Factor: 0.0929

#### **Total Volumes by:**

Trapezoidal Rule: 7638.8258849384  
Simpson's Rule: 7621.5143258306  
Simpson's 3/8 Rule: 7651.0005832074

#### **Cut & Fill Volumes**

Positive Volume [Cut]: 7767.7453066422  
Negative Volume [Fill]: 128.91942170381  
Net Volume [Cut-Fill]: 7638.8258849384

### **Areas**

#### **Planar Areas**

Positive Planar Area [Cut]: 5672637.3118046  
Negative Planar Area [Fill]: 2786010.1954491  
Blanked Planar Area: 9285331.259546  
Total Planar Area: 17743978.7668

#### **Surface Areas**

Positive Surface Area [Cut]: 5672637.3139195  
Negative Surface Area [Fill]: 2786010.195457

**APPENDIX D**

**NATURAL SPRINGS PHOTOGRAPHIC DOCUMENTATION**





**Photo 1 – Watson Well Spring  
October 16, 2008**



**Photo 2 – High Watson Spring  
October 16, 2008**



**Photo 3 – View from High Watson Spring  
October 16, 2008**



**Photo 4 – View from High Watson  
October 16, 2008**



**Photo 5 – Ramona Spring  
October 16, 2008**



**Photo 6 – View From Ramona Spring  
October 16, 2008**



**October 16, 2008**



**Photo 8 – Townsend Spring  
October 17, 2008**



**Photo 9 – Walt Spring #1  
October 17, 2008**

**APPENDIX E**

**NATURAL SPRINGS LABORATORY ANALYTICAL RESULTS**



## Methane Analysis Report

Four Corners Geoscience, Inc.  
P.O. Box 4224  
Durango, CO 81302

### Client

L T Environmental, Inc.  
15 West Mill Street  
Bayfield, CO 81122  
Mark Yalom  
970-884-5215

Project Name: La Plata Spring Sampling  
Project Number: MSO814.04  
Report Date: 10/22/2008  
Sampled By: Lindsay Voss

FCGeo #	Sample Date	Sample Time (Hrs)	Site ID-Location	Results:		
				CH4 (mg/L)	Limit (mg/L)	C2
101608-LB1	10/16/2008	10:15	Ramona Leonard Spring	<0.02	0.02	ND
101608-LB2	10/16/2008	11:15	Beaver Creek	<0.02	0.02	ND
101608-LB3	10/16/2008	13:00	Crain Spring	<0.02	0.02	ND
101608-LB4	10/16/2008	14:00	Watson Well Spring	<0.02	0.02	ND
101608-LB5	10/16/2008	17:10	Vance Meadow	<0.02	0.02	ND
101608-LB6	10/16/2008	17:30	Vance Spring #1	0.05	0.02	ND

### Notes:

Samples delivered to FCGeo 12:00 p.m. 10/17/08  
Analyses were conducted on SRI gas chromatograph w/ FID within 24 hours of delivery.  
**Conducted Methane analysis per protocol and method established  
by BLM San Juan Resource Area 1993 and USGS method.**  
Laboratory calibration quality control conducted the same day as sample runs.  
Blanks and duplicated runs conducted for each sample set.  
No field blanks received at FCGeo Lab  
ND- Non Detected

Lynn M. Fechter, B.S. Geology



## Methane Analysis Report

Four Corners Geoscience, Inc.  
Lynn M. Fechter, B.S. Geology  
P.O. Box 4224  
Durango, CO 81302

### Client

L T Environmental, Inc.  
15 West Mill Street  
Bayfield, CO 81122  
Mark Yalom  
970-884-5215

Project Name: Acrchuleta Spring Sampling  
Project Number: MS0814.04  
Report Date: 10/22/2008  
Sampled By: Mark Ebert

Analysis: FCGeo #	Brant Landers			Results:		
	Sample Date	Sample Time (Hrs)	Site ID-Location	CH4 (mg/L)	Limit (mg/L)	C2
101808-LB1	10/18/2008	12:00	Willow Spring	<0.02	0.02	ND
101808-LB2	10/18/2008	13:00	SE John Grub	<0.02	0.02	ND
101808-LB3	10/18/2008	13:25	NW John Grub	0.03	0.02	ND
101808-LB4	10/18/2008	14:30	Section 14	0.02	0.02	ND

### **Notes:**

Samples delivered to FCGeo 15:28:00 10/18/08  
Analyses were conducted on SRI gas chromatograph w/ FID within 24 hours of delivery.  
**Conducted Methane analysis per protocol and method established  
by BLM San Juan Resource Area 1993 and USGS method.**  
Laboratory calibration quality control conducted the same day as sample runs.  
Blanks and duplicated runs conducted for each sample set.  
No field blanks received at FCGeo Lab  
ND- Non Detected

Lynn M. Fechter, B.S. Geology



**APPENDIX F**  
**PHOTOGRAPHS OF SUSPECT AREAS**





### **Suspect Area 6**

Description: Vegetation is sparse, but appears healthy. Coal outcrop, tailings, and wooden debris are present. October 15, 2008.



### **Suspect Area 7**

Description: Low grasses and vegetation, shrubs are interspersed, healthy. Vegetation washed by overland water flow. Some wood, metal, and glass debris are present. October 15, 2008.



### **Suspect Area 8**

Description: No vegetation, suspect area is a man-made pond. October 16, 2008.



### **Suspect Area 9**

Description: No vegetation present. Suspect area is a rock outcrop. October 16, 2008.



**Suspect Area 11**



**Suspect Area 11 (Continued)**

Description: Scrub oak, juniper, heavily vegetated, healthy. Very steep rock outcrop, scarce, very rocky soil. October 8, 2008.



### **Suspect Area 12**

Description: Scrub oak and thick deadfall. Rocky soil present. October 8, 2008.



### **Suspect Area 13**

Description: Predominantly scrub oak, few juniper, healthy. Rocky soil, steep slope. October 8, 2008.



### **Suspect Area 15**

Description: Some scrub oak, juniper, and low grasses; healthy. A small gully/washout with very rocky soil, some rock outcrop. October 9, 2008.



### **Suspect Area 16**

Description: Mainly scrub oak, some juniper and Ponderosa pine. Some deadfall, but overall healthy. Rocky soil on slopes, some outcrops. October 9, 2008.



### **Suspect Area 17**

Description: Mixed scrub oak and grasses; healthy. Rock outcrops and very rocky soil.  
October 3, 2008.



**Suspect Area 18**

Description: Grasses growing on fractured rocky soil, with outcrop present. October 3, 2008.



### **Suspect Area 20**

Description: Mainly scrub oak, all healthy, few junipers, Ponderosa pines, and spruce. Rock outcrops, rocky, thin soil, cover, mostly a ravine. October 3, 2008.



### **Suspect Area 21**

Description: Mainly scrub oak with a few Ponderosa pines, healthy to okay. Rock outcrops, rocks, with some thin soil. October 3, 2008.



### **Suspect Area 22**

Description: Mainly scrub oak with some grasses, healthy. Very rocky soil, some small outcrops, thin soil layer. October 3, 2008.



**Suspect Area 23**

Description: Mainly grasses, some scrub oak, all healthy. Rocky soil. October 3, 2008.



### **Suspect Area 25**

Description: Scrub oak, occasional spruce, some small cacti; healthy. Rock outcrops, rocky soil, and coal seams. October 3, 2008.



### **Suspect Area 26**

Description: Few low bushes and grasses, healthy. Predominantly a rock outcrop, with very rocky, fractured soils. October 2, 2008.



### **Suspect Area 27**

Description: Predominantly scrub oak, also juniper, Ponderosa pine, all are healthy. Very rocky soil and rock outcrops. October 2, 2008.



### **Suspect Area 28**

Description: Scrub oak, Ponderosa pine, fir; healthy. Rocky soil, rock outcrops, sparse vegetation in suspect area. October 2, 2008.



### **Suspect Area 29**

Description: Predominantly scrub oak, also juniper, Ponderosa pine; healthy. Rocky soil, rock outcrops, sparse vegetation in suspect area. October 2, 2008.



### **Suspect Area 30**

Description: Mainly scrub oak, Ponderosa pine, and occasional fir; Healthy. Rocky soil.  
October 6, 2008.



### **Suspect Area 31**

Description: Predominantly scrub oak, some Ponderosa pine and fir. Scrub oak healthy. Rocky soil with rock outcrops. October 6, 2008.



**Suspect Area 32**

Description: Scrub oak, juniper, fir and short bushes. Rocky soil with some rock outcrops.  
October 6, 2008.



### **Suspect Area 33**

Description: Scrub oak, juniper, Ponderosa pine; healthy. Rocky outcrop with thin rocky soil.  
October 3, 2008.



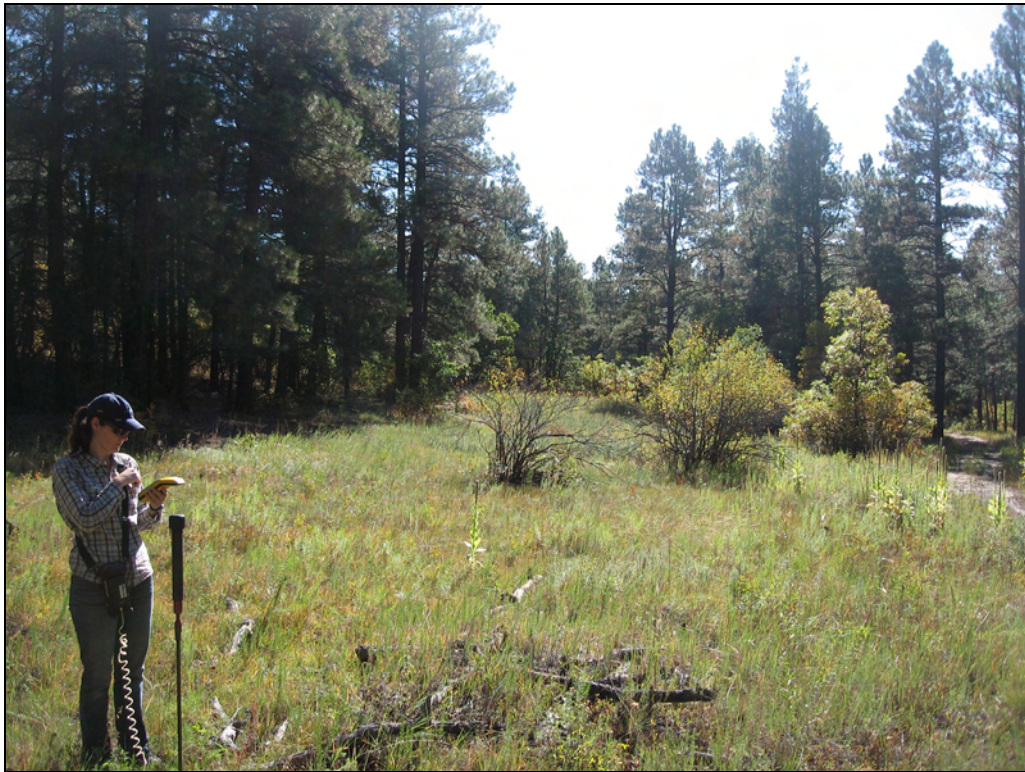
### **Suspect Area 34**

Description: Predominantly scrub oak, some Ponderosa pine, fir, juniper; healthy. Rocky soil with rock outcrops. October 6, 2008.



### **Suspect Area 35**

Description: Scrub oak, Ponderosa pine and fir; healthy, some dying pine. Rocky soil and rock outcrops. October 6, 2008.



Suspect Area 36

Predominantly low grasses, some scrub oak and Ponderosa pine; healthy. Mainly a meadow.  
October 7, 2008.



### **Suspect Area 37**

Description: Mainly low grasses with Ponderosa pine, spruce and scrub oak; healthy. Mainly a meadow, some bare rock. October 7, 2008.



### **Suspect Area 38**

Description: Mainly Ponderosa pine and juniper. Lots of deadfall; remaining trees look healthy. Steep slope with deadfall, forested. October 7, 2008.



### **Suspect Area 39**

Description: Mainly scrub oak and low bushes, some grasses. South-facing moderate slope, rocky soil. October 7, 2008.



### **Suspect Area 40**

Description: Mainly short grasses, some scrub oak and Ponderosa pine; healthy. Rocky soil meadow. October 20, 2008.



### **Suspect Area 41**

Description: Some scrub oak; healthy. Exposed coal seam, some thin soil. October 7, 2008.



### **Suspect Area 42**

Description: Mainly short grasses, some juniper, small bushes, Ponderosa pine; healthy. A meadow that sees much cattle traffic. October 7, 2008.



**Suspect Area 43**



**Suspect Area 43 (Continued)**

Description: Mainly scrub oak with one or two firs; healthy. Exposed coal seam, very thin soil. October 7, 1008.



### **Suspect Area 44**

Description: Mainly scrub oak; healthy. Exposed coal seam, some thin soils. October 7, 2008.



**Suspect Area 51**

Description: Green grass and clover field; healthy. Moist, firm, tight soil. October 4, 2008.



**Suspect Area 58**



**Suspect Area 58 (Continued)**



**Photo 9 – Walt Spring #1  
October 17, 2008**