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2013 COLORADO RULE 608 COMPLIANCE REPORT

RATON BASIN, COLORADO

OCTOBER 2013

Prepared for:

XTO ENERGY, INC.
TRINIDAD, COLORADO

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

FIGURES

TABLES

APPENDICES

LT Environmental, Inc. (LTE) completed the tasks for the 2013 Colorado Rule 608 Compliance Program on behalf of XTO Energy, Inc. (XTO) with respect to XTO operations in Las Animas County, Colorado (Project Area). LTE followed the Colorado Oil and Gas Conservation Commission (COGCC)-approved *Work Plan*, dated May 5, 2010, in accordance with the following subsections of the COGCC Rule 608:

- 608(a) – Assessment and monitoring of plugged and abandoned (P&A) production wells within one-quarter (¼) mile of proposed coalbed methane (CBM) wells;
- 608(b) – Water well sampling; and
- 608(c) – Coal outcrop and coal mine monitoring.

The 2013 Rule 608 Compliance Program meets the requirements of subsections a, b, and c of the COGCC Rule 608.

XTO proposes to drill CBM production wells in the Project Area of the Raton Basin. The 2013 Project Area was determined by a 2-mile buffer around the 2010 and 2011 proposed XTO CBM production wells as well as CBM production wells XTO installed in 2010 and 2011. XTO did not install any new CBM production wells in the Raton Basin in 2012 or 2013 and as a result, the 2013 Project Area is identical to the 2011 Project Area. Due to the absence of any proposed 2013 CBM production wells by XTO, tasks and subtasks were omitted from the 2013 Rule 608 Compliance Program. XTO confirmed this plan with the COGCC after reviewing the *2013 Colorado Rule 608 Compliance Proposed Action Items* letter, dated March 29, 2013, prepared by LTE.

LTE identified, through previous investigations, six known and three diminishing methane seep areas for surveying in 2013. Based on the findings from 2013 and a review of historical flux surveys at these nine areas, seep areas L-1021 and 32 & L-1049 continue to appear to be methane seep areas. LTE recommends these areas be included in the 2014 Colorado Rule 608 Compliance Program. Seep areas 14, L-1030, L-1033, L-1050, and 5 appear to be diminishing methane seeps. LTE recommends these seep areas be included in the 2014 Colorado Rule 608 Compliance Program to confirm the reduction in methane flux. If the methane flux continues to diminish or is absent, LTE will re-evaluate the need to monitor those areas in the future. Seep areas 13 & L-1026 and 19 appear to be diminished methane seeps and as a result, LTE recommends these two areas be omitted from future monitoring activities.

Below is a summary of the historically identified suspect seeps, the category each historical suspect seep has been assigned, and proposed monitoring of each historical seep area.

Methane Seep[1]	Diminishing Methane Seep Areas[2]	Other Source of Methane[3]	No Methane Seep Activity Observed[3]
L-1021	14	L-1023	623/L-99
32 & L-1049	L-1030	L-1025	11
	L-1033	L-1027	15
	L-1050	L-1031	17
	5	L-1036	18
		L-1039	21, 33, 617, & L-100
		L-1040	L-109
		L-1041	13 & L-1026
		L-1042	19
		L-1043	
		L-1044	
		L-1045	
		L-1047	
		L-1048	
		7, 8, 9, & L-1046	

[1] Recommended for continuation of detailed flux mapping in 2013
[2] Recommended for detailed flux mapping in 2013 to verify the absence of methane
[3] Recommended for discontinuation of detailed flux mapping in 2013

Three natural springs were sampled for water quality analysis (Chavez01, Chavez02, and Chavez03). The water types appear to be predominately calcium bicarbonate and calcium chloride in composition. In addition to collecting a water sample, flux measurements were collected in the vicinity of the natural springs. Reportable methane flux was not detected at any of the measurement locations.

LTE, at the direction of XTO, proposes to continue conducting Rule 608 compliance activities in Las Animas County in accordance with the COGCC-approved *Work Plan* as XTO development activities expand.

1.0 INTRODUCTION

LT Environmental, Inc. (LTE) has prepared this 2013 Colorado Rule 608 Compliance Report, on behalf of XTO Energy, Inc. (XTO), to summarize the tasks completed with respect to XTO operations in Las Animas County, Colorado (Project Area) (Figure 1). Compliance activities were conducted in accordance with the Colorado Oil and Gas Conservation Commission (COGCC)-approved *Work Plan* (LTE, May 2010) previously submitted on May 5, 2010. This is the fourth annual event conducted in accordance with this compliance program.

1.1 OBJECTIVE

The objective of this Rule 608 Compliance Program is to meet compliance requirements, as discussed in the May 2010 *Work Plan*, associated with the drilling and installation of coalbed methane (CBM) production wells, specifically in Las Animas County, Colorado, which applies to the following subsections of Rule 608 from the COGCC 600 Series Safety Regulations, as amended on March 30, 2009:

- 608(a) – Assessment and monitoring of plugged and abandoned (P&A) production wells within one-quarter (¼) mile of proposed CBM wells;
- 608(b) – Water well sampling; and
- 608(c) – Coal outcrop and coal mine monitoring.

1.2 PROJECT AREA

The Project Area is located in the Raton Basin in southern Colorado. The Raton Basin is a geologic structural basin in southern Colorado and northern New Mexico. The basin is situated in Huerfano and Las Animas counties, Colorado, and Colfax County, New Mexico. The basin has long been a source of coal production and more recently a source of CBM. Much of the regional geology presented herein was derived from the report, *A Geologic Assessment of Natural Gas from Coal Seams in the Raton and Vermejo Formations, Raton Basin* (Stevens, et.al. 1992).

The Raton Basin is an asymmetric synclinal basin with the axis of the La Veta syncline oriented roughly north-south and passing through Weston, Colorado, which is immediately east of the area defined by XTO for development of CBM. The Raton Formation outcrops over approximately 50 percent (%) of the Project Area. The discontinuous nature of the coal beds both in the subsurface and on the surface makes it difficult to identify and/or correlate individual continuous coal beds from the subsurface producing zone to the surface coal outcrop. The XTO proposed drilling area is located on the western side of the La Veta syncline suggesting that the formations encountered within the Project Area are dipping to the east.

The Vermejo Formation consists of sandstone, interbedded siltstone, shale, carbonaceous shale, and coal accumulated above the fluvial-deltaic sequences of the Trinidad Sandstone (Stevens, et al. 1992). The Vermejo Formation outcrops along the western edge of the Raton Basin syncline basin, which is on the west side of the Project Area. Of the more than 90,000-acre Project Area,

the Vermejo Formation outcrop covers approximately 2% of the overall Project Area. The Raton and Vermejo formation outcrops are depicted on Figure 1.

1.3 SCOPE OF WORK

XTO has proposed to drill CBM production wells in the Project Area of the Raton Basin over the next several years (red outline on Figure 1), which began in 2010. XTO did not install any CBM production wells in the Project Area in 2012 and did not propose any new CBM productions wells for 2013. As a result, the 2013 Project Area was determined by a 2-mile buffer around the 2010 and 2011 proposed XTO CBM production wells as well as CBM production wells XTO installed in 2010 and 2011. The 2013 Project Area (green outline on Figure 2), proposed 2010 and 2011 CBM production well locations, recorded P&A production well locations, water well locations, topography, and mine features are illustrated on Figure 2.

The scope of work for the Rule 608 Compliance Program included the following tasks:

- Task 1: Assessment of applicable P&A production wells;
- Task 2: Assessment of applicable water wells;
- Task 3: Detailed mapping of known and diminishing methane seep areas;
- Task 4: Assessment of applicable natural springs; and
- Task 5: Preparation of this report.

1.4 DEVIATIONS

XTO did not propose or install any new CBM production wells in 2013. As a result, tasks and subtasks were omitted from the 2013 Rule 608 Compliance Program. XTO confirmed this plan with the COGCC after reviewing the *2013 Colorado Rule 608 Compliance Proposed Action Items* letter, dated March 29, 2013, prepared by LTE. Historical procedures and findings for these tasks are described in previous annual reports and have been omitted from this report.

There were no new P&A production wells within the 2013 Project Area to assess in 2013 and as a result, Task 1 was not conducted for this 2013 Colorado Rule 608 Compliance Program.

A review of water wells within the 2013 Project Area meeting the requirements set forth in Rule 608(b) identified one water well (Permit Number 39685) that met the second criteria above for sampling. However, the two proposed XTO CBM production wells (New Elk 22-13 and New Elk 22-14) nearest to the water well were not installed during 2013. As a result, Task 2 was not conducted during the 2013 Colorado Rule 608 Compliance Program. Water well #39685 will be sampled prior to the drilling of New Elk 22-13 and New Elk 22-14.

Ground surveys to locate suspect methane seeps on the Raton Formation outcrop and color infrared (CIR) aerial imagery and field verification of suspect areas along the Vermejo Formation and at the Quinto, Tercio, and Vega mines were not conducted as part of Task 3 since no new CBM production wells were proposed for 2013.

While conducting detailed mapping of methane seeps areas during 2010, 2011, and 2012 (Task 3), gas samples were collected from those areas with reportable methane flux and where existing isotopic information from the 2007 *COGCC Phase II Seep Investigation* (LTE, 2007) did not exist. During the 2007 Phase II seep investigation conducted for the COGCC, gas samples were collected from many of the known and suspect seep areas in the Raton Basin. As a result, re-sampling these seeps was not necessary in 2013. Each known or diminishing methane seep area currently has isotopic analysis.

The COGCC informed XTO and LTE that those natural springs that overlap with other oil and gas industry companies conducting similar activities to comply with Rule 608 did not need to be sampled. As a result, Task 4 was reduced by not sampling Spring 05 (Vega Canyon), Spring 07 (Spring Canyon), or Spring 08 (Middle Lorencito). Spring 01 (North Fork Apache Canyon) was observed to be dry during the 2013 sampling event. As a result, a natural spring water sample was not collected in 2013. LTE did not gain property access for Spring 02, Spring 03, Spring 04, Spring 06, Spring 09, or Spring 10 prior to the 2013 field activities. As a result, natural spring water samples from these six springs were not collected in 2013.

1.5 REPORT ORGANIZATION

This report is organized into five sections including this introduction (Section 1.0), which presents the objectives and scope of work related to the project. The field methods are described in Section 2.0. The 2012 results are summarized in Section 3.0. The conclusions of the 2012 work are in Section 4.0. The report references are included in Section 5.0. Figures, tables, and appendices follow the text.

2.0 FIELD METHODS

2.1 2013 PROJECT AREA

The 2011 Project Area was utilized for the 2012 and 2013 Project Area since XTO did not propose/install any new CBM production wells in 2012 or 2013. The 2013 Project Area was determined by a 2-mile buffer around the 2010 and 2011 proposed XTO CBM production wells as well as CBM production wells XTO installed in 2010 and 2011. The 2013 Project Area is outlined in green on Figure 2. The overall Project Area is outlined in red on Figure 2.

2.2 PROPERTY ACCESS

Prior to conducting 2013 field activities, LTE acquired landowner information from the Las Animas County Assessor's office. LTE cross-referenced parcel data to identify owners of parcels located in the 2013 Project Area. LTE requested to gain access to all properties where field work was proposed, but was denied access to several properties; as a result, no investigation activities were conducted on those properties. The 2013 property owner and access information is presented in Table 1.

2.3 DETAILED MAPPING OF KNOWN AND DIMINISHING SEEP AREAS

To be compliant with Rule 608(c), annual detailed mapping of known and diminishing methane seep areas are conducted within the Project Area for that year. Known and diminishing methane seep areas mapped in 2013 were identified during previous Rule 608 Compliance Program investigations as well as previous COGCC investigations.

2.4 FLUX SURVEY

Field mapping of known and diminishing methane seep areas consists of utilizing a West Systems® portable gas flux meter (flux meter) to measure the magnitude and extent of methane seepage within the survey area. Measurements for previously identified suspect seep areas are typically collected using a sampling grid approach.

Grids for detailed mapping areas consisted of varying numbers of squares, with grid nodes spaced 50 feet to 400 feet apart, depending on historical data for previously identified known and diminishing methane seep areas. The smaller grid spacings are typically used to map known methane seep areas of relatively small extent. A flux measurement is collected at the corner of each grid square. When methane is detected along the outer edges of the mapping area, additional grid points are developed and measured to determine the extent of methane seepage. Where appropriate, photographs of vegetative conditions, visible seeps, and sensitive receptors are collected.

The flux meter has been used to measure soil gas seepage on the Raton Formation in the Raton Basin in Colorado. The portable flux meter measures the flux of methane, hydrogen sulfide, and carbon dioxide by employing individual gas-specific sensors that records the increases, if any, of gas concentrations over time for a given surface area. These increases in concentration over time are proportional to the flux of each gas. For this flux survey, only methane flux rates are reported.

The flux meter components include an accumulation chamber connected by circulation tubes to the gas detector unit. At each sampling point, the accumulation chamber is placed on the ground surface to capture gas seeping from the ground. 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. Increases in concentrations are measured and recorded automatically. No gas is allowed to escape the system. However, a vacuum is not created during the process. This enables measurement of natural seep conditions, if present. The result for each gas is reported as a mass flux in units of moles per square meter per day (mol/m^2·day).

Flux measurement accuracy can be limited by surface conditions. One of the most important factors is the quality of the seal between the accumulation chamber base and the ground surface. To ensure a proper seal between the ground surface and the chamber, field personnel choose relatively flat surfaces where possible and placed loose soil surrounding the base of the chamber to reduce the potential for gas loss at the base of the chamber. In addition, ground disturbance is minimized during the measurement process in order to maintain the natural seep conditions. In areas with heterogeneous surfaces, the seal is sometimes difficult to achieve. This scenario is evident at locations with poorly developed soil or where the soil surface is obscured by decayed organic matter on the forest floor.

The accuracy of the total flux estimation within the Project Area is influenced by the ability of the grid spacing system to represent the actual flux on a detailed level relative to the subsurface fracture system, coal quality, and stratigraphy within the Raton Formation.

The methane sensor within the flux meter unit has a range of 60 parts per million (ppm) to 50,000 ppm. The flux meter methane measurement range is 0.0 mol/m^2·day to 300 mol/m^2·day. Methane fluxes below 0.2 mol/m2·day are detectable with decreased accuracy. As a result, reporting of methane fluxes will not include values less than 0.2 mol/m^2·day. Information on the flux meter is provided in Appendix A.

During the measurement process, gas concentrations are recorded at 1-second intervals and directly downloaded via Bluetooth® connection to a portable digital assistant (PDA) integrated with the Global Positioning System (GPS) unit. Other measurements recorded include barometric pressure, temperature, date, and time.

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

Full color spectrum aerial photographs were used as base maps for field use and figures for reporting. The geologic contacts depicted on the aerial photographic maps were derived from geologic maps prepared by the Colorado Geological Survey (CGS) and digitized. Accuracy of the formation contact is reduced when aerial photographs are viewed at a smaller scale.

2.4.1 Global Positioning System Data Management

Each sample location is recorded using a GPS unit. Soil gas sampling grids are created in ArcView® and pre-loaded into the GPS unit so field personnel can quickly and accurately position detection equipment along the Project Area. Soil gas measurements and other relevant field data are then stored as attributes in the GPS unit along with the associated location data. The data stored in the GPS unit is downloaded later for processing and reporting.

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

Readings collected with the GPS unit can be located with 1-meter accuracy. However, the terrain and forest canopy can adversely affect GPS unit accuracy. North-facing slopes and heavily wooded areas can distort or block satellite signals. When satellite signals are limited, positioning accuracy decreases. In locations where the GPS unit cannot obtain a signal, field personnel will note measurement data on their field reference maps. Specifications of the GPS unit are included in Appendix A.

2.4.2 Flux Volume Estimations

LTE estimated the volumetric flux of methane and carbon dioxide for each suspect seep area or a combination of several suspect seep areas if they are close in lateral proximity. Flux data were interpolated and gridded, then contoured and processed to estimate total volumetric flux.

The results were converted to volumetric flux rates common to the natural gas production industry in units of thousand cubic feet per day (MCFD). For a better perspective of the methane flux and carbon dioxide 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 7,400 feet above mean sea level.

For methane flux, the calculation is as follows:

$$\frac{\text{mol } CH_4}{\text{day}} \times \frac{16.04276 \text{ g } CH_4}{\text{mol } CH_4} \times \frac{0.0698 \text{ ft}^3 CH_4}{\text{g } CH_4} = \frac{\text{ft}^3 CH_4}{\text{day}}$$

For example,

1.0 mol/day CH_4 = 1.12 CFD CH_4

Notes:

Ft^3 – cubic feet
CH_4 – methane
CO_2 – carbon dioxide
g – gram
CFD – cubic feet per day
mol - mole

The volumetric flux values calculated are estimates and may not represent actual values for the specific areas. Interpolation calculation techniques are highly sensitive to data skewness and can result in large changes in calculated flux values based on measurements made at only a few locations.

2.5 NATURAL SPRING MONITORING

Surveys of natural springs are conducted on a well-by-well basis. Only natural springs identified on United States Geological Survey (USGS) topographic maps within the 2013 Project Area were surveyed.

Once a natural spring was identified, collection of water samples was attempted, barring any property access restrictions or lack of flow. At each natural spring, field personnel located the position and elevation using a GPS. A discharge rate was measured, when possible, using a graduated cylinder and stopwatch. Water quality measurements, including pH, total dissolved solids (TDS), specific conductance (SC), oxidation-reduction potential (ORP), and temperature were collected using a YSI® 556 meter. The equipment specifications for the water quality field meter are provided in Attachment A.

Water samples from the natural spring were collected and analyzed for the following:

- Major Cations [dissolved sodium (Na), calcium (Ca), magnesium (Mg), potassium (K), and iron (Fe)] by Environmental Protection Agency (EPA) Method 6010/6020;
- Dissolved Metals [selenium (Se), manganese (Mn)] by EPA Method 6010/6020;
- Alkalinity (carbonate/bicarbonate) by EPA Method 300;
- Major Anions [chloride (Cl), sulfate (SO_4), bromide (Br), and fluoride (F)] by EPA Method 300;
- pH by EPA Method150.1;
- SC by MCA Method WW 120.1;
- Nitrate/Nitrite as Nitrogen (N) by EPA Method 353.3;
- TDS by EPA Method 160.1;
- Sodium Adsorption Ratio (SAR) by Louisiana Department of Natural Resources (LaDNR) Statewide Order Number 29B; and
- Bacteria by IRB/SRB/SLYM/ Coliform.

Laboratory-provided sample bottles were filled with water for analysis of the parameters identified above. All water samples collected were submitted in a cooler under strict chain-of-custody documentation to Accutest Mountain States Laboratories (Accutest) located in Wheat Ridge, Colorado.

LTE sampled natural springs Chavez01, Chavez02, and Chavez03 during the sampling event in 2013.

3.0 RESULTS

3.1 DETAILED MAPPING OF KNOWN AND SUSPECT SEEP AREAS

As a result of the 2012 Colorado Rule 608 Compliance Program, LTE identified six known and three diminishing methane seep areas for surveying in 2013. Below is a summary table of findings from the 2013 detailed mapping event.

Methane Flux Survey Summary

Seep Area ID	2012 Classification	Reportable Methane Identified in 2013	2013 Classification
L-1021	Known	Yes – 2 points	Methane Seep
L-1030	Known	Yes – 1 point	Diminishing Methane Seep
L-1033	Known	No	Diminishing Methane Seep
L-1050	Known	No	Diminishing Methane Seep
5	Known	No	Diminishing Methane Seep, discontinue monitoring
13 & L-1026	Diminishing	No	Diminished Methane Seep, discontinue monitoring
14	Diminishing	Yes – 3 points	Diminishing Methane Seep
32 & L-1049	Known	Yes – 37 points	Methane Seep
19	Diminishing	No	Diminished Methane Seep, discontinue monitoring

Methane measurements are presented on Figures 3 through 11. Summaries of current and historical seep areas, including the rationale for the potential source of methane, is included in Table 2.

3.2 NATURAL SPRING SURVEY

LTE identified 13 natural springs within the 2013 Project Area (Figure 2). Natural springs Spring 05 (Vega Canyon), Spring 07 (Spring Canyon), and Spring 08 (Middle Lorencito) were excluded from the sampling list as approved by the COGCC. Six natural springs were located on private property with no access granted at the time of the sampling event. Spring 01 (North Fork Apache Canyon) was dry at the time of sampling. Three natural springs (Chavez01, Chavez02, and Chavez03) were included in the survey in 2012. These three natural springs were sampled on August 15, 2013.

3.2.1 Field Observations

The North Fork Apache Canyon natural spring was identified as a pooled area of water and was not flowing at the time of field work. As a result, flow rate readings were not collected. LTE field personnel did observe what appeared to be a pipe connected to the natural spring and a windmill platform. The pipe appeared to be filled in with sand to approximately one foot below the top of the well casing. LTE could not collect field measurements from the pooled water as this data would not necessarily be reflective of the natural spring.

LTE collected field measurements from the Chavez01, Chavez02, and Chavez03 natural springs, which were documented in the field logbook. The 2013 field observations and measurements for the natural springs are summarized in Table 3.

3.2.2 Sampling and Analysis

By plotting the major anions (Cl, SO_4, Br, and F) and major cations (Na, Ca, Mg, K, Fe) that are dissolved in the natural spring water samples on a Stiff diagram, the water type can be presented graphically. The water from Chavez01 and Chavez02 indicates a predominately calcium bicarbonate composition. The water from Chavez03 indicates a predominately calcium chloride composition, which differs from the 2012 results when the composition appeared to be predominately calcium carbonate.

Laboratory analytical results for the natural spring samples are summarized in Table 4. A Stiff diagram illustrating the water type is depicted on Figure 12. Natural spring analytical results are presented in Appendix D.

3.2.3 Flux Measurements

During the 2013 natural spring sampling event, flux measurements were collected near each natural spring location. Reportable methane flux was not detected in any of the flux measurement locations near the three natural springs.

4.0 CONCLUSIONS

The 2013Rule 608 Compliance Program meets the requirements of subsections a, b, and c of the COGCC Rule 608.

LTE identified, through previous investigations, six known and three diminishing methane seep areas for surveying in 2013. Based on the findings from 2013 and a review of historical flux surveys at these nine areas, seep areas L-1021 and 32 & L-1049 continue to appear to be methane seep areas. LTE recommends these areas be included in the 2014 Colorado Rule 608 Compliance Program. Seep areas 14, L-1030, L-1033, L-1050, and 5 appear to be diminishing methane seeps. LTE recommends these seep areas be included in the 2014 Colorado Rule 608 Compliance Program to confirm the reduction in methane flux. If the methane flux continues to diminish or is absent, LTE will re-evaluate the need to monitor those areas. Seep areas 13 & L-1026 and 19 appear to be diminished methane seep and as a result, LTE recommends these two areas be omitted from future monitoring activities.

Below is a summary of the historically identified suspect seeps, the category each historical suspect seep has been assigned, and proposed monitoring of each historical seep area.

Methane Seep[1]	Diminishing Methane Seep Areas[2]	Other Source of Methane[3]	No Methane Seep Activity Observed[3]
L-1021	14	L-1023	623/L-99
32 & L-1049	L-1030	L-1025	11
	L-1033	L-1027	15
	L-1050	L-1031	17
	5	L-1036	18
		L-1039	21, 33, 617, & L-100
		L-1040	L-109
		L-1041	13 & L-1026
		L-1042	19
		L-1043	
		L-1044	
		L-1045	
		L-1047	
		L-1048	
		7, 8, 9, & L-1046	

[1] Recommended for continuation of detailed flux mapping in 2014
[2] Recommended for detailed flux mapping in 2014 to verify the absence of methane
[3] Recommended for discontinuation of detailed flux mapping in 2014

Three natural springs were sampled for water quality analysis (Chavez01, Chavez02, and Chavez03). The water types appear to be predominately calcium bicarbonate and calcium chloride in composition. In addition to collecting a water sample, flux measurements were collected in the vicinity of the natural springs. Reportable methane flux was not detected at any of the measurement locations.

LTE, at the direction of XTO, proposes to continue conducting Rule 608 compliance activities in Las Animas County in accordance with the COGCC-approved *Work Plan* as XTO's development activities expand.

5.0 REFERENCES

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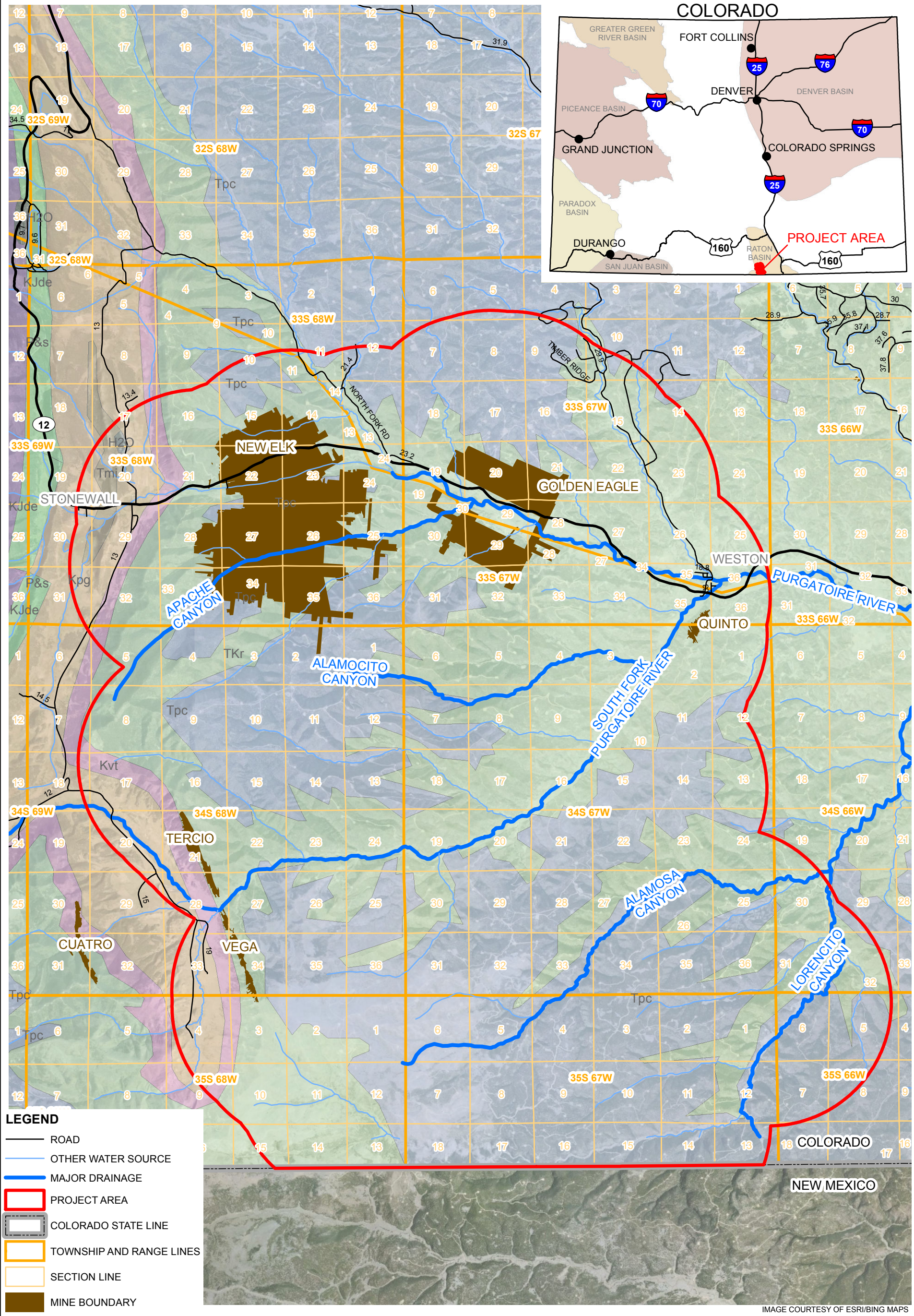
FIGURES



LEGEND

- ROAD
- OTHER WATER SOURCE
- MAJOR DRAINAGE
- PROJECT AREA
- COLORADO STATE LINE
- TOWNSHIP AND RANGE LINES
- SECTION LINE
- MINE BOUNDARY

GEOLOGIC CONTACTS (TWETO, 1979)

- Tmi - MIDDLE TERTIARY INTRUSIVE ROCKS
- Tpc - POISON CANYON FORMATION
- TKr - RATON FORMATION
- Kvt - VERMEJO FORMATION
- Kpg - PIERRE SHALE FORMATION
- KJde - DAKOTA FORMATION
- P[Ps - SANGRE DE CRISTO FORMATION

IMAGE COURTESY OF ESRI/BING MAPS

0 1.5 3
Miles

N

FIGURE 1
PROJECT AREA MAP
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

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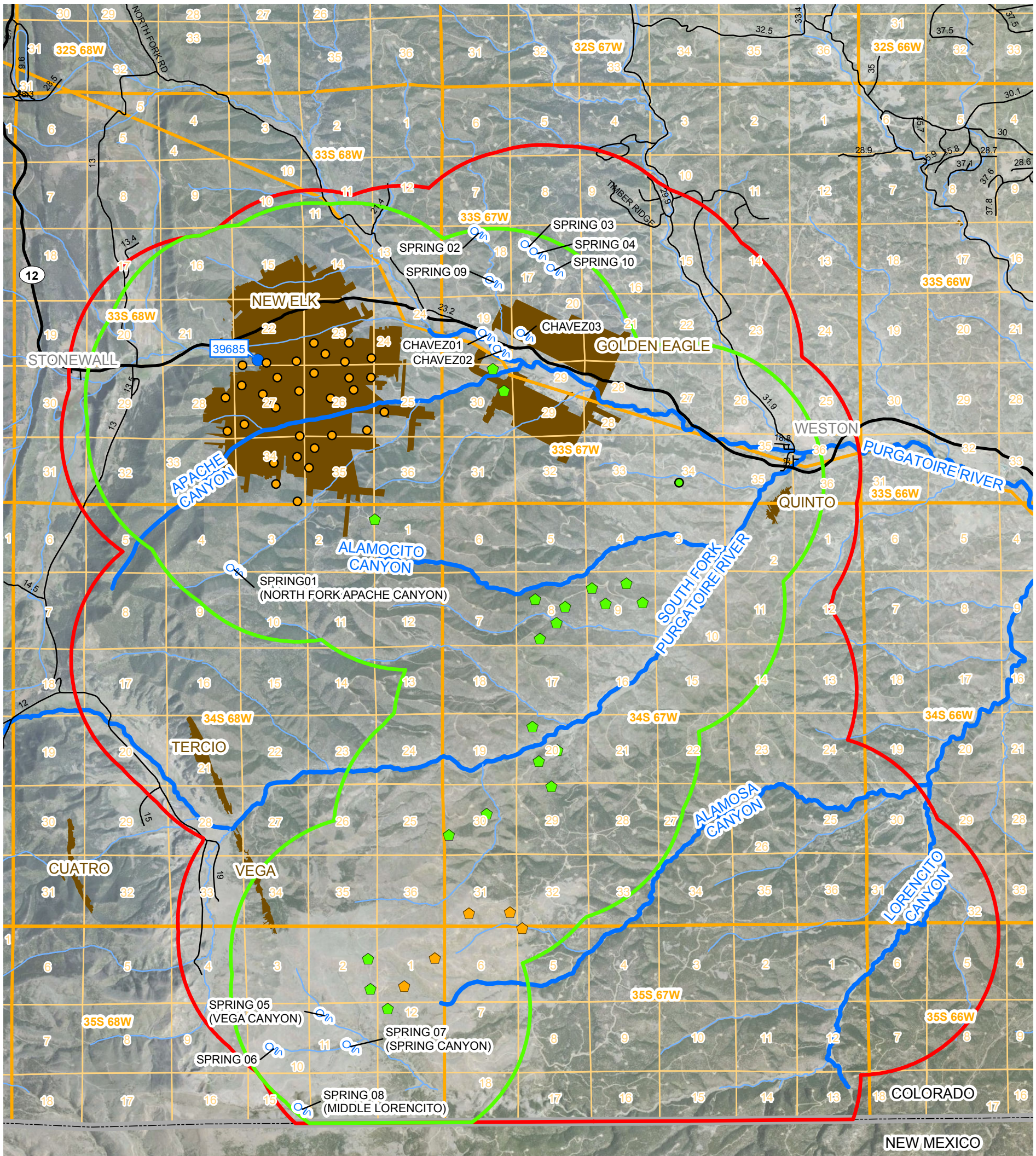


LEGEND

- 2010 PROPOSED COALBED METHANE PRODUCTION WELL
- 2010 INSTALLED COALBED METHANE PRODUCTION WELL
- 2011 PROPOSED COALBED METHANE PRODUCTION WELL
- 2011 INSTALLED COALBED METHANE PRODUCTION WELL
- WATER WELL LABELED WITH PERMIT NUMBER
- SPRING LABELED WITH SAMPLE ID
  (SPRING NAME, IF APPLICABLE)
- ROAD
- OTHER WATER SOURCE
- MAJOR DRAINAGE
- PROJECT AREA
- 2013 PROJECT AREA
- COLORADO STATE LINE
- TOWNSHIP AND RANGE LINES
- SECTION LINE
- MINE BOUNDARY

IMAGE COURTESY OF ESRI/BING MAPS

0 1.5 3
Miles

N

FIGURE 2
2013 PROJECT AREA MAP
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG02_2013_PROJ.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 3
METHANE FLUX CONTOURS
METHANE SEEP AREA L-1021
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 4
METHANE FLUX CONTOURS
DIMINISHING METHANE SEEP AREA L-1030
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 5
METHANE FLUX CONTOURS
DIMINISHING METHANE SEEP AREA L-1033
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 6
METHANE FLUX CONTOURS
DIMINISHING METHANE SEEP AREA L-1050
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 7
METHANE FLUX CONTOURS
DIMINISHING METHANE SEEP AREA 5
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

0 100 200
Feet

N

FIGURE 8
METHANE FLUX CONTOURS
DIMINISHED METHANE SEEP AREAS 13 & L-1026
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

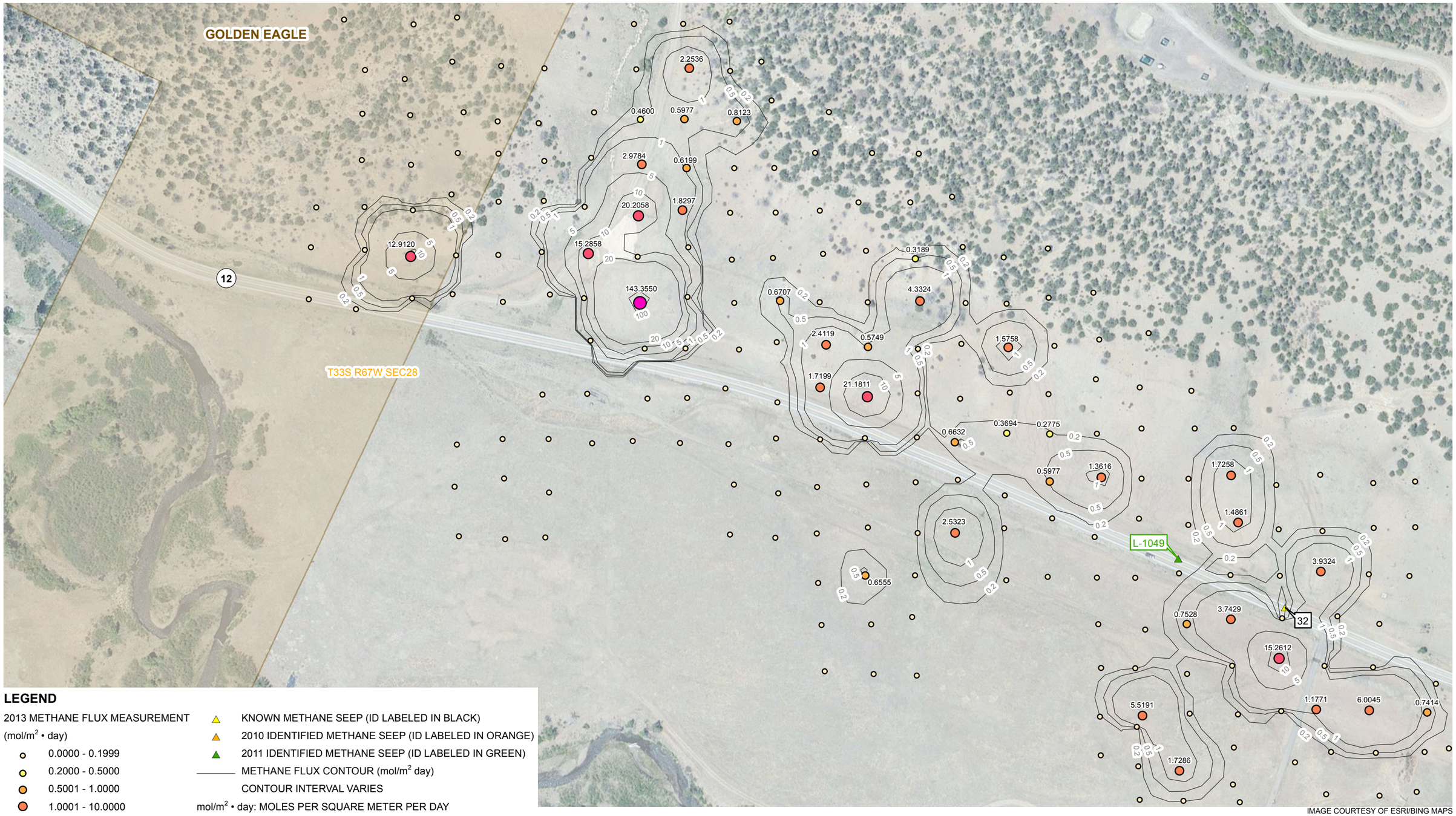
0 100 200
Feet

N

FIGURE 9
METHANE FLUX CONTOURS
DIMINISHING METHANE SEEP AREA 14
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd



LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- KNOWN METHANE SEEP (ID LABELED IN BLACK)
- 2010 IDENTIFIED METHANE SEEP (ID LABELED IN ORANGE)
- 2011 IDENTIFIED METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES

mol/m^2 • day: MOLES PER SQUARE METER PER DAY
ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED

- LEWICKI MINE BOUNDARY
- SECTION LINE

0 200 400
Feet

N

IMAGE COURTESY OF ESRI/BING MAPS

FIGURE 10
METHANE FLUX CONTOURS
METHANE SEEP AREA 32 & L-1049
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG10_CH4_LANDSCAPE.mxd

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

2013 METHANE FLUX MEASUREMENT
(mol/m^2 • day)

- 0.0000 - 0.1999
- 0.2000 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 10.0000
- 10.0001 - 50.0000
- 50.0001 - 100.0000
- 100.0001 - 400.0000

- 2007 SUSPECT METHANE SEEP (ID LABELED IN BLACK)
- 2010 SUSPECT METHANE SEEP (ID LABELED IN ORANGE)
- 2011 SUSPECT METHANE SEEP (ID LABELED IN GREEN)
- METHANE FLUX CONTOUR (mol/m^2 day)
- CONTOUR INTERVAL VARIES
- mol/m^2 • day: MOLES PER SQUARE METER PER DAY
- ONLY METHANE FLUX MEASUREMENTS GREATER THAN OR EQUAL TO 0.2 mol/m^2 • day ARE LABELED
- LEWICKI MINE BOUNDARY
- SECTION LINE

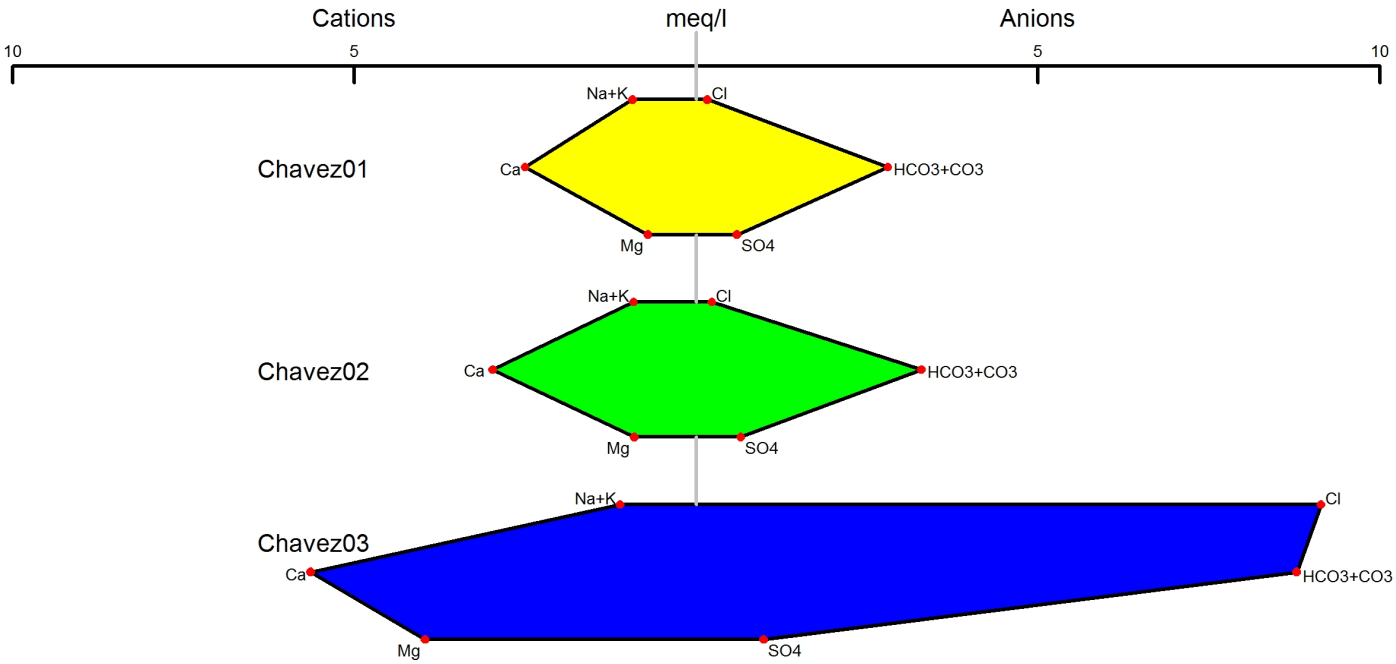
0 100 200
Feet

N

FIGURE 11
METHANE FLUX CONTOURS
DIMINISHED METHANE SEEP AREA 19
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG03_CH4.mxd



LEGEND

Ca: CALCIUM

Cl: CHLORIDE

CO3: CARBONATE

HCO3: BICARBONATE

K: POTASSIUM

Mg: MAGNESIUM

Na: SODIUM

SO4: SULFATE

meq/l: MILLIEQUIVALENTS PER LITER

FIGURE 12
STIFF DIAGRAMS
AUGUST 15, 2013
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012913001_RULE_608_2013\012913001_FIG13_STIFF.mxd

TABLES

TABLE 1
PROPERTY OWNER AND ACCESS INFORMATION
2013 COLORADO RULE 608 COMLPIANCE PROGRAM
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

LANDOWNER	PARCEL ID	SECTION	TOWNSHIP	RANGE	PERMISSION GRANTED
XTO Energy, Inc.	14533300 14533405 14533200	28 27, 28 27	33 33 33	67 67 67	Yes
Red River Ranch Holdings, LLC	14182121 1418210	4, 5, 6, 7, 8 1, 2, 3, 10, 11, 12, 13, 14, 15	35 35	67 68	No
Hill Ranch LTD and Kozad Properties LTD	12220713 12220714 11071110 13432508 14533003 13297000	4, 5, 6, 7, 10 1,2, 3, 10, 11, 12, 13, 14, 15 21, 22, 28 2, 31, 32, 33 28 27, 35	35 35 34 34 33 33	67 68 67 67 67 67	Yes
Department of Natural Resources (care of mibe.truillo@state.co.us)	10877304 10877303	30 2, 3, 13, 23, 24, 25, 26 19 25 35	33 34 34 33 33	67 68 67 68 68	Yes
Bill R. and Rossana T. Chavez	13940200	19	33	67	Yes
Silver Bernadina Sandra Chacon	14021300	19	33	67	No Response
Candido Anthony III, Deloris G., and Christina Marie Chacon	10581000	19	33	67	No Response
Donald Mounier		17	33	67	No Response
Mr. and Mrs. Jurajda		17	33	67	No Response
Sabrina Blakeney	14239500	17	33	67	No Response
Gery Navalesi		18	33	67	No
Richard W Stiles		18	33	67	No
Bill Toupal		28 27, 28 27	33 33 33	67 67 67	Yes
Veronica Law		19	33	67	Yes

TABLE 2
SEEP AREA SUMMARIES
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

Area IDs	Figure Number	Ground Survey				2007	2010			2011			2012			2013			Observations	Classification	Conclusions	Recommendations
		2007	2010	2011	2012	Subsurface Methane Gas Detected	Total Number of Flux Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**				
L-1021	10	--	--	x	NA	--	--	--	--	44	10	129.71	47	6	6.7	46	2	NA	Gas lines in the vicinity of the detected methane during the 2011 ground survey. Dead vegetation such as bushes and grass in vicinity of reportable methane flux. Reportable methane flux present during 2012 and 1013 flux surveys.	Methane seep	Based on the correlation of methane flux within an area that contains stressed/dead vegetation and the lack of other potential sources, it appears that this area is still a methane seep.	Will monitor during 2014 event
32 & L-1049	38	x	--	--	NA	--	--	--	--	372	146	304.12	217	55	720.4	234	37	332.4	Apogee identified gas lines and risers near suspect seep area L-1049 during the 2011 ground survey. Suspect seep areas are just east of the Golden Eagle mine. Reportable methane flux present during 2012 and 2013 flux surveys.	Methane seep	Based on reportable methane detected in 2011, 2012 and 2013 and the lack of other observable potential sources of methane, it appears that this area is still a methane seep.	Will monitor during 2014 event
L-1030	14	--	--	x	NA	--	--	--	--	17	3	2.19	17	3	2.2	18	1	NA	Apogee identified a well pad southeast of the suspect area during the 2011 ground survey. Limited reportable methane flux present during the 2012 and 2013 flux surveys.	Diminishing Methane seep	Reportable methane flux has decreased from 2011 to 2013, where methane was not detected in 2013. This areas appears to be a diminishing methane seep area.	Will monitor during 2014 event to confirm results of 2013 event
L-1033	16	--	--	x	NA	--	--	--	--	26	1	0.02	40	4	0.1	40	0	0.0	Apogee identified small concentration of methane in the vicinity. LTE observed stressed and dead vegetation near vacant structures on the north side of Basque De Oso Road. Reportable methane flux still present during 2012 flux survey.	Diminishing Methane seep	Reportable methane flux has decreased from 2011 to 2013, where methane was not detected in 2013. This areas appears to be a diminishing methane seep area.	Will monitor during 2014 event to confirm results of 2013 event
L-1050	27	--	--	x	NA	--	--	--	--	22	4	0.69	22	2	1.0	22	0	0.0	Apogee identified seep area during the 2011 ground survey. Apogee observed a well pad upwind of the seep area where methane was detected during the 2011 ground survey. Limited reportable methane flux still present during 2012 flux survey.	Diminishing Methane seep	Based on reportable methane detected in 2011 and 2012 and the lack of other observable potential sources of methane, it appears that this area is still a methane seep.	Will monitor during 2014 event to confirm results of 2013 event
5	28 & 29	x	--	x	NA	Yes	--	--	--	167	16	2.16	83	6	1.9	83	0	0.0	Seep area is located near or within Golden Eagle mine boundary. Reportable methane flux present during 2011 and 2012 flux surveys. Reportable methane flux was not detected in 2013.	Diminishing Methane seep	Reportable methane flux has decreased from 2011 to 2013, where methane was not detected in 2013. This areas appears to be a diminishing methane seep area.	Will monitor during 2014 event to confirm results of 2013 event
14	32	x	--	--	NA	--	94	16	0.56	50	7	0.34	46	0	0.00	58	3	0.0	Reportable methane detected in 2010 and confirmed in 2011. No reportable methane flux detected in 2012 and limited reportable methane flux was detected in 2013.	Diminishing Methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the limited reportable methane flux during the 2011, 2012, and 2013 mapping event, this area does not appear to be a methane seep.	Will monitor during 2014 event to confirm results of 2013 event
13 & L-1026	31	x	--	x	NA	--	29	8	10.74	56	2	0.03	61	1	NA	61	0	0.0	Reportable methane detected in 2010 and confirmed in 2011. Limited reportable methane flux detected in 2012 and no methane flux detected in 2013.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the limited reportable methane flux during the 2011, 2012, and 2013 mapping events,this area does not appear to be a methane seep.	Will discontinue monitoring of area
19	36	x	--	--	NA	Yes	--	--	--	23	0	0.00	15	1	NA	15	0	0.0	Methane was detected in 2007. No reportable methane flux detected in 2011. Limited reportable flux detected in 2012. No reportable methane flux detected in 2013.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the limited reportable methane flux during the 2011, 2012, and 2013 mapping events, this area does not appear to be a methane seep.	Will discontinue monitoring of area
623/L-99	9	x	x	--	NA	623: Yes L-99: --	78	4	0.07	27	0	0.00	--	--	--	--	--	--	Methane was detected in 2007 and 2010. Methane was not detected in 2011 or 2012.	Diminished methane seep	LTE did not detect reportable methane flux at this area in 2011 or 2012. At this time, the methane seep appears to have diminished and is no longer present.	Monitoring discontinued
11	30	x	--	--	NA	Yes	--	--	--	47	0	0.00	--	--	--	--	--	--	Methane was detected in 2007. No reportable methane flux detected in 2011 or 2012.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued

TABLE 2
SEEP AREA SUMMARIES
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

Area IDs	Figure Number	Ground Survey				2007	2010			2011			2012			2013			Observations	Classification	Conclusions	Recommendations
		2007	2010	2011	2012	Subsurface Methane Gas Detected	Total Number of Flux Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**				
15	33	x	--	--	NA	Yes	--	--	--	23	0	0.00	--	--	--	--	--	--	Methane was detected in 2007. No reportable methane flux detected in 2011 or 2012.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued
17	34	x	--	--	NA	--	--	--	--	38	0	0.00	--	--	--	--	--	--	Methane was detected in 2007. No reportable methane flux detected in 2011 or 2012.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued
18	35	x	--	--	NA	--	--	--	--	40	1	0.00	--	--	--	--	--	--	Methane was detected in 2007. No reportable methane flux detected in 2011 or 2012.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued
21, 33, 617, & L-100	37	x	x	--	NA	--	74	1	0.03	35	0	0.00	--	--	--	--	--	--	Methane was detected in 2007 and 2010. No reportable methane flux detected in 2011 or 2012.	Diminished methane seeps	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued
L-109	39	--	x	--	NA	--	83	3	0.03248	24	0	0.00	--	--	--	--	--	--	Limited reportable methane flux detected in 2010. Suspect seep area located within Allen-East and West Portals mine. No reportable methane flux detected in 2011 or 2012.	Diminished methane seep	Due to the low methane subsurface concentrations recorded in 2007 and the lack of reportable methane flux during the 2011 & 2012 mapping event, this area does not appear to be a methane seep.	Monitoring discontinued
7, 8, 9, & L-1046	28 & 29	x	--	x	NA	7: -- 8: -- 9: --	-- -- --	-- -- --	-- -- --	167	16	2.16	--	--	--	--	--	--	Suspect seep areas located near or within Golden Eagle mine boundary. Apogee identified a well pad northeast of suspect area L-1046. Reportable methane flux detected in 2011 related to methane seep 5.	Diminished methane seeps	Suspect seep areas 7, 8, 9, and L-1046 do not appear to be methane seeps. Due to the low concentrations recorded four years ago and the lack of reportable methane flux during the 2011 mapping event appears to indicate the historical seeps has diminished.	Monitoring discontinued
L-1023	11	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee identified gas lines and risers in the vicinity of the detected methane during the 2011 ground survey. LTE also observed gas lines and risers during the 2011 mapping event.	Other - Leaking gas lines and/or risers	With the absence of methane flux in the vicinity of suspect seep area, it appears this area is not a seep area.	Monitoring discontinued
L-1025	12	--	--	x	NA	--	--	--	--	9	0	0.00	--	--	--	--	--	--	Apogee identified the methane near a well pad and associated generator. LTE personnel also observed the well pad and generator during the detailed mapping event.	Other - Off-gassing of wellhead and/or generator	The lack of methane flux in the vicinity of suspect seep area and the presence of a well head, well pad, and generator indicate the likely source is from the off-gassing of wellhead and/or generator.	Monitoring discontinued
L-1027	13	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee identified a riser pipe in the vicinity of the detected methane during the 2011 ground survey.	Other - Leaking gas lines and/or risers	The lack of methane flux in the vicinity of suspect seep area and the presence of a riser pipe indicates the likely source of the methane is from a leaking riser pipe.	Monitoring discontinued
L-1031	15	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee identified a riser pipe in the vicinity of the suspect area during the 2011 ground survey	Other - Leaking gas lines and/or risers	The lack of reportable methane flux in the vicinity of the suspect seep area and observations of riser pipes indicate the likely source of methane is from leaking riser pipes.	Monitoring discontinued
L-1036	17	--	--	x	NA	--	--	--	--	9	0	0.00	--	--	--	--	--	--	Apogee identified a gas compressor station near the suspected seep areas during the 2011 ground survey. LTE also observed the gas compressor station west of the suspect area.	Other - Off-gassing of compressor station	Based on the lack of methane flux and the presence of a gas compressor station nearby, it appears the methane Apogee detected during the ground survey was from the gas compressor station and not methane seep.	Monitoring discontinued
L-1039	18	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee observed the nearby gas compressor station off-gas while recording the methane measurements at L-1039.	Other - Off-gassing of compressor station	Based on the lack of reportable methane flux and the off-gassing of the gas compressor station at the time of the 2011 ground survey, the likely source of methane is the gas compressor station.	Monitoring discontinued
L-1040	19	--	--	x	NA	--	--	--	--	14	1	0.02	--	--	--	--	--	--	Apogee identified a well pad near the detected methane during the 2011 ground survey. LTE also observed the well pad during the detailed mapping event.	Othe r- Off-gassing wellhead and/or leaking gas lines	Based on the low methane flux and limited total reportable volumetric methane flux, the detected methane appears related to the well pad and is not considered a methane seep.	Monitoring discontinued

TABLE 2
SEEP AREA SUMMARIES
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

Area IDs	Figure Number	Ground Survey				2007	2010			2011			2012			2013			Observations	Classification	Conclusions	Recommendations
		2007	2010	2011	2012	Subsurface Methane Gas Detected	Total Number of Flux Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**	Total Number of Sample Points	Reportable CH_4 Flux Points*	Total CH_4 Flux (MCFD)**				
L-1041	20	--	--	x	NA	--	--	--	--	7	0	0.00	--	--	--	--	--	--	Apogee during the 2011 ground survey. Apogee identified a gas compressor station near the suspect area during the 2011 ground survey.	Other - Off-gassing of compressor station	Based on the presence of a gas compressor station and no reportable methane flux, methane detected by Apogee in 2011 appears to be from off-gassing of the gas compressor station and not a methane seep.	Monitoring discontinued
L-1042	21	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee identified a well pad and associated wellhead near the suspect area during the 2011 ground survey.	Other - Off-gassing wellhead and/or leaking gas lines	Based on the presence of a wellhead and no reportable methane flux, methane detected by Apogee in 2011 appears to be from off-gassing of the wellhead and not a methane seep. Will monitor during 2012 event.	Monitoring discontinued
L-1043	22	--	--	x	NA	--	--	--	--	11	0	0.00	--	--	--	--	--	--	Apogee did not identify any oil and gas structure that could be the potential source of the detected methane during the 2011 ground survey.	Other - Fugitive atmospheric gas	Based on the lack of methane flux in the vicinity of the suspect seep area, methane detected by Apogee appears to be fugitive gas in the atmosphere and not a methane seep	Monitoring discontinued
L-1044	23	--	--	x	NA	--	--	--	--	9	0	0.00	--	--	--	--	--	--	Apogee identified a new production well being drilling during the 2011 ground survey.	Other - Production well installation activities	Based on the lack of reportable methane flux in the vicinity of the suspect seep area and the installation of a new production well, it appears methane detected by Apogee during the 2011 ground survey was related to the installation of the production well and not a methane seep. Will monitor during 2012 event.	Monitoring discontinued
L-1045	24	--	--	x	NA	--	--	--	--	8	0	0.00	--	--	--	--	--	--	Apogee identified a well pad in the vicinity of where methane was detected during the 2011 ground survey.	Other - Off-gassing wellhead and/or leaking gas lines	Based on the location of the suspect seep area to an active well pad and the lack of reportable methane flux, the methane Apogee detected during the 2011 ground survey appears to be from the tank battery associated with the well pad and not a methane seep.	Monitoring discontinued
L-1047	25	--	--	x	NA	--	--	--	--	17	0	0.00	--	--	--	--	--	--	Apogee observed a well pad in the vicinity of the suspect seep area where methane was detected during the 2011 ground survey.	Other - Off-gassing wellhead and/or leaking gas lines or off-gassing of mine	Based on the lack of reportable methane flux and the presence of an active well pad, the methane detected by Apogee during the 2011 ground survey is related to the well pad and not a methane seep. Also within mine boundary to be another possible source.	Monitoring discontinued
L-1048	26	--	--	x	NA	--	--	--	--	15	1	0.27	--	--	--	--	--	--	Apogee observed a well pad upwind of the suspect seep area where methane was detected during the 2011 ground survey.	Other - Off-gassing wellhead and/or leaking gas lines	Based on limited reportable methane flux and the presence of an active well pad, the methane detected by Apogee during the 2011 ground survey is related to the well pad and not a methane seep.	Monitoring discontinued

Notes:

Will monitor during 2014 event

Will monitor during 2014 event to confirm 2013 results

Will discontinue monitoring of suspect seep area

CH_4 - Methane

moles/m^2·day - moles per meter squar

MCFD - thousand cubic feet per day

-- - No data available

* - Points where flux values were abo

* - Only points where flux values were above the reporting limit of 0.2 moles/m^2·day

** - Volume includes only gridded values > 0.2 moles/m^2·day

PLSS - Public Land Survey System

NA - Not applicable

TABLE 4
NATURAL SPRING FIELD OBSERVATIONS AND MEASUREMENTS
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENERGY, INC.

Natural Spring	Location	Latitude	Longitude	Inspection Date	Specific Electrical Conductance (µS/cm)	pH (Units)	ORP (mV)	Temperature (^{0}C)	DO (mg/L)	TDS (mg/L)
Spring01	North Fork Apache Canyon	-104.991708	37.108089	8/13/2010	381	9.2	140.5	22.4	10.25	247
				8/19/2011	408	7.1	-99.5	13.29	13.4	432
				9/4/2012	DRY - NOT MEASURED					
				8/15/2013	DRY - NOT MEASURED					
Chave01	Rancho Escondido	-104.9265768	37.15615866	9/4/2012	391	6.8	106.5	15.7	NM	200.7
				8/15/2013	356	7.0	12	14.9	NM	NM
Chave02	Rancho Escondido	-104.922814480	37.152863914	9/4/2012	414	6.51	105.5	16.0	NM	207.7
				8/15/2013	417	6.9	#NAME?	14.1	NM	NM
Chave03	Rancho Escondido	-104.916708750	37.156096546	9/4/2012	1,864	6.95	104.7	14.1	NM	921.9
				8/15/2013	1,464	7.3	47.3	14.7	NM	NM

Notes:

Blank cells indicate no measurement.
µS/cm - microSiemens per centimeter
ORP - oxidation reduction potential
mV - millivolts
mg/L - milligrams per liter
^{0}C - degrees celsius
TDS - total dissolved solids
ppm - parts per million
NM - Not Measured
DO - dissolved oxygen

TABLE 5
NATURAL SPRING ANALYTICAL RESULTS
2013 COLORADO RULE 608 COMPLIANCE REPORT
RATON BASIN, LAS ANIMAS COUNTY, COLORADO

XTO ENGERGY, INC.

Natural Spring	Location	Sample Date	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	TDS (mg/L)	Specific Conductivity (umhos/cm)	pH
Spring01	North Fork Apache Canyon	8/13/2010	3.4	0.652	97.7	1.41	0.021	<0.00080	<5.0	205	280	364	10.13
		8/19/2011	2.21	0.52	136	1.640	0.126	<0.00080	<5.0	332	420	428	8.16
		9/4/2012	DRY - NOT SAMPLED										
		8/15/2013	DRY - NOT SAMPLED										
Chavez01	Rancho Escondido	9/4/2012	44.5	8.12	20.4	<1.0	<0.0050	<0.0020	<5.0	157	194	323	7.28
		8/15/2013	50.2	8.59	20.8	1.070	NA	<0.0020	<5.0	171	224	358	7.4
Chavez02	Rancho Escondido	9/4/2012	49.3	9.56	18.2	1.430	<0.0050	<0.0020	<5.0	163	206	330	7.17
		8/15/2013	59.7	11	20.2	1.510	0.0055	<0.0020	<5.0	201	264	428	7.28
Chavez03	Rancho Escondido	9/4/2012	117	43.2	20.8	6.250	<0.0050	<0.0020	<5.0	495	990	160	7.44
		8/15/2013	113	48.2	22.3	5.500	<0.0050	<0.0020	<5.0	536	1090	1850	7.38

Natural Spring	Location	Sample Date	Sulfate (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Fluoride (mg/L)	Hydrogen Sulfide (mg/L)	Nitrogen as Nitrate (mg/L)	Nitrogen as Nitrite (mg/L)	Iron Reducing Bacteria (cfu/ml)	Slime Forming Bacteria (cfu/ml)	Sulfate Reducing Bacteria (cfu/ml)
Spring01	North Fork Apache Canyon	8/13/2010	2.9	3.3	<0.20	0.74	<0.50	<0.23	<0.061	500	>350,000	700,000
		8/19/2011	2.7	3.7	<0.20	1.4	NA	<0.045	<0.011	9,000	350,000	700,000
		9/4/2012	DRY - NOT SAMPLED									
		8/15/2013	DRY - NOT SAMPLED									
Chavez01	Rancho Escondido	9/4/2012	19.3	3.4	<0.050	0.27	0.0	0.011	<0.0040	74,500	350,000	359,000
		8/15/2013	28.7	5.8	<0.050	0.27	NA	0.012	<0.0040	74,500	66,500	1,200
Chavez02	Rancho Escondido	9/4/2012	20.3	4	<0.050	0.3	0.0	0.088	<0.0040	74,500	350,000	359,000
		8/15/2013	31.3	8.1	<0.050	0.29	NA	1.8	1.8	75,500	12,500	5,000
Chavez03	Rancho Escondido	9/4/2012	63.7	254	2	0.35	0.0	0.083	0.024	74,500	66,500	359,000
		8/15/2013	47.4	324	2.6	0.72	NA	0.26	0.26	9,000	350,000	359,000

Notes:

mg/L - milligrams per liter
TDS - Total dissolved solids
umhos/cm - Microohms per centimeter
cfu/ml - Coliform units per milliliter

< - Less than the laboratory reporting limit
NA - Not analyzed
> - greater than

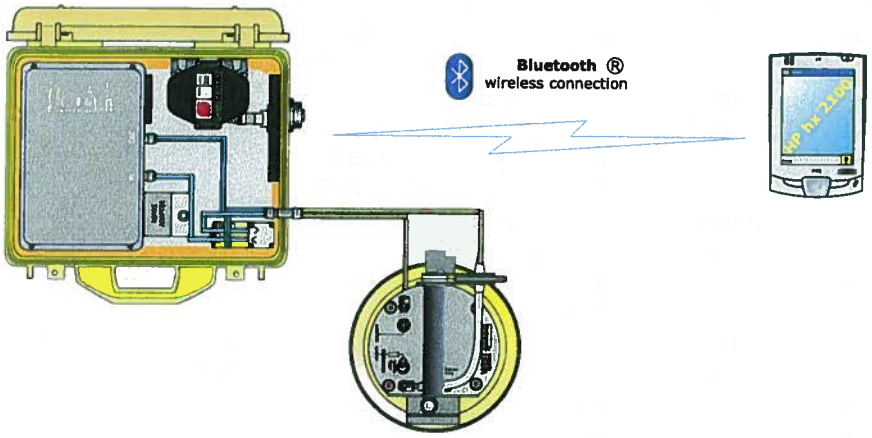
APPENDIX A

EQUIPMENT SPECIFICATIONS

WEST Systems portable soil flux meter

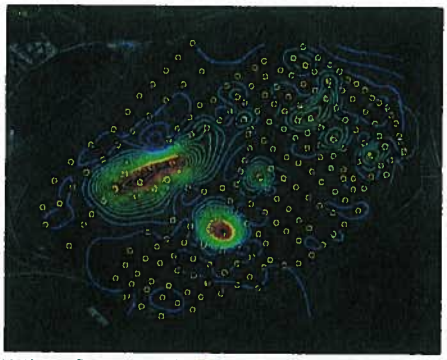
for Carbon dioxide, Methane and Hydrogen sulfide fluxes

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 linees

a group of researchers during a flux mapping fieldwork, using the WS-LI820 flux meter

Courtesy of United States Geological Survey

WEST Systems

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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

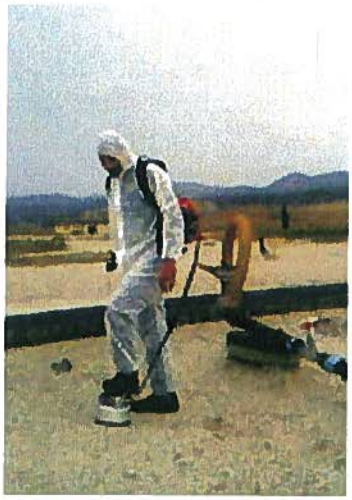
Palm top computer: PocketPC Color Display based on Windows Mobile operating system.
- PalmTop with cables, 0.3 Kg/0.7 lbs.
- Size 125mm (4.8") x 82mm (3.2") * 25 mm (1").

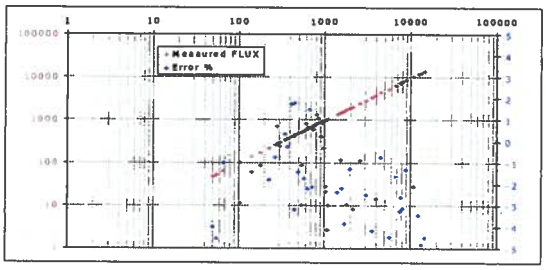
Software The instrument is supplied with a custom software, FluxManager, which allows recording and visualization of the increase in concentration of the target gas in the accumulation chamber, and then the flux calculations. The obtained measurements can be saved on the palmtop computer and then transferred 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.

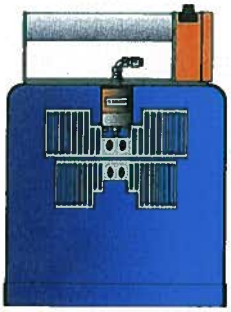
Finally we improved the connection between the instrument and the palmtop that now is based on BlueTooth wireless embedded device.





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 landifll.



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

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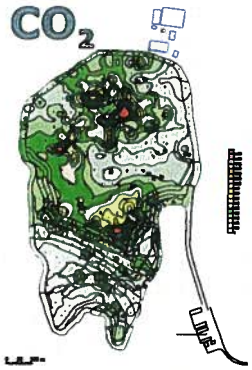


CO_2 - LI820

LI820 based Carbon dioxide fluxmeter

The CO_2 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^{-2} day^{-1}

CO_2 FLUX Measurement range:
from 0 up 600 moles m^{-2} day^{-1}

The accuracy depends on the measured flux:

0 to 0.5 moles m^{-2} day^{-1}	25% (Acc.ch.A)
0.5 to 1 moles m^{-2} day^{-1}	15% (Acc.ch.A or B)
1 to 150 moles m^{-2} day^{-1}	10% (Acc.ch.B)
150 to 300 moles m^{-2} day^{-1}	10% (Acc.ch.B)
300 to 600 moles m^{-2} day^{-1}	20% (Acc.ch.B)

WS-DRAGER CO_2

WS-DRAGER: CO_2 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^2 per day.

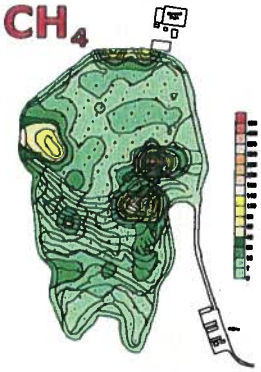
The precision depends on the measured flux:

range:0.5 – 5 moles/m^2 per day 25% (Acc. chamber A)

5-350 moles/m^2/day 10% (Acc. chamber B)

350-600 moles/ m^2/day 25% (Acc. chamber B)

600-1500 moles/ m^2/day 25% (Acc.Ch.B / F.S.=10%)



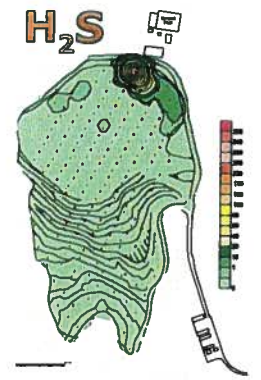
WS-HC CH^4

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^2/day detection limit is acceptable.

Methane Flux measurement range
from 0.2 up 300 moles m^{-2} day^{-1}
The fluxmeter is provided with 2 accumulation chambers and the accuracy depends on the measured flux:

0.2 to 10 moles m^{-2} day^{-1}	25% (Acc.Ch.A)
10 to 150 moles m^{-2} day^{-1}	15% (Acc.Ch.A)
150 to 300 moles m^{-2} day^{-1}	20% (Acc.Ch.B)



H_2S - WEST

Hydrogen sulfide

The hydrogen sulphide detector is a 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_2S Flux measurement range: from 0.0025 to 0.5 moles/m^2 per day.
The precision depends on the measured flux:
0.0025 – 0.05 moles/m^2 per day ±25% (Acc. Chamber A)
0.05 – 0.5 moles/m^2 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.

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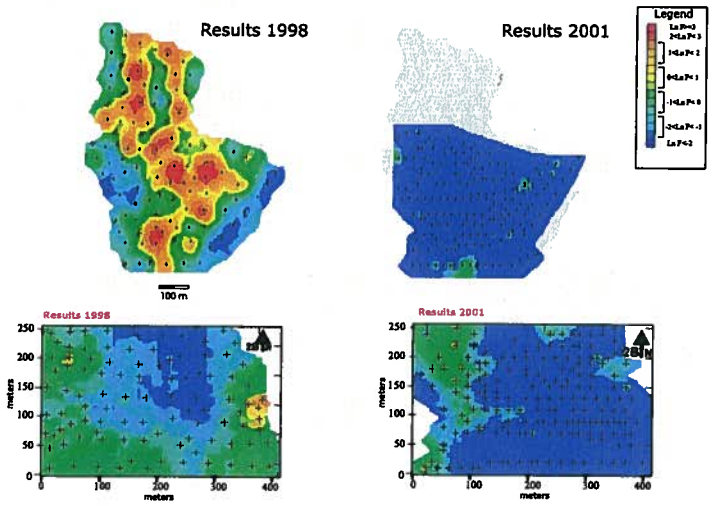
Application on a landfill: mapping the biogas non controlled emissions.

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 intervensions 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

Local sales representative

H.Q.

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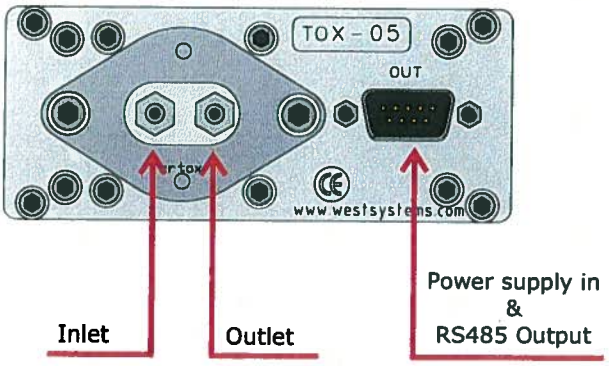
Hydrogen Sulfide Detector



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:

$$H_2S + 2O_2 = H_2SO_4$$

the gas sample specific consuption is very low:

2.5×10^{-10} moles/Sec per ppm

Due to this consuption the H2S flux is methodically understimated by a -10% with the AccumulationChamber 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.

Appendix M

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%

Repeatibility 2%

Resolution 22 ppm (Methane equivalent)

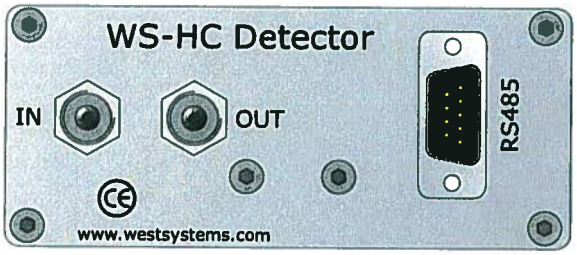
Full scale range is 50000 ppm of methane.

Detection limit 60 ppm.

Methane flux measurement range from 0.1 to 150 moles/m^2 per day.
The precision depends on the measured flux:

```
range 0.1  5      moles/ m^2 per day ±25%
      5 - 150     moles/ m^2 per day ±10%
```

The measurement of very low fluxes (< 0.1 moles/m^2/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_2 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

[1]Zero Drift: < 0.15 ppm / °C

[2]Span Drift at 370 ppm: < 0.03% / °C

[3]Total Drift at 370 ppm: <0.4 ppm / °C

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

[1] Zero drift is the change with temperature at 0 concentration
[2] Span drift is the change after re-zeroing following a temperature change
[3] 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

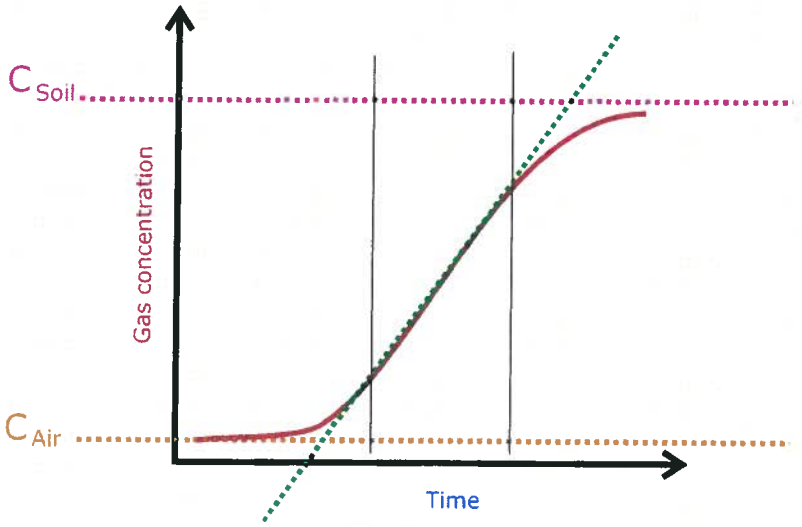
Relative Humidity Range: 0 to 95% RH, Non-Condensing

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^{-1} mol^{-1}
- **T_k** 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

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

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

An example:

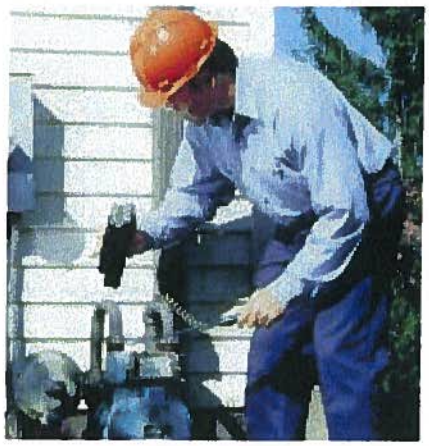
You're using the accumulation chamber B, the slope of the flux curve is 2.5 ppm/sec, the barometric pressure is 1008 mBar (HPa) and the air temperature is 22 °C.
From the table B get the value that correspond to the barometric pressure and temperature. In this case I get the value computed for 25°C and 1013 mBar : 0.696.

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

Gasport® Gas Tester

MSA

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_4	1 % LEL or 0.1% CH_4
Methane	5–100% CH_4	1% CH_4
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

Gasport® Gas Tester

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_2
812389	CO
812390	H_2S

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_2S
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. Gaspor 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_2	CO	H_2S	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).**

ID 08-04-27-MC / May 2000

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MSA International
Phone (412) 967-3354
FAX (412) 967-3451

Offices and representatives worldwide
For further information:

MSA

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[1] or EGNOS[2]. 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 Mobile lets you choose a software solution to match your workflow.

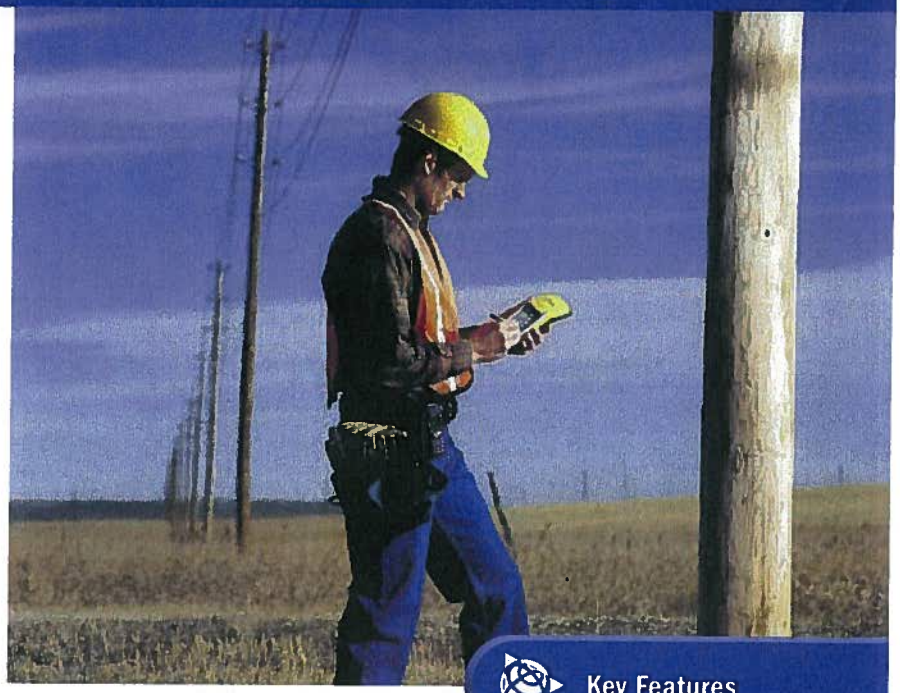
Windows Mobile includes familiar Microsoft productivity tools, including Pocket Word, Pocket Excel, and Pocket Outlook®. Pocket Outlook lets you synchronize e-mails, contacts, appointments, and data with your office computer, so whether you're in the office or in the field, you're always up to date.

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.



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

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.*

Trimble.

GeoXT

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[1]/EGNOS[2]
- 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® Media Player, Bluetooth File Transfer, Calculator, ActiveSync®
- 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® ArcPad®
- GPS Pathfinder® Tools Software Development Kit (SDK)
- GPS Pathfinder Office
- Trimble GPS Analyst extension for ArcGIS®

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

Specifications subject to change without notice.

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 vie support module, serial via optional DE9 serial clip adaptor
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 www.trimble.com/geoxt_ts.asp.
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[1] or EGNOS[2]
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)[4] after differential correction

Postprocessed[5]	Submeter
Carrier postprocessed[6]	
With 10 minutes tracking satellites	30 cm
Real-time	Submeter

1 *WAAS (Wide Area Augmentation System). Available in North America only. For more information, see http://gps.faa.gov/programs/index.htm.*
2 *EGNOS (European Geostationary Navigation Overlay System). Available in Europe only. For more information, see http://www.esa.int/export/esaSA/navigation.html.*
3 *Serial clip also required.*
4 *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.*
5 *Postprocessing with GPS Pathfinder Office software or GPS Analyst extension for ArcGIS.*
6 *Requires collection of carrier data. (Only available with the GPS Pathfinder Office software).*

YOUR LOCAL TRIMBLE OFFICE OR REPRESENTATIVE

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ULTRAMETER II™

OVER 50 YEARS

MYRON L COMPANY

Water Quality Instrumentation

Accuracy • Reliability • Simplicity

ULTRAMETER II™

Advanced Design • Superior Performance

MADE IN USA

OVER 50 YEARS

pH/ORP Sensor protective cap

Four-digit display for full 9999 readings, with autoranging capability up to 200 mS/200 ppt

Powerful microprocessor based surface-mount circuitry

Display prompts for simple pH calibration

Memory for 100 readings with Date & Time Stamp

Real Time Clock

Factory calibrations stored in microprocessor

Conductivity

Resistivity

TDS

Temperature

pH

ORP

CE

ULTRA-FAST
ULTRA-EASY
ULTRA-POWERFUL

Since 1957, the Myron L Company has designed and manufactured highly reliable analytical instruments for a wide variety of applications. Thousands of professionals around the world rely every day on the performance of our instruments. Demanding uses range from boiler water testing to ultrapure water control to medical instruments for artificial kidney machines.

We are proud of the trust our handheld instruments and monitor/controllers have earned in the past. Our product line has evolved to a new level of outstanding performance and value in analytical instruments: the Ultrameter II series. While priced like affordable single-parameter instruments, the Ultrameter II does the job of three, four or even six instruments.

Accuracy You Can Trust

Both Ultrameter II models deliver performance of ±1% of reading (not merely full scale). This high level of accuracy has been achieved through advanced four-electrode conductivity cell technology, a unique pH/ORP sensor and powerful microprocessor-based circuitry. With displayed values of up to 9999, the full four-digit LCD ensures resolution levels never before possible in such affordable instruments. Factory calibrated with NIST traceable solutions, each Ultrameter II may be supplied with both certification of traceability and NIST traceable solutions for definitive calibration.

Fast and accurate in the laboratory, both Ultrameter II models are rugged enough for daily in-line controller checks in hostile process applications.

Innovative Engineering

The Ultrameter II is a prime example of how high-tech engineering can greatly simplify and streamline a task. Whether in the lab, industrial plant, or in a remote field location, merely:

1. Fill the cell cup
2. Push a parameter key
3. Take the reading

Temperature compensation and range selection are both rapid and automatic. The Ultrameter II is a true one-hand operation instrument.

Easy to Calibrate

All calibrations are quickly accomplished by pressing the ☒ or ☒ keys to agree with our NIST traceable Standard Solution. When calibration is necessary, display prompts simplify pH calibration and make sure the correct buffer is being used. Plus, all parameters (excluding factory-set temperature) have an internal electronic setting that can be used for field calibration and as a check on pH/ORP sensor life.

Advanced Features

- Fully automatic temperature compensation
- User adjustable temperature compensation (up to 9.99%/°C) which also allows TC to be disabled for applications requiring non-compensated readings.
- User adjustable conductivity/TDS conversion ratio for greater accuracy when measuring solutions not contained in the microprocessor.
- Auto-shutoff maximizes the life of the single 9V battery to more than 100 hours/5000 tests.
- Non-volatile microprocessor provides data back-up, even when the battery is changed. This assures all calibrations and memory data will be retained.
- Extended life pH/ORP sensor is user replaceable in the field.

High Performance at a Low Cost

Beyond their affordable purchase price, Ultra-Fast, Ultra-Easy, Ultra-Powerful Ultrameter II's save both time and money. Measure for measure, Ultrameter II's give you a better return on your investment than any other handheld instrument. To see for yourself, contact your distributor or the Myron L Company today.

Multiple Applications

Irrigation Water

Hydroponics

Laboratories

Homeland Security

Reverse Osmosis

Deionization

Wastewater

Cooling Towers

Environmental

Desalination

Fountain Solutions

BENEFITS DESIGNED TO SAVE YOU TIME & MONEY

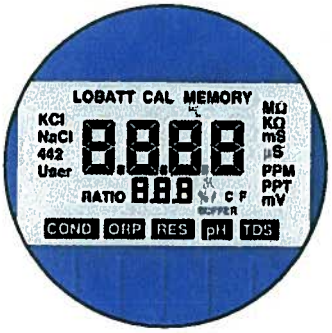
Built-in IR Port allows you to conveniently download your data to a computer. **(Requires Myron L uDock™ Accessory Package)**

Ample memory provides increased flexibility to record and store 100 separate readings.

Real Time Clock with Date & Time Stamp allows you to maintain the integrity of each individual reading.

The advanced four-electrode cell for conductivity/resistivity/TDS eliminates polarization, allowing greater accuracy and stability with minimal maintenance.

The pH/ORP sensor chamber provides protection to a unique porous liquid-junction.



The large capacity KCl reservoir guarantees extended life.

A custom LCD helps simplify calibration and operation by using annunciators and prompts to indicate various conditions.

IP67/NEMA 6 rated Ultrameter II's are waterproof and buoyant and can be fully immersed to 3 feet/1 meter.

Features

Ultrameter II™ Models	4PII Conductivity TDS, Resistivity Temperature	6PII Conductivity, TDS Resistivity, pH ORP, Temperature
Autoranging	•	•
Adjustable Temp. Compensation	•	•
Adjustable Cond/TDS ratio	•	•
Memory (100 readings)	•	•
Date & Time Stamp	•	•
pH Calibration Prompts		•
Low battery indicator	•	•
Auto-off	•	•

Specifications

Display	4 Digit Liquid Crystal Display
Dimensions LxWxH	196 x 68 x 64 mm/ 7.7 x 2.7 x 2.5 inches
Weight	352 g/12.4 oz.
Case/conductivity cell material	VALOX*
Cell capacities	pH/ORP: 1,2 ml/0.04 oz. Cond/TDS/Res: 5 ml/0.2 oz.
Power	9V alkaline battery
Battery life	>100 hours (5000 readings)
Operating/storage temperature	0 – 55°C/32 – 132°F
Protection ratings	IP67/NEMA 6 Waterproof to 1 meter/3 feet

*™GENERAL ELECTRIC

Parameters

	Conductivity	TDS	Resistivity	pH	ORP	Temperature
Ranges	0–9999 µS/cm 10–200 mS/cm in 5 autoranges	0–9999 ppm 10–200 ppt in 5 autoranges	10 KΩ–30 MΩ	0–14 pH	±999 mV	0–71°C 32–160°F
Resolution	0.01(<100 µS) 0.1(<1000 µS) 1.0(<10 mS) 0.01(<100 mS) 0.1(<200 mS)	0.01(<100 ppm) 0.1(<1000 ppm) 1.0(<10 ppt) 0.01(<100 ppt) 0.1(<200 ppt)	0.01(<100 KΩ) 0.1(<1000 KΩ) 0.1(>1 MΩ)	±0.01 pH	±1 mV	0.1°C/F
Accuracy	±1% of reading	±1% of reading	±1% of reading	±0.01 pH	±1 mV	±0.1°C
Auto Temperature Compensation	0–71°C 32–160°F	0–71°C 32–160°F	0–71°C 32–160°F	0–71°C 32–160°F	—	—
Adjustable Temperature Compensation to 25°C	0–9.99%/°C	0–9.99%/°C	0–9.99%/°C	—	—	—
Conductivity/TDS Ratios Preprogrammed	KCl, 442*, NaCl	KCl, 442*, NaCl	—	—	—	—
Adjustable Conductivity/TDS Ratio Factor	0.20–7.99	0.20–7.99	—	—	—	—

*442 Natural Water Standard ™ Myron L Company

Accessories

uDock™ Accessory Package includes uDock™, USB cable and Macintosh/PC application software for downloading data. MODEL: U2CIP

Certificates confirming the NIST traceability of an Ultrameter II are available (must be specified when placing instrument order). MODEL: MC

Conductivity Standard Solutions are necessary to maintain accuracy and for periodic calibration of conductivity/TDS parameters. All Standard Solutions are NIST traceable for your complete confidence. RECOMMENDED VALUES: KCl-7000 (7 mS), 442-3000 (TDS), or NaCl-14.0 (mS) available in 2 oz/59 ml, 1 qt/1 L, and 1 gal/3,8 L.

pH Buffers are necessary to maintain accuracy and for periodic calibration of pH and ORP parameters. Calibration with pH 7 Buffer is especially important. All pH 4, 7, and 10 Buffers are NIST traceable and are available in 2 oz/59 ml, 1 qt/1 L, and 1 gal/3,8 L.

pH Sensor Storage Solution
Available in 2 oz/59 ml, 1 qt/1 L, and 1 gal/3,8 L.
MODEL: SS20Z, SSQ and SSG

Certificate of NIST traceability for pH Buffer or Conductivity Standard Solutions are available (must be specified when placing solution order). MODEL: SC

Hard protective case (small)
MODEL: UPP

Hard protective case (kit) with three buffers (pH 4, 7, and 10), one pH/ORP storage solution, and two standard solutions, (KCl-7000 and 442-3000). All bottles are 2 oz/59 ml.
MODEL: PKU

Soft protective case is constructed of padded Nylon and features a belt clip for hands-free mobility.
MODEL: UCC (Blue)
UCCDT (Desert Tan)

Replacement pH/ORP sensor user-replaceable, features a unique/porous liquid-junction.
MODEL: RPR

Built on Trust

Founded in 1957, Myron L Company is one of the world's leading manufacturers of water quality instruments. Because of our policy of continuous product improvement, changes in design and the specifications in this brochure are possible. You have our assurance any changes will be guided by our product philosophy: Accuracy, Reliability, Simplicity.

Limited Warranty

All Myron L Ultrameter II's have a Two (2) Year Limited Warranty. The pH/ORP sensors have a Six (6) Month Limited Warranty. Warranty is limited to the repair or replacement of the Ultrameter II only, at our discretion. Myron L Company assumes no other responsibility or liability.

MYRON L COMPANY
Water Quality Instrumentation
Accuracy • Reliability • Simplicity

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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

UMIIB 03-08

APPENDIX B

FLUX METER DATA

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
ApacheCanyonSpring_01	ApacheCanyonSpring	Apache	1161067.163	3148102.318	8/15/2013	0	0	0.201944664	A	761.2	24.4	15-08-2013 09:48:27	0	-0.002	0.843999982	0.239270926
Chavez01_01	Chavez01	Chavez	1178749.916	3167116.109	8/15/2013	0	0	0.385255814	A	787.7	35.5	15-08-2013 13:22:09	0	-0.01	1.613999963	0.238696292
Chavez02_01	Chavez02	Chavez	1177560.489	3168222	8/15/2013	0	0	0.243757635	A	788.8	28.0	15-08-2013 12:43:08	0	-0.004	0.995000005	0.244982541
Chavez03_01	Chavez03	Chavez	1178748.963	3169995.489	8/15/2013	0	0	0.220830068	A	787.5	27.7	15-08-2013 11:22:11	0	-0.003	0.90200001	0.244822681
L-1030_01	L-1030	L-1030	1146316.008	3164656.475	8/13/2013	0	0.002110567	0.052529663	A	781.9	38.7	13-08-2013 14:49:28	0	0.009	0.224000007	0.234507412
L-1030_02	L-1030	L-1030	1146262.06	3164660.109	8/13/2013	0	0.001404342	0.315274894	A	781.9	39.3	13-08-2013 14:52:43	0	0.006	1.347000003	0.234057084
L-1030_03	L-1030	L-1030	1146201.391	3164669.175	8/13/2013	0	0.00070087	0.064947292	A	781.7	39.8	13-08-2013 14:55:15	0	0.003	0.277999997	0.233623356
L-1030_04	L-1030	L-1030	1146211.852	3164704.594	8/13/2013	0	0.00023337	0.001633588	A	781.6	40.1	13-08-2013 14:57:51	0	0.001	0.007	0.233369768
L-1030_05	L-1030	L-1030	1146208.148	3164771.606	8/13/2013	0	0	0.113790035	A	781.7	40.4	13-08-2013 15:00:47	0	0	0.488000005	0.233176306
L-1030_06	L-1030	L-1030	1146204.273	3164814.462	8/13/2013	0	0.000233028	0.010253217	A	781.7	40.6	13-08-2013 15:03:28	0	0.001	0.044	0.233027667
L-1030_07	L-1030	L-1030	1146096.793	3164855.494	8/13/2013	0	0.000698994	0.091801159	A	781.6	40.6	13-08-2013 15:06:03	0	0.003	0.393999994	0.232997864
L-1030_08	L-1030	L-1030	1146264.166	3164815.05	8/13/2013	0	0.000465996	0	A	781.6	40.6	13-08-2013 15:09:06	0	0.002	-0.039999999	0.232997864
L-1030_09	L-1030	L-1030	1146252.199	3164754.864	8/13/2013	0	0	0.030548075	A	782.0	40.5	13-08-2013 15:11:54	0	0	0.130999997	0.233191416
L-1030_10	L-1030	L-1030	1146257.364	3164716.241	8/13/2013	0	0	0.121049464	A	781.9	40.4	13-08-2013 15:14:24	0	-0.001	0.518999994	0.23323597
L-1030_11	L-1030	L-1030	1146314.691	3164722.593	8/13/2013	0	0	0	A	782.3	40.3	13-08-2013 15:17:09	0	-0.002	-0.028999999	0.23342973
L-1030_12	L-1030	L-1030	1146308.073	3164763.015	8/13/2013	0	0	0.014004881	A	782.0	40.2	13-08-2013 15:19:45	0	0	0.059999999	0.23341468
L-1030_13	L-1030	L-1030	1146313.017	3164806.915	8/13/2013	0	0.00186863	0.163271561	A	782.3	40.1	13-08-2013 15:22:15	0	0.008	0.699000001	0.233578771
L-1030_14	L-1030	L-1030	1146363.029	3164814.497	8/13/2013	0	0.00140192	0.036917232	A	782.3	40.0	13-08-2013 15:24:32	0	0.006	0.158000007	0.233653352
L-1030_15	L-1030	L-1030	1146354.405	3164759.257	8/13/2013	0	0.002804736	0.291458815	A	782.3	39.9	13-08-2013 15:27:35	0	0.012	1.246999979	0.233727992
L-1030_16	L-1030	L-1030	1146360.572	3164715.095	8/13/2013	0	0.002571829	0.068036579	A	782.3	39.8	13-08-2013 15:30:04	0	0.011	0.291000009	0.233802676
L-1030_17	L-1030	L-1030	1146355.897	3164661.427	8/13/2013	0	0.001402726	0.003273028	A	782.0	39.7	13-08-2013 15:32:34	0	0.006	0.014	0.23378773
L-1030_18	L-1030	L-1030	1146280.626	3164746.323	8/13/2013	0.565298736	0.008416358	2.916969538	A	782.0	39.7	13-08-2013 15:35:33	2.417999983	0.035999998	12.47700024	0.23378773
L-1033_01	L-1033	L-1033	1167778.882	3188859.213	8/13/2013	0	0	1.207083821	A	798.8	27.1	13-08-2013 09:14:23	0	0	4.850999832	0.248831958
L-1033_02	L-1033	L-1033	1167709.552	3188859.186	8/13/2013	0	0.000247841	0.219835341	A	798.8	28.3	13-08-2013 09:19:05	0	0.001	0.887000024	0.247841418
L-1033_03	L-1033	L-1033	1167662.855	3188866.281	8/13/2013	0	0.001481508	0.083705224	A	798.2	29.2	13-08-2013 09:23:02	-0.342000008	0.006	0.338999987	0.246918067
L-1033_04	L-1033	L-1033	1167557.619	3188925.999	8/13/2013	0	0.002213477	0.109444164	A	798.2	30.4	13-08-2013 09:27:12	0	0.009	0.444999993	0.245941937
L-1033_05	L-1033	L-1033	1167475.832	3188787.902	8/13/2013	0	0.000980614	0.066191435	A	798.0	31.3	13-08-2013 09:31:29	0	0.004	0.270000011	0.245153457
L-1033_06	L-1033	L-1033	1167403.294	3188673.271	8/13/2013	0	0.001221754	0.101649962	A	798.0	32.3	13-08-2013 09:35:47	0	0.005	0.416000009	0.244350865
L-1033_07	L-1033	L-1033	1167477.403	3188590.346	8/13/2013	0	0.000243474	0.572650969	A	798.0	33.4	13-08-2013 09:41:58	0	0.001	2.351999998	0.243474051
L-1033_08	L-1033	L-1033	1167599.356	3188522.046	8/13/2013	0	0.00194321	0.445966542	A	798.2	34.2	13-08-2013 09:46:23	0	0.008	1.835999966	0.242901176
L-1033_09	L-1033	L-1033	1167595.76	3188634.272	8/13/2013	0	0.002182509	0.566239893	A	798.7	34.9	13-08-2013 09:51:15	0	0.009	2.335000038	0.24250102
L-1033_10	L-1033	L-1033	1167615.054	3188812.881	8/13/2013	0	0.002661992	0.03847789	A	798.6	35.5	13-08-2013 09:55:49	0	0.011	0.158999994	0.241999313
L-1033_11	L-1033	L-1033	1167665.9	3188813.883	8/13/2013	0	0.000966069	0.082357347	A	798.3	36.0	13-08-2013 09:59:26	0	0.004	0.340999991	0.241517156
L-1033_12	L-1033	L-1033	1167658.802	3188766.92	8/13/2013	0	0.00241205	0.888117015	A	798.3	36.4	13-08-2013 10:02:30	0	0.01	3.681999922	0.241205066
L-1033_13	L-1033	L-1033	1167727.33	3188798.286	8/13/2013	0	0.003131619	0.68221122	A	798.3	36.8	13-08-2013 10:06:04	-0.188999996	0.013	2.832000017	0.240893781
L-1033_14	L-1033	L-1033	1167725.288	3188748.403	8/13/2013	0	0.000240428	0.336118877	A	798.3	37.4	13-08-2013 10:11:14	0	0.001	1.398000002	0.240428373
L-1033_15	L-1033	L-1033	1167747.332	3188760.124	8/13/2013	0	0.000240162	0.090060815	A	798.7	37.9	13-08-2013 10:15:30	0	0.001	0.375	0.240162164
L-1033_16	L-1033	L-1033	1167767.561	3188812.93	8/13/2013	0	0.000959723	0.616861999	A	798.7	38.2	13-08-2013 10:19:12	0	0.004	2.571000099	0.239930764
L-1033_17	L-1033	L-1033	1167704.996	3188500.779	8/13/2013	0	0.005508567	0.701025009	A	798.3	38.6	13-08-2013 10:25:44	0	0.023	2.927000046	0.239502907
L-1033_18	L-1033	L-1033	1167734.695	3188469.876	8/13/2013	0	0.001673393	0.664097965	A	798.6	39.3	13-08-2013 10:36:18	0	0.007	2.778000116	0.239056125
L-1033_19	L-1033	L-1033	1167713.519	3188416.45	8/13/2013	0	0.001672323	0.449854761	A	798.6	39.5	13-08-2013 10:39:47	0	0.007	1.883000016	0.23890321
L-1033_20	L-1033	L-1033	1167726.734	3188367.07	8/13/2013	0	0.004535377	0.902778864	A	798.7	39.8	13-08-2013 10:43:31	0	0.018999999	3.782000065	0.238704085
L-1033_21	L-1033	L-1033	1167760.189	3188364.291	8/13/2013	0	0.004768046	1.0458709	A	798.2	40.0	13-08-2013 10:46:25	0	0.02	4.387000084	0.238402292
L-1033_22	L-1033	L-1033	1167810.625	3188372.291	8/13/2013	0	0.000714254	0.588307023	A	797.9	40.3	13-08-2013 10:51:07	0	0.003	2.470999956	0.238084599
L-1033_23	L-1033	L-1033	1167862.004	3188369.271	8/13/2013	0	0.006418918	0.311674118	A	797.5	40.6	13-08-2013 10:55:15	0	0.027000001	1.31099999	0.2377377
L-1033_24	L-1033	L-1033	1167911.287	3188410.89	8/13/2013	0	0.002140298	0.838045776	A	798.0	40.7	13-08-2013 11:00:00	0	0.009	3.523999929	0.237810954
L-1033_25	L-1033	L-1033	1167972.441	3188417.329	8/13/2013	0	0.004749616	0.787486374	A	797.4	40.9	13-08-2013 11:02:59	0	0.02	3.315999985	0.237480819
L-1033_26	L-1033	L-1033	1167966.59	3188455.052	8/13/2013	0	0.00546169	0.446908683	A	797.6	41.0	13-08-2013 11:05:29	0	0.023	1.881999969	0.237464771
L-1033_27	L-1033	L-1033	1167960.978	3188510.317	8/13/2013	0	0.006884287	0.50492686	A	797.6	41.1	13-08-2013 11:08:24	0	0.028999999	2.127000093	0.237389207
L-1033_28	L-1033	L-1033	1167911.707	3188510.421	8/13/2013	0	0.004273253	0.207015365	A	797.9	41.2	13-08-2013 11:11:10	0	0.017999999	0.871999979	0.237402946
L-1033_29	L-1033	L-1033	1167909.029	3188462.979	8/13/2013	0	0.004982292	1.795523047	A	797.9	41.4	13-08-2013 11:14:10	0	0.021	7.56799984	0.237251997
L-1033_30	L-1033	L-1033	1167873.745	3188504.019	8/13/2013	0	0.002608615	0.081815667	A	797.8	41.5	13-08-2013 11:16:50	0	0.011	0.344999999	0.237146869
L-1033_31	L-1033	L-1033	1167858.524	3188464.725	8/13/2013	0	0.004505488	0.476633221	A	798.0	41.6	13-08-2013 11:19:18	0	0.018999999	2.00999999	0.237130955
L-1033_32	L-1033	L-1033	1167850.38	3188414.088	8/13/2013	0	0.001185506	1.222019792	A	797.9	41.6	13-08-2013 11:22:43	0	0.005	5.153999805	0.237101242
L-1033_33	L-1033	L-1033	1167822.097	3188430.083	8/13/2013	0	0.005216881	2.725583315	A	798.0	41.6	13-08-2013 11:25:33	0	0.022	11.49400043	0.237130955
L-1033_34	L-1033	L-1033	1167815.824	3188448.494	8/13/2013	0	0.004742025	0.655110717	A	797.9	41.6	13-08-2013 11:28:24	0	0.02	2.763000011	0.237101242
L-1033_35	L-1033	L-1033	1167767.135	3188390.182	8/13/2013	0	0.006402536	0.06853085	A	798.0	41.6	13-08-2013 11:32:58	0	0.027000001	0.289000005	0.237130955
L-1033_36	L-1033	L-1033	1167768.757	3188410.032	8/13/2013	0	0.008536714	0.113585725	A	798.0	41.6	13-08-2013 11:35:43	0	0.035999998	0.479000002	0.237130955
L-1033_37	L-1033	L-1033	1167769.611	3188483.202	8/13/2013	0	0.008294313	0.278214961	A	798.0	41.8	13-08-2013 11:42:19	0	0.035	1.174000025	0.236980379

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
L-1033_38	L-1033	L-1033	1167817.268	3188496.452	8/13/2013	0	0.005687529	0.167545125	A	798.0	41.8	13-08-2013 11:45:05	0	0.024	0.707000017	0.236980379
L-1033_39	L-1033	L-1033	1167765.528	3188523.02	8/13/2013	0	0.001895004	0.366683215	A	797.9	41.9	13-08-2013 11:48:09	0	0.008	1.547999978	0.236875474
L-1033_40	L-1033	L-1033	1167259.16	3188843.502	8/13/2013	0	0.003312467	0.024370288	A	798.0	42.3	13-08-2013 11:58:16	-0.052000001	0.014	0.103	0.23660475
Seep_Area_13_L-1026_01	Seep Area 13 L-1026	SA13	1174563.455	3164375.936	8/14/2013	0	0.000237696	0.448770612	A	784.4	35.5	14-08-2013 13:56:25	0	0.001	1.888000011	0.23769629
Seep_Area_13_L-1026_02	Seep Area 13 L-1026	SA13	1174613.506	3164408.834	8/14/2013	0	0.001421572	0.009003289	A	784.4	36.5	14-08-2013 14:00:40	0	0.006	0.037999999	0.236928672
Seep_Area_13_L-1026_03	Seep Area 13 L-1026	SA13	1174636.37	3164477.726	8/14/2013	0	0.004491761	0.008037889	A	784.7	37.3	14-08-2013 14:03:40	0	0.018999999	0.034000002	0.236408502
Seep_Area_13_L-1026_04	Seep Area 13 L-1026	SA13	1174642.36	3164525.272	8/14/2013	0	0.004718134	0.293939799	A	784.8	38.0	14-08-2013 14:06:54	0	0.02	1.246000051	0.23590672
Seep_Area_13_L-1026_05	Seep Area 13 L-1026	SA13	1174573.716	3164537.957	8/14/2013	0	0.005650864	0.642079473	A	784.8	38.6	14-08-2013 14:10:00	0	0.024	2.726999998	0.235452682
Seep_Area_13_L-1026_06	Seep Area 13 L-1026	SA13	1174525.359	3164539.767	8/14/2013	0	0.003998586	0.238268644	A	785.0	39.0	14-08-2013 14:12:54	0	0.017000001	1.013000011	0.235210896
Seep_Area_13_L-1026_07	Seep Area 13 L-1026	SA13	1174486.221	3164532.781	8/14/2013	0	0.002585165	0.178846404	A	785.1	39.3	14-08-2013 14:15:34	0	0.011	0.760999978	0.23501499
Seep_Area_13_L-1026_08	Seep Area 13 L-1026	SA13	1174479.461	3164500.263	8/14/2013	0	0.003052852	0.206889391	A	785.0	39.5	14-08-2013 14:18:05	0	0.013	0.880999982	0.234834731
Seep_Area_13_L-1026_09	Seep Area 13 L-1026	SA13	1174524.547	3164492.112	8/14/2013	0	0.003753997	0.154148504	A	784.8	39.7	14-08-2013 14:21:36	0	0.016000001	0.657000005	0.234624818
Seep_Area_13_L-1026_10	Seep Area 13 L-1026	SA13	1174557.439	3164418.238	8/14/2013	0	0.003286003	2.103746176	A	785.1	39.7	14-08-2013 14:24:43	0	0.014	8.963000298	0.234714508
Seep_Area_13_L-1026_11	Seep Area 13 L-1026	SA13	1174494.694	3164413.032	8/14/2013	0	0.002112161	0.763898432	A	785.0	39.7	14-08-2013 14:28:32	0	0.009	3.255000114	0.234684601
Seep_Area_13_L-1026_12	Seep Area 13 L-1026	SA13	1174477.252	3164400.026	8/14/2013	0	0.003051289	0.248327941	A	785.1	39.7	14-08-2013 14:31:25	0	0.013	1.057999969	0.234714508
Seep_Area_13_L-1026_13	Seep Area 13 L-1026	SA13	1174434.643	3164405.329	8/14/2013	0	0.003286003	0.47717458	A	785.1	39.7	14-08-2013 14:34:41	0	0.014	2.032999992	0.234714508
Seep_Area_13_L-1026_14	Seep Area 13 L-1026	SA13	1174375.696	3164286.847	8/14/2013	0	0.00281568	0.33952412	A	784.6	39.6	14-08-2013 14:37:53	0	0.012	1.447000027	0.234640032
Seep_Area_13_L-1026_15	Seep Area 13 L-1026	SA13	1174316.907	3164285.87	8/14/2013	0	0.003518931	0.385205656	A	784.2	39.5	14-08-2013 14:41:33	0	0.015	1.64199996	0.234595418
Seep_Area_13_L-1026_16	Seep Area 13 L-1026	SA13	1174278.245	3164294.876	8/14/2013	0	0.002577754	0.21981214	A	783.1	39.4	14-08-2013 14:44:38	0	0.011	0.938000023	0.234341294
Seep_Area_13_L-1026_17	Seep Area 13 L-1026	SA13	1174234.028	3164298.11	8/14/2013	0	0.002109477	0.401503861	A	783.0	39.3	14-08-2013 14:47:35	0	0.009	1.713000059	0.23438637
Seep_Area_13_L-1026_18	Seep Area 13 L-1026	SA13	1174202.577	3164243.145	8/14/2013	0	0.00070262	1.073135376	A	782.4	39.3	14-08-2013 14:51:16	0	0.003	4.581999779	0.234206766
Seep_Area_13_L-1026_19	Seep Area 13 L-1026	SA13	1174219.594	3164192.492	8/14/2013	0	0.000702755	0.342007637	A	782.3	39.2	14-08-2013 14:55:22	0	0.003	1.460000038	0.234251797
Seep_Area_13_L-1026_20	Seep Area 13 L-1026	SA13	1174241.074	3164228.075	8/14/2013	0	0.002110289	0.33788076	A	782.8	39.1	14-08-2013 14:58:21	0	0.009	1.440999985	0.234476581
Seep_Area_13_L-1026_21	Seep Area 13 L-1026	SA13	1174278.303	3164240.667	8/14/2013	0	0.00211002	0.411922723	A	782.7	39.1	14-08-2013 15:01:38	0	0.009	1.756999969	0.23444663
Seep_Area_13_L-1026_22	Seep Area 13 L-1026	SA13	1174270.93	3164194.326	8/14/2013	0	0.001875573	0.257187963	A	782.7	39.1	14-08-2013 15:05:06	0	0.008	1.097000003	0.23444663
Seep_Area_13_L-1026_23	Seep Area 13 L-1026	SA13	1174323.618	3164233.247	8/14/2013	0	0.006570377	0.9773435	A	783.4	39.1	14-08-2013 15:07:50	0	0.028000001	4.164999962	0.234656304
Seep_Area_13_L-1026_24	Seep Area 13 L-1026	SA13	1174309.933	3164204.598	8/14/2013	0	0.004459608	0.268280625	A	783.6	39.1	14-08-2013 15:10:23	0	0.018999999	1.143000007	0.234716207
Seep_Area_13_L-1026_25	Seep Area 13 L-1026	SA13	1174333.249	3164141.471	8/14/2013	0	0.002816235	0.180943117	A	783.5	39.1	14-08-2013 15:14:28	0	0.012	0.771000028	0.234686255
Seep_Area_13_L-1026_26	Seep Area 13 L-1026	SA13	1174332.561	3164099.711	8/14/2013	0	0.003288543	0.150803193	A	784.2	39.1	14-08-2013 15:17:40	0	0.014	0.64200002	0.23489593
Seep_Area_13_L-1026_27	Seep Area 13 L-1026	SA13	1174319.184	3164053.034	8/14/2013	0	0.003757611	0.343586564	A	784.3	39.2	14-08-2013 15:20:19	0	0.016000001	1.463000059	0.234850675
Seep_Area_13_L-1026_28	Seep Area 13 L-1026	SA13	1174375.565	3164049.182	8/14/2013	0	0.002583028	0.177994117	A	784.2	39.2	14-08-2013 15:23:02	0	0.011	0.758000016	0.234820738
Seep_Area_13_L-1026_29	Seep Area 13 L-1026	SA13	1174380.792	3164093.254	8/14/2013	0	0.005164403	0.624188483	A	784.2	39.3	14-08-2013 15:25:39	0	0.022	2.65899992	0.234745577
Seep_Area_13_L-1026_30	Seep Area 13 L-1026	SA13	1174370.086	3164148.777	8/14/2013	0	0.002815504	0.180426866	A	784.3	39.5	14-08-2013 15:28:20	-0.012	0.012	0.768999994	0.234625325
Seep_Area_13_L-1026_31	Seep Area 13 L-1026	SA13	1174361.736	3164198.411	8/14/2013	0	0.002812269	0.282633036	A	783.9	39.7	14-08-2013 15:30:58	0	0.012	1.20599997	0.234355748
Seep_Area_13_L-1026_32	Seep Area 13 L-1026	SA13	1174370.94	3164235.81	8/14/2013	0	0.003748494	0.473013073	A	783.9	39.8	14-08-2013 15:33:24	0	0.016000001	2.019000053	0.234280869
Seep_Area_13_L-1026_33	Seep Area 13 L-1026	SA13	1174430.883	3164243.641	8/14/2013	0	0.008434643	1.499726415	A	784.2	39.9	14-08-2013 15:36:06	-0.017000001	0.035999998	6.401000023	0.234295651
Seep_Area_13_L-1026_34	Seep Area 13 L-1026	SA13	1174450.586	3164235.112	8/14/2013	0	0.004686806	0.077566646	A	784.6	40.0	14-08-2013 15:38:18	0	0.02	0.331	0.23434031
Seep_Area_13_L-1026_35	Seep Area 13 L-1026	SA13	1174425.695	3164189.682	8/14/2013	0	0.003278881	0.363721579	A	784.4	40.1	14-08-2013 15:41:02	-0.025	0.014	1.552999973	0.234205782
Seep_Area_13_L-1026_36	Seep Area 13 L-1026	SA13	1174428.925	3164136.029	8/14/2013	0	0.005384327	0.630668581	A	784.3	40.2	14-08-2013 15:43:43	0	0.023	2.694000006	0.234101191
Seep_Area_13_L-1026_37	Seep Area 13 L-1026	SA13	1174427.876	3164088.267	8/14/2013	0	0.001404607	0.041904114	A	784.3	40.2	14-08-2013 15:46:12	0	0.006	0.179000005	0.234101191
Seep_Area_13_L-1026_38	Seep Area 13 L-1026	SA13	1174439.426	3164048.131	8/14/2013	0	0.002808856	0.414306283	A	784.2	40.2	14-08-2013 15:49:07	0	0.012	1.769999981	0.234071344
Seep_Area_13_L-1026_39	Seep Area 13 L-1026	SA13	1174501.967	3164213.213	8/14/2013	0	0.00140407	0.066225298	A	784.0	40.2	14-08-2013 15:52:03	0	0.006	0.282999992	0.23401165
Seep_Area_13_L-1026_40	Seep Area 13 L-1026	SA13	1174540.071	3164222.549	8/14/2013	0	0.004213284	0.482186943	A	784.2	40.2	14-08-2013 15:54:26	0	0.017999999	2.059999943	0.234071344
Seep_Area_13_L-1026_41	Seep Area 13 L-1026	SA13	1174560.019	3164266.056	8/14/2013	0	0.006321944	0.565228641	A	784.2	40.1	14-08-2013 15:56:48	0	0.027000001	2.414000034	0.234146073
Seep_Area_13_L-1026_42	Seep Area 13 L-1026	SA13	1174558.832	3164313.699	8/14/2013	0	0.002108256	0.149686202	A	784.3	40.0	14-08-2013 15:59:03	0	0.009	0.638999999	0.234250709
Seep_Area_13_L-1026_43	Seep Area 13 L-1026	SA13	1174617.309	3164362.778	8/14/2013	0	0.003046232	0.064908177	A	784.3	39.9	14-08-2013 16:02:05	0	0.013	0.27700001	0.234325528
Seep_Area_13_L-1026_44	Seep Area 13 L-1026	SA13	1174615.72	3164317.404	8/14/2013	0	0.001875442	1.06196928	A	784.4	39.8	14-08-2013 16:04:41	0	0.008	4.53000021	0.234430298
Seep_Area_13_L-1026_45	Seep Area 13 L-1026	SA13	1174608.509	3164262.307	8/14/2013	0	0.002814604	0.227044702	A	784.3	39.6	14-08-2013 16:07:52	0	0.012	0.967999995	0.234550312
Seep_Area_13_L-1026_46	Seep Area 13 L-1026	SA13	1174613.259	3164211.144	8/14/2013	0	0.003047407	0.304975122	A	783.6	39.5	14-08-2013 16:10:24	0	0.013	1.300999999	0.234415919
Seep_Area_13_L-1026_47	Seep Area 13 L-1026	SA13	1174649.913	3164260.216	8/14/2013	0	0.004689818	0.574971676	A	783.6	39.4	14-08-2013 16:13:14	0	0.02	2.451999903	0.234490916
Seep_Area_13_L-1026_48	Seep Area 13 L-1026	SA13	1174654.241	3164313.895	8/14/2013	0	0.002815869	0.075324506	A	783.9	39.3	14-08-2013 16:16:26	0	0.012	0.32100001	0.234655768
Seep_Area_13_L-1026_49	Seep Area 13 L-1026	SA13	1174650.305	3164364.268	8/14/2013	0	0.002347755	0.14250873	A	784.3	39.3	14-08-2013 16:19:39	0	0.01	0.606999993	0.234775513
Seep_Area_13_L-1026_50	Seep Area 13 L-1026	SA13	1174522.432	3164343.384	8/14/2013	0	0.002817665	1.006141305	A	784.4	39.3	14-08-2013 16:24:01	0	0.012	4.284999847	0.23480545
Seep_Area_13_L-1026_51	Seep Area 13 L-1026	SA13	1174515.433	3164368.709	8/14/2013	0	0.002817665	0.527373075	A	784.4	39.3	14-08-2013 16:26:31	0	0.012	2.246000051	0.23480545
Seep_Area_13_L-1026_52	Seep Area 13 L-1026	SA13	1174497.605	3164369.55	8/14/2013	0	0.003052471	0.436972916	A	784.4	39.3	14-08-2013 16:28:44	0	0.013	1.860999942	0.23480545
Seep_Area_13_L-1026_53	Seep Area 13 L-1026	SA13	1174480.254	3164341.617	8/14/2013	0	0.003288115	0.189536318	A	784.6	39.3	14-08-2013 16:31:17	0	0.014	0.806999981	0.234865323
Seep_Area_13_L-1026_54	Seep Area 13 L-1026	SA13	1174510.179	3164317.272	8/14/2013	0	0.003756643	0.487659186	A	784.6	39.4	14-08-2013 16:33:47	0	0.016000001	2.076999903	0.234790176
Seep_Area_13_L-1026_55	Seep Area 13 L-1026	SA13	1174524.252	3164282.285	8/14/2013	0	0.003287063	0.007278495	A	784.6	39.4	14-08-2013 16:36:26	0	0.014	0.030999999	0.234790176
Seep_Area_13_L-1026_56	Seep Area 13 L-1026	SA13	1174499.951	3164264.393	8/14/2013	0	0.003051494	0.244354263	A	784.4	39.4	14-08-2013 16:39:06	0	0.013	1.041000009	0.234730318

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
Seep_Area_13_L-1026_57	Seep Area 13 L-1026	SA13	1174471.084	3164240.124	8/14/2013	0	0.00258286	0.448478401	A	784.4	39.3	14-08-2013 16:41:47	0	0.011	1.909999967	0.23480545
Seep_Area_13_L-1026_58	Seep Area 13 L-1026	SA13	1174465.794	3164289.8	8/14/2013	0	0.003756887	0.342815965	A	784.4	39.3	14-08-2013 16:44:20	0	0.016000001	1.460000038	0.23480545
Seep_Area_13_L-1026_59	Seep Area 13 L-1026	SA13	1174449.04	3164303.796	8/14/2013	0	0.003053638	0.398382336	A	784.7	39.3	14-08-2013 16:46:44	0	0.013	1.69599998	0.234895244
Seep_Area_13_L-1026_60	Seep Area 13 L-1026	SA13	1174423.009	3164281.408	8/14/2013	0	0.001878444	0.087817244	A	784.4	39.3	14-08-2013 16:49:19	-0.01	0.008	0.374000013	0.23480545
Seep_Area_13_L-1026_61	Seep Area 13 L-1026	SA13	1174419.513	3164328.996	8/14/2013	0	0.002113249	0.389307439	A	784.4	39.3	14-08-2013 16:52:02	0	0.009	1.657999992	0.23480545
Seep_Area_14_01	SeepArea14	SA14	1168900.952	3156460.573	8/14/2013	0	0	0	A	774.9	21.5	14-08-2013 09:56:38	0	-0.002	-0.109999999	0.24597463
Seep_Area_14_02	SeepArea14	SA14	1168913.712	3156416.965	8/14/2013	0	0.00171368	0.665152729	A	774.9	22.9	14-08-2013 10:00:29	0	0.007	2.717000008	0.244811445
Seep_Area_14_03	SeepArea14	SA14	1168900.303	3156355.974	8/14/2013	0.431306928	0.000486802	0.172814846	A	774.6	24.5	14-08-2013 10:04:59	1.771999955	0.002	0.709999979	0.2434012
Seep_Area_14_04	SeepArea14	SA14	1168907.13	3156310.699	8/14/2013	0.328766137	0.000725753	0.492302507	A	773.5	25.9	14-08-2013 10:08:48	1.358999968	0.003	2.035000086	0.241917685
Seep_Area_14_05	SeepArea14	SA14	1168914.74	3156242.782	8/14/2013	0	0.001203952	0.514809906	A	773.5	27.3	14-08-2013 10:13:01	0	0.005	2.138000011	0.240790427
Seep_Area_14_06	SeepArea14	SA14	1168867.272	3156228.138	8/14/2013	0	0.000239961	0.130058661	A	773.4	28.3	14-08-2013 10:16:00	0	0.001	0.541999996	0.239960626
Seep_Area_14_07	SeepArea14	SA14	1168860.28	3156299.576	8/14/2013	0.279729098			A	773.9	29.6	14-08-2013 10:20:58	1.169999957			0.239084706
Seep_Area_14_08	SeepArea14	SA14	1168859.467	3156347.152	8/14/2013	0	0.00071208	0.032280944	A	773.9	31.8	14-08-2013 10:29:31	0	0.003	0.136000007	0.237359881
Seep_Area_14_09	SeepArea14	SA14	1168816.908	3156342.098	8/14/2013	0	0.001184999	0.406217784	A	774.5	32.5	14-08-2013 10:32:43	0	0.005	1.713999987	0.236999884
Seep_Area_14_10	Seep Area 14	SA14	1168817.104	3156282.907	8/14/2013	0	0	0.68881011	A	774.3	34.8	14-08-2013 10:48:26	0	-0.001	2.928999901	0.235169053
Seep_Area_14_11	Seep Area 14	SA14	1168836.097	3156216.575	8/14/2013	0	0.000234468	0.010785546	A	774.5	35.8	14-08-2013 10:54:17	0	0.001	0.046	0.2344684
Seep_Area_14_12	Seep Area 14	SA14	1168824.672	3156411.577	8/14/2013	0	0	0	A	774.0	36.4	14-08-2013 10:58:46	0	-0.003	-0.07	0.233862862
Seep_Area_14_13	Seep Area 14	SA14	1168867.91	3156409.038	8/14/2013	0	0.000234089	0.00304316	A	775.5	36.7	14-08-2013 11:01:48	0	0.001	0.013	0.234089226
Seep_Area_14_14	Seep Area 14	SA14	1168964.424	3156519.664	8/14/2013	0	0.001869094	0.124995694	A	775.5	37.3	14-08-2013 11:07:32	0	0.008	0.535000026	0.233636796
Seep_Area_14_15	Seep Area 14	SA14	1168968.076	3156456.012	8/14/2013	0	0.000233336	0.075600915	A	775.5	37.7	14-08-2013 11:11:00	0	0.001	0.324000001	0.233336151
Seep_Area_14_16	Seep Area 14	SA14	1168972.582	3156407.461	8/14/2013	0	0.000698792	0.154899001	A	774.9	38.0	14-08-2013 11:13:43	0	0.003	0.665000021	0.232930824
Seep_Area_14_17	Seep Area 14	SA14	1168953.931	3156362.015	8/14/2013	0	0	0	A	774.5	38.3	14-08-2013 11:16:55	0	-0.003	-0.107000001	0.232586339
Seep_Area_14_18	Seep Area 14	SA14	1168968.72	3156304.361	8/14/2013	0	0	0.019981846	A	774.2	38.5	14-08-2013 11:20:03	0	-0.003	0.086000003	0.232347041
Seep_Area_14_19	Seep Area 14	SA14	1168976.402	3156242.927	8/14/2013	0	0.000231884	0.02550721	A	773.4	38.8	14-08-2013 11:23:27	0	0.001	0.109999999	0.231883734
Seep_Area_14_20	Seep Area 14	SA14	1169003.844	3156352.567	8/14/2013	0	0.000926701	0.108424008	A	773.2	39.0	14-08-2013 11:26:59	0	0.004	0.467999995	0.231675237
Seep_Area_14_21	Seep Area 14	SA14	1169000.897	3156414.999	8/14/2013	0	0.004636527	0.563337982	A	774.2	39.2	14-08-2013 11:30:26	0	0.02	2.430000067	0.231826335
Seep_Area_14_22	Seep Area 14	SA14	1169004.349	3156456.071	8/14/2013	0	0.000463595	0.026656736	A	774.6	39.4	14-08-2013 11:33:25	0	0.002	0.115000002	0.231797695
Seep_Area_14_23	Seep Area 14	SA14	1169011.637	3156509.199	8/14/2013	0	0.000695397	0.089242607	A	775.1	39.6	14-08-2013 11:36:31	0	0.003	0.38499999	0.231798992
Seep_Area_14_24	Seep Area 14	SA14	1169013.126	3156588.017	8/14/2013	0	0.001391426	0.332318813	A	775.7	39.7	14-08-2013 11:39:16	0	0.006	1.432999969	0.231904268
Seep_Area_14_25	Seep Area 14	SA14	1169039.585	3156655.301	8/14/2013	0	0.00115945	0.206150144	A	775.9	39.8	14-08-2013 11:42:26	0	0.005	0.888999999	0.231889933
Seep_Area_14_26	Seep Area 14	SA14	1169101.298	3156671.811	8/14/2013	0	0.001855598	0.126180649	A	776.1	39.8	14-08-2013 11:45:03	0	0.008	0.54400003	0.231949717
Seep_Area_14_27	Seep Area 14	SA14	1169154.453	3156663.253	8/14/2013	0	0.00023189	0	A	775.9	39.8	14-08-2013 11:48:35	0	0.001	-0.001	0.231889933
Seep_Area_14_28	Seep Area 14	SA14	1169107.831	3156617.355	8/14/2013	0	0.001158852	0.316830128	A	775.5	39.8	14-08-2013 11:51:10	0	0.005	1.366999984	0.231770396
Seep_Area_14_29	Seep Area 14	SA14	1169114.02	3156558.592	8/14/2013	0	0.001390264	0.068818048	A	775.3	39.8	14-08-2013 11:53:45	0	0.006	0.296999991	0.231710613
Seep_Area_14_30	Seep Area 14	SA14	1169109.265	3156519.25	8/14/2013	0	0.000463063	0.313030332	A	774.7	39.8	14-08-2013 11:56:17	0	0.002	1.351999998	0.231531307
Seep_Area_14_31	Seep Area 14	SA14	1169063.602	3156508.351	8/14/2013	0	0.000463003	0.188210651	A	774.6	39.8	14-08-2013 11:59:31	0	0.002	0.813000023	0.231501415
Seep_Area_14_32	Seep Area 14	SA14	1169058.515	3156454.542	8/14/2013	0	0.003472073	0.287256181	A	774.5	39.8	14-08-2013 12:02:27	0	0.015	1.241000056	0.231471524
Seep_Area_14_33	Seep Area 14	SA14	1169052.666	3156412.011	8/14/2013	0	0.001849986	0.21714206	A	774.0	39.9	14-08-2013 12:04:57	0	0.008	0.93900001	0.2312482
Seep_Area_14_34	Seep Area 14	SA14	1169167.64	3156510.137	8/14/2013	0	0.000694013	0.126310453	A	774.3	39.9	14-08-2013 12:08:22	0	0.003	0.546000004	0.23133783
Seep_Area_14_35	Seep Area 14	SA14	1169180.29	3156562.997	8/14/2013	0	0.000925534	0.050904352	A	774.7	40.0	14-08-2013 12:11:19	0	0.004	0.219999999	0.231383428
Seep_Area_14_36	Seep Area 14	SA14	1169169.81	3156624.325	8/14/2013	0	0.001389376	0.001620938	A	775.3	40.0	14-08-2013 12:13:58	0	0.006	0.007	0.231562629
Seep_Area_14_37	Seep Area 14	SA14	1169214.559	3156674.053	8/14/2013	0	0.000463245	0	A	775.5	40.0	14-08-2013 12:16:55	0	0.002	-0.017999999	0.231622368
Seep_Area_14_38	Seep Area 14	SA14	1169218.07	3156624.224	8/14/2013	0	0	0	A	775.1	40.0	14-08-2013 12:19:38	0	-0.002	-0.128999993	0.231502891
Seep_Area_14_39	Seep Area 14	SA14	1169227.454	3156560.787	8/14/2013	0	0	0.023144318	A	774.9	40.0	14-08-2013 12:23:00	0	0	0.100000001	0.231443167
Seep_Area_14_40	Seep Area 14	SA14	1169223.484	3156510.534	8/14/2013	0	0.000925232	0.090904027	A	774.2	39.9	14-08-2013 12:25:55	0	0.004	0.393000007	0.231307954
Seep_Area_14_41	Seep Area 14	SA14	1169277.325	3156568.621	8/14/2013	0	0.000925351	0.151988953	A	774.3	39.9	14-08-2013 12:28:37	0	0.004	0.657000005	0.23133783
Seep_Area_14_42	Seep Area 14	SA14	1169264.076	3156612.162	8/14/2013	0	0.001619992	0.040731233	A	774.6	39.9	14-08-2013 12:31:17	0	0.007	0.175999999	0.231427461
Seep_Area_14_43	Seep Area 14	SA14	1169269.158	3156653.096	8/14/2013	0	0.00162062	0.063435681	A	774.9	39.9	14-08-2013 12:34:02	0	0.007	0.273999989	0.231517091
Seep_Area_14_44	Seep Area 14	SA14	1169314.322	3156723.937	8/14/2013	0	0.000463242	0.206142664	A	775.0	39.8	14-08-2013 12:37:38	0	0.002	0.889999986	0.231620967
Seep_Area_14_45	Seep Area 14	SA14	1169329.041	3156660.767	8/14/2013	0	0.001158475	0.117005974	A	775.0	39.7	14-08-2013 12:41:18	0	0.005	0.504999995	0.231694996
Seep_Area_14_46	Seep Area 14	SA14	1169316.161	3156598.614	8/14/2013	0	0.000694816	0.047015876	A	774.7	39.7	14-08-2013 12:45:02	0	0.003	0.202999994	0.231605306
Seep_Area_14_47	Seep Area 14	SA14	1169314.395	3156554.638	8/14/2013	0	0.000462792	0.009024446	A	774.0	39.7	14-08-2013 12:47:52	0	0.002	0.039000001	0.231396034
Seep_Area_14_48	Seep Area 14	SA14	1169373.182	3156563.573	8/14/2013	0	0.003008722	0.500604987	A	773.9	39.6	14-08-2013 12:50:28	0	0.013	2.163000107	0.231440112
Seep_Area_14_49	Seep Area 14	SA14	1169378.172	3156606.53	8/14/2013	0	0.00231396	0.108987533	A	774.0	39.7	14-08-2013 12:53:26	0	0.01	0.470999986	0.231396034
Seep_Area_14_50	Seep Area 14	SA14	1169366.79	3156661.604	8/14/2013	0	0.001157877	0	A	774.6	39.7	14-08-2013 12:55:58	0	0.005	-0.059999999	0.231575415
Seep_Area_14_51	Seep Area 14	SA14	1169353.519	3156709.99	8/14/2013	0	0.000694863	0.056052275	A	775.0	39.8	14-08-2013 12:58:40	0	0.003	0.241999999	0.231620967
Seep_Area_14_52	Seep Area 14	SA14	1169390.273	3156710.547	8/14/2013	0	0.003008945	1.358191609	A	774.7	39.9	14-08-2013 13:01:32	0	0.013	5.868000031	0.231457338
Seep_Area_14_53	Seep Area 14	SA14	1169414.838	3156649.145	8/14/2013	0	0.002313096	0.250045627	A	774.7	40.1	14-08-2013 13:04:20	0	0.01	1.08099997	0.231309563
Seep_Area_14_54	Seep Area 14	SA14	1169467.24	3156666.038	8/14/2013	0	0.000924465	0.063325882	A	774.3	40.2	14-08-2013 13:07:09	0	0.004	0.273999989	0.231116354

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
Seep_Area_14_55	Seep Area 14	SA14	1169469.727	3156614.512	8/14/2013	0	0.001617089	0.118509553	A	774.2	40.3	14-08-2013 13:09:39	0	0.007	0.513000011	0.231012776
Seep_Area_14_56	Seep Area 14	SA14	1169479.588	3156551.342	8/14/2013	0	0.001615739	0.181885988	A	773.8	40.4	14-08-2013 13:12:13	0	0.007	0.787999988	0.230819792
Seep_Area_14_57	Seep Area 14	SA14	1169415.708	3156615.663	8/14/2013	0	0.000923104	0	A	773.9	40.5	14-08-2013 13:15:00	0	0.004	-0.050999999	0.230776012
Seep_Area_14_58	Seep Area 14	SA14	1169426.385	3156556.822	8/14/2013	0	0.000923223	0.102016173	A	774.0	40.5	14-08-2013 13:18:18	0	0.004	0.442000002	0.230805829
SeepArea_5_01	SeepArea 5	SA05	1172619.083	3176608.278	8/19/2013	0	0.00049203	0.10111209	A	786.6	25.9	19-08-2013 10:41:25	0	0.002	0.411000013	0.246014804
SeepArea_5_02	SeepArea 5	SA05	1172670.315	3176600.407	8/19/2013	0	0.001716583	0.565491319	A	786.7	26.9	19-08-2013 10:44:46	0	0.007	2.305999994	0.24522607
SeepArea_5_03	SeepArea 5	SA05	1172706.038	3176596.973	8/19/2013	0	0.002196784	0.524787426	A	786.7	28.3	19-08-2013 10:49:38	-0.054000001	0.009	2.150000095	0.244087175
SeepArea_5_04	SeepArea 5	SA05	1172701.871	3176574.886	8/19/2013	0	0.00584095	0.437341154	A	787.0	29.3	19-08-2013 10:52:50	0	0.024	1.797000051	0.243372917
SeepArea_5_05	SeepArea 5	SA05	1172662.503	3176549.12	8/19/2013	0	0.000969521	0.134036317	A	786.9	30.5	19-08-2013 10:57:19	0	0.004	0.552999973	0.242380336
SeepArea_5_06	SeepArea 5	SA05	1172658.469	3176507.71	8/19/2013	0	0.003139571	0.780545652	A	786.9	31.6	19-08-2013 11:00:51	0	0.013	3.232000113	0.241505459
SeepArea_5_07	SeepArea 5	SA05	1172716.579	3176506.05	8/19/2013	0	0.002167858	0.258216023	A	786.9	32.4	19-08-2013 11:04:53	0	0.009	1.072000027	0.240873143
SeepArea_5_08	SeepArea 5	SA05	1172754.142	3176595.487	8/19/2013	0	0.000479237	0.869095922	A	786.9	34.0	19-08-2013 11:11:08	0	0.002	3.627000093	0.239618391
SeepArea_5_09	SeepArea 5	SA05	1172752.62	3176557.901	8/19/2013	0	0.005733636	0.301493675	A	787.1	35.0	19-08-2013 11:15:01	0	0.024	1.261999965	0.238901481
SeepArea_5_10	SeepArea 5	SA05	1172754.529	3176490.735	8/19/2013	0	0.003571477	0.642865837	A	787.0	36.0	19-08-2013 11:19:43	0	0.015	2.700000048	0.238098457
SeepArea_5_11	SeepArea 5	SA05	1172757.514	3176453.796	8/19/2013	0	0.003328419	0.572012544	A	787.1	36.5	19-08-2013 11:22:28	0	0.014	2.405999899	0.237744197
SeepArea_5_12	SeepArea 5	SA05	1172757.236	3176401.943	8/19/2013	0	0.002610639	0.361454785	A	787.0	37.0	19-08-2013 11:25:14	0	0.011	1.523000002	0.237330779
SeepArea_5_13	SeepArea 5	SA05	1172755.351	3176350.867	8/19/2013	0	0.004738976	0.31608969	A	787.0	37.5	19-08-2013 11:28:37	0	0.02	1.333999991	0.236948788
SeepArea_5_14	SeepArea 5	SA05	1172774.329	3176326.048	8/19/2013	0	0.003787012	0.204972029	A	787.4	38.0	19-08-2013 11:31:46	-0.017000001	0.016000001	0.865999997	0.236688256
SeepArea_5_15	SeepArea 5	SA05	1172792.469	3176292.124	8/19/2013	0	0.003543491	0.40372172	A	787.4	38.6	19-08-2013 11:35:12	0	0.015	1.708999991	0.236232728
SeepArea_5_16	SeepArea 5	SA05	1172763.187	3176245.991	8/19/2013	0	0.001650453	0.215501949	A	787.4	39.2	19-08-2013 11:39:02	0	0.007	0.913999975	0.235778943
SeepArea_5_17	SeepArea 5	SA05	1172754.464	3176213.53	8/19/2013	0	0.002823379	0	A	787.5	39.9	19-08-2013 11:43:09	0	0.012	-0.119000003	0.235281602
SeepArea_5_18	SeepArea 5	SA05	1172710.843	3176354.533	8/19/2013	0	0.004695133	0.172546148	A	787.5	40.6	19-08-2013 11:48:15	0	0.02	0.735000014	0.234756663
SeepArea_5_19	SeepArea 5	SA05	1172701.089	3176298.971	8/19/2013	0	0.022707714	0.294029772	A	787.3	41.4	19-08-2013 11:53:43	0	0.097000003	1.256000042	0.234100133
SeepArea_5_20	SeepArea 5	SA05	1172697.833	3176260.593	8/19/2013	0	0.006083509	0.035331145	A	787.4	41.6	19-08-2013 11:56:24	-0.01	0.026000001	0.150999993	0.233981103
SeepArea_5_21	SeepArea 5	SA05	1172664.555	3176312.968	8/19/2013	0	0.004441971	0.292001188	A	787.5	41.9	19-08-2013 11:59:18	0	0.018999999	1.248999953	0.233787984
SeepArea_5_22	SeepArea 5	SA05	1172693.524	3176201.521	8/19/2013	0	0.005603085	0.29976508	A	787.4	42.3	19-08-2013 12:02:52	0	0.024	1.284000039	0.233461887
SeepArea_5_23	SeepArea 5	SA05	1172611.721	3176361.378	8/19/2013	0	0.002799771	0.032664001	A	787.9	42.7	19-08-2013 12:07:02	-0.254000008	0.012	0.140000001	0.233314291
SeepArea_5_24	SeepArea 5	SA05	1172571.822	3176349.001	8/19/2013	0	0.003955808	0.538222551	A	787.3	43.3	19-08-2013 12:12:19	0	0.017000001	2.312999964	0.232694581
SeepArea_5_25	SeepArea 5	SA05	1172502.569	3176347.97	8/19/2013	0	0.003486442	0.283331513	A	786.9	43.5	19-08-2013 12:15:10	0	0.015	1.218999982	0.23242946
SeepArea_5_26	SeepArea 5	SA05	1172465.102	3176316.927	8/19/2013	0	0.009747196	0.706207573	A	786.2	43.7	19-08-2013 12:17:52	0	0.041999999	3.042999983	0.232076108
SeepArea_5_27	SeepArea 5	SA05	1172454.027	3176259.251	8/19/2013	0	0.006259713	0.247374579	A	785.9	43.9	19-08-2013 12:20:16	0	0.027000001	1.067000031	0.231841207
SeepArea_5_28	SeepArea 5	SA05	1172414.893	3176244.164	8/19/2013	0	0.004633312	0.058379728	A	785.8	44.1	19-08-2013 12:22:41	0	0.02	0.252000004	0.231665581
SeepArea_5_29	SeepArea 5	SA05	1172469.987	3176197.736	8/19/2013	0	0.002316375	0.305066556	A	786.2	44.3	19-08-2013 12:25:34	0	0.01	1.317000031	0.231637478
SeepArea_5_30	SeepArea 5	SA05	1172457.574	3176147.773	8/19/2013	0	0.003010339	0.212807804	A	786.2	44.4	19-08-2013 12:28:12	0	0.013	0.91900003	0.231564522
SeepArea_5_31	SeepArea 5	SA05	1172412.276	3176152.856	8/19/2013	0	0.005091213	0.499864578	A	786.2	44.6	19-08-2013 12:31:27	0	0.022	2.160000086	0.231418774
SeepArea_5_32	SeepArea 5	SA05	1172343.244	3176106.364	8/19/2013	0	0.006937731	0.379956394	A	785.9	44.7	19-08-2013 12:34:36	0	0.029999999	1.643000007	0.231257692
SeepArea_5_33	SeepArea 5	SA05	1172337.985	3176065.671	8/19/2013	0	0.005312877	0.233997568	A	785.5	44.9	19-08-2013 12:38:15	-0.012	0.023	1.013000011	0.230994642
SeepArea_5_34	SeepArea 5	SA05	1172341.307	3176007.521	8/19/2013	0	0.00531427	0.365991443	A	786.2	45.1	19-08-2013 12:41:57	0	0.023	1.583999991	0.2310552
SeepArea_5_35	SeepArea 5	SA05	1172386.766	3176004.509	8/19/2013	0	0.004156662	0.279650986	A	786.5	45.4	19-08-2013 12:45:31	0	0.017999999	1.210999966	0.230925679
SeepArea_5_36	SeepArea 5	SA05	1172404.064	3176051.316	8/19/2013	0	0.004154582	0.802526772	A	786.6	45.6	19-08-2013 12:48:34	0	0.017999999	3.476999998	0.230810121
SeepArea_5_37	SeepArea 5	SA05	1172395.425	3176096.52	8/19/2013	0	0.005073649	0.342932522	A	786.2	45.7	19-08-2013 12:51:08	0	0.022	1.486999989	0.230620399
SeepArea_5_38	SeepArea 5	SA05	1172453.756	3176097.208	8/19/2013	0	0.004149866	0.40599522	A	786.2	45.8	19-08-2013 12:53:57	-0.063000001	0.017999999	1.761000037	0.230548099
SeepArea_5_39	SeepArea 5	SA05	1172419.944	3176058.847	8/19/2013	0	0.006457428	0.757825255	A	786.7	45.9	19-08-2013 12:57:24	0	0.028000001	3.286000013	0.230622411
SeepArea_5_40	SeepArea 5	SA05	1172450.454	3176048.34	8/19/2013	0	0.010599915	0.533913076	A	786.3	46.0	19-08-2013 13:00:05	0	0.046	2.316999912	0.230432928
SeepArea_5_41	SeepArea 5	SA05	1172425.8	3175991.098	8/19/2013	0	0.008295096	0.016590191	A	786.5	46.1	19-08-2013 13:02:30	0	0.035999998	0.071999997	0.230419338
SeepArea_5_42	SeepArea 5	SA05	1172504.573	3175990.043	8/19/2013	0	0.003688585	0.069160961	A	786.9	46.1	19-08-2013 13:06:31	0	0.016000001	0.300000012	0.230536535
SeepArea_5_43	SeepArea 5	SA05	1172508.655	3176064.653	8/19/2013	0	0.009223259	0.368469238	A	787.3	46.2	19-08-2013 13:10:50	0	0.039999999	1.59800005	0.230581492
SeepArea_5_44	SeepArea 5	SA05	1172509.149	3176099.417	8/19/2013	0	0.008290957	0.98339963	A	786.6	46.3	19-08-2013 13:13:18	0	0.035999998	4.269999981	0.23030436
SeepArea_5_45	SeepArea 5	SA05	1172513.798	3176149.471	8/19/2013	0	0.007370243	0.248515382	A	786.9	46.4	19-08-2013 13:15:44	0	0.032000002	1.078999996	0.230320096
SeepArea_5_46	SeepArea 5	SA05	1172517.734	3176209.19	8/19/2013	0	0.015412896	0.621116698	A	786.2	46.5	19-08-2013 13:18:16	0	0.067000002	2.700000048	0.230043218
SeepArea_5_47	SeepArea 5	SA05	1172506.972	3176260.82	8/19/2013	0	0.005980774	0.522627652	A	786.4	46.6	19-08-2013 13:21:06	0	0.026000001	2.272000074	0.230029777
SeepArea_5_48	SeepArea 5	SA05	1172517.05	3176295.989	8/19/2013	0	0.006666694	0.251495272	A	786.4	46.8	19-08-2013 13:24:14	0	0.028999999	1.093999982	0.229885995
SeepArea_5_49	SeepArea 5	SA05	1172566.738	3176306.366	8/19/2013	0	0.003905351	0.522857487	A	786.1	46.9	19-08-2013 13:26:59	0	0.017000001	2.276000023	0.229726493
SeepArea_5_50	SeepArea 5	SA05	1172545.754	3176252.581	8/19/2013	0	0.003906614	0.456614196	A	786.6	47.0	19-08-2013 13:29:43	0	0.017000001	1.986999989	0.229800805
SeepArea_5_51	SeepArea 5	SA05	1172551.388	3176210.681	8/19/2013	0	0.002757449	0.584579289	A	786.8	47.1	19-08-2013 13:34:10	0	0.012	2.54399991	0.229787454
SeepArea_5_52	SeepArea 5	SA05	1172566.501	3176151.344	8/19/2013	0	0.009885204	1.062084675	A	786.9	47.0	19-08-2013 13:38:29	0	0.043000001	4.619999886	0.229888454
SeepArea_5_53	SeepArea 5	SA05	1172543.848	3176096.316	8/19/2013	0	0.005752207	0.318442166	A	786.6	46.6	19-08-2013 13:48:58	0	0.025	1.383999944	0.230088279
SeepArea_5_54	SeepArea 5	SA05	1172549.94	3176063.828	8/19/2013	0	0.003913987	0.194317937	A	787.1	46.6	19-08-2013 13:51:36	0	0.017000001	0.843999982	0.230234534
SeepArea_5_55	SeepArea 5	SA05	1172569.115	3176023.866	8/19/2013	0	0.003685842	0.301778257	A	787.3	46.5	19-08-2013 13:55:31	0	0.016000001	1.309999943	0.230365083

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepArea_5_56	SeepArea 5	SA05	1172621.33	3176102.392	8/19/2013	0	0.005069319	0.465916544	A	787.5	46.5	19-08-2013 13:59:44	0	0.022	2.022000074	0.230423599
SeepArea_5_57	SeepArea 5	SA05	1172606.848	3176159.395	8/19/2013	0	0.00576059	0.225354284	A	787.5	46.5	19-08-2013 14:02:26	0	0.025	0.977999985	0.230423599
SeepArea_5_58	SeepArea 5	SA05	1172611.987	3176204.427	8/19/2013	0	0.009672876	0.430442959	A	787.1	46.5	19-08-2013 14:04:47	0	0.041999999	1.868999958	0.230306566
SeepArea_5_59	SeepArea 5	SA05	1172623.472	3176256.51	8/19/2013	0	0.007137689	0.222649872	A	786.9	46.5	19-08-2013 14:08:03	0	0.030999999	0.967000008	0.230248049
SeepArea_5_60	SeepArea 5	SA05	1172630.688	3176304.579	8/19/2013	0	0.007830883	0.481829643	A	786.9	46.4	19-08-2013 14:11:16	0	0.034000002	2.092000008	0.230320096
SeepArea_5_61	SeepArea 5	SA05	1172806.923	3176217.245	8/19/2013	0	0.004380194	0.055789839	A	786.9	46.1	19-08-2013 14:15:51	-0.086999997	0.018999999	0.241999999	0.230536535
SeepArea_5_62	SeepArea 5	SA05	1172815.327	3176261.814	8/19/2013	0	0.002539426	0.178452417	A	787.5	45.9	19-08-2013 14:18:18	0	0.011	0.773000002	0.23085694
SeepArea_5_63	SeepArea 5	SA05	1172815.167	3176349.206	8/19/2013	0	0.002540868	0.271410853	A	787.7	45.8	19-08-2013 14:20:52	0	0.011	1.174999952	0.230987966
SeepArea_5_64	SeepArea 5	SA05	1172811.537	3176396.599	8/19/2013	0	0.000461652	0.613073111	A	786.9	45.7	19-08-2013 14:23:13	0	0.002	2.655999899	0.230825737
SeepArea_5_65	SeepArea 5	SA05	1172804.514	3176461.419	8/19/2013	0	0.008543741	0.759469271	A	786.7	45.5	19-08-2013 14:25:52	0	0.037	3.289000034	0.230911911
SeepArea_5_66	SeepArea 5	SA05	1172823.17	3176498.693	8/19/2013	0	0.005548186	0.457956493	A	787.1	45.3	19-08-2013 14:28:20	0	0.024	1.980999947	0.231174409
SeepArea_5_67	SeepArea 5	SA05	1172806.887	3176562.956	8/19/2013	0	0.001850087	0.28260082	A	786.9	45.1	19-08-2013 14:30:48	0	0.008	1.222000003	0.231260911
SeepArea_5_68	SeepArea 5	SA05	1172844.273	3176547.661	8/19/2013	0	0.001851721	0.424044192	A	787.1	44.9	19-08-2013 14:33:17	0	0.008	1.832000017	0.231465161
SeepArea_5_69	SeepArea 5	SA05	1172850.858	3176503.297	8/19/2013	0	0.00185301	0.532045364	A	787.4	44.8	19-08-2013 14:35:15	0	0.008	2.296999931	0.231626198
SeepArea_5_70	SeepArea 5	SA05	1172862.821	3176460.933	8/19/2013	0	0.002318014	0.23551026	A	787.5	44.6	19-08-2013 14:37:22	0	0.01	1.016000032	0.231801435
SeepArea_5_71	SeepArea 5	SA05	1172856.024	3176401.608	8/19/2013	0	0.002087262	0.240035102	A	787.4	44.4	19-08-2013 14:39:48	0	0.009	1.034999967	0.231917977
SeepArea_5_72	SeepArea 5	SA05	1172855.201	3176356.82	8/19/2013	0	0.005104451	0.924601674	A	787.5	44.3	19-08-2013 14:41:32	0	0.022	3.984999895	0.232020497
SeepArea_5_73	SeepArea 5	SA05	1172845.976	3176304.167	8/19/2013	0	0.003251986	0.074098811	A	787.9	44.1	19-08-2013 14:43:29	0	0.014	0.319000006	0.23228468
SeepArea_5_74	SeepArea 5	SA05	1172856.667	3176259.383	8/19/2013	0	0.001627125	0.031612713	A	788.2	44.0	19-08-2013 14:45:23	0	0.007	0.136000007	0.232446402
SeepArea_5_75	SeepArea 5	SA05	1172851.739	3176211.803	8/19/2013	0	0.001861332	0.182643205	A	788.2	43.7	19-08-2013 14:47:51	0	0.008	0.785000026	0.232666492
SeepArea_5_76	SeepArea 5	SA05	1172928.906	3176187.089	8/19/2013	0	0.002808473	0.351293206	A	791.6	43.2	19-08-2013 14:52:21	0	0.012	1.501000047	0.234039441
SeepArea_5_77	SeepArea 5	SA05	1172835.096	3176072.985	8/19/2013	0	0.002105158	0.829432368	A	790.4	42.9	19-08-2013 14:54:54	0	0.009	3.546000004	0.233906478
SeepArea_5_78	SeepArea 5	SA05	1172781.527	3175984.956	8/19/2013	0	0.000468168	0.054775704	A	790.5	42.7	19-08-2013 14:57:10	0	0.002	0.233999997	0.234084204
SeepArea_5_79	SeepArea 5	SA05	1172713.565	3175901.187	8/19/2013	0	0.002812748	0.088835962	A	790.8	42.4	19-08-2013 14:59:33	0	0.012	0.379000008	0.234395668
SeepArea_5_80	SeepArea 5	SA05	1172643.27	3175881.972	8/19/2013	0	0.004456342	0.149873823	A	790.8	42.2	19-08-2013 15:01:58	0	0.018999999	0.638999999	0.234544322
SeepArea_5_81	SeepArea 5	SA05	1172710.335	3176037.828	8/19/2013	0	0.003986004	0.215244189	A	789.8	41.9	19-08-2013 15:04:49	0	0.017000001	0.917999983	0.2344708
SeepArea_5_82	SeepArea 5	SA05	1172928.121	3176318.047	8/19/2013	0	0.000470224	0.114734627	A	790.2	41.2	19-08-2013 15:11:07	0	0.002	0.488000005	0.235111937
SeepArea_5_83	SeepArea 5	SA05	1172994.746	3176372.048	8/19/2013	0	0	0.836866796	A	789.1	40.9	19-08-2013 15:14:37	0	-0.002	3.561000109	0.235008925
SeepArea19_01	SeepArea19	SA19	1146462.417	3158681.821	8/13/2013	0	0	0.462542176	A	779.4	33.7	13-08-2013 13:51:27	0	-0.001	1.947000027	0.237566605
SeepArea19_02	SeepArea19	SA19	1146472.859	3158743.106	8/13/2013	0	0.00260559	0.219580203	A	779.4	34.6	13-08-2013 13:55:46	0	0.011	0.926999986	0.236871853
SeepArea19_03	SeepArea19	SA19	1146326.544	3158830.015	8/13/2013	0	0.001655301	0.744412601	A	779.6	35.2	13-08-2013 13:59:31	0	0.007	3.148000002	0.236471593
SeepArea19_04	SeepArea19	SA19	1146382.106	3158890.18	8/13/2013	0	0.001654005	0.103493452	A	780.0	35.6	13-08-2013 14:02:20	0	0.007	0.437999994	0.236286417
SeepArea19_05	SeepArea19	SA19	1146457.575	3158867.555	8/13/2013	0	0.00377546	0.096746162	A	779.7	35.9	13-08-2013 14:04:56	0	0.016000001	0.409999996	0.23596625
SeepArea19_06	SeepArea19	SA19	1146482.964	3158885.81	8/13/2013	0	0	0.157596722	A	779.4	36.3	13-08-2013 14:07:51	0	-0.001	0.66900003	0.235570565
SeepArea19_07	SeepArea19	SA19	1146518.151	3158858.72	8/13/2013	0	0.008935537	0.818071961	A	779.0	36.7	13-08-2013 14:11:44	0	0.037999999	3.479000092	0.235145718
SeepArea19_08	SeepArea19	SA19	1146512.523	3158907.769	8/13/2013	0	0.002111817	0.038951289	A	778.6	37.2	13-08-2013 14:16:15	0	0.009	0.165999994	0.23464632
SeepArea19_09	SeepArea19	SA19	1146492.832	3158918.621	8/13/2013	0	0.001641253	0.050644372	A	779.0	37.6	13-08-2013 14:19:01	0	0.007	0.216000006	0.234464675
SeepArea19_10	SeepArea19	SA19	1146457.9	3158914.93	8/13/2013	0	0.001171117	0.048250016	A	779.2	38.0	13-08-2013 14:22:10	0	0.005	0.206	0.234223381
SeepArea19_11	SeepArea19	SA19	1146466.952	3158961.34	8/13/2013	0	0.001170289	0	A	779.4	38.3	13-08-2013 14:24:57	0	0.005	-0.035999998	0.234057829
SeepArea19_12	SeepArea19	SA19	1146510.496	3158977.252	8/13/2013	0	0.002103278	0.248654276	A	779.2	38.7	13-08-2013 14:27:41	0	0.009	1.06400001	0.233697623
SeepArea19_13	SeepArea19	SA19	1146473.237	3158998.794	8/13/2013	0	0.000700239	0.01283772	A	779.0	39.0	13-08-2013 14:30:30	0	0.003	0.055	0.2334131
SeepArea19_14	SeepArea19	SA19	1146399.8	3159050.527	8/13/2013	0	0.000700106	0.055541724	A	779.6	39.3	13-08-2013 14:33:10	0	0.003	0.238000005	0.23336859
SeepArea19_15	SeepArea19	SA19	1146391.851	3158954.451	8/13/2013	0	0.001865158	0.372332156	A	779.6	39.6	13-08-2013 14:35:41	0	0.008	1.597000003	0.233144745
SeepArea32L-1049_01	SeepArea32L-1049	SA32/L-1049	1174869.804	3176356.283	8/16/2013	0	0	0	A	791.7	31.1	16-08-2013 11:48:13	0	-0.008	-0.098999999	0.243377909
SeepArea32L-1049_02	SeepArea32L-1049	SA32/L-1049	1174854.085	3176253.468	8/16/2013	0	0	0.00557023	A	791.7	32.6	16-08-2013 11:52:34	0	-0.003	0.023	0.242183909
SeepArea32L-1049_03	SeepArea32L-1049	SA32/L-1049	1174870.769	3176143.842	8/16/2013	0	0	0.081654847	A	791.8	33.4	16-08-2013 11:55:35	0	0	0.338	0.241582394
SeepArea32L-1049_04	SeepArea32L-1049	SA32/L-1049	1174861.583	3176055.628	8/16/2013	0	0.000481933	0.245785788	A	792.1	34.3	16-08-2013 11:58:52	0	0.002	1.019999981	0.240966469
SeepArea32L-1049_05	SeepArea32L-1049	SA32/L-1049	1174837.921	3175933.316	8/16/2013	0	0.002163772	0.056017648	A	792.1	35.0	16-08-2013 12:01:58	0	0.009	0.232999995	0.24041909
SeepArea32L-1049_06	SeepArea32L-1049	SA32/L-1049	1174859.679	3175830.303	8/16/2013	0	0	0.017760923	A	792.3	35.6	16-08-2013 12:05:08	0	-0.001	0.074000001	0.240012467
SeepArea32L-1049_07	SeepArea32L-1049	SA32/L-1049	1174956.148	3176243.741	8/16/2013	0	0	0.03585092	A	792.3	36.9	16-08-2013 12:13:42	0	-0.001	0.150000006	0.239006132
SeepArea32L-1049_08	SeepArea32L-1049	SA32/L-1049	1174955.38	3176151.557	8/16/2013	0	0.000238427	0.5004583	A	791.4	37.3	16-08-2013 12:16:27	0	0.001	2.098999977	0.238427028
SeepArea32L-1049_09	SeepArea32L-1049	SA32/L-1049	1174953.034	3176052.739	8/16/2013	12.91199684	0.00023818	0.268191129	A	791.6	37.7	16-08-2013 12:19:00	54.21099854	0.001	1.126000047	0.238180399
SeepArea32L-1049_10	SeepArea32L-1049	SA32/L-1049	1174967.177	3175952.542	8/16/2013	0	0	0.028314196	A	791.8	38.1	16-08-2013 12:21:51	0	0	0.119000003	0.237934411
SeepArea32L-1049_100	SeepArea32L-1049	SA32/L-1049	1174353.971	3178041.364	8/17/2013	0	0.00213592	0.593785703	A	791.8	38.9	17-08-2013 09:56:58	0	0.009	2.502000093	0.237324417
SeepArea32L-1049_101	SeepArea32L-1049	SA32/L-1049	1174476.526	3178036.315	8/17/2013	0	0.001893868	0.106056578	A	791.6	39.6	17-08-2013 10:00:27	0	0.008	0.448000014	0.236733422
SeepArea32L-1049_102	SeepArea32L-1049	SA32/L-1049	1174454.301	3177940.554	8/17/2013	0	0.002834833	0.380103916	A	791.2	40.1	17-08-2013 10:03:16	0	0.012	1.608999968	0.236236125
SeepArea32L-1049_103	SeepArea32L-1049	SA32/L-1049	1174357.686	3177945.456	8/17/2013	0	0.001415516	0.496610075	A	791.4	40.6	17-08-2013 10:06:29	0	0.006	2.105000019	0.235919267
SeepArea32L-1049_104	SeepArea32L-1049	SA32/L-1049	1174475.227	3177842.087	8/17/2013	1.72579515	0.001884828	0.906602025	A	791.6	41.1	17-08-2013 10:09:39	7.324999809	0.008	3.84800005	0.235603437
SeepArea32L-1049_105	SeepArea32L-1049	SA32/L-1049	1174578.777	3177847.73	8/17/2013	0	0.002351103	0.15517281	A	791.2	41.6	17-08-2013 10:12:32	0	0.01	0.660000026	0.235110298

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepArea32L-1049_106	SeepArea32L-1049	SA32/L-1049	1174659.823	3177755.163	8/17/2013	0	0.003284451	0.517770231	A	791.0	42.2	17-08-2013 10:17:12	0	0.014	2.207000017	0.234603643
SeepArea32L-1049_107	SeepArea32L-1049	SA32/L-1049	1174577.678	3177762.596	8/17/2013	0	0.002576068	0.342617005	A	790.6	42.6	17-08-2013 10:20:23	0	0.011	1.463000059	0.234187961
SeepArea32L-1049_108	SeepArea32L-1049	SA32/L-1049	1174467.985	3177749.098	8/17/2013	0	0.001404859	0.179821998	A	791.2	42.9	17-08-2013 10:23:37	0	0.006	0.768000007	0.234143227
SeepArea32L-1049_109	SeepArea32L-1049	SA32/L-1049	1174577.616	3177646.482	8/17/2013	0	0.002573133	0.42082423	A	791.2	43.2	17-08-2013 10:26:11	0	0.011	1.799000025	0.233921185
SeepArea32L-1049_11	SeepArea32L-1049	SA32/L-1049	1174973.076	3175834.767	8/16/2013	0	0	0.024224265	A	791.6	38.6	16-08-2013 12:25:15	0	-0.002	0.101999998	0.2374928
SeepArea32L-1049_110	SeepArea32L-1049	SA32/L-1049	1174667.164	3177642.652	8/17/2013	0	0.002104093	0.500774205	A	791.0	43.3	17-08-2013 10:29:23	-0.013	0.009	2.14199996	0.233788148
SeepArea32L-1049_111	SeepArea32L-1049	SA32/L-1049	1174785.49	3177661.93	8/17/2013	0	0.001634966	0.049282543	A	790.5	43.4	17-08-2013 10:32:19	0	0.007	0.210999995	0.233566567
SeepArea32L-1049_112	SeepArea32L-1049	SA32/L-1049	1174873.882	3177541.758	8/17/2013	0	0.001866169	0.072314039	A	789.5	43.4	17-08-2013 10:36:28	0	0.008	0.310000002	0.233271092
SeepArea32L-1049_113	SeepArea32L-1049	SA32/L-1049	1174862.958	3177443.965	8/17/2013	0	0.00279801	0.235499144	A	788.9	43.3	17-08-2013 10:42:52	0	0.012	1.00999999	0.23316747
SeepArea32L-1049_114	SeepArea32L-1049	SA32/L-1049	1174970.143	3177442.225	8/17/2013	0	0.002800668	0.266530246	A	789.4	43.2	17-08-2013 10:46:58	0	0.012	1.14199996	0.233389005
SeepArea32L-1049_115	SeepArea32L-1049	SA32/L-1049	1174951.066	3177345.795	8/17/2013	0	0.001632584	0.112181805	A	788.6	43.1	17-08-2013 10:49:53	0	0.007	0.481000006	0.23322621
SeepArea32L-1049_116	SeepArea32L-1049	SA32/L-1049	1174973.787	3177256.443	8/17/2013	0	0.001633721	0.167806491	A	788.9	43.0	17-08-2013 10:52:51	0	0.007	0.718999982	0.233388737
SeepArea32L-1049_117	SeepArea32L-1049	SA32/L-1049	1175083.327	3177233.116	8/17/2013	0	0.001868529	0.03737057	A	789.0	42.8	17-08-2013 10:56:08	0	0.008	0.159999996	0.233566076
SeepArea32L-1049_118	SeepArea32L-1049	SA32/L-1049	1175071.071	3177142.124	8/17/2013	0	0.004431846	0.218793243	A	787.7	42.7	17-08-2013 10:59:10	0	0.018999999	0.938000023	0.233255059
SeepArea32L-1049_119	SeepArea32L-1049	SA32/L-1049	1175177.35	3177160.64	8/17/2013	0	0.001169977	0.049607038	A	789.7	42.5	17-08-2013 11:02:45	0	0.005	0.211999997	0.233995467
SeepArea32L-1049_12	SeepArea32L-1049	SA32/L-1049	1175060.03	3175846.512	8/16/2013	0	0	0.207935438	A	791.3	39.0	16-08-2013 12:28:49	0	0	0.876999974	0.237098575
SeepArea32L-1049_120	SeepArea32L-1049	SA32/L-1049	1175178.765	3177058.783	8/17/2013	0	0.001632576	0.38132298	A	787.1	42.5	17-08-2013 11:05:42	0	0.007	1.63499999	0.233225062
SeepArea32L-1049_121	SeepArea32L-1049	SA32/L-1049	1175071.073	3177029.127	8/17/2013	0	0.00303674	0.85869664	A	788.1	42.4	17-08-2013 11:09:13	0	0.013	3.676000118	0.233595386
SeepArea32L-1049_122	SeepArea32L-1049	SA32/L-1049	1174965.181	3177045.555	8/17/2013	0	0.002106494	0.235693261	A	789.4	42.3	17-08-2013 11:11:58	0	0.009	1.006999969	0.234054878
SeepArea32L-1049_123	SeepArea32L-1049	SA32/L-1049	1174948.062	3177153.346	8/17/2013	0.318891883	0.004686141	0.298038572	A	790.0	42.2	17-08-2013 11:14:44	1.360999942	0.02	1.271999955	0.234307051
SeepArea32L-1049_124	SeepArea32L-1049	SA32/L-1049	1174855.575	3177163.274	8/17/2013	4.332348347	0.002109567	2.271535397	A	789.8	42.0	17-08-2013 11:18:34	18.4829998	0.009	9.690999985	0.234396398
SeepArea32L-1049_125	SeepArea32L-1049	SA32/L-1049	1174851.249	3177262.909	8/17/2013	0	0.001879218	0.227385417	A	790.5	41.6	17-08-2013 11:24:02	0	0.008	0.967999995	0.234902292
SeepArea32L-1049_126	SeepArea32L-1049	SA32/L-1049	1174850.035	3177352.361	8/17/2013	0	0.000939551	0.173112273	A	790.2	41.5	17-08-2013 11:26:20	0	0.004	0.736999989	0.234887764
SeepArea32L-1049_127	SeepArea32L-1049	SA32/L-1049	1174754.753	3177355.922	8/17/2013	1.575817108	0.000940506	0.667523801	A	790.5	41.3	17-08-2013 11:29:24	6.702000141	0.004	2.838999987	0.235126391
SeepArea32L-1049_128	SeepArea32L-1049	SA32/L-1049	1174757.935	3177456.591	8/17/2013	0	0.000470612	0.357900143	A	790.6	41.1	17-08-2013 11:31:54	0	0.002	1.521000028	0.235305801
SeepArea32L-1049_129	SeepArea32L-1049	SA32/L-1049	1174771.521	3177554.276	8/17/2013	0	0.000706367	0.629843831	A	790.6	40.9	17-08-2013 11:34:34	0	0.003	2.674999952	0.235455647
SeepArea32L-1049_13	SeepArea32L-1049	SA32/L-1049	1175061.106	3175951.822	8/16/2013	0	0.000236586	0.086353771	A	790.6	39.4	16-08-2013 12:31:53	0	0.001	0.36500001	0.236585662
SeepArea32L-1049_130	SeepArea32L-1049	SA32/L-1049	1174684.94	3177546.968	8/17/2013	0	0.002354711	0.427144527	A	790.4	40.8	17-08-2013 11:37:18	0	0.01	1.81400001	0.23547107
SeepArea32L-1049_131	SeepArea32L-1049	SA32/L-1049	1174566.247	3177549.102	8/17/2013	0	0.001650392	0.727115393	A	790.9	40.6	17-08-2013 11:40:06	0	0.007	3.084000111	0.235770226
SeepArea32L-1049_132	SeepArea32L-1049	SA32/L-1049	1174652.707	3177443.654	8/17/2013	0	0.00070803	0.369591832	A	791.2	40.4	17-08-2013 11:42:59	0	0.003	1.565999985	0.236010104
SeepArea32L-1049_133	SeepArea32L-1049	SA32/L-1049	1174655.971	3177359.307	8/17/2013	0	0.00165218	0.186224282	A	791.0	40.3	17-08-2013 11:45:21	0	0.007	0.788999975	0.236025721
SeepArea32L-1049_134	SeepArea32L-1049	SA32/L-1049	1174762.143	3177253.761	8/17/2013	0	0.001180882	0.567768097	A	791.0	40.1	17-08-2013 11:48:02	0	0.005	2.404000044	0.236176401
SeepArea32L-1049_135	SeepArea32L-1049	SA32/L-1049	1174751.226	3177158.989	8/17/2013	0	0.002126266	0.241449356	A	791.0	40.0	17-08-2013 11:50:21	0	0.009	1.021999955	0.236251831
SeepArea32L-1049_136	SeepArea32L-1049	SA32/L-1049	1174755.738	3177049.862	8/17/2013	0.574893296	0.000709161	0.476083487	A	791.2	39.9	17-08-2013 11:53:02	2.431999922	0.003	2.013999939	0.236387044
SeepArea32L-1049_137	SeepArea32L-1049	SA32/L-1049	1174853.103	3177049.382	8/17/2013	0	0.001655238	0.203830734	A	791.2	39.8	17-08-2013 11:56:24	0	0.007	0.861999989	0.236462578
SeepArea32L-1049_138	SeepArea32L-1049	SA32/L-1049	1174769.154	3176444.519	8/18/2013	0	0.0017243	0.655480087	A	790.5	27.0	18-08-2013 11:31:14	0	0.007	2.661000013	0.246328488
SeepArea32L-1049_139	SeepArea32L-1049	SA32/L-1049	1174751.881	3176562.882	8/18/2013	0	0.004417163	0.801960588	A	790.4	28.1	18-08-2013 11:35:06	0	0.017999999	3.267999887	0.245397985
SeepArea32L-1049_14	SeepArea32L-1049	SA32/L-1049	1175163.38	3175945.789	8/16/2013	0	0	0.039203174	A	790.2	39.8	16-08-2013 12:35:34	0	-0.001	0.165999994	0.23616372
SeepArea32L-1049_140	SeepArea32L-1049	SA32/L-1049	1174664.824	3176738.98	8/18/2013	0	0	0.099266231	A	790.9	29.4	18-08-2013 11:39:41	0	-0.003	0.405999988	0.244498119
SeepArea32L-1049_141	SeepArea32L-1049	SA32/L-1049	1174634.785	3176852.101	8/18/2013	0	0	0.009996722	A	790.8	30.2	18-08-2013 11:42:18	0	-0.001	0.041000001	0.2438225
SeepArea32L-1049_142	SeepArea32L-1049	SA32/L-1049	1174556.707	3177043.286	8/18/2013	0	0	0.012628812	A	790.8	31.4	18-08-2013 11:46:58	0	-0.004	0.052000001	0.242861778
SeepArea32L-1049_143	SeepArea32L-1049	SA32/L-1049	1174558.337	3177156.452	8/18/2013	0	0.000484574	0.925535381	A	791.0	32.2	18-08-2013 11:50:52	0	0.002	3.819999933	0.242286757
SeepArea32L-1049_144	SeepArea32L-1049	SA32/L-1049	1174465.592	3177245.816	8/18/2013	0	0	0.091888405	A	791.0	32.8	18-08-2013 11:54:36	0	0	0.379999995	0.241811603
SeepArea32L-1049_145	SeepArea32L-1049	SA32/L-1049	1174431.545	3177348.265	8/18/2013	0	0.000241575	0.3384462	A	791.0	33.1	18-08-2013 11:57:10	0	0.001	1.401000023	0.24157472
SeepArea32L-1049_146	SeepArea32L-1049	SA32/L-1049	1174381.676	3177451.557	8/18/2013	0	0	0.148374662	A	791.0	33.5	18-08-2013 11:59:55	0	-0.003	0.61500001	0.241259605
SeepArea32L-1049_147	SeepArea32L-1049	SA32/L-1049	1174341.048	3177544.33	8/18/2013	0	0.000482388	0.278096437	A	791.3	33.7	18-08-2013 12:02:37	0	0.002	1.152999997	0.241193801
SeepArea32L-1049_148	SeepArea32L-1049	SA32/L-1049	1174261.546	3177728.362	8/18/2013	0	0	1.164403915	A	791.2	34.0	18-08-2013 12:05:52	0	-0.001	4.833000183	0.240927771
SeepArea32L-1049_149	SeepArea32L-1049	SA32/L-1049	1174258.072	3177840.564	8/18/2013	0	0.002167213	0	A	791.3	34.2	18-08-2013 12:09:56	0	0.009	-0.018999999	0.240801424
SeepArea32L-1049_15	SeepArea32L-1049	SA32/L-1049	1175264.138	3175947.257	8/16/2013	0	0.000470769	0.038603086	A	788.6	40.2	16-08-2013 12:39:14	0	0.002	0.164000005	0.235384673
SeepArea32L-1049_150	SeepArea32L-1049	SA32/L-1049	1174163.563	3177953.172	8/18/2013	0	0.000962579	0.092888914	A	791.3	34.4	18-08-2013 12:13:01	0	0.004	0.386000007	0.240644842
SeepArea32L-1049_151	SeepArea32L-1049	SA32/L-1049	1174167.869	3178073.868	8/18/2013	0	0.001202833	0.109217241	A	791.3	34.5	18-08-2013 12:16:30	0	0.005	0.453999996	0.240566611
SeepArea32L-1049_152	SeepArea32L-1049	SA32/L-1049	1174059.544	3178045.656	8/18/2013	0	0	0.131613672	A	791.7	34.6	18-08-2013 12:19:49	0	0	0.546999991	0.240610018
SeepArea32L-1049_153	SeepArea32L-1049	SA32/L-1049	1174056.489	3178151.642	8/18/2013	0	0.000721361	0.578531682	A	791.7	34.8	18-08-2013 12:22:46	0	0.003	2.405999899	0.24045375
SeepArea32L-1049_154	SeepArea32L-1049	SA32/L-1049	1174020.778	3178288.434	8/18/2013	0	0.000240419	0.062749386	A	792.1	35.0	18-08-2013 12:25:48	0	0.001	0.261000007	0.24041909
SeepArea32L-1049_155	SeepArea32L-1049	SA32/L-1049	1173958.186	3178269.712	8/18/2013	0.74135828	0.00096062	0.558840513	A	792.0	35.3	18-08-2013 12:31:13	3.086999893	0.004	2.326999903	0.240154937
SeepArea32L-1049_156	SeepArea32L-1049	SA32/L-1049	1173965.408	3178341.507	8/18/2013	0	0.000960482	0.343372345	A	792.4	35.5	18-08-2013 12:34:25	0	0.004	1.429999948	0.24012053
SeepArea32L-1049_157	SeepArea32L-1049	SA32/L-1049	1174044.201	3178357.423	8/18/2013	0	0.002158868	0.463436931	A	792.1	35.7	18-08-2013 12:37:55	0	0.009	1.932000041	0.239874184
SeepArea32L-1049_158	SeepArea32L-1049	SA32/L-1049	1173879.631	3178317.007	8/18/2013	0	0	0	A	791.8	35.9	18-08-2013 12:43:11	0	-0.002	-0.331	0.239628166
SeepArea32L-1049_159	SeepArea32L-1049	SA32/L-1049	1173872.103	3178264.045	8/18/2013	0			A	792.3	36.1	18-08-2013 12:46:21	0			0.239624411

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepArea32L-1049_16	SeepArea32L-1049	SA32/L-1049	1175359.667	3175952.828	8/16/2013	0	0.000469453	0.159144416	A	787.9	40.8	16-08-2013 12:44:26	0	0.002	0.677999973	0.23472628
SeepArea32L-1049_160	SeepArea32L-1049	SA32/L-1049	1173785.027	3178246.53	8/18/2013	0	0.005267	0.224805132	A	792.1	36.3	18-08-2013 12:50:23	0	0.022	0.93900001	0.239409089
SeepArea32L-1049_161	SeepArea32L-1049	SA32/L-1049	1173776.712	3178165.702	8/18/2013	0	0	1.098014355	A	792.5	36.5	18-08-2013 12:53:38	0	0	4.586999893	0.239375278
SeepArea32L-1049_162	SeepArea32L-1049	SA32/L-1049	1173870.081	3178157.474	8/18/2013	0	0.001195953	0.49655965	A	792.4	36.7	18-08-2013 12:56:41	0	0.005	2.075999975	0.239190578
SeepArea32L-1049_163	SeepArea32L-1049	SA32/L-1049	1173962.792	3178143.256	8/18/2013	6.004468918	0.002389458	1.911805391	A	792.1	36.9	18-08-2013 12:59:35	25.12899971	0.01	8.001000404	0.238945797
SeepArea32L-1049_164	SeepArea32L-1049	SA32/L-1049	1173964.692	3178027.63	8/18/2013	1.177094698	0.001910093	0.597381592	A	792.0	37.1	18-08-2013 13:03:04	4.929999828	0.008	2.502000093	0.238761619
SeepArea32L-1049_165	SeepArea32L-1049	SA32/L-1049	1173872.072	3178059.891	8/18/2013	0	0.000954244	0.850708783	A	792.1	37.4	18-08-2013 13:06:58	0	0.004	3.565999985	0.238561079
SeepArea32L-1049_166	SeepArea32L-1049	SA32/L-1049	1173779.674	3178049.258	8/18/2013	0	0.002147564	0.877637804	A	792.8	37.6	18-08-2013 13:10:47	0	0.009	3.677999973	0.238618225
SeepArea32L-1049_167	SeepArea32L-1049	SA32/L-1049	1173849.269	3177981.193	8/18/2013	0	0.000715124	0.127530366	A	792.5	37.8	18-08-2013 13:13:44	0	0.003	0.535000026	0.238374516
SeepArea32L-1049_168	SeepArea32L-1049	SA32/L-1049	1173960.818	3177951.265	8/18/2013	0	0.000476322	0.225538641	A	792.3	38.0	18-08-2013 13:17:05	0	0.002	0.947000027	0.238161176
SeepArea32L-1049_169	SeepArea32L-1049	SA32/L-1049	1174075.826	3177946.665	8/18/2013	15.26120663	0.00237858	1.629565001	A	791.8	38.2	18-08-2013 13:19:58	64.16100311	0.01	6.850999832	0.237857983
SeepArea32L-1049_17	SeepArea32L-1049	SA32/L-1049	1175469.73	3175907.295	8/16/2013	0	0.000703059	0.771021545	A	787.9	41.3	16-08-2013 12:48:58	0	0.003	3.289999962	0.234353051
SeepArea32L-1049_170	SeepArea32L-1049	SA32/L-1049	1174161.367	3177841.138	8/18/2013	3.742925644	0.002139494	1.164835572	A	791.6	38.3	18-08-2013 13:23:06	15.74499989	0.009	4.900000095	0.237721547
SeepArea32L-1049_171	SeepArea32L-1049	SA32/L-1049	1174059.897	3177844.431	8/18/2013	0	0.001425414	0.133751348	A	791.6	38.5	18-08-2013 13:25:46	0	0.006	0.563000023	0.237569004
SeepArea32L-1049_172	SeepArea32L-1049	SA32/L-1049	1173953.827	3177857.001	8/18/2013	0	0.00142486	0.298508108	A	791.8	38.7	18-08-2013 13:28:35	0	0.006	1.256999969	0.237476617
SeepArea32L-1049_173	SeepArea32L-1049	SA32/L-1049	1173830.902	3177729.419	8/18/2013	1.728613734	0.001187072	5.602740765	A	792.1	38.9	18-08-2013 13:31:59	7.281000137	0.005	23.59900093	0.23741433
SeepArea32L-1049_174	SeepArea32L-1049	SA32/L-1049	1173765.193	3177738.038	8/18/2013	0	0.001187141	0.08357472	A	792.4	39.0	18-08-2013 13:34:54	0	0.005	0.351999998	0.237428173
SeepArea32L-1049_175	SeepArea32L-1049	SA32/L-1049	1173801.044	3177846.029	8/18/2013	0	0.003560282	0.175165862	A	792.4	39.1	18-08-2013 13:37:34	0	0.015	0.737999976	0.237352133
SeepArea32L-1049_176	SeepArea32L-1049	SA32/L-1049	1173762.267	3177861.026	8/18/2013	0	0.001660933	0.110333405	A	792.4	39.2	18-08-2013 13:39:59	0	0.007	0.465000004	0.237276137
SeepArea32L-1049_177	SeepArea32L-1049	SA32/L-1049	1173881.781	3177847.877	8/18/2013	0	0.000474341	0.247605756	A	792.3	39.3	18-08-2013 13:42:48	0	0.002	1.04400003	0.237170264
SeepArea32L-1049_178	SeepArea32L-1049	SA32/L-1049	1173955.663	3177751.436	8/18/2013	0	0.000948138	0.138428167	A	792.1	39.4	18-08-2013 13:46:15	0	0.004	0.583999991	0.237034529
SeepArea32L-1049_179	SeepArea32L-1049	SA32/L-1049	1174042.32	3177745.944	8/18/2013	0	0.001421669	0.153066322	A	791.8	39.4	18-08-2013 13:48:46	0	0.006	0.646000028	0.236944765
SeepArea32L-1049_18	SeepArea32L-1049	SA32/L-1049	1175459.426	3176058.999	8/16/2013	0	0.003030949	0.918843806	A	785.6	42.0	16-08-2013 12:54:45	0	0.013	3.940999985	0.233149916
SeepArea32L-1049_180	SeepArea32L-1049	SA32/L-1049	1174150.89	3177745.412	8/18/2013	0.7528162	0.001420855	2.500941277	A	791.6	39.5	18-08-2013 13:51:41	3.178999901	0.006	10.56099987	0.236809134
SeepArea32L-1049_181	SeepArea32L-1049	SA32/L-1049	1174252.09	3177633.032	8/18/2013	0	0.00260341	2.1272223	A	791.4	39.6	18-08-2013 13:55:02	-0.388999999	0.011	8.987999916	0.236673608
SeepArea32L-1049_182	SeepArea32L-1049	SA32/L-1049	1174138.929	3177654.599	8/18/2013	0	0.001892784	0.091800012	A	791.4	39.7	18-08-2013 13:58:22	-0.192000002	0.008	0.388000011	0.236597955
SeepArea32L-1049_183	SeepArea32L-1049	SA32/L-1049	1174054.54	3177632.994	8/18/2013	0	0.002128701	0.295179904	A	791.4	39.8	18-08-2013 14:01:26	-0.714999974	0.009	1.248000026	0.236522362
SeepArea32L-1049_184	SeepArea32L-1049	SA32/L-1049	1173951.46	3177648.717	8/18/2013	5.519092083	0.002838796	9.507363319	A	791.8	39.9	18-08-2013 14:04:20	23.32999992	0.012	40.18899918	0.236566305
SeepArea32L-1049_185	SeepArea32L-1049	SA32/L-1049	1173840.76	3177639.756	8/18/2013	0	0.003546229	1.815432787	A	791.8	40.1	18-08-2013 14:07:18	0	0.015	7.678999901	0.236415267
SeepArea32L-1049_186	SeepArea32L-1049	SA32/L-1049	1173767.668	3177642.471	8/18/2013	0	0.002127595	0.171153247	A	792.0	40.2	18-08-2013 14:10:27	0	0.009	0.723999977	0.236399516
SeepArea32L-1049_187	SeepArea32L-1049	SA32/L-1049	1173864.505	3177557.546	8/18/2013	0	0.001181393		A	792.1	40.4	18-08-2013 14:13:34	0	0.005		0.236278564
SeepArea32L-1049_188	SeepArea32L-1049	SA32/L-1049	1173926.474	3177636.216	8/18/2013	0	0	0.823747933	A	791.8	40.7	18-08-2013 14:17:05	0	-0.004	3.490999937	0.235963315
SeepArea32L-1049_189	SeepArea32L-1049	SA32/L-1049	1173949.024	3177556.053	8/18/2013	0	0.002357832	2.557069302	A	791.7	40.9	18-08-2013 14:19:52	0	0.01	10.84500027	0.235783249
SeepArea32L-1049_19	SeepArea32L-1049	SA32/L-1049	1175474.229	3176153.561	8/16/2013	0	0	0	A	785.9	42.4	16-08-2013 12:59:19	0	-0.001	-0.259000003	0.232943296
SeepArea32L-1049_190	SeepArea32L-1049	SA32/L-1049	1174055.266	3177558.254	8/18/2013	0	0.001885066	0.28158167	A	791.7	41.1	18-08-2013 14:22:38	0	0.008	1.195000052	0.235633194
SeepArea32L-1049_191	SeepArea32L-1049	SA32/L-1049	1174150.677	3177552.209	8/18/2013	0	0.001883153	0.381103009	A	791.4	41.3	18-08-2013 14:25:47	0	0.008	1.618999958	0.23539409
SeepArea32L-1049_192	SeepArea32L-1049	SA32/L-1049	1174252.355	3177549.221	8/18/2013	0	0.00047037	0.148872122	A	791.2	41.5	18-08-2013 14:28:33	0	0.002	0.633000016	0.235185012
SeepArea32L-1049_193	SeepArea32L-1049	SA32/L-1049	1174254.004	3177441.822	8/18/2013	0	0.000939905	0.072372675	A	791.0	41.7	18-08-2013 14:31:22	0	0.004	0.307999998	0.234976217
SeepArea32L-1049_194	SeepArea32L-1049	SA32/L-1049	1174246.511	3177351.543	8/18/2013	0	0.000939844	0.102208033	A	791.2	41.8	18-08-2013 14:34:04	0	0.004	0.435000002	0.234961003
SeepArea32L-1049_195	SeepArea32L-1049	SA32/L-1049	1174360.102	3177347.05	8/18/2013	0	0.000469446	0.135904536	A	790.9	42.0	18-08-2013 14:36:54	0	0.002	0.578999996	0.234722853
SeepArea32L-1049_196	SeepArea32L-1049	SA32/L-1049	1174349.956	3177240.034	8/18/2013	2.532325506	0.000234648	0.163784578	A	790.9	42.1	18-08-2013 14:40:15	10.79199982	0.001	0.698000014	0.234648392
SeepArea32L-1049_197	SeepArea32L-1049	SA32/L-1049	1174460.224	3177153.991	8/18/2013	0	0.000703499	0.149845272	A	790.9	42.3	18-08-2013 14:43:21	0	0.003	0.638999999	0.234499633
SeepArea32L-1049_198	SeepArea32L-1049	SA32/L-1049	1174349.535	3177158.296	8/18/2013	0	0.001406374	0.560674429	A	790.8	42.4	18-08-2013 14:46:49	0	0.006	2.39199996	0.234395668
SeepArea32L-1049_199	SeepArea32L-1049	SA32/L-1049	1174257.443	3177152.614	8/18/2013	0	0.005625136	0.565794945	A	791.0	42.5	18-08-2013 14:49:17	0	0.024	2.414000034	0.234380677
SeepArea32L-1049_20	SeepArea32L-1049	SA32/L-1049	1175378.096	3176143.396	8/16/2013	0	0.001163758	0.291870564	A	786.0	42.7	16-08-2013 13:03:45	0	0.005	1.253999949	0.232751653
SeepArea32L-1049_200	SeepArea32L-1049	SA32/L-1049	1174166.429	3177146.37	8/18/2013	0	0.002577206	0.202193558	A	791.2	42.7	18-08-2013 14:51:43	0	0.011	0.862999976	0.234291494
SeepArea32L-1049_201	SeepArea32L-1049	SA32/L-1049	1174038.714	3177156.255	8/18/2013	0	0.003044825	0.469605774	A	791.2	42.8	18-08-2013 14:54:36	0	0.013	2.005000114	0.234217331
SeepArea32L-1049_202	SeepArea32L-1049	SA32/L-1049	1174042.072	3177062.286	8/18/2013	0	0.003511481	1.369945884	A	791.3	43.0	18-08-2013 14:57:11	0	0.015	5.852000237	0.234098747
SeepArea32L-1049_203	SeepArea32L-1049	SA32/L-1049	1174048.042	3176955.643	8/18/2013	0	0.001871606	0.261556953	A	791.3	43.2	18-08-2013 14:59:40	0	0.008	1.118000031	0.233950749
SeepArea32L-1049_204	SeepArea32L-1049	SA32/L-1049	1174148.81	3176948.64	8/18/2013	0	0.000934916	0.31062597	A	791.3	43.5	18-08-2013 15:02:31	0	0.004	1.328999996	0.233729094
SeepArea32L-1049_205	SeepArea32L-1049	SA32/L-1049	1174150.4	3177056.882	8/18/2013	0	0.002815022	0.636898816	A	794.7	43.7	18-08-2013 15:05:57	0	0.012	2.714999914	0.234585196
SeepArea32L-1049_206	SeepArea32L-1049	SA32/L-1049	1174256.971	3177043.914	8/18/2013	0.655468106	0.002100111	1.660021424	A	791.0	43.9	18-08-2013 15:08:49	2.809000015	0.009	7.113999844	0.233345717
SeepArea32L-1049_207	SeepArea32L-1049	SA32/L-1049	1174240.569	3176941.202	8/18/2013	0	0.001399015	0.456078827	A	790.9	44.1	18-08-2013 15:11:47	0	0.006	1.95599997	0.233169138
SeepArea32L-1049_208	SeepArea32L-1049	SA32/L-1049	1174348.704	3176938.176	8/18/2013	0	0.001863591	0.376678288	A	790.9	44.4	18-08-2013 15:18:06	0	0.008	1.616999984	0.232948855
SeepArea32L-1049_209	SeepArea32L-1049	SA32/L-1049	1174361.662	3177049.546	8/18/2013	0	0.001164378	0.095478959	A	790.9	44.5	18-08-2013 15:20:55	0	0.005	0.409999996	0.232875511
SeepArea32L-1049_21	SeepArea32L-1049	SA32/L-1049	1175340.011	3176039.478	8/16/2013	0	0.001165093	0.030991485	A	787.4	42.9	16-08-2013 13:07:56	0	0.005	0.133000001	0.233018681
SeepArea32L-1049_210	SeepArea32L-1049	SA32/L-1049	1174455.504	3177046.368	8/18/2013	0	0.000931209	0.194157049	A	790.9	44.6	18-08-2013 15:23:41	0	0.004	0.833999991	0.232802227
SeepArea32L-1049_211	SeepArea32L-1049	SA32/L-1049	1174449.962	3176939.078	8/18/2013	0	0.000232773	0.19715856	A	790.8	44.6	18-08-2013 15:26:19	0	0.001	0.847000003	0.232772797
SeepArea32L-1049_212	SeepArea32L-1049	SA32/L-1049	1174553.961	3176945.731	8/18/2013	0	0.000698407	0.569434285	A	790.9	44.6	18-08-2013 15:29:04	-0.949000001	0.003	2.446000099	0.232802227

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepArea32L-1049_213	SeepArea32L-1049	SA32/L-1049	1174556.125	3176849.426	8/18/2013	0	0.001861711	0.600867331	A	790.6	44.6	18-08-2013 15:31:46	0	0.008	2.582000017	0.232713923
SeepArea32L-1049_214	SeepArea32L-1049	SA32/L-1049	1174436.37	3176854.101	8/18/2013	0	0.000931091	0.251860172	A	790.8	44.6	18-08-2013 15:34:39	0	0.004	1.082000017	0.232772797
SeepArea32L-1049_215	SeepArea32L-1049	SA32/L-1049	1174339.144	3176848.046	8/18/2013	0	0.000931209	0.112676278	A	790.9	44.6	18-08-2013 15:37:16	0	0.004	0.483999997	0.232802227
SeepArea32L-1049_216	SeepArea32L-1049	SA32/L-1049	1174346.465	3176748.803	8/18/2013	0	0.000465604	0.132697269	A	790.9	44.6	18-08-2013 15:39:57	0	0.002	0.569999993	0.232802227
SeepArea32L-1049_217	SeepArea32L-1049	SA32/L-1049	1174455.392	3176757.605	8/18/2013	0	0.000698099	0.220599189	A	790.8	44.7	18-08-2013 15:42:44	0	0.003	0.948000014	0.232699558
SeepArea32L-1049_218	SeepArea32L-1049	SA32/L-1049	1174543.557	3176745.553	8/18/2013	0	0.001627973	0.14558728	A	790.6	44.8	18-08-2013 15:45:17	-0.915000021	0.007	0.625999987	0.232567534
SeepArea32L-1049_219	SeepArea32L-1049	SA32/L-1049	1174545.847	3176640.012	8/18/2013	0	0.00092945	0.048563771	A	790.4	45.0	18-08-2013 15:47:55	0	0.004	0.209000006	0.232362539
SeepArea32L-1049_22	SeepArea32L-1049	SA32/L-1049	1175261.41	3176051.691	8/16/2013	0	0.000699322	0.466914237	A	787.7	42.9	16-08-2013 13:12:20	0	0.003	2.003000021	0.233107448
SeepArea32L-1049_220	SeepArea32L-1049	SA32/L-1049	1174644.31	3176655.566	8/18/2013	0	0.001857262	0.748708844	A	790.2	45.2	18-08-2013 15:51:19	0	0.008	3.224999905	0.232157797
SeepArea32L-1049_221	SeepArea32L-1049	SA32/L-1049	1174642.897	3176569.057	8/18/2013	0	0.000696255	0.118131213	A	790.2	45.3	18-08-2013 15:54:05	0	0.003	0.509000003	0.2320849
SeepArea32L-1049_222	SeepArea32L-1049	SA32/L-1049	1174550.462	3176536.922	8/18/2013	0	0.000928048	0.109045662	A	790.2	45.4	18-08-2013 15:56:50	0	0.004	0.469999999	0.232012048
SeepArea32L-1049_223	SeepArea32L-1049	SA32/L-1049	1174545.269	3176448.298	8/18/2013	0	0.000695818	0.102053262	A	790.2	45.5	18-08-2013 15:59:53	0	0.003	0.439999998	0.231939226
SeepArea32L-1049_224	SeepArea32L-1049	SA32/L-1049	1174653.406	3176437.735	8/18/2013	0	0.00046382	0.151437148	A	790.1	45.5	18-08-2013 16:02:25	0	0.002	0.652999997	0.231909886
SeepArea32L-1049_225	SeepArea32L-1049	SA32/L-1049	1174651.777	3176339.855	8/18/2013	0	0.000231808	0.159947366	A	790.0	45.6	18-08-2013 16:05:04	0	0.001	0.689999998	0.231807783
SeepArea32L-1049_226	SeepArea32L-1049	SA32/L-1049	1174554.724	3176353.366	8/18/2013	0	0.000927522	0.11083889	A	790.0	45.5	18-08-2013 16:08:13	0	0.004	0.477999985	0.231880531
SeepArea32L-1049_227	SeepArea32L-1049	SA32/L-1049	1174438.014	3176354.29	8/18/2013	0	0.000463878	0.064942986	A	790.2	45.5	18-08-2013 16:10:53	0	0.002	0.280000001	0.231939226
SeepArea32L-1049_228	SeepArea32L-1049	SA32/L-1049	1174339.919	3176346.388	8/18/2013	0	0	0.25327763	A	790.2	45.5	18-08-2013 16:13:43	0	0	1.092000008	0.231939226
SeepArea32L-1049_229	SeepArea32L-1049	SA32/L-1049	1174336.268	3176258.542	8/18/2013	0	0.000464142	0.215361655	A	790.4	45.4	18-08-2013 16:16:24	-5.327000141	0.002	0.927999973	0.232070759
SeepArea32L-1049_23	SeepArea32L-1049	SA32/L-1049	1175153.108	3176053.167	8/16/2013	0	0.000933672	0.763277054	A	788.5	42.8	16-08-2013 13:15:43	0	0.004	3.269999981	0.233418062
SeepArea32L-1049_230	SeepArea32L-1049	SA32/L-1049	1174342.587	3176157.46	8/18/2013	0	0.000696212	0.350658923	A	790.4	45.4	18-08-2013 16:18:53	0	0.003	1.511000037	0.232070759
SeepArea32L-1049_231	SeepArea32L-1049	SA32/L-1049	1174450.6	3176148.169	8/18/2013	0	0.00046417	0.441889673	A	790.2	45.3	18-08-2013 16:21:30	0	0.002	1.904000044	0.2320849
SeepArea32L-1049_232	SeepArea32L-1049	SA32/L-1049	1174468.499	3176256.35	8/18/2013	0	0.000696385	0.787611723	A	790.1	45.2	18-08-2013 16:24:09	0	0.003	3.392999887	0.232128426
SeepArea32L-1049_233	SeepArea32L-1049	SA32/L-1049	1174554.695	3176253.076	8/18/2013	0	0.000464344	0.142553598	A	790.0	45.1	18-08-2013 16:26:38	0	0.002	0.614000022	0.232171968
SeepArea32L-1049_234	SeepArea32L-1049	SA32/L-1049	1174542.692	3176153.171	8/18/2013	0	0.000232113	0.109789543	A	789.8	45.1	18-08-2013 16:29:10	0	0.001	0.47299999	0.232113197
SeepArea32L-1049_24	SeepArea32L-1049	SA32/L-1049	1175053.913	3176057.375	8/16/2013	0	0.001402551	0.083919287	A	789.4	42.7	16-08-2013 13:20:40	0	0.006	0.358999997	0.233758464
SeepArea32L-1049_25	SeepArea32L-1049	SA32/L-1049	1175088.301	3176141.721	8/16/2013	0	0	0.061603155	A	790.5	42.5	16-08-2013 13:24:52	0	0	0.263000011	0.234232515
SeepArea32L-1049_26	SeepArea32L-1049	SA32/L-1049	1175178.719	3176155.176	8/16/2013	0	0.000936871	0.363740265	A	790.2	42.4	16-08-2013 13:27:46	0	0.004	1.552999973	0.234217823
SeepArea32L-1049_27	SeepArea32L-1049	SA32/L-1049	1175267.505	3176167.976	8/16/2013	0	0.000468288	0.114730477	A	789.7	42.3	16-08-2013 13:31:01	0	0.002	0.49000001	0.234143823
SeepArea32L-1049_28	SeepArea32L-1049	SA32/L-1049	1175368.515	3176249.902	8/16/2013	0	0.001168198	0.059344478	A	787.5	42.1	16-08-2013 13:36:21	0	0.005	0.254000008	0.233639672
SeepArea32L-1049_29	SeepArea32L-1049	SA32/L-1049	1175247.499	3176242.121	8/16/2013	0	0.000467754	0.072268002	A	787.8	41.9	16-08-2013 13:39:59	0	0.002	0.308999985	0.233877048
SeepArea32L-1049_30	SeepArea32L-1049	SA32/L-1049	1175177.321	3176244.006	8/16/2013	0	0	0.056457378	A	789.1	41.9	16-08-2013 13:42:48	0	-0.002	0.240999997	0.234262988
SeepArea32L-1049_31	SeepArea32L-1049	SA32/L-1049	1175072.346	3176244.14	8/16/2013	0	0.002344411	0.641430855	A	789.7	41.9	16-08-2013 13:46:06	0	0.01	2.736000061	0.234441102
SeepArea32L-1049_32	SeepArea32L-1049	SA32/L-1049	1174962.576	3176338.123	8/16/2013	0	0.000704125	0.385860443	A	790.6	41.9	16-08-2013 13:49:20	0	0.003	1.644000053	0.234708294
SeepArea32L-1049_33	SeepArea32L-1049	SA32/L-1049	1175074.353	3176342.812	8/16/2013	0	0	0.030744804	A	790.8	42.0	16-08-2013 13:52:55	0	0	0.130999997	0.23469317
SeepArea32L-1049_34	SeepArea32L-1049	SA32/L-1049	1175161.16	3176343.872	8/16/2013	0	0	0.06909433	A	789.7	42.2	16-08-2013 13:56:01	0	-0.006	0.294999987	0.234218076
SeepArea32L-1049_35	SeepArea32L-1049	SA32/L-1049	1175243.66	3176331.662	8/16/2013	0	0	0.038119532	A	789.0	42.4	16-08-2013 13:58:45	0	0	0.163000003	0.233862147
SeepArea32L-1049_36	SeepArea32L-1049	SA32/L-1049	1175363.445	3176344.326	8/16/2013	0	0	0.024284694	A	788.3	42.6	16-08-2013 14:02:28	0	-0.001	0.104000002	0.233506665
SeepArea32L-1049_37	SeepArea32L-1049	SA32/L-1049	1175267.207	3176452.759	8/16/2013	0	0	0.266780078	A	788.7	42.9	16-08-2013 14:05:56	0	0	1.143000007	0.233403385
SeepArea32L-1049_38	SeepArea32L-1049	SA32/L-1049	1175168.307	3176446.265	8/16/2013	0	0	0.219677433	A	790.2	43.1	16-08-2013 14:08:47	0	0	0.939999998	0.233699396
SeepArea32L-1049_39	SeepArea32L-1049	SA32/L-1049	1175061.241	3176431.967	8/16/2013	0	0.000700877	0.142511576	A	790.2	43.2	16-08-2013 14:11:41	0	0.003	0.610000014	0.233625531
SeepArea32L-1049_40	SeepArea32L-1049	SA32/L-1049	1174959.334	3176439.874	8/16/2013	15.28578758	0.000701054	1.661498547	A	790.9	43.4	16-08-2013 14:16:04	65.41200256	0.003	7.110000134	0.233684748
SeepArea32L-1049_41	SeepArea32L-1049	SA32/L-1049	1174861.834	3176430.722	8/16/2013	0	0.001168202	0.410039067	A	791.0	43.5	16-08-2013 14:18:56	0	0.005	1.754999995	0.233640492
SeepArea32L-1049_42	SeepArea32L-1049	SA32/L-1049	1174851.706	3176552.47	8/16/2013	143.355423	0.001868417	1.798817992	A	791.2	43.7	16-08-2013 14:23:01	613.8049927	0.008	7.702000141	0.233552054
SeepArea32L-1049_43	SeepArea32L-1049	SA32/L-1049	1174952.459	3176547.471	8/16/2013	0	0.000933383	0.803875983	A	791.0	43.9	16-08-2013 14:25:38	0	0.004	3.444999933	0.233345717
SeepArea32L-1049_44	SeepArea32L-1049	SA32/L-1049	1175041.567	3176549.411	8/16/2013	20.20582008	0.001166066	1.901153803	A	790.8	44.0	16-08-2013 14:28:16	86.64099884	0.005	8.152000427	0.233213156
SeepArea32L-1049_45	SeepArea32L-1049	SA32/L-1049	1175153.953	3176556.69	8/16/2013	2.978387833	0.000232978	0.179858834	A	790.5	44.2	16-08-2013 14:31:21	12.7840004	0.001	0.772000015	0.232977763
SeepArea32L-1049_46	SeepArea32L-1049	SA32/L-1049	1175251.914	3176553.44	8/16/2013	0.45998615	0.003260661	3.21035409	A	790.5	44.3	16-08-2013 14:35:00	1.975000024	0.014	13.7840004	0.232904375
SeepArea32L-1049_47	SeepArea32L-1049	SA32/L-1049	1175361.202	3176544.622	8/16/2013	0	0.00139584	0.255206019	A	790.1	44.5	16-08-2013 14:37:55	0	0.006	1.097000003	0.232639953
SeepArea32L-1049_48	SeepArea32L-1049	SA32/L-1049	1175460.024	3176539.76	8/16/2013	0	0.002790448	0.732492566	A	790.0	44.6	16-08-2013 14:40:42	0	0.012	3.150000095	0.232537314
SeepArea32L-1049_49	SeepArea32L-1049	SA32/L-1049	1175460.296	3176647.009	8/16/2013	0	0.003021837	3.46442008	A	789.7	44.6	16-08-2013 14:44:01	0	0.013	14.90400028	0.23244901
SeepArea32L-1049_50	SeepArea32L-1049	SA32/L-1049	1175363.501	3176660.214	8/16/2013	2.253592968	0.001627143	0.724078655	A	789.7	44.6	16-08-2013 14:47:45	9.694999695	0.007	3.11500001	0.23244901
SeepArea32L-1049_51	SeepArea32L-1049	SA32/L-1049	1175252.732	3176649.537	8/16/2013	0.597657621	0.001162758	0.655562997	A	789.8	44.5	16-08-2013 14:51:00	2.569999933	0.005	2.819000006	0.232551619
SeepArea32L-1049_52	SeepArea32L-1049	SA32/L-1049	1175145.931	3176654.198	8/16/2013	0.61994803	0.000232713	2.248940468	A	790.1	44.4	16-08-2013 14:54:14	2.664000034	0.001	9.663999557	0.232713223
SeepArea32L-1049_53	SeepArea32L-1049	SA32/L-1049	1175053.921	3176645.142	8/16/2013	1.829696774	0.000931618	3.591618299	A	790.5	44.3	16-08-2013 14:57:09	7.855999947	0.004	15.42099953	0.232904375
SeepArea32L-1049_54	SeepArea32L-1049	SA32/L-1049	1174972.907	3176657.906	8/16/2013	0	0.003959876	1.546214938	A	790.6	44.3	16-08-2013 14:59:46	0	0.017000001	6.638000011	0.232933849
SeepArea32L-1049_55	SeepArea32L-1049	SA32/L-1049	1174864.476	3176656.185	8/16/2013	0	0.002330662	0.527894914	A	790.8	44.2	16-08-2013 15:02:33	0	0.01	2.265000105	0.233066186
SeepArea32L-1049_56	SeepArea32L-1049	SA32/L-1049	1174752.432	3176651.808	8/16/2013	0	0.001399104	1.014117479	A	791.2	44.2	16-08-2013 15:05:28	0	0.006	4.348999977	0.233184069
SeepArea32L-1049_57	SeepArea32L-1049	SA32/L-1049	1174750.042	3176768.449	8/16/2013	0	0.000699773	0.526462317	A	791.2	44.1	16-08-2013 15:08:34	0	0.003	2.256999969	0.233257577
SeepArea32L-1049_58	SeepArea32L-1049	SA32/L-1049	1174851.782	3176758.214	8/16/2013	0	0.000700214	0.459107101	A	791.2	43.9	16-08-2013 15:11:40	0	0.003	1.967000008	0.233404726

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepArea32L-1049_59	SeepArea32L-1049	SA32/L-1049	1174946.124	3176752.866	8/16/2013	0	0.00023336	0.280265749	A	790.8	43.8	16-08-2013 15:14:23	0	0.001	1.200999975	0.23336032
SeepArea32L-1049_60	SeepArea32L-1049	SA32/L-1049	1175048.193	3176749.168	8/16/2013	0	0.000933676	0.080529585	A	790.5	43.6	16-08-2013 15:17:32	0	0.004	0.344999999	0.233419091
SeepArea32L-1049_61	SeepArea32L-1049	SA32/L-1049	1175145.531	3176758.284	8/16/2013	0	0.000933794	1.143196583	A	790.1	43.4	16-08-2013 15:20:54	0	0.004	4.896999836	0.233448371
SeepArea32L-1049_62	SeepArea32L-1049	SA32/L-1049	1175248.366	3176763.942	8/16/2013	0.812343359	0	0.255988598	A	789.5	43.0	16-08-2013 15:26:46	3.477999926	0	1.095999956	0.233566239
SeepArea32L-1049_63	SeepArea32L-1049	SA32/L-1049	1175357.789	3176749.374	8/16/2013	0	0.000934679	0.14814654	A	789.1	42.7	16-08-2013 15:30:34	0	0.004	0.634000003	0.233669624
SeepArea32L-1049_64	SeepArea32L-1049	SA32/L-1049	1175465.347	3176747.854	8/16/2013	0	0.001635479	0.144623101	A	788.5	42.5	16-08-2013 15:34:01	0	0.007	0.619000018	0.233639896
SeepArea32L-1049_65	SeepArea32L-1049	SA32/L-1049	1175377.97	3176817.466	8/16/2013	0	0.000934796	0.09464813	A	788.2	42.3	16-08-2013 15:38:07	0	0.004	0.405000001	0.233699083
SeepArea32L-1049_66	SeepArea32L-1049	SA32/L-1049	1175293.346	3176839.656	8/16/2013	0	0.000466894	0.070034087	A	787.1	42.2	16-08-2013 15:41:35	0	0.002	0.300000012	0.233446941
SeepArea32L-1049_67	SeepArea32L-1049	SA32/L-1049	1175267.916	3176964.613	8/16/2013	0	0.000233625	0.114008948	A	787.7	42.2	16-08-2013 15:45:48	0	0.001	0.488000005	0.23362489
SeepArea32L-1049_68	SeepArea32L-1049	SA32/L-1049	1175178.803	3176934.546	8/16/2013	0	0.000466449	0.01539283	A	786.6	42.3	16-08-2013 15:49:19	0	0.002	0.066	0.23322469
SeepArea32L-1049_69	SeepArea32L-1049	SA32/L-1049	1175145.869	3176845.486	8/16/2013	0	0.00070083	0.288041323	A	787.9	42.3	16-08-2013 15:53:45	0	0.003	1.23300004	0.233610138
SeepArea32L-1049_70	SeepArea32L-1049	SA32/L-1049	1175048.771	3176848.466	8/16/2013	0	0.010528468	1.488725185	A	789.1	42.3	16-08-2013 15:57:26	0	0.045000002	6.362999916	0.233965933
SeepArea32L-1049_71	SeepArea32L-1049	SA32/L-1049	1175052.973	3176944.862	8/16/2013	0	0.002574766	0.745043635	A	789.7	42.4	16-08-2013 16:00:00	0	0.011	3.183000088	0.234069631
SeepArea32L-1049_72	SeepArea32L-1049	SA32/L-1049	1174958.504	3176952.089	8/16/2013	0	0.003742742	0.573809147	A	789.7	42.6	16-08-2013 16:03:08	0	0.016000001	2.453000069	0.233921364
SeepArea32L-1049_73	SeepArea32L-1049	SA32/L-1049	1174949.566	3176842.466	8/16/2013	0	0.000935982	3.194738626	A	790.2	42.7	16-08-2013 16:05:57	0	0.004	13.65299988	0.233995363
SeepArea32L-1049_74	SeepArea32L-1049	SA32/L-1049	1174856.232	3176858.101	8/16/2013	0.670672953	0.00093604	0.356865406	A	790.5	42.8	16-08-2013 16:10:17	2.865999937	0.004	1.524999976	0.234010115
SeepArea32L-1049_75	SeepArea32L-1049	SA32/L-1049	1174853.209	3176944.653	8/16/2013	0	0.00046802	1.168412566	A	790.5	42.8	16-08-2013 16:13:20	0	0.002	4.993000031	0.234010115
SeepArea32L-1049_76	SeepArea32L-1049	SA32/L-1049	1174760.357	3176958.695	8/16/2013	2.411942244	0.002106091	0.892982602	A	790.5	42.8	16-08-2013 16:16:12	10.30700016	0.009	3.815999985	0.234010115
SeepArea32L-1049_77	SeepArea32L-1049	SA32/L-1049	1174766.075	3176850.955	8/16/2013	0	0.000936692	0.273279965	A	790.8	42.7	16-08-2013 16:19:11	0	0.004	1.167000055	0.234173045
SeepArea32L-1049_78	SeepArea32L-1049	SA32/L-1049	1174667.387	3176945.643	8/16/2013	1.719933867	0.000937166	1.933607817	A	791.2	42.7	16-08-2013 16:22:05	7.34100008	0.004	8.253000259	0.234291494
SeepArea32L-1049_79	SeepArea32L-1049	SA32/L-1049	1174646.972	3177048.642	8/17/2013	21.18105316	0	0.42572695	A	792.5	19.7	17-08-2013 08:49:42	83.68399811	-0.002	1.682000041	0.253107578
SeepArea32L-1049_80	SeepArea32L-1049	SA32/L-1049	1174654.411	3177158.15	8/17/2013	0	0.001006245	0.130308792	A	792.5	21.5	17-08-2013 08:54:26	0	0.004	0.518000007	0.251561373
SeepArea32L-1049_81	SeepArea32L-1049	SA32/L-1049	1174642.666	3177250.83	8/17/2013	0	0.001001491	0.380065769	A	791.7	22.6	17-08-2013 08:57:19	0	0.004	1.518000007	0.250372708
SeepArea32L-1049_82	SeepArea32L-1049	SA32/L-1049	1174547.668	3177239.371	8/17/2013	0.663222075	0.001248066	0.205431595	A	791.7	23.5	17-08-2013 09:00:26	2.657000065	0.005	0.823000014	0.249613121
SeepArea32L-1049_83	SeepArea32L-1049	SA32/L-1049	1174567.381	3177352.471	8/17/2013	0.369446009	0.002487852	0.741131067	A	792.0	24.6	17-08-2013 09:03:20	1.485000014	0.01	2.979000092	0.248785183
SeepArea32L-1049_84	SeepArea32L-1049	SA32/L-1049	1174565.734	3177446.363	8/17/2013	0.277535617	0.000247579	0.275307387	A	791.6	25.9	17-08-2013 09:07:13	1.121000051	0.001	1.111999989	0.247578591
SeepArea32L-1049_85	SeepArea32L-1049	SA32/L-1049	1174461.933	3177446.404	8/17/2013	0.597664773	0.001728068	0.497930557	A	791.7	26.8	17-08-2013 09:10:24	2.421000004	0.007	2.01699996	0.246866912
SeepArea32L-1049_86	SeepArea32L-1049	SA32/L-1049	1174470.917	3177558.866	8/17/2013	1.361587524	0.001967968	1.373641491	A	791.8	27.9	17-08-2013 09:13:44	5.534999847	0.008	5.584000111	0.245995954
SeepArea32L-1049_87	SeepArea32L-1049	SA32/L-1049	1174468.327	3177646.597	8/17/2013	0	0	0.474052459	A	791.7	29.1	17-08-2013 09:17:26	0	-0.003	1.934999943	0.244988352
SeepArea32L-1049_88	SeepArea32L-1049	SA32/L-1049	1174380.908	3177641.027	8/17/2013	0	0.0029321	2.448303223	A	791.7	29.9	17-08-2013 09:20:11	-0.018999999	0.012	10.02000046	0.244341627
SeepArea32L-1049_89	SeepArea32L-1049	SA32/L-1049	1174367.397	3177748.491	8/17/2013	0	0.001950572	1.520714283	A	792.1	30.7	17-08-2013 09:23:00	0	0.008	6.236999989	0.243821442
SeepArea32L-1049_90	SeepArea32L-1049	SA32/L-1049	1174372.615	3177857.126	8/17/2013	1.486134052	0.001458424	0.857310295	A	792.0	31.6	17-08-2013 09:26:01	6.113999844	0.006	3.52699995	0.243070677
SeepArea32L-1049_91	SeepArea32L-1049	SA32/L-1049	1174256.286	3177948.118	8/17/2013	0	0.001937083	0.942874849	A	791.8	32.7	17-08-2013 09:29:42	0	0.008	3.894000053	0.242135301
SeepArea32L-1049_92	SeepArea32L-1049	SA32/L-1049	1174265.619	3178037.677	8/17/2013	3.932395935	0.005556279	6.645551205	A	792.3	33.6	17-08-2013 09:32:45	16.27799988	0.023	27.50900078	0.241577342
SeepArea32L-1049_93	SeepArea32L-1049	SA32/L-1049	1174259.754	3178142.307	8/17/2013	0	0.002408577	0.933564484	A	792.0	34.4	17-08-2013 09:35:56	0	0.01	3.875999928	0.24085772
SeepArea32L-1049_94	SeepArea32L-1049	SA32/L-1049	1174151.393	3178165.197	8/17/2013	0	0.00168054	0.583627462	A	792.0	35.4	17-08-2013 09:39:55	0	0.007	2.430999994	0.240077108
SeepArea32L-1049_95	SeepArea32L-1049	SA32/L-1049	1174255.986	3178231.065	8/17/2013	0	0.001915756	0.15709202	A	792.3	36.3	17-08-2013 09:43:44	0	0.008	0.656000018	0.239469543
SeepArea32L-1049_96	SeepArea32L-1049	SA32/L-1049	1174362.342	3178243.717	8/17/2013	0	0.00238795	0.031282142	A	791.6	36.9	17-08-2013 09:46:21	0	0.01	0.130999997	0.238794968
SeepArea32L-1049_97	SeepArea32L-1049	SA32/L-1049	1174462.057	3178243.309	8/17/2013	0	0.002621372	0.2445025	A	791.0	37.3	17-08-2013 09:49:00	0	0.011	1.026000023	0.238306522
SeepArea32L-1049_98	SeepArea32L-1049	SA32/L-1049	1174458.781	3178152.033	8/17/2013	0	0.002377867	0.195222884	A	790.8	37.9	17-08-2013 09:51:42	0	0.01	0.82099998	0.23778671
SeepArea32L-1049_99	SeepArea32L-1049	SA32/L-1049	1174360.666	3178153.044	8/17/2013	0	0.003326193	1.237818956	A	791.4	38.4	17-08-2013 09:54:20	0	0.014	5.210000038	0.237585217
SeepAreaL-1021_01	SeepAreaL-1021	L-1021	1174233.044	3178834.859	8/20/2013	0	0	0.246762946	A	789.1	39.4	20-08-2013 13:11:50	0	-0.004	1.044999957	0.236136794
SeepAreaL-1021_02	SeepAreaL-1021	L-1021	1174206.056	3178906.971	8/20/2013	0	0	0.112421438	A	789.1	40.0	20-08-2013 13:14:35	0	-0.002	0.476999998	0.23568435
SeepAreaL-1021_03	SeepAreaL-1021	L-1021	1174047.341	3178836.518	8/20/2013	0	0.001175717	0.097584493	A	789.3	40.8	20-08-2013 13:18:05	0	0.005	0.414999992	0.235143363
SeepAreaL-1021_04	SeepAreaL-1021	L-1021	1174010.787	3178869.604	8/20/2013	0	0.001174664	0.120990343	A	790.1	41.4	20-08-2013 13:20:34	0	0.005	0.514999986	0.234932706
SeepAreaL-1021_05	SeepAreaL-1021	L-1021	1173969.972	3178887.78	8/20/2013	0	0.00164244	0.190288454	A	790.1	41.8	20-08-2013 13:22:58	0	0.007	0.81099999	0.23463434
SeepAreaL-1021_06	SeepAreaL-1021	L-1021	1174008.812	3178821.189	8/20/2013	0	0.000936753	0.014519667	A	790.1	42.4	20-08-2013 13:26:52	0	0.004	0.061999999	0.234188184
SeepAreaL-1021_07	SeepAreaL-1021	L-1021	1174008.233	3178779.278	8/20/2013	0	0.001169311	0.107108846	A	790.0	42.8	20-08-2013 13:29:15	0	0.005	0.458000004	0.233862102
SeepAreaL-1021_08	SeepAreaL-1021	L-1021	1174007.84	3178729.446	8/20/2013	0	0	0.167158514	A	790.5	43.1	20-08-2013 13:31:48	0	0	0.714999974	0.233788133
SeepAreaL-1021_09	SeepAreaL-1021	L-1021	1174053.392	3178770.369	8/20/2013	0	0.000233448	0.046456225	A	790.1	43.4	20-08-2013 13:34:19	0	0.001	0.199000001	0.233448371
SeepAreaL-1021_10	SeepAreaL-1021	L-1021	1174062.394	3178715.383	8/20/2013	0	0	0.119630486	A	790.0	43.7	20-08-2013 13:36:54	-0.025	0	0.513000011	0.233197823
SeepAreaL-1021_11	SeepAreaL-1021	L-1021	1174003.723	3178667.821	8/20/2013	0	0.000699109	0	A	790.2	44.0	20-08-2013 13:39:50	0	0.003	-0.02	0.23303622
SeepAreaL-1021_12	SeepAreaL-1021	L-1021	1174007.96	3178606.572	8/20/2013	0	0.000698713	0.024920769	A	790.5	44.3	20-08-2013 13:42:16	0	0.003	0.107000001	0.232904375
SeepAreaL-1021_13	SeepAreaL-1021	L-1021	1174005.719	3178562.84	8/20/2013	0	0.000465339	0.289906085	A	790.2	44.5	20-08-2013 13:45:06	0	0.002	1.246000051	0.232669398
SeepAreaL-1021_14	SeepAreaL-1021	L-1021	1173965.054	3178716.284	8/20/2013	0	0.001627149	0.035797279	A	790.2	44.8	20-08-2013 13:48:14	0	0.007	0.153999999	0.232449874
SeepAreaL-1021_15	SeepAreaL-1021	L-1021	1173954.368	3178786.988	8/20/2013	5.940224648	0.007902326	4.21705246	A	790.6	45.0	20-08-2013 13:51:24	25.55800056	0.034000002	18.1439991	0.232421339
SeepAreaL-1021_16	SeepAreaL-1021	L-1021	1173958.79	3178829.094	8/20/2013	0	0.00441658	0.428640753	A	791.2	45.2	20-08-2013 13:54:47	0	0.018999999	1.843999982	0.232451603
SeepAreaL-1021_17	SeepAreaL-1021	L-1021	1173932.312	3178834.091	8/20/2013	0	0.004644635	0.706216753	A	790.7	45.3	20-08-2013 13:58:20	0	0.02	3.040999889	0.232231751
SeepAreaL-1021_18	SeepAreaL-1021	L-1021	1173907.954	3178865.487	8/20/2013	0	0.006726237	0.151688248	A	790.2	45.5	20-08-2013 14:00:42	0	0.028999999	0.653999984	0.231939226

APPENDIX B - FLUX DATA

SitePt	Site	AreaAbbrev	Northing	Easting	Date	CH_4flux	H_2Sflux	CO_2flux	ACCUMULATION CHAMBER	PRESSURE (HPa)	TEMP DegC	TIME	CH_4slope	H_2Sslope	CO_2slope	AcK
SeepAreaL-1021_19	SeepAreaL-1021	L-1021	1173857.849	3178877.538	8/20/2013	0	0.003714089	0.517651141	A	791.1	45.6	20-08-2013 14:02:59	0	0.016000001	2.230000019	0.232130557
SeepAreaL-1021_20	SeepAreaL-1021	L-1021	1173886.827	3178771.325	8/20/2013	0	0.008119968	0.611317575	A	790.9	45.7	20-08-2013 14:06:14	0	0.035	2.63499999	0.231999084
SeepAreaL-1021_21	SeepAreaL-1021	L-1021	1173869.345	3178817.811	8/20/2013	0	0.003941512	0.350098997	A	790.9	45.9	20-08-2013 14:08:41	0	0.017000001	1.50999999	0.231853649
SeepAreaL-1021_22	SeepAreaL-1021	L-1021	1173899.831	3178716.351	8/20/2013	0	0.001158758	0.100811988	A	790.8	46.0	20-08-2013 14:11:14	0	0.005	0.435000002	0.231751695
SeepAreaL-1021_23	SeepAreaL-1021	L-1021	1173951.853	3178673.386	8/20/2013	0	0	0.060460601	A	790.7	46.1	20-08-2013 14:13:46	0	0	0.261000007	0.231649801
SeepAreaL-1021_24	SeepAreaL-1021	L-1021	1173962.09	3178620.203	8/20/2013	0	0	0.133354768	A	790.5	46.2	20-08-2013 14:16:01	0	-0.003	0.575999975	0.231518701
SeepAreaL-1021_25	SeepAreaL-1021	L-1021	1173975.209	3178564.793	8/20/2013	0	0	0.011584023	A	791.3	46.3	20-08-2013 14:18:31	0	0	0.050000001	0.231680453
SeepAreaL-1021_26	SeepAreaL-1021	L-1021	1173904.118	3178355.231	8/20/2013	0	0.002544316	0.236158744	A	790.5	46.5	20-08-2013 14:23:05	0	0.011	1.021000028	0.231301412
SeepAreaL-1021_27	SeepAreaL-1021	L-1021	1173894.574	3178412.983	8/20/2013	0	0.002312291	0.205562636	A	790.5	46.6	20-08-2013 14:25:33	0	0.01	0.888999999	0.231229067
SeepAreaL-1021_28	SeepAreaL-1021	L-1021	1173896.425	3178467.05	8/20/2013	0	0.003699444	0.26289174	A	790.7	46.7	20-08-2013 14:27:43	0	0.016000001	1.136999965	0.231215253
SeepAreaL-1021_29	SeepAreaL-1021	L-1021	1173891.857	3178510.459	8/20/2013	0	0.003959248	0.34818095	A	796.7	46.8	20-08-2013 14:29:52	0	0.017000001	1.495000005	0.232896954
SeepAreaL-1021_30	SeepAreaL-1021	L-1021	1173900.035	3178559.628	8/20/2013	0	0.001862012	0.037472986	A	796.7	47.0	20-08-2013 14:32:01	0	0.008	0.160999998	0.232751459
SeepAreaL-1021_31	SeepAreaL-1021	L-1021	1173922.22	3178574.833	8/20/2013	0	0.00230868	0.259726554	A	790.5	47.1	20-08-2013 14:34:12	0	0.01	1.125	0.230868056
SeepAreaL-1021_32	SeepAreaL-1021	L-1021	1173895.363	3178616.044	8/20/2013	0	0.001846835	0.411613345	A	790.7	47.2	20-08-2013 14:36:37	0	0.008	1.782999992	0.230854377
SeepAreaL-1021_33	SeepAreaL-1021	L-1021	1173892.082	3178660.923	8/20/2013	0	0.000461537	0.070615217	A	790.9	47.4	20-08-2013 14:39:03	0	0.002	0.305999994	0.230768695
SeepAreaL-1021_34	SeepAreaL-1021	L-1021	1173838.988	3178715.583	8/20/2013	0	0.00023058	0.127280191	A	790.5	47.5	20-08-2013 14:41:22	-0.129999995	0.001	0.551999986	0.230580062
SeepAreaL-1021_35	SeepAreaL-1021	L-1021	1173850.995	3178764.035	8/20/2013	0	0.004841896	0.153096139	A	790.7	47.6	20-08-2013 14:43:34	0	0.021	0.663999975	0.230566487
SeepAreaL-1021_36	SeepAreaL-1021	L-1021	1173832.189	3178652.817	8/20/2013	0	0.001152988	0.017756021	A	791.3	47.8	20-08-2013 14:46:00	0	0.005	0.077	0.23059766
SeepAreaL-1021_37	SeepAreaL-1021	L-1021	1173839.801	3178608.023	8/20/2013	0	0.000460586	0.0158902	A	790.5	47.9	20-08-2013 14:48:39	0	0.002	0.068999998	0.230292767
SeepAreaL-1021_38	SeepAreaL-1021	L-1021	1173836.677	3178557.497	8/20/2013	0	0.003452879	0.443810076	A	790.4	48.0	20-08-2013 14:51:25	0	0.015	1.927999973	0.230191946
SeepAreaL-1021_39	SeepAreaL-1021	L-1021	1173849.246	3178511.964	8/20/2013	0	0.002532284	0.183245286	A	790.7	48.1	20-08-2013 14:53:47	0	0.011	0.796000004	0.230207637
SeepAreaL-1021_40	SeepAreaL-1021	L-1021	1173800.589	3178510.601	8/20/2013	0	0.000920311	0.100774072	A	790.5	48.2	20-08-2013 14:56:21	0	0.004	0.437999994	0.230077788
SeepAreaL-1021_41	SeepAreaL-1021	L-1021	1173804.605	3178451.682	8/20/2013	0	0.001381259	0.096227735	A	791.2	48.3	20-08-2013 14:58:38	0	0.006	0.418000013	0.230209887
SeepAreaL-1021_42	SeepAreaL-1021	L-1021	1173850.922	3178450.826	8/20/2013	0	0.001841106	0.557164788	A	791.2	48.4	20-08-2013 15:00:49	0	0.008	2.421000004	0.230138287
SeepAreaL-1021_43	SeepAreaL-1021	L-1021	1173839.444	3178417.638	8/20/2013	0.44018802	0.000919453	1.62214458	A	790.5	48.5	20-08-2013 15:03:22	1.914999962	0.004	7.05700016	0.229863197
SeepAreaL-1021_44	SeepAreaL-1021	L-1021	1173801.174	3178407.986	8/20/2013	0	0.004597579	0.156317696	A	790.8	48.6	20-08-2013 15:05:43	0	0.02	0.680000007	0.229878962
SeepAreaL-1021_45	SeepAreaL-1021	L-1021	1173799.206	3178352.572	8/20/2013	0	0.005971974	0.319500595	A	790.4	48.7	20-08-2013 15:08:09	0	0.026000001	1.391000032	0.229691297
SeepAreaL-1021_46	SeepAreaL-1021	L-1021	1173849.578	3178362.372	8/20/2013	0	0.002758228	0.276282549	A	791.2	48.8	20-08-2013 15:10:35	0	0.012	1.202000022	0.229852363
SeepAreaL-1050_01	SeepAreaL-1050	L-1050	1172720.298	3179622.781	8/20/2013	0	0	0.045400102	A	792.0	28.7	20-08-2013 11:31:34	0	-0.004	0.185000002	0.245405957
SeepAreaL-1050_02	SeepAreaL-1050	L-1050	1172656.484	3179609.619	8/20/2013	0	0	0.060912002	A	792.1	29.7	20-08-2013 11:35:37	0	-0.002	0.248999998	0.244626522
SeepAreaL-1050_03	SeepAreaL-1050	L-1050	1172625.247	3179607.194	8/20/2013	0	0	0.080743864	A	791.7	30.4	20-08-2013 11:38:27	0	0	0.331	0.243939161
SeepAreaL-1050_04	SeepAreaL-1050	L-1050	1172569.6	3179601.647	8/20/2013	0	0	0.057405274	A	791.0	31.0	20-08-2013 11:40:56	0	-0.001	0.236000001	0.243242681
SeepAreaL-1050_05	SeepAreaL-1050	L-1050	1172507.189	3179653.452	8/20/2013	0	0.000728199	0.054129478	A	790.9	31.6	20-08-2013 11:43:58	0	0.003	0.223000005	0.242733076
SeepAreaL-1050_06	SeepAreaL-1050	L-1050	1172577.421	3179674.61	8/20/2013	0	0	1.889341474	A	791.3	32.2	20-08-2013 11:46:30	0	-0.002	7.795000076	0.242378637
SeepAreaL-1050_07	SeepAreaL-1050	L-1050	1172620.976	3179661.249	8/20/2013	0	0	0.976244628	A	791.3	32.9	20-08-2013 11:49:36	0	-0.001	4.037000179	0.241824269
SeepAreaL-1050_08	SeepAreaL-1050	L-1050	1172659.943	3179641.243	8/20/2013	0	0	0.225728869	A	791.2	33.7	20-08-2013 11:53:26	0	-0.002	0.93599999	0.241163328
SeepAreaL-1050_09	SeepAreaL-1050	L-1050	1172666.968	3179676.596	8/20/2013	0	0.000481594	0.397314876	A	791.8	34.4	20-08-2013 11:56:04	0	0.002	1.649999976	0.240796894
SeepAreaL-1050_10	SeepAreaL-1050	L-1050	1172708.636	3179675.19	8/20/2013	0	0	0.064913154	A	792.1	35.0	20-08-2013 11:58:49	0	-0.004	0.270000011	0.24041909
SeepAreaL-1050_11	SeepAreaL-1050	L-1050	1172705.977	3179722.09	8/20/2013	0	0	0.162447423	A	792.1	35.6	20-08-2013 12:01:45	0	0	0.676999986	0.239951879
SeepAreaL-1050_12	SeepAreaL-1050	L-1050	1172641.487	3179708.032	8/20/2013	0	0	0.039275784	A	792.1	36.2	20-08-2013 12:04:37	0	0	0.164000005	0.239486486
SeepAreaL-1050_13	SeepAreaL-1050	L-1050	1172615.799	3179714.392	8/20/2013	0	0.000716475	0.289217234	A	791.7	36.9	20-08-2013 12:08:49	0	0.003	1.210999966	0.238825127
SeepAreaL-1050_14	SeepAreaL-1050	L-1050	1172571.747	3179714.559	8/20/2013	0	0	0.120917849	A	791.6	37.9	20-08-2013 12:16:30	0	-0.002	0.508000016	0.23802726
SeepAreaL-1050_15	SeepAreaL-1050	L-1050	1172503.78	3179704.534	8/20/2013	0	0.003800182	0.435120761	A	790.9	38.3	20-08-2013 12:19:15	0	0.016000001	1.832000017	0.237511337
SeepAreaL-1050_16	SeepAreaL-1050	L-1050	1172511.598	3179752.987	8/20/2013	0	0.005453684	0.390531212	A	790.6	38.7	20-08-2013 12:22:19	0	0.023	1.646999955	0.237116709
SeepAreaL-1050_17	SeepAreaL-1050	L-1050	1172556.671	3179769.816	8/20/2013	0	0.002605931	0.081968375	A	790.9	39.1	20-08-2013 12:24:55	0	0.011	0.345999986	0.236902818
SeepAreaL-1050_18	SeepAreaL-1050	L-1050	1172493.889	3179821.168	8/20/2013	0	0.002839556	0.134642273	A	791.0	39.5	20-08-2013 12:28:02	0	0.012	0.569000006	0.23662965
SeepAreaL-1050_19	SeepAreaL-1050	L-1050	1172521.118	3179939.857	8/20/2013	0	0.000708756	0.104895815	A	791.0	40.0	20-08-2013 12:32:33	0	0.003	0.444000006	0.236251831
SeepAreaL-1050_20	SeepAreaL-1050	L-1050	1172538.873	3180066.484	8/20/2013	0	0.001418661	0.021752799	A	792.4	40.3	20-08-2013 12:35:36	0	0.006	0.092	0.23644346
SeepAreaL-1050_21	SeepAreaL-1050	L-1050	1172616.637	3179854.1	8/20/2013	0	0.001651743	0.290706813	A	791.8	40.7	20-08-2013 12:38:41	0	0.007	1.231999993	0.235963315
SeepAreaL-1050_22	SeepAreaL-1050	L-1050	1172597.47	3179767.364	8/20/2013	0	0.00353607	0.301508874	A	791.8	41.0	20-08-2013 12:41:17	0	0.015	1.279000044	0.235737979

APPENDIX C

VOLUMETRIC FLUX CALCULATIONS

Grid Volume Computations

Wed Aug 28 11:11:34 2013

Upper Surface

Grid File Name:	P:\XTO Energy\608\2013 Survey\Surfer\SA32_L1049_CH4notail.grd
Grid Size:	53 rows x 76 columns
X Minimum:	3175780.303
X Maximum:	3178407.423
X Spacing:	35.028266666668
Y Minimum:	1173712.267
Y Maximum:	1175524.229
Y Spacing:	34.845423076924
Z Minimum:	0
Z Maximum:	125.2940436382

Lower Surface

Level Surface defined by Z = 0

Volumes

Z Scale Factor:	0.0929

Total Volumes by:

Trapezoidal Rule:	296746.24105452
Simpson's Rule:	295888.66347783
Simpson's 3/8 Rule:	297486.36473122

Cut & Fill Volumes

Positive Volume [Cut]:	296746.24105452
Negative Volume [Fill]:	0
Net Volume [Cut-Fill]:	296746.24105452

Areas

Planar Areas

Positive Planar Area [Cut]:	3087443.8848921
Negative Planar Area [Fill]:	0

Blanked Planar Area:	1672797.7245482
Total Planar Area:	4760241.6094404

Surface Areas

Positive Surface Area [Cut]:	3087636.927721
Negative Surface Area [Fill]:	0

APPENDIX D

NATURAL SPRING ANALYTICAL RESULTS

Mountain States ACCUTEST LABORATORIES

08/30/13

Technical Report for

LT Environmental

Colo Rule 608 Compliance Raton Basin CO

Accutest Job Number: D49476

Sampling Date: 08/15/13

Report to:

LT Environmental
4600 W 60th Ave
Arvada, CO 80003
dmoir@ltenv.com

ATTN: Dan Moir

Total number of pages in report: **60**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

Sections: 1 2 3 4 5 6 7 8

Table of Contents

Accutest Laboratories

Sample Summary

LT Environmental

Job No: D49476

Colo Rule 608 Compliance Raton Basin CO

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D49476-1	08/15/13	11:10	DH	08/16/13	AQ	Ground Water	CHAVEZ 03
D49476-1A	08/15/13	11:10	DH	08/16/13	AQ	Ground Water	CHAVEZ 03
D49476-1F	08/15/13	11:10	DH	08/16/13	AQ	Groundwater Filtered	CHAVEZ 03
D49476-2	08/15/13	12:30	DH	08/16/13	AQ	Ground Water	CHAVEZ 02
D49476-2A	08/15/13	12:30	DH	08/16/13	AQ	Ground Water	CHAVEZ 02
D49476-2F	08/15/13	12:30	DH	08/16/13	AQ	Groundwater Filtered	CHAVEZ 02
D49476-3	08/15/13	13:10	DH	08/16/13	AQ	Ground Water	CHAVEZ 01
D49476-3A	08/15/13	13:10	DH	08/16/13	AQ	Ground Water	CHAVEZ 01
D49476-3F	08/15/13	13:10	DH	08/16/13	AQ	Groundwater Filtered	CHAVEZ 01

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	LT Environmental	**Job No**	D49476
Site:	Colo Rule 608 Compliance Raton Basin CO	**Report Date**	8/30/2013 3:34:53 PM

On 08/16/2013, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D49476 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Metals By Method SW846 6010C

Matrix AQ **Batch ID:** MP10859

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49476-2FMS, D49476-2FMSD, D49476-2FSDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Iron, Manganese, Potassium are outside control limits for sample MP10859-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Matrix AQ **Batch ID:** MP10865

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49476-1MS, D49476-1MSD, D49476-1SDL were used as the QC samples for the metals analysis.
- The matrix spike / matrix spike duplicate (MS/MSD) recovery(s) of Sodium are outside control limits. Spike recovery indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix AQ **Batch ID:** MP10860

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49476-2FMS, D49476-2FMSD, D49476-2FSDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Selenium are outside control limits for sample MP10860-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ **Batch ID:** GP10701

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49497-1MS, D49497-1MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D49476-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

Matrix AQ **Batch ID:** R18422

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- D49476-3 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

Matrix AQ **Batch ID:** R18423

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- D49476-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

Matrix AQ **Batch ID:** R18424

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- D49476-2 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

Wet Chemistry By Method HACH IRB-BART

Matrix AQ **Batch ID:** MB236

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SLYM-BART

Matrix AQ **Batch ID:** MB237

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SRB-BART

Matrix AQ **Batch ID:** MB238

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ **Batch ID:** GN21597

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49387-1DUP, D49387-1MS, D49387-1MSD were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

Matrix AQ **Batch ID:** GN21598

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix AQ **Batch ID:** GN21599

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM 2540C-2011

Matrix	AQ	Batch ID:	GN21535

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D49385-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix	AQ	Batch ID:	GN21550

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D49476-1, D49476-2, D49476-3

Wet Chemistry By Method USDA HANDBOOK 60

Matrix	AQ	Batch ID:	MP10865

- D49476-1,2,3 for Sodium Adsorption Ratio: Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+(Mg meq/L)/2]

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D49476
Account: LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO
Collected: 08/15/13

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D49476-1	**CHAVEZ 03**					
Calcium		130	2.0		mg/l	SW846 6010C
Magnesium		53.5	1.0		mg/l	SW846 6010C
Sodium		210	2.0		mg/l	SW846 6010C
Alkalinity, Bicarbonate as CaCO3		536	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		536	5.0		mg/l	SM 2320B-2011
Bromide		2.6	0.25		mg/l	EPA 300.0/SW846 9056
Chloride		324	10		mg/l	EPA 300.0/SW846 9056
Fluoride		0.72	0.50		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate		0.26	0.050		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate + Nitrite [a]		0.26	0.070		mg/l	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [b]		3.91			ratio	USDA HANDBOOK 60
Solids, Total Dissolved		1090	10		mg/l	SM 2540C-2011
Specific Conductivity		1850	1.0		umhos/cm	SM 2510B-2011
Sulfate		47.4	2.5		mg/l	EPA 300.0/SW846 9056
pH		7.38			su	SM4500HB+ -2011/9040C
D49476-1A	**CHAVEZ 03**					
Iron Reducing Bacteria		9000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		359000	200		CFU/ml	HACH SRB-BART
D49476-1F	**CHAVEZ 03**					
Calcium		113000	400		ug/l	SW846 6010C
Iron		200	70		ug/l	SW846 6010C
Magnesium		48200	200		ug/l	SW846 6010C
Manganese		1280	5.0		ug/l	SW846 6010C
Potassium		5500	1000		ug/l	SW846 6010C
Sodium		223000	400		ug/l	SW846 6010C
D49476-2	**CHAVEZ 02**					
Calcium		63.6	2.0		mg/l	SW846 6010C
Magnesium		11.9	1.0		mg/l	SW846 6010C
Sodium		22.2	2.0		mg/l	SW846 6010C
Alkalinity, Bicarbonate as CaCO3		201	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		201	5.0		mg/l	SM 2320B-2011
Chloride		8.1	0.50		mg/l	EPA 300.0/SW846 9056
Fluoride		0.29	0.10		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate		1.8	0.050		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate + Nitrite [a]		1.8	0.054		mg/l	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [b]		0.670			ratio	USDA HANDBOOK 60

Summary of Hits

Job Number: D49476
Account: LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO
Collected: 08/15/13

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Solids, Total Dissolved		264	10		mg/l	SM 2540C-2011
Specific Conductivity		428	1.0		umhos/cm	SM 2510B-2011
Sulfate		31.3	2.5		mg/l	EPA 300.0/SW846 9056
pH		7.28			su	SM4500HB+ -2011/9040C
D49476-2A	**CHAVEZ 02**					
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		12500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		5000	200		CFU/ml	HACH SRB-BART
D49476-2F	**CHAVEZ 02**					
Calcium		59700	400		ug/l	SW846 6010C
Magnesium		11000	200		ug/l	SW846 6010C
Manganese		5.5	5.0		ug/l	SW846 6010C
Potassium		1510	1000		ug/l	SW846 6010C
Sodium		20200	400		ug/l	SW846 6010C
D49476-3	**CHAVEZ 01**					
Calcium		55.8	2.0		mg/l	SW846 6010C
Magnesium		9.48	1.0		mg/l	SW846 6010C
Sodium		23.2	2.0		mg/l	SW846 6010C
Alkalinity, Bicarbonate as CaCO3		171	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		171	5.0		mg/l	SM 2320B-2011
Chloride		5.8	0.50		mg/l	EPA 300.0/SW846 9056
Fluoride		0.27	0.10		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate		0.012	0.010		mg/l	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [b]		0.755			ratio	USDA HANDBOOK 60
Solids, Total Dissolved		224	10		mg/l	SM 2540C-2011
Specific Conductivity		358	1.0		umhos/cm	SM 2510B-2011
Sulfate		28.7	0.50		mg/l	EPA 300.0/SW846 9056
pH		7.40			su	SM4500HB+ -2011/9040C
D49476-3A	**CHAVEZ 01**					
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		66500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		1200	200		CFU/ml	HACH SRB-BART
D49476-3F	**CHAVEZ 01**					
Calcium		50200	400		ug/l	SW846 6010C
Magnesium		8590	200		ug/l	SW846 6010C

Summary of Hits

Job Number: D49476
Account: LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO
Collected: 08/15/13

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Potassium		1070	1000		ug/l	SW846 6010C
Sodium		20800	400		ug/l	SW846 6010C

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

Mountain States ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: CHAVEZ 03
Lab Sample ID: D49476-1
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	130	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Magnesium	53.5	1.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Sodium	210	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]

(1) Instrument QC Batch: MA3891
(2) Prep QC Batch: MP10865

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 03
Lab Sample ID: D49476-1
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	536	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Total as CaCO3	536	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Bromide	2.6	0.25	mg/l	5	08/16/13 12:04	SK	EPA 300.0/SW846 9056
Chloride	324	10	mg/l	20	08/16/13 15:47	SK	EPA 300.0/SW846 9056
Fluoride	0.72	0.50	mg/l	5	08/16/13 12:04	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.26	0.050	mg/l	5	08/16/13 12:04	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate + Nitrite [a]	0.26	0.070	mg/l	1	08/16/13 12:04	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite [b]	< 0.020	0.020	mg/l	5	08/16/13 12:04	SK	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [c]	3.91		ratio	1	08/20/13 15:22	JB	USDA HANDBOOK 60
Solids, Total Dissolved	1090	10	mg/l	1	08/19/13	BF	SM 2540C-2011
Specific Conductivity	1850	1.0	umhos/cm	1	08/21/13	RW	SM 2510B-2011
Sulfate	47.4	2.5	mg/l	5	08/16/13 12:04	SK	EPA 300.0/SW846 9056
pH	7.38		su	1	08/19/13 14:10	BF	SM4500HB+ -2011/9040C

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Elevated detection limit due to matrix interference.
(c) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 03
Lab Sample ID: D49476-1A
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	9000	25	CFU/ml	1	08/20/13	MM	HACH IRB-BART
Slime Forming Bacteria	350000	500	CFU/ml	1	08/20/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	359000	200	CFU/ml	1	08/20/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 03
Lab Sample ID: D49476-1F
Matrix: AQ - Groundwater Filtered
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	113000	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Iron	200	70	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Magnesium	48200	200	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Manganese	1280	5.0	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Potassium	5500	1000	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Selenium	< 0.0020	0.0020	mg/l	5	08/21/13	08/23/13	JB	SW846 6020A [2]	SW846 3010A [4]
Sodium	223000	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]

(1) Instrument QC Batch: MA3896
(2) Instrument QC Batch: MA3902
(3) Prep QC Batch: MP10859
(4) Prep QC Batch: MP10860

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 02
Lab Sample ID: D49476-2
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	63.6	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Magnesium	11.9	1.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Sodium	22.2	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]

(1) Instrument QC Batch: MA3891
(2) Prep QC Batch: MP10865

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 02
Lab Sample ID: D49476-2
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	201	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Total as CaCO3	201	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Bromide	< 0.050	0.050	mg/l	1	08/16/13 12:15	SK	EPA 300.0/SW846 9056
Chloride	8.1	0.50	mg/l	1	08/16/13 12:15	SK	EPA 300.0/SW846 9056
Fluoride	0.29	0.10	mg/l	1	08/16/13 12:15	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	1.8	0.050	mg/l	5	08/16/13 15:58	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate + Nitrite [a]	1.8	0.054	mg/l	1	08/16/13 15:58	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	08/16/13 12:15	SK	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [b]	0.670		ratio	1	08/20/13 15:48	JB	USDA HANDBOOK 60
Solids, Total Dissolved	264	10	mg/l	1	08/19/13	BF	SM 2540C-2011
Specific Conductivity	428	1.0	umhos/cm	1	08/21/13	RW	SM 2510B-2011
Sulfate	31.3	2.5	mg/l	5	08/16/13 15:58	SK	EPA 300.0/SW846 9056
pH	7.28		su	1	08/19/13 14:10	BF	SM4500HB+ -2011/9040C

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 02
Lab Sample ID: D49476-2A
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	08/20/13	MM	HACH IRB-BART
Slime Forming Bacteria	12500	500	CFU/ml	1	08/20/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	5000	200	CFU/ml	1	08/20/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 02
Lab Sample ID: D49476-2F
Matrix: AQ - Groundwater Filtered
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	59700	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Iron	< 70	70	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Magnesium	11000	200	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Manganese	5.5	5.0	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Potassium	1510	1000	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Selenium	< 0.0020	0.0020	mg/l	5	08/21/13	08/23/13	JB	SW846 6020A [2]	SW846 3010A [4]
Sodium	20200	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]

(1) Instrument QC Batch: MA3896
(2) Instrument QC Batch: MA3902
(3) Prep QC Batch: MP10859
(4) Prep QC Batch: MP10860

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 01
Lab Sample ID: D49476-3
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	55.8	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Magnesium	9.48	1.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]
Sodium	23.2	2.0	mg/l	1	08/20/13	08/20/13	JB	SW846 6010C [1]	SW846 3010A/M [2]

(1) Instrument QC Batch: MA3891
(2) Prep QC Batch: MP10865

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 01
Lab Sample ID: D49476-3
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	171	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Alkalinity, Total as CaCO3	171	5.0	mg/l	1	08/21/13	KB	SM 2320B-2011
Bromide	< 0.050	0.050	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Chloride	5.8	0.50	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Fluoride	0.27	0.10	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.012	0.010	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate + Nitrite [a]	< 0.014	0.014	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
Sodium Adsorption Ratio [b]	0.755		ratio	1	08/20/13 15:55	JB	USDA HANDBOOK 60
Solids, Total Dissolved	224	10	mg/l	1	08/19/13	BF	SM 2540C-2011
Specific Conductivity	358	1.0	umhos/cm	1	08/21/13	RW	SM 2510B-2011
Sulfate	28.7	0.50	mg/l	1	08/16/13 12:27	SK	EPA 300.0/SW846 9056
pH	7.40		su	1	08/19/13 14:10	BF	SM4500HB+ -2011/9040C

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 01
Lab Sample ID: D49476-3A
Matrix: AQ - Ground Water
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	08/20/13	MM	HACH IRB-BART
Slime Forming Bacteria	66500	500	CFU/ml	1	08/20/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	1200	200	CFU/ml	1	08/20/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: CHAVEZ 01
Lab Sample ID: D49476-3F
Matrix: AQ - Groundwater Filtered
Project: Colo Rule 608 Compliance Raton Basin CO

Date Sampled: 08/15/13
Date Received: 08/16/13
Percent Solids: n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	50200	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Iron	< 70	70	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Magnesium	8590	200	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Manganese	< 5.0	5.0	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Potassium	1070	1000	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]
Selenium	< 0.0020	0.0020	mg/l	5	08/21/13	08/23/13	JB	SW846 6020A [2]	SW846 3010A [4]
Sodium	20800	400	ug/l	1	08/21/13	08/21/13	JB	SW846 6010C [1]	SW846 3010A [3]

(1) Instrument QC Batch: MA3896
(2) Instrument QC Batch: MA3902
(3) Prep QC Batch: MP10859
(4) Prep QC Batch: MP10860

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Subcontract Lab Data

Report of Analysis

Industrial LABORATORIES

Industrial Laboratories is your independent, third-party analytical testing laboratory

To: Accutest Mountain States (AMS)
4036 Youngfield St.

Wheat Ridge CO 80033

Attn: Shea Greiner

TEST REPORT
ACCUTEST - M
Date Received: 8/16/2013
Date Reported: 8/21/2013
PO Number: D49476X

5

Note: Sample test procedures conform to EPA 40CFR136 requirements.

Lab No.	Sample Description	Test Method	Result	Units	MDL	Analysis Date/By
130816006-01A	D49476X-1, 08/15/13, 11:10 AM	* Total Coliforms MPN SM 9221 B	1600 Fecal; >1600 Total	MPN/100mL		GL 8/16/2013
130816006-02A	D49476X-2, 08/15/13, 12:30 PM	* Total Coliforms MPN SM 9221 B	<2 Fecal; 1600 Total	MPN/100mL		GL 8/16/2013
130816006-03A	D49476X-3, 08/15/13, 1:10 PM	* Total Coliforms MPN SM 9221 B	<2 Fecal; 200 Total	MPN/100mL		GL 8/16/2013

Department Manager

* = Scope Analysis
# = Subcontracted Analysis
MDL = Method Detection Limit
ND = Not Detected at the Method Detection Limit

4046 Youngfield Street • Wheat Ridge, Colorado 80033 • (303) 287-9691 • (303) 287-0964 FAX • www.industriallabs.net

CHAIN OF CUSTODY

ACCUTEST
4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D49476X
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information			Analytical Information
Name: Accutest Mountain States (AMS)			Name: Industrial Lab			
Address: 4036 Youngfield St.			Address: 4046 Youngfield St.			
City: Wheat Ridge,	State: CO	Zip: 80033	City: Wheat Ridge	State: CO	Zip: 80033	
Send Report to: Scott Heideman			Contact: Sample Management			
Any questions contact: Shea Greiner						
Phone/Fax #: (303) 425-6021; (303)425-6854			Phone: (303) 287-9691			

13081600G Field ID / Point of Collection	Collection Date	Collection Time		Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2So4	None	total coliform MPN					Comments
01A D49476X -1	8/15/13	11:10 AM		AQ	1						X					
02A -2		12:30 PM		AQ	1						X					
03A -3		1:10 PM		AQ	1						X					

Turnaround Information

[X] 10 Business Day Standard — Approved By: _____
[ ] Other _____ (Days) _____
_____
_____

10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.

Data Deliverable Information

[ ] Commercial "A" [ ] PDF
[ ] Commercial "B" [ ] Compact Disk Deliverable
[ ] Commercial "BN" [ ] Electronic Delivery: _____
[ ] Reduced Tier 1 [ ] State Forms
[ ] Full Tier 1 [ ] Other (Specify) _____

Comments / Remarks

Please use Colorado regulations and RLs.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date & Time:	Received By:	Date & Time:
1		8/16/13		8/16/13 1415
2				
3				

For Subcontract Laborartory Use Only

Seal #: Headspace: Yes [ ] No [ ] NA [ ]
Preserved where applicable: [ ]
Temperature °C _____ On Ice [ ]

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST LABORATORIES

Accutest Laboratories Mountain States
4036 Youngfield Street Wheat Ridge, Co 80033
TEL. 303-425-6021 877-737-4521
FAX 303-425-6021

UPS

PAGE 1 OF 1

FED-EX Tracking # 796698678O | Bottle Order Control #
Accutest Quote # | Accutest Job # D49476

Client / Reporting Information

Company Name: LT Environmental
Street Address: 4600 West 6th Ave
City: Arvada State: CO Zip: 80003
Project Contact: Dan MOIR E-mail: moir@ltenv.com
Phone #: 303-433-9788 Fax #:
Sampler(s) Name(s): Devin Hencmann Phone #:

Project Information

Project Name: Raton Basin Rule 608 compliance
Street:
City: Las Animas County State: Zip:
Project#:
Client PO#:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City State Zip:
Attention: PO#:

Requested Analysis (see TEST CODE sheet)

See Attached

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB- Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Bisulfate	LAB USE ONLY
	Chavez 03		8/15/13	1110	DH	GW	7										01
	Chavez 02		8/15/13	1230	DH	GW	7										02
	Chavez 01		8/15/13	1310	DH	GW	7										03

8/16/13

Turnaround Time (Business days)

Approved By (Accutest PM): / Date:

- [x] Std. 10 Business Days
- [ ] Std. 5 Business Days (By Contract only)
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY

Emergency & Rush T/A data available VIA Labilink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] Commercial "B" +Narrative
- [ ] FULLT1 (Level 3+4)
- [ ] State Forms
- [ ] EDD Format
- [ ] PDF

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		8/15/13 1420	1 JACOB PORTER 8/16/13 0720	2		2
3			3	4		4
5			5			

Custody Seal # UPS [x] Intact [ ] Not intact | Preserved where applicable [X] | On Ice [X] | Cooler Temp. 2.1

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D49476 **Client:** LT **Immediate Client Services Action Required:** No

Date / Time Received: 8/16/2013 10:20:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: 609 **Airbill #'s:** UPS

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www/accutest.com

D49476: Chain of Custody
Page 2 of 3

CHAIN OF CUSTODY

ACCUTEST

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D49476X
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information			Analytical Information						
Name: Accutest Mountain States (AMS)			Name: Industrial Lab									
Address: 4036 Youngfield St.			Address: 4046 Youngfield St.									
City: Wheat Ridge,	State: CO	Zip: 80033	City: Wheat Ridge	State: CO	Zip: 80033							
Send Report to: Scott Heideman			Contact: Sample Management									
Any questions contact: Shea Greiner												
Phone/Fax #: (303) 425-6021; (303)425-6854			Phone: (303) 287-9691									

	Collection					Preservation							
Field ID / Point of Collection	Date	Time		Matrix	# of bottles	HCL	NaOH	HNO3	H2SO4	None	total coliform MPN		Comments
D49476X -1	8/15/13	11:10 AM		AQ	1						X		
-2		12:30 PM		AQ	1						X		
-3		1:10 PM		AQ	1						X		

Turnaround Information

[X] 10 Business Day Standard — Approved By:
[ ] Other _____ (Days)

10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.

Data Deliverable Information

- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] Commercial "BN"
- [ ] Reduced Tier 1
- [ ] Full Tier 1
- [ ] PDF
- [ ] Compact Disk Deliverable
- [ ] Electronic Delivery: _____
- [ ] State Forms
- [ ] Other (Specify) _____

Comments / Remarks

Please use Colorado regulations and RLs.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date & Time:	Received By:	Date & Time:
1		8/16/13	1	8/16/13 1415
2			2	
3			3	

For Subcontract Laborartory Use Only

Seal #: Headspace: Yes [ ] No [ ] NA [ ]
Preserved where applicable: [ ]
Temperature °C _____ On Ice [ ]

D49476: Chain of Custody
Page 3 of 3

Mountain States ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 08/21/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	11	41		
Antimony	30	2.1	19		
Arsenic	25	3.8	5.6		
Barium	10	.2	1.4		
Beryllium	10	.9	1.2		
Boron	50	.8	6.6		
Cadmium	10	.2	.36		
Calcium	400	2.4	41	2.9	<400
Chromium	10	.3	.4		
Cobalt	5.0	.5	.57		
Copper	10	.8	1.9		
Iron	70	1.5	9.5	7.3	<70
Lead	50	2.1	21		
Lithium	5.0	.4	2.7		
Magnesium	200	6.8	19	4.5	<200
Manganese	5.0	.5	.46	0.10	<5.0
Molybdenum	10	.4	.84		
Nickel	30	.5	.87		
Phosphorus	100	15	20		
Potassium	1000	99	270	-4.1	<1000
Selenium	50	7.1	11		
Silicon	50	4.7	5.2		
Silver	30	.3	.6		
Sodium	400	7.3	170	5.9	<400
Strontium	5.0	.01	.12		
Thallium	10	1.8	4		
Tin	50	12	16		
Titanium	10	.1	2.1		
Uranium	50	2.9	5.5		
Vanadium	10	.4	.4		
Zinc	30	.4	3.2		

Associated samples MP10859: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/21/13

Metal	D49476-2F Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	anr				
Beryllium					
Boron	anr				
Cadmium	anr				
Calcium	59700	86400	25000	106.8	75-125
Chromium	anr				
Cobalt					
Copper					
Iron	53.0	4820	5000	95.3	75-125
Lead	anr				
Lithium					
Magnesium	11000	35800	25000	99.2	75-125
Manganese	5.5	493	500	97.5	75-125
Molybdenum					
Nickel					
Phosphorus					
Potassium	1510	27700	25000	104.8	75-125
Selenium	anr				
Silicon					
Silver	anr				
Sodium	20200	45400	25000	100.8	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP10859: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/21/13

Metal	D49476-2F Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	anr					
Beryllium						
Boron	anr					
Cadmium	anr					
Calcium	59700	83300	25000	94.4	3.7	20
Chromium	anr					
Cobalt						
Copper						
Iron	53.0	4850	5000	95.9	0.6	20
Lead	anr					
Lithium						
Magnesium	11000	35100	25000	96.4	2.0	20
Manganese	5.5	488	500	96.5	1.0	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	1510	27300	25000	103.2	1.5	20
Selenium	anr					
Silicon						
Silver	anr					
Sodium	20200	44300	25000	96.4	2.5	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP10859: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/21/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium	25600	25000	102.4	80-120
Chromium	anr			
Cobalt				
Copper				
Iron	4760	5000	95.2	80-120
Lead	anr			
Lithium				
Magnesium	24500	25000	98.0	80-120
Manganese	489	500	97.8	80-120
Molybdenum				
Nickel				
Phosphorus				
Potassium	25300	25000	101.2	80-120
Selenium	anr			
Silicon				
Silver	anr			
Sodium	24500	25000	98.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10859: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/21/13

Metal	D49476-2F Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium	59700	61500	2.9	0-10
Chromium	anr			
Cobalt				
Copper				
Iron	53.0	0.00	100.0(a)	0-10
Lead	anr			
Lithium				
Magnesium	11000	11300	2.8	0-10
Manganese	5.50	4.50	18.2 (a)	0-10
Molybdenum				
Nickel				
Phosphorus				
Potassium	1510	951	37.1 (a)	0-10
Selenium	anr			
Silicon				
Silver	anr			
Sodium	20200	20800	3.0	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10859: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10859
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10860
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: mg/l

Prep Date: 08/21/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	0.25	.0055	.0026		
Antimony	0.0020	.000011	.00055		
Arsenic	0.0010	.000085	.0003		
Barium	0.010	.00008	.00026		
Beryllium	0.0010	.00008	.0005		
Boron	0.20	.0025	.0044		
Cadmium	0.00050	.00018	.0002		
Calcium	2.0	.028	.022		
Chromium	0.010	.00027	.0012		
Cobalt	0.0010	.000025	.000055		
Copper	0.010	.0003	.00031		
Iron	0.050	.018	.018		
Lead	0.0025	.00004	.00034		
Magnesium	0.50	.0065	.0065		
Manganese	0.0050	.0006	.00065		
Molybdenum	0.0050	.00025	.000045		
Nickel	0.010	.000044	.00008		
Phosphorus	0.30	.013	.034		
Potassium	1.0	.015	.015		
Selenium	0.0020	.0003	.00031	0.00050	<0.0020
Silver	0.00050	.0000095	.00003		
Sodium	2.5	.025	.025		
Strontium	0.10	.00005	.00005		
Thallium	0.0010	.000012	.000025		
Tin	0.050	.00032	.0004		
Titanium	0.010	.0003	.0003		
Uranium	0.0010	.0000085	.00001		
Vanadium	0.0050	.00019	.0033		
Zinc	0.050	.0011	.0023		

Associated samples MP10860: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10860 Methods: SW846 6020A
Matrix Type: AQUEOUS Units: mg/l

Prep Date: 08/21/13

Metal	D49476-2F Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	anr				
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	0.0011	1.1	1.0	109.9	75-125
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP10860: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10860 Methods: SW846 6020A
Matrix Type: AQUEOUS Units: mg/l

Prep Date: 08/21/13

Metal	D49476-2F Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	anr					
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium	0.0011	1.1	1.0	109.9	0.0	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP10860: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10860
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: mg/l

Prep Date: 08/21/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	1.2	1.0	120.0	80-120
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10860: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10860 Methods: SW846 6020A
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/21/13

Metal	D49476-2F Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	1.11	0.00	100.0(a)	0-10
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10860: D49476-1F, D49476-2F, D49476-3F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 08/20/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	55	210		
Antimony	150	11	95		
Arsenic	130	19	28		
Barium	50	1	7		
Beryllium	50	4.5	6		
Boron	250	4	33		
Cadmium	50	1	1.8		
Calcium	2000	12	210	-4.5	<2000
Chromium	50	1.5	2		
Cobalt	25	2.5	2.9		
Copper	50	4	9.5		
Iron	350	7.5	48		
Lead	250	11	110		
Lithium	25	2	14		
Magnesium	1000	34	95	10.5	<1000
Manganese	25	2.5	2.3		
Molybdenum	50	2	4.2		
Nickel	150	2.5	4.4		
Phosphorus	500	75	100		
Potassium	5000	500	1400		
Selenium	250	36	55		
Silicon	250	24	26		
Silver	150	1.5	3		
Sodium	2000	37	850	-32	<2000
Strontium	25	.05	.6		
Thallium	50	9	20		
Tin	250	60	80		
Titanium	50	.5	11		
Uranium	250	15	28		
Vanadium	50	2	2		
Zinc	150	2	16		

Associated samples MP10865: D49476-1, D49476-2, D49476-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 08/20/13

Metal	D49476-1 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	130000	276000	125000	116.8	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	53500	189000	125000	108.4	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	210000	373000	125000	130.4N(a	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP10865: D49476-1, D49476-2, D49476-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 08/20/13

Metal	D49476-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	130000	280000	125000	120.0	1.4	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	53500	190000	125000	109.2	0.5	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	210000	384000	125000	139.2N(a	2.9	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP10865: D49476-1, D49476-2, D49476-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 08/20/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	136000	125000	108.8	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	129000	125000	103.2	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	130000	125000	104.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10865: D49476-1, D49476-2, D49476-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 08/20/13

Metal	D49476-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	26100	28100	7.7	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	10700	11500	7.2	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	41900	44900	7.1	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP10865: D49476-1, D49476-2, D49476-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

QC Batch ID: MP10865
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

Mountain States ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN21598	5.0	0.0	mg/l	100.0	101	100.8	90-110%
Alkalinity, Carbonate	GN21599	5.0	0.0	mg/l	100.0	101	100.8	80-120%
Alkalinity, Total as CaCO3	GN21597	5.0	0.0	mg/l	100.0	101	100.8	90-110%
Bromide	GP10701/GN21514	0.050	0.0	mg/l	20	19.9	99.5	90-110%
Chloride	GP10701/GN21514	0.50	0.26	mg/l	20	21.5	107.5	90-110%
Fluoride	GP10701/GN21514	0.10	0.0	mg/l	10	9.35	93.5	90-110%
Iron Reducing Bacteria	MB236	25	<25	CFU/ml				
Nitrogen, Nitrate	GP10701/GN21514	0.010	0.0	mg/l	4.52	4.41	97.6	90-110%
Nitrogen, Nitrite	GP10701/GN21514	0.0040	0.0	mg/l	6.09	5.92	97.2	90-110%
Slime Forming Bacteria	MB237	500	<500	CFU/ml				
Solids, Total Dissolved	GN21535	10	0.0	mg/l	400	395	98.8	90-110%
Specific Conductivity	GP10747/GN21603			umhos/cm	100.8	104	103.2	90-110%
Sulfate	GP10701/GN21514	0.50	0.0	mg/l	30	29.6	98.7	90-110%
Sulfate Reducing Bacteria	MB238	200	<200	CFU/ml				
pH	GN21550			su	8.00	8.01	100.1	99.3-100.7%

Associated Samples:
Batch MB236: D49476-1A, D49476-2A, D49476-3A
Batch MB237: D49476-1A, D49476-2A, D49476-3A
Batch MB238: D49476-1A, D49476-2A, D49476-3A
Batch GN21535: D49476-1, D49476-2, D49476-3
Batch GN21550: D49476-1, D49476-2, D49476-3
Batch GN21597: D49476-1, D49476-2, D49476-3
Batch GN21598: D49476-1, D49476-2, D49476-3
Batch GN21599: D49476-1, D49476-2, D49476-3
Batch GP10701: D49476-1, D49476-2, D49476-3
Batch GP10747: D49476-1, D49476-2, D49476-3
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN21597	D49387-1	mg/l	145	142	1.7	0-20%
Solids, Total Dissolved	GN21535	D49385-1	mg/l	1030	1030	0.0	0-20%
Specific Conductivity	GN21603	D49385-1	umhos/cm	1190	1190	0.0	0-20%

Associated Samples:
Batch GN21535: D49476-1, D49476-2, D49476-3
Batch GN21597: D49476-1, D49476-2, D49476-3
Batch GN21603: D49476-1, D49476-2, D49476-3
Batch GP10747: D49476-1, D49476-2, D49476-3
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN21597	D49387-1	mg/l	145	100.0	240	95.1	80-120%
Bromide	GP10701/GN21514	D49497-1	mg/l	0.16	12.5	12.8	101.1	80-120%
Chloride	GP10701/GN21514	D49497-1	mg/l	20.3	50	71.1	101.6	80-120%
Fluoride	GP10701/GN21514	D49497-1	mg/l	2.0	12.5	14.0	96.0	80-120%
Nitrogen, Nitrate	GP10701/GN21514	D49497-1	mg/l	0.0	2.83	2.9	102.7	80-120%
Nitrogen, Nitrite	GP10701/GN21514	D49497-1	mg/l	0.0	1.52	1.6	105.1	80-120%
Sulfate	GP10701/GN21514	D49497-1	mg/l	22.0	50	72.2	100.4	80-120%

Associated Samples:
Batch GN21597: D49476-1, D49476-2, D49476-3
Batch GP10701: D49476-1, D49476-2, D49476-3
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D49476
Account: LTENCODE - LT Environmental
Project: Colo Rule 608 Compliance Raton Basin CO

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN21597	D49387-1	mg/l	145	100.0	238	0.6	20%
Bromide	GP10701/GN21514	D49497-1	mg/l	0.16	12.5	12.9	0.8	20%
Chloride	GP10701/GN21514	D49497-1	mg/l	20.3	50	70.3	1.1	20%
Fluoride	GP10701/GN21514	D49497-1	mg/l	2.0	12.5	13.6	2.9	20%
Nitrogen, Nitrate	GP10701/GN21514	D49497-1	mg/l	0.0	2.83	3.0	3.4	20%
Nitrogen, Nitrite	GP10701/GN21514	D49497-1	mg/l	0.0	1.52	1.6	0.0	20%
Sulfate	GP10701/GN21514	D49497-1	mg/l	22.0	50	72.3	0.1	20%

Associated Samples:
Batch GN21597: D49476-1, D49476-2, D49476-3
Batch GP10701: D49476-1, D49476-2, D49476-3
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits