COMPLIANCE / ENGINEERING / REMEDIATION

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May 7, 2007

Ms. Debbie Baldwin
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

RE: April 20, 2007 Methane Seep Survey
Bondad, Colorado

Dear Ms. Baldwin:

LT Environmental, Inc. (LTE) is pleased to provide the Colorado Oil and Gas Conservation Commission (COGCC) with this letter summarizing the results of the 12th methane seep survey conducted at the Bondad Gas Seep Site (Site) located in Bondad, Colorado on April 20, 2007. This is the fourth survey since drilling and re-completion activities were conducted at the Bryce 1-X (API #05-067-09087) well between late July 2006 and early August 2006.

**BACKGROUND**

At the request of the COGCC, LTE conducted an initial methane gas seep survey of the Site in response to an explosion of a residence located at 4034 US Highway 550 (the former Yoakum Residence). The results of the initial soil gas survey are presented in the *Methane Seep Survey Report* (March 2005). Additional soil gas surveys were performed on April 19, 2005, June 10, 2005, November 1, 2005, December 2, 2005, January 30, 2006, April 6, 2006, June 28, 2006, August 28, 2006, September 21, 2006, and December 13, 2006. All project reports are available on the COGCC website at www.oil-gas.state.co.us.

LTE conducted a geophysical survey of the seep area in April 2005 which identified several areas suspected of containing buried structures with the potential to act as conduits for methane gas. Exploratory excavation activities were conducted in these suspect areas in August 2005 and the abandoned Bryce 1-X (API #05-067-09087) well was uncovered in the main gas seep area. In November, 2005, LTE provided oversight during the excavation, inspection, and initial remediation of the Bryce 1-X (API #05-067-09087) well and sandstone bedrock surface. Reports summarizing the geophysical survey, exploratory excavation activities, and the Bryce 1-X (API #05-067-09087) well remediation activities are also available on the COGCC website.

Recent activity at the site has included continued operation and maintenance (O&M) of the methane detection systems located at the fire station, the Weston well house, and the Weston, Wilson, Buddhue, and Bandy (former Grant) residences. LTE also conducted a limited surface inspection of the Nick Spatter #1 (API #05-067-05217) well location to confirm its location and to determine whether methane gas is seeping to the ground surface near this well.

Carl Weston has recently denied access to his property to conduct methane surveys and O&M of the structures on his property. Current plans include removal of the methane detection system on his property.

## SITE DESCRIPTION

The Site is located in Bondad, Colorado, approximately 20 miles south of Durango, Colorado (Figure 1). The Site is located approximately 0.25 miles north of the confluence of the Animas River and the Florida River. The Site consists of several tracts of land covering more than 100 acres. The surrounding land use consists of several residential properties, agricultural properties, a fire station, US Highway 550, the Animas River, to the west, and the Florida River, to the east. The majority of land in the area is privately owned.

## METHANE GAS SEEP SURVEY

### Methodology

On April 20, 2007, LTE was on site to conduct the 12$^{th}$ methane gas seep survey of the Site. The scope of the survey was similar to the previous surveys conducted at the Site. During the soil gas survey, tubing was lowered into each borehole and gas measurements were collected directly from the shallow surface soil approximately three feet below ground surface (bgs). LTE measured the concentration of methane, carbon monoxide, hydrogen sulfide, and oxygen at each sampling location.

LTE created a sampling grid to cover the mapping area systematically and to provide a means to delineate the extent of the gas seepage. LTE collected a soil gas measurement at the corners of each square in the grid. Each sample location was recorded using a Trimble GeoXT® global positioning system (GPS). When methane was detected along the edges of the grid, additional measurements were collected outside of the grid to define the extent of the seep area more completely.

LTE measured the methane concentration in the soil around the exterior of the fire station and three houses in the mapping area, near the water wells associated with each of the structures, and along the valley floor of the Florida River. Carl Weston denied access to LTE to conduct this survey, therefore no survey was performed west of Highway 550.

### Soil Gas Survey Results

LTE personnel advanced a total of 80 subsurface probes across the project area. Results of this survey indicate that elevated methane gas was detected in an area around the Bryce 1-X (API #05-067-09087) well covering approximately 3.1 acres. The distribution of the methane gas in this area extended approximately 600 feet north of, 90 feet south of, 100 feet west of, and 1000 feet east of the Bryce 1-X (API #05-067-09087) well. Detected methane concentrations in the seep area ranged from 2,000 parts per million (ppm) (0.2%) to 25,000 ppm (2.5%).

Methane was not detected around the Bandy, Buddhue, or Wilson residences or near the water wells associated with these structures. Methane was not detected in the vicinity of the Cain 31-2 (API #05-067-08114) coal bed methane (CBM) gas well during this April 2007 survey.

Methane was not detected along the floodplains of the Florida River during the April 2007 methane seep survey. Figure 1 shows all methane concentrations recorded during the April 2007 methane seep survey.

**Methane Seep Survey Comparison**

Fewer gas measurements were collected during the April 2007 survey than during previous surveys. The decrease in the number of gas measurements collected is the result of a smaller seep area requiring fewer measurements to define the areal extent of seepage and access restrictions imposed by Carl Weston.

LTE prepared a map illustrating the historical areal extent of methane seepage identified during previous gas survey events on a semi-annual basis(Figure 2). Comparison of the April 2007 data indicates that the areal extent of the primary seep area (around the abandoned Bryce 1-X (API #05-067-09087) well) is slightly larger than the extent observed during the December 2006 survey but smaller than the historic maximum seepage extent.

The average methane concentration detected within the primary seep area during April 2007 survey is the lowest average concentration detected since monitoring began in February 2005, with the exception of the December 2006 event. The table below presents the number of points reporting detectable concentrations of methane; the average methane concentrations; and the estimated size of the primary seep area during each of the soil gas survey events.

**Table 1. Average Methane Concentrations – Primary Seep Area**

| Survey Date | Number of Survey Points | Estimated Seep Area (acres) | Average Subsurface Methane (%) |
|---|---|---|---|
| Feb-05 | 112 | 10.3 | 23 |
| Apr-05 | 45 | 10.6 | 33 |
| Jun-05 | 37 | 8.1 | 21 |
| Nov-05 | 45 | 8.8 | 32 |
| Dec-05 | 25 | 5.7 | 21 |
| Jan-06 | 31 | 7.3 | 10 |
| Apr-06 | 32 | 7.7 | 29 |
| Jun-06 | 23 | 5.7 | 25 |
| Aug-06 | 13 | 2.7 | 2 |
| Sep-06 | 13 | 2.4 | 3 |
| Dec-06 | 10 | 2.2 | 0.63 |
| Apr-07 | 14 | 3.1 | 0.96 |

**CONCLUSIONS AND RECOMMENDATIONS**

The results of the April 2007 survey indicate that the areal extent of methane seepage is slightly larger than detected during the December 2006 survey but smaller than the historic maximum seepage extent. The slight increase may be related to seasonal fluctuations as demonstrated by the area of seepage in winter and area of seepage in the spring in the table above. Seepage areal extent is consistently larger in the Spring as compared to the previous winter. Continued monitoring of the seepage at the site is recommended.

The average methane concentration detected within the seep area has decrease by more than an order of magnitude from historic maximum concentrations. The decrease is most likely the result of reentering, plugging, and abandoning the Bryce 1-X (API #05-067-09087) well in July - August 2006 and subsequent venting of gas that had accumulated in the subsurface. Seepage continues around the fire station but not in the vicinity of the other residences within the mapping area.

The primary methane seep appears to have been caused by gas migrating from the Fruitland Formation up the well bore of the Bryce 1-X (API #05-067-09087) well. The gas moved vertically upward along the well bore and then migrated laterally into permeable layers and aquifers of the Nacimiento Formation where well casing was absent and/or structurally compromised. It appears that the plugging of the Bryce 1-X (API #05-067-09087) has reduced the gas seepage at the ground surface. LTE recommends continued monitoring of the methane seep at the Site as a safety precaution for the residents in the area and to monitor the effectiveness of the plugging activities.

The next soil gas survey event is scheduled for June 2007. The monthly O&M of the methane detection systems in the residences and fire station will continue to be conducted by Standby Safety of Cortez, Colorado with the exception of the detection system in the Carl Weston structures. The methane detection system in the Carl Weston residence and well house will be schedule for removal within the next two weeks.

LTE appreciates the opportunity to provide environmental services to the COGCC. If you have any questions regarding this report or would like additional information, please contact us at (303) 433-9788.

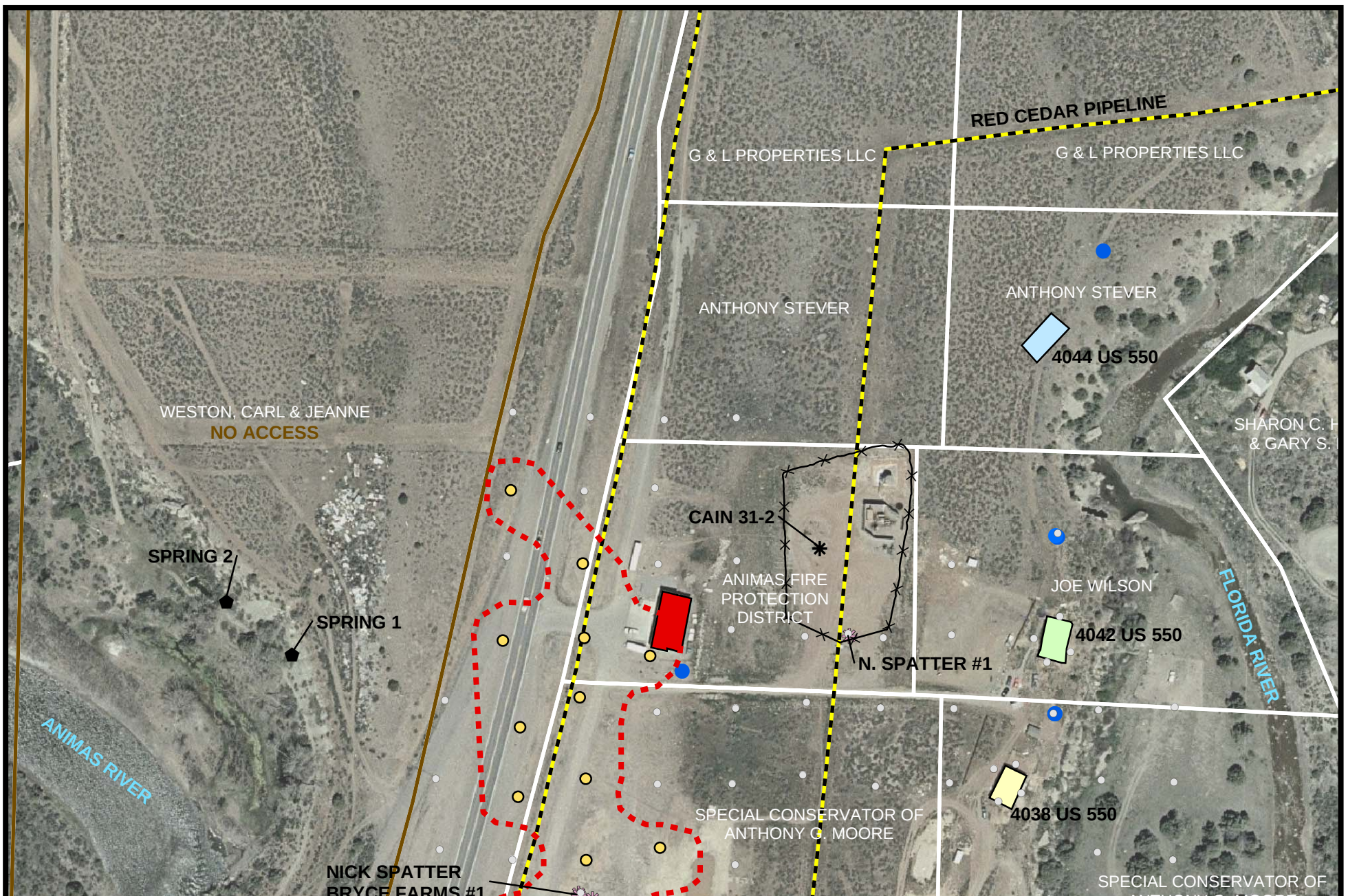
Sincerely,

LT ENVIRONMENTAL, INC.

John D. Peterson, P.G.
Project Manager

Attachments

**FIGURES**




**LEGEND**

- Water Supply Well
- Springs
- Gas Well
- Former Oil and Gas Well

**Extent of Methane Seepage**

- April 2007

**Utilities**

- Buried Gas Pipeline
- No Access

**Structures**

- Williams Residence
- Fire Station
- Wilson Residence
- Buddhue Residence
- Bandy (former Grant) Residence
- Former Yoakum Residence
- Weston Residence

**Sub_CH4_Co**

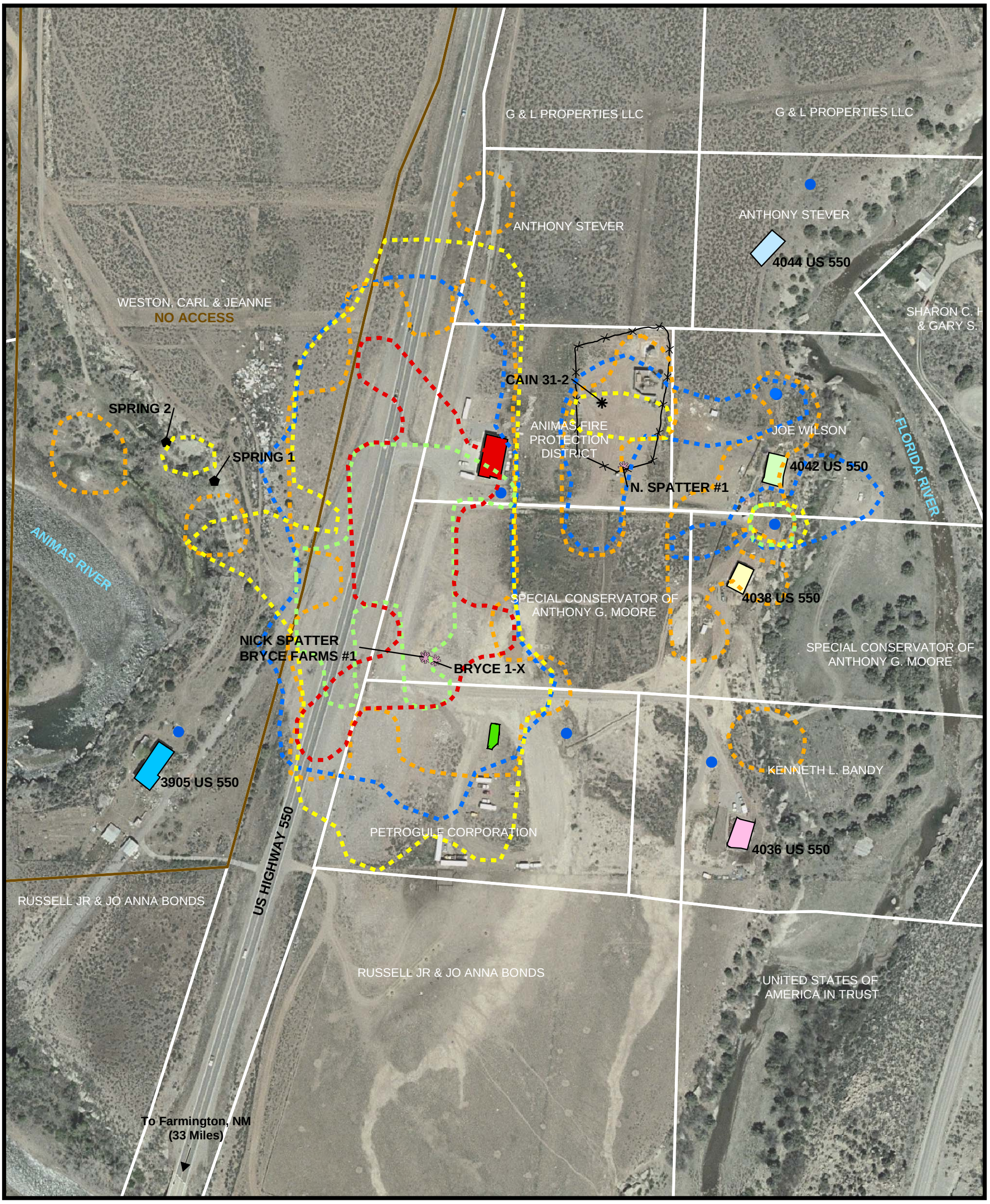
- 0 ppm
- 500 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 75% - 100%

0 350
Feet

N

Landowner and Property Boundaries Labeled in White

FIGURE 1
SUBSURFACE METHANE MEASUREMENTS
APRIL 2007
BONDAD GAS SEEP
BONDAD, CO
COLORADO OIL AND GAS CONSERVATION COMMISSION




**LEGEND**

**Extent of Methane Seepage**

- April 2007
- September 2006
- April 2006
- November 2005
- April 2005
- Water Supply Well
- Springs
- Gas Well
- Former Oil and Gas Well
- No Access

**Structures**

- Williams Residence
- Fire Station
- Wilson Residence
- Buddhue Residence
- Bandy (former Grant) Residence
- Former Yoakum Residence
- Weston Residence

Landowner and Property Boundaries Labeled in White

0 175 350
Feet

N

FIGURE 2
HISTORICAL SUBSURFACE METHANE MEASUREMENTS
APRIL 2005 - APRIL 2007
BONDAD GAS SEEP
BONDAD, CO
COLORADO OIL AND GAS CONSERVATION COMMISSION