

# Data Validation Package

---

**June 2011**  
**Natural Gas and Produced Water**  
**Sampling at the Gasbuggy,**  
**New Mexico, Site**

**October 2011**



**U.S. DEPARTMENT OF**  
**ENERGY**

Legacy  
Management

---

This page intentionally left blank

# Contents

Sampling Event Summary .....	1
Gas Sampling Locations at the Gasbuggy, New Mexico, Site .....	3
Data Assessment Summary.....	5
Water Sampling Field Activities Verification Checklist .....	7
Laboratory Performance Assessment .....	9
Sampling Quality Control Assessment .....	19
Certification .....	21

## **Attachment 1—Data Presentation**

Produced Water Quality Data  
Natural Gas Data

## **Attachment 2—Sampling and Analysis Work Order**

## **Attachment 3—Trip Report**

This page intentionally left blank

# Sampling Event Summary

**Site:** Gasbuggy Site, Rio Arriba County, New Mexico

**Sampling Period:** June 7–8, 2011

Annual natural gas and produced water monitoring was conducted for gas wells adjacent to Section 36, where the Gasbuggy test was conducted, in accordance with the draft *Long-Term Surveillance and Maintenance Plan for the Gasbuggy Site, Rio Arriba County, New Mexico*. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites (LMS/PLN/S04351, continually updated)*. Natural gas samples were collected for tritium and carbon-14 analyses. Produced water samples were collected and analyzed for tritium, gamma-emitting radionuclides (by high-resolution gamma spectrometry), gross alpha, and gross beta. A duplicate produced water sample was collected from well 30-039-21743. Produced water samples were not collected at locations 30-039-30161 and 30-039-21744 because of the lack of water. Samples were not collected from location 30-039-29988 because the well was shut-in.

Refer to Table 1 for produced water sample analytical results. Low levels of gamma-emitting nuclides, gross alpha, and/or gross beta activity were detected in the samples of produced water from the natural gas production wells. The low levels detected are representative of natural background radioactivity and do not indicate the presence of detonation-related radionuclides.

*Table 1. Gasbuggy Natural Gas Production Well Produced Water Sample Analysis Results*

Sample Location (API #)	Collection Date	Tritium (pCi/L)	Gamma Spectrometry, Total (pCi/L)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
Indian A No. 002 (30-039-07525)	06/07/2011	ND	254	ND	69.6 <sup>a</sup>
Schalk 29-4 No. 007 (30-039-21620)	06/08/2011	ND	458	ND	474
Schalk 29-4 No. 017 (30-039-21743)	06/08/2011	ND	ND	14.9 <sup>a</sup>	23.3 <sup>a</sup>
Valencia Canyon Unit No. 037 (30-039-21647)	06/08/2011	ND	ND	ND	28.1 <sup>a</sup>

<sup>a</sup> Estimated value.

pCi/L = picocuries per liter.

ND = Not detected, below the decision level concentration.

Refer to Table 2 for natural gas sample analytical results. Carbon-14 and tritium were not detected in any of the natural gas samples collected.

Table 2. Gasbuggy Natural Gas Production Well Gas Sample Analysis Results

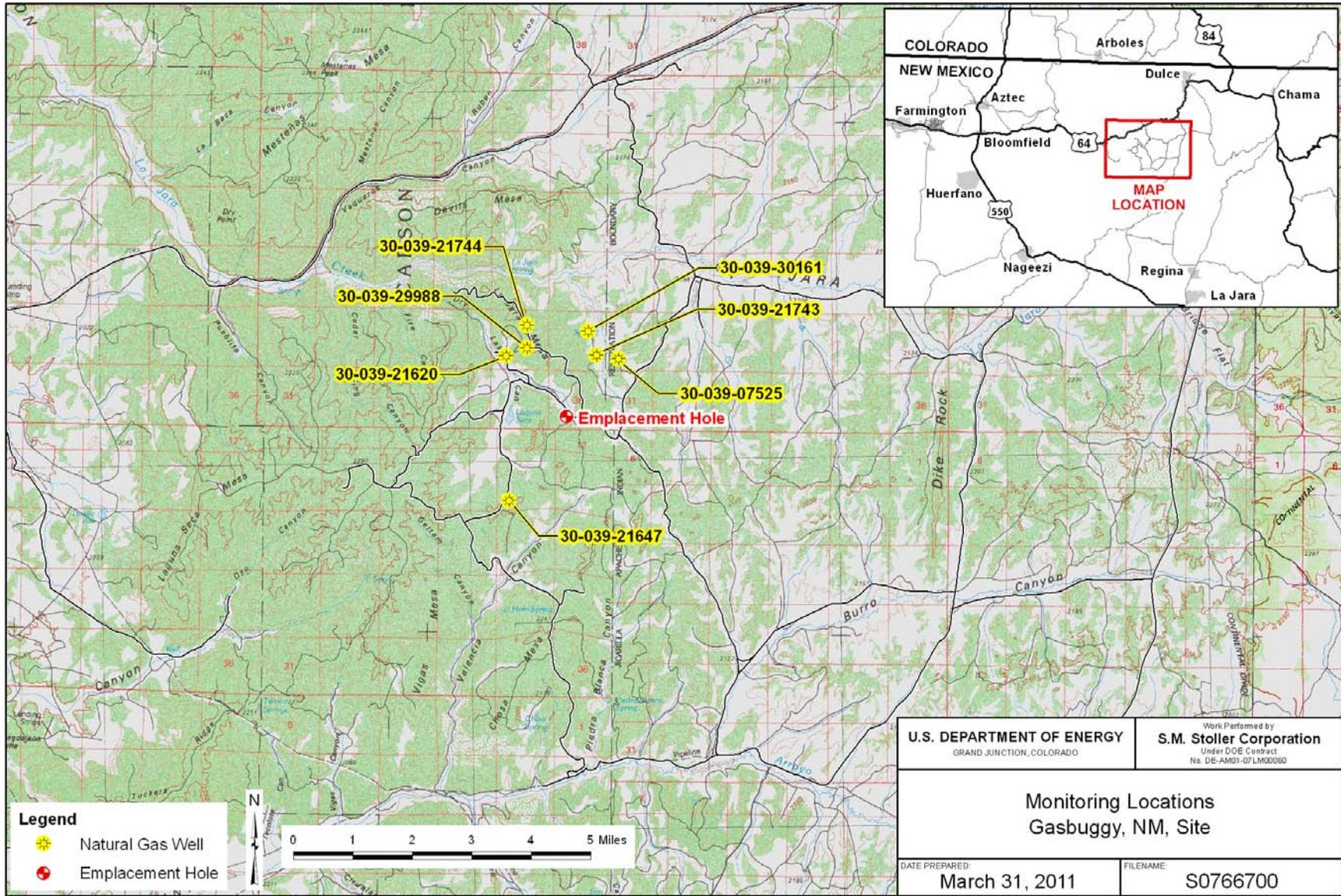
Sample Location (API #)	Collection Date	Tritium (pCi/L)	Carbon-14 (pCi/L)
Indian A No. 002 (30-039-07525)	06/07/2011	ND	ND
Many Canyons 29-04-25 No. 123 (30-039-30161)	06/08/2011	ND	ND
Schalk 29-4 No. 007 (30-039-21620)	06/08/2011	ND	ND
Schalk 29-4 No. 014 (30-039-21744)	06/08/2011	ND	ND
Schalk 29-4 No. 017 (30-039-21743)	06/08/2011	ND	ND
Valencia Canyon Unit No. 037 (30-039-21647)	06/08/2011	ND	ND

pCi/L = picocuries per liter of methane.

ND = Not detected, below the decision level concentration.

  
 \_\_\_\_\_  
 Mark Plessinger  
 Site Lead, S.M. Stoller Corporation

10/24/2011  
 \_\_\_\_\_  
 Date



Gas Sampling Locations at the Gasbuggy, New Mexico, Site

This page intentionally left blank

# Data Assessment Summary

This page intentionally left blank

### Water Sampling Field Activities Verification Checklist

<b>Project</b>	<u>Gasbuggy, New Mexico</u>	<b>Date(s) of Water Sampling</b>	<u>June 7-8, 2011</u>
<b>Date(s) of Verification</b>	<u>August 9, 2011</u>	<b>Name of Verifier</b>	<u>Steve Donovan</u>

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	Yes	Work Order letter dated May 4, 2011.
2. Were the sampling locations specified in the planning documents sampled?	No	Produced water samples were not collected at locations 30-039-30161 and 30-039-21744 because of the lack of water. Samples were not collected from location 30-039-29988 because the well was shut-in.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	NA	No field measurements were required.
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	NA	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	NA	
6. Was the category of the well documented?	Yes	All wells were Category IV.
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	NA	
Did the water level stabilize prior to sampling?	NA	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	NA	
Was the flow rate less than 500 mL/min?	NA	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

### Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well: Was the flow rate less than 500 mL/min?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from well 30-039-21743.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number? Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	NA	Sample chilling was not required.
20. Were water levels measured at the locations specified in the planning documents?	NA	

## Laboratory Performance Assessment

### General Information

Requisition No. (RIN): 11063858  
 Sample Event: June 7-8, 2011  
 Site(s): Gasbuggy, New Mexico  
 Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
 Work Order No.: 1106224  
 Analysis: Radiochemistry  
 Validator: Steve Donivan  
 Review Date: August 9, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), “Standard Practice for Validation of Laboratory Data.” The procedure was applied at Level 2, Data Deliverables Verification. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

*Table 3. Analytes and Methods*

Analyte	Line Item Code	Prep Method	Analytical Method
Gross Alpha/Beta	GPC-A-001	PA SOP702R19	PA SOP724R10
Gamma Spectrometry	GAM-A-001	PA SOP739R9	PA SOP713R10
Tritium	LCS-A-001	PA SOP700R10	PA SOP704R9

### Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the sections below for an explanation of the data qualifiers applied.

*Table 4. Data Qualifier Summary*

Sample Number	Location	Analyte	Flag	Reason
1106224-1	30-039-21743 Dup	Gross Beta	J	Less than 3 times the MDC
1106224-1	30-039-21743 Dup	Uranium-235	U	Nuclide identification criteria not met
1106224-2	30-039-07525	Actinium-228	J	Less than 3 times the MDC
1106224-2	30-039-07525	Gross Beta	J	Less than 3 times the MDC
1106224-2	30-039-07525	Lead-212	J	Less than 3 times the MDC
1106224-2	30-039-07525	Promethium-144	U	Nuclide identification criteria not met
1106224-4	30-039-21647	Gross Beta	J	Less than 3 times the MDC
1106224-5	30-039-21743	Actinium-228	U	Nuclide identification criteria not met
1106224-5	30-039-21743	Gross Alpha	J	Less than 3 times the MDC
1106224-5	30-039-21743	Gross Beta	J	Less than 3 times the MDC

### Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received five water samples on June 15, 2011, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions. Copies of the air waybills were included with the receiving documentation.

### Preservation and Holding Times

The sample shipment was received intact at ambient temperature which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. Sample analysis was completed within the applicable holding times.

### Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

### Radiochemical Analysis

Radiochemical results are qualified with a “U” flag (not detected) when the result is greater than the minimum detectable concentration (MDC) but less than the Decision Level Concentration, estimated as 3 times the one-sigma total propagated uncertainty. Results above the Decision Level Concentration and the MDC are qualified with a “J” flag (estimated) when the result is less than Determination Limit (3 times the MDC).

### Gamma Spectrometry

Activity concentrations above the MDC were reported in some instances where minimum nuclide identification criteria were not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the ‘diagnostic’ peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Sample results for gamma-emitting radionuclides that do not meet the identification criteria are qualified with a “U” flag as not detected.

### Method Blank

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. All method blank results were below the applicable Decision Level Concentration.

### Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

### Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference value for the chloride matrix spike replicate was not provided and could not be calculated from raw data. The radiochemical relative error ratio (calculated using the one-sigma total propagated uncertainty) for the sample replicates was less than three for all duplicates with the exception of cesium-134. Cesium-134 was not detected in any of the associated samples.

### Matrix Spike Analysis

Matrix spike samples are used to measure method performance in the sample matrix. The spike data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spike recoveries met the recovery and precision criteria for all analytes evaluated with the exception of gross alpha. There was no gross alpha activity detected in the associated sample.

### Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were met for all analytes with the following exceptions. The required detection limits were not met for gross alpha and gross beta because of the elevated levels of dissolved solids in the samples.

### Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

### Electronic Data Deliverable (EDD) File

The EDD file arrived on July 13, 2011. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

RIN: 11063858 Lab Code: PAR Validator: Steve Donovan Validation Date: 8/9/2011

Project: Gasbuggy Site Analysis Type:  Metals  General Chem  Rad  Organics

# of Samples: 5 Matrix: WATER Requested Analysis Completed: Yes

### Chain of Custody

Present: OK Signed: OK Dated: OK

### Sample

Integrity: OK Preservation: OK Temperature: OK

### Select Quality Parameters

- Holding Times
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

There are 10 detection limit failures.

There was 1 duplicate evaluated.

**SAMPLE MANAGEMENT SYSTEM**

RIN: 11063858      Lab Code: PAR

**Non-Compliance Report: Detection Limits**

Project: Gasbuggy Site

Validation Date: 8/9/2011

Ticket	Location	Lab Sample ID	Method Code	Lab Method	Analyte Name	Result	Qualifier	Reported Detection Limit	Required Detection Limit	Units
JHS 855	2790	1106224-1	GPC-A-001	724R11	GROSS ALPHA	10.3	U	18	2	pCi/L
JHS 855	2790	1106224-1	GPC-A-001	724R11	GROSS BETA	27.8		24	4	pCi/L
JHS 853	30-039-07525	1106224-2	GPC-A-001	724R11	GROSS BETA	69.6		61	4	pCi/L
JHS 853	30-039-07525	1106224-2	GPC-A-001	724R11	GROSS ALPHA	-21.4	U	36	2	pCi/L
JHS 850	30-039-21620	1106224-3	GPC-A-001	724R11	GROSS BETA	474		24	4	pCi/L
JHS 850	30-039-21620	1106224-3	GPC-A-001	724R11	GROSS ALPHA	6.68	U	14	2	pCi/L
JHS 854	30-039-21647	1106224-4	GPC-A-001	724R11	GROSS ALPHA	2.38	U	13	2	pCi/L
JHS 854	30-039-21647	1106224-4	GPC-A-001	724R11	GROSS BETA	28.1		21	4	pCi/L
JHS 852	30-039-21743	1106224-5	GPC-A-001	724R11	GROSS BETA	23.3		22	4	pCi/L
JHS 852	30-039-21743	1106224-5	GPC-A-001	724R11	GROSS ALPHA	14.9		12	2	pCi/L

**SAMPLE MANAGEMENT SYSTEM**  
**Radiochemistry Data Validation Worksheet**

**RIN:** 11063858                      **Lab Code:** PAR                      **Date Due:** 7/13/2011  
**Matrix:** Water                      **Site Code:** GSB01                      **Date Completed:** 7/15/2011

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
30-039-21743	Actinium-228	06/20/2011						2.06
30-039-21743	Americium-241	06/20/2011						1.89
Blank_Spike	Americium-241	06/21/2011				95.50		
30-039-21743	Antimony-125	06/20/2011						1.43
30-039-21743	Cerium-144	06/20/2011						1.61
30-039-21743	Cesium-134	06/20/2011						3.36
30-039-21743	Cesium-137	06/20/2011						0.97
Blank_Spike	Cesium-137	06/21/2011				100.00		
30-039-21743	Cobalt-60	06/20/2011						1.40
Blank_Spike	Cobalt-60	06/21/2011				98.90		
30-039-21743	Europium-152	06/20/2011						1.18
30-039-21743	Europium-154	06/20/2011						0.55
30-039-21743	Europium-155	06/20/2011						0.94
30-039-21620	GROSS ALPHA	06/23/2011						1.30
Blank_Spike	GROSS ALPHA	06/23/2011				113.00		
30-039-21647	GROSS ALPHA	06/23/2011					59.1	
Blank	GROSS ALPHA	06/23/2011	0.3020	U				
30-039-21620	GROSS BETA	06/23/2011						0.14
Blank_Spike	GROSS BETA	06/23/2011				86.30		
30-039-21647	GROSS BETA	06/23/2011					90.9	
Blank	GROSS BETA	06/23/2011	0.4940	U				
30-039-07525	H-3	06/29/2011						0.29
30-039-21743	H-3	06/29/2011					98.0	
Blank_Spike	H-3	06/30/2011				103.00		
Blank	H-3	06/30/2011	-51.2000	U				
30-039-21743	Lead-212	06/20/2011						0.43
30-039-21743	Potassium-40	06/20/2011						1.21
30-039-21743	Promethium-144	06/20/2011						1.67
30-039-21743	Promethium-146	06/20/2011						0.06
30-039-21743	Ruthenium-106	06/20/2011						0.19
30-039-21743	Thorium-234	06/20/2011						0.94
30-039-21743	Uranium-235	06/20/2011						1.40

**SAMPLE MANAGEMENT SYSTEM**  
**Radiochemistry Data Validation Worksheet**

**RIN:** 11063858                      **Lab Code:** PAR                      **Date Due:** 7/13/2011  
**Matrix:** Water                      **Site Code:** GSB01                      **Date Completed:** 7/15/2011

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
30-039-21743	Yttrium-88	06/20/2011						0.44

This page intentionally left blank

## General Information

Requisition (RIN): 11053840  
Sample Event: June 7-8, 2011  
Site(s): Gasbuggy Site  
Laboratory: Isotech Laboratories  
Work Order No.: 213285  
Analysis: Radiochemistry  
Validator: Steve Donovan  
Review Date: August 9, 2011

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) “Standard Practice for Validation of Laboratory Data.” The procedure was applied at Level 1, Data Deliverables Examination. The data were examined to assess the completeness of the deliverables, identify any reporting errors, and assess the usability of the data based on the results of the field duplicate and the laboratory’s evaluation of their data, as described in the narrative provided. The data are acceptable as received. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 5.

*Table 5. Analytes and Methods*

Analyte	Line Item Code	Prep Method	Analytical Method
Natural Gas Analysis	LMG-01	NA	Gas Chromatography
Carbon-14 and Tritium	LMG-03	Combustion	Liquid Scintillation Counting

## Data Qualifier Summary

None of the analytical results required qualification.

## Sample Shipping/Receiving

Isotech Laboratories received six natural gas samples on June 15, 2011, accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions.

## Summary

Six natural gas samples were received at Isotech Laboratories and analyzed by gas chromatography to determine the natural gas composition. The samples were then combusted with the resulting water collected for analysis. Carbon-14 and tritium in the collected water were measured by liquid scintillation counting. There were no analytical difficulties noted by the laboratory.

## Completeness

The results of the gas chromatography analysis were reported in volume percent showing sample methane concentrations ranging from 83 percent to 88 percent methane.

The carbon-14 results were reported in percent modern carbon, and the tritium results were reported in tritium units. Neither carbon-14 nor tritium were not detected in any of the samples.

## **Sampling Quality Control Assessment**

The following information summarizes and assesses quality control for this sampling event.

### Equipment Blank Assessment

An equipment blank was not required.

### Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates which measure only laboratory performance. A duplicate sample was collected from location 30-039-21743. The radiochemical duplicate results had relative error ratios less than three demonstrating acceptable precision.

**SAMPLE MANAGEMENT SYSTEM**  
**Validation Report: Field Duplicates**

RIN: 11063858    Lab Code: PAR    Project: Gasbuggy Site    Validation Date: 8/9/2011

Duplicate: 2790

Sample: 30-039-21743

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Actinium-228	23.9		13.8	1	-1.83	U	19.4	1		2.1	pCi/L
Americium-241	-0.559	U	4.08	1	-9.03	U	38.5	1		0.4	pCi/L
Antimony-125	3.99	U	6.93	1	7.02	U	9.96	1		0.5	pCi/L
Cerium-144	13.8	U	14	1	11.2	U	26.4	1		0.2	pCi/L
Cesium-134	-4.7	U	3.36	1	0.622	U	4.35	1		1.9	pCi/L
Cesium-137	-1.12	U	3.1	1	0.0374	U	4.26	1		0.4	pCi/L
Cobalt-60	0.448	U	3.59	1	2.06	U	4.92	1		0.5	pCi/L
Europium-152	-14.5	U	17.1	1	18.6	U	24.1	1		2.2	pCi/L
Europium-154	0.631	U	19.4	1	5.76	U	23	1		0.3	pCi/L
Europium-155	1.92	U	5.66	1	1.88	U	13.2	1		0	pCi/L
GROSS ALPHA	14.9		8.49	1	10.3	U	11.1	1		0.6	pCi/L
GROSS BETA	23.3		14.1	1	27.8		15.5	1		0.4	pCi/L
H-3	-8.01	U	187	1	-121	U	185	1		0.8	pCi/L
Lead-212	1.68	U	6.67	1	-1.51	U	7.74	1		0.6	pCi/L
Potassium-40	-19.1	U	76.2	1	-56.5	U	74	1		0.7	pCi/L
Promethium-144	-3.82	U	5.85	1	-4.46	U	6.69	1		0.1	pCi/L
Promethium-146	-0.344	U	3.33	1	0	U	4.58	1		0.1	pCi/L
Ruthenium-106	8.6	U	30	1	8.49	U	41.4	1		0	pCi/L
Thorium-234	8.06	U	39.9	1	2.46	U	82.4	1		0.1	pCi/L
Uranium-235	13.6	U	13.1	1	41.7		26	1		1.9	pCi/L
Yttrium-88	3.14	U	2.58	1	-2.02	U	6	1		1.5	pCi/L

### Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donovan 10-13-2011  
Steve Donovan Date

Data Validation Lead: Steve Donovan 10-13-2011  
Steve Donovan Date

This page intentionally left blank

# **Attachment 1**

## **Data Presentation**

This page intentionally left blank

## **Produced Water Quality Data**

This page intentionally left blank

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**

**REPORT DATE: 9/14/2011**

**Location: 30-039-07525 WELL Indian A No. 002; N-30-29N-3W; Producing Well**

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA		
Actinium-228	pCi/L	06/07/2011	N001	0 - 0	19		J	#	12	8.21
Americium-241	pCi/L	06/07/2011	N001	0 - 0	-8.22	U		#	19	11
Antimony-125	pCi/L	06/07/2011	N001	0 - 0	3.22	U		#	7.8	4.33
Cerium-144	pCi/L	06/07/2011	N001	0 - 0	9.53	U		#	19	11.6
Cesium-134	pCi/L	06/07/2011	N001	0 - 0	-4.08	U		#	3.9	2.29
Cesium-137	pCi/L	06/07/2011	N001	0 - 0	0.054	U		#	3.1	1.85
Cobalt-60	pCi/L	06/07/2011	N001	0 - 0	0.209	U		#	3.9	2.33
Europium-152	pCi/L	06/07/2011	N001	0 - 0	-6.26	U		#	20	11.7
Europium-154	pCi/L	06/07/2011	N001	0 - 0	1.26	U		#	19	11.1
Europium-155	pCi/L	06/07/2011	N001	0 - 0	-.614	U		#	10	5.99
Gross Alpha	pCi/L	06/07/2011	N001	0 - 0	-21.4	U		#	36	19.2
Gross Beta	pCi/L	06/07/2011	N001	0 - 0	69.6		J	#	61	39.3
Lead-212	pCi/L	06/07/2011	N001	0 - 0	14.6		J	#	5.7	4.03
Potassium-40	pCi/L	06/07/2011	N001	0 - 0	59	U		#	84	51.9
Promethium-144	pCi/L	06/07/2011	N001	0 - 0	3.77		U	#	3.1	2
Promethium-146	pCi/L	06/07/2011	N001	0 - 0	1.25	U		#	3.6	2.17
Ruthenium-106	pCi/L	06/07/2011	N001	0 - 0	1.15	U		#	30	18.2
Thorium-234	pCi/L	06/07/2011	N001	0 - 0	220			#	48	41.7
Tritium	pCi/L	06/07/2011	N001	0 - 0	-52.2	U		#	320	187
Uranium-235	pCi/L	06/07/2011	N001	0 - 0	12.8	U		#	18	11.3
Yttrium-88	pCi/L	06/07/2011	N001	0 - 0	2.9	U		#	3.6	2.27

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**  
**REPORT DATE: 9/14/2011**  
**Location: 30-039-21620 WELL SCHALK 29-4 No. 007; K-26-29N-4W; Producing Well**

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Actinium-228	pCi/L	06/08/2011	N001	0 - 0	5.15	U		#	31	18.5
Americium-241	pCi/L	06/08/2011	N001	0 - 0	-7.1	U		#	64	37.7
Antimony-125	pCi/L	06/08/2011	N001	0 - 0	6.32	U		#	16	9.9
Cerium-144	pCi/L	06/08/2011	N001	0 - 0	3.52	U		#	46	27.1
Cesium-134	pCi/L	06/08/2011	N001	0 - 0	-2.26	U		#	7.3	4.23
Cesium-137	pCi/L	06/08/2011	N001	0 - 0	0.0749	U		#	7.4	4.32
Cobalt-60	pCi/L	06/08/2011	N001	0 - 0	4.58	U		#	7.6	4.68
Europium-152	pCi/L	06/08/2011	N001	0 - 0	9.2	U		#	40	23.4
Europium-154	pCi/L	06/08/2011	N001	0 - 0	11.9	U		#	41	24.3
Europium-155	pCi/L	06/08/2011	N001	0 - 0	12.6	U		#	22	13.5
Gross Alpha	pCi/L	06/08/2011	N001	0 - 0	6.68	U		#	14	8.59
Gross Beta	pCi/L	06/08/2011	N001	0 - 0	474			#	24	78.4
Lead-212	pCi/L	06/08/2011	N001	0 - 0	-1.03	U		#	14	8.42
Potassium-40	pCi/L	06/08/2011	N001	0 - 0	458			#	130	106
Promethium-144	pCi/L	06/08/2011	N001	0 - 0	-5.82	U		#	12	6.91
Promethium-146	pCi/L	06/08/2011	N001	0 - 0	-1.57	U		#	8.1	4.65
Ruthenium-106	pCi/L	06/08/2011	N001	0 - 0	-27.4	U		#	69	39.4
Thorium-234	pCi/L	06/08/2011	N001	0 - 0	40.2	U		#	170	105
Tritium	pCi/L	06/08/2011	N001	0 - 0	-132	U		#	320	184
Uranium-235	pCi/L	06/08/2011	N001	0 - 0	-5.51	U		#	45	26.3
Yttrium-88	pCi/L	06/08/2011	N001	0 - 0	1.2	U		#	11	6.3

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**  
**REPORT DATE: 9/14/2011**  
**Location: 30-039-21647 WELL VALENCIA CANYON UNIT No. 037; M-14-28N-4W; Producing Well**

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Lab	Data	QA						
Actinium-228	pCi/L	06/08/2011	N001	0	-	0	3.71	U		#	24	14.5
Americium-241	pCi/L	06/08/2011	N001	0	-	0	-2.79	U		#	43	25.9
Antimony-125	pCi/L	06/08/2011	N001	0	-	0	-4.49	U		#	8.3	4.88
Cerium-144	pCi/L	06/08/2011	N001	0	-	0	3.67	U		#	21	12.8
Cesium-134	pCi/L	06/08/2011	N001	0	-	0	0.529	U		#	3.5	2.13
Cesium-137	pCi/L	06/08/2011	N001	0	-	0	0.993	U		#	3.4	2.07
Cobalt-60	pCi/L	06/08/2011	N001	0	-	0	-0.915	U		#	3.9	2.27
Europium-152	pCi/L	06/08/2011	N001	0	-	0	-5.04	U		#	20	11.8
Europium-154	pCi/L	06/08/2011	N001	0	-	0	6.22	U		#	19	11.7
Europium-155	pCi/L	06/08/2011	N001	0	-	0	-1.1	U		#	11	6.62
Gross Alpha	pCi/L	06/08/2011	N001	0	-	0	2.38	U		#	13	7.87
Gross Beta	pCi/L	06/08/2011	N001	0	-	0	28.1		J	#	21	13.9
Lead-212	pCi/L	06/08/2011	N001	0	-	0	-0.897	U		#	8.8	5.27
Potassium-40	pCi/L	06/08/2011	N001	0	-	0	-9.67	U		#	83	49.6
Promethium-144	pCi/L	06/08/2011	N001	0	-	0	-0.543	U		#	9.4	5.67
Promethium-146	pCi/L	06/08/2011	N001	0	-	0	-0.0539	U		#	3.8	2.25
Ruthenium-106	pCi/L	06/08/2011	N001	0	-	0	-0.629	U		#	32	19.1
Thorium-234	pCi/L	06/08/2011	N001	0	-	0	35.1	U		#	96	57.2
Tritium	pCi/L	06/08/2011	N001	0	-	0	-1.82	U		#	320	188
Uranium-235	pCi/L	06/08/2011	N001	0	-	0	24.7	U		#	31	19.7
Yttrium-88	pCi/L	06/08/2011	N001	0	-	0	2.85	U		#	3.8	2.35

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**  
**REPORT DATE: 9/14/2011**  
**Location: 30-039-21743 WELL SCHALK 29-4 No. 017; I-25-29N-4W; Producing Well**

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
								Lab	Data QA		
Actinium-228	pCi/L	06/08/2011	N001	0	-	0	23.9	U	#	21	13.8
Actinium-228	pCi/L	06/08/2011	N002	0	-	0	-1.83	U	#	33	19.4
Americium-241	pCi/L	06/08/2011	N001	0	-	0	-5.59	U	#	6.9	4.08
Americium-241	pCi/L	06/08/2011	N002	0	-	0	-9.03	U	#	66	38.5
Antimony-125	pCi/L	06/08/2011	N001	0	-	0	3.99	U	#	13	6.93
Antimony-125	pCi/L	06/08/2011	N002	0	-	0	7.02	U	#	16	9.96
Cerium-144	pCi/L	06/08/2011	N001	0	-	0	13.8	U	#	23	14
Cerium-144	pCi/L	06/08/2011	N002	0	-	0	11.2	U	#	44	26.4
Cesium-134	pCi/L	06/08/2011	N001	0	-	0	-4.7	U	#	6	3.36
Cesium-134	pCi/L	06/08/2011	N002	0	-	0	0.622	U	#	7.4	4.35
Cesium-137	pCi/L	06/08/2011	N001	0	-	0	-1.12	U	#	5.5	3.1
Cesium-137	pCi/L	06/08/2011	N002	0	-	0	0.0374	U	#	7.3	4.26
Cobalt-60	pCi/L	06/08/2011	N001	0	-	0	0.448	U	#	6.2	3.59
Cobalt-60	pCi/L	06/08/2011	N002	0	-	0	2.06	U	#	8.3	4.92
Europium-152	pCi/L	06/08/2011	N001	0	-	0	-14.5	U	#	32	17.1
Europium-152	pCi/L	06/08/2011	N002	0	-	0	18.6	U	#	40	24.1
Europium-154	pCi/L	06/08/2011	N001	0	-	0	0.631	U	#	34	19.4
Europium-154	pCi/L	06/08/2011	N002	0	-	0	5.76	U	#	39	23

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**  
**REPORT DATE: 9/14/2011**  
**Location: 30-039-21743 WELL SCHALK 29-4 No. 017; I-25-29N-4W; Producing Well**

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
									Data	QA		
Europium-155	pCi/L	06/08/2011	N001	0	-	0	1.92	U		#	9.5	5.66
Europium-155	pCi/L	06/08/2011	N002	0	-	0	1.88	U		#	22	13.2
Gross Alpha	pCi/L	06/08/2011	N001	0	-	0	14.9		J	#	12	8.49
Gross Alpha	pCi/L	06/08/2011	N002	0	-	0	10.3	U		#	18	11.1
Gross Beta	pCi/L	06/08/2011	N001	0	-	0	23.3		J	#	22	14.1
Gross Beta	pCi/L	06/08/2011	N002	0	-	0	27.8		J	#	24	15.5
Lead-212	pCi/L	06/08/2011	N001	0	-	0	1.68	U		#	11	6.67
Lead-212	pCi/L	06/08/2011	N002	0	-	0	-1.51	U		#	13	7.74
Potassium-40	pCi/L	06/08/2011	N001	0	-	0	-19.1	U		#	130	76.2
Potassium-40	pCi/L	06/08/2011	N002	0	-	0	-56.5	U		#	130	74
Promethium-144	pCi/L	06/08/2011	N001	0	-	0	-3.82	U		#	10	5.85
Promethium-144	pCi/L	06/08/2011	N002	0	-	0	-4.46	U		#	12	6.69
Promethium-146	pCi/L	06/08/2011	N001	0	-	0	-.344	U		#	5.8	3.33
Promethium-146	pCi/L	06/08/2011	N002	0	-	0	0	U		#	7.8	4.58
Ruthenium-106	pCi/L	06/08/2011	N001	0	-	0	8.6	U		#	51	30
Ruthenium-106	pCi/L	06/08/2011	N002	0	-	0	8.49	U		#	70	41.4
Thorium-234	pCi/L	06/08/2011	N001	0	-	0	8.06	U		#	83	39.9
Thorium-234	pCi/L	06/08/2011	N002	0	-	0	2.46	U		#	140	82.4

**General Water Quality Data by Location (USEE105) FOR SITE GSB01, Gasbuggy Site**  
**REPORT DATE: 9/14/2011**  
**Location: 30-039-21743 WELL SCHALK 29-4 No. 017; I-25-29N-4W; Producing Well**

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
								Lab	Data	QA		
Tritium	pCi/L	06/08/2011	N001	0	-	0	-8.01	U		#	320	187
Tritium	pCi/L	06/08/2011	N002	0	-	0	-121	U		#	320	185
Uranium-235	pCi/L	06/08/2011	N001	0	-	0	13.6	U		#	23	13.1
Uranium-235	pCi/L	06/08/2011	N002	0	-	0	41.7		U	#	41	26
Yttrium-88	pCi/L	06/08/2011	N001	0	-	0	3.14	U		#	4	2.58
Yttrium-88	pCi/L	06/08/2011	N002	0	-	0	-2.02	U		#	10	6

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

- F Low flow sampling method used.
- L Less than 3 bore volumes purged prior to sampling.
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- Q Qualitative result due to sampling technique.
- X Location is undefined.
- J Estimated value.
- R Unusable result.

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

## **Natural Gas Data**

This page intentionally left blank

---

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site****REPORT DATE: 9/14/2011****Location: 30-039-07525 WELL, Natural Gas Well - Vertical, Indian A No. 002; N-30-29N-3W; Producing Well**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/07/2011	0001	JGS 549	-	NATURAL GAS - DRY	0.4	U	#	0.4	
Tritium	pCi/L	06/07/2011	0001	JGS 549	-	NATURAL GAS - DRY	0.0545	U	#	0.0545	

---

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site****REPORT DATE: 9/14/2011****Location: 30-039-21620 WELL, Natural Gas Well - Vertical, SCHALK 29-4 No. 007; K-26-29N-4W; Producing Well**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/08/2011	0001	JGS 551	-	NATURAL GAS - DRY	1	U	#	1	
Tritium	pCi/L	06/08/2011	0001	JGS 551	-	NATURAL GAS - DRY	0.0514	U	#	0.0514	

---

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site****REPORT DATE: 9/14/2011****Location: 30-039-21647 WELL, Natural Gas Well - Vertical, VALENCIA CANYON UNIT No. 037; M-14-28N-4W; Producing Well**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/08/2011	0001	JGS 553	-	NATURAL GAS - DRY	0.4	U	#	0.4	
Tritium	pCi/L	06/08/2011	0001	JGS 553	-	NATURAL GAS - DRY	0.0514	U	#	0.0514	

---

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site****REPORT DATE: 9/14/2011****Location: 30-039-21743 WELL, Natural Gas Well - Vertical, SCHALK 29-4 No. 017; I-25-29N-4W; Producing Well**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/08/2011	0001	JGS 555	-	NATURAL GAS - DRY	0.5	U	#	0.5	
Tritium	pCi/L	06/08/2011	0001	JGS 555	-	NATURAL GAS - DRY	0.0514	U	#	0.0514	

---

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site****REPORT DATE: 9/14/2011****Location: 30-039-21744 WELL, Natural Gas Well - Vertical, SCHALK 29-4 No. 014; B-26-29N-4W; Producing Well**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/08/2011	0001	JGS 550	-	NATURAL GAS - DRY	0.5	U	#	0.5	
Tritium	pCi/L	06/08/2011	0001	JGS 550	-	NATURAL GAS - DRY	0.0514	U	#	0.0514	

**Gas Matrix Chemistry Data by Location (USEE510) FOR SITE GSB01, Gasbuggy Site**

**REPORT DATE: 9/14/2011**

**Location: 30-039-30161 WELL, Natural Gas Well - Angle, MANY CANYONS 29 4 25 No. 123; G-25-29N-4W; Producing Well, New Well 06/07**

Parameter	Units	Sample Date ID	Ticket Number	Elev. Range (Ft)	Matrix Subtype	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Carbon-14	pMC	06/08/2011 0001	JGS 554	-	NATURAL GAS - DRY	0.5	U		#	0.5	
Tritium	pCi/L	06/08/2011 0001	JGS 554	-	NATURAL GAS - DRY	0.0514	U		#	0.0514	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

**DATA QUALIFIERS:**

- F Low flow sampling method used.
- L Less than 3 bore volumes purged prior to sampling.
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- Q Qualitative result due to sampling technique.
- X Location is undefined.
- J Estimated value.
- R Unusable result.

**QA QUALIFIER:**

- # Validated according to quality assurance guidelines.

**Attachment 2**  
**Sampling and Analysis Work Order**

This page intentionally left blank



established 1959

Task Order LM00-502  
Control Number 11-0613

May 4, 2011

U.S. Department of Energy  
Office of Legacy Management  
ATTN: Jalena Dayvault  
Site Manager  
2597 Legacy Way  
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S. M. Stoller Corporation (Stoller)  
June 2011 Environmental Sampling at Gasbuggy, New Mexico

REFERENCE: Task Order LM00-502-07-616, Gasbuggy, NM, Site

Dear Ms. Dayvault:

The purpose of this letter is to inform you of the upcoming sampling event at Gasbuggy, New Mexico. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at the Gasbuggy site. Natural gas will be collected from gas wells at this site as part of the environmental sampling currently scheduled to begin the week of June 6, 2011.

The following list shows the locations scheduled to be sampled during this event.

30-039-07525	30-039-21620	30-039-21647	30-039-21743
30-039-21744	30-039-29988	30-039-30161	

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

Please contact me at (970) 248-6378 if you have any questions or concerns.

Sincerely,

2011.05.04  
15:10:11 -06'00'

Mark Plessinger  
Site Lead

Jalena Dayvault  
Control Number 11-0613  
Page 2

MP/lcg/dc

Enclosures (2)

cc: (electronic)  
Steve Donovan, Stoller  
Bev Gallagher, Stoller  
Lauren Goodknight, Stoller  
Rick Hutton, Stoller  
EDD Delivery  
rc-grand.junction

## Sampling Frequencies for Locations at Gasbuggy, New Mexico

Location ID	Quarterly	Semiannually	Annually	Every 5 Years	Not Sampled	Notes
<b><i>Gas and Produced Water Locations</i></b>						
30-039-21744			X			
30-039-21620			X			
30-039-29988			X			
30-039-30161			X			
30-039-21743			X			
30-039-07525			X			
30-039-21647			X			

Annual GAS sampling conducted in June.

## Constituent Sampling Breakdown

Site	Gasbuggy			
Analyte	Gas	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
<b>Approx. No. Samples/yr</b>	8			
<i>Field Measurements</i>				
Alkalinity				
Dissolved Oxygen				
Redox Potential				
pH				
Specific Conductance				
Turbidity				
Temperature				
<i>Laboratory Measurements</i>				
Aluminum				
Ammonia as N (NH <sub>3</sub> -N)				
Calcium				
Carbon-14	X	NA	Liquid Scintillation	LMG-03
Chloride				
Chromium				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Nickel-63				
Nitrate + Nitrite as N (NO <sub>3</sub> +NO <sub>2</sub> )-N				
Potassium				
Radium-226				
Radium-228				
Selenium				
Silica				
Sodium				
Strontium				
Total Dissolved Solids				
Total Organic Carbon				
Tritium	X	NA	Liquid Scintillation	LMG-03
Uranium				
Vanadium				
Zinc				
<b>Total No. of Analytes</b>	2			

Note: All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

# **Attachment 3 Trip Report**

This page intentionally left blank

*Memorandum*

Control Number N/A

DATE: August 1, 2011  
TO: Mark Plessinger  
FROM: Jeff Price  
SUBJECT: Trip Report (Natural Gas and Produced Water Sampling)

**Site:** Gasbuggy, NM

**Dates of Sampling Event:** June 7–8, 2011

**Team Members:** Rick Hutton and Jeff Price.

**Number of Locations Sampled:** Produced water from 4 natural gas wells and natural gas from 6 natural gas wells.

**Locations Not Sampled/Reason:** Because of the lack of water, no produced water was collected at locations 30-039-30161 and 30-039-21744; neither gas nor water samples were collected from location 30-039-29988 because the well was “shut-in.” A complete suite of analytes, including natural gas, was collected from all other sampled locations. Field measurements were not taken on the produced water samples.

**Quality Control Sample Cross Reference:** The following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2790	30-039-21743	Duplicate	Produced Water	JHS 855

**RIN Number Assigned:** Samples were assigned to RIN 11063858 (water) and RIN 11053840 (natural gas).

**Sample Shipment:** Samples were shipped on June 13, 2011.

**Water Level Measurements:** N/A.

**Trip Summary:**

The 2011 Gasbuggy, NM sampling event was conducted June 7-8, 2011. Jalena Dayvault with DOE LM, Rick Hutton, Mark Plessinger, and Jeff Price with the LMS contractor staff participated in the sampling event.

On Tuesday June 7, the sampling crew traveled from Grand Junction to the site. Natural gas and produced water samples (taken from the separator) were acquired from the Williams Production Co. well number 30-039-07525, located on the Jicarilla Apache Nation property. Several tribal and two Williams representatives accompanied staff during the sampling of this well. Keith Manwell, Hobson Sandoval, and one other individual with the Jicarilla Environmental Protection Office were present and Bryce Hammond and Rod Velarde with the Jicarilla Oil and Gas Administration were present. Russ Knight, the new Williams Production Supervisor and one of his staff were present during the sampling of this well.

On Wednesday June 8, natural gas and produced water samples were acquired from five gas wells located on the Carson National Forest, operated by three different gas producers. The gas producers (ConocoPhillips, Black Hills Gas Resources, and Schalk Development) were met at Gasbuggy ground zero at different scheduled times and accompanied staff to the gas wells for sampling. Two ConocoPhillips representatives, Troy Salyers with the BLM and two BLM interns accompanied the sampling team to the ConocoPhillips well. Wells 30-039-30161 and 30-039-21744 did not have any produced water.

The following table is a list of natural gas wells sampled:

<b>Gas Well ID (API #)</b>	<b>Alternate Gas Well ID</b>	<b>Gas Well Operator</b>
30-039-21744	B-26-29N-4W Schalk 29-4 No. 014	John E. Schalk
30-039-21620	K-26-29N-4W Schalk 29-4 No. 007	John E. Schalk
30-039-30161	G-25-29N-4W Many Canyons 29 4 25 No. 123	Black Hills Gas Resources, Inc.
30-039-21743	I-25-29N-4W Schalk 29-4 No. 17	John E. Schalk
30-039-07525	N-30-29N-3W Indian A No. 002	Williams Production Co., LLC
30-039-21647	M-14-28N-4W Valencia Canyon Unit No. 037	ConocoPhillips

Gas samples will be analyzed for tritium and carbon-14; produced water samples will be analyzed for tritium, gross alpha, gross beta, and gamma emitters by high resolution gamma spectroscopy. Because of limited water volume, only one liter (instead of one gallon) for gamma spectroscopy was collected at location 30-039-07525.

Additionally, on June 8 Jalena Dayvault and Mark Plessinger went to the New Mexico Oil Conservation Division office in Aztec to obtain historic gas production records for use with the Gasbuggy modeling effort. They were also able to meet informally with Charlie Perrin, district supervisor, while at the office.

(JP/lcg)

cc: (electronic)  
 Jalena Dayvault, DOE  
 Bev Gallagher, Stoller  
 Steve Donovan, Stoller  
 Mark Plessinger, Stoller  
 EDD Delivery