DOCUMENT #1597088

FORM 4 Rev 12/05

Page 1

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax:(303)894-2109

DC | ET | GE | CS

RECEIVED 4/12/2012

SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: 96850
2. Name of Operator: Williams Production RMT Company LLC
3. Address: 1001 17th Street, Suite 1200
   City: Denver State: CO Zip 80202
4. Contact Name: Howard Harris
   Phone: (303) 606-4086
   Fax: (303) 629-8268

Complete the Attachment Checklist

	OP	OGCC
Survey Plat		
Directional Survey		
Surface Eqpmt Diagram		
Technical Info Page		
Other		

5. API Number 05-103-08914-00
6. Well/Facility Name: Government
7. Well/Facility Number 398-10-1
8. Location (QtrQtr, Sec, Twp, Rng, Meridian): SE SEC. 10 T3S-R98W 6TH PM
9. County: Rio Blanco
10. Field Name: Sulphur Creek
11. Federal, Indian or State Lease Number:

OGCC Facility ID Number

General Notice

☐ **CHANGE OF LOCATION:** Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

	FNL/FSL		FEL/FWL		
Change of Surface Footage from Exterior Section Lines:					
Change of Surface Footage to Exterior Section Lines:					
Change of Bottomhole Footage from Exterior Section Lines:					
Change of Bottomhole Footage to Exterior Section Lines:					attach directional survey

Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer

Latitude | Distance to nearest property line | Distance to nearest bldg, public rd, utility or RR
Longitude | Distance to nearest lease line | Is location in a High Density Area (rule 603b)? Yes/No
Ground Elevation | Distance to nearest well same formation | Surface owner consultation date:

GPS DATA:
Date of Measurement | PDOP Reading | Instrument Operator's Name

☐ **CHANGE SPACING UNIT**

Formation	Formation Code	Spacing order number	Unit Acreage	Unit configuration

☐ **Remove from surface bond** Signed surface use agreement attached

☐ **CHANGE OF OPERATOR (prior to drilling):**
Effective Date:
Plugging Bond: ☐ Blanket ☐ Individual

☐ **CHANGE WELL NAME** NUMBER
From:
To:
Effective Date:

☐ **ABANDONED LOCATION:**
Was location ever built? ☐ Yes ☐ No
Is site ready for Inspection? ☐ Yes ☐ No
Date Ready for Inspection:

☐ **NOTICE OF CONTINUED SHUT IN STATUS**
Date well shut in or temporarily abandoned:
Has Production Equipment been removed from site? ☐ Yes ☐ No
MIT required if shut in longer than two years. Date of last MIT

☐ **SPUD DATE:**

☐ **REQUEST FOR CONFIDENTIAL STATUS** (6 mos from date casing set)

☐ **SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK** *submit cbl and cement job summaries

Method used	Cementing tool setting/perf depth	Cement volume	Cement top	Cement bottom	Date

☐ **RECLAMATION:** Attach technical page describing final reclamation procedures per Rule 1004.
Final reclamation will commence on approximately
☐ Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

☐ Notice of Intent
Approximate Start Date:

☐ Report of Work Done
Date Work Completed:

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

☐ Intent to Recomplete (submit form 2)	☐ Request to Vent or Flare	☐ E&P Waste Disposal
☐ Change Drilling Plans	☐ Repair Well	☐ Beneficial Reuse of E&P Waste
☐ Gross Interval Changed?	☐ Rule 502 variance requested	☐ Status Update/Change of Remediation Plans for Spills and Releases
☐ Casing/Cementing Program Change	☒ Other: Radionuclides Testing	

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: Howard Harris Date: 4/9/12 Email: Howard.Harris@williams.com

Print Name: Howard Harris Title: Sr. Regulatory Specialist

COGCC Approved: Title Env. Supv Date: 5/14/12

CONDITIONS OF APPROVAL, IF ANY:

FORM 4 Rev 12/05

TECHNICAL INFORMATION PAGE

FOR OGCC USE ONLY

1. OGCC Operator Number: 96850 API Number: 05-103-08914
2. Name of Operator: Williams Production RMT Co OGCC Facility ID #
3. Well/Facility Name: Government Well/Facility Number: 398-10-1
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): SE Sec 10-3S-98W

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

DESCRIBE PROPOSED OR COMPLETED OPERATIONS

The following Condition of Approval (COA) was attached on the approved Form 6 to plug and abandon the Government 398-10-1.

Condition of Approval (COA) for the Plugging and Abandonment for 05-103-08914:
• To demonstrate that identified Project Rio Blanco-related radionuclides are not present prior to disposal of any media derived from the subsurface well abandonment, fluids and/or solids that are generated during the abandonment shall be monitored as set forth in the Rio Blanco Sampling and Analysis Plan (RBSAP).

Per the COA listed above, water samples were collected during P&A operations of makeup, kill and flowback waters and analyzed according to the Project Rio Blanco Sampling and Analysis Plan (RBSAP) requirements. No solids were generated during the P&A operations. Please find attached the sampling results.

Based on the analytical results, no Project Rio Blanco-related radionuclides were detected above their respective screening levels in the flowback fluid sample collected during the plugging and abandonment of Government 398-10-1 Tier I gas well. Therefore, per the RBSAP, flowback fluid may be transported, re-used, or disposed without approval from the Colorado Oil & Gas Conservation Commission (COGCC) if tritium is below the screening level of 400 pCi/L. This Sundry Notice Form 4 and the attached letter and lab results are being submitted to the COGCC to document the fluid sample results and to demonstrate compliance with the RBSAP.

Fischer, Alex

From: Robert Morris [robert_morris@mhchew.com]
Sent: Monday, May 14, 2012 9:40 AM
To: Danforth, Brandon; Fischer, Alex; Submittal, Rioblanco; King, Kevin; rick.hutton@lm.doe.gov; betty_lau@blm.gov
Subject: RE: Sundry Federal 398-10-1 Radiological results

Thanks.

This is as expected and is acceptable. Please be sure this information, along with details of the instrument serial number and calibration record, is included in the next public report submitted in accordance with the Rio Blanco SAP.
Bob Morris

Robert Morris, MS, CHP, CIH
Principal Health Physicist
M.H. Chew & Associates, Inc.
7985 Vance Dr Suite 307
Arvada, CO 80003

Robert_Morris@mhchew.com
303 424-0007 (office)
303 912-6225 (mobile)

From: Danforth, Brandon [mailto:Brandon.Danforth@wpxenergy.com]
Sent: Monday, May 14, 2012 9:21 AM
To: robert_morris@mhchew.com; alex.fischer@state.co.us; Rioblanco.submittal@state.co.us; kevin.king@state.co.us; rick.hutton@lm.doe.gov; betty_lau@blm.gov
Subject: FW: Sundry Federal 398-10-1 Radiological results

All – Please find Richard Henry's response below in regards to screening of the removed tubing.

Thanks,

Brandon Danforth
970.773.3166

From: Henry, Richard [mailto:richard.henry@urs.com]
Sent: Friday, May 04, 2012 10:50 AM
To: Danforth, Brandon
Subject: RE: Sundry Federal 398-10-1 Radiological results

Brandon

Sorry for the delay in responding, I was traveling last week and early this week.

Yes, the pipe removed from the hole was surveyed for radiation. The radiation screening survey was performed using a Ludlum 2401-EW Pocket Survey Meter equipped with an end window GM detector. The survey was performed by screening the length of selected pipes once they were removed from the hole and stacked. The instrument was held about 0.5 inches from the pipe while screening along its length. All radiation screening results were less than (<) 0.1 mR/hr or < 100 counts per minute (cpm). Background activity was also < 100 cpm or < 0.1 mR/h.

Let me know if you need any additional information.

Richard

Richard Henry, PG
Principal Hydrogeochemist
URS Corporation
8181 East Tufts Avenue
Denver, CO 80237
303.740.3978 Direct
303.994.1747 Cell
richard.henry@urs.com

From: Danforth, Brandon [mailto:Brandon.Danforth@wpxenergy.com]
Sent: Monday, April 30, 2012 7:41 AM
To: Henry, Richard
Subject: FW: Sundry Federal 398-10-1 Radiological results

Richard?

Brandon Danforth
970.773.3166

From: Robert Morris [mailto:robert_morris@mhchew.com]
Sent: Thursday, April 12, 2012 8:33 PM
To: Danforth, Brandon; alex.fischer@state.co.us; Rioblanco.submittal@state.co.us; kevin.king@state.co.us; rick.hutton@lm.doe.gov; betty_lau@blm.gov
Cc: Lindsay Sanders; Kohler, Gretchen; Foster, Greg
Subject: RE: Sundry Federal 398-10-1 Radiological results

This looks good.

Are contamination surveys of tubing made using a hand-held monitoring instrument available? I was informed during the recent site audit that the plan was to survey tubing and pipe prior to unrestricted release to landowner.

Bob Morris

Robert Morris, MS, CHP, CIH
Principal Health Physicist
M.H. Chew & Associates, Inc.
7985 Vance Dr Suite 307
Arvada, CO 80003

Robert_Morris@mhchew.com
303 424-0007 (office)
303 912-6225 (mobile)

From: Danforth, Brandon [mailto:Brandon.Danforth@wpxenergy.com]
Sent: Thursday, April 12, 2012 2:02 PM
To: alex.fischer@state.co.us; Rioblanco.submittal@state.co.us; kevin.king@state.co.us; rick.hutton@lm.doe.gov; betty_lau@blm.gov; robert_morris@mhchew.com
Cc: Lindsay Sanders; Kohler, Gretchen; Foster, Greg
Subject: FW: Sundry Federal 398-10-1 Radiological results

Attached is the COGCC Sundry with radiological results from recent P&A operations at the Federal 398-10-1 well.

Thanks,

NOTE - My new email address is brandon.danforth@wpxenergy.com
Please update your contacts, Thanks.

Brandon Danforth | Environmental Specialist
WPX Energy Rocky Mountain, LLC | 1058 County Rd 215, Parachute, CO 81635
o: 970.263.2792 | c: 970.773.3166 | brandon.danforth@wpxenergy.com

WPXENERGY

From: Harris, Howard [mailto:Howard.Harris@Williams.com]
Sent: Monday, April 09, 2012 4:01 PM
To: Danforth, Brandon; Kohler, Gretchen; Foster, Greg; Shoemaker, Mike
Subject: Sundry Federal 398-10-1 Radiological results

The attached sundry and attachments was submitted to COGCC 4/9/12

Howard Harris
Sr. Regulatory Specialist
WPX Energy
Phone: (303) 606-4086
Fax: (303 629-8272
E-mail: Howard.Harris@Williams.com

URS

April 9, 2012

Mr. Brandon Danforth
WPX Energy Rocky Mountain LLC
1058 County Road 215
Parachute, CO 81635

Subject: Transmittal of Radiological Analysis Results for Plugging and Abandonment Fluids
WPX Energy Federal 398-10-1 Tier I Gas Well, Project Rio Blanco Area

Dear Mr. Danforth:

Per WPX Energy's request, URS Corporation (URS) collected on February 24 and 29, 2012 grab samples of makeup and kill water samples prior to their use and a flowback fluid sample returned from WPX Energy's Federal 398-10-1 Tier I gas well in monitoring sector 11 during plugging and abandonment. The make-up and kill waters were used during abandonment of the well. The flowback fluid sample was fluid that was returned from the well during plugging and abandonment. The waters and fluids were stored in separate tanks. The samples collected were designated FED-398-10-1-FW-GPTF (make-up water), FED-398-10-1-FW-T-GPTF (kill water), and FED-398-10-1-FB-GPTF (flowback fluid). These samples were collected, composited, and analyzed in accordance with the Rio Blanco Sampling and Analysis Plan (RBSAP) Revision 1, dated July 7, 2010. The samples were sent by overnight carrier to GEL Laboratories LLC (GEL) in Charleston, South Carolina for analysis of gross alpha, gross beta, gamma-emitting radionuclides, strontium-90, and technetium-99 under GEL sample data group (SDG) number 296920. Samples were also sent to Isotech Laboratories of Champaign, Illinois for analysis of tritium under Isotech job numbers 17586 and 17588.

The laboratory data reported by GEL and Isotech were independently validated by URS and generally found to be usable without qualification. Data that are deemed usable as qualified or unusable are identified in the data validation report and the qualified laboratory certificates of analysis. The data validation reports and qualified laboratory certificates of analysis are attached for your reference.

The results of the radiological analyses (Table 1) indicate that total uranium was detected in the make-up and kill water samples at concentrations of 1.18 ± 0.0566 and 5.80 ± 0.258

URS Corporation
8181 E. Tufts Avenue
Denver, CO 80237
Tel: 303.694.2770
Fax: 303.694.3946

milligrams per liter (mg/L), respectively. Gross beta was detected in the kill water sample at an estimated (J) activity of 7.05 ± 4.09. Total uranium and potassium-40 were the only radionuclides detected in the flowback fluid sample. The total uranium concentration was 3.94 ± 0.155 mg/L and the potassium-40 activity was 33.7 ± 30.6 picocuries per liter (pCi/L). Total uranium and potassium-40, both naturally-occurring radionuclides, and gross beta, a measurement of beta-emitting radionuclides such as potassium-40, were detected at concentrations or activities typical of background for natural subsurface fluids.

Tritium concentrations in the make-up and kill water samples were less than the method reporting limits of 10 and 14.9 tritium units (TU), or less than 32 or 48 pCi/L, respectively. Tritium was detected in the flowback fluid sample at a concentration of 10.6 ± 2.4 TU, or 34 ± 7.7 pCi/L, which is slightly higher than the method reporting limit of 10 TU. The tritium concentrations for the make-up water, kill water, and flowback fluid samples are either not detected or less than the 400 pCi/L screening level for tritium in fluid samples specified in Table 8 of the RBSAP.

Based on the analytical results, no Project Rio Blanco-related radionuclides were detected above their respective screening levels in the flowback fluid sample collected during the plugging and abandonment of FED 398-10-1 Tier I gas well. Therefore, per the RBSAP, flowback fluid may be transported, re-used, or disposed without approval from the Colorado Oil & Gas Conservation Commission (COGCC) if tritium is below the screening level of 400 pCi/L. This letter, along with a Sundry Notice Form 4, should be submitted by WPX Energy to the COGCC to document the fluid sample results and demonstrate compliance with the RBSAP.

URS appreciates the opportunity to perform these services for WPX Energy. Please call me if you have any questions concerning this transmittal.

Sincerely,

Richard L. Henry

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/24/2012	KW	SA	Gross Beta	7.05	4.09	6.59	pCi/L	J,D-I	Yes
FED-398-10-1	Tier I	02/29/2012	FB	SA	K-40	33.7	30.6	33.2	pCi/L		Yes
FED-398-10-1	Tier I	02/24/2012	KW	SA	Total Uranium	5.8	0.258	0.158	ug/L		Yes
FED-398-10-1	Tier I	02/24/2012	MW	SA	Total Uranium	1.18	0.0566	0.158	ug/L	J,D-I	Yes
FED-398-10-1	Tier I	02/29/2012	FB	SA	Total Uranium	3.94	0.155	0.158	ug/L		Yes
FED-398-10-1	Tier I	02/29/2012	FB	SA	Tritium	10.6	2.4	10	TU		Yes
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ac-228	4.3	7.74	14.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ac-228	-6.05	11	17.7	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ac-228	-5.63	9.74	15.2	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ag-110m	-3.74	1.93	2.82	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ag-110m	0.0901	1.92	3.53	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ag-110m	-0.563	1.76	3.1	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Am-241	-4.63	7.76	11.9	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Am-241	-7.41	14.6	25.6	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Am-241	9.84	9.24	15	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ba-133	-0.254	3.26	4.92	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ba-133	0.823	3.01	4.78	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ba-133	-1.7	2.47	4.04	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ba-140	3.01	11.2	21.3	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ba-140	0.435	14.7	27	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ba-140	5.98	7.36	14.1	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Be-7	13.6	16.8	31.5	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Be-7	-16.4	21.8	35.4	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/29/2012	FB	SA	Be-7	4.64	16.1	30	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Bi-212	8.58	26.2	49.3	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Bi-212	17	31.5	59.1	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Bi-212	12	22.2	43.1	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Bi-214	3.12	5.75	8.65	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Bi-214	5.57	6.46	9.23	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Bi-214	1.14	3.54	6.62	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ce-139	1.82	1.81	3.23	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ce-139	-1.87	2.19	3.55	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ce-139	-0.0464	1.61	2.85	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ce-141	2.19	3.7	6.5	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ce-141	1.94	4.85	7.57	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ce-141	1.17	3	5.41	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ce-144	5.3	13	21.6	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ce-144	11.3	14.3	25.3	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ce-144	6.22	12.1	22	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Co-56	0.23	1.95	3.6	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Co-56	1.28	2.31	4.37	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Co-56	-1.11	1.76	2.95	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Co-57	1.58	1.59	2.86	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Co-57	2.25	1.95	3.52	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Co-57	1.01	1.52	2.8	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Co-58	0.829	1.94	3.69	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/24/2012	MW	SA	Co-58	-1.48	2.35	3.94	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Co-58	-1.34	1.81	3	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Co-60	1.57	2.21	4.43	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Co-60	-0.755	2.29	4.06	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Co-60	-0.144	1.82	3.42	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Cr-51	-5.75	19.8	34.6	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Cr-51	-14.8	23.3	39.5	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Cr-51	2.57	15.7	27.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Cs-134	0.27	2.22	4.11	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Cs-134	1.98	2.36	4.66	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Cs-134	-0.17	2.29	4.11	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Cs-136	1.41	4.85	9.33	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Cs-136	-2.25	4.4	7.78	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Cs-136	0.768	2.84	5.54	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Cs-137	0.474	2.48	4.12	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Cs-137	1.04	2.21	4.17	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Cs-137	0.329	2.02	3.72	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Eu-152	0.678	5.25	9.44	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Eu-152	-0.286	6.18	10.9	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Eu-152	-4.15	5.53	9.05	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Eu-154	0.442	4.83	9.36	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Eu-154	3.29	7.26	13.9	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Eu-154	2.14	4.87	9.83	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/24/2012	KW	SA	Eu-155	1.31	6.11	10.7	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Eu-155	-2.47	7.71	13.3	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Eu-155	-0.62	6.34	11.3	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Fe-59	0.774	4.33	8.26	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Fe-59	0.177	4.46	8.36	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Fe-59	0.917	3.34	6.52	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Gross Alpha	7.12	5.91	9.19	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Gross Alpha	3.64	3.21	4.6	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Gross Alpha	5.86	4.28	6.55	pCi/L	UJ,MS-L	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Gross Beta	0.744	1.88	3.38	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Gross Beta	-0.732	4.89	8.46	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Hg-203	-2.85	2.09	3.4	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Hg-203	-0.764	2.18	3.82	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Hg-203	0.826	1.85	3.33	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ir-192	0.78	1.91	3.5	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ir-192	2.82	2.28	4.31	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ir-192	-1.38	1.74	2.85	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	K-40	11.9	31.2	56.5	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	K-40	-22.2	36	58.4	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Kr-85	-1430	589	904	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Kr-85	-1690	661	1010	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Kr-85	-1910	627	891	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Mn-54	-0.0669	1.94	3.5	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/24/2012	MW	SA	Mn-54	-0.00665	2.25	4.02	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Mn-54	-0.798	1.81	3.11	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Na-22	0.156	1.7	3.3	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Na-22	1.11	2.55	4.88	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Na-22	0.722	1.71	3.44	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Nb-94	0.728	1.85	3.47	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Nb-94	0.0687	1.93	3.5	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Nb-94	0.582	1.74	3.24	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Nb-95	-0.345	2.28	3.52	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Nb-95	-0.481	2.15	3.8	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Nb-95	1.62	1.68	3.36	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Nd-147	3.47	24.4	45.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Nd-147	16.5	28.3	54	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Nd-147	3.69	13.5	25.6	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Np-239	-1.17	16.1	27.6	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Np-239	15.3	19.4	34.8	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Np-239	1.94	16.1	29	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Pb-210	-184	171	264	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Pb-210	280	397	742	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Pb-210	116	209	325	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Pb-212	6.1	5.43	7.64	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Pb-212	2.8	5.31	7.46	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Pb-212	1.86	4.36	7.19	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/24/2012	KW	SA	Pb-214	1.82	5.46	8.39	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Pb-214	3.27	7.16	9.74	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Pb-214	4.45	4.4	8.11	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Pm-144	-0.312	1.78	3.2	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Pm-144	0.0719	2.08	3.76	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Pm-144	0.619	1.91	3.54	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Pm-146	2.68	2.27	4.37	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Pm-146	1.5	2.79	5.06	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Pm-146	-1.83	2.11	3.58	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ra-228	4.3	7.74	14.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ra-228	-6.05	11	17.7	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ra-228	-5.63	9.74	15.2	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Ru-106	-8.34	16.4	28.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Ru-106	-8.71	20.1	35.2	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Ru-106	-14.8	14.2	23.1	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Sb-124	0.832	3.99	8.25	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Sb-124	-2.42	5.71	10.2	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Sb-124	-0.81	3.86	7.13	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Sb-125	-6.61	5.41	8.51	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Sb-125	-5.8	6.27	10.2	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Sb-125	0.0266	4.87	8.93	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Sn-113	0.883	2.41	4.38	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Sn-113	-1.18	2.81	4.79	pCi/L	U	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/29/2012	FB	SA	Sn-113	1.84	2.19	4.09	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Sr-90	-0.737	0.602	1.41	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Sr-90	-1.21	0.815	1.84	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Sr-90	0.667	0.965	1.68	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Tc-99	-6.49	18.2	32	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Tc-99	5.23	18	31	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Tc-99	-2.87	20.7	36.7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Th-230	-92.2	545	953	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Th-230	160	883	1590	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Th-230	516	781	1210	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Th-234	25	93.6	129	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Th-234	-77.4	165	263	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Th-234	1.44	105	149	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Tl-208	-2.34	2.44	3.67	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Tl-208	0.782	3.87	3.61	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Tl-208	0.906	1.9	3.59	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Tritium	10	-----	10	TU	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Tritium	14.9	-----	14.9	TU	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	U-235	1.4	15.2	22.4	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	U-235	10.5	23	24.5	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	U-235	3.7	12.4	22.1	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	U-238	25	93.6	129	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	U-238	-77.4	165	263	pCi/L	UJ,D-I	No

Table 1
WPX Energy Federal 398-10-1 Plugging and Abandonment Fluids Radiological Results

Well Number	Well Type	Sample Date	Medium	Sample Type	Parameter	Activity	Counting Error	Reporting Limit	Units	Flag	Detected
FED-398-10-1	Tier I	02/29/2012	FB	SA	U-238	1.44	105	149	pCi/L	UJ,D-I	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Y-88	0.698	1.99	4.15	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Y-88	-0.479	2.89	5.32	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Y-88	-0.925	2.41	4.39	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Zn-65	-3.39	4.14	7	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Zn-65	-0.194	4.75	8.74	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Zn-65	-0.0895	3.66	6.87	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	KW	SA	Zr-95	2.3	3.81	6.59	pCi/L	U	No
FED-398-10-1	Tier I	02/24/2012	MW	SA	Zr-95	2.96	4.07	7.83	pCi/L	U	No
FED-398-10-1	Tier I	02/29/2012	FB	SA	Zr-95	3.81	3.06	6.28	pCi/L	U	No

Notes:

FB = flowback fluid

KW = kill water (contains sodium hypochlorite)

MW = make-up water

SA = primary sample

pCi/L = picoCuries per liter

µg/L = micrograms per liter

TU = tritium units (1 TU = 3.19 pCi/L)

U = analyte was analyzed for but was not detected above the reporting activity (i.e., minimum detectable activity)

UJ = the analyte was analyzed for but was not detected above the minimum detectable activity; the reported analytical result is an estimate

J = The analyte was detected below the method quantitation limit; the reported analytical result is an estimate

D-I = the result was qualified as estimated because the duplicate error ratio criterion was not met; the result has an indeterminant bias

MS-L = matrix spike-matrix spike duplicate recovery did not meet acceptance limits; low potential bias

WPX ENERGY – RIO BLANCO AREA
DATA REVIEW SUMMARY

Data Package Numbers: GEL 296920
Sample-specific Parameter Review? **Yes**
Data Reviewer: Joseph Capotrio
Peer Reviewer: Sheri Fling

Sampling Event: February 24 & 29, 2012
Laboratory Performance Parameters? **No**
Date Completed: March 21, 2012
Date Completed: March 23, 2012

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab Job Number	Lab ID	Sample Date	Matrix	Analyses				
						Gross Alpha/ Beta	Gamma Spec	Technetium-99	Strontium-90	Total Uranium
FED-398-10-1-FW-GPTF	SA	296920	296920001	2/24/12	W	X	X	X	X	X
FED-398-10-1-FW-T-GPTF	SA	296920	296920002	2/24/12	W	X	X	X	X	X
FED-398-10-1-FB-GPTF	SA	296920	296920003	2/29/12	W	X	X	X	X	X

Matrix: W = Water
QC Type: SA = Sample
--- = Not analyzed for this parameter.
ID = Identification

The data review was conducted in accordance with the Rio Blanco Sampling and Analysis Plan for Operational and Environmental Radiological Monitoring within a Two-Mile Radius of Project Rio Blanco, Revision 1, July 7, 2010.

General Overall Assessment:

_____ Data are usable without qualification.
_X_ Data are usable with qualification; some data were qualified as unusable (noted below).

Case Narrative Summary: Any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the following table.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	Yes	The sample was received intact. The cooler temperatures were 2 and 3 degrees Celsius (°C) upon arrival at the laboratory meeting the criterion of ≤6 °C.
Holding Times	Yes	All holding times were met.
Method Blanks	Yes	No target analytes were reported as detected within the associated method blanks.

Review Parameter	Criteria Met?	Comments
Matrix Quality Control • **Matrix Spike/ Matrix Spike Duplicate (MS/MSD)** FED-398-10-1-FW-GPTF (Gross Alpha/ Beta) FED-398-10-1-FB-GPTF (Gross Alpha/ Beta) • **Matrix Spike (MS)** FED-398-10-1-FW-GPTF (Strontium-90, Gross Alpha/ Beta, Total Uranium) FED-398-10-1-FB-GPTF (Strontium-90, Gross Alpha/ Beta, Technetium-99, Total Uranium) • **Laboratory Duplicate (LD)** FED-398-10-1-FW-GPTF (Gamma Spec, Gross Alpha/ Beta, Technetium-99, Total Uranium) FED-398-10-1-FB-GPTF (Gamma Spec, Strontium-90, Gross Alpha/ Beta, Total Uranium)	No	**MS/ MSD** With the exception listed in Table 1, the recoveries and relative percent difference (RPDs) for the MS and MSD analyses were within the acceptance ranges. **LD** With the exceptions listed in Table 2, The agreement between parent sample results and the lab duplicate sample results was evaluated. The duplicate error ratios (DERs) met criterion of ≤1. Data qualification was not necessary.
Method Quality Control • Implied Detection Limits • Sample Specific Chemical Recovery (Chemical Yield) • Laboratory Control Sample	Yes	**Implied Detection Limits** No values for radionuclides were reported as detected with associated uncertainties greater than the reported result. **Sample Specific Chemical Recovery** The sample specific recoveries were within the QAPP acceptance limits of 50-120% for the applicable methods. Data qualification was not required. **Laboratory Control Sample (LCS)** The LCS recoveries were within the QAPP acceptance limits of 80-120% for waters. Data qualification was not required.
Field Quality Control • Field Duplicate N/A • Rinsate Blank N/A	N/A	A field duplicate and rinsate blank were not collected in association with this sampling event.
Maximum Detected Concentrations (MDCs) Met?	Yes	
Total Uncertainty	Yes	The strontium-90, technetium-99, total uranium, gross alpha, and gross beta parent sample results were reported as non-detect or the total uncertainty was ≤20%.
All Data Usable?	Yes	All data met criteria for the field samples and were usable as qualified.
Package Completeness	Yes	Analytical data package was complete.
Other Parameters	Yes	

°C – Degrees Celsius
≤ - Less Than or Equal to
% - Percent
COC – Chain of Custody
DER – Duplicate Error Ratio
LCS – Laboratory Control Sample
LD – Laboratory Duplicate
MDCs – Maximum Detected Concentrations
MS/MSD – Matrix spike/ matrix spike duplicate
N/A – Not Applicable
QAPP – Quality Assurance Project Plan
QC – Quality Control
RPD – Relative Percent Difference

Table 1: MS/MSD Outliers and Resultant Data Qualification

Sample	Analyte	MS/MSD %R (Limits)	RPD	Data Qualification
FED-398-10-1-FB-GPTF	Gross Alpha	**69.5/ 57.7** (75-125)	18.6 (±20)	As the potential bias was considered to be low, the gross alpha result for the listed sample was qualified as estimated (J MS-L).

Bold indicates a recovery outside of acceptance limits.
± - Plus or minus
H – High Bias
J – Estimated
L – Low Bias
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
%R – Percent Recovery
RPD – Relative Percent Difference

Table 2: DER Outliers and Resultant Data Qualification

Sample	Analyte	DER	Qualification
FED-398-10-1-FW-GPTF	Iridium – 192	1.1	The DER between the parent sample results and laboratory duplicate sample results for listed analytes exceeded the criterion of ≤1.0. The listed analytical results for all samples were qualified as estimated (J/ UJ D-I).
	Krypton – 85	1.7	
	Total Uranium	2.0	
FED-398-10-1-FB-GPTF	Cerium – 141	1.2	
	Europium – 155	1.4	
	Iridium – 192	1.2	
	Krypton – 85	3.2	
	Lead – 214	1.3	
	Thorium – 234	1.1	
	Thallium – 208	1.3	
	Uranium – 238	1.1	
	Gross Beta	1.5	
FED-398-10-1-FB-GPTF (MS/MSD)	Gross Beta	2.1	

≤ - Less than or equal to
D – Duplicate precision criteria not met.
DER – Duplicate Error Ratio
I – Indeterminate Bias
J/ UJ – Estimated
MS/MSD – Matrix Spike/ Matrix Spike Duplicate

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 15, 2012

Company : URS Corporation
Address : 8181 E. Tufts Avenue
Denver, Colorado 80237
Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-GPTF
Sample ID: 296920001
Matrix: Produced Water
Collect Date: 24-FEB-12 10:43
Receive Date: 02-MAR-12
Collector: Client

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Actinium-228	U	-6.05	+/-11.0	17.7		pCi/L		KXG3	03/07/12	1415	1194067	1
Americium-241	U	-7.41	+/-14.6	25.6		pCi/L						
Antimony-124	U	-2.42	+/-5.71	10.2		pCi/L						
Antimony-125	U	-5.8	+/-6.27	10.2		pCi/L						
Barium-133	U	0.823	+/-3.01	4.78		pCi/L						
Barium-140	U	0.435	+/-14.7	27.0		pCi/L						
Beryllium-7	U	-16.4	+/-21.8	35.4		pCi/L						
Bismuth-212	U	17.0	+/-31.5	59.1		pCi/L						
Bismuth-214	U	5.57	+/-6.46	9.23		pCi/L						
Cerium-139	U	-1.87	+/-2.19	3.55		pCi/L						
Cerium-141 U J D-I	U	1.94	+/-4.85	7.57		pCi/L						
Cerium-144	U	11.3	+/-14.3	25.3		pCi/L						
Cesium-134	U	1.98	+/-2.36	4.66		pCi/L						
Cesium-136	U	-2.25	+/-4.40	7.78		pCi/L						
Cesium-137	U	1.04	+/-2.21	4.17	5.00	pCi/L						
Chromium-51	U	-14.8	+/-23.3	39.5		pCi/L						
Cobalt-56	U	1.28	+/-2.31	4.37		pCi/L						
Cobalt-57	U	2.25	+/-1.95	3.52		pCi/L						
Cobalt-58	U	-1.48	+/-2.35	3.94		pCi/L						
Cobalt-60	U	-0.755	+/-2.29	4.06		pCi/L						
Europium-152	U	-0.286	+/-6.18	10.9		pCi/L						
Europium-154	U	3.29	+/-7.26	13.9		pCi/L						
Europium-155 U J D-I	U	-2.47	+/-7.71	13.3		pCi/L						
Iridium-192 U J D-I	U	2.82	+/-2.28	4.31		pCi/L						
Iron-59	U	0.177	+/-4.46	8.36		pCi/L						
Krypton-85 U J D-I	U	-1690	+/-661	1010		pCi/L						
Lead-210	U	280	+/-397	742		pCi/L						
Lead-212	U	2.80	+/-5.31	7.46		pCi/L						
Lead-214 U J D-I	U	3.27	+/-7.16	9.74		pCi/L						
Manganese-54	U	-0.00665	+/-2.25	4.02		pCi/L						
Mercury-203	U	-0.764	+/-2.18	3.82		pCi/L						
Neodymium-147	U	16.5	+/-28.3	54.0		pCi/L						
Neptunium-239	U	15.3	+/-19.4	34.8		pCi/L						
Niobium-94	U	0.0687	+/-1.93	3.50		pCi/L						
Niobium-95	U	-0.481	+/-2.15	3.80		pCi/L						
Potassium-40	U	-22.2	+/-36.0	58.4		pCi/L						
Promethium-144	U	0.0719	+/-2.08	3.76		pCi/L						
Promethium-146	U	1.50	+/-2.79	5.06		pCi/L						

3/21/12

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Certificate of Analysis

Report Date: March 15, 2012

Company : URS Corporation
Address : 8181 E. Tufts Avenue
Denver, Colorado 80237
Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-GPTF
Sample ID: 296920001
Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Radium-228	U	-6.05	+/-11.0	17.7		pCi/L						
Ruthenium-106	U	-8.71	+/-20.1	35.2		pCi/L						
Silver-110m	U	0.0901	+/-1.92	3.53		pCi/L						
Sodium-22	U	1.11	+/-2.55	4.88		pCi/L						
Thallium-208	U	0.782	+/-3.87	3.61		pCi/L						
Thorium-230	U	160	+/-883	1590		pCi/L						
Thorium-234	U	-77.4	+/-165	263		pCi/L						
Tin-113	U	-1.18	+/-2.81	4.79		pCi/L						
Uranium-235	U	10.5	+/-23.0	24.5		pCi/L						
Uranium-238	U	-77.4	+/-165	263		pCi/L						
Yttrium-88	U	-0.479	+/-2.89	5.32		pCi/L						
Zinc-65	U	-0.194	+/-4.75	8.74		pCi/L						
Zirconium-95	U	2.96	+/-4.07	7.83		pCi/L						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, liquid "As Received"												
Alpha	U	3.64	+/-3.21	4.60	5.00	pCi/L		DXF3	03/13/12	1806	1195527	2
Beta	U	0.744	+/-1.88	3.38	5.00	pCi/L						
GFPC, Sr90, liquid "As Received"												
Strontium-90	U	-1.21	+/-0.815	1.84	2.00	pCi/L		VXC2	03/09/12	1326	1194139	3
Rad Liquid Scintillation Analysis												
Liquid Scint Tc99, Liquid "As Received"												
Technetium-99	U	5.23	+/-18.0	31.0	50.0	pCi/L		MYM1	03/13/12	0405	1193967	4
Rad Total Uranium												
KPA, Total U, Liquid "As Received"												
Total Uranium		1.18	+/-0.0566	0.158	1.00	ug/L		JXR1	03/12/12	1615	1194153	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 900.0/SW846 9310	
3	EPA 905.0 Modified	
4	DOE EML HASL-300, Tc-02-RC Modified	
5	ASTM D 5174	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"			95.6	(25%-125%)

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Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-GPTF
Sample ID: 296920001

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Technetium-99m Tracer		Liquid Scint Tc99, Liquid "As Received"							98.6	(15%-125%)		

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Denver, Colorado 80237
Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-T-GPTF
Sample ID: 296920002
Matrix: Produced Water
Collect Date: 24-FEB-12 10:12
Receive Date: 02-MAR-12
Collector: Client

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Actinium-228		U 4.30	+/-7.74	14.7		pCi/L		KXG3	03/07/12	1415	1194067	1
Americium-241		U -4.63	+/-7.76	11.9		pCi/L						
Antimony-124		U 0.832	+/-3.99	8.25		pCi/L						
Antimony-125		U -6.61	+/-5.41	8.51		pCi/L						
Barium-133		U -0.254	+/-3.26	4.92		pCi/L						
Barium-140		U 3.01	+/-11.2	21.3		pCi/L						
Beryllium-7		U 13.6	+/-16.8	31.5		pCi/L						
Bismuth-212		U 8.58	+/-26.2	49.3		pCi/L						
Bismuth-214		U 3.12	+/-5.75	8.65		pCi/L						
Cerium-139		U 1.82	+/-1.81	3.23		pCi/L						
Cerium-141	UJ R-Z	U 2.19	+/-3.70	6.50		pCi/L						
Cerium-144		U 5.30	+/-13.0	21.6		pCi/L						
Cesium-134		U 0.270	+/-2.22	4.11		pCi/L						
Cesium-136		U 1.41	+/-4.85	9.33		pCi/L						
Cesium-137		U 0.474	+/-2.48	4.12	5.00	pCi/L						
Chromium-51		U -5.75	+/-19.8	34.6		pCi/L						
Cobalt-56		U 0.230	+/-1.95	3.60		pCi/L						
Cobalt-57		U 1.58	+/-1.59	2.86		pCi/L						
Cobalt-58		U 0.829	+/-1.94	3.69		pCi/L						
Cobalt-60		U 1.57	+/-2.21	4.43		pCi/L						
Europium-152		U 0.678	+/-5.25	9.44		pCi/L						
Europium-154		U 0.442	+/-4.83	9.36		pCi/L						
Europium-155	UJ R-Z	U 1.31	+/-6.11	10.7		pCi/L						
Iridium-192	UJ R-Z	U 0.780	+/-1.91	3.50		pCi/L						
Iron-59		U 0.774	+/-4.33	8.26		pCi/L						
Krypton-85	UJ R-Z	U -1430	+/-589	904		pCi/L						
Lead-210		U -184	+/-171	264		pCi/L						
Lead-212		U 6.10	+/-5.43	7.64		pCi/L						
Lead-214	UJ R-Z	U 1.82	+/-5.46	8.39		pCi/L						
Manganese-54		U -0.0669	+/-1.94	3.50		pCi/L						
Mercury-203		U -2.85	+/-2.09	3.40		pCi/L						
Neodymium-147		U 3.47	+/-24.4	45.7		pCi/L						
Neptunium-239		U -1.17	+/-16.1	27.6		pCi/L						
Niobium-94		U 0.728	+/-1.85	3.47		pCi/L						
Niobium-95		U -0.345	+/-2.28	3.52		pCi/L						
Potassium-40		U 11.9	+/-31.2	56.5		pCi/L						
Promethium-144		U -0.312	+/-1.78	3.20		pCi/L						
Promethium-146		U 2.68	+/-2.27	4.37		pCi/L						

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Certificate of Analysis

Report Date: March 15, 2012

Company : URS Corporation
Address : 8181 E. Tufts Avenue
Denver, Colorado 80237
Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-T-GPTF
Sample ID: 296920002
Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Radium-228	U	4.30	+/-7.74	14.7		pCi/L						
Ruthenium-106	U	-8.34	+/-16.4	28.7		pCi/L						
Silver-110m	U	-3.74	+/-1.93	2.82		pCi/L						
Sodium-22	U	0.156	+/-1.70	3.30		pCi/L						
Thallium-208	U	-2.34	+/-2.44	3.67		pCi/L						
Thorium-230	U	-92.2	+/-545	953		pCi/L						
Thorium-234	U	25.0	+/-93.6	129		pCi/L						
Tin-113	U	0.883	+/-2.41	4.38		pCi/L						
Uranium-235	U	1.40	+/-15.2	22.4		pCi/L						
Uranium-238	U	25.0	+/-93.6	129		pCi/L						
Yttrium-88	U	0.698	+/-1.99	4.15		pCi/L						
Zinc-65	U	-3.39	+/-4.14	7.00		pCi/L						
Zirconium-95	U	2.30	+/-3.81	6.59		pCi/L						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, liquid "As Received"												
Alpha	U	7.12	+/-5.91	9.19	5.00	pCi/L		DXF3	03/13/12	1806	1195527	2
Beta		7.05	+/-4.09	6.59	5.00	pCi/L						
GFPC, Sr90, liquid "As Received"												
Strontium-90	U	-0.737	+/-0.602	1.41	2.00	pCi/L		VXC2	03/09/12	1326	1194139	3
Rad Liquid Scintillation Analysis												
Liquid Scint Tc99, Liquid "As Received"												
Technetium-99	U	-6.49	+/-18.2	32.0	50.0	pCi/L		MYM1	03/13/12	0427	1193967	4
Rad Total Uranium												
KPA, Total U, Liquid "As Received"												
Total Uranium		5.80	+/-0.258	0.158	1.00	ug/L		JXR1	03/12/12	1618	1194153	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 900.0/SW846 9310	
3	EPA 905.0 Modified	
4	DOE EML HASL-300, Tc-02-RC Modified	
5	ASTM D 5174	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"			98.9	(25%-125%)

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Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FW-T-GPTF
Sample ID: 296920002

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Technetium-99m Tracer		Liquid Scint Tc99, Liquid "As Received"							95.6	(15%-125%)		

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Company : URS Corporation
Address : 8181 E. Tufts Avenue

Denver, Colorado 80237
Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FB-GPTF
Sample ID: 296920003
Matrix: Produced Water
Collect Date: 29-FEB-12 11:20
Receive Date: 02-MAR-12
Collector: Client

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Actinium-228	U	-5.63	+/-9.74	15.2		pCi/L		KXG3	03/05/12	1439	1193560	1
Americium-241	U	9.84	+/-9.24	15.0		pCi/L						
Antimony-124	U	-0.81	+/-3.86	7.13		pCi/L						
Antimony-125	U	0.0266	+/-4.87	8.93		pCi/L						
Barium-133	U	-1.7	+/-2.47	4.04		pCi/L						
Barium-140	U	5.98	+/-7.36	14.1		pCi/L						
Beryllium-7	U	4.64	+/-16.1	30.0		pCi/L						
Bismuth-212	U	12.0	+/-22.2	43.1		pCi/L						
Bismuth-214	U	1.14	+/-3.54	6.62		pCi/L						
Cerium-139	U	-0.0464	+/-1.61	2.85		pCi/L						
Cerium-141	U	1.17	+/-3.00	5.41		pCi/L						
Cerium-144	U	6.22	+/-12.1	22.0		pCi/L						
Cesium-134	U	-0.17	+/-2.29	4.11		pCi/L						
Cesium-136	U	0.768	+/-2.84	5.54		pCi/L						
Cesium-137	U	0.329	+/-2.02	3.72	5.00	pCi/L						
Chromium-51	U	2.57	+/-15.7	27.7		pCi/L						
Cobalt-56	U	-1.11	+/-1.76	2.95		pCi/L						
Cobalt-57	U	1.01	+/-1.52	2.80		pCi/L						
Cobalt-58	U	-1.34	+/-1.81	3.00		pCi/L						
Cobalt-60	U	-0.144	+/-1.82	3.42		pCi/L						
Europium-152	U	-4.15	+/-5.53	9.05		pCi/L						
Europium-154	U	2.14	+/-4.87	9.83		pCi/L						
Europium-155	U	-0.62	+/-6.34	11.3		pCi/L						
Iridium-192	U	-1.38	+/-1.74	2.85		pCi/L						
Iron-59	U	0.917	+/-3.34	6.52		pCi/L						
Krypton-85	U	-1910	+/-627	891		pCi/L						
Lead-210	U	116	+/-209	325		pCi/L						
Lead-212	U	1.86	+/-4.36	7.19		pCi/L						
Lead-214	U	4.45	+/-4.40	8.11		pCi/L						
Manganese-54	U	-0.798	+/-1.81	3.11		pCi/L						
Mercury-203	U	0.826	+/-1.85	3.33		pCi/L						
Neodymium-147	U	3.69	+/-13.5	25.6		pCi/L						
Neptunium-239	U	1.94	+/-16.1	29.0		pCi/L						
Niobium-94	U	0.582	+/-1.74	3.24		pCi/L						
Niobium-95	U	1.62	+/-1.68	3.36		pCi/L						
Potassium-40		33.7	+/-30.6	33.2		pCi/L						
Promethium-144	U	0.619	+/-1.91	3.54		pCi/L						
Promethium-146	U	-1.83	+/-2.11	3.58		pCi/L						

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Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FB-GPTF
Sample ID: 296920003
Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid "As Received"												
Radium-228	U	-5.63	+/-9.74	15.2		pCi/L						
Ruthenium-106	U	-14.8	+/-14.2	23.1		pCi/L						
Silver-110m	U	-0.563	+/-1.76	3.10		pCi/L						
Sodium-22	U	0.722	+/-1.71	3.44		pCi/L						
Thallium-208 UJ D-I	U	0.906	+/-1.90	3.59		pCi/L						
Thorium-230	U	516	+/-781	1210		pCi/L						
Thorium-234 UJ D-I	U	1.44	+/-105	149		pCi/L						
Tin-113	U	1.84	+/-2.19	4.09		pCi/L						
Uranium-235	U	3.70	+/-12.4	22.1		pCi/L						
Uranium-238 UJ D-I	U	1.44	+/-105	149		pCi/L						
Yttrium-88	U	-0.925	+/-2.41	4.39		pCi/L						
Zinc-65	U	-0.0895	+/-3.66	6.87		pCi/L						
Zirconium-95	U	3.81	+/-3.06	6.28		pCi/L						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, liquid "As Received"												
Alpha UJ M3-L	U	5.86	+/-4.28	6.55	5.00	pCi/L		CAS2	03/07/12	1441	1193639	2
Beta UJ D-I	U	-0.732	+/-4.89	8.46	5.00	pCi/L						
GFPC, Sr90, liquid "As Received"												
Strontium-90	U	0.667	+/-0.965	1.68	2.00	pCi/L		VXC2	03/08/12	1346	1193634	3
Rad Liquid Scintillation Analysis												
Liquid Scint Tc99, Liquid "As Received"												
Technetium-99	U	-2.87	+/-20.7	36.7	50.0	pCi/L		MYM1	03/11/12	0536	1193690	4
Rad Total Uranium												
KPA, Total U, Liquid "As Received"												
Total Uranium		3.94	+/-0.155	0.158	1.00	ug/L		DXF3	03/08/12	1752	1193604	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 900.0/SW846 9310	
3	EPA 905.0 Modified	
4	DOE EML HASL-300, Tc-02-RC Modified	
5	ASTM D 5174	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"			102	(25%-125%)

3/21/12

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Contact: Ms. Sheri Fling
Project: Williams 2009 - Vendor ID 1168722

Client Sample ID: FED-398-10-1-FB-GPTF
Sample ID: 296920003

Project: URSC01104
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Technetium-99m Tracer		Liquid Scint Tc99, Liquid "As Received"							99.3	(15%-125%)		

WILLIAMS – RIO BLANCO AREA
DATA REVIEW SUMMARY

Data Package Numbers: Isotech 17586 and 17588
Sample-specific Parameter Review? **Yes**
Data Reviewer: Joseph Capotrio
Peer Reviewer: Sheri O'Connor

Sampling Event: February 24 & 29, 2012
Laboratory Performance Parameters? **No**
Date Completed: March 21, 2012
Date Completed: March 23, 2012

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab Job Number	Lab ID	Sample Date	Matrix	Analyses				
						Tritium	C-14	Delta D	Delta C-13	Chemical mol. %
FED-398-10-1-FW-GPTF	SA	17588	238718	2/24/12	W	X	---	---	---	---
FED-398-10-1-FW-T-GPTF	SA	17588	238719	2/24/12	W	X	---	---	---	---
FED-398-10-1-FB-GPTF	SA	17586	238716	2/29/12	W	X	---	---	---	---

Matrix: W = Water
QC Type: SA = Sample
--- = Not analyzed for this parameter.
C-14 = Carbon 14 C-13 = Carbon 13 D = Deuterium mol % = Molecular percentage

The data review was conducted in accordance with the Rio Blanco Sampling and Analysis Plan for Operational and Environmental Radiological Monitoring within a Two-Mile Radius of Project Rio Blanco, Revision 1, July 7, 2010.

General Overall Assessment:

_X_ Data are usable without qualification.
_____ Data are usable with qualification.

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the following table.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	Yes	The laboratory did not note any sample receipt discrepancies or samples being received outside the required temperature range. Qualification of data was not required.
Holding Times	Yes	All holding times were met.
Method Blanks	Yes	Target analytes were not reported outside the acceptable background range for the associated method blanks.
Matrix Quality Control • **MS/MSD** None • **LD** None	N/A	
Method Quality Control • NIST Sample Count	Yes	The measured count for the NIST known concentration sample were within the acceptable value and met the laboratory QC criterion.

Review Parameter	Criteria Met?	Comments
Field Quality Control • Field Duplicate None • Rinsate Blank N/A	N/A	Field duplicates were not collected for this event. Field duplicates were collected during separate events and reported under different covers to meet project frequency requirements. An assessment could not be made for these samples.
All Data Usable?	Yes	All data met criteria for the field samples and were usable as reported.
Package Completeness	Yes	Analytical data packages were complete.
Other Parameters	N/A	

COC = Chain of Custody
FD = Field Duplicate
MDCs = Minimal Detectable Concentration
MS/MSD = Matrix Spike/ Matrix Spike Duplicate
N/A = Not applicable
NIST = National Institute of Science and Technology
QC = Quality Control

ISOTECH
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Water Analysis

Lab Number: 238718 Job Number: 17588

Submitter Sample Name: FED-398-10-1-FW-GPTF

Submitter Sample ID:

Submitter Job #: 22240417.00001

Company: URS Corporation

Field or Site: Williams - Rio Blanco Monitoring

Location:

Depth/Formation:

Container Type: 125ml Plastic Bottle

Sample Collected: 2/24/2012 Results Reported: 3/21/2012

δD of water	----------	na
$\delta^{18}O$ of water	----------	na
Tritium content of water	----------	< 14.9 TU
$\delta^{13}C$ of DIC	----------	na
^{14}C content of DIC	----------	na
$\delta^{15}N$ of nitrate	----------	na
$\delta^{18}O$ of nitrate	----------	na
$\delta^{34}S$ of sulfate	----------	na
$\delta^{18}O$ of sulfate	----------	na

Remarks:

3/21/12

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ANALYSIS REPORT

Water Analysis

Lab Number: 238719 Job Number: 17588

Submitter Sample Name: FED-398-10-1-FW-T-GPTF

Submitter Sample ID:

Submitter Job #: 22240417.00001

Company: URS Corporation

Field or Site: Williams - Rio Blanco Monitoring

Location:

Depth/Formation:

Container Type: 125ml Plastic Bottle

Sample Collected: 2/24/2012 Results Reported: 3/21/2012

δD of water	----------	na
$\delta^{18}O$ of water	----------	na
Tritium content of water	----------	< 10.0 TU
$\delta^{13}C$ of DIC	----------	na
^{14}C content of DIC	----------	na
$\delta^{15}N$ of nitrate	----------	na
$\delta^{18}O$ of nitrate	----------	na
$\delta^{34}S$ of sulfate	----------	na
$\delta^{18}O$ of sulfate	----------	na

3/21/12

Remarks:

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ANALYSIS REPORT

Water Analysis

Lab Number: 238716 Job Number: 17586

Submitter Sample Name: FED-398-10-1-FB-GPTF

Submitter Sample ID:

Submitter Job #: 22240417.00001

Company: URS Corporation

Field or Site: Williams - Rio Blanco

Location:

Depth/Formation:

Container Type: 125ml Plastic Bottle

Sample Collected: 2/29/2012 Results Reported: 3/13/2012

δD of water	----------	na
$\delta^{18}O$ of water	----------	na
Tritium content of water	----------	10.6 ± 2.4 TU
$\delta^{13}C$ of DIC	----------	na
^{14}C content of DIC	----------	na
$\delta^{15}N$ of nitrate	----------	na
$\delta^{18}O$ of nitrate	----------	na
$\delta^{34}S$ of sulfate	----------	na
$\delta^{18}O$ of sulfate	----------	na

3/13/12

Remarks: