



02231319

REM # 4889  
Form 19 # 1630878Page 1  
FORM  
4  
Rev 12/05

State of Colorado

Oil and Gas Conservation Commission

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



## 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 803b.)

RECEIVED  
DEC 3 - 2012  
COGCC

1. OGCC Operator Number: 10079	4. Contact Name: Cole Kilstrom	Complete the Attachment Checklist OF OGCC
2. Name of Operator: Antero Resources Pinnacle Corporation	Phone: 303-357-6709	
3. Address: 1625 17th St STE 300 A11N Cole Kilstrom City: Denver State: CO Zip: 80202	Fax: 303-357-6709	
5. API Number: 05-045-13707	OGCC Facility ID Number: 289262	Survey Plat
6. Well/Facility Name: Burckle A Pad	7. Well/Facility Number: A1	Directional Survey
8. Location (Qtr/Clr, Sec, Twp, Rng, Meridian): NWSE 16 6S 92W 6		Surface Equip Diagram
9. County: Garfield	10. Field Name: Mann Creek	Technical Info Page
11. Federal, Indian or State Lease Number:		Other

Location ID  
# 335540

## General Notice

<input type="checkbox"/> CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qr is substantive and requires a new permit)													
Change of Surface Footage from Exterior Section Lines:	<table border="1"> <tr> <td></td> <td>FUL/FSL</td> <td>FEL/FWL</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>		FUL/FSL	FEL/FWL									
	FUL/FSL	FEL/FWL											
Change of Surface Footage to Exterior Section Lines:													
Change of Bottomhole Footage from Exterior Section Lines:													
Change of Bottomhole Footage to Exterior Section Lines:													
Bottomhole location Qtr/Clr, Sec, Twp, Rng, Mer													
Latitude	Distance to nearest property line												
Longitude	Distance to nearest bldg, public rd, utility or RR												
Ground Elevation	Distance to nearest lease line												
	Is location in a High Density Area (rule 803b)? Yes/No												
	Distance to nearest well same formation												
	Surface owner consultation date:												
GPS DATA:													
Date of Measurement	PDOP Reading												
	Instrument Operator's Name												
<input type="checkbox"/> CHANGE SPACING UNIT	<input type="checkbox"/> Remove from surface bond												
Formation	Signed surface use agreement attached												
Formation Code													
Spacing order number													
Unit Acreage													
Unit configuration													
<input type="checkbox"/> CHANGE OF OPERATOR (prior to drilling):	<input type="checkbox"/> CHANGE WELL NAME												
Effective Date:	NUMBER												
Plugging Bond: <input type="checkbox"/> Blanket <input type="checkbox"/> Individual	From:												
	To:												
	Effective Date:												
<input type="checkbox"/> ABANDONED LOCATION:	<input type="checkbox"/> NOTICE OF CONTINUED SHUT IN STATUS												
Was location ever drilled? <input type="checkbox"/> Yes <input type="checkbox"/> No	Date well shut in or temporarily abandoned:												
Is site ready for inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No	Has Production Equipment been removed from site? <input type="checkbox"/> Yes <input type="checkbox"/> No												
Date Ready for Inspection:	MIT required if shut in longer than two years. Date of last MIT												
<input type="checkbox"/> SPUD DATE:	<input type="checkbox"/> REQUEST FOR CONFIDENTIAL STATUS (if area from data ceasing out)												
<input type="checkbox"/> SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK													
*submit cbl and cement job summaries													
Method used	Date												
Cementing tool setting/perf depth													
Cement volume													
Cement top													
Cement bottom													
<input type="checkbox"/> RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.													
Final reclamation will commence on approximately													
<input type="checkbox"/> Final reclamation is completed and site is ready for inspection.													

## Technical Engineering/Environmental Notice

<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Report of Work Done
Approximate Start Date:	Date Work Completed:
Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)	
<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repeat Well
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested
<input type="checkbox"/> Casing/Cementing Program Change	<input type="checkbox"/> Other:
	<input type="checkbox"/> EAP Waste Disposal
	<input type="checkbox"/> Beneficial Reuse of EAP Waste
	<input checked="" type="checkbox"/> Status Update/Change of Remediation Plans for Spills and Releases

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

Signed: Cole Kilstrom Date: 11/29/12 Email: ck.kilstrom@anteroresources.com  
Print Name: Cole Kilstrom Title: ENV SpecialistCOGCC Approved: Chy Fin Title: Env. Sup. Date: 1/4/13

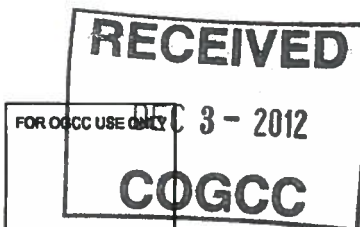
CONDITIONS OF APPROVAL, IF ANY:

See attached comments.



Page 2

## TECHNICAL INFORMATION PAGE



1. OGCC Operator Number: 10079 API Number: 05-045-13707  
2. Name of Operator: Antero Resources Piceance Corp. OGCC Facility ID # 289262  
3. Well/Facility Name: Burckle A Pad Well/Facility Number: A1  
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NWSE 16 6S 92W 6

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.

5. DESCRIBE PROPOSED OR COMPLETED OPERATIONSSummary of Corrective Actions and Request for Remediation Closure:

On November 22, 2009 a valve malfunction at Antero's Burckle A Pad in Garfield County caused a frac water spill impacting area soils to a depth of three inches. Antero halted the flow, constructed a temporary berm, dispatched vacuum trucks to the site to recover liquid on the surface, and excavated the impacted area down to the three inch affected depth.

COGCC Form 27 Remediation Plan # 4889 stated that following the excavation, Antero would conduct confirmation sampling to ensure that COGCC Table 910-1 standards are met. Antero would also re-contour, re-seed and mulch the area affected by the incident.

Antero submitted a Form 4 on August 11, 2010 which included a description of Antero's confirmation sampling and remediation to date. The soil results were returned in compliance with COGCC Table 910-1 standards, with the exception of TPH, arsenic and pH in a small area on the pad. The small area that continued to exceed COGCC standards was to be remediated during interim or final reclamation (as recommended by Linda Spry O'Rourke in a May 6, 2010 email). Following the excavation, Antero performed re-contouring, re-seeding and mulching of the impacted areas on May 22, 2010.

Because Antero has conducted the required remediation actions and confirmed that the impacted area is in compliance with Table 910-1 standards for the exception of a small area to be remediated during interim or final reclamation, Antero respectfully requests final COGCC closure of Remediation Project # 4889 in accordance with COGCC Rule 909(e).

*Comments:*

Based on review of information presented on data presented it appears that no further action is necessary at this time, and COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if ground water is found to be significantly impacted, then further investigation and/or remediation activities may be required at the site.

*PR*  
*1/4/13*

State of Colorado  
Oil and Gas Conservation Commission

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



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**COGCC**

**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: 10079	4. Contact Name: Gerard G. Alberts	Complete the Attachment Checklist
2. Name of Operator: Antero Resource Piceance Corporation	Phone: 303-357-7341	
3. Address: 1625 17th Street, Suite 300	Fax: 303-357-7315	OP OGCC
City: Denver State: CO Zip: 80202		
5. API Number: 05-045137070000	OGCC Facility ID Number (Loc ID): 335540	Survey Plat
6. Well/Facility Name: Burckle A Pad	7. Well/Facility Number: Burckle A1	Directional Survey
8. Location (Qtr/Sec, Twp, Rng, Meridian): NWSE, Sec. 16, T6S, R92W, 6th Meridian		Surface Eqpm Diagram
9. County: Garfield	10. Field Name: Piceance	Technical Info Page
11. Federal, Indian or State Lease Number:		Other Analytical Data

**General Notice**

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

Change of Surface Footage from Exterior Section Lines: ☐ FNL/FSL ☐ FEL/FWL

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/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.)

<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input checked="" type="checkbox"/> Status Update/Change of Remediation Plans for Spills and Releases
<input type="checkbox"/> Casing/Cementing Program Change	<input checked="" type="checkbox"/> Other: Spill Analytical Submittal	

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

Signed: Gerard G. Alberts Date: 8-11-10 Email: jalberts@anteroresources.com

Print Name: Gerard G. Alberts Title: Manager, Environmental & Regulatory

COGCC Approved: [Signature]

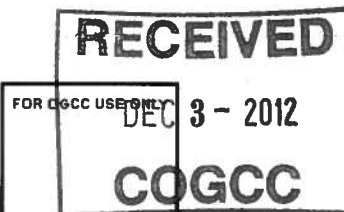
Title: FOR

Date: 01/08/2013

CONDITIONS OF APPROVAL, IF ANY:

A Fischer  
Supervisor  
Western Region

TECHNICAL INFORMATION PAGE



1. OGCC Operator Number: 10079	API Number: 05-045137070000
2. Name of Operator: Antero Resources Piceance Corp	OGCC Facility ID #: 335540
3. Well/Facility Name: Burckle A Pad	Well/Facility Number: Burckle A1
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NWSE, Sec. 16, T6S, R92W, 6th P.M.	

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5.

**DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

Attached is the Antero Resources Piceance Corporation's (Antero) Burckle A Pad confirmatory soil analytical report from Accutest Laboratories. This analytical data is being submitted to supplement the approved Form 27 remediation plan submitted 3/9/2010 associated with the 11/22/2009 26 bbis frac water spill.

The remediation plan proposed on the Form 27 was to excavate the soil on the pad labeled "well pad confirmation sample location" on Attachment A: Spill Location Map. Excavation would occur until the pad soil shows compliance with the Table 910-1 Standards. Antero subsequently excavated 25 cubic yards of soil on the pad and disposed of it at Eagle County Landfill. Attachment C: 5/21/2010 Analytical Data, represents the soil that is currently on the pad after excavation. The analytical data shows that the soil meets Table 910-1 Standards except for pH and arsenic.

Arsenic concentrations in this area are generally higher than the Table 910-1 Standards. As such, Antero performed a background study of arsenic for the area and the results of the investigation were sent to your attention under a separate Form 4 submitted with this packet. The Table 910-1 standard for arsenic is 0.39 mg/kg. The background study confirms that the 1.4 mg/kg of arsenic in the soil while above the Table 910-1 standards, is relatively low compared to average concentration in the area which is 9.79 mg/kg. Therefore Antero has concluded that further remediation of the pad is not warranted.

Antero also requests that the COGCC disregard the pH concentration of 9.29 (su). The Table 910-1 Standard for pH is 6-9 which puts our soil 0.29 over the limit. The pH parameter is a test of acidity which could have an effect on vegetation growth, however the Burckle A Pad is a fully functional pad and Antero does not intend to advance to final reclamation in the near future. Once this pad is in the direction of interim reclamation or final reclamation, Antero will be using a number of soil conditioning techniques to promote vegetation growth.

State of Colorado  
Oil and Gas Conservation Commission

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



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2. Name of Operator: Antero Resource Pkceance Corporation	Phone: 303-357-7341	
3. Address: 1625 17th Street, Suite 300 City: Denver State: CO Zip: 80202	Fax: 303-357-7315	
5. API Number: 05-045137070000	OGCC Facility ID Number (Loc ID): 335540	OP OGCC
6. Well/Facility Name: Burckle A Pad	7. Well/Facility Number: Burckle A1	Survey Plat
8. Location (Qtr/Sec, Twp, Rng, Meridian): NWSE, Sec. 16, T6S, R92W, 6th Meridian		Directional Survey
9. County: Garfield	10. Field Name: Piceance	Surface Eqpm Diagram
11. Federal, Indian or State Lease Number:		Technical Info Page
		Other Analytical Data <input checked="" type="checkbox"/>

**General Notice**

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

Change of Surface Footage from Exterior Section Lines: ☐ FNL/FSL ☐ FEL/FWL

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/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**  
Method used: \_\_\_\_\_ Cementing tool setting/perf depth: \_\_\_\_\_ Cement volume: \_\_\_\_\_ Cement top: \_\_\_\_\_ Cement bottom: \_\_\_\_\_ Date: \_\_\_\_\_  
\*submit cbl and cement job summaries

☐ **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.)

<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input checked="" type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input checked="" type="checkbox"/> Other: Soil Analytical Submittal	for Spills and Releases

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

Signed: Gerard G. Alberts Date: 8-11-10 Email: jalberts@anteroresources.com  
Print Name: Gerard G. Alberts Title: Manager, Environmental & Regulatory

COGCC Approved: Carolyn Fisher Title: FOR Date: 01/08/2013

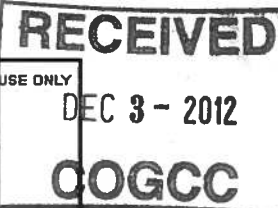
CONDITIONS OF APPROVAL, IF ANY:

A Fischer  
Supervisor  
Western Region

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY



1. OGCC Operator Number: 10079 API Number: 05-045137070000  
 2. Name of Operator: Antero Resources Piceance Corp. OGCC Facility ID #: 335540  
 3. Well/Facility Name: Burckle A Pad Well/Facility Number: Burckle A1  
 4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NWSE, Sec. 16, T6S, R92W, 6th P.M.

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5. **DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

Please find Attachment B and Attachment C which supplement the Antero Resources Piceance Corporation's (Antero) Burckle A Pad background arsenic analytical study. The background arsenic investigation is being submitted to supplement the approved Form 27 remediation plan submitted on 3/9/2010 in response to the 11/22/2009 26 bbls frac water spill.

**Project Overview:**

The spill occurred on 11/22/2009 and originated at the butterfly valve labeled as "Area 3" on Attachment A: Spill Location Map. The spill migrated downhill and off-site which is shown in yellow as the affected area on the map. The off-site impacted soil was excavated and re-used on the pad to treat ruts on the pad surface. The location where the soil was re-used is labeled "well pad confirmation sample location" on the Attachment A. Confirmatory samples were taken where the soil was re-used on the pad and at "Area 3" to confirm that it meets Table 910-1 standards.

The analytical data shown in Attachment B demonstrates that the "well pad confirmation sample location" resulted in elevated concentrations of TPH (diesel range) as well as arsenic and pH. The "Area 3" analytical data confirmed elevated concentration of arsenic, pH, specific conductivity (EC) and the sodium absorption ratio (SAR). As per my conversation with Linda Spry O'Rourke on 5/6/2010, further spill remediation was limited to excavation of soil on the pad where the "well pad confirmation sample location" was taken until the soil met 910-1 standards for TPH (see Attachment D: E-mail). Since "Area 3" is a small location on the pad, and the pad is surrounded by a perimeter berm, further remediation of the pH, EC, and SAR will take place during interim reclamation or final reclamation. In addition, a background arsenic study was requested to address the elevated concentrations described earlier in this report and the findings of this work are summarized below.

Antero excavated 25 cubic yards of impacted soil on the pad in response to the conversation with Linda Spry O'Rourke on 5/6/2010. After excavation, the analytical data detailed in Attachment C demonstrated that the pad soil meets Table 910-1 standards with the exception of arsenic and pH. Further details of the pad confirmatory sampling event are provided as a separate Form 4 that is attached with this submittal.

**Background Arsenic Study:**

Antero performed a background arsenic study because arsenic concentrations in this area are generally higher than the Table 910-1 standards. The Table 910-1 standard for arsenic is 0.39 mg/kg. Five background samples were taken and analyzed for arsenic. The sample locations are shown on the attached map. Below are the results of this study.

BKGD 1: 27.7 mg/kg, collected 3/31/2010 (Attachment B)  
 BKGD 2: 0.96 mg/kg, collected 5/21/2010 (Attachment C)  
 BKGD 3: 3.4 mg/kg, collected 5/21/2010 (Attachment C)  
 BKGD 4: 5.7 mg/kg, collected 5/21/2010 (Attachment C)  
 BKGD 5: 11.2 mg/kg, collected 5/21/2010 (Attachment C)

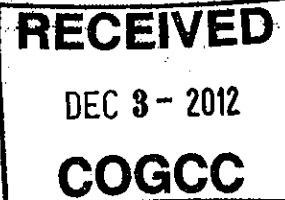
Mean: 9.792 mg/kg  
 Median: 5.7 mg/kg  
 Minimum: 0.96 mg/kg  
 Maximum: 27.7 mg/kg  
 Standard Deviation: 9.574  
 (See attached calculations sheet for details)

The results of this study show that all five (5) samples exceed the Table 910-1 standard for arsenic. After soil excavation of the Burckle A Pad at the "well pad confirmation sample location" the arsenic analytical data concentration result is 1.4 mg/kg. The soil on the pad following site excavation while above the Table 910-1 standards is well below the mean concentration of 9.792 mg/kg depicted by the five background samples. As such, Antero has concluded that further remediation of the Burckle A Pad soils is not warranted.

The "Area 3" confirmation arsenic analytical result is 25.9 mg/kg. This concentration is lower than the maximum concentration found in the arsenic background study which is 27.7 mg/kg. Since "Area 3" is within the pad perimeter berm and is a small location on the pad, Antero has concluded that further remediation at the Burckle A Pad is not warranted because the elevated arsenic concentration on the pad following excavation and at "Area 3" is due to the natural variability of arsenic concentrations and not the frac water spill that occurred on 11/22/2009.



1580 Lincoln Street, Suite 1280  
Denver, CO 80203  
Phone: (303) 893-2005 Fax: (720) 484-3730



Monday, December 03, 2012  
File no. Antero Resources

Alex Fischer  
Environmental Supervisor- Western Colorado  
Colorado Oil & Gas Conservation Commission  
1120 Lincoln Street  
Suite 801  
Denver, CO, 80203

*Re: Antero Resources Piceance Corporation*

Dear Alex,

Please find the enclosed six Form 4s and related documentation for your review and consideration. We trust you will find everything in order, but if we can be of any further assistance as you review the submittals, please feel free to contact me at your convenience.

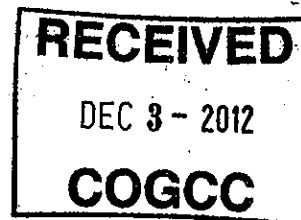
Thank you for all of your assistance as we work to close-out these outstanding matters.

Yours very truly,

A handwritten signature in cursive script, appearing to read "Diane O'Neil".

Diane O'Neil

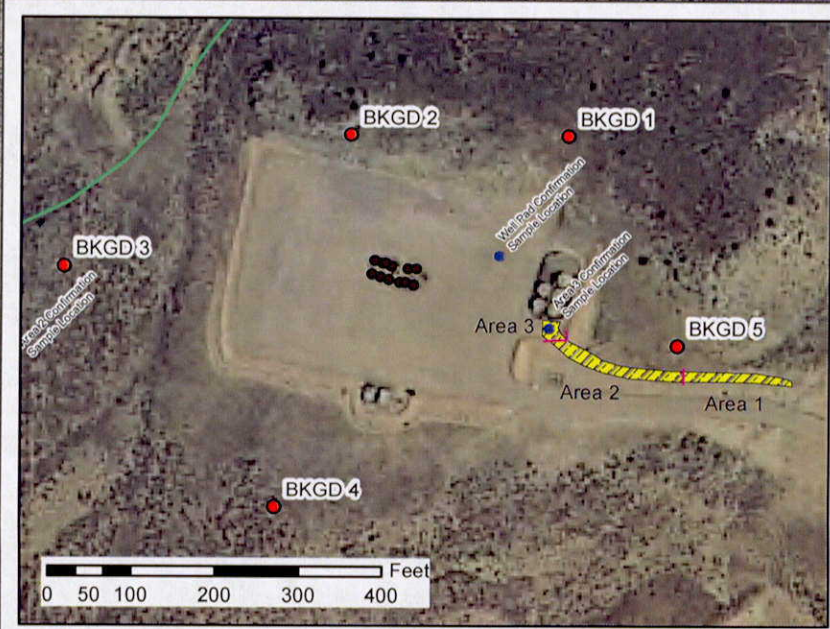
August 11<sup>th</sup> 2010  
Antero Resources Piceance Corporation  
Sundry Form 4  
Attachment A



**Attachment A: Spill Location Map**



DEC 3 - 2012



**Spill Location Map**  
**Location: Burckle A Pad**  
 Antero Resources Piceance Corp.

**Legend**

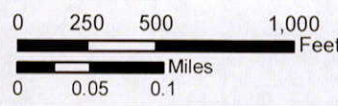
- Background Arsenic Sample Locations
- Proposed Confirmation Sample Locations
- Well Location

**Hydrologic Features**

- Perennial Stream
- - - Intermittent Stream
- | | | Ditch/Canal

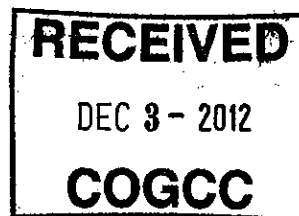
**Transportation Features**

- Highways
- Public Roads





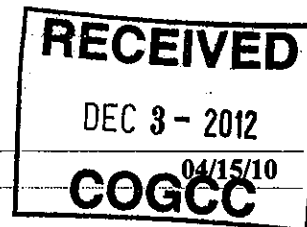
August 11<sup>th</sup> 2010  
Antero Resources Piceance Corporation  
Sundry Form 4  
Attachment B



**Attachment B: 3/31/2010 Analytical Data**



IT'S ALL IN THE CHEMISTRY



## Technical Report for

### Antero Resources

Antero Burckle A Pad

Accutest Job Number: D12173

Sampling Date: 03/31/10

### Report to:

HRL Compliance  
744 Horizon Court Suite 140  
Grand Junction, CO 81506  
mmumby@hrlcomp.com

ATTN: Mark Mumby

Total number of pages in report: 82



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

Client Service contact: Shea Greiner 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Test results relate only to samples analyzed.

*Jesse L. Smith*  
Jesse L. Smith  
Laboratory Director

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## Sample Summary

Antero Resources

Job No: D12173

Antero Burckle A Pad

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D12173-1	03/31/10	14:45 MM	04/02/10	SO	Soil	AREA 3
D12173-1A	03/31/10	14:45 MM	04/02/10	SO	Soil	AREA 3
D12173-2	03/31/10	14:50 MM	04/02/10	SO	Soil	PAD
D12173-2A	03/31/10	14:50 MM	04/02/10	SO	Soil	PAD
D12173-3	03/31/10	15:00 MM	04/02/10	SO	Soil	BKGD

---

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

**CASE NARRATIVE / CONFORMANCE SUMMARY****Client:** Antero Resources**Job No** D12173**Site:** Antero Burckle A Pad**Report Dat** 4/15/2010 11:21:34 AM

On 04/02/2010, three (3) samples were received at Accutest Mountain States at a temperature of 2.9°C. The samples were intact and properly preserved, unless noted below. An Accutest Mountain States Job Number of D12173 was assigned to the project. The laboratory sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

**Volatiles by GC By Method SW846 8015B**

Matrix	SO	Batch ID:	GGB185
--------	----	-----------	--------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12073-4MS and D12073-4MSD were used as the QC samples indicated.
- The matrix spike (MS) recovery of TPH-GRO (C6-C10) is outside control limits. The blank spike (BS) recovery of TPH-GRO (C6-C10) is within the QC limits.
- D12073-4MS and D12073-4MSD recoveries of 1,2,4-Trichlorobenzene are outside control limits due to matrix interference. The blank spike (BS) recovery of 1,2,4-Trichlorobenzene is within the QC limits.

**Volatiles by GC By Method SW846 8021B**

Matrix	SO	Batch ID:	GTA328
--------	----	-----------	--------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12073-1MS and D12073-1MSD were used as the QC samples indicated.
- The matrix spike duplicate (MSD) recovery of Toluene is outside control limits. Probable cause due to matrix interference. The blank spike (BS) recovery of Toluene is within the QC limits.
- D12073-1MS and D12073-1MSD recoveries of 1,2,4-Trichlorobenzene are outside control limits due to matrix interference. The blank spike (BS) recovery of 1,2,4-Trichlorobenzene is within the QC limits.

**Extractables by GC By Method SW846-8015B**

Matrix	SO	Batch ID:	OP1645
--------	----	-----------	--------

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D12170-1MS and D12170-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery of TPH-DRO (C10-C28) is outside control limits. The spike recovery indicates possible sample nonhomogeneity.
- OP1645-MS and OP1645-MSD recoveries of t-Butylbenzene are outside control limits due to matrix interference. The blank spike (BS) recovery of t-Butylbenzene is within the QC limits.

**Metals By Method SW846 6010B**

<b>Matrix</b> AQ	<b>Batch ID:</b> MP1645
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12204-1ADUP and D12204-1AMS were used as the QC samples for metals.
- The matrix spike (MS) recovery of Sodium is outside control limits. The spike amount is low relative to the sample amount. Refer to lab control or spike blank for recovery information.

<b>Matrix</b> SO	<b>Batch ID:</b> MP1577
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12173-1MS, D12173-1MSD, and D12173-1SDL were used as the QC samples for metals.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Silver and Zinc, and matrix spike (MS) of Barium are outside control limits. The spike recovery indicates possible matrix interference.
- The serial dilution RPDs of Cadmium, Lead, Barium, Chromium, Nickel, and Zinc are outside control limits for sample MP1577-SD1. The percent difference is acceptable due to low initial sample concentration (< 50 times IDL).

<b>Matrix</b> SO	<b>Batch ID:</b> MP1594
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12076-1MS, D12076-1MSD, and D12076-1SDL were used as the QC samples for metals analysis.
- The matrix spike (MS) recovery of Selenium is outside control limits. The spike recovery indicates possible matrix interference.
- The serial dilution RPD of Selenium is outside control limits for sample MP1594-SD1. The percent difference is acceptable due to low initial sample concentration (< 50 times IDL).

**Metals By Method SW846 6020**

<b>Matrix</b> SO	<b>Batch ID:</b> MP1580
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D12173-1MS, D12173-1MSD, and D12173-1SDL were used as the QC samples for metals.

**Metals By Method SW846 7471A**

<b>Matrix</b> SO	<b>Batch ID:</b> MP1581
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D11909-1MS and D11909-1MSD were used as the QC samples for metals analysis.

**Wet Chemistry By Method ASTM E1498-76M**

<b>Matrix</b> SO	<b>Batch ID:</b> M:GN31531
------------------	----------------------------

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D12173-1 and D12173-2
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

**Wet Chemistry By Method LADNR29B**

<b>Matrix</b> SO	<b>Batch ID:</b> MP1645
------------------	-------------------------

- Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

**Wet Chemistry By Method SM19 2540B M**

<b>Matrix</b> SO	<b>Batch ID:</b> GN3827
------------------	-------------------------

- The data for SM19 2540B M meets quality control requirements.

**Wet Chemistry By Method SW846 3060/7196A M**

<b>Matrix</b> SO	<b>Batch ID:</b> R1731
------------------	------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

**Wet Chemistry By Method SW846 3060A/7196A**

<b>Matrix</b> SO	<b>Batch ID:</b> M:GP11491
------------------	----------------------------

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

**Wet Chemistry By Method SW846 9045C**

<b>Matrix</b> SO	<b>Batch ID:</b> GN3820
------------------	-------------------------

- The following samples were run outside of holding time for method SW846 9045C: D12173-1 and D12173-2

Accutest Mountain States certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest Mountain States's Quality System precision, accuracy and complete

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

Accutest Mountain States is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Mountain States indicated via signature on the report cov



**SAMPLE DELIVERY GROUP CASE NARRATIVE****Client:** Accutest Mountain States**Job No** D12173**Site:** ANTRCODN: Antero Burckle A Pad**Report Date** 4/14/2010 9:33:13 AM

2 Sample(s) were collected on 03/31/2010 and were received at Accutest on 04/02/2010 properly preserved, at 1.9 Deg. C and intact. These Samples received an Accutest job number of D12173. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

**Wet Chemistry By Method ASTM E1498-76M****Matrix** SO**Batch ID:** GN31531

- Sample(s) D12201-IDUP were used as the QC samples for Redox Potential Vs H2.

**Wet Chemistry By Method SW846 3060A/7196A****Matrix** SO**Batch ID:** GP11491

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) M90369-8DUP, M90369-8MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D12173).



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Sample Results

---

Report of Analysis

---

## Report of Analysis

Page 1 of 1

3.1

3

**Client Sample ID:** AREA 3  
**Lab Sample ID:** D12173-1  
**Matrix:** SO - Soil  
**Method:** SW846 8015B  
**Project:** Antero Burckle A Pad

**Date Sampled:** 03/31/10  
**Date Received:** 04/02/10  
**Percent Solids:** 88.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB3599.D	1	04/02/10	LAC	n/a	n/a	GGB185
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.1	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	104%		60-140%

ND = Not detected      MDL - Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

**Client Sample ID:** AREA 3  
**Lab Sample ID:** D12173-1  
**Matrix:** SO - Soil  
**Method:** SW846 8021B  
**Project:** Antero Burckle A Pad

**Date Sampled:** 03/31/10  
**Date Received:** 04/02/10  
**Percent Solids:** 88.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA5998.D	1	04/03/10	LAC	n/a	n/a	GTA328
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	5.7	ug/kg	
108-88-3	Toluene	ND	11	ug/kg	
100-41-4	Ethylbenzene	ND	11	ug/kg	
	m,p-Xylene	ND	11	ug/kg	
95-47-6	o-Xylene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	93%		60-140%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

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3.1

3

<b>Client Sample ID:</b>	AREA 3	<b>Date Sampled:</b>	03/31/10
<b>Lab Sample ID:</b>	D12173-1	<b>Date Received:</b>	04/02/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.4
<b>Method:</b>	SW846-8015B SW846 3550B		
<b>Project:</b>	Antero Burckle A Pad		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE2032.D	1	04/05/10	CP	04/05/10	OP1645	GFE144
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	99.5	15	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-06-6	t-Butylbenzene	76%		39-130%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> AREA 3	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-1	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.4
<b>Project:</b> Antero Burckle A Pad	

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	25.9	0.34	mg/kg	5	04/02/10	04/05/10 SES	SW846 6020 <sup>3</sup>	SW846 3050B <sup>6</sup>
Barium	694	0.84	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Cadmium	< 0.84	0.84	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Chromium	7.9	0.84	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper	11.4	1.7	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Lead	12.7	4.2	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Mercury	< 0.11	0.11	mg/kg	1	04/02/10	04/02/10 SES	SW846 7471A <sup>1</sup>	SW846 7471A <sup>7</sup>
Nickel	10.1	2.5	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium	< 4.3	4.3	mg/kg	1	04/06/10	04/07/10 JM	SW846 6010B <sup>4</sup>	SW846 3050B <sup>8</sup>
Silver	< 2.5	2.5	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Zinc	42.4	2.5	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA546

(2) Instrument QC Batch: MA548

(3) Instrument QC Batch: MA551

(4) Instrument QC Batch: MA557

(5) Prep QC Batch: MP1577

(6) Prep QC Batch: MP1580

(7) Prep QC Batch: MP1581

(8) Prep QC Batch: MP1594

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	AREA 3	<b>Date Sampled:</b>	03/31/10
<b>Lab Sample ID:</b>	D12173-1	<b>Date Received:</b>	04/02/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.4
<b>Project:</b>	Antero Burckle A Pad		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	< 2.3	2.3	mg/kg	1	04/12/10 15:23	AMA	SW846 3060A/7196A
Chromium, Trivalent <sup>b</sup>	7.9	3.1	mg/kg	1	04/12/10 15:23	AMA	SW846 3060/7196A M
Redox Potential Vs H2 <sup>a</sup>	238		mv	1	04/06/10	AMA	ASTM E1498-76M
Solids, Percent	88.4		%	1	04/05/10	SWT	SM19 2540B M
Specific Conductivity	5040	1.0	umhos/cm	1	04/06/10	CJ	DEPT. OF AG, BOOK N9
pH	9.19		su	1	04/02/10 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> AREA 3	
<b>Lab Sample ID:</b> D12173-1A	<b>Date Sampled:</b> 03/31/10
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 04/02/10
	<b>Percent Solids:</b> 88.4
<b>Project:</b> Antero Burckle A Pad	

## SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	79.4	2.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>
Magnesium	19.0	1.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>
Sodium	843	2.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>

(1) Instrument QC Batch: MA571

(2) Prep QC Batch: MP1645

RL = Reporting Limit



## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> AREA 3	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-1A	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.4
<b>Project:</b> Antero Burckle A Pad	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	22.0		ratio	1	04/13/10 19:02	JM	LADNR29B

(a) Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$ 

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: PAD

Lab Sample ID: D12173-2

Matrix: SO - Soil

Method: SW846 8015B

Project: Antero Burckle A Pad

Date Sampled: 03/31/10

Date Received: 04/02/10

Percent Solids: 94.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB3600.D	1	04/02/10	LAC	n/a	n/a	GGB185
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.1	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	88%		60-140%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** PAD  
**Lab Sample ID:** D12173-2  
**Matrix:** SO - Soil  
**Method:** SW846 8021B  
**Project:** Antero Burckle A Pad

**Date Sampled:** 03/31/10  
**Date Received:** 04/02/10  
**Percent Solids:** 94.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TAS999.D	1	04/03/10	LAC	n/a	n/a	GTA328
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	5.3	ug/kg	
108-88-3	Toluene	ND	11	ug/kg	
100-41-4	Ethylbenzene	ND	11	ug/kg	
	m,p-Xylene	ND	11	ug/kg	
95-47-6	o-Xylene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	67%		60-140%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID: PAD

Lab Sample ID: D12173-2

Matrix: SO - Soil

Method: SW846-8015B SW846 3550B

Project: Antero Burckle A Pad

Date Sampled: 03/31/10

Date Received: 04/02/10

Percent Solids: 94.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE2033.D	1	04/05/10	CP	04/05/10	OP1645	GFE144
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	549	14	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-06-6	t-Butylbenzene	72%		39-130%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> PAD	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-2	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.6
<b>Project:</b> Antero Burckle A Pad	

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.8	0.34	mg/kg	5	04/02/10	04/05/10 SES	SW846 6020 <sup>3</sup>	SW846 3050B <sup>6</sup>
Barium	2210	0.86	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Cadmium	< 0.86	0.86	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Chromium	7.2	0.86	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper	8.4	1.7	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Lead	9.3	4.3	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Mercury	< 0.10	0.10	mg/kg	1	04/02/10	04/02/10 SES	SW846 7471A <sup>1</sup>	SW846 7471A <sup>7</sup>
Nickel	7.8	2.6	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium	< 4.1	4.1	mg/kg	1	04/06/10	04/08/10 JM	SW846 6010B <sup>4</sup>	SW846 3050B <sup>8</sup>
Silver	< 2.6	2.6	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>
Zinc	42.5	2.6	mg/kg	1	04/02/10	04/02/10 JM	SW846 6010B <sup>2</sup>	SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA546  
 (2) Instrument QC Batch: MA548  
 (3) Instrument QC Batch: MA551  
 (4) Instrument QC Batch: MA562  
 (5) Prep QC Batch: MP1577  
 (6) Prep QC Batch: MP1580  
 (7) Prep QC Batch: MP1581  
 (8) Prep QC Batch: MP1594

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	PAD	<b>Date Sampled:</b>	03/31/10
<b>Lab Sample ID:</b>	D12173-2	<b>Date Received:</b>	04/02/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	94.6
<b>Project:</b>	Antero Burckle A Pad		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	< 2.1	2.1	mg/kg	1	04/12/10 15:23	AMA	SW846 3060A/7196A
Chromium, Trivalent <sup>b</sup>	7.2	3.0	mg/kg	1	04/12/10 15:23	AMA	SW846 3060/7196A M
Redox Potential Vs H2 <sup>a</sup>	355		mv	1	04/06/10	AMA	ASTM E1498-76M
Solids, Percent	94.6		%	1	04/05/10	SWT	SM19 2540B M
Specific Conductivity	3320	1.0	umhos/cm	1	04/06/10	CJ	DEPT. OF AG, BOOK N9
pH	8.50		su	1	04/02/10 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

## Report of Analysis

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3.4

3

<b>Client Sample ID:</b> PAD	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-2A	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.6
<b>Project:</b> Antero Burckle A Pad	

## SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	280	2.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>
Magnesium	60.3	1.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>
Sodium	403	2.0	mg/l	1	04/13/10	04/13/10 JM	SW846 6010B <sup>1</sup>	EPA 200.7 <sup>2</sup>

(1) Instrument QC Batch: MA571

(2) Prep QC Batch: MP1645

RL = Reporting Limit

## Report of Analysis

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3.4

3

<b>Client Sample ID:</b> PAD	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-2A	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.6
<b>Project:</b> Antero Burckle A Pad	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	5.69		ratio	1	04/13/10 19:27	JM	LADNR29B

(a) Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$ 

RL = Reporting Limit



## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> BKGD	<b>Date Sampled:</b> 03/31/10
<b>Lab Sample ID:</b> D12173-3	<b>Date Received:</b> 04/02/10
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.6
<b>Project:</b> Antero Burckle A Pad	

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	27.7	0.34	mg/kg	5	04/02/10	04/05/10 SES	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA551

(2) Prep QC Batch: MP1580

RL = Reporting Limit



## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody





## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D12173 Client: OLSSON Immediate Client Services Action Required: No  
Date / Time Received: 4/2/2010 9:24:00 AM No. Coolers: 1 Client Service Action Required at Login: No  
Project: ANTERO BURKLE A PAD Airbill #'s: FEDX

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

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

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

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

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

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

Comments

Accutest Laboratories  
V: 508.481.6200

495 Technology Center West, Bldg One  
P: 508.481.7753

Marlborough, MA  
www.accutest.com

D12173: Chain of Custody  
Page 2 of 2

4.1  
4



## GC Volatiles

5

## QC Data Summaries

Includes the following where applicable:

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

## Method Blank Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB185-MB	GB3594.D	1	04/02/10	LAC	n/a	n/a	GGB185

The QC reported here applies to the following samples:

Method: SW846 8015B

D12173-1, D12173-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.0	1.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	102% 60-140%

5.1.1  
5

## Method Blank Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA328-MB	TA5981.D	1	04/02/10	LAC	n/a	n/a	GTA328

The QC reported here applies to the following samples:

Method: SW846 8021B

D12173-1, D12173-2

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	5.0	ug/kg	
100-41-4	Ethylbenzene	ND	10	ug/kg	
108-88-3	Toluene	ND	10	ug/kg	
95-47-6	o-Xylene	ND	10	ug/kg	
	m,p-Xylene	ND	10	ug/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	109% 60-140%

5.1.2

5

## Blank Spike Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB185-BS	GB3595.D	1	04/02/10	LAC	n/a	n/a	GGB185

The QC reported here applies to the following samples:

Method: SW846 8015B

D12173-1, D12173-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	11	10.1	92	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	109%	60-140%

5.2.1

5



## Blank Spike Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA328-BS	TA5982.D	1	04/02/10	LAC	n/a	n/a	GTA328

The QC reported here applies to the following samples:

Method: SW846 8021B

D12173-1, D12173-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	136	134	99	70-130
100-41-4	Ethylbenzene	228	226	99	70-130
108-88-3	Toluene	1060	968	91	70-130
95-47-6	o-Xylene	330	337	102	70-130
	m,p-Xylene	750	747	100	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	128%	60-140%

5.2.2

5

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D12073-4MS	GB3597.D	1	04/02/10	LAC	n/a	n/a	GGB185
D12073-4MSD	GB3598.D	1	04/02/10	LAC	n/a	n/a	GGB185
D12073-4	GB3596.D	1	04/02/10	LAC	n/a	n/a	GGB185

The QC reported here applies to the following samples:

Method: SW846 8015B

D12173-1, D12173-2

CAS No.	Compound	D12073-4 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	7.38	16	16.6	58* a	19.7	77	17	62-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D12073-4	Limits
120-82-1	1,2,4-Trichlorobenzene	311%* a	358%* a	280%* a	60-140%

(a) Outside control limits due to matrix interference.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D12073-1MS	TA5984.D	1	04/02/10	LAC	n/a	n/a	GTA328
D12073-1MSD	TA5985.D	1	04/02/10	LAC	n/a	n/a	GTA328
D12073-1	TA5983.D	1	04/02/10	LAC	n/a	n/a	GTA328

The QC reported here applies to the following samples:

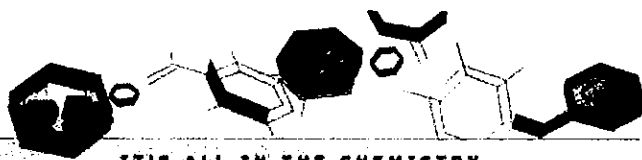
Method: SW846 8021B

D12173-1, D12173-2

CAS No.	Compound	D12073-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	6.8		183	152	79	140	73	8	70-130/30
100-41-4	Ethylbenzene	ND		307	251	82	240	78	4	62-130/30
108-88-3	Toluene	17.2		1420	1050	73	994	69* a	5	70-130/30
95-47-6	o-Xylene	25.8		443	368	77	358	75	3	65-135/30
	m,p-Xylene	72.3		1010	836	76	805	73	4	60-140/30

CAS No.	Surrogate Recoveries	MS	MSD	D12073-1	Limits
120-82-1	1,2,4-Trichlorobenzene	462%* a	455%* a	389%* a	60-140%

(a) Outside control limits due to matrix interference.



IT'S ALL IN THE CHEMISTRY

## Section 6

### GC Semi-volatiles

---

### QC Data Summaries

---

Includes the following where applicable:

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

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## Method Blank Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1645-MB	FE2027.D	1	04/05/10	CP	04/05/10	OP1645	GFE144

The QC reported here applies to the following samples:

Method: SW846-8015B

D12173-1, D12173-2

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	13	mg/kg	

CAS No.	Surrogate Recoveries	Limits
98-06-6	t-Butylbenzene	73% 39-130%

6.1.1  
6

## Blank Spike Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1645-BS	FE2028.D	1	04/05/10	CP	04/05/10	OP1645	GFE144

The QC reported here applies to the following samples:

Method: SW846-8015B

D12173-1, D12173-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	641	96	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
98-06-6	t-Butylbenzene	78%	39-130%

6.2.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D12173

Account: ANTRCODN Antero Resources

Project: Antero Burckle A Pad

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1645-MS	FE2048.D	10	04/06/10	CP	04/05/10	OP1645	GFE145
OP1645-MSD	FE2049.D	10	04/06/10	CP	04/05/10	OP1645	GFE145
D12170-1	FE2047.D	10	04/06/10	CP	04/05/10	OP1645	GFE145

The QC reported here applies to the following samples:

Method: SW846-8015B

D12173-1, D12173-2

CAS No.	Compound	D12170-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	3210	687	3150	-9* a	3750	78	17	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D12170-1	Limits
98-06-6	t-Butylbenzene	236%* b	293%* b	280%* b	39-130%

(a) Spike recovery indicates possible sample nonhomogeneity.

(b) Outside control limits due to matrix interference.



IT'S ALL IN THE CHEMISTRY

## Metals Analysis

## QC Data Summaries

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Includes the following where applicable:

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



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/02/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	3.3	2		
Antimony	3.0	1.4	.5		
Arsenic	2.5	.7	.72		
Barium	1.0	.02	.05	0.11	<1.0
Beryllium	1.0	.33	.21		
Boron	5.0	.33	.91		
Cadmium	1.0	.073	.12	0.060	<1.0
Calcium	40	.18	2.7		
Chromium	1.0	.06	.18	0.060	<1.0
Cobalt	0.50	.059	.058		
Copper	2.0	.18	.38	1.1	<2.0
Iron	7.0	.55	.91		
Lead	5.0	.33	.24	0.34	<5.0
Lithium	0.20		.09		
Magnesium	20	.061	.93		
Manganese	0.50	.01	.028		
Molybdenum	1.0	.15	.16		
Nickel	3.0	.081	.075	0.050	<3.0
Phosphorus	10	4.7	3.5		
Potassium	200	1.1	130		
Silicon	5.0	.96	.68		
Silver	3.0	.03	.068	-0.10	<3.0
Sodium	40	.34	6.3		
Strontium	5.0		.02		
Thallium	1.0	.14	.21		
Tin	5.0	.26	.56		
Titanium	1.0	.013	.041		
Uranium	5.0	.43	.53		
Vanadium	1.0	.067	.034		
Zinc	3.0	.051	.49	0.30	<3.0

Associated samples MP1577: D12173-1, D12173-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/02/10

Metal	D12173-1 Original MS	Spikelot MPICPR1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	694	1360	428	155.4N(a) 75-125
Beryllium				
Boron				
Cadmium	0.25	13.5	17.1	77.3 75-125
Calcium	anr			
Chromium	7.9	142	171	78.2 75-125
Cobalt				
Copper	11.4	158	171	85.5 75-125
Iron				
Lead	12.7	145	171	77.2 75-125
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	10.1	139	171	75.2 75-125
Phosphorus				
Potassium				
Silicon				
Silver	0.0	11.6	17.1	67.7N(a) 75-125
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	42.4	165	171	71.5N(a) 75-125

Associated samples MP1577: D12173-1, D12173-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

(a) Spike recovery indicates possible matrix interference.

7.1.2

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/02/10

Metal	D12173-1 Original MSD	Spikelot MPICPR1	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium	694	1210	419	123.2	11.7	20
Beryllium						
Boron						
Cadmium	0.25	13.2	16.8	77.3	2.2	20
Calcium	anr					
Chromium	7.9	139	168	78.2	2.1	20
Cobalt						
Copper	11.4	154	168	85.1	2.6	20
Iron						
Lead	12.7	141	168	76.6	2.8	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	10.1	137	168	75.7	1.4	20
Phosphorus						
Potassium						
Silicon						
Silver	0.0	11.2	16.8	66.8N(a)	3.5	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	42.4	165	168	73.2N(a)	0.0	20

Associated samples MP1577: D12173-1, D12173-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

(a) Spike recovery indicates possible matrix interference.

7.1.2

7

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/02/10

Metal	BSP Result	Spikelot MPICPR1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	445	500	89.0	80-120
Beryllium				
Boron				
Cadmium	17.6	20	88.0	80-120
Calcium	anr			
Chromium	183	200	91.5	80-120
Cobalt				
Copper	187	200	93.5	80-120
Iron				
Lead	182	200	91.0	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	181	200	90.5	80-120
Phosphorus				
Potassium				
Silicon				
Silver	16.1	20	80.5	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	170	200	85.0	80-120

Associated samples MP1577: D12173-1, D12173-2

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

# SERIAL DILUTION RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: ug/l

Prep Date: 04/02/10

Metal	D12173-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	8230	9480	15.2* (a)	0-10
Beryllium				
Boron				
Cadmium	3.00	0.00	100.0 (b)	0-10
Calcium	anr			
Chromium	93.2	109	16.4* (a)	0-10
Cobalt				
Copper	135	133	1.5	0-10
Iron				
Lead	150	176	17.1 (b)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	119	143	20.0* (a)	0-10
Phosphorus				
Potassium				
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	502	605	20.5* (a)	0-10

Associated samples MP1577: D12173-1, D12173-2

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested  
(a) Serial dilution indicates possible matrix interference.

SERIAL DILUTION RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1577  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: ug/l

Prep Date:

Metal

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

7.1.4

7



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1580  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 04/02/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.24	.89		
Arsenic	0.40	.058	.26	0.063	<0.40
Calcium	200	2.6	6.1		
Copper	1.0	.0045	.14		
Iron	20	2.1	6.1		
Lead	0.25	.0013	.18		
Magnesium	50	.096	1.3		
Potassium	100	4.3	9.1		
Sodium	250	.25	1.8		
Uranium	0.25	.0005	.12		

Associated samples MP1580: D12173-1, D12173-2, D12173-3

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

7.2.1

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1580  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 04/02/10

Metal	D12173-1 Original MS	Spikelot MPICPR1	% Rec	QC Limits
-------	-------------------------	---------------------	-------	--------------

Aluminum

Arsenic 25.9 184 171 92.2 60-119

Calcium

Copper

Iron

Lead

Magnesium

Potassium

Sodium

Uranium

Associated samples MP1580: D12173-1, D12173-2, D12173-3

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

7.2.2

7

# MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1580  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 04/02/10

Metal	D12173-1 Original	MSD	Spikelet MPICPR1	% Rec	MSD RPD	QC Limit
Aluminum						
Arsenic	25.9	180	168	92.0	2.2	20
Calcium						
Copper						
Iron						
Lead						
Magnesium						
Potassium						
Sodium						
Uranium						

Associated samples MP1580: D12173-1, D12173-2, D12173-3

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

7.2.2

7

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1580  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 04/02/10

Metal	BSP Result	Spikelot MPICPR1	% Rec	QC Limits
Aluminum				
Arsenic	178	200	89.0	80-120
Calcium				
Copper				
Iron				
Lead				
Magnesium				
Potassium				
Sodium				
Uranium				

Associated samples MP1580: D12173-1, D12173-2, D12173-3

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

7.2.3

7

SERIAL DILUTION RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1580  
Matrix Type: SOLID

Methods: SW846 6020  
Units: ug/l

Prep Date: 04/02/10

Metal	D12173-1			QC
	Original	SDL 5:25	%DIF	Limits

Aluminum

Arsenic 307 321 4.7 0-10

Calcium

Copper

Iron

Lead

Magnesium

Potassium

Sodium

Uranium

Associated samples MP1580: D12173-1, D12173-2, D12173-3

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

7.2.4

7

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1581  
Matrix Type: SOLID

Methods: SW846 7471A  
Units: mg/kg

Prep Date: 04/02/10

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.0012	-0.0033	<0.10

Associated samples MP1581: D12173-1, D12173-2

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

7.3.1

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1581  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 04/02/10

Metal	D11909-1		SpikeLot		QC
	Original MS		HGWSR1	% Rec	Limits
Mercury	0.016	0.43	0.429	96.4	85-115

Associated samples MP1581: D12173-1, D12173-2

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

7.3.2

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1581  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 04/02/10

Metal	D11909-1		SpikeLot		MSD	QC
	Original MSD		HGWSR1	% Rec	RPD	Limit
Mercury	0.016	0.45	0.446	97.2	4.5	20

Associated samples MP1581: D12173-1, D12173-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

7.3.2

7



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1581  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 04/02/10

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.38	0.4	95.0	80-120

Associated samples MP1581: D12173-1, D12173-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

7.3.3

7

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/06/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	3.3	2		
Antimony	3.0	1.4	.5		
Arsenic	2.5	.7	.72		
Barium	1.0	.02	.05		
Beryllium	1.0	.33	.21		
Boron	5.0	.33	.91		
Cadmium	1.0	.073	.12		
Calcium	40	.18	2.7		
Chromium	1.0	.06	.18		
Cobalt	0.50	.059	.058		
Copper	2.5	.18	.38		
Iron	7.0	.55	.91		
Lead	5.0	.33	.24		
Lithium	0.20		.09		
Magnesium	20	.061	.93		
Manganese	0.50	.01	.028		
Molybdenum	1.0	.15	.16		
Nickel	3.0	.081	.075		
Phosphorus	10	4.7	3.5		
Potassium	200	1.1	130		
Selenium	5.0	.5	.54	-0.24	<5.0
Silicon	5.0	.96	.68		
Silver	3.0	.03	.068		
Sodium	40	.34	6.3		
Strontium	5.0		.02		
Thallium	1.0	.14	.21		
Tin	5.0	.26	.56		
Titanium	1.0	.013	.041		
Uranium	5.0	.43	.53		
Vanadium	1.0	.067	.034		
Zinc	3.0	.051	.49		

Associated samples MP1594: D12173-1, D12173-2

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

7.4.1

7

# MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1594  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 04/06/10

Metal	D12076-1 Original MS	Spikelet MPICPR1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	1.7	170	227	74.3N(a) 75-125
Silicon				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP1594: D12173-1, D12173-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

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

7.4.2

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1594  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 04/06/10

Metal	D12076-1 Original MSD	Spikelet MPICPR1	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic					
Barium	anr				
Beryllium					
Boron	anr				
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	1.7	163	213	75.6	4.2 20
Silicon					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP1594: D12173-1, D12173-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

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

7.4.2

7

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/06/10

Metal	BSP Result	Spikelot MPICPR1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	167	200	83.5	80-120
Silicon				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP1594: D12173-1, D12173-2

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



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1594  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

7.4.3

7

# SERIAL DILUTION RESULTS SUMMARY

Login Number: D12173  
 Account: ANTRCODN - Antero Resources  
 Project: Antero Burckle A Pad

QC Batch ID: MP1594  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: ug/l

Prep Date: 04/06/10

Metal	D12076-1	Original SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	14.5	0.00	100.0(a)	0-10
Silicon				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP1594: D12173-1, D12173-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 04/13/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	160	250		
Antimony	150	68	65		
Arsenic	130	35	33		
Barium	50	1	12		
Beryllium	50	17	22		
Boron	250	17	93		
Cadmium	50	3.7	6		
Calcium	2000	9	46	11.5	<2000
Chromium	50	3	8		
Cobalt	25	3	1.5		
Copper	25	9	14		
Iron	350	28	50		
Lead	250	17	16		
Lithium	10		8		
Magnesium	1000	3.1	62	-120	<1000
Manganese	25	.5	3.5		
Molybdenum	50	7.5	6		
Nickel	150	4.1	3		
Phosphorus	500	230	270		
Potassium	5000	57	2700		
Selenium	250	25	36		
Silicon	250	48	100		
Silver	150	1.5	1.5		
Sodium	2000	17	110	206	<2000
Strontium	25		17		
Thallium	50	7	11		
Tin	250	13	22		
Titanium	50	.65	3.5		
Uranium	250	22	20		
Vanadium	50	3.4	1.5		
Zinc	150	2.6	8.5		

Associated samples MP1645: D12173-1A, D12173-2A

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

7.5.1

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 04/13/10 04/13/10

Metal	D12204-1A Original DUP		RPD	QC Limits	D12204-1A Original MS		Spikelot MPICPR1	% Rec	QC Limits
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Boron									
Cadmium									
Calcium	54400	59300	8.6	0-20	54400	112000	50000	115.2	75-125
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Lithium									
Magnesium	24000	26200	8.8	0-20	24000	75900	50000	103.8	75-125
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver									
Sodium	3110000	3340000	7.1	0-20	3110000	3410000	50000	600.0 (a)	75-125
Strontium									
Thallium									
Tin									
Titanium									
Uranium									
Vanadium									
Zinc									

Associated samples MP1645: D12173-1A, D12173-2A

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

7.5.2

7

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 04/13/10

Metal	BSP Result	Spikelot MPICPR1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	52300	50000	104.6	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	50800	50000	101.6	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	50400	50000	100.8	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP1645: D12173-1A, D12173-2A

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

QC Batch ID: MP1645  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date:

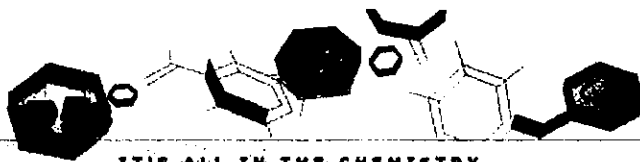
Metal

(anr) Analyte not requested

7.5.3

7





IT'S ALL IN THE CHEMISTRY

## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP1736/GN3851			umhos/cm	9990	10000	100.3	90-110%
pH	GN3820			su	8.00	7.96	99.5	99.3-100.7%

Associated Samples:

Batch GN3820: D12173-1, D12173-2

Batch GP1736: D12173-1, D12173-2

(\*) Outside of QC limits

8.1

8

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
---------	----------	--------------	-------	--------------------	---------------	-----	--------------

Associated Samples:  
Batch MP1645: D12173-1A, D12173-2A  
(\*) Outside of QC limits

8.2  
8

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ANTRCODN - Antero Resources  
Project: Antero Burckle A Pad

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
---------	----------	--------------	-------	--------------------	-----------------	--------------	------	--------------

Associated Samples:

Batch MP1645: D12173-1A, D12173-2A

(\*) Outside of QC limits

8.3

8



## Misc. Forms

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### Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

---

Includes the following where applicable:

- Chain of Custody



**ACCUTEST**

# CHAIN OF CUSTODY

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

Accutest Job #:	D12173
Accutest Quote #:	
AMS P.O. #:	
Project No.:	

Client Information				Subcontract Laboratory Information										Analytical Information				Comments	
Name <b>Accutest Mountain States (AMS)</b>				Name <b>Accutest - New England</b>															
Address <b>4036 Youngfield St.</b>				Address <b>495 Technology Center West, BLDG C</b>															
City <b>Wheat Ridge,</b>	State <b>CO</b>	Zip <b>80033</b>		City <b>Marlborough</b>	State <b>MA</b>	Zip <b>01752</b>													
Send Report to: <b>Carl Smith</b>				Contact: <b>Sample Management</b>															
Any questions contact: <b>Shea Greiner</b>				Phone: <b>(508) 481-6200</b>															
Phone/Fax #: <b>(303) 425-6021; (303) 425-6854</b>																			
Field ID / Point of Collection				Collection			Matrix	# of bottles	Preservation						XCR	EH			
				Date	Time				HCL	NOH	PHOS	NO3	NO2	None					
D12173 -1				3/31/10	2:45 PM		Soil	1								X	X		
-2				3/31/10	2:50 PM		Soil	1								X	X		
Turnaround Information				Date Deliverable Information										Comments / Remarks					
<input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days)				Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input checked="" type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) _____										Please use Colorado regulations and RLs.  <div style="text-align: center;">140</div>					
10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.																			
Sample Custody must be documented below each time samples change possession, including courier delivery.																			
Relinquished by:				Date & Time:				Received by:				Date & Time:				Seal #:			
1				4/5/10				1				1				Seal #:			
2				4/6/10 10:15				2				2				Seal #:			
3								3				3				Seal #:			
For Subcontract Laboratory Use Only Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> Preserved Where applicable: <input type="checkbox"/> Temperature °C <u>15°</u> On Ice <input checked="" type="checkbox"/>																			

D12173: Chain of Custody

Page 1 of 2

Accutest Labs of New England, Inc.



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D12173 Client: AMS Immediate Client Services Action Required: No  
Date / Time Received: 4/6/2010 10:15:00 AM No. Coolers: 1 Client Service Action Required at Login: No  
Project: N/A Airbill #s: N/A

**Cooler Security**      Y or N      Y or N  
1. Custody Seals Present: ☒ ☐      3. COC Present: ☒ ☐  
2. Custody Seals Intact: ☒ ☐      4. Smp1 Dates/Time OK: ☒ ☐

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

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

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

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

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

Comments

Accutest Laboratories  
V: 508.481.6200

495 Technology Center West, Bldg One  
F: 508.481.7753

Marlborough, MA  
www.accutest.com

**D12173: Chain of Custody**  
**Page 2 of 2**



## General Chemistry

### QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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



METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ALMS - Accutest Mountain States  
Project: ANTRCODN: Antero Burckle A Pad

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP11491/GN31571	2.0	0.0	mg/kg	40	40.6	101.5	80-120%
Chromium, Hexavalent	GP11491/GN31571			mg/kg	708	717	101.3	80-120%

Associated Samples:

Batch GP11491: D12173-1, D12173-2

(\*) Outside of QC limits

10.1 10

BLANK SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ALMS - Accutest Mountain States  
Project: ANTRCODN: Antero Burckle A Pad

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
Chromium, Hexavalent	GP11491/GN31571	mg/kg	40	40.3	0.7	

Associated Samples:

Batch GP11491: D12173-1, D12173-2

(\*) Outside of QC limits

10.2 10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ALMS - Accutest Mountain States  
Project: ANTRCODN: Antero Burckle A Pad

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP11491/GN31571	M90369-8	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN31531	D12201-1	mv	244	243	0.4	0-20%

Associated Samples:

Batch GN31531: D12173-1, D12173-2

Batch GP11491: D12173-1, D12173-2

(\*) Outside of QC limits

10.3  
10

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D12173  
Account: ALMS - Accutest Mountain States  
Project: ANTRCODN: Antero Burckle A Pad

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP11491/GN31571	M90369-8	mg/kg	0.0	45.7	45.3	99.1	75-125%
Chromium, Hexavalent	GP11491/GN31571	M90369-8	mg/kg	0.0	930	990	106.4	75-125%

Associated Samples:

Batch GP11491: D12173-1, D12173-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4 10

August 11<sup>th</sup> 2010  
Antero Resources Piceance Corporation  
Sundry Form 4  
Attachment C

**Attachment C: 5/21/2010 Analytical Data**



06/03/10

## Technical Report for

Antero Resources

Burkle A Pad

Accutest Job Number: D13588

Sampling Date: 05/21/10

Report to:

Antero Resources

ckilstrom@anteroresources.com

ATTN: Cole Kilstrom

Total number of pages in report: 23



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

Jesse L. Smith  
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Test results relate only to samples analyzed.

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## Sample Summary

Antero Resources

Job No: D13588

Burkle A Pad

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D13588-1	05/21/10	09:40 MM	05/25/10	SO	Soil	EXCAVATION
D13588-2	05/21/10	09:40 MM	05/25/10	SO	Soil	BKGD AS LOC 2
D13588-3	05/21/10	09:40 MM	05/25/10	SO	Soil	BKGD AS LOC 3
D13588-4	05/21/10	09:40 MM	05/25/10	SO	Soil	BKGD AS LOC 4
D13588-5	05/21/10	09:40 MM	05/25/10	SO	Soil	BKGD AS LOC 5

---

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



**CASE NARRATIVE / CONFORMANCE SUMMARY****Client:** Antero Resources**Job No** D13588**Site:** Burkle A Pad**Report Dat** 6/3/2010 10:14:30 AM

On 05/25/2010, five (5) sample were received at Accutest Mountain States (AMS) at a temperature of 5.4°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D13588 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

**Extractables by GCMS By Method SW846 8270C BY SIM****Matrix** SO**Batch ID:** OP1923

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D13588-1MS and D13588-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

**Volatiles by GC By Method SW846 8015B****Matrix** SO**Batch ID:** GGB255

- All samples were analyzed within the recommended method holding time.
- Samples D13636-1MS and D13636-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

**Volatiles by GC By Method SW846 8021B****Matrix** SO**Batch ID:** GTB255

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D13636-1MS and D13636-1MSD were used as the QC samples indicated.

**Extractables by GC By Method SW846-8015B****Matrix** SO**Batch ID:** OP1917

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D13530-1MS and D13530-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The RPD for the MS and MSD recoveries of TPH-DRO (C10-C28) is outside control limits for sample OP1917-MSD; however, the MS and MSD recoveries are within control limits.

**Metals By Method SW846 6010B**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> MP1966
---------------	-----------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D13397-IMS, D13397-1MSD, and D13397-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery of Zinc is outside control limits. The blank spike (BS) recovery of Zinc is within QC limits, proving the analysis is in control.
- The matrix spike (MS) recovery of Barium is outside control limits. The spike amount is low relative to the sample amount. Refer to the lab control or spike blank for recovery information.
- The RPDs for Barium, Cadmium, Chromium, Nickel, Selenium, and Zinc are outside control limits for sample MP1966-SD1. The percent differences are acceptable due to low initial sample concentration (< 50 times IDL).

**Metals By Method SW846 6020**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> MP1967
---------------	-----------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D13397-IMS, D13397-1MSD, and D13397-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic are outside control limits for sample MP1967-SD1.

**Metals By Method SW846 7471A**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> MP1983
---------------	-----------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D13740-IMS and D13740-1MSD were used as the QC samples for the Mercury analysis.

**Wet Chemistry By Method ASTM E1498-76M**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> M:GN31965
---------------	-----------	----------------------------

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D13588-1
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

**Wet Chemistry By Method SM19 2540B M**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> GN4519
---------------	-----------	-------------------------

- The data for SM19 2540B M meets quality control requirements.

**Wet Chemistry By Method SW846 3060/7196A M**

<b>Matrix</b>	<b>SO</b>	<b>Batch ID:</b> R2477
---------------	-----------	------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

### Wet Chemistry By Method SW846 3060A/7196A

<b>Matrix</b> SO	<b>Batch ID:</b> M:GP11656
------------------	----------------------------

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium, : Analysis performed at Accutest Laboratories, Marlborough, MA.

### Wet Chemistry By Method SW846 9045C

<b>Matrix</b> SO	<b>Batch ID:</b> GN4513
------------------	-------------------------

- The following samples were run outside of holding time for method SW846 9045C: D13588-1

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

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

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

**SAMPLE DELIVERY GROUP CASE NARRATIVE****Client:** Accutest Mountain States**Job No** D13588**Site:** ANTRCODN: Burkle A Pad**Report Date** 6/2/2010 8:54:33 AM

1 Sample was collected on 05/21/2010 and were received at Accutest on 05/25/2010 properly preserved, at 3.7 Deg. C and intact. These Samples received an Accutest job number of D13588. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

**Wet Chemistry By Method ASTM E1498-76M****Matrix** SO**Batch ID:** GN31965

- Sample(s) D13523-2DUP were used as the QC samples for Redox Potential Vs H2.

**Wet Chemistry By Method SW846 3060A/7196A****Matrix** SO**Batch ID:** GP11656

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D13592-IMS, D13592-IDUP were used as the QC samples for Chromium, Hexavalent.
- RPD(s) for Duplicate for Chromium, Hexavalent are outside control limits for sample GP11656-D1. RPD acceptable due to low duplicate and sample concentrations.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D13588).



### Sample Results

---

### Report of Analysis

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## Report of Analysis

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3.1

3

Client Sample ID: ECAVATION

Lab Sample ID: D13588-1

Date Sampled: 52111

Matrix: SO - Soil

Date Received: 52511

Method: S86 82CC SIM S86 35CC

Percent Solids: 91.5

Project: Curkle A Pad

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run 1	3G119.D	1	52111	TM	52611	OP1923	E3G23
Run 2							

	Initial Weight	Final Volume
Run 1	311g	1.1ml
Run 2		

## BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	13	6.8	ug/kg	
218-96-8	Acenaphthylene	ND	36	15	ug/kg	
121-12-1	Anthracene	ND	13	11	ug/kg	
56-55-3	Benzo(a)anthracene	ND	13	11	ug/kg	
51-32-8	Benzo(a)pyrene	ND	13	16	ug/kg	
215-99-2	Benzo(b)fluoranthene	ND	13	5.3	ug/kg	
191-21-2	Benzo(g,h,i)perylene	ND	13	16	ug/kg	
211-18-9	Benzo(k)fluoranthene	ND	13	16	ug/kg	
218-11-9	Chrysene	ND	13	3.6	ug/kg	
53-11-3	Dibenzo(a,h)anthracene	ND	13	5.1	ug/kg	
216-11-1	Fluoranthene	ND	13	15	ug/kg	
86-13-1	Fluorene	ND	13	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	13	18	ug/kg	
91-12-1	1-Methylnaphthalene	ND	13	6.1	ug/kg	
91-51-6	2-Methylnaphthalene	ND	36	11	ug/kg	
91-21-3	Naphthalene	ND	36	8.1	ug/kg	
85-11-8	Phenanthrene	ND	13	5.8	ug/kg	
129-11-1	Pyrene	ND	13	19	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1165-61-1	Nitrobenzene-d5	55		1193
321-61-8	2-Fluorobiphenyl	52		2138
1118-51-1	Terphenyl-d11	51		1111

ND 1 Not detected MDL - Method Detection Limit

RL 1 Reporting Limit

E 1 Indicates value exceeds calibration range

11 Indicates an estimated value

11 Indicates analyte found in associated method blank

N 1 Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID: ECAVATION  
 Lab Sample ID: D13588-1  
 Matrix: SO - Soil  
 Method: S 86 815  
 Project: Curkle A Pad

Date Sampled: 52111  
 Date Received: 52511  
 Percent Solids: 91.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run 1	G68D	1	52111	DG	n	n	GG255
Run 2							

	Initial Weight
Run 1	1.1g
Run 2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C1)	ND	1.1	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
12382-1	1,2,3-Trichlorobenzene	111		6111

ND ☐ Not detected MDL - Method Detection Limit  
 RL ☐ Reporting Limit  
 E ☐ Indicates value exceeds calibration range

☐ Indicates an estimated value  
☐ Indicates analyte found in associated method blank  
 N ☐ Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

3.1

3

Client Sample ID: E0CAVATION  
 Lab Sample ID: D13588-1  
 Matrix: SO - Soil  
 Method: S080680210  
 Project: 0urkle A Pad

Date Sampled: 050100  
 Date Received: 050500  
 Percent Solids: 91.5

Run	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run 01	T00680D	1	050100	DG	n0	n0	GT0255
Run 02							

Run	Initial Weight
Run 01	1.0g
Run 02	

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
01-03-2	0enzene	ND	5.5	5.5	ug/kg	
108-88-3	Toluene	ND	11	11	ug/kg	
103-01-0	Ethylbenzene	ND	11	11	ug/kg	
	m,p-0ylene	ND	11	11	ug/kg	
95-006	o-0ylene	ND	11	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,0-Trichlorobenzene	90		60-100

ND 0 Not detected MDL - Method Detection Limit  
 RL 0 Reporting Limit  
 E 0 Indicates value exceeds calibration range

00 Indicates an estimated value  
 00 Indicates analyte found in associated method blank  
 N 0 Indicates presumptive evidence of a compound



## Report of Analysis

Page 1 of 1

3.1

3

Client Sample ID: ECAVATION

Lab Sample ID: D13588-1

Date Sampled: 5/21/05

Matrix: SO - Soil

Date Received: 5/25/05

Method: S806-815 S806 355

Percent Solids: 91.5

Project: Curkle A Pad

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run 1	D1581.D	1	5/26/05	LAC	5/26/05	OP191	GCD12
Run 2							

	Initial Weight	Final Volume
Run 1	3.1 g	2.0 ml
Run 2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C1-C28)	ND	15	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
806-15-1	o-Terphenyl	9		63-13

ND ☐ Not detectedRL ☐ Reporting LimitE ☐ Indicates value exceeds calibration range☐ Indicates an estimated value☐ Indicates analyte found in associated method blankN ☐ Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

3.1

3

Client Sample ID: ECAVATION

Lab Sample ID: D13588-1

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 5/21/05

Date Received: 5/25/05

Percent Solids: 91.5

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1.0	0.3	mg/kg	5	5/28/05	5/28/05 CM	SO 806 602 <sup>2</sup>	SO 806 305 <sup>6</sup>
Barium	82.5	0.85	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Cadmium	0.085	0.85	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Chromium	0.0	0.85	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Copper	5.0	0.02	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Lead	10.1	0.2	mg/kg	1	5/28/05	6/01/05 CM	SO 806 600 <sup>3</sup>	SO 806 305 <sup>5</sup>
Mercury	0.011	0.11	mg/kg	1	6/02/05	6/02/05 RN	SO 806 000A <sup>0</sup>	SO 806 000A <sup>0</sup>
Nickel	5.3	2.5	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Selenium	0.02	0.2	mg/kg	1	5/28/05	6/01/05 CM	SO 806 600 <sup>3</sup>	SO 806 305 <sup>5</sup>
Silver	0.25	2.5	mg/kg	1	5/28/05	5/29/05 CM	SO 806 600 <sup>1</sup>	SO 806 305 <sup>5</sup>
Zinc	20.0	2.5	mg/kg	1	5/28/05	6/01/05 CM	SO 806 600 <sup>3</sup>	SO 806 305 <sup>5</sup>

(1) Instrument QC Batch MA02

(2) Instrument QC Batch MA00

(3) Instrument QC Batch MA06

(4) Instrument QC Batch MA00

(5) Prep QC Batch MP1966

(6) Prep QC Batch MP1960

(7) Prep QC Batch MP1983

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: ECAVATION

Lab Sample ID: D13588-1

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 5/21/05

Date Received: 5/25/05

Percent Solids: 91.5

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	2.2	2.2	mg/kg	1	5/28/05 16:00	AMA	SO 826 306A 96A
Chromium, Trivalent <sup>b</sup>		3.1	mg/kg	1	5/29/05 00:00	AM	SO 826 306A 96A M
Redox Potential Vs H2 <sup>a</sup>	26		mv	1	5/26/05	AMA	ASTM E1098-C6M
Solids, Percent	91.5		%	1	5/25/05	ID	SM19 2500 M
pH	9.29		su	1	5/25/05 11:05	C	SO 826 905C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as (Chromium) - (Chromium, Hexavalent)

RL Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: GD AS LOC 2

Lab Sample ID: D13588-2

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 5/21/21

Date Received: 5/25/21

Percent Solids: 9.6

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	0.96	0.32	mg/kg	5	5/28/21	5/28/21 M	S0806602 <sup>1</sup>	S0806305 <sup>2</sup>

(1) Instrument QC Batch MA

(2) Prep QC Batch MP196

RL Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: 11GD AS LOC 3

Lab Sample ID: D13588-3

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 5/21/11

Date Received: 5/25/11

Percent Solids: 93.9

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.1	13.1	mg/kg	5	5/28/11	5/28/11 CM	S0806602 <sup>1</sup>	S0806305 <sup>2</sup>

(1) Instrument QC Batch MA111

(2) Prep QC Batch MP196

RL 1 Reporting Limit

## Report of Analysis

Page 1 of 1

3.4

3

Client Sample ID: 00GD AS LOC 0

Lab Sample ID: D13588-0

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 05/21/11

Date Received: 05/25/11

Percent Solids: 9.2

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.0	0.3	mg/kg	5	05/28/11	05/28/11	0M	S0806602 <sup>1</sup>

(1) Instrument QC Batch 00MA000

(2) Prep QC Batch 00MP196

RL 0 Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: GD AS LOC 5

Lab Sample ID: D13588-5

Matrix: SO - Soil

Project: Curkle A Pad

Date Sampled: 5/21/11

Date Received: 5/25/11

Percent Solids: 95.9

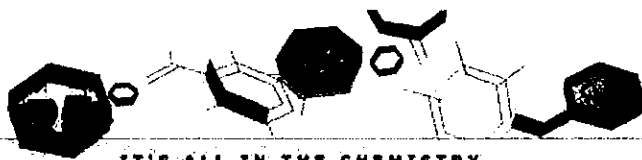
## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	11.2	32	mg/kg	5	5/28/11 5/28/11 CM	S0806602 <sup>1</sup>	S0806305 <sup>2</sup>	

(1) Instrument QC Batch MA

(2) Prep QC Batch MP196

RL Reporting Limit



Misc. ☐orms

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Custody Documents and Other ☐orms

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Includes the following where applicable ☐

- ☐ Chain of Custody
- ☐ Chain of Custody (Accutest Labs of New England, Inc.)



4036 Youngfield Street, Wheat Ridge, Colorado 80033  
TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854  
[www.acctest.com](http://www.acctest.com)

PMA-20 Testing <b>5322</b> Account Quote #		Some Order Contact # Account Job #	
Requested Analysis (see TEST CODE sheet)			
Matrix Codes			
DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIO - Other Liquid AIR - Air SOL - Other Solid WP - Waste FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank			
LAB USE ONLY			
C1 C2 C3 C4 C5			
Comments / Special Instructions			
Do not run BOD - Run for Tot 1 BOD.			
Shipping container delivery.			
Date Recd:		Received By:	
Date Time:		Received By:	
Preserved where applicable <input type="checkbox"/> N/A		On Ice <input checked="" type="checkbox"/>	
Order Temp:		Order Temp:	

#### 4.1

**D13588: Chain of Custody**  
**Page 1 of 2**



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D13588 Client: HRL Immediate Client Services Action Required: No  
Date / Time Received: 5/25/2010 9:00:00 AM No. Coolers: 1 Client Service Action Required at Login: No  
Project: BURCKLE A PAD Airbill #'s: fedx

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

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

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

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

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

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

Comments

Accutest Laboratories  
V:(303) 425-6021

4036 Youngfield Street  
F: (303) 425-6854

Wheat Ridge, CO  
www.accutest.com

**D13588: Chain of Custody**  
**Page 2 of 2**

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

Accutest Job #: D13588

**Acute1 Quote #:**

AMS P.O. #:

Project No.:

Client Information						Subcontract Laboratory Information								Analytical Information									
<b>Name</b> Accutest Mountain States (AMS)						<b>Name</b> Accutest - New England																	
<b>Address</b> 4036 Youngfield St.						<b>Address</b> 495 Technology Center West, BLDG O																	
<b>City</b> Wheat Ridge,		<b>State</b> CO		<b>Zip</b> 80033		<b>City</b> Marlborough		<b>State</b> MA		<b>Zip</b> 01752													
<b>Send Report to:</b> Tiffany Pham <b>Any questions contact:</b> Amanda Klessell						<b>Contact:</b> Sample Management Phone: (508) 481-6200																	
<b>Phone/Fax #:</b> (303) 425-6021; (303) 425-8854																							
<b>Collection</b>						<b>Preservation</b>						XCRA	EH				Comments						
<b>Field ID / Point of Collection</b>		<b>Date</b>		<b>Time</b>		<b>Matrix</b>	<b># of bottles</b>	<b>NCL</b>	<b>NaOH</b>	<b>HNO<sub>3</sub></b>	<b>H<sub>2</sub>O<sub>2</sub></b>							<b>Note</b>					
D13588 -1		5/21/10				Soil												X					
<b>Turnaround Information</b>						<b>Data Deliverable Information</b>						<b>Comments / Remarks</b>											
<input checked="" type="checkbox"/> 3 - 5 Business Day Rush <b>Approved By:</b> <input type="checkbox"/> Other _____ (Days) 10 Day Turnaround Hardcopy, RU8H is FAX Data unless previously approved.						<input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1						<input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify)						Please use Colorado regulations and RLS.  14F					
Sample Custody must be documented below each time samples change possession, including courier delivery.														For Subcontract Laboratory Use Only									
Relinquished by:				Date & Time:				Received By:				Date & Time:				Seal #: _____		Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>					
1 [Signature]				3/25/10 16:00				1 UPS				1											
Relinquished by:				Date & Time:				Received By:				Date & Time:				Preserved where applicable: <input type="checkbox"/>							
2 UPS				5/26/10 10:10				2 [Signature]				2 5/26/10 10:10											
Relinquished by:				Date & Time:				Received By:				Date & Time:				Temperature °C 3.7°		On Ice <input type="checkbox"/>					
3								3				3											

## 4.2

## D13588: Chain of Custody

Page 1 of 2

**Accutest Labs of New England, Inc.**



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D13588 Client: AMS Immediate Client Services Action Required: No  
Date / Time Received: 5/26/2010 10:10:00 AM No. Coolers: 1 Client Service Action Required at Login: No  
Project: N/A Airbll #s: N/A

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

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

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

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

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

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

Comments

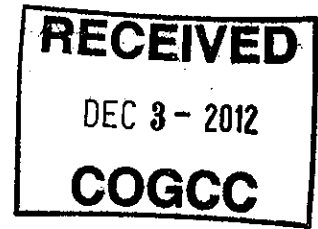
Accutest Laboratories  
V: 508.481.6200

495 Technology Center West, Bldg One  
F: 508.481.7753

Marlborough, MA  
www.accutest.com

**D13588: Chain of Custody**  
**Page 2 of 2**

August 11<sup>th</sup> 2010  
Antero Resources Piceance Corporation  
Sundry Form 4  
Attachment D

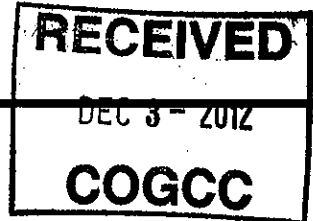


**Attachment D: E-mail**

**Cole Kilstrom**

**From:** Spry ORourke, Linda [Linda.SpryORourke@state.co.us]  
**Sent:** Thursday, May 06, 2010 11:40 AM  
**To:** Cole Kilstrom  
**Subject:** RE: Revised Burckle A Form 27

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged



Cole,

Regarding the further remediation work we discussed for the Burckle A pad, here are some answers.

Because the Area 3 location is a small location on the pad, within the berm, remediation of the pH, EC and SAR can wait until interim or final reclamation of the pad. However, as we discussed, the areas where material from the spill path were reused will need to be excavated and treated so that they meet the table 910-1 levels for TPH. A laboratory confirmation sample will be necessary after this work is completed to demonstrate compliance with Table 910-1.

Also as we discussed, a more robust background study is needed for this site to evaluate the elevated arsenic levels found on the pad and in the single background sample. The 27.7 mg/kg arsenic result from the background sample is elevated relative to what we typically see in the area. Please submit a Sundry Form 4 containing the results from this study, a map of sample locations and the analytical data supporting the study.

And, please submit a Sundry form 4 and re-transmit the analytical data you sent to me in an email 4/23/2010. I cannot get it entered into our database without the Form 4 accompanying the data. I forgot to mention this in our call.

Thanks much.

Linda Spry O'Rourke  
Environmental Protection Specialist, Northwest Region  
Colorado Oil & Gas Conservation Commission  
707 Wapiti Court  
Suite 204  
Rifle, CO 81650

(970) 625-2497 Office  
(970) 625-5682 Fax  
(970) 309-3356 Cellular  
[linda.spryorourke@state.co.us](mailto:linda.spryorourke@state.co.us)

---

**From:** Spry ORourke, Linda  
**Sent:** Tuesday, May 04, 2010 3:02 PM  
**To:** 'Cole Kilstrom'  
**Subject:** RE: Revised Burckle A Form 27

Cole,

I'm sorry I am tardy getting back to you on this. I was in training last week and out of pocket for much of the remainder.