

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

<input type="checkbox"/> Spill	<input type="checkbox"/> Complaint
<input type="checkbox"/> Inspection	<input type="checkbox"/> NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe): _____

GENERAL INFORMATION

OGCC Operator Number: 10079	Contact Name and Telephone
Name of Operator: <u>Antero Resources Piceance Corporation (Antero)</u>	Name: <u>Jerry Alberts</u>
Address: <u>1625 17th Street, Suite 300</u>	No: <u>(303) 357-7341</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	Fax: <u>(303) 357 7315</u>
API/Facility No: <u>NA</u>	County: <u>Garfield</u>
Facility Name: <u>River Ranch A Pad access road</u>	Facility Number: <u>418648</u>
Well Name: <u>NA</u>	Well Number: <u>NA</u>
Location (QtrQtr, Sec, Twp, Rng, Meridian) <u>SESE, Sec 7, T6S, R92W, 6th PM</u> Latitude: <u>39.536077</u> Longitude: <u>-107.700495</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): <u>Produced water</u>		
Site Conditions: Is location within a sensitive area (according to Rule 9C) <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation.		
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): <u>Gravel mining, irrigated</u>		
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: <u>Wann sandy loam, 1 to 3 percent slopes/Halaquepts, nearly level</u>		
Potential receptors (water wells within 1/4 mi, surface waters, etc.): <u>Groundwater seeps in the gravel pit are located approximately 150 ft west, Surface ponds associated with the gravel pit are located 1,140 ft north</u>		
Description of Impact (if previously provided, refer to that form or document):		
Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>See attached ESA</u>	<u>Soil samples were submitted for laboratory analysis</u>
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>See attached ESA</u>	<u>Groundwater samples were submitted for laboratory analysis</u>
<input checked="" type="checkbox"/> Surface water	<u>Limited to groundwater seeps</u>	<u>Visual and laboratory analysis</u>

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document)
<u>A Form 27 was submitted on 8/19/10 (Remediation #5171).</u>
Describe how source is to be removed
<u>To be determined. Antero will conduct additional assessment to determine if impacted source soils exist at the site.</u>
Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
<u>To be determined.</u>

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REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

Tracking Number: _____
Name of Operator: Antero
OGCC Operator No: 10079
Received Date: _____
Well Name & No: _____
Facility Name & No.: River Ranch A access road

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Each of the sixteen borings advanced at the site were completed as temporary groundwater monitoring wells. Following purging and development, each of the wells (except for one installed within the gravel pit) were sampled and submitted to a laboratory for analysis of BTEX by EPA Method 8260. Analytical results indicate benzene concentrations in five of the sixteen wells adjacent to the release area exceeded the Table 910-1 concentration level. Ethylbenzene and total xylenes concentrations for two of the same wells also exceeded the Table 910-1 concentration levels. Since BTEX concentrations in each of the other wells were in compliance with the Table 910-1 concentration levels, Antero believes the extent of groundwater impact has been defined (see attached ESA report). The temporary wells will be converted to permanent monitoring points as necessary and will be sampled on a quarterly basis until four consecutive quarters of BTEX concentrations in groundwater are in compliance with Table 910-1 concentration levels.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

NA

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

Based on the ESA conducted at the site, the extent of groundwater impact has been defined. Soil impacts were not encountered in any of the soil borings installed during site assessment activities; however, to ensure mitigation of potential, additional leaching of contaminants to the aquifer, Antero is proposing sampling the soil beneath the pipeline. Antero was not able to characterize soils close to the pipeline during the site assessment due to an open excavation and subsurface utilities. Sampling below the pipeline excavation will determine if there is impacted soil above COGCC Standards that will continue to release hydrocarbons to groundwater and extend the remediation process. Antero will sample the soil below the pipeline for BTEX and TPH. Antero will also re-sample select groundwater monitoring wells and analyze for BTEX to determine if the magnitude of the plume is stable or in flux. Recent analytical results from routine sampling at the seeps exhibit a decreasing trend in hydrocarbon concentrations. The new soil and groundwater data will be crucial in helping Antero understand the changes in plume magnitude, extent, and the site conceptual model, which will lead to a more efficient/successful remedial program. After the additional assessment of impacted soil and water, Antero will submit a revised Form 27 to propose the remediation strategy going forward.

During this additional investigation, Antero will continue to monitor the seeps as previously agreed upon with the COGCC and landowners.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Not applicable.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	<u>7/27/10</u>	Date Site Investigation Completed:	<u>TBD</u>	Remediation Plan Submitted:	<u>9/30/10</u>
Remediation Start Date:	<u>TBD</u>	Anticipated Completion Date:	<u>TBD</u>	Actual Completion Date:	<u>TBD</u>

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

Print Name Jerry Alberts

Signed: _____

Title: _____

Date: 9/30/10

OGCC Approved: _____ Title: _____

Date: _____