

Kubeczko, Dave

From: Kubeczko, Dave
Sent: Friday, March 18, 2011 11:39 AM
To: Kubeczko, Dave
Subject: FW: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review
Attachments: Monument Ridge_COA list_Antero Revisions (3-15-11).docx

Scan No 2033647 CORRESPONDENCE 2A#400097171

From: Hannah Knopping [mailto:hknopping@anteroresources.com]
Sent: Tuesday, March 15, 2011 5:23 PM
To: Kubeczko, Dave
Subject: RE: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hi Dave,

Antero has reviewed the additional Conditions of Approval which you provided to us for review/ comment on 3/7/2011. Please find attached an Antero-revised COA list. We respectfully request that the COGCC consider the use of the **revised** COA list that we have attached.

Please let us know if you have any questions.

Thanks,

Hannah Knopping
Permit Representative
Antero Resources Corporation
1625 17th Street
Denver, CO 80202
Office: (303) 357-6412
Cell: (720) 985-6647

MONUMENT RIDGE PAD (Form 2A; Document # 400097171)
ADDITIONAL PROPOSED COA'S RECEIVED FROM COGCC ON 3/7/11
***Reviewed and Revised by Antero Resources on 3/15/2011**

1. **Residential:** The following conditions of approval (COAs) will apply:

COA R1 - Operator will implement sufficient public notification of proposed oil and gas activities, including: (1) provide ~~30-day~~advance notice and community awareness to neighborhood ~~through monthly Battlement Mesa Oil and meet with the neighborhood residents~~Gas Committee meetings regarding schedule and activities, include local emergency response agencies (Fire/Police); ~~(2) posting schedule changes at a location convenient to residents, as well as notifying local emergency response agencies (Fire/Police) of schedule changes; and (3) notify all homes within a ¼-mile radius and~~ (2) notify local emergency responders (Fire/Police) 7 days prior to mobilization in, rig up (MIRU); ~~(3) significant schedule changes will be communicated to the community at aforementioned meetings via attendance or emails to the Committee.~~

COA R2 - Notify the local emergency responders (Fire/Police), COGCC Oil and Gas Location Assessment (OGLA) Specialist for Western Colorado (Dave Kubeczko; email dave.kubeczko@state.co.us), and the COGCC Field Inspection Supervisor for Northwest Colorado (Shaun Kellerby; email shaun.kellerby@state.co.us) 48 hours prior to location construction and 24 hours prior to MIRU.

COA R3 - Operator will review local governmental requirements for access from public roads. At a minimum the following traffic requirements will apply: (1) ~~a traffic control plan~~operator will be in place; ~~(2) work with the Garfield County Road and Bridge Department to review and establish designated haul routes;~~ (2) designate haul routes to avoid school zones ~~(3) additional signage on major and/or local roads will be employed to warn the public of increased truck traffic where practicable;~~ (3) all oil and gas related construction, drilling, and operational traffic shall access the location from a single point; (4) designate haul routes to avoid school zones; (5) ~~no oil and gas related traffic shall be permitted on neighborhood roads;~~ (5) schedule work to avoid peak traffic flow when practicable; (6) schedule heavy equipment movement to avoid school bus operation hours; ~~(7) provide and require safe driving training for employees and contractors; and (8) truck route entry points to avoid Battlement Mesa "front door".~~

COA R4 - Operator will prepare a job specific Emergency Management/Response Plan that ~~has been reviewed~~will be developed with input from the local emergency responders (Fire/Police). Operator will provide temporary engineering controls to prevent uncontrolled public access during drilling and completion activities. Site security shall include, but not be limited to, appointing a Health and Safety Officer that will insure the Emergency Management/Response Plan is adhered to and who is authorized to shut down operations at any time when health and safety risk is present.

COA R5 - Temporary perimeter sound walls (consisting of ~~a combination of~~ earthen berms, stacked hay bales; and/or metal, synthetic or wood sheeting) shall be used on the west, north, and east perimeters of the ~~well pad~~ location during ~~construction~~, drilling and completion activities to provide noise relief to nearby residents. Operator shall conduct noise monitoring as described in 802.c. at a minimum once during each phase of activity (pad construction, drilling, completion and production), and ~~submit the results~~make data available to the Director upon request. The COGCC may require additional noise mitigation if measures taken are deemed insufficient.

Field Code Changed

Field Code Changed

COA R6 - Operator will ~~take aggressive action to establish vegetation on~~ stabilize cut and fill slopes to prevent ~~sediment discharges from~~ storm water ~~erosion runoff~~ and the generation of fugitive dust. ~~Operator shall install and maintain permanent vegetative visual buffering on the west and east sides in conjunction with interim reclamation.~~ Visual mitigation shall also include the use of low profile tanks. Interim reclamation will commence immediately upon conclusion of ~~completion operations.~~ pad development.

COA R7 - Lighting abatement measures beyond the requirements of Rule 803. shall be implemented, including the following, at a minimum: (1) rig oriented to direct light away from nearby residents; (2) install lighting shield devices on all of the more conspicuous lights; (3) low density sodium lighting; ~~and (4) rig shrouded on the west and east sides.~~

COA R8 - Air quality and odor controls will be implemented and will include the following: (1) ~~Emissions from production tank venting will be routed to a VOC combustor and VOC combustors will operate with an auto-igniter;~~ (2) ~~a low emissions flowback process will be used which includes routing the~~ flowback stream to ~~be routed from wellhead to a "four-phase" a separator and then to a sealed flowback tank, with (green completion skid). From this vessel, salable gas will be routed to a gas sales line and the non-salable gas sent, when practicable, will be routed to a temporary flare or VOC combustor;~~ (2) oil or condensate captured during separation process will be sent to a tank equipped with emissions controls ~~(see COA R10); an automatic igniter;~~ (3) frac/flowback storage tank hatches ~~should~~ will be closed and latched until the tanks are prepared to receive flowback water, then ~~the~~ hatches ~~should~~ will be closed but unlatched when receiving flowback fluids, ~~and then operate with;~~ (4) ~~frac/flowback storage tanks will be equipped with~~ hydrocarbon absorbing blankets when full to control odors; (4) ~~daily odor monitoring should be conducted during well completions using a Nasal Ranger to monitor compliance with detectable odor limits in Colorado Regulation 2, documentation of such monitoring shall be submitted to COGCC;~~ and (5) maintain a portable meteorological weather station during well drilling and completion operations, that includes a data logger to archive wind speed/direction; ~~and~~ temperature, and humidity with information provided to COGCC and CDPHE. ~~make related data available to Director upon request.~~

COA R9 - Flares (such as TCI's portable flare with high combustion rate, low noise, and low visibility flare) will be utilized ~~and will have appropriate emissions controls to prevent VOCs from impacting nearby residents in harmful concentrations.~~

COA R10 - Emissions from condensate, crude oil, and produced water tanks and from glycol dehydrators shall be controlled as described in Rule 805.b.(2), not withstanding the exceptions for production facilities emitting less than five tons per year (TPY) of volatile organic compounds (VOC).

COA R11 - Access roads to well sites, completion staging sites and production facilities shall be constructed to meet the requirements of emergency responders, including all weather surface.

COA R12 - Land-farming of E&P waste is prohibited on the location. This shall not preclude onsite disposal of E&P waste in accordance with COGCC Rules and permit conditions.

2. **Water Resources:** The following condition of approval (COA) will also apply:

COA WQ1 - Water Testing: ~~Prior to drilling operator shall sample the two (2) closest domestic water wells, springs, or surface water features within a one (1) mile radius of the proposed oil and gas location. Testing preference shall be given to domestic water wells and springs over surface water. Testing of surface water features shall only be conducted if two (2) water wells or springs do not exist within a one (1) mile radius of the selected oil and gas~~

location. If possible, the water wells or springs selected should be on opposite sides of the oil and gas location not exceeding a one (1) mile radius. If water wells or springs on opposite sides of the oil and gas location cannot be identified, then the two (2) closest wells or springs within a one (1) mile radius of the oil and gas location shall be sampled. The sample location shall be surveyed in accordance with Rule 215.

WQ1.a. Prior to drilling, operator shall test all water wells within ½ mile radius of the surface-hole location from each well on a well pad location and will consider testing springs within ½ mile radius upon landowner request. Within one year or after all wells have been drilled and completed on a well pad location, a post/follow-up test will be performed on all water wells/springs that were tested prior to drilling.

WQ1.b. Initial baseline testing shall include laboratory analysis of all major cations and anions, total dissolved solids, iron and manganese, nutrients (nitrates, nitrites, selenium), dissolved methane, pH, specific conductance, and benzene, toluene, ethylbenzene, and xylenes ("BTEX"). Sampling shall be performed by qualified individuals using methods consistent with commonly accepted environmental sampling procedures. Field observations such as pH, temperature, specific conductance, odor, water color, sediment, bubbles, and effervescence shall also be included.

~~After 90 days, but less than 180 days of completion of the first proposed well a "post-completion" test shall be performed for the same analytical parameters listed above and repeated one (1), three (3) and six (6) years thereafter. If no significant changes from the baseline have been identified after the third test (i.e. the six-year test), no further testing shall be required. Additional "post-completion" test(s) may be required if changes in water quality are identified during follow-up testing. The Director may require further water well sampling at any time in response to complaints from water well owners.~~

~~If free gas or a methane concentration level greater than 1 mg/l is detected in a water quality testing well, gas compositional analysis, and stable isotopes of both the carbon and hydrogen isotopes of methane shall be performed to determine gas type (thermogenic, biogenic or a mixture).~~

Copies of all test results analytical data described above shall be provided to the Director and the landowner where the water quality testing well is located ~~within three (3) months of collecting the samples used for the test. The~~. In addition, the analytical data and surveyed well locations ~~shall also will~~ be submitted available to the Director upon request in an electronic data deliverable format.

From: Kubeczko, Dave [mailto:Dave.Kubeczko@state.co.us]
Sent: Monday, March 07, 2011 10:13 AM
To: Hannah Knopping
Subject: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hannah,

COGCC would like to attach the following additional conditions of approval (COAs) to the Monument Ridge Pad **Form 2A** (#400097171) based on the well pad's proximity to residences in the Battlement Mesa area. These COAs incorporate Best Management Practices (BMPs) that have been proposed by several operators in the area as well as from operators in other areas of the state where drilling has occurred near residences, and are directed at issues of concern when operating near communities.

1. **Residential:** The following conditions of approval (COAs) will apply:

COA R1 - Operator will implement sufficient public notification of proposed oil and gas activities, including: (1) provide 30-day notice and community awareness to neighborhood and meet with the neighborhood residents regarding schedule and activities, include local emergency response agencies (Fire/Police); (2) posting schedule changes at a location convenient to residents, as well as notifying local emergency response agencies (Fire/Police) of schedule changes; and (3) notify all homes within a ¼-mile radius and local emergency responders (Fire/Police) 7 days prior to mobilization in, rig up (MIRU);

COA R2 - Notify the local emergency responders (Fire/Police), COGCC Oil and Gas Location Assessment (OGLA) Specialist for Western Colorado (Dave Kubeczko; email dave.kubeczko@state.co.us), and the COGCC Field Inspection Supervisor for Northwest Colorado (Shaun Kellerby; email shaun.kellerby@state.co.us) 48 hours prior to location construction and 24 hours prior to MIRU.

COA R3 - Operator will review local governmental requirements for access from public roads. At a minimum the following traffic requirements will apply: (1) a traffic control plan will be in place; (2) additional signage on major and/or local roads will be employed to warn the public of increased truck traffic; (3) all oil and gas related construction, drilling, and operational traffic shall access the location from a single point; (4) designate haul routes to avoid school zones; (5) no oil and gas related traffic shall be permitted on neighborhood roads; (5) schedule work to avoid peak traffic flow; (6) schedule heavy equipment movement to avoid school bus operation hours; (7) provide and require safe driving training for employees and contractors; and (8) truck route entry points to avoid Battlement Mesa "front door".

COA R4 - Operator will prepare a job specific Emergency Management/Response Plan that has been reviewed with the local emergency responders (Fire/Police). Operator will provide temporary engineering controls to prevent uncontrolled public access during drilling and completion activities. Site security shall include, but not be limited to, appointing a Health and Safety Officer that will insure the Emergency Management/Response Plan is adhered to and who is authorized to shut down operations at any time when health and safety risk is present.

COA R5 - Temporary perimeter sound walls (consisting of a combination of earthen berms, stacked hay bales, and/or metal or wood sheeting) shall be used on the west, north, and east perimeters of the well pad location during construction, drilling and completion activities to provide noise relief to nearby residents. Operator shall conduct noise monitoring as described in 802.c. at a minimum once during each phase of activity (pad construction, drilling, completion and production), and submit the results to the Director. The COGCC may require additional noise mitigation if measures taken are deemed insufficient.

COA R6 - Operator will take aggressive action to establish vegetation on cut and fill slopes to prevent storm water erosion and the generation of fugitive dust. Operator shall install and maintain permanent vegetative visual buffering on the west and east sides in conjunction with interim reclamation. Visual mitigation shall also include the use of low profile tanks. Interim reclamation will commence immediately upon conclusion of completion operations.

COA R7 - Lighting abatement measures beyond the requirements of Rule 803. shall be implemented, including the following, at a minimum: (1) rig oriented to direct light away from nearby residents; (2) install

lighting shield devices on all of the more conspicuous lights; (3) low density sodium lighting; and (4) rig shrouded on the west and east sides.

COA R8 - Air quality and odor controls will be implemented and will include the following : (1) flowback stream to be routed from wellhead to a “four-phase” separator and then to a sealed flowback tank, with non-salable gas sent to a temporary flare or VOC combustor; (2) oil or condensate captured during separation process will be sent to a tank with emissions controls (see COA R10); (3) frac/flowback storage tank hatches should be closed and latched until the tanks are prepared to receive flowback water, then hatches should be closed but unlatched when receiving flowback fluids, and then operate with hydrocarbon absorbing blankets when full to control odors; (4) daily odor monitoring should be conducted during well completions using a Nasal Ranger to monitor compliance with detectable odor limits in Colorado Regulation 2, documentation of such monitoring shall be submitted to COGCC; and (5) maintain a portable meteorological weather station during well drilling and completion operations, that includes a data logger to archive wind speed/direction, temperature, and humidity with information provided to COGCC and CDPHE.

COA R9 - Flares (such as TCI’s portable flare with high combustion rate, low noise, and low visibility flare) will be utilized and will have appropriate emissions controls to prevent VOCs from impacting nearby residents in harmful concentrations.

COA R10 - Emissions from condensate, crude oil, and produced water tanks and from glycol dehydrators shall be controlled as described in Rule 805.b.(2), notwithstanding the exceptions for production facilities emitting less than five tons per year (TPY) of volatile organic compounds (VOC).

COA R11 - Access roads to well sites, completion staging sites and production facilities shall be constructed to meet the requirements of emergency responders, including all weather surface.

COA R12 - Land-farming of E&P waste is prohibited on the location. This shall not preclude onsite disposal of E&P waste in accordance with COGCC Rules and permit conditions.

2. **Water Resources:** The following condition of approval (COA) will also apply:

COA WQ1 - Water Testing: Prior to drilling operator shall sample the two (2) closest domestic water wells, springs, or surface water features within a one (1) mile radius of the proposed oil and gas location. Testing preference shall be given to domestic water wells and springs over surface water. Testing of surface water features shall only be conducted if two (2) water wells or springs do not exist within a one (1) mile radius of the selected oil and gas location. If possible, the water wells or springs selected should be on opposite sides of the oil and gas location not exceeding a one (1) mile radius. If water wells or springs on opposite sides of the oil and gas location cannot be identified, then the two (2) closest wells or springs within a one (1) mile radius of the oil and gas location shall be sampled. The sample location shall be surveyed in accordance with Rule 215.

Initial baseline testing shall include laboratory analysis of all major cations and anions, total dissolved solids, iron and manganese, nutrients (nitrates, nitrites, selenium), dissolved methane, pH, specific conductance, and benzene, toluene, ethylbenzene, and xylenes (“BTEX”). Sampling shall be performed by qualified individuals using methods consistent with commonly accepted environmental sampling procedures. Field observations such as pH, temperature, specific conductance, odor, water color, sediment, bubbles, and effervescence shall also be included.

After 90 days, but less than 180 days of completion of the first proposed well a “post-completion” test shall be performed for the same analytical parameters listed above and repeated one (1), three (3) and six (6) years thereafter. If no significant changes from the baseline have been identified after the third test (i.e. the six-year test), no further testing shall be required. Additional “post-completion” test(s) may be required if changes in water quality are identified during follow-up testing. The Director may require further water well sampling at any time in response to complaints from water well owners.

If free gas or a methane concentration level greater than 1 mg/l is detected in a water quality testing well, gas compositional analysis, and stable isotopes of both the carbon and hydrogen isotopes of methane shall be performed to determine gas type (thermogenic, biogenic or a mixture).

Copies of all test results described above shall be provided to the Director and the landowner where the water quality testing well is located within three (3) months of collecting the samples used for the test. The

analytical data and surveyed well locations shall also be submitted to the Director in an electronic data deliverable format.

Please review and get back to me by Wednesday as COGCC would like to approve this permit as soon as possible. If you have any questions, or would like to address these COAs with detailed site-specific Best Management Practices (BMPs) that will be attached to this permit, please do not hesitate to call me at (970) 309-2514 (cell), or email. Thanks.

Dave

David A. Kubeczko, PG
Oil and Gas Location Assessment Specialist

Colorado Oil & Gas Conservation Commission
Northwest Area Office
707 Wapiti Court, Suite 204
Rifle, CO 81650
Phone: (970) 625-2497x5
FAX: (970) 625-5682
Cell: (970) 309-2514
dave.kubeczko@state.co.us



 *Please consider the environment before printing this e-mail*

From: Hannah Knopping [mailto:hknopping@anteroresources.com]
Sent: Tuesday, February 22, 2011 5:16 PM
To: Kubeczko, Dave
Subject: RE: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hi Dave,

I apologize for the delay in responding to the proposed COA's for the 3 Battlement Mesa pads (Monument Ridge Pad, Speakman A and Speakman B Pad). Antero requests that **COA R4 be removed** from the COA lists. We had discussed providing a site specific BMP list for this pad, however our current position is to remove the COA altogether. This is due to the fact that the BOCC has also intervened on Encana's Cook Martin pad and for consistency's sake we would like to have similar COA's as are being contemplated for Encana's pad. We do, however, concur with the other proposed COA's listed below.

Let me know if you have any questions.

Thanks,

Hannah Knopping
Permit Representative
Antero Resources Corporation

1625 17th Street
Denver, CO 80202
Office: (303) 357-6412
Cell: (720) 985-6647

From: Kubeczko, Dave [mailto:Dave.Kubeczko@state.co.us]
Sent: Monday, December 20, 2010 5:22 PM
To: Hannah Knopping
Subject: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hannah,

I have been re-reviewing the Monument Ridge Pad **Form 2A** (#400097171). COGCC would like to attach the following additional conditions of approval (COAs) based on the information and the data Antero has submitted on or attached to the Form 2A prior to passing the Oil and Gas Location Assessment (OGLA) review.

3. **General:** The following conditions of approval (COAs) will also apply:
 - COA 91** - Notify COGCC Oil and Gas Location Assessment (OGLA) Specialist for Western Colorado (Dave Kubeczko; email dave.kubeczko@state.co.us; phone 970-309-2514) 48 hours prior to start of construction.
 - COA 25** - Flowback and stimulation fluids must be sent to tanks to allow the sand to settle out before the fluids can be placed into any pipeline or pit located on the well pad. The flowback and stimulation fluid tanks must be placed on the well pad in an area with additional downgradient perimeter berming. The area where flowback fluids will be stored/reused must be constructed to be sufficiently impervious to contain any spilled or released material (per Rule 604.a.(4)). In addition, operator must implement odor controls during fracing operations.
 - COA 26** - Notify COGCC Oil and Gas Location Assessment (OGLA) Specialist for Western Colorado (Dave Kubeczko; email dave.kubeczko@state.co.us; phone 970-309-2514) 48 hours prior to start of fracing operations.
4. **Residential:** The following conditions of approval (COAs) will also apply:
 - COA R1** - Provide temporary engineering controls to prevent uncontrolled public access during drilling and completion activities. Operator shall create a job specific Emergency Management Plan that has been reviewed with the local emergency responders. Site security shall include, but not be limited to, appointing a Health and Safety Officer that will insure the Emergency Management Plan is adhered to and who is authorized to shut down operations at any time when health and safety risk is present.
 - COA R2** - Provide temporary engineering controls to mitigate visual impacts and nuisance noise to nearby residences.
 - COA R3** - Visual mitigation shall be used on production equipment and may consist of: low profile tanks, appropriate tank and production equipment color palette, vegetative visual buffer, and/or other visual buffering.
 - COA R4** - All other BMPs and mitigation measures outlined in "Antero Resources' Mitigation Strategies and Best Management Practices, Battlement Mesa Area, November 15, 2010" (see attachment) must be followed and implemented.

COGCC would appreciate your concurrence with attaching these additional COAs (items 1 and 2) to the Form 2A permit prior to passing the OGLA review. If you have any questions, please do not hesitate to call me at (970) 309-2514 (cell), or email. Thanks.

Dave

From: Hannah Knopping [<mailto:hknopping@anteroresources.com>]

Sent: Wednesday, November 03, 2010 9:26 AM

To: Kubeczko, Dave

Subject: RE: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hi Dave,

Antero does concur with the conditions of approval listed below, including the reworded COA 25, for the **Monument Ridge Pad**.

Thanks,

Hannah Knopping

Permit Representative

Antero Resources Corporation

1625 17th Street

Denver, CO 80202

Office: (303) 357-6412

Cell: (720) 985-6647

From: Kubeczko, Dave [<mailto:Dave.Kubeczko@state.co.us>]

Sent: Tuesday, November 02, 2010 6:03 PM

To: Hannah Knopping

Subject: RE: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hannah,

I have reworded COA 25 as follows:

COA 25 - Flowback to tanks only. Flowback and stimulation fluids shall be contained within tanks that are placed on the well pad in an area with additional downgradient perimeter berming. In addition, operator must implement odor controls during fracing operations.

Thanks.

Dave

David A. Kubeczko, PG

Oil and Gas Location Assessment Specialist

Colorado Oil & Gas Conservation Commission

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Rifle, CO 81650

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dave.kubeczko@state.co.us



 *Please consider the environment before printing this e-mail*

From: Hannah Knopping [<mailto:hknopping@anteroresources.com>]
Sent: Tuesday, November 02, 2010 3:19 PM
To: Kubeczko, Dave
Subject: RE: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hi Dave,

I think our Environmental Department will be fine with these, but can you let me know what is triggering COA 25 (tertiary containment) just so I can relay that to them?

Thanks,

Hannah Knopping
Permit Representative
Antero Resources Corporation
1625 17th Street
Denver, CO 80202
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Cell: (720) 985-6647

From: Kubeczko, Dave [<mailto:Dave.Kubeczko@state.co.us>]
Sent: Saturday, October 30, 2010 11:29 AM
To: Hannah Knopping
Subject: Antero Resources, Monument Ridge Pad, SESE Sec 18 T7S R95W, Garfield County, Form 2A (#400097171) Review

Hannah,

I have been reviewing the Monument Ridge Pad **Form 2A** (#400097171). COGCC COGCC would like to attach the following conditions of approval (COAs) based on the information and the data Antero has submitted on or attached to the Form 2A prior to passing the Oil and Gas Location Assessment (OGLA) review.

Water Resources (Section 14): Form 2A indicates the distance to the nearest surface water is 568 feet. COGCC guidelines require designating all locations within close proximity to surface water a **sensitive area**. The following conditions of approval (COAs) will apply:

COA 4 - Location is in a sensitive area because of its proximity to surface water; therefore, operator must ensure 110 percent secondary containment for any volume of fluids contained at well site during drilling and completion operations; including, but not limited to, construction of a berm or diversion dike, diversion/collection trenches within and/or outside of berms/dikes, site grading, or other comparable measures (i.e., BMPs associated with stormwater management) sufficiently protective of nearby surface water. If fluids are conveyed via pipeline, operator must implement best management practices to contain any unintentional release of fluids.

COA 5 - Operator must implement best management practices to contain any unintentional release of fluids.

Water Resources (Section 14): Form 2A indicates the depth to groundwater to be 77 feet bgs for a well located 595 feet from the proposed well pad. COGCC guidelines require designating all locations with close proximity of a domestic water well (1/8 mile or 660 feet) a **sensitive area**. The following conditions of approval (COA) will apply:

COA 7 - Location is in a sensitive area because of proximity to a domestic water well and potential for shallow groundwater; therefore either a lined drilling pit or closed loop system (which Antero has already indicated on the Form 2A) must be implemented.

COA 8 - Location is in a sensitive area because of proximity to a domestic water well and potential for shallow groundwater; therefore production pits must be lined.

General: The following conditions of approval (COAs) will also apply:

COA 6 - Reserve pit (if constructed) must be lined or a closed loop system (which has already been indicated by Antero on the Form 2A) must be implemented during drilling; however, Antero will be using a closed loop drilling system, therefore, a reserve pit will not be constructed.

COA 25 - Flowback to tanks only. Operator must submit a secondary and tertiary containment plan via sundry notice Form 4 for the tanks to Dave Kubeczko. In addition, operator must implement odor controls during fracing operations.

COA 38 - The moisture content of any drill cuttings in a cuttings pit, trench, or pile shall be as low as practicable to prevent accumulation of liquids greater than de minimis amounts. At the time of closure, the drill cuttings must also meet the applicable standards of table 910-1.

COA 39 - No portion of any pit that will be used to hold liquids shall be constructed on fill material, unless the pit and fill slope are designed and certified by a professional engineer, subject to review and approval by the director prior to construction of the pit. The construction and lining of the pit shall be supervised by a professional engineer or their agent. The entire base of the pit must be in cut.

COA 46 - The surface soils and materials are fine-grained and highly unconsolidated; therefore the pad shall be constructed as quickly as possible and appropriate BMPs need to be in place both during, after well pad construction completion, as well as during all drilling and well completion operations. Standard stormwater BMPs must be implemented at this location to insure compliance with CDPHE and COGCC requirements and to prevent any stormwater run-on and /or stormwater runoff.

COGCC would appreciate your concurrence with attaching these COAs (items 1, 2, and 3) to the Form 2A permit prior to passing the OGLA review. If you have any questions, please do not hesitate to call me at (970) 309-2514 (cell), or email. Thanks.

Dave

David A. Kubeczko, PG
Oil and Gas Location Assessment Specialist

Colorado Oil & Gas Conservation Commission
Northwest Area Office
707 Wapiti Court, Suite 204
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David A. Kubeczko, PG

Oil and Gas Location Assessment Specialist

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