BMC B Pad
Form 2A - Attachment M
Proposed Best Management Practices and Applicant Committed Measures

Revised 9/2/2016

Operator BMP #	Rule Reference / Citation	Ursa BMP
	PLANNING	
	BEST MANAGEMENT PRACTICES	
1	**Garfield County COA #23 - Development timing**	• Ursa agrees and commits to a three year time frame which includes placing up to 24 natural gas wells into full production on the BMC B pad. This time frame will commence at the start of construction of a well pad.
	APPLICANT COMMITTED MEASURES	
2	**604.c.(2)W. - Site-specific measures**	• Ursa has incorporated the mitigation requirements identified in COGCC Rule 604 as applicable on a site-specific basis into its Operations Checklists, voluntary and mandatory Site Inspections and Environmental Programs plans, status monitoring, policies and procedures. The BMPs and Applicant Committed Measures outlined in this BMP document have been tailored to the BMC B pad location and specific concerns therein. Please note, no additional mitigation measures were discussed or are being proposed as a result of a Rule 306 consultation.
3		• The best management practices (BMPs) and other applicant committed measures incorporated herein also considered other Federal, state and county agency requirements and guidance, including those under the jurisdiction of the Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (ACOE), Federal Emergency Management Agency (FEMA), Colorado Department of Public Health and Environmental (CDPHE), Colorado Parks and Wildlife (CPW), and Garfield County (GARCO), among others.
4		• Prior to initiation of the Form 2A permitting process, internal onsites are held to determine the feasibility of the location (based on the SUA and landowner preferences), topographic constraints, proximity to building units, and public and environmental concerns including surface waters, traffic/haul routes, 317B applicability, wildlife RSOs and SWH areas, noise potential, soil stability, etc.
5		• Planning and permitting information relevant to the location based on Federal, state and county regulations, guidance and policies is documented as appropriate in Ursa's internal "Site Assessment Checklist/Map" tool.
6		• Ursa has developed and implemented processes and systems to track all agency inspections and concerns (e.g. COGCC, CDPHE, BLM…). Corrective actions are typically implemented with 24 hours of discovery.
7		• Ursa will comply with CDPHE regulations regarding air permits, including the application for general permits, including compliance monitoring. In addition, Ursa is required to track, monitor and report Greenhouse Gas (GHG) emissions to EPA. All air sources will be assigned AIRS ID numbers and tracked for compliance and reporting purposes.
8		• Upon approval of the Form 2A, Ursa holds Pre-Construction, Pre-Spud, Pre-Completions and Pre-Production meetings with contractors performing work at the location as determined necessary by the responsible Ursa Operations Manager or Supervisor. Additionally, Ursa has developed checklists for these meetings to review COAs, NTOs and related issues.
9		• Ursa will implement corrective actions necessary in response to all Federal and state agency inspections in a timely manner. Inspections resulting in the potential for immediate or significant environmental impacts will be addressed immediately, subject to safety and weather considerations.
10		• Ursa conducts voluntary inspections and corrective actions of all locations at least monthly using a self-implemented checklist of key actions (including environmental) that require compliance with COGCC, Federal, and other state and county requirements.
11		• Ursa will comply with CDPHE regulations regarding air permitting, compliance monitoring, inspections and reporting. All air sources will be assigned AIRS ID numbers by the CDPHE and tracked for compliance and reporting purposes. In addition, Ursa is required to track, monitor and report Greenhouse Gas (GHG) emissions to EPA annually.
12		• Safety requirements and buffers as required by the COGCC 602, 603, and 606A and 606B Series Rules, among others, and the Office of Safety and Health Administration (OSHA) will be observed at all time. Daily safety briefings and Job Safety Assessments (JSA's) are routinely conducted in all phases of operations. In addition, Ursa employees a full-time safety manager to oversee all field contractors.
	COMMUNITY OUTREACH AND NOTIFICATION	
	BEST MANAGEMENT PRACTICES	
13	**Complaints**	• Ursa has a dedicated phone line to address complaints and responds 24 hours per day, 7 days a week. All complaints received by Ursa are documented, investigated, responded to immediately with appropriate corrective actions and communicated to the complainant, landowner, county LGD and appropriate state agency officials. Coordination with Kirby Wynn, Garfield County LGD, will be ongoing to ensure the effectiveness of our complaint management process. The following phone numbers and websites are available to the community members to report complaints: - Ursa complaint / 24 hr hotline: 970-620-2787 - Ursa emergency / 24 hotline: 855-625-9922 - Community Counts: 866-442-9034 - Garfield County (Kirby Wynn): 970-987-2557 - Colorado Oil & Gas Conservation Commission: http://cogcc.state.co.us/complaints.html#/complaints
	APPLICANT COMMITTED MEASURES	
14	**305.a.(1) - Pre-application Notifications**	• Once the Form 2A permitting process was initiated the LGD was notified by letter with an invitation to meet or discuss the proposal (certification attached). Communication with Kirby Wynn and municipal LGDs are also held routinely in addition to communication required by COGCC regulations. Please note that this location was negotiated under the 2009 SUA with Battlement Mesa Partners, LLC, which is prior to the Aug 2013; and therefore qualifies for exemption from the setback (hence UMA) rules per 604.b.(2) and 604.a. However, Ursa has voluntarily elected to follow the notification requirements under the 300 and 604.c. rules for setback locations.
15	**305.a.(2) - Pre-application Notifications**	• Once the Form 2A permitting process was initiated all surface owners and owners of building units within 1000 feet of the location were notified by letter with an invitation to meet or discuss the proposal (certification attached).
16	**305.h. - Buffer Zone Move-in, Rig-up Notice**	• Unless waived, Notice to all Building Unit owners will be sent at least 30 days, but no more than 90 days within the 1000' Buffer Zone prior to the Move-In, Rig-Up of the drilling rig when more than 1 year has elapsed since previous notice or since drilling activity last occurred, or if no notice had previously been required in accordance with the COGCC MIRU policy.
17		• Ursa has voluntarily conducted a series of six (6) stakeholder meetings between June 2015 and December 2015 which focused on development of this and other locations within the Battlement Mesa PUD. Approximately 50 community citizens and 25 oil and gas contractors and employees attended these meetings. All meetings were recorded and published on a website made available to the public. The meetings covered all operations phases, potential impacts, and proposed BMPs. Mass mailings and newspaper articles and notices were published on a voluntary basis and also in accordance with Garfield County noticing requirements.
18		• Ursa routinely communicates proposed plans and operations schedules with Community Counts, the GARCO Energy Advisory Board, and Battlement Mesa Concerned Citizens (BMCC), if the proposal or work may affect Battlement Mesa. In addition, periodic stakeholder meetings are held with landowners and affected parties.
19		• An SUA has been signed with the landowner allowing this location to be constructed, drilled and operated in accordance with the Form 2A submitted.
20		• Unless waivers are received from surface and building unit owners regarding COGCC required notifications to include: Pre-application notifications, statutory notifications, drilling and completions notifications, Ursa will complete the notifications in accordance with COGCC regulations.
21		• Ursa typically holds weekly meetings to address new, expanded, or additional wells at Oil and Gas locations. Once a location is determined feasible, Ursa's land department contacts the landowner to get an initial approval, prior to formal Pre-application notifications to all affected stakeholders.
	TRAFFIC CONTROL	
	BEST MANAGEMENT PRACTICES	

Operator BMP #	Rule Reference / Citation	Ursa BMP
22	**604.c.(2)D. - Traffic Plan** **Garfield County COA #24 - Haul Route**	• In consultation with Garfield County and the local emergency response agencies (Fire/police), Ursa has developed a site-specific Emergency Response Plan and Haul Route Map which is communicated to local emergency response agencies and stakeholders, as well as contractors performing work at the location. The preferred/primary haul route for this location is the Upper Route (I-70 exit 75). The Lower Route (I-70 exit 72). shall be a secondary route.
	PRE-CONSTRUCTION	
	BEST MANAGEMENT PRACTICES	
23	**604.c.(2)N. - Control of fire hazards** **604.c.(4)B.i. - Control of fire hazards**	• All production and injection equipment will be grounded to prevent lightning strike hazards. Injection tanks will be low-profile tanks of steel construction to allow for more effective grounding than standard fiberglass produced water tanks. Systems including VOC combustors and emission controls will be installed on all tanks to capture potentially flammable vapors and therefore reduce fire hazards in the event of a lightning strike or other unintended ignition source. As required by Rule, any material not in use that might constitute a fire hazard will be removed a minimum of 25 feet from the wellheads and production equipment.
	APPLICANT COMMITTED MEASURES	
24	**317B.d.(5) - Public Water Supply**	• The BMC B pad location falls within a the intermediate buffer zone of 317B Public Water Supply area in relation to the Colorado River. 317B Public Water Supply Notifications were completed 12/21/15 to the Town of Parachute. Water sampling will be completed prior to construction. Post baseline sampling will be conducted within the timeframes established under the COGCC rules.
25		• Ursa completed a floodplain assessment and found that this location did not meet criteria to be designated within the 100 year floodplain.
26		• For safety purposes, the location and site layout has been designed to accommodate all operations, including drilling and completions, within the limits of disturbance while meeting Federal and state safety regulations, including required buffers and distances between operating components and combustion sources in accordance with COGCC Section 600 Rules.
	CONSTRUCTION	
	BEST MANAGEMENT PRACTICES	
27	**Garfield County COA #9 - Construction**	• The construction of the BMC B Pad shall be limited to the hours of 7:00AM to 7:00PM, with the exception of emergencies and episodic events beyond Ursa's control.
37	**Garfield County COA #15 - Water well sampling** **317B.d.(4)**	• Ursa will install at least one up-gradient and two down-gradient groundwater piezometer monitoring wells at the B Pad location. Ursa will conduct baseline sampling in accordance with Rule 317B.d.(4). Ursa will conduct monthly monitoring of the well site groundwater wells for the parameters specified in Rule 317B.d.(4) during well drilling and completion activities, followed by annual monitoring for the duration of the project.
82	**317B.d.(2)**	• In addition to steel-reinforced, lined secondary containment for production tanks at 150% of capacity, tertiary containment with a holding capacity 100% of production tank fluids will be installed on the north side of the proposed pad location as this pad falls within the intermediate buffer of a 317B area. The containment will be designed to shed stormwater away from the tertiary containment, as has been approved by COGCC on other Ursa locations. Inspections of the secondary and tertiary containment will be conducted in accordance with COGCC regulations, and Ursa's EPA Spill Prevention and Control plan, typically on a monthly basis.
28	**604.c.(2)E.i. - Multi-well Pads** **604.c.(2)V. - Development from existing well pads**	• Drilling multiple wells from the BMC B pad location using directional drilling will be implemented to minimize the need for additional well pads; reducing potential environmental impacts including habitat loss and fragmentation, noise, traffic concerns, and related impacts to air, land and water. There are no existing Ursa pads nor available shared locations with other operators to access the targeted bottom hole locations. The initial plan by Antero consisted of 14 well pads to access the minerals beneath the BMPUD which will now be accessed by consolidating the wells on 5 total pads within the BMPUD, including the BMC B Pad.
29	**604.c.(2)E.ii. - Multi-well Pads**	• This pad is planned to be constructed to allow for the installation and removal of Ursa's proposed sound mitigation measures (i.e. sound walls) without disturbing the location or proposed landscaping.
30	**604.c.(2)E.iii. - Multi-well Pads**	• Access road will be maintained as an all-weather access route for operator and emergency response. Accumulations of snow that prevent or limit access to the location will be removed within 24 hours or as soon as conditions allow after a weather event. The road will be timely maintained to prevent ruts, potholes and other damage.
31	**604.c.(3)B.i.-iv. - Berm construction (Exception Zone)** **317B.d.(3)**	• All containment is constructed of steel rings with an engineered imperverous liner and are sized to hold 150% of the volume of the largest single tank in the secondary containment. No more than 2 oil tanks will be located within a berm.
32	**604.c.(2)M. - Fencing requirements**	• Fencing will be installed per the surface use agreement and shall be designed and maintained to prevent unauthorized access to the site during production operations.
33	**604.c.(2)R. - Tank specifications**	• All production tanks and tanks used for completions activities will be installed, labeled, contained, operated, and decommissioned in accordance with NFPA Code 30 (2008 Revision) and Ursa's SPCC/Containment Plan, which is required by EPA regulations (40 CFR 112). The plan, in combination with Ursa's Spill Prevention and Management plan, addresses COGCC 600 and 900 Series Rules, among others, regarding the management of tanks. Records will be maintained in accordance with Rule 604.c.(2)R.
34	**604.c.(4)B.iii. - Automated well shut-in control**	• All wells on the BMC B pad will be equipped with remote monitoring / telemetry system setup to allow for automated shut-in controls in the event of an emergency.
35	**604.c.(4)C.iii. - Visual Impacts**	• Above-ground facilities (e.g. production tanks) will be managed to minimize visual effects (e.g. painted to blend with environment).
36	**Garfield County COA #10 - Flowlines**	• Ursa will utilize only welded and flanged connections for all buried flowlines. Ursa will bed and partially backfill flowlines on the pad with non-native backfill to eliminate the corrosive soil concern. Ursa will line all flowline trenches with either a bentonite liner at least 6 inches in depth, a geosynthetic clay liner (GCL) or a barrier / leak detection alternative that provides equivalent protection of groundwater. The liner will be placed below the bedding material. Flowlines will be tested annually in accordance with permit COAs and COGCC 1100 series rules.
	APPLICANT COMMITTED MEASURES	
38		• In order to keep community impact and surface disturbance to a minimum, new water pipeline infrastructure will be installed concurrently with the gas pipeline infrastructure where possible.
39		• This location will be constructed and maintained in accordance with COGCC 1002 Rules regarding soil and stormwater management and surface disturbance minimization as incorporated into Ursa's plans, policies and procedures.
83		• Ursa will anchor production equipment and will construct containment in accordance with Rule 603g. and h.
	DRILLING / COMPLETION OPERATIONS	
	BEST MANAGEMENT PRACTICES	
40	**Garfield County COA #8 - Lighting**	• All lighting, except as demonstrated for safety reasons, shall be directed inward and downward and be shaded in order to prevent direct reflection on adjacent property and residences in the area. LED lights will be used when possible and practical. Workers will be advised when moving light plants to ensure that the light is focused directly on the work being done. Most lighting will be below the sound wall. Drilling mast lighting that is above the sound wall will be downcast and/or shielded to reduce fugitive light outside sound wall and well pad. Safety considerations will take precedence.
41	**Garfield County COA #9 - Completions**	• Well completion activity shall be limited to occurring between 7:00AM and 7:00PM. Once the wells are in production, vehicle trips to the pad shall be limited to the hours of 7:00AM to 7:00PM, with the exception of emergencies and episodic events beyond Ursa's control.
42	**604.c.(2)B.i. - Closed Loop Drilling Systems – Pit Restrictions** **317B.d.(1)**	• A closed-loop (pitless) drilling system will be used.
43	**604.c.(2)B.ii-v. - Closed Loop Drilling Systems – Pit Restrictions**	• No stimulation, flowback or fresh water storage pits will be constructed for the BMC B pad location.
44	**604.c.(2)C.i. - Green Completions – Emission Control Systems**	• Green completions will be used for this well. Salable quality gas will be immediately routed to the sales line or shut in and conserved.
45	**604.c.(2)C.ii. - Green Completions – Emission Control Systems** **604.c.(4)B.iv. - Venting**	• Ursa commits to zero venting / flaring of gas upon completion and flowback of these wells except during upset or emergency conditions only. If plans change and venting / flaring during completion and flowback operations becomes necessary, Ursa will obtain COGCC approval prior to venting / flaring when required in accordance with the Venting / Flaring NTO Policy and Rule 912.a.
46	**604.c.(2)C.iii.aa. - Green Completions – Emission Control Systems**	• Flowback equipment is sized to accommodate a minimum of 1.5 times the largest flowback volume of gas experienced in a ten (10) mile radius.
47	**604.c.(2)C.iii.bb. - Green Completions – Emission Control Systems**	• Flowback tanks will employ valves and porting available to divert gas to temporary equipment or to permanent flaring and oxidizing equipment. Open flares will not be used during flowback operations.
48	**604.c.(2)C.iii.cc. - Green Completions – Emission Control Systems**	• Flowback tanks will be equipped with auxiliary fuel with sufficient supply and heat to sustain combustion or oxidation of the gas mixture when the mixture includes non-combustible gases.

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49	**604.c.(2)H.ii. - Blowout preventer equipment ("BOPE")**	• BOPE will meet minimum requirements per Rule 604.c.(2)H.ii. The person with Well Control Certification or Director approved training present during drilling will be identified using the sign-in sheet and training certifications will be available upon request by COGCC.
50	**604.c.(2)I. - BOPE testing for drilling operations**	• BOPE testing will be completed in accordance with Rule 604.c.(2)I.
51	**604.c.(2)J.i. - BOPE for well servicing operations**	• Adequate blowout prevention equipment will be used on all well servicing operations. This prevention equipment will be rated to pressures of 5000 psi.
52	**604.c.(2)J.ii. - BOPE for well servicing operations**	• Backup stabbing valves will be used on well servicing operations during reverse circulation. Valves will be pressure tested in accordance with Rule 604.c.(2)J.ii prior to being put into use. Ursa will keep valve pressure testing results on file for a minimum of one year and provide test results to COGCC upon request.
53	**604.c.(2)K. - Pit level indicators**	• Tank level indicators will be installed on all tanks associated with the drilling rig. No stimulation, flowback or freshwater storage pits will be constructed.
54	**604.c.(2)L. - Drill stem tests**	• Ursa does not plan to conduct drill stem tests. If plans change and drill stem tests are required, Ursa will notify COGCC via Form 4 prior to completing the test.
55	**604.c.(2)O. - Loadlines**	• All loadlines will be capped. The loadline ports will be located inside of the tank containment berms and will have sumps in place in the event of small drips or spills.
56	**604.c.(2)Q. - Guy line anchors**	• All guy line anchors left buried for future use will be identified as required per Rule 604.c.(2)Q.
57	**604.c.(4)B.vi. - Proppant** **Garfield County COA #27 - Proppant**	• Ursa plans to utilize "proppant-less" fracture stimulation. Should Ursa plans change to utilize silica proppant during completion of wells on the BMC B pad, silica proppant shall be utilized only with silica dust controls including dustless silos, sand boxes, or equivalent vacuum technology. Ursa will notify COGCC via Form 4 prior to using or changing proppant materials.
86	**604.c.(4)C.iv. - Remote Stimulation Operations**	• Ursa plans to utilize the BMC B pad surface area for staging of completion operations. Staging at the pad location allows for planned BMPs (i.e. soundwalls, noise monitoring, etc.) to be in place for the duration of completion operations on this location. Due to difficult surface topography in the area as well as proximity to residences in the Battlement Mesa PUD, Ursa has determined that staging the completion operations on the pad rather than a remote location will minimize surface disturbance, noise, visual impacts and traffic to the surrounding neighborhoods. We have designed site specific noise mitigation plans for the BMC B pad that are based on actual equipment, topography, typical wind direction, and closest possible affected neighbor. Additionally, we have performed voluntary ambient noise studies to better help us determine the impacts of our operations. Fracking from a remote location (i.e. the existing Watson Ranch B pad) would require a several thousand feet of temporary high pressure line, which would cross 3 major traffic thoroughfares within Battlement Mesa and would be in close proximity to homes and other sensitive areas. Remote completions from any other area would move operations closer to residences, the Colorado river, high occupancy buildings or outdoor recreational areas. After careful consideration of several alternatives, it has been determined that the preferred completion staging area remains on the pad.
	APPLICANT COMMITTED MEASURES	
58	**Garfield County COA #12 - Green Completions**	• Ursa will comply with COGCC green completion practices and EPA's natural gas STAR program to reduce VOC emissions to the lowest level technically possible for the wells on the BMC B Pad. Additionally, Ursa commits to using carbon blankets over thief hatches on temporary tanks to reduce odors.
59		• Produced / flowback water used for well completions will be recycled and treated to the maximum extent practical at the location. Water that can't be recycled will be injected through the use of wells approved by COGCC and Garfield County, or transported via truck to the COGCC and Garfield County approved Wasatch E&P Facility.
60		• All chemicals used will be tracked and reported in accordance with COGCC rules and submitted through FracFocus within 120 days of initiating well stimulation.
	DUST CONTROL	
	BEST MANAGEMENT PRACTICES	
61	**604.c.(2)S. - Access roads** **Garfield County COA # 7.c. & #14 - Dust Control**	• The pad and access road will be graveled to reduce fugitive dust and maintained as required by COGCC rules. In addition, Operator will have water trucks onsite for dust abatement during construction. Water and other dust suppressants are used as required, dependent upon the level of activity, moisture conditions, etc. throughout all phases of operations. Ursa commits to ensuring truckloads of dirt, sand, aggregate materials, drilling cuttings, and similar materials are covered to reduce dust and PM emissions during transport.
62		• Remote monitoring and telemetry will be used to optimize truck trips and reduce resultant fugitive dust to the extent practical.
	NOISE MITIGATION	
	BEST MANAGEMENT PRACTICES	
63	**Garfield County COA #7.a. - Noise** **Garfield County COA #7.b. - Vibration**	• Volume of the sound generated: Every use shall be so operated that the volume of sound inherently and recurrently generated does not exceed 70 dB(A) from 7:00 AM to 7:00 PM and 65 dB(A) from 7:00 PM to 7:00 AM, measured 350 feet from the edge of the pad. As set forth in COGCC Regulation 802(b), the noise levels shall be subject to an increase by 10 dB(A) for a period not to exceed 15 minutes in any one (1) hour period and cannot exceed 65 dB(A) for shrill or periodic impulsive noise. Complaint protocols shall be governed by COGCC Rule 802(c). Every use shall be so operated that the ground vibration inherently and recurrently generated is not perceptible, without instruments, at any point of any boundary line of the property on which the use is located.
64	**604.c.(2)A. - Noise**	• Lighting, noise, odors, dust and related nuisances are managed in accordance with COGCC 600 and 802, 803, 804 and 805 Series Rules, and in accordance with Ursa policies, procedures and checklists. Additional noise monitoring above and beyond COGCC regulations may be conducted by Ursa on a voluntary basis. If conditions warrant further mitigation at the time of operations, Ursa will request approval as necessary from the COGCC to implement additional measures.
65	**604.c.(4)C.i. - Noise** **Garfield County COA #26 - Noise** **Site Control Access**	• Sound walls will be installed per the site specific plan provided by a professional third party firm to include on-pad mitigation designed for specific equipment and orientation of said equipment to be used during drilling and completion operations. This includes a combination of 32' and 40' sound walls to surround the entire pad including and acoustic gate to close off the entrance of the pad. Sound barriers shall be included around the perimeter of the well pad and internal completions equipment. Additional sound walls closer to residential units shall be available upon mutual agreement between the Operator, landowner, and homeowner(s).
	ODOR MITIGATION	
	BEST MANAGEMENT PRACTICES	
66	**604.c.(2)C. - Green Completions – Emission Control Systems**	• Combustor controls will be used to mitigate odors from all production and injection tanks. Ursa will perform inspections at minimum on a monthly basis to ensure potential emissions sources are properly managed. In addition, Ursa's pumper crew inspects each location on a daily basis.
	APPLICANT COMMITTED MEASURES	
67	**604.c.(4)B.v. - Tank gauging**	• Automated tank level indicators will be used in an effort to avoid opening tanks to the extent practicable. Occasional opening of hatches may occur while calibrating tank gauges, maintenance or in the event of emergency.
	INTERIM RECLAMATION	
	APPLICANT COMMITTED MEASURES	
68		• The site/soils will be stabilized as soon as practical during and immediately following construction. Once wells at the location are drilled, Ursa will complete interim reclamation in accordance with the COGCC 1003 rules using seed mixes and materials compatible with soil types, moisture, and local climate conditions as specified by the appropriate agency and/or in landowner surface use agreements, or locally acceptable industry practices.•
	FINAL RECLAMATION	
	BEST MANAGEMENT PRACTICES	
69	**604.c.(2)T. - Well site cleared**	• Within 90 days of plugging and abandonment, the well site will be cleared of all non-essential equipment, trash, and debris. The location will be fully reclaimed and recontoured in accordance with COGCC Rules.
70	**604.c.(2)U. - Identification of plugged and abandoned wells**	• Upon plugging and abandonment, the location of the wellbore will be marked per Rule 319.a.(5)
	STORMWATER / EROSION CONTROL	
	APPLICANT COMMITTED MEASURES	

Operator BMP #	Rule Reference / Citation	Ursa BMP
71		• The location will be constructed / maintained in accordance with the CDPHE and COGCC 1002.f. (1) and (2) stormwater regulations as implemented by Ursa's Stormwater Management Plan, so as to control sediment and potential pollutant run-off. Stormwater BMPs will also serve as secondary or tertiary containment in the event of a spill. Site specific plans (i.e. diagrams) will be developed and inspected against at the frequency required by CDPHE regulations, to include 14 day, 30 day, and major storm event inspections until 70% reclamation is achieved. Corrective actions and maintenance will be tracked and implemented. The post-construction stormwater program will be managed in accordance with COGCC Rule 1002.f. (3). Inspections and corrective actions will be conducted through 80% interim reclamation and annually thereafter. These inspections are also tracked and corrective actions implemented. Native soils will be used whenever available to construct stormwater BMPs.
	MATERIAL HANDLING AND SPILL PREVENTION	
	BEST MANAGEMENT PRACTICES	
72	**604.c.(2)F. - Leak Detection Plan - Monitoring**	• TANK MONITORING - Fluid Monitoring in tanks will be achieved through high level alarms installed in each tank with floating tank level gauges. These gauges report remotely tank volumes via telemetry. This telemetry allows pumpers to have real time access to information and review levels on a daily basis. Pumpers also have the ability to program the wells to be shut in automatically in the event of pressure loss. Reference Ursa's Leak Detection and Flowline Management plan for specifics on inspections, testing, documentation, etc. • FLOWLINE TESTING / MONITORING - will be tested per COGCC 1100 regulations/1101 and 1102 guidance document Updated February 25, 2016. - New flowlines will be hydrotested to manufactures recommended levels before put in to use. - Ursa will use SCADA to continuously monitor line pressures. Any fluctuations or drops in pressures that indicate a drop or rise in pressure will be closely monitored and will trigger immediate action including shutting in and scheduling repairs/replacements as necessary.
73	**604.c.(2)F. - Leak Detection Plan - Maintenance**	• MAINTENANCE - Corrective actions relating to the tanks or flowlines will have effected equipment repaired or replaced as necessary. If larger issues are identified, the repairs may require further attention and/or redesign.
74	**604.c.(2)F. - Leak Detection Plan - Inspections**	• TANK INSPECTIONS - will be formally inspected every 30 days under the Spill Prevention Control and Countermeasures (SPCC) plan unless specific COAs warrant more frequent inspections. Ursa contracts Forward Looking Infrared (FLIR) inspections to HCSI. HCSI performs regulatory required FLIR inspections with frequencies determined by throughput volumes. Tanks are also inspected daily by the lease operator (pumper) and contract water haulers, who have been trained on identifying corrective actions on tanks/flowlines. Reference Ursa's SPCC, Storage Tank Emissions Monitoring (STEM) and Leak Detection and Flowline Management Plans for inspection and location specifics. • FLOWLINE INSPECTIONS - will be inspected per COGCC 1100 regulations/1101 and 1102 guidance document Updated February 25, 2016. - Daily site visits are made by lease operators (aka pumpers) to the well pad for maintenance issues including leaks and spill potential - Monthly site inspections will be conducted by 3rd party environmental contractors to look for any signs of leaks and or potential leaks. - FLIR surveys are used to identify any leaks coming from the flowlines on a regular basis. - According to Ursa's STEM Management Plan onsite inspections will also conducted to check for leaks. - New flowlines will be hydrotested to manufactures recommended levels before put in to use. - Ursa will use SCADA to continuously monitor line pressures. Any fluctuations or drops in pressures that indicate a drop or rise in pressure will be closely monitored and will trigger immediate action including shutting in and scheduling repairs/replacements as necessary.
75	**604.c.(2)F. - Leak Detection Plan** **604.c.(4)B.ii. - Leak Detection, repair, reporting and record keeping** **317B.d.(6)**	• Spill prevention and response are addressed in Ursa's Spill Prevention and Management Plan which includes training of employees and contractors personnel on at least an annual basis. Spill response includes notifications, reporting, response actions, remediation and corrective actions. The spill criteria in Ursa's plan requires that waste be properly classified as E&P or non-E&P wastes. For E&P waste, all spills greater than 1 barrel (outside containment) or greater than 5 barrels (inside containment) will be reported to the COGCC using a Form 19. Should remediation be required, a Form 27 will be submitted as well. Spills related to non-E&P waste will be managed in accordance with CDPHE and EPA regulations depending on the volume spilled. As a BMP, Ursa tracks and cleans up all spills, including those that are not reportable.
76	**604.c.(4)B.ii. - Leak Detection, repair, reporting and record keeping Garfield County COA #11 - Air quality / leak detection**	• Operator shall comply with the CDPHE regulations and air quality permit conditions for emission controls considering technically and economically feasible BMPs. All facilities onsite shall be subjected to an instrument-based leak detection and repair (LDAR) inspection at least monthly during drilling and completion and quarterly during production. If a leak over 10,000 ppm hydrocarbons is discovered, the first attempt to repair the leak shall be made as soon as reasonably possible and in accordance with state law.
77		• High level alarms will be installed on all production and injection tanks.
	APPLICANT COMMITTED MEASURES	
78		• All materials and chemicals will be managed to minimize environmental contamination in accordance with MSDS sheets and EPA, COGCC and CDPHE regulations. Materials and chemicals that are not a waste may be reused or recycled.
	WILDLIFE	
	BEST MANAGEMENT PRACTICES	
79		• All separators/dehydrators and heater –treater equipment are outfitted with bird cones.
80		• Ursa will operate in accordance with the Wildlife Mitigation Plan (signed with CPW in 2011) that allows for up to 15 well pads in the Battlement Mesa area (including within the PUD). Quarterly meetings will be held with CPW to determine the status of BMP implementation and any outstanding commitments.
84	**306.c.(1).A.i. - CPW Wildlife Consultation**	• The Ursa BMC B and D Pad locations were provided to CPW and analyzed as part of the Antero (now Ursa) Battlement Mesa Wildlife Mitigation Plan (WMP). The terms and conditions agreed upon within the WMP document are still adequate to avoid, minimize, and mitigate any impacts to wildlife from the proposed actions. Agreed upon BMPs from the WMP document have been sent for inclusion as an attachment to the Form 2A permit and are listed below: 1. Closed loop (pitless) drilling systems. 2. Annual raptor and other bird surveys will be conducted in accordance with protocols provided by CPW. 3. Rig shift changes will take place when practical at 6am and 6pm and will utilize one (1) vehicle to minimize impacts to wildlife. 4. Development program is planned to include four phases as a means for mitigating wildlife impacts. These phases will be based on infrastructure construction schedules and will be coordinated with affected land owners, the Battlement Mesa Services Association (BMSA), local municipalities, Garfield County, COGCC, and CDPHE during the Comprehensive Drilling Plan and the Major Land Use Impact Review process. 5. Well pad location visits during the production phase of operations (post drilling and completion for all wells on a well pad location) will be restricted when/where possible to between the hours of 10am and 3pm to minimize impacts to wildlife unless operational concerns warrant pad visits outside this timeframe. 6. Buried water and gas pipelines will be utilized as means to reduce truck traffic and impacts to wildlife. 7. Restrict rig operation to no more than 2 rigs per section (or equivalent acreage) within the big-game seclusion areas during the winter. 8. Maintaining a ¼ mile no surface occupancy buffer around active bald eagle nests. 9. New pad construction not to exceed 3 acres of working surface. 10. Pad density not to exceed 1 pad per 160 acres. 11. Bury all gas and water pipelines adjacent to roads whenever possible. 12. A weed management plan will be developed and implemented to monitor and control noxious and invasive weeds. 13. Noxious weed control includes three treatments per year. 14. Existing weed infestations will be mapped prior to the development of each pad, access road and pipeline when practicable. 15. Antero (now Ursa) has completed all habitat restoration contributions contained within the WMP.
	GENERAL HOUSEKEEPING	
	BEST MANAGEMENT PRACTICES	
81	**Garfield County COA #13 - Noxious Weeds**	• Weeds will be managed in accordance COGCC Rule 1003.f. and 1004.e. as incorporated into Ursa's Noxious Weed plan; to include up to three treatments per year depending upon the species being managed and mapping as needed, throughout the life cycle of the location (construction – final reclamation). Additionally, Once construction begins, the Operator shall treat all List A, B, C noxious weeds within pad site perimeter and along access road according to Ursa's noxious weed management plan. This shall include three treatments annually by a licensed and certified herbicide applicator.
85	**604.c.(2)P. - Removal of surface trash**	• The location will be managed in accordance with COGCC 907 and 907A Rules, which are incorporated into Ursa's Waste Management Plan, which addresses both E&P and non-E&P waste, including those under the jurisdiction of the CDPHE and EPA. The plan, in combination with Ursa's Spill Prevention and Management Plan, minimizes the potential for any exploration and production wastes, chemicals, fluids, etc. from leaving the location, using BMPs including berms, barriers, and use of spill control materials.