# Environment Assessment

# Jack Sparrow Supplemental 1

BLM

High Desert District/Rawlins Field Office

September 2011

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

**BLM/WY/PL-12/020+1310**

# DOI-BLM-WY-030-2009-0243-EA

**THIS ENVIRONMENTAL ASSESSMENT IS TIERED TO AND REFERENCES THE "Atlantic Rim Natural Gas Development Project Final Environmental Impact Statement."**

**ENVIRONMENTAL ASSESSMENT** **EA NUMBER**: DOI-BLM-WY-030-2009-0243-EA

**BLM Office**: Rawlins Field Office

**Lease Numbers**: WYW-138670 and WYW- 14848

**Proposed Action Title / Type**: Jack Sparrow Supplemental 1 AR Federal 1691 11-28,1-33, 7-33,10-33, 15-33, 10-29, and 12-29 Coal bed Natural Gas Wells, Well Pads, Access Roads, Pipeline/ Utility Corridors and Associated Infrastructure.

**Applicant**: Anadarko E & P Company LP (Anadarko)

**Location of Proposed Action**: NESW, 28 T16N R91W; NENE, SWNE,NESE, SWSE 33 T16N R91W; NWSE, NWSW, 29 T16N R91W; 6th PM, Carbon County, Wyoming

## INTRODUCTION

### Purpose and Need for the Proposed Action

This site-specific Environmental Assessment (EA) is being prepared in response to the Applications for Permit to Drill (APDs), and will disclose information which will allow the Authorized Officer to determine whether to prepare an environmental impact statement or a finding of no significant impact (FONSI). The purpose of the action is to allow the lease holder to exercise their right to drill for, extract, remove and market natural gas products in the above described location. The need for the action is established by the BLM's authority under the Minerals Leasing Act of 1920 as amended, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

### Scoping and Issues

Upon receipt of an APDs or Notice of Staking (NOS) for the proposed wells/locations, the APDs/NOSs is posted in the public room of the Rawlins Field Office (RFO) for a period of 30 days. During that time, the APDs/NOSs are available for public review and comment. The information required under 43 CFR 3162.3-1(g) for the APDs was posted in the Bureau of Land Management (BLM) RFO public room on October14th, 2008. The project was entered into the NEPA Register on June 25th, 20109. No public comments have been received as of this time.

On-site inspections of the proposals were conducted on May 14, 2009. A BLM interdisciplinary team has reviewed the proposal for potential effects upon the following issues of concern: air quality; cultural and historic resources; wildlife resources including threatened, endangered and sensitive species; weeds; soils; recreation/visual resources; lands with wilderness characteristics: range; and noise. Other resources, either were not present or the impacts were adequately addressed through the application of Standard Operating Procedures (SOPs), Best Management Practices (BMPs) and/or site-specific mitigation measures (see Appendix 1). These include: lands and realty (RMP, p. 2-16, Appendices 1, 6, 7 and 34); paleontology (AREIS, Chapter 3.1.3, p.13, RMP, p.2-24); water resources (AR FEIS section 3.4, pp. 33-68), vegetation (AR FEIS section 3.5, pp. 68-80), socioeconomics (AR FEIS section 3.12, pp. 132-146), transportation (AR FEIS section 3.13, pp. 146-148), wild horses (AR FEIS section 3.16, pp. 149-150), forest management (RMP, p. 2-14 and Appendix 19);; off-highway vehicles (RMP, p. 2-22 and Appendix 21); fire and fuels management (RMP, p. 2-13 and Appendix 19); health and safety (AREIS, Chapter 3.14, p. 148, RMP Appendix 32); and special management areas (AR FEIS section 3.17, pp. 150-154). However, some resources discussed in the impact section of this EA, while not elevated to a

level of concern that might influence a FONNSI, are of sufficient concern to the public to warrant mention. These resources are water quality and aquatic organisms and health and safety.

**Conformance with Land Use Plan**

This proposed action is subject to the Rawlins Resource Management Plan (RMP), approved on December 24, 2008. The RMP has been reviewed to determine if the proposed action conforms to the land use plan as required by 43 CFR 1610.5-3. Development of oil and gas reserves is covered on pages 2-20 to 2-22 of the RMP. The proposed action is in conformance with the RMP Management Objective to provide opportunity for exploration and development of conventional and un-conventional oil and gas while protecting other resource values.

The BLM uses the RMP as a guiding document in its environmental review of the leasing, exploration, and development of mineral resources. As a result of initial interdisciplinary environmental review of the proposed action, appropriate design features, best management practices (BMPs), and standard operating procedures (SOPs) were identified and would be applied if the APDs and SN-NOI APD extensions are approved. The federal minerals leased to Anadarko carry a contractual commitment to allow for development in accordance with the Lease Notice and stipulations of the lease.

**Consistency with the EIS**

The project is located within the area covered by the Atlantic Rim Area Natural Gas Field Development Project Final Environmental Impact Statement (AR FEIS), which was written to assess oil and gas drilling within the Atlantic Rim project area. The Record of Decision (ROD) for this action was approved on March 23, 2007. The proposed action is in conformance with this EIS. The EIS can be viewed and downloaded at the following location: http://www.blm.gov/wy/st/en/info/NEPA/rfodocs/atlantic_rim.html.

**Relationship to Statutes, Regulations, or Other Plans**

This EA is prepared in accordance with NEPA procedures, and is in compliance with all applicable laws and regulations passed subsequently, including Council of Environmental Quality (CEQ) regulations (40 CFR, Parts 1500-1508); U.S. Department of Interior (DOI) Regulations for Implementation of the National Environmental Policy Act of 1969 (43 CFR Part 46); DOI BLM NEPA Handbook, H-1790-1 (BLM January 2008); Guidelines for Assessing and Documenting Cumulative Impacts (BLM 1994); and the Departmental Manual (DM) part 516. This EA, Catalina PODs A and B EA (WY-030-07-EA-186), and the AR FEIS assess the environmental impacts of the Proposed Action and serves to guide the decision-making process.

Onshore Oil and Gas Order No. 1 (43 CFR 3164.1) requires that an Application for Permit to Drill (APD) provide sufficient detail to permit a complete appraisal of the technical adequacy of and environmental effects associated with the proposed project. The APD must be developed in conformity with the provisions of the lease, including the lease stipulations. The APD must provide for safe operations, adequate protection of surface resources and uses, and other environmental components, and must include adequate measures for reclamation of disturbed lands.

If the APD is inadequate or incomplete, the applicant must modify or amend the APD and/or BLM can set forth design features that are necessary for the protection of the surface resources, uses, and the environment and for the reclamation of the disturbed lands. For the purpose of this analysis, the design features for the APD are considered part of the proposed action.

A Right-of-Way (ROW) grant for construction of a buried pipeline is required to transport the produced gas from the well location. The ROW grant for the pipeline would be issued under the authority of Section 28 of the Mineral Leasing Act of 1920, as amended (30 U.S.C. 185), and be subject to the terms and conditions in 43 CFR 2880 and rental payments as determined by 43 CFR 2885.20.

The area was assessed as per the Wyoming Instruction Memorandum (IM) WY-IM-2010-012 (Greater Sage-grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered

Lands including the Federal Mineral Estate). The IM directs the BLM to analyze Greater sage-grouse habitat out to a minimum of 4 miles. In addition, this analysis is to occur both within and outside of the Greater sage-grouse core areas, as designated by the Governor's Executive Order (EO 2008-2). None of the locations are located within greater sage-grouse core area.

Note: This project does not fit any of the specified criteria allowing for Categorical Exclusion from NEPA analysis under Section 390 of the Energy Policy Act of 2005, 516 DM Appendix 1 and 516 DM2, 11.9, and is therefore being analyzed herein.

## PROPOSED ACTION AND ALTERNATIVES

### Proposed Action

The proposed action is to approve the APDs for the Jack Sparrow Supplemental 1. The proposed action includes the construction of access roads and well pads for the purpose of drilling 7 CBNG wells. All 7 are federal wells (APDs). The proposed action also includes the construction, operation and reclamation of associated underground gas gathering/sales pipelines, underground produced water-gathering pipelines, underground power-lines and utility corridors (see map 1). The maps and illustrations attached to the APDs and master surface use plan (MSUP) display the locations of the proposed wells, access roads, gas and water-gathering pipelines, power-line (electrical) and other utility (gas and water) corridors. To minimize surface disturbance, the pipeline/utility corridors are located adjacent and parallel to the proposed or existing access roads and existing pipeline disturbances, except where not feasible or applicable. There would be approximately **35.0 acres** of new disturbance 12.6 acres for the well pads and 22.4 acres of new disturbance for the access roads and utility corridors.

The Central Delivery Point (CDP) for the Jack Sparrow POD is already constructed and in use.

Any additional facilities later determined to be necessary would be proposed and applied for via a Sundry Notice.

A discussion of the actions generally associated with drilling a well, including the plan of operations, construction of the access road, drilling pad and pipeline installation can be found in the Atlantic Rim Area Natural Gas Field Development Project Final Environmental Impact Statement (AR FEIS Appendix K: Plan of Development / Detailed Proposed Action).

Access: The location of the proposed development is approximately 20 miles north of Baggs, Wyoming. Access to the area would be to travel from Baggs approximately 22.3 miles north on Wyoming Highway 789, turn right on Carbon County Road 608 and travel east-southeasterly approximately 5.9 miles to the northern most edge of the Jack Sparrow Supplemental POD. Directions to the individual wells are given in the APDs.

The operator proposes to construct new or re-construct existing access roads to the proposed well locations. The new constructed or reconstructed roads would be constructed to meet BLM specifications for a "Resource Road", as specified in BLM Manual Section 9113. Proper drainage structures would be constructed/installed along the access roads. The width of the roadway (travel surface) would be a minimum of 14 feet within an average right-of-way width of 50 feet. Unless prohibited by terrain and or excessive surface disturbance or other such circumstances, the access road right-of-way would be combined with the pipeline/utility right-of-way into a road/utility corridor that would be a total of 80 feet in width. Some local connector or collector roads between multiple well locations, or where engineering design dictates, widths may vary and will be reported by the operator via annual disturbance calculations/summaries
To minimize surface disturbance, the majority of pipeline/utility corridors are located adjacent and parallel to the proposed or existing access roads and existing pipeline disturbances, except where not feasible or applicable.

The access roads including utility corridors would be reclaimed during production operations to the maintenance width of approximately 30 to 40 feet. Utility corridors upon completion of pipeline/power-line installation along with any unneeded access road would be recontoured, ripped, seeded, and re-vegetated.

As provided for in the fourth edition of the BLM Gold Book (containing BLM guidance for consideration of oil & gas activities on BLM-administered public lands), "The appropriateness of primitive roads or routes is both site-specific and use specific and is typically based on many factors. . ." Non-constructed (primitive) roads were not mandated for this POD due to a lack of unresolved resource conflicts, scope of construction/drilling equipment needed, the necessity of year round access, and equipment operator safety. Should the BLM determine that alternate road designs are appropriate or necessary, the BLM may mandate the use of a reviewed and approved alternate design.

Well Sites

In order to drill and complete the wells, a drill pad would be constructed for each well location. The average size of the 7 well pads is 1.8 acres, or 250 feet X 300 feet (approximately **12.6 acres**). In the event the wells become producers, cut and fill portions of the well site would be brought back to grade and reclaimed along with any other unneeded portions of the well site. Soil stockpiles would be re-spread or stabilized, and reseeded with native vegetation. The well pad would be reduced to less than one-half acre for the duration of production operations. Unless otherwise authorized and in conjunction with interim pad reclamation, the reserve pits would have been dried and backfilled within 180 days (six months) of well completion or plugging and abandonment. The entire well pad would be recontoured, ripped, seeded, and re-vegetated during final reclamation upon final plugging and abandonment.

Pipeline/Utility Corridors

The produced water and gas sales and gathering pipelines and power-lines would be buried upon completion of construction and installation, and the surface disturbed areas reclaimed soon thereafter. Upon well plugging and abandonment and or pipeline/power-line abandonment, the pipelines/power-lines would be properly abandoned in accordance with BLM procedures for abandonment and the right-of-ways and corridors appropriately reclaimed. Any major crossings of drainages have been engineered to insure design/construction adequacy and erosion protection. All channel crossings will comply with current BLM policies and mitigation measures appropriate to the crossings (see "Hydraulic Considerations for Pipelines Crossing Stream Channels," BLM Technical Note 423, April 2007).

**Surface Use Data Summary**

| Well Name | Location | Proposed Aproximate Access Road Length (feet) | Approximate Short-Term Disturbance (Road and Utilities Acres) | Approximate Long-Term Disturbance (Road and Utilities Acres) |
|---|---|---|---|---|
| AR FED 1691 11-28 | NESW 28 16N91W | 3,720 | 6.83 | 2.56 |
| AR FED 1691 10-29 | NWSE 29 16N 91W | 901 | 1.65 | 0.62 |
| AR FED 1691 12-29 | NWSW 29 16N 91W | 1,295 | 2.38 | 0.89 |
| AR FED 1691 1-33 | NENE 33 16N 91W | 2,306 | 4.24 | 1.59 |
| AR FED 1691 10-33 | NWSE 33 16N 91W | 1,726 | 3.17 | 1.19 |

| | | | | |
|---|---|---|---|---|
| AR FED 1691 15-33 | SWSE 33 16N 91W | 2.17 | 2.17 | 0.81 |
| AR FED 1691 7-33 | SWNE 33 16N 91W | 1,055 | 1.94 | 0.73 |
| **TOTALS** | | **12,182** | **22.37** | **8.39** |

Produced Water Disposal

Produced water from the proposed wells would be gathered and transported via buried water pipelines to water re-injection wells within the Jack Sparrow POD. Produced water collection, transport and disposal, is addressed in detail in the MSUP and Jack Sparrow Supplemental 1Water Management Plan (WMP).

The only method of produced water disposal considered and analyzed under the "proposed action" and this EA is subsurface re-injection using underground injection disposal wells permitted by the State of Wyoming and approved by BLM.

At new injection facilities, it is anticipated that subsurface water sumps will be constructed in lieu of above ground storage tanks.

Produced water collection, transport and disposal, is addressed in further detail in the MSUP and Water Management Plan (WMP).

The submitted APDs, with SUPs, and standard design features, contain complete descriptions of the wells, well pads, access roads, and pipelines. These documents are considered an integral part of this Environmental Assessment (EA) by reference. The APDs are located in the well/lease files in the Fluid Minerals Section of the Rawlins Field Office, Bureau of Land Management, USDI, 1300 North Third Street, Rawlins, Wyoming.

**Standard Operating Procedures (SOP's), Best Management Practices (BMP's), and Mitigation**

Site-specific design features, as identified during BLM interdisciplinary review, would be applied to the APDs and SN-NOI APD extensions (see Appendix 1). All other SOP's, BMP's, and mitigation measures are a part of the SUP and standard design features in the APD.

**ALTERNATIVES INCLUDING THE NO ACTION ALTERNATIVE**

The BLM interdisciplinary team, in review of this Proposed Action (as modified during on-site inspections, internal scoping, and subsequent review), identified no unresolved resource conflicts that would necessitate development of additional alternatives.

**No Action Alternative:**

The "no action" alternative would be to not approve the APDs and SN-NOI APD extensions. Under leasing provisions, the BLM has an obligation to allow mineral development if the environmental consequences are not irreversible or too severe. If the APDs are not approved, the applicant is allowed to, and generally would, submit new APDs that correct any flaws in the originals. The APD process is designed to overcome the "no action" alternative situation by not accepting the APD as complete, until all environmental problems or impacts are either resolved or mitigated in the application and approval process.

The AR FEIS analyzed the "No Action Alternative" in detail. The AR FEIS ROD approved development of oil and gas within the AR FEIS project area. The proposed action for this EA is consistent with the AR FEIS ROD. For the above stated reasons, the "No Action" alternative of not approving the APDs was considered but dropped and will not be analyzed further in this EA.

**Environmental Impacts:**

The site-specific environmental impacts discussed herein are issue-driven and encompass information found during on-site inspections by BLM specialists and in supporting documentation submitted by the operator as part of the APD with SUP.

Air Quality: The basic framework for controlling air pollutants in the United States is mandated by the 1970 Clean Air Act (CAA) and its amendments, and the 1999 Regional Haze Regulations. The CAA addresses criteria air pollutants, state and national ambient air quality standards for criteria air pollutants, and the Prevention of Significant Deterioration program. The Regional Haze Regulations address visibility impairment.

The National Ambient Air Quality Standards (NAAQS) are established by the Environmental Protection Agency to protect human health and are designed to protect the most sensitive portion of the population. The NAAQS specify the maximum concentration level, the averaging time or exposure time, and a statistical form of the standard that defines when an exceedance would occur. State standards must be as strict as national standards, or stricter. Air pollutant concentrations above the Wyoming Ambient Air Quality Standards (WAAQS) and the NAAQS represent a risk to human health. Existing air quality throughout the Rawlins Field Office area is in attainment of all ambient air quality standards.

Regional air quality monitoring by federal and state agencies would identify any exceedance of state air quality standards, should they occur. On August 2n, 2011, the Wyoming Air Quality Monitoring Network's Wamsutter, Wyoming station (http://www.wyvisnet.com/wams1/index.html) recorded that no exceedance was occurring for Ozone ($O_3$), Particulate Matter ($PM_{10}$), or Nitrogen Dioxide ($NO_2$) as of 12:30 PM mountain standard time. On March 31, 2009, the Wyoming Department of Environmental Quality (WDEQ) released the 2008 Annual Summary for the Wamsutter air quality monitoring site. Within this report, WDEQ identified one day (February 21, 2008) that exceeded the ambient air quality standards. This exceedance was for ozone at 87 parts per billion (ppb) (standard is 75 ppb in an 8-hour time period). All other monitored values were within or below air quality standard limits. During the same time period (February 23, 2008), the highest reading captured by a monitoring station operated by Anadarko Petroleum Company approximately 25 miles to the southeast averaged 73.1 ppb in an 8-hour period. All other readings were below WDEQ air quality thresholds. The annual report for 2009 is not available at this time; however, there was no exceedance in air quality thresholds during the four quarters of 2009 documented at the Wamsutter monitoring station. The first and second quarter reports for 2010 are available and do not show any exceedance in air quality thresholds from the Wamsutter station.

Air pollutant emissions from the construction of the proposed coal bed methane well pad, access roads, and utility corridor would cause some localized effects from fugitive dust and vehicle and equipment exhausts/emissions. These impacts are expected to be temporary (i.e. occurring during an average of a 12-day construction period) and would occur in isolation, without significantly interacting with adjacent well locations. Particulate matter emissions from well pad and resource road construction would be minimized by application of water and/or chemical suppressants.

Air pollutant emissions from drilling and completion activities at the proposed site would include diesel smoke and natural gas emissions. Impacts to air quality from these emissions would also be localized and are expected to be temporary.

If the wells are producers, two possible sources of air pollutants would exist throughout the life of the wells. The first would be air pollutants resulting from the venting and flaring of natural gas from the wells themselves. The second source of air pollutant emissions would occur during operations and would include those emissions associated with the burning of natural gas to operate production equipment at the site.

In the first source noted above, the venting and flaring of natural gas is limited to what is allowed by Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL-4A). These emissions generally become greater and more frequent as the need to purge the wells of produced fluids increases towards the end of the well's life. In the second source, The Wyoming Department of Environmental Quality has air quality permitting requirements and issues permits for existing, new, and

modified oil and gas production units under the Wyoming Air Quality Standards and Regulations (WAQS&R).

The singular effects on air quality values associated with the construction, drilling and completion, and operation of the proposed well are expected to be minimal. Cumulatively, air quality impacts analyzed for the Rawlins Resource Management plan (RMP) concluded that the cumulative impacts of developments in the region of influence – which include oil and gas development – would increase emissions for all sources of carbon monoxide (CO), nitrogen oxides (Nox), sulfur dioxide (SO2), PM10, and PM2.5, but that these increases would not cause any exceedance of state or federal ambient air quality standards. It also concluded that although cumulative impacts to air quality values of visibility, atmospheric deposition, or ozone cannot be determined through the qualitative studies conducted for the RMP, air quality analyses from an energy development project (Desolation Flats EIS) suggest that RMP planning area activities could contribute to a significant impact on visibility in the Bridger, Fitzpatrick, Mount Zirkel, and Rawah Wilderness Areas. Similarly, the more recent Atlantic Rim EIS (completed in 2007), found that "there is a potential for cumulative visibility impacts to exceed visibility thresholds within PSD Class I Bridger Wilderness Area, Popo Agie Wilderness Area, and Wind River Roadless Area." (40 CFR 52.21 "Prevention of significant deterioration of air quality" (PSD) identifies Class I and Class II areas that warrant special air quality protection measures).

Climate and Climate Change: The Rawlins Field Office is located in a semi-arid, mid-continental climate regime typified by dry, windy conditions, limited rainfall, and long, cold winters (Trewatha and Horn 1980). The region is subject to strong, gusty winds that are often accompanied by snow and blizzard conditions during winter months. Winds frequently originate from the west-southwest, and the mean annual wind speed is 12.9 miles per hour. Wind strength and frequency affects dispersion of noises, odors, and transport of dust and other airborne elements. Therefore, the region's strong winds increase the potential for atmospheric dispersion of pollutants.

Climate change refers to any significant change in measures of climate (e.g., temperature or precipitation) lasting for an extended period of time (decades or longer). Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1° F since 1900, with nearly a 1.8°F increase since 1970 alone. Temperature in southwestern Wyoming is expected to increase by 0.25 to 0.40 degrees Fahrenheit per decade. Precipitation across western Wyoming is expected to decrease by 0.1 to 0.6 inches per decade, with the largest decrease expected in southwestern Wyoming.

Climate change may result from natural processes, such as changes in the sun's intensity; and from human activities that change the atmosphere's composition (such as burning fossil fuels) and the land surface (such as urbanization) (IPCC 2007). Some authorized activities within the Rawlins Field Office generate GHG emissions. Oil and gas development activities can generate CO2 and NH4 (during processing). Carbon dioxide emissions result from the use of combustion engines for OHV and other recreational activities. Wildland fires also are a source of CO2 and other GHG emissions, and livestock grazing is a potential source of methane. Other activities in the Rawlins Field Office area with the potential to contribute to climate change include soil erosion from disturbed areas and fugitive dust from roads, which have the potential to darken snow-covered surfaces and cause faster snow melt. It is important to note that neither EPA nor the Wyoming DEQ has established limits for GHG emissions.

Greenhouse Gas Emissions: Wyoming's gross GHG emissions are expected to continue to grow to 69 MMtCO2e by 2020, 56% above 1990 levels.

As of 2008, the Inventory indicates that there over 33,000 active gas and oil wells in the State, 45 operational gas processing plants, 5 oil refineries, and over 9,000 miles of gas pipelines, there are significant uncertainties associated with estimates of Wyoming's GHG emissions from this sector. This is compounded by the fact that there are no regulatory requirements to track CO2 or CH4 emissions. Therefore, estimates based on emissions measurements in Wyoming are not possible at this time. (Wyoming GHG Inventory and Reference Case Projection CCS, Spring 2007).

Some of these year-to-year fluctuations in temperature are due to natural processes, such as the effects of El Niños, La Niñas, and the eruption of large volcanoes (summarized in the Climate Change SIR 2010). This information illustrates the difficulty of predicting actual regional or site specific changes or conditions which may be due to climate change during any specific time frame.

Climate: Ongoing scientific research has identified the potential impacts of anthropogenic GHG emissions and changes in biological sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused carbon dioxide equivalent ($CO_2e$) concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007). Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the proposed action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information will be incorporated into the BLM's planning and NEPA documents as appropriate.

Cultural and Historic Resources: A discussion of the affected environment for cultural resources, including the historic trails, can be found in the final AREIS at Section 3.11 Cultural and Historical Resources, page 3-122. Potential impacts to cultural resources are described in the final AREIS at Section 4.11 Cultural Resources, page 4-116.

A Class III cultural resource inventory was conducted for each component of the proposed project so that appropriate mitigation measures could be developed to reduce or eliminate adverse impacts to cultural resources as well as historic sites. Archaeological resources identified during the inventory will be avoided where possible and/or mitigated as described in the final AREIS at Appendix I Cultural Resources Management, page I-8. Site-specific stipulations in the form of COA attached to the APD are applied for specific locations, as necessary.

The entire proposed project is located within two miles and within the view-shed of the historic Rawlins to Baggs Road, and some project components would be visible from contributing segments of the historic trail/road. Certain measures were taken during field on-site inspections to relocate well pads, roads and utility corridors to less visible areas where possible and practical.

Since adverse effects such as destruction of the physical remains of the historic trails and roads were identified in the AREIS, a Programmatic Agreement (PA) was executed between the BLM, SHPO, ACHP, proponents, and other interested parties to develop the necessary mitigation to minimize impacts. As a result, additional general, project and site-specific mitigation measures were developed. Application of these stipulations will produce an acceptable level of protection for this resource. .....

Further discussion on cultural and historical resources can be found in the AR FEIS, section 3.11, pp. 122-132 and section 4.10, pp. 116-119)

Wildlife: Portions of the proposed actions (wells, pads, access roads and pipeline/power-line ROW /corridors) are located within two miles (protective buffer) of Greater sage grouse leks, within sage grouse

winter concentration areas, and within 0.75 miles(protective buffer) of nesting raptors (Burrowing Owl). The AR FEIS documented that adverse impacts from the Proposed Action would occur to greater sage grouse, sharp-tailed grouse, raptors, and big game, including mule deer and elk (see section 3.7, pp. 84-98 and section 4.7, pp. 68-85). These impacts include direct and indirect loss of wildlife habitat, displacement of some wildlife species from increased human access and activity, and increased potential for collisions between wildlife and motor vehicles, an increase to stress , and disruption of life history requirements of a species of population segment(see section 4.7.1 p. 68).
Fish, wildlife, and special status plant, wildlife, and fish species is further discussed in the AR FEIS (sections 3.7 and 3.8 pp. 84-112, and sections 4.7 and 4.8, pp. 68-97).

Recreation and Visual Resources: The main recreational activity in this area is hunting for big game, small game, and upland birds. The construction of this project would not result in the loss of recreational activities in the area; however, the quality of the recreational experience continues to be diminished by the presence of additional oil and gas facilities and related activity and traffic.

The Visual Resource Management (VRM) class of the project location is VRM Class III. A visual resource contrast rating worksheet was completed for this project; the following analysis is based on the contrast rating worksheet. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer.

This project is located in an area experiencing heavy oil and gas development. The height and shape of the existing facilities and the addition of the new oil and gas pad and associated infrastructure would contrast with the form, line and texture of the surrounding landscape. The new facilities would not be visible above the natural topographic horizon. The form of the relatively open, sloped landscape would be modified by the placement of rectangular manufactured objects. Additional facilities only add to the decline in the visual value of the landscape and the loss of the natural appeal of the area. This project and others like it decrease the overall visual value of the landscape. The color contrast would be minimal due to the project requirement to paint the facilities to blend with the natural colors of the soil and vegetation.

Further discussion about recreation and visual resources can be found in the AR FEIS (sections 3.9 and 3.10 pp. 115-122, and in sections 4.9 and 4.10, pp. 98-113).

Lands with Wilderness Characteristics (LWC) : FLPMA section 201(a) and 603 directed the BLM to manage the public lands and their resources under principles of multiple use and sustained yield. Wilderness is one of the multiple use values.

Section 2(c) of the Wilderness Act of 1964 requires that in order to be considered to have wilderness characteristics, an area must meet all of the following criteria:

(1) "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;" This is commonly referred to as naturalness.

(2) "has outstanding opportunities for solitude or a primitive and unconfined type of recreation;"

(3) "has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition;"

The Wilderness Act further states areas with wilderness characteristics "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." These are commonly referred to as supplemental values and are not required to be present.

In 1979, the BLM conducted a 'Lands with Wilderness Characteristics' analysis for 375,000 acres of mixed-managed lands, labeled the Wild Horse Basin WY-030-408 Wilderness Inventory Area. The proposed project located in the Wild Horse Basin Inventory Area is within an area of at least five thousand acres of contiguous federal property. In 2009, aerial photography and physical survey showed an increase in man-made structures and disturbances such as well locations, resource roads, two-track routes, fencing, manmade reservoirs and other water developments. The accumulation of these human impacts has decreased the visual value within the area surrounding the proposed project. The human impacts within the project area are clearly noticeable to the average visitor, and the landscape has lost the apparent naturalness in the project area as defined in BLM Manual 6301.14.B.2.b, thus eliminating the proposed project from further analysis under LWC guidelines.

Weeds: The current presence, or introduction, of invasive weeds is a concern. The well operator is required to control weeds along the access road, well pad, and flow-line corridor, and native areas infested as a result of the project. Weeds would have the potential to increase as a result of new disturbance as they have at other locations in this area. In addition, weed seeds could be spread by livestock and wildlife, as well as from vehicle traffic and other human activities. A weed management plan has been submitted by the operator describing the weeds found in this project area, the methods proposed to control them, and the monitoring protocol.

Further discussion about weeds within the project area can be found in the AR FEIS (section 3.5.2 pp. 79-80)

Soils: The soils within the project area are classified as moderately deep sandy loam to loams with some clay loams and salty loams at one location. A summary of the soils classifications and erosion hazard is given below.

**Summary of Soil Classification and Erosion Hazard**

| Well Name | Soil Classification | Hazards |
|---|---|---|
| AR FED 1691 11-28 | Moderately deep ,sandy loams | Wind erosion moderate, water erosion moderate |
| AR FED 1691 1-33 | Moderately deep, sandy loams to loams | Wind erosion moderate, water erosion moderate |
| AR FED 1691 7-33 | Moderately deep, sandy loams | Wind erosion moderate, water erosion moderate. |
| AR FED 1691 10-33 | Moderately deep, loams | Wind erosion moderate, water erosion moderate |
| AR FED 1691 15-33 | Moderately deep, salty loams, with a sandy veneer at surface | Wind erosion moderate, water erosion moderate |
| AR FED 1691 10-29 | Moderately deep, clay loams | Wind erosion slight, water erosion moderate |
| AR FED 1691 12-29 | Moderately deep, loams to clay loams | Wind erosion slight, water erosion moderate |

With application of SOP's, BMP's, and mitigation measures identified for the soils present within the Proposed Action area of influence, runoff and erosion would be reduced to an acceptable level. The AR FEIS documented that soils categorized as poor and fair with excess salt are difficult and more costly to reclaim and special attention would be given to potential soil disturbance and reclamation problems (see Reclamation Plan).

Further discussion about soils within the project area can be found in the AR FEIS (section 3.3, pp. 22-33 and section 4.3, pp16-19)

Range: The Doty Mountain Allotment is grazed as part of a cow/calf operation (650 cow/calf pairs). The livestock in the allotment graze from April 1 to December 31 and rotate through multiple pastures. The allotment contains approximately 56,000 acres and is 67 percent public land. The allotment is allocated 5,643 animal unit months (AUMs) of forage with an average of 8.2 AUMs per acre on the public lands. The project area lies within the north central region of the allotment and encompasses multiple pastures and range improvements. Further discussion about range and livestock within the project area can be found in the AR DEIS (Ch. 3, p. 3-80 through 3-83).

The proposed action is located within the Upper Colorado River watershed, which was assessed in 2001 for conformance with the Wyoming Standards for Healthy Rangelands. At that time, although the watershed area containing the proposed project was meeting Standards, the drainage below the project area (lower Muddy Creek) was on the State of Wyoming 303(d) list of impaired water bodies due to oil and gas development and livestock grazing, and therefore, did not meet Standard #5- Water Quality. This impaired water body listing has since been removed. Issues relating to this listing and described in the watershed assessment report primarily relate to road design and maintenance and how they affect

Noise: The Proposed Action would add noise from construction, drilling, completion, and production to the area. Noise associated with construction, drilling, completion, and producing a well, however, can exceed 55 dBA. However, these noises are transient and short-term in nature, generally lasting less than 2 days for construction and 2-3 weeks for drilling and completion. These levels could potentially affect human comfort. Noise intensity would increase with the levels of activity that an area would receive. The oil and gas field noise would be more noticeable to individuals that are recreating in the area. Noise from oil and gas activities could cause recreationists to find alternative areas in order to enjoy wide open spaces free from human induced noise. Noise is further discussed in the AR FEIS, section 3.15, pp. 149, and section 4.15, pp. 155-157.

**RECLAMATION**

Interim reclamation would commence within six months (weather and wildlife stipulations permitting) of drilling completion, reducing the well pad to approximately a two acre production well site. All unneeded portions of the well site would be backfilled, leveled, re-contoured, reclaimed, and re-seeded with native vegetation. This includes pits, cut and fill, and soil stockpile areas. Total (final) reclamation would take place when the well(s) are no longer productive and are plugged and abandoned. The seed mix is located in the Reclamation Plan submitted by the operator. The goal of reclamation would be to establish species composition, diversity, structure and total ground cover appropriate for the desired plant community. All reclamation standards and guidelines are located in the Wyoming State Reclamation Policy (IM-WY-2009-022), Rawlins RMP (Appendix 36), and Rawlins Field Office Reclamation Guidance (IM-WYD-03-2011-002).

Upon the determination that the wells are not, or no longer, productive and/or are plugged and abandoned, then final reclamation of the entire well pad and location including access road, flowline and associated ROWs would take place in accordance with the operator's site-specific reclamation plan. Plans for reclamation are included in the well SUP, design features, and the submitted site-specific reclamation plan. Reclamation is further discussed in the AR FEIS, Appendix B.

**Additional Mitigation Measures:**

General and site-specific design features, SOPs, BMPs, and mitigation measures developed for the proposed project are standard for oil and gas well development projects and are part of the Proposed Action found in the well APDs/SUPs. After review of the impacts described above, no additional mitigation measures are proposed or necessary.

**Residual Impacts:**

Since no additional mitigation measures (beyond the standard mitigation measures as incorporated in the APDs/SUPs and design features) have been proposed or recommended to reduce impacts, no residual impacts other than those impacts described above, are anticipated.

**Cumulative Impacts:**

In total (including disturbance associated with the pipelines), the approval of this project is expected to add approximately **35.0 acres** of additional surface disturbance to the area. The well pads, access roads, and pipeline disturbances lie completely on federal land administered by the BLM.

The table below shows the number of producing/permitted coal bed methane gas wells and their associated access roads within a one-mile radius of the proposed project sit as well as the number of locations either permitted or proposed within that wells section.

| Well Number | Number of producing/permitted coal bed methane gas wells and their associated access roads within a one-mile radius of the proposed project site. | Number of locations either permitted or proposed within this section. |
|---|---|---|
| AR FED1691 11-28 | 18 | 4 |
| AR FED1691 1-33 | 19 | 5 |
| AR FED1691 7-33 | 19 | 7 |
| AR FED1691 10-33 | 22 | 7 |
| AR FED1691 15-33 | 19 | 7 |
| AR FED1691 10-29 | 20 | 8 |
| AR FED1691 12-29 | 14 | 8 |

Cumulative impacts are discussed in the AR FEIS, sections 5.1 and 5.2 (*Cumulative Impact Analysis*), under each resource section. This project would not exceed the cumulative effects analyzed.

Cumulative impacts of development in the region of influence - which include oil and gas development - would increase emissions for all sources of carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO2), PM10, and PM2.5, but these increases would not cause any exceedance of state or federal ambient air quality standards. Moreover, regional air quality monitoring by federal and state agencies would identify any exceedance of state air quality standards, should they occur.

The impacts of the proposed action in conjunction with existing and reasonably foreseeable oil and gas development projects would contribute to a change in the area from a relatively open, sloped, high desert landscape to an area exhibiting increased examples of human intrusion and occupancy. Visitors to the area would be exposed to the increased sights and sounds of industrial development.

As described in the analysis of environmental consequences, the proposed action and/or the alternatives may contribute to the effects of climate change to some extent through GHG emissions. However, it is not currently possible to associate any of these particular actions with the creation of any specific climate-related environmental effects. The lack of scientific tools designed to predict climate change at regional or local scales limits the ability to quantify potential future impacts. It is currently beyond the scope of existing science to predict climate change on regional or local scales resulting from specific sources of GHG emissions.

Computer model forecasts indicate that increases in temperature will not be evenly or equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures.

IPCC also discloses that significant uncertainties remain with respect to the estimates of the current level of emissions and projections of future production of fossil fuels as the oil and gas industry is difficult to forecast with the mix of drivers: economics, resource supply, demand, and regulatory procedures. The assumptions used for the projections, based on recent trends or State production trends in the near-term, and AEO 2006 growth rates through 2020, do not include any significant changes in energy prices, relative to today's prices. Large price swings, resource limitations, or changes in regulations could significantly change future production and the associated GHG emissions. Other uncertainties include the volume of GHGs vented from gas processing facilities in the future, any commercial oil shale or coal-to-liquids production, and potential emissions-reducing improvements in oil and gas production, processing, and pipeline technologies.

The AR FEIS (section 4.2.2.3, pp. 15, disclosed that the Proposed Action would not exceed the significance criteria found in section 4.2.1, pp. 6). Further discussion on climate and air quality can be found in the AR FEIS. Section 3.2, pp. 14-22, and section 4.2, pp. 6-16.

**Persons/Agencies Consulted:**

| Individual | Discipline | Organization |
|---|---|---|
| Nyle Layton | Natural Resource Specialist | BLM |
| Heath Cline | Wildlife Biologist | BLM |
| Patrick Walker | Archaeologist | BLM |
| Kay Nation | Legal Instruments Examiner | BLM |
| Susan Foley | Soil Scientist | BLM |
| Bruce Estvold | Engineer | BLM |
| Jennifer Fleuret | Hydrologist | BLM |
| Anna Figueroa | Supervisory NRS | BLM |
| Charles Chase | Reclamation Analyst | Anadarko |
| Kenny Trueax | Regulatory Affairs | Anadarko |

The proposed action has been considered, and/or appropriate changes made and mitigation applied as part of the field onsite inspection and evaluation process.

Preparer: _____ Date: 9/6/2011

Nyle Layton Natural Resource Specialist/Physical Scientist

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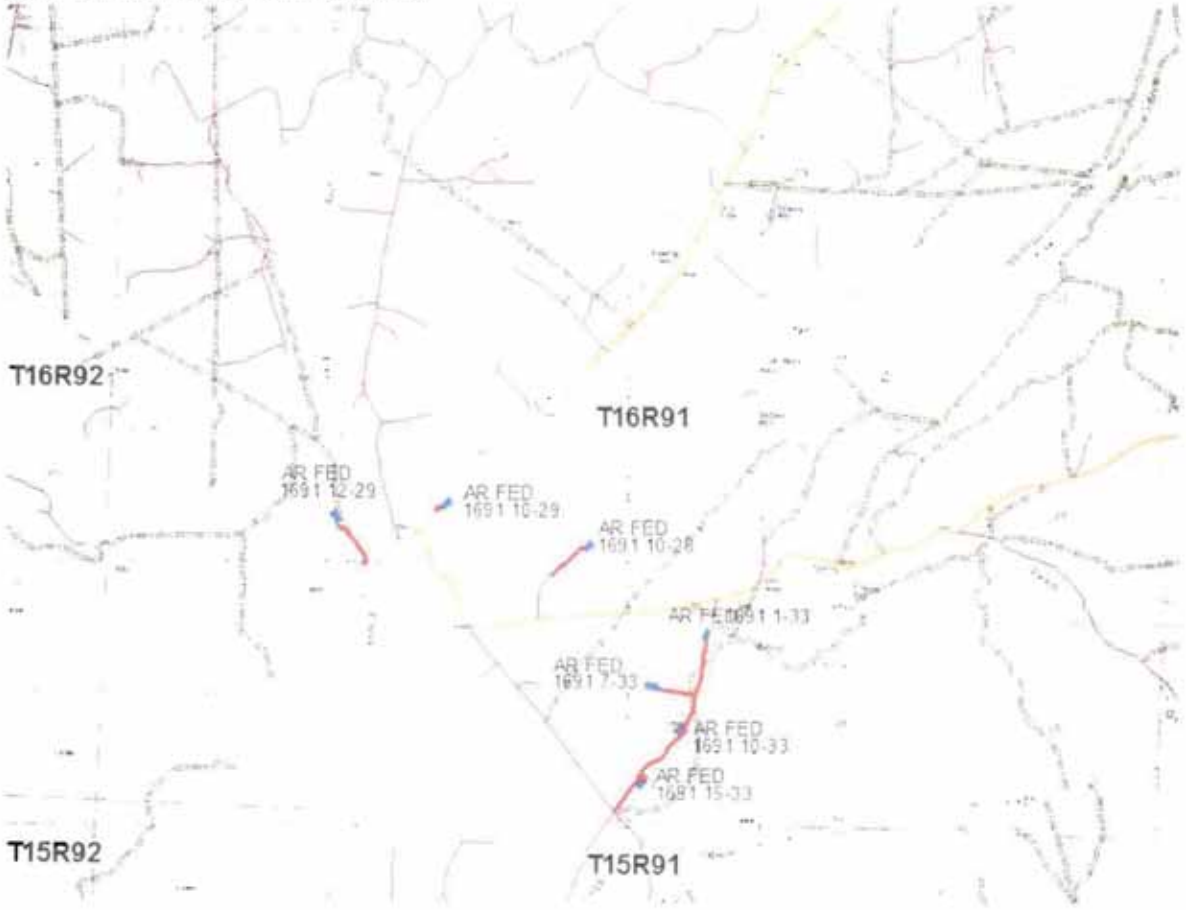
Map 1. Jack Sparrow Supplemental 1 AR Fed1691 11-28, AR1691 1-33, 1691 AR Fed 7-33, AR Fed 1691 10-33, AR Fed 1691 15-33, AR Fed 10-29, and AR Fed 12-29 coal-bed natural gas wells, , well pads, access roads, and utility corridor





No warranty is made by the Bureau of Land Management as to the accuracy, completeness, or reliability of the information presented

# Appendix 1

**General Design Features**

1. Approval of this Application for Permit to Drill (APD) does not warrant that any party holds equitable or legal title.

2. All lease exploration, development, construction, production, operations, and reclamation activity would be conducted in a manner which conforms to all applicable federal, state, and local laws and regulations.

3. All lease operations are subject to the terms of the lease and its stipulations, the regulations of 43 CFR Part 3100, Onshore Oil and Gas Orders, Notices to Lessees (NTL's), the approved APD, and any written instructions or Orders of the Bureau of Land Management (BLM) Authorized Officer (AO).

4. The approval of this APD does not grant authority to use off-lease federal lands. Facilities approved by this APD and/or Sundry Notices that are no longer included within the lease, due to a change in the lease or unit boundary would be authorized with a right-of-way. Similarly, should unit or lease boundaries change during the life of the project, the Operator would be responsible for acquiring necessary rights-of-way for affected facilities. Failure to do so may cause the operation to be shut-in.

5. This permit would be valid for a period of two years from the date of APD approval or until lease expiration or termination, whichever is sooner. APD extensions may be requested and granted for up to two additional years, but not to exceed a total sum of four years from the initial APD approval date. Should a permit extension be requested, it must be submitted prior to the permit expiration date via a Sundry Notice (Form 3160-5) to the AO for approval. If the permit terminates, any surface disturbance created under the application would be reclaimed in accordance with the approved reclamation plan found herein.

6. The Operator would submit a Sundry Notice (Form 3160-5) to the AO for approval prior to beginning any new surface-disturbing activities or operations that are not specifically addressed and approved by this APD.

7. The Operator may submit to the AO's Representative written requests (including documentation, supporting analysis and an acceptable plan for mitigation of anticipated impacts) for exception, waiver, or modification to this approved APD, associated design features, or other requirements. Such written approval would be obtained prior to commencement of operations that cause any deviation from the approved APD and associated limitations. Emergency approval may be obtained orally, but such approval would not waive the written reporting requirement.

8. At **least 48-hours prior to** beginning any APD related construction (e.g. access road, well pad, pipeline) and/or reclamation activities (e.g. dirt-work, seeding) the operator would notify the BLM via internet notice.

9. All construction of the well pad, flare pit, reserve pit, roads, flow lines, production facilities, and all associated infrastructure on federal lands would be monitored onsite by a licensed professional engineer OR designated qualified inspector (to be named at the time of construction notification) who would serve as the Operator's Compliance Coordinator to ensure construction meets the BLM-approved plans.

10. Within **24-hours** of spudding the well, the spud date would be submitted to the BLM via internet notice. A follow up report on Form 3160-5 confirming the date and time of the actual spud would be

submitted to this office within 5 working days from date of spud.

11. At **least 24-hours in advance** of all BOP tests, running and cementing all casing strings (other than conductor casing), pluggings, DST's and/or other formation tests, and drilling over lease expiration dates, notification would be submitted to the BLM via internet notice.

12. The operator would submit a production facility layout (Onshore Order 1, Section III. D.4.d. and D 4.i., or Section VIII. A.) for approval (prior to construction) which includes permitted location boundaries, production facility placement, access road inlet, and cut/fill slopes.

13. A site facility diagram (Onshore Order 3, Section III. I. and 43 CFR 3162.7-5(d)) for the purpose of a site security plan (Onshore Order 3, Section III. H. and 43 CFR 3162.7-5(c)) would be filed no later than 60 calendar days following first production.

14. Use of any tank heater/burners in production storage tanks must be approved prior to installation and/or use by the AO. Failure to obtain approval for installation/use of tank heater/burners in any production storage tanks may result in a Written Order (WO), Incidence of Non-compliance (INC), assessments and potentially a Shut-In Order.

15. No below or partially below ground fluid storage/containment tanks or vessels are to be used without prior approval of the AO. Below or partially below ground fluid storage/containment tanks or vessels would require systems for the prevention, containment, detection, and monitoring of any below ground leakage (e.g. secondary containment and leak detection/monitoring systems, etc.) A production facility layout depicting the proposed vessel construction and installation/location must be submitted for prior approval via APD or Sundry. As applicable, all subsurface vessels must comply with the Wyoming Storage Tank Act of 2007 (W.S. 35-11-14-29) and/or the Wyoming DEQ Underground Injection Control (UIC) Program.

Operations

Upon request, Operator must be prepared to provide copies of applications for, and approved copies of, federal, state, and local operating permits.

1. All survey monuments found in the area of operations would be protected. Survey monuments include, but are not limited to: General Land Office and BLM Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Operator would immediately report the incident, in writing, to the AO and the respective installing authority if known. Where General Land Office or BLM Right-of-Way monuments or references are obliterated during operations, the Operator would secure the services of a registered land surveyor or a BLM cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the "Manual of Surveying Instructions for the Survey of the Public Lands in the United States," latest edition. The Operator would record such survey in the appropriate county and send a copy to the AO. If the Bureau cadastral surveyors or other federal surveyors are used to restore the disturbed survey monument, the Operator would be responsible for the survey cost.

2. If any cultural values [sites, artifacts, human remains] are observed during operation of this lease/permit/right-of-way, they would be left intact and the AO notified. The AO would conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The Operator would be responsible for informing all persons in the area who are associated with this project that they would be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the Operator would immediately stop work that might further disturb such materials, and contact the AO. Within seven (7) days after the operator contacted the BLM, the AO would inform the Operator as to: whether the materials appear eligible for the National Register of Historic Places; the

mitigation measures the Operator would likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and, a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would then be allowed to resume construction measures.

The Operator would be responsible for informing all persons associated with this project that they would be subject to prosecution for damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects or site. If archaeological, historical, or vertebrate fossil materials are discovered, the Operator would suspend all operations that further disturb such materials and immediately contact the AO. Operations would not resume until written authorization to proceed is issued by the AO.

The Operator would be responsible for the cost of any mitigation required by the AO. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would be allowed to resume operations.

3. If paleontological resources, either large or conspicuous, and/or of a significant scientific value are discovered during construction, the find would be reported to the AO immediately. Construction would be suspended within 250 feet of said find. An evaluation of the paleontological discovery would be made by a BLM-approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery would not be resumed until written authorization to proceed is issued by the AO. The Operator would bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.

   The Operator would be responsible for informing all persons associated with this project that they would be subject to prosecution for damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects or site. If archaeological, historical, or vertebrate fossil materials are discovered, the Operator would suspend all operations that further disturb such materials and immediately contact the AO. Operations would not resume until written authorization to proceed is issued by the AO.

   Within five (5) working days, the AO would evaluate the discovery and inform the Operator of actions that would be necessary to prevent loss of significant cultural or scientific values.

   The Operator would be responsible for the cost of any mitigation required by the AO. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would be allowed to resume operations.

4. If any dead or injured threatened, endangered, proposed, or candidate animal species is located during construction or operation, the U.S. Fish and Wildlife Service's Wyoming Field Office (307-772-2374), its law enforcement office (307-261-6365), and the BLM Rawlins Field Office (307-328-4200) would be notified within 24 hours. If any dead or injured sensitive species is located during construction or operation, the Rawlins Field Office would also be notified within 24 hours.

5. Operators and Operator's sub-contracted personnel would not intentionally harm or harass wild horses, other wildlife, or domestic livestock.

6. ROW, mineral lease, mining claim, and permit holders would monitor and control noxious and invasive weeds, according to an approved weed management plan, on project-disturbed areas and

native areas infested as a direct result of the project. The control methods would be in accordance with guidelines established by the EPA, BLM, state and local authorities. Prior to the use of pesticides, the Operator will obtain written approval from the AO - meaning an approved Pesticide Use Proposal form - showing the type and quantity of material(s) to be used, pest(s) to be controlled, and method of application. Copies of daily Pesticide Application Records (required by the State of Wyoming) and Summary Herbicide Use Reports are due monthly to the BLM AO-Weed Coordinator.

7. The Operator would be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or its subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the AO. Should a fire occur, it would be immediately reported to this office by calling 307-328-4200, and notifying the Fluid Minerals staff.

8. Emissions of particulate matter from well pad, road, and other facility construction, operation, and reclamation activities would be minimized by application of water or other dust suppressants. Dust inhibitors (surfacing materials, dust suppressants, and water) would be used as necessary on locations that present a fugitive dust problem. The use of chemical dust suppressants on public surface would require prior approval from the AO.

9. If groundwater or permeable/porous subsoil or bedrock is encountered upon construction of the pad or pits, or upon drilling and completing shallow holes for surface conductor, rat/mouse holes, or water supply well, the Operator must immediately notify the AO's Representative before proceeding.

10. The Operator would comply with the Hazardous Materials Management Plan/Summary in the RMP ROD (Appendix 32) and/or the appropriate EIS ROD, including requirements to transport, store, utilize, and dispose of hazardous substances. The Operator would maintain a hazardous substances release contingency plan that would include, among other things, provision to notify the AO in the event of any release of hazardous substances associated with project operations. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.

11. If a portable sewage treatment facility is moved onto location, the well/lease Operator would provide the BLM AO a copy of the facility Operator's notification letter to the Wyoming Department of Environmental Quality. Facility operations would comply with BLM requirements, including unauthorized discharge notification and reclamation of disturbed surfaces.

12. Only those hazardous wastes that qualify as exempt, under the Resource Conservation and Recovery Act (RCRA), Oil and Gas Exemption, may be disposed of in the reserve pit. Generally, oil or gas wastes are exempt if they 1) have been sent down hole and then returned to the surface during oil/gas operations involving exploration, development, or production, or 2) have been generated during the removal of produced water or other contaminants from the oil/gas production stream. The term hazardous waste, as referred to above, is defined as a listed (40 CFR 261.31-33) or characteristic (40 CFR 261.20-24) hazardous waste under RCRA.

13. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL-3A and immediately cleaned up in accordance with BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks. The Operator would segregate, treat, and/or bio-remediate contaminated soil materials as authorized via Sundry Notice (Form 3160-5) or dispose of contaminated soils at a permitted waste facility. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.

14. The Operator would install an identification sign consistent with the requirements of 43 CFR 3162.6 immediately upon completion of the well pad/location construction operations.

15. The Operator would contain and remove all debris, unused equipment, and other waste materials not

needed for production. Waste materials would be disposed of at an approved disposal facility

16. Upon APD expiration, it is the responsibility of the Applicant/Operator to see that all stakes, flagging, posts or other materials placed on the locations and/or access roads, pipelines and associated rights-of-way are removed. Operator must immediately cease all operations associated with preparing to drill the well and begin final reclamation activities of all APD related disturbance, pursuant to the approved APD design features and to be completed within 6 months of the APD expiration date.

**Site Specific Design Features**

1. Construction, drilling, reclamation, and other activities potentially disruptive to nesting raptors would be prohibited during the period of April15 to September 15 for the protection of raptor nesting areas for all well pad locations except AR Federal 10-29.

2. Construction, drilling, reclamation, and other potentially disruptive activities in suitable Greater sage-grouse identified nesting and early-brood rearing habitat within two (2) miles of the perimeter of an occupied Greater sage-grouse lek, or in identified Greater sage-grouse nesting and early brood rearing habitat, would be prohibited from March 1 to July 15 for all well pad locations

3. Construction, drilling, reclamation and other activities potentially disruptive to wintering sage-grouse would be prohibited during the period of November 15 to March 14 for the protection of sage-grouse winter concentration areas for AR Federal 10-29 .

4. All wells, above-ground structures, production equipment, tanks, transformers, and insulators not subject to coloring requirements for safety would be painted the color of "Shale Green" (5Y 4/2).

5. For AR Federal 11-28,12-29,1-33,7-33,10-33,and 15-33 an archaeologist with a current BLM permit would monitor construction of the well location and access road due to culturally sensitive soils in accordance with the approved Discovery Plan.

6. For AR Federal 11-28,1-33,7-33,10-33, and 15-33 an archaeologist with a current BLM permit would inspect any open pipeline trench due to culturally sensitive soils in accordance with the approved Discovery Plan.

7. For AR Federal 11-28,10-29,12-29,1-33,7-33,and 15-33 the Operator would select and use a seed mix most applicable to each disturbed location, with the goal of restoring individual disturbed sites to closely resemble the pre-disturbance native plant communities, as provided in Appendix A of the ROD, "Project Reclamation Plan."

8. For AR Federal 11-28,10-29,12-29,1-33,7-33,10-33 and 15-33 the access road would be surfaced with material compatible in color with the local environment.

9. For AR Federal 10-29, a ditch block needs to be placed northeast of the pad location at the confluence of the natural drainage and the man-made drainage. This ditch block should force runoff to follow the natural drainage and prevent drainage from continuing onto the pad location.

10. Unless otherwise authorized, for AR Federal 11-28,10-29,12-29,1-33,7-33,and 15-33 the pipelines/utilities would be plowed or ripped into the un-bladed surface (using technology that does not require trenching). If such techniques are infeasible due to terrain or geology, the

surface would be brush-hogged and the utilities would be placed no farther than the outside edge of the ditch slope.

11. For AR Federal 11-28,10-29,12-29, and 15-33 no blading would be allowed outside the staked well location for placement or removal of the topsoil stockpile.

12. If production facilities are needed, the facilities would be placed as close the entrance of the well pad (where the primary access road ties into the well pad) and would be placed on grade or cut portions of the pad.

13. Pesticide Use Proposals would be submitted to and approved by the BLM AO—Weed Coordinator, prior to any application of any herbicide on the BLM lands. Pesticide Use Proposals would be tiered to the approved Reclamation Plan/Weed Management Plan.

14. Copies of daily Pesticide Application Records (required by the State of Wyoming) and Summary Herbicide Use Reports would be due monthly to the BLM AO--Weed Coordinator.

15. The following site specific surface design features establish reclamation requirements as set forth in The Wyoming Bureau of Land Management (BLM) Reclamation Policy, effective March 31, 2009, Rawlins Field Office Reclamation Guidance (IM-WYD-03-2011-002), effective March 1, 2011, and the Rawlins Resource Management Plan (RMP) Record of Decision (ROD) Appendix 36, effective December 28, 2008.

16. Prior to any surface disturbing activities, the Operator would submit to the BLM Authorized Officer, via Sundry Subsequent Report (Form 3160-5), the results of all vegetation inventories and soils surveys and tests.( submitted by the operator on 7/27/2011)

17. Prior to any surface disturbing activities, vegetation inventories would be conducted. At a minimum, vegetation inventories would be conducted for basal cover and vegetative life form type and frequency (including individual invasive and noxious weed species). An inventory of 100 to 400 points (depending on the amount and type of vegetative cover) using transects is highly recommended. Other methods may be used as authorized by the State Reclamation Policy, Rawlins Field Office Reclamation Policy, or BLM AO (submitted by the operator on 7/27/2011).

18. Prior to any surface disturbing activities, soil surveys, sampling and testing would be conducted for soil depth, chemical, and physical characteristics. At a minimum, the soil would be tested for texture, electrical conductivity and pH. Soil texture and characteristics as well as depth are an important component, in addition to pre-disturbance vegetation inventories, in determining the soil types and associated plant communities or ecological sites (ES) and appropriate seed mixes. Soil moisture and density are also valuable tests. An agricultural suitability test should be performed if harsh conditions exist (pH over 8.5, sandy or clayey textures, EC >12 mmhos/cm etc.). To determine suitable growth material salvage depth and the ES, soil would be tested at a depth of 4-6 inches. If soil is deeper than 20", another sample would be taken at 10-12 inches. If the soil is shallower, or if test results indicate harsh conditions, then sample at shallower depths to determine the suitable salvage depth. At a minimum, one (1) sample for each ES occurring on the site would be taken (submitted by the operator on 7/27/2011).

19. Prior to any surface disturbing activities, the proposed seed mix, commensurate with the ecological site(s) present, would be submitted to the Authorized Officer via Sundry Notice of Intent (Form 3160-5) for approval before actual seeding operations begin (submitted by the operator on 1/6/2011). If broadcast seeding, the rates specified would be doubled.

20. Prior to the completion of interim reclamation, and prior to seeding, the operator would again sample and test soils for suitable surface and subsurface physical, chemical properties as per pre-disturbance testing. These tests are to be used by the operator for comparison of the pre-reclamation soils with pre-disturbance soils and evaluation of the suitability of the soils or seedbed for seed germination and vegetative success under the proposed reclamation plan.

21. Prior to the completion of final reclamation, and prior to seeding, the operator would again sample and test soils for suitable surface and subsurface physical, chemical properties as per pre-disturbance testing. These tests are to be used by the operator for comparison of the pre-reclamation soils with pre-disturbance soils and evaluation of the suitability of the soils or seedbed for seed germination and vegetative success under the proposed reclamation plan.

22. Prior to the completion of interim and final reclamation and seeding, the Operator would submit to the BLM Authorized Officer, via Sundry Subsequent Report (Form 3160-5), the results of all vegetative and soils surveys and tests. Should pre-disturbance and interim/final reclamation test results differ to the extent that seed mix modifications or soil amendments are required to achieve the desired ecological community, the Operator would then submit a revised reclamation plan via Sundry Notice of Intent (Form 3160-5). The Sundry Notice of intent would outline any proposed soil amendments, treatments, additives or modifications, seed mix changes, and other necessary revisions to the reclamation plan and procedures.

23. Reclamation and restoration efforts including seeding/re-vegetation, invasive plant control/treatment, and soil stabilization and erosion prevention would be monitored (for success or failure) and reported by the Operator to the BLM Authorized Officer. Monitoring and reporting would be in accordance and consistent with the Wyoming State Reclamation Policy, RFO RMP Record of Decision (ROD) and Appendix 36, and the field/project level EA/EIS, as applicable. The reclamation plan including procedures for seeding/revegetation and weed control (via the weed management plan) would be modified and revised as necessary and required to achieve desired results and requirements.

24. The operator's requested variance to Onshore Order #1 requiring all pits to be closed within 6 months would be granted. The operator would submit a Sundry Notice (Form 3160-5) with additional plans addressing the timeline for the closure and reclamation of any pit that would be open for more than six (6) months.

25. The operator's requested variance to the portion of design feature "Pits, #8", listed below "Before backfilling synthetically lined reserve pits, those liner portions remaining above the "mud line" would be cut off as close to the top of the mud surface as possible and disposed of at an approved solid waste disposal facility" would be granted due to BP's safety standards. The liner would be folded into the reserve pit and the pit would be backfilled containing all solids that were contained in the reserve pit during drilling.

**Construction**

1. All facilities on location that have the potential to leak/spill oil, glycol, methanol, produced water, condensate, or other fluids which may constitute a hazard to the environment, public health or safety (including, but not limited to, drain sumps, sludge holdings, and chemical containers), would be within secondary containment, impervious to those fluids, exclusive of wildlife and livestock, with animal/bird escape capability, and able to contain a minimum of 110% of the volume of the largest storage vessel, respective to content, or 100% with at least one foot of freeboard, whichever is greater, so that any spill or leakage would not drain, infiltrate, or otherwise escape to ground water, surface water, or navigable waters before cleanup can be completed (within 72 hours).

2. Construction over and/or immediately adjacent to existing pipelines would be coordinated, and in

accordance with, the relevant pipeline companies' policy.

3. Fencing would be installed around produced water, oil, and condensate tank batteries in order to help maintain the integrity of the surrounding containment structure and to prevent livestock and wildlife from entering the area in case of a leak or spill.

4. All open vent stack equipment would be designed and constructed to prevent entry by birds and bats and to discourage perching.

5. The immediate repair/replacement (to BLM standards) of any range infrastructure breached, altered, or damaged by construction, drilling, or operation activities related to this APD would be the responsibility of the Operator. All fence relocations would be in accordance with BLM approval.

6. Construction, maintenance, and reclamation operations with frozen material or during periods when the soil material is saturated is expressly prohibited. If equipment, including licensed highway vehicles, creates ruts in excess of four (4) inches deep, the soil would be deemed too wet to adequately support maintenance and/or heavy equipment.

7. Accumulated snow present on the ground at the outset of construction, maintenance, or reclamation activities would be removed before the soil is disturbed and piled downhill and/or downwind from the disturbed area. Equipment used for any non-construction snow removal operations would be equipped with 6" shoes to ensure blades do not remove topsoil or vegetation. Written approval must be obtained before snow removal related to a federal action but outside of designated disturbance areas is undertaken. When blading/removing snow, drifts/berms would be constructed with a gap of 20-30 yards every ¼ mile, to allow unobstructed movement of wildlife, livestock and human activities.

8. Clearly remove, segregate, and delineate from all other spoils, all available topsoil from constructed locations and surface disturbances including areas of cut and fill. Stockpile and clearly identify topsoils at the site for use in reclamation on all areas of surface disturbance (well pads/locations, roads, pipelines, etc ).

9. Plugs or embankments providing wildlife with access out of and across open pipeline trenches would be installed, at minimum, every 1320 linear feet along open pipeline trenches.

10. No construction and/or reclamation would block or change the natural course of any drainage, nor would topsoil, waste, or fill material be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways. The lower edge of soil or other material stockpiles would be located outside active floodplains. All spoils would be placed where they can be retrieved without creating additional surface disturbance and where they do not impede and/or contribute sediment to watershed and drainage flows. The Operator would also reconstruct and stabilize stream channels, drainages, and ephemeral draws to exhibit similar hydrologic characteristics that were found in stable, naturally occurring and functioning systems.

11. Drainage and runon/runoff would be diverted away from all new construction naturally or through the use of spoil material to create berms. All drainage structures would approximate topographic contour lines, have a grade no greater than 0.5 - 1 percent, would release water onto natural undisturbed ground without causing additional accelerated erosion. The use of riprap or other armoring to prevent erosion may be necessary (BLM Manual 9113). Drainage structures would not discharge directly into/onto natural drainages/channels. Water-bars, waddles, hay bales, and/or silt fences would be used as needed to reduce surface runoff velocity and promote upland sediment deposition, thus reducing drainage/channel sedimentation and erosion.

12. Silt fences, if needed, would be installed after topsoil removal and before pad leveling begins and must remain in place until interim reclamation is complete and there is adequate vegetation present to stabilize the soil. Silt fences would be constructed in locations where surface erosion is evident or

potential for surface erosion exists such as areas of steep slopes or highly erosive soils. Fences would be installed at the inside edge of disturbance.

13. Silt fences would be constructed using metal posts that are at least 5 feet long with at least 2 feet in the ground (3 feet above ground) with 8 feet spacing if a wire re-enforcement backing is used or 6 feet spacing if no wire backing is used. The fabric is to be toed into the ground at the base of the fence a minimum of 8 inches deep and an 18 inch overlap is required when splicing two fences together. The fabric is to be installed on the uphill side of the metal posts and attached to the posts at least every 6 inches along the length of the post. Silt fences are to be inspected at least once a month or 48 hours after a rain storm event. If holes in the fence or undercutting of the fence are found, repair is required within 48 hours of discovery. When silt accumulates to a height equal to two-thirds the height of the fabric, the silt is to be cleaned out and deposited on the excess spoils pile.

14. Sediment fences, straw wattles, erosion mats, and/or hay bales should be used to minimize erosion and sediment transport on disturbance area.

15. If temporary surface pipelines, as authorized by the AO, are used to transport water, they would be placed/removed when the ground surface is dry. Surface blading prior to line placement is prohibited. The pipelines must be removed within 30 days after well completion (or determination of inactivity).

16. Construction control stakes would be placed as necessary to ensure construction of the well pad, topsoil stockpile, spoil pile, and outer limits of the area to be disturbed in accordance with the specifications outlined in the APD. The Operator would assume full responsibility for protecting all stakes and offsetting any additional stakes or grades which may be necessary.

17. Cathodic protection wells would be drilled on the existing well pad, placed so as not to interfere with re-contouring of cut and fill slopes during interim reclamation, designed and constructed to prevent commingling and contamination of water aquifers. The AO would be notified of any water flows at surface and the problem would be resolved promptly.

Roads

1. All access roads and drainage control structures, whether existing or newly-constructed, would be both constructed to resource road standards and regularly maintained in a safe and usable condition as outlined in BLM Manual, Section 9113. A regular maintenance program may include, but is not limited to, blading, ditching, culvert installation, dust control, and gravel surfacing or other activities as specified by the AO. The Lessee and/or Operator would enter into a maintenance agreement with all other "authorized users" of the common access road(s) to the well site. The costs of road maintenance in dollars, equipment, materials, labor, and other related expenses would be shared proportionally among the "authorized users." Upon request, the AO would be provided copies of any maintenance agreement or agreements.

2. All operators and operator's representative vehicles are restricted to authorized travel routes only and would not use any other access route, e.g.; two-track roads, trails, and pipeline rights-of-way to access the drill/well pad and any ancillary facilities.

3. Two-track roads would not be cut-off as a direct result of construction, maintenance, or reclamation of the well access road or associated well facilities, unless authorized by the BLM.

4. Prior to construction, road(s) would be surveyed and staked with construction control stakes set continuously along the centerline at maximum 100-foot intervals (less where needed to be inter-visible) and at all tangent and curve control points, fence or utility crossings, and culverts. In addition to centerline stakes, slope stakes would be placed at the top of the cut and the bottom of the fill for those portions of the road that are engineered.

5. Before proposed road construction activities begin, the topsoil must be bladed to the side of the road

and stockpiled. The topsoil stockpile would be contoured so as to prevent water ponding or flow concentration. Once the borrow ditch and the cut slopes are constructed, cleared vegetative material and topsoil that is windrowed would be spread back onto the cut/fill slopes of the road, removing any windrows or berms remaining at the edge of the road.

6. The minimum travel-way width of the immediate access road would be 14 feet with turnouts at least 10 feet in width. No structure would be allowed to narrow the road top. The inside slope would be 4:1. The bottom of the ditch would be a smooth V with no vertical cut in the bottom. The outside slope would be 2:1 or flatter. After the road is crowned and ditched with a .03 - .05 ft/ft crown the topsoil and windrowed vegetative material would be pulled back down on the cut slope so there is no berm left at the top of the cut slope. Turnouts would be spaced at a maximum distance of 1000 feet and would be intervisible. If the access road crosses a floodplain, the ditch would be flat-bottomed so as to provide material to raise the road, unless otherwise approved by the AO.

7. If soils along the access road route are dry during road construction, use, and/or maintenance, fresh water would be applied to the road surface to facilitate soil compaction and minimize soil loss as a result of wind erosion

8. Construction and surfacing of the new access road would be complete prior to moving drilling equipment onto the well pad and the presence of heavy vehicular traffic. Compact the top foot of sub-grade in even six (6) to eight (8) inch lifts to established standards, adding water as needed for compaction. Surface with an appropriate grade of gravel to a minimum depth of four (compacted) inches.

9. All cattle guards would be designed and maintained consistent with BLM standards and would be a minimum of 16 feet wide and 8 feet long; set on either timber, pre-cast concrete, or cast-in-place concrete bases at right angles to the roadway; have an adjacent 16 foot wide bypass gate; not narrow the road surface; and have fence and end panels on either side constructed using 3 posts with braces.

10. All culverts would be a minimum of 18 inches in diameter. Culverts would have a minimum of 12" of fill or 1/2 the pipe diameter, whichever is greater, placed on top of the culvert, and would be of length sufficient to allow at least 12" of culvert to extend beyond the toe of any slope. The inlet and outlet would be set on grade. No rocks would be used in the bed material and no rocks greater than 2" in diameter would be immediately adjacent to the culvert. The entire length of pipe would be bedded on native material before backfilling, which would be completed using unfrozen material and rocks no larger than two inches in diameter; compact the backfill evenly in 6" lifts on both sides of the culvert. A permanent marker would be installed at both ends of the culvert to help prevent traffic from damaging the culvert. Additional culverts would be placed in the new access road as the need arises or as directed by the AO.

11. Wing-ditches would be staked and constructed at a slope of .5 to 1.0 percent down slope unless otherwise approved by the AO. All wing/drainage ditches and culverts would be kept clear and free-flowing, and would also be maintained in accordance with the original construction standards. Drainage structures would not discharge directly into/onto natural drainages/channels, and/or use riprap or other armoring to protect from erosion (BLM Manual 9113).

12. Low water crossings would be constructed perpendicular to the channel and at original channel elevation in a manner that would not block or restrict existing channel flow. Excavated material would be stockpiled for use in reclamation of the crossings.

Pits

1. All oil and gas pits that could contain fracture/stimulation fluids, recycled pit fluids, or produced water, except those only containing fresh-water based constituents, are required to be lined with an impermeable (12 mil minimum with a permeability less than or equal to $1x10^{-7}$ cm/sec) liner. The liner

would be physically and chemically-compatible with all substances which it may contact and would be of sufficient strength and thickness to withstand normal installation and use, and installed so that it would not leak. The liner would be installed over a smooth sub-grade, matting, or fill materials (e.g. sifted dirt, sand, or bentonite) free of pockets, loose rocks, and other objects that could damage the liner.

2. The only fluids/waste materials which are authorized to go into reserve pits are RCRA-exempt exploration and production wastes. Any evidence of RCRA non-exempt wastes being put into the reserve pit may result in the BLM Authorized Officer requiring specific testing and closure requirements.

3. All pits are required to maintain a minimum of 2 feet of freeboard between the liquid level and the top of the liner. If operations cause fluid levels in pits to rise above the required freeboard, immediate notification would be provided to the AO with concurrent steps taken to cease the introduction of additional fluids, until alternative containment methods can be approved.

4. Flaring of gas into the reserve or completion pits would not be allowed without prior approval from the AO.

5. All pits would be kept free of trash, debris, solid wastes, and other unauthorized waste materials including oil and liquid hydrocarbons.

6. For the protection of livestock and wildlife, all pits and open cellars would be fenced on all sides, with corner bracing, immediately upon construction. Reserve, flare, completion, and production pits would be adequately fenced during and after drilling operations until pits are reclaimed so as to effectively keep out wildlife and livestock. Operator would, within ten (10) days of discovery, remove any floating hydrocarbons from pit surface or install netting over the pit. Approved netting (mesh diameter no larger than one inch) is required over any pit that contains or is identified as containing hydrocarbons or hazardous substances (per RCRA 40 CFR Part 261 or CERCLA Section 101(14) (E)).

7. Pits would be dried, backfilled, and closed within six (6) months from well completion (total depth) or well plugging. Pits must be void of all free fluids prior to backfilling. Pit trenching or squeezing is prohibited. Pits may be dewatered/dried in the following manner: natural evaporation, mechanical aeration, chemical and mechanical solidification (e.g. with fly ash, cement kiln dust, etc.) and/or hauled to an approved DEQ disposal site. The installation/operation of any sprinklers, misters, aerators, pumps, hoses, and related equipment would ensure that water spray or mist does not drift outside of the pit. All other dewatering/drying, removal or disposal methods not listed in the APD and or Design features would have prior written approval from the AO.

8. Pits, once dry, would be backfilled and compacted with a minimum cover of at least three (3) feet of soil, void of any topsoil, vegetation, large stones, rocks or foreign objects. The pit area would be mounded to allow for settling and to promote positive surface drainage away from the pit. Before backfilling synthetically lined reserve pits, those liner portions remaining above the "mud line" would be cut off as close to the top of the mud surface as possible and disposed of at an approved solid waste disposal facility. The pit bottom and remaining liner would not be trenched, cut, punctured, or perforated.

Reclamation

1. By March 1 of each year the operator would report and submit annual surface disturbance and reclamation data for the previous calendar year, utilizing the BLM Rawlins Field Office Disturbance (As-Built) and Reclamation Database. The Rawlins Field Office surface disturbance and reclamation database, as well as information on the database and submission of the data, is available at the following web address: http://www.blm.gov/wy/st/en/field_offices/Rawlins/oil_and_gas.html, or by contacting the Rawlins Field Office, Minerals and Lands, Supervisory Natural Resource Specialist/Physical Scientist at 307-328-4200 for further information.

2. Reclamation earthwork for interim and/or final reclamation would be completed within 6 months of well completion or well plugging (weather permitting), and would consist of: 1) backfilling pits, 2) re-contouring and stabilizing the well site, access road, cut/fill slopes, drainage channels, utility and pipeline corridors, and all other disturbed areas, to approximately the original contour, shape, function, and configuration that existed before construction (any compacted backfilling activities would ensure proper spoils placement, settling, and stabilization), 3) surface ripping, prior to topsoil placement, to a depth of 18-24 inches deep on 18-24 inch centers to reduce compaction, 4) final grading and replacement of topsoil, 5) surface-roughening and other techniques such as snow fencing to increase soil moisture retention and reduce compaction (all surface soil material would be pitted or roughened such that the entire reclamation area would be uniformly covered with depressions constructed perpendicular to the natural flow of water and/or prevailing wind), and 6) seeding in accordance with reclamation portions of the APD and these Design features.

3. Interim or final reclamation of all surface disturbed areas would commence and be completed within one year of initial disturbance unless needed for well production operations, or otherwise approved by the AO. Interim reclamation for those areas not needed for production operations, including unnecessary access roads and pipeline right(s)-of-way, would commence and be completed within six (6) months of well completion. Fill and stockpiled soils would be distributed on disturbed areas and the production pad would be as small as possible to allow for safe and prudent production operations.

4. Temporary fencing of the reclaimed well/facilities locations for the first two growing seasons after either interim or final seeding may be required to exclude livestock and wildlife and to help ensure better re-vegetation success. Similarly, off-road vehicle prevention measures would be employed on reclaimed locations.

5. Any subsequent re-disturbance of interim reclamation would be reclaimed within six (6) months by the same means described herein.

6. A Notice of Intent to Abandon (Form 3160-5) must be submitted and approved prior to any well abandonment activities. A joint inspection of the disturbed areas may be required and attended by the BLM and the Operator (or Operator's Designee), the primary purpose of which is to review and agree to the existing (or a new) abandonment and/or final reclamation plan. Earthwork must commence and be completed within six (6) months from the date of plugging and abandonment and seeding no later than the next immediate growing season upon the completion of earthwork. All reclamation should be accomplished as soon as possible after the disturbance occurs, with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized (3-5 years) (RMP ROD Appendix 13-8).

7. The Operator would submit a Final Abandonment Notice (FAN), using Form 3160-5, to the AO when adequate reclamation of surface-disturbed areas has been completed. This FAN indicates that the Operator believes the location is considered ready for final inspection, with adequate vegetation cover and species diversity. Upon receipt of the FAN, the BLM would conduct a field inspection prior to releasing the bond liability for this location.

8. Re-vegetation would consist of species occurring in the surrounding natural vegetation and/or included in the approved seed mix as deemed desirable by the BLM or private surface owner in review and approval of the reclamation plan. Inter-seeding, secondary seeding, or staggered seeding may be required to accomplish re-vegetation objectives. The seed mixture(s) would be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There would be no primary or secondary noxious weed seed in the seed mixture. Seed would be tested and the viability testing of seed would be done in accordance with State law(s) and within 9 months prior to purchase. Commercial seed would be either certified or registered seed. The seed mixture container would be tagged in accordance with State law(s) and available for inspection by the AO. Since seeds are of different sizes and require different planting depths, the Operator would use the appropriate equipment to

ensure that the seed mixture is correctly and uniformly planted over the disturbed area. Seed would be broadcast if drilling is not possible. When broadcasting the seed, the pounds per acre are to be doubled. The seeding would be repeated until a satisfactory stand is established as determined by the AO.

9. Evaluation of growth and success would be conducted as per RMP ROD (Appendix 36). The site would also comply with additional management needs, including control of weed infestations. Success criteria as defined by the RMP is: criteria based on pre-disturbance surveys or surveys of adjacent undisturbed natural ground cover and species composition (which the Operator would do prior to disturbance) or eighty percent of pre-disturbance ground cover, ninety percent dominant species, no noxious weeds, and erosion features equal to or less than surrounding area.

10. All practicable measures would be utilized to minimize erosion and stabilize disturbed soils on or adjacent to the disturbed and reclaimed area. There would be no evidence of mass-wasting, head-cutting, large rills or gullies, down cutting or overall slope instability. Should the use or storage of hay, straw, or mulch be necessary, the Operator is required to use certified weed-free hay, straw, and mulch on BLM lands.

11. Any topsoil to be stockpiled for longer than one year would be spread in layers not to exceed 2 feet maximum thickness and appropriately identified/signed as topsoil. These soil stockpiles would be seeded with a prescribed seed mixture or sterile cover crop (approved by the AO) and covered with mulch to reduce erosion and discourage weed invasion.

Fluids

1. All storage, removal and disposal of produced water must be in accordance with and comply with Onshore Oil and Gas Order No. 7. Produced water must be disposed of at a permitted off-site commercial disposal facility, unless approved otherwise by the BLM AO. The onsite storage/disposal of produced water, in open pits, tinhorns, sumps, etc., is not authorized except as follows: 1) produced water from the well subsequent to drilling may be disposed of in the approved well site reserve pit (for up to 90 days), and/or 2) used for well drilling or completion, upon prior written approval from the AO via approved APD or Sundry. Produced water may be transported and used for drilling/completion operations from approved fee, state, or federal wells/leases to federal wells/leases within the developed field/unit and/or EIS area, subject to WOGCC and BLM approval.

2. Pit drilling fluids may be transferred from a reserve pit at an approved federal well location to a lined reserve pit at another approved federal well location, for the purpose of drilling the well. Transfer/reuse would only be permitted when transfer is by a lease operator from one or more pits to another pit or pits on the operator's federal lease/unit or adjacent federal lease. Unless approved by this APD, the transfer and reuse of pit drilling fluids would require prior written approval from the AO, via a Sundry Notice (Form 3160-5).

3. The AO may authorize the use of produced water or reuse of pit drilling fluids for drilling when: 1) surface casing has been set with fresh water through any and all possible fresh water zones, 2) use is for drilling/completion only, and 3) the receiving pit is lined.

4. Pit fluids may be transferred by a lease operator from one or more pits to another (lined) pit or pits on the operator's federal lease/unit or adjacent federal lease, for the purpose of fluid consolidation and mechanical/chemical drying and disposal. The 6 month pit closure requirement would apply. Unless approved by this APD, the transfer of pit fluids for consolidation/disposal would require prior written approval from the AO, via a Sundry Notice (Form 3160-5).

5. Initial operator requests for the transport and use/reuse of produced water or pit drilling fluids or the transfer/consolidation of pit fluids would include: 1) the potential locations/leases in which fluids are to be transferred to and from, and 2) the potential quantity to be moved. Requests would be submitted for prior written approval from the AO via APD or Sundry Notice. Upon completion of transport,

use/reuse or consolidation, the specific information on leases, units or locations and quantities transferred would be submitted to the AO, via Sundry Subsequent Report. Transportation of fluids would be along approved haul routes and authorized right-of-ways. Temporary surface pipelines may be authorized by the AO for the transfer of fresh water only, and NOT for produced water or pit fluids.

6. Drilling water sources/supplies or any changes to drilling water sources/supplies, the fate of drilling/completion fluids, routes and means of fluid transportation/disposal, and location or method of produced water disposal requires prior written approval from the AO via approved APD, Sundry Notice or Right-of-Way (ROW) as applicable.

7. The drilling of water wells on federal lands would require prior BLM approval via APD, Sundry, or ROW as applicable, in addition to State Engineer Office (SEO) approval.

U.S. Department of the Interior
Bureau of Land Management
Rawlins Field Office

September 2011

# Finding of No Significant Impact (FONSI)

Anadarko E & P Company LP

Jack Sparrow Supplemental 1 AR Federal 1691 11-28,1-33, 7-33,10-33, 15-33, 10-29, and 12-29
Lease Number: WYC-138670 and WYC- 148483
DOI-BLM-WY-030-2009-0243-EA

**Finding of No Significant Impact:**

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment (DOI-BLM-WY-030-2009-0234-EA, May 2011), I have determined that the Proposed Action will not result in significant impacts other than those analyzed and disclosed in the Atlantic Rim Area Natural Gas Field Development Project (AR) Record of Decision (ROD). The Proposed Action, which incorporates the BLM required Standard Operating Procedures and Best Management Practices, would not create any additional effects (above and beyond what was already disclosed in the AR ROD), which would have sufficient context and intensity, as defined in section 7.3 of the BLM National Environmental Policy Act Handbook (Manual H-1790-1, page 70), to be considered significant.

The considerations listed in 40 CFR 1508.27(b) (1-10) were used to evaluate the intensity of the effects described in the EA:

1. There would not be an offset of potential significant adverse effects as a result of beneficial effects by approving the Proposed Action.

2. Health and safety would not be significantly affected. Solid wastes would be disposed of properly. Air and water quality would not be significantly affected. There would be no significant Social or Economic effects.

3. Neither the Rawlins Resource Management Plan (RMP) review nor interdisciplinary review found unique characteristics in the geographic area which would be adversely affected.

4. Interdisciplinary review found no indication to which the effects on the quality of the human environment would likely be highly controversial.

5. The effects of constructing an access road, well pad, pipeline, and drilling a well as the Proposed Action describes are well known. There would not be high uncertainty of the effects, nor unique or unknown risks.

6. The degree to which the Proposed Action would establish a precedent for future actions with significant effects or would represent a decision in principle about a future consideration would be minimal.

7. The proposed action falls within the development and cumulative impact analysis in the draft and final versions of the AR EIS. The proposed action does not result in impacts beyond those disclosed in the EIS.

8. There would be no significant adverse effects to resources with scientific, cultural, or historic value.

9. There would be no significant effect to habitat for threatened or endangered species. Construction timing restrictions would minimize or prevent adverse effects to other wildlife species and their habitat.

10. Approving either the Proposed Action or the No Action alternative would not violate any Federal, State, or local laws or regulations imposed for the protection of the environment.

**Authorized Official:**

Rawlins Field Manager

9/15/11
Date

# Decision Record

Anadarko E & P Company LP

Jack Sparrow Supplemental 1 AR Federal 1691 11-28,1-33, 7-33,10-33, 15-33, 10-29, and 12-29
Lease Number: WYC-138670 and WYC- 148483
DOI-BLM-WY-030-2009-0243-EA

**Decision:**

I have reviewed this Environmental Assessment (EA) including the analysis and discussion of any potentially significant environmental impacts. I have determined that the Proposed Action with the mitigation measures described below will not lead to new significant impacts not previously addressed in the Atlantic Rim Area Natural Gas Field Development Project (AR) Record of Decision (ROD) (see FONSI for this EA (DOI-BLM-WY-030-2009-0243-EA)). It is my decision to select the proposed action, with the mitigation measures identified below.

**Rationale for Decision:**

The proposed action meets the standards and direction of the various guiding laws, regulations, and directives that apply, including the Federal Land Policy and Management Act (43 USC 35).The proposed action meets the decisions from, and is in conformance with, the Rawlins Resource Management Plan (RMP) approved on December 24, 2008. Adoption of the proposed action will allow the operator to develop their fluid mineral leases as identified in the AREIS ROD.

**Mitigation Measures/Remarks:**

This project will be implemented with all Standard Operating Procedures (SOP's), Best Management Practices (BMP's), and mitigation measures as described and/or referenced in the EA. All required SOP's, BMP's, and mitigation measures are part of the Proposed Action and can be located in the Application for Permit to Drill (APD), Surface Use Plan (SUP), and Conditions of Approval (COAs) for the Jack Sparrow Supplemental 1 AR Federal 1691 11-28,1-33, 7-33,10-33, 15-33, 10-29, and 12-29 coal bed natural gas wells, 1692 13-12I and 1692 42-13I injector wells APD extensions, well pads, access roads, and buried pipelines.

**Compliance and Monitoring:**

Designated Bureau of Land Management personnel will monitor and review operations as needed to ensure compliance with the terms and conditions of the APD, SUP, and COAs.

**Appeal:**

Under BLM regulation this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of the decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003 within 20 business days of the date the decision is received, or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

**Authorized Official:**

Rawlins Field Manager

9/15/11
Date