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Bureau of Land Management  
Pinedale Field Office

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### Environmental Assessment for the Questar Year-Round Drilling Proposal - Condensate Pipeline Modifications, Sublette and Lincoln Counties, Wyoming



## **MISSION STATEMENT**

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

**WY-100-EA05-283**

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# CHAPTER ONE INTRODUCTION

## 1.1 Introduction

Questar Gas Management (QGM) proposes to modify the route of the buried 6-inch condensate pipeline (611 Pipeline) originally proposed and approved in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) and to make other modifications to the condensate gathering system within the Pinedale Anticline Project Area (PAPA). The U.S. Department of the Interior, Bureau of Land Management (BLM) prepared this Environmental Assessment (EA) to evaluate the impacts associated with construction of the modified route of the condensate pipeline in Sublette and Lincoln counties and some of the modifications to the gathering system. Some of the modifications have been addressed separately in right-of-way grants issued by BLM and have been previously analyzed under the National Environmental Policy Act (NEPA). However, there are some modifications which are included under the Proposed Action in this document because they have not yet been analyzed under NEPA. Other modifications to the Questar Year-Round Drilling Proposal EA and Decision Record (BLM, 2004a) are also included in this EA and are based on requests made by QGM and Questar Exploration and Production Company (Questar).

QGM proposes to modify the original condensate pipeline route by constructing a pipeline 14.4 miles west from the Bird Canyon Compressor Station to the Rocky Mountain Pipeline Terminal in Lincoln County, Wyoming, rather than south to the Black's Fork Processing Plant near Granger in Sweetwater County. This modification will shorten the original pipeline route by 46 miles so that the entire length will be 61 miles rather than the 107-mile route analyzed in the Questar Year-Round Drilling Proposal EA (WYW-100-EA05-034 - BLM, 2004a). Additionally the modification will require fewer river crossings than the original proposal. The modification would only involve a crossing of the Green River, whereas the original proposal involved a crossing of the Green River and crossing of the Hams Fork and Blacks rivers. The Green River crossing would be relocated from a point approximately 10 miles below Fontenelle Reservoir to its present location approximately 8 miles upstream from Fontenelle Reservoir. With construction of the condensate pipeline, it is generally agreed that impacts from development within the Pinedale Anticline Project Area (PAPA) will be reduced by significantly reducing overall truck traffic and eliminating the need for on-site storage of condensate.

## 1.2 Purpose and Need

As part of the Finding of No Significant Impact and Decision Record for the Questar Year-Round Drilling Proposal (WY-100-EA05-034 – BLM, 2004a), BLM stipulated as a condition of approval that Questar install the condensate gathering system. Completion of the gathering system would significantly reduce truck traffic and related impacts to wildlife, air quality, traffic, dust, noise, and other resources within the PAPA by transporting condensate offsite by pipeline for sale and disposal. Condensate is a mixture of heavier hydrocarbons produced as a by-product of natural gas extraction. Questar has estimated that construction of the condensate pipeline, together with other committed mitigation, will eliminate more than 25,000 tanker truck trips annually when their leases on the PAPA are at peak production.

## 1.3 Authorizing Actions and Relationships to Statutes and Regulations

BLM is not the only agency required to issue approvals for QGM and Questar's proposed pipeline route and other modifications. A list of permits, approvals and authorizing actions necessary to construct, operate, maintain and abandon the proposed pipeline and other modifications is provided in Table 1-1.

**Table 1-1  
Federal, State and Local Permits, Approvals and Authorizing Actions Necessary for  
Construction, Operation, Maintenance and Abandonment of QGM's Proposed Action and Alternatives 1**

<b>Issuing Agency/Permit Name</b>	<b>Nature of Permit/Approval</b>	<b>Authority</b>
<b>Bureau of Land Management</b> Rights-of-way Grants and Temporary Use Permits	Right-of-way grants on Federal lands	Mineral Leasing Act of 1920 as amended (30 U.S.C. 185); 43 CFR 2880
Rights-of-way Grants and Temporary Use Permits	Right-of-way grants on Federal lands	Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761 - 1771); 43 CFR 2800
Antiquities, Cultural and Historic Resource Permits	Issue antiquities and cultural resources use permits to inventory, excavate or remove cultural or historic resources from Federal lands	Antiquities Act of 1906 (16 U.S.C. Section 431-433); Archaeological Resources Public Protection Act of 1979 (16 U.S.C. Sections 470aa - 47011); 43 CFR Part 3; Section 106 of the National Historic Preservation Act.
Approval to Dispose of Produced Water	Controls disposal of produced water from Federal leases	Mineral Leasing Act of 1920 (30 U.S.C. 181 <i>et seq.</i> ); 43 CFR 3164; Onshore Oil and Gas Order No. 7
<b>U.S. Army Corps of Engineers</b> Section 404 Permit (Nationwide and Individual)	Controls discharge of dredged or fill materials into waters of the United States.	Section 404 of the Clean Water Act of 1972 (33 USC 1344)
<b>U.S. Fish and Wildlife Service</b> Consultation Process, Endangered and Threatened Species	Biological Assessment	Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. <i>et seq.</i> )
<b>Wyoming Department of Environmental Quality</b> Water Quality Division Notice of Intent - Storm Water Discharge Permit	Controls off-site storm water runoff from construction activities resulting in 1 acre or more of disturbance	Wyoming Environmental Quality Act; Section 405 of the Clean Water Act (40 CFR Parts 122, 123 and 124); WDEQ Water Quality Rules and Regulations, Chapter 18
Water Quality Division Temporary Discharge Permit	Discharge of Hydrostatic Test Water	Federal Water Pollution Control Act Wyoming Environmental Quality Act
<b>Wyoming State Engineer's Office</b> Water Quality Division Notice of Intent Temporary Permit to Appropriate Surface Water	Withdrawal of water from the Green River	Section 41-3-101 In Article 1, Chapter 3 Of Title 41 in Wyoming State Statutes
Air Quality Division Permits to construct and operate Notice of Installation	Regulates emissions from project components  Notification of Potential Emissions from production equipment	Wyoming Air Quality Standards and Regulations WDEQ Rules and Regulations
<b>Wyoming Department of Transportation</b> Oversize and Overlength Load Permits Utility Permit  Access Permit	Permits for oversize, overlength and overweight loads  Highway pipeline crossing  Highway access construction	Chapters 17 and 20 of the Wyoming Department of Transportation Rules and Regulations  Title 12: Code of Civil Procedures, Chapter 26: Eminent Domain Rules and Regulations for Access Driveways as Approved by the Wyoming Highway Commission
<b>Wyoming Department of Employment</b> Workers Safety and Compensation Division	Provides the rules and regulations governing the health and safety of employees and employers of oil and gas drilling and servicing, includes equipment spacing, lighting requirements, hours of operation and other items pertinent to pad size and design.	W.S. 27-11-105
<b>Wyoming State Lands and Investments</b>	Right-of-way and easements on state lands	W.S. 36-9-118

<sup>1</sup> This list is intended to provide only an overview of key regulatory requirements that would govern project implementation. Additional approvals, permits and authorizing actions could be necessary.

#### **1.4 Decisions to be Made Based on this NEPA Analysis**

BLM decision-makers will decide, based on the analysis contained in this EA, whether or not to authorize the Proposed Action or one of the alternatives including the No Action Alternative.

#### **1.5 Decisions to be Made Following this NEPA Process**

The Decision Record associated with this EA may not constitute the final approval for all actions, such as individual right-of-way grants and temporary use permits associated with QGM's Proposed Action. It does, however, provide the authorized officer with an umbrella analysis from which to base the final approval for individual project components such as an individual right-of-way or temporary use permit.

## **CHAPTER TWO PUBLIC PARTICIPATION, ISSUES AND ALTERNATIVES**

### **2.1 Introduction**

The chapter describes QGM's proposed route change to the 611 Pipeline and other condensate gathering system modifications (the Proposed Action) and reasonable alternatives developed by the BLM. The Proposed Action and project alternatives developed by the BLM are based on QGM's submission of a revised Plan of Development (WYW-146051) that modifies the route of the condensate pipeline previously approved in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a). In addition, QGM's Proposed Action includes other modifications to the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) which are based on requests by QGM and Questar. Some of the modifications have been previously analyzed under NEPA in the right-of-way grants and will be included in this impact analysis only under the cumulative analysis. Other components which have not been previously analyzed under NEPA will be analyzed in this EA as parts of the Proposed Action. Most of the other modifications are to gathering system components within the PAPA and are a result of inspection and enforcement issues which require changes to QGM and Questar's systems to ensure accurate measurement of gas for royalty purposes, or are contingencies for operations in emergency situations.

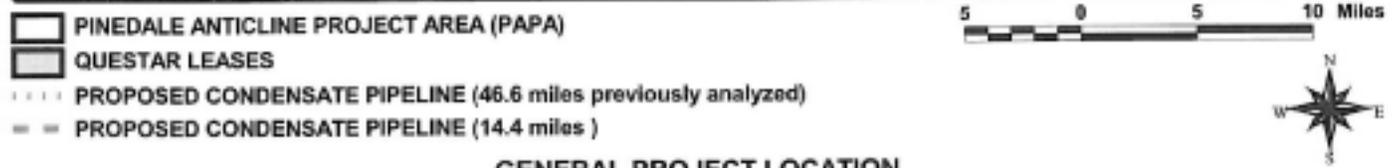
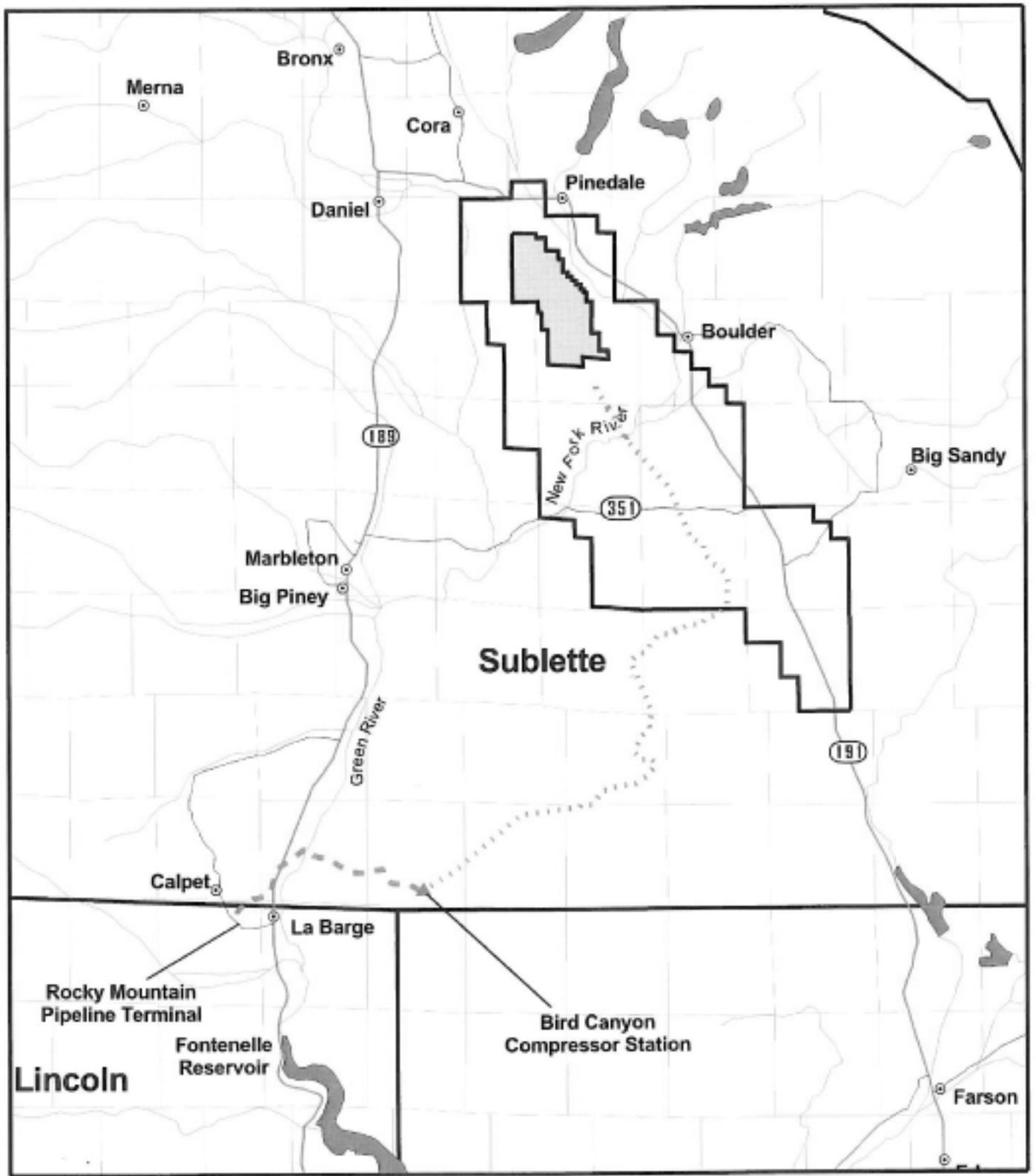
### **2.2 Scoping, Consultation and Coordination**

BLM has solicited public involvement in its evaluation of the Proposed Action through public announcements and by making the scoping notice available to the public. The public has been provided opportunity to submit comments and recommendations by mail, over the telephone, by e-mail or in person. BLM has not received any responses from other regulatory agencies, interested groups or the public regarding the Proposed Action and/or the scope of the analysis contained in this EA.

### **2.3 Project Location**

In this proposal, QGM is applying for a right-of-way grant to construct 14.4 miles of condensate pipeline from the Bird Canyon Compressor Station in the NW  $\frac{1}{4}$  of Section 34, Township 27 North, Range 111 West in Sublette County to the Rocky Mountain Pipeline Terminal in the NE  $\frac{1}{4}$  of Section 11, Township 26 North, Range 113 West in Lincoln County. The proposed 14.4 mile-long condensate pipeline is located in west-central Wyoming in Sublette and Lincoln counties. The Town of LaBarge is located approximately 1.2 miles northeast of the pipeline terminus in Lincoln County.

Other modifications to the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) that are included in this EA are located within the PAPA which is adjacent to the Town of Pinedale. Pinedale is located approximately 80 highway miles south of Jackson Hole and 100 miles north of Rock Springs. Other communities/settlements in the general vicinity include Cora, Daniel, Boulder, Bargerville, Marbleton and Big Piney (see Figure 2-1). Generally, the PAPA lies between U.S. Highway 191 and the Green River. The project area is dominated by sagebrush and high desert vegetation blending with riparian areas and wetlands associated with the New Fork and Green River floodplains. The sagebrush covered higher elevation area between the rivers in the northern half of the PAPA is known locally as the "Mesa".



**GENERAL PROJECT LOCATION**  
**QUESTAR GAS MANAGEMENT**  
**QUESTAR YEAR-ROUND DRILLING PROPOSAL CONDENSATE PIPELINE MODIFICATION**

U.S. Highway 191 is the primary access to the PAPA and generally runs along the eastern and northern edges of Questar’s lease area. It is a primary route for tourist travel to Yellowstone and Teton National parks and Jackson Hole. U.S. Highway 189 runs west of the PAPA and State Highway 351 crosses through the southern portion of the PAPA.

Although no national forest lands are located in the PAPA, the Bridger-Teton National Forest is located west, north and east of the PAPA. At their closest, national forest lands are approximately 2.3 miles from the northern boundary of the PAPA at Fremont Lake.

## 2.4 QGM’s Proposed Action

### 2.4.1 Condensate Pipeline Modification

QGM proposes to construct a 14.4-mile long 6-inch diameter condensate pipeline and related facilities (including filters, screens, valves, pigging equipment, side taps, and metering equipment). The proposed pipeline would be buried to a minimum depth of 60 inches and would be located parallel and adjacent to existing pipelines for approximately 74 percent of its total length. In a few places, the proposed pipeline route would leave existing adjacent pipeline rights-of-way to avoid environmentally-sensitive sites or facilities.

The condensate pipeline route is shown on Figure 2-1. The pipeline would head in a westerly direction from the Bird Canyon Compressor Station in the NW ¼ of Section 34, Township 27 North, Range 111 West (Sublette County) to the LaBarge Tank Farm in the north half of Section 11, Township 26 North, Range 113 West (Lincoln County). The pipeline, from the Pinedale 4 well site in the PAPA to the Bird Canyon Compressor Station, was analyzed in the Questar Year-Round Drilling EA (BLM, 2004a).

The total length of the modified pipeline segment would be approximately 14.4 miles, of which 87.5 percent is on Federal lands administered by the BLM (see Table 2-1). Maps showing the pipeline route and landownership can be found in Appendix A.

**Table 2-1  
Land Ownership for the Proposed Condensate Pipeline**

	<b>Total</b>	<b>Federal</b>	<b>State</b>	<b>Private</b>
Miles	14.4	12.6	1.1	0.7
Percent	100	87.5	7.6	4.9

The condensate pipeline would consist of 6-inch steel API 5Lx52 pipe with a maximum operating pressure of approximately 2,120 pounds per square inch gauge (psig). QGM estimates the condensate pipeline will transport 12,000 to 18,000 barrels per day.

Operating pressure would be generated by electric pumps within the NGL (natural gas liquids) Stabilizer and Water Handling Facility located at the northern end of the entire 611 Pipeline. No additional pump stations would be required under the current volume projections. Valve assemblies would be located on either side of the Green River crossing and at the southern receiver.

Liquids would be piped from each of Questar’s well pads to the Gobblers Knob Facility. The expanded facility would house a 3-phase separator to separate water, gas and condensate. Water from the 3-phase separator would be piped to on-site water storage tanks or would be pumped into an existing water gathering system. Gas from the 3-phase separator would be metered and sold. Condensate from the 3-phase separator would be pumped along the

condensate pipeline by electric-driven pumps, processed and sold. Aboveground valve assemblies would be spaced approximately every 20-miles along the condensate pipeline and on each side of major river crossings.

If there is an equipment failure or power loss at the Gobblers Knob Facility, gas would be flared. A back-up generator capable of running one pump would be installed.

**Workforce Requirements and Construction Schedule.** Construction of the 14.4 miles of the 611 Pipeline would begin in mid July 2005 and would proceed from west to east. QGM would notify the authorized officers of the appropriate agencies five days prior to commencing construction activities. QGM would comply with all timing stipulations for wildlife. Easements would be obtained from private landowners. Construction would be complete and the entire 611 Pipeline would be operational by November 15, 2005.

QGM expects the peak construction workforce to reach approximately 50 workers. The construction workforce would commute daily from surrounding communities in the Rock Springs and Pinedale areas.

**Design.** The design and engineering of the condensate pipeline would be completed by QGM personnel or its contractors in accordance with safe and proven engineering practices. Pipeline plans and specifications, alignment sheets, road profiles, cross sections, site-specific details, and design drawings associated with the project would be provided to the BLM field office in Pinedale prior to issuance of the right-of-way grant.

**Rights-of-Way and Permits.** QGM would secure all rights-of-way and permits necessary for construction of the 14.4 pipeline prior to commencing construction. QGM is requesting Federal rights-of-way for a period of 30 years with options to renew for as long as there are marketable quantities of condensate available. QGM would conduct all activities associated with construction, operation, maintenance and abandonment of the pipeline within the authorized limits of the right-of-way.

During construction, QGM is requesting temporary use of an additional 20-foot width of construction area for a total 50-foot wide construction right-of-way for the entire length of the pipeline. Additional workspace beyond the 50-foot width would be necessary for temporary work areas at truck turn-arounds and at each road, river and pipeline crossing. Temporary extra workspace would also be required at deep draws or sidehill cuts for the storage of topsoil and subsoil. The locations of temporary extra work areas are shown on the maps in Appendix A.

Table 2-2 shows the surface disturbance associated with construction of the proposed 14.4-mile long portion of the 611 pipeline. Surface disturbance would occur on undisturbed land as well as on previously disturbed land within the proposed condensate pipeline right-of-way. Because the condensate pipeline route is adjacent to or between existing pipelines for most of its alignment, most disturbance will occur in areas previously disturbed during construction of other existing pipelines.

**Table 2-2  
Condensate Pipeline Surface Disturbance Summary**

	Size	Total Construction Disturbance (acres)	Permanent Right-of-Way (acres)
Pipeline	14.4 miles	87.0	52.2
Temporary Extra Workspace	See Appendix A Maps	39.0	0.0
Total		126.0	52.2

**Construction.** Construction sites would be maintained in a clean and safe condition at all times and construction waste materials would be disposed of promptly in accordance with State and local regulations. Construction activities would not inhibit public use of existing roads and trails, or prevent wildlife or livestock movement.

Clearing and Grading. Prior to the start of construction, the limits of the construction right-of-way would be clearly staked. After staking, the right-of-way would be cleared of vegetation. A motor grader with a blade would be used to remove vegetation, such as sagebrush, within as much of the 50 foot right-of-way as is needed to provide a safe and level working area.

After vegetation clearing, a minimum of 6 inches of topsoil would be stripped from the trench line and any other area that needs to be graded and stockpiled on the non-working side of the construction right-of-way. Topsoil would not be mixed with trench spoil or other excavated material.

Grading would be conducted as necessary to allow the safe movement of equipment and personnel along the right-of-way. Grading would also be conducted where necessary to reduce the need to bend pipe. Grading usually requires cutting or filling and may include ripping rock close to the surface.

Equipment traffic across/through drainage channels would be limited to sloping drainage sides or to vertical banks of less than two feet. To the extent practicable, drainage crossings would be aligned perpendicular to the stream channel.

Trenching. After grading is complete, a wheel trencher would be used to dig a 2 foot wide trench, stockpiling the dirt beside the trench. In rocky areas or areas where the pipeline changes direction, an excavator (track-hoe) would be used. The trench would be excavated to a minimum depth adequate to allow for 60 inches of cover over the pipeline.

Hauling and Stringing. Once grading is complete, all construction materials would be hauled to construction sites by truck. Pipe would be strung along the right-of-way in a manner that would cause the least interference with the normal use of the land crossed by the right-of-way.

Public Road Crossings. At all public road crossings, the pipeline would be buried to a minimum of 60 inches below the bottom of the borrow trench. Public road crossing techniques would be determined by the agency responsible for maintaining the road (i.e., BLM, State, county). Roads that are not heavily used would be open cut, backfilled and compacted. Heavily traveled roads would be bored to avoid disrupting traffic. Shoe-flies (detour roads) would be constructed at road crossings to prevent disruption of use.

Bending, Welding, and Coating. A bending machine would be used to bend the pipe to fit the trench and contour of the land. All welding would be conducted in compliance with American Petroleum Institute (API) Standard 1104, "Welding of Pipelines and Related Facilities." The welds would be X rayed to insure the quality of the weld. The welded pipe string would be temporarily stored on skids until lowered into the trench.

Although the pipe would arrive at the right-of-way with a corrosion-resistant coating, additional coating would be applied to the welds and any damaged areas. Cathodic test stations would be installed at all other pipeline crossings, at road bores and approximately every mile along the pipeline. These stations would be used to test and monitor corrosion during operations.

Lowering In, Padding, and Backfilling. Side booms would be used to lower the pipe into the trench. In rocky areas, the trench would be padded with sand or soil using a padding machine, which separates rocks from satisfactory padding materials.

In steeply sloping areas such as the section where the line enters Bird Canyon, trench breakers would be installed within the trench to prevent subsurface erosion along the pipeline. Spacing of the trench breakers would be as follows:

Slope Percent	Spacing (feet)
5 -15	300
15-30	200
>30	100

After the pipe is placed in the trench, a motor grader or dozer would be used to backfill the trench. The fill within the trench would then be compacted with the grader wheels. Excavated material that cannot be placed in the trench would be disposed of in compliance with landowner and agency requirements.

Horizontal Directional Drill (HDD). QGM specifically proposes to cross the Green River utilizing HDD to prevent erosion and to minimize any increase in sediment load to the waters. In addition, crossing the Green River by HDD avoids the cultural resources site at this location. The HDD of the Green River will be done outside of the waters of the U.S. and non-isolated wetlands in compliance with Section 404 of the Clean Water Act and Nationwide Permit #12.

This construction technique uses drilling equipment to bore and install a pipeline beneath a surface obstruction or environmentally-sensitive area without disturbing the surface area. First, a pilot hole is bored along a pre-determined path under the area of concern. Once the pilot hole has been successfully completed, the pilot hole is enlarged by reaming out the hole in multiple passes with a reamer. After the hole has been enlarged to a diameter large enough to receive the pipe, a pre-tested section of pipe (coated with abrasion resistant coating) is pulled into the drilled and reamed hole using a bentonite slurry. This slurry helps to keep the hole open, acts as a slicking agent and also seals the drilled annulus. Once the pipe section is pulled through the drilled hole, the HDD section would be welded to pipe on both sides of the HDD.

QGM has conducted a geotechnical investigation at the Green River to determine the feasibility of crossing the Green River by HDD. This investigation consisted of three bores of varying depth below the riverbed. These bores showed geologic conditions that are very conducive to HDD with a thick clay layer approximately 28 feet below the riverbed. This zone will be the target for the HDD. With the 28 feet elevation difference the HDD would be set up and started approximately 200 feet west of the river. This procedure helps minimize the hydraulic pressure in the hole, which helps prevent inadvertent returns of drilling fluid. The HDD would be approximately 1,900 feet long and would exit on the disturbed area of Bird State 1-16 well pad.

Dirt berms will be built around the entry and exit pits. These pits will then be encircled with safety fencing. Dirt berms will be built around the base of the mud recycling system, below the shaker screens, to ensure that all of the solids that are produced are contained prior to disposal. Fuel, oil or grease that is stored on the ground will have a dirt berm built around it and will be lined with plastic liner. The equipment will be fueled on a daily basis from a fuel supplier to eliminate the need to have on-site fuel storage.

A supply of hay bales, silt fence, shovels, brooms, small and large capacity pumps, sand bags and a vacuum truck will be on-site to respond immediately to any potential environmental concerns. Spill kits will also be on-site, to insure proper containment and clean up in case of any oil spills.

Actual ground conditions and site conditions will determine what other erosion or sediment control measures will be necessary to ensure the greatest protection to waterways, wetlands and any other sensitive areas.

Fabrication/Tie-Ins. Valve assemblies, pig receivers, pig launchers, filters, strainers, side taps, and meter stations would be prefabricated off-site. Tie-in crews would be used to complete the final installation of fabricated assemblies, road crossings, and other congested areas.

Hydrostatic Testing. After the trench is backfilled, the pipeline would be pressure tested with water. The pipeline would be filled with water and pressurized to a minimum of 1.25 times the designated operating pressure for 8 hours to verify integrity. Test water would be obtained from the Green River and pumped to the pipeline for testing. QGM has obtained a permit from the Wyoming State Engineer's Office for withdrawal of water from the Green River. Prior to release, the water would be tested and processed, if necessary, to ensure it meets local, State and Federal water quality standards. A permit has also been obtained from the Wyoming Department of Environmental Quality/Water Quality Division (WDEQ/WQD) prior to release of the hydrostatic test water. In order to prevent scouring and erosion, test water would be discharged into energy dissipation devices, filter bags, or straw bale dewatering structures, which would be removed upon completion of testing.

A total of 120,750 gallons (0.37 acre-feet) of water will be necessary for hydrostatic testing of the 14.4-mile long pipeline segment. Testing would be performed in two segments with one water source (Green River) and two discharge point locations. These withdraw and discharge points would be located in close proximity to each other. The withdrawal point on the Green River would be located in the SW SE ¼ of Section 16, Township 27 North, Range 112 West (see Appendix A).

Dust Control. Additional water will be withdrawn from the Green River and obtained from municipal sources for dust control. The volume of water will depend on several conditions including soil type and moisture content, weather and BLM/landowner requirements.

Hazardous Materials. QGM would comply with all applicable Federal and State laws with respect to hazardous substances. Hazardous waste would not be generated during construction of the pipeline. A release of a hazardous substance, such as a leak or spill, in excess of the reportable quantity as established by 40 CFR Part 117.3, would be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, Section 102 B. No toxic substances are proposed for use in connection with construction; however, if toxic substances are necessary, their usage would comply with provisions of the Toxic Substances Control Act of 1976, as amended (40 CFR Part 702-799).

Appendix B provides a list of the hazardous and extremely hazardous materials, as identified in the Environmental Protection Agency Consolidated List of Chemicals Subject to Reporting under Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 355, that QGM may use during construction of the pipeline. Quantities would be limited to only the amounts needed for construction. Fuels would not be stored on location and would be provided by a vehicle that refuels and services construction equipment. Material Safety Data Sheets would be maintained by QGM for all materials used.

Fire Control. QGM would notify the authorizing officer of any fires during construction and would comply with all rules and regulations administered by the authorizing officer concerning the use, prevention, and suppression of fires on Federal lands. In the event of a fire, QGM or their contractors would initiate fire suppression actions in the work area. Suppression would continue until the fire is out or until the crew is relieved by an authorized representative of the agency on whose land the fire occurred. Heavy equipment would not be used for fire

suppression outside the right-of-way without prior approval of the authorizing officer unless there is imminent danger to life or property. QGM or their contractors would be responsible for all costs associated with the suppression of fires and the rehabilitation of fire damage resulting from their operations, employees, or contractors.

QGM would designate a representative to be in charge of fire control during pipeline construction. The fire representative would ensure that each construction crew has fire fighting tools and equipment (such as extinguishers, shovels and axes) available at all times. QGM would, at all times during construction, maintenance, and operations, require that spark arresters be maintained on internal combustion engines.

Reclamation. Initial reclamation would begin following completion of hydrostatic testing. The right-of-way would be restored in accordance with agency/landowner specifications. All disturbed areas would be re-contoured so that the disturbed area is visually consistent with the surrounding terrain. Topsoil would be evenly spread across the right-of-way. Erosion would be prevented by the use of construction diversion terraces, rip-rap, matting and water bars. No berms or mounds would be created over the backfilled trench.

QGM proposes to restore BLM lands and waters of the United States (including stream and wetland crossings) in accordance with the following stipulations:

- Certified weed-free seed would be used during re-seeding of disturbed areas;
- Adherence to permit conditions required under Section 404 of the Clean Water Act and Nationwide Permit #12.
- Native plant species would be used in re-seeding;
- Noxious weed control would be conducted for the life of the pipeline;
- Monitoring for noxious weeds and for the success of vegetation establishment following initial and any subsequent plantings would be conducted;
- All compacted areas would be ripped to the necessary depth to reduce compaction prior to seeding at the request of the BLM;
- Surface disturbance would be minimized during pipeline construction;
- Slope breakers would be installed on slopes following criteria presented in Figure 10 in "Surface Operating Standards for Oil and Gas Exploration and Development," DOI-BLM and USDA Forest Service, 3<sup>rd</sup> edition, January 1989 (the Gold Book);
- Water breaks would be installed on slopes following BLM and Bureau of Reclamation criteria;
- Contour furrows, water bars check dams, erosion control blankets or other appropriate BMPs (Best Management Practices) would be installed to limit conditions favorable for accelerated erosion at the request of the BLM;
- Channel cross-sections of ephemeral stream channels would be restored to pre-disturbance contours, or to a stable profile to minimize accelerated erosion and bank sloughing. Appropriate BMPs would also be utilized, as required to prevent accelerated erosion or gully formation. Appropriate BMPs would be determined in consultation with the BLM and QGM;
- Ephemeral stream crossings would be monitored during construction and following reclamation to identify and mitigate conditions of accelerated erosion within the pipeline right-of-way. Monitoring during construction would ensure that appropriate BMPs are

implemented, as necessary, to prevent accelerated erosion or the potential hazard of gully erosion. Monitoring would continue until the agencies determine disturbed areas have been stabilized and an adequate percent cover density of native vegetation has been established; and

- Reclamation must be completed within one growing season after recontouring and backfilling of completion of surface disturbance. Successful reclamation would include less than 2 percent weeds and at least 85 percent of original cover at a minimum.

All disturbed areas along the pipeline right-of-way would be seeded according to BLM specifications, including components of the seed mixture, application rate and application technique. Where applicable, seed would be planted using a drill or Trax drill. Prior to seeding, an appropriate seedbed would be prepared that would be rough enough to reduce runoff and promote infiltration. In unsuitable areas, the seed would be broadcast and raked or chained to ensure sufficient soil cover (broadcast seed rates would be double that of the drilled seed rate), or hydroseeded, or other applicable methodologies may be used, per BLM specifications. A typical upland seed mixture is shown in Table 2-3, though BLM may specify a different seed mixture based on site-specific conditions.

**Table 2-3  
Typical Upland Seed Mixture**

Species	Variety	Drill Seeding Rate lbs/acre pure live seed (PLS)
Western Wheatgrass ( <i>pascopyrum smithii</i> )	Rosanna	4
Sandberg bluegrass ( <i>Poa sandbergii</i> )		1
Thickspike Wheatgrass ( <i>Elymus lanceolatus</i> )	Critana	4
Indian Ricegrass ( <i>Achnatherum hymenoides</i> )		4
Bluebunch Wheatgrass ( <i>Agropyron Spicatum</i> )		2
Winterfat ( <i>Krascheninnikovi lanata</i> )		2
Fourwing Saltbush ( <i>Atriplex canescens</i> )		2
Total		19

QGM would comply with all Federal and State laws for herbicide uses and limitations imposed by the authorizing officer. Prior to using herbicides, QGM would obtain written approval from the authorized officer of a plan showing the type and quantity of material to be used, the pest(s) to be controlled, the application methods, the storage locations, the container disposal protocol, and any other information deemed necessary by the authorized officer.

**Operation and Maintenance.** QGM would conduct all activities associated with operations, maintenance and abandonment of the right-of-way within the authorized limits of the right-of-way. All permanent aboveground facilities, piping, and valves would be painted a non-contrasting color harmonious with the surrounding landscape (Shale Green unless otherwise specified by the BLM on a case-by-case basis).

The pipeline would be routinely patrolled and inspected by foot or vehicle from roads, the permanent right-of-way, and by aircraft to check for problems such as right-of-way conditions such as erosion, encroachment on the right-of-way, and any other situation that could cause a safety hazard or require preventive maintenance. If damage should occur to the pipe from external sources, repair or replacement of the portion of the pipeline may be necessary.

QGM would be responsible for weed control on the disturbed areas within the established limits of the right-of-way. QGM would coordinate with the authorized officer of the appropriate regulatory authority or local authorities to develop acceptable weed control methods for the disturbed areas within the right-of-way limits. Before using pesticides, including use in emergency situations, QGM would obtain written approval of its plan detailing the type and quantity of material to be used, pests to be controlled, method of application, location of storage, disposal of containers, and any other information deemed necessary by the regulatory agency. If pesticides were required, QGM would comply with all applicable Federal and State laws. Pesticides would be used in accordance with registered uses and within limitations imposed by the appropriate regulatory authority.

**Abandonment.** Prior to abandonment, QGM would obtain authorization from the appropriate regulatory agency. BLM would determine whether the pipeline and all aboveground pipeline facilities are removed and unsalvageable materials disposed of at approved sites or abandoned in place. Re-grading and revegetation of disturbed land areas would be completed where necessary.

#### **2.4.2 Other Gathering System Modifications Included in the Proposed Action**

In addition to the 611 Pipeline, QGM and Questar are proposing other modifications to the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) that have not been previously analyzed under NEPA and therefore are included in this Proposed Action. These components include:

**Power Line to Stewart Point 16-18 CDP (WYW-162828).** As part of this Proposed Action, PacifiCorp proposes to construct an underground 25 kV three-phase distribution line. The distribution line will provide power to the previously analyzed generator at the Stewart Point 16-18 CDP site (see Section 2.4.3, below). The requested right-of-way is approximately 630 feet in length and 20 feet in width, being 10 feet each side of centerline. All of the line will be located on public land, a portion of which is within existing BLM rights-of-way. The proposed power line is located in Section 18, Township 33 North, Range 109 West and is within the PAPA. Total disturbance for the power line is approximately 0.29 acres.

**Connecting Pipelines (WYW-16280).** QGM is proposing to construct ten parallel pipelines to connect the new NGL Stabilizer and Water Handling Facilities with the existing Gobblers Knob Compressor Station. The proposed new pipelines will transmit natural gas, produced water, compressed air, and condensate between the two facilities. The requested permanent right-of-way will be 180 feet long, 50 feet wide and cross an existing road. It will be located entirely within the W ½ NW ¼, Section 2, Township 31 North, Range 109 West. The total permanent right-of-way requested is 0.21 acres. A total of 0.11 acres of temporary right-of-way is requested for construction of a temporary shoe-fly road. The northern 108 feet of the permanent right-of-way is within previously disturbed land while the southern 72 feet will be located in previously undisturbed land.

**Power Line from Gobblers Knob Compressor Station to NGL Stabilizer and Water Handling Facilities Site (WYW-162827).** PacifiCorp is proposing to construct an underground 25 kV three-phase distribution line to connect the NGL Stabilizer and Water Handling Facilities Site to the Gobblers Knob Compressor Station. It will require a right-of-way approximately 1,250 feet in length and 20 feet in width with 10 feet on either side of centerline. All of this line will be located on Federal land and a portion will be within existing rights-of-way. It is located in Section 3, Township 31 North, Range 109 West and is within the PAPA. Total disturbance for this power line is 0.57 acres.

**Blowdown Tanks within the PAPA.** As part of the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a), and because of installation of the condensate and water gathering systems, Questar planned to remove the condensate and water storage tanks from each well pad. Questar has determined that a blowdown tank is necessary on each pad, and plan to leave one water storage tank on each pad to serve that purpose. Water tank volumes vary from 300 barrels to 540 barrels and from 8 to 9 feet in height. Under the Proposed Action, one water tank would remain on each well pad for up to two years and then would be replaced by smaller 90 barrel blowdown tanks not to exceed 6 foot in height.

**Drill Rig Emissions.** The Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a), states that “as committed to by Questar, by January 1, 2007, all drilling rigs operating in Questar’s leasehold will be either EPA Tier II compliant or will utilize alternate fuels engines whose emissions are equivalent to Tier II engines”. Due to the lack of availability of Tier II compliant rigs, Questar is not able to implement the EPA Tier II or equivalent engines on drilling rigs until January 1, 2008.

## **2.5 Alternatives**

BLM has developed alternatives to QGM’s modified pipeline route and other modifications. Impacts of these alternatives are addressed in detail in Chapter 4 of this EA. Other alternatives were considered but not analyzed in detail for the reasons listed in Section 2.5.2.

### **2.5.1 Alternatives Considered in Detail**

**No Action Alternative.** If the No Action Alternative is implemented, BLM would deny QGM’s application to construct the 14.4-mile long condensate pipeline between the Rocky Mountain Pipeline Terminal and the Bird Canyon Compressor Station. QGM would be allowed to construct the entire 107-mile long condensate pipeline from the PAPA to the Black’s Fork Processing Plant near Granger as approved in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a).

All three CDPs have been analyzed under NEPA and CXs have been issued (see Section 2.4.3). With those approvals, QGM has commenced construction on the CDPs even though the non-611 Pipeline components of the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, the 1,250-foot long 25 kV distribution line, blowdown tanks on each well pad) that are integral to moving the condensate are being analyzed through this EA and could potentially not be approved.

**Alternative A.** Under this alternative, the winter stipulations in the PAPA ROD (BLM, 2000b) would be reapplied and year-round drilling would not be allowed within Questar’s leases. Questar proposed eliminating those winter stipulations to shorten the period necessary to develop their leases and to provide for more economically-attractive drilling rig utilization, beginning in the winter of 2004. BLM approved of the proposal in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) which included development of Questar’s remaining lease acreage by constructing only 9 additional well pads (using multiple wells drilled from a single pad) and drilling from 52 existing well pads. Questar maintained that those features of their proposal would only be possible with year-round drilling.

As a consequence, there would be no condensate gathering system on Questar’s lease area under Alternative A and no reason for QGM to construct any of the modification components included in the Proposed Action (630-foot 25 kV power line, right-of-way for ten pipelines from the stabilizer site to the Gobblers Knob Compressor Station, the 1,250-foot long 25 kV power

line, blowdown tanks on each well pad) or modifications previously analyzed under NEPA (Section 2.4.3).

Questar would have existing pads with multiple wells but because the condensate gathering system would not be feasible, Questar would most likely develop new well pads with only one well on each pad. Potentially, the number of new pads would be consistent with that allowed in the PAPA ROD (BLM, 2000b) and would be connected by a more extensive road network than under the Proposed Action.

## **2.5.2 Alternatives Considered but not Analyzed in Detail**

**Alternative 1.** BLM considered an alternative that would require Questar to drill multiple wells from one pad and construct the condensate delivery and storage system, but not allow year-round drilling within their leases. This alternative was considered but not analyzed in detail because it is not economical for Questar to implement multi-well pad drilling and install the condensate delivery system without year-round drilling.

**Alternative 2.** BLM also considered an alternative that would require QGM to construct the gathering system without the CDPs. This alternative was considered but not analyzed in detail because the CDPs are necessary to maintain the flow of the liquid condensate due to the elevational differences between wells north of Stewart Point and the NGL Stabilizer and Water Handling Facility near the Gobblers Knob Compressor Station. The CDPs are also designed to be emergency facilities to temporarily store condensate in case of a line break.

## **2.6 Modifications Previously Analyzed Under NEPA**

QGM and Questar have proposed other modifications to the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a) that have been previously analyzed under NEPA and therefore are not included in the Proposed Action but will be discussed in this EA under Cumulative Impacts. QGM has submitted respective Plans of Development for these components, BLM has conducted a NEPA analysis and has issued right-of-way grants for each of the following components:

**Central Delivery Points (WYW-162012 and WYW-162013).** QGM proposed to construct three central delivery points (CDPs) within the PAPA to receive produced water and natural gas liquids from producing wells. One of the CDPs will be located at the existing MESA 15-06 location and will be located entirely within the Mesa 15-06 pad. A second CDP will be located at the existing Stewart Point 16-18 pad and will be located entirely within the pad. The third CDP will be located within a State section at the Mesa 15-16 pad and will be located entirely within the pad. There will be no new disturbance associated with installation of the CDPs. Impacts associated with construction and operation of the CDPs on Federal surface have been analyzed under NEPA and Categorical Exclusions (CXs) have been issued (EA-WY-100-05-178 for Mesa 15-06 CDP and EA-WY-100-05-177 for Stewart Point 16-18 CDP).

**NGL Stabilizer and Water Handling Facility (WYW-160774).** The Gobblers Knob Compressor Station expansion was analyzed in the Questar Year-Round Drilling Proposal EA (BLM, 2004a) and included 5.5 acres (approximately 500 feet by 500 feet). QGM has modified their plans to include a NGL Stabilizer and Water Handling Facility. This modification has been analyzed under NEPA by BLM and a DNA (Documentation of Land Use Plan Conformance and NEPA Adequacy) was issued (WY-100-DNA-05-172). The purpose of the NGL Stabilizer is to make a “stable” condensate product that can be metered and can then be pumped to the 611 Pipeline for transport off the PAPA.

**Mesa Phase IV Multi-Pipelines (WYW-162014).** QGM proposes to construct several parallel pipelines within or adjacent to the existing QGM right-of-way for the Mesa 1 Pipeline. The total distance crossed by the pipelines is 6.29 miles of which the requested Federal right-of-way is 5.52 miles. Existing roads will be paralleled for most of the new right-of-way length. Installation will required approximately 33.5 acres during construction (30 foot permanent right-of-way and 20 foot temporary right-of-way). The proposed new pipelines will transmit natural gas, produced water, and condensate from gas wells located within the PAPA to downstream facilities. Impacts associated with installation of these pipelines has been previously analyzed under NEPA by BLM and an EA was issued (EA-WY-100-05-142).

**16,000 Barrel Condensate Storage at LaBarge (WYW-162015).** QGM is proposing to install a 16,000 barrel condensate storage tank as part of the facilities located adjacent to the Rocky Mountain Pipeline Terminal near LaBarge in the NW ¼ of Section 11, Township 26 North, Range 113 West. The purpose of this tank is to store condensate during upset conditions at the terminal. All disturbance required for this tank is included in the total disturbance required for the LACT (Lease Automatic Custody Transfer) unit (7.1 acres) and is included in the Proposed Action for the 14.4-mile long portion of the 611 Pipeline. Impacts associated with installation of the 16,000 barrel tank have been analyzed under NEPA by BLM and an EA was issued (EA-WY-100-05-176).

**351 Tank Battery (WYW-159580).** QGM is proposing to install a water storage facility located near Highway 351. This facility would be used for emergency purposes only in the event of an upset at the evaporation pond. If water cannot be delivered to the evaporation pond, then it will be delivered to the truck loading facility. Impacts associated with the emergency tank storage facility have been analyzed under NEPA by BLM and an EA was issued (EA-WY-100-05-176).

## **CHAPTER THREE AFFECTED ENVIRONMENT**

### **3.1 Introduction**

This chapter provides a description of the human and natural environmental resources that could be affected by the Proposed Action and alternatives. This EA draws upon information compiled in the following Resource Management Plans (RMPs) analyses that have been completed for planning areas that would be crossed by the proposed pipeline:

- Green River Resource Area RMP (BLM, 1996)
- Pinedale Resource Area RMP and FEIS (BLM, 1987)

More recently, information has been compiled in the following NEPA documents:

- Pinedale Anticline Oil and Gas Exploration and Development EIS (BLM 1999a and BLM, 2000a)
- Questar Year Round Drilling Proposal Environmental Assessment (BLM, 2004a)

### **3.2 Socioeconomics and Environmental Justice**

The proposed 611 Pipeline route is located in Lincoln and Sublette counties. Approximately two miles of the pipeline right-of-way is located in Lincoln County, and the remainder of the right-of-way is in southern Sublette County. All other proposed modifications included in the Proposed Action are located in the PAPA, also within Sublette County.

The closest community to the proposed condensate pipeline right-of-way is LaBarge which is approximately 1.2 miles to the northeast. Pinedale, in Sublette County, is a larger town in the area of the proposed pipeline. The two counties are primarily rural and their economies are tied to traditional natural resource based industries. Ranching provided the basis for community development during the nineteenth century, but its importance has recently diminished. The mineral extraction industries, particularly the oil and gas industry, now provide for much of the area's economic well being.

#### **3.2.1 Demographics**

The populations of Lincoln and Sublette counties are primarily Caucasian and male. Slightly more than 50 percent of the population is male and 97 percent are Caucasian. Each county contains very small populations of Native Americans, Hispanics, and other minorities (U.S. Census Bureau, 2005a and 2005b). The populations of Sublette and Lincoln counties have remained fairly level during the 1990s and have since grown annually by 3.0 and 1.7 percent, respectively, since 2000. Recent population statistics are shown in Table 3-1.

The 2004 estimated population of LaBarge is 419, a decrease from 431 estimated in 2000. The population of Pinedale has increased 11.5 percent from 1,412 in 2000 to 1,575 in 2004 (Wyoming Department of Administration and Information, 2004a).

**Table 3-1  
Population Statistics for Lincoln and Sublette Counties**

Region	Population Census Estimates			Population % Change 1990-2000	Annual % Change 1990-2000	Population % Change 2000- 2004	Annual % Change 2000-2004
	1990	2000	2004				
Wyoming	453,588	493,782	501,242	8.9	0.9	2.6	.6
Lincoln County	12,625	14,573	15,626	15.4	1.4	7.2	1.7
Sublette County	4,843	5,920	6,654	22.2	2.0	12.4	3.0

Sources: US Census Bureau, 2005b, 2005c and Wyoming Department of Administration and Information, 2004a.

### 3.2.2 Economic Activity

Wyoming's economy reached a minimum level during an economic "bust" in 1987. Since then it has begun to recover. The primary industries in Lincoln and Sublette counties are mining (including oil and gas), government, transportation, and manufacturing. Mining is the largest revenue-producing industry. In terms of Gross State Product (GSP), which is the state equivalent to GDP, mining contributed 24 percent in 2000. Nationwide, the mining industry contribution to the GDP was only 1.4% for the same year (Wyoming Department of Administration and Information, 2003).

Wyoming's natural resource and mining industry has demonstrated strong growth since 2000. The following table breaks down contributions to state and local governments in the fiscal year 2003 from oil and gas industries. This would compute to a direct payment of nearly \$1,500 for each person living in Wyoming.

**Table 3-2  
Taxes From Oil and Gas Industries  
In Wyoming During 2003**

Tax Source	Revenue (in millions)
Property Taxes	\$228.5
Severance Taxes	\$198.9
Federal Royalties	\$220.8
State Royalties	\$ 57.9
Sales and Use Taxes	\$ 38.0
Conservation Mill Levy	\$ 3.6
Total For State	\$747.7

Source: Petroleum Association of Wyoming Oil and Gas Facts and Figures, 2004.

In Sublette County, 95.62 percent of the property tax was paid by the oil and gas industry. The 2004 county's assessed valuation of 1.88 billion more than doubled since 2000 due to high natural gas prices (Sublette County Assessor, 2005). In Lincoln County, 61 percent of the total property assessed was mineral property (Larson, 2005). In 2003, natural gas accounted for 78 percent of Lincoln County's \$362 million mineral valuation up from \$189 million in 2000 (Wyoming Business Council, 2004a).

### 3.2.3 Employment

Between May 2004 and May 2005, employment in the natural resource and mining sectors in the state increased 10.8 percent. Unemployment in Wyoming is expected to remain constant at around 4.5 percent, lower than the national average of 5.8 percent (State of Wyoming Department of Administration and Information, 2003). In 2000, the largest employment sectors in Lincoln and Sublette counties were Services and Professional (48 percent) and Government (19 percent and 17 percent, respectively). Mining made up 6.3 percent and 7.8 percent of the total jobs in the two counties, respectively (Wyoming Department of Administration and Information, 2000).

Unemployment in Lincoln County was 5.4 percent in 2001, somewhat higher than the state unemployment average of 3.9 percent for that year. Sublette County, however, fell below the state figure at 2.1 percent (Wyoming Department of Administration and Information, 2004b).

**Table 3-3  
Income and Poverty Statistics for 2000 and 2003 (where available).**

Statistic	Lincoln County		Sublette County		Wyoming	
	2000	2003	2000	2003	2000	2003
Median Household Income	40,776	43,516	39,096	41,664	37,892	
Per Capita Money Income	17,310	19,369	19,827	21,747	19,134	
Persons below Poverty Line	9.0%		9.7%		11.4%	
Source: Wyoming Business Council, 2004b						

### 3.2.4 Environmental Justice

Federal agencies are required to conduct their programs, policies and activities that substantially affect human health or the environment in a way that ensures that no person is excluded from participation therein, denied the benefit of, or subjected to discrimination due to race, color or national origin. Executive Order 12898 requires Federal agencies to assess their projects to ensure they do not result in disproportionately high and adverse environmental, health or safety effects to minority or low-income populations.

Sublette and Lincoln counties are greater than 97 percent white. Each county contains very small populations of Native Americans, Hispanics and other minorities (U.S. Census Bureau, 2005a and 2005b).

### 3.3 Transportation

A regional network of State highways and county, local and rural roads provides the basic transportation infrastructure for access to the proposed 611 Pipeline route. U.S. Highway 189 (US 189) extends from Interstate 80 north to LaBarge, Big Piney, and Marbleton and intersects with State Highways 351 and 191. The proposed pipeline route would cross U.S. Highway 189 approximately 1.7 miles south of the Green River pipeline crossing location. The 611 Pipeline would also cross State Highway 235 at the LaBarge Tank Farm. The eastern terminus of the 611 Pipeline would be accessed from the Burma Road (BLM Road 5406), the Luman Road (BLM Road 5407), and/or from BLM Road 4203 which joins US 189 after crossing the Green River approximately 1 mile north of LaBarge.

Included in the Proposed Action is the 630-foot 25 kV power line which is adjacent to the Pinedale South Road, an improved dirt-surfaced road that can be accessed from Tyler Avenue in Pinedale, from the Mesa Road (BLM Road 5102), or from the Green River Road (Sublette

County Road 23-110). Access to the new NGL Stabilizer and Water Handling Facility and existing Gobblers Knob Compressor Station where ten parallel pipelines are proposed is from the Anticline Crest Road which joins U.S. Highway 191 via the Paradise Road (Sublette County Road 23-136). The proposed 1,250-foot long 25 kV distribution power line would also be accessed by that route.

Roads in rural areas crossed by the pipeline route are typically characterized by low traffic volumes, infrequent congestion, low travel speeds and rugged terrain. Common attributes of rural roads include a mix of rural and urban travelers, secondary roads with less frequent maintenance, large variances in travel speeds and frequent passing, adverse road surface conditions, light usage, and large geographical areas that impede rapid emergency detection and response (Goehring and Sundeen, 1999). However, all roads within the PAPA and Pinedale area have experienced increased traffic volumes and speed recently (BLM, 2004a).

### **3.4 Land Use and Grazing**

Sublette and Lincoln counties are primarily rural and are tied to traditional natural resource based industries. Agricultural and mineral extraction industries, particularly oil and gas, are principal land uses. The pipeline route through Sublette County is zoned as resource/conservation (BLM, 1999b) with the exception of Sections 16, 20, and 21 in T27N, R112W. These latter sections are zoned A-1 (agricultural) (Curry, 2005). In Lincoln County, the pipeline route crosses land which is zoned industrial.

The only urban development in proximity to the proposed 14.4-mile long portion of the 611 Pipeline is in the small community of LaBarge, Lincoln County, located one to two miles south and east of the right-of-way near its southern terminus. Green River and Rock Springs to the southeast and Kemmerer to the southwest are the larger cities located near the proposed pipeline.

Grazing is the primary agricultural use of the lands in the vicinity of the proposed pipeline and other modifications. Arid conditions and relatively unproductive soils preclude extensive crop development. However, within the Green River Floodplain and to the west of the Green River, there are irrigated hay meadows which the proposed pipeline route crosses (USGS, 1996).

The majority of the proposed pipeline route crosses public lands managed by BLM. Other lands crossed are owned and managed by the State of Wyoming, small privately owned parcels, and Lincoln County (see Appendix A). Livestock grazing is authorized on BLM-managed lands under Section 3 of the Taylor Grazing Act of 1934. Recently the BLM (2004b) released a final environmental impact statement that proposes revisions to grazing regulations for public lands. The revisions would require, among other actions, a consistent approach to assess and monitor resource conditions to help evaluate the grazing use applicable for each managed allotment (BLM, 2004b).

The proposed condensate pipeline route would cross approximately 13.4 miles of three grazing allotments in Sublette and Lincoln counties: the Figure Four allotment for 7.3 miles all on BLM land, the Bird Individual allotment for 0.7 mile on BLM land and 0.6 mile on private land, and the North LaBarge Common allotment for 3.2 miles across BLM land, 1.1 miles of State land, and 0.5 mile across land owned by Lincoln County.

The proposed buried power lines and ten connecting pipelines would cross approximately 0.12 mile of Mount Airy Common Allotment and 0.27 mile of Mesa Common Allotment all within BLM land.

Yearly grazing uses (AUMs and season of use) of each allotment are based on biological assessments and biological evaluations (BLM, 2004b), and therefore are subject to change. Available information for livestock use within each allotment is provided in Table 3-4.

**Table 3-4  
Grazing Allotments and Livestock Use Potentially Affected by the Proposed Condensate Pipeline and Other Modifications**

Allotment	Allotment Area (acres)	Livestock Type	Season of Use	AUMs
Figure Four	114,425	Sheep/Cattle	05/10 – 01/10	1,969
Bird Individual	597	Cattle	05/20 – 06/19	52
North LaBarge Common	131,713	Cattle	05/15 – 10/31	19,398
Mount Airy Common	9,999	Cattle	05/16 – 06/25	758
Mesa Common	55,841	Cattle/Horse	05/01 – 11/15	5,003
Sources: BLM, 1987, 1992, 1996				

### 3.5 Recreation Resources

Recreation resources within the project area and located on BLM land are managed to prevent or mitigate environmental degradation that could result from recreation and/or other land uses (BLM 1987, 1997a). Focus is mainly on recreation management areas. Within the project area there is only one undeveloped BLM site, north of LaBarge on the Green River that will be within the vicinity of any proposed component.

BLM lands crossed by the proposed 14.4-mile long portion of the 611 Pipeline support dispersed recreation, such as hiking, camping, mountain biking, fishing, boating, swimming, sight-seeing, hunting, and wildlife watching (Tyrrell, 2000; Sweetwater County Joint Travel & Tourism Board, 2002). Such a diverse representation of activities is a factor in the location of the proposed pipeline within the Green River Basin.

The Green River offers excellent opportunities for trout fishing. The condensate pipeline will cross beneath the Green River at a segment that is considered a fishery of statewide importance and is provided a designation of Class 2 by the Wyoming Game and Fish Department (Tyrrell, 2000). The southern terminus of the proposed pipeline is located approximately seven miles from the northern end of the Fontenelle Reservoir. Recreation use is low and seasonal (Sweetwater County Joint Travel & Tourism Board, 2002).

Hunters pursue numerous game species in the project area including antelope, mule and white-tailed deer, elk, moose, and waterfowl (WGFD, 2005; Tyrrell, 2000). The proposed 611 Pipeline will cross over several large game hunt areas. In addition, other modifications proposed will be located in large game hunt areas. Table 3-5 provides big game species, hunt areas, and hunting season for each species.

BLM land in southwest Wyoming supports over 1,600 wild horses. These horses are managed by the BLM in partnership with private landowners in Wild Horse Herd Management Areas. The proposed condensate pipeline will cross through the Little Colorado Wild Horse Herd Area (BLM, 1997a).

**Table 3-5  
Big Game Hunt Areas (2005) Crossed By the Proposed Condensate Pipeline  
and Other Modifications**

Species	Hunt Area	Hunting Season
Antelope	87, 88, 89, 90	September 10 – October 31
Mule/White-tailed Deer	138, 139, 140, 142, 143	September 15 – November 7
Elk	92, 94, 97, 98	September 20 – November 15
Moose	4, 25	September 20 – October 31
Source: WGFD, 2005		

The network of historic trails in the area provides a unique recreational and historic experience for mountain bikers (Sweetwater County Joint Travel & Tourism Board, 2002).

Other proposed modifications occur within the PAPA. Recreation opportunities in and adjacent to the PAPA are described in the PAPA EIS in Section 3.8 (BLM, 1999a).

### **3.6 Visual Resources**

The Visual Resource Management (VRM) System is a tool used by the BLM to inventory and manage visual resources on public lands. The VRM classification combines an evaluation of visual quality, visual sensitivity of the area, and view distances. VRM classes are used to identify the degree of acceptable visual change within a characteristic landscape. Throughout development of the PAPA, BLM maintained visual resource protection in Management Areas 2 and 4.

The proposed 14.4-mile long portion of the 611 Pipeline route would cross two VRM sensitivity classes (Classes III, and IV; BLM, 1987, 1997a) parallel and adjacent to multiple pipeline rights-of-way that connect the LaBarge Tank Farm with the Bird Canyon Compressor Station (Figure 2-1). The proposed 14.4-mile long portion of the 611 Pipeline is either parallel, adjacent, or overlaps with permanent rights-of-way of other existing natural gas pipelines, power lines, and/or roads for 70 percent of the proposed route.

Other modifications included in the Proposed Action will also be located within BLM classified areas. The ten connecting pipelines and power line from NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station occur in VRM sensitivity Class II, and the power line to Stewart Point 16-18 CDP would occur in VRM sensitivity Class III (BLM, 1999a), all within previously disturbed sites. Location of blowdown tanks within the PAPA occur on existing disturbance in all three VRM sensitivity classes affected by previously described project components (Class II, III, and IV) (BLM, 1999a).

The objectives for management of the three VRM sensitivity classes affected by the proposed project are as follows (BLM, 1997a):

- Class II: to retain the existing character of the landscape with designs which will blend into the surrounding landscapes and not attract attention of the casual observer;
- Class III: to partially retain the existing character of the landscape with designs that do not dominate the surrounding landscape; and

- Class IV: to provide for management activities that may result in major modifications to the existing character of the surrounding landscape. The level of change to the characteristic landscape can be high, and management activities may dominate the view; however, the change should repeat the basic elements of form, line, color, and texture of the surrounding landscape.

VRM Class III that would be crossed by the proposed 14.4-mile long portion of the 611 Pipeline is associated with the Green River, riparian zones, floodplain, and adjacent uplands on either side of the river. (Note: The disturbance for the condensate pipeline in all VRM classes would typically be adjacent to or within existing pipeline corridors/rights-of-way and would not constitute a new intrusion into the VRM area. VRM Class IV areas would occupy the remainder of land crossed by the proposed pipeline, including other waterbodies crossed by the pipeline (BLM, 1987 and 1997a).

The proposed power lines, ten connecting pipelines, and blowdown tanks lie within the PAPA. VRM Class II areas are found adjacent to the New Fork River and Green River, with VRM Class III designated areas falling just outside of these VRM Class II areas. VRM Class IV-designated areas apply to the rest of the PAPA (BLM, 1999a). Again, these facilities would be located immediately adjacent to existing disturbances in identified VRM areas.

### **3.7 Cultural and Historic Resources**

#### **3.7.1 Cultural History Overview**

Cultural resources are protected under the National Historic Preservation Act of 1966, the Archaeological Resources Protection Act of 1979, Executive Order 11593 Protection and Enhancement of *the Cultural Environment*, and Executive Order 13007 *Indian Sacred Sites*.

Cultural resources in the area of the proposed 14.4-mile long portion of the 611 Pipeline route consist of sites associated with prehistoric and historic time periods. The prehistoric period extends from approximately 12,000 years before present time (B.P.) through 250 B.P. when European cultural items began to arrive in the Green River Basin. Approximately 75 percent of the sites found in the Green River Basin are prehistoric. Artifacts from prehistoric times include projectile points, grinding slabs, pottery, and evidence of camp sites (BLM, 1996).

Many historic sites in the Green River Basin are associated with historic trails. The Upper Green River Basin provided routes over the Continental Divide and over the major rivers of the region. Trails provided a route through the arid region on the way to finding moister lands to the west and near the coast (BLM, 2003). No historic trails are crossed by the proposed 14.4-mile long portion of the 611 Pipeline; however, the Sublette Cutoff (48LN225) is located six to ten miles to the south.

Many other historic sites in the Green River Basin are associated with the early fur trade, the frontier military, railroads, the mining industry, ranching, and early oil and gas development (BLM, 1996).

One Expansion Era Road, the Opal Wagon Road (48SU852), is eligible for inclusion on the National Register of Historic Places. It is a remnant of the original Highway 191 grade (48SU1595) and is located in the project area. The Opal Wagon Road was the major route between Opal, Wyoming and the upper Green River Basin. It was established in 1882 when Opal became a rail stop on the Oregon Shortline railroad north of the main Union Pacific tracks at Granger. After completion of the Oregon Shortline, Opal became a major shipping center from the railroad to Big Piney, LaBarge, and the upper Green River. Establishment of the Opal station brought the railroad approximately 30 miles closer to the upper Green River than the

stations at Rock Springs and Green River, and consequently it became a center for both freight and passenger service. The Opal Wagon Road is considered to be eligible for nomination to the National Register of Historic Places because of the significant role it played in the development of the Upper Green River Basin. This road was essential to the settlement of, and the continued economic maintenance of, ranching families living in the area, as well as, the pioneering oil and gas industry.

An abandoned grade of Highway 191 was relocated within the project area. The grade is considered not eligible for nomination to the National Register of Historic Places because it lacks the qualities of a significant historic property.

### **3.7.2 Cultural Resource Inventory Results**

The proposed 14.4-mile long portion of the 611 Pipeline route parallels existing pipelines for most of its length. Previous Class III inventories were completed in association with the installation of the existing pipelines (Hakiel, 1982a and 1982b; Darlington, 1994; Murray, 1997; Murray, 1998). The inventories resulted in the testing and documentation of previously known sites, the evaluation of previously unevaluated sites, and the identification of isolated finds.

Additional field work (Murray, 2005 and Yerkovich, 2005) conducted for the proposed 14.4-mile long portion of the pipeline route includes:

- A Class III cultural resource inventory of the right-of-way including staging areas, a tank farm, and LACT facility; and
- Testing for eligibility for nomination to the National Register of Historic Places (NRHP).

Based on the current Class III inventory, approximately eight sites, six prehistoric and two historic, are documented within the proposed pipeline right-of-way. These eight sites were also recorded during previous surveys. Two of the sites are recommended eligible (48SU390 and 48SU852) and six sites are recommended not eligible for nomination to the NRHP. Site 48SU390 is located at the proposed condensate pipeline crossing of the Green River. The other site, 48SU852 (Opal Wagon Road), is located west of the Green River crossing (see Appendix C).

### **3.7.3 Traditional Cultural Properties**

Native American tribes, including the Ute, Arapahoe, Cheyenne, Shoshone, and Shoshone-Bannock, have been identified with tribal territories located in the general area of the proposed pipeline route. Outreach with potentially affected Native American Tribes was conducted for the proposed condensate pipeline. No Native American religious concerns were identified.

## **3.8 Geology and Geologic Hazards, Minerals and Paleontological Resources**

### **3.8.1 Geology**

The proposed 14.4-mile long portion of the 611 Pipeline is located within the Green River Basin, primarily a flat to gently rolling plain. Slopes along the route are generally less than five percent with limited areas of slopes greater than 10 percent (Hamerlinck and Arneson, 2002). Elevations range from 6,600 feet at the Green River crossing to approximately 7,320 feet, 1.2 miles west-northwest of the Bird Canyon Compressor Station. Therefore, total relief along the right-of-way is more than 700 feet.

Most of the pipeline corridor is underlain by the Eocene-age Wasatch Formation (Love and Christiansen, 1985). Within the project area, this bedrock consists of mudstone, conglomerate, sandstone, and thin limestone beds of the New Fork Tongue, LaBarge Member, and Chappo

Member of the Wasatch Formation. The cap rock of the upland plateau near the Bird Canyon Compressor Station is marlstone and oil shale of the Laney Member of the Eocene-age Green River Formation.

Much younger unconsolidated sediments of Quaternary age overlie the Wasatch and Green River formation bedrock in stream valleys and the buttes west of the Green River. These sediments include alluvium, colluvium, stream terrace gravels, and wind-blown sands that are late Pleistocene to Holocene (Recent) in age. Some of these deposits may pre-date the most recent glacial (Wisconsin) period (Mears, 1987). Thick, Holocene deposits are found in the Green River valley at the pipeline crossing location.

### **3.8.2 Geologic Hazards**

Lands crossed by the proposed 14.4-mile long portion of the 611 Pipeline route do not show evidence of major landslides (BLM, 1999b). There are no known active faults along the pipeline route (Wyoming State Geological Survey, 2000). There have been no major earthquakes recorded in historic times in the vicinity of the proposed pipeline route, although the USGS estimated that a 4.2 to 4.5 magnitude earthquake might occur somewhere in the Green River Basin every 62 years (BLM, 1999b).

### **3.8.3 Minerals**

Although oil production began in the Green River Basin in the 1920s, most of the development occurred in the 1970s and 1980s and continues today. About 6,000 billion cubic feet (Bcf) of gas has been produced from Cretaceous beds in the greater Green River Basin, while only 1,600 Bcf has come from all other formations combined. The basin contains more than 100 fields with more than one million barrels of oil equivalent. In the project vicinity, the most prolific production comes from the LaBarge Platform (including Big Piney Field), which has produced more than 80 million barrels of oil and has an estimated ultimate recovery of more than two trillion cubic feet (Tcf) of gas (Gibson, n.d.).

Of the fields that would have access to the proposed 611 Pipeline, the Moxa Arch fields are estimated to contain more than one Tcf of gas (estimated ultimate recovery) in the Frontier Formation and other strata. Other deep basin-centered tight gas plays produce from the coal and carbonaceous shales of the Cretaceous Cloverly, Frontier, and Mowry formations. Similar sandstone reservoirs exist in both the Cloverly and Frontier formations. The play extends to the Mesaverde group, where it is focused on the Almond Formation (Gibson, n.d.).

The Jonah Field produces natural gas and liquids from innumerable late Cretaceous and early Tertiary fluvial sandstone bodies at depths of 7,300 to 12,800 feet. The Jonah Field is currently producing over 175 MMCF/D from over-pressured fluvial channel sandstones of the Upper Cretaceous Lance Formation. Gas production originates from multiple layers that compose a column as great as 4,000 feet thick (Hanson et al., 2002). The field was discovered in 1975 (Robinson, 1998).

In 2002, the U.S. Geological Survey (USGS) used a geology-based assessment methodology to estimate the remaining undiscovered natural gas and oil in the Southwestern Wyoming Province. The Southwestern Wyoming Province includes the Green River Basin, Moxa Arch, and the entire area in and around the proposed 611 Pipeline. The USGS estimated that an average 84.6 Tcf of gas, 131 million barrels of oil, and 2.6 million barrels of natural gas liquids remain in the reservoirs evaluated in the study (USGS, 2002).

Salable minerals include sand, gravel, topsoil, boulders, riprap, sandstone, shale, limestone, and borrow material. Sand, gravel, and fill material are used by the Wyoming Department of Transportation, other agencies, and local contractors. Gravel deposits occur along the Green

River valley (BLM, 1996). There is currently no active exploitation of salable minerals within the proposed pipeline corridor.

Although mining claims exist throughout the basin, there are no claims along the route of the proposed pipeline. No significant deposits of locatable minerals are present along the pipeline corridor.

### **3.8.4 Paleontological Resources**

The condensate pipeline route crosses the Green River and Wasatch formations which are recognized for the presence of significant fossil remains (Dames & Moore, 1992 and EVG, 1999). During the Eocene, this region was located at much the same latitude it is today, but the climate was moist temperate or sub-tropical. A series of large inland lakes extended across the region, and it is in the bottoms of these lakes that various plants and animals were buried and fossilized. These lakes later dried up as the local climate changed, and many of the plants and animals living there became extinct. The Green River and Wasatch formations have yielded fossil resources of vertebrates, invertebrates, trace fossils, and plants (EVG, 2002 and 2005).

Vertebrate fossils in the Green River and Wasatch formations can include fish, reptiles, birds, and mammals. Invertebrate fossils are abundant, with remnants of snails and insects being common. Plant fossils, including many reeds, leaves, and wood specimens, are also very prevalent. A large majority of known fossils are fragmentary but some complete skeletons exist of fish, birds, reptiles, and mammals (Winterfeld, 2005).

Literature reviews and preconstruction field and open trench field monitoring of nearby and paralleling linear pipeline construction projects have been conducted on several occasions since 1998 (EVG, 1999, 2001, 2001a, 2002, 2002a, 2005). These reports have confirmed the presence of vertebrate fossils in the surface lithology along existing pipeline rights-of-ways and along the proposed route for 14.4-mile long portion of the 611 Pipeline.

These two formations crossed by the proposed pipeline route are rated as having the highest paleontological potential and meet the BLM's Paleontology Condition 1 and Probable Fossil Yield Classification 5. The unnamed deposits of Quaternary age are not known to yield scientifically significant fossils in the project area. Similar age deposits, however, have yielded scientifically significant fossils elsewhere in Wyoming and for that reason these deposits are considered to have an undetermined, but probably low, paleontological potential.

A field survey of the proposed 14.4-mile long portion of the 611 Pipeline right-of-way was conducted by the principal paleontology investigator on April 5-7, 2005 (EVG, 2005). Most of the proposed pipeline right-of-way is flat-lying and vegetated (chiefly by sagebrush) and covered by a thin veneer of Holocene or possibly Pleistocene colluvial, terrace, or alluvial deposits. Bedrock outcrops are generally not found in these areas and fossil resources are not easily identified at the surface. As a result, the survey consisted primarily of a drive-by to delineate areas of outcrop that warranted a pedestrian survey and visual examination.

Only one significant outcrop area was identified along the proposed 14.4-mile long portion of the 611 Pipeline route. It is located along the sides of Bird Canyon (Sections 19, 20, 22, 23, 24, and 25, T27N, R111W) where the Laney Shale, Farson Sandstone, and Tipton Shale (Scheggs Bed) members of the Green River Formation and the Alkali Creek and Main Body members of the Wasatch Formation are exposed. Most outcrops contained some fossil material. Fossil wood and invertebrate trace fossils were identified in the Laney Member and fossil vertebrate material was discovered in the Wasatch Formation at several locations. No fossils of scientific significance were discovered during the survey.

### **3.9 Water Resources**

#### **3.9.1 Surface Water**

The proposed 14.4-mile long portion of the 611 Pipeline route is located within the lower portion of the Upper Green Sub-basin (Hydrologic Unit 14040101) of the Green River Basin (WYDEQ, 2004), a major tributary of the Colorado River. The pipeline crosses the Green River approximately six miles above the confluence with LaBarge Creek and approximately eight miles south of the confluence with Dry Piney Creek. The lower portion of the sub-basin is underlain by fine-grained sedimentary rock which is a natural source of sediment and TDS (total dissolved solids) in surface waters. The primary land uses in the sub-basin (grazing, recreation, irrigated hay production, and oil and gas development) all contribute to increased sediment and TDS over natural background levels. Other surface water resources in the vicinity of the proposed pipeline route include intermittent, ephemeral, and perennial streams; livestock ponds; seeps; and springs (BLM, 1999b).

The PAPA where QGM and Questar's proposed other modifications are located is also within the Green River Basin. Portions of five perennial streams and rivers flow through the PAPA including Duck Creek, East Fork River, Green River, New Fork River and Pine Creek. The majority of the PAPA is drained by intermittent and ephemeral streams (BLM, 1999a).

The Wyoming Environmental Quality Council pursuant to W.S. 35-11-101 through 1304 has promulgated regulations for quality standards for Wyoming surface waters. The objectives of the Wyoming pollution control program are specifically designed to maintain the best possible quality of waters commensurate with the designated use. The Green River at the proposed crossing location has been designated Class 2AB by WDEQ (2001), meaning that the waters are protected for drinking water, game and non-game fish, fish consumption, other aquatic life, recreation, wildlife, agriculture, industry, and scenic value. In the PAPA, the Green River has been designated Class 1 which means that no further water quality degradation by point source discharge other than from dams would be allowed (WDEQ, 2001).

Section 303(d) of the Clean Water Act requires states to identify waters which are not supporting their designated uses. The Green River at the proposed pipeline crossing location is not on the State of Wyoming's 2004 303(d) list. Similarly, there are no streams within the PAPA that are on the 2004 303(d) list (WDEQ, 2004).

#### **3.9.2 Ground Water**

Groundwater along the proposed 14.4-mile portion of the 611 Pipeline route west of the Green River is found within 20 to 50 feet of the surface. East of the Green River depths to the water table are 100 to 200 feet in the upland areas. Shallow ground water can be found in the Quaternary alluvial sand and gravel deposits of the Green River Floodplain. Groundwater vulnerability to environmental contaminants is low to medium in upland areas because these areas receive little recharge. In the Green River Floodplain and Birch Creek valley, vulnerability is medium to high because of the high water table, sandy soils, and high hydraulic conductivity associated with alluvium (Hamerlinck et al., 2002).

Groundwater in the Green River Basin is used for agricultural, municipal, domestic, and industrial purposes (States West, 2001). A number of water wells have been drilled in the vicinity of the proposed pipeline route but only two wells appear to be potentially located within 100 feet of the proposed pipeline right-of-way (Hamerlinck et al., 1998). These are located in the SW¼, Section 28, Township 27 North, Range 111 West and the NE¼, Section 30, Township 27 North, Range 112 West. Approximately half of the water wells in Lincoln and

Sublette counties are used for domestic purposes. About one-third of the Sublette County wells are tapping water from alluvial aquifers (Hamerlinck et al., 2002).

### **3.10 Soils**

Soils in Wyoming are closely related to geologic parent materials and vegetation communities because of the state's harsh climate (Munn and Arneson, 1998). The Bridger Formation, the Laney member of the Green River Formation, and the Wasatch Formation dominate the surface rock. In upland areas, these mostly high-clay-content parent materials produced a complex of aridic soils, or Aridisols, that characterize the area. The majority of the upland soils crossed by the proposed pipeline route mostly range from very shallow to mostly moderately deep to deep, forming on rolling upland plains dissected by rock ravines, short escarpments, and draws (BLM, 1996 and 1999a).

Slopes range from nearly level to steeply sloping. Sensitive upland soils include shallow soils occupying steeper slopes and areas of rock outcrop. These soils typically have high water runoff rates and are subject to accelerated rates of soil erosion, especially when disturbed. The high runoff rates limit the effective moisture received by these soils and their mostly shallow depth limits their water holding capacity, causing them to be droughty and which limits their reclamation potential. Less sensitive upland soils include shallow to moderately deep to deep soils that occupy less steep topography. These less sensitive soils are more dominant in extent along the proposed pipeline route, but the shallow soil depths may still limit successful reclamation should recent drought conditions continue in the Green River Basin of Wyoming.

Emphasis should continue to be placed on the reduction of soil erosion and sediment into the Green River watershed. Of particular importance would be those areas with saline soils such as the Little Colorado Desert to the east of the Green River crossing (BLM, 1992).

Bottomlands associated with drainage bottoms crossed by the proposed pipeline route are floodplains, terraces, and tributary alluvial fans of the perennial Green Rivers and several intermittent drainages. The bottomland soils of these drainages are forming in mostly alluvial deposits, vary in texture, are deep, and are subject to flooding. These soils typically have a high reclamation potential, if they are not saline or sodic. These soils can also be susceptible to gully erosion when disturbed.

Soils along the floodplains of the intermittent drainages are likely to be saline and can be sodic, affected by high concentrations of sodium in proportion to concentrations of calcium and magnesium in the soil (BLM, 1999a). These soils are sensitive because of their potential to cause water quality impacts, if disturbed, and potential sedimentation of downstream perennial streams. In addition, the elevated salinity and possibly sodicity of these soils reduces their reclamation potential (BLM, 1999a).

### **3.11 Vegetation and Noxious Weeds**

#### **3.11.1 Native Vegetation**

The proposed 14.4-mile long portion of the 611 Pipeline route crosses Wyoming big sagebrush – mixed grass steppe for approximately 13.70 miles. Dominant species include Wyoming big sagebrush, basin big sagebrush, Gardner saltbush, greasewood, and cushion plants including Hood's phlox, wildbuckwheats, pusseytoes, and Hooker sandwort. Other understory species include western wheatgrass, needle-and-thread grass, Sandberg blue grass, pricklypear cactus, scarlet globemallow, and rabbitbrush, species adapted to aridic soils and droughty conditions. Species composition varies depending on soil type, salinity, exposure, and moisture levels.

Grassland communities along the proposed 14.4-mile long portion of the 611 Pipeline route are generally limited in size, principally found on reclaimed rights-of-way adjacent to and overlapping the proposed pipeline route, and in small patches along the length of the proposed pipeline route. Many of the same plant species associated with sagebrush-steppe as understory components are dominant species within grasslands. While species vary by soil type and succession, they include western, crested, and thickspike wheatgrasses, Indian ricegrass, Sandberg bluegrass, and winterfat. Crested wheatgrass is a non-native species often planted to stabilize disturbed soils.

Vegetation in the vicinity of other modifications included in the Proposed Action include Wyoming big sagebrush – mixed grass steppe along the 630-foot 25 kV distribution line and undisturbed land in the vicinity of the NGL Stabilizer and Water Handling Facility. Portions of the 1,250-foot long 25 kV distribution line (NGL Stabilizer site to Gobbler’s Knob Compressor Station) will be within sagebrush – grass steppe as well as previously disturbed vegetation. All blowdown tanks will be on well pads where vegetation has been or will be removed.

Vegetation in the vicinity of the proposed 14.4-mile long portion of the 611 Pipeline and other modifications under the Proposed Action can be important as a forage base for livestock, big game (pronghorn and mule deer), and wild horses. However, shallow soils and arid conditions limit vegetative production (Knight, 1994; BLM, 1997a). The amount of vegetative cover partially determines the amount of precipitation infiltration. Vegetation impedes runoff and increases temporary surface storage, increasing the infiltration of rainfall.

### **3.11.2 Non-Native and Invasive Species**

Noxious weeds are plants designated by a Federal, State, or county government as injurious to public health, agriculture, recreation, wildlife, or property. They are plants that are competitive, persistent, and pernicious. They are also often non-native. Invasive species are plants introduced into an environment with no natural enemies, such as insects or other plants, to limit their reproduction and spread. They frequently dominate native vegetation if left unchecked.

Based on field reconnaissance, noxious weed establishment along the proposed pipeline route and within the PAPA is limited to existing pipeline rights-of-way, roadsides, well pads, and other previously disturbed areas. The most common weed observed within or near the proposed pipeline route is halogeton with others such as perennial pepperweed, Canada thistle, and tamarisk present in wetter areas. The proposed 14.4-mile long portion of the 611 Pipeline route would be located parallel and adjacent to existing pipelines and/or power lines for approximately 74 percent of the route.

### **3.12 Wetland and Riparian Resources**

Riparian habitat is a highly valued wetland vegetation community found along or around streams, lakes, ponds, and other open water (both perennial and intermittent). This unique habitat is crucial to the continued existence of many fish and wildlife species known to occur in the area. Riparian vegetation helps maintain high water tables, stabilize ponds and stream-banks, create quality fish and wildlife habitat, prevent or reduce flooding, and maintain or improve water quality (BLM, 1997b).

Wetlands are lands where at least periodic inundation or saturation with water (either from the surface or subsurface) is the dominant factor determining the nature of soil development and the types of plant and animal communities living there. These include the entire zones associated with streams, lakes, ponds, springs, canals, seeps, wet meadows, and some aspen stands. Wetlands provide habitats for more species of wildlife (in higher densities) than any other habitat type in the project area though comprising less than one percent of the public land

acreage (BLM, 1997b). Wetlands in the Green River Basin are important for waterfowl production and recreation.

Based on wetland reconnaissance identification and mapping of the proposed route of the 14.4-mile long portion of the 611 Pipeline, wetland and riparian areas are limited to margins of the Green River in the vicinity of the proposed pipeline crossing. The proposed route crosses approximately 0.26 mile of palustrine emergent wetlands on the west bank of the Green River which has been delineated on National Wetland Inventory (NWI) maps. The wetlands coincide with hay meadows and are dominated by clustered field sedge, threesquare, bullrush, creeping spikerush, curly dock, foxtail barley, horsetail, arrow-grass, and other low-lying hydrophytic species.

Portions of those wetlands are within a zone of forest-dominated riparian vegetation on both banks of the river dominated by narrowleaf cottonwood and patches of shrubby understory composed of silver sagebrush, shrubby cinquefoil, sandbar willow, and Geyer willow. Although 0.23 mile of the proposed route crosses the forested riparian zone, no riparian forest is present within the immediate vicinity of the proposed pipeline right-of-way. Forested riparian communities are used by many wildlife species for feeding, nesting habitat, and cover.

### **3.13 Threatened and Endangered Species**

#### **3.13.1 Federally Listed Species**

Consultations to date: Consultation was completed for the PAPA and was included in the Record of Decision for that document. Additionally, a species list was reviewed for the Questar Year-Round Drilling Proposal EA (BLM, 2004a) for potential impacts to listed species. Those impacts were disclosed in the EA and Decision Record for that document. An updated species list from the U.S. Fish and Wildlife Service (FWS) Ecological Services was reviewed for this EA.

Listed species potentially occurring in the vicinity of the proposed 14.4-mile long portion of the 611 Pipeline route include the gray wolf, black-footed ferret and bald eagle. Four listed fish species – bonytail, humpback chub, Colorado pikeminnow, and razorback sucker may be impacted by water depletions from the Colorado River System. Ute ladies'-tresses orchid, grizzly bear, Canada lynx, Kendall warm springs dace are also listed species that may be present in the two-county project area but not present in the project area vicinity and would not be impacted by the Proposed Action and are not discussed any further.

**Black-footed Ferret.** There is historical evidence that black-footed ferrets occurred in the Green River Basin (Jobman and Anderson, 1981). Ferrets are closely associated with prairie dog colonies, including those in sagebrush-grasslands (Cerovski et al., 2004).

FWS (2004a) has been evaluating the potential for prairie dog colonies in Wyoming to support black-footed ferrets. As a result, FWS has determined there are many areas in the State not likely to be inhabited by the species, based on the quality of habitat and likelihood that ferrets, if ever they were present, are now extirpated in the areas. FWS (2004a) has determined that all white-tailed prairie dog colonies within the area including the 611 Pipeline route have been cleared from the recommendation for black-footed ferret surveys. In addition, biological surveys were conducted during the spring of 2005. No white-tailed prairie dog colonies were located within 0.25 mile of the 611 Pipeline route.

FWS (2004a) has determined that approximately 64 square miles of the PAPA (all or portions of Township 30 North and 31 North, Range 109 West and 110 West) are within the Big Piney prairie dog complex in which surveys for black-footed ferrets are recommended. Although there are no white-tailed prairie dogs present within Questar's lease area on the PAPA, colonies are

proximate to the new NGL Stabilizer and Water Handling Facility, Gobbler's Knob Compressor Station, and 1,250-foot long 25 kV distribution power line

**Gray Wolf.** Since reintroduction of 31 animals in Yellowstone National Park (YNP) during 1995 and 1996, the gray wolf population in the Greater Yellowstone Recovery Area has grown to over 300 animals in 2003 (FWS et al., 2004). Those animals are classified as a nonessential experimental population (FWS, 2004b). Gray wolves inhabit coniferous forests as well as shrub and grasslands in mountains and foothills where they feed on big game as well as smaller prey species (Cerovski et al., 2004).

Packs have become established outside of YNP including two north and east of the project area: the Green River Pack east of the Pinedale in the upper Green River Basin in 2002 and the Daniel Pack northwest of Pinedale in 2003 (FWS et al., 2004). Since their establishment, both wolf packs have preyed on cattle and sheep and pack members in both have been killed in control actions. Recently, one female wolf and four pups were removed by the FWS northeast of Farson, Wyoming. The male wolf and two pups are still unaccounted for and whereabouts unknown. While unlikely, wolves could potentially be present in the vicinity of the proposed pipeline route.

**Bald Eagle.** Bald eagles nesting in northwestern Wyoming have been increasing steadily since 1978 (Patla et al., 2003). Bald eagles nest in trees, including cottonwoods in riparian zones associated with large lakes and streams (Cerovski et al., 2004).

Potential bald eagle nesting and roosting habitat is present along the Green River. Surveys for nesting bald eagles were conducted during the spring of 2005. No bald eagles were found nesting within a one-mile buffer of the proposed 611 Pipeline route.

Wintering bald eagles regularly occur in western Wyoming generally from November 1 through April 15 (FWS, 2004b) and may occur during any time of year along the Green River corridor corresponding with the project area. A winter survey completed by BLM personnel in January 2005 found 52 wintering bald eagles within the boundaries of the Pinedale Field Office, many of which were along the Green and New Fork rivers and their tributaries. Migratory bald eagles have been observed during April and November generally through the Green River Basin (Patla, 2004). Bald eagles arrive on the Green River the second week of October coinciding with kokanee salmon and brown trout runs which are probably a primary source of autumn food (BLM, 1995).

**Colorado River Fish.** There are four listed threatened and endangered fish species possibly present in the vicinity of the proposed pipeline. Bonytail, Colorado pikeminnow, humpback chub, and razorback sucker may inhabit the Colorado River System downstream of the Proposed Action. No documented observations of these species in the vicinity of the proposed 611 Pipeline have been recorded though prior to construction of Flaming Gorge Reservoir, pikeminnows and bonytails may have had viable populations in the Green River (Baxter and Stone, 1995).

### **3.13.2 Other Special Status Species**

In addition to species listed under ESA, BLM has identified sensitive species (BLM, 2001) within the Pinedale and Rock Springs resource areas, some of which are known within or potentially occur in the project area. Sensitive species known to occur within the vicinity of the project area include ferruginous hawk, greater sage grouse, burrowing owl, sage thrasher, Brewer's sparrow, sage sparrow, pygmy rabbit, and white-tailed prairie dog (Table 3-6). Other species' occurrences are judged as possible, unlikely, or highly unlikely based on their habitat requirements and known distributions (Baxter and Stone, 1980; Baxter and Stone, 1995; Cerovski et al., 2004).

**Special Status Wildlife Species.** According to Wyoming Natural Diversity Database (WNDD, Keinath et al., 2003) records, most of the bird species identified as sensitive by BLM (2001) have been observed southeast of the Green River crossing in the Seedskaadee National Wildlife Refuge. These include the burrowing owl, ferruginous hawk, sage grouse, long-billed curlew, sage thrasher, loggerhead shrike, Brewers sparrow, and sage sparrow. Trumpeter swans are very rare and it is unlikely that they are present in the vicinity of the proposed 611 Pipeline route (BLM, 1999a). Many of these species have suitable habitat in the vicinity of the proposed 611 Pipeline route.

Pygmy rabbits are known to occur in the vicinity of the proposed 611 Pipeline, and their habitat may occur along the proposed route. Surveys conducted during spring and summer 2002 revealed their presence in tall, dense sagebrush at several locations in the vicinity of the Pinedale Mesa (McGee et al., 2002). In addition, a specimen was found on the Mesa, apparently killed by a vehicle (Smith, 2004).

**Table 3-6  
BLM-Sensitive Vertebrate Species Not Listed Under ESA That Could Occur within the Project Area, Habitats, and Other Status Designations**

<b>Common Name Scientific Name</b>	<b>Habitat (BLM, 2001)</b>	<b>Potential Occurrence</b>	<b>State Rank<sup>1</sup></b>	<b>WGFD Status<sup>2</sup></b>
<b>Fish</b>				
Roundtail chub <i>Gila robusta</i>	Colorado River drainage in large rivers, streams and lakes	possible	S3	NSS1
Leatherside chub <i>Gila coperi</i>	Green River drainage in clear, cool streams and pools	highly unlikely	S1	NSS1
Bluehead sucker <i>Catostomus discobolus</i>	Green River drainage, all water types	possible	S3	NSS1
Flannelmouth sucker <i>Catostomus latipinnis</i>	Colorado River drainage in large rivers, streams and lakes	possible	S3	NSS1
Colorado River cutthroat trout <i>Oncorhynchus clarki pleuriticus</i>	Colorado River drainage, clear mountain streams	unlikely	S1	NSS2
<b>Amphibians</b>				
Northern leopard frog <i>Rana pipiens</i>	Beaver ponds, permanent water in plains and foothills	possible	S3	none
Spotted frog <i>Rana pretiosa</i>	Ponds, sloughs, small streams	unlikely	S3	none
Boreal toad <i>Bufo boreas boreas</i>	Pond margins, wet meadows, riparian areas	possible	S1	none
Great basin spadefoot <i>Spea intermontana</i>	Spring seeps, permanent and ephemeral waters	unlikely	S3	none
<b>Birds</b>				
White-faced ibis <i>Plegadis chihi</i>	Marshes, wet meadows	possible	S1B	NSS3
Trumpeter swan <i>Cygnus buccinator</i>	Lakes, ponds, rivers	possible	S2	NSS2
Ferruginous hawk <i>Buteo regalis</i>	Basin-prairie shrub, grasslands, rock outcrops	present	S5N	NSS3
Peregrine falcon <i>Falco peregrinus</i>	Tall cliffs in most habitats	possible	S2	NSS3
Greater sage grouse <i>Centrocercus urophasianus</i>	Basin-prairie shrub, mountain-foothills shrub	present	S4	game bird
Long-billed curlew <i>Numenius americanus</i>	Grasslands, plains, foothills, wet meadows	possible	S3B	NSS3
Yellow billed cuckoo <i>Coccyzus americanus</i>	Open woodlands, streamside willow and alder groves	highly unlikely	S1	NSS2

**Table 3-6 (concluded)**

<b>Common Name Scientific Name</b>	<b>Habitat (BLM, 2001)</b>	<b>Potential Occurrence</b>	<b>State Rank<sup>1</sup></b>	<b>WGFD Status<sup>2</sup></b>
Burrowing owl <i>Athene cucularia</i>	Grasslands, basin-prairie shrub	present	S3	NSS4
Loggerhead shrike <i>Lanius ludovicianus</i>	Basin-prairie shrub, mountain-foothills shrub	possible	S3	none
Sage thrasher <i>Oreoscoptes montanus</i>	Basin-prairie shrub, mountain-foothills shrub	present	none	NSS4
Brewers sparrow <i>Spizella breweri</i>	Basin-prairie shrub	present	none	NSS4
Sage sparrow <i>Amphispiza belli</i>	Basin-prairie shrub, mountain-foothills shrub	present	S3	NSS4
<b>Mammals</b>				
Dwarf shrew <i>Sorex nanus</i>	Mountain-foothills shrub	unlikely	none	NSS3
Long-eared myotis <i>Myotis evotis</i>	Conifer and deciduous forests, caves and mines	possible	none	NSS2
Fringed myotis <i>Myotis thysanodes</i>	Conifer forests, woodland chaparral, caves and mines	highly unlikely	S2	NSS2
Spotted bat <i>Euderma maculatum</i>	Cliffs over perennial water, basin-prairie shrub	highly unlikely	S3	NSS2
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Forests, basin-prairie shrub, caves and mines	highly unlikely	S2	NSS2
Pygmy rabbit <i>Brachylagus idahoensis</i>	Prairie-basin shrub and riparian shrub	present	S1	NSS3
White-tailed prairie dog <i>Cynomys leucurus</i>	Grasslands, basin-prairie shrub	present	S3	NSS3
Wyoming pocket gopher <i>Thomomys clusius</i>	Meadows with loose soils	highly unlikely	S2	none
Idaho pocket gopher <i>Thomomys idahoensis</i>	Shallow stony soils	highly unlikely	S2	NSS3
Swift fox <i>Vulpes velox</i>	Grasslands	highly unlikely	S2	NSS4

Sources: BLM, 2001, Keinath et al., 2003; Cerovski et al., 2004

<sup>1</sup> State Rank: Assigned by WNDD and reflects status of species within political borders of the State of Wyoming: S1 = Extremely rare, S2 = Very rare, S3 = Rare, S4 = Apparently secure, but may be rare in portions of its range, S5 = Secure under present conditions. "B" following state rank indicates breeding status; "N" indicates non-breeding status.

<sup>2</sup> WGFD Status = Wyoming Game and Fish Department Status:

NSS1 = Species with ongoing significant habitat loss, populations greatly restricted or declining, and extirpation appears possible.

NSS2 = Species 1) whose habitat is limited or vulnerable, but no recent or significant loss has occurred and populations are greatly restricted or declining; or 2) with ongoing significant loss of habitat and populations are declining or restricted in numbers and distribution, but extirpation is not imminent.

NSS3 = Species in which 1) habitat is not limited, but populations are greatly restricted or declining and extirpation appears possible; 2) habitat is limited or vulnerable, although no significant recent loss has occurred and populations are declining or restricted in numbers or distribution, but extirpation is not imminent; or 3) significant habitat loss is ongoing, but the species is widely distributed and population trends are thought to be stable.

NSS4 = Populations greatly restricted or declining, extirpation possible; habitat stable and not restricted -OR- Populations declining or restricted in numbers or distribution, extirpation not imminent; Species widely distributed, population status or trends unknown but suspected to be stable; habitat restricted or vulnerable but no recent or ongoing significant loss; species likely sensitive to human disturbance -OR- Populations stable or increasing and not restricted in numbers or distribution; on-going significant loss of habitat.

White-tailed prairie dogs were surveyed in spring 2005 and no colonies were observed within the proposed pipeline route. Colonies are proximate, however, to the new NGL Stabilizer and Water Handling Facility, Gobblers Knob Compressor Station, and 1,250-foot long 25 kV distribution line. As noted earlier, greater sage grouse inhabit the entire project area.

Fish listed as state sensitive that occur in the area are the roundtail chub, flannelmouth sucker, Colorado River cutthroat trout, and the bluehead sucker. WNDD includes a single record of a bluehead sucker from the Green River north of the Fontenelle Reservoir. Several Colorado River cutthroat trout populations inhabit tributary streams west of the Green River including Horse Creek, Cottonwood Creek and LaBarge Creek. WGFD Fish Division (WGFD, 2003) has initiated multiple projects to restore native cutthroat trout in those watersheds but the species is not expected in the Green River mainstem.

**Special Status Plant Species.** BLM has indicated the following special status plant species may occur within the vicinity of the proposed pipeline: Cedar Rim thistle, large-fruited bladderpod, Beaver Rim phlox, and tufted twinpod (Table 3-7). Nelson's milkvetch, mystery wormwood, and Trelease's racemose milkvetch could occur if required habitats were encountered.

**Table 3-7  
BLM-Sensitive Plant Species Not Listed Under ESA That Could Occur within the Project Area,  
Habitats, and Other Status Designations**

<b>Common Name Scientific Name</b>	<b>Habitat (BLM, 2001)</b>	<b>Potential Occurrence</b>	<b>State Rank<sup>1</sup></b>
Meadow pussytoes <i>Antennaria arcuata</i>	Moist, hummocky meadows, seeps or springs surrounded by sage/grasslands 4950-7900' elevation	highly unlikely	S2
Small rock cress <i>Arabis pusilla</i>	Cracks/crevices in sparsely vegetated granite/pegmatite outcrops within sage/grasslands, 8000-8100' elevation	highly unlikely	none
Mystery wormwood <i>Artemisia biennis</i> var. <i>diffusa</i>	Clay flats and playas, 6500' elevation	possible	S1
Nelson's milkvetch <i>Astragalus nelsonianus</i>	Alakine clay flats, shale bluffs and gullies, pebbly slopes in sparse sagebrush – cushion plant associations 5200-7600' elevation	possible	none
Precocious milkvetch <i>Astragalus proimanthus</i>	Cushion plant communities on rocky, clay soils mixed with shale on white shale hills, 6800-7200' elevation	highly unlikely	S1
Trelease's racemose milkvetch <i>Astragalus racemosus</i> var. <i>treleasei</i>	Sparsely vegetated sagebrush on shale or limestone outcrops, barren clay slopes, 6500-8200' elevation	possible	S2
Cedar Rim thistle <i>Cirsium aridum</i>	Barren, chalky hills, gravelly slopes, fine textured sandy-shaley draws, 6700-7200' elevation	likely	S2
Ownbey's thistle <i>Cirsium ownbeyi</i>	Sparsely vegetated shaley slopes in sagebrush, juniper, 6400-8400' elevation	highly unlikely	S2
Wyoming tansymustard <i>Descurainia torulosa</i>	Sparsely vegetated sandy slopes at base of cliffs of volcanic breccia or sandstone, 8300-10000' elevation	highly unlikely	S1
Large-fruited bladderpod <i>Lesquerella macrocarpa</i>	Gypsum-clay hills, benches, clay flats, barren hills, 7200-7700' elevation	likely	S2
Stemless beardtongue <i>Penstemon acaulis</i> var. <i>acaulis</i>	Cushion plant or black sage grassland communities on semi-barren rocky ridges, knolls, slopes, 5900-8200' elevation	highly unlikely	S1

**Table 3-7 (concluded)**

<b>Common Name Scientific Name</b>	<b>Habitat (BLM, 2001)</b>	<b>Potential Occurrence</b>	<b>State Rank<sup>1</sup></b>
Beaver Rim phlox <i>Phlox pungens</i>	Sparsely vegetated slopes on sandstone, siltstone, limestone substrates, 6000-7400' elevation	likely	S2
Tufted twinpod <i>Physaria condensata</i>	Sparsely vegetated shale slopes, ridges, 6500-7000' elevation	likely	S2
Green River greenthread <i>Thelesperma caespitosum</i>	White shale slopes, ridges of Green River Formation, 6300' elevation	unlikely	S1
Uinta greenthread <i>Thelesperma pubescens</i>	Sparsely vegetated benches, ridges on coarse, cobbly soils of Bishop Conglomerate, 8200-8900'	highly unlikely	S1
Cedar Mountain Easter daisy <i>Townsendia microcephala</i>	Rocky slopes of Bishop Conglomerate, 8500' elevation	highly unlikely	S1

Source: BLM, 2001; Keinath et al., 2003.

<sup>1</sup> State Rank: assigned by WYNDD and reflects status of species within political borders of the State of Wyoming:

S1 = Extremely Rare

S2 = Very Rare

S3 = Rare

S4 = Apparently secure, but may be rare in portions of its range

S5 = Secure under present conditions

### **3.14 Wildlife and Aquatic Resources**

Detailed information regarding wildlife occurrence and habitat and fisheries along the proposed pipeline route has been reported in BLM's Green River (BLM, 1996) and Pinedale (BLM, 1987) Resource Management Plans and more recently in the Draft Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project (BLM, 1999a) and the Environmental Assessment for the Questar Year-Round Drilling Proposal (BLM, 2004a). Information obtained from those sources along with data provided by Wyoming Game and Fish Department (WGFD) and field observations are used in this analysis.

#### **3.14.1 Big Game**

The proposed pipeline route is entirely within the Sublette Antelope Herd Unit. The pipeline will cross approximately 8.5 miles of pronghorn crucial winter yearlong range and 5.9 miles of spring/summer/fall range within the herd unit. The proposed route crosses portions of the Sublette and Wyoming Range mule deer herd units. Approximately 5.2 miles of the pipeline will cross crucial winter range in the Sublette Mule Deer Herd Unit and 6.6 miles of crucial winter range in the Wyoming Range Mule Deer Herd Unit.

Crucial winter-yearlong range utilized by moose in the Sublette Herd Unit is present along 4 miles of the proposed pipeline route, principally on both banks of the Green River. The route also crosses the Pine and Pinedale elk herd units. No seasonally occupied ranges in the Pinedale Elk Herd Unit will be affected. However, the proposed route crosses 6.6 miles of winter-yearlong range within the Piney Elk Herd Unit.

The 630-foot long 25 kV distribution line is within crucial winter range on the Sublette Mule Deer Herd Unit while the NGL Stabilizer and Water Handling Facility and 1,250-foot long 25 kV distribution line (NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station) are within crucial winter range on the Sublette Antelope Herd Unit. Blowdown tanks will be on each of Questar's well pads, all of which are within crucial mule deer winter range.

### **3.14.2 Upland Game Birds**

Several species classified as upland game birds are likely to occur in the vicinity of the 14.4-mile long portion of the proposed 611 Pipeline. Sage grouse are the predominant upland game bird in southwestern Wyoming and are known to occur within or near the proposed route. Any sagebrush habitat within two miles of a lek is considered potential nesting habitat. Approximately 3.2 miles of the proposed route is within 2 miles of two known sage grouse leks. Two other leks are farther than two miles from the route.

A survey conducted during Spring 2005 documented sage grouse breeding activity at one lek farther than two miles from the proposed 611 Pipeline. No breeding activities were observed during that survey at the other three leks known to be in the project vicinity.

Although the 630-foot long 25 kV power line is within 2 miles of several sage grouse leks, none have been active recently. Likewise, the NGL Stabilizer and Water Handling Facility and 1,250-foot long 26 kV distribution power line (Stabilizer site to Gobbler's Knob Compressor Station) are within 2 miles of inactive leks. There are 26 leks on or within 2 miles of Questar's lease on the PAPA. Not all leks are active but currently there are 6 active leks within 2 miles of Questar's lease area. Consequently, blowdown tanks on each of Questar's well pads are likely to be within 2 miles of an active or inactive lek and generally within potential sage grouse nesting habitat.

The proposed 611 Pipeline route is within Upland and Small Game Management Area (USGMA) 3 (Bridger) west of the Green River and in USGMA 7 (Eden) east of the river. WGFD (2004) has documented harvests of ring-necked pheasant, chukar partridge, blue grouse, ruffed grouse, and mourning doves in one or both USGMAs. Of these species, mourning doves are most likely to occur along the proposed pipeline route. Chukars and ruffed grouse may also be present in suitable habitats.

### **3.14.3 Migratory Birds**

Data compiled for nine National Biological Survey BBS routes in the upper Green River area document 150 bird species have been observed on one or more routes since 1980 (Sauer et al., 2005). Of those, 147 species are listed as migratory birds protected under the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703-712) and Migratory Bird Treaty Reform Act of 2004. Migratory species in the vicinity that are sagebrush obligates - nesting in and almost entirely dependent on sagebrush vegetation - include sage thrasher, Brewer's sparrow, and sage sparrow. Others are nearly sagebrush obligates including green-tailed towhee and vesper sparrow. Abundance of at least one, the sage thrasher, appeared to be declining within the region through 2003 (BLM, 2004a).

Other migratory species include raptors that are known to nest, migrate, and seasonally reside, in the general vicinity of the proposed pipeline route. These species include golden eagle, red-tailed hawk, ferruginous hawk, great horned owl, bald eagle, Swainson's hawk, northern harrier, prairie falcon, American kestrel, merlin, and osprey. Sharp-shinned hawk, Cooper's hawk, burrowing owl, and long-eared owl may also be present in the area during the summer months. Raptors that may winter in the area include golden eagle, rough-legged hawk, and great horned owl.

There is potential nesting habitat for buteo raptors and some other species within one mile of the proposed pipeline route. Raptor surveys were conducted during spring 2005 prior to construction of this project. Only one red-tailed hawk nest was found along the Green River, beyond one mile of the proposed route.

#### **3.14.4 Other Wildlife**

Many other small mammals, birds, amphibians, and reptiles occur in areas crossed by the proposed pipeline route. Wading birds, shorebirds and waterfowl may utilize limited habitats in wetlands, the Green River, and nearby Fontenelle Reservoir. Mammals such as beaver, mink, muskrat, and river otter are also likely to be associated with those aquatic habitats. Lists of species commonly found in the region are available in the Fontenelle and Jonah II EISs (BLM, 1995b, 1997b).

#### **3.14.5 Wild Horses**

The Little Colorado Desert Wild Horse Herd Management Area (HMA) occurs to the east of the Green River along the entire proposed 14.4-mile long pipeline route. The Little Colorado Desert HMA is managed under the Green River RMP as an important part of the natural system under the multiple-use concept and is managed to maintain a herd of 69 to 100 animals (BLM, 1997a).

#### **3.14.6 Aquatic Resources**

Fisheries resources within the Project Area are limited to the Green River, crossed by the proposed pipeline upstream from Fontenelle Reservoir. Other drainages that will be crossed are intermittent and do not support fisheries. The Green River is classified as 2AB fisheries (WYDEQ, 2004). The Green River and Fontenelle Reservoir support brown, rainbow, and cutthroat trout and provides spawning habitat for Kokanee salmon. Spawning occurs in October (BLM, 1995b). Common nongame fish include mountain sucker, speckled dace, mottled sculpin, and fathead minnow.

### **3.15 Air Quality**

Current (2006) air quality conditions in the Pinedale region are under analysis. Air quality monitoring and preliminary results from the current conditions analysis are described in this section.

#### **3.15.1 Concentrations**

Ozone and sulfur dioxide concentrations monitored by CASTNet (Clean Air Status Trends Network) near Pinedale, available from 1989 through 2003, are below applicable guidelines and standards. Nitrogen dioxide and particulate matter concentrations monitored by SLAMS (State and Local Air Monitoring System) near Pinedale, available from late 2004 through the present, are below applicable standards.

Potential concentrations of nitrogen dioxide, particulate matter and sulfur dioxide from cumulative sources are below Wyoming and Federal air quality standards.

Potential concentrations of nitrogen dioxide, particulate matter and sulfur dioxide from cumulative sources are less than applicable PSD (Prevention of Significant Deterioration) increments. A comparison of potential concentration to PSD increments does not constitute a regulatory PSD Increment Consumption Analysis.

#### **3.15.2 Visibility**

Visibility monitored by IMPROVE (Interagency Monitoring of Protected Visual Environment) near Pinedale, available from 1989 through 2003, shows a steady trend over the monitoring period. Potential visibility impairment is significant in several Class I areas and communities in the Pinedale region.

### **3.15.3 Atmospheric Deposition**

Total nitrogen and sulfur deposition monitored by NADP (National Atmospheric Deposition Program) and CASTNet, available from 1989 through 2003, are below applicable levels-of-concern (LOC). Precipitation pH monitored by NADP near Pinedale, available from 1987 through 2003, shows slight acidification from 1987 through 1998.

Potential deposition from cumulative sources are below current levels-of-concern for nitrogen and sulfur at PSD Class I areas. The US Forest Service and the National Park Service are concerned that the current LOCs are set too high and so are re-evaluating the LOC's. Potential changes to lake chemistry are below levels-of-acceptable-change (LAC) for lakes.

## **CHAPTER FOUR ENVIRONMENTAL CONSEQUENCES**

### **4.1 Introduction**

This chapter describes the environmental consequences of BLM approval of the Proposed Action and each of the alternatives considered in detail as described in Section 2.5. This chapter discusses both adverse impacts and benefits associated with the Proposed Action and the alternatives.

The No Action Alternative would only preclude installation of the 14.4-mile long portion of the proposed 611 Pipeline. This alternative would not preclude QGM from proceeding with the condensate pipeline route approved in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a). It would also not preclude Questar from continuing winter drilling and development of their lease area in mule deer winter range or sage grouse breeding and nesting habitat. Development of these areas was approved by the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a). Consequently, if the No Action Alternative is selected, the impacts to resources discussed in Chapter 4 of the Questar Year-Round Drilling Proposal EA (BLM, 2004a) would still occur.

This chapter also discusses cumulative impacts. The cumulative impact assessment includes all existing, proposed and connected actions.

### **4.2 Socioeconomics and Environmental Justice**

#### **4.2.1 Proposed Action**

Impacts to socioeconomic resources from construction of the proposed 14.4-mile long portion of the 611 Pipeline and other proposed modifications are expected to be mostly positive. There would be increased employment opportunities for the construction and operation of the proposed pipeline and other modifications. There would also be an increase in tax revenues generated by construction activities, which are generally evaluated as positive impacts for an area.

There would be no influx of workers and their families into the area because the workers who designed and would construct the pipeline are current employees of QGM and residents of southwestern Wyoming. Therefore, construction of the proposed pipeline would not place additional demands on schools and other governmental services. The same applies for the other Proposed Action modifications within the PAPA.

QGM and Questar estimate that the operation of the condensate pipeline and previously-approved produced water gathering system would reduce tanker traffic in the lease area by approximately 25,000 truck trips annually under peak production. The condensate pipeline and produced water gathering system would reduce trucking opportunities for firms that currently provide this service to QGM. However, this impact cannot be quantified and it is possible that truck capacity may be absorbed by current and future needs elsewhere in southwestern Wyoming.

It is unlikely that construction of the pipeline would generate high levels of concern, opposition, or dissatisfaction among local residents. The oil and gas industry is the primary revenue-generating activity in the area and provides employment opportunities for many local residents.

## 4.2.2 Alternatives

**No Action Alternative.** Under this alternative, construction of the previously proposed condensate pipeline route (BLM, 2004a) would continue. This pipeline route is longer and could require more man hours, thus an increase in potential revenue compared with the Proposed Action. The increase in tax revenue would remain, as well as the benefits discussed for the Proposed Action, with the exception that the other Proposed Action modifications would not be constructed.

**Alternative A.** Under this alternative, none of the socioeconomic benefits described above would occur. Socioeconomic impacts would be identical to those described in the PAPA EIS (BLM, 1999a). Questar would continue to develop their lease area and the proposed condensate pipeline and other Proposed Action modifications would not be constructed or operated.

## 4.2.3 Cumulative Impacts

The Proposed Action and the alternatives would not result in significant changes to the cumulative impacts described in the Questar Year-Round Drilling EA (BLM, 2004a) or the PAPA EIS (BLM, 1999a). The benefits are expected to be only locally important. However, additional benefits would be expected outside of the PAPA (Sublette County) with construction of the proposed condensate 611 Pipeline and other modifications previously analyzed under NEPA. Overall, increased employment opportunities may occur in the region if energy production grows as a result of the increased capacity to bring the NGL (condensate) resource to market after construction of the pipeline.

## 4.3 Transportation

### 4.3.1 Proposed Action

Construction of the 14.4-mile long portion of the 611 Pipeline is not expected to result in significant impacts to transportation resources and all impacts are expected to be temporary. Construction would comply with permit requirements from State and county regulatory agencies to assure that roads are repaired after construction and that adequate traffic control is implemented to protect the traveling public. Heavily-traveled roads (US 189 and State Highway 235) would be bored so that traffic would not be impeded. Shoe-fly (detour) roads would be constructed at appropriate road crossings to prevent disruption of use. Impacts to local transportation from construction of the condensate pipeline would be temporary.

Construction of the 630-foot 25 kV distribution line, pipelines connecting the new NGL Stabilizer and Water Handling Facility to the existing Gobblers Knob Pinedale Compressor Station, and the proposed 1,250-foot long 25 kV distribution line is not expected to impact local transportation.

### 4.3.2 Alternatives

**No Action Alternative.** Implementation of the No Action Alternative would require construction of the 107-mile condensate pipeline analyzed in the Questar Year-Round Drilling Proposal EA (BLM, 2004a). Construction of the pipeline within that proposed right-of-way was not expected to result in significant impacts to transportation resources and all impacts are expected to be temporary (BLM, 2004a). Exempting the other modified components of the Proposed Action from implementation would have no effect on transportation.

QGM is not expected to construct the three CDPs or any of the other components previously analyzed under NEPA under the No Action Alternative since condensate would not be able to be passed along the approved condensate pipeline. Consequently, Questar would have to

remove condensate from the PAPA by tanker trucks, significantly increasing traffic levels during all times of year from levels expected under the Proposed Action.

**Alternative A.** Questar would have existing pads with multiple wells but because the condensate gathering system would not be feasible, Questar would most likely develop new well pads with only one well on each pad. However, the number of new pads would be consistent with that allowed in the PAPA ROD (BLM, 2000b). With that expectation, there would be an extensive road network on the PAPA with concomitant high volumes of traffic during all seasons, including winter. Consequently, many more miles of roads on the PAPA would have to be maintained for access during winter and other times of year than under the Proposed Action. Questar would have to remove condensate from the PAPA by tanker trucks, significantly increasing traffic levels during all times of year from levels expected under the Proposed Action.

### **4.3.3 Cumulative Impacts**

Unlike the No Action Alternative and Alternative A, implementation of the Proposed Action would result in less tanker truck traffic on the PAPA and other area roads. This reduced traffic volume would result in safer roads for the traveling public, wildlife, and livestock. Cumulative impacts described in the PAPA EIS and currently occurring in the vicinity of the PAPA would be reduced. Tanker truck traffic on Highway 351 would increase, however, when stored water would need to be removed from the 351 Tank Battery.

## **4.4 Land Use and Grazing**

### **4.4.1 Proposed Action**

Implementation of the Proposed Action would not preclude current land uses of the areas in and around the pipeline and power line routes, because the proposed routes follow existing pipeline and power line rights-of-way, as well as existing roads for most of the proposed lengths (see Appendix A). There would be no changes in surface ownership. Installation of the condensate pipeline, ten connecting pipelines, and buried power lines would not conflict with current zoning regulations.

Construction of the proposed condensate pipeline and other components within the rights-of-way would have a temporary effect on the quality and quantity of resources available, especially where lands are used for grazing. For example, if the proposed condensate pipeline, connecting pipelines, and power lines were constructed, vegetation would be bladed within the rights-of-way, completely removing vegetation and available forage within the construction area. After construction the surface would be available to grazing animals, although re-establishment of vegetation would require time (one to three years) and sufficient precipitation (Barker et al., 1985).

The total amount of disturbed area within the grazing allotments during condensate pipeline construction (50 feet right-of-way) would be approximately 81.3 acres, corresponding to 5.65 animal unit months (AUMs) (see Table 4-1). This impact would be short-term until grasses are re-established. After construction of the pipeline, an operational right-of-way of 30 feet would be maintained. This is would be approximately 48.8 acres of disturbance for all three grazing allotments, corresponding to 3.4 AUMs, during the life of the project (see Table 4-1). However, maintenance of the right-of-way would not have an impact on available forage. The impacts to grazing are considered to be minimal because they would be short-term (one to three years) and would not affect the long-term use of the grazing allotments.

Approximately 0.18 acres of vegetation would be temporarily disturbed on Mount Airy Common grazing allotment during construction of the buried power line to Stewart Point 16-18 CDP. This

corresponds to 0.01 AUMs. Construction on the ten connecting pipelines, as well as buried power line from Gobblers Knob Compressor Station to the NGL Stabilizer and Water Handling Facility would disturb approximately 0.53 acres within the Mesa Common Allotment, corresponding to 0.05 AUMs. Impacts to grazing would be minimal because they would be short-term and the proximity to existing facilities most likely would preclude high usage of this portion of both grazing allotments.

**Table 4-1  
Grazing Allotments Potentially Affected by the Proposed Action**

<b>Allotment</b>	<b>AUMs/Acre</b>	<b>Pipeline Construction ROW (acres)</b>	<b>Pipeline Operation ROW (acres)</b>	<b>AUMs Disturbed (Construction)</b>	<b>AUMs Disturbed (Operation)</b>
Figure Four	0.017	44.3	26.6	0.76	0.46
Bird Individual	0.087	7.7	4.6	0.67	0.40
North LaBarge Common	0.147	29.3	17.6	4.22	2.54
Mount Airy Common	0.076	0.18	0.0	0.01	0.0
Mesa Common	0.090	0.53	0.0	0.05	0.0
<b>Total</b>	<b>0.417</b>	<b>82.01</b>	<b>48.8</b>	<b>5.71</b>	<b>3.4</b>
Source: BLM, 1987, 1992					

Consistent with mitigation presented in Section 2.3, QGM would not trench more area than can be successfully backfilled and compacted in a two-day period. Portions of the proposed right-of-way within 0.25 mile of livestock would be fenced if required by the BLM field agent. Application of these measures would minimize impacts of open trench conditions on livestock and wildlife, particularly big game species.

#### **4.4.2 Alternatives**

**No Action Alternative.** Under this alternative, grazing and land use impacts described in the Questar Year-Round Drilling EA (BLM, 2004a) would continue. QGM would continue its original plans for constructing the condensate pipeline (BLM, 2004a). Disturbance associated with this alternative would be greater than the Proposed Action and Alternative A, since this alternative maintains the longer route proposed resulting in more surface disturbance during construction of the condensate pipeline and/or continues to construct a condensate pipeline not included with Alternative A.

No disturbance would occur to 1.07 acres of potential grazing sites in Mount Airy Common and Mesa Common, since the additional modifications of the Proposed Plan would not transpire.

**Alternative A.** Under this alternative, the winter stipulations in the PAPA ROD (BLM, 2000b) would be reapplied. There would no longer be a condensate gathering system on Questar's lease area, and therefore, no additional condensate pipeline would be constructed. As a result, no disturbance would occur to 81.30 acres of grazing allotments impacted under the Proposed Action. In addition, none of the other modification included in the Proposed Action or previously analyzed under NEPA would be implemented since those are dependent on the presence of the condensate gathering system.

If this alternative were implemented, additional well pads would be potentially constructed, resulting in a more extensive road network, thus impacting additional acres of grazing

allotments. Land use and grazing impacts from implementing this alternative would be identical to those described in the PAPA EIS (BLM, 1999a).

#### **4.4.3 Cumulative Impacts**

Questar's proposal to modify the route of the 611 Pipeline would reduce total disturbance during construction compared to action taken under the Questar Year-Round Drilling EA (BLM, 2004a). This reduced disturbance should result in less overall cumulative impacts to land use and grazing along the proposed pipeline route. The temporary loss of 5.65 AUMs represents only a small portion (less than 1 percent) of the AUMs currently available in the affected grazing allotments. In addition, the impacts from the pipeline are linear, further reducing the severity of the impact to grazing. Because the condensate pipeline is located adjacent to existing rights-of-way for most of its length, additional cumulative impacts to land use are expected to be negligible. In addition, placement of the buried power lines and ten connecting pipelines are mostly within previously disturbed sites, and therefore impacts to land use are also minor.

#### **4.4.4 Recreation Resources**

#### **4.4.5 Proposed Action**

The 14.4-mile long portion of the proposed 611 Pipeline is not expected to change recreation resource impacts because only dispersed recreation resources occur along the condensate pipeline right-of-way. There may be some limited displacement of recreation use on BLM-managed lands during construction. However, the impact is expected to be insignificant and temporary. Using HDD to cross the Green River would eliminate adverse impacts to water quality from an open-cut that would impair trout fishing downriver, as well as allow for continued boating passage. Proposed construction of the condensate pipeline would occur during many of the designated hunt seasons (see Table 3-5 in Section 3.5). Hunting success could be hindered during construction, although disturbance would be temporary. Other proposed modifications should not impact recreational opportunities.

#### **4.4.6 Alternatives**

**No Action Alternative.** Recreation impacts described in the Questar Year-Round Drilling EA (BLM, 2004a) would continue. Under this alternative, impacts to recreation resources described above for the proposed 14.4 mile condensate pipeline reroute and other proposed modifications would not occur, but impacts to recreation resources along the long 107-mile route would be impacted.

**Alternative A.** Recreation impacts from implementing this alternative would be identical to those described in the PAPA EIS (BLM, 1999a). There would be no potential adverse affects to fishing and boating opportunities on the Green River, since the proposed condensate 611 Pipeline would not be constructed. In addition, other proposed modifications would not be constructed since each is dependent on the presence of the condensate gathering system; therefore, there would be no adverse impacts on recreational resources.

#### **4.4.7 Cumulative Impacts**

Construction of the proposed 611 Pipeline would result in a temporary loss of recreational opportunities on BLM lands in the vicinity of construction activities, especially in areas used extensively for hunting purposes. However, it is anticipated that these impacts would be short-term and negligible. Other proposed modifications, including those previously analyzed using NEPA, should not impact recreational opportunities since they are located at previously established sites and are expected to be undesirable to recreationists.

## 4.5 Visual Resources

### 4.5.1 Proposed Action

**The 611 Pipeline.** The 14.4-mile long portion of the 611 Pipeline crosses approximately 2.2 miles of the Green River Floodplain which is land designated as VRM Class III. This represents approximately 15 percent of the 14.4-mile long proposed pipeline. The Green River crossing would be completed by a 0.29 mile HDD beneath the river instead of trenching the river banks and bed. This procedure would minimize disturbance within VRM Class III by eliminating the need for extensive stream bank grading and restoration. Construction and operation, including reclamation of this segment of the pipeline through VRM Class III lands would be adjacent to or within areas previously disturbed for other pipelines, roads and/or well pads and would not significantly change the existing character of the landscape. It also should not attract attention following the re-establishment of vegetation as part of committed reclamation of the disturbed construction right-of-way.

Two automated isolation valves are also proposed within the VRM Class III areas on each side of the Green River crossing in the State Section 16, Township 27 North, Range 112 West. These facilities would be designed to blend into and retain the existing character of the natural landscape. These exposed pipeline segments would be painted a non-contrasting color harmonious with the surrounding landscape (i.e., Shale Green unless otherwise specified by BLM on a case-by-case basis). Detailed construction plans for these facilities would be submitted to the authorizing officers for approval prior to construction. Additional mitigation measures would be applied as required by the State of Wyoming.

The 14.4-mile long pipeline also crosses approximately 3.95 miles (27 percent) of land outside the floodplain which is also designated as VRM Class III. This area is located on the western side of the Green River. The existing character of the landscape would be retained following right-of-way restoration. Pipeline construction and operation in this VRM class would be consistent with the objective to partially retain the existing character of the landscape. The activity may draw the attention of the causal observer, but should not dominate the landscape.

The remaining 8.25 miles (57 percent) of the 14.4-mile long pipeline would cross VRM Class IV landscapes that allow for major modifications of the existing character of the landscape. Construction and operation of the proposed pipeline is consistent with VRM Class IV objectives.

Currently condensate is stored in tanks of various heights and diameters at each pad. Upon completion of the proposed pipeline and condensate gathering system, serviced wells would no longer store condensate in tanks; therefore the tanks could be removed. The elimination of these tanks would reduce the visual impact from gas development in areas serviced by the pipeline, which occupy VRM classes II, III, and IV.

**Other Modifications.** Construction of the power line to Stewart Point 16-18 CDP would occur in VRM Class III. The connecting pipelines and power line from the NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station would be constructed in VRM Class III. These construction projects would maintain the objectives of each VRM class and retain the existing character of the landscape upon revegetation.

One water tank at each well pad would remain and be converted to blowdown tanks. At present these tanks vary in size from 300 to 540 barrels and range in height from 8 to 9 feet. Leaving these tanks would not benefit or adversely affect the current viewshed in each of the affected VRM classes. Two years after completion of the project, Questar has committed to replacing each water tank with a 90 barrel, low-profile tank that would not exceed 6 feet in height. Each tank would be painted a non-contrasting color harmonious with the surrounding landscape (i.e.,

Shale Green unless otherwise specified by BLM on a case-by-case basis). This conversion would reduce visual impact at each well pad.

#### **4.5.2 Alternatives**

**No Action Alternative.** Implementation of the No Action Alternative would result in no disturbance along the 14.4-mile long portion of the 611 Pipeline. Therefore, no impact to the existing character of the landscape would occur. However, there would be an increase of disturbance during construction of the condensate pipeline as described in the Questar Year-Round Drilling EA (BLM, 2004a), because it incorporates a longer route. No additional disturbance would occur from the other modifications included in the Proposed Action.

**Alternative A.** Visual impacts and benefits from implementing this alternative would be greater than the No Action Alternative or Proposed Action. Under this alternative, no condensate gathering system would be constructed and/or operable on Questar's lease area, thus Questar would not proceed with concentrating their drilling efforts to no more than 61 well pads. Well pads would be developed at the density allowed by Management Area in the PAPA ROD, which would likely create greater visual impact than developing the entire Questar leasehold with no more than 61 pads. Both condensate and water tanks storage tanks would remain on each well pad.

No disturbance would occur by the other modifications included in the Proposed Action, or any of the other modifications previously analyzed under NEPA, since those components are dependent on the presence of the condensate gathering system.

#### **4.5.3 Cumulative Impacts**

Implementation of the Proposed Action would result in a temporary increase to visual disturbance of VRM Classes II, III, and IV during construction of the 14.4-mile long portion of the 611 Pipeline. These impacts are expected to be short-term, although noticeable, until restoration is complete. Since the impacts would occur primarily adjacent to existing pipelines, in the long-term the impacts are expected to blend with the adjacent landscape.

Additional components of the Proposed Action (630-foot 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, and the 1,250-foot long 25 kV distribution line) and modifications previously analyzed under NEPA (CDPs within the PAPA, NGL Stabilizer and Water Handling Facility, Mesa Phase IV Multi-pipelines, the 16,000 barrel condensate storage tank at LaBarge, and the 351 Tank Battery) would increase visual impact throughout the PAPA.

### **4.6 Cultural and Historic Resources**

#### **4.6.1 Proposed Action**

The potential for the project to affect subsurface historic properties not detected by the Class III inventory exists; therefore, an open trench inspection would be conducted in accordance with the terms of the Discovery Plan and Research Orientation detailed in the Class III Cultural Resource Inventories of the Questar Gas Management 611 Pipeline, Segments 3 and 4 (Yerkovich, 2005 and Murray, 2005).

Two cultural resource sites present in the 14.4-mile long portion of the 611 Pipeline right-of-way are eligible for nomination to the NRHP and would be affected by construction of the pipeline. However, the portion of 48SU852 (Opal Wagon Road) that would be crossed by the proposed pipeline occurs in an area that does not contribute to the site's overall eligible status. The archeological site located adjacent to the Green River, 48SU390, would also not be affected because the pipeline will cross the Green River using the HDD method.

The impacts anticipated at each of the eligible sites are discussed below.

**48SU390.** The proposed pipeline would cross the Green River by HDD. The pipeline would be installed 28 feet below the Green River and 44 feet below the known extent of archeological site 48SU390. The plan for the HDD was approved verbally by the Wyoming State Historic Preservation Officer (SHPO), Ms. Claudia Nissley, on March 8, 2005. Site 48SU390 has been characterized and researched extensively due to the construction of other pipelines in this area. The known extent of site 48SU390 would be avoided during construction using HDD and as a result, no surface disturbance is expected to occur. Monitoring of this activity would document any impacts to the site.

**Opal Wagon Road (48SU852).** The pipeline would encounter the Opal Wagon Road (48SU852) within an area of previous pipeline disturbance. A fence would be erected across the contributing portion of the road at the point of intersection to avoid inadvertent vehicle traffic along that portion of the road.

Cultural resources that are not eligible for nomination to the NRHP are not considered "historic properties". Consequently, by Advisory Council's guidelines (Section 106), there would be no effect on six of the eight historic properties identified within the proposed project area. However, two other historic sites within the project area are eligible for nomination to the NRHP. Though, in compliance with the Advisory Council's guidelines for Section 106, eligible site 48SU852 (Opal Wagon Road) that is crossed by the proposed pipeline in a portion that does not contribute to its eligible status, would not likely be adversely effected. The other eligible site, 48SU390, would be crossed by the condensate pipeline the archeological site and should have no impact on this historical site historic property. Section 106 compliance of this project would be in accordance with the Wyoming Protocol implementing the National Programmatic Agreement for cultural resources. A Memorandum of Agreement (MOA) between BLM, SHPO, and QGM has been executed and is included as Appendix C.

No impacts to traditional cultural properties are anticipated due to the absence of currently identified Native American tribal concerns.

#### **4.6.2 Alternatives**

**No Action Alternative.** Under this alternative, the potential impacts described above to subsurface historic properties and historic trails would not occur. Cultural and historic resource impacts would be identical to those described in the Questar Year-Round Drilling EA (BLM, 2004a).

**Alternative A** Under Alternative A, the potential impacts to subsurface historic properties and historic trails would be the same as those described in the PAPA ROD (BLM, 2000b). Potential impacts to cultural and historic resources would be evaluated by BLM to determine that field development activities were consistent with discovery plans and individual project treatment plans developed.

#### **4.6.3 Cumulative Impacts**

Implementation of the Proposed Action and alternatives would result in the same cumulative impacts described in the PAPA ROD (BLM, 2000b) and Questar Year-Round Drilling EA (BLM, 2004a). Because the portion of the Opal Wagon Road crossed by the condensate pipeline does not contribute to trail eligibility, there would be no additional unmitigated cumulative impacts on this historic property. In addition, using HDD to cross beneath archeological site 48SU390 would mitigate surface disturbance to this site and maintain its eligible status. Other proposed project components would not impact any cultural or historic sites.

## 4.7 Geology, Geologic Hazards, Minerals and Paleontological Resources

### 4.7.1 Proposed Action

The Proposed Action would have no adverse impacts on mineral resources along the pipeline route. The 611 Pipeline would not be allowed to encroach on other mineral leases, infrastructure, or rights-of-way without prior approval. Construction or operational activities of the pipeline would not precipitate seismic activity in the vicinity of the site because there are no active faults in the immediate area, and there would be only minor intrusion into bedrock. Excavation for the new pipeline would be slightly below the alluvial surfaces in some locations along the route. However, the fractured nature of the bedrock would probably allow excavation to proceed without blasting. Terrain along the route shows local variations in elevation. Because the slope is generally low, it is not physically predisposed to landslides that could be exacerbated by precipitation on surfaces exposed or denuded as a result of construction activities. The slope rating indicates that the surface along the route is suitable for surface and deep mechanical site preparations (Halasz et al., 2000).

There would be no impacts to the availability of locatable or salable minerals as a result of pipeline construction because there are no known occurrences of those resources along the pipeline route. Access to potentially available oil and gas resources along the 611 Pipeline route would not be hindered by construction and operation of the proposed pipeline due to the linear nature of the project and the minimal width of the right-of-way (30-feet).

Construction of the proposed pipeline would, in some areas, disturb unconsolidated bedrock as trenching occurs in the relatively shallow soils and would have the potential to impact undiscovered scientifically significant fossils. However, implementation of BLM's BMPs would effectively eliminate impacts to paleontological resources. BMPs include worker instruction and education with respect to legal requirements and procedures if fossils are uncovered. They also include contingency plans if a paleontological discovery were made. In Bird Canyon, where fossil wood, invertebrate trace fossils, and fossil vertebrate material were identified during the paleontological survey, a paleontology monitor would be on site during trenching operations.

Increased public access to the construction sites may increase the opportunities for unauthorized fossil collection. However, because the pipeline would be constructed adjacent to existing pipelines for much of its length, it is unlikely that new discoveries would be made.

### 4.7.2 Alternatives

**No Action Alternative.** This alternative would allow construction of the 107-mile condensate pipeline analyzed in the Questar Year-Round Drilling EA (BLM, 2004a). That document concluded that the condensate pipeline would have no adverse impacts on mineral resources. Further, there would be no impacts to the availability of locatable or salable minerals from the pipeline because there are no known occurrences of those resources along the route. Also, access to potentially-available oil and gas resources along the pipeline route would not be restricted.

**Alternative A.** No potential impact to geological resources from construction of the 14.4-mile long 611 Pipeline or the remainder of the 107-mile long condensate pipeline would occur under Alternative A. Impacts from implementing this alternative would be identical to those described analyzed under the PAPA EIS.

### 4.7.3 Cumulative Impacts

Construction of the 611 Pipeline is likely to disturb unconsolidated bedrock as trenching occurs in the relatively shallow soils. In those sites there is some potential to damage undiscovered,

scientifically-significant fossils. However, construction could also result in the discovery of fossils that add to the understanding of paleontological resources in southwestern Wyoming.

QGM would inform workers about the legal requirements of disturbing paleontological resources and procedures if fossils are uncovered. If paleontological resources are uncovered, construction activities would be suspended to prevent further disturbance and QGM would immediately contact the BLM who would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan. Mitigation of paleontological resources would occur on a case-by-case basis, and QGM would be responsible for the costs. Increased public access to the construction sites may also increase opportunities for unauthorized fossil collection.

## **4.8 Surface Water**

### **4.8.1 Proposed Action**

Potential impacts to surface waters could include short-term increased turbidity, salinity and sedimentation of the surface waters during seasonal flows or precipitation events due to runoff and erosion from disturbed upland areas, and depletion of Green River tributary waters for construction and hydrostatic testing.

Clearing and blading followed by construction vehicle travel across ephemeral stream channels could break down banks, increase sediment load, cause or accelerate erosion, and destabilize the channel. However, vehicle access to the pipeline right-of-way would be confined to existing access roads and to the construction right-of-way. No new roads would be constructed. If vehicles were operated when soils were saturated, ruts could form that could increase erosion. However, QGM has committed to avoiding vehicle travel during saturated soil conditions to avoid impacts that could be caused by rutting.

Using conventional crossing techniques (i.e., open cut) for the Green River would cause an increase in sedimentation from river bank erosion and streambed excavation. To prevent this impact, the pipeline would be installed beneath the Green River using HDD. Potential adverse impacts to the floodplain of the Green River would be reduced by using HDD. QGM would obtain the permits required to complete pipeline construction across the Green River. Section 404 and Nationwide #12 permit conditions would require adequate measurements to be taken to protect these resources. In this area, erosion control BMPs would remain in place until disturbance is successfully reclaimed.

Accidental leaks from the pipeline could impact surface water quality. The principal risks of pipeline operations include excessive pressure, physical damage through flooding or soil erosion and corrosion. Pipeline failures due to excess pressure would be prevented through engineering design and relief valves which dissipate excessive pressures. The pipeline would be monitored through periodic leakage surveys and patrols to anticipate and correct problems before failures occur.

QGM has obtained a permit to appropriate surface water from the Wyoming State Engineer's Office for 2.31 acre-feet of water from the Green River. QGM would use 0.37 acre-feet of water for hydrostatic testing of the proposed 14.4-mile long pipeline. The additional water that is appropriated would be used for dust control and for drilling water for the HDD.

QGM and Questar's other modifications within the PAPA would have the same potential impacts as those described above for general clearing. Most of the components would be constructed within upland areas and are not expected to impact surface waters.

## 4.8.2 Alternatives

**No Action Alternative.** Under this alternative, the potential for impacts to surface water would increase. This alternative would result in greater surface disturbance than the Proposed Action because QGM would construct the condensate pipeline to the Blacks Fork Processing Plant in Sweetwater County which is an increase in over 40 miles condensate pipeline and two additional river crossings. Consequently, potential water quality degradation would increase under this alternative.

**Alternative A.** This alternative would require even less disturbance than the Proposed Action or Alternative A because no additional condensate pipeline would be constructed. Therefore, potential impacts to water resources from implementing this alternative would be reduced.

## 4.8.3 Cumulative Impacts

There could be additional cumulative water quality impacts (i.e., sedimentation) from construction of the condensate pipeline and the other modifications. However, BLM and the State of Wyoming have developed Best Management Practices to reduce off-site water quality degradation and QGM is proposing to cross the Green River by HDD. These practices would result in only and short-term water quality impacts. Depletions for the entire length of the QGM 611 Pipeline and dust control is estimated to be 5.65 acre-feet.

## 4.9 Groundwater

### 4.9.1 Proposed Action

Bedrock and alluvial groundwater aquifers underlie the proposed pipeline route. Vulnerability of these aquifers is a function of the depth to groundwater and the permeability of the overlying soils.

While routine operation of the pipeline would not affect groundwater, an accidental release of condensate from a pipeline segment could migrate through the overlying surface materials and enter the groundwater. Only those compounds that do not readily volatilize at atmospheric pressure (2-4 percent of the potential release) would be left to migrate. If a release were to occur, QGM would be responsible for monitoring groundwater to ensure that contaminants did not reach receptors.

In the unlikely event of a release, groundwater wells in close proximity to the pipeline would be potential receptors. There is also the potential for spills of fuel, oils, and solvents during pipeline construction of both the pipelines and other modifications included in the Proposed Action that could enter into shallow groundwater sources. These spills would be localized and adherence to the project Spill Prevention, Control and Countermeasures (SPCC) Plan would minimize the occurrence and impacts of these spills.

### 4.9.2 Alternatives

**No Action Alternative.** The potential impacts to groundwater resources would be greater under this alternative than for the Proposed Action because there would be greater disturbance associated with the original condensate pipeline route approved in the Questar Year-Round Drilling Decision Record (BLM, 2004a). Potential operational impacts to groundwater quality would be the same as for the Proposed Action.

**Alternative A.** Under this alternative, the condensate gathering system would not be constructed and potential impacts to groundwater as a result of construction would not occur. However, the potential for operational impacts to groundwater would increase because there

would be greater overall disturbance within the PAPA if the condensate system is not installed and there are a larger number of well pads.

#### **4.9.3 Cumulative Impacts.**

There could be additional cumulative water quality impacts (i.e., contamination of groundwater from construction of the condensate pipeline and the other modifications. However, BLM and the State of Wyoming have developed Best Management Practices to reduce the potential for groundwater contamination. QGM would follow their SPCC Plan for the Proposed Action. These practices would result in only insignificant and short-term water quality impacts.

### **4.10 Soils**

#### **4.10.1 Proposed Action**

Potential impacts from pipeline construction include stream sedimentation, soil contamination, and stream bank and channel instability. Linear features, such as a pipeline, can augment erosion impacts due to the large amount of edge between disturbed and undisturbed areas. There would be some loss of soils due to the physical alteration of the existing soil profile. In general, there are no large steep areas along the route where development would likely result in slumping or landslides.

Soil exposure to forces of erosion would be increased during construction after vegetation is stripped and topsoil is bladed into windrowed stockpiles within the construction right-of-way. Windrowed topsoil and exposed subsoils would be subject to accelerated water and wind erosion due to loss of protective vegetative cover, higher runoff rates, lower infiltration rates, and more direct exposure to wind. The temporary placement of topsoil and excavated subsoil into separate windrowed stockpiles for the duration of construction, one of BLM's BMPs, would prevent soil mixing and would allow for restoration of the soil profile and optimization for re-establishment of productive soil conditions and vegetative cover following trench backfilling.

Soil compaction from vehicular traffic could result in reduced soil productivity due to loss of soil structure, increased erodibility, and decreased infiltration and water storage capacity. Increased soil erosion can potentially increase sediment yield, turbidity, and salinity to drainages. As described in Section 2.2.1, all equipment and vehicular access would be confined to existing roads and the established right-of-way, thereby avoiding soil compaction on undisturbed areas. BLM would require that QGM avoid vehicle travel during saturated soil conditions to avoid impacts that could be caused by rutting.

Travel and pipeline construction through/across ephemeral stream channels could break down banks, increase sediment load, cause or accelerate erosion, and destabilize the channel potentially causing gully erosion. Where ephemeral stream channels are affected by pipeline construction, QGM would return the banks to their approximate original contour/form. However, where existing banks are unstable such as vertically-banked walls of gullies, QGM would recontour or lay banked slopes back to form stable slopes/bank configuration to minimize erosion and bank instability. Where necessary at ephemeral stream crossings, QGM would consult with the BLM field agent or resource specialist to ensure appropriate BMPs are implemented during construction and restoration to minimize accelerated erosion. Potential BMPs may include rip-rap, erosion control matting or fabric, check dams or other appropriate measures to minimize the potential of accelerated erosion or gully formation.

The pipeline would be drilled (HDD) beneath the Green River to prevent erosion and to minimize any increase in sediment load to the waters from pipeline construction. Use of HDD to install pipelines beneath the rivers preserves the vegetation along the river banks thereby maintaining soil stability. If river banks are affected by pipeline construction, QGM will return the

bank to its original form and stabilize the slope. With implementation of environmental protection measures presented in Section 2.4.1, impacts to soils along the pipeline route would be avoided or minimized.

#### **4.10.2 Alternatives**

**No Action Alternative.** Under the No Action alternative, there would be greater impact to soils than for the Proposed Action because the pipeline route would be longer as analyzed in the Questar Year-Round Drilling EA (BLM, 2004a).

**Alternative A.** Under this alternative, there would be no further disturbance to soils resulting from construction of the 611 Pipeline. However, there would be greater disturbance to soils within the PAPA because the number of well pads would increase as described in the PAPA EIS (BLM, 1999a). The reduction in the number of wells pads within the PAPA as described in the Questar Year-Round Drilling EA (BLM, 2004a) would not occur.

#### **4.10.3 Cumulative Impacts**

In the PAPA, implementation of the Proposed Action would result in less cumulative impact to soils than described in the PAPA EIS because disturbance necessary to complete development of Questar's lease area would be reduced. Under the No Action Alternative and Alternative A, cumulative impacts within the PAPA would be similar to those analyzed in the PAPA EIS (BLM, 1999a).

Additional cumulative impacts to soils in the region would occur from construction of the 611 Pipeline outside the PAPA. However, all impacts to soils from construction of the condensate pipeline, other modifications included in the Proposed Action, and components previously analyzed under NEPA (three CDPs, NGL Stabilizer and Water Handling Facility, Mesa Phase IV Multi-Pipelines, Condensate Storage at LaBarge, and Highway 351 Tank Battery) are expected to be short-term with non-significant impact to soils.

### **4.11 Vegetation and Noxious Weeds**

#### **4.11.1 Proposed Action**

Construction of the proposed pipeline would temporarily disturb approximately 126 acres primarily within Wyoming big sagebrush – mixed grass steppe of which 87 acres would be affected by pipeline construction and 39 acres affected by temporary work areas necessary during construction. After construction, approximately 52.2 acres would remain within QGM's 30-year right-of-way.

During construction, surface disturbance to vegetation would be the result of blading, grading, and/or trenching within the right-of-way to install the pipeline. Vehicles and foot traffic would also crush or otherwise cause superficial damage to vegetation within the right-of-way.

Invasive, noxious weed species could become established in disturbed areas if seeds or regenerative plant parts of noxious species are transported naturally or accidentally to the disturbed areas. All disturbed areas would, however, be reclaimed and revegetated within one growing season after construction is complete in accordance with agency requirements. Grasses could require two to three years for successful re-establishment (70 percent cover) in the area's arid environment. The shrub component on newly disturbed areas may require more than 20 years for recovery to pre-disturbance levels after reseeding and reclamation activities begin. Long-term productivity of shrubs would be adversely affected within the 30-year right-of-way and construction areas. Long-term productivity of grasses would not be affected.

Impact to vegetation by other modifications included in the Proposed Action include trenching and burial of the 630-foot long 25 kV distribution line which would disturb approximately 0.18 acre of Wyoming big sagebrush – mixed grass steppe. Construction of ten parallel pipelines from the new NGL Stabilizer and Water Handling Facility to the existing Gobblers Knob Compressor Station would affect approximately 0.08 acre of previously undisturbed sagebrush – grass steppe but the temporary shoe-fly access road and remaining 108 feet of permanent right-of-way needed for the ten pipelines would be within previously disturbed vegetation. Likewise, portions of the 1,250-foot long 25 kV distribution line (NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station) would be within sagebrush – grass steppe (0.14 acre) and previously disturbed vegetation (0.44 acre). Installation of blowdown tanks at each of Questar’s well pads would not be on disturbed surfaces.

#### **4.11.2 Alternatives**

**No Action Alternative.** There would be no disturbance to 126 acres of existing vegetation on the 14.4 miles of proposed right-of-way. Instead, there would be disturbance to approximately 755 acres of vegetation as described in the Questar Year-Round Drilling Proposal EA (BLM, 2004a). No disturbance to sagebrush – grassland steppe on the PAPA would occur by the other modifications included in the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line).

**Alternative A.** Under this alternative, the winter stipulations in the PAPA ROD would be reapplied. There would be no condensate gathering system on Questar’s lease area. Questar would have existing pads with multiple wells but, because the condensate gathering system would not be implemented. Questar would develop new well pads according to the PAPA ROD requirements, which would result in more than 9 new well pads associated with the year-round drilling proposal. Potentially, the number of new pads would be connected by a more extensive road network than under the Proposed Action. Disturbance to approximately 126 acres of vegetation by the 611 Pipeline, primarily within Wyoming big sagebrush – mixed grass steppe, would not occur under Alternative A.

No disturbance to sagebrush–grassland steppe on the PAPA would occur by the other modifications included in the Proposed Action (630-foot long 25 kV power line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line). Likewise, none of the other modifications previously analyzed under NEPA would be implemented since those are dependent on the presence of the condensate gathering system. In Alternative A, total disturbance to vegetation would be much greater than by the Proposed Action.

#### **4.11.3 Cumulative Impacts**

Construction of the 14.4-mile long portion of the 611 Pipeline would temporarily increase the area of disturbed lands along the pipeline route by 126 acres. The pipeline route, however, was planned to minimize impacts to natural resources, principally by locating it adjacent to existing parallel and adjacent to existing pipelines and/or power lines for approximately 74 percent of the 14.4-mile long route. The 611 Pipeline route adjacent to existing disturbed sites localizes surface disturbance rather than substantively increasing fragmentation of undisturbed vegetation. The incremental loss of vegetation by construction of the proposed pipeline would be minimal.

Likewise, implementation of other modifications included in the Proposed Action would have minimal impact to Wyoming big sagebrush – mixed grassland steppe vegetation. Other modifications previously analyzed under NEPA generally affect previously disturbed lands

including the three CDP's, the NGL Stabilizer and Water Handling Facility, the Phase IV Multi-Pipelines, condensate storage tank at LaBarge, and Highway 351 Tank Battery.

Weedy species often thrive on disturbed sites and out-compete more desirable plant species. Increased weed infestation may render a site less productive as a source of forage for wildlife and livestock. Although some weed infestation may be anticipated on the proposed 611 Pipeline right-of-way, any of the surface disturbances associated with various modifications included in the Proposed Action, and other modifications previously analyzed under NEPA, the application of weed preventative and control measures presented in Section 2.3.15 would minimize impacts from weed species. The overall impacts to vegetative resources would, therefore, be minimal.

## **4.12 Wetland and Riparian Resources**

### **4.12.1 Proposed Action**

The Green River would be crossed by HDD. Approximately 0.07 mile of the pipeline would be drilled below the river riparian zone while 0.06 mile would be drilled below the Green River. The pipeline would be installed 28 feet below the Green River and 44 feet below wetlands and riparian areas associated with the pipeline crossing of the Green River, avoiding direct impacts and allowing the wetlands/riparian area to continue to function. HDD allows the pipeline to be constructed beneath these environmentally sensitive areas to avoid surface disturbance.

The 14.4-mile long portion of the 611 Pipeline would affect approximately 1.58 acre (0.26 mile) of palustrine emergent wetlands on the west bank of the Green River. Effects to those wetlands would be temporary because successful revegetation can be accomplished with seed mixtures specified by the BLM. In addition, QGM would obtain the permits required to complete pipeline construction in these areas. Section 404 and Nationwide #12 permit conditions would require adequate measurements to be taken to protect these resources. Based on use of protective measures described in Chapter 2 and compliance with the Nationwide #12 permit administered by the U.S. Army Corps of Engineers, there would be no loss of wetlands/wetland function or riparian areas/riparian area functionality or impacts to existing wetlands/riparian areas. Therefore, wetlands and riparian areas would not be significantly adversely impacted by construction and operation of the pipeline.

No impact to wetlands or riparian vegetation would occur during implementation of other modifications included in the Proposed Action.

### **4.12.2 Alternatives**

**No Action Alternative.** Under the No Action Alternative, wetlands and riparian areas associated with pipeline crossings of the Hams Fork River would be impacted as described in the Questar Year-Round Drilling Proposal EA (BLM, 2004a). There would be no effect to wetland and riparian vegetation associated on the Green River. Crossing of the Hams Fork River would be completed in such a way as to avoid direct impacts and to allow the wetlands/riparian area to continue to function.

**Alternative A.** Under Alternative A, wetlands and riparian areas affected by the 611 Pipeline crossing of the Green River would not occur. The number of new pads and extensive road network that would be constructed on the PAPA under this alternative would be consistent with those allowed in the PAPA ROD. Neither wetlands nor riparian vegetation would be affected.

### **4.12.3 Cumulative Impacts**

Construction of the 14.4-mile long portion of the 611 Pipeline would affect approximately 1.58 acre (0.26 mile) of palustrine emergent wetlands on the west bank of the Green River over the

short-term. Approximately 0.07 mile of the pipeline would be drilled below the Green River riparian zone, thus avoiding impact to riparian vegetation. QGM has also placed a portion of the pipeline beneath the New Fork River within the PAPA. That action was included in Questar Year-Round Drilling Proposal EA (BLM, 2004a).

No impact to wetlands or riparian vegetation would occur during implementation of other modifications included in the Proposed Action or other modifications previously analyzed under NEPA including the three CDP's, the NGL Stabilizer and Water Handling Facility, the Phase IV Multi-Pipelines, condensate storage tank at LaBarge, and Highway 351 Tank Battery.

#### **4.13 Threatened and Endangered Species**

##### **4.13.1 Proposed Action**

###### **4.13.1.1 Federally Listed Species**

Black-footed Ferret. FWS (2004a) has determined that all white-tailed prairie dog colonies within the area including the 611 Pipeline route have been cleared from the recommendation for black-footed ferret surveys. In addition, biological surveys were conducted during the spring of 2005. No white-tailed prairie dog colonies were located within 0.25 mile of the 611 Pipeline route. Although there are no white-tailed prairie dogs present within Questar's lease area on the PAPA, colonies are proximate to the new NGL Stabilizer and Water Handling Facility, Gobblers Knob Compressor Station, and 1,250-foot long 25 kV distribution line. Consequently, construction and operation of the 611 Pipeline would not impact black-footed ferrets or their habitat.

QGM and BLM would comply with requirements identified by the FWS's concurrence with BLM's determination for the PAPA EIS that project activities were not likely to adversely affect black-footed ferrets. That concurrence was based on mitigative measures provided in the PAPA EIS ROD including:

- Examining construction sites prior to surface disturbance for presence of prairie dog colonies;
- Avoid disturbance to prairie dog colonies that meet criteria as suitable habitat for black-footed ferrets;
- If colonies can not be avoided, conduct surveys for black-footed ferrets; and
- If black-footed ferrets or sign are detected during surveys, all actions that may affect black-footed ferrets would be stopped immediately and Section 7 review would be re-initiated with FWS.

These measures would insure that the Proposed Action would not impact black-footed ferrets or their habitat.

Gray Wolf. The proposed 611 Pipeline crosses four big game wintering areas where gray wolves could potentially be present. However, pipeline construction is expected to be complete before affected winter ranges become populated by wintering big game. In the event, however remote, of a wolf being in the project area during construction, it would be expected to avoid the slow conspicuous movements of construction equipment. The Proposed Action, including the 630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to Gobblers Knob Compressor Station, the 1,250-foot long 25 kV distribution line, and blowdown tanks on each well pad, would have no impact on gray wolves or their habitat.

Bald Eagle. There are no active bald eagle nests within one mile of the 611 Pipeline crossing of the Green River. The closest bald eagle nest to any of Questar's well pads that are proposed for year-round drilling is approximately 1.2 miles away and none are proximate to any of the other modifications included in the Proposed Action. Since the 611 Pipeline and other project components will be implemented after nesting and prior to bald eagle use of wintering habitats along the Green River and new For River, bald eagles and their habitat would not be impacted or otherwise disturbed by the Proposed Action.

Following their review of PAPA EIS, FWS concurred with BLM's determination that project activities were not likely to adversely affect bald eagles. That concurrence was based on mitigative measures provided in the PAPA EIS ROD including:

- No surface disturbing activities would occur within 1 mile of bald eagle winter use areas between November 15 and March 15;
- No surface disturbing activities (construction of roads, pipelines, well pads, drilling, completions, workovers) would occur within 1 mile of an active bald eagle nest between February 15 and August 15;
- No permanent structure would be placed within 2,600 feet from and out of direct line of sight to an active bald eagle nest;
- Wells placed closer than 2,600 feet (but not within 2,000 feet) of an active nest would be out of direct line of sight and would have no human activity from February 15 to August 15;
- Central production facilities would be at least 2,600 feet from an active bald eagle nest; and
- Prior to initiating surface disturbances during nesting and wintering periods, surveys for bald eagles would be conducted.
- Any new surface disturbing activities that may impact bald eagles would require re-initiation of Section 7 consultation with FWS.

Colorado River Fish. QGM estimates that 120,750 gallons (0.37 acre-feet) of water would be required for hydrostatic testing of the 14.4-mile long portion of the 611 Pipeline. Water withdrawals from the Green and New Fork rivers for hydrostatic testing and dust control could potentially impact Colorado river fishes due to downstream influences. FWS has determined that withdrawal of water from the Colorado River System will adversely affect and potentially jeopardize populations of the following listed species: Colorado pikeminnow, humpback chub, bonytail and razorback sucker.

BLM formal consultation with the FWS is required before hydrostatic testing and dust control activities take place. Payment to the mitigation fund for Colorado River fishes may be required after consultation is complete with the FWS. Additionally, all depletions for this project must be monitored and reported to the BLM.

#### **4.13.2 Other Special Status Species.**

Special Status Wildlife Species. The Proposed Action is not likely to jeopardize the status of sensitive wildlife species. Disturbance of sagebrush-grasslands may reduce potential habitat for the pygmy rabbit. Pygmy rabbits inhabiting big sagebrush within the pipeline right-of-way would be permanently displaced from those sites to habitat in surrounding areas but adverse effects to the population (increased mortality, decreased recruitment) are not expected. Construction of the 611 Pipeline is not expected to impact nesting burrowing owl, ferruginous hawk, sage grouse, long-billed curlew, sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow.

Because most of the proposed 611 Pipeline would be within or adjacent to existing pipeline and other existing rights-of-way and construction is not expected to create significant new edge features through otherwise continuous sagebrush habitat that could affect the species' nesting during operation. Burrowing owls or owl nests were not observed during field surveys. Areas of suitable habitat (prairie dog colonies) are not found within the proposed pipeline corridor. No significant adverse impacts to burrowing owls or their nests are expected.

Special Status Plant Species. The BLM has indicated the following special status plant species may occur within the vicinity of the proposed pipeline: Cedar Rim thistle, large-fruited bladderpod, beaver rim phlox, and tufted twinpod. There are no plant species listed under ESA known to occur in the vicinity of the proposed pipeline. Suitable habitat for BLM sensitive plant species was identified prior to construction and disturbance would be minimized using HDD. Locations with BLM sensitive plant populations would be avoided during construction and no impacts to the species are anticipated as a result of this project.

#### **4.13.3 Alternatives**

**No Action Alternative.** If the No Action Alternative is implemented, BLM would deny QGM's application to construct the 14.4-mile long 611 Pipeline between the Rocky Mountain Pipeline Terminal and the Bird Canyon Compressor Station. QGM would be allowed to construct the entire 107-mile long condensate pipeline from the PAPA to the Black's Fork Processing Plant near Granger as approved in the Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a). As discussed under the Proposed Action, no impact to species listed under ESA would be expected with one exception. The increased volume of water required to hydrostatically test the 107-mile long pipeline would be more than the volume need to test the 14.4-mile 611 Pipeline.

Approximately 755 acres of vegetation would be disturbed by construction of the condensate pipeline analyzed in the Questar Year-Round Drilling Proposal EA (BLM, 2004a). Because most of that proposed condensate pipeline would be within or adjacent to existing pipeline rights-of-way, construction was not expected to create significant new edge features through otherwise continuous sagebrush habitat. Sage grouse, migratory landbirds that are also sagebrush obligates, and other sensitive species would not be impacted by the No Action Alternative.

None of the modifications in the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line, blowdown tanks) would be implemented. Consequently, there would be no high-profile manmade structures (blowdown tanks) retained on well pads that would serve as perch sites for avian predators and/or require human presence with concomitant vehicular traffic during sensitive periods in the annual cycle (winter for big game, lek attendance and nesting for sage grouse).

**Alternative A.** Under this alternative, the winter stipulations in the PAPA ROD would be reapplied. There would be no condensate gathering system on Questar's lease area. Questar would have existing pads with multiple wells but, because the condensate gathering system would not be implemented. Questar would develop new well pads according to the PAPA ROD requirements, which would result in more than 9 new well pads associated with the year-round drilling proposal. Potentially, the number of new pads would be connected by a more extensive road network than under the Proposed Action. None of that potential disturbance is expected to impact species listed under ESA although other sensitive species inhabiting the PAPA (pygmy rabbits, sage grouse, migratory landbird sagebrush-obligate bird species) would probably be subject to additional impacts due to increased habitat fragmentation by proliferating roads and high levels of vehicular traffic.

With no condensate gathering system in place or functional, Questar would have storage tanks on each well pad that would serve as perch sites for avian predators and/or require human presence with concomitant vehicular traffic during sensitive periods in the annual cycle (nesting by migratory birds, lek attendance and nesting for sage grouse). Stored condensate would be removed by tank trucks which would increase traffic on the PAPA during all times of year but especially during nesting periods. That consequence of the Alternative A would generate more impact than was evaluated in the Questar Year-Round Drilling Proposal EA (BLM, 2004a) and under the Proposed Action.

No impact to habitats used by sensitive species on the PAPA would occur by the other modifications included in the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line). Likewise, none of the other modifications previously analyzed under NEPA would be implemented since those are dependent on the presence of the condensate gathering system. In Alternative A, total disturbance to sensitive species' habitats would be much greater than by the Proposed Action due to construction of pads with single wells and the accompanying road network.

#### **4.13.4 Cumulative Impacts**

Construction of the 14.4-mile long portion of the 611 Pipeline would temporarily increase the area of disturbed lands along the pipeline route by 126 acres within habitats potentially utilized by various sensitive wildlife species. The 611 Pipeline route adjacent to existing disturbed sites localizes surface disturbance rather than substantively increasing fragmentation of undisturbed vegetation thus minimizing impact to wildlife including nesting migratory landbirds.

Likewise, implementation of other modifications included in the Proposed Action would have minimal impact to functional wildlife habitat since most disturbance would be on previously disturbed site or would be proximate to existing disturbance. Other modifications previously analyzed under NEPA generally impact previously disturbed lands including the three CDP's, the NGL Stabilizer and Water Handling Facility, the Phase IV Multi-Pipelines, condensate storage tank at LaBarge, and Highway 351 Tank Battery.

There would be a slight increase in visual impacts and potential for impacts from avian predators due to the 8 to 9 foot tall water storage tanks being left on each pad for blowdown. This impact would continue until the tanks are replaced with 90 barrel blowdown tanks within two years as committed to by Questar.

Truck traffic on Highway 351 is expected to increase since trucks would remove water from the storage facility offsite for disposal. Increased traffic on Highway 351 may increase potential vehicle-wildlife collisions and mortalities.

QGM's Proposed Action would not result in major changes to the cumulative impacts described for threatened and endangered species and special status species in the PAPA EIS. The cumulative water depletions would be 5.65 acre-feet to hydrostatically test the pipeline and dust control activities. The incremental disturbance associated with construction of the condensate pipeline would be a cumulative impact in the previously disturbed utility alignment but would not significantly add to new disturbed areas in the vicinity or threaten the viability of any of the species that may inhabit the area.

## **4.14 Wildlife and Aquatic Resources**

### **4.14.1 Proposed Action**

#### **4.14.1.1 Big Game**

Construction of the 14.4-mile long portion of the 611 Pipeline would temporarily disturb approximately 51.52 acres of vegetation on pronghorn crucial winter yearlong range and 35.78 acres of vegetation on spring/summer/fall range within the Sublette Antelope Herd Unit. The proposed pipeline route crosses portions of the Sublette and Wyoming Range mule deer herd units. Approximately 31.52 acres of crucial winter range in the Sublette Mule Deer Herd Unit and 40.00 acres of crucial winter range in the Wyoming Range Mule Deer Herd Unit would be disturbed during construction.

Nearly 25 acres of crucial winter-yearlong range utilized by moose in the Sublette Herd Unit would be affected by construction of the 611 Pipeline, principally on both banks of the Green River. Construction would also affect 40.00 acres of winter-yearlong range within the Piney Elk Herd Unit. Surface disturbances to vegetation within these seasonally used big game ranges would result from blading, grading, and/or trenching within the right-of-way to install the pipeline. No construction would occur between November 15 and April 30, thereby avoiding disturbance to wintering big game.

The 630-foot long 25 kV distribution line is within crucial winter range on the Sublette Mule Deer Herd Unit while the NGL Stabilizer and Water Handling Facility and 1,250-foot long 25 kV distribution line (NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station) are within crucial winter range on the Sublette Antelope Herd Unit. Blowdown tanks would be on each of Questar's well pads, all of which are within crucial mule deer winter range. Construction of those modifications included in the Proposed Action would not occur between November 15 and April 30. However, the presence of blowdown tanks would require some maintenance and personnel with vehicles are expected to servicing tanks more frequently than under the No Action Alternative, during the big game wintering period included.

#### **4.14.1.2 Upland Game Birds**

Construction of the 14.4-mile long portion of the 611 Pipeline would remove approximately 19.39 acres of sagebrush-grassland steppe within 2 miles of two known sage grouse leks. Depending on vegetative characteristics of the affected sagebrush, potential sage grouse nesting habitat could be affected. Since there are 26 leks – not all of them active - on or within 2 miles of Questar's lease on the PAPA, implementation of the 630-foot long 25 kV distribution line and 1,250-foot long 25 kV distribution line (NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station) may impact sage grouse nesting habitat. However, since those components of the Proposed Action are already within or adjacent to previously disturbed sites, the likelihood of sage grouse utilization during nesting is extremely remote.

Blowdown tanks would be present on each of Questar's well pads. Existing water storage tanks 8-9 feet tall would be utilized as blowdown tanks for up to 2 years, then replaced with smaller tanks approximately 6 feet tall. In either case, tanks remaining on well pads until abandonment provide manmade perch sites which can be used by raptors and ravens that prey on sage grouse and other wildlife. Blowdown tanks on each of Questar's well pads are likely to be within 2 miles of an active or inactive lek and generally within potential sage grouse nesting habitat. Construction of the 611 Pipeline and other components under the Proposed Action would not occur between March 1 and July 15, thereby avoiding impact to sage grouse leks, nesting habitat, and brood-rearing habitats.

#### **4.14.1.3 Migratory Birds**

BLM would impose buffers around active raptor nest sites to prevent disturbance. No surface disturbing activities would be permitted within 0.5 mile of active raptor nests and within 1 mile of an active ferruginous hawk nest (active nests are defined as those occupied within the past 3 years) during the period from February 1 through July 31. Exclusion dates and buffer distances may be adjusted based on site-specific conditions. Consequently, no impacts to nesting raptors are anticipated. Nevertheless, Construction of the 611 Pipeline and other components under the Proposed Action would not occur from February 1 through July 31, thereby avoiding impact to nesting raptors.

Loss of sagebrush-steppe and increasing levels of fragmentation in remaining sagebrush-dominated habitats have become concerns since there have been concomitant declines of sagebrush-dependent migratory passerine bird species (Knick and Rotenberry, 1995; Knick et al., 2003). Because most of the proposed 611 Pipeline would be within or adjacent to existing pipeline and other existing rights-of-way and construction is not expected to create significant new edge features through otherwise continuous sagebrush habitat. Migratory landbirds that are also sagebrush obligates are not expected to be adversely affected by the project or face significant cumulative effects in the pipeline area of disturbance.

#### **4.14.1.4 Wild Horses**

The BLM considers any activity that results in substantial habitat loss or a permanent reduction in the wild horse population below established management levels to be a significant impact. Revegetation with palatable forage would occur along the right-of-way after completion of the 611 Pipeline. Grasses would be established in approximately 3 years. Horses would be able to leave the relatively small, affected area during pipeline construction. Due to the availability of habitat in the area surrounding the pipeline route, the 126-acre disturbance and short-term loss of forage caused by construction of the 14.4-mile long portion of the 611 Pipeline would not have a significant impact on wild horses in the project area. Implementation of other components of the Proposed Action would have no effect on wild horses.

#### **4.14.1.5 Aquatic Resources**

Construction of the 14.4-mile long portion of the 611 Pipeline is not expected to measurably affect fish populations in the Green River. The pipeline would be placed beneath the river by HDD. Successful use of HDD is considered an effective technique for avoidance of instream impacts by eliminating the need for instream excavation (Reid et al., 2004). Even with this technique there is a potential for impact with the HDD process. Drilling requires use of a drilling mud for lubrication of the bit and removal of cuttings. Bentonite clay would be used as the drilling mud. Because the drilling mud is under pressure during drilling, if the bit encounters substrate fractures or channels it is possible for bentonite to escape from the hole (termed a "frac-out"). Bentonite can escape to the surface if the fractures lead to and through the drilled substrate.

Bentonite, by itself, is essentially non-toxic (Breteler et al., 1985; Hartman and Martin, 1984; and Sprague and Logan, 1979). Bentonite, as with any fine particulate material, can interfere with oxygen exchange by gills (Environmental Protection Agency, 1986), and the degree of interference generally increases with water temperature (Horkel and Pearson, 1976). This is a localized effect, and if any impacts do occur, those impacts would be limited to individual fish in the vicinity of the leak. Fish move away from turbidity spots and plumes and if a frac-out occurred, there would be minimal impact to fisheries and aquatic resource in the immediate area. However, the depth of the HDD beneath the Green River and the overlying strata are conducive to successful HDD without a frac-out.

#### 4.14.2 Alternatives

**No Action Alternative.** There would be no disturbance to 126 acres along the 14.4 miles of proposed pipeline right-of-way through the seasonally ranges used several big game populations that would occur under the Proposed Action. Instead, approximately 8 miles of the condensate pipeline route analyzed in the Questar Year-Round Drilling Proposal EA (BLM, 2004a) would be constructed through pronghorn crucial winter range. No crucial winter ranges or other sensitive areas utilized by mule deer or moose would be crossed by the pipeline under this alternative. However, 6 miles of the pipeline route would cross crucial severe winter relief range used by elk during extreme winter conditions.

Approximately 755 acres of vegetation would be disturbed by construction of the condensate pipeline analyzed in the Questar Year-Round Drilling Proposal EA (BLM, 2004a). Because most of that proposed condensate pipeline would be within or adjacent to existing pipeline rights-of-way, construction was not expected to create significant new edge features through otherwise continuous sagebrush habitat. Sage grouse and migratory landbirds that are also sagebrush obligates were not expected to be adversely affected by the No Action Alternative.

Construction of the condensate pipeline under the No Action Alternative was not expected to measurably affect fish populations in the Blacks Fork, Hams Fork, Green and New Fork rivers (BLM, 2004a). The pipeline would be placed beneath those rivers by HDD which would be subject to similar risks of frac-out that were described under the Proposed Action.

None of the modifications in the Proposed Action (630-foot 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line, blowdown tanks) would be implemented. Consequently, there would be no high-profile manmade structures (blowdown tanks) retained on well pads that would serve as perch sites for avian predators and/or require human presence with concomitant vehicular traffic during sensitive periods in the annual cycle (winter for big game, lek attendance and nesting for sage grouse). Without approval of the modifications in the Proposed Action which are necessary to remove condensate from the PAPA, Questar would likely have to retain condensate storage tanks on each well pad; stored condensate would be removed by tank trucks which would increase traffic on the PAPA during all times of year but especially during winter. That consequence of the No Action Alternative would generate more impact, particularly to big game, than was evaluated in the Questar Year-Round Drilling Proposal EA (BLM, 2004a).

**Alternative A.** Under this alternative, the winter stipulations in the PAPA ROD would be reapplied. There would be no condensate gathering system on Questar's lease area. Questar would have existing pads with multiple wells but, because the condensate gathering system would not be implemented. Questar would develop new well pads according to the PAPA ROD requirements, which would result in more than 9 new pads associated with the year-round drilling proposal. Potentially, the number of new pads would be connected by a more extensive road network than under the Proposed Action. All of that potential disturbance would be within mule deer crucial winter range.

With no condensate gathering system in place or functional, Questar would have storage tanks on each well pad that would serve as perch sites for avian predators and/or require human presence with concomitant vehicular traffic during sensitive periods in the annual cycle (winter for big game, lek attendance and nesting for sage grouse). Stored condensate would be removed by tank trucks which would increase traffic on the PAPA during all times of year but especially during winter. That consequence of the Alternative A would generate more impact, particularly to big game, than was evaluated in the Questar Year-Round Drilling Proposal EA (BLM, 2004a) and under the Proposed Action.

No disturbance to sagebrush–grassland steppe on the PAPA would occur by the other modifications included in the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line). Likewise, none of the other modifications previously analyzed under NEPA would be implemented since those are dependent on the presence of the condensate gathering system. In Alternative A, total disturbance to vegetation would be much greater than by the Proposed Action due to construction of pads with single wells and the accompanying road network.

#### **4.14.3 Cumulative Impacts**

Construction of the 14.4-mile long portion of the 611 Pipeline would temporarily increase the area of disturbed lands along the pipeline route by 126 acres within various big game seasonally used ranges. The 611 Pipeline route adjacent to existing disturbed sites localizes surface disturbance rather than substantively increasing fragmentation of undisturbed vegetation thus minimizing impact to wildlife including nesting migratory landbirds.

Likewise, implementation of other modifications included in the Proposed Action would have minimal impact to functional wildlife habitat since most disturbance would be on previously disturbed site or would be proximate to existing disturbance. Other modifications previously analyzed under NEPA generally affect previously disturbed lands including the three CDP's, the NGL Stabilizer and Water Handling Facility, the Phase IV Multi-Pipelines, condensate storage tank at LaBarge, and Highway 351 Tank Battery.

Truck traffic on Highway 351 is expected to increase since trucks would remove water from the storage facility offsite for disposal. Increased traffic on Highway 351 may increase potential vehicle-wildlife collisions and mortalities, including mortality of pronghorns on crucial winter ranges adjacent to the highway. That possibility cannot be estimated.

### **4.15 Air Quality**

#### **4.15.1 Proposed Action**

As a part of the Proposed Action, QGM would install the 14.4 miles of condensate pipeline. BLM has previously approved installation of a produced water gathering system. The northern portion of the condensate pipeline was approved in the Questar Year-Round Drilling Decision Record (BLM, 2004a). These pipeline systems would eliminate the need to store condensate and produced water on well sites. Questar has estimated that at peak production in 2008, a total of 25,000 annual tanker truck trips would be eliminated by these pipeline systems. The benefits to air quality as a result of the installation of the pipelines are two-fold. First, there would be no need for the on-site tanks that store the condensate. Volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) are emitted from the condensate storage tanks through the vent lines and are also released into the atmosphere when the truck hooks up to the tank to empty it. Therefore, there would be a net reduction of VOC and HAP emissions in the PAPA as a result of the Proposed Action. Secondly, NO<sub>x</sub>, other combustion-related emissions and fugitive dust would be reduced by eliminating the tanker truck traffic (25,000 annual trips) in the PAPA.

The Questar Year-Round Drilling Proposal Decision Record (BLM, 2004a), states that “as committed to by Questar, by January 1, 2007, all drilling rigs operating in Questar’s leasehold will be either EPA Tier II compliant or will utilize alternate fuels engines whose emissions are equivalent to Tier II engines”. Due to the lack of availability of Tier II-compliant rig engines, Questar is not able to implement the EPA Tier II or equivalent engines on drilling rigs until January 1, 2008. This would result in additional air quality impacts for one additional year.

Table 4-2 shows the reduction in nitrogen oxide emissions on an annual basis by implementation of the EPA Tier II technology on drill rigs.

**Table 4-2  
Estimated Nitrogen Oxide Emission Reduction in the PAPA Using EPA Tier II Compliant Engines**

Average Drill Rig Engine Horsepower	No Emission Controls NOx Emissions (tons/year) <sup>2</sup>	Tier II Emission Controls NOx Emissions (tons/year) <sup>3</sup>	Net Reduction in NOx Emissions (tons/year)
1,000	623	134	489
2,000	1,246	268	978
3,000	1,869	402	1,467

1 Calculations are based on 2003 actual drilling data from WOGCC. Assumes 4,010 days of drilling per year with a load factor of 0.42.  
2 No Emission Controls case uses an emission rating of 14 g/hp-hr.  
3 Tier II Emission Controls case assumes an emission rating of 3 g/hp-hr.

Installation of the condensate pipeline and the other modifications in the Proposed Action (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line) would cause temporary and short-term emissions and dust during construction due to truck traffic to and from the work location and equipment used during construction. Once the pipelines and power lines are installed, there would be no additional impacts to air quality as a result of operation.

As part of the Proposed Action, Questar has determined that it is necessary to have one blowdown tank at each well pad for upset conditions. Questar is currently using the water storage tank at each well pad for blowdown which was originally to be removed once the gathering system was installed. Emissions from the blowdown tanks would be intermittent and short term in nature and not expected to impact air quality on a long-term basis.

#### 4.15.2 Alternatives

**No Action Alternative.** Under this alternative, the impacts to air quality would be greater than for the Proposed Action. The condensate gathering system could still be constructed, however, it is likely that QGM would not construct the pipeline without the other components (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line). If the 107-mile condensate pipeline were constructed, there would be short-term impact to air quality.

**Alternative A.** Under this alternative, benefits to air quality in the PAPA would be greatly reduced because the condensate gathering system would not be implemented. Emissions from condensate tanks at each well pad would continue as described in the PAPA EIS (BLM, 1999a). However, there would be no short-term impacts to air quality from installation of the gathering system or other modifications (630-foot long 25 kV distribution line, right-of-way for ten pipelines from the NGL Stabilizer and Water Handling Facility to the Gobblers Knob Compressor Station, or the 1,250-foot long 25 kV distribution line). There would also be no air quality impacts from the stabilizer facility or the CDPs.

### 4.15.3 Cumulative Impacts

Other modifications have been proposed by QGM and Questar and have been previously analyzed under NEPA and include the CDPs, the NGL Stabilizer and Water Handling Facility, the Mesa Phase IV multi pipelines, the 16,000 barrel condensate storage tank at the Rocky Mountain Pipeline Terminal near LaBarge and the 351 Tank Battery. Of these, the Mesa Phase IV multi pipelines and the 351 Tank Battery would have short term emissions associated with construction but no long term emissions. The 16,000 barrel condensate storage tank would have fugitive emissions associated with operation but would be intermittent because the tank would be used only for upset conditions. Table 4-3 shows the estimated emission levels for the CDPs and the NGL Stabilizer and Water Handling Facility.

**Table 4-3  
Estimated Emission Levels in Tons per Year Other Modifications Previously Analyzed**

<b>Facility</b>	<b>NOx</b>	<b>CO</b>	<b>SO2</b>	<b>VOC</b>	<b>Total HAPS</b>
Stabilizer	14.34	16.21	0.05	1.50	0.00
Mesa 14-16 CDP	11.22	9.85	0.01	4.11	1.09
Stewart Point 16-18 CDP	2.40	1.17	0.01	0.06	0.02
Mesa 15-16 CDP	10.82	9.52	0.01	4.09	1.08
16,000 Barrel Storage Tank	0.0	0.0	0.0	1.42	0.00
<b>Total</b>	<b>38.78</b>	<b>36.75</b>	<b>0.08</b>	<b>11.18</b>	<b>2.19</b>

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**Appendix A**  
**Project Location Maps**







## **Appendix B**

### **Hazardous and Extremely Hazardous Materials Used for Construction of the Proposed QGM Pipeline**

## Hazardous and Extremely Hazardous Materials Used for Construction of the Proposed QGM Pipeline

Material	Approximate Quantity	Hazardous Substances	CAS Number
<b>Miscellaneous Materials</b>			
Antifreeze	unknown	Acrolein	107-02-8
		Cupric sulfate	7758-38-7
		Ethylene glycol	107-21-1
		Freon	76-13-1
		Phosphoric acid	766-38-2
		Potassium hydroxide	1310-58-3
		Sodium hydroxide	1310-73-2
		Triethylene glycol	112-27-6
Batteries	unknown	Cadmium	7440-43-9
		Lead	1306-19-0
		Nickel hydroxide	7440-02-0
		Potassium hydroxide	1310-58-3
		Sulfuric acid	7664-93-9
Cleaners	unknown	Hydrochloric acid	7647-01-0
<b>Fuels</b>			
Diesel fuel	unknown	Benzene	71-43-2
		Cumene	98-82-8
		Ethylbenzene	100-41-4
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	-
		POM	-
		Toluene	108-88-3

<b>Material</b>	<b>Approximate Quantity</b>	<b>Hazardous Substances</b>	<b>CAS Number</b>
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Gasoline	unknown	Benzene	71-43-2
		Cumene	98-82-8
		Cyclohexane	110-82-7
		Ethylbenzene	100-41-4
		n-Hexane	110-54-3
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	-
		POM	-
		Tetraethyl lead	78-00-2
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
	p-Xylene	106-42-3	
Natural Gas Liquids	unknown	Ethane	74-84-0
		Propane	74-98-6
		Butane	106-97-8
<b>Pipeline Materials</b>			
Coating	unknown	Aluminum oxide	1334-28-1
Cupric sulfate solution	unknown	Cupric sulfate	7758-98-7
Diethanolamine	unknown	Diethanolamine	111-42-2

<b>Material</b>	<b>Approximate Quantity</b>	<b>Hazardous Substances</b>	<b>CAS Number</b>
LP gas	unknown	Benzene	71-43-2
		n-Hexane	110-54-3
		Propylene	115-07-1
Molecular sieves	unknown	Aluminum oxide	1344-28-1
Pipeline Primer	unknown	Napthalene	91-20-3
		Toluene	108-88-3
Potassium hydroxide	unknown	Potassium hydroxide	1310-58-3
Rubber resin coatings	unknown	Acetone	67-64-1
		Coal tar pitch	68187-57-5
		Ethyl acetate	141-78-6
		Methyl ethyl ketone	78-93-3
		Toluene	108-88-3
		Xylene	1330-20-7
Fertilizers	unknown		
Lead-free thread compound	unknown	Copper	7440-50-8
Lubricants	unknown	1,2,4-trimethylbenzene	95-63-6
		Barium	7440-39-3
		Cadmium	7440-43-9
		Copper	7440-50-8
		n-Hexane	110-54-3
		Lead	7439-92-1
		Manganese	7439-96-5
		Nickel	7440-02-0
		PAHs	-
		POM	-
		Zinc	7440-66-6
Motor oil	unknown	Zinc compounds	-

<b>Material</b>	<b>Approximate Quantity</b>	<b>Hazardous Substances</b>	<b>CAS Number</b>
Paints	unknown	Aluminum	7429-90-5
		Barium	7440-39-3
		n-Butyl alcohol	71-36-3
		Cobalt	7440-48-4
		Lead	7439-92-1
		Manganese	7439-96-5
		PAHs	-
		POM	-
		Sulfuric acid	7664-93-9
		Toluene	108-88-3
		Triethylamine	121-44-8
		Xylene	1330-20-7
Sealants	unknown	1,1,1-Trichloroethane	71-55-6
		n-Hexane	110-54-3
		PAHs	-
		POM	-

<b>Material</b>	<b>Approximate Quantity</b>	<b>Hazardous Substances</b>	<b>CAS Number</b>
Solvents	unknown	1,1,1-Trichloroethane	71-55-6
		Acetone	67-64-1
		t-Butyl alcohol	75-65-0
		Carbon tetrachloride	56-23-5
		Isopropyl alcohol	67-63-0
		Methyl ethyl ketone	78-93-3
		Methanol	
		PAHs	-
		POM	-
		Toluene	108-88-3
		Xylene	1330-20-7
Starting fluid	unknown	Ethyl ether	60-29-7

**Appendix C**  
**Cultural Memorandum of Agreement**

**MEMORANDUM OF AGREEMENT  
AMONG  
THE BUREAU OF LAND MANAGEMENT  
THE WYOMING STATE HISTORIC PRESERVATION OFFICER  
AND  
QUESTAR GAS MANAGEMENT COMPANY  
REGARDING THE QUESTAR 611 PIPELINE PROJECT,  
SUBLETTE COUNTY, WYOMING**

**WHEREAS** the Bureau of Land Management (BLM) has determined that construction of the Questar 611 Pipeline Project will have adverse effects on 48SU261, which has been determined to be eligible for listing in the National Register of Historic Places (NRHP) under criterion d at 36 CFR § 60.4; and will affect sites 48SU2265, 48SU2615, and 48SU2800, which have been determined eligible for listing in the NRHP under criterion d but will affect non-contributing portions of these sites; and may affect other sites yet to be found within the APE; and

**WHEREAS** BLM has determined the Area of Potential Effect (APE) to be the linear corridor illustrated in Appendix A; and

**WHEREAS** BLM has consulted with the Wyoming State Historic Preservation Officer (SHPO) pursuant to the State Protocol Between the Wyoming BLM State Director and the Wyoming State Historic Preservation Officer (Protocol) regarding Section 106 of the National Historic Preservation Act; and

**WHEREAS** BLM and SHPO have agreed that identification and evaluation may be segmented for this undertaking; and

**WHEREAS** BLM has invited Questar Gas Management Company to participate in consultation and sign this Memorandum of Agreement (MOA); and

**WHEREAS** the use of Questar in this agreement will refer to Questar Gas Management Company employees, contractors and designees; and

**WHEREAS** the State of Wyoming and the SHPO do not waive their sovereign immunity by entering into this MOA, and each fully retains all immunities and defenses provided by law with respect to any action based on or occurring as a result of this MOA; and

**WHEREAS** this MOA represents the entire and integrated agreement between the parties and supersedes all prior negotiation, representations and agreements, whether written or oral, regarding the Section 106 review of the effects of the Questar 611 Pipeline on historic properties;

**NOW, THEREFORE,** BLM, SHPO, and Questar agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

Questar 611 Pipeline Project Memorandum of Agreement

## STIPULATIONS

BLM shall ensure that the following measures are carried out:

### I. Segmentation

The project will be constructed in the following four segments, identified on map (Appendix A), north to south, each segment of which may or may not be constructed separately from other segments. Identification, evaluation, and treatment may be completed for each segment separately to expedite construction.

- A. Segment 1 – from the Pinedale #4 well location to the Pinedale Field Office/Rock Springs Field Office (PFO/RSFO) boundary
- B. Segment 2 – from the PFO/RSFO boundary to the Bird Canyon Compressor site
- C. Segment 3 – from the Bird Canyon Compressor site to the Green River (48SU390)
- D. Segment 4 – from the Green River to the LACT tank farm and from the LACT tank farm to Rocky Mountain Pipeline terminal

### II. Identification

- A. Reports documenting inventory and evaluation of cultural resources in Segments 1 and 2 have been submitted to SHPO.
- B. Class III inventory of Segments 3 and 4 has been completed and reports will be submitted to SHPO for review and concurrence after acceptance by BLM.

### III. Evaluation and Treatment

- A. All unevaluated cultural resources within the APE will be evaluated for National Register eligibility using criteria at 36 CFR § 60.4.
- B. Avoidance of historic properties is the preferred treatment. If historic properties cannot be avoided BLM, SHPO, and Questar will consult on treatment. Questar will fund treatment plans that meet the “Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation” (Federal Register, Vol. 48, No. 190, September 29, 1983). Treatment plans will be prepared by cultural resources specialists permitted by BLM and submitted to BLM.
- C. Adverse effects to archaeological site 48SU390, determined eligible for listing in the NRHP (criterion d) and located on State of Wyoming land, shall be avoided by using Horizontal Directional Drilling (HDD) to construct the pipeline under the site. No new testing will be conducted on this site unless new discoveries of cultural materials outside the known boundaries are made during work or it is found that HDD will not result in total avoidance of adverse effects. In the event of an unforeseen discharge of drilling fluid onto the ground surface within the established site boundary, operations will cease and Questar will notify BLM prior to entry into the site boundary for cleanup purposes. The HDD will be part of both Segments 3 and 4.

- D. Effects to National Register eligible site 48SU261 will be evaluated via pipeline archaeological open trench examination. Procedures for evaluating exposed cultural materials at this site are specified in the Discovery Plan (Appendix B). (This document is also attached as Appendix C to the cultural resources report for segments 1 and 2; Pinedale BLM Cultural Resources Report No. 046-05-133.)
- E. Open trench inspection at sites 48SU2265, 48SU2615, and 48SU2800 will be conducted to confirm that only non-contributing portions of these sites will be affected.
- F. Treatment of all other sites located during surface inventory and determined eligible under Criterion d will be carried out at the time that open trench inspection occurs following procedures specified in the Discovery Plan (Appendix B).
- G. Effects to known National Register eligible site 48SU852, the Opal Wagon Road, and other such sites, should they occur within the APE, will be reduced by redesigning the project to avoid impacting them. Should project redesign not be feasible, BLM, SHPO, and Questar will consult to develop treatment plans.
- G. Reports documenting results of treatment will be prepared and submitted to BLM for review. Upon acceptance by BLM, reports will be transmitted to SHPO.

### III. Monitoring

Monitoring at site 48SU390 during directional drilling will be carried out by cultural resource specialists permitted by BLM and hired by Questar. Monitoring will be carried out after drilling to determine whether or not subsidence or any other conditions resulting from drilling occur that may affect 48SU390. This monitoring will occur once every six months, beginning when drilling is completed. It will continue for a minimum of two years. If conditions resulting from drilling that may affect the site develop, all parties to this agreement will consult to resolve the issue.

### IV. Discoveries

- A. Open trench examination will be carried out by cultural resource specialists permitted by BLM and by BLM cultural resource specialists. Previously unknown sites discovered during construction will be identified and evaluated via open trench examination following procedures specified in the Discovery Plan (Appendix B).
- B. Unplanned Discoveries  
If BLM determines after completion of the review process that an undertaking may affect or has affected a previously unidentified property that may be eligible for listing in the NRHP, the BLM will consult with SHPO to resolve the adverse effects. Resolution may require that a treatment plan be prepared in consultation amongst all parties to the agreement.

V. Dispute Resolution

- A. The BLM shall consult with any signatory to this MOA if there is an objection by a signatory to the manner in which the terms of this agreement are implemented.
- B. If the objection cannot be resolved between the BLM Field Manager and the objecting signatory, the matter shall be referred to the BLM Deputy Preservation Officer (DPO) for resolution.
- C. If the objection cannot be resolved with the BLM DPO, then all signatories should consult to resolve the matter.
- D. If the objection cannot be resolved among the signatories, the matter shall be referred to the BLM State Director. The matter may be referred to the BLM Preservation Board, which will provide recommendations for resolution to the State Director. The final decision for resolution of the objection by any signatory shall be made by the BLM State Director.
- E. The BLM Field Manager shall consider non-signatory objections to the manner in which the terms of the agreement are implemented. If the objection cannot be resolved to the satisfaction of BLM and the objecting party, the BLM Field Manager shall request the signatories to provide their opinion on the matter. Prior to making a final decision on the matter, the BLM Field Manager shall take into account all the signatory opinions received within 15 days of the request.

VI. Amendment

Any party to this agreement may request that it be amended, whereupon the parties to the Agreement will consult to consider such amendment.

VII. Termination

BLM or SHPO may terminate this agreement by providing 30 calendar days written notice to the other parties. The parties shall consult during the period prior to the termination to seek agreement on amendments that would avoid termination. In the event of termination, the BLM will comply with the Protocol to complete the project.

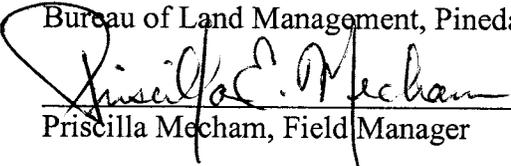
VIII. Duration

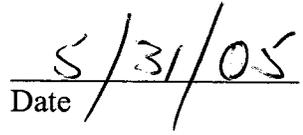
This agreement will terminate upon acceptance of final data recovery reports by BLM and SHPO. If final reports are not completed within four (4) years of the date of execution all parties will meet to evaluate progress under this agreement and extend or amend this agreement as necessary.

This agreement may be executed on separate signature pages.

**SIGNATORIES**

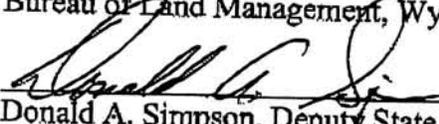
Bureau of Land Management, Pinedale Field Office

  
Priscilla Mecham, Field Manager

  
Date

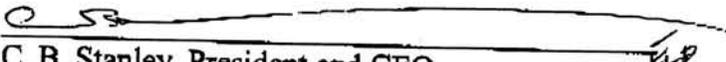
Questar 611 Pipeline Project Memorandum of Agreement

Bureau of Land Management, Wyoming State Office

  
Donald A. Simpson, Deputy State Director, Resource Policy  
and Management

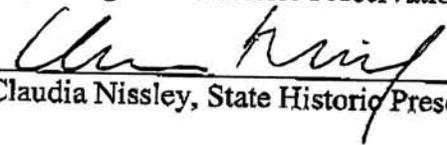
6/11/05  
Date

Questar Gas Management Company

  
C. B. Stanley, President and CEO *ELP RHP*

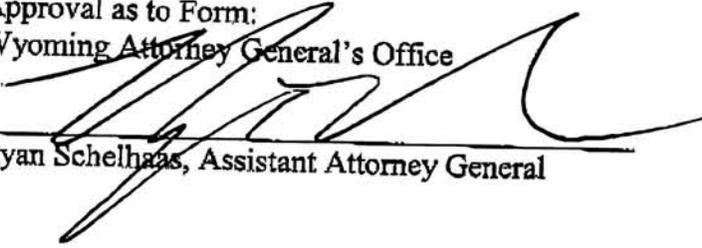
6/8/05  
Date

Wyoming State Historic Preservation Office

  
Claudia Nissley, State Historic Preservation Officer

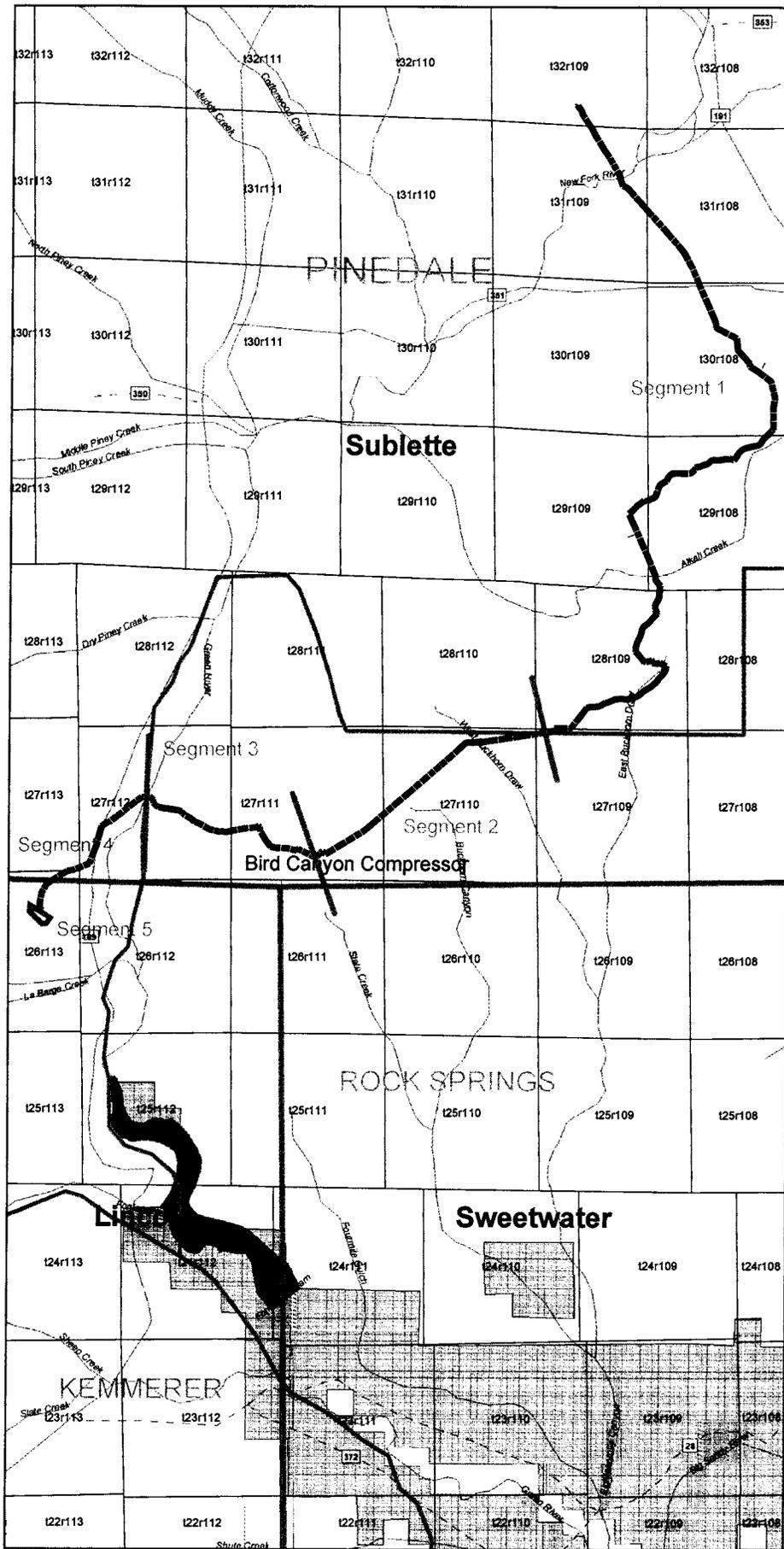
6/14/05  
Date

Approval as to Form:  
Wyoming Attorney General's Office

  
Ryan Schelhaas, Assistant Attorney General

6/17/05  
Date

**Figure 1:  
Proposed  
Questar Gas  
Management  
Pipeline 611  
Showing Cultural  
Segments**



**Legend**

----- QGM Pipeline 611 Alignment

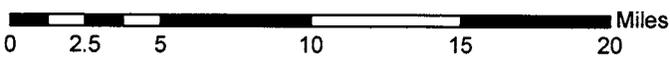
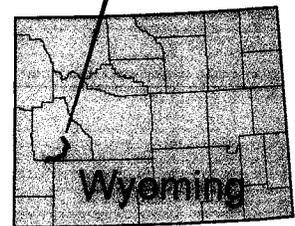
**Roads**

- Limited Access Highway
- Other Highway
- Other Through Highway
- Principal Highway

**Federal Lands**

- BLM
- BOR

**Project Area**



***APPENDIX B***  
***DISCOVERY PLAN***

***Questar Gas Management***  
***611 Pipeline***

***by***

***Jana V. Pastor***  
***And***  
***K.W. Thompson***

## *Introduction*

The following document outlines the proposed cultural resource compliance procedures to be followed during construction of the Questar Gas Management (QGM) 611 pipeline. These procedures are pursuant to the recommendations for an open trench inspection requested by the Bureau of Land Management (BLM). The discovery procedures needed to identify, record, and evaluate any buried cultural resources detected during trenching operations are summarized.

The discovery plan is based on the results of the Class III inventory of the proposed QGM 611 pipeline and on previous work done within the pipeline corridor. Based on these results, trenching and earth-moving activities associated with construction of the proposed pipeline are thought to have a moderate potential for exposing significant cultural resources. The types of cultural resources expected to be encountered are buried prehistoric hearth features, stone and bone artifacts, and ecofacts that are associated with residential activity areas. Housepits and trash dump areas could also be found, but the potential for encountering these other types of resources is low.

### *Identification of Buried Cultural Resources*

The detection and identification of buried cultural resources will be accomplished by performing an inspection of the excavated pipeline trench. To minimize the natural hazards associated with pipeline construction, close coordination between the project archaeologists and pipeline personnel will be emphasized at all times. This will include following all safety procedures and regulations applicable to the project and project personnel. In the event that cultural materials are detected in the trench wall, it may be necessary for the archaeologist to enter the trench to properly document and evaluate the remains. When this is necessary, all safety precautions as recommended by the pipeline construction company will be followed.

Inspection of the open pipeline trench will entail physically walking along the edge of the trench and examining the walls for cultural features. This will also include the identification of geologic strata which have the potential to contain prehistoric cultural remains. The entire length of the constructed pipeline will be inspected.

Recordation of the detected cultural materials will consist of: 1) completion of an Wyoming Cultural Properties (WCP) site form (or some other approved site form) for newly discovered sites or amending the existing WCP site form for cultural remains occurring at known site locations; 2) generating a stratigraphic profile of the trench wall clearly showing the relationship of the cultural features, natural stratigraphy, and the ground surface; 3) photographing definable features; 4) collection of appropriate samples for radiocarbon dating and other ancillary analyses. A site-specific datum stake, marked with the temporary field number and Western Archaeological Services (WAS) project identification, will be placed off the construction right-of-way so that the cultural remains can be relocated after construction is complete. To facilitate relocation of the cultural remains, distance and compass bearings to each feature and/or soil unit profile from the site datum or a permanent reference point will be recorded.

In some cases it may be desirable to augment the examination of the cultural remains visible in the open trench wall by auger/shovel probes and hand-dug test units. When required, the auger/shovel probes will be systematically placed to encompass the area containing the cultural

materials. Formal hand-dug units will be excavated as necessary to gain a better understanding of the geomorphic and geoarchaeologic context of the cultural materials and to aid in the evaluation of the remains. Of particular interest will be the recovery of sediment or charcoal samples for radiocarbon assay.

After completion of the open trench inspection and associated fieldwork, a meeting between Questar Gas Management personnel, the Pinedale Field Office Archaeologist, and WAS staff may be held. The purpose of this meeting will be to discuss the cultural resources located in the trench (if any) and to develop additional testing and/or mitigation procedures, if appropriate.

All artifacts encountered during the open trench inspection will be analyzed following standard WAS procedures. All collected artifacts and ancillary samples (e.g., soil, charcoal, botanic) will be curated at Western Wyoming College, Rock Springs.

The BLM Pinedale Field Office archaeologist will be updated periodically regarding the progress of the project, including all cultural materials detected during the open trench inspection. Except in extreme cases, in particular the detection of human remains, pipeline construction will be allowed to continue with no interruptions due to the detection of buried cultural materials.

### *Treatment of Human Remains*

In the event that human remains are encountered, all construction activity in the area of the find will be immediately suspended and the BLM Pinedale Field Office archaeologist or the compliance officer will be contacted. If human remains are discovered, no construction activities shall be allowed until authorization is provided by the Bureau of Land Management authorized officer. In the event of the discovery of any human remains or other items covered under the Native American Graves Protection and Repatriation Act (NAGPRA), compliance with the terms of NAGPRA shall be required.

### *Evaluation Criteria*

The cultural materials will be evaluated using National Register of Historic Places (NRHP) criteria A and D (36CFR60.4, 7/1/89 edition) and various supporting state and federal guidelines for the evaluation of significant cultural resources.

Criterion A deals with historic era cultural properties and states that significant sites are those that are associated with events that have made a significant contribution to the broad patterns of history. For example, historic trails, town sites, and other localities which played a major role in the development of the west are usually considered significant.

Criterion D states that eligible properties are those which have yielded, or may be likely to yield, information important to the understanding and interpretation of history or prehistory. These data may include, but are not limited to, culturally and temporally diagnostic artifacts and features, charcoal or other materials suitable for radiocarbon dating, and preserved flora, fauna, and other materials that would provide information on prehistoric subsistence and settlement patterns. Also of interest are soils data and pollen which can provide information on past depositional regimes and paleoclimatic models. It is generally understood that physical integrity is the primary criterion necessary for cultural materials to be considered significant.

**CRITERIA TO BE USED EVALUATING NRHP ELIGIBILITY FOR PREHISTORIC  
SITES IN THE PINEDALE AREA**

Eligibility will be defined on the basis of site characteristics and data which are necessary to test the model of prehistoric land use patterns and culture change postulated in the foothills and basin margins. Eligibility determinations are derived from inventory and evaluation, including results of surface documentation and subsurface exploration.

General criteria which are applicable to all aspects of the research design include:

1. Does the site contain important paleoenvironmental information?
2. Does the site contain data by which to infer seasonality of occupation?
3. Does the site contain high quality evidence of prehistoric subsistence practices?
4. Can artifacts and/or features be associated in a definable occupation with a high degree of integrity?
5. Is the investigator able to define the size of a single occupation or series of occupations based upon horizontal extent and depth of cultural staining.
6. Does the site contain unusual remains and/or features which are not expected to occur or thought to be uncommon in the project area?

A site does not have to exhibit all of the criteria listed above to be considered NRHP eligible. Some combination of more than one of the above criteria should generally be present. The presence of one criterion in outstanding form or quality can occasionally be sufficient to justify NRHP eligibility, if adequate justification is presented by the field investigator.

1. With respect to paleoenvironmental information, stratigraphic profiles of sites should show some general indication of change in past environmental conditions, for example change in depositional regimes or pedological changes. Datable materials should also occur within stratigraphic units in order to gain chronological control over depositional and pedological events.
2. Seasonality can be inferred by the presence of items such as animal bone, egg shell, fish bone or other extremely well-preserved organic remains. Field investigators are urged to use all potential sources of information in evaluating site seasonality.
3. Well-preserved evidence of specific types of food resources utilized throughout prehistory is an important criterion for NRHP eligibility. This will primarily include plant remains and bone or functionally specific procurement or processing implements.
4. Artifacts and/or features should occur in a definable cultural level in primary context. Integrity of a cultural deposit can be inferred by the thickness of the cultural level. The thickness of the cultural level should be generally equivalent to the predicted thickness of the cultural churn zone relative to the texture of sediments. The thickness of the carbonaceous stained horizon can be used as a general indicator of the churn zone. The reader should refer to Eckerle's chapter in the Moxa Arch

Research Design for a discussion of churn zone thickness in different types of sediments (MARDT 1996).

5. An NRHP-eligible property should contain a cultural level which is a minimum size of 5m in diameter.
6. Sites containing unusual remains and/or features not expected to occur or thought to be uncommon in the project area can also be considered for NRHP eligibility. Examples include sites which contain any type of domestic architectural features (e.g. housepits, wickiups, stone circles and alignments), rock art, well-preserved processing or storage features, or bone beds, or exotic materials. Sites with a reasonable degree of integrity dating to the Paleoindian period, the Great Divide phase, Opal phase, or Firehole phase should also be considered NRHP eligible. This should not be considered an all-inclusive list.

### ***Report Production***

Upon completion of the open trench inspection, a written report will be submitted to the BLM Pinedale Field Office, which will document all cultural materials located during the trenching operations. Included in the report will be National Register evaluations of the remains and detailed site-specific data recovery recommendations (if necessary) based on established research objectives. In consultation with the reviewing agencies, any additional work will be detailed subsequent to this evaluation.

### ***REFERENCES CITED***

MARDT (Moxa Arch Research Design Team.)

1996 *Modeling Prehistoric Adaption in Western Wyoming: The Moxa Arch Archaeological Research Design*. K.W. Thompson and J.V. Pastor, compilers. Copies available from BLM-Kemmerer Field Office.