ENVIRONMENTAL ASSESSMENT (EA) FOR QUESTAR EXPLORATION AND PRODUCTION COMPANY CUTTHROAT 1-23

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Section 23, T. 37 N., R. 19 W.
1138' FNL & 937' FEL
MONTEZUMA COUNTY, COLORADO
LEASE #COC-10364A

DOI-BLM-CO-SO10-2009-0067

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1.0 Project Description

1.1 Introduction

Questar Exploration and Production Company (Questar) has submitted an Application for Permit to Drill (APD) for one (1) gas well on federal surface within the boundaries of the Canyons of the Ancients National Monument. This well is located approximately 19 miles west-northwest of Cortez, Colorado. The proposed project area is located in Montezuma County, Colorado. The proposed well site and access are all within the perimeter of a reclaimed well site and access of the Cutthroat Unit 10A.

The planned drilling depth is approximately 7,833 feet targeting the Paradox Salt formation.

Project Summary Tables

Well Name	***Length/ Acres Used***			***Well Pad Area***	***Total Surface Area***
Cutthroat 1-23	1.10acres* (1598.04' x 30')	1.94 acres** (4206.78'x 20')	Total length 5804.82'	2.22 acres (≈350' x 275')	5.26 Acres

* road and pipeline corridor to be within reclaimed access to the Cutthroat Unit 10A
** pipeline to be located parallel to existing road in barrow ditch

1.2 Background and Location

The location of the Proposed Action is given as Section, Township and Range in Table 1 below. A portion of the USGS quadrangle map Negro Canyon, CO depicting the proposed location follows on pages 3 and 4 (Figures 1.1 and 1.2).

Table 1.1 Location of the Proposed Well
37.45360 N 108.90711 W

Well	***USGS quadrangle map, 7.5 minute***	***Footages***	***Section(s)***	***Township***	***Range***	***County***
Cutthroat 1-23	Negro Canyon, CO	1138' FNL, 937' FEL	23	37N	19W	Montezuma County, CO

The proposed project area is within the McLean Basin, an area of sustained development by oil and gas producers. The area encompassed by the proposed project, as well as adjacent areas, has been affected by oil and gas development since the early 1950s. Exploration and development of existing oil and gas leases on BLM-administered lands in Montezuma County continues today. Existing oil and gas exploration consists of seismic surveys and the ongoing drilling of wells.

- Within a one-mile radius of the proposed action there are three (3) producing wells, three (3) plugged and abandoned wells, and no water, injection, or shut in wells.

The proposed Cutthroat 1-23 well location was selected by the BLM in coordination with Questar Exploration and Production Company as an alternative to two other proposed locations,

the Federal 10-24 and Cutthroat #16. Both wells proposed in 2007 and their access roads conflicted with the cultural resource management requirements of the National Historic Preservation Act. Specifically, the Cutthroat 1-23 and Federal 10-24 would have resulted in negative impacts to cultural resources. In addition, Native American Tribes that claim a cultural affiliation with the National Monument, including the Hopi Tribe, objected to the proposed locations. Therefore, a Finding of No Significant Impact would not have been justified for the two original proposed locations.

1.3 Purpose and Need for the Action

The purpose of this project is to develop fluid mineral resources while ensuring compliance with the Presidential Proclamation that established the Monument, with the National Environmental Policy Act, with the 1985 San Juan/San Miguel Resource Management Plan, and with Interim Guidance for managing the Monument. The action is needed to develop Fluid Mineral resources for commercial marketing to the public.

Figure 1.1 Location Map of the Proposed Action

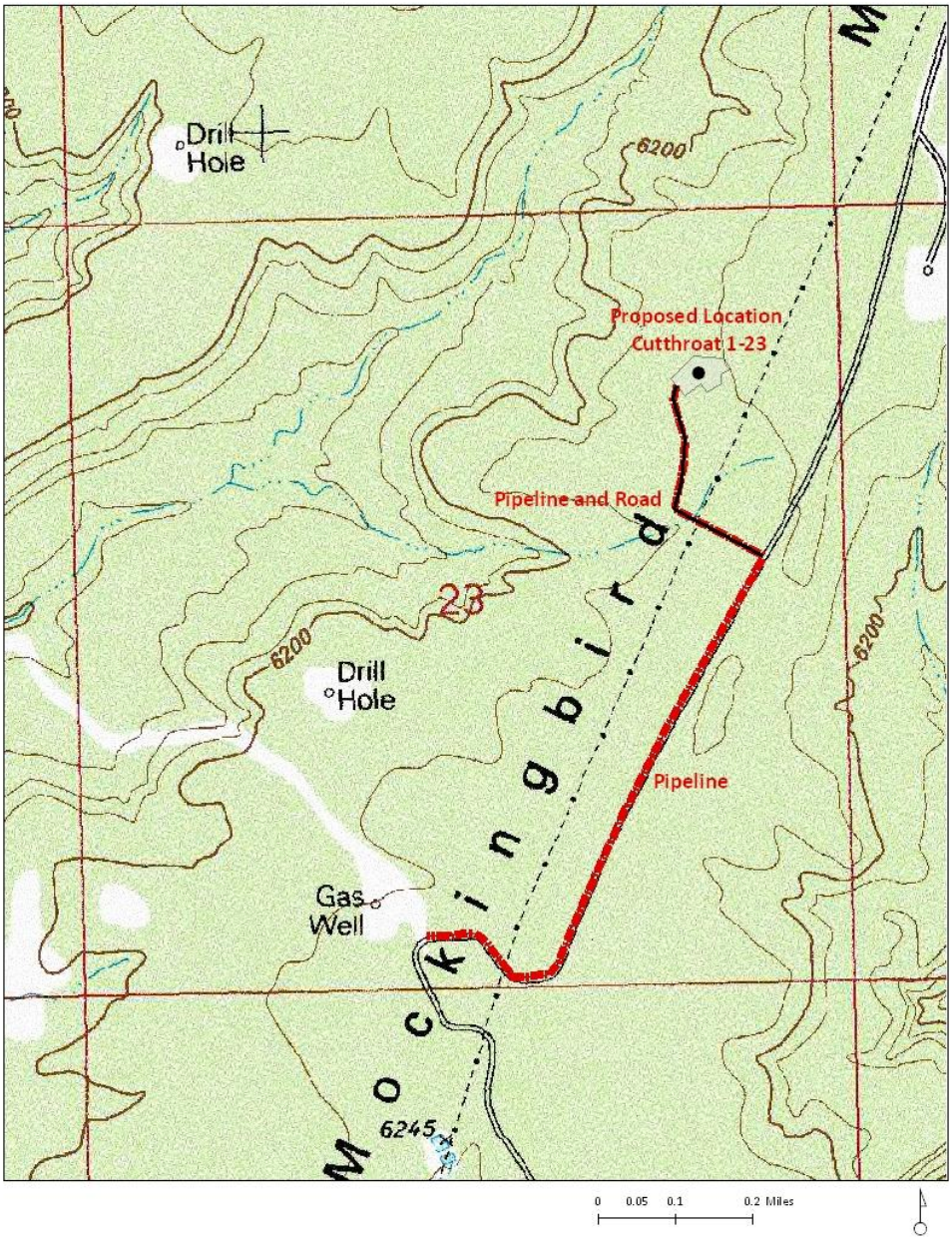
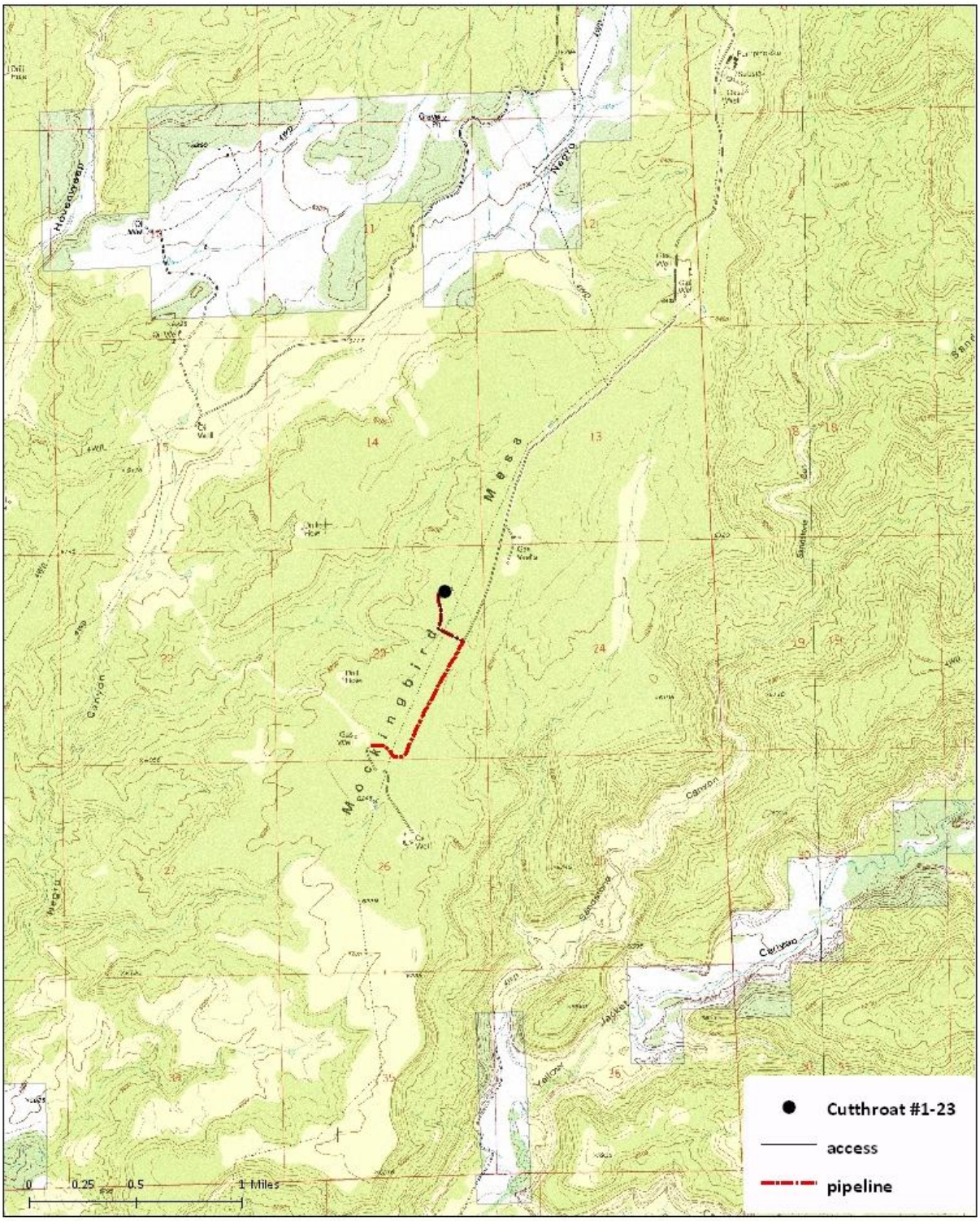


Figure 1.2 Vicinity Map of the Proposed Action



QEP Cutthroat 1-23 Vicinity Map

yellow denotes BLM surface
no shading denotes private

1.4 Conformance with Existing Management Plans and Regulations

The Proposed Action is subject to and has been reviewed for conformance with the following plan and amendment (43 CFR 1610.5, BLM 1617.3):

Plan: *San Juan/San Miguel Planning Area Resource Management Plan (RMP)*
Date Approved: September 1985
Page Number: Page 17 states "BLM actively encourages and facilitates the development by private industry of public land mineral resources so that national and local needs are satisfied and economically and environmentally sound exploration, extraction, and reclamation practices are provided."

Amendment: *San Juan/San Miguel Resource Management Plan Amendment Record of Decision (1991).* The Final Environmental Impact Statement (FEIS) is also known as the Amendment to the RMP.
Date Approved: October 28, 1991
Page Number: Page 11 states that the objective is to "Facilitate orderly, economic, and environmentally-sound exploration and development of oil and gas resources using balanced multiple-use management." Also, page 2-2 of the FEIS states that: "In addition to this EIS, an Environmental Assessment (EA) would be completed on each Application for Permit to Drill or group of APDs."

The Proposed Action is also subject to conformance with the Presidential Proclamation that established the Monument, the BLM Interim Management Policy for BLM National Monuments and National Conservation Areas (BLM 2001a), the BLM Interim Management Guidelines for Canyons of the Ancients National Monument (BLM 2001b), and the BLM Interim Management Guidance for Oil and Gas Leasing and Development (BLM 2001c).

Proclamation: Monument Proclamation
Date: June 9, 2000
Language: "NOW, THEREFORE, I, the President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Canyons of the Ancients National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Canyons of the Ancients National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 164,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected."

***Guidance*:**	BLM Interim Management Guidelines for National Monuments
Language:	Monument lands remain open to continued oil and gas (including carbon dioxide) development under existing leases, under current lease restrictions, and BLM regulations. The Proclamation also directs the Secretary to manage development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by the Proclamation. With respect to oil and gas leases, "valid existing rights" vary from case to case, but generally involve rights to explore, develop, and produce within the constraints of the lease terms, laws, and regulations.

The Proposed Action would fulfill the objective and intent of the 1985 San Juan/San Miguel RMP that public land mineral resources be developed in an environmentally sound way, and thus is in conformance with the RMP. This EA is being utilized to determine conformance with the Monument Proclamation and Interim Guidance. A written decision by the Authorized Officer would include a decision on conformance.

CONFORMANCE WITH STATUES/OTHER REGULATIONS

Exploration and development of Federal oil and gas leases by private industry is an integral part of the BLM's oil and gas leasing program under authority of the Mineral Leasing Act of 1920, as amended, the Mining and Minerals Policy Act of 1970 (30 U.S.C. 21), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761-1777), the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 195 et seq.), and applicable BLM Onshore Oil and Gas Orders (43 CFR 3160).

BLM regulates oil and gas development so as to minimize environmental impacts to public lands as required by numerous Federal laws, including:

- The Endangered Species Act of 1973 (P.L. 94-325)
- The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712)
- The Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d)
- The Federal Water Pollution Control Act of 1948, as amended (33 U.S.C. Chap. 26)
- The Clean Air Act of 1963, as amended (P.L. 88-206)
- Clean Water Act of 1972, amended 1977
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. Chap. 103)
- The Antiquities Act of 1906, as amended (P.L. 52-209)
- The National Historic Preservation Act of 1966, as amended (P.L. 89-665)
- The Archaeological and Historic Preservation Act of 1974 (P.L. 86-253)
- The Archaeological Resources Protection Act of 1979, as amended (P.L. 96-95)
- The American Indian Religious Freedom Act of 1978, as amended (42 U.S.C. 1996)
- The Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601)

- Executive Order 12898 of 1994 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"

This EA considers the requirements of these laws and implementing regulations, as applicable, as part of the Proposed Action. The Proposed Action, including associated applicant-committed mitigation measures, complies with the laws and implementing regulations indicated above.

Conformance with Colorado Standards for Public Lands Health

In September 1997, BLM established standards for health of public lands in Colorado (BLM 1997). The standards relate to all uses of public lands, and a finding for each standard must be included in each EA. The five standards for protecting Public Lands Health are:

1) Insure healthy upland soils;
2) Protect and improve riparian systems;
3) Maintain healthy, productive, native plant and animal communities;
4) Maintain or enhance threatened or endangered species and their habitats; and
5) Insure water quality meets minimum Water Quality Standards established by the State of Colorado.

The standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The standards are applied on a landscape scale and relate to the potential overall health and sustainability of the landscape. Additional information on the standards and guidelines can be found at the Colorado BLM website: http://www.co.blm.gov/standguide.htm. Findings for each of the specific project study area standards (if applicable) are described in the relevant resource description in Section 8.0 below.

2.0 Proposed Action and Alternatives

2.1 Alternative 1: Proposed Action

Questar Exploration and Production Company (Questar) filed an APD on 08 August 2008 to construct and drill a well on Mockingbird Mesa. The project would involve the construction of a well pad and associated access roads and pipelines if the well were a producer. The proposed location would use a previously disturbed access route and well pad (Questar Cutthroat Unit #10A), and all pad disturbance would remain inside the previous disturbance limits. The Cutthroat Unit #10A is a plugged and abandoned well that has been revegetated.

All surface activity would be conducted in accordance with the BLM Gold Book standards, site specific stipulations as required by the Conditions of Approval (COAs) determined at the BLM onsite inspections and in accordance to the 12 point surface use plan submitted with the APD. The 12 point surface plan is attached as Appendix 1.

2.1.1 Access

Access to the Proposed Action is from Pleasant View, Colorado. Travel southeast 1 mile on US 491 then sharply turn right onto County Road BB, proceed for 3.8 miles on the paved road.

From County Road BB, turn left and travel southwest 7 miles on gravel County Road 12. Turn left and travel southeast 1.3 miles on a gravel road to a locked gate. 2.3 miles beyond the locked gate the reclaimed road from the Cutthroat Unit #10A joins the Mockingbird Mesa road. The proposed location for the Cutthroat 1-23 is located at the end of the abandoned well access approximately 1,598' northwest of where the two roads meet. All existing roads would be maintained at current standards via a maintenance agreement with the county, BLM, and other authorized users.

2.1.2 Well Drilling

A fresh water mud system would be used to drill the well. The well pad and construction buffer would be approximately 2.22 acres (≈350' x 275') The top six-inches of brush and soil would be stockpiled for use in reclamation. The reserve pit would be constructed in cut as shown on the well pad plat and cross-sections in Appendix 1. A twelve mil plastic liner would be installed in the reserve pits and the pits would be fenced sheep tight on three sides with woven wire fence topped with barbed wire. The fourth side of each pit would be fenced once the rig moves off site and the fences would be kept in good repair while the pit dries. Once dry, the pits contents would be buried in place and backfilled by a minimum of five (5) feet of fill. Production facilities that would be located on the well pad would include a well head and line heater. Questar may need to install a pumpjack if artificial lift is required (typically after 3-5 years of production). The surface equipment would be low profile, not exceeding ten (10) feet in height, and would be painted a flat Yuma green to blend with natural surroundings. In addition, the clearing and construction would comply with the VRM plan attached as Appendix 2.

2.1.3 Road & Pipeline Construction

Access to the Cutthroat 1-23 would be along the reclaimed access route to the plugged and abandoned Cutthroat Unit #10-A. The reconstructed road would be built to standards as described in Appendix 5. Additionally, the 1,598' of newly reconstructed road would be flat bladed 25' wide. Three (3) to seven (7) graveled, rolling water bars would be placed to drain the road.

If the well is a commercially viable producer, the road would be upgraded as described in Appendix 5 with an approximate 14' wide running surface and 3' borrow ditches. Maximum grade would be less than eight (8%) percent. The existing entrance would be widened and a cattle guard would be installed. The borrow ditches and remaining disturbed areas would be recontoured and revegetated.

Prior to re-constructing the road a three (3) inch O.D. steel flow line, a two (2) inch O.D. water line and a two (2) inch fuel gas line would be installed in parallel to the roads. The lines would be buried below frost line (≈36"). All topsoil would be removed prior to pad construction and windrowed for use in reclamation. All surface disturbance would be kept inside the 30' road corridor.

2.1.4 Reclamation

If the well is not a commercially viable producer, than all disturbed areas would be recontoured and reclaimed once the pits are dry.

If the well is a commercially viable producer after production equipment, flowline, and the road are in place, all areas not needed for operations and maintenance of the well would be recontoured and revegetated. This would leave a small work and parking area where the production facilities are located and a 14' wide running surface with revegetated borrow ditches. The majority of the pad would be revegetated but would remain flat, so that it can be occupied when workovers, fracings, or other maintenance is needed.

All reclamation would be done in consultation with the BLM using native seed mixes approved by the BLM. Additionally, all reclamation would be done in accordance with the VRM plan (see Appendix 2). Questar would use effective reclamation techniques including drill seeding and cultipaction, in consultation with the BLM. The following seed mixture would be used for reclamation

Seed Mixture*	**Drilled Rate (lbs/acre PLS)**
Indian Ricegrass	6.2
Squirrel tail	1.1
Blue grama	0.3
Mutton grass	0.4
Needle and thread	1.9
Galleta	1.4
Gardner Saltbush	1.7
Antelope Bitterbrush	2.0
Total	**15.0**

(*as determined by BLM: Tom Rice personal communication, 18 December 2008)

2.2 Alternative 2: No Action Alternative

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity would not take place. This option is provided in 43 CFR 3162.3-2 (h) (2). This alternative would deny the approval of the APD necessary to construct the Proposed Action on BLM surface and valid federal leases held by Questar. Current land and resource uses would continue to occur in the proposed project area. This would include resource protection, cattle grazing, and oil and gas production.

Under the terms of the valid federal mineral leases, the lessee has the right to develop mineral resources. Other laws, regulations, and policy include provisions for the economic development of existing leases. By federal law, the government must abide by the terms, conditions, and provisions agreed to when leases were issued. In the Council of Environmental Quality (CEQ) regulations (40 CFR 1500.3), it states that parts 1500-1508 of this title provide regulations

applicable to and binding on all Federal agencies for implementing the procedural provisions of the Nation Environmental Policy Act of 1969…"

Since lease No. #COC-10364A gives valid existing rights, the BLM cannot deny the right to drill and develop the leasehold unless it conflicts with updated management decisions. Only Congress can completely prohibit development activities. Based on the existing RMP, the 1991 Oil and Gas Amendment, and Interim Criteria under which the APD is being reviewed for approval, approval cannot be denied outright. The BLM, in issuing these leases, has made an irrevocable commitment to allow some surface disturbance activities, and can only impose reasonable mitigation measures such as the Surface Use COA.

The No Action Alternative is presented for baseline analysis of resource impacts.

2.3 Other alternatives considered but dismissed with no detailed analysis

Six additional alternatives were discussed during consultation between Questar and the BLM. These alternatives attempted to address resource concerns and find ways to minimize potential impacts. Table 2.1 provides further information regarding these alternatives.

Table 2.1 Discussion of Other Alternatives

Alternative Description	**Objective**	**Reason Dismissed**
1. Twinning with Kinder-Morgan HD #3 Well in NE Section 13	Minimize new surface disturbance	Alternative did not fulfill objective
Discussion: The objective of the Proposed Action is to allow Questar to develop a potentially new shale play within its Cutthroat Unit. As a wildcat well, Questar is seeking a new resource. This alternative allowed for the co-location of the well on an existing pad, thus minimizing surface disturbance. Section 13 is however farther away from Questar's centralized production facilities and would have required increased surface disturbance due to a longer pipeline route. Preliminary archeological surveys also identified numerous cultural resource issues associated with the pipeline route and well pad expansion. Questar's lease interest in Section 13 is less than it is in Section 23 and thus a well in Section 13 was also not as advantageous to Questar.		
2. Well Site Location is SE of NW Section 13	Place well pad in location that minimized impact to cultural resources	Alternative did not fulfill objective
Discussion: The BLM identified a potential location that appeared to avoid cultural resources based on previously recorded data. Preliminary field investigations identified that there were cultural resources present that would make locating the well difficult. In addition, similar to dismissed Alternative 1, Section 13 is farther away from Questar's centralized production facilities and would have required increased surface disturbance due to a longer pipeline route. Questar's lease interest in Section 13 is less than it is in Section 23 and thus a well in Section 13 was also not as advantageous to Questar		
3. Reentering P&A Cutthroat 10A	Minimize drilling time and therefore cost, noise, surface occupancy, etc	Alternative did not fulfill objective
Discussion: Reentering a plugged well bore has increased mechanical risks and is likely to more costly and time consuming than drilling a fresh bore. Mechanical risks include encountering drilling tools and other equipment that cannot be drilled through. Re-drilling a plugged and abandoned well does not reduce costs nor decrease the drilling time and occupancy of a well pad.		
4. Use well pad constructed for the Cutthroat 10	Minimize new surface disturbance	No noticeable improvement over the Proposed Action.

		Increased drilling risks.
Discussion: Cutthroat 1-23 drilling targets are Paradox shale intervals above and below the lower Desert Creek reservoir. The 1-23 bore must avoid the lower Desert Creek reservoir in order to avoid drilling risks such as fluid loss, stuck pipe, and formation break down. The Cutthroat 10 pad is SW of the Proposed Action moving it closer to the lower Desert Creek reservoir. Data from the Cutthroat 10A dry hole suggests that this location is not within lower Desert Creek reservoir.		
5. Federal 10-24	Place well pad in location that minimized impact to cultural resources	Alternative would have negative impacts to cultural resources and would not achieve the management requirements of the National Monument
Discussion: The proposed well and access road conflicts with the cultural resource management requirements of the National Historic Preservation Act and the Monument Proclamation. Specifically, the Federal 10-24 would have resulted in negative impacts to cultural resources. In addition, Native American Tribes that claim a cultural affiliation with the National Monument, including the Hopi Tribe, objected to the proposed locations. Therefore, a Finding of No Significant Impact would not have been justified for the two original proposed locations.		
6. Cutthroat #16	Place well pad in location that minimized impact to cultural resources	Alternative would have negative impacts to cultural resources and would not achieve the management requirements of the National Monument
Discussion: The proposed well and access road conflicts with the cultural resource management requirements of the National Historic Preservation Act and the Monument Proclamation. Specifically, the Cutthroat #16 would have resulted in negative impacts to cultural resources. In addition, Native American Tribes that claim a cultural affiliation with the National Monument, including the Hopi Tribe, objected to the proposed locations. Therefore, a Finding of No Significant Impact would not have been justified for the two original proposed locations.		

3.0 Affected Environment

Table 3.0: Elements of the Affected Environment

Resources	Potentially Affected	No Potential Impact	Further Analysis Presented in Text	Comments
Air Quality	**X**		**X**	
Areas of Critical Environmental Concern	**X**		**X**	
Cultural Resources	**X**		**X**	
Native American Religious Concerns	**X**		**X**	
Environmental Justice		**X**	**X**	

Farmlands, Prime or Unique		**X**		**No Unique or prime farmlands are located in the vicinity of the proposed action**
Floodplains		**X**		**The proposed action is not located in or adjacent to a floodplain**
Invasive, Non-native Species	**X**		**X**	
Threatened or Endangered Species	**X**		**X**	
Wastes, Hazardous or Solid	**X**		**X**	
Water Quality – Surface/Ground	**X**		**X**	
Wetlands/Riparian Zones		**X**		**None Located within the project area.**
Wild and Scenic Rivers		**X**		**The proposed action is approximately 20 miles from the Delores River and not within its watershed. This area is proposed for designation as a wild and scenic river.**
Wilderness/WSA		**X**		**The Cross Canyon WSA is located approximately 5 miles to the northwest of the Proposed Action.**
General Topography/Surface Geology	X		X	
Mineral Resources	X		X	
Soils/Watershed/Hydrology	X		X	
Paleontology	X		X	
Vegetation, Forestry	X		X	
Rangeland Management	X		X	
Special Status Species	X		X	
Wildlife	X		X	
Wild Horse and Burros		X		None present in the vicinity of the project
Recreation	X		X	
Visual Resources	X		X	Also see Appendix 2
Public Health and Safety	X		X	
Noise	X		X	
Socioeconomics	X		X	
Fire	X		X	

3.1 General Discussion of Resource Elements

Chapter Three (3) identifies and discusses resources of the human environment that may potentially be affected by the proposed action or any of the potential management alternatives. Components of human environment not present in the project area or with minimal likelihood for impact are not analyzed in detail. This portion of the document should be used to judge the merits of potential management decisions against a range of options provided as alternatives in Chapter Two (2).

Currently the project area is managed in order to protect the historic and pre-historic cultural resources within Canyons of the Ancients National Monument's boundary. Management of the monument takes into account specifically and explicitly protection of the cultural landscape. Livestock grazing and natural resource development are present in proximity to the project area. Recreational uses include big game hunting, hiking, rock climbing and viewing cultural resource sites.

Resource elements for which it has been determined there would be no potential impacts (see Table 3.0) are not discussed in detail.

3.2 Discussion of Resource Elements

3.2.1 Air Quality

According to the Colorado Air Quality Control Commission (AQCC) Report to the Public, 2001, the project site is within the West Slope Colorado Air Quality Control Region. The primary sources of air pollutants in this region are from unpaved roads and streets, seasonal sanding for winter travel, motor vehicles, oil and gas industry, and wood burning stove emissions.

The Colorado Department of Public Health and Environment, Air Quality Division regulates air quality impacts under the 1972 Clean Air Act, as amended and develops both mitigation measures and emission standards. On 17 December 2006 the Colorado AQCC adopted changes to oil and gas industry standards addressing dehydrators, condensors, separators, condensate tanks and natural gas engines larger than 100 horsepower.

Elevated PM10 (particulate matter smaller than 10 microns) levels have been identified in the Western Slope Region. These elevated levels are typically associated with high-density urban areas and communities located in long narrow valleys. Elevated levels were observed throughout the western slope in 2000-2001 due to dust storms; however, these did not violate regulatory limits because the elevated levels of particulates were caused by natural phenomena, not human activity.

There is also concern regarding ozone levels. Levels in the planning area have been measured between 71-74 parts per billion. Ozone levels are considered in non-attainment of standards at 75 parts per billion.

Recently, the BLM initiated the process by which future natural gas development would occur under the jurisdiction of the San Juan Public Lands Center, Durango, Colorado. The cumulative air quality impact assessment performed by San Juan Public Lands Center which included oil and gas development as potential emission sources, determined that potential visibility impacts to federal PSD Class I Areas (Mesa Verde National Park and the Weeminuche Wilderness Area) could occur. Additional air quality monitoring and modeling may be required. The BLM would work directly with the state regulatory agency to ensure that any data gathered meets state standards. Results may require additional mitigation measures on future projects.

3.2.2 Cultural Resources

Existing cultural resources inventory data indicate that the vicinity of the project area has been utilized and inhabited by human groups from as early as 5,500 B.C. to present. It was most intensively occupied by Ancestral Puebloan people between AD 675 to 1290. The Ancestral Puebloans were sedentary agricultural people who built settlements on the mesas and canyons of the area. Archaeologists divide the chronology of Ancestral Puebloan occupation into a series of developmental periods (Basketmaker II (AD 1- 500), Basketmaker III (AD 500 – 750), Pueblo I (AD 750 – 900), Pueblo II (AD 900 – 1100), and Pueblo III (AD 1100 – 1300)) that reflect changes in culture during the six hundred years of occupation. Surveys in the project area suggest intensive occupation of the project area in the Basketmaker III, Pueblo II and Pueblo III periods. During the Basketmaker III period, the Ancestral Puebloan built single and multiple pit house settlements in areas of deep soils. During the Pueblo II period, Ancestral Puebloans built single or multiple habitation units composed of masonry and adobe surface rooms and kivas also situated in the areas of deep soils on the mesa tops. During the last century of the occupation in the Pueblo III period, the Ancestral Puebloans built large villages made of masonry situated away from the mesa centers, often near spring sources at the heads of Canyons.

Prior to designation as a National Monument, the entire area now known as Canyons of the Ancients National Monument (CANM) was an Area of Critical Environmental Concern known as the Anasazi Culture Multiple Use Area (ACMUA). The ACMUA was designated on October 2, 1985 in the San Juan/San Miguel Resource Management Plan on the basis of the collective significance and density of cultural resources. An ACEC management plan was developed to guide overall management of the ACEC with the objective of reducing impacts to significant cultural resources and their setting, as directed in the RMP.

Subsequent site or area-specific management plans have also been developed and implemented within the ACEC prior to establishment of the monument, including the Mockingbird Mesa Management Plan. This plan was based upon an intensive (Class III) archaeological inventory that was conducted between 1981 and 1984. The inventory examined 3,976 acres, and 684 sites were located and documented.

The Presidential Proclamation that established the monument on June 9, 2000, states that "the Secretary of the Interior shall manage the development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by this proclamation…"

Archaeologists from LaPlata Archaeological Consultants conducted a Class III archaeological inventory of the proposed well site, associated access road, and pipeline. A 40 acre block was examined for the well pad and portion of access road that fell within the block. The remainder of the road and the pipeline rights-of-ways were surveyed 300 feet wide on either side of the R.O.W. A total of 104.7 acres were intensively inventoried.

Prior to field surveys, a records search was undertaken at the Anasazi Heritage Center and State of Colorado Office of Archaeology and Historic Preservation office in order to identify previously recorded sites within and near the proposed project area. A total of 27 archaeological sites were identified. Of these 27 sites, 16 were recommended as eligible to the National Register of Historic Places (NRHP), and 11 are unevaluated requiring additional data in order to make a formal determination of eligibility to the NRHP. All of the sites can be avoided and protected during proposed construction activities but several sites within the pipeline right-of-way fall within the 100 meter buffer zone of protection required by the BLM in Colorado.

The BLM determination of effect for the undertaking under Section 106 of the National Historic Preservation Act is "no historic properties effected." The project determination of effect and the site eligibility recommendations were submitted to the Colorado State Historic Preservation Officer under the "State Protocol Agreement Between the Bureau of Land Management (BLM), and the Colorado State Historic Preservation Officer (SHPO)" on January 23, 2009.

3.2.3 Native American Religious Concerns

No traditional cultural properties, sacred sites, or use areas were identified during the cultural resource assessment. However, a variety of tribes claim a cultural affiliation or a traditional tie to the Canyons of the Ancients National Monument.

Twenty-five Native American groups have been determined to have traditional associations with the Monument (Personal Communication Jacobson, 2007). The monument consults with these groups during every planning project as a standard protocol. The groups include The Northern Ute Tribe, The Ute Mountain Ute Tribe, The Southern Ute Tribe, The Navajo Nation, The Hopi Tribe, The Jicarilla Apache Tribe, and the Pueblos of Acoma, Cochiti, Isleta, Jemez, Laguna, Nambe, Picuris, Pojoaque, Santa Ana, Santo Domingo, Sandia, San Felipe, Ohkay Owingeh, San Ildefonso, Santa Clara, Tesuque, Taos, Zia, and Zuni.

Consultation for the proposed action was initiated by a letter dated October 26, 2007 from the BLM to the Tribes. The letter described the proposed action, requested identification of traditional cultural properties in the project area, and sought input regarding the proposal.

The Tribes were also mailed the quarterly Schedule of Proposed Actions (SOPA) mailings for the San Juan Public Lands, and have access to the SOPA on the Internet (http://www.co.blm.gov/nepa/sjplcnepa.htm). Interested tribes are asked to contact the BLM if they would like to receive additional information concerning a project. This project was listed on the SOPA database.

The Tribal responses and consultation include:

- November 9, 2007- Response from the Hopi Tribe stating that they opposed oil and gas development in the Canyons of the Ancients National Monument, and the proposal was likely to adversely affect Hopi ancestral sites.

- November 20, 2007-Response from the Pueblo of Isleta stating that the project would not have an impact on religious or cultural sites affiliated with the Pueblo of Isleta. Requested to be notified in the event of a discovery.

- May 21, 2008 Hopi Cultural Preservation Office Administrative Meeting, Kykotsmovi, AZ. The BLM updated the Hopi about the archaeological inventory results and that many sites were in close proximity to a potential access road. The Hopi were very concerned about the number and proximity of sites to the proposed access roads and well pads. The Hopi stated they cannot support mitigation (data recovery) as it would have irretrievable and irreversible impacts to these ancestral sites.

- September 3, 2008 Tribal Field Visit to Questar Cutthroat 1-23 proposals. Representatives from Acoma, Jemez, Laguna, Nambe, San Juan, Santa Ana, Zia, Santa Clara, Santo Domingo, Hopi, Ute Mountain Ute. The tribes acknowledged the difficulty of balancing valid existing rights while preserving cultural resources and landscapes. The Tribes suggested it is important for the Monument to come up with a model for planning oil and gas development with criteria and policy/objectives to feed into a process. Tribes should be involved at the beginning of the planning process, and sites should be avoided with as much space as possible.

- October 2, 2008 Field visit to the proposed action with representatives from the Hopi Cultural Resources Advisory Task Team. The morning was spent looking at the originally proposed (2007) access routes and well locations east of the Mockingbird Mesa Road. The group discussed the high site densities and potential impact and subsequently identified alternate locations utilizing existing disturbance. The group looked at the proposed action located on the previously disturbed Cutthroat Unit 10A well pad and access road (aka the proposed Cutthroat 1-23 well site and access road). The adjacent sites were relocated and examined, as well as the proposed pipeline route along the side of the existing road in the borrow ditch. The group felt that this alternative best addressed the concerns regarding proximity to cultural resources and also avoided new ground disturbance in a previously undeveloped area.

3.2.4 Environmental Justice

Executive Order 12898 requires federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety effects on minority and low-

income populations. Minority and low income populations comprise a large proportion of the population residing inside the boundaries of the San Juan Public Lands.

The Proposed Action is located on Public Lands behind a locked gate. The closest residence to the well is a seasonally used cabin more than 2 miles away. There are four private land owners within a two mile radius to the Proposed Action.

3.2.5 Invasive and Non-native Species

The Proposed Action is located within the limits of a previously disturbed and reclaimed well pad and access. The area has been successfully revegetated and is dominated by bromes, rabbitbrush, bitterbrush, and saltbush.

The Colorado Department of Agriculture lists seventy species as noxious weeds in Colorado (CDA, 2008).

Cheatgrass and mullein (*Verbascum thapsus*) are List C weed species, indicating that state noxious weed management plans would not necessarily be designed to stop the continued spread of this species, but may be designed to provide additional education, research, and biological control resources to jurisdictions that choose to require their management. (CDA, 2008)

Cheatgrass is common throughout the project area, sometimes as one of the dominant groundcovers. Cheatgrass is known to increase fire danger and reduce range quality.

3.2.6 Threatened or Endangered Species

There are 5 federally listed threatened and endangered plant species and 7 listed threatened and endangered wildlife species known to occur within the San Juan Resource Area. No suitable habitat exists within the project area for Federally Listed Threatened and Endangered species. In Table 3.1a and 3.1b these species are listed and a description of their suitable habitat and presence is given.

Table 3.1a Federally Listed Plant Species of the San Juan Resource Area (USDOI, 2008)

Species	Status	Suitable Habitat	Suitable Habitat Occurring in Project Area
Sclerocactus mesae-verdae	Threatened	Shale or adobe clay badlands of the Mancos and Fruitland formations, 4,000 to 5,000 feet	No
Astragalus humillimus	Endangered	Exfoliating Point Lookout Sandstone formation of the Mesa Verde Group, 5,000 to 6,500 feet	No
Astragalus tortipes	Candidate	Gravels derived from a volcanic intrusion into Mancos Shale, 5,700 feet	No
Pediocactus knowltonii	Endangered	Alluvial deposits forming rolling gravelly hills in pinyon - juniper and sagebrush types, 6400 feet	No
Ipomopsis polyantha var. *polyantha*	Candidate	Mancos shale; barren shrublands; around 7,000'.	No

Table 3.1b Federally Listed Wildlife Species of the San Juan Resource Area (USDOI, 2008)

Common Name	Scientific name	Status	Suitable Habitat	Suitable Habitat Occurring in Project Area
Black-footed ferret	*Mustela nigripes*	E	Associated with prairie dog colonies in basin-prairie shrublands, sagebrush-grasslands, eastern Great Plains, and Great Basin foothills.	No
Canada lynx	*Lynx canadensis*	T	Mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare snowshoe hare.	No
Colorado pikeminnow	*Ptychocheilus lucius*	E	Aquatic	No
Mexican spotted owl	*Strix occidentalis lucida*	T	Mixed conifer with ponderosa pine, forested steep rock walled canyon bottoms.	No
Razorback sucker*	*Xyrauchen texanus*	E	Aquatic	No
Southwestern wouldow flycatcher	*Empidonax traillii extimus*	E	Riparian thickets, scrubby and brushy areas. Nest primarily in swampy thickets, especially in wouldow where vegetation is 4-7m or more in height.	No
Yellow-billed cuckoo	*Coccyzus americanus*	C	Open woodlands, streamside wouldow and alder groves.	No

Information regarding Federally Listed T&E plant species was provided by the San Juan Public Lands Office. Please see Appendix 3 for further details

3.2.7 Hazardous and Solid Wastes

The Proposed Action area would consist of approximately 3.22 acres of re-disturbance (Cutthroat #10A well site and access) and an additional 1.94 acres of disturbed area that is the Mockingbird Mesa Road and borrow ditch.

This disturbance as well as ongoing construction and oil and gas activities in the general area may have and could potentially result in the presence of hazardous or solid wastes in the area. Such wastes would include crude oil and natural gas from spills or leaks, construction debris, and drilling fluids and chemicals used in drilling, completing, and maintaining oil and gas production activities. Cement, paint, fuels, and other materials typical of a 'job site' are also occasionally used in the area.

3.2.8 Water Quality, Surface and Ground

There are no perennial water resources within the proposed project area. Surface water flows only intermittently during significant precipitation events. Ephemeral drainages, waterways, washes, and streams are fed by snowmelt, but the primary source of flow for the area is thunderstorms.

There are no wetlands or riparian zones within the project area. Surface water runoff from the project site flows westward into Negro Canyon through small ephemeral drainage channels. Negro Canyon flows into Yellow Jacket Canyon and then into McElmo Creek approximately 12 miles from the project area. McElmo Creek drains into the San Juan River at Aneth, Utah. The San Juan River experiences peak flows from fall storm events. This occurs annually between April and June. Principal water uses within the San Juan River Basin include irrigation, municipal, industrial, domestic, recreational, and transbasin diversion uses. The San Juan joins the Colorado River at Lake Powell.

Factors influencing surface water quality of McElmo Creek and the San Juan River more generally include natural processes such as limited vegetative cover, erosive, saline soils, and rapid runoff. Water quality is also impacted by agricultural activities such as irrigation and livestock grazing.

The Colorado Plateau's aquifers underlie an area of approximately 110,000 square miles. Colorado Plateau aquifers are composed of permeable sedimentary rocks varying in thickness, lithology, and hydraulic characteristics. (Robson and Banta, 1995).

The uppermost aquifer is found between the Dakota sandstone and underlying Morrison Formation. Seeps develop between these two areas but are generally limited in aerial extent. The most productive aquifer is the Glen Canyon group of sandstone. The top of this group would be approximately 1,178' deep in the well bore. All of the Glen Canyon group would be protected with casing and cement.

There is no known water well within the project area. There is no residential use or ground water supplied stock watering that occurs within one mile of the project area.

3.2.9 General Topography and Surface Geology

The Proposed Action is located near the southern end of the Mockingbird Mesa Road on top of Mockingbird Mesa. The location is a shallow depression on relatively flat terrain with a general aspect towards the northwest. The elevation of the project area is between 6220' and 6263'.

The surface geology is comprised of Cretaceous sandstones from the Dakota Formations.

3.2.10 Mineral Resources

The Paradox Basin in which the Proposed Action is located has seen oil and gas production since 1908. The McElmo Fields west of Cortez began producing in 1948.

The Proposed Action is located in the Cutthroat Unit of the Mclean Oil Field on the Southwest shelf of the Paradox Basin. The discovery well of the McClean Field was completed on July 31, 1974 in the Southwest Quarter of Section 15, Township 37 North, Range 19 West (Fassett, et al., 1978). BLM lease COC-10364A became effective 01 April 1970. The Cutthroat Unit was formed 15 June 1987 and comprises approximately 9,171 acres. Questar currently operates 7 wells in the unit.

The McElmo Dome Unit is thought to be the largest producing CO_2 field in the world. Discovered in the 1930s the unit encompasses more than 200,000 acres in Dolores and Montezuma Counties, Colorado. CO_2 produced from the McElmo Dome is nearly pure and used extensively for advanced recovery of Oil and Gas (Havens, 2008).

Within Township 37 North, Range 19 West there are 14 producing, 11 plugged and abandoned, 2 shut-in, 1 injection, 2 planned, and 2 undrilled abandoned wells (COGCC, 2008).

3.2.11 Soils, Watershed, and Hydrology

Soils within the project area are predominantly composed of Wetherill loam with portions being composed of Gladel-Pulpit complex, Romberg-Crosscan-Rock outcrop complex, and Sharps Pulpit complex. Wetherill loam's parent materials are Aeolian deposits derived from sandstone (NRCS, 2008).

There are no perennial water resources within the proposed project area. Surface water flows only on an intermittent basis based in significant precipitation events. Ephemeral drainages, waterways, washes, and streams are fed by snowmelt, but the primary source of flow for the area is thunderstorms.

There are no wetlands or riparian zones within the project area. Surface water runoff from the project site flows westward into Negro Canyon through small ephemeral drainage channels. Negro Canyon, flows into Yellow Jacket Canyon and then into McElmo Creek approximately 12 miles from the project area, McElmo Creek drains into the San Juan River at Aneth, Utah. The San Juan River experiences peak flows from snowmelt. This occurs annually between April and June. Principal water uses within the San Juan River Basin include irrigation, municipal,

industrial, domestic, recreational, and transbasin diversion uses. The San Juan joins the Colorado River at Lake Powell.

Factors influencing surface water quality of McElmo Creek and the San Juan River more generally include natural processes such as limited vegetative cover, erosive, saline soils, and rapid runoff. Water quality is also impacted by agricultural activities such as irrigation and livestock grazing.

3.2.12 Paleontology

The project is located on the Dakota Formation, which is a Cretaceous period sandstone. No fossils were found during the surveys performed by La Plata Archeological Services. The Dakota formation has yielded significant fossils discoveries in the past (Foster, 2003).

3.2.13 Vegetation and Forestry

The Proposed Action is located on Mockingbird Mesa. The dominant vegetation community within the vicinity is second growth piñon-juniper woodland with shrubs, forbs, and grasses forming a small percentage of total ground cover. The area was chained in the mid-1960s as part of a vegetation treatment (see Figure 3.0).

Figure 3.0. Oblique Aerial Imagery of the Proposed Action and Vicinity

The Proposed Action would be located on previously disturbed land. The previously disturbed area includes road surface and borrow ditch as well as reclaimed road and well pad. The

reclaimed areas are dominated by four-winged saltbush, antelope bitterbrush, broom snakeweed, and Indian ricegrass.

3.2.14 Rangeland Management

The Proposed Action is located in the Cahone Mesa Grazing Allotment (# 08012). The allotment is permitted for 153 head of cattle from 16 November to 30 April for a total of 829 Animal Unit Months (Personal Communication, Michael Jensen, 18 December 2008).

A fence line roughly parallels the east-west portion of the access and an old seismic trail. There is an existing wire gate where the access crosses this fence line.

3.2.15 Special Status Species

There are five federally listed plant species that occur in the San Juan Resource Area and 17 BLM listed sensitive plant species. None of theses species are known to occur within the project area. The project area does not provided suitable habitat for theses species (MacMillan, 2008).

The project area provides potential habitat for three BLM listed sensitive wildlife species. The Yuma myotis, fringed myotis, and Allen's big-eared bat are BLM sensitive wildlife species with the potential to occur in the area of the Proposed Action. Please see Appendix 4 for more information.

3.2.16 Wildlife

The proposed Action is located on a reclaimed well pad surrounded by piñon-juniper woodland. Piñon-juniper woodland comprises approximately 67% of the monument's surface area (BLM, 2007). The area was chained in the mid-1960s and has re-grown to relatively mature woodland. These woodlands provide both cover and forage for a variety of species, including obligates such as the gray flycatcher and juniper titmouse (BLM, 2007).

Mockingbird Mesa also provides habitat for both mule deer and elk. For more information please refer to Appendix 4 and the DRMP/DEIS (BLM, 2007).

3.2.17 Recreation

The Mockingbird Mesa Road is closed to unauthorized vehicle use. The road is used by the BLM for management activities and by companies with oil and gas development on Mockingbird Mesa. Recreation in the area is therefore dispersed in nature and consists of hiking, hunting, visits by archeological enthusiasts, and back country horseback riding. The area is not particularly accessible and the BLM does not direct the public to this area.

The area has been impacted by illegal archeological vandalism and looting of cultural resource sites. This is a serious management concern (LouAnn Jacobson, Personal Communication, 27 June 2007).

3.2.18 Visual Resources

The proposed Cutthroat Unit 1-23 is located on the southern end of Mockingbird Mesa about one and one-half (1½) miles north of the southern terminus of the Mockingbird Mesa Road. The area is characterized by open grassland/shrubland resulting from vegetative treatments and thick piñon-juniper woodland. Mockingbird Mesa can be described as a Colorado Plateau Rangeland landscape. This landscape is characterized as being largely rural with dirt roads and scattered structures, with a large proportion of public or federally managed lands, often appearing to be dominated by natural processes, but having experienced a large degree of anthropogenic change from activities such as farming, grazing, fire management, mining, and oil and gas development. The landscape is quintessentially open and dry with red, yellow, and umber soils, rock outcroppings, deep canyons, and numerous arroyos.

The proposed Cutthroat Unit 1-23 pad and access is located on the previously disturbed location of the plugged and abandoned well. The site has been fully revegetated. The surrounding area was chained as a vegetative treatment during the 1960s. Oil and gas development activities, grazing, and resource protection are the dominant land uses. Mockingbird Mesa contains a high density of archeological resources.

Cultural modifications in the immediate vicinity of the proposed action include producing wells, plugged and abandoned wells, approximately 50' high power lines, seismic trails, access roads, livestock improvements, and vegetative treatments. Please see Appendix 2 for further detail.

3.2.19 Public Health and Safety

The Proposed Action is located in a relatively remote area accessed from the Mockingbird Mesa Road. A locked gate on the road prohibits motorized vehicle entry by the public. Public access is allowed by foot, bicycle or horseback. There are no residences with a two mile radius of the Proposed Action.

Mockingbird Mesa has producing oil, gas, and CO_2 wells, pipelines, centralized facilities, power lines, and traffic associated with maintaining and operating the above facilities.

3.2.20 Noise

There are no BLM Noise Sensitive Areas within 400 feet of the Proposed Action. There are no residences located within a two-mile radius of the Proposed Action.

Mockingbird Mesa has producing oil, gas, and CO_2 wells, pipelines, centralized facilities, power lines, and traffic associated with maintaining and operating the above facilities.

3.2.21 Socioeconomics

Montezuma County's basic industries include agriculture, mining (including oil and gas), and construction. Government jobs account for 25% of total employment with an average annual

income of $37,597. Agriculture accounts for 7% of total employment with an average annual income of $8,460. The mining sector is responsible for 2% of total employment but provides for 3.9% of total wages. The mining sector is the highest paid sector with an average income of $69,046 (Cortez Chamber of Commerce, 2008)

The 2005-2007 American Community Survey Estimates from the US Census Bureau reports Montezuma County as having a population of 24,704 with a population of 12,670 in the labor force. The median family income was reported at $60,374 with approximately 9.8% of families below the poverty line.

Approximately 81.8% of the population self-identifies as white compared to national reporting of 74.1%. 12.8% self-identifies as American Indian or Alaskan Native compared to national reporting of 0.8%. There were no records available for the percentage of population that self-identifies as Hispanic or Latino (US Census Bureau, 2008).

3.2.22 Fire

Piñon-juniper woodland dominates the portion of Mockingbird Mesa surrounding the Proposed Action. This vegetative community experiences a fire regime ranging from "frequent, low intensity fires to rare, high intensity, stand replacing fires (BLM, 2007)." Like much of the Rocky Mountain west, the area surrounding Mockingbird Mesa has experienced an increase in stand density in the last forty years. Furthermore, these standing dead piñon trees, combined with infestations of cheatgrass in the understory, have increased the fuel load in this area. This increased the fuel load, and, in conjunction with beetle infestations, has increased the fire risk (BLM, 2009).

Current conditions throughout the monument have resulted and would likely continue to result in "larger and higher-intensity fires (BLM, 2007)."

4.0 Environmental Consequences

4.1 General Discussion of Environmental Consequences

Chapter 4 presents the environmental consequences or potential impacts to each of the resource elements discussed in Chapter 3. Chapter 4 should be used to evaluate the environmental merits of each alternative.

Potential impacts are defined as any change or alteration in the existing condition of the environment related to implementation of an alternative, either directly or indirectly. Impacts can be beneficial to the resource (positive) or adverse (negative), and can be either long-term (more than 5 years), or short-term (less than five years), or temporary (less than 1 year). Short-term and temporary impacts may be disruptive and obvious but they affect the environment for only a limited time, and the environment generally reverts to the pre-project condition. Long-term impacts can range from "low" to "significant" impacts levels (see below) and can sometimes result in permanent alterations to the environment. Long-term impacts are defined as those

impacts whose results endure more than five years. The consequences of potential impacts have been divided into four categories:

Severe-Impacts that are substantial and therefore should receive the greatest attention in decision-making;
Moderate -Impacts which cause a degree of change that is easy to detect but do not meet the criteria for significant impacts;
Low or Limited-Impacts which cannot be easily detected and cause little change in the existing environment;
None or Negligible –No increased impact would occur to this element under the identified alternative.

This impact analysis assumes full implementation of the specific mitigation measures, Conditions of Approval, the 12 point Surface Use Plan contained in the APD, and standard oil field BMPs.

4.2 Environmental Consequences

4.2.1 Air Quality

Alternative 1: Proposed Action
Air emissions associated with natural gas production include hydrocarbons, carbon monoxide (CO) and nitrogen oxides (NOx) from separators, vents, and compressor plants. Air quality permits are required for emission sources on the well pads if established emission thresholds for designated pollutants are exceeded. Emissions from construction equipment, generators, production equipment, and service vehicles also add to air quality impacts.

Additionally, fugitive dust from wind erosion and vehicle operations can lead to increased suspension of particulate matter. Bare construction sites and increased traffic on un-paved roads associated with oil and gas development would lead to an increase in suspended particulates.

During construction, short term decrease in local air quality is expected in the vicinity of the proposed action. Exhaust and fugitive dust would subside once the well is constructed, completed, and interim reclamation is established. Impacts associated with the construction and drilling of a single well are not expected to influence regional air quality to any degree of significance.

Production and Operation of the well would result in approximately one (1) inspection daily. Workovers and maintenance would occur occasionally over the productive life of the well. Additional localized impacts are expected to occur due to emissions from production equipment. A pumpjack may be added if the need for artificial lift is required. This would likely occur within 3-5 years after completion. These impacts should be considered low to negligible.

Regional air quality standards as stated above are close to non-attainment for Ozone levels.

Alternative 1: Mitigation

1. Questar would apply water for dust control if necessary.
2. Surface disturbance and vehicular traffic would be limited to the approved location to reduce combustive emissions and dust.
3. Questar would comply with the Clean Air Act and all applicable state and local regulations.
4. Questar would complete interim reclamation and revegetation immediately after the well is in production according to BLM specifications. Final reclamation would be completed when the well is plugged and abandoned.
5. Questar would limit flaring, venting, and vehicle idling.
6. Questar would use car pooling for its drill crews.
7. Questar would use an existing central tank battery for storage of produced liquids.
8. The use of "Best Management Practices" (BMPs) designed to reduce impacts to air quality by reducing all emissions from field production and operations would be implemented. These measures would include:
   - Flaring of hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion.
   - Requirement that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored.
   - Placement of compressors engines with 300 horsepower or less must have nitrous oxide emissions limited to 2 grams per horsepower hour.

Alternative 2: No Action

Under the No Action Alternative there would be no impact to air quality in the Monument. No mitigation would be required.

4.2.2 Cultural Resources

Alternative 1: Proposed Action

The Proposed Action was determined to have no effect on recorded cultural sites because it would avoid all recorded and NHP eligible sites located in the vicinity of the project. All sites in the vicinity would be avoided and protected during all construction activities. Under the Proposed Action there is the potential to disturb undiscovered cultural resources. There are required protocols should a previously unknown site be encountered.

Alternative 1: Mitigation

1. It is the responsibility of the operator to inform all employees, contractors, and subcontractors before beginning any activities on this project, of the specific protective measures for cultural resources; and to notify them that disturbance to, defacement of, or collection or removal of archaeological, historic, or sacred material is prohibited by law on Federal land. Violations of

the laws that protect these resources would be treated as criminal or civil violations by the BLM.

2. Disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the Bureau of Land Management, is prohibited under provisions of the Archaeological Resources Protection Act. Cultural resource permittees of the Bureau of Land Management are allowed to use this information during the course of the project for site protection purposes only. Unauthorized use or distribution of this information is considered a violation of Federal statute.

3. Pursuant to 43 CFR 10.4 the holder of this authorization must notify the Canyons of the Ancients National Monument Archaeologist, (970-882-5614), by telephone, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. The operator must stop activities in the vicinity of the discovery and protect the remains. The procedures noted below would be followed.

4. If previously unidentified cultural resources are discovered during construction, activity in the vicinity of the resource would cease, the resource would be protected, and the Canyons of the Ancients National Monument Archaeologist, (970-882-5614) notified immediately. The operator shall take any measures requested by the BLM to protect the resources until they can be evaluated and treated. The discovered resources would be documented and evaluated by a permitted archaeologist. The permitted archaeologist, in consultation with the BLM archaeologist, would make a determination of the nature and significance of the discovery, and would determine the appropriate method of treatment for it. Avoidance is the preferable treatment. However, if the resources cannot be avoided, the appropriate treatment method would be determined, and the permitted archaeologist would prepare any and all necessary treatment plans. These plans would be reviewed and approved by the BLM. Treatment activities would be conducted after all necessary consultations have been completed as required by Section 106 of the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act. The BLM would be responsible for conducting all necessary consultations. Construction within the area of the discovery would be allowed to proceed after the appropriate treatment has been completed.

5. The operator would hire a permitted archaeological firm to oversee compliance with the protective measures specified in the attached Table 4, to perform archaeological monitoring, and submit the written results of monitoring to the BLM in a timely manner.

6. Installation of temporary protective fencing would occur prior to the start of any construction activities, under the direction of the archaeologist working under permit as specified in item 5. All initial ground disturbing activities associated with well pad, road, and pipeline construction would be monitored by the archaeologist.

7. All mechanized equipment associated with the project would be confined to previously disturbed areas (the existing roads, borrow ditches, and well pad). No new ground disturbance is authorized.

Alternative 2: No Action

Under the No-Action Alternative there would be no impact to cultural resources. There would be no mitigation required.

4.2.3 Native American Religious Concerns

Alternative 1: Proposed Action
No traditional cultural properties, sacred sites, or use areas were identified during the cultural resource assessment. The Proposed Action would have no impact to identified traditional cultural properties.

The monument consults with 25 Native American Tribes and Pueblos for planning projects within the monument as a standard protocol. Input received from these consultations would be considered in the decision made by the authorized official.

Alternative 2: No Action

The No Action would have no impact to identified traditional cultural properties. No mitigation would be necessary.

4.2.4 Environmental Justice

The families that own land and reside in close proximity to the well, or along its access routes would experience the disturbance more heavily than other residences and land users in the area. Temporary construction impacts including noise, dust, and traffic would last for a short period of time. Long-term effects including noise, traffic, and reduction of air quality would be locally more acute then in the general vicinity Indirect effects could include positive effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to the state and county governments related to royalty payments and severance taxes. Indirect negative effects could include an increase in activity, traffic, and noise disturbance in areas used for grazing or hunting, and on roads used by area residents. These effects would not apply to all land users in the project area equally.

Alternative 1: Proposed Action
The Proposed Action, due to its non-locatable nature does not benefit from locating in a specific area. Exploration and production (E&P) activities can only be located where the resource is likely to be found. The area where the well is proposed is on public lands in a relatively sparsely populated portion of Montezuma County. The county has experienced sustained drill activities and routinely works with operators to enter into road use agreements and ensure the public welfare. The Proposed Action would affect all individuals who use the project area within the Monument proportionate to their type and level of use.

The impacts to Environmental Justice in the area should be considered low to negligible and adverse. These impacts would be most prevalent during the construction and drilling of the Proposed Action and would lessen during the productive life of the well.

Alternative 2: No Action

Under the No Action Alternative there would be no potential impacts to environmental justice. No mitigation would be required.

4.2.5 Invasive and Non-native Species

Surface disturbance on arid range lands in the west leaves them vulnerable to invasion by noxious weeds. Previous disturbance has resulted in the establishment of some weeds within the project area.

Alternative 1: Proposed Action
The proposed action would result in approximately 5.26 acres of surface re-disturbance. This could provide opportunity for weeds to become further established. If weeds were to become established within the disturbance limits this should be considered a moderate adverse effect on the existing environment. Under the Proposed Action Questar is required to control weed infestations.

Weeds would not be expected to spread rapidly outside project limits into areas with healthy natural vegetation. Weeds, however, could spread rapidly and out-compete native vegetation in areas with sustained drought, heavy grazing pressure, or other surface disturbing activities.

Alternative 1: Mitigation

1. Questar would eradicate weeds within any disturbed areas or on adjacent lands associated with their lease activity.
2. After construction is complete, Questar would monitor disturbed areas biannually for weeds until revegetation is complete. Complete revegetation determination would be made by a BLM natural resource specialist.
3. Questar would consult with the BLM before any weed control activities are inititiated.

Alternative 2: No Action
Weeds within the project would be expected to be replaced by natural vegetation overtime (10+ years) if the BLM did not undertake specific management activities. No new surface disturbance would occur in the area.

4.2.6 Threatened or Endangered Species

Alternative 1: Proposed Action
There would be no impact under the proposed action to federally listed Threatened and Endangered plant species. As determined by BLM resource specialists, there is no suitable

habitat within the project area for the listed species. Please see BLM Clearance Report attached as Appendix 3 for more information.

There would be no impact to federally listed Threatened and Endangered wildlife species. No suitable habitat for listed species occurs within the project area. No mitigation would be required.

Alternative 2: No Action
Under the No Action alternative there would be no impact to Federally Listed Species. No Mitigation would be required.

4.2.7 Hazardous and Solid Wastes

This existing disturbance as well as proposed construction and oil and gas activities in the general area may have and could potentially result in the presence of hazardous or solid wastes in the area. Such wastes would include crude oil and natural gas from spills or leaks, construction debris, and drilling fluids and chemicals used in drilling, completing, and maintaining oil and gas production activities. Cement, paint, fuels, and other materials typical of a job site are also occasionally found in the area.

Alternative 1: Proposed Action

Construction and drilling of an oil and gas well would generate both hazardous and solid wastes. These wastes would typically include drilling fluids, fuels, lubricants, drill bits, piping, food stuffs, packaging materials, wood scraps, human waste, etc.

In addition, drilling could result in a blowout or the production of hydrogen sulfide (H_2S) gas. All these wastes likely to be generated are typical of drilling and are handled according to industry standards. Some hazardous materials such as proprietary drilling fluids, fracing solutions, paint, fuel, and cement would be stored on site during construction. These materials would be stored safely in accordance with their respective Material Safety Data Sheets (MSDSs).

The presence of hazardous and solid wastes during construction and operation of the well pose a potentially low-moderate adverse effect on the local environment in the case of a spill. Through proper storage, maintenance, and operations Questar would remove much of the potential for a spill but can not completely eliminate the possibility. Trace amounts of materials maybe present onsite for many years; these should be considered a low and long-term adverse impact.

In addition, drilling could result in a blow out or the production of hydrogen sulfide (H2S) gas. The Application for Permit to Drill (APD), approved by the BLM, requires protective measures and contingencies to address these safety issues.

Alternative 1: Mitigation

1. Questar would store all hazardous materials according to their MSDS.
2. A trash cage would be onsite. Questar would place all non-hazardous solid wastes inside this bin and remove it from the well site. Wastes would be disposed of at the county landfill.
3. Questar would build, berm, and line a reserve tank to prevent overflow of drilling materials. Industry BMPs would be employed to prevent the possibility of a spill, blowout, or overflow.
4. Any hazardous materials and wastes would be contained and disposed of off-site at an approved location.
5. Spill kits would be kept on site. All spills would be cleaned up immediately and reported immediately to the BLM.
6. There would be an appropriate number of chemical toilets onsite. These would be cleaned and emptied as needed.
7. All food scraps would be disposed of appropriately. There would be no cooking or campfires onsite.
8. Production equipment would be installed according to industry standards. This would include a berm to contain potential leaks.
9. Questar would have in place all standard and safety requirements as described in the approved H_2S plan.

Alternative 2: No Action

There would be no new increase in wastes within the project area. No mitigation measures would be required.

4.2.8 Water Quality, Surface and Ground

Alternative 1: Proposed Action

The Proposed Action involves the construction, drilling, and operation of a gas well on Mockingbird Mesa. There is limited connectivity to surface and ground water from the location. By the nature of its setting this reduces the possibility of potential impacts to water quality.

Oil and gas activities, however, do elevate the potential risk to water quality. All operations would be conducted in a safe manner complying with applicable rules and regulations as well as industry standards and BMPs.

Alternative 1: Mitigation

1. Questar would keep the job site clean and free of potential hazards.
2. Spill kits would be onsite. All spills would be contained and cleaned immediately and reported.
3. Questar would build, berm, and line a reserve tank to prevent overflow of drilling materials. Industry BMPs would be employed to prevent the possibility of a spill, or overflow.

4. Any hazardous materials and wastes would be contained and disposed of off-site at a state approved location.
5. There would be chemical toilets onsite. These would be cleaned, maintained, and their contents would be hauled to a state approved disposal site.
6. All food scraps would be disposed of covered trash containers on site and ultimately disposed of at an approved state facility. There would be no cooking or campfires onsite.
7. Production equipment would be installed according to industry standards. This would include a berm to contain potential leaks.

Alternative 2: No Action
There would be no change associated with water quality under the No Action Alternative. No mitigation would be required.

4.2.9 General Topography and Surface Geology

Alternative 1: Proposed Action
5.26 acres of previously disturbed surface would be re-disturbed. If the well is not a producer, or when the well reaches the end of its service life, the site would be reclaimed as described in section 2.1.4. If the well produces, a small tear-drop-shaped work area would be left flat and the roads would be maintained. The majority of the pad would remain level, but be reseeded with native vegetation. All other areas would be reclaimed as described in Section 2.1.4. The Proposed Action would affect the surface topography until the area is revegetated. The operator would be required to re-seed the area until the BLM determines reclamation is successful.

Alternative 2: No Action
No impact to topographic or geologic resources is expected. No mitigation is required.

4.2.10 Mineral Resources

Alternative 1: Proposed Action
The Proposed Action would allow Questar to efficiently develop and produce valuable federal mineral resources that it has leased as part of its Cutthroat Unit. Questar plans to produce gas in paying quantities according to applicable federal and state rules and regulations. The Proposed Action is planned to lead to continued production of natural gas to meet the public demand and the payment of royalties to the federal and state governments.

Alternative 1: Mitigation
No site specific mitigation is required. All operations would be conducted in a workmanlike manner, according to standard oil field practices and BMPs and in compliance with all federal, state, and local rules and regulations.

Alternative 2: No Action
The No Action Alternative would leave Questar unable to efficiently develop its leased federal minerals within the Cutthroat Unit. The mineral resources would remain in place and undeveloped. Questar and the Federal governments as stakeholders in the mineral resource

would experience a moderate negative impact from the implementation of the No Action Alternative.

Alternative 2: Mitigation
No mitigation to the mineral resource is planned under the No Action Alternative.

4.2.11 Soils, Watershed, and Hydrology

Alternative 1: Proposed Action
Under the Proposed Action approximately 5.26 acres of previously disturbed surface would be cleared and impacted. The soil would be structurally reduced and mixing of soils would occur. The seedbank within the project area would be disturbed and some of the seed bank's potential would be lost.

Precipitation that falls on the newly disturbed areas would likely infiltrate at a lower rate and therefore surface runoff from the project site would be greater. Linear features (road and pipeline) for the Proposed Action would be constructed with drainage and runoff protection. This would include culverts, rolling dips, and borrow ditches as appropriate (see road stipulations attached as Appendix 5).

The Cutthroat Unit #1-23 well pad would be constructed to provide drainage away from the reserve pit. All run-off would be managed to reduce run-off and erosion off pad. These impacts would be highly localized, limited in nature and reduced to negligible in the short-term as vegetation becomes re-established in 1-3 years.

Alternative 1: Mitigation
No site specific mitigation would be required. All activities would comply with the COAs, attached appendices, industry standards and BMPs and the State of Colorado's storm water permitting program.

Alternative 2: No Action
No impacts are expected under the No Action Alternative. No mitigation would be required.

4.2.12 Paleontology

Alternative 1: Proposed Action
Under the Proposed Action, there exists the possibility of discovering paleontological resources. The likelihood of discovery is low given the location of the project, the nature of the activity, past disturbance, and the presence of loamy soils at the project site.

Alternative 1: Mitigation

1. If paleontological resources are unearthed during construction or drilling, all activities in the vicinity of the discovery would cease. Questar and its agents, contractors, and employees would take immediate responsibility for securing and protecting the resources.
2. The BLM would be notified of the discovery immediately.
3. Questar has limited its operation to previously disturbed areas in order to reduce the possibility of discovering new resources.

Alternative 2: No Action

Under the No-Action Alternative there would be no activities associated with the Cutthroat Unit 1-23 that have a possibility of impacting paleontological resources.

4.2.13 Vegetation and Forestry

Alternative 1: Proposed Action

Under the Proposed Action approximately 5.26 acres of previously disturbed surface area would be impacted. This area would be cleared of vegetation, surface excavation would occur, and then the area would be recontoured and revegetated. The majority of the well pad would remain level during the productive life of the well. A smaller tear drop area (approximately $^{1}/_{3}$ of an acre) would be left flat and clear of vegetation greater than 6 in. in height. These areas would be used for maintenance, operations, driving, parking, and workovers as required.

One to three years after surface disturbance vegetation in the disturbed area would likely be fully revegetated. At this time, natural processes would likely lead to the disturbed area undergoing a slow transition from being dominated by grasses and forbs to and increased percentage of ground cover provided by shrubs and seedlings. In the long-term the disturbed surface would transition to the piñon and juniper dominated woodland that surrounds it. Other processes such as drought and fire may impact the area and cause differing outcomes.

As a result of the limited area affected this impact should be considered a low and negative. There is some evidence to suggest that revegetation with grass, forbs, and shrubs may be beneficial as it is likely to provide greater forage for both wild and domestic animals and a greater percentage of ground cover than the piñon and juniper woodland, thus slowing runoff and assisting in absorption.

Alternative 1: Mitigation

Effective reclamation would be pursued as described in Section 2.1.4.

Alternative 2: No Action

Under the No Action Alternative no new impact would occur. The project area would be dominated by natural processes. No new mitigation would be required.

4.2.14 Rangeland Management

Alternative 1: Proposed Action
Up to 5.26 acres of previously disturbed rangeland would be disturbed by the Proposed Action. This would result in a slight reduction of available forage in the Cahone Mesa Grazing Allotment for 1-3 years while the area was revegetating. After reclamation is complete the area may see a slight increase in forage quality for several years while grasses and forbs are dominant and before shrubs and bushes re-colonize. Any impacts to range resources would be temporary in nature and low or limited in severity.

Alternative 1: Mitigation

1. The area would be reclaimed as described above (see Sections 4.2.13 and 2.1.4)
2. Questar would assume immediate responsibility for the prevention and control of any noxious or invasive weeds within the disturbed areas.

Alternative 2: No Action
There would be no noticeable change to range resources under the No Action Alternative. No mitigation would be required.

4.2.15 Special Status Species

Alternative 1: Proposed Action
There would be no impact to special status plant species under the Proposed Action. No mitigation for impacts to plant species would be required.

Three BLM listed sensitive species have the potential to occur within the project area (see table 4.2.15 below).

Table 4.2.15 List of species of management concern occurring in Montezuma County, Colorado with potential to occur within the project area.

Species	Federal Status	Habitat	Project Area Habitat Suitability
Yuma myotis (*Myotis yumanensis yumanensis*)	BLM	Inhabits semi-deserts, riparian and pinyon/juniper woodlands	Suitable habitat exists
Fringed myotis *(Myotis thysanodes)*	BLM	Inhabits caves, mines, and buildings, most often in desert and woodland areas.	Suitable habitat exists
Allan's big-eared bat (*Idionycteris phyllotis*)	BLM	Inhabits caves, mines, and buildings, most often in woodland areas.	Suitable habitat exists

Suitable habitat exists for three bat species listed as BLM Sensitive Species at the site or within the vicinity of the Proposed Action. As a result of the Proposed Action approximately 5.26 acres of suitable habitat would be temporarily disturbed. Given that all disturbance would be limited to previous disturbance limits and that there would be limited removal of small trees, this

Proposed Action should result in a limited to negligible adverse impact on BLM listed sensitive species.

Alternative 1: Mitigation

1. The area would be reclaimed as described above (see Sections 4.2.13 and 2.1.4)
2. Questar would screen, net, or close all cavities, openings, or hazards for wildlife.

Alternative 2: No Action
No impact to BLM listed sensitive species is expected under the No Action Alternative. No mitigation would be required.

4.2.16 Wildlife

Alternative 1: Proposed Action
As a result of the Proposed Action approximately 5.26 acres of wildlife habitat would be disturbed. All disturbance would be limited to previous disturbance limits and that there would be limited removal of small trees. This disturbance and the linear nature of the road would lead to increased wildlife fragmentation in the local area.

In addition to 5.26 acres of productive habitat being removed, wildlife may avoid the area during drilling due to noise and activity, and habitat would be altered for up to 25 or more years in an area where habitat recovery takes a great deal of time. There may be a limited adverse impact to birds and small animals as a result of becoming trapped in surface or production equipment. Ongoing during the productive lifetime would be vehicle trips, noise, and surface occupancy associated with production, maintenance, and operation at the well site.

The Proposed Action would employ effective interim and final reclamation, production pipelines, and also limit disturbance to previously disturbed areas. These actions would greatly reduce the amount of fragmentation associated with the Proposed Action. As a result of the limited size and nature of the Proposed Action, and these and other mitigation measure the impact resulting from the disturbance should be considered a limited adverse impact to wildlife. The Proposed Action's size only represents a small fraction of the habitat available to wildlife.

Alternative 1: Mitigation

1. The area would be reclaimed as described above (see Sections 4.2.13 and 2.1.4)
2. Questar would screen, net, or close all cavities, openings, or hazards for wildlife.
3. Flow lines installed would minimize Questar's need to make vehicle trips to the wells site, thereby minimizing disturbance over the productive life of the well.
4. Questar and its employees would adhere to speed limits to minimize impacts to wildlife from direct collision and noise.
5. All surface equipment and motor vehicles would be equipped with factory installed (or equivalent) hospital mufflers and low emission exhaust systems.

Alternative 2: No Action

Under the No Action Alternative there would be no change or increase in impacts to wildlife resources. No mitigation would be required.

4.2.17 Recreation

Alternative 1: Proposed Action
During drilling phases of the well there would be a localized moderate negative impact to recreation resources in the close proximity of the Proposed Action. This would result most acutely from increased noise and traffic associated with the construction, drilling, and completion of a gas well.

Those recreating in the area may be disturbed by noise, dust, and the visual intrusion into the landscape, when they are looking for a "quiet, natural" environment. These impacts would be temporary.

Short and long-term the visual impacts may seem out of place in the mainly naturalistic environment. There would also be an increase in traffic on the Mockingbird Mesa by approximately 1 vehicle per day. Please also see Appendix 2. These impacts would be similar to the impacts already existing on the Mockingbird Mesa from development activities. Another well and associated activities would increase slightly the potential for disturbance and decrease the feeling of quiet, solitude, and naturalness of the setting. The short and long-term impacts to recreation resources should be considered low and negative.

Alternative 1: Mitigation
Effective reclamation would be pursued (see section 2.1.4).

Alternative 2: No Action
No change to recreation resources is expected. No mitigation would be required.

4.2.18 Visual Resources

Alternative 1: Proposed Action

The well site location has been designed to minimize the location's intrusion in the visual resources of the surrounding area. The location is in an already existing disturbance as discussed above. The well is located in a slight depression with a northwest facing aspect. Surface equipment would be low profile with a maximum height of ten feet (see Figure 5).

During construction, drilling, and completion visual impacts at the well location are expected to be most severe. These impacts would include non-painted surface equipment, bare and disturbed soils and vegetation, heavy construction equipment, pits, and the drill rig. The drill rig (120' in height) would be illuminated at night. The completion rig (60-100' in height) would not be illuminated. During construction, drilling, and completion, Questar may need to flare gas as a safety measure. Flaring would be limited to what is necessary for safe and efficient operations as regulated by the BLM.

The access (as shown in Figure 8; see Visual Resource Management Plan) to the Proposed Action is approximately 1598 feet long with a proposed width of 30 feet. The road is located within existing surface disturbance for its entire length. It intersects the Mockingbird Mesa road from the west at a nearly perpendicular angle. For the first approximately 648 feet (190m) the road runs slightly down hill and then uphill, paralleling an old seismic trail. From the Mockingbird Mesa Road the line of sight extends beyond the access route along the seismic trail (See Figure 4). The remaining 950 feet of the access cut nearly due north from the seismic trail along existing disturbance to the proposed location. This stretch of access never has sight lines of more than 328 feet. Along the entire length of access ROW, approximately five (5) immature trees would be removed.

To minimize the access footprint, the ROW width has been limited to 25 feet, and the route was chosen to follow the existing disturbance.

Management direction has determined that this area be managed Class IV VRM rating. The visual resource management plan attached as Appendix 2 concluded that after reclamation was complete the project area would meet the requirements of a Class III area. Given these ratings the Proposed Action should be considered a limited negative impact to visual resources.

Alternative 1: Mitigation

1. All surface equipment would be painted flat Yuma green if it is over four (4) feet in total height. Surface equipment under four (4) feet in total height would be painted Yuma Green. These standard environmental colors were chosen at on-site meetings with BLM resource specialists to minimize contrast with the existing environment.
2. Feathering along the northwest and southeast edges of the disturbance would also be used to break up the "line" of the disturbance. Feathering would be done on foot with a chainsaw. Less than 30 trees total would be removed.
3. Reclamation activities would include: controlling weeds and invasive species, mulching, drilling seed, and reseeding if required.

Alternative 2: No Action
There would be no anticipated impact to visual resources associated with the No Action Alternative. No mitigation would be required.

4.2.19 Public Health and Safety

Alternative 1: Proposed Action
Due to the relative remoteness of the Proposed Action there would be a negligible adverse impact to public health and safety. All operations would be conducted according to applicable rules and regulations, in a workmanlike manner, and in accordance with safety, operations, and maintenance plans, BMPs, and industry standards.

Alternative 1: Mitigation

No site specific mitigation is required

Alternative 2: No Action
Under the No Action Alternative there would be no impacts to public health and safety. No mitigation is required

4.2.20 Noise

Alternative 1: Proposed Action
Temporary impacts in the form of noise associated with the traffic, heavy equipment operations, generators, and other engines should be considered moderate and negative. These would reduce to limited negative impacts associated with a producing well (and possible pump-jack) and traffic necessary to operate and maintain the well (approximately 1 vehicle per day).

Alternative 1: Mitigation
Due to its remote location no site specific mitigation measures are necessary. All operations would be conducted to standard oil field practices and equipment would be equipped with factory installed (or comparable) hospital mufflers and low emissions exhaust systems.

Alternative 2: No Action
Under the No Action Alternative no impacts in the form of noise would be expected. No mitigation would be required.

4.2.21 Socioeconomics

Alternative 1: Proposed Action
Under the Proposed Action, Questar would continue to develop in the Cutthroat Unit to produce valuable natural gas. Continued development of mineral leases and production of oil and gas are strategic to Questar's operations. Mineral royalties and in lieu of tax payments are important for federal, state, and local governments.

The mineral sector forms an important basic industry for Montezuma County. Direct employment by the oil and gas industry, government jobs, oil and gas service companies such as welders and dirt contractors, as well as money spent in the local economy comprise an important part of the local and regional economy. The sector, with its spinoff effects, relies on continued exploration and production on both new and existing leases.

The overall impact to the socioeconomics of the local area from Questar's continued operations in the Cutthroat Unit should be considered moderate and beneficial. No mitigation is planned for socioeconomic resources under the Proposed Action.

Alternative 2: No Action
Under the No Action Alternative, this well would not be developed. Expenditures in the Montezuma County area, including wages and contracting of services associated with the drilling

of the Cutthroat 1-23 would be lost. These impacts of the No Action Alternative should be considered moderately negative.

Alternative 2: Mitigation
No mitigation of impacts to socioeconomic impacts is planned.

4.2.22 Fire

Alternative 1: Proposed Action
An increase in local construction activity slightly raises the potential for human caused fires. Since all construction activities would take place in cleared areas free of debris the increased chance of human caused fire associated with the Proposed Action should be considered negligible.
Alternative 1: Mitigation

1. Questar would conduct its operations is a prudent, fire-wise manner. The site would be kept free of debris and potential fire hazards.
2. There would be no smoking onsite. Smoking would only be allowed in company vehicles and trailers.
3. There would be no camp, cooking, or warming fires on site.

Alternative 2: No Action
There would be no change to fire potential or the possibility of human caused fire. No mitigation would be required.

5.0 Cumulative Impacts

5.1 Cumulative Effects

Cumulative effects are those effects determined by adding the incremental impacts of a proposed action to other past, present, and reasonably foreseeable actions in the Area of Influence (AOI), which varies by resource.

Cumulative effects can be identified both quantitatively and qualitatively. Cumulative effects are evaluated by identifying a spatial and temporal boundary. Because of the widespread oil and gas development activity in the planning area, the entire planning area is being used as the area evaluated. Reasonably foreseeable effects are estimated for about 10 years into the future (approximately one planning period). Past and existing activities within the planning area that have impacted resources include:

- Oil and gas exploration, production, and transport;
- Livestock grazing activities; and
- Recreation activities, principally hunting and off-road travel

As for future oil and gas activity, increasing demands for domestic sources of energy suggest that more oil and gas development would occur within the Monument. The Cutthroat Unit is

considered a mature field as it has been producing fluid minerals since 1974. Without new production, the life of this field is estimated to last for at least ten more years. The twenty year projected numbers of new oil and gas natural gas wells within the Cutthroat Unit are estimated to be 22 new wells. This includes 18 in the Ismay/Desert Creek formations and 4 in the Cutler/Honaker Trail formations. (USDI BLM, Reasonable Foreseeable Development for Oil, Gas & Carbon Monoxide in the Canyons of the Ancients National Monument, Canyons of the Ancients National Monument, 2005) New shale gas plays including the Gothic and Hovenweep Shales are currently being explored on the western side of the Paradox Basin, adjacent to the Monument. The Gothic Shale diminishes in thickness under the Monument and is not a feasible formation to explore. However, the Hovenweep Shale is considered a potential play underneath the Monument. Although early shows are hopeful by industry standards the exploration is in its infancy and therefore an accurate development scenario is premature.

Increases in grazing and recreational pressures in this area are not foreseen. Therefore, the existing grazing effects (reduction in vegetation height, trampling and soil compaction, etc.) would remain unchanged. Current effects on the land from grazing and recreational activities are within acceptable limits. Thus, the cumulative impacts discussion focuses only on the effects of additional oil and gas development.

The Area of Interest for most resources would be the immediate vicinity of the proposed well pad. The design criteria and mitigation measures built into the Proposed Project would reduce the potential impacts of this proposal to minimal levels for most resources. Therefore, the majority of the effects generated by this proposal would be confined to the immediate area of development.

Expected oil and gas activities were evaluated in the 1991 Oil and Gas Leasing and Development Final Environmental Impact Statement (1991 FEIS). The 1991 FEIS estimated that over a 20-year period (1989-2009), about 2% of the land (1,430 acres) within the planning area (entire San Juan Resource Area) would be impacted by oil and gas development (1991 FEIS Page 2-2). The total disturbance from all surface disturbing activities predicted during that time was estimated at 84,660 acres (1991 FEIS Page 4-30). The 1991 FEIS did not break out the Monument as a separate land area because the Monument was not established until 2000. The 1991 FEIS predicted that over this 10-year period, 353 new wells (wildcat and development) would be drilled in the entire San Juan Resource Area. Dividing 353 wells over 1430 acres of disturbance gives an average disturbance of about 4.0 acres/well. Although the proposed action would be a new well, it would be located on previously disturbed surface, and would not contribute new acres of disturbance.

In using data provided by the Colorado Oil and Gas Conservation Commission (COGCC), there are 293 Producing, Dry and Abandoned, Plugged and Abandoned, Temporarily Abandoned, and Waiting on Completion wells on the San Juan Resource Area (including the Monument). The data provided is current as of 6/24/2009. The COGCC data does not provide a date for when each well was drilled, so it is unknown how many wells were drilled before and after 1991. However, the total number of wells (293) in the categories listed above is below the 353 provided for in the 1991 FEIS.

The 1991 FEIS evaluated the cumulative effects of oil and gas development with the impacts of all other BLM management activities. The EIS concluded that the major concern was the amount of surface disturbance resulting from oil and gas activity when added to that of other surface disturbing activities. However, with the expected disturbance, described above, the 1991 EIS, on page 4-28, concluded the following:

> *"The amounts of surface disturbance that are anticipated would have an insignificant impact on forage for livestock, wild horses, and on soil and water resources. Any impacts to these environmental components would be local and short term. Similarly, impacts to forest resources, recreation uses, visual resources, wilderness values land use authorizations, social and economic conditions and other mineral development is expected to be local and short term."*

The 1991 FEIS identified cumulative impacts to cultural resources as a particularly acute management concern. In addition, the Monument Manger has identified impacts to cultural resources in the Monument as a principal concern, and has stated that all developments, even if they do not directly affect sites in the Monument, put increasing pressure on the objects protected within the Monument. Therefore, every oil and gas development project contributes towards a cumulative effect on cultural resources. Cumulative effects from oil and gas developments occur from the construction of pads and roads, increases in vehicle traffic, increases in pedestrian traffic, increased access leading to increased recreation, and looting of resources and vandalism of sites.

The direct and indirect effects from this proposal that would reasonably contribute towards a cumulative effect in the Monument are shown in Table 5.2 below.

Table 5.2			
Cumulative Effects Summary			
Affected Resource	**Direct and Indirect Effects from this Proposal**	**Effects from Past, Present and Reasonably Foreseeable Actions**	**Conclusion**
Cultural Resources	The Proposed Action has been designed to avoid impacts to cultural resources within the project area. Therefore, this project would not directly contribute towards a cumulative effect of damage to cultural resources and/or sites within the Monument. However, every project in the Monument contributes towards a cumulative pressure on the cultural resources protected within the Monument. This project would provide increased access into the Monument, which would lead to increased vehicle and pedestrian traffic. This increase can lead to site damage and increases in possible vandalism and looting of sites. In addition, every project in the Monument also disturbs the continuity of connections between sites.	Oil and gas projects put pressure on the cultural resources protected by the Monument. The continuity of connections between cultural sites has been disrupted through the construction of roads and well pads. Increased access into the Monument has led to increases in looting and site damage. Future oil and gas projects would continue these contributions.	Because the Monument is so dense with cultural resources and sites, many of which are connected, every project, even though it may not directly disturb cultural resources does have a cumulative effect contribution in placing increased pressure on the sites within the Monument. Also, every oil and gas activity affects the continuity of connections between cultural sites. However, since this proposed action is on an existing pad, the disturbance to site continuity has already occurred. Therefore, this proposed action's contribution towards a cumulative disturbance on the connections between sites would be minimal. Every oil and gas project provides for increased access into the Monument. Although this is an existing pad, new activity would be occurring. This activity would result in increased vehicle and pedestrian traffic. This increase would contribute towards a cumulative effect on site damage, looting, and vandalism of sites. Law enforcement activities in the Monument have increased to partially offset looting and vandalism of sites.
Wildlife	Immediate loss of 5.26 acres of habitat and possible long-term loss of several acres of habitat if the well is a producer. Disturbance would also result in habitat fragmentation.	Loss of habitat and fragmentation of habitat due to the construction of roads and well pads. More oil and gas activity is expected in the future. Reclamation efforts have restored the habitat in some of these areas.	Because the site has been reclaimed, the new disturbance would contribute towards a cumulative effect in the fragmentation of wildlife habitat. All disturbed areas would be reclaimed, either in the short-term (if well is not a producer), or the long-term (if well is a producer). No wildlife thresholds have been identified, and therefore none would be exceeded. In some instances, sites have been in better condition after

			reclamation than they were before the disturbance due to the removal of dead vegetation and reseeding with native vegetation.
Noxious Weeds	Disturbance of soil which allows noxious weeds to establish.	Spread and establishment of noxious weeds due to past construction of roads and well pads. This activity is expected to continue in the future. Weed control plans are used to attempt to limit the spread of noxious weeds.	Although the spread of noxious weeds is a cumulative contribution, weed control measures would reduce the spread of noxious weeds to minimal levels. As described above, the area would be fully reclaimed in the future. This may be in the near future if it is a dry hole, or further out in time if the well is a producer.
Socioeconomics	Short-term influx of revenue into the economy from construction and drilling operations. Possible long term generation of royalties if the well is a producer.	Portions of the local economy depend on income generated from oil and gas activities.	If the well is a producer, it would combine with all the other producing wells for a cumulative contribution of revenue into the local economy.

All other direct and indirect effects identified in this EA would not contribute towards a cumulative impact for the following reasons:

- The impacts to all other affected resources, for example soil, public health and safety, and water are effectively eliminated or reduced to an unquantifiable amount by design criteria contained within the APD Surface Use Plan and applicable COAs.
- The impacts are temporary and would only occur during the construction and drilling period. For example, air quality impacts from vehicle and drilling rig exhaust are temporary and not necessarily additive. After construction and drilling operations are completed, the equipment moves to another area. For this reason, it was not reasonably anticipated that construction and operation of this well would cumulatively contribute towards the ozone standard, described in section 3.2.1, being exceeded.

Cumulative impacts are evaluated against thresholds (when they exist) to help the Authorized Officer determine the magnitude of the cumulative effect contribution. Thresholds can come from various sources including law, the Resource Management Plan (RMP), policy, best available science, other NEPA documents, and the judgment of the Authorized Officer. The proposed activity is an allowable use under the RMP and is within the number of wells provided for in the 1991 FEIS. No thresholds for resources have been identified in association with oil and gas development for wildlife, noxious weeds, and socioeconomics. Therefore, the cumulative effect contribution of the proposal would not exceed any known effect thresholds for those resources.

However, a critical concern is the continuing pressure on cultural sites and objects within the Monument from oil and gas activities. The Monument Proclamation states that oil and gas exploration and development may continue, as long as the new activities do not interfere with the

proper care and management of the objects protected within the Monument. The proper care and management of the objects protected within the Monument are the responsibility of the Monument Manager. There is no established threshold for this pressure, or the disturbance of the continuity between cultural sites within the Monument. Therefore, judgment on whether this threshold would be reached is at the sole discretion of the Monument Manager.

6.0 Consultation and Coordination

The list below provides the individuals and agencies that have been consulted in the preparation and review of this Environmental Assessment:

NATIVE AMERICAN TRIBES:
The Northern Ute Tribe
The Ute Mountain Ute Tribe
The Southern Ute Tribe
The Navajo Nation
The Hopi Tribe
The Jicarilla Apache Tribe
The Pueblos of Acoma, Cochiti, Isleta, Jemez, Laguna, Nambe, Picuris, Pojoaque, Santa Ana, Santo Domingo, Sandia, San Felipe, Ohkay Owingeh, San Ildefonso, Santa Clara, Tesuque, Taos, Zia, and Zuni.

BLM/USFS: Canyon of the Ancients National Monument and San Juan Public Lands Office:
Linda Farnsworth – Archaeologist
Gary Ferdinando – Engineer
LouAnn Jacobson – Monument Manager/Authorized Officer
Mike Jensen – Rangeland Management Specialist
Eric La Price – Biological Scientist/NEPA Coordinator
Kathy Nickell – Wildlife Biologist
Cara MacMillian – Ecologist
Tom Rice – Natural Resource Specialist

Questar Exploration and Production Company
Jennifer Bates –Supervisor, Regulatory Affairs
Sarah Boxley –Permit Agent
Leonard Maez – Production Foreman
Laura Murno – Geologist

LaPlata Archeological Consultants
Steve Fuller – Archeologist
Leslie Sesler – Archeologist

Permits West, Inc.
Charles Black – Wildlife Biologist
Marian Rohman – Botanist
Brian Wood – Consultant

Benjamin Yanda – Natural Resource Specialist

7.0 List of Appendices

Appendix 1: 12-point Surface Use Plan
Appendix 2: VRM Analysis and Plan
Appendix 3: Botanical Clearance Report *(as provided by BLM)*
Appendix 4: Wildlife Report
Appendix 5: Road Standards *(as provided by BLM)*

8.0 References

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