

**U.S. Department of the Interior
Bureau of Land Management
White River Field Office
220 East Market St.
Meeker, CO 81641**

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-110-2010-0066-EA

CASEFILE/PROJECT NUMBER:

LEASE SERIAL NUMBER	WELL NUMBER
COC63331	33-42
COC63322	4-12
COC63331	33-33
COC61170	10-32

PROJECT NAME: Fletcher Gulch Coalbed Methane Project

LEGAL DESCRIPTIONS: 6th PM,
T. 2 N., R.100 W.,
Sec. 33: S1/2SE1/4, NW1/4SE1/4, SE1/4SW1/4

T.1 N., R.100 W.,
Sec. 4: NW1/4
Sec. 10: N1/2NW1/4, SE1/4NW1/4, NE1/4SW1/4

APPLICANT: Genesis Gas & Oil, LLC.

ISSUES AND CONCERNS: Disturbance acreages have been revised to reflect the new surveyed access routes to well locations for 33-33, 33-42 and 4-12, and the new location of pad 33-42. Stream depletion data received on 05/04/10.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

Background/Introduction: This environmental assessment (EA) is in response to Applications for Permit to Drill (APDs) received from Genesis Gas & Oil, LLC. (Genesis) to drill 4 gas wells with associated access roads, gas gathering pipelines, and wastewater collection pipelines. The project would be located in Rio Blanco County, Colorado, approximately 8 air miles east of Rangely in the vicinity of Fletcher Gulch and Yanks Gulch. All proposed wells and other facilities would occur on land administered by the Bureau of Land Management (BLM) within the Fletcher Gulch Oil and Gas Unit (BLM 2008a). Access to the project area from Colorado State Highway (SH) 64 would be via Rio Blanco County Road (CR) 122 and a number of additional existing dirt roads off of CR 122. The general project location is shown on the map in Appendix A, Figure 1. The proposed facilities would be integrated with the 18 Genesis wells

and associated roads and pipelines approved by BLM in 2009 (DOI-BLM-CO-110-2009-0180-EA) and the 12 Genesis pilot wells and associated roads and pipelines approved by BLM in 2006 and 2007 (DOI-BLM-CO-110-2006-200-EA and DOI-BLM-CO-110-2007-038-EA). A gas transmission pipeline to move produced gas from the Genesis wells to the natural gas distribution system (DOI-BLM-CO-110-2007-055-EA) and a compressor station for the pipeline (DOI-BLM-CO-110-2007-232-DNA) were also approved in 2007 and constructed in 2008. The proposed, approved, and existing facilities are shown in Appendix A, Figure 2.

Proposed Action: The proposed action includes the construction and operation of 4 gas wells for the production of coalbed methane. The proposal also includes the required access roads, culvert installation in minor drainages, production facilities on each pad location, and pipelines for produced gas and water. All proposed disturbance would take place on public land administered by the BLM. All proposed wells, roads, and pipelines would be on Genesis lease tracts. Table 1 provides a description of the range sites, soils, and elevations present at the proposed well sites.

Table 1. Well numbers, range sites, and elevations for the proposed well locations

Well Numbers ¹	Range Site/ Soil Mapping Unit	Elevation (ft)
4-12, 33-33, 33-42	Pinyon-juniper woodland / 74	6,200 – 6,700
10-32	Stony foothills / 91	6,100 – 6,320

¹ Range sites and soil mapping units (MUs) apply to the final well pad footprint and the area required for construction. A portion of the proposed access road to 10-32 occurs in the Foothill swale range site with soil MU 41.

Natural gas and water would be extracted from the Williams Fork Formation of the Mesa Verde group of geologic strata at depths ranging from 1,570 to 3,735 ft below surface. Depth variations are partly due to variances in surface elevations for each well location. Wastewater produced from the coal strata in the process of removing the methane would be disposed of by injection into the deeper Segó Formation, also part of the Mesa Verde group, at an unspecified depth. Produced water from the proposed wells would be injected into an existing injection well co-located with existing well 3-31. As the proposed wells are drilled, Genesis would monitor the rate of produced water and schedule new drilling accordingly. If the rate of water produced is projected to exceed the capacity of the existing injection well, Genesis would submit via Sundry Notice a proposal to drill a new injection well co-located on one of the wells proposed in this environmental assessment (EA) or the approved DOI-BLM-CO-110-2009-0180-EA. Initially, each well is expected to produce 200 to 300 barrels of water per day. As water is removed from the coal layer, it is expected that the volume of produced water would decrease. Production has the potential to occur over a period of 30 years.

All of the gas and wastewater collection pipelines for this project would be located in the same trench. To protect the integrity of the pipelines, they would be located in the borrow ditch for the road, 5 ft below the surface, or adjacent to the access roads except where steep slopes would result in excessive surface disturbance. In steep locations, the pipeline would be located within the roadway. Pipe to be used in the project would be plastic. Gas collection system pipe would vary from 4 to 12 inches in diameter, depending on the number of wells being served. Water collection pipeline diameter would vary from 2 to 4 inches depending on the number of wells being served and distance to the injection well. The gathering system would collect gas at the

existing compressor unit near existing well 3-22 for transport from the project area via the pipeline constructed in 2008 (see below, *Integration of the Proposed, Approved, and Existing Gathering Line*).

Genesis would improve or construct 6,948 ft (1.3 miles) of access roads with pipelines within a 50-ft right-of-way (ROW), resulting in 8 acres (ac) of disturbance. The construction of the 4 well pads would cause 9.5 ac of disturbance. Stormwater measures are included within the current proposed limits of disturbance. Total projected disturbance would equal 17.5 ac. Table 2 shows the acres of disturbance for each proposed well location and associated access road/pipeline. Acreages shown represent the maximum short-term disturbance prior to any interim reclamation. Once production has begun, interim reclamation activities would reshape the cut and fill slopes and reseed 8.5 of the 9.5 ac disturbed during pad construction, leaving approximately 0.25 ac around each wellhead unreclaimed.

Table 2. Disturbance estimates for proposed well pads, access roads, and pipelines that follow access roads

Well Number	Disturbed Area			Total per Well (ac)	Interim Reclamation (ac)	Total Excess Spoil (CY)
	Pad (ac) ^a	Access (ft)	Access (ac) ^b			
4-12	1.8	1,449	1.7	3.5	1.6	13,191
10-32	2.4	1,665.3	1.9	4.3	2.2	472
33-33	2.2	1,933	2.2	4.4	2.1	1,606
33-42	3.1	1,901	2.2	5.3	2.6	2,967
Totals	9.5	6,948.3	8	17.5	8.5	18,236

^a Estimate includes total acres disturbed for pad surface, cut-and-fill slopes, and stormwater control measures.

^b Estimate is based upon a 50-ft disturbance width along the length of the access route. Disturbance for all pipelines that parallel access routes or lie in the roadbed itself are included in this estimate.

Construction of each well location would take place in the following order:

1. Clear road and pad
2. Trench along or in the road for gas and water pipeline installation
3. Install gas and water gathering pipelines and bury
4. Dress up road and pad location
5. Drill and complete the well

Installation of the gathering pipelines at the time of road and pad construction would allow each well to be tied in to the gathering system immediately after well completion. As a consequence, venting of up to two million cubic feet equivalent (MMcfe) of gas from each well into the atmosphere should occur less frequently. Venting is used to flow back any nitrogen used in the completion process thereby allowing the produced gas to regain pipeline quality, as a production testing measure, and as a safety measure to prevent pressure and gas buildup in the operational system. The determinant to vent is arrived at by in-field operational factors at the time of completion.

All surface disturbing activities would conform to the standards in the *Oil and Gas Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (The Gold

Book) prepared by BLM and the U.S. Forest Service (Fourth Edition, revised 2007), BLM Manual 9113 (USDI BLM 1985), and all other applicable laws and regulations. An onsite walk-through of the proposed project was made by BLM on July 16 and 17, 2008 and November 20, 2008. In early January 2010, BLM, Natural Resource Specialist, Brett Smithers made a site visit to determine the preferred access routes to well locations 4-12, 33-33, and 33-42.

Integration of the Proposed, Approved, and Existing Gathering Line: Due to the way the existing, approved, and proposed gas collecting lines are integrated, approval of proposed wells 4-12, 33-33, and 33-42 is critical to the operation of 14 of the 18 wells approved in 2009 (DOI-BLM-CO-110-2009-0180-EA). Gas from wells 4-12, 33-33, and 33-42 would join the existing gathering system associated with the pilot project at existing well 33-44. An approved cross-country pipeline that runs north from approved well 4-31 in Fletcher Gulch to proposed well 4-12 would link all of the approved wells in and south of Fletcher Gulch to the wells north of Fletcher Gulch and existing compressor station. This would include proposed well 10-32 in Fletcher Gulch. Hence the majority of the 18 wells approved in 2009 cannot be operated until wells 4-12, 33-33, and 33-42 are approved.

Importance of Pad Locations: To develop a coalbed methane resource, it is necessary to (1) reduce pressure in the coal reservoir so that gas (predominantly methane) is released into the system of natural fractures, and (2) increase the permeability of the coals by hydraulic fracturing. Fractures in coal seams contain mostly water. Removing water from the coal formation reduces the pressure and allows natural gas and produced water held in the formation by adsorption to flow to the well bores and be produced at the surface. To maximize the ultimate recovery of gas in the Fletcher Gulch Unit, the pressure needs to be reduced across the entire reservoir under lease. This is done by a process called “interference”, whereby coalbed methane wells are placed contiguous with one another so that they can, as a group, drain pressure from the coalbed. Without offsetting wells to create interference, the coal acts as an infinite aquifer and continues to feed water into the drainage area producing wells, maintaining high pressure and significantly lowering the ultimate recovery of gas. The 4 wells proposed in this EA are positioned at particularly important locations to create interference with each other, the wells currently under production, and the 18 approved wells.

Genesis Committed Mitigation: 1. Any project modifications that involve site disturbance outside of areas previously inventoried for cultural resources will be inventoried prior to approval of the modification.

2. Any project modifications that involve site disturbance outside of areas previously inventoried for plants listed under the Endangered Species Act, or those that are Proposed or Candidates for such listing will be inventoried prior to approval of the modification.

No Action Alternative: Under the No Action Alternative, the applications would be denied and the well pads, pipelines, and access roads would not be constructed.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD: None

NEED FOR THE ACTION: The purpose of the proposed action is to manage the exploration and development of mineral resources on Public Lands in a manner that avoids, minimizes, reduces, or mitigates potential impacts to other resource values.

PLAN CONFORMANCE REVIEW: The proposed action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5; BLM 1617.3):

Name of Plan: White River Record of Decision and Approved Resource Management Plan (ROD/RMP) (USDI BLM 1997)

Date Approved: July 1, 1997

Decision Number/Page: Pages 2-5 through 2-6

Decision Language: “Make federal oil and gas resources available for leasing and development in a manner that provides reasonable protection for other resource values.”

AFFECTED ENVIRONMENT / ENVIRONMENTAL CONSEQUENCES / MITIGATION MEASURES:

STANDARDS FOR PUBLIC LAND HEALTH: In January 1997, the Colorado BLM approved the *Standards for Public Land Health*. These standards cover 5 resource categories: upland soils, riparian systems, plant and animal communities, Threatened and Endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Because a standard exists for each of these 5 categories, a finding must be made for each of them in an EA. These findings are provided under the relevant resource headings below.

NATURAL, BIOLOGICAL, AND CULTURAL RESOURCES

AIR QUALITY

Affected Environment: The entire White River Field Office area has been classified as either attainment or unclassified for all pollutants (National Ambient Air Quality Standard [NAAQS] and Colorado Ambient Air Quality Standard [CAAQS]), and most of the area has been designated Prevention of Significant Deterioration Class II (CDPHE 2009a). The proposed action is not located within a 10-mile radius of any special designation airsheds or non-attainment areas. Dinosaur National Monument, located approximately 22 miles north of the project area, has been identified as a Class II airshed with special designations regarding visibility.

Although specific air quality monitoring data are not available for the White River Field Office area, data have been collected in the region. Two new air quality monitoring locations (one in Meeker and one in Rangely) will become fully operational in 2010 and will provide actual data

to evaluate regional air quality. The cities of Grand Junction (southwest), Steamboat Springs (northeast), and Parachute (south) all host air quality-monitoring stations. Available monitoring data at these stations indicate that the area is likely to be in the attainment category, meaning that the ambient concentrations of criteria pollutants are less than the applicable air quality standards (NAAQS, CAAQS). However, it should be noted that not all criteria pollutants have been monitored at each site, there is not continuous monitoring of all criteria pollutants at any of the sites, and the atmospheric proximity to emissions and climate conditions at these monitoring sites are likely to be different.

Because the historic air quality in the White River Field Office area has been good, small changes in air quality may have noticeable localized effects, especially on visibility. The Colorado Air Pollution Control Division estimates that maximum levels (24-hour average) for particles 10 µm or less in diameter (PM₁₀) in rural portions of western Colorado like the Piceance Basin are near 50 micrograms per cubic meter (µg/m³). This estimate is well below the 150 µg/m³ NAAQS for PM₁₀ (24-hour average).

Environmental Consequences of the Proposed Action: Construction of the proposed facilities would result in low and short-term impacts on air quality during construction, drilling, completion and, to a lesser extent, from vehicles and gas processing and compression facilities during the production phase. Box 1 below shows estimates from Genesis of vehicular and large equipment usage during the various project phases. These estimates address activities for the construction of 26 wells and associated roads and pipelines (the 4 wells currently proposed, the 18 wells approved in DOI-BLM-CO-110-2009-0180-EA, and 4 wells pending proposal in the summer of 2010). Increases in the following criteria pollutants would occur due to combustion of fossil fuels during construction activities: carbon monoxide, ozone (secondary pollutant), nitrogen dioxide, and sulfur dioxide. Non-criteria pollutants such as nitric oxide, air toxics (e.g. benzene), and total suspended particulates (TSP) may also experience slight, temporary increases as a result of the proposed action (NAAQS have not been set for non-criteria pollutants). Even with an increase in these pollutants, the project would be unlikely to result in an exceedance of NAAQS and CAAQS and would most likely be under PSD thresholds.

Soil disturbance resulting from construction, heavy equipment, and drill rigs is expected to cause increases in fugitive dust and inhalable particulate matter, specifically PM₁₀ and PM_{2.5}, in the project area and immediate vicinity. During these construction phases dust production is likely, especially when conditions are dry and/or are windy. Once the wells go into interim reclamation all the roads should have the topsoil redistributed and stabilized, the pipelines should be in final reclamation and the pads should be recontoured and stabilized. As vegetation establishes in the reclaimed areas, the only dust production will occur when vehicles travel on the access roads to service the wells. The increase in airborne particulate matter from this project and the other wells previously approved for this project is not expected to exceed CAAQS or NAAQS on an hourly or daily basis. Emissions from drilling would cause low, short-term impacts to local air quality. Additional low, short-term impacts to air quality may occur due to venting of gas from the wells.

Box 1. Traffic and large equipment estimates during construction, drilling, completion, and production

Construction

Well location and access road construction:

- Road grader and 2 large cats, active in field each day
- 2 trucks drive in and out daily to bring operators to equipment
- Large gravel dumps – 6 per day for 2 days

Pipeline construction:

- Large trencher
- Backhoe
- 6 pickups to bring hands and equipment operators plus 2 trailers
- Welder pickup

Drilling

- 3 pickups per day to bring in drilling hands and drilling supervisor
- 7 semi loads (estimate) to move in the drilling rig, then in-field move every 7 days
- 3 large vehicles for cementing operations (1 pump truck, bulk truck, iron truck) every 3 days plus 1 pickup
- 4 semis delivering pipe at beginning of drilling
- Smaller trucks moving pipe in field every 3 days
- Logging vehicle every 7 days

Completions

- 2 semis delivering tubing at beginning of completions
- Small trucks moving tubing in field every 7 days
- Rig initial move in and in-field moves every 7 days plus 2 pickups for hands
- Frac vehicles – 4 large trucks, 2 pump trucks, sand truck, pipe truck plus 2 pickups – every 7 days
- 5 large trucks to move in frac tanks, then in-field moves every 7 days
- 2 pickups to bring in completions supervisor daily and engineer every 7 days)
- 2 semis per well delivering surface equipment (pump unit, separator)
- 1 pickup 2 days per week installing telemetry
- 2 trucks for 4 days per well for roustabout crew to install surface equipment and tie well in to pipelines

Production

- 1 pickup per day for operator
- 1 grader 4 days per month to maintain roads

Environmental Consequences of the No Action Alternative: No impacts to air quality would result from the No Action Alternative.

Mitigation: The following should be added as a condition of approval (COA):

1. All access roads will be treated with water and/or a dust suppressant during construction and drilling activities so that there is not a visible dust trail behind vehicles. All vehicles will abide by company and public speed restrictions during all activities. If water is used as a dust suppressant, there should be no traces of oil or solvents in the water and it should be properly permitted for this use by the State of Colorado. Only water needed for abating dust should be applied; dust abatement should not be used as a water disposal option under any circumstances.

SOILS (includes a finding on Public Land Health Standard 1)

Affected Environment: Three soil mapping units (MU) occur within the project area: Havre loam, 0 to 4% slopes; Rentsac-Moyerson-Rock outcrop complex, 5 to 65% slopes; and Torriorthents-Rock outcrop complex, 15 to 90% slopes (USDA NRCS 2009; USDA SCS 1982). The pads and roads associated with well locations 4-12, 33-33, and 33-42 occur on Rentsac-Moyerson-Rock outcrop complex. Well location 10-32 and a small portion (0.1 mi) of its access road occur on Torriorthents-Rock outcrop complex; the remaining 0.25 mi of the access road to this pad is on Havre loam. Table 3 highlights important soil characteristics and the area of each MU that would be disturbed during project construction.

Table 3. Characteristics of soil mapping units occurring within the proposed project area

Soil Mapping Unit (MU)	Soil Name	MU Acreage Disturbed ¹	Slope	Ecological Site	Salinity (µmhos/cm)	Runoff	Erosion Potential	Bedrock (inches)
41	Havre loam	6.0	0-4%	Foothill swale	< 4	Medium	Slight	> 60
74	Rentsac-Moyerson-rock outcrop complex	39	5-65%	Pinyon-juniper woodlands/clayey slopes	< 4	Medium	Moderate to very high	10-20
91	Torriorthents-rock outcrop complex	9	15-90%	Stony foothills	< 2	Rapid	Very high	10-20

¹ A 30-m buffer around roads, pipelines, and pads was used (as requested by Bob Lange, WRFO BLM) when calculating the acres of each soil MU that would be disturbed by the proposed action to represent the soils that could be impacted by the project. Of course, this size buffer is larger than the proposed limits of disturbance used when estimating the total disturbance from the proposed action; hence the total acres of disturbance in Table 3 is greater than in Table 2.

41-Havre loam (0 to 4% slopes) is a deep, well-drained soil found on flood plains and low stream terraces. It was formed in calcareous alluvium. Vegetation consists primarily of low shrubs and grasses at elevations ranging from 5,800 to 7,200 ft. Average annual precipitation is

14 to 17 inches. Permeability is moderate and available water capacity is high. Runoff is medium, and hazard of water erosion is low.

74-Rentsac-Moyerson-Rock outcrop complex (5 to 65%) slopes are shallow and well-drained soils occurring on foothills and ridges. Both soils were formed in residuum, with Rentsac formed primarily from sandstone, and Moyerson derived mostly from shale. Native vegetation consists primarily of pinyon-juniper woodland with understory grasses and shrubs at elevations ranging from 5,800 to 7,200 ft.

Average annual precipitation is 13 to 16 inches. Permeability of the Rentsac and Moyerson soils is moderately rapid and slow, respectively. Available water capacity of both soil types is low. Runoff of the Rentsac soils is medium, and hazard of water erosion is moderate to very high. Runoff of the Moyerson soils is medium to rapid, and hazard of water erosion is very high.

91-Torriorthents-Rock outcrop complex (15 to 90% slopes) are found in rough and eroded areas on mountains, hills, ridges, and canyons. Native vegetation consists of pinyon-juniper woodland with sparse understory shrubs and grasses at elevations ranging from 5,100 to 7,500 ft. Average annual precipitation is 8 to 18 inches. Torriorthents are very shallow to moderately deep and well-drained soils formed in residuum and colluvium derived from sandstone, shale, limestone, and siltstone. Permeability is moderate and available water capacity is very low. Runoff is rapid, and hazard of water erosion is very high. Rock outcrop is barren sandstone, shale, limestone, or siltstone. In some areas, slopes are likely to exceed those shown in Table 3.

Fragile soils on slopes greater than 35% are managed as a Controlled Surface Use (CSU-1) lease stipulation by the WRFO (USDI BLM 2009b), and are defined as being highly or severely erodible by wind or water and having slopes greater than 35% if they have one of the following soil characteristics: (a) surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silt clay or clay; (b) a depth to bedrock that is less than 20 inches; (c) an erosion condition that is rated poor; or (d) a K (erosion potential) factor of greater than 0.32. A map showing the extent of fragile soils in the project area is provided in Appendix A, Figure 3. According to spatial data on fragile soils provided by WRFO, approximately 28% (0.1 mi) of the access road between proposed wells 33-33 and 33-42 would cross steep slopes, resulting in disturbance to approximately 0.6 ac of fragile soils. No other proposed project features would be located on fragile soils.

Biological Soil Crust (BSC), a highly specialized community of cyanobacteria, mosses, and lichen that lives within or on top of the uppermost soil horizons, occurs patchily but extensively throughout the project area. BSCs are typically more abundant in some locations due to microclimate conditions that are the result of vegetation modifying the local environment by providing nutrients, moisture, reducing sunlight, and protecting BSCs from wind and/or water erosion. The highest quality patches are found at locations that have not experienced significant livestock grazing. BSCs are an important component of soil productivity. Depending on the site, BSCs play a significant factor in stabilizing soils and reducing erosion and they often play a decisive role in the retention and/or production of soil nutrients and success of revegetation. BSCs may be easily damaged by mechanical disturbance of the soil surface. Damage to BSCs may increase the risk of erosion and alter soil nutrient cycling.

Environmental Consequences of the Proposed Action: At the present time, soils in the proposed project area exhibit infiltration and permeability rates that are appropriate to soil type, landform, climate, and geologic processes. The proposed action would temporarily decrease infiltration and permeability rates due to soil compaction and loss of vegetative cover. Clearing and grading would remove protective vegetative cover from the affected soils, accelerating the erosion process. Water erosion of soils caused by construction activities would likely result in a net loss of topsoil by sheet, rill, and gully erosion. The greatest soil erosion problems are likely to occur on the fragile soils located along the access road between well locations 33-33 and 33-42, and at pad location 10-32 and its access road in Fletcher Gulch. Increased erosion risks, construction complexity, and difficulties with reclamation are likely at these locations. In these areas, Genesis would apply the practices used in the engineered section of the access road to approved well location 9-14 in Fletcher Gulch. Application of the standards contained in the Gold Book (USDI and USDA 2007) and BLM Manual 9113 (USDI BLM 1985) would allow long-term erosion in this area to fall within acceptable levels.

Surface disturbance would remove or bury BSCs, potentially decreasing diversity, soil nutrients, soil stability, and organic matter in these areas. Cascading effects may occur in terms of increased erosion, loss of topsoil, and decreased revegetation potential. Crusts are well adapted to severe growing conditions, but poorly adapted to the compressional disturbances and/or removal that would occur as a result of the proposed action. Limiting the size of the disturbed area increases the rate of BSC recovery, provided that there is a nearby source of inoculum (viable source of biological soil components that can be transported to the site via water, air, and/or animals). Replacement of topsoil, which harbors BSC inoculum and recruitment from adjacent sites, would allow BSCs to recolonize most sites post disturbance.

Full recovery of BSCs from disturbance, however, is a slow process, particularly for mosses and lichens. Recovery of pre-disturbance crust thickness can take up to 50 years, and mosses and lichens can take up to 250 years to recover. Minimizing the disturbance footprint and retention and replacement of topsoil would be critical to the success of BSC recolonization and reestablishment. Saving and replacing topsoil allows for inoculums to repopulate a site; however, the quantities of inoculums needed, viability after storage in a topsoil pile, and other factors that determine success are not well known. Therefore, it is likely that BSCs would decrease overall in amount and diversity in the areas disturbed for some time into the future.

Reclamation of disturbed soil can be very difficult. Decreased soil productivity as a result of the loss of topsoil has the potential to hinder revegetation efforts and leave soils further exposed to erosional processes. In addition, grading, trenching, and backfilling activities may cause mixing of the soil horizons, which could diminish soil fertility, reducing the potential for successful revegetation.

All road and well pad construction must adhere to Gold Book standards (USDI and USDA 2007) and to BLM Manuals 9112 and 9113 (USDI BLM 1984; USDI BLM 1985), relating to culvert and road design and construction requirements as per the proposed action.

Environmental Consequences of the No Action Alternative: The No Action Alternative would not impact soils in the project area.

Mitigation: Refer to the *Water Quality, Surface and Ground* section of this document for mitigation pertinent to soil disturbance, including CSU-1 relating to fragile soils (USDI BLM 1997). The following should be applied as Conditions of Approval:

1. All construction and drilling activity shall cease when soils or road surfaces become saturated to a depth of three inches unless there are safety concerns or activities are otherwise approved by the Authorized Officer (AO).
2. In order to protect rangeland health standards, erosion features such as riling, gullying, piping and mass wasting on the surface disturbance or adjacent to the surface disturbance as a result of this action will be addressed immediately after observation by contacting the AO and submitting a plan to assure successful soil stabilization with BMPs to address erosion problems.

Finding on the Public Land Health Standard for Upland Soils: Following implementation of the mitigation measures, the proposed action would be unlikely to reduce the long-term productivity of soils on a landscape scale beyond what might be expected with natural disturbances. Hence the Public Land Health Standard for Upland Soils in the proposed project area would continue to be met.

WASTES, HAZARDOUS OR SOLID

Affected Environment: There are no known hazardous or other solid wastes on the subject lands. No hazardous materials are known to have been used, stored, or disposed of at sites included in the project area. Genesis did not propose to utilize hazardous substances during drilling or production operations associated with this project.

Most of the exploration and production wastes generated during the proposed action would be exempt from the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations (e.g., produced water, produced oil). However, the exemption would not mean that these wastes present no hazard to human health and the environment, nor would the exemption relieve the operator from corrective action to address releases of exempt wastes. Non-exempt wastes such as lubricants, fuels, caustics or acids, and other chemicals would be used during exploration and production activities and solid waste (e.g., human waste, garbage, etc.) would be used during the proposed activities.

The operator has not specified the chemicals that would be used for drilling, completion, and hydraulic fracturing. Constituents found in hydraulic fracturing fluids may include salts, acids, petroleum hydrocarbons, and numerous other additives. The concentrations of these constituents are not well documented.

Environmental Consequences of the Proposed Action: No listed or extremely hazardous materials in excess of threshold quantities are proposed for use in this project. While commercial preparations of fuels and lubricants proposed for use may contain some hazardous constituents, they would be stored, used, and transported in a manner consistent with applicable laws such that generation of hazardous wastes is not anticipated. Solid wastes would be properly disposed of off-site at an approved facility.

Accidental releases associated with equipment failures, equipment maintenance and refueling, and storage of fuel, oil, other fluids, and chemicals could cause soil, surface water, and/or groundwater contamination. Improper management of pit contents may also contribute to environmental contamination. Releases of produced water would present the greatest threat for widespread impacts. The high salinity of produced water may affect plant growth due to the high osmotic pressure of the soil solution, and impact groundwater or surface water through leaching or run-off. The sodicity (i.e., excess sodium) of produced water would cause deterioration of the soil structure if spills occurred, thereby increasing the potential for soil erosion. With implementation of the mitigation measures and the Spill Prevention, Control, and Countermeasure (SPCC) Plan described below, impacts would likely be temporary.

Since not all chemicals that would be used on the site have been disclosed, specifically chemicals or other additives used for drilling, completion, and hydraulic fracturing operations, impacts to groundwater may occur. These chemicals and additives can also be present in the reserve pit after it is closed as well as in drill cuttings within the cuttings pit. With proper well completion, impacts to aquifers above the producing zone are unlikely.

Environmental Consequences of the No Action Alternative: No hazardous or other solid wastes would be generated under the No Action Alternative.

Mitigation: The following should be applied as Conditions of Approval (COAs):

1. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to: human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
2. A chemical portable toilet shall be furnished with the drilling rig. Garbage, trash, and other waste materials shall be collected in a portable, self-contained, fully enclosed trash cage during operations. No trash shall be burned on location. All debris and other waste material not contained in the trash cage shall be cleaned up and removed from the location immediately after removal of the drilling rig.
3. The operator shall submit an updated SPCC Plan to the AO prior to construction activities.
4. Since the reserve pits may receive fluids from completion and fracing activities, they shall be lined with a minimum 24-millimeter (mm) liner. The pits must be closed within approximately six months of drilling and completion at each of the proposed 4 wells, regardless if additional

wells were planned for these pads. See also mitigation measures under *Water Quality, Surface and Ground*.

5. The concentration of contaminants of concern in pits and around production equipment (e.g., separators, above-ground storage tanks, etc.) at the time of closure must not exceed applicable or relevant and appropriate requirements (e.g., Colorado Oil and Gas Conservation Commission [COGCC] 900 Series Rules – Exploration and Production Waste Management, Table 910-1 [COGCC 2009]). This condition applies to pit contents and underlying soil.

6. The release of any oil, produced water, toxic liquid, or other waste materials must be controlled and contained immediately upon discovery and cleaned up as soon as possible. The BLM authorized officer (AO) may require additional action to prevent or mitigate potential or actual adverse environmental impacts on any air, water, soil, or biological resource. Releases shall be reported by the operator to the BLM according to Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL-3A). In addition to the reporting requirements set forth in NTL-3A, the operator shall provide a monthly report to the BLM documenting any release of liquids less than 10 barrels in quantity. The report will include: (a) the date and time of occurrence; (b) the location where the incident occurred; (c) the type and volume of the material released; (d) the volume of material recovered; (e) the cause of the incident; and (f) corrective action to address the incident (e.g., initial mitigation, investigation, remediation, etc.). The monthly report will be submitted electronically via email as a Microsoft Excel file to the BLM White River Field Office Hazardous Materials Coordinator, Christina Barlow (christina_barlow@blm.gov).

WATER QUALITY, SURFACE AND GROUND (includes a finding on Public Land Health Standard 5)

Affected Environment, Surface Water: The proposed action is located on stream segment 13a of the White River Basin, defined as all tributaries to the White River, including all wetlands, from a point immediately below the confluence with Piceance Creek to a point immediately above the confluence with Douglas Creek, except for the specific listings in segments 13b through 20. The project is within the Gillam Draw 5th level Hydrologic Unit Code (HUC) and the Fletcher Gulch 6th level HUC. Two wells are also located in the 7th level Yanks Gulch HUC. The project area drains into Fletcher Gulch to the south and Yanks Gulch to the north. Yanks Gulch is an ephemeral tributary to Fletcher Gulch. Fletcher Gulch is perennial in its upper reaches inside the project area, and ephemeral in its lower reaches as it approaches the White River. Based on debris depositions, it appears that both Yanks Gulch and Fletcher Gulch experience occasional heavy flows and sediment loads as a result of late summer convection storms and both have an active floodplain. The White River is a tributary to the Green River (in Utah), which is a tributary to the Colorado River. Spring Creek, a perennial tributary to the White River, lies to the southwest of the proposed action.

The *Status of Water Quality in Colorado – 2008* (CDPHE 2008) and *Regulation No. 37 Classifications and Numeric Standards for Lower Colorado River Basin* (CDPHE 2009b) were reviewed for information relating to drainages within the project area. The State has classified

stream segment 13a of the White River Basin as “Use Protected” and further designated it as beneficial for the following uses: Warm Aquatic Life 2 (WS-IV), Not Primary Contact Use Recreation, and Agriculture. The antidegradation review requirements in the *Antidegradation Rule* (CDPHE 2008) are not applicable to waters designated as Use-Protected. For those waters, only the protection specified in each reach would apply. For stream segment 13a, minimum standards for 4 parameters have been listed: Temperature, dissolved oxygen = 5.0 milligrams per liter (mg/l); pH = 6.5 to 9.0; and *Escherichia coli* = 630/100 ml. Numeric standards for inorganic compounds and metals can be found in *Regulation No. 37*.

Ground Water: Ground water resources at the location of the proposed action were assessed using the existing *U.S. Geological Survey Ground Water Atlas of the United States* (Topper et al. 2003) and the *Fletcher Gulch Coalbed Methane Stream Depletion Study* (WWL 2009) prepared for the proposed action. Information presented in Topper et al. (2003) indicates that the extent of the Mesaverde Aquifer encompasses the proposed project area. The saturated thickness of the Mesaverde Aquifer ranges from 500 to 1,000 ft in the general project area, with the Mancos Shale forming a relatively impermeable aquitard below (WWL 2009 and references therein). Existing data on the hydraulic properties of the Mesa Verde Group Coal Unit and Sego Sandstone are summarized in the *Stream Depletion Study* (WWL 2009).

Fletcher Gulch and Spring Creek are the 2 main drainages present that drain Calamity Ridge and discharge to the White River. Fletcher Gulch and Spring Creek most likely have shallow alluvial aquifers up to several miles in length and approximately 200 ft wide and 100 ft thick, whereas Yanks Gulch to the northeast most likely does not (WWL 2009). The White River is the primary water source for the town of Rangely, CO, is located approximately 5 miles north of the proposed project area. Springs in the vicinity of the proposed project occur within the Garden Gulch Member of the Green River Formation (WWL 2009). The *Stream Depletion Study* provides a figure showing the locations of water wells, springs, and diversion structures within a 5-mile radius of the project area (WWL 2009). These water resources are mostly used for livestock watering. There are no known springs or wells used as drinking water sources or irrigation water within one mile of the proposed facilities.

Surface geology in the project area transitions from the Lower Green River and Wasatch Formations (Tertiary) on the eastern side of the project area to the Williams Fork Formation (Cretaceous) on the western side. The Lower Green River Formation is composed primarily of siltstones and shales and is generally defined as a confining unit. The Wasatch Formation underlies and intertongues with the Green River Formation. It consists primarily of shale with minor lenticular sandstone and is also defined as a confining unit. However, within the unit the Frontier Formation (thin sandstone) may occur as a local aquifer that is of poor water quality (highly saline). The Williams Fork Formation makes up a portion of the Mesaverde Aquifer and is composed of sandstone interbedded with shale and coal. Water from the Mesaverde Aquifer is also of poor water quality with high total dissolved solids (TDS). Water quality data from active Genesis wells for the coal bearing strata and the Sego formation are provided in Appendix B.

Environmental Consequences of the Proposed Action, Surface Water: Clearing, grading, and soil stockpiling activities associated with the proposed action would alter overland flow and natural groundwater recharge patterns. Approximately 17.5 ac of vegetation would be removed

to construct the proposed facilities. Potential impacts include surface soil compaction caused by construction equipment and vehicles, which would likely reduce the soil's ability to absorb water, increasing the volume and rate of surface runoff, which in turn would cause increased surface erosion. Runoff associated with storm events may increase sediment/salt loads in surface waters down gradient of the disturbed areas. Sediment may be deposited and stored in minor drainages where it would be readily moved downstream during heavy convection storms. Some sediment from project activities may eventually be carried into the White River and ultimately to the Colorado River. The 5-mile distance to the White River would have an attenuating effect on the amount of sediment contributed by project activities to the river. Surface erosion would be greatest during the construction and early production phases of the project and would be controlled using BMPs for stormwater. It is unlikely this increase in sedimentation would be measurable in the White River.

The magnitude and duration of potential impacts to surface runoff and groundwater recharge would depend on a variety of factors including soil depth, soil type, vegetation type and density, slope, aspect, storm duration and intensity, erosive force of rainfall or surface runoff, and duration and extent of construction activities. Since the project would likely reduce infiltration and concentrate surface runoff, indirect effects would include increasing peak flow events and sediment loads downstream. Successful reclamation and proper road design would go a long way towards reducing indirect impacts, especially after active construction and drilling activities are completed and interim reclamation is completed on the pads.

The 10-32 pad and its 1,665-ft access road would be constructed on the terrace above Fletcher Gulch banks. The proposed action would not require a new crossing of Fletcher Gulch. The access road would require installation of a culvert in an ephemeral side drainage to Fletcher Gulch, as well as some relief cuts along steep slopes. Indirect impacts to the channel from sedimentation may occur during and immediately after culvert installation and relief cuts. These impacts would be expected to be of low intensity and short duration. The design and engineering principles applied to the approved Fletcher Gulch crossing and access road to approved well 9-14 would be applied to this stretch of access of road. The 2 west corners of the 10-32 pad come within approximately 20 ft of the top of bank. Low intensity direct impacts to water quality from sediment loading may occur during construction where the pad approaches the top of bank, even though no work within the banks of Fletcher Gulch would be required. Some sedimentation into the waterway may continue after construction until interim reclamation has stabilized the pad edges next to the bank. Application of the standards contained in the Gold Book (USDI and USDA 2007), BLM Manual 9113 (USDI BLM 1985), and CSU-1 (USDI BLM 1997) would reduce any potential short-term impacts to surface water quality in Fletcher Gulch and maintain long-term impacts at pre-project levels.

Pad locations 33-33 and 33-42 are in the Yanks Gulch watershed, although they are well removed from the channel. The closest of these pads to Yanks Gulch is 33-33, which is approximately 1,600 ft from the active channel via an unnamed ephemeral side drainage. With the application of standards contained in the Gold Book (USDI and USDA 2007), BLM Manual 9113 (USDI BLM 1985), and CSU-1 (USDI BLM 1997), any sediment-laden runoff that may reach Yanks Gulch from the construction of this pad and its access road would be of very low

intensity and duration during construction, becoming undetectable after completion and the implementation of interim reclamation.

Spills or leaks of any toxic material associated with fluid mineral development may be washed directly into surface waters or, if the toxin is relatively insoluble in water, may be adsorbed on the surface of the soil and transported to surface waters in sediment. The chemical profile of produced water from active Genesis wells is provided in Appendix B. The severity of potential impacts resulting from leaks or spills of environmentally hazardous substances such as fuels, antifreeze, lubricants, or condensate would largely depend on the substance spilled, quantity of the spill, and proximity of the spill to drainage paths. The operator would be required to have a SPCC plan for the project and provide BLM a copy of this to review. This plan outlines the efforts that would be made to contain, cleanup, and notify appropriate parties in the event of a spill. These efforts should be protective of water quality.

Groundwater: Coalbed methane development typically requires the pumping of water from the targeted formation to change the pressure characteristics in the coalbed and allow natural gas to migrate to the well bore. Pumping for these projects typically involves higher volumes of water initially until the pressure threshold is reached and then lower volumes during gas production. Each well is expected to produce 200 to 300 barrels of water per day, initially. At a predicted maximum production of 300 barrels/day (12,600 gallons/day), production would equal 14 acre-foot (af)/well/year, or 56 af/year for 4 wells. There are 12 existing and 18 approved wells. Assuming the same rates for these wells, the maximum production for the entire project would be an additional 420 af/year, or a total of 476 af/year for the entire project.

Depletions from the Colorado River from these activities would likely occur in Spring Creek and were estimated to range from zero to a maximum of 35 af/year in 2074 and 2075. The *Stream Depletion Study*, written by Western Waters & Land (WWL 2009), estimated potential effects to surface and subsurface flows from the proposed project using a Glover Analysis. The Glover Analysis considered a total of 26 new wells and the 12 previously drilled wells. The analysis modeled depletions and accretions for a 100-yr period, since such effects may continue well beyond the end of methane production. Based on model results, the White River could experience a maximum net rate of loss of 3 to 5 af per year in 2108. These values are equivalent to a decrease in flow of 0.004 to 0.007 cubic feet per second (cfs), respectively. Average annual discharge to the White River is 727 cfs. The potential impacts of the estimated depletions to the flow and water chemistry in the White River were considered to be minimal. The authors of the *Study* stressed that data upon which to base the model were scarce and that the results of the analysis should therefore be viewed cautiously. Even if the results of the Glover Analysis were very conservative, it appears unlikely that depletions or accretions to ground water due to the proposed action would have a deleterious effect on the surface water flows in the White River.

The primary effects on groundwater resources would be associated with the removal of groundwater contained in coal bed aquifers and the subsequent recharge of aquifers through injection of produced water into the Se-go formation. The removal of groundwater from the coal aquifer results in the reduction of the hydraulic pressure head. The effects of producing water from the targeted formation would potentially change the characteristics of existing springs, seeps, and flowing artesian wells. Another impact of the proposed project on groundwater

resources would be an increase in the hydraulic pressure head in the aquifers receiving the injected coal bed water. Produced water would be collected in buried polyethylene pipelines for transport to an injection well. Centrifugal pumps, reciprocating pumps, filter systems, and tanks at the disposal facility would be used to remove solids from the water stream and to pump the water at pressures sufficient to allow downhole disposal. In the event that an injection well ceases to operate properly due to formation over-pressuring or mechanical failure, the operator would curtail or halt the rate of water production or route the discharge to additional injection wells.

Groundwater could also be affected during drilling operations. If they were to occur, improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits could introduce contaminants into the groundwater. The potential for groundwater contamination in bedrock aquifers increases if fractures in confining units are formed. Hydraulic conductivity increases exponentially along fracture zones, resulting in rapid transport of fluids/contaminants in these areas. The potential for cross contamination of groundwater aquifers, dewatering, and gas migration would be minimized by the required casing and cementing of wells penetrating fresh water zones as put forward in the operator's drilling plan contained in the well APDs. Chemicals used for production drilling could cause local contamination of soils and groundwater if not managed properly. Construction of drilling pads, proper disposal practices, proper well casing and cementing, and recycling of drilling fluids would be in accordance with BLM guidelines and should minimize effects on groundwater quality. If accidental spills occur, they would be addressed through implementation of the Hazardous Materials Management and Release Contingency Plans (appendix C) and Spill Prevention Control and Countermeasures (SPCC) plans developed in accordance with 40 CFR Part 112.

Shallow groundwater quality could be impacted by leakage of fluids from the transfer and transportation of drilling fluids, additives, and fuels. Trucks carrying production water also pose risks of spills that could impact shallow groundwater quality. The severity of potential impacts resulting from leaks, spills, and down-hole water/gas/drilling fluid migration would largely depend on the contaminant type, quantity of the contaminant, and proximity of the contaminant to alluvial/colluvial material and joints/fractures.

Springs and seeps are important local water sources for livestock and wildlife. One BLM spring (149-12) under permit with DWR is located west of the Fletcher Gulch facility and stratigraphically within the depletion and accretion flow path. Impact to this spring's livestock use may be affected depending on the spring's source water. This potential impact was identified in the depletion study (WWL 2009) as a potential increase or decrease in the flow from the injection of water; therefore if impacts to groundwater quality occur, this may be a good monitoring site.

Liberated natural gas associated with pressure changes from pumping water would likely follow natural fractures and faults to the surface or to shallow groundwater resources. Methane seeps from these natural fractures and faults could possibly develop in the outcrop region of the Mesaverde Group as a result of this project. These seeps could contaminate shallow groundwater sources and may also cause the death of vegetation in limited areas. The number or

location of these impacts is impossible to predict. Methane seep and changes in springs and water seeps have been documented with CBNG development in the San Juan Basin and in the Atlantic Rim area in South-Central Wyoming and are likely from this project.

Environmental Consequences of the No Action Alternative: No impacts to the quality of surface or groundwater would occur as a result of the No Action Alternative. Potential impacts from the existing 12 CBM wells would continue.

Mitigation, Surface Water: Apply the following as Conditions of Approval:

1. Genesis would restrict non-emergency maintenance activities on pipeline ROW and associated access roads when soils become saturated to a depth of three inches or more.
2. The operator will submit via Sundry Notice the location of all frac pits, should they be required.
3. The following design features are likely to improve the design of pads to reduce adverse impacts to water resources. Provide via Sundry Notices that describe changes to pad designs that take into account the problems identified. If changes cannot be made, provide a technical argument explaining why and describe how impacts will be mediated.
 - a. Consider rounding the northeastern corner of pad 4-12 to reduce the cut in this location which is currently estimated at 18.1 feet.
 - b. Consider taking the road onto pad 33-33 on the western corner. This will improve the road access into the site by taking it off of a cut slope. If the access road cannot be moved please provide a method to keep water from the road surface from running onto the pad.
 - c. The fill slopes on 10-32 would inundate Fletcher Gulch. Under no circumstances should the fill for the pad enter the active drainage channel for Fletcher Gulch. The fill and the pad need to stay up on the bench adjacent to the channel to allow for unimpeded flood flows in Fletcher Gulch.
 - d. Adequately size the culvert on the drainage to the southeast of pad 10-12 and submit the selected size via Sundry.
4. Genesis would be responsible for complying with all local, state, and federal water quality regulations, such as, but not limited to, Phase I Storm Water Permit, U.S. Army Corps of Engineers (USACE) Section 404 permit coverage, and Industrial Wastewater/Produced Water Permits. Genesis will provide confirmation of these permits at the request of the BLM. If fill from the access road or the pad for 10-32 would result in fill into Fletcher Gulch, estimates for the amount of fill material and area disturbed should be estimated and may require a notification process or maybe a permit with USACE.
5. Genesis will provide for erosion-resistant surface drainage by adding necessary drainage facilities and armoring prior to fall rain or snow. When erosion is anticipated, sediment barriers shall be constructed to slow runoff, allow deposition of sediment, and prevent it from leaving the site. In addition, straining or filtration mechanisms may also contribute to sediment removal from runoff.

6. Genesis will locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Install culverts with adequate armoring of inlet and outlet. Patrol areas susceptible to road or watershed damage during periods of high runoff.

7. Genesis will keep road inlet and outlet ditches, catchbasins, and culverts free of obstructions, particularly before and during spring runoff. Routine machine cleaning of ditches should be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.

8. Genesis will size culverts for the 10-year storm event with no static head and to pass a 25-year event without failing.

9. The AO will be notified via Sundry within 48 hours after well completion. The operator will not dispose of produced water in the reserve pits after well completion; all produced water will be disposed of in an approved injection well.

10. The operator will submit a Sundry Notice if average field-wide water volumes exceed the 300 barrel-per-day per well maximum volume assumed for produced water production. Include the WRFO Hydrologist in the review of this sundry notification.

11. To mitigate project-related soil erosion and increased surface runoff to nearby surface waters, all reserve pits be closed and pads recontoured for interim reclamation no later than October 1st of the year they are drilled unless prior approval is obtained from the AO. Requests for interim reclamation activities that are anticipated to occur after October 1st will be submitted to WRFO via Sundry Notice.

12. To allow optimal opportunity for the maximum extent of interim reclamation of well pads, all tanks and production facilities will be situated on the access road side of the well pad, unless otherwise approved by the WRFO AO.

13. Pits shall not be constructed on known intermittent or perennial springs, seeps, or other surface water features. If groundwater is encountered during pit construction activity, pit construction shall cease and the location shall be reclaimed. An alternate location or an alternate plan (e.g., use of a closed loop and/or semi-closed loop system) must be approved by the AO before resuming operations. Pits shall be constructed, monitored, and operated to provide for a minimum of two (2) feet of freeboard at all times. Maintain fluids in pits at the lowest practicable level, subject to the type of operation in process.

14. All pits will be lined with a synthetic liner(s) with a minimum thickness of twenty-four (24) ml and shall be of a high-density polyethylene, polypropylene, poly vinyl chloride, hypalon, or other synthetic material that is impervious, weather resistant, and resistant to deterioration when in contact with hydrocarbons, aqueous acids, alkali, fungi, or other substances in the produced water. The synthetic liner(s) shall also be resistant to deterioration by ultraviolet light, punctures and tearing, and shall be designed for the life of the pit.

15. It is the operator's responsibility to design and construct a liner system to contain fluids in the pit without compromising the integrity of the liner(s). The pit should be padded with material if necessary to reduce potential damage to the liner by sharp rock edges.

16. If the COGCC requires the removal of the pit liner, the method of removal and location of disposal for pit liners and pit solids must be submitted to the AO and approved before beginning the pit closure. If pit liners are to be left in place, the fluids from the pit must be removed and/or evaporated before closing. The pit liner should be cut or folded at the mudline and the pit should be buried with at least 3 feet of clean spoils before interim reclamation efforts are started, as stated in the SUP.

17. Any spills or releases of hazardous substances shall be cleaned up and disposed of in accordance with applicable requirements and spill response plans.

18. If erosion occurs on improved roads during the life of the project, Genesis shall promptly repair it and control it through maintenance of existing structures, construction of additional culverts, lead-out ditches, or other modifications as necessary.

19. BMPs for stormwater need to be submitted via Sundry for all surface disturbances planned. No ditches are currently approved for stormwater and all surface disturbances should stay within the cut and fill diagrams submitted by the operator. Any stormwater BMPs that would result in additional surface disturbance must be submitted via Sundry and approved by the AO before installation.

Finding on the Public Land Health Standard for Water Quality: Surface and groundwater quality within the project area currently meets the criteria established in the standard. Following implementation of the mitigation measures outlined above, changes to water quality from the construction and operation of the proposed facilities would likely be undetectable in the project area or downstream of it. Therefore, the proposed action would be unlikely to change the currently acceptable status of water quality in the project area.

WETLANDS AND RIPARIAN ZONES (includes a finding on Public Land Health Standard 2)

Affected Environment: A survey for wetlands and riparian areas was conducted in the project area on June 2 and September 16, 2009. Proposed well 10-32 is located on a gentle slope above the Fletcher Gulch channel. This portion of Fletcher Gulch supports a poorly developed riparian system composed of narrow, discontinuous margins of arctic rush (*Juncus arcticus*) and Nebraska sedge (*Carex nebrascensis*). Scattered tamarisk (*Tamarix ramosissima*), willow (*Salix* sp.), and one Russian olive (*Eleagnus angustifolia*) also occur in this reach.

Yanks Gulch was surveyed at the existing pipeline crossing, which is approximately 1.3 valley miles upstream from any part of the channel that could conceivably be influenced by the wells proposed in the current EA. A poorly developed riparian system occurs at that location, composed of narrow, discontinuous margins of arctic rush and associated spikerush (*Eleocharis*

macrostachya). One cottonwood (*Populus deltoides*) and 2 tamarisk occur just upstream of the crossing and another tamarisk just downstream. According to 2009 aerial photography, it appears that riparian expression becomes increasingly sparse below the pipeline crossing and is essentially absent in that portion of the channel that would receive runoff from the proposed project sites.

Evidence of high sediment loads and high water levels was observed in Fletcher Gulch and Yanks Gulch during project area surveys, indicating that both systems experience pulses of sedimentation under seasonally high flow regimes at least during some years.

Spring Creek is a perennial drainage that lies to the west of the project area. It supports an obligate riparian community and has the potential to experience indirect impacts from the proposed project due to water depletions.

Environmental Consequences of the Proposed Action: Proposed well 10-32 and its access road would be located on the terrace above the Fletcher Gulch channel. Two corners of the pad would come to within approximately 30 ft of the top of bank. Access road construction would require placement of a culvert in an ephemeral side drainage to Fletcher Gulch and some relief cuts on steep slopes set back from the channel. Surface disturbance would be confined to terraces outside the flood-prone area or in the side drainage, effectively preventing direct impacts to wetlands and riparian zones in Fletcher Gulch. Minor and temporary impacts may occur if rainfall following surface disturbance results in surface runoff into the riparian zone or if fill placed during culvert installation causes sedimentation downstream in Fletcher Gulch.

The design and engineering principles applied to the approved Fletcher Gulch crossing and access road to approved well 9-14 would be applied to construction of the access road to well location 10-32. The application of the standards contained in the Gold Book (USDI and USDA 2007), BLM Manual 9113 (USDI BLM 1985), and CSU-1 (USDI BLM 1997) and the implementation of the mitigation measures outlined in the *Water Quality, Surface and Ground* section, would further reduce potential short-term impacts to vegetation in Fletcher Gulch (e.g. sediment input from upland or side drainage sources) and maintain long-term impacts at pre-project levels.

Pad locations 33-33 and 33-42 are in the Yanks Gulch watershed, although they are well removed from the channel. The closest of these pads to Yanks Gulch is 33-33, which is approximately 1,600 ft from the active channel. Indirect effects to any riparian vegetation occurring in Yanks Gulch from the proposed action are highly unlikely given this distance and the required application of storm water controls and best management practices.

Indirect impacts to Spring Creek associated with dewatering (see *Threatened, Endangered and Sensitive Animal Species*) may affect wetland and riparian zones along that drainage. The levels of depletion cited (zero to a maximum of 34.77 af per year in 2074 and 2075 for 38 wells) would have the potential to significantly decrease surface flows in this largely perennial creek or reduce groundwater levels in the alluvial aquifer in years when the creek has less surface expression.

Environmental Consequences of the No Action Alternative: The No Action Alternative would have no impact on wetland or riparian zones.

Mitigation: See mitigation measures in the *Water Quality, Surface and Ground and Soils* sections of this document.

Finding on the Public Land Health Standard for Riparian Systems: The proposed action would not directly impact wetland or riparian zones. Indirect impacts are expected to be minor and temporary. Conditioned by applied mitigation measures and successful reclamation, the proposed project would have no substantive influence on these systems' land health status. Offsite indirect depletions of an unknown magnitude and duration may occur in Spring Creek as a result of the proposed action. These would have the potential to affect riparian systems associated with that drainage. If long-term, significant, and unmitigated reductions to flows in Spring Creek occur, they would be inconsistent with the land health standard and would lead to a degraded capacity to achieve the standard for an undetermined length of time.

VEGETATION (includes a finding on Public Land Health Standard 3)

Affected Environment: The proposed project area occurs within a mixed-aged Colorado Plateau pinyon-juniper woodland community heavily dominated by Utah juniper (*Juniperus utahensis*), with an average ratio of 1:9 pinyon (*Pinus edulis*) to juniper trees. Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) dominates the Fletcher Gulch valley floor where the access road to well location 10-32 passes. Table 1 identifies the ecological sites occurring at each well pad. Ecological sites have specific potential plant communities, but actual plant communities on a given site can vary depending on seral states, disturbance regimes and other factors. Photos of each well pad and associated access road are available at the BLM WRFO.

Most of the project area woodlands are composed of mid-aged trees; however, some stands of large old-growth pinyon-juniper are present in small pockets throughout the project area. The area near proposed well location 33-42 that has a northern goshawk nest site is an example of such a site. These areas have a higher ratio of pinyon to juniper trees (up to 1:3) and some trees reach heights of up to 35 ft, with an average of 20 to 25 ft. Understory shrub species include Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), mountain mahogany (*Cercocarpus montanus*), and Utah serviceberry (*Amelanchier utahensis*), with scattered individuals of antelope bitterbrush (*Purshia tridentata*). Understory shrub cover is generally less than 25% and in many areas less than 5%. Herbaceous cover is generally less than 5% in the woodlands, but increases up to 40% in the sagebrush-dominated openings. Cheatgrass (*Bromus tectorum*) has invaded most of the larger sagebrush stands in the project area.

Environmental Consequences of the Proposed Action: The proposed action would result in the removal of 17.5 ac of vegetation: 16.5 ac of pinyon-juniper woodland and 1 ac of big sagebrush shrubland. Given approximately 13,500 ac in the Fletcher Gulch Watershed, the project would directly impact well under 1% of the vegetated acreage in this watershed. This impact would be of low intensity, but long-term in duration, as regeneration of mid-aged trees to

their former level of dominance may take 30 to 50 years, and old growth stands may require 200 to 300 years to return to maturity (Gottfried and Severson 1994).

Disturbed areas would be at risk for invasion by noxious weed species/cheatgrass. No Colorado State List A (CDA 2009) species were observed in the project area. Tamarisk and Russian olive, both List B species, occur in Fletcher Gulch nearby but outside the construction zone for pad 10-32 and its access road (BIO-Logic 2009). Other invasive, non-native weed species that occur in the area, such as cheatgrass, pose a threat to native pinyon-juniper and sagebrush systems. Invasion of disturbed ground and adjacent intact vegetation by noxious weeds is expected to be a moderate and long-term effect of the proposed project. All unused portions of well pads would undergo interim reclamation after drilling is complete. The operator would also monitor and treat weeds for the life of the project as required by WRFO (see *Mitigation* under *Invasive, Non-native Species*). As interim reclamation and weed abatement proceed, the impact from invasive plant species is likely to drop to low and long-term. Accidental spills of hazardous substances, including produced water, over the life of the project could potentially affect the surrounding flora. These impacts would be low and short-term during drilling and construction, and low and long-term during operation.

Environmental Consequences of the No Action Alternative: No impacts to project area vegetation would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. Trees or shrubs that must be removed for construction or ROW preparation shall be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. Trees removed for construction that are not needed for reclamation purposes shall be cut in 4 foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal by the public. Woody materials required for reclamation shall be stockpiled along the margins of the authorized use area. The boles and limbs of the larger trees should be retained for redistribution not to exceed 20% total ground cover.
2. Stripped topsoil and vegetation shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed.
3. Genesis shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes allowed for reclamation are provided in *Table 4* and are based on the ecological site defined by the soil MUs within the project area (USDI BLM 1997; Hafkenschiel 2009).
4. Fences shall be erected around well pads to exclude livestock during reclamation of unused portions of the pads (Mark Hafkenschiel, BLM Rangeland Management Specialist, pers. comm. 2008). The fences shall consist of a four-strand BLM Type-D barbed-wire fence braced with wooden H-posts at each corner, constructed in compliance with BLM Fencing Manual 1741-1 (USDI BLM 1989). Fencing may be in place for three years or more, depending upon moisture levels and reclamation success, and must be maintained so as to remain in a continuously functional state. Cattle guards shall be installed where fences cross access roads. Cattle guards

shall provide a minimum 16-ft driving surface, unless otherwise stipulated by the AO. Cattle guards shall have an adjacent wire or welded steel livestock access gate, and shall be placed at a 90° angle to the access road. The gate shall be properly braced in accordance with the requirements of the Gold Book and BLM manual 1741-1.

Table 4. Native seed mixes appropriate for reclamation efforts in the ecological/woodland sites found in the project area

Seed Mix	Species	Lbs/Acre	Range Site
2	Western wheatgrass (Arriba)	3	Clayey foothills, clayey slopes
	Streambank wheatgrass (Sodar)	2	
	Thickspike wheatgrass (Critana)	2	
	Fourwing saltbush (Wytana, VNS, Northern Lat)	2	
	Alternates: Winterfat, shadscale, globemallow		
4	Western wheatgrass (Rosanna)	2	Pinyon-juniper woodlands, stony foothills
	Beardless wheatgrass (Whitmar)	2	
	Thickspike wheatgrass (Critana)	1	
	Indian ricegrass (Rimrock,)	2	
	Fourwing saltbush (Wytana or VNS, Northern Lat)	1	
	Utah sweetvetch	1	
Alternates: Needle and thread, globemallow, American vetch			
7	Beardless wheatgrass (Whitmar)	2	Deep clay loam
	Slender wheatgrass (Primar)	2	
	Big bluegrass (Sherman)	1	
	Canby bluegrass (Canbar)	1	
	Mountain brome (Bromar)	2	
	Alternates: Blue flax, Rocky Mountain penstemon, balsamroot		

Source: Hafkenschiel 2009; USDI BLM 1997.

Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also *Wildlife, Aquatic and Wildlife, Terrestrial*): The vegetation within the proposed project area meets the criteria established in the standard for plant and animal communities. Following implementation of the proposed mitigation measures and with successful reclamation, the proposed action would not change this status.

INVASIVE, NON-NATIVE SPECIES

Affected Environment: The proposed well pad, access road, and pipeline areas were surveyed for invasive non-native plant species on August 6 through 8, 2008; September 25 through 26, 2008; and between June 1 and 30, 2009 (BIO-Logic 2008a, 2008b; BIO-Logic 2009). Special focus was placed on the noxious weed species listed in the following documents: *White River Resource Area Resource Management Plan and Environmental Impact Statement* (USDI BLM 1997); *Rio Blanco County Land Use Resolution* (RBCDD 2002); and the Colorado Department of Agriculture (CDA) Noxious Weed List (CDA 2009). The WRFO rare plant inventory protocol issued in February 2009, *Standards for Contractor Inventories for Special Status Plant Species and Noxious Weed Affiliates* (USDI BLM 2009c), stipulates that CDA List A and List B noxious weed species be surveyed for within the boundaries of all rare plant inventories.

No Colorado State List A species were observed in the project area. More than one dozen tamarisk trees and one Russian olive, both CDA List B species, were observed along Fletcher Gulch in areas that will not be directly affected by proposed project activities. Cheatgrass was observed throughout the project area, with highest densities occurring along the Fletcher Gulch valley bottom.

Environmental Consequences of the Proposed Action: The proposed action would result in approximately 17.5 ac of surface disturbance, which would increase the potential for the establishment and spread of invasive, non-native species. Project-related spread of tamarisk in Fletcher Gulch is not expected, given that there will be no impacts within the banks of that waterway.

Noxious upland weed species found in the project area have the potential to further invade native plant communities along lines of disturbance created by new roads and well pads (Hansen and Clevenger 2005). Such invasion may displace natives and alter the visual character of the landscape. Because cheatgrass is already present on the floor of Fletcher Gulch, it is likely that some project sites will be invaded by this species following project-related disturbance. Cheatgrass is known to be very difficult to control. Weed propagules may also enter the project area on vehicles and other heavy equipment used during the construction and production phases of the proposed project. The earthwork for the project is balanced, so introduction of weeds in borrow material is not anticipated.

Low to moderate impacts from noxious weeds are expected during construction activities and interim reclamation. During the production phase and final reclamation, noxious weed impacts are expected to be moderate and long-term. Effects that can be expected include: a change in the visual character of the area; competition with and/or displacement of native plant species; and, if the weeds are annuals, there is a potential for elevated susceptibility of soils to erosion.

Environmental Consequences of the No Action Alternative: No impacts from invasive non-native plant species would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. All disturbed areas shall be revegetated as outlined in the *Vegetation, Water Quality, Surface and Ground* and sections of this document and as directed by the AO.
2. Genesis shall be required to monitor the project area for the life of the project to detect the presence of Colorado State List A and B noxious weed species (CDA 2009). If List A or B noxious weed species are found, control/eradication measures shall be implemented using materials and methods approved in advance by the AO.
3. Use of pesticides shall comply with the applicable federal and state laws and would require an approval *Pesticide Use Proposal*. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior.

4. All vehicles and heavy machinery shall be cleaned to remove seed and soil prior to construction and drilling activities. When moving equipment from an area infested with cheatgrass, Genesis shall clean equipment as required by the AO.
5. All activities shall comply with the requirements of Rio Blanco County for noxious and invasive species management.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES (includes a finding on Public Land Health Standard 4)

Affected Environment: Federally Protected Plant Species: A list of federally Threatened, Endangered, Proposed, and Candidate plant species having the potential to occur in Rio Blanco County was obtained from the United States Fish and Wildlife Service (FWS) (USDI FWS 2009). According to the FWS list, there are 2 federally listed as Threatened and one Candidate species that have the potential to occur on the WRFO. Table 5 provides information on these 3 species, including a brief description of their habitat and the potential for each species to occur in the proposed project area.

Table 5. FWS Threatened, Endangered, Proposed, and Candidate plant species with potential to occur in Rio Blanco County, Colorado

Species	Status ¹	Habitat Description	Potential to Occur in the Proposed Project Area
Dudley Bluffs bladderpod (<i>Lesquerella congesta</i>)	T	Barren, white shale outcrops of the Green River and Uinta Formations (6,000-6,700 ft).	This species is unknown from the vicinity of the proposed action. No Green River white shale outcrops occur in the areas proposed to be impacted by the project. Proposed action is in the vicinity of, but not directly on Green River Formations.
Dudley Bluffs twinpod (<i>Physaria obcordata</i>)	T	Barren white shale outcrops and steep slopes of the Parachute Creek Member of the Green River Formation (5,900-7,500 ft).	This species is known to occur in the vicinity of proposed project activities. The action is adjacent to, but not directly impacting Green River-derived soils.
White River beardtongue (<i>Penstemon scariosus</i> var. <i>albifluvis</i>)	C	Desert shrub and pinyon-juniper habitats, on sparsely vegetated shale slopes of the Green River Formation (5,000-7,200 ft).	Known populations occur in the far western portion of Rio Blanco County, at least 12 miles from the proposed action

¹ T = Threatened, C = Candidate

Based upon the information summarized in the table and conversations with BLM WRFO botanists (Holsinger and Marston), only one of these 3 species, the Dudley Bluffs twinpod (*Physaria obcordata*), was considered to have potential to occur in the project area. This species is currently known from sites generally associated with surficial geology belonging to the Green River Formation, although populations have been shown to extend onto thin channery loams that have been mapped as the Uinta Formation or in alluvial drainages where Green River soils have accumulated over other fine shales. Surface geology in the proposed project area, including inside all survey boundaries, is mapped as belonging to the Wasatch and Williams Fork; with the

Green River Formation very close by well location 10-32 (Hail and Smith 1994; USDI BLM WRFO electronic data). The Dudley Bluffs twinpod was considered to have the potential to occur in the project area due to the presence of the Green River Formation and because BLM records from 2006 indicate a mapped occurrence approximately 0.09 mile east of well location 10-32. The closest well known occurrence of this species to the project area is on the CR 122 road cut, approximately 2 miles southeast of proposed well location 10-32. Another mapped location for the twinpod lies approximately 1.75 miles to the northeast. The surficial geology at these locations is the Parachute Member of the Green River Formation.

BLM Sensitive Plant Species: The 13 Colorado BLM Sensitive plant species with potential to occur in the WRFO resource area (USDI BLM 2009a) are also considered in this EA. Table 6 lists these species, their habitat requirements, and a determination of their potential to occur within the proposed project area. Of the 13 BLM sensitive species, 2 have the potential to occur in the project area: Piceance bladderpod (*Lesquerella parviflora*) and debris milkvetch (*Astragalus detritalis*).

The Piceance bladderpod grows on barren shale soils of the Green River Formation. A known occurrence lies about 2 miles southeast of the proposed project area, along CR 122. This species was considered to have the potential to occur in the project area due to the presence of Green River shales in the proximity.

Three occurrences of the debris milkvetch within the Genesis Fletcher Gulch project area were identified during field surveys in 2008 and 2009 (BIO-Logic 2008a, 2008b, 2009). Prior to conducting rare plant surveys for the 18 approved Genesis wells in Fletcher Gulch (DOI-BLM-CO-110-2009-0180-EA), debris milkvetch was not known from the Calamity Ridge or Gillam Draw USGS quadrangles, where the proposed action occurs. The closest known occurrences mapped during the 2008/2009 inventory are 0.6 miles southwest (CR 122 Occurrence) and 0.8 miles northeast (Ridge Occurrence) of proposed well 10-32 and 0.9 miles east (Yanks Gulch Watershed Occurrence) of the proposed 4-12, 33-33, and 33-42 group of wells (Appendix A, Figure 4).

Colorado Natural Heritage Program Rare Plant Species: Plant species listed as rare by the Colorado Natural Heritage Program (CNHP) were also reviewed for their potential to occur in the WRFO resource area (CNHP 1999). Seven species were identified, but none of these were considered to have potential to occur in the vicinity of the project, as described in Table 6.

The western segment of the Yanks Gulch Area of Critical Environmental Concern (ACEC) is located approximately 2.1 miles east of proposed well 10-32 and the 4-12, 33-33, and 33-42 group of wells. The ACEC is home to a Dudley Bluffs twinpod population and the Utah Mountain lilac (*Ceanothus martinii*), a species tracked by the State of Colorado.

Survey Results: Under the direction of BLM WRFO Botanists Holsinger and Marston, rare plant surveys were conducted in the proposed project area in 2008 and 2009, with a focus on the Dudley Bluffs twinpod, Piceance bladderpod, and debris milkvetch (BIO-Logic 2008b, 2009). All 4 proposed pads and their associated access roads were surveyed in 2008 within a 100-ft buffer from the proposed edge of disturbance. Additional surveys of proposed well 10-32 and its

access road were conducted in 2009 because the requested survey area for the Dudley Bluffs twinpod was increased to 200 m from the pad center stake and edge of disturbance on roads and pipelines. With this increase in survey area, the survey boundary was found to overlap with a potential occurrence of this species in the BLM database. Additional surveys for the Dudley Bluffs twinpod were not conducted at well locations 4-12, 33-33, and 33-42 because suitable habitat for this species does not occur in that area.

No individuals or suitable habitat for the Dudley Bluffs twinpod were found within the survey limits, including where the survey area overlapped the potential Dudley Bluffs twinpod occurrence east of proposed well 10-32. Similarly, no occurrences of the BLM Sensitive Piceance bladderpod or debris milkvetch were found within the survey areas of the proposed action.

The center stake of well 33-42 has been moved approximately 135 m southeast of the location proposed at the time the rare plant surveys were conducted. The access roads associated with this well and the adjacent 4-12 and 33-33 wells have also been partially re-routed (Appendix A, Figure 5). The BLM WRFO determined that additional rare plant surveys in the new pad and road locations were not necessary based upon the negative findings from the 2008 surveys, the similarity of the soils, aspect, and vegetation community in the original and new locations, and the soil type and geological formation that the pads and roads occur on. These 3 pads and their access roads occur on Rentsac-Moyerson-Rock outcrop complex (soil MU 74) over the William’s Fork Formation. In the Fletcher Gulch area, debris milkvetch has to date only been found on soil MU 13. In addition, the 4-12, 33-33, and 33-42 group of wells do not present the appropriate geology or vegetation community for the Dudley Bluffs twinpod or Piceance bladderpod.

Table 6. BLM Sensitive plant species and CNHP Rare species with potential to occur on WRFO BLM lands

Species	Status ¹	Habitat Description	Potential to Occur in the Proposed Project Area
Narrow-stem gilia (<i>Aliciella stenothyrsa</i>)	S	Grassland, sagebrush, mountain mahogany or pinyon-juniper; silty to gravelly loam soils of the Green River or Uinta Formations (5,000-6,000 ft).	Southeastern portion of the project area has potential habitat for this species, but at higher elevations than typical. Species known from far NW Rio Blanco County. Proposed wells not on Green River or Uinta Formations.
Debris milkvetch (<i>Astragalus detritalis</i>)	S	Alluvial terraces with cobbles in pinyon-juniper and mixed desert shrub habitats (5,400-7,200 ft).	Suitable habitat is present in the project area.
Duchesne milkvetch (<i>Astragalus duchesnensis</i>)	S	Pinyon-juniper woodlands and desert shrub communities, around sandstone or shale outcrops (4,600-6,400 ft).	Suitable habitat is present in the project area, at higher elevations than typical; the species is currently known from far western Rio Blanco County.
Tufted Cryptantha (<i>Cryptantha caespitosa</i>)	S	Sparsely vegetated shale knolls with pinyon-juniper or sagebrush (6,200-8,100 ft).	No shale knolls occur in the project area or immediate vicinity.

Species	Status ¹	Habitat Description	Potential to Occur in the Proposed Project Area
Rollins' Cryptantha (<i>Cryptantha rollinsii</i>)	S	White shale slopes in pinyon-juniper or shrubland habitats of the Green River Formation (5,300-5,800 ft).	No white shale slopes occur in the project area or immediate vicinity. Proposed wells not on Green River Formation.
Ephedra buckwheat (<i>Eriogonum ephedroides</i>)	S	Shale and clay flats or slopes in saltbush, sage, and pinyon-juniper habitats (4,900-6,900 ft).	No shale slopes occur in the project area or immediate vicinity.
Cathedral Bluff dwarf gentian (<i>Gentianella tortuosa</i>)	S	Barren shale knolls and slopes of the Green River Formation (8,500-10,800 ft).	No barren shale knolls or slopes occur in the project area or immediate vicinity. Proposed wells not on Green River Formation. Elevation too low (~ 6,300-7,000 ft).
Piceance bladderpod (<i>Lesquerella parviflora</i>)	S	Shale outcrops of the Green River Formation (6,200-8,600 ft).	BLM records indicate that this species occurs two miles east of the project area. The action is adjacent to, but not directly impacting Green River-derived soils.
Flaming Gorge evening primrose (<i>Oenothera acutissima</i>)	S	Seasonally wet areas with sandy, gravelly, and rocky soils (5,300-8,500 ft).	No seasonally wet habitats occur in the project area or immediate vicinity.
Colorado feverfew (<i>Parthenium ligulatum</i>)	S	Barren shale knolls (5,400-6,500 ft).	No shale knolls occur in the project area or immediate vicinity.
Graham's beardtongue (<i>Penstemon grahamii</i>)	S	Sparsely vegetated desert shrub and pinyon-juniper communities on talus slopes and knolls of Green River Formation shales (5,800-6,000 ft).	No sparsely vegetated shale talus slopes or knolls in the project area or immediate vicinity. Proposed wells not on Green River Formation.
White River beardtongue (<i>Penstemon scariosus</i> var. <i>albifluvis</i>)	S	Desert shrub and pinyon-juniper habitats, on sparsely vegetated shale slopes of the Green River Formation (5,000-7,200 ft).	No shale slopes present in the project area or immediate vicinity. Proposed wells not on Green River Formation.
Cathedral Bluff meadow-rue (<i>Thalictrum heliophilum</i>)	S	Sparsely vegetated, steep shale talus slopes of the Green River Formation (6,300-8,800 ft).	No sparsely vegetated shale talus slopes in the project area or immediate vicinity. Proposed wells not on Green River Formation.
Shale columbine (<i>Aquilegia barnebyi</i>)	R	Shale substrates on cliff walls and talus slopes (4,900-8,600 ft).	No shale cliffs or talus slopes occur in the project area or immediate vicinity.
Dragon milkvetch (<i>Astragalus lutosus</i>)	R	Barren shale knolls and bluffs of the Green River Formation.	No barren shale knolls or bluffs occur in the project area or vicinity. Proposed wells not on Green River Formation.
Ligulate feverfew (<i>Bolophyta ligulata</i>)	R	Barren shale knolls (5,400-6,500 ft).	No barren shale knolls occur in the project area or vicinity.

Species	Status ¹	Habitat Description	Potential to Occur in the Proposed Project Area
Utah Mountain lilac (<i>Ceanothus martini</i>)	R	Dry, coarse shale or hard clay soils on mountain sides, associated with pinyon-juniper, mountain brush, sagebrush, ponderosa pine, douglas fir, aspen, bristlecone pine communities, and Gambel oak (7,600-8,080).	Known from the Yanks Gulch ACEC, 2 miles east of the project area.
Sedge fescue (<i>Festuca dasyclada</i>)	R	Alpine or rangeland prairie, dry habitats.	No alpine or prairie habitats occur in the project area.
Stemless penstemon (<i>Penstemon acaulis</i> var. <i>yampensis</i>)	R	Semi-barren, pale substrates in pinyon-juniper and sagebrush-grasslands (5,900-7,200 ft).	No pale, semi-barren substrates occur in the project area or immediate vicinity.
Hanging garden Sullivantia (<i>Sullivantia hapemanii</i> var. <i>purpusii</i>)	R	Hanging gardens on cliffs or boulders (7,000-10,000 ft).	No hanging gardens occur in the project area or vicinity.

¹ S = BLM sensitive (USDI BLM 2009a), R = CNHP Rare

Environmental Consequences of the Proposed Action: Federally Protected Plant Species: Based on existing data and the results of the 2008 and 2009 plant surveys, the proposed action should have no direct or indirect effects on federally listed Threatened, Endangered, or Proposed plant species or their habitats.

BLM Sensitive Plant Species: Based upon the results of the 2008 and 2009 surveys, the proposed action should have no direct or indirect impacts to the debris milkvetch or other BLM sensitive plant species.

Environmental Consequences of the No Action Alternative: No federally listed, Proposed, or Candidate plant species, or BLM Sensitive species should be influenced as a result of the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. In the future, if it becomes evident that direct or indirect effects to any plant special status plant species are resulting from project related activities, additional requirements may be applied, as deemed necessary and approved by the AO.

Finding on the Public Land Health Standard for Threatened & Endangered Plant Species: Special status plant species within the project area currently meet the criteria established in Land Health Standard 4. Therefore, the proposed action should not change the current status of special status plants in the project area.

THREATENED, ENDANGERED AND SENSITIVE ANIMAL SPECIES (includes a finding on Public Land Health Standard 4)

Affected Environment: Federally Protected Animal Species: A list of federally Threatened, Endangered, Proposed, or Candidate animal species having the potential to occur in Rio Blanco County was obtained from the FWS (USDI FWS 2010). According to the FWS list, there are 5 federally listed as Endangered, one Threatened, and one Candidate species that have potential to occur in Rio Blanco County. Threatened and Endangered species are legally protected under the ESA, while Candidate species are not. Table 7 provides information on these 7 species, including a brief description of the habitat and the potential for each species to occur in the proposed project area.

Table 7. FWS Threatened, Endangered, Proposed, and Candidate animal species with potential to occur in Rio Blanco County, Colorado, and Colorado State Endangered and Threatened species likely to occur in the project area

Species	Status ¹	Habitat Description	Potential to Occur in the Proposed Project Area
Mammals			
Black-footed ferret (<i>Mustela nigripes</i>)	E (XN), SE	Open grasslands with prairie dog colonies.	No grassland habitats or prairie dog colonies occur in the project area. The nearest prairie dog complex capable of supporting ferrets associated with the NE Utah/NW Colorado Experimental Non-essential Population is about 8 miles from the project area.
Canada lynx (<i>Lynx canadensis</i>)	T, SE	Mixed conifer forest, generally above 8,000 ft.	No mixed conifer forest occurs in the project area or vicinity.
Birds			
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	C	Breeds in riparian gallery forests with dense understory vegetation.	No riparian woodland habitats occur in the project area or vicinity.
Fish			
Bonytail (<i>Gila elegans</i>)	E, SE	Large rivers with fast, flowing waters.	No perennial water sources that support fisheries exist within the project area or vicinity. ²
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	E, ST	Large rivers with strong currents and deep pools.	No perennial water sources that support fisheries exist within the project area. ^{2,3}
Humpback chub (<i>Gila cypha</i>)	E, ST	Rivers with sand, gravel, or boulder bedrock stream beds; prefers deep eddies and pools.	No perennial water sources that support fisheries exist within the project area or vicinity. ²
Razorback sucker (<i>Xyrauchen texanus</i>)	E, SE	Rivers with strong currents and deep pools with sandy or rocky bottoms.	No perennial water sources that support fisheries exist within the project area or vicinity. ²

¹ E = Federally Endangered; T = Federally Threatened; C = Federal Candidate; XN = Experimental non-essential population; SE = Colorado State Endangered; ST = Colorado State Threatened. ² Water depletions to the White River may affect this species or its designated Critical Habitat located downstream in the Green and Colorado Rivers. ³ Critical Habitat for this species has been designated in Rio Blanco County (see text).

Black-footed ferrets (*Mustela nigripes*) are associated with white-tailed prairie dog (*Cynomys leucurus*) colonies, none of which occur in the project area. The nearest white-tailed prairie dog habitat is an isolated 15-ac town on the opposite side of the White River from the mouth of Hammond Draw. The next nearest town is 2.3 miles beyond that. Neither of these would be capable of supporting black-footed ferrets. The nearest white-tailed prairie dog complex capable of supporting ferrets associated with the NE Utah/NW Colorado Experimental Non-essential Population (XN) is about 8 valley miles up the White River Valley (nearest point of Wolf Creek ferret management area), or in Coal Oil Basin, which is about 8 valley miles down the White River Valley.

State-listed Animal Species: Colorado Threatened and Endangered Species and Species of Concern having potential to occur in Rio Blanco County were determined from the Colorado Division of Wildlife (CDOW) List (CDNR CDOW 2007) and Species Activity Maps (CDNR CDOW 2009). Of the Threatened and Endangered species on the CDOW list, 4 species of fish have any potential of being affected by the proposed action. These are the same as the 4 federally listed fish species addressed above and in Table 7. One State Species of Concern, the Townsend’s big-eared bat (*Corynorhinus townsendii*), has the potential to occur in the project area. This species is also considered to be Sensitive species by BLM and is addressed in Table 8.

BLM Sensitive Animal Species: The 24 Colorado BLM Sensitive animal species with potential to occur in the WRFO resource area (USDI BLM 2009a) are also considered in this EA. BLM Sensitive animal species are protected by policy rather than statute (USDI BLM 2008). Table 8 lists these species, their habitat requirements, and a determination of their potential to occur within the proposed project area. Of the 24 BLM sensitive species, 7 have potential to occur in the project area: Townsend’s big-eared bat, fringed myotis (*Myotis thysanodes*), big free-tailed bat (*Nyctinomops macrotis*), northern goshawk (*Accipiter gentilis*), greater sage grouse (*Centrocercus urophasianus*), Brewer’s sparrow (*Spizella breweri*), and Great Basin spadefoot (*Spea intermontana*). Of the animal species addressed, surveys were conducted for breeding northern goshawks.

Townsend’s big-eared bat and the fringed myotis are known to occur in pinyon-juniper woodland habitats. Acoustic surveys conducted by the BLM WRFO documented the presence of Townsend’s big-eared bat within 10 miles of the project vicinity during the summer of 2008. Big free-tailed bat has also been detected by BLM in the Piceance Basin; this species is not known to breed in Colorado. Preferred roost sites for large numbers of bats (e.g., hibernacula and maternity sites) include caves, mines, rock crevices, or man-made structures. These features do not occur on the proposed project area, but mature pinyon-juniper woodlands offer roosting sites in the form of small rock crevices and tree cavities or other deformities that may be used by small numbers of males during the summer months.

Table 8. BLM Sensitive animal species with potential to occur on WRFO BLM lands

Species	Habitat Description	Potential to Occur in the Project Area
Mammals		

Species	Habitat Description	Potential to Occur in the Project Area
Townsend's big-eared bat ¹ (<i>Corynorhinus townsendii</i>)	Sagebrush, semi-desert, pinyon-juniper, and ponderosa pine. Roosts mainly in caves and mines, but also rock crevices, buildings, bridges or hollow trees.	Project area provides pinyon-juniper woodlands, but has limited roost sites (few rock outcroppings, some snags). Known maternity roost occurs within foraging distance (at least 10 miles) of the project area.
Spotted bat (<i>Euderma maculatum</i>)	Semi-desert canyonlands with desert shrub, ponderosa pine, or pinyon-juniper woodland; also open pasture and hayfields. Roosts in crevices in cliffs with surface water nearby.	Project area provides appropriate foraging habitat, but limited roost sites (few rock outcroppings). Species has been noted in the northwest corner of the Resource Area, but has not been detected during acoustic surveys by BLM in Rio Blanco County.
Fringed Myotis (<i>Myotis thysanodes</i>)	Pinyon-juniper and ponderosa pine woodlands. Roosts in caves, mines, rock crevices, buildings, bridges, and large snags.	Project area provides pinyon-juniper woodlands, but has limited roost sites (few rock outcroppings, some snags).
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	Open rocky country in conifer forests or desert shrub communities. Roosts high on cliff faces, occasionally in tree cavities; may use buildings as day roosts.	Project area offers limited roost sites. Species detected in the Piceance Basin during acoustic surveys by BLM. Species not known to breed in Colorado.
White-tailed prairie dog (<i>Cynomys leucurus</i>)	Level to gently sloping grasslands and semi-desert grasslands from 5,000-10,000 ft in elevation.	No grassland habitats or prairie dog colonies occur in the project area.
Birds		
American white pelican (<i>Pelecanus erythrorhynchos</i>)	Typically large reservoirs but also observed on smaller water bodies including ponds; nest on islands.	No suitable habitat in the project area. The closest suitable habitat is in Kenney (Taylor Draw) Reservoir, 4.5 miles northwest of the project area.
Northern goshawk (<i>Accipiter gentilis</i>)	Mature ponderosa pine or mixed conifer forests. There are at least 6 confirmed nests in mature pinyon-juniper woodland in the WRFO.	Mature pinyon trees occur in the project area; an existing goshawk nest near pad 33-42 was relocated during 2008 survey by BLM. Breeding may have been attempted in 2008, but was not successful. In 2009, the nest was largely on the ground and inactive; alternate nests were searched for but not detected.
Ferruginous hawk ¹ (<i>Buteo regalis</i>)	Flat or rolling terrain (grasslands, shrub-steppes, deserts). Prefers elevated nest sites (e.g., buttes, trees); may also nest on the ground.	No extensive grasslands, shrub-steppes, or desert habitats occur in the project area or vicinity.
Bald eagle ² (<i>Haliaeetus leucocephalus</i>)	Nests along forested rivers and lakes; winters in upland areas, often with rivers or lakes nearby.	No suitable habitat occurs in the project area. A winter concentration area and several roost sites occur along a 9-mile segment of the White River, 4.5 to 5.5 miles northwest of the project area.

Species	Habitat Description	Potential to Occur in the Project Area
American peregrine falcon ¹ (<i>Falco peregrinus anatum</i>)	Open country near cliff habitat, often near water such as rivers, lakes, and marshes; nests on ledges or holes on cliff ledges and crags.	Potentially suitable foraging habitat occurs along the White River, 5 miles north of the project area. Nest sites are limited in the project area, making it unlikely for this species to occur there.
Columbian sharp-tailed grouse ¹ (<i>Tympanuchus phasianellus columbianus</i>)	Oak/serviceberry shrublands often interspersed with sagebrush, aspen forests, irrigated pasture lands.	No shrubland, aspen forest, or irrigated pasture habitats occur in the project area or vicinity.
Greater sage-grouse ¹ (<i>Centrocercus urophasianus</i>)	Large expanses of sagebrush shrublands; riparian areas used during brood-rearing.	Suitable year-round habitat occurs along the benches and parks extending about 3 miles south of the White River Valley to within less than one mile of the project area. Current status of species in this portion of the White River Valley is unknown, but few, if any, individuals remain.
Mountain plover ¹ (<i>Charadrius montanus</i>)	Flat, open grasslands, often associated with prairie dog towns and intensive grazing.	No grassland habitats occur in the project area or vicinity.
Long-billed curlew ¹ (<i>Numenius americanus</i>)	Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography.	No short-grass or mixed-prairie habitat occurs in the project area or vicinity.
White-faced ibis (<i>Plegadis chihi</i>)	Shallow marshes with emergent vegetation. Forages in shallow wetlands.	No marsh or wetland habitats occur in the project area or vicinity.
Burrowing owl ² (<i>Athene unicularia</i>)	Level to gently sloping grasslands and semi-desert grasslands. Requires prairie dog colonies for shelter and food; may use badger burrows.	No grassland habitats or prairie dog colonies occur in the project area.
Brewer's sparrow (<i>Spizella breweri</i>)	Common and widespread in big sagebrush, mixed shrub, and salt desert associations at all elevations in Resource Area. Small upland sagebrush parks likely to support small numbers; probably more prevalent in basin big sagebrush bottoms.	Suitable habitat occurs in the sagebrush shrubland along Fletcher Gulch, on the northern portion of the access road to proposed well 10-32.
Fish		
Bluehead sucker (<i>Catostomus discobolus</i>)	Inhabits perennial waters from headwater streams to large rivers.	No perennial water sources that support a fisheries exist within the project area or vicinity.
Flannelmouth sucker (<i>Catostomus latipinnis</i>)	Inhabits perennial waters from headwater streams to large rivers.	No perennial water sources that support a fisheries exist within the project area or vicinity.
Mountain sucker ¹ (<i>Catostomus platyrhynchus</i>)	Pools and eddies in streams with rocky or gravelly bottoms.	No perennial water sources that support a fisheries exist within the project area or vicinity.

Species	Habitat Description	Potential to Occur in the Project Area
Roundtail chub ¹ (<i>Gila robusta</i>)	Deep pools and eddies in mid- to large-sized rivers and streams throughout the Colorado River Basin.	No perennial water sources that support a fisheries exist within the project area or vicinity.
Colorado River cutthroat trout ¹ (<i>Oncorhynchus clarki pleuriticus</i>)	Occurs in headwater streams and lakes.	No perennial water sources that support a fisheries exist within the project area or vicinity.
Amphibians		
Northern leopard frog ¹ (<i>Rana pipiens</i>)	Banks and shallows of permanent bodies of water.	Northern leopard frogs are associated with perennial water sources. Fletcher Gulch provides marginal perennial flow that does not appear to support aquatic vertebrate life within the project area.
Great Basin spadefoot (<i>Spea intermontana</i>)	Sagebrush, semi-desert scrub, and pinyon-juniper habitats. Breeds in temporary or permanent pools and streams.	Pinyon-juniper habitat occurs in the project area, and temporary water is present within Fletcher Gulch.
Boreal toad ³ (<i>Anaxyrus boreas boreas</i>)	Mountain lakes, ponds, meadows, and wetlands in subalpine forest; may feed away from water.	No suitable habitat exists within the project area.

^{1,2,3} Species also ranked as a ¹ Species of Concern, ² Threatened, or ³ Endangered by the Colorado Division of Wildlife (CDNR CDOW 2007).

Northern goshawks are typically found in mixed-conifer or aspen (*Populus tremuloides*) forests during the breeding season; however, goshawk nests have been documented in mature pinyon-juniper woodlands within the WRFO resource area (Brett Smithers, WRFO BLM, pers. comm. 2008). These nests have been variably located in the interior of extensive stands, stand margins, and narrow residual stringers above 6,500 ft elevation. A known goshawk nest approximately 625 ft west of proposed well location 33-42 was located by the BLM in 2008 and represents the lowest elevation site known from this Field Office. Evidence indicates that breeding may have been attempted at the site that year, but was not successful (Smithers 2009). Protocol-level surveys done in 2008 got no response from call stations near the nest (BIO-Logic 2008c). When relocated by BLM in 2009, most of the nest material was on the ground at the base of the tree and the nest was inactive; alternate nests were searched for but not detected (Smithers 2009). Proposed well location 33-42 was originally 250 ft from the nest. Genesis agreed to move the well and its associated access roads and pipelines to the southeast to provide an approximately 625-ft buffer between the project footprint and the nest (Appendix A, Figure 5).

The project area is outside greater sage-grouse occupied range and historic habitat as mapped by CDOW (CDNR CDOW 2009; Holmes 2009). The historic Hammond Draw lek site is located a little over 3 miles east of the intersection of CR 122 and SH 64 and 1 mile south of SH 64. The lek site has not been occupied for a long time and is about 3 miles north of the proposed facilities (Holmes 2009). Sagebrush communities ostensibly suitable for year-round support of sage-grouse are continuous along the benches and parks extending along the south side of the White River Valley, however, there is little, if any recent evidence that birds persist in habitats potentially influenced by the project and its principal access.

A narrow strip of sagebrush interspersed with greasewood flat dominates the Fletcher Gulch valley floor in the Genesis lease tract. Brewer's sparrow, a sagebrush associate, may occur where the access road to proposed well location 10-32 passes through this area. The northern portion of that road is in sagebrush before entering pinyon-juniper woodland. Habitat for Brewer's sparrow is not widespread in the immediate project area, but does occur over larger areas along the White River Valley, 5 miles north of the project area.

The Great Basin spadefoot is widespread in northwestern Colorado (Hammerson 1999), typically at elevations below 7,000 ft. The pinyon-juniper woodlands and shrublands associated with stockponds and temporary pools along Fletcher Gulch could support Great Basin spadefoot. Great Basin spadefoots are known to occur in Rio Blanco County and the species may be present in the project area. In western Rio Blanco County, BLM has encountered Great Basin spadefoots very infrequently in sagebrush valleys and basins only along the Utah border.

Environmental Consequences of the Proposed Action: Federally and State Listed Animal Species: The 4 species of federally and state Endangered Colorado River fish, the bonytail, Colorado pikeminnow, humpback chub, and razorback sucker, may be indirectly affected by the proposed action if ground water depletions alter surface flows in the White River. The proposed development of the coalbed methane resource at Fletcher Gulch would require that water be extracted from the producing zone in the Mesaverde Group at a depth of about 2,500 ft, starting at a rate of 200 to 300 barrels a day. Excess water would then be disposed of by injecting it into the Sego Sandstone, at a lower depth. Extraction and injection of such volumes of water may have effects on offsite surface flows. The FWS has determined that any new consumptive use of water in the Upper Colorado River Basin represents a depletion that is likely to adversely affect the four species of Endangered Colorado River fish and their designated Critical Habitat downstream.

In May 2008, BLM prepared a Programmatic Biological Assessment (PBA) that addressed water-depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado (USDI BLM 2008b). In response to BLM's PBA, the FWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008 (USDI FWS 2008b), which determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, or razorback sucker, and that BLM water depletions are not likely to destroy or adversely modify designated Critical Habitat for these species.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated in January 1988. The Recovery Program serves as the reasonable and prudent alternative to avoid jeopardy and provide recovery to the endangered fishes by depletions from the Colorado River Basin. The PBO addresses water depletions associated with fluid minerals development on BLM lands, including water used for well drilling, hydrostatic testing of pipelines, and dust abatement on roads. The PBO includes reasonable and prudent alternatives developed by the FWS which allow BLM to authorize oil and gas wells that result in water depletion while avoiding the likelihood of jeopardy to the endangered fishes and avoiding destruction or adverse modification of their critical habitat. As a reasonable and prudent alternative in the PBO, FWS authorized BLM to solicit a one-time contribution to the Recovery

Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in the amount equal to the average annual acre-feet depleted by fluid minerals activities on BLM lands.

The PBA estimated that within the WRFO resource area, the drilling of each well uses approximately 2.41 af/well of water for drilling, 0.1 af/well for dust abatement, and 0.11 af/well for hydrostatic pipeline testing (USDI BLM 2008a). Genesis would not use hydrostatic testing on the proposed project. The total water depletion for well drilling and dust abatement would therefore be just over 9 af for the 4 gas wells currently proposed. As a partnered contributor to the endangered fish recovery program, depletion impacts attributable to Genesis' development are integral with results of the PBO and fulfill BLM's responsibility under the reasonable and prudent alternative. Water depletions from the Upper Colorado River Basin attributable to this project have been entered into the White River Field Office fluid minerals water depletion log, which would be submitted to the Colorado State Office at the end of the Fiscal Year.

Depletions of Upper Colorado River Basin water attributable to dewatering of the Williams Fork Formation and subsequent reinjection of this water into the Sego Formation is not a use covered by the above-referenced PBA and PBO. Depletions from this proposed operation need to be evaluated separately with respect to their potential effect upon the Endangered Colorado River fish and their designated Critical Habitat. The *Stream Depletion Study*, written by Western Waters & Land (WWL 2009) estimated potential effects to surface and subsurface flows from the proposed project using a Glover Analysis. Thirty-eight wells were included in the analysis, the 4 that are proposed in this EA, 4 wells that are pending proposal, the 18 approved in 2009 (DOI-BLM-CO-110-2009-0180-EA), and the 12 existing pilot project wells. The analysis modeled depletions and accretions for a 100-yr period, since such effects may continue well beyond the end of methane production. Results from that analysis indicated that substantial effects to surface water expression in Spring Creek may occur, while overall potential depletions to the White River would be minimal, with results varying based upon model assumptions. Depletions to Spring Creek ranged from zero to a maximum of 35 af per year in 2074 and 2075. Such levels of depletion would have the potential to substantially decrease surface flows in perennial reaches or reduce groundwater levels in the alluvial aquifer where the creek is intermittent or ephemeral.

Based on model results, the White River might experience a net gain in flow through year 2090. The model alternatively indicated that the river could experience a maximum net rate of loss of 3 to 5 af per year in 2108. These values are equivalent to a decrease in flow of 0.004 to 0.007 cubic feet per second (cfs), respectively. Average annual discharge to the White River is 727 cfs. The potential impacts of the estimated depletions to the flow and water chemistry in the White River were considered to be minimal. The authors stressed that data upon which to base the model were scarce and that the results of the analysis should therefore be viewed cautiously. Even if the results of the Glover Analysis are very conservative, it appears unlikely that depletions or accretions to ground water due to the proposed action would have a deleterious effect on the federally protected Colorado River fish species.

These minor depletions were considered in a manner identical to those associated with BLM's fluid mineral development, but in a complementary 1994 Programmatic consultation effort that

evaluated the effects of small water depletions associated with other BLM management activities. The estimated depletion value of 5 af that would be lost during the transfer of water from one formation to another was considered too small to deal with efficiently as an independent action, and BLM has assumed this depletion payment under the Programmatic Agreement. This value has been entered into the White River Field Office fluid minerals water depletion log and was submitted to the Colorado State Office at the end of the Fiscal Year.

BLM Sensitive Animal Species: The proposed action may have an impact on northern goshawks in the vicinity of proposed well location 33-42. During a 2009 site visit by BLM, the known goshawk nest near that well location was found largely on the ground and no alternate nests were detected in the vicinity. While this may be a sign that the pair no longer utilizes the area for breeding, the site has clearly been acceptable as breeding habitat to goshawks in the recent past. Maintaining the habitat in the vicinity of well location 33-42 in a condition suitable to goshawk breeding will be an important management strategy for encouraging continued use or reoccupation of the area by goshawks. Construction at that location may discourage reoccupation of the nest site by altering the character of the woodland stand and by creating ongoing human and mechanical disturbance. Impacts to this woodland stand as raptor nest habitat will be substantially reduced by moving the 33-42 pad and access such that about 200 meters of separation from the nest site would be gained (versus the 80 meters as originally proposed) and observing timing limitations during construction, as outlined below under *Mitigation*. Moving the pad and implementing the mitigation measures listed are expected to provide an effective means for avoiding disruption of nest activities and maintaining the long-term utility of the woodland stand for subsequent nesting functions.

The project has the potential to affect greater sage-grouse by adding to the already existing deterrents to reoccupation of suitable sagebrush habitats along the White River Valley. CR 122 provides the main access to the proposed project area. Truck traffic from many oil and gas companies is heavy along SH 64 near its intersection with CR 122 and may act as a deterrent to reoccupation of nearby habitats suitable to greater sage-grouse. Increase in truck traffic from the proposed facility at that intersection would contribute to the cumulative effects on potential greater sage-grouse habitat close by.

Brewer's sparrows breeding in sagebrush in Fletcher Gulch have the potential to be affected by the proposed action. The access road to 10-32 would travel through approximately 7,767 ft of the Fletcher Gulch valley floor. DOI-BLM-CO-110-2009-0180-EA authorized the northern 6,102 ft of this road, which provides access to approved wells 4-31, 4-42, 9-14, and 10-12. The proposed access road extension that would connect proposed 10-32 to these approved wells would cross 1,665 ft of the valley floor. If roughly one Brewer's sparrow nest territory occurs every 328 ft of valley bottom, then the total project area in Fletcher Gulch supports approximately 23 territories. The valley floor where the access road between 10-12 and 10-32 would pass supports an estimated 5 territories.

Construction of the access road to 10-32 would cause direct disturbance to sagebrush shrubland and pinyon-juniper woodland in the Fletcher Gulch Valley. Long-term loss of sagebrush habitat during production would total approximately 2.3 ac, 0.4 ac associated with the proposed access road between 10-12 and 10-32, and 1.9 ac associated with the access road between 4-31 and 10-

12 that was authorized in DOI-BLM-CO-110-2009-0180-EA. The number of Brewer’s sparrow nest territories the valley can support would drop due to habitat loss during construction and operation of the road to 10-32, and it would take years to re-establish suitable sagebrush habitat after interim and final reclamation. Noise and human activity may also discourage use of the sagebrush in the narrow Fletcher Gulch valley, further diminishing the number of territories the valley supports, especially during construction. Previous gating requirements (DOI-BLM-CO-110-2009-0180-EA) may prove effective in reducing vehicle-related disturbances over the production phase, such that long-term reductions in nest territories would be limited to possibly one-half dozen or less.

It is unlikely that the proposed action would have a measurable impact on any other BLM sensitive animal species addressed in this EA, given that the potential for each to occur in the project area is low due to the absence of important habitat components.

Environmental Consequences of the No Action Alternative: The No Action Alternative would have no detectable effect on federally Endangered, Threatened, Proposed, or Candidate species; State Endangered, Threatened, or Special Concern species; or BLM Sensitive animal species.

Mitigation: Apply the following as Conditions of Approval:

1. Prior to issuing a Notice to Proceed, a raptor survey must be conducted using the current BLM WRFO raptor survey protocol and the results of that survey approved by BLM biologists. Raptor surveys are only valid for the breeding season (i.e., April 1 to August 15 in woodland habitats and February 1 to August 15 in cliff habitats) in which they are conducted; a new raptor survey will be required if the project were delayed until a subsequent breeding season. Suitable nesting habitat associated with the following well locations and proposed pipeline and access corridors will be surveyed during the 2010 breeding season: 4-12, 33-42, 33-33.
2. Pending results of 2010 survey, proposed developments (e.g., vegetation clearing, construction, drilling, completion and scheduled workovers or fracing, reclamation) that have potential to disrupt active nesting attempts would be subject to raptor timing limitations (i.e., nest initiation to dispersal of young from nest). These stipulations will remain in effect over the life of the project, although the timing limitation provisions are contingent on occupancy status.
3. Table 9, below, outlines the appropriate No Surface Occupancy and timing limitation restrictions related to listed and unlisted nesting raptors that shall be in effect during the life of the project. Modifications to this stipulation may be granted by the Field Office Manager as specified in Table A-3, page A-13 of the WRFO ROD/RMP (USDI BLM 1997).

Table 9. No surface occupancy and timing limitation restrictions related to raptors

Species	No Surface Occupancy Buffer Size	Timing Limitation Buffer Size	Dates that Activities are Prohibited ¹
Northern Goshawk and Burrowing Owl	1/4 mi of nests	1/2 mi of nests	4/1 - 8/15 or until dispersal of young
Golden Eagle and Great Horned Owl	1/8 mi of nests	1/4 mi of nests	2/1 - 8/15 or until dispersal of young

Species	No Surface Occupancy Buffer Size	Timing Limitation Buffer Size	Dates that Activities are Prohibited ¹
Ferruginous Hawk	1/4 mi of nests	1 mi of nests	2/1 - 8/15 or until dispersal of young
Bald Eagle	1/4 mi of nests	1/2 mi of nests	12/15 – 7/15 or until dispersal of young
All Other Raptors	1/8 mi of nests	1/4 mi of nests	4/1 - 8/15 or until dispersal of young

¹ Prohibited activities are any disruptive activities including, but not limited to, vegetation clearing, construction, drilling, completion, and reclamation work.

4. Based on the currently proposed total water used for the 4 gas wells, BLM WRFO will log and report the project's average annual depletion from the Upper Colorado River Basin.
5. If at any time new information reveals that impacts from the proposed project to animal species listed as Endangered or Threatened under the ESA exceed those described in this document, or if a species that may be affected by the project becomes newly listed, Section 7 consultation with the FWS will be initiated.

Finding on the Public Land Health Standard for Threatened and Endangered Species: After implementation of mitigation, the proposed action would not be likely to have a detectable effect on federally Endangered, Threatened, Proposed, or Candidate species; State Endangered, Threatened, or Special Concern species; or BLM Sensitive animal species. The Public Land Health Standard 4 would therefore continue to be met.

MIGRATORY BIRDS

Affected Environment: The proposed project area is dominated by pinyon-juniper woodland, a vegetation community supporting the most diverse upland avian populations in the western U.S. (CPIF 2000). The project area thus supports a large suite of migratory and resident bird species that are protected under the Migratory Bird Treaty Act (MBTA). Common bird species that breed in pinyon-juniper habitats include the gray flycatcher (*Empidonax wrightii*), juniper titmouse (*Baeolophus ridgwayi*), black-throated gray warbler (*Dendroica nigrescens*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), pinyon jay (*Gymnorhinus cyanocephalus*), plumbeous vireo (*Vireo plumbeus*), and blue-gray gnatcatcher (*Poliophtila caerulea*). The project area also includes several open areas within the woodlands dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) or black sagebrush (*Artemisia nova*). The project area lies south of T2N R100W Section 27. South of this Section, the naturally fragmented and isolated sage parks that occur are inappropriate for use by greater sage-grouse (*Centrocercus urophasianus*), although they are used by other sage-brush associates such as Brewer's sparrow (*Spizella breweri*) (Ed Hollowed 2009, pers comm.).

The proposed project area is located within Colorado Partners in Flight (CPIF) Physiographic Region 87, Colorado Plateau (CPIF 2000). CPIF species considered priority in pinyon-juniper habitats in this region include the black-chinned hummingbird (*Archilochus alexandri*), gray flycatcher, Cassin's kingbird (*Tyrannus vociferans*), gray vireo (*Vireo vicinior*), pinyon jay, juniper titmouse, black-throated gray warbler, and Scott's oriole (*Icterus perisorum*). The gray

flycatcher, juniper titmouse, Pinyon jay, and black-throated gray warbler were observed in the project area during raptor and migratory bird field surveys conducted between July 19 and 21, 2006 and July 21 and August 4, 2008 (BIO-Logic 2006; 2008c). These species are widely distributed at appropriate densities throughout the WRFO. Table 10 lists all avian species observed in the project area and indicates which of these are considered by the FWS to be Birds of Conservation Concern for the Southern Rockies/Colorado Plateau (USDI FWS 2008a). The FWS applies this status to avian species that are likely to become candidates for listing under the ESA if not properly conserved.

In 2008, raptor surveys were conducted of the 18 approved wells and 4 proposed wells using the inventory methodology provided by BLM WRFO biologist Brett Smithers (BIO-Logic 2008c). The survey consisted of visual searches to locate cliff or tree nests and broadcasting of recorded Cooper’s hawk (*Accipiter cooperii*) calls intended to elicit responses from northern goshawks and Cooper’s hawks. Nests were found or sightings made of the following raptor species in the project area: American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), Cooper’s hawk, great-horned owl (*Bubo virginianus*), and golden eagle (*Aquila chrysaetos*). Nest locations pertinent to the four wells proposed in this EA include:

- An inactive golden eagle nest was located approximately 1,700 ft south of proposed well location 4-12.
- An inactive red-tailed hawk nest was located about 1,700 ft east of proposed well location 33-33.
- A red-tailed hawk nest, apparently active in 2008, was located near the top of a cliff in a side drainage off Fletcher Gulch, approximately 2,300 ft northwest of proposed well location 10-32.
- An active red-tailed hawk nest was located approximately 750 ft northeast of proposed well location 10-32.
- A known northern goshawk nest was relocated by BLM in 2008 approximately 625 ft west of proposed well location 33-42. No response was received at that location during protocol-level surveys in 2008 (BIO-Logic 2008c), although the visit by BLM indicated that an aborted attempt at breeding may have occurred. The nest was mostly on the ground in 2009 and no alternate nests were detected by BLM (see *Endangered, Threatened, and Sensitive Animal Species*).

Table 10. Avian species observed within the proposed project area, July 19 to 21, 2006 and July 21 to August 4, 2008

Common Name	Scientific Name	Common Name	Scientific Name
Turkey vulture	<i>Cathartes aura</i>	Common raven	<i>Corvus corax</i>
Cooper’s hawk	<i>Accipiter cooperii</i>	American crow	<i>Corvus brachyrhynchos</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>	Violet-green swallow	<i>Tachycineta thalassina</i>
Golden eagle ¹	<i>Aquila chrysaetos</i>	Juniper titmouse ¹	<i>Baeolophus ridgwayi</i>
American kestrel	<i>Falco sparverius</i>	Bushtit	<i>Psaltriparus minimus</i>
Mourning dove	<i>Zenaida macroura</i>	White-breasted nuthatch	<i>Sitta carolinensis</i>
Great-horned owl	<i>Bubo virginianus</i>	Rock wren	<i>Salpinctes obsoletus</i>
Common nighthawk	<i>Chordeiles minor</i>	Canyon wren	<i>Catherpes mexicanus</i>
Rufous hummingbird ²	<i>Selasphorus rufus</i>	Bewick’s wren	<i>Thryomanes bewickii</i>
Northern flicker	<i>Colaptes auratus</i>	Blue-gray gnatcatcher	<i>Polioptila caerulea</i>

Common Name	Scientific Name	Common Name	Scientific Name
Gray flycatcher	<i>Empidonax wrightii</i>	Mountain bluebird	<i>Sialia currucoides</i>
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	Black-throated gray warbler	<i>Dendroica nigrescens</i>
Plumbeous vireo	<i>Vireo plumbeus</i>	Spotted towhee	<i>Pipilo maculatus</i>
Western scrub jay	<i>Aphelocoma californica</i>	Chipping sparrow	<i>Spizella passerina</i>
Pinyon jay ¹	<i>Gymnorhinus cyanocephalus</i>	Western meadowlark	<i>Sturnella neglecta</i>
Black-billed magpie	<i>Pica hudsonica</i>		

¹ Species on the USFWS Birds of Conservation Concern for the Southern Rockies/Colorado Plateau (FWS 2008a).

² This species does not breed in the project area.

Environmental Consequences of the Proposed Action: The proposed action would remove approximately 16.5 ac of pinyon-juniper woodland and 1.0 ac of sagebrush that are utilized by bird species protected under the MBTA. Vegetation removal would result in relatively small levels of long-term avian habitat loss and modification in shrubland and woodland types. Direct and localized impacts to avian reproduction would be expected if construction occurs during the breeding season from April to August when nest destruction is possible. Noise and human disturbance may also disrupt nesting attempts in areas adjacent to construction if work occurs during the breeding season. Migratory raptors with the potential to be impacted in this way include the Cooper’s hawk, golden eagle, northern goshawk, and red-tailed hawk. However, thorough inventory requirements designed to locate and monitor raptor nest sites to prevent physical and behavioral disruption are considered effective in protecting these birds.

Birds of Conservation Concern that could be subjected to adverse influences include the pinyon jay and juniper titmouse. Pinyon jays are loosely colonial, aggressive and persistent re-nesters, and generally nest very early in the spring (March-April). Much of their initial nesting activity, if it were to occur in the project area, would be complete prior to normal schedules of heavy construction and well development. There is a very low probability that juniper titmouse, as a low density cavity nester, would be directly affected by woodland clearing that would involve about 1% of the higher canopy density woodland available in the project area.

The development of reserve pits in the project area may attract waterfowl and other migratory birds for the purposes of resting, foraging, or drinking. Waterfowl mortality at reserve pits has been observed in the past on BLM WRFO lands after birds have contacted oil-based drilling fluids (Brett Smithers, BLM WRFO, pers. comm. 2008). Contact with drilling fluids may impact migratory birds by causing acute or chronic toxicity, or by affecting the insulating capacity of feathers. Raptors that may feed on hydrocarbon contaminated migratory birds may also be impacted or killed. Such anthropogenic mortality of migratory birds is prohibited under the MBTA. The extent of these incidents is not well understood, but until the causes of mortality are better understood, mitigation measures should be designed to prevent any bird contact with produced water and drilling and completion fluids.

Environmental Consequences of the No Action Alternative: No impacts to migratory birds would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. The operator shall prevent migratory bird access to facilities that store or are expected to store fluids that may pose a risk to such birds (e.g., toxicity, compromised insulation). Features that prevent access to such fluids must be in place and functional within 24 hours of the drilling rig moving off the location and shall remain effective until such pits are removed or incapable of storing fluids. Deterrence methods may include netting or other alternative methods that effectively prevent use and that meet BLM approval (the use of “bird balls” is discouraged). It will be the responsibility of the operator to notify the BLM of the method that will be used two weeks prior to when completion activities are expected to begin. The BLM approved method will be applied within 24 hours after completion activities have begun. All lethal and non-lethal events that involve migratory birds will be reported to the BLM Petroleum Engineer Technician immediately.
2. For additional measures applicable to raptors, see mitigation measures 1 through 3 in the *Endangered, Threatened and Sensitive Animal Species* section of this document.

WILDLIFE, AQUATIC (includes a finding on Public Land Health Standard 3)

Affected Environment: The project area includes Fletcher Gulch, a perennial tributary to the White River, and Yanks Gulch, an ephemeral tributary to Fletcher Gulch. According to USGS topographic maps, Fletcher Gulch becomes seasonal downstream of the project area. Neither Fletcher Gulch nor Yanks Gulch supports a fishery. Spring Creek is a perennial drainage that lies to the west of the project area; it may experience indirect effects from the project due to water depletions (see *Endangered, Threatened and Sensitive Animal Species*). Based on BLM surveys conducted in early May 2009, Spring Creek is capable of supporting fish (species not identified, but likely to be speckled dace [*Rhinichthys osculus*]) on at least a sporadic basis, and more consistently, amphibians (e.g., western chorus frogs [*Pseudacris triseriata*]). Because of its fairly marginal nature, the Spring Creek fishery may be particularly susceptible to changes in flow rates. Any project-induced changes to water quality or surface flows in Fletcher Gulch, Yanks Gulch, or Spring Creek may have downstream effects to aquatic wildlife in the White River.

Environmental Consequences of the Proposed Action: No direct effects to water quality or volume would occur in Fletcher Gulch as a result of the proposed action and any indirect effects to water quality in that drainage would be minor and temporary. Minor and short-term increases in sediment loads in Fletcher Gulch, should they occur, would be unlikely to cause any detectable impacts to aquatic wildlife in the White River, or downstream in the Green and Colorado Rivers (see *Water Quality, Surface and Ground*). No direct or indirect impacts to water quality or volume in Yanks Gulch are expected. The project would have no direct impact on aquatic wildlife in Fletcher Gulch or Yanks Gulch.

Indirect effects to Spring Creek associated with dewatering (see *Threatened, Endangered and Sensitive Animal Species*) may affect aquatic wildlife along that drainage. The levels of depletion predicted (zero to a maximum of 34.77 af per year in 2074 and 2075 for the 18 approved, 4 proposed, 12 existing wells, and 4 pending) would have the potential to substantially decrease surface flows in this largely perennial creek or reduce groundwater levels in the alluvial

aquifer in years when the creek is ephemeral. Should water depletions to Spring Creek occur as a result of the proposed action, an unavoidable and unmitigated long-term impact to aquatic wildlife may occur in that drainage depending upon the volume of the depletion.

Environmental Consequences of the No Action Alternative: No aquatic wildlife would be impacted by the No Action Alternative.

Mitigation: See mitigation measures in *Water Quality, Surface*.

Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also *Vegetation and Wildlife, Terrestrial*): The proposed project area does not support aquatic wildlife. Offsite downstream impacts to aquatic wildlife in the White River and beyond are expected to be undetectable, and would therefore be consistent with the standard. Offsite indirect depletions of an unknown magnitude and duration may occur in Spring Creek as a result of the proposed action. If long term, substantial, and unmitigated reductions to flows in Spring Creek occur, they would be inconsistent with the land health standard and would lead to a degraded capacity to achieve the standard for an undetermined length of time.

WILDLIFE, TERRESTRIAL (includes a finding on Public Land Health Standard 3)

Affected Environment: The project area supports a wide variety of terrestrial wildlife common to pinyon-juniper woodlands. No narrowly distributed species or subspecific taxa are known to occur in the proposed project area. Pinyon-juniper communities are among the most common habitat types in the West. These woodland communities provide cover and forage for a wide variety of wildlife. Moreover, pinyon pines and junipers depend on birds and mammals for seed dispersal. Pinyon jays feed on and cache pinyon seeds, effectively planting them and thereby providing an essential dispersal mechanism. Several small mammals including the pinyon mouse (*Peromyscus truei*), which nests in hollow pinyon pines, and the bushy-tailed woodrat (*Neotoma cinerea*) depend on pinyon seeds for food. Some large mammals, including the black bear (*Ursus americanus*), utilize pinyon seeds as a fall food source.

Juniper seeds are also an abundant and important food source for some mammals, such as the gray fox (*Urocyon cinereoargenteus*). Many birds, including wintering Townsend's solitaires (*Myadestes townsendi*), feed on juniper seeds and are instrumental in their propagation. Other passerine species that utilize pinyon-juniper woodlands include the gray flycatcher, black-throated gray warbler, juniper titmouse, and bushtit. These species nest almost exclusively in pinyon-juniper habitats. Other bird species commonly found in pinyon-juniper woodlands are described in the *Migratory Birds* section.

While juniper is only marginally palatable to mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*), other shrubs that occur throughout the project area such as mountain mahogany, antelope bitterbrush, serviceberry, and sagebrush are important browse plants for these species. Pinyon-juniper communities provide valuable escape and thermal cover for both big game species. The pinyon-juniper/mountain shrub habitats are used by big game from October through April or May as general winter ranges. According to the CDOW Species Activities

Maps (CDNR CDOW 2009), severe winter range for mule deer occurs inside the project area in T2N R100W Section 33: S1/2SE1/4, NW1/4SE1/4, SE1/4SW1/4; and T1N R100W Section 4: NW1/4. This area includes proposed well locations 4-12, 33-33, and 33-42 and their associated access roads and pipelines. The entire project area is considered a winter concentration area for mule deer. Severe winter range for elk occurs between CR 122 and the project area, in portions of T2N R100W Sections 32 and 33. An elk winter concentration area occurs to the north and east of the project area, principally in T2N R100W Sections 34 and 35, coming closest to proposed activities in T2N R100W Section 33 SE1/4NE 1/4. The intersection of CR 122 and SH 64, which serves as the main access point for the proposed project, is mapped by CDOW as a mule deer and elk crossing area.

Raptor species which could potentially utilize habitats within the project area include golden eagle, red-tailed hawk, prairie falcon (*Falco mexicanus*), great-horned owl, American kestrel, and the 3 North American accipiter species: northern goshawk, Cooper's hawk, and sharp-shinned hawk (*Accipiter striatus*). During raptor surveys conducted in the area in 2006 and 2008, American kestrel, golden eagle, red-tailed hawk, great-horned owl, and Cooper's hawk were documented (BIO-Logic 2006, 2008c). Cliff habitat useful to larger raptors for nesting is limited in the project area, although evidence of use of these areas for nesting by golden eagles or red-tailed hawks was observed. The majority of the woodland habitat throughout the project area consists of intermediate or mixed-age pinyon-juniper with larger, mature trees occurring in some of the draws leading down into Yanks Gulch and in the vicinity of proposed well 33-42. Woodland stands suitable for the support of raptor nesting functions are well distributed throughout the project area.

Environmental Consequences of the Proposed Action: The proposed action would remove approximately 16.5 ac of pinyon-juniper woodland and 1 ac of sagebrush that could be utilized by a variety of wildlife. Bisecting of large continuous stands of mature pinyon-juniper by project access roads would contribute to the previous network access and add to moderate, long-term wildlife habitat loss and modification. Longer term occupation of these lands and the reduction during construction in the herbaceous and woody forage base for big game by about 17.5 ac would be of low intensity (0.3 %) across the 10.5 sq mi (6,720 ac) project area. Herbaceous forage availability would be largely regained on about 49% of this acreage in the short term following successful interim reclamation. Similarly, the loss of forage and cover for non-game animals would be of low intensity at the landscape scale (e.g., 16.5 acres of woodland habitat, with only a portion of that mature and most conducive to raptor nesting; see discussion in *Threatened, Endangered and Sensitive Animal Species* section above).

Newly constructed access roads required for development of the proposed wells represent substantial encroachment onto important big game winter ranges and would add substantially and incrementally to road density-related impacts (i.e., habitat disuse adjacent to disturbance and elevated energetic demands associated with harassment). Increased frequency and duration of vehicle-related disturbance, both as shorter-term well development and longer-term public access, would reduce the capacity of these ranges to sustain former levels of big game use.

Prior to development, the project area (a 10.50 sq mi area of analysis) hosted a road and trail network of up to 2.25 mi/sq mi (based on 2005 aerial photographs). Previous field development

has added about 5.20 miles of new road (2009 aerial photographs) for a current road density figure of about 2.75 mi/sq mi. With the addition of access approved for 18 wells under DOI-BLM-CO-110-2009-0180-EA (6.30 miles) and that currently proposed (1.30 miles of new road), collective road density in the analysis area would be elevated to about 3.47 mi/sq mi. Current WRFO RMP road density thresholds call for maintaining effective road densities at 1.50 mi/sq mi or less on big game critical habitats (currently coincident severe winter range/winter concentration area in northwest quarter of project area) and 3 mi/sq mi on remaining big game ranges. Because road density prior to development was very low and the CDOW has upgraded the status of deer range throughout the project area to “critical winter range”, it is appropriate to reduce increases in road density attributable to development as much as practical. Gate installation required for the approved and existing wells (DOI-BLM-CO-110-2009-0180-EA) would control access on about 8.5 miles of roads that were constructed (i.e., not upgraded) solely for well access (see *Mitigation*, below) and would reduce effective road density by about 0.8 mi/sq mi (overall density of 2.67 mi/sq mi). Assuming gating requirements are effectively employed, stabilizing the overall road network is considered consistent with RMP objectives. Although intense short-term influences would continue to attend well development, long-term effects over the productive life of the well would likely have relatively small additive influence on current big game use patterns.

Vegetation removal would result in a loss of habitat for a variety of ground and tree-nesting birds protected under the MBTA. Similarly, construction activities may cause disturbance to avian species, particularly during the breeding season. Disturbance during the breeding season could result in the loss of reproductive effort. These impacts are described in the *Migratory Birds* section.

Occasional direct mortality of small animals by crushing or entombment could occur during earth moving activities. For the species considered, the width of the disturbance associated with the access roads would not constitute a significant barrier to travel given the light traffic expected (see *Air Quality*), although some measure of animal mortality along roads is expected.

After construction is complete, wildlife would likely return to the area if reclamation is successful and vehicular traffic is kept to a minimum. Availability of large woody debris as cover on disturbed surfaces should promote caching activity by small mammals and, together with increased microclimatic diversity, accelerate reestablishment of shrubs useful to a variety of wildlife.

Environmental Consequences of the No Action Alternative: No impacts to terrestrial wildlife would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. Disruptive forms of activity, including road construction, drilling and completion operations, and scheduled workover and refracing, will be prohibited in severe winter range for mule deer from 1 January to 30 April: T2N R100W Section 33: S1/2SE1/4, NW1/4SE1/4, SE1/4SW1/4; and T1N R100W Section 4: NW1/4. This condition applies to development of proposed

locations 4-12, 33-42, and 33-33, including the preparation of pads and pipeline and access right-of-ways, and well drilling and completion activities.

2. General access to the following proposed locations shall be restricted by means of a lockable gate (may require fence wings) placed along the proposed access at a point as close as possible to the intersection of the proposed and established access: 4-12/33-42 group.

3. In consultation with the WRFO staff, specific locations for the recommended gates will be determined in 2010 during the construction phase of the project. The proponent would be responsible for constructing and maintaining these structures through the life of the project. The selected control point would be subject to the approval of the AO with the objectives of effectively deterring all unauthorized vehicle use not associated with natural gas development and production (including other BLM permitted users, but excepting CDOW DWM and WRFO Ranger) and preventing bypass of the control. These gates should be installed by the time initial well completion activities are complete and are to remain locked throughout the year, except during well workover or high-traffic maintenance activities.

Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also *Vegetation and Wildlife, Aquatic*): The project area currently meets the Public Land Health Standards for terrestrial animal communities, but is subject to considerable development activity that has, to an indeterminate but probably minor degree, reduced the availability and utility of forage and cover resources for wildlife. Implementation of proposed mitigation measures and successful reclamation would be effective in reducing physical and behavioral impacts to wildlife habitat and populations, but the proposed action would persist in contributing to incremental long-term effects on the extent and utility of habitat for big game, non-game, and avian species using the project area. As conditioned, the cumulative influences of the proposed action may incrementally elevate influences that temporarily suppress abundance, but would not be expected to alter the distribution or compromise the viability of any wildlife population within the Project Area, and would, therefore, not contradict continued meeting of Public Land Health Standard 3.

WILD HORSES

Affected Environment: The proposed action is located in the North Piceance Basin Herd Area, which covers 76,959 ac of BLM land and 12,396 ac of other land, for a total of 89,355 ac (USDI BLM 2006a). The area is currently managed to provide forage for a herd of 0 to 50 horses. The long-term objective (i.e., +10 years) would be to remove all wild horses from this area (USDI BLM 1997). The proposed action occurs in an area dominated by mixed-aged pinyon-juniper woodland with pockets of sagebrush. The woodland provides cover for the wild horses and the sagebrush provides foraging habitat. During the field surveys conducted for rare plants and raptors in July 2008 and for rare plants in June 2009, wild horse sign (droppings, tracks) was observed in numerous parts of the general project area, with a concentration in the grasslands adjacent to CR 122. Sign was not observed associated with the currently proposed 4 well locations.

Environmental Consequences of the Proposed Action: Construction activities associated with this project may cause short-term displacement of horses from the immediate area. Due to nearby county roads and existing oil and gas activities, wild horses in the area are likely to be habituated to human activity to some degree. Horses may use areas within ¼ mile of well pads during the drilling phase and most likely would use forage resources much closer to well pads during the production phase, with the result that they might negatively impact reclamation efforts at well locations.

Low intensity long-term loss of shelter would occur for wild horses with the loss of 16.5 ac of pinyon-juniper woodland in the project area; this is unlikely to have a detectable effect on wild horse health or use of the habitat given the size of the Herd Area. Very little short-term forage loss would occur for wild horses in the project area, given that 1 ac of sagebrush shrubland would be disturbed. This level of forage loss within the herd area would not be expected to result in displacement of horses or change in horse population trend in the area during most years. Should atypical environmental conditions exist, forage loss may place added stress on the horses, especially during foaling seasons. Such conditions include heavy snow cover late in winter, drought, fire, or a late spring green-up. Well construction would occur largely outside the foaling season (mid-March through early May), relieving stress to the horses during that sensitive time period. Normal operations following well completion would not require implementation of work windows.

Environmental Consequences of the No Action Alternative: No impacts to wild horses would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. Reclaim unused areas of the well pads as stipulated in the *Vegetation* section of this document.
2. If environmental conditions during the construction and drilling phase warrant it, work restrictions may be initiated to reduce stress on mares and foals during the foaling season (mid-March through early May).

CULTURAL RESOURCES

Affected Environment: The proposed well pads and access roads were inventoried at the Class III (100% pedestrian) level on August 13 to 18 and November 14, 16, and 17, 2008 (McDonald 2008a, Compliance Dated 5/1/2009; McDonald 2008b, Compliance Dated 5/20/2009). The inventory included 40-ac blocks around the center stakes of each of the 4 proposed and 18 approved well pads and approximately 9.3 linear miles of access road, for a total of 998 ac. A file search of the COMPASS database showed records of 6 isolated finds known to occur in the project area (McDonald 2008b). An additional 5 sites and 7 isolated finds are known to occur within the Sections that encompass the project area. One new prehistoric isolated find (5RB6080) was identified during this 100% pedestrian inventory. Isolated finds by definition are not eligible for inclusion in the National Register of Historic Places (NRHP). In

2006, a historic habitation was identified within the general project area, but did not meet Criterion A, B, C, or D and was not eligible for inclusion in the NRHP (McDonald 2006, Compliance Dated 8/31/2006). No further work was recommended for the proposed facilities.

Environmental Consequences of the Proposed Action: The proposed action would not impact any known Historic Properties as defined in the regulations.

Environmental Consequences of the No Action Alternative: No impacts to cultural resources would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. Genesis will be responsible for informing all personnel associated with the proposed project's operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts.
2. If historic or archaeological materials are uncovered during construction activities, Genesis shall immediately cease construction activities in the vicinity of the find and contact the BLM AO. Within five working days the AO will inform Genesis as to:
 - Whether the materials appear eligible for the NRHP;
 - The mitigation measures that are necessary before work can recommence at the site (assuming *in situ* preservation is not necessary);
 - A timeframe for the AO to complete an expedited review under 36 CFR 800-11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and the prescribed mitigation is appropriate.

If materials are eligible for the NRHP and Genesis decides to relocate construction activities to avoid the expense and/or time delays of mitigation efforts, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, Genesis will be responsible for the costs of mitigation. The AO will provide technical and procedural guidelines to Genesis for undertaking mitigation measures. Upon verification from the AO that the required mitigation has been completed, Genesis will then be allowed to resume construction activities.

3. Pursuant to 43 CFR 10.4(g), the holder of this authorization shall notify the AO, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), the holder must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
4. The known historic habitation 5RB 5356, located in the general project area, shall be avoided by all construction and maintenance activities unless permission to do otherwise is provided by the private landowner.

5. Any project modifications that are located outside areas previously inventoried for cultural resources shall be inventoried prior to approval of the modification.

PALEONTOLOGY

Affected Environment: Within the WRFO resource area, over 116 paleontological sites are known, including fossil invertebrates and vertebrates such as fish, dinosaurs and other reptiles, and mammals (USDI BLM 1997). It is believed that the known localities represent a small percentage of fossil resources present. The potential for paleontological resources to occur on BLM-managed lands and be impacted by a proposed project is assessed using the Potential Fossil Yield Classification (PFYC) system, which uses surface geologic units as a basis for its classification (USDI BLM 2007d).

Both spatial mapping data of surface geologic units provided by WRFO and Hail and Smith's *Geologic Map of the Northern Part of the Piceance Creek Basin, Northwestern Colorado* (1994) were referred to when doing this analysis. According to both sources, proposed well location 10-32 occurs in an area with surface geology mapped as the Wasatch Formation (tw). The Lower Green River Formation occurs close by to the south and east. According to Hail and Smith (1994), proposed locations 4-12, 33-33, and 33-42 and almost all of their access roads occur in an area mapped as the Mesaverde Group Upper Unit (kmvu), or Williams Fork Formation. Only a very small portion of the access road between 33-33 and 33-42 enters the Wasatch Formation. The BLM mapping data give a similar result for these 3 wells, except that almost the entire access road linking wells 33-33 and 33-42 passes over the Wasatch Formation; only where the road joins each pad does it enter the Williams Fork Formation. All of these formations are considered to be PFYC 5 geological formations, having very high potential to yield fossils.

Environmental Consequences of the Proposed Action: The entire project area occurs in formations assigned a PFYC of 5. If it is necessary to excavate into the underlying rock formation to construct well pads and project infrastructure anywhere in the project area, there is a potential to impact scientifically important fossil resources.

Environmental Consequences of the No Action Alternative: No impacts to paleontological resources would result from the No Action Alternative.

Mitigation: Apply the following as Conditions of Approval:

1. A paleontological monitor will need to be present any time it becomes necessary to excavate into the underlying rock formations (Selle, personal communications 7/15/2010).
2. Genesis is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for knowingly disturbing paleontological sites, or for collecting fossils.

3. Should fossil resources be discovered at any time during construction, all construction activity in the vicinity of the discovery shall cease until the BLM and an approved paleontologist have time to evaluate the discovery and recover the remains. Work shall not resume in the area of the find without written approval of the AO. Within five working days the AO will inform Genesis as to:

- Whether the materials appear to be of noteworthy scientific interest;
- The mitigation measures Genesis will likely have to undertake before the site can be used (assuming in situ preservation is not feasible).

If Genesis wishes at any time to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, Genesis will be responsible for the mitigation cost. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, Genesis will then be allowed to resume construction.

ELEMENTS NOT PRESENT OR NOT AFFECTED:

No flood plains or prime and unique farmlands occur within the area affected by the proposed action. There are also no Native American religious or environmental justice concerns associated with the proposed action.

OTHER ELEMENTS:

Of other elements listed in Table 11, only those marked as “applicable and present and brought forward for analysis” were addressed further.

Table 11. Other elements considered under NEPA

Other Elements	Not Applicable or Not Present	Applicable or Present, No Impact	Applicable and Present, Brought Forward for Analysis
Visual Resources			X
Fire Management			X
Forest Management			X
Hydrology/Water Rights			X
Rangeland Management			X
Realty Authorizations		X	
Recreation			X
Access and Transportation			X
Geology and Minerals			X
Areas of Critical Environmental Concern	X		
Wilderness	X		
Wild and Scenic Rivers	X		
Cadastral	X		

Other Elements	Not Applicable or Not Present	Applicable or Present, No Impact	Applicable and Present, Brought Forward for Analysis
Socio-Economics		X	
Law Enforcement		X	

VISUAL RESOURCES

Affected Environment: The proposed action is located on BLM Visual Resource Management Class III lands. The management objective for Class III lands is to partially retain the existing character of the landscape while allowing for a moderate level of change. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements and form found in the predominant natural features of the characteristic landscape (USDI BLM 1997). The vegetative cover in the project area consists primarily of mixed-age pinyon-juniper woodland with small pockets of sagebrush.

The proposed project area has fairly severe topographical features composed of generally northwest-southeast trending ridges with steep-walled valleys between. This kind of topography allows for long views from ridge tops and valley sides. CR 122, the main public road accessing the project area, runs along the ridge and affords wide views of the North Piceance Basin. Traffic in the vicinity of the project area typically consists of oil and gas development employees, big game hunters, other recreationists, and ranchers.

Environmental Consequences of the Proposed Action: The proposed facilities would alter the landscape by removing 16.5 ac of pinyon-juniper woodland and 1 ac of sagebrush, re-contouring the natural surface during construction, and introducing linear features and contrasting soil or vegetation colors and patterns not previously present. The removal of pinyon and juniper trees would have the most visual impact; 94% of all vegetation clearing would occur in pinyon-juniper woodland. Proposed wells 4-12 and 10-32 would be visible in the distance from CR 122. These changes would be of low intensity and long-term duration. Gas production facilities would appear as man-made artifacts to the public due to their size, color, and shape. Small buildings located on each well pad during the production phase of the project would most likely not be highly visible due to their small size and the use of natural color paint, as specified by the AO.

Environmental Consequences of the No Action Alternative: No impacts to visual resources would result from the No Action Alternative.

Mitigation: 1. Paint and maintain paint on all facilities approved with the proposed action to Juniper Green (Munsell Soil Color Chart of Standard Environmental Colors). Initial painting will occur within 6 months of installation

FIRE MANAGEMENT

Affected Environment: The project area is located within the C-10 Fletcher Gulch Fire Management Unit and has minimal constraints on the use of wildfires to achieve public land health objectives. The pinyon-juniper woodlands that comprise the bulk of the project area are mid-aged to mature, and in some areas carry considerable fuel loads. The fire history indicates that this area is very fire-prone. Most fires occurring in pinyon-juniper communities do not become very large (< 500 ac); however, there have been at least 9 fires in the C-10 Fire Management Unit with an average fire size of 866 ac. The 2 largest fires in the project area have been the Yanks and Switchback fires, 572 ac and 1,590 ac respectively, which burned in 2000 (Holsinger 2008). Both of these wildfires were successfully revegetated with a mixture of native and introduced species (Holsinger 2008). None of the historical fires in the C-10 Fire Management Unit were managed as wildland fire use for resource benefit.

All 4 proposed well locations and access roads are located in pinyon-juniper stands. Construction of these well pads and associated clearing for roads and pipelines would result in about 16.5 ac of disturbance in pinyon-juniper stands. A small portion of the access road leading to proposed well 10-32 goes through sagebrush and would result in approximately 1 ac of disturbance to this community. Sagebrush in this area occurs as a narrow band on the terrace above Fletcher Gulch, with pinyon-juniper stands on either side. The fire behavior of the pinyon-juniper communities would likely dominate this location.

Environmental Consequences of the Proposed Action: Development of the proposed facilities could temporarily restrict the BLM's ability to utilize fire as a management tool to achieve public land health objectives. During construction and drilling, any naturally occurring fires in the vicinity of the new well pads would likely be suppressed while they are small. Once well completion is achieved and in production, the small facilities associated with natural gas wells would be relatively isolated from fires due to the vegetation clearing that is maintained around these facilities.

The proposed action would require the removal of a substantial amount of woody vegetation. If cleared vegetation were to be left in place, it would result in an elevated hazardous dead fuel load that would remain on the ground for many years. Such accumulations of dead material are very receptive to fire brands and spotting from wind-driven fires and can greatly accelerate the rate of spread of the fire front. If not treated, the slash and woody debris could pose significant control problems in the event of a wildfire or wildland fire use event. Additionally there would be greater threat to the public, gas well personnel, and fire management personnel.

The roads associated with this project may be used by the general public for a variety of activities, including access for firewood gathering, hunting, and other dispersed recreational activities. Increased public use of an area would nearly always result in an increased potential for human-caused wildland fires. Gating of a number of approved and existing access roads was required as a COA for the 18 Genesis Fletcher Gulch wells authorized in 2009, (see *Wildlife, Terrestrial* in DOI-BLM-CO-110-2009-0180-EA). One of the required gates would effectively block public access to wells located in Fletcher Gulch proper, including proposed well 10-32, helping to reduce the threat of wildfire from increased use of that area by the public.

Environmental Consequences of the No Action Alternative: No impacts to fire management would result from the No Action Alternative,

Mitigation: Apply the following as Conditions of Approval:

1. Fire avoidance and prevention measures would be implemented and described in the APD's Surface Use Plan.
2. Options available to Genesis for removing project-related slash are set forth in mitigation measure 2 under *Vegetation*.
3. Some tree boles shall be retained for use as erosion control, as stated in the *Water Quality, Surface and Ground* and *Vegetation* sections. These stored materials shall not be windrowed, as this would result in an elevated hazardous fuel condition. When placed onto reclaimed areas, the boles should be evenly scattered to maintain 20% surface cover without creating pockets of fuels.

FOREST MANAGEMENT

Affected Environment: The WRFO Forest Management Program consists of Timberland Management and Woodland Management. Approximately 652,800 ac of pinyon-juniper woodlands occur within the WRFO resource area (USDI BLM 1997). Woodlands are categorized as commercial if they produce greater than eight cords per ac with at least 50% of the wood being pinyon (USDI BLM 1997). The WRFO issues both commercial and personal use permits for woodland products, including firewood, Christmas trees, fence posts, and transplants.

Most of the project area is composed of early to mid-seral stage pinyon and juniper trees that provide potential woodland products for personal use permits. However, there are some old-growth stands in the project area, most notably in the vicinity of proposed well location 33-42, which could be eligible for management as commercial woodlands, although pinyon pines constitute less than 50% of the tree layer. In these areas, pinyon pines reach heights of up to 35 ft, with an average of 20 to 25 ft.

Environmental Consequences of the Proposed Action: The proposed action would result in the removal of approximately 16.5 ac of pinyon-juniper woodland in various seral stages. Some of the trees that would be removed as a result of the proposed action could otherwise be utilized for personal or commercial woodland products. The effect to this resource would be low and long-term. After interim and final reclamation, it could take 30 to 50 years for trees to establish dominance and 200 to 300 years for old-growth stands to reestablish.

Environmental Consequences of the No Action Alternative: The No Action Alternative would have no impact on forest management.

Mitigation: Apply the following as Conditions of Approval:

1. As listed in the COAs for all surface-disturbing activities in the White River ROD/RMP, Appendix B, Page B-1 (USDI BLM 1997), Genesis shall be required to purchase from the BLM prior to any surface disturbing activity, all trees that would be removed as a result of the proposed action. Cut trees not being used for reclamation (see mitigation measure 2 in *Vegetation*) shall be cut into four-ft lengths, down to four inches in diameter, and placed along the edge of the disturbance prior to being removed for resale or private use.

HYDROLOGY AND WATER RIGHTS

Affected Environment: Refer to the *Water Quality, Surface and Ground* section for a description of the surface and subsurface water resources in the proposed action area. In the vicinity of the proposed project, the White River is under-appropriated (WWL 2009).

Environmental Consequences of the Proposed Action: The *Stream Depletion Study*, written by Western Waters & Land (WWL 2009), estimated potential effects to surface and subsurface flows from the project using a Glover Analysis. The results of this study are summarized in the *Threatened, Endangered and Sensitive Animals* section of this document. Affects to water rights from the proposed action appear to be unlikely (WWL 2009). The *Stream Depletion Study* addressed potential impacts to area springs and wells (WWL 2009). One BLM spring (Spring 149-12) with a decreed use of 0.005 cfs for livestock is located approximately 5 miles west of the project area in Taylor Draw and would be expected to experience a decrease or increase in discharge rates as a result of the proposed action. Area wells drawing from the White River Alluvial Aquifer would most likely not be affected by the project. Seasonal variations in that aquifer would be greater than any drop caused by coalbed methane extraction.

Significant depletions would not be expected in the White River. The reach of the White River that has the potential of being affected by the proposed action is under-appropriated. Because of this, decreed augmentation plans, typically used to mitigate impacts to water rights, are not currently required for well permits along this reach (WWL 2009). Spring Creek may experience significant depletions, but no water rights exist below the assumed depletion point. No water rights exist along Fletcher Gulch or Yanks Gulch. The authors of the *Stream Depletion Study* stressed that data upon which to base their analysis were scarce and that the results should therefore be viewed cautiously.

Since not all the water in the White River within Colorado is allocated for beneficial uses, this project is unlikely to injure water rights due loss of surface flows caused by depletions of groundwater. Genesis indicated that they believe that the Mesaverde Group coal unit and Segó aquifers are tributary to surface water in the White River Basin. It is also assumed that removing the produced water from the coal bed aquifer and injecting it into the Segó formation would have no net effect on surface flows in the White River Basin.

The WWL depletions study includes the potential for mitigation of local water sources such as BLM Spring 149-12, which may need to be addressed through individual agreements whereby spring water is replaced by leased or purchased water from other sources. Stock tanks can be installed at certain locations and supplied by various means. Domestic water supplies can be

temporarily supplied by water hauling. Potential impacts to this spring should be avoided if possible before mitigation is pursued. Monitoring should identify any measureable changes to the spring's water quantity and quality.

More rapid runoff from disturbed and compacted soils might have some effect on flows within Yanks Gulch and Fletcher Gulch, and their tributary drainages. Drainage from well pads and access roads would elevate sediment production from disturbed areas. A more in-depth discussion of sediment loads and the potential impacts on water quality is provided in the *Water Quality, Surface and Ground* section of this document. Increased sediment loads to local surface water drainages may result in a system that is more sediment rich than the current situation. It is unlikely that this change or the potential increase in runoff from disturbed sites would result in a detectable impact in the overall hydrologic function of the Fletcher Gulch watershed.

If any natural gas wells are converted to water wells, the potential exists for water right filings.

Environmental Consequences of the No Action Alternative: The No Action Alternative would not impact hydrology or water rights in the project area.

Mitigation: The following should be added as a condition of approval:

1. For all wells, submit via Sundry an indication of the location, method of transportation and an indication of the water right or water right holder for the use of freshwater for construction, drilling and dust abatement to meet Onshore Order #1 requirements that states, "e. Location and Types of Water Supply: Information concerning water supply, such as rivers, creeks, springs, lakes, ponds, and wells, may be shown by quarter-quarter section on a map or plat, or may be described in writing. The operator must identify the source, access route, and transportation method for all water anticipated for use in drilling the proposed well."
2. The operator will monitor BLM Spring 149-12 by doing a Spring Survey in the spring of 2010 using the technique and Spring Survey Form developed by the BLM WRFO Hydrologist (contact WRFO for location and form). A water quality sample will be taken, if possible, during the 2010 field season and analyzed for basic water chemistry, metals, and major cations and anions. In addition to this information an assessment will be made if any natural gas may be seeping into the spring as can be indicated by bubbles and/or odors. The water quality results will be submitted to the WRFO hydrologist for review by October 1st, 2010. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

RANGELAND MANAGEMENT

Affected Environment: All 4 proposed wells are located within the Upper Fletcher Draw grazing allotment (USDI BLM 1996a). This allotment includes 6,250 ac of public land providing a total of 506 AUMs. Forage production in this allotment averages 12.4 ac per AUM. The Upper Fletcher Draw allotment is utilized by cattle annually from June 16 to October 31 (USDI BLM 1997).

Environmental Consequences of the Proposed Action: In the Upper Fletcher Draw allotment, approximately 17.5 ac providing 1.4 AUMs would be removed from production during construction and drilling operations. After interim reclamation and during the production phase, approximately 4.2 ac (1.0 ac [unreclaimed pads] + 3.2 ac [unreclaimed access roads, 20-ft driving width]) providing less than 1 AUM would remain out of production.

Forage availability within the allotments is sufficient to compensate for the short- and long-term loss of forage from the proposed action. Once interim reclamation of the unused disturbed areas is complete, a portion of the forage lost would be regained. After final reclamation, acreage and forage production available for livestock would return to pre-project levels.

Potential forage losses in these allotments are not expected to require any alteration in livestock management or stocking rates. Plant species used in reclamation within the pinyon-juniper communities may create a short-term increase in herbaceous cattle forage above present levels. Construction and drilling activities and associated traffic may cause some annoyance impact to cattle if this activity coincides with grazing use near these locations. Traffic accidents, open pits, trenches, or consumption of contaminated water or forage may cause physical harm or mortality to livestock.

Environmental Consequences of the No Action Alternative: No impacts to rangeland management would result from the No Action Alternative.

Mitigation: None identified.

RECREATION

Affected Environment: The proposed action occurs within the White River Extensive Recreation Management Area (ERMA). The White River ERMA is managed custodially to provide unstructured recreational opportunities such as hunting, camping, hiking, horseback riding, wildlife viewing, and off-highway vehicle use. The area is within the Recreation Opportunity Spectrum of Semi-Primitive Motorized (USDI BLM 1996c). This classification provides management controls, some opportunity for isolation from human-made sights and sounds, and a low concentration of visitors, although evidence of other users is present.

Environmental Consequences of the Proposed Action: Approximately 17.5 ac of dispersed recreation potential would be lost while the proposed wells and roads are in construction. After reclamation, this would drop to approximately 4.2 ac (1.0 ac [unreclaimed pads] + 3.2 ac [unreclaimed access roads, 20-ft driving width]). The proposed action would alter the landscape and viewsheds in the action area (see *Visual Resources*). However, the public would most likely continue to recreate in the area. Were construction activities to occur during big game hunting seasons (September through November), the experience of hunters in the area would be negatively impacted. During the production phase, only those recreational users wishing to have a more secluded experience would be deterred from using the area.

Environmental Consequences of the No Action Alternative: No loss of dispersed recreation potential and no impact to hunters would occur as a result of the No Action Alternative.

Mitigation: None identified.

ACCESS AND TRANSPORTATION

Affected Environment: County Road 122 and an unnamed existing access road leading from CR 122 to the north side of Fletcher Gulch would be the main access roads into the project area. Access to the proposed project area would require travel along approximately 8.5 miles of CR 122 and an additional 2.5 miles on the unnamed road just mentioned. Existing and proposed spurs off of these 2 roads would access all proposed well locations. Well 10-32 would be accessed from a 0.3-mile extension to an already approved access road that follows the north side of Fletcher Gulch. The access road to well 33-33 would follow an existing 2-track, and the roads to 33-42 and 4-12 would follow a new route. Specific directions to each well location are provided in the APDs submitted for the proposed action.

Environmental Consequences of the Proposed Action: An increase in traffic along CR 122 and the main road that accesses the area north of Fletcher Gulch would be expected during the life of the wells. Construction and drilling at the sites would intensify the use of the local road system but this impact is expected to be moderate and short-term (see *Air Quality*). During the production period, traffic impacts are expected to be low and long-term. With the placement of locked gates along many of the approved access roads, the project area would not experience greatly increased levels of traffic (see mitigation measure 2 in the *Wildlife, Terrestrial* section).

Environmental Consequences of the No Action Alternative: No change to access and transportation opportunities in the proposed action area would occur as a result of the No Action Alternative.

Mitigation: No additional mitigation required above what is being proposed in the proposed action.

REALTY AUTHORIZATIONS

Affected Environment: All of the proposed well pads and associated access roads and pipelines would be authorized as part of the Genesis Fletcher Gulch development. All of the facilities would be on lease and would not require a ROW authorization. Access roads would be from SH 64 and CR 122.

Environmental Consequences of the Proposed Action: No ROW authorizations would be required. The Colorado State Highway Department and Rio Blanco County may require permits for entrance locations.

Environmental Consequences of the No Action Alternative: Under the No Action Alternative the application would be denied and use of the area would remain the same as the current condition.

Mitigation: None identified.

GEOLOGY AND MINERALS

Affected Environment: Surficial geology in the project area is derived from the Williams Fork, Wasatch, and Lower Green River Formations (Hail and Smith 1994; USDI BLM WRFO electronic data). Proposed well locations 4-12, 33-33, and 33-42 are mapped within the Williams Fork Formation, with possibly a portion of the access road between 33-33 and 33-42 entering the Wasatch Formation (see *Paleontology*). Proposed well location 10-32 is mapped within the Wasatch Formation.

The Williams Fork Formation is the upper unit of the Mesa Verde Group and as such is a major source of natural gas that is expected to receive ongoing development pressure. The Formation also holds an important regional aquifer, which complicates coalbed methane extraction. Drainage patterns and fluid storage are significantly affected by the stratigraphic architecture of the fluvial deposits and fractures within this formation (Geological Society of America 2003).

The tertiary Wasatch Formation is characterized by a coarse conglomerate of rock fragments from several inches to several feet in diameter. The color of this formation can vary from reddish to pinkish in color and may be comprised of bands of red alternating with bands of white or light green.

The 4 wells are located in area that is identified in the White River ROD/RMP as suitable and available for underground coal leasing. There are no active coal leases or coal exploration licenses in the project area. The nearest active coal mine is located approximately 7 miles north and west of the project area.

Environmental Consequences of the Proposed Action: Hydrocarbon resources would be depleted in the targeted formations by the development of the wells. The proposed casing and cementing procedures will isolate the formations and prevent the migration of gas and water between formations.

Environmental Consequences of the No Action Alternative: The No Action Alternative would have no impacts on geology and minerals in the project area and the natural gas resources would not be developed at this time.

Mitigation: None identified.

CUMULATIVE IMPACTS SUMMARY:

Within the 10.5 sq mi. area of analysis around the proposed action, the following disturbances are currently known to exist:

- Existing trails, roads, and pipelines: 28.8 mi
- Approved roads and pipelines: 7.9 mi
- Compressor station: 3 ac
- Existing well locations (12): 8.3 ac
- Approved well locations (18): 34.4 ac

After successful interim reclamation, the acres of disturbance at existing and approved well locations would drop to 7.2 ac (30 x 0.24 ac), and after final reclamation, would drop to zero, although the original habitat functions and values would most likely not be regained at the well locations for decades, and in the case of mature stands of pinyon-juniper woodland, for hundreds of years.

The proposed action would add 1.3 miles of new road to the 10.5 sq mi area of analysis, bringing the total length of trails, roads, and overland pipelines to 38 miles. The 4 proposed well pads would add 9.5 ac of disturbance to the area, bringing the total disturbed acres from well sites and the compressor station to 55.2 ac. After interim reclamation, the area in disturbed condition at the 4 well sites would be reduced about 8.5 ac, and after final reclamation it would drop to zero, with the caveats made above applying.

Future development that is reasonably certain to occur in the Fletcher Gulch Oil and Gas Unit includes 3 additional Genesis wells (34-22, 34-33, and 34-44). Additional development of this unit and the neighboring Calamity Ridge Unit is likely. If development of the coalbed methane resource in these units expands, further increases in long-term surface disturbance, water extraction, and re-injection would occur. The cumulative impacts of oil and gas activities are addressed in the White River ROD/RMP for each resource value that would be affected by the proposed action (USDI BLM 1997). The current proposed action is consistent with the scope of impacts addressed in the White River ROD/RMP.

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PERSONS / AGENCIES CONSULTED: Rio Blanco County, Colorado Division of Wildlife

INTERDISCIPLINARY REVIEW:

PROJECT TEAM		
Name	Title	Area of Responsibility
BLM Oversight		
Bob Lange	Hydrologist	Air Quality; Hydrology and Water Rights; Soils; Water Quality, Surface and Ground
Ryan Mersmann	Natural Resource Specialist/Hazardous Materials Coordinator	Wastes, Hazardous or Solid
Maggie Marston	Botanist	Areas of Critical Environmental Concern; Threatened and Endangered Plant Species
Michael Selle	Archeologist	Cultural Resources; Paleontological Resources
Mark Hafkenschiel	Rangeland Management Specialist	Invasive, Non-Native Species; Rangeland Management; Vegetation;
Ed Hollowed	Wildlife Biologist	Migratory Birds; Terrestrial and Aquatic Wildlife;

PROJECT TEAM		
Name	Title	Area of Responsibility
		Threatened, Endangered and Sensitive Animal Species; Wetlands and Riparian Zones
Andrew Burrows	Outdoor Recreation Planner	Access and Transportation; Recreation; Wilderness, Visual Resources
Jim Michels	Fire / Fuels Technician	Fire Management, Forest Management
Paul Daggett	Mining Engineer	Geology and Minerals
Linda Jones	Realty Specialist	Realty Authorizations
Melissa Kindall	Range Technician	Wild Horses
Name	Title	Area of Responsibility
BIO-Logic, Inc. (Third Party Contractor)		
Jim Ferguson Alison Graff	Biologist Biologist	Access and Transportation; Air Quality; Fire Management; Forest Management; Geology and Minerals; Hydrology and Water Rights; Invasive, Non-Native Species; Migratory Birds; Rangeland Management; Realty Authorizations; Recreation; Soils; Terrestrial and Aquatic Wildlife; Threatened, Endangered and Sensitive Animal Species; Threatened, Endangered and Sensitive Plant Species; Vegetation; Visual Resources; Wetlands and Riparian Zones; Wastes, Hazardous or Solid; Water Quality, Surface and Ground; Wild Horses
Jim Ferguson Alison Graff Gretchen Van Reyper	Biologist Biologist Biologist (ERO)	Rare Plant Surveys
Jim Le Fevre	Wildlife Biologist	Raptor Surveys
Kae McDonald	Archaeologist (Flattops Archaeological Consultants)	Cultural Resource Surveys
Bruce Smith	Hydrogeologist (Western Water & Land)	Stream Depletion Study

Finding of No Significant Impact/Decision Record (FONSI/DR)

DOI-BLM-CO-110-2010-0066-EA

FINDING OF NO SIGNIFICANT IMPACT (FONSI)/RATIONALE: The environmental assessment and analysis of the environmental effects of the proposed action have been reviewed. The approved mitigation measures (listed below) result in a Finding of No Significant Impact on the human environment. Therefore, an environmental impact statement is not necessary to further analyze the environmental effects of the proposed action.

BIO-Logic, Inc, an environmental consulting firm, with the guidance, participation, and independent evaluation of the Bureau of Land Management (BLM) prepared this document. The BLM, in accordance with 40 CFR 1506.5 (a) and (c), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

DECISION/RATIONALE: It is my decision to approve the proposed action as described in this EA with the addition of the mitigation listed below.

MITIGATION MEASURES:

Air, Soil and Water Resources

1. All access roads will be treated with water and/or a dust suppressant during construction and drilling activities so that there is not a visible dust trail behind vehicles. All vehicles will abide by company and public speed restrictions during all activities. If water is used as a dust suppressant, there should be no traces of oil or solvents in the water and it should be properly permitted for this use by the State of Colorado. Only water needed for abating dust should be applied; dust abatement should not be used as a water disposal option under any circumstances.
2. All construction and drilling activity shall cease when soils or road surfaces become saturated to a depth of three inches unless there are safety concerns or activities are otherwise approved by the Authorized Officer (AO).
3. The operator will submit via Sundry Notice the location of all frac pits, should they be required.
4. The following design features are likely to improve the design of pads to reduce adverse impacts to water resources. Provide via Sundry Notices that describe changes to pad designs that take into account the problems identified. If changes cannot be made, provide a technical argument explaining why and describe how impacts will be mediated.

- a. Consider rounding the northeastern corner of pad 4-12 to reduce the cut in this location which is currently estimated at 18.1 feet.
 - b. Consider taking the road onto pad 33-33 on the western corner. This will improve the road access into the site by taking it off of a cut slope. If the access road cannot be moved please provide a method to keep water from the road surface from running onto the pad.
 - c. The fill slopes on 10-32 would inundate Fletcher Gulch. Under no circumstances should the fill for the pad enter the active drainage channel for Fletcher Gulch. The fill and the pad need to stay up on the bench adjacent to the channel to allow for unimpeded flood flows in Fletcher Gulch.
 - d. Adequately size the culvert on the drainage to the southeast of pad 10-12 and submit the selected size via Sundry.
5. Genesis would be responsible for complying with all local, state, and federal water quality regulations, such as, but not limited to, Phase I Storm Water Permit, U.S. Army Corps of Engineers (USACE) Section 404 permit coverage, and Industrial Wastewater/Produced Water Permits. Genesis will provide confirmation of these permits at the request of the BLM. If fill from the access road or the pad for 10-32 would result in fill into Fletcher Gulch, estimates for the amount of fill material and area disturbed should be estimated and may require a notification process or maybe a permit with USACE.
 6. The operator will provide for erosion-resistant surface drainage by adding necessary drainage facilities and armoring prior to fall rain or snow. When erosion is anticipated, sediment barriers shall be constructed to slow runoff, allow deposition of sediment, and prevent it from leaving the site. In addition, straining or filtration mechanisms may also contribute to sediment removal from runoff.
 7. The operator will locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Install culverts with adequate armoring of inlet and outlet. Patrol areas susceptible to road or watershed damage during periods of high runoff.
 8. The operator will keep road inlet and outlet ditches, catchbasins, and culverts free of obstructions, particularly before and during spring runoff. Routine machine cleaning of ditches shall be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.
 9. Access roads shall be maintained to BLM Manual Section 9113 standards for road shape and drainage features. Culverts and waterbars shall be sized for the 10-year storm event with no static head and to pass a 25-year event without failing.
 10. The AO will be notified via Sundry Notice within 48 hours after well completion. The operator will not dispose of produced water in the reserve pits after well completion; all produced water will be disposed of in an approved injection well.

13. The operator shall submit a Sundry Notice if average field-wide water volumes exceed the 300 barrel-per-day maximum volume assumed for produced water production. Include the WRFO Hydrologist in the review of this sundry notification.
14. To mitigate project-related soil erosion and increased surface runoff to nearby surface waters, all reserve pits shall be closed and pads recontoured for interim reclamation no later than October 1st of the year they are drilled unless prior approval is obtained from the AO. Requests for interim reclamation activities that are anticipated to occur after October 1st will be submitted to WRFO via Sundry Notice.
15. To allow optimal opportunity for the maximum extent of interim reclamation of well pads, all tanks and production facilities will be situated on the access road side of the well pad, unless otherwise approved by the WRFO AO.
16. Pits shall not be constructed on known intermittent or perennial springs, seeps, or other surface water features. If groundwater is encountered during pit construction activity, pit construction shall cease and the location shall be reclaimed. An alternate location or an alternate plan (e.g., use of a closed loop and/or semi-closed loop system) must be approved by the AO before resuming operations. Pits shall be constructed, monitored, and operated to provide for a minimum of two (2) feet of freeboard at all times. Maintain fluids in pits at the lowest practicable level, subject to the type of operation in process.
17. It is the operator's responsibility to design and construct a liner system to contain fluids in the pit without compromising the integrity of the liner(s). The pit shall be padded with material if necessary to reduce potential damage to the liner by sharp rock edges.
18. If the COGCC requires the removal of the pit liner, the method of removal and location of disposal for pit liners and pit solids must be submitted to the AO and approved before beginning the pit closure. If pit liners are to be left in place, the fluids from the pit must be removed and/or evaporated before closing. The pit liner shall be cut or folded at the mudline and the pit shall be buried with at least 3 feet of clean spoils before interim reclamation efforts are started, as stated in the SUP.
19. If erosion occurs on improved roads during the life of the project, the operator shall promptly repair it and control it through maintenance of existing structures, construction of additional culverts, lead-out ditches, or other modifications as necessary. New construction will require a Sundry Notice.
20. BMPs for stormwater need to be submitted via sundry for all surface disturbance planned. Not ditches are currently approved for stormwater and all surface disturbance should stay within the cut and fill diagrams submitted by the operator. Any stormwater BMPs that would result in additional surface disturbance must be submitted via sundry and approved by the AO before installation.
21. For all wells, submit via Sundry Notice an indication of the location, method of transportation and an indication of the water right or water right holder for the use of

freshwater for construction, drilling and dust abatement to meet Onshore Order #1 requirements that state, “e. Location and Types of Water Supply: Information concerning water supply, such as rivers, creeks, springs, lakes, ponds, and wells, may be shown by quarter-quarter section on a map or plat, or may be described in writing. The operator must identify the source, access route, and transportation method for all water anticipated for use in drilling the proposed well.”

23. The operator will monitor BLM Spring 149-12 by doing a Spring Survey in the spring of 2010 using the technique and Spring Survey Form developed by the BLM WRFO Hydrologist (contact WRFO for location and form). A water quality sample will be taken, if possible, during the 2010 field season and analyzed for basic water chemistry, metals, and major cations and anions. In addition to this information an assessment will be made if any natural gas may be seeping into the spring as can be indicated by bubbles and/or odors. The water quality results will be submitted to the WRFO hydrologist for review by October 1st, 2010. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

Hazardous or Solid Wastes

24. The operator shall submit an updated Spill Prevention, Control, and Countermeasure (SPCC) Plan to the AO prior to construction activities.
25. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. A chemical portable toilet shall be furnished with the drilling rig. Garbage, trash, and other waste materials shall be collected in a portable, self-contained, fully enclosed trash cage during operations. “Waste” means all discarded matter including, but not limited to: human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. No trash shall be burned on location. All debris and other waste material not contained in the trash cage shall be cleaned up and removed from the location immediately after removal of the drilling rig.
26. Any spills or releases of hazardous substances shall be cleaned up and disposed of in accordance with applicable requirements and spill response plans.
22. Since the reserve pits may receive fluids from completion and fracing activities, all pits will be lined with a synthetic liner(s) with a minimum thickness of twenty-four (24) ml and shall be of a high-density polyethylene, polypropylene, poly vinyl chloride, hypalon, or other synthetic material that is impervious, weather resistant, and resistant to deterioration when in contact with hydrocarbons, aqueous acids, alkali, fungi, or other substances in the produced water. The synthetic liner(s) shall also be resistant to deterioration by ultraviolet light, punctures and tearing, and shall be designed for the life of the pit.
23. The pits must be closed within approximately six months of drilling and completion at each of the proposed 4 wells, regardless of whether additional wells are planned for the pads or not.

27. The concentration of contaminants of concern in pits and around production equipment (e.g., separators, above-ground storage tanks, etc.) at the time of closure must not exceed applicable or relevant and appropriate requirements (e.g., Colorado Oil and Gas Conservation Commission [COGCC] 900 Series Rules – Exploration and Production Waste Management, Table 910-1 [COGCC 2009]). This condition applies to pit contents and underlying soil.
28. The release of any oil, produced water, toxic liquid, or other waste materials must be controlled and contained immediately upon discovery and cleaned up as soon as possible. The BLM AO may require additional action to prevent or mitigate potential or actual adverse environmental impacts on any air, water, soil, or biological resource. Releases shall be reported by the operator to the BLM according to Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL-3A). In addition to the reporting requirements set forth in NTL-3A, the operator shall provide a monthly report to the BLM documenting any release of liquids less than 10 barrels in quantity. The report will include: (a) the date and time of occurrence; (b) the location where the incident occurred; (c) the type and volume of the material released; (d) the volume of material recovered; (e) the cause of the incident; and (f) corrective action to address the incident (e.g., initial mitigation, investigation, remediation, etc.). The monthly report will be submitted electronically via email as a Microsoft Excel file to the BLM White River Field Office Hazardous Materials Coordinator, Christina Barlow (christina_barlow@blm.gov).

Vegetation, Reclamation and Invasive, Non-Native Species

29. The operator will clear the minimum vegetation necessary for construction of the proposed facilities.
30. The operator shall provide a plan indicating how and where excess cut or borrow will be disposed of (e.g., used on other roads, stockpiled, etc.). The plans shall show stockpile and borrow locations.
31. Stripped topsoil and vegetation shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed.
32. During construction, stockpiled topsoil and spoil piles will be separated and clearly identified to prevent mixing during reclamation efforts. Topsoil stockpiles will be seeded with a BLM-approved seed mixture and protected with hydromulch or an erosion control fabric, unless interim reclamation activities will occur within one month of the spud date.
33. The operator shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes allowed for reclamation are provided in the table below and are based on the ecological site defined by the soil MUs within the project area (USDI BLM 1997; Hafkenschiel 2009).

Seed Mix	Species	PLSLbs/Acre	Ecological Site
2	Western wheatgrass (Arriba)	3	Clayey foothills,
	Streambank wheatgrass (Sodar)	2	

Seed Mix	Species	PLSLbs/Acre	Ecological Site
	Thickspike wheatgrass (Critana) Fourwing saltbush (Wytana, Rincon) Alternates: Winterfat; shadscale, globemallow	2 2	clayey slopes
4	Western wheatgrass (Rosanna) Beardless wheatgrass (Whitmar) Thickspike wheatgrass (Critana) Indian ricegrass (Rimrock,) Fourwing saltbush (Wytana or VNS) <u>Utah sweetvetch</u> Alternates: Needle and thread, globemallow, American vetch	2 2 1 2 1 1	Pinyon-juniper woodlands, stony foothills
7	Beardless wheatgrass (Whitmar) Slender wheatgrass (Primar) Big bluegrass (Sherman) Canby bluegrass (Canbar) <u>Mountain brome (Bromar)</u> Alternates: Blue flax, Rocky Mountain penstemon, balsamroot	2 2 1 1 2	Deep clay loam

Source: Hafkenschiel 2009; USDI BLM 1997.

34. Fences shall be erected around well pads to exclude livestock during reclamation of unused portions of the pads (Mark Hafkenschiel, BLM Range Specialist, pers. comm. 2008). The fences shall consist of a four-strand BLM Type-D barbed-wire fence braced with wooden H-posts at each corner, constructed in compliance with BLM Fencing Manual 1741-1 (USDI BLM 1989). Fencing may be in place for three years or more, depending upon moisture levels and reclamation success, and must be maintained so as to remain in a continuously functional state. Cattle guards shall be installed where fences cross access roads. Cattle guards shall provide a minimum 16-ft driving surface, unless otherwise stipulated by the AO. Cattle guards shall have an adjacent wire or welded steel livestock access gate, and shall be placed at a 90° angle to the access road. The gate shall be properly braced in accordance with the requirements of the Gold Book and BLM manual 1741-1.
35. The following reclamation success criteria shall be adhered to in order to ensure that adequate vegetation groundcover is established on disturbed surfaces to stabilize soils through the production phase:
- A functioning vegetation community will present a minimum cover and composition of 70% of the Desired Plant Community (DPC) as defined by the ecological site description or in relation to the specified seed mix applied. On pinyon-juniper woodland sites, this would equate to the productive capability of those sites in an herbaceous state. These attributes shall be assessed using quantitative methods such as presented in BLM Technical Reference 1730-1, 1734-4, or other preapproved methods.
 - The functioning vegetation community established on the reclaimed site will be capable of persisting on the site without continued intervention and will allow plant community successional processes to progress toward advanced community states.
 - Bare ground will not exceed the ecological site description or if not described, bare ground will not exceed that of a representative undisturbed community meeting Public Land Health Standards.

36. It shall be the responsibility of the operator to continue revegetation/reclamation efforts until vegetative communities on all disturbed surfaces are successful. Rehabilitation efforts must be repeated, if necessary, to achieve BLM reclamation success criteria as above.
37. The Reclamation Coordinator for this project is Brett Smithers (Phone: (970) 878-3818; Email: brett_smithers@blm.gov).
38. All seed tags will be submitted to the Reclamation Coordinator within 14 calendar days from the time the seeding activities have ended via Sundry Notice. The Sundry will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor, etc.). In addition, the Sundry will include the well or well pad number associated with the seeding activity, if applicable, the name of the contractor that performed the work, his or her phone number, the method used to apply the seed (e.g., broadcast, hydro-seeded, drilled), whether the seeding activity represents interim or final reclamation, an estimate of the total acres seeded, an attached map that clearly identifies all disturbed areas that were seeded, and the date the seed was applied.
39. The Reclamation Coordinator will be notified 24 hours prior to beginning all reclamation activities associated with this project via email or by phone. Reclamation activities may include, but are not limited to, seedbed preparation that requires disturbance of surface soils, seeding, constructing exclosures (e.g., fences) to exclude livestock from reclaimed areas.
40. The Reclamation Coordinator will be notified 24 hours prior to beginning all construction-related activities associated with this project that result in disturbance of surface soils via email or by phone. Construction-related activities may include, but are not limited to, pad and road construction, clearing pipeline corridors, trenching, etc. Notification of all construction-related activities, regardless of size, that result in disturbance of surface soils as a result of this project, is required.
41. In an attempt to track interim and final reclamation of federal actions related to the development of federal mineral resources, the operator shall submit Geographic Information System (GIS) data to the White River Field Office (WRFO) for any post construction (i.e., “as-built”) polygon feature that was included in the Application for Permit to Drill (APD) or Sundry Notice, and associated with the proposed action. GIS polygon features may include, but are not limited to, constructed access roads, existing roads that were upgraded, pipeline corridors, and well pad footprints. Geospatial data shall be submitted, for each completed activity, electronically to the designated BLM staff person responsible for the initial submitted request; and, in accordance with WRFO geospatial data submittal standards (available from WRFO GIS Staff). If the operator is unable to send the data electronically, the operator shall submit the data on compact disk(s) to:
- BLM, White River Field Office
220 East Market Street
Meeker, Colorado 81641

These data shall be submitted within 14 calendar days from the time when construction-related activities have ended for all geographic features associated with the approved action, or as stipulated by the BLM if the data are not received as intended. If the operator is unable

to submit the required information within the specified time period, the operator shall notify the designated BLM staff person via email or by phone, and provide justification supporting an extension of the required data submission time period. Internal and external review of the reporting process and the adequacy of the associated information to meet established goals will be conducted on an on-going basis. New information or changes in the reporting process will be incorporated into the request, as appropriate. Subsequent permit application processing may be dependent upon successful execution of this request, as stated above. Internal and external review of the reporting process and the adequacy of the associated information to meet established goals will be conducted on an on-going basis.

If for any reason the location or orientation of the geographic feature associated with the proposed action changes, the operator shall submit updated GIS data to BLM, WRFO within 7 calendar days of the change. This information shall be submitted via Sundry Notice.

42. A Reclamation Status Report will be submitted electronically via email and as a hard-copy to WRFO Reclamation Coordinator. Please submit the hardcopy to:
- BLM, White River Field Office
 - 220 East Market Street
 - Meeker, Colorado 81641
 - Attn: Brett Smithers

The Reclamation Status Report will be submitted annually for all actions that require disturbance of surface soils on BLM-administered lands as a result of the proposed action. Actions may include, but are not limited to, well pad and road construction, construction of ancillary facilities, or power line and pipeline construction. The Reclamation Status Report will be submitted by September 30th of each calendar year, and will include the well number, API number, legal description, UTM coordinates (using the NAD83 datum, Zone 13N coordinate system), project description (e.g., well pad, pipeline, etc.), reclamation status (e.g., Phase I Interim, Phase II Interim, or Final), whether the well pad or pipeline has been re-vegetated and/or re-contoured, percent of the disturbed area that has been reclaimed, method used to estimate percent area reclaimed (e.g., qualitative or quantitative), technique used to estimate percent area reclaimed (e.g., ocular, line-intercept, etc.), date seeded, photos of the reclaimed site, estimate of acres seeded, seeding method (e.g., broadcast, drilled, hydro-seeded, etc.), and contact information for the person(s) responsible for developing the report. The report will be accompanied with maps and GIS data showing each discrete point (i.e., well pad), polygon (i.e., area where seed was applied for Phase I and/or Phase II interim reclamation or area reclaimed for final reclamation), or polyline (i.e., pipeline) feature that was included in the report. Geospatial data shall be submitted: for each completed activity electronically to the designated BLM staff person responsible for the initial request and in accordance with WRFO geospatial data submittal standards (available from WRFO GIS Staff, or on the WRFO website). Internal and external review of the WRFO Reclamation Status Report, and the process used to acquire the necessary information will be conducted annually, and new information or changes in the reporting process will be incorporated into the report.

43. The operator will be required to meet with the WRFO reclamation staff in March or April of each calendar year and present a comprehensive work plan. The purpose of the plan is to

provide information pertaining to reclamation activities that are expected to occur during the current growing season. The operator shall also provide a map that shows all reclamation sites where some form of reclamation activity is expected to occur during the current growing season.

44. Reclamation activities on barrow areas and along roads and interim reclamation on pads will be completed within six months of well completion, but no later than November 1st of the year that the well is completed. Reclamation activities include the decompaction of soils, drill seeding and/or broadcast seeding, and mulching as needed. Reclamation shall occur on all disturbed areas affected by construction and drilling, except areas needed for production operations.
45. The operator shall be required to monitor all reclaimed areas for signs of erosion. In order to protect rangeland health standards, erosion features such as riling, gulying, piping and mass wasting on the surface disturbance or adjacent to the surface disturbance as a result of this action will be addressed immediately after observation by contacting the AO and submitting a plan to assure successful soil stabilization with BMPs to address erosion problems.
46. Upon final abandonment of well pads, 100% of all disturbed surfaces, including access roads, shall be restored to pre-construction contours to the extent practicable and revegetated with a BLM-stipulated seed mixture. Two-track roads improved for fluid mineral development will be reclaimed as nearly as practicable to original conditions. Natural drainage patterns will be restored and stabilized with a combination of vegetative (seeding, planting) and non-vegetative (material not harmful to wildlife, including straw bales and wattles, woody debris, biodegradable fabric) techniques. Monitoring and additional reclamation efforts shall persist until reclamation is proven successful, as determined by the BLM.
47. The operator shall be required to monitor the project area for a minimum of three years after construction to detect the presence of Colorado State List A and B noxious weed species (CDA 2009). If List A or B noxious weed species are found, abatement measures shall be implemented using materials and methods approved in advance by the AO.
48. The operator shall be responsible for noxious weed and cheatgrass control on disturbed areas within the limits of the approved project footprint. The operator is responsible for consultation with the AO and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations).
49. All vehicles and heavy machinery shall be cleaned to remove seed and soil prior to construction and drilling activities. When moving equipment from an area infested with cheatgrass, the operator shall clean equipment as required by the AO.
50. All activities shall comply with the requirements of Rio Blanco County for noxious and invasive species management.
51. Use of pesticides shall comply with the applicable federal and state laws and will require application for a Pesticide Use Proposal. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior.

Threatened, Endangered and Sensitive Plant Species

52. No surface occupancy will be allowed within known populations of BLM Sensitive plant species, unless an exception is granted by the Field Office Manager (NSO-09 cited in USDI BLM 1997).
53. If fugitive dust is determined to be affecting debris milkvetch populations, either during construction or during production, additional requirements may be applied as deemed necessary by the AO.

Wildlife

54. Prior to issuing a Notice to Proceed, a raptor survey must be conducted using the current BLM WRFO raptor survey protocol and the results of that survey approved by BLM biologists. Raptor surveys are only valid for the breeding season (i.e., April 1 to August 15 in woodland habitats and February 1 to August 15 in cliff habitats) in which they are conducted; a new raptor survey will be required if the project were delayed until a subsequent breeding season. Suitable nesting habitat associated with the following well locations and proposed pipeline and access corridors will be surveyed during the 2010 breeding season: 4-12, 33-42, 33-33.
55. Pending results of 2010 survey, proposed developments (e.g., vegetation clearing, construction, drilling, completion and scheduled workovers or fracing, reclamation) that have potential to disrupt active nesting attempts would be subject to raptor timing limitations (i.e., nest initiation to dispersal of young from nest). These stipulations will remain in effect over the life of the project, although the timing limitation provisions are contingent on occupancy status.

The table below outlines the appropriate No Surface Occupancy and timing limitation restrictions related to listed and unlisted nesting raptors that shall be in effect during the life of the project. Modifications to this stipulation may be granted by the Field Office Manager as specified in Table A-3, page A-13 of the White River ROD/RMP USDI BLM 1997).

Species	No Surface Occupancy Buffer Size	Timing Limitation Buffer Size	Dates that Activities are Prohibited ¹
Northern Goshawk and Burrowing Owl	1/4 mi of nests	1/2 mi of nests	4/1 - 8/15 or until dispersal of young
Golden Eagle and Great Horned Owl	1/8 mi of nests	1/4 mi of nests	2/1 - 8/15 or until dispersal of young
Ferruginous Hawk	1/4 mi of nests	1 mi of nests	2/1 - 8/15 or until dispersal of young
Bald Eagle	1/4 mi of nests	1/2 mi of nests	12/15 – 7/15 or until dispersal of young
All Other Raptors	1/8 mi of nests	1/4 mi of nests	4/1 - 8/15 or until dispersal of young

¹ Prohibited activities are any disruptive activities including, but not limited to, vegetation clearing, construction, drilling, completion, and reclamation work.

56. If at any time new information reveals that impacts from the proposed project to animal species listed as Endangered or Threatened under the ESA exceed those described in this document, or if a species that may be affected by the project becomes newly listed, Section 7 consultation with the FWS will be initiated.
57. The operator shall prevent migratory bird access to facilities that store or are expected to store fluids that may pose a risk to such birds (e.g., toxicity, compromised insulation). Features that prevent access to such fluids must be in place and functional within 24 hours of the drilling rig moving off the location and shall remain effective until such pits are removed or incapable of storing fluids. Deterrence methods may include netting or other alternative methods that effectively prevent use and that meet BLM approval (the use of “bird balls” is discouraged). It will be the responsibility of the operator to notify the BLM of the method that will be used two weeks prior to when completion activities are expected to begin. The BLM approved method will be applied within 24 hours after completion activities have begun. All lethal and non-lethal events that involve migratory birds will be reported to the BLM Petroleum Engineer Technician immediately.
58. Disruptive forms of activity, including road construction, drilling and completion operations, and scheduled workover and refracing, will be prohibited in severe winter range for mule deer from 1 January to 30 April: T2N R100W Section 33: S1/2SE1/4, NW1/4SE1/4, SE1/4SW1/4; and T1N R100W Section 4: NW1/4. This condition applies to development of proposed locations 4-12, 33-42, and 33-33, including the preparation of pads and pipeline and access right-of-ways, and well drilling and completion activities.
59. General access to the following proposed locations shall be restricted by means of a lockable gate (may require fence wings) placed along the proposed access at a point as close as possible to the intersection of the proposed and established access: 4-12/33-42 group.
60. In consultation with the WRFO staff, specific locations for the recommended gates will be determined in 2010 during the construction phase of the project. The proponent would be responsible for constructing and maintaining these structures through the life of the project. The selected control point would be subject to the approval of the AO with the objectives of effectively deterring all unauthorized vehicle use not associated with natural gas development and production (including other BLM permitted users, but excepting CDOW DWM and WRFO Ranger) and preventing bypass of the control. These gates should be installed by the time initial well completion activities are complete and are to remain locked throughout the year, except during well workover or high-traffic maintenance activities.

Cultural and Paleontology

61. The operator will be responsible for informing all personnel associated with the proposed project’s operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts.

62. If historic or archaeological materials are uncovered during construction activities, the operator shall immediately cease construction activities in the vicinity of the find and contact the BLM AO. Within five working days the AO will inform The operator as to:

- Whether the materials appear eligible for the NRHP;
- The mitigation measures that are necessary before work can recommence at the site (assuming *in situ* preservation is not necessary);
- A timeframe for the AO to complete an expedited review under 36 CFR 800-11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and the prescribed mitigation is appropriate.

If materials are eligible for the NRHP and the operator decides to relocate construction activities to avoid the expense and/or time delays of mitigation efforts, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for the costs of mitigation. The AO will provide technical and procedural guidelines to the operator for undertaking mitigation measures. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction activities.

63. Pursuant to 43 CFR 10.4(g), the holder of this authorization shall notify the AO, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), the holder must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
64. The known historic habitation 5RB 5356, located in the general project area, shall be avoided by all construction and maintenance activities unless permission to do otherwise is provided by the private landowner.
65. Any project modifications that are located outside areas previously inventoried for cultural resources shall be inventoried prior to approval of the modification.
66. A paleontological monitor will need to be present any time it becomes necessary to excavate into the underlying rock formations (Selle, personal communications 7/15/2010).
67. The operator is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for knowingly disturbing paleontological sites, or for collecting fossils.
68. Should fossil resources be discovered at any time during construction, all construction activity in the vicinity of the discovery shall cease until the BLM and an approved paleontologist have time to evaluate the discovery and recover the remains. Work shall not resume in the area of the find without written approval of the AO. Within five working days the AO will inform The operator as to:
- Whether the materials appear to be of noteworthy scientific interest;

- The mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not feasible).

If the operator wishes at any time to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for the mitigation cost. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.

Visual

69. Paint and maintain paint on all facilities approved with the proposed action to Juniper Green (Munsell Soil Color Chart of Standard Environmental Colors). Initial painting will occur within 6 months of installation.

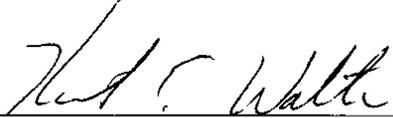
Fire and Forestry

70. Trees or shrubs that must be removed for construction or ROW preparation shall be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. Trees removed for construction that are not needed for reclamation purposes shall be cut in four foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal by the public. Woody materials required for reclamation shall be stockpiled along the margins of the authorized use area. The boles and limbs of the larger trees shall be retained for redistribution not to exceed 20% total ground cover.
71. Some tree boles shall be retained for use as erosion control, as stated in the *Water Quality, Surface and Ground* and *Vegetation* sections. These stored materials shall not be windrowed, as this would result in an elevated hazardous fuel condition. When placed onto reclaimed areas, the boles should be evenly scattered to maintain 20% surface cover without creating pockets of fuels.
72. As listed in the COAs for all surface-disturbing activities in the White River ROD/RMP, Appendix B, Page B-1 (USDI BLM 1997), Genesis shall be required to purchase from the BLM prior to any surface disturbing activity, all trees that would be removed as a result of the proposed action. Cut trees not being used for reclamation shall be cut into four-ft lengths, down to four inches in diameter, and placed along the edge of the disturbance prior to being removed for resale or private use.

COMPLIANCE/MONITORING: On-going compliance inspections and monitoring of drilling, production and post-production activities will be conducted by White River Field Office staff during construction of well pads, access roads, and pipelines. Specific mitigation developed in this Environmental Assessment will be followed. The operator will be notified of compliance related issues in writing, and depending on the nature of the issue(s), will be provided 30 days to resolve such issues.

NAME OF PREPARER: Brett Smithers, Natural Resource Specialist

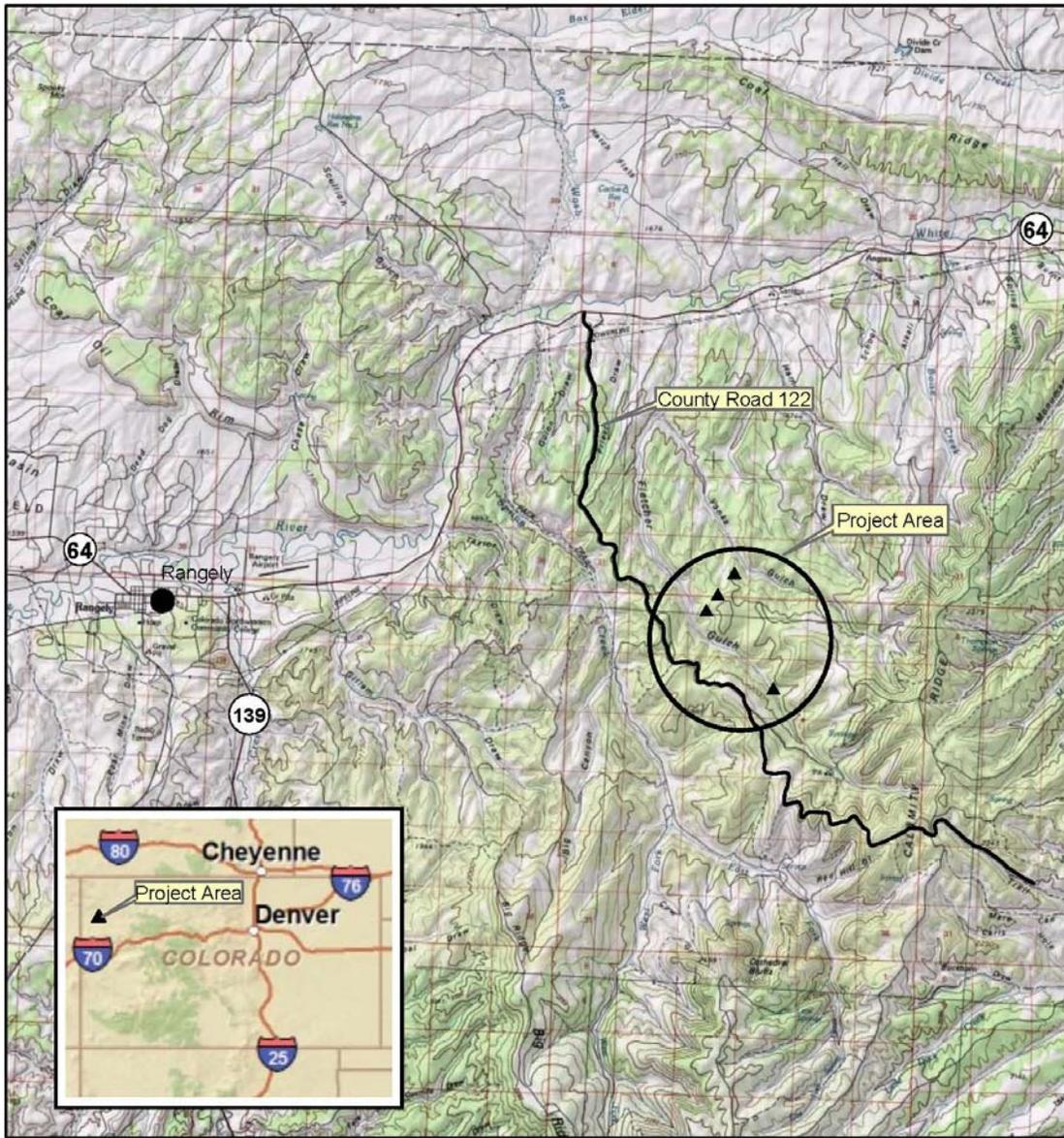
NAME OF ENVIRONMENTAL COORDINATOR: Caroline Hollowed

SIGNATURE OF AUTHORIZED OFFICIAL: 
Field Manager

DATE SIGNED: 6/02/10

ATTACHMENTS: Appendix A - Maps
Appendix B – Water Quality Data
Appendix C - Stream Depletion Analysis Fletcher Gulch
Coalbed Methane proposed action

APPENDIX A - MAPS



Legend

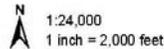
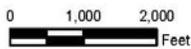
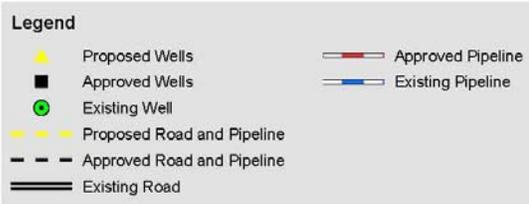
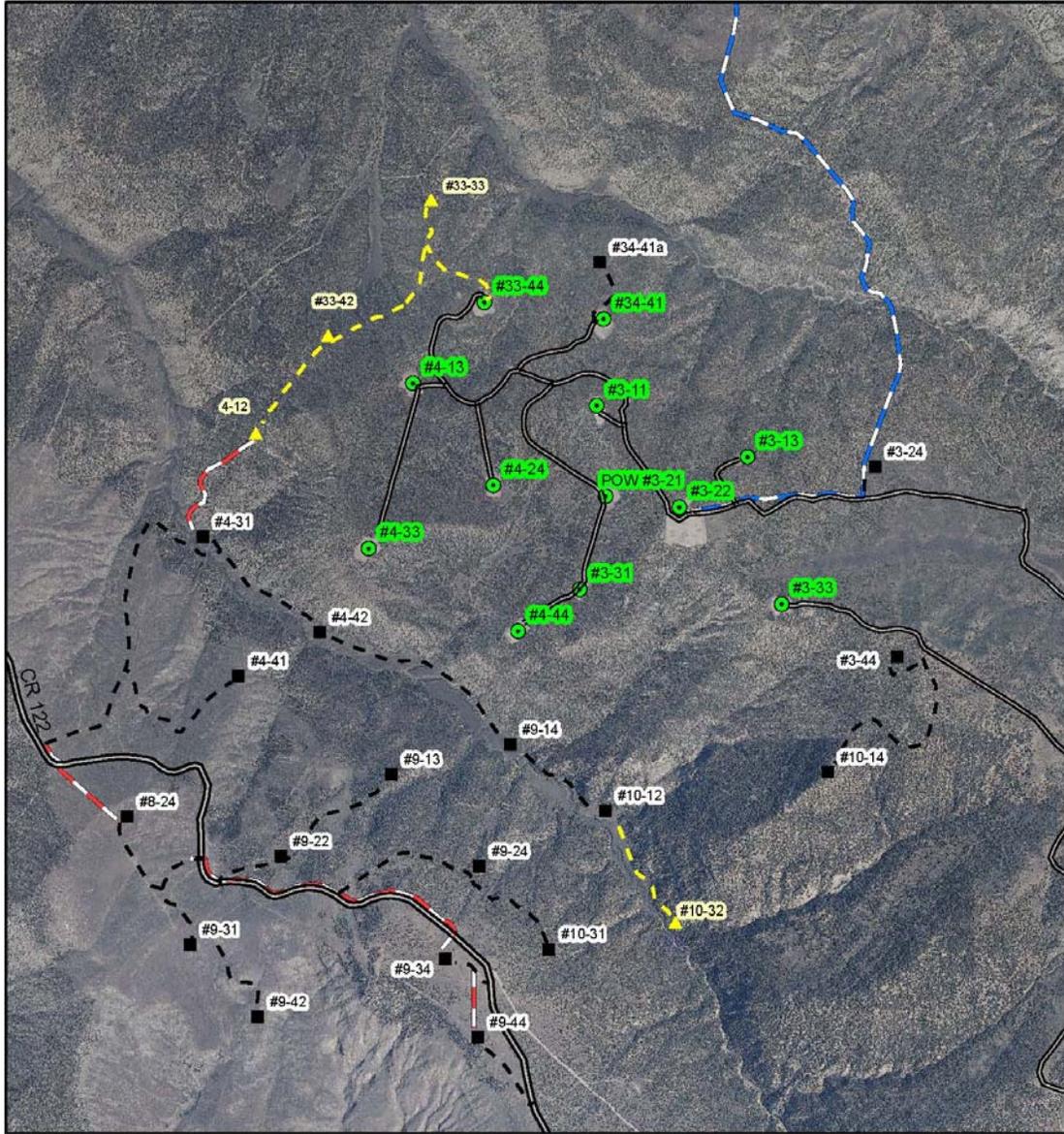
- ▲ Proposed Wells

Figure 1
Fletcher Gulch Four Gas Well Project
Project Location and Vicinity Map

February 10, 2010



BIO-Logic Environmental
635 East Main St., Suite 100
Montrose, CO 81401
(970) 240-4374
www.bio-geo.com



Basemap Source: U.S. Geological Survey,
National Agricultural Imagery Program (NAIP)
Digital full color aerial image, Summer 2009

Figure 2
Fletcher Gulch Four Gas Well Project
Existing, Approved and Proposed Locations of
Gas Wells, Pipelines and Roads

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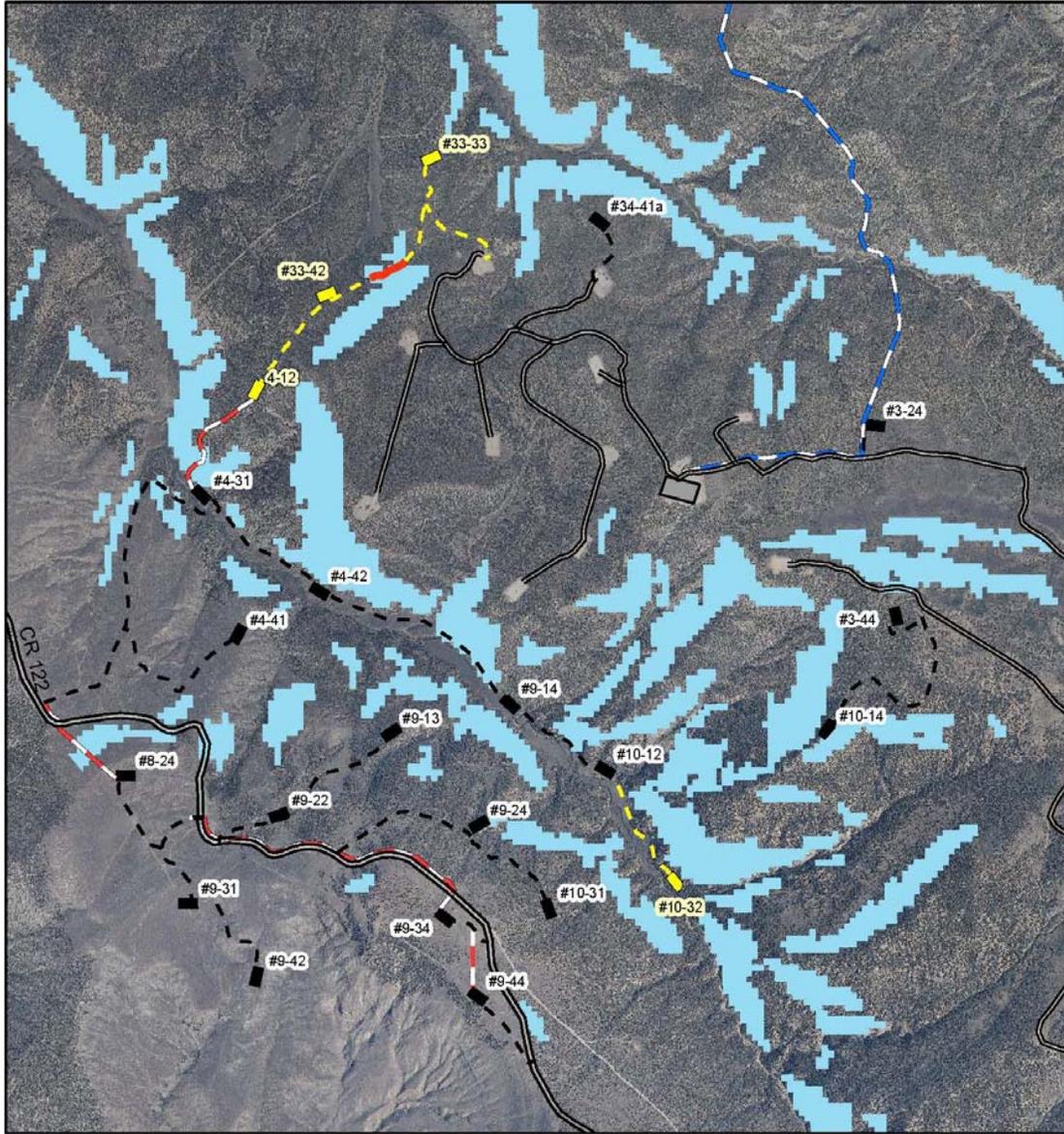


Figure 3
Fletcher Gulch Four Gas Well Project
Fragile Soils in the Project Area

February 10, 2010

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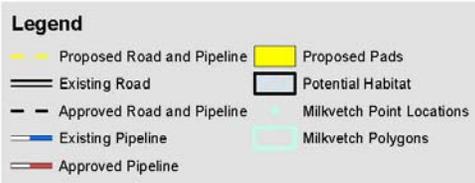
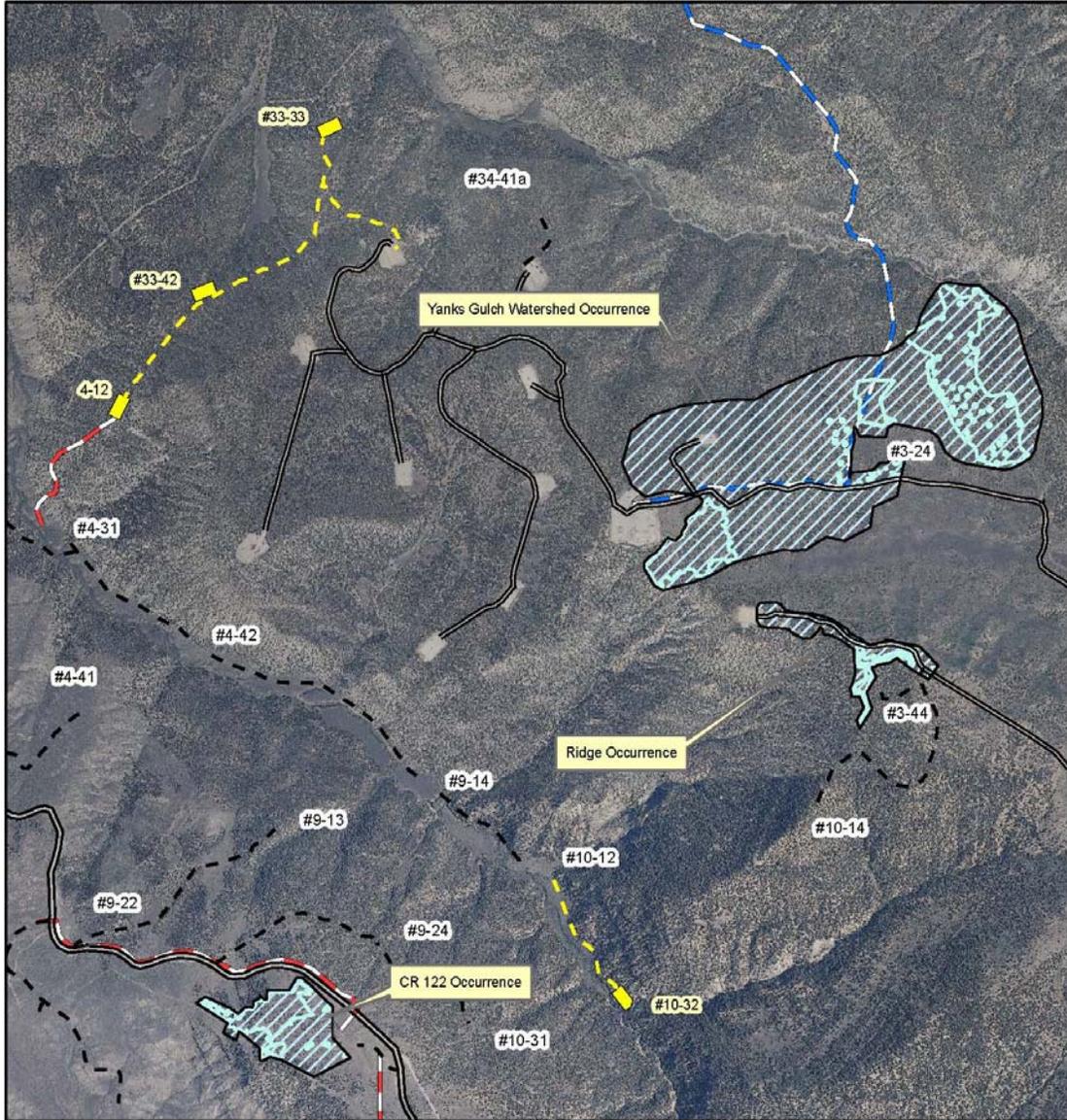
Proposed Road on Fragile Soil	Compressor Station
Approved Road and Pipeline	Proposed Pads
Proposed Road and Pipeline	Approved Pads
Existing Road	Fragile Soils
Approved Pipeline	
Existing Pipeline	

0 1,000 2,000
Feet

N 1:24,000
1 inch = 2,000 feet

Basemap Source: U.S. Geological Survey,
National Agricultural Imagery Program (NAIP)
Digital full color aerial image, Summer 2009

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Basemap Source: U.S. Geological Survey,
National Agricultural Imagery Program (NAIP)
Digital full color aerial image, Summer 2009

Figure 4
Fletcher Gulch Four Gas Well Project
Debris Milkvetch Occupied and Potential
Habitat in the Fletcher Gulch Gas Well Project Area

February 10, 2010

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APPENDIX B

WATER QUALITY AND OTHER SUPPORTING INFORMATION

Fluid Sample Analyses taken from FG #3-31

COAL ZONES

WATER *

Parameter	Detailed			Detailed		est avg
	9/14/2008	9/14/2008	9/15/2008	9/26/2008	10/8/2008	
Chlorides	11666.04	14464	13506	11235.98	10670	12000
Carbonates	170.8	360	240	24.4	0	200
Bicarbonates	1866	4148	8076	1662	8540	5000
Sulfates	<200	0	0	<200	0	0
Iron	0			0	4	0
Magnesium	146.04	24	0	97.36	24	50
Calcium	80.2	40	40	120.3	0	60
	13929.08	19036	21862	13140.04	19234	17310
Carbohydrate	detected	40	40	detected		40
Resistivity	waiting	0.35	0.325	waiting		0.33
Specific Gravity		1.02	1.015		1	1.01
pH		8.18	7.67		7.4	7.5

GAS

mole percent

	9/15/2008	9/20/2008	10/7/2008	10/14/2008
C6+	0.0355	0.0295	0.3856	0.1438
propane	0.2122	0.2548	0.2023	0.2542
i-butane	0.0785	0.0836	0.0765	0.0877
n-butane	0.0164	0.0208	0.0186	0.0359
i-pentane	0.0107	0.0119	0.0145	0.0189
n-pentane	0.0000	0.0015	0.0080	0.0076
nitrogen	30.3078	24.7565	16.3423	12.2711
methane	66.8585	71.9538	79.6316	83.9045
carbon dioxide	1.3035	1.6191	2.2054	2.1029
ethane	1.1769	1.2684	1.1152	1.1735
	100.0000	99.9999	100.0000	100.0001
dry btu	709.4700	764.0200	856.9500	890.9500
sat btu	697.1300	750.7300	842.0400	875.4500

* Values are in parts per million (ppm)
Source: Genesis Gas & Oil, LLC.

Fluid Sample Analyses taken from FG #3-31WD

UPPER SEGO FORMATION

WATER*

	sample 1	sample 2	
	9/26/2008	9/26/2008	average
Chlorides	12408	11309	11858.5
Carbonates	0	0	0
Bicarbonates	3904	3904	3904
Sulfates	5000	5000	5000
Iron	6	10	8
Magnesium	0	0	0
Calcium	80	80	80
TDS	21392	20293	20842.5
Carbohydrate	0	0	0
Resistivity	0.4	0.32	0.36
Specific Gravity	1.01	1.01	1.01
pH	7	7.9	7.45

GAS

mole percent

C6+

propane

i-butane

n-butane

i-pentane

n-pentane

nitrogen

methane

carbon dioxide

ethane

dry btu

sat btu

* Values are in parts per million (ppm).

Source: Genesis Gas & Oil, LLC.

**APPENDIX C - STREAM DEPLETION ANALYSIS
FLETCHER GULCH COALBED METHANE PROPOSED ACTION**