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

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-110-2012-0041-EA

CASEFILE/PROJECT NUMBER:

Table 1. Lease and Right-of-Way Case Serial Numbers

LEASE SERIAL NUMBER	UNIT	FEATURE	ROW CASE SERIAL NUMBER
COC-063445	Calamity Ridge II	2-21, 2-32, 2-33, 2-41, 2-43	Pending COC75370/75371
COC-061170	Calamity Ridge II	2-44	Pending COC75370/75371
COC-065645	Calamity Ridge II	14-11, 14-22, 14-24	Pending COC75370/75371
COC-063332	Fletcher Gulch Shallow	2-11, 34-22, 34-33, 34-44	COC75987(PWDD) Amend COC70201

PROJECT NAME: Genesis Gas Wells, 13 Applications for Permit to Drill:
Calamity Ridge Unit II: 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 14-24
Fletcher Gulch Shallow Unit: 2-11, 34-22, 34-33, 34-44

LEGAL DESCRIPTION: T.1 N., R.100 W., 6th PM,
Section 2: S1/2, NW1/4
Section 11: NE1/4, SW1/4
Section 14: E1/2, NW1/4

T.2 N., R.100 W., 6th PM,
Section 34: E1/2, NW1/4
Section 35: SW1/4

APPLICANT: Genesis Gas & Oil Colorado LLC.

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PURPOSE & NEED FOR THE ACTION: The purpose of the Proposed Action is to respond to Genesis Gas & Oil Colorado LLC's (hereafter Genesis or the operator) 13 Applications for Permit to Drill (APDs), which would permit Genesis to access their valid and existing right to develop the coalbed methane resource in their Federal leases within the Calamity Ridge II and Fletcher Gulch Shallow Units. The need for the Proposed Action is to manage and enable the exploration and development of mineral resources on public and split estate lands in accordance with the Bureau of Land Management's (BLM) multiple use mandate established under the Federal Land Policy and Management Act of 1976, and to do so while providing reasonable protection for other resource values under the National Environmental Policy Act (NEPA).

Decision to be Made: The BLM will decide whether or not to approve the APDs, and if so, under what conditions.

SCOPING, PUBLIC INVOLVEMENT, AND ISSUES:

Scoping: Internal scoping was the primary mechanism used by the BLM to identify resource issues. Internal scoping was initiated when the project was first presented to the White River Field Office (WRFO) interdisciplinary team on May 10, 2010. . External scoping was conducted by posting this project on the WRFO's on-line National Environmental Policy Act (NEPA) register on 2/7/2012.

Issues: No issues were identified during scoping.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

Background/Introduction: Field reviews of the Proposed Action were conducted on the following dates: September 7 and 16, 2012, and May 11, 2011.

Initial Applications for Permit to Drill (APDs) for a subset of the 13 wells were submitted on the following dates: 34-22, 34-33, and 34-44 on March 23, 2009; and 2-21, 2-33, 2-41, 2-43, 14-22, 14-24 on October 15, 2010.

The following surveys were conducted in support of this EA:

- Threatened, endangered, and BLM sensitive plant species (BIO-Logic 2010b):
  May 21, 25-27, 2010;
  June 1, 2, 9-11, 16-18, 22, 23, 25, 2010.
- Raptors (BIO-Logic 2010a):
  June 30, 2010;
  July 1, 2, 6, 7, 2010.
- Cultural resources (Greubel 2006; McDonald 2008, 2010, 2011, 2012a):
  October 31 to November 2, 2006;
  August 13-18, 2008;
  September 28, 29, 30, 2010;
  October 10, 2010;
  June 10, 13, 17, 2011;
  April 6, 2012.

An analysis of potential stream depletion effects from Genesis' development of the Fletcher Gulch Shallow Unit was completed in 2009 (WWL 2009) in support of DOI-BLM-CO-110-2009-0180-EA. The analysis was updated in 2010 in support of the current proposed wells (WWL 2010).

Currently in the Genesis Fletcher Gulch Shallow Unit and Calamity Ridge II Unit (T1N, R100W, and T2N, R100W) there are 11 producing gas wells, one water disposal well, one monitoring well, two drilling shut-in wells, 16 approved APDs, and six well pads that have been constructed in the year 2010 and not drilled. The six well pads that have constructed and not drilled are the following: FGSU 4-12, FGSU 33-42, FGSU 4-31, FGSU 4-41, FGSU 4-42, and FGSU 9-14. Total combined disturbance for the subject six well pads, roads, and pipelines was approved at 29.90 acres.

Proposed Action: Genesis proposes to expand current development by constructing 13 new well pads and drilling one vertical hole well on each pad. Four of the wells would be in the Fletcher Gulch Shallow Unit, and 9 in the Calamity Ridge II Unit. Construction of associated access roads and gathering pipelines would accompany well pad construction.

Location

The project would be located in Rio Blanco County, Colorado, approximately 10 air miles east of Rangely in the vicinity of Fletcher Gulch and Yanks Gulch. The general project location is shown in Appendix A, Figure 1. To access the project area from the intersection of Colorado State Highway (SH) 64 and Rio Blanco County Road (RBC) 122, travel 8.4 miles southeast on RBC 122 and turn left onto BLM Road 1100 (BLM 1100). Locations of proposed pads and access roads are shown in the context of existing and approved development in Appendix A, Figure 2.

Surface and Minerals Ownership

The proposed facilities would be located primarily on land administered by the BLM, with some on private surface, as shown in Table 2 and Appendix A, Figure 3. The majority of the 14-24 pad and a portion of its access road are proposed on private surface. The pad would occupy both split estate (gas rights reserved to the Federal government) and fee land (coal only reserved to the Federal government), with the well accessing private minerals. Just over one-half of the access road to 14-24 would be on fee land (1,283 feet [ft]) and the other half (1,127 feet) would be on land managed by the BLM. The portion of the project on private land would be located within an existing Genesis access right-of-way (ROW), as defined in the *Wyatt ROW and Surface Use Agreement* between Genesis and the landowner. All proposed pads, roads, and pipelines would be on Genesis lease tracts.

Table 2. Surface and Natural Gas Ownership at Locations of Proposed Disturbance

Pad Numbers	Surface Ownership	Gas Ownership
2-11, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 34-22, 34-33, 34-44	Federal	Federal
14-24	Part Federal, Part Private	Private
Access Roads with Pipelines[1]		
2-11, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 34-22, 34-33, 34-44	Federal	Federal
14-24	Part Federal, Part Private	Part Federal, Part Private

[1] Access roads are designated by the number of the pad with which they are associated.

Project Overview

Estimated disturbance and interim reclamation acres for the 13 proposed well pads and associated access roads are provided in Table 3. The working surface on all pads would be 150 by 275 feet and would accommodate one vertical well. Construction of the 13 well pads would create 24.2 acres of disturbance. Construction of 3.8 miles (20,063 feet) of access roads with pipelines within a 50-foot ROW would result in 22.9 acres of disturbance. The maximum short-term disturbance prior to interim reclamation would equal 47.1 acres. Stormwater measures, turnouts, and the culvert in Yanks Gulch are included within the estimates of disturbance. Once production has begun, interim reclamation activities would reshape the cut and fill slopes and reseed 21.4 acres of disturbed land, leaving a total of 2.8 acres, or approximately 0.2 to 0.3 acres around each wellhead, unreclaimed during the production phase. 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 (USDI and USDA 2007), BLM Manual 9113 (BLM 1985), Controlled Surface Use Stipulation-1 (CSU-1) (BLM 1997), and all other applicable laws and regulations.

Access

Access to the proposed pads would be on BLM 1100 and extensions from it. This main service road has an improved, compacted, and cobbled surface to prevent rutting and erosion. An engineered extension of the existing main service road is proposed to access pads 2-11, 34-22, 34-33, and 34-44. This extension follows an existing two-track and would require a culverted crossing of Yanks Gulch. The crossing was engineered for a 25-year storm and would require an 8 by 80-foot corrugated metal culvert. Culvert specifications are provided in Table 4. The culvert would be sunk 1.5 feet below original grade and the bottom surfaced with materials stockpiled during dredging operations to provide a natural channel bed. One or more additional culverts would be required along the access roads to pads 2-11, 2-21, 2-32, 2-33, 2-41, 2-44, 14-11, 14-22, 14-24, 34-22, and 34-44 to channel surface runoff.

Surface disturbance from new access would be minimized by locating six of the proposed well pads (2-21, 2-32, 2-33, 2-41, 2-43, and 14-22) directly adjacent to or within 0.3 mile of the existing main service road. Three of these pads (2-21, 2-41, and 2-43) would require a 0.02-acres turnout on the opposite side of the service road from the pad entry point.

Pipelines

Approximately 14,926 feet of gathering lines would be located within the ROW for the proposed access roads and pads. The gas and wastewater collection pipelines would be co-located in the borrow ditch for the road, five feet below the surface, except where steep slopes would result in excessive surface disturbance. In steep locations, the pipelines 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 two to four inches depending on the number of wells being served and distance to the injection well. Installation of the gathering pipelines at the time of road and pad construction would allow each well to be tied into 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 would occur infrequently.

Table 3. Disturbance Estimates for Proposed Well Pads and Access Roads with Pipelines

Well Pad	Pad Disturbance (ac)[1]	Access Length (feet)	Access Disturbance (ac)[2]	Pipeline Length (feet)	Total Site Disturbance (ac)[3, 4, 5, 6]	Pad Interim Reclamation		Total Excess Spoil (cubic yards)
						Reclaimed Area (ac)	Unreclaimed Area (ac)	
2-11	2.0	2,487	2.8	2,466	4.8	1.7	0.3	587
2-21	1.7	205	0.2	84	1.9	1.5	0.2	671
2-32	1.6	284	0.3	345	1.9	1.4	0.2	588
2-33	1.8	266	0.3	258	2.1	1.6	0.2	659
2-41	1.6	30	0.03 (1,500 square feet)	59	1.63	1.4	0.2	584
2-43	1.8	25	0.02 (871.2 square feet)	177	1.82	1.6	0.2	744
2-44	1.9	3,250	3.7	3,271	5.6	1.6	0.3	588
14-11	1.6	1,585	1.8	1,603	3.4	1.4	0.2	588
14-22	1.9	255	0.3	214	2.2	1.7	0.2	685
14-24[4]	2.2	2,410	1.30 (BLM surface) 1.50 (private surface)	2,522	5	2.0	0.1	5,919
34-22	1.9	6,131	7.0	793	8.9	1.7	0.2	820
34-33	1.4	966	1.1	965	2.5	1.2	0.2	1,002
34-44	2.8	2,169	2.5	2,169	5.3	2.6	0.2	4,375
Totals	**24.2**	**20,063**	**22.9[4]**	**14,926**	**47.1[3, 4, 5, 6]**	**21.5**	**2.7**	**17,810**

[1] Estimate includes total acres disturbed for pad surface, cut-and-fill slopes, and stormwater control measures.
[2] Estimate is based upon a 50-foot disturbance width along the length of the access route. Disturbance for turnouts at 2-21, 2-41, and 2-43, and for the culvert at Yanks Gulch, are also included.
[3] All pipelines will be placed within the road or pad ROW, so disturbance estimates for all pipelines are included in estimates for pads and roads.
[4] The 14-24 well proposed access road upgrade includes 1,127 feet on BLM surface and 1,283 feet on private surface.
[5] Disturbance acres includes 45.60 acres on BLM surface and 1.50 acres on private surface.
[6] Pad disturbance acreage for the 14-24 is primarily on private surface, with the exception of 0.006572 acres or 286.27 square feet on BLM on the ENE corner of the wellpad.

Table 4. Design Criteria for the Yanks Gulch Culvert

Culvert Size	Invert/ Road Elevation	Storm	Volume (CFS)	Peak Elevation	Velocity (FPS)	Headwater Depth	Road Freeboard
8 x 80 feet	6,173.9/ 6,192.2	10-24	117.6	6,178	7.2	3.9	14.5
		25-24	273.2	6,180	8.6	6.5	11.8
		50-24	370.0	6,182	9.1	8.0	10.3

Production and Wastewater Disposal

Natural gas and water would be extracted from the Williams Fork Formation of the Mesaverde group of geologic strata at depths ranging from 1,570 to 3,735 feet below surface. Depth variations are partly due to differences in surface elevations for each well location. Wastewater would be disposed of by injection into the deeper Sego Formation, also part of the Mesaverde group, at approximately 3,200 feet.

Gas produced by the project would be collected at the existing compressor unit (DOI-BLM-CO-110-2007-232-DNA) near existing well 3-22 and transported from the project area via a distribution pipeline constructed in 2008 (DOI-BLM-CO-110-2007-055-EA; see Appendix A, Figure 2). The pipeline travels from the compressor station to Williams' Fletcher Gulch meter station on SH 64. An existing injection well in the Fletcher Gulch Shallow Unit, 3-31, would be used to dispose of produced water. No upgrades or expansions of these facilities would be required. Produced water would be collected in buried polyethylene pipelines for transport to the 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. Initially, each well is expected to produce 200 to 300 barrels (bbls) 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.

In the event that the 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. 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 (SN) a proposal to drill a new injection well co-located on an approved well or one of the wells proposed in this EA.

Water Supply and Usage

Genesis would use fresh water to drill to surface casing depth. Below surface casing and for completion, they would use produced water pumped through the water gathering system from the existing injection well 3-31. An estimated 300 barrels per day of fresh water would be used during construction of pads and associated roads, including dust abatement. Drilling would require an estimated 300 barrels of fresh water and 1,500 barrels of produced water. Approximately 2,000 barrels per well of produced water would be required for well completion.

Water for construction would be hauled along the main service road from an existing pond on Fletcher Gulch close to where BLM 1100 crosses Fletcher Gulch. The pond is on private surface. Fresh water for drilling to surface casing depth would be hauled by Urie Trucking from a well

(#208610) at the Wade Cox residence on SH 64, east of the intersection of SH 64 and RBC 122. No new roads would be required to haul water.

Constraints on Pad Locations
The proposed locations of the 13 wells have been chosen with a number of factors in mind, including distance to legal section lines, location of sensitive natural resources, topography, and minimization of new access road construction. In addition to these factors, the behavior of gas and the techniques available for extracting it places considerable constraints on the location of gas wells over the landscape. 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 coal 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 from the proposed wells, the pressure needs to be reduced across the entire reservoir under lease. Pressure reduction is accomplished by a process called "interference", whereby coalbed methane wells are placed contiguous to 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 of producing wells, maintaining high pressure and significantly lowering the ultimate recovery of gas. The 13 wells proposed in this EA are positioned at particularly important locations to create interference with each other and other existing wells.

In addition to what Genesis has proposed in their Surface Use Plans and in the Proposed Action, Genesis has committed to Applicant Committed Measures attached as Appendix C – Genesis Gas and Oil Colorado LLC Applicant Committed Measures.

No Action Alternative: Under the No Action Alternative, the APDs would not be permitted, nor would the well pad sites and associated infrastructure be constructed. The natural gas resource would not be developed.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD: A number of alternatives were considered but not carried forward:

1) The current proposed access from the existing main service road down to Yanks Gulch follows an existing two-track. An alternative route to the east of the proposed access road was considered as a means of reducing impacts from the road to the BLM sensitive species debris milkvetch. A field review of the alternative was conducted on May 11, 2011. The alternative was dropped from consideration due to unavoidable steep grades along portions of the route. It was expected that road construction and operation would result in unacceptable impacts to soils and surface waters. Debris milkvetch occurs within the footprint of the alternative route, so impacts to the species would occur regardless of which route were chosen. Potential impacts to debris milkvetch along the alternative were not quantified.

2) Proposed wells 34-22 and 34-33 are on the north side of Yanks Gulch from the other 11 proposed wells. Proposed access to these two wells approaches from the south and requires

crossing Yanks Gulch. Genesis considered accessing 34-22 and 34-33 from the north to avoid crossing Yanks Gulch and reduce impacts to debris milkvetch from the current proposed road. The alternative route would leave SH 64 at the Williams' Fletcher Gulch meter station and follow an existing two-track before entering the ROW of the distribution pipeline installed by Genesis in 2008 (DOI-BLM-CO-110-2007-055-EA). This alternative route was dropped from consideration because it would have isolated 34-22 and 34-33 from the main Genesis field. Travel distance from the compressor station in the main field to 34-22 via this alternative route would have been just over 20 miles. The long distance gave Genesis concerns regarding operational efficiency and safety. In addition, the alternative route would have traveled through Colorado Parks and Wildlife (CPW)-mapped preliminary priority and general habitat for greater sage-grouse (CPW 2012), a Federal candidate and BLM sensitive species.

3) Ten of the original 14 proposed locations and associated access roads were moved to avoid cultural resources or minimize disturbance to occurrences of the BLM Sensitive debris milkvetch, wildlife habitat, or soil and water resources. One location (13-41 and its access road) was removed from the proposal to avoid impacts to the federally listed Dudley Bluffs twinpod, bringing the total number of wells proposed down to 13. Table 5 lists the relocations that were made during project development and the resources that were protected by the relocations. Multiple moves were made on several of the pad locations before the final proposed location was determined. The original well 2-22 was first moved to minimize impacts to debris milkvetch, sagebrush shrubland that provides habitat for wildlife including the BLM Sensitive Brewer's sparrow, and a shallow drainage. It was subsequently moved again to avoid impacts to cultural resources. The well's final location as proposed well 2-11 will have impacts to debris milkvetch.

Table 5. Resource Impacts Avoided or Minimized by Proposed Pad Relocations

Original Pad #	Proposed Pad #	Resources Protected by the Relocations
2-11	2-21	Debris milkvetch
2-22	2-11	Debris milkvetch, cultural resources, wildlife habitat, soils, water
2-23	2-32	Debris milkvetch, cultural resources
2-34	2-44	Debris milkvetch, cultural resources, soils, water
2-41	2-41	Debris milkvetch
2-42a	2-33	Debris milkvetch
2-42b	2-43	Debris milkvetch
13-41	Removed from consideration	Dudley Bluffs twinpod
14-21	14-11	Cultural resources
14-22	14-22	Soils, water
14-24	14-24	Wetlands, water, soils

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 (White River ROD/RMP).

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

Standards for Public Land Health: In January 1997, the Colorado BLM approved the *Standards for Public Land Health*. These standards cover 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 public lands. Because a standard exists for these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in the analyses for the relevant resources below.

Cumulative Effects Analysis Assumptions: Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7) as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Table 6 provides presence/absence information on various types of past, present, and reasonably foreseeable future actions within the Proposed Action area. The area of interest is generally the Fletcher Gulch 6th level Watershed; however, the geographic scope used for analysis may vary for each resource, and when it does it is described in the *Affected Environment* section for that resource.

Table 6. Past, Present, and Reasonably Foreseeable Actions

Action Description	STATUS[1]		
	Past	Present	Future
Livestock Grazing	P	P	P
Wild Horse Gathers	P	NP	P
Recreation	P	P	P
Invasive Weed Inventory and Treatments	P	P	P
Range Improvement Projects : Water Developments Fences & Cattleguards	P	P	P
Wildfire and Emergency Stabilization and Rehabilitation	P	P	P
Wind Energy Met Towers	NP	NP	NP
Oil and Gas Development: Well Pads Access Roads Pipelines Gas Plants Facilities	P	P	P
Power Lines	P	P	NP
Seismic	NP	NP	NP
Vegetation Treatments	NP	NP	NP

[1] P = Activity present; NP = Activity not present.

Affected Resources: The CEQ Regulations state that NEPA documents "must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an EA. Issues will be analyzed if: (1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or (2) if the issue is associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of the impacts. Table 7 lists the resources considered and the determination as to whether they require additional analysis.

Table 7. Resources and Determination of Need for Further Analysis

Determination[1]	Resource	Rationale for Determination
Physical Resources		
PI	Air Quality	Criteria and non-criteria pollutants generated by the project may affect air quality.
PI	Geology and Minerals	The project involves extraction of Federal natural gas resources; well 34-22 occurs in an area open to coal leasing.
PI	Soil Resources*	47.1 acres of soils would be disturbed by the proposed project.
PI	Surface and Ground Water Quality*	Surface waters occur in the project area and may be affected by surface disturbance and spills; ground water may be affected by drilling and disposal of produced water.
Biological Resources		
PI	Wetlands and Riparian Zones*	A wetland in Yanks Gulch would be impacted by culvert installation. An offsite riparian area has the potential to be impacted by dewatering and reinjection of produced water.
PI	Vegetation*	47.1 acres of vegetation would be cleared.
PI	Invasive, Non-native Species	Invasion of the project area by noxious weeds may attend pad and road construction and project operation.
PI	Special Status Animal Species*	Special status animal species have the potential to occur in the project area.
PI	Special Status Plant Species*	Special status plant species occur inside and near the proposed construction footprint.
PI	Migratory Birds	If proposed activities take place during the migratory bird breeding season, nesting birds may be affected; reserve pits may impact birds attempting to use them.
PI	Aquatic Wildlife*	Aquatic resources occur in the project area.
PI	Terrestrial Wildlife*	The project area is inside elk and mule deer winter range; game and non-game wildlife may be affected by the project.
PI	Wild Horses	The project occurs within a herd area; wild horses have been observed in the project area.
Heritage Resources and the Human Environment		
PI	Cultural Resources	Cultural resources field-evaluated as eligible for the National Register of Historic Places have been found in the project area and resulted in 4 pad/road relocations.
PI	Paleontological Resources	All surface geologic formations found in the project area are PFYC 5.
NP	Native American Religious Concerns	No Native American Religious Concerns are known in the area, and none have been noted by Northern Ute tribal authorities. Should

Determination[1]	Resource	Rationale for Determination
		recommended inventories or future consultations with Tribal authorities reveal the existence of such sensitive properties, appropriate mitigation and/or protection measures may be undertaken.
PI	Visual Resources	The project area is inside VRM Class II and III lands.
PI	Hazardous or Solid Wastes	Hazardous and solid wastes will attend construction, drilling, completion, and operation of the proposed facilities.
PI	Fire Management	The project area occurs largely inside pinyon-juniper woodland, which is susceptible to wildfires.
NI	Social and Economic Conditions	No substantial changes to social and economic conditions are expected from the Proposed Action.
NI	Environmental Justice	According to the most recent Census Bureau statistics (2005-2009), very low percentages (< 5%) of minority and low income persons live within the WRFO. The project is not expected to affect these groups.
Resource Uses		
PI	Forest Management	The project area occurs largely inside pinyon-juniper woodland.
PI	Rangeland Management	The project area occurs inside 3 allotments.
PI	Floodplains, Hydrology, and Water Rights	Surface waters occur in the project area and may be affected by surface disturbance and spills; ground water may be affected by drilling and disposal of produced water.
PI	Realty Authorizations	The project will require new ROW authorizations.
PI	Recreation	The project area is used for big game hunting and potentially other recreational activities.
PI	Access and Transportation	The project will increase traffic on existing roads and create new access into BLM lands.
NP	Prime and Unique Farmlands	There are no Prime and Unique farmlands within the project area.
Special Designations		
NP	Areas of Critical Environmental Concern	The closest ACEC, Yanks Gulch, is 0.6 miles from proposed disturbance and would not be affected by the proposed project.
NP	Wilderness	The closest Wilderness Study Area, Skull Creek, is 13 miles from proposed disturbance and would not be affected by the proposed project. The Flattops Wilderness is 60 miles east of the project area.
NP	Wild and Scenic Rivers	There are no Wild and Scenic rivers in the WRFO.
NP	Scenic Byways	There are no Scenic Byways within the project area.

[1] PI = Present with potential for impact analyzed in detail in the EA; NI = Present, but not affected to a degree that analysis is required in the EA; NP = Not present in the area impacted by the Proposed Action or Alternatives.
* Public Land Health Standard finding provided below.

AIR QUALITY

Affected Environment: The Proposed Action is in an attainment area for national and state air quality standards, based on a review of designated non-attainment areas for criteria pollutants

published by the U.S. Environmental Protection Agency (EPA) (EPA 2012). The Proposed Action is also located more than 10 miles from any special designation airsheds or non-attainment areas. Non-attainment areas are areas designated by EPA as having air pollution levels that persistently exceed the national ambient air quality (NAAQ) standards. Projects that could impact special designation areas and/or non-attainment areas may require special consideration from the Colorado Department of Public Health and Environment (CDPHE) and EPA. The closest special designation areas are Dinosaur National Monument, which is located northwest of the project area (designated Class II airshed with Prevention of Significant Deterioration [PSD] with thresholds for sulfur oxides and visibility), and the Mount Zirkel and Flat Tops Wilderness Areas located north and east of the Proposed Action (designated Class I areas). The closest non-attainment area in Colorado is near Denver on the Front Range for ozone. General conformity regulations require that Federal activities do not cause or contribute to a new violation of NAAQ standards; that actions do not cause additional or worsen existing violations of the NAAQ standards; and that attainment of these standards is not delayed by Federal actions in non-attainment areas.

The Proposed Action is in Rio Blanco County within the Western Slope Counties Monitoring Region of Colorado (CDPHE 2012a). Local air quality parameters including particulates are measured at monitoring sites located at Meeker, Rangely, Dinosaur, and Ripple Creek Pass near the Flat Tops Wilderness Area. Ozone data have been collected in Meeker and Rangely since 2010 and at Colorado National Monument in Mesa County since 2007. To a limited extent ozone is also measured at Dinosaur National Monument. The closest location for an Interagency Monitoring of Protected Visual Environments (IMPROVE) site is near the Flat Tops Wilderness, northeast of the Project Area. IMPROVE sites measure visibility impairment from air borne particles.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would result in low and short-term impacts to air quality during construction, drilling, completion and, to a lesser extent, from vehicles and compressor facilities during the production phase. Table 8 provides traffic load summary statistics for the Proposed Action. 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.

Additional low, short-term impacts to air quality may occur due to venting or flaring of gas from the wells and volatile organic compounds (VOCs) from pits and tanks during completion activities. Venting and/or flaring of natural gas is typically done for short periods of time in order to determine potential production amounts and characterize the quality of the gas. If the exploratory wells are successful, VOCs including hazardous air pollutants (HAPs) commonly associated with oil and gas production (benzene, toluene, ethylbenzene, xylene, and n-hexane) will be released from tanks, separation equipment, and during transportation of natural gas, produced water, and condensate by pipeline or trucks. The amount of these releases are difficult to estimate, but would be within CDPHE air permit limits estimated in tons per year. Non-criteria pollutants (NAAQ standards have not been set for non-criteria pollutants) such as nitric oxide, air toxics (e.g., benzene), and total suspended particulates may experience slight, temporary increases as a result of the Proposed Action.

Soil disturbance resulting from construction, heavy equipment, and drill rigs is expected to cause increases in fugitive dust and inhalable particulate matter, specifically particulate matter 10 microns (μm) or less in diameter (PM_{10}) and 2.5 μm or less in diameter ($PM_{2.5}$). Particulate matter is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. More than 70 percent of PM_{10} (coarse particles) in the project area is created from windblown dust and soil from roads, fields and construction sites. A smaller percentage of coarse particles comes from automobile and diesel engine exhaust, soot from wood fires, and sulfates and nitrates from combustion sources such as industrial boilers (CDPHE 2011). Dust production is most likely during the construction and drilling phases, especially when conditions are dry and/or windy. Particulate matter is the major contributor to reductions in visibility, due to its ability to scatter or absorb light. Particulate matter can also have human health impacts.

Fugitive dust emissions would likely cause low, short-term impacts to local air quality, specifically visibility. Once the wells go into interim reclamation, topsoil removed during road construction would be redistributed and stabilized alongside the road and the pads would also be recontoured and stabilized. As vegetation establishes in the reclaimed areas, dust production will occur only when vehicles travel on the access roads to service the wells. The increase in airborne particulate matter from this project is not expected to exceed Colorado Ambient Air Quality (CAAQ) or NAAQ standards on an hourly, eight-hour average, or daily basis.

Table 8. Traffic Load Summary Statistics for the Proposed Action

Activity/Personnel	Vehicle Type	Empty Vehicle Trips per Year	Loaded Vehicle Trips per Year
Drilling Supply	5-axle tractor-semitrailer	182	406
Drill Rig	6-axle tractor-semitrailer	--	28
Rig Hands, Genesis Field Manager, BLM	Pickup	--	7,434
Inspections, Maintenance	Passenger car	--	104

In summary, soil disturbance resulting from construction of pads and roads and drilling is expected to cause increases in fugitive dust and inhalable particulate matter in the project area and immediate vicinity, which may contribute to reductions in regional visibility and have effects on human health. In addition, increases in the following criteria pollutants would occur due to combustion of fossil fuels during exploration and production activities: carbon monoxide, VOCs, ozone, nitrogen dioxide, and sulfur dioxide. Non-criteria pollutants such as carbon dioxide, methane and nitrous oxides, air toxics (e.g., benzene), total suspended particulates (TSP), as well as impacts to visibility and atmospheric deposition, may also increase as a result of the Proposed Action. Even with these increased pollutants the Proposed Action is unlikely to result in an exceedance of NAAQ and CAAQ standards, and is likely to comply with applicable PSD increments and other significant impact thresholds.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Air Quality was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number two below, all apply.

Cumulative Effects: The principal sources of air pollution in Rio Blanco County include motor vehicles, oil and gas development, coal-fired power plants, coal mines, sand and gravel operations, windblown dust, wildfires, and prescribed fire (CDPHE 2011). Emissions in the Proposed Action area are dominated by oil and gas exploration, processing, and transportation. The Fletcher Gulch Shallow and Calamity Ridge II Units currently host 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. Although the price of natural gas is currently low, the oil and gas industry as a whole is expected to continue to grow in Colorado. As it does, emissions of criteria and non-criteria pollutants are expected to increase.

In 2011, no NAAQ standard exceedances for PM_{10} were recorded in the Western Slope counties (CDPHE 2012a). Ozone levels may increase in localized areas and are influenced by emissions in the White River Basin as well as from the nearby Uinta and Yampa River basins. Data collected in Dinosaur, Meeker, and Rangely have measured exceedance in standards for 1-hour and 8-hour values for ozone (120 parts per billion ppb and 75 ppb, respectively). To date, these exceedances have not been persistent enough to result in a violation of NAAQ standards.

The Proposed Action will increase emissions of criteria and noncriteria pollutants in the area. Despite an increase in air pollutant emissions, air quality in the White River Basin is likely to remain in attainment of both NAAQ and CAAQ standards given the low human population and lack of metropolitan development in the area. Between 2000 and 2010, the population in Rio Blanco County grew 11.4 percent, but this represents an increase from 5,986 to 6,666 people over a 3,221 square mile (sq mi) area (U.S. Census Bureau 2012).

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: No effects to air quality would result from the No Action Alternative.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to air quality in the project area. Cumulative effects would be similar to those described for the Proposed Action.

Mitigation: The following mitigation measures are required:

1) Genesis will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable Federal, state, and local air quality laws and regulations.

2) Genesis Applicant Committed Measures (ACM) from Appendix C of this document (DOI-BLM-CO-110-2012-0041-EA) Air Quality was reviewed. With the following exceptions, all apply:
    - Air Quality ACM mitigation measure number two is not currently recognized as a BLM WRFO standard COA. Air Quality mitigation number three (below) replaces it; therefore Genesis must not follow this ACM.

3) All access roads and pipeline ROW will be treated with water and/or a BLM-approved chemical dust suppressant during construction and drilling activities so that there is not a visible dust plume behind vehicles. All vehicles will abide by company or 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.

GEOLOGY AND MINERALS

Affected Environment: Wells 2-11, 34-22, 34-33, and 34-44 would be located in the Fletcher Gulch Shallow Federal Oil and Gas Exploratory Unit (COC68958X) and the remaining wells would be within the Calamity Ridge II Federal Oil and Gas Exploratory Unit (COC74676X). There are approximately 1,120 acres of private oil and gas minerals committed to the Calamity Ridge II Unit. Well 14-24 would be located on private minerals with the exception of coal resources which were retained by the Federal government when the lands went to patent.

Well 34-22 is the only well located in the area identified for underground coal leasing (BLM 1997). There are no active coal leases or coal exploration licenses in the project area. The nearest active coal mine is the Deserado Mine, located approximately seven miles northwest of the project area.

Surficial geology in the project area is derived from the Wasatch Formation, and Green River Formation. Proposed well locations and the surface geologic units they occur on are presented in Table 9.

Table 9. Surface Geology at Proposed Well Locations (Donnell and Hail 1984)

Surface Geologic Unit	Well Number
Wasatch Formation (Tw)	2-11, 2-33, 34-22, 34-33, 34-44
Green River Formation Garden Gulch (Tgg)	2-41, 2-43, 14-11, 14-22, 14-24, 2-44
Green River Formation Cow Ridge (Tgcr)	2-21, 2-32

The tertiary Wasatch Formation is characterized by a coarse conglomerate of rock fragments from several inches to several feet in diameter. The Green River Formation is exposed in northwest Colorado, southwest Wyoming, and northeast Utah. It is formed of sediments from a large lake that existed 60 to 38 million years ago. Both formations are known to have significant hydrocarbon reserves.

Targeted zones of development are within the Mesaverde formation.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Hydrocarbon resources would be depleted in the targeted formations by the development of the wells. Well 14-24 would deplete both private and Federal natural gas resources within the drainage area of the well. The proposed casing and cementing procedures, if implemented correctly, will isolate the formations and prevent the migration of gas and water between formations. Although 34-22 is in the area identified as suitable for

underground coal development there is no foreseeable development of the underlying coal resources. Well 14-24 is located outside the area identified in the White River ROD/RMP as suitable and available for coal development and would not affect the future recovery of suitable and available Federal coal resources.

Cumulative Effects: The Genesis field in the Fletcher Gulch and Calamity Ridge II Units currently hosts 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more. The COGCC database indicates that approximately 15 other wells were previously permitted in the area of analysis. These wells have all been plugged and abandoned. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. Genesis has estimated that an additional 392 wells may be drilled if they pursue full development of their leases in the Fletcher Gulch and Calamity Ridge II Units (see DOI-BLM-CO-110-2011-0043-EA). Full field development would deplete the hydrocarbon resources of the targeted formations.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: The No Action Alternative would have no impacts on geology and minerals in the project area. The natural gas resources would not be developed at this time and would remain available for future recovery.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to geology and minerals, including natural gas resources, in the project area.

Mitigation: None.

SOIL RESOURCES

Affected Environment: The Proposed Action would occur on seven soil map units (SMU) (SCS 1982; NRCS 2008). Important soil characteristics for each SMU are provided in Table 10.

Table 10. Characteristics of SMUs Occurring within the Proposed Project Area

SMU	Soil Name	Slope (%)	Range Site	Salinity (mmhos/cm)	Runoff	Erosion Potential	Depth to Bedrock (inches)
1	Abor clay loam	5-30	Clayey foothills	< 4	Rapid	High	20-40
13	Bulkley channery silty clay loam	5-30	Pinyon-juniper woodlands	2-8	Rapid	High	40-60
48	Kobar silty clay loam	3-8	Deep clay loam	1-13	Rapid	Moderate	> 60
49	Kobar silty clay loam	8-15	Deep clay loam	0-4	Rapid	Very high	> 60

SMU	Soil Name	Slope (%)	Range Site	Salinity (mmhos/cm)	Runoff	Erosion Potential	Depth to Bedrock (inches)
53	Moyerson stony clay loam	15-65	Clayey slopes	0-10	Rapid	Very high	10-20
74	Rentsac-Moyerson-rock outcrop complex	5-65	Pinyon-juniper woodlands/clayey slopes	< 4	Medium	Moderate to very high	10-20
91	Torriorthents-rock outcrop complex	15-90	Stony foothills	< 2	Rapid	Very high	10-20

A map showing the extent of fragile soils in the project area is provided in Appendix A, Figure 4. Fragile soils are areas with slopes greater than 35 percent that have one of the following soil characteristics: (a) a surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay; (b) a depth to bedrock that is less than 20 inches; (c) an erosion condition that is rated as poor; and/or (d) an erosion potential factor (K) greater than 0.32. Fragile soils are managed as a CSU-1 lease stipulation by the WRFO (BLM 1997). Increased erosion risks, construction complexity, and difficulties with reclamation are likely in areas where fragile soils are disturbed.

Six well pads that have been constructed and not drilled are the following: FGSU 4-12, FGSU 33-42, FGSU 4-31, FGSU 4-41, FGSU 4-42, and FGSU 9-14. Total combined disturbance for the subject six wellpads, roads, and pipelines was approved at 29.90 acres.

Biological Soil Crusts (BSCs) occur patchily but extensively throughout the project area, primarily in pinyon-juniper woodland. Within the pinyon-juniper, the BSCs are densest in areas on the north side of Yanks Gulch. BSCs are highly specialized communities of cyanobacteria, mosses, and lichen that live within or on top of the uppermost soil horizons. They are typically more abundant in some locations due to microclimate conditions created by vegetation modifying the local environment by reducing sunlight and providing nutrients, moisture, and protection from wind and/or water erosion. The highest quality patches are found at locations that have not experienced significant livestock grazing. BSCs can be easily damaged by mechanical disturbance of the soil surface. Damage to BSCs may increase the risk of erosion and alter soil nutrient cycling. 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.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: A total of 47.1 acres of surface would be disturbed by the Proposed Action. Table 11 shows how those acres are divided among SMUs.

Table 11. SMUs within the Area of Proposed Pad and Road Disturbance

SMU	Soil Name	SMU Acreage Disturbed[1]	Well Pad and/or Access within SMU
1	Abor clay loam	5.9	2-21, 2-32, 2-43
13	Bulkley channery silty clay loam	26.5	2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-33, 34-44
48	Kobar silty clay loam (3-8%)	0.34	14-24
49	Kobar silty clay loam (8-15%)	0.16	14-24
53	Moyerson stony clay loam	9.8	2-44, 14-24
74	Rentsac-Moyerson-rock outcrop complex	3.0	34-33
91	Torriorthents-rock outcrop complex	1.41	14-11, 14-24
	Total Acreage Disturbed	**47.1**	

[1] Acreages include disturbance from pads and access roads with pipelines.

Direct impacts from the construction of well pads, installation of pipelines and construction of access roads would include soil compaction, removal of vegetation, exposure of subsoil, mixing of soil horizons, loss of topsoil productivity, and an increase in the susceptibility of soils to wind and water erosion. Compaction due to construction activities would reduce aeration, permeability and water-holding capacities of soils in some locations. Removal of vegetation exposes soils to erosion from rainfall, wind, and surface runoff. Exposure of subsoil and mixing of soil horizons can change the physical characteristics of subsoil and may reduce the productivity of these soils into the future. Loss of topsoil productivity can occur during storage due to nutrient loss through percolation of precipitation through the soils, physical loss, mixing of less productive soil layers during moving, and a loss of structure. Impacted soils are likely to be less resilient to erosion from surface runoff after disturbance, resulting in an increase in surface runoff and sedimentation.

These direct impacts could result in increased indirect impacts to undisturbed soils near construction sites due to increased runoff and erosion. Implementation of best management practices (BMPs) for stormwater, mitigation measures, and reclamation will reduce impacts to the disturbed areas. However, there is the potential for intense storm events and BMP failures to cause off-site erosion. Water erosion of soils caused by construction activities would likely result in a net loss of topsoil by sheet, rill, and gully erosion. Erosion is most likely to occur on the steep slopes adjacent to well pads. The greatest soil erosion problems are likely to occur in the sensitive soil location at proposed well 14-24, where roughly 0.09 acres (4.23 percent) of pad disturbance would occur on sensitive soils. Monitoring of areas around the pad as required in the

mitigation below should identify any failure of BMPs or unanticipated erosion and allow a plan to be developed for addressing them.

Six well pads have been constructed and not drilled for an estimated combined disturbance of 29.90 acres. These well pads were assumed to be drilled and in interim reclamation within the same season as construction in the approval. The stability of roads and potential for weeds increases with no use. Topsoil stored for pads is likely losing its biological component that can be very valuable for successful reclamation. Moving these areas into final reclamation according to the Surface Use Plan will begin the recovery of the productivity of soils in these locations. Delays reduce the viability of topsoil and increase the risk of soil instability along roads and at drainage crossings.

As described in the *Affected Environment*, BSCs are present, especially on the north side of Yanks Gulch. Surface disturbance from the Proposed Action would remove or bury BSCs, potentially decreasing diversity, soil nutrients, soil stability, and organic matter in those areas. Cascading effects may occur due to 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 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. 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.

Full recovery of BSCs from disturbance is a slow process, particularly for mosses and lichens. Recovery of pre-disturbance crust thickness can take up to 50 years, and reestablishment of mosses and lichens up to 250 years. Reclamation of disturbed soil can be difficult in sensitive soils and areas with BSCs. Adherence to the Conditions of Approval (COAs), implementation of stormwater BMPs, and good reclamation practices would serve to minimize project-related impacts to soil resources.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Soils was reviewed for conformance with BLM WRFO Standard COAs. All ACMs as proposed in Appendix C apply.

Cumulative Effects: The main surface disturbing activities in the area of analysis are oil and gas development, livestock and wild horse grazing and associated range improvements, and wildfires. The bulk of the area is inside the North Piceance Herd Area (NPHA). The two largest

fires in the project area in the recent past have been the Yanks and Switchback fires, which burned 2,162 acres in the Year 2000.

The Genesis field in the Fletcher Gulch and Calamity Ridge II Units currently hosts 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more. The COGCC database indicates that approximately 15 other wells were previously permitted in the area of analysis. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. Oil and gas exploration and development creates surface disturbance that can reduce soil productivity and may lead to increased erosion and instability of soils in localized areas. Impacts from the current Proposed Action are expected to add incrementally to the cumulative impacts to soil resources in the area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: The No Action Alternative would not affect soils in the project area.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to soil resources in the project area. Cumulative effects would be similar to those described for the Proposed Action.

Mitigation: The following mitigation measures are required:

1) Soils shall be replaced during reclamation in their respective original position (last out, first in) to minimize mixing of soil horizons.

2) Topsoil will be removed to a depth of six to eight inches or as determined on-site by BLM in areas of surface disturbance. To protect topsoil for future use during reclamation, topsoil piles will be covered, seeded, labeled, and stored unmixed with other soils.

3) Genesis shall be required to monitor all reclaimed areas for signs of erosion. If problems arise, Genesis will notify BLM as soon as possible and will prepare a reclamation plan to be submitted via SN to address the concern(s). Any erosion features (e.g., rilling, gullying, piping, or mass wasting) that are the result of this action and are located either on or adjacent to surface disturbance will be addressed immediately by Genesis.

4) All areas where the topsoil has been removed and soils have become compacted will be ripped to a depth of 18 inches below the finished grade or to bedrock, whichever is less. Another suitable method of de-compaction may be used before topsoil is re-spread with approval of the BLM AO. Areas where the topsoil has not been removed, but have been compacted, must be de-compacted by disking or other methods to prepare the soils for reclamation.

5) The six well pads that have been constructed and not drilled are the following: FGSU 4-12, FGSU 33-42, FGSU 4-31, FGSU 4-41, FGSU 4-42, and FGSU 9-14. Total combined disturbance for the subject six wellpads, roads, and pipelines was approved at 29.90 acres. These areas will be drilled or put into final reclamation as described in the surface use plans

for the wells before any additional disturbance will be allowed to construct approved well pads. Earthwork and reclamation must be approved by the BLM AO before earthwork can begin on wells approved in this document.

6) Following upgrade of the access road to the 2-44 pad, those portions of the existing 2-track road that remain between the constructed pad and upgraded 2-track shall be put into final reclamation, including but not limited to recontoured to final contours and seeded in accordance with the seed mix mitigation for the 2-44 pad.
7) At final reclamation of the 2-44 pad, unless otherwise directed by the BLM, the 2-track road that was upgraded to access the 2-44 will be returned to a 2-track road to its functionality and use prior to upgrading of the road.

Finding on the Public Land Health Standard #1 for Upland Soils: 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 in localized areas due to soil compaction and loss of vegetative cover. Following implementation of the mitigation measures and with adherence to the COAs, the Proposed Action would be unlikely to reduce the long-term productivity of soils on public lands 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.

SURFACE & GROUND WATER QUALITY

Affected Environment: Surface Water: The Proposed Action would be 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, not including the specific listings in segments 13b through 20. Fletcher Gulch, Yanks Gulch, and a number of unnamed mostly ephemeral tributaries to these drainages occur inside the immediate project area. Yanks Gulch is tributary to Fletcher Gulch. Fletcher Gulch flows approximately nine miles north from the eastern end of the project area to the White River, joining the river above its confluence with Douglas Creek. The White River above the confluence with Douglas Creek serves as the primary water source for the Town of Rangely (Williams 2010). Spring Creek is a perennial drainage that lies to the west of the project area and flows directly into the White River. It has the potential to experience indirect effects from the proposed project due to water depletions.

The State has classified stream segment 13a of the White River Basin as "Use Protected" and beneficial for the following uses: Aquatic Life Warm 2 (not capable of sustaining a wide variety of warm water biota), Not Primary Contact Use Recreation, and Agriculture. The Colorado antidegradation review requirements are not applicable to waters designated as Use Protected. For those waters, no further water quality degradation is allowable which would interfere with designated uses. The designated uses are considered protected if the narrative and numerical standards published in Regulation 37 are not exceeded (CDPHE 2012b, 2012c). No tributaries in

stream segment 13a of the White River Basin are on Colorado's Section 303(D) list of impaired waters and monitoring and evaluation list, and therefore are not considered water-quality-limited and do not require total maximum daily load (TMDL) limitations on any pollutants (CDPHE 2012d). Surface waters in the project area are described in detail in DOI-BLM-CO-110-2010-0066-EA.

Ground Water: Surface geology in the project area transitions east to west from the Lower Green River Formation to the Wasatch Formation. The Mesaverde Aquifer underlies the project area. Water from the Mesaverde Aquifer is of poor water quality with high total dissolved solids. Fletcher Gulch and Spring Creek most likely have shallow alluvial aquifers up to several miles in length and approximately 200 foot wide and 100 feet thick (WWL 2009). The White River Alluvial Aquifer contributes to the drinking water source for the Town of Rangely (Williams 2010).

Springs in the vicinity of the proposed project occur within the Garden Gulch Member of the Green River Formation (WWL 2009). Appendix A, Figure 5 shows the locations of water wells, springs, and diversion structures within a one-mile radius of the project area. 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 (see *Hydrology and Water Rights*). Water quality data from active Genesis wells for the coal bearing strata and the Sego formation are provided in Appendix B. Classifications and water quality standards have not been assigned to ground water in the project area (CDPHE 2006). Ground water resources and surficial geology in the project area are described in detail in DOI-BLM-CO-110-2010-0066-EA.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Surface Water: Approximately 47.1 acres of vegetation in the Fletcher Gulch Watershed would be removed to construct the proposed facilities. This size area comprises less than 0.4 percent of the approximately 13,500-acre Fletcher Gulch watershed. Potential effects from the project to surface waters include direct effects from dredge and fill, and indirect effects from sediment flows into waters within and downstream of the project area, alteration to surface runoff and groundwater recharge patterns, spills or leaks of toxic materials, and offsite changes to flow volume or water quality following pumping and reinjection of water during drilling.

Proposed access roads would cross and directly impact two drainages mapped as ephemeral by the USGS:

- Access to proposed wells 34-22 and 34-33 would require a crossing of Yanks Gulch in Section 34. Yanks Gulch shows evidence of an active floodplain that supports herbaceous wetlands.

- Access to proposed wells 2-11, 34-22, 34-33, and 34-44 would cross a drainage in Section 2, just northeast of proposed well 2-21. This drainage is very lightly described on the landscape, with no evidence of frequent flows, an ordinary high water mark, or an active floodplain. It joins Yanks Gulch upstream of the proposed Yanks Gulch crossing.

A culverted crossing of Yanks Gulch would be required to access proposed wells 34-22 and 34-33. The Yanks Gulch crossing has been engineered to 25-year storm standards and would require installation of an 8 by 80 foot corrugated metal pipe (Table 4). The pipe would be sunk below original grade and the bottom surfaced with salvaged dredged material to create a natural channel bed. Approximately 104 feet of Yanks Gulch would be directly and permanently impacted by installation of the culvert. Sediment released during construction may find its way down to Fletcher Gulch and eventually the White River. Given the 6.3-mile distance between the proposed culvert and the White River, it is unlikely that any increase in sedimentation would be detectable in the river. Based on debris and sediment deposits defining the active floodplain of Yanks Gulch, it appears that pulses of sedimentation under seasonally high flow regimes occur at least during some years, making it unlikely that the proposed project would alter hydrologic function in the drainage.

No culvert is proposed were the access road would cross the ephemeral drainage in Section 2. When surface flows do cross the road at this location, sediment from the road surface would mix with other naturally-occurring sediment and be carried downstream, possibly 1,600 feet into Yanks Gulch. A large number of sparsely-vegetated side drainages flow to Yanks Gulch along its length, most likely delivering sediment during heavy flow events. With successful implementation of all mitigation measures and adherence to the COAs, the amount of sediment released downstream at this location during construction and operation is expected to be low and undetectable compared to the amounts of sediment typically seen in these flashy, sparsely vegetated ephemeral drainages.

The pad and access route for proposed well 14-24 would be built adjacent to a mapped perennial tributary to Fletcher Gulch and have the potential to affect it. Where the access route departs from the main service road, it would come within 50 feet of the top of bank of the drainage. Along its length, the road continues to parallel the drainage, but the centerline remains approximately 300 feet from the channel. This road would not cross sensitive soils. The maximum extent of disturbance at the northern corner of the pad would come to within 150 feet of the channel. A portion of this pad would be located on sensitive soils.

Direct effects to the perennial tributary to Fletcher Gulch may occur if soils are inadvertently pushed into the gulch. Indirect effects to surface waters from proposed clearing, grading, and soil stockpiling activities are described in DOI-BLM-CO-110-2010-0066-EA, and include erosion and sedimentation. An increased risk of erosion and sedimentation would exist at the 14-24 pad, where roughly 0.04 acres of disturbance associated with pad construction would occur on sensitive soils upslope from a perennial tributary to Fletcher Gulch (Appendix A, Figure 4). Implementation of the mitigation measures and adherence to the COAs are expected to prevent long-term erosion and sediment loading or maintain them within acceptable levels. Any sediment released into surface waters is expected to be low and undetectable compared to the amount of sediment typically seen in these flashy ephemeral systems.

Potential consequences of spills or leaks of toxic materials to surface waters are also addressed in DOI-BLM-CO-110-2010-0066-EA. Implementation of the mitigation measures and adherence to the COAs are expected to protect surface waters from spills of hazardous materials.

Well development would involve pumping groundwater from the producing coal unit and re-injecting it into the deeper Sego Formation, as described in the *Description of the Proposed Action* and section on *Ground Water*, below. Extraction and reinjection of groundwater has the potential to affect surface and subsurface flows and/or water quality at offsite locations. Western Water & Land (WWL) analyzed such effects with a Glover Analysis, focusing on a set of 51 existing and proposed Genesis wells, including the 13 currently proposed (WWL 2009, 2010). Results from the study indicate that this level of well development may have substantial effects on surface and subsurface water expression in Spring Creek, while potential impacts to the White River would be undetectable. The potential for changes in river flow volume to affect water chemistry was considered to be minor to undetectable (WWL 2010). This finding indicates that the Proposed Action would not affect the primary surface source of drinking water for the Town of Rangely, the White River. A more detailed account of the WWL *Stream Depletion Analysis* (WWL 2009, 2010) is presented under *Special Status Animal Species*.

Groundwater: Pumping water from the producing coals in the Mesaverde Formation and re-injecting it into the deeper Sego sandstone Formation has the potential to affect the White River Alluvial Aquifer and springs, seeps, and artesian wells in the project vicinity. Coalbed methane development typically requires the pumping of water from the targeted formation to change the pressure characteristics and allow natural gas to migrate to the well bore. Pumping for these projects often involves higher volumes initially until the pressure threshold is reached, and then a lower rate 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 per day (12,600 gallons/day), production would equal 14 acre-feet (acre feet)/well/year, or 182 acre feet/year for 13 wells. The Genesis field currently hosts 16 operational wells and 22 approved wells. Assuming the same rates for these wells, they would produce an additional 532 acre feet/year of water, for a maximum production of 714 acre feet/year across the field.

The existing injection well 3-31 (UIC Facility Number 159,218) would serve the current proposed wells. That well has a maximum fluid volume limitation of 26,142,000 barrel from the date of approval. 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 SN a proposal to drill a new injection well co-located on an approved well or one of the wells proposed in this EA.

The primary effects on groundwater resources would be associated with the removal of groundwater contained in coal bed aquifers and the subsequent recharge of other aquifers through injection of produced water into the Sego Formation. These effects are described in DOI-BLM-CO-110-2010-0066-EA. According to the *Stream Depletion Analysis* (WWL 2009, 2010); pumping and re-injecting water for the proposed 13 wells may reduce groundwater levels in the Spring Creek alluvial aquifer where the creek is intermittent or ephemeral. No detectable change to flow or water quality in the White River Alluvial Aquifer was predicted.

Groundwater could also be affected during drilling operations. Use of fresh water for drilling to surface casing depth would prevent the contamination of freshwater zones by production water. However, improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits, if they were to occur, could introduce contaminants into the groundwater.

Shallow groundwater quality could also be impacted by leakage of fluids from the transfer and transportation of drilling fluids, additives, and fuels. These effects are described in DOI-BLM-CO-110-2010-0066-EA. If accidental spills occur, they would be addressed through implementation of the *Hazardous Materials Management, Release Contingency*, and *Spill Prevention, Control, and Countermeasure* (SPCC) plans developed in accordance with 40 CFR Part 112.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Water Quality, Surface and Ground was reviewed for conformance with BLM WRFO Standard COAs. With the exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: Surface disturbing activities and activities that may result in surface or subterranean release of toxic substances are expected to contribute to cumulative effects to surface and ground water quality in the area of analysis. The main surface disturbing activities in the area are oil and gas development, livestock grazing, wild horse grazing, and wildfires. Chemicals used during oil and gas exploration and development, spills of produced water, and application of herbicides in the context of gas field maintenance and rangeland management are the main sources of contaminants that could affect water resources in the area.

The Genesis field in the Fletcher Gulch Shallow and Calamity Ridge II Units currently hosts 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. The COGCC database indicates that approximately 15 other wells were previously permitted in the area of analysis. The Proposed Action is expected to contribute incrementally to cumulative effects to surface and ground water resources in the area. Based upon analyses presented in this EA, and with the implementation of successful mitigation measures and adherence to COAs, detectable cumulative effects to human drinking water supplies are not expected.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: The No Action Alternative would not affect surface or ground water quality in the project area.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to surface or ground water quality in the project area. Impacts would be similar to those described for the Proposed Action.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Water Quality, Surface and Ground was reviewed. With the following exceptions, all apply:
   - Applicant Committed Measures (ACM) Water Quality, Surface and Ground number nine is not currently recognized as a BLM WRFO standard Condition of Approval (COA), therefore Genesis must not follow this ACM.

- Applicant Committed Measure number nine has been replaced by Surface and Ground Water Quality mitigation number four below.
- Applicant Committed Measure Water Quality Surface and Ground number 14 is not currently recognized as a BLM WRFO standard COA, therefore Genesis must not follow this ACM.
  - Applicant Committed Measure number 14 has been replaced with Surface and Ground Water Quality mitigation number two below.
- Applicant Committed Measure Water Quality, Surface and Ground number 16 is not currently recognized as a BLM WRFO standard COA, therefore Genesis must not follow this ACM.
  - Applicant Committed Measure number 16 has been replaced with Surface and Ground Water Quality mitigation number three below.

2) Genesis will line pits with a minimum 24 mil synthetic liner, which 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 liners shall also be resistant to deterioration by ultraviolet light, punctures and tearing, and shall be designed for the life of the pit.

3) 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.

4) The operator will submit a Sundry Notice (SN) if average water volumes within the lease area exceed the 300 barrel-per-day maximum volume assumed for produced water production for each well.

Finding on the Public Land Health Standard #5 for Water Quality: Following implementation of the mitigation measures and with adherence to the COAs, the Proposed Action would be unlikely to reduce the quality of surface or ground water in the project area or downstream of it at a detectable level. Hence the Public Land Health Standard for Water Quality in the proposed project area would continue to be met.

WETLANDS AND RIPARIAN ZONES

Affected Environment: Within the project area, perennial herbaceous wetlands are present in Yanks Gulch at the proposed crossing and scattered patchily along a perennial tributary to Fletcher Gulch that parallels the north side of the proposed access to well 14-24. These areas are mostly dominated by rush *(Juncus* spp.*)*, spikerush *(Eleocharis macrostachya)*, and a variety of wetland indicator grasses such as alkali muhly *(Muhlenbergia asperifolia)*, redtop bentgrass *(Agrostis gigantea)*, and rabbitsfoot grass *(Polypogon monspeliensis)*. Fletcher Gulch supports only poorly developed patches of herbaceous wetland vegetation in the project area.

The centerline of the proposed access across Yanks Gulch is just upstream of where the buried distribution pipeline constructed in 2008 crosses under the same waterway. Impacts from culvert

installation would overlap with impacts from the pipeline and extend upstream from there. Pipeline installation did not impact wetlands (DOI-BLM-CO-110-2007-055-EA); the wetland area that would be impacted by the culvert begins upstream of the pipeline crossing.

A woody riparian corridor has not developed along any of the drainages within the project limits. Several widely scattered tamarisk are present at the Yanks Gulch crossing, and a cottonwood is present upstream of the crossing, but a defined woody riparian zone is absent. 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 effects from the proposed project due to water depletions.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Approximately 104 feet of the Yanks Gulch channel would be directly and permanently impacted by installation of the culvert along the proposed access road to wells 34-22 and 34-33, directly affecting roughly 80 linear feet of the wetland community found at the crossing. The culvert would be sunk below grade and given a natural bottom with dredged material from the excavation (see *Description of the Proposed Action*). The goal would be to recreate original grade within the culvert. Mitigation measures include revegetation of disturbed areas upstream and downstream of the culvert.

The proximity of pad 14-24 and its access to the perennial tributary to Fletcher Gulch are described above in the section on *Surface and Ground Water Quality*. At its closest point, disturbance would come to within 50 feet of the channel. Direct effects to the herbaceous wetlands within this drainage are unlikely given the distance between the limits of access road disturbance and the channel. Installation of stormwater BMPs where access comes closest to the top of bank will help prevent inadvertent discharge of fill into wetlands in this drainage.

Indirect effects to undisturbed herbaceous perennial wetlands in Yanks Gulch and the perennial tributary to Fletcher Gulch may include short-term increases in sedimentation due to erosion of disturbed soils during construction, potential effects from spills of toxic substances from heavy equipment and vehicles; and an increase in cover of exotic species in disturbed soils in and adjacent to the channel. An approved *Stormwater Management Plan* and SPCC Plan are on file at the WRFO. Implementation of these plans and other mitigation measures for *Surface and Ground Water Quality*, *Soil Resources*, and *Invasive, Non-native Species*, and adherence to the COAs, are expected to minimize indirect effects to wetland communities in the project area.

Indirect effects to Spring Creek associated with dewatering (see *Surface and Ground Water Quality,* and *Special Status Animal Species*) may affect wetland and riparian zones along that drainage. The maximum level of depletion cited (37.99 acre feet/year in 2080 and 2081) 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 (WWL 2009, 2010).

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Wetlands and Riparian Zones was reviewed for conformance with BLM WRFO Standard COAs. All ACMs as proposed in Appendix C apply.

Cumulative Effects: Impacts to wetland and riparian resources in the area of analysis may result from livestock grazing and associated range improvements, oil and gas exploration and development, and herbicide applications made in the context of gas field maintenance and rangeland management. The Proposed Action is not anticipated to add substantially to existing or proposed disturbances to wetland or riparian zones in the Fletcher Gulch watershed. Offsite impacts to the riparian community along Spring Creek, should they occur; would contribute to long-term cumulative effects to riparian zones in that watershed.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct or indirect effects to wetland or riparian resources under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances that would potentially affect riparian or wetland resources under the No Action Alternative.

Mitigation: The following mitigation measures are required:

1) The Yanks Gulch crossing should be as close to perpendicular to the channel as possible to reduce the affected length of the channel.

2) Genesis will revegetate the herbaceous riparian zone upstream and downstream of the Yanks Gulch crossing. Revegetation will be done within the limits of disturbance from culvert installation or up to 30 feet upstream and downstream of the culvert footprint, whichever is larger. Species used for revegetation will include *Juncus arcticus*, *Eleocharis macrostachya, Carex nebrascensis,* and possibly other hydrophytic species found upstream of the culvert location. Within 60 days of completion of the Yanks Gulch crossing (see Appendix C – Genesis Gas and Oil Colorado LLC Applicant Committed Measures – Post-Construction Notification Measure Number one), Genesis will submit an as-built of the culvert to the WRFO Wildlife Biologist. The submittal will include photos of current conditions upstream and downstream of the culvert and a brief description of water availability and flow characteristics upstream and downstream of the culvert. The WRFO staff will then determine the approach to revegetation and communicate this to Genesis. Revegetation will be completed by October 15 of the year the culvert is installed. A report documenting the revegetation effort will be submitted to the Wildlife Biologist within three months of the completion of planting.

3) Physical means to prevent livestock and big game access to revegetated areas at the Yanks Gulch crossing will be required to accelerate development of an erosion-resistant vegetative armor in disturbed channel areas described above. Genesis will monitor fencing regularly to ensure that it prevents access by livestock to the revegetated area. Fences will not be removed without approval of the WRFO.

Finding on the Public Land Health Standard #2 for Riparian Systems: The Proposed Action would have direct and indirect impacts to the herbaceous riparian community in Yanks Gulch where an 80-foot culvert would be installed. Riparian systems occurring downstream of the project area, may be affected by low-level short-term sedimentation during construction. With

the implementation of the mitigation measures and adherence to the COAs, localized long-term losses in the extent of riparian vegetation would be offset and riparian systems in the project area would still meet the Public Land Health Standard for Riparian Systems. 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, and unmitigated reductions to flows in Spring Creek occur, they would be inconsistent with the Public Land Health Standard for Riparian Systems and would lead to a degraded capacity to achieve the standard for an undetermined length of time.

VEGETATION

Affected Environment: Proposed surface disturbance would occur in the following vegetation communities: pinyon-juniper woodland, mountain shrubland, greasewood-sagebrush shrubland, and sagebrush with scattered junipers. Table 12 provides the range sites at each proposed pad location.

Table 12. Well Numbers, Range Sites, and Elevations for the Proposed Well Locations

Well Numbers [1]	Range Site	Elevation (feet)
2-21, 2-32	Clayey foothills	6,600
2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-33, 34-44	Pinyon-juniper woodland	6,280 – 6,600
34-22	Pinyon-juniper woodland/clayey slopes	5,800 – 7,200
2-44, 14-24	Clayey slopes	5,600 – 7,300
14-11	Stony foothills	6,100 – 6,320

[1] Well locations that occupy more than one range site appear twice in this column.

The Proposed Action would occur primarily within pinyon-juniper woodland and mountain shrubland communities. The pinyon-juniper woodland is dominated by Utah juniper (*Juniperus osteospermum*). Understory shrub species include Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), black sagebrush *(Artemisia nova)*, 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 percent and in many areas less than 5 percent. Most of the project area woodlands are composed of mid-aged trees. A stand of more mature pinyon-juniper is found west and southwest of well 2-41. This stand has a high ratio of pinyon to juniper trees (up to 1:3) and some trees reach heights of up to 25 to 30 feet. A similar mature stand occurs west of well 34-22; the access road to that pad passes along the edge of the stand. These stands were mapped by a biologist while conducting raptor surveys for the proposed project (BIO-Logic 2010a).

The mountain shrubland community is concentrated on north-facing slopes. Shrub cover is very dense and dominated by Utah serviceberry, with associated mountain mahogany, antelope bitterbrush, and bluebunch wheatgrass *(Pseudoroegneria spicata)*.

A Wyoming sagebrush park with junipers scattered at varying densities occurs in Section two on both sides of the main service road at proposed locations 2-21 and 2-32. Greasewood *(Sarcobatus vermiculatus)* and associated Basin big sagebrush *(Artemisia tridentata* ssp. *tridentata)* occur along the perennial tributary to Fletcher Gulch that parallels the access road to 14-24.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Table 13 lists the vegetation communities found within the maximum limits of disturbance. A total of 47.1 acres of vegetation would be removed during construction of the proposed facilities. Given approximately 13,500 acres in the Fletcher Gulch Watershed, the project would directly impact less than one percent of the vegetated acreage in the watershed. This impact would be of high intensity locally where vegetation was removed in its entirety, but low intensity at the watershed scale. Impact duration would be long-term at both scales.

Impacts would occur primarily within pinyon-juniper woodland, followed by mountain shrubland. Most of the woodland (95 percent) that would be cleared as a result of the project is classed as productive exposure (see *Forest Management*). Regeneration of productive exposure stands may require 400 years. Roughly five percent of the woodland is classed as dry exposure, with a rotation cycle of as much as 600 years. The mountain shrubland associated with wells 2-43, 2-44, and 14-24 would most likely regenerate fairly rapidly where surface disturbance leaves the root masses intact, given that the dominant shrub species are strong resprouters (Baker 2009). In areas of heavy disturbance and compaction, regeneration from seed would take some time.

Table 13. Vegetation Communities within the Limits of Proposed Disturbance

Vegetation Community	Well Pads Occurring in the Community	Acreage to be Disturbed[1]
Greasewood-sagebrush	14-24	1.5
Mountain shrubland	2-43, 2-44, 14-24	10.9
Pinyon-juniper	2-11, 2-33, 2-41, 14-11,14-22, 34-22, 34-33, 34-44	30.1
Sagebrush	2-21, 2-32	4.6
	Total acreage	**47.1**

[1] Proposed disturbance includes well pads and access roads with pipelines.

Basin and Wyoming big sagebrush regenerate from seed only (Boyle and Reeder 2005) and may take many years to return to pre-disturbance conditions, even under the best of reclamation scenarios. Estimates for Wyoming big sagebrush regeneration after fire range from 50 to 120 years (Baker 2006). Depending upon the depth of surface disturbance, greasewood is a strong resprouter and would be expected to replace itself more rapidly than sagebrush in the greasewood sagebrush mixed shrubland.

Disturbed areas would be at risk for invasion by noxious weed species. Five Colorado Department of Agriculture (CDA) List B (CDA 2012) species were observed in the project area

(see *Invasive, Non-native Species*). Other nuisance weed species that occur in the area, such as cheatgrass, also pose a threat to native pinyon-juniper, sagebrush, and greasewood 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. Implementation of weed abatement mitigation measures and adherence to the COAs are expected to prevent significant invasions of List A and B species in the project area. Accidental spills of hazardous substances, including produced water, over the life of the project could potentially affect the surrounding flora and regeneration potential of disturbed ground. With the successful implementation of the mitigation measures and adherence to the COAs, impacts from spills are expected to be low and long-term.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Pre-Construction Activities and Notifications, Post-Construction Notifications, Pre & Post-Drilling Notifications, Pre-Reclamation Notification, Vegetation, Invasive, and Non-Native Species was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number 11 below, all apply.

Cumulative Effects: Sources of vegetation disturbance in the project area include oil and gas exploration and development, livestock grazing and associated range improvements, wild horse grazing, wildfires, and application of herbicides in the context of gas field maintenance and rangeland management. Current and approved development by Genesis in the Fletcher Gulch watershed has resulted in an estimated 144.4 acres of vegetation clearing. The Proposed Action will result in another 47.1 acres of clearing, for a total of 191.5 acres of natural gas-related vegetation clearing in the area, or 1.4 percent of the 13,500-acre Fletcher Gulch Watershed. This clearing will add incrementally to cumulative effects to vegetation in the watershed. The project area currently has a diverse and healthy plant community composition. With the successful implementation of interim and final reclamation, the removal of 47.1 acres of additional vegetation as a result of the Proposed Action is not expected to change this in the area of analysis.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no action authorized that would influence the upland or aquatic vegetation in the area of analysis.

Cumulative Effects: There would be no additional contribution to previous, existing, or foreseeable future disturbances to vegetation under this alternative.

Mitigation: The following mitigation measures are required:

1) All disturbed areas for wells 2-21, 2-32, 2-44 shall be promptly seeded with Seed Mix one (see Table 14 below). It is recommended that all sites be seeded between September one and March 31. If an alternate date of seeding is requested, contact the designated NRS (Natural Resource Specialist) or Realty Specialist prior to seeding for approval. Seed mixture rates are Pure Live Seed (PLS) pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be

accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 14. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites (2-21, 2-32, 2-44)

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
1	Rosana	Western wheatgrass	*Pascopyrum smithii*	4.5
	Critana	Thickspike wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*	3.5
	Toe Jam Creek	Bottlebrush squirreltail	*Elymus elymoides*	3.0
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5
		Sulphur flower	*Eriogonum umbellatum*	1.5
		Winterfat	*Krascheninnikovia lanata*	1.0

2) All disturbed areas for wells 2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-22, 34-33, 34-44 shall be promptly seeded with Seed Mix three (see Table 15 below). It is recommended that all sites be seeded between September one and March 31. If an alternate date of seeding is requested, contact the designated NRS or Realty Specialist prior to seeding for approval. Seed mixture rates are PLS pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 15. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites (2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-22, 34-33, 34-44)

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
3	Rosana	Western wheatgrass	*Pascopyrum smithii*	4.0
	Whitmar	Bluebunch wheatgrass	*Pseudoroegneria spicata* ssp. *inermis*	3.5
	Rimrock	Indian ricegrass	*Achnatherum hymenoides*	3.0
		Needle and thread grass	*Hesperostipa comata* ssp. *comata*	2.5
	Maple Grove	Lewis flax	*Linum lewisii*	1.0
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5

3) Refer to Special Status Plant Species section for the recommended seed mix to be used for reclamation of well 14-24.

4) Use seed that is certified free of noxious weeds. All seed tags will be submitted via SN to the designated NRS within 14 calendar days from the time the seeding activities have ended. The SN will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor, etc.). In addition, the SN 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.

5) A Reclamation Status Report will be submitted to the WRFO annually (by January first) for all actions that require disturbance of surface soils on BLM administered lands as a result of the Proposed Action. The Reclamation Status Report will include the well number, API number, legal description, UTM coordinates, project description (e.g., well pad, pipeline, etc.), reclamation status (e.g., interim or final), whether the well pad or pipeline has been revegetated and/or re-contoured, 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 responsible for developing the report. The report will include maps showing each point (i.e., well pad), polygon, or polyline (i.e., pipeline) feature that was included in the report. The data must be submitted in UTM Zone 13N, NAD 83, in units of meters. In addition, scanned copies of seed tags that accompanied the seed bags will be included with the report. 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. The Reclamation Status Report will be submitted to the BLM Reclamation Coordinator.

6) Stripped topsoil shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed. Properly store topsoil to protect it from erosion and compaction, assure that it remains readably identifiable (i.e., signed), viable, and available for redistribution during reclamation. Topsoil piles that will be stored for more than one month should be seeded with an approved BLM seed mix, stabilized with certified weed free erosion fabric or mulch, and may require fencing. When topsoil will be stored for more than one year and other resource values can be accommodated, topsoil will be stored in piles with a depth of two feet or less.

7) Genesis shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes planned for use in reclamation are provided in Tables 14, 15, and 22, and are based on the ecological site defined by the soil map units within the project area.

8) If necessary to achieve successful reclamation, livestock shall be excluded from reclaimed areas. Fences, cattle guards, and gates (all built to BLM specifications per BLM manual H-1741-1) will be installed, maintained, and removed by the operator upon approval by the

WRFO BLM. BLM specifications for cattle fencing provided in Chapter 4 of H-1741-1 are as follows: "H. Domestic Livestock Fence: Fencing is commonly used to control domestic livestock to achieve safety and vegetation management objectives. The standard BLM fence design for control of cattle only, consists of a 4-wire (barbed) fence with 42-inch top height and wire spacings of 16, 6, 8, and 12 inches." In specific and predetermined instances, livestock exclosures may be retained for extended periods to meet other resource objectives.

9) Upon final abandonment of well pads, 100 percent 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 (see Tables 14, 15, and 22). 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.

10) 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:

- Final reclamation is considered successful when the entire reclamation site (including obliterated roads) has attained the following criteria:

  i. Basal vegetative cover must be at least 80 percent of the DPC. On woodland or shrub sites, this would equate to the capability of those sites in an herbaceous state.

  ii. The resulting plant community (in a healthy early seral state) must contain at least five desirable plant species, at least one of which must be a forb or shrub, each comprising at least five percent relative cover. No one species may exceed 70 percent relative cover in the resulting plant community to ensure that site species diversity is achieved. Desirable species include those defined by the range site, seeded in the BLM approved mix, or other desired species found in the surrounding areas (approved by the BLM).

  iii. Undesirable weed cover must not exceed amounts addressed below.

- Cover, composition, and diversity data should be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. Approved methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start. Other data collection methods such as those described in BLM Technical Reference 1730-1 or 1734-4 may be pre-approved by the BLM.
- The vegetation community established on the reclaimed site stabilizes soils, is capable of persisting without continued intervention (excluding routine weed management), and will allow plant community successional processes to progress toward advanced community states.

- Bare ground does not exceed that of the range site or if not described, bare ground does not exceed that of a representative undisturbed DPC meeting the Colorado Standards for Public Land Health.
- Reclamation success in areas affected by cheatgrass and/or other invasive annuals will be qualified based on the condition of the project site (i.e., the relative vegetative cover) prior to disturbance.
- If the project site contains less than 25 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed five percent.
- If the project site contains 25 percent to 50 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 10 percent.
- If the project site contains more than 50 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed the level defined by site-specific criteria established in the reclamation plan developed for that site.

11) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Pre-Construction Activities and Notifications, Post-Construction Notifications, Pre & Post-Drilling Notifications, Pre-Reclamation Notification, Vegetation, Invasive, and Non-Native Species was reviewed. With the following exceptions, all apply:
    - Post-Construction Notifications:
        - Applicant Committed Measure (ACM) number two is not currently recognized as a BLM WRFO standard Condition of Approval (COA), therefore Genesis must not follow this ACM.
    - Vegetation:
        - Applicant Committed Measure number two is not currently recognized as a BLM WRFO standard COA. Forest Management mitigation numbers two, three, four, and five replace it, therefore Genesis must not follow this ACM.
        - Applicant Committed Measure number four, ACM number 17, and Table four combine multiple pads, including some which are not in the Proposed Action of DOI-BLM-CO-110-2012-0041-EA. Additionally, BLM WRFO review of the Proposed Action showed additional seed mix recommendations. Vegetation mitigation numbers one, two, four, and nine and Special Status Plants Species mitigation measure number four will replace these ACMs; therefore Genesis must not follow these ACMs.
        - Applicant Committed Measure number eight is not the current BLM WRFO standard for reclamation success. Vegetation mitigation number 10 replaces this ACM; therefore Genesis must not follow this ACM.
        - Applicant Committed Measure number nine is not the current BLM WRFO standard for the Reclamation Status Report. Vegetation mitigation number five replaces this ACM; therefore Genesis must not follow this ACM.
        - Applicant Committed Measure number 16 if applicable is required.

Finding on the Public Land Health Standard #3 for Plant and Animal Communities: The vegetation within the proposed project area currently meets the criteria established in the Public Land Health Standard #3 for Plant and Animal Communities. Following implementation of the mitigation measures and with adherence to the COAs, the Proposed Action would not change this status.

INVASIVE, NON-NATIVE SPECIES

Affected Environment: All BLM-managed lands in the project area are inside a BLM designated weed-free zone (BLM 1997). The proposed well pads and access roads were surveyed for invasive non-native plant species within the rare plant survey area between May 21 and June 25, 2010 (BIO-Logic 2010b). Special focus was placed on List A and B species found on the CDA Noxious Weed List (CDA 2012), as per the WRFO rare plant inventory protocol issued in May 2010, *Standards for Contractor Inventories for Special Status Plant Species and Noxious Weed Affiliates* (BLM 2010).

Five List B species were found inside the survey area: tamarisk *(Tamarix* sp.*)*, Russian olive *(Eleagnus angustifolia)*, bull thistle *(Cirsium vulgare)*, Canada thistle *(Cirsium arvense)*, and houndstongue *(Cynoglossum officinale)*. Precise locations are provided in the *Rare Plant and Noxious Weed Survey Report* (BIO-Logic 2010b). None of the occurrences are dense or very extensive. A few dozen bull thistle individuals were found on the edge of existing well pad 4401D A 23; these were sprayed by Genesis during the survey period. Houndstongue was found along a path that travels up an ephemeral side drainage from the same pad. Tamarisk occurs scattered along both Fletcher Gulch and Yanks Gulch. A patch of Canada thistle and one Russian olive tree were found in Yanks Gulch, approximately one mile upstream of the proposed crossing.

In addition to the above List B species, cheatgrass was observed throughout the project area, with highest densities occurring in sagebrush shrublands near roads. Other weedy/adventive species that occur within the Genesis field or along RBC 122 between SH 64 and BLM 1100 include: curly cup gumweed (*Grindelia camporum*), halogeton (*Halogeton glomeratus*), yellow sweet meliot (*Melilotus officinale*), Russian thistle (*Salsola australis*), and salsify (*Tragopogon dubius*).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would result in approximately 47.1 acres of surface disturbance, which would increase the potential for the establishment and spread of invasive, non-native species. Approximately 41 acres of this disturbance would take place within a BLM-designated weed-free zone, with the rest on private surface. Of the List B species detected, only tamarisk occurs within the limits of proposed disturbance. Nonetheless, noxious weed species have the potential to invade the project area along lines of disturbance created by the new roads, pipelines, and well pads (Gelbard and Belnap 2003; Hansen and Clevenger 2005; Christen and Matlack 2009). Such invasion may displace natives, causing changes in vegetation communities, and alter the visual character of the landscape. Weed propagules may 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. Because cheatgrass is already present in many portions of the project area, it is likely that some project sites would be invaded by this species following disturbance. Cheatgrass is known to out-compete native plant species (Booth et al. 2003) and is difficult to control (Shinneman and Baker 2009). It has been shown to decrease nitrogen availability to plants following invasion of undisturbed grassland on the Colorado Plateau (Evans et al. 2001) and to increase fire frequency (Knapp 1996; Whisenant 1992). Seeds from tamarisk and Russian olive trees found along drainages can be transported downstream and colonize disturbed areas along waterways. Culvert installation in Yanks Gulch will create disturbed surfaces in and adjacent to the waterway and may facilitate spread of these species which are known to occur at (tamarisk) or upstream (tamarisk and Russian olive) of the crossing.

Implementation of the mitigation measures and adherence to the COAs are expected to moderate impacts from noxious weeds during the interim reclamation and production phases of the proposed project. During the production phase and after 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, elevated susceptibility of soils to erosion.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Invasive, Non-Native Species was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: The Proposed Action would contribute to incremental fragmentation of native plant communities, which puts these areas at greater risk for establishment and spread of noxious and invasive weed species. If noxious weeds establish in these plant communities, the health of the upland plant communities and their associated ecological function would decline. With timely and successful reclamation and implementation of mitigation measures, the cumulative effects to native communities from the establishment of noxious weeds would be minimized.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no action authorized that would influence native vegetation in the area of analysis.

Cumulative Effects: There would be no additional contribution to previous, existing, or foreseeable future disturbances that would influence native vegetation under this alternative.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Invasive, and Non-Native Species was reviewed. With the following exceptions, all apply:

- Applicant Committed Measure number two is not currently recognized as a BLM WRFO standard COA, and has been replaced by Invasive, Non-Native Species mitigation measure number five below, therefore Genesis must not follow this ACM.
- Applicant Committed Measure number three is not currently recognized as a BLM WRFO standard COA, and has been replaced by Invasive, Non-Native Species mitigation number two below, therefore Genesis must not follow this ACM.
- Applicant Committed Measure numbers four and five are not currently recognized as BLM WRFO standard COAs and have been replaced by Invasive, Non-Native Species mitigation numbers three and six below, therefore Genesis must not follow these ACMs.

2) All equipment that may act as a vector for weeds will be cleaned before entering the WRFO. Equipment will also be cleaned when leaving and/or moving between work sites if the pre-disturbance weed survey indicated the presence of undesirable invasive or noxious weeds and there is a risk of transporting weed seeds or other propagules.

3) All seed placed on BLM and split-estate lands will comply with United States Department of Agriculture (USDA) state noxious weed seed requirements and shall be certified by a qualified Federal, State, or county office as free of noxious weeds. Any seed lot with test results showing presence of State of Colorado A or B list species will be rejected in its entirety and a new tested lot will be used instead.

4) All straw, mulch, or other vegetative material used on site (e.g., for site stability or rehabilitation) shall be certified by a qualified Federal, State, or county office as free of noxious weeds or weed seed.

5) All sites shall be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the BLM.

6) Application of herbicides shall comply with the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environments Impact Statement* (EIS), and the WRFO Integrated Weed Management Plan (DOI-BLM-CO-110-2010-0005-EA).

7) Pesticide Use Proposals (PUPs) shall be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds.

8) All disturbed areas shall be revegetated as outlined in the mitigation measures related to Vegetation and Surface and Ground Water Quality and Special Status Plant Species sections, and as directed by the AO.

SPECIAL STATUS ANIMAL SPECIES

Affected Environment: Federally Protected Animal Species: Following the guidelines of the Endangered Species Act (ESA) of 1973, as amended, a list of federally threatened, endangered, proposed, or candidate animal species having the potential to occur in Rio Blanco County was obtained from the U.S. Fish and Wildlife Service (FWS) (FWS 2012a). According to the FWS county list, there are five federally listed endangered, two threatened, and three candidate animal species that have potential to occur in Rio Blanco County or the action area as it extends downstream from Fletcher Gulch and Spring Creek to the White, Green, and Colorado Rivers. Threatened, endangered, and proposed species are legally protected under the ESA; candidate species are protected according to BLM policy (BLM 1997, 2008b). Table 16 provides information on these 10 species, including a brief description of their habitat and the potential for each to occur in the proposed project area.

Table 16. Federally and State Listed Animal Species with Potential to Occur in Rio Blanco County, Colorado

Species	Status[1]	Habitat Description	Potential to Occur in the Proposed Project Area
Mammals			
Black-footed ferret *(Mustela nigripes)*	E, SE	Open grasslands with prairie dog colonies.	No suitable habitat exists within 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 eight miles from the project area.
Canada lynx *(Lynx canadensis)*	T, SE	Mixed conifer forest, generally above 8,000 feet	No suitable habitat exists within the project area or vicinity.
North American wolverine *(Gulo gulo luscus)*	C, SE	In Colorado, high elevation alpine with persistent snow late into the summer.	No suitable habitat exists within the project area or vicinity.
Birds			
Greater sage-grouse *(Centrocercus urophasianus)*	C, SC	Large expanses of sagebrush shrubland from 4,000 to over 9,000 feet in elevation; riparian areas used during brood rearing.	The project area is in the vicinity of greater sage-grouse habitat as mapped by CPW. The CPW range comes closest to the project area 0.9 miles east of 14-24 (Calamity Ridge) and 1.5 miles northeast of 34-22 (White River Valley).

Species	Status[1]	Habitat Description	Potential to Occur in the Proposed Project Area
Mexican spotted owl (*Strix occidentalis lucida*)	T, ST	Typical nesting habitat consists of areas with complex forest structure or rocky canyons, with mixed-aged, multi-storied mature or old-growth stands with high canopy closure. In Colorado, most nests are in caves or on cliff ledges in steep-walled canyons. A wider variety of forest conditions are used for foraging.	No suitable nesting habitat exists within the project area. The nearest known spotted owl sighting was in Dinosaur National Monument, where a single bird was observed in two consecutive years in the late 1990s.
Yellow-billed cuckoo *(Coccyzus americanus)*	C, SC	Breeds in riparian gallery forests with dense understory vegetation.	No suitable habitat would be subject to influence within the project area or vicinity.
Fish			
Bonytail chub *(Gila elegans)*	E, CH, SE	Large rivers with fast flowing waters.	Action area extends downstream to occupied and designated critical habitat in the Green and Colorado Rivers.
Colorado pikeminnow *(Ptychocheilus lucius)*	E, CH, ST	Large rivers with strong currents and deep pools.	Project area separated from White River's designated critical habitat by 6 valley miles (Yanks Gulch to Fletcher Gulch) and from occupied pikeminnow habitat by an additional 8 river miles. Action area extends downstream to designated critical habitat in the Green and Colorado Rivers.
Humpback chub *(Gila cypha)*	E, CH, ST	Rivers with sand, gravel, or boulder bedrock stream beds; prefers deep eddies and pools.	Action area extends downstream to occupied and designated critical habitat in the Green and Colorado Rivers.
Razorback sucker *(Xyrauchen texanus)*	E, CH, SE	Rivers with strong currents and deep pools with sandy or rocky bottoms.	Action area extends downstream to occupied and designated critical habitat in the Green and Colorado Rivers.
Amphibians			
Boreal toad *(Anaxyrus boreas boreas)*	SE	Mountain lakes, ponds, meadows, and wetlands in subalpine forest; may feed away from water.	No suitable habitat exists within the project area or vicinity.

[1] E = federally endangered; T = federally threatened; C = Federal candidate; CH = critical habitat has been designated; SE = Colorado State endangered; ST = Colorado State threatened.

Based upon the information summarized in Table 16, the four species of endangered fish and greater sage-grouse are the only federally listed or candidate species that have the potential to be affected by the Proposed Action. Water depletions following extraction of water from the

Mesaverde Formation and subsequent re-injection into the lower Sego Formation have the potential to affect surface and subsurface flows in the White River, effectively extending the action area downstream from the project area to designated critical habitat for the four fish species in the White, Green, and Colorado Rivers. Critical habitat for the Colorado pikeminnow occurs along the White River in Rio Blanco County from the Rio Blanco Lake Dam in Section 6, T1N R96W downstream to the river's confluence with the Green River (FWS 1994). Approximately six miles northwest of the project area, Fletcher Gulch and Spring Creek join the White River inside Colorado pikeminnow critical habitat. Critical habitat for the other three species of endangered fish is located downstream of the White River in the Green and Colorado Rivers.

The project area is outside greater sage-grouse priority and general habitat as mapped by Colorado Parks and Wildlife (CPW) (CPW 2012). Nonetheless, general habitat does occur in the project vicinity. Sagebrush communities ostensibly suitable for year-round support of sage-grouse are strongly dissected, but generally continuous along the benches and parks extending along the south side of the White River Valley north of the project. General sage-grouse habitat also occurs along the crest of Calamity Ridge, about one mile east of the project.

State Protected Animal Species: Colorado threatened and endangered species and species of concern having the potential to occur in Rio Blanco County were determined from the CPW threatened and endangered list (CPW 2011b) and species activity maps (CPW 2011a). The State-listed or special concern species having the potential to be affected by development in Rio Blanco County include all of the species shown in Table 16. Of these, only the four fish species and greater sage-grouse have the potential to be affected by the Proposed Action, as discussed above.

BLM Sensitive Animal Species: The 25 Colorado BLM sensitive animal species with potential to occur in the WRFO resource area (BLM 2009) are considered in this EA. BLM sensitive species are protected by policy rather than statute (BLM 1997, 2008b). Table 17 lists these species, their habitat requirements, and a determination of their potential to occur within the proposed project area. Of the 25 species listed, seven have potential to occur in the vicinity of the proposed project: Townsend's big-eared bat, fringed myotis, big free-tailed bat, northern goshawk, greater sage-grouse, Brewer's sparrow, and Great Basin spadefoot. Of the BLM sensitive animal species addressed, surveys were conducted for breeding northern goshawks.

Table 17. BLM Sensitive Animal Species with Potential to Occur on WRFO BLM Lands

Species	Habitat Description	Potential to Occur in the Project Area
Mammals		
Townsend's big-eared bat[1] *(Corynorhinus townsendii)*	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 appropriate foraging habitat but limited roost sites (rock outcrops, snags). A known maternity roost occurs within foraging distance (at least 10 miles) of the project area.

Species	Habitat Description	Potential to Occur in the Project Area
Spotted bat *(Euderma maculatum)*	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 (rock outcrops). 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 *(Myotis thysanodes)*	Pinyon-juniper and ponderosa pine woodlands. Roosts in caves, mines, rock crevices, buildings, bridges, and large snags.	Project area provides appropriate foraging habitat but limited roost sites (rock outcrops, snags).
Big free-tailed bat *(Nyctinomops macrotis)*	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 provides appropriate foraging habitat but limited roost sites (rock outcrops, snags). Species detected in the Piceance Basin during acoustic surveys by BLM. Species not known to breed in Colorado.
White-tailed prairie dog *(Cynomys leucurus)*	Level to gently sloping grasslands and semi-desert grasslands from 5,000-10,000 feet in elevation.	No grassland or shrubland habitats with prairie dog colonies occur in the project area.
Birds		
Amerian white pelican *(Pelecanus erythrorhyncos)*	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 along the White River, one mile west of the SH 64 and RBC 122 intersection, where seasonal flooding creates a pond in which white pelicans have been observed to feed for several days at a time.
Northern goshawk *(Accipiter gentilis)*	Mature ponderosa pine, aspen, or mixed conifer forests. There are at least six confirmed nests in mature pinyon-juniper woodland in the WRFO resource area.	Potential nesting habitat occurs adjacent to wells 34-22 and 34-44, and all wells other than 2-21, 2-32, 2-43, and 2-44 have the potential to disrupt nearby nest efforts. A known goshawk nest site is located 1-1.5 miles west of wells 34-22, 34-33, and 34-44. Breeding at that site may have been attempted in 2008, but was not successful. In 2009 and 2010, the nest was on the ground and inactive; alternate nests were searched for but not detected.
Ferruginous hawk[1] *(Buteo regalis)*	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[1] *(Haliaeetus leucocephalus)*	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 nine-mile segment of the White River, 5.5 miles northwest of the project area.

Species	Habitat Description	Potential to Occur in the Project Area
American peregrine falcon[1] *(Falco peregrinus anatum)*	Open country near cliff habitat, often near water such as rivers, lakes, and marshes; nests on ledges or holes on cliff ledges and crags.	Potential nest and foraging habitat occurs along the White River, 5.5 miles north of the project area. Foraging opportunities over the project site and surrounding uplands are unexceptional and unlikely to attract concentrated or routine use.
Columbian sharp-tailed grouse[1] *(Tympanuchus phasianellus columbianus)*	Oak/serviceberry shrublands often interspersed with sagebrush, aspen forests, or irrigated pasturelands.	No shrubland, aspen forest, or irrigated pasture habitats occur in the project area or vicinity.
Greater sage-grouse[1] *(Centrocercus urophasianus)*	Large expanses of sagebrush shrubland from 4,000 to over 9,000 feet in elevation; riparian areas used during brood rearing.	The project area is not within greater sage-grouse habitat as mapped by CPW. The CPW range comes closest to the project area 0.9 miles east of proposed 14-24 (Calamity Ridge) and 1.5 miles northeast of proposed 34-22 (White River Valley).
Mountain plover[1] *(Charadrius montanus)*	Flat, open grasslands, often associated with prairie dog towns and intensive grazing.	Very limited grassland habitats occur in the project area or vicinity; none of these are suitable for prairie dogs.
Long-billed curlew[1] *(Numenius americanus)*	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 *(Plegadis chihi)*	Shallow marshes with emergent vegetation. Forages in shallow wetlands.	No marsh or well-developed wetland habitats occur in the project area or vicinity. The wetlands along the drainages in the project area are diminutive and are situated in narrow incised channels and would not provide a suitable prey base for this species
Burrowing owl[2] *(Athene cunicularia)*	Level to gently sloping grasslands and semi-desert grasslands. Requires prairie dog colonies for shelter and food; may use badger burrows.	No grassland habitats suitable for prairie dog colonies occur in the project area.
Brewer's sparrow *(Spizella breweri)*	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 in the project area is provided by a sagebrush park, greasewood-sagebrush shrublands, and sagebrush inclusions in the pinyon-juniper woodland.
Fish		
Bluehead sucker *(Catostomus discobolus)*	Inhabits perennial waters from headwater streams to large rivers.	No suitable perennial waters exist within the project area or vicinity.
Flannelmouth sucker *(Catostomus latipinnis)*	Inhabits perennial waters from headwater streams to large rivers.	No suitable perennial waters exist within the project area or vicinity.
Mountain sucker[1] *(Catostomus platyrhynchus)*	Pools and eddies in streams with rocky or gravelly bottoms.	No suitable perennial waters exist within the project area or vicinity.

Species	Habitat Description	Potential to Occur in the Project Area
Roundtail chub[1] *(Gila robusta)*	Deep pools and eddies in mid- to large-sized rivers and streams throughout the Colorado River Basin.	No suitable perennial waters exist within the project area or vicinity.
Colorado River cutthroat trout[1] *(Oncorrhynchus clarki pleuriticus)*	Occurs in headwater streams and lakes.	No suitable perennial waters exist within the project area or vicinity.
Amphibians/Reptiles		
Northern leopard frog[1] *(Rana pipiens)*	Banks and shallows of permanent bodies of water.	Northern leopard frogs are associated with perennial water sources. Fletcher Gulch and a tributary to it provide marginal perennial flow that does not appear to support aquatic vertebrate life within the project area.
Great Basin spadefoot *(Spea intermontana)*	Sagebrush, semi-desert scrub, and pinyon-juniper habitats. Breeds in temporary or permanent pools and streams.	Project area near published elevation limit of 7,000 feet. Project site meets basic demands of suitable habitat, including pinyon-juniper and sagebrush habitat in close proximity to persistent surface waters in Fletcher Gulch and nearby stock ponds.
Boreal toad[3] *(Anaxyrus boreas boreas)*	Mountain lakes, ponds, meadows, and wetlands in subalpine forest; may feed away from water.	No suitable habitat exists within the project area.
Midget faded rattlesnake (*Crotalus concolor*)	Dens associated with appropriate rock substrate on south to southeast facing aspects below 7,000 feet elevation. Snakes remain within about 1.3 miles of dens June through September.	Distribution of species not well established in project area, but suitable den habitat limited by suitable rock outcrops and elevation. Proposed locations, roads, and pipelines do not involve suitable den habitat.

[1, 2, 3] Species also ranked as a [1] special concern, [2] threatened, or [3] endangered by CPW (CPW 2011b).

Northern goshawks are typically found in mixed-conifer or aspen (*Populus tremuloides*) forests during the breeding season; however, goshawk nests have been documented by BLM in mature pinyon-juniper woodlands within the WRFO. These nests have been variably located in the interior of extensive stands, stand margins, and narrow residual stringers above 6,500 feet elevation. A known goshawk nest in the project vicinity is located one to 1.5 miles west of proposed wells 34-22, 34-33, and 34-44. It 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. Protocol-level surveys done in 2008 and 2010 got no response from call stations near the nest (BIO-Logic 2008c, 2010a). 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. When the area was surveyed again in 2010, the remains of the nest were still on the ground and no alternate nests were observed (BIO-Logic 2010a).

Brewer's sparrow is a sagebrush associate that will breed at reduced densities in mixed sagebrush shrublands. Homogenous stands of sagebrush considered optimal for Brewer's

sparrow nesting habitat comprise less than one percent of the Genesis project area. These sagebrush habitats are dispersed sparingly among a pinyon-juniper dominated matrix and are represented by small sagebrush parks (largest about 25 acres) or narrow drainage bottoms (largest contiguous reach about 40 acres). Occupied habitat for Brewer's sparrow occurs in the sagebrush and mixed shrub communities found at well locations 2-21, 2-32, 2-33, 2-43, 2-44, and 14-22 and along several of the associated access routes. The 2010 plant and raptor survey crews heard Brewer's sparrows and observed active nests in these areas and other small pockets of sagebrush inside the project area. Expansive habitat for Brewer's sparrow is not widespread in the immediate project area, but does occur along the White River Valley, approximately 5.5 miles north of the project area.

Townsend's big-eared bat and fringed myotis are known to occur in pinyon-juniper woodland habitats. Acoustic surveys conducted by the BLM WRFO in the summer of 2008 documented the presence of Townsend's big-eared bat within 10 miles of the project area. 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 in the proposed project area, although mature pinyon-juniper woodlands may 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. BLM acoustic surveys have detected big free-tailed bat in the Piceance Basin, but the species is not known to breed in Colorado.
The Great Basin spadefoot is widespread in northwestern Colorado (Hammerson 1999), including Rio Blanco County, typically at elevations below 7,000 feet. In western Rio Blanco County, BLM has encountered spadefoot very infrequently in sagebrush valleys and basins within a few miles of the Utah border at elevations below 5,500 feet. The pinyon-juniper woodlands and mixed shrublands, generally within 0.6 mile (one kilometer) of stockponds and temporary pools along Fletcher Gulch or the perennial tributary to Fletcher Gulch could support Great Basin spadefoot. Yanks Gulch is deeply incised within the project area. Marginal habitat for spadefoot may occur in scattered patches along this drainage.

The distribution of midget faded rattlesnake and their habitat is not fully established in the WRFO, but recent surveys have documented a number of sites that support the snakes in the Douglas Creek and Piceance Creek basins. Communal hibernacula or dens are used during winter hibernation and all reproductive activity and are composed of appropriately configured rock outcrops on south to southeast facing slopes. Emerging in May, gravid females and juvenile snakes remain in close association with these features throughout the year, whereas remaining snakes disperse up to 1.25 miles before returning to hibernacula in mid to late September. The general project area has not been surveyed for midget faded rattlesnake habitat, but those terrain features that support development infrastructure are generally situated on ridges that that do not appear to meet the general requirements for this species' choice of hibernacula. These habitat features; if they occur, are expected to be fine-scale and widely separated and are probably relegated to outcrops along the lower margins of narrow drainageways.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Federally and State Protected Animal Species: The four species of federally and state-listed Colorado River fish, the bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker, and their designated critical habitat, may be indirectly affected by the Proposed Action if consumptive use of water for project development

and operation, or ground water depletions due to dewatering and subsequent reinjection of produced water during drilling, alter surface flows in the White River. The FWS has determined that new consumptive use of water greater than 0.1 acre feet/year (FWS 2009) in the Upper Colorado River Basin represents a depletion that is likely to adversely affect the four fish species and adversely modify their designated critical habitat.

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 (BLM 2008a). 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 (FWS 2008b), which determined, as conditioned, that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail chub, or razorback sucker, and that BLM water depletions are not likely to destroy or adversely modify designated critical habitat for these species.

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 depletions while avoiding the likelihood of jeopardy to the endangered fishes and avoiding destruction or adverse modification of their critical habitat. 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 provide recovery to the endangered fishes and avoid jeopardy due to depletions from the Colorado River Basin. As a reasonable and prudent alternative in the PBO, FWS authorized BLM to solicit from operators 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 acre feet/well of water for drilling, 0.1 acre feet/well for dust abatement, and 0.11 acre feet/well for hydrostatic pipeline testing (BLM 2008a). Genesis would not use hydrostatic testing on the proposed project. According to these numbers, the total water depletion for well drilling and dust abatement would therefore be approximately 34.1 acre feet for the 13 gas wells currently proposed. This is higher than the estimated freshwater use per well for construction and drilling estimated by the operator (300 barrels for construction and 300 barrels for drilling to surface casing depth, for a total of 7,800 barrels , or 1.0 acre feet, for the 13 wells). Water used for drilling to total depth and for completion would be production water circulated through a closed loop system (see *Description of the Proposed Action*). 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. Additive depletions attributable to this project will be entered into the WRFO fluid minerals water depletion log, which is submitted to the Colorado State Office at the end of each fiscal year.

Depletions of Upper Colorado River Basin water attributable to dewatering and reinjection of produced water are not covered by the above-referenced PBA and PBO. Such water use must be evaluated separately with respect to its potential effect on the Colorado River endangered fish and their designated critical habitat. The proposed development of the coalbed methane resource would require that water be extracted from the producing zone in the Mesaverde Group at a depth of about 2,300 feet, 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 approximately 3,200 feet. Extraction and injection of such volumes of water may have effects on offsite surface flows, which in turn could affect the four fish species.

Western Water & Land analyzed potential accretions and depletions to offsite surface waters with a Glover Analysis (WWL 2009, 2010). The analysis was first done in 2009 for 38 wells (WWL 2009), and then updated to address additional proposed wells (WWL 2010). A total of 51 Genesis gas wells were included in the 2010 analysis: the 13 currently proposed, 22 approved, 14 existing, and two wells that have since been dropped. The analysis modeled depletions and accretions for a 100-year period, since such effects may continue well beyond the end of coalbed methane production. Results from the study indicate that development of the wells may have substantial effects to surface and subsurface water expression in Spring Creek, while potential depletions to the White River would be undetectable, with results varying based upon model assumptions.

The model assumes that Spring Creek is perennial from the Mesaverde coal unit outcrop to the White River (Appendix A, Figure 6). Maximum depletions peaked at 37.99 acre feet/year (0.0525 cubic feet/second) in 2080-81, and slowly decreased to 34.45 acre feet/year (0.0476 cubic feet/second in 2110. Such levels of depletion would have the potential to substantially decrease surface flows in perennial reaches of Spring Creek or reduce groundwater levels in the alluvial aquifer where the creek is intermittent or ephemeral. No effect would be expected to surface flows if Spring Creek is ephemeral.

A net gain in flow in the White River is predicted along the 1.5 to 2 mile reach between the outcrop of the Mesaverde coal unit and the Sego Sandstone, peaking at 226.80 acre feet/year (0.31 cubic feet/second) in 2042 and declining to 30.93 acre feet/year (0.043 cubic feet/second) in 2110. Along the 3.2-mile reach of the river between the confluence with Spring Creek and the Sego Sandstone outcrop, the maximum potential depletion predicted in any simulation was 0.03 acre feet/year (0.00004 cubic feet/second) in 2010 (Appendix A, Figure 6). All other years showed accretions. Average annual discharge to the White River is 727 cubic feet/second. Against this background flow rate, the authors considered potential impacts of the estimated depletions and accretions to the White River to be undetectable. The potential effect of changes in flow volume to water chemistry was considered to be minor to undetectable (WWL 2010). 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. Based on these results, as qualified, it appears unlikely that the Proposed Action would have a large enough effect on flow rates or water chemistry in the White River to have a deleterious effect on the federally protected Colorado River fish species.

Minor depletions to the White River such as those predicted in the 2010 *Stream Depletion Evaluation* were considered by BLM in a manner identical to those associated with BLM's fluid minerals 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 0.03 acre feet/year that would be lost during the transfer of water from one formation to another is considered too small to deal with efficiently as an independent action, and BLM has assumed this depletion payment under the Programmatic Agreement. This value will be entered into the WRFO fluid minerals water depletion log and will be submitted to the Colorado State Office at the end of the fiscal year.

Greater sage-grouse would not be affected by the Proposed Action, even though suitable habitat is mapped within one mile of proposed construction. The project area has never been known to support sage-grouse in any capacity (Holmes 2009). Mapped general sage-grouse habitat in the White River Valley comes to within 2.5 miles of proposed well 34-22 at the northern extent of the project area. These ranges south of the White River are best characterized as historic. There are no recent indications of sage-grouse using these benches and no active leks are known to exist within 10 miles of these habitats. General sage-grouse habitat also occurs along the crest of Calamity Ridge, 0.8 mile east of proposed well 2-44, and 0.9 mile east of 14-24. Location 14-24 is located in a deep, narrow canyon 1,200 vertical feet below the ridgeline – a habitat arrangement that sage-grouse appear incapable of exploiting. Approximately 20 acres of sagebrush shrubland with junipers scattered at varying densities occurs near proposed wells 2-21 and 2-32, surrounded by dense pinyon-juniper woodland and mountain shrubland. A small isolated park like this does not offer suitable habitat for greater sage-grouse.

BLM Sensitive Animal Species: Based upon the 2010 raptor survey of the proposed project area (BIO-Logic 2010a), no direct effects to northern goshawks would occur as a result of the Proposed Action. Several pads have been relocated since that survey. Because of these relocations and the outdated nature of the survey, a new raptor survey will be required prior to construction of any of the proposed features (see mitigation measures 1 and 2, below). Updated preconstruction raptor surveys, creation of No Surface Occupancy (NSO) buffers around nests, and enforcement of timing restrictions near active nests will prevent substantive direct or indirect effects to this species should a breeding pair occupy the project area. Proposed wells 34-22 and 34-44 occur near pinyon-juniper woodland with highest potential for accipiter nesting (roughly five acres total) and all wells but the 2-21, 2-32, 2-43, and 2-44 have potential to disrupt nearby nest efforts. Approximately 0.8 acres of potential habitat would be lost at location 34-22 due to pad and access road construction. The disturbed area lies on the edge of potential habitat and could have a detectable effect on future occupation of the area by northern goshawk. Noise from operation of the wells and attendant human activity could alter the function and utility of potential woodland habitat in the project area for goshawks.

Brewer's sparrows breeding in the sagebrush and mixed shrublands in the project area are likely to be affected by the Proposed Action. Long-term loss of approximately 29.7 acres of sagebrush suitable for breeding by Brewer's sparrow would occur, divided between 21 acres of sagebrush with scattered junipers near proposed wells 2-21 and 2-32, and 8.7 acres of scattered mixed sagebrush shrublands near wells 2-33, 2-41, 2-43, 2-44, 14-22, 14-24, and 34-44. Locations 2-21, 2-32, 2-33, 2-41, 2-43, and 14-22 are adjacent to the main service road. Since breeding bird

habitat within 328 feet (100 meters) of roads is expected to support approximately one-half nest density (Ingelfinger and Anderson 2004), the sagebrush associated with these locations very likely currently supports fewer breeding pairs than it would if it were more isolated. According to one publication, territory size of Brewer's sparrow varies between regions, but is typically 1.2 to five acres (Walker 2004). Estimating an average local territory size of three acres in sagebrush cleared for roads, pipelines, and pads at proposed wells 2-21 and 2-32, and perhaps six acres in the other patches of mixed sagebrush shrublands, long-term reductions in nest habitat due to facility occupation or shrubland modification would involve habitat capable of supporting about a half dozen territories.

Brewer's sparrows breed from May through early August in the project area – a timeframe largely coincident with well development schedules. Indirect effects to Brewer's sparrows mediated by noise and human disturbance during sequential construction and operation of the proposed facilities are expected, although the consequence of disturbance on nest fates would be contingent on proximity and nest phenology. Overall, up to 72 additional acres of breeding habitat would be subject to single-year disturbance levels capable of disrupting ongoing nest attempts (those nest efforts coinciding with well/pad development). Nest densities in that affected habitat would likely remain somewhat diminished from pre-disturbance levels during the productive life of the wells.

The likelihood of the project site supporting an isolated population of Great Basin spadefoot is considered remote. Nonetheless, if Great Basin spadefoot do occur in the project area, they may be affected by the Proposed Action. Potential habitat for the species occurs within 3,281 feet (1,000 meters) of Fletcher Gulch, a perennial tributary to Fletcher Gulch, and two stock ponds. The construction of the pad and access road for 14-24 would result in the loss of roughly 3.2 acres of highest potential upland habitat for Great basin spadefoot. This amounts to approximately four percent of available habitat in the project site. After successful interim and pipeline reclamation, some of this habitat would be regained, for a total long-term loss of approximately one acre (two percent) of potential habitat. In addition to habitat loss, construction may result in the entombment and death of spadefoot burrowed in graded areas, and vehicular traffic may result in additional spadefoot mortality should the species occur in the project area. After interim reclamation, exposure of spadefoot to vehicle collisions on the pads and access roads would continue at a reduced level for the life of the well. Long-term, after successful final reclamation, the proposed 14-24 and its access road would not be expected to pose barriers to spadefoot movements in the area. Considering that the project area has no past indication of occupation by this species and is at the upper extreme of elevation for spadefoot, and that long term habitat loss attributable to the project would be minor in extent, it is unlikely that this project would have any discernible influence on the viability or distribution of local spadefoot populations.

The proposed locations and access/pipeline corridors associated with this project do not involve habitat suited for midget faded rattlesnake den sites (e.g., inappropriate aspect and lack of rock substrate at upper elevation limit) although widely dispersed male and non-reproductive female snakes could occur in any area within 1.25 miles of a den from June through September.

It is unlikely that the Proposed Action would have a measurable effect on 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.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Threatened, Endangered and Sensitive Animal Species was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: Cumulative effects would be similar to those discussed in the *Migratory Bird* and *Terrestrial Wildlife* sections of this EA.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct or indirect impacts to special status animal species under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances that would potentially impact special status animal species or important habitats under the No Action Alternative.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Threatened, Endangered and Sensitive Animal Species was reviewed. With the following exceptions, all apply:
   - Applicant Committed Measure number one does not reflect the need for a current raptor survey prior to construction and has been replaced by Special Status Animal Species mitigation number two below, therefore Genesis must not follow this ACM.
   - Applicant Committed Measure number two does not reflect current No Surface Occupancy and Timing Limitation Restrictions for Raptors for the BLM WRFO and has been replaced by Special Status Animal Species mitigation number three below, therefore Genesis must not follow this ACM.
2) 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 one to August 15 in woodland habitats and February one to August 15 in cliff habitats) in which they are conducted and the following breeding season.
3) Pending results of the raptor 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). Well and road/pipeline locations would be subject to NSO restrictions if a nest is identified within the NSO buffer. These stipulations will remain in effect over the life of the project, although the timing limitation provisions are contingent on occupancy status. Table 18 outlines the appropriate NSO and timing limitation

restrictions related to nesting raptors that shall be in effect during the life of the project. Exceptions or 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 (BLM 1997).

Table 18. No Surface Occupancy and Timing Limitation Restrictions for 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
Great Horned Owl	1/8 mi of nests	1/4 mi of nests	2/1 - 8/15 or until dispersal of young
Golden Eagle	1/4 mi of nests	1/2 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.

Finding on the Public Land Health Standard #4 for Special Status Species: As conditioned by the mitigation measures and COAs, the Proposed Action would not be likely to have a detectable effect on federally or state-protected animal species. The Proposed Action would reduce habitat of varying quality available for the BLM-sensitive Brewer's sparrow by about 19 acres and may disrupt as many as 25 to 30 nesting attempts during the initial construction year, but breeding bird density in the surrounding affected habitat is expected to be largely regained thereafter. These impacts are not expected to effectively influence the viability or distribution of local Brewer's sparrow populations. The Public Land Health Standard for Special Status Species would therefore continue to be met.

SPECIAL STATUS PLANT SPECIES

Affected Environment: Federally Protected Plant Species: Following the guidelines of the ESA, a list of federally threatened, endangered, proposed, and candidate plant species having the potential to occur in Rio Blanco County was obtained from the FWS (FWS 2012a). According to the FWS county list, there are two federally threatened, one proposed threatened, and one candidate species that have the potential to occur in the county. Threatened and proposed species are legally protected under the ESA; candidate species are protected by BLM policy (BLM 1997; 2008b). Table 19 provides information on these four species, their habitat, and the potential for each to occur in the area of the Proposed Action. Based upon the information summarized in

Table 19, spatial data on rare plant distributions available from the BLM, and the results of the 2010 rare plant survey for the Proposed Action (BIO-Logic 2010b); the only federally listed species found in the project area is the Dudley Bluffs twinpod (*Physaria obcordata*).

Table 19. Federally and State Listed 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 *(Physaria congesta)*	T	Barren, white shale outcrops of the Green River Formation, sometimes with Uinta Formation soils overlying the shale (6,000-6,700 feet).	Green River shale badlands occur in the project area, but on slopes that are severe and uncharacteristic for the species. The area is outside the known range of the species.
Dudley Bluffs twinpod *(Physaria obcordata)*	T	Barren white shale outcrops and steep slopes of the Parachute Creek member of the Green River Formation (5,900-7,500 feet).	Known to occur in the vicinity of proposed project activities.
Graham's beardtongue *(Penstemon grahamii)*	P	Semi-barren knolls, ridges, steep slopes on white shale mixed with silty clay soils of the Parachute Creek and Evacuation members of the Green River Formation (4,690-6,760 feet).	Known only from the far western end of Rio Blanco County.
White River beardtongue *(Penstemon scariosus* var. *albifluvis)*	C	Desert shrub and pinyon-juniper habitats, on sparsely vegetated shale slopes of the Green River Formation (5,000-7,200 feet).	Known only from the far western end of Rio Blanco County.

[1] T = threatened, P = proposed, C = candidate

BLM Sensitive Plant Species: The eight Colorado BLM sensitive plant species with potential to occur in the WRFO resource area (BLM 2009) are considered in this EA. BLM sensitive species are protected by BLM policy rather than statute (BLM 1997; 2008b). Table 20 lists these species, their habitat requirements, and a determination of their potential to occur within the proposed project area. Based upon the information summarized in Table 20, spatial data on rare plant distributions available from the BLM, and the results of the 2008-2010 rare plant surveys in the Genesis field (BIO-Logic 2008a, 2008b, 2009, 2010b), two of the eight species occur in the project area: Piceance bladderpod (*Physaria parviflora*) and debris milkvetch (*Astragalus detritalis*).

Table 20. BLM Sensitive Plant Species with Potential to Occur on WRFO BLM lands

Species	Habitat Description	Potential to Occur in the Proposed Project Area
Narrow-stem gilia *(Aliciella stenothyrsa)*	Grassland, sagebrush, mountain mahogany or pinyon-juniper; silty to gravelly loam soils of the Green River or Uinta Formations (5,000-6,000 feet).	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.
Debris milkvetch *(Astragalus detritalis)*	Alluvial terraces with cobbles in pinyon-juniper and mixed desert shrub habitats (5,400-7,200 feet).	Occupied habitat is present in the project area.
Duchesne milkvetch *(Astragalus duchesnensis)*	Pinyon-juniper woodlands and desert shrub communities, around sandstone or shale outcrops (4,600-6,400 feet).	Suitable habitat is present in the project area, but at higher elevations than typical; the species is currently known from far western Rio Blanco County.
Tufted cryptantha *(Cryptantha caespitosa)*	Sparsely vegetated shale knolls in pinyon -juniper or sagebrush (6,200-8,100 feet).	Known only from the Colorado-Utah border.
Rollins' cryptantha *(Cryptantha rollinsii)*	White shale slopes in pinyon-juniper or shrubland habitats of the Green River Formation (5,300-5,800 feet).	Some potential to occur in the project area. In Colorado, this species is currently known primarily from the far western edge of Rio Blanco County, although it also occurs several miles southeast of the project area.
Ephedra buckwheat *(Eriogonum ephedroides)*	Shale and clay flats or slopes in saltbush, sage, and pinyon-juniper habitats (4,900-6,900 feet).	Known from the far western edge of Rio Blanco County.
Cathedral Bluff dwarf gentian *(Gentianella tortuosa)*	Barren shale knolls and slopes of the Green River Formation (8,500-10,800 feet).	Known from Cathedral Bluffs. Elevation in the project area too low (~ 6,600-7,160 feet).
Piceance bladderpod *(Physaria parviflora)*	Shale outcrops of the Green River Formation (6,200-8,600 feet).	Occupied habitat is present in the general project area, but outside the 100-m survey buffer for BLM sensitive species.
Flaming Gorge evening primrose *(Oenothera acutissima)*	Seasonally wet areas with sandy, gravelly, and rocky soils (5,300-8,500 feet).	No seasonally wet habitats occur in the project area or immediate vicinity.
Colorado feverfew *(Parthenium ligulatum)*	Barren shale knolls (5,400-6,500 feet).	Known from the far western edge of Rio Blanco County.
Graham's beardtongue *(Penstemon grahamii)*	Sparsely vegetated desert shrub and pinyon-juniper communities on talus slopes and knolls of Green River Formation shales (5,800-6,000 feet).	Known from the far western edge of Rio Blanco County.

Species	Habitat Description	Potential to Occur in the Proposed Project Area
White River beardtongue *(Penstemon scariosus* var. *albifluvis)*	Desert shrub and pinyon-juniper habitats, on sparsely vegetated shale slopes of the Green River Formation (5,000-7,200 feet).	Green River shale badlands occur in the vicinity of the project. Known only from the far western edge of Rio Blanco County.
Cathedral Bluff meadow-rue *(Thalictrum heliophilum)*	Sparsely vegetated, steep shale talus slopes of the Green River Formation (6,300-8,800 feet).	Project outside the current known range of the species.

2010 Rare Plant Survey:

Methods: Under the direction of BLM WRFO botanists Marston and Schulte, a rare plant survey was conducted in May and June 2010 to WRFO standards (BIO-Logic 2010b). The listed and sensitive plant species noted above as having the potential to occur in the project area were the focus of the survey. However, a floristic approach was taken to the survey to avert the possibility of missing other rare species that occur in the area but were not expected to be found. Federally listed species were surveyed for in potential habitat found within 1,969 feet (600 meters) of the limits of proposed disturbance for pads and roads. BLM sensitive species were surveyed for in potential habitat found within 328 feet (100 meters) of the limits of proposed disturbance. Both occupied habitat and suitable but unoccupied habitat for the two special status species encountered in the survey area were mapped with a GPS unit. A more detailed account of the survey method and results is presented in the *Rare Plant and Noxious Weed Survey Report* (BIO-Logic 2010b).

Results: Four new occurrences of the federally threatened Dudley Bluffs twinpod were found within the survey area, and the known occurrences of debris milkvetch in the project area were expanded. The known extent of occupied and suitable twinpod and milkvetch habitat in the project area are presented in Appendix A, Figures 7-8 and summarized below. An occurrence of Piceance bladderpod was found outside the survey limit for BLM sensitive species.

The four Dudley Bluffs twinpod occurrences (A-D) occur on very steep shale badlands (45 to 70 percent slopes) on finger ridges extending southwest from Calamity Ridge (Appendix A, Figure 7). One is entirely on split estate in Section 14, one is on fee land in Section 14, and the other two are partially on split estate, extending onto public lands in Sections 13 and 24. The occurrences span a total of 28 acres, with an estimated 3,600 individuals. Suitable habitat totaling 15 acres is associated with Occurrences A-C. Two previously known twinpod occurrences are found along RBC 122, approximately 1,300 meters southwest of the intersection of the main service road and the proposed access road to well 14-24.

The known debris milkvetch occurrences in the project area were substantially enlarged (Appendix A, Figure 8a-b). The expansions were largely into pinyon-juniper woodland with black sagebrush and dwarf rabbitbrush in the understory. In some areas, occurrences were expanded into mountain shrubland with rock outcrops providing openings for milkvetch. In 2009, the Yanks Gulch Watershed, Ridge, and County Road 122 occurrences of debris milkvetch were defined in the project area (BIO-Logic 2009). During the current survey, the Yanks Gulch

Watershed Occurrence was extended north across Yanks Gulch, and the Ridge occurrence was expanded east and south. The Ridge occurrence now extends into the Yanks Gulch Watershed. The 2010 survey increased the amount of known occupied milkvetch habitat in the area from 57 to 261.5 acres. The increase in population size is estimated to be from 12,000 in 2009 to 40,000+ individuals in 2010. Several of the occurrences are known to extend outside the survey limits required for the Proposed Action (BIO-Logic 2010b).

Environmental Consequences of the Proposed Action: Direct and Indirect Effects: Table 21 shows the extent of proposed disturbance that would occur inside and near occupied special status plant species habitat.

Table 21 – Proximity of Proposed Wells and Access Roads to Occupied Dudley Bluffs Twinpod and Debris Milkvetch Habitat

Inside Milkvetch Habitat	**Area (ac) of Habitat Impacted**	
Well Location	***Pad***	***Road***
2-11	0.6	3.0
2-21	--	0.02 (turnout only) (1,006 square feet)
2-41	0.01 (436 square feet)	0.01 (turnout) (436 square feet)
2-43	1.6	0.04 (turnout and road) (1,742 square feet)
34-44	--	2.1
Total area	**2.2**	**5.2**
Within 328 ft (100 m) of Milkvetch Habitat	**Distance to Habitat[1]**	
Well Location	***Pad***	***Road***
2-21	39 feet (12 meters) to occurrence to the NE	--
2-32	236 feet (72 meters) to occurrence to the NE	--
2-33	144 feet (44 meters) to occurrence to the SW	--
2-44	--	14 feet (4 meters) to occurrence to the W
Within 1,969 ft (600 m) of Twinpod Habitat	**Distance to Habitat[1]**	
Well Location	***Pad***	***Road***
14-24	1,631 feet (497 meters) Occurrence B 1,923 feet (586 meters) to Occurrence C 1,283 feet (391 meters) to Occurrence D	1,778 feet (542 meters) to Occurrence B 1,417 feet (432 meters) to Occurrence C 1,635 feet (498 meters) to Occurrence D

[1] Refers to the shortest distance between the maximum limits of disturbance from well pads or roads and occupied rare plant habitat, up to 328 feet (100 meters) for debris milkvetch and 1,969 feet (600 meters) for twinpod. All distances are approximate, based upon GIS analysis. Disturbance area for roads is estimated as length x 50-foot ROW.

Dudley Bluffs Twinpod

The Proposed Action would have no direct effects to occupied or suitable habitat for the federally listed Dudley Bluffs twinpod. As indicated in Table 21 and Appendix A, Figure 7,

disturbance from proposed well 14-24 and its access road would come to within 600 meters of occupied habitat. The maximum limits of disturbance at pad 14-24 would extend to within 1,283 feet (391 meters) of Occurrence D. From the pad, this occurrence is north across a drainage and upvalley and upslope, only partially visible around a knob on the steep valley side. Disturbance from the pad would come to within 1,631 feet (497 meters) of Occurrence B, which is on the other side of a steep ridge from the pad, and 1,923 feet (586 meters) of Occurrence C, which is around the tip of a finger ridge from the pad. The access road to 14-24 would come to within 1,417 feet (432 meters) of occupied habitat. A well (13-41) that would have been less than 100 meters from Occurrences A and B was withdrawn from consideration. Based on an action area analysis using draft *Guidance for Section 7 Consultations that Include Plants within the State of Colorado* (FWS 2012b), the proposed 14-24 well will have No Effect on Dudley Bluffs twinpod and Section 7 consultation will not be required.

Although Section 7 consultation is not required, indirect effects to twinpod from the Proposed Action may occur. Potential indirect effects may result from the introduction of noxious weeds, increased human presence, effects from fugitive dust, or effects to pollinators. As described above under *Invasive, Non-native Species*, weeds may invade disturbed ground near proposed well pads and access roads; and vehicles and large equipment traveling on access roads and pads can spread weed propagules. Cheatgrass is already common on the lower slopes of the documented twinpod occurrences. It is unlikely that proposed development would increase density of this species in twinpod occurrences above its current levels given that no disturbance within occupied habitat is proposed. However, the introduction of new weed species to the area cannot be precluded. Implementation of the mitigation measures and adherence to the COAs will help minimize the spread of invasives near the twinpod occurrences.

From the standpoint of access from the Proposed Action area, the four twinpod occurrences are effectively screened from the public by their location fully or partially on private surface (see Appendix A, Map 7). Proposed access to 14-24 would follow a little used existing two-track for almost half its length. The two-track starts on public land before passing onto private surface. Little public use of the road is expected given that it does not provide access onto a large expanse of public land. The private landowner may use the improved two-track to facilitate access to the northeast during the hunting season. Improvement of the two-track may therefore cause some increased human presence near occupied twinpod habitat. Although hunters are very unlikely to venture up the steep slopes on which twinpod is found, potential impacts from foot traffic through the occurrences cannot be fully discounted. Foot or off-road vehicle traffic near the twinpod occurrences may promote the spread of invasive exotics into occupied habitat.

Fugitive dust from earth moving, traffic on unpaved access roads, or unvegetated soils may be deposited inside occupied habitat. The effects of fugitive dust on plant species have been documented, primarily in the arctic or heath communities. Near-source redeposition of dust has been found to alter soil chemistry, triggering changes in plant community composition (Walker and Everett 1987; Auerbach et al. 1997; Brown 2009). Accumulation of dust on plant surfaces may interfere with gas exchange by clogging stomata (Hirano 1995), reduce photosynthetic rate (Farmer 1993; Vardaka et al. 1995; Rasoul Sharif et al. 1997; but see Wijayratne et al. 2009), or decrease fruit production (Alexandrakis and Neuenschwander 1979; McCrea 1984). No data currently exists that demonstrate effects of fugitive dust on Dudley Bluffs twinpod.

As described in the section on *Air Quality*, moderate levels of dust are expected to be generated during construction given the predicted amount of vehicular traffic and heavy equipment use. Any effects from dust during construction would be short-term, although deleterious effects during even one reproductive season could affect population trends for some time. During operation, vehicular traffic would be low at 14-24, especially given that the well is just under 0.5 miles up a spur road that services just one pad on private surface. Dust levels have been shown to fall off sharply with distance from the source (Everett 1980), making it unlikely that significant dust would accumulate on Dudley Bluffs twinpod plants found closest (1,417 feet [432 meters]) to that road. Short-term increases in fugitive dust would be expected during construction, but with the application of the mitigation measures and adherence to the COAs, typical dust levels would be kept low. Given the low volumes of dust expected during operation and the distance between proposed disturbance and the four twinpod occurrences, fugitive dust is unlikely to have long-term effects on Dudley Bluffs twinpod in the area.

Twinpod depends on pollinators to reproduce (Tepedino 2009). The Proposed Action is unlikely to affect pollinator service of Dudley Bluffs twinpod given the lightly developed nature of the project area and the generalist suite of early season pollinators known to service this species (Tepedino 2009). Twinpod pollinators are largely ground-nesting native bees, but nesting habitat remains unknown (Tepedino 2009). It is possible that surface disturbance associated with the Proposed Action could cause loss of pollinator nesting habitat, but given the lightly developed nature of the area, any effect on pollinator populations or service to twinpod would be unexpected. The distance between the documented occurrences and proposed disturbance make it unlikely that the project would affect pollinator movements within and between occurrences.

The documented occurrences of Dudley Bluffs twinpod in the project area are located on the western edge of potential habitat for the species (Decker et al. 2006). This and the fact that disturbance would not occur inside or very near occupied or suitable habitat make it unlikely that the Proposed Action would contribute to twinpod habitat fragmentation. There are no expected impacts associated with the Proposed Action on nearby twinpod populations.

Debris Milkvetch

Three of the 13 proposed well locations (2-11, 2-41, 2-43) and 5 of the access roads (2-11, 2-21, 2-41, 2-43, 34-44) would fall fully or partially within occupied debris milkvetch habitat (Appendix A, Figures 8a-b). The turnouts for pads 2-21 and 2-43 would be located in occupied debris milkvetch habitat, and the turnout for pad 2-41 would be half inside occupied and half inside suitable habitat. Approximately 7.4 acres of occupied habitat and 0.7 acres of suitable habitat would be disturbed by the Proposed Action. The disturbance at pads 2-11 and 2-41 would be on the edge of occupied habitat. At 2-43, the pad and access would disturb the southwest quadrant of an 8.5-acre area of occupied habitat. The road to 2-11 and Yanks Gulch and the spur access to 34-44 would pass through the Yanks Gulch Watershed occurrence of debris milkvetch, which is the largest patch of continuously occupied milkvetch habitat in the Genesis field. The road to 2-11 and Yanks Gulch would widen a little-used existing two-track that passes 3,168 feet through occupied habitat. The spur access to 34-44 would be new, passing 1,771 feet through occupied habitat.

Within occupied habitat that would be disturbed by the project, approximately 2,100 individuals of debris milkvetch would be lost, or 5.3 percent of all known individuals in the Genesis field. This estimate was arrived at by counting plants inside the Yanks Gulch road 50-foot ROW in 2009 and then using the average milkvetch density in the project area for the other areas of disturbance inside milkvetch habitat. There is an unusually high density of plants in several patches along the existing two-track down to Yanks Gulch. The average milkvetch density across the known occupied habitat in the Genesis field is 153 milkvetch individuals per acre (40,000 individuals/261.5 acres [BIO-Logic 2010b]).

Debris milkvetch has been observed recolonizing reclaimed areas along roads and pipelines in the Genesis field, with mature reproductive plants establishing within two years of disturbance. This indicates that the species has a certain amount of resilience in the face of direct impacts from surface disturbance, possibly due to its ability to fix nitrogen. After interim reclamation, approximately 6 of the 7.4 acres of disturbed occupied habitat would be available for potential recolonization by debris milkvetch. Recolonization of well sites very likely would not occur as readily as recolonization along roads and pipelines given the compacted soils found on pads and the potential for soil contamination from produced water and drilling fluids. Reclaimed areas on pads may not regain suitable habitat characteristics for debris milkvetch for some time, if ever. Based on the original well locations proposed by Genesis, six of the seven wells in Section 2 would have been located inside debris milkvetch habitat. Following coordination with the WRFO, the well locations were shifted to reduce direct impacts to the species. Occupied habitat for debris milkvetch in Section 2 is contiguous with Wyoming big sagebrush-dominated shrublands that are occupied by the BLM Sensitive Brewer's sparrow. Final proposed locations for the wells and new roads in Sections 2 and 34 balanced the needs of these two BLM Sensitive species, and considered topography and cultural resources.

Potential indirect effects to debris milkvetch from the Proposed Action may occur due to: (1) habitat fragmentation; (2) habitat degradation from invasion by noxious weeds, an increase in recreational use of the area following the increase in road density, and grading-induced changes to drainage patterns; and (3) fugitive dust. Fragmentation can have a number of deleterious effects on plant populations. Those potentially relevant to debris milkvetch include restriction of gene flow and an increase in habitat edge. Fragmentation and road traffic have the potential to restrict gene flow in the form of pollen transfer and/or seed dispersal by altering insect movement patterns (Bhattacharya et al. 2003; Aguilar et al. 2006). The pollination and seed dispersal mechanisms of debris milkvetch remain unknown, making it difficult to assess the effects of fragmentation on gene flow. Should changes in gene flow occur following increased fragmentation, they may affect genetic diversity in milkvetch (Honnay and Jacquemyn 2007). The breeding system of debris milkvetch is not known beyond the fact that flowers are hermaphroditic, making it difficult to predict the effect of any restriction in gene flow on reproductive effort, population genetic diversity, or population viability.

The increase in edge habitat following the fragmentation of the Yanks Gulch Watershed occurrence has the potential to expose debris milkvetch to increases in disturbance from trampling and invasion by non-native plant species. Occupied debris milkvetch habitat throughout the project area will receive increased long-term exposure to invasive exotics as a result of the Proposed Action due to the increase in human activity attending field expansion.

The relationship between ground disturbance and the spread of invasive weeds is addressed in the section on *Invasive, Non-native Species*. Five CDA List B noxious weed species were found inside the survey area. Although only tamarisk occurred within the limits of proposed disturbance and this species would not invade debris milkvetch habitat, other weed species found in the general vicinity, particularly along RBC 122, have the potential to be transported into milkvetch habitat on vehicles and heavy equipment, or by natural processes. Cheatgrass does occur within the limits of proposed disturbance and could invade milkvetch habitat along lines of disturbance. Observation of debris milkvetch in the project area indicates that it does not grow in grassy areas or other areas with a dense herbaceous layer, making invasion of occupied habitat by cheatgrass a relevant threat. By implementing the weed monitoring and management actions outlined in the mitigation measures (see mitigation measures for *Vegetation* and *Invasive, Non-native Species*) and COAs, Genesis would moderate the encroachment of weed species into debris milkvetch occurrences. After successful reclamation, the threat would remain moderate and long-term.

Grading during the construction of the proposed pads and access roads has the potential to alter drainage patterns and direct surface flows into occupied or suitable milkvetch habitat. Any change in drainage patterns may alter habitat function and suitability for the species. Increased susceptibility of soils to erosion following clearing and grading may also negatively affect habitat suitability. These effects are expected to be of moderate or even high intensity in localized areas. Implementation of mitigation measures (see mitigation measures for *Soil Resources* and *Surface and Ground Water Quality*) and adherence to the COAs are expected to minimize changes to drainage patterns in milkvetch habitat and to correct those that do occur. The recontouring of disturbed surface to near original grade during final reclamation will help return natural drainage patterns to the project area after gas production has ceased.

The occurrence of fugitive dust in the project area during construction and operation and possible consequences for rare plant species is addressed above for the Dudley Bluffs twinpod. Debris milkvetch occupied habitat occurs directly adjacent to proposed disturbance. Fugitive dust will be deposited on occupied milkvetch habitat, but in unknown amounts and with unknown effects. In the project area, debris milkvetch is currently found growing adjacent to roads used by Genesis for the operation of existing wells, and has been found colonizing disturbed areas adjacent to roads. This observation provides some indication that this species can tolerate the levels of dust currently found in the Genesis field. Long-term studies addressing population growth rates in milkvetch occurrences near versus far from dust sources would be required to assess the potential for impacts from fugitive dust to this species.

Concentrating disturbance from well sites on the edge of milkvetch habitat should minimize the extent and severity of indirect effects at those locations. Two of the three well sites in occupied habitat are positioned alongside the main service road in areas that already receive disturbance from field traffic. Indirect effects are likely to be more pronounced along the road to Yanks Gulch and the spur access to well 34-44, where 4,939 feet of new linear disturbance would occur inside the Yanks Gulch Watershed occurrence of debris milkvetch.

Debris Milkvetch Regional Population Status: The known distribution of debris milkvetch is confined to two counties in Colorado (Rio Blanco and Moffat) and two counties in Utah (Uintah and Duchesne). Based upon occurrence data collected from 2008-2010 for environmental

clearance in the Genesis field (BIO-Logic 2008a, 2008b, 2009, 2010b) and the BLM WRFO database, the center of distribution for debris milkvetch in Colorado is in the contiguous Calamity Ridge and Divide Creek USGS quadrangles. All debris milkvetch occurrences known from the Calamity Ridge quadrangle were documented during environmental clearance in the Genesis field. Some of the documented occurrences are known to extend outside the survey limits, as noted in the survey reports cited above. In addition to the individuals documented during clearance surveys, undocumented debris milkvetch have been observed in the Genesis pilot project area. This species was not surveyed for during clearance for the 12 pilot wells (Ecosphere 2006). The extent of the occurrence in that area is unknown.

The WRFO rare plant database includes 44 occurrences of debris milkvetch outside the Genesis field but inside the resource area. Of those, 34 are polygon locations totaling 126 acres and dating from 1982 to 2006. Count data are associated with 8 of the polygons, providing a range from 1 to 500 individuals, for a total of 1,581 individuals. An average of 20 individuals/acre occurs across the 78.5 acres in those eight polygons. In addition to the polygon data, there are 10 point features for occurrences last observed in 1979 or 1982. No population size or acreage estimates are associated with those points. Peggy Lyon of the Colorado Natural Heritage Program (CNHP) revisited more than one of the debris milkvetch occurrences in CNHP's database, and was unable to relocate the species, so the reliability of some of the existing data is in doubt (Lyon 2010, pers. comm.).

Using an average density of 20 individuals/acre across the 126 acres of occupied milkvetch habitat outside the Genesis field, it is possible to make an estimate of 2,400 milkvetch individuals outside the Calamity Ridge quadrangle. Combining this figure with the estimated 40,000 plus individuals currently known in the Calamity Ridge quadrangle, approximately 42,400 milkvetch individuals have been documented to occur over 387.5 acres in Colorado, based upon data collected between 1979 and 2010. Without additional focused surveys for the species, it is difficult to evaluate how well the current known distribution reflects the species' true distribution.

The species occurs in an extremely common vegetation community (pinyon-juniper woodland), but the soil type on which it primarily occurs in the Genesis field, Bulkley channery silty clay loam 5 to 30 percent slopes (SMU 13) is, at least within the WRFO resource area, fairly confined to the field and an area south of the field. Outlying patches of it occur further south within Rio Blanco County, bringing the total acreage in Rio Blanco County to 7,851 acres. A portion of the population in the Genesis field also occurs on Abor Clay Loam 5 to 30 percent slopes (SMU 1). This soil type is more common than SMU 13, totaling 12,634 acres in Rio Blanco County, but its center of distribution in and south of the Genesis field appears to be similar to that of SMU 13, except that outlying patches are more common, especially to the east. The debris milkvetch occurrences in the WRFO plant database that are found outside the Genesis field appear to be located on SMUs other than 1 and 13. Verification of those occurrences and an analysis of their soil types would be required to determine how closely confined the species is to restricted soil types.

Current and historic impacts to documented occurrences of debris milkvetch outside the Genesis field are unknown. Inside the Genesis field, impacts may have occurred during construction of

the pilot project, but this is not known for certain. Approved wells 9-34 and 3-44 were moved by Genesis to avoid all direct impacts to debris milkvetch, and a pad (3-24) that had been proposed south of the compressor station was permanently withdrawn from consideration to avoid bisecting an occurrence of the species. The impacts from the current proposed project would be the first documented impacts to the species from field development.

To summarize, three of 13 proposed well locations and five of the access roads are located in or near occurrences of the BLM Sensitive debris milkvetch. In consultation with the BLM Ecologist, Genesis has moved some project components to minimize loss and fragmentation of milkvetch habitat and provide a buffer between disturbance and milkvetch individuals. While 2,100 individuals will be removed for the project, mitigation efforts to reseed the species in reclamation may offset the loss. Indirect effects from loss of potential habitat, fragmentation of occupied habitat, and habitat degradation from the invasion of weedy species may occur. The projected overall impact is considered to be less than significant. Effects would be low and long-term and would not threaten the viability of local populations of this species or the species as a whole.

Genesis Applicant Committed Measures Appendix C of this document (DOI-BLM-CO-110-2012-0041-EA), Threatened, Endangered and Sensitive Plant Species was reviewed for conformance with BLM WRFO Standard COAs. All ACMs as proposed in Appendix C apply.

Cumulative Effects: Sources of impacts to special status plant species in the area of analysis include oil and gas exploration and development, livestock grazing and associated range improvements, wild horse grazing, wildfires, recreation, and application of herbicides in the context of gas field maintenance and rangeland management. There is potential that the Genesis pilot project, compressor station, and distribution line resulted in impacts of an unknown magnitude to debris milkvetch, but this remains unknown. Subsequently approved development in the Genesis field was planned to avoid direct effects to special status plant species. The Proposed Action will result in the first documented effects to debris milkvetch in the Fletcher Gulch Watershed. No direct effects to Dudley Bluffs twinpod occurrences have been documented in the Fletcher Gulch Watershed. The Proposed Action is not expected to contribute any new direct effects to this species; any indirect effects are not expected to be measurable.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no action authorized that would influence special status plant species in the area of analysis.

Cumulative Effects: There would be no additional contribution to previous, existing, or foreseeable future effects to special status plant species in the area of analysis.

Mitigation: The following mitigation measures are required:

1) General access to well locations (wells 2-11, 2-21, 34-44, 2-41, 2-43) and five of the access roads (wells 2-11, 2-21, 2-41, 2-43, 34-44) shall be restricted by means of a lockable gate (may require fence wings) to protect future disturbance to the affected debris milkvetch populations. The independent third party oversight contractor will help place the gates to

avoid further impacts and to ensure the placement of the gates will provide the most protection of the species. Also, when possible gates should be placed as close as possible to the intersection of the main service road and the spur access leading to the wells. The gates will be required to effectively deter (including preventing bypass) vehicle use unrelated to Genesis well operations throughout the year. Final location of gates must be approved by the BLM prior to installation.

a. Additionally, permanent fences must be installed around the well pads and the length of the access roads, blocking all human access (foot and motorized) where gates are not appropriate. "Sensitive Area" signs must be place along fences to deter public access. The third party oversight contractor will help place the fence to avoid further impacts and to ensure the placement of the fence will provide the most protection of the species. BLM must approve the final location and design of gates and fence used.

2) Weed management shall follow measures provided in the *Invasive, Non-native Species* section:

a. All sites shall be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the BLM.

b. All herbicide use must comply with buffers found in DOI-BLM-CO-110-2010-0005-EA. If buffers will not be met then consultation with FWS within 600 m of the twinpod habitat is required.

c. Invasive species found in and near debris milkvetch populations must be manually controlled. Surrounding areas must be spotted treated with backpack sprayers. BLM must approve all herbicides used within 300 m of debris milkvetch populations.

d. Herbicide applicator personnel must be trained in the identification of debris milkvetch.

3) Construction and drilling of pads (wells 2-11, 2-21, 34-44, 2-41, 2-43, 14-24) and access roads (2-11, 2-21, 2-41, 2-43, 34-44) must occur outside the growing season of twinpod and debris milkvetch or not between April 1st – July 1st.

4) All disturbed areas for well 14-24 shall be promptly seeded with Native or Standard Seed Mix 1 (see Table 22 below). Therefore it is recommended that all sites be seeded between September 1 and March 31. If an alternate date of seeding is requested, contact the designated NRS or Realty Specialist prior to seeding for approval. Seed mixture rates are PLS pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 22. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites 14-24

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
1	Rimrock	Indian ricegrass	*Achnatherum hymenoides*	3
	Critana	Thickspike wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*	3
	Toe Jam Creek	Bottlebrush squirreltail	*Elymus elymoides*	3.5
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5
		Sulphur flower buckwheat	*Eriogonum umbellatum*	1.5
		Winterfat	*Krascheninnikovia lanata*	1
		Rocky Mountain beeplant	*Cleome serrulata*	2
		Annual sunflower	*Helianthus annuus*	2
		Mat saltbush	*Atriplex corrugata*	2
		Rayless tansyaster	*Machaeranthera grindelioides*	0.25

5) Seed from individual debris milkvetch plants should be collected prior to construction/plant removal. The seed can be preserved by a botanical preservation organization (such as the Denver Botanical Gardens). The seed must also be grown out at the Upper Colorado Environmental Plant Center to be used in the reclamation in all areas where plants were removed. A third party botany consultant and the BLM ecologist should be consulted throughout this process.

6) If construction of the Proposed Action will not be completed before May 2013, areas within 100 meters of the edge of all disturbances must be re-surveyed for special status plant species, as the current plant surveys will expire. The new survey must be completed the growing season before construction is planned. If new populations are found or existing populations have expanded since previous surveys, additional NEPA or mitigation may be required. The results of this survey must be reviewed and approved by the BLM Ecologist prior to construction. All plant surveys expire after three years and all project construction (e.g. vegetation clearing, road, well pad, and pipeline construction, etc.) requires current surveys.

7) To ensure all construction activities (including but not limited to: well pad construction, access road construction, and pipeline construction and installation) stay within the boundaries of the permit and are within the requirements of the COAs; third party oversight by a qualified botanist will be required during development of the following wells: well locations (wells 2-11, 2-21, 34-44, 2-41, 2-43, 14-24) and five of the access roads (wells 2-11, 2-21, 2-41, 2-43, 34-44) to reduce impacts to debris milkvetch. Additionally, the botanist will provide oversight of the construction of the 2-32, 2-33, 2-44, 14-11, 14-22, 34-22 and 34-33. Third party oversight contractor must be approved by the BLM WRFO, and must have a MOU and Financial Disclosure Statement with the operator. Within 30 days of completion of construction activities the third party contractor must submit a monitoring report to the BLM WRFO with the details of the construction.

a. Construction fences must be used around the permitted construction area of well pads, pipelines, and access roads so that workers and the public will avoid the sensitive area. These fences must be removed after construction is completed. These fences will be placed under the direction of the third party oversight contractor.
b. The third party oversight contractor will also advise placement of fences and gates to protect the debris milkvetch populations (see above mitigation measure 2).

8) Where debris milkvetch is removed, the soil layers must be stored separately and replaced in the proper order: last out, first in. The third party oversight monitor should include observations of this COA in their report for confirmation.

9) Pipelines must be put in the access roadways where debris milkvetch is present to avoid more disturbances to the species. Areas include wells 2-11, 2-41, 2-43 and seven of the access roads: 2-11, 2-21, 2-41, 2-43, 34-44, 2-44, and 34-33.

10) Dust abatement near all special status plant species will be required using fresh water. Third Party oversight and compliance monitoring (mitigation measure 7) may temporarily halt construction if fugitive dust plumes become large enough to affect either species. If fugitive dust is determined qualitatively or quantitatively to be affecting Dudley Bluffs twinpod or debris milkvetch populations, either during construction or during production, additional requirements may be applied as deemed necessary by the AO.

11) The BLM Ecologist must be notified at least one week prior to the commencement of construction of the well pads.

Finding on the Public Land Health Standard #4 for Special Status Species: The projected level of impact to the BLM Sensitive debris milkvetch from the Proposed Action would not have a significant effect on the local population or the species. The implementation of the proposed mitigation measures would further decrease the level of impact. Federally listed, Proposed, or candidate plant species would not be directly affected. Therefore the project would meet Public Land Health Standard 4.

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 United States (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). Table 23 lists all avian species opportunistically observed in the project area during the 2010 rare plant and raptor surveys and indicates which of these are considered by the FWS to be Birds of Conservation Concern for the Southern Rockies/Colorado Plateau (FWS 2008a). The FWS gives this status to avian species that are likely to become candidates for listing under the ESA if not properly conserved.

Common bird species that breed in pinyon-juniper habitats include the gray flycatcher (*Empidonax wrightii*), juniper titmouse, black-throated gray warbler, bushtit, white-breasted nuthatch, pinyon jay, plumbeous vireo *(Vireo plumbeus)*, and blue-gray gnatcatcher. The proposed project area is located within Colorado Partners in Flight (CPIF) Physiographic Region 87, the Colorado Plateau (CPIF 2000). Colorado Partners in Flight, organized by the Rocky Mountain Bird Observatory, is comprised of multiple government agencies, including the BLM, and other stakeholders with an interest in the conservation and management of Colorado birds. Species considered by CPIF to be priority in pinyon-juniper habitats associated with the Proposed Action include the black-chinned hummingbird (*Archilochus alexandri*), gray flycatcher, pinyon jay, juniper titmouse, and black-throated gray warbler. These species are widely distributed at appropriate densities throughout the WRFO. The juniper titmouse, pinyon jay, and black-throated gray warbler were observed in the project area during biological field surveys conducted between May and July 2010. The gray flycatcher was observed in the vicinity of the proposed project during field surveys conducted in 2008 for other Genesis wells (BIO-Logic 2008c).

In addition to pinyon-juniper woodland, the project area also includes mountain shrubland, Wyoming big sagebrush shrubland, and greasewood-sagebrush mixed shrubland. Common species that breed in mountain shrubland include the spotted towhee, green-tailed towhee, and chipping sparrow. According to CPIF, priority species in mountain shrubland include the common poorwill, which was observed during field surveys in 2010. As described above under *Special Status Animal Species,* the sagebrush habitat in the project area is inappropriate for use by the Federal candidate and BLM sensitive greater sage-grouse, although it is used by other sagebrush associates such as Brewer's sparrow. Brewer's sparrow is a CPIF priority species in sagebrush systems and a BLM sensitive species.

Table 23. Avian Species Detected During Field Surveys from May-July 2010

Common Name	Scientific Name	Common Name	Scientific Name
turkey vulture	*Cathartes aura*	mountain chickadee	*Poecile gambeli*
northern harrier	*Circius cyneus*	white-breasted nuthatch	*Sitta carolinensis*
Cooper's hawk	*Accipiter cooperii*	Bewick's wren	*Thryomanes bewickii*
red-tailed hawk	*Buteo jamaicensis*	rock wren	*Salpinctes obsoletus*
American kestrel	*Falco sparverius*	blue-gray gnatcatcher	*Polioptila caerulea*
blue grouse	*Dendragapus obscurus*	mountain bluebird	*Sialia currucoides*
great-horned owl	*Bubo virginianus*	American robin	*Turdus migratorius*
northern saw-whet owl	*Aegolius acadius*	hermit thrush	*Catharus guttatus*
common poorwill	*Phalaenoptilus nuttallii*	black-throated gray warbler	*Dendroica nigrescens*
common nighthawk	*Chordeiles minor*	western tanager	*Piranga ludoviciana*
rufous hummingbird	*Selasphorus rufus*	spotted towhee	*Pipilo maculatus*
hairy woodpecker	*Picoides villosus*	green-tailed towhee	*Pipilo chlorurus*
northern flicker	*Colaptes auratus*	Brewer's sparrow	*Spizella breweri*
ash-throated flycatcher	*Myiarchus cinerascens*	chipping sparrow	*Spizella passerina*
pinyon jay[1]	*Gymnorhinus cyanocephalus*	lark sparrow	*Chondestes grammacus*
Clark's nutcracker	*Nucifraga columbiana*	dark-eyed junco	*Junco hyemalis*
black-billed magpie	*Pica hudsonica*	western meadowlark	*Sturnella neglecta*
common raven	*Corvus corax*	Brewer's blackbird	*Euphagus cyanocephalus*
juniper titmouse[1]	*Baeolophus ridgwayi*		

[1] Species listed as FWS Birds of Conservation Concern for the Southern Rockies/Colorado Plateau (FWS 2008a).

A 2010 raptor survey of the proposed project area conducted in accordance with WRFO guidelines documented no raptor activity within 300 meters of proposed disturbance (BIO-Logic 2010a). During the 2010 survey, sightings were made of the following raptor species: Cooper's hawk, American kestrel, and red-tailed hawk. Two active Cooper's hawk nests were detected north of the current proposed wells, outside the survey area. The 2010 rare plant survey crew also observed great-horned owl fledglings, a northern harrier, and a juvenile northern saw-whet owl inside the survey area. 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 and red-tailed hawks has been observed. The majority of the woodland habitat in the project area consists of intermediate or mixed-age pinyon-juniper dominated by juniper. Mature woodland suitable for raptor nesting occurs in the vicinity of proposed well locations 2-11, 2-33, 2-41, 14-11, 14-22, 14-24, 34-22, 34-33, and 34-44.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would remove approximately 30.1 acres of pinyon-juniper woodland, 10.9 acres of mountain shrubland, 1.5 acres of greasewood-sagebrush mixed shrubland, and 4.6 acres 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. Indirect effects to birds may be more widespread. Habitat in close proximity to disturbance (e.g., roads) is usually avoided to some degree. Recent work in Wyoming suggests up to 50 percent reductions in breeding bird densities within 328 feet (100 meters) of well-field access roads (Ingelfinger and Anderson 2004). Noise

and human disturbance may indirectly disrupt nesting attempts in areas adjacent to proposed roads and pads during construction if work occurs during the breeding season. Noise and attendant human activity during operation could cause long-term alteration of the function and utility of breeding habitat in the surrounding areas. No breeding raptors were found inside the project area during the 2010 raptor survey. A new survey will be required prior to ground-breaking on the proposed project to account for several pad relocations and the outdated nature of the 2010 survey (see mitigation measures 1 and 2, below). The 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 one percent of the higher canopy density woodland available in the project area. Effects to Brewer's sparrows and greater sage-grouse are addressed under *Special Status Animal Species*.

The development of reserve pits in the project area may attract waterfowl and other migratory bird species for the purposes of resting, foraging, or drinking. Waterfowl mortality at reserve pits has been observed in the past on WRFO lands after birds have contacted oil-based drilling fluids. 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, measures to prevent any bird contact with produced water and drilling and completion fluids will be implemented (see mitigation measure 3, below). With the implementation of required mitigation measures and adherence to the COAs, mortality to migratory birds from contact with drilling fluids should be effectively prevented.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Migratory Birds was reviewed for conformance with BLM WRFO Standard COAs. With the following exception noted in mitigation measure number one below, all apply.

Cumulative Effects: Vegetation clearing, mechanical noise, and traffic related to oil and gas exploration and development are currently the main sources of anthropogenic disturbance to migratory birds in the project area. Standing fluids in reserve pits also pose hazards when not properly fitted with bird exclusion devices. Current and approved development by Genesis in the Fletcher Gulch Watershed has resulted in an estimated 144.4 acres of vegetation clearing, primarily in pinyon-juniper woodland. The Proposed Action will result in another 47.1 acres of clearing, for a total of 191.50 acres of clearing in the area, or 1.5 percent of the 13,500-acre Fletcher Gulch Watershed. The project area currently has diverse and healthy avian populations. Long-term, the removal of 47.1 acres of vegetation as a result of the Proposed Action and

continued disturbance from field expansion and operation are not expected to measurably contribute to cumulative effects to migratory birds in the area of analysis.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct or indirect impacts to migratory bird species or important habitats under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances under the No Action Alternative.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Migratory Birds was reviewed. With the following exception, all apply:
   - Applicant Committed Measure number one is not a current BLM WRFO COA and has been replaced by Migratory Birds mitigation number four below, therefore Genesis must not follow this ACM.

2) 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 and the following breeding season.

3) Pending results of the raptor 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). Well and road/pipeline locations would be subject to NSO restrictions if a nest is identified within the NSO buffer. These stipulations will remain in effect over the life of the project, although the timing limitation provisions are contingent on occupancy status. Table 24 outlines the appropriate NSO and timing limitation restrictions related to nesting raptors that shall be in effect during the life of the project. Exceptions or 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 (BLM 1997).

Table 24. No Surface Occupancy and Timing Limitation Restrictions for 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
Great Horned Owl	1/8 mi of nests	1/4 mi of nests	2/1 - 8/15 or until dispersal of young
Golden Eagle	1/4 mi of nests	1/2 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) The operator shall prevent migratory bird access to facilities that store or are expected to store fluids which may pose a risk to such birds (e.g., toxicity, compromised insulation, drowning). 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. It will be the responsibility of the operator to notify the BLM of the method that will be used to prevent use two weeks prior to when completion activities are expected to begin. All lethal and non-lethal events that involve migratory birds will be reported to the designated NRS immediately.

AQUATIC WILDLIFE

Affected Environment: Fletcher Gulch and Yanks Gulch are the main waterways in the project area. According to USGS topographic maps, Fletcher Gulch is ephemeral upstream of the BLM 1100 culvert, and perennial downstream of it. As it continues towards the White River, it becomes seasonal again downstream of the Genesis field. Fletcher Gulch is not known to support fisheries. Yanks Gulch is an ephemeral drainage that also does not support fisheries. Spring Creek is a perennial water that lies to the west of the project area; it may experience indirect effects from the project due to water depletions (see *Special Status 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 fisheries may be particularly susceptible to changes in flow rates.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The absence of fisheries in Fletcher Gulch and Yanks Gulch makes direct impacts to aquatic wildlife in the project area unlikely. Sediment loads into Yanks Gulch will be augmented during culvert installation, but the effect is expected to be moderate and short-term in Yanks Gulch and low and short-term downstream in Fletcher Gulch (see *Surface and Ground Water Quality*). Potential downstream effects on aquatic wildlife in the White, Green, or Colorado Rivers are expected to be undetectable.

Indirect effects to Spring Creek associated with dewatering (see *Special Status Animal Species*) may affect aquatic wildlife along that drainage. The levels of depletion predicted due to the Proposed Action (zero to a maximum of 34.77 acre feet per year in 2074 and 2075) would have the potential to substantially decrease surface flows in this largely perennial creek or reduce groundwater levels in the 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.

Cumulative Effects: The Proposed Action is not expected to contribute measurably to cumulative effects to aquatic wildlife downstream of the Fletcher Gulch Watershed in the White River. Although the potential for future development of the Genesis field is unknown at this time, should development continue, impacts to water quality from sedimentation and possibly release of hazardous materials may contribute incrementally to downstream impacts to aquatic wildlife. Off-site impacts to flows in Spring Creek, should they occur, would contribute to cumulative effects to aquatic wildlife in that drainage.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct or indirect impacts to aquatic wildlife species under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances that would potentially impact aquatic wildlife species or habitats under the No Action Alternative.

Mitigation: None.

Finding on the Public Land Health Standard #3 for Plant and Animal Communities: 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 Public Land Health Standard for Plant and Animal Communities and would lead to a degraded capacity to achieve the standard for an undetermined length of time.

TERRESTRIAL WILDLIFE

Affected Environment: The project area supports a wide variety of terrestrial wildlife common to pinyon-juniper woodlands and mountain shrublands. Pinyon-juniper woodland is utilized by elk and mule deer from October through April or May as general winter range, providing valuable forage, escape, and thermal cover for both big game species. According to the CPW Species Activity Maps (CPW 2011a), the entire project area except wells 2-41, 2-43, and 2-44 is in mule deer critical winter range. Severe winter range for elk occurs along the White

River Valley, extending south towards the project area to within 0.5 to 0.8 mile of proposed well 34-22. The two well locations on the north side of Yanks Gulch, 34-22 and 34-33, are inside an elk winter concentration area. The intersection of RBC 122 and SH 64, which serves as the main access point for the proposed project, is mapped by CPW as a mule deer and elk crossing area. Special status terrestrial wildlife and avian species are addressed above in *Special Status Animal Species* and *Migratory Birds.*

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The Proposed Action would remove approximately 30.1 acres of pinyon-juniper woodland, 10.9 acres of mountain shrubland, 1.5 acres of greasewood-sagebrush mixed shrubland, and 4.6 acres of sagebrush that are utilized by a variety of wildlife. Substantial bisecting of large continuous stands of mature pinyon-juniper by project access roads would contribute to the previous access network 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 47 acres would be of low intensity (0.6 percent) across the approximately 12.0 square miles (7,680 acres) developed or approved-for-development Genesis field. Herbaceous forage availability would be largely regained on about 80 percent of this acreage in the short term following successful interim reclamation, whereas woody forage would take much longer to return to pre-project levels (see *Vegetation*). For purposes of this analysis, the Genesis field area is defined as:

T.1 N., R.100 W., 6th PM,
Section 2: NW1/4, S1/2
Sections 3, 4, 9, 10, 11, 14, 15
Section 8: E1/2
Section 5: E1/2
Section 13: W1/2
Section 23: N1/2
Section 24: NW1/4

T.2 N., R.100 W., 6th PM,
Section 33, 34
Section 35: SW1/4 SW1/4

Prior to development, the field area hosted a road and trail network of up to 36.2 miles, or 3.0 miles/square mile, based on 2005 aerial photographs. Previous field development and approved but unconstructed development together add about 12.9 miles of new road, for a currently projected road density figure of about 4.1 miles/square mile. With the addition of the currently proposed 3.8 miles of new road, collective road density in the analysis area would rise to about 4.4 miles/square mile. Current WRFO RMP road density objectives call for maintaining effective road densities at 1.50 miles/square mile or less on big game critical habitats and three miles/square mile on remaining big game ranges. Because road density prior to development was at the threshold of road density in big game habitat and the CPW has upgraded the status of mule deer range throughout almost the entire field area to critical winter range (proposed wells 2-41, 2-43, and 2-44 lie outside this designation), it is appropriate to reduce or mitigate increases in road density attributable to development as much as practicable. Genesis has installed a gate at

the departure from RBC 122 of the access route to approved wells 4-41, 4-31, 4-42, 9-14, 10-12, and 10-32. This gate is intended to control access on 3.1 miles of approved roads and reduce effective road density by about 0.3 miles/square mile, but vandalism and by-pass have been difficult to control and diminished the utility of the gate. A required gate (see mitigation measure 1, below) installed at the intersection of the main service road and the spur access leading to the 2-41, 10-14, 3-44, and 3-33 wells is expected to control access on 1.5 miles of approved roads and reduce effective road density by roughly 0.13 miles/square mile. Intense short-term influences of road density would attend well development, and long-term effects over the productive life of the wells would likely have substantial and chronic additive influence on current big game use patterns.

Newly constructed access roads required for development of the proposed wells would add substantially and incrementally to road density-related impacts (i.e., habitat disuse adjacent to disturbance and elevated energetic demands associated with harassment). Upgrading the road across Yanks Gulch is expected to increase access to the project area from the north along the pipeline and access route that leads from Yanks Gulch to the Williams' Fletcher Gulch meter station on SH 64. Increased frequency and duration of vehicle-related disturbance during the period of occupation, both during well development and long-term due to public access, would reduce the capacity of these ranges to sustain former levels of big game use. 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 (e.g., pipelines and interim reclamation applied to pads) should promote caching activity by small mammals and, together with increased microclimatic diversity, accelerate reestablishment of shrubs useful to a variety of wildlife.

Cumulative Effects: Habitat loss and fragmentation, noise, road density-related impacts related to oil and gas development, and hunting are currently the main sources of disturbance to terrestrial wildlife in the area of analysis. The Fletcher Gulch Watershed provides important big game winter range; critical winter range for mule deer occurs within the current extent of the Genesis field. The Proposed Action will contribute incrementally to past, existing, and reasonably foreseeable loss of big game winter range and disturbances to wildlife in the area, although it is not expected to have measurable impacts on local big game populations. Although unknown at this time, potential for future development is probable. Increased and expansive development in this area would be expected to contribute to reductions in important big game wintering habitat with potential negative consequences for local big game populations.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no direct or indirect impacts to terrestrial wildlife species under the No Action Alternative.

Cumulative Effects: There would be no contribution to previous or existing disturbances that would potentially impact terrestrial wildlife species or habitats under the No Action Alternative.

Mitigation: The following mitigation measures are required:

1) General access to well locations 2-41, 10-14, 3-44, and 3-33 shall be restricted by means of a lockable gate (may require fence wings) placed as close as possible to the intersection of the main service road and the spur access leading to the wells. This gate will be required to effectively deter (including preventing bypass) vehicle use unrelated to Genesis well operations throughout the year.

2) Disruptive forms of activity, including preparation of pads and pipeline and access rights-of-way, road construction, well drilling and completion operations, and scheduled workover and refracing, will be prohibited in severe winter range for mule deer from December one to April 30. This includes all proposed pads, wells, access, and pipelines except those associated with the following locations: 2-41, 2-43, and 2-44.

Finding on the Public Land Health Standard #3 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. With implementation of the mitigation measures and adherence to the COAs, the Proposed Action would have relatively minor long-term effects on the extent or function of habitat for big game, non-game, or avian species using the project area. Lands affected by the Proposed Action, as conditioned, would continue to meet the Public Land Health Standard for Plant and Animal Communities.

WILD HORSES

Affected Environment: The bulk of the Proposed Action would occur in the North Piceance Herd Area (NPHA). The access road to 14-24 and the southern two-thirds of its pad would be the only project features outside the herd area. The NPHA covers 76,959 acres of BLM land and 12,396 acres of other land, for a total of 89,355 acres (BLM 2006). Although BLM is planning on removing wild horses from the NPHA at an unspecified time in the future (BLM 1997), the area is currently managed to provide forage for a herd of zero to 50 horses. The portion of the Proposed Action that would occur inside the NPHA is dominated by pinyon-juniper woodland, which provides thermal and security cover for wild horses. Within the project area, some of the more open shrub land communities that have significant grass in the understory provide forage for wild horses, also forage is found in the revegetated burn area along RBC 122, outside of the current proposed project area but within the larger Genesis field. During the 2008 field surveys for rare plants and raptors in the Genesis field, wild horse sign (droppings) was observed at numerous proposed well locations. Wild horses were observed in the Genesis field during the 2009 and 2010 rare plant surveys and the 2010 onsite review with BLM.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Approximately 43.1 acres of proposed pad and road disturbance would be located in the NPHA. 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 become habituated to human activity to some degree. Horses may use areas within one-quarter 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 herbaceous forage loss would occur with the disturbance of 4.6 acres of sagebrush shrub land and 1.5 acres of mixed greasewood-sagebrush shrub land in the NPHA. This amount of area constitutes about 0.005 percent of the total acreage in the NPHA. Interim reclamation of unused portions of well pads would replace approximately 80 percent of the forage lost during pad construction, making the impact relatively short-term. Herbaceous forage would replace woody forage during the early stages of reclamation, creating the potential for a short-term increase in herbaceous forage for wild horses in the area. The overall level of forage loss within the herd area is not expected to result in displacement of horses or change in horse population trend in the area. It is unlikely to have a detectable effect on wild horse health or use of the habitat given the size of the NPHA.

Should atypical environmental conditions exist, forage loss may place added stress on the wild horses, especially during foaling seasons. Such conditions include heavy snow cover late in winter, drought, fire, or a late spring green-up. The foaling season typically occurs between March one and June 15. Big game severe winter range timing limitations are in place for all well locations except 2-41, 2-43, and 2-44 (see mitigation measure 2, *Terrestrial Wildlife*). During this period, construction, drilling, completion, and scheduled workover and refracing are prohibited, limiting potential effects to wild horses during a portion of the foaling season and helping to relieve some stress to the wild horses during that sensitive time period. Normal operations following well completion would not require implementation of work windows.

Cumulative Effects: Implementation of the Proposed Action in conjunction with existing and future uses is not expected to impede or affect the wild horses on rangelands within the NPHA.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative, there would be no change from the present situation.

Cumulative Effects: Under the No Action Alternative, there would be no vegetation disturbing activities which would contribute to short-term reduction of forage for wild horses within the project area.

Mitigation: The following mitigation measure is required: None

CULTURAL RESOURCES

Affected Environment: The proposed wells and access roads were surveyed for cultural resources over the course of four inventories conducted in accordance with WRFO standards. Multiple Class III surveys were needed to address changes in the project area required in order to avoid effects to historic properties.

The three wells in Section 34 and their spur access roads were surveyed in 2008 (McDonald 2008, Compliance Dated February 27, 2009). The proposed trunk road across Yanks Gulch was surveyed in 2006 (Greubel 2006, Compliance Dated December 8, 2006). No cultural resources were identified during these inventories.

Thirteen well pads and associated infrastructure, including proposed pads 2-21, 2-33, 2-41, 2-43, 14-22, and 14-24 were surveyed in 2010 (McDonald 2010, Compliance Dated October 22, 2010). The survey documented two prehistoric isolated finds, three protohistoric/historic sites, two prehistoric sites, one previously recorded prehistoric, one new historic site, and three new segments of historic fences. The isolated finds are by definition not eligible to the National Register of Historic Places (NHRP). The four historic sites are field evaluated as not eligible to the NRHP. The three protohistoric/historic, two prehistoric sites, and one previously recorded prehistoric are field evaluated as eligible to the NRHP. The three newly documented proto-historic/historic sites are sensitive site types, with aspects of integrity vulnerable to issues regarding any oil and gas development, being located within their view shed. Location, setting, and feeling are important aspects of their integrity.

Four relocated pads (2-11, 2-32, 2-44, and 14-11) with roads were inventoried in 2011 and 2012 (McDonald 2011, Compliance Dated August 12, 2011; McDonald 2012a, Compliance Dated April 24, 2012). In the two inventories two isolated finds were documented. The isolated finds are by definition not eligible to the NHRP.

None of the eligible sites documented as part of these surveys are located within the direct area of potential effect for this present project. However, the proposed well pad locations 2-21, 2-32, and 2-33 are potentially located within the view shed of an eligible, sensitive, wickiup site (5RB6683,) that is in the area.

Environmental Consequences of the Proposed Action:
Direct and Indirect Effects: The Operator has worked with WRFO to avoid direct effects to known cultural resources by relocating four well pads and associated roads. However direct effects due to the inadvertent discovery of cultural resources, such as buried features that could be impacted by construction, cannot be ruled out. Indirect effects related to the increase in road density may attend well and road development. Increased use of the area by the public would increase the potential for damage to or unauthorized collection of cultural resources in the project area.

New proposed development at wells 2-21, 2-32 and 2-33, is located within the potential view shed of one of the sensitive proto-historic site types mentioned above. Specifically, the proposed well imprint for well 2-21 is approximately 1400 ft, well 2-32 is approximately 685 ft, and well 2-33 is 900 ft, from the site boundary of a wickiup site (5RB6683). This has the potential to have an adverse effect on a historic property. "An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." (Protection of Historic Properties 1986). The actual location of a historic property, complemented by its setting, is particularly important in recapturing the sense of historic events and persons. Setting and feeling

can be diminished by such factors as the visible view shed from a person standing at the site and also by the increase in ambient noise levels audible from the site.

Cumulative Effects: The cultural resource inventories and avoidance measures that have been implemented during project planning greatly limit effects to cultural resources in the project area. Nonetheless, inadvertent damage to buried resources during construction and unauthorized collection of cultural artifacts due to increased accessibility of the area would contribute incrementally to cumulative effects to cultural resources in the project area. Future continued oil and gas development in the Fletcher Gulch area will gradually alter the view shed and increase the ambient noise levels audible from wickiup sites in the area, and therefore has the potential to have adverse effects to the integrity of these sensitive sites.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Cultural Resources was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no new effects to cultural resources under the No Action Alternative. There would, however, continue to be the slow natural degradation of cultural artifacts in the area of analysis. This loss is irreversible and irretrievable but very slow compared to potential losses resulting from development-related activities. The potential for the deterioration of the view shed surrounding structural wickiup sites would be less than the proposed action.

Cumulative Effects: The loss of cultural resources under the No Action Alternative would be much less than under the Proposed Action but would, nevertheless, result in an overall loss of cultural resources, particularly those more subject to decay by natural processes. These losses are slow, limited but, still irreversible and irretrievable resulting in an overall loss of data for the regional archaeological database.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Cultural Resources was reviewed. With the following exceptions, all apply:
   - Applicant Committed Measure number two is not a current BLM WRFO standard COA and has been replaced by Cultural Resources mitigation number two below, therefore Genesis must not follow this ACM.
   - Applicant Committed Measure number three is not a current BLM WRFO standard COA and therefore Genesis must not follow this ACM.

2) If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator/holder/applicant will make every effort to protect the

site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator/holder/applicant, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.

3) To protect the visual landscape surrounding site 5RB6683, the locations 2-21, 2-32 and 2-33 shall adhere to the same five mitigation measures listed under the Visual Resources section (below).

PALEONTOLOGICAL RESOURCES

Affected Environment: Within the WRFO Resource Area, over 338 paleontological sites are known, including fossil invertebrates and vertebrates such as fish, dinosaurs and other reptiles, and mammals (McDonald 2012b). 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 (BLM 2007).

The three surface geologic formations upon which the proposed wells would be located are presented in Table 9, above. All of these formations are considered to be PFYC 5, having very high potential to yield fossils. The PFYC 5 includes "…highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation" (BLM 2007).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The 13 proposed well pads and roads would be located on PFYC 5 formations. 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 potential to directly affect scientifically important fossil resources. Indirect effects to paleontological resources may occur due to increased potential for soil erosion in and adjacent to disturbed areas. The increase in road density that will attend well and road development may cause additional indirect effects from increased use of the area by the public. Increased public use would augment the potential for damage to or unauthorized collection of paleontological resources in the project area.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Paleontological Resources was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: The Proposed Action has the potential to contribute incrementally to impacts to fossil resources in the Wasatch and Green River formations. If scientifically noteworthy fossils are impacted during project construction, there would be an irreversible and irretrievable loss of scientific data to the regional paleontological database. Monitoring of construction could limit that loss to some extent and recover any fossil material that is exposed. However, there would still be some overall loss of data. Increased human activity in the area could, potentially, result in unauthorized collection of exposed fossil resources due to the increased accessibility of the area.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no new impacts to fossil resources under the No Action Alternative. There would, however, continue to be the slow natural erosion of the formation with the natural slow loss of data and fossils. This loss is irreversible and irretrievable but very slow compared to the loss resulting from construction activities.

Cumulative Effects: The loss of data under the No Action Alternative would be much less than under the Proposed Action but would, never the less, result in an overall loss of scientific paleontological data and some fossils, particularly the smaller, more fragile fossil resources of the local formations.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Paleontological Resources was reviewed. With the following exceptions, all apply:
    - Applicant Committed Measure number one is not a current BLM WRFO standard COA and has been replaced by Paleontological Resources mitigation number three below, therefore Genesis must not follow this ACM.
    - Applicant Committed Measure number two is not a current BLM WRFO standard COA and has been replaced by Paleontological Resources mitigation measure number two below, therefore Genesis must not follow with this ACM.
    - Applicant Committed Measure numbers three and four are not current BLM WRFO standard COAs and have been replaced by Paleontological Resources mitigation number four below, therefore Genesis must not follow this ACM.

2) The operator/holder is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25 lbs./day, up to 250 lbs./year), or collecting fossils for commercial purposes on public lands.

3) Any excavations into the underlying native sedimentary stone must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.

4) If any paleontological resources are discovered as a result of operations under this authorization, the operator or any of his agents must stop work immediately at that site,

immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinator's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinator's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

VISUAL RESOURCES

Affected Environment: The Proposed Action would occur in an area of extreme topography. Pads and roads would be located on the slopes and ridges above the Fletcher Gulch and Yanks Gulch valleys, at elevations ranging from 6,200 to 7,200 feet above mean sea level. Directly to the east, the steep walls of Calamity Ridge rise to over 8,200 feet Pinyon-juniper woodland and mountain shrubland are the dominant vegetation communities in the project area, with greasewood-sagebrush mixed shrubland occupying the Fletcher Gulch valley floor.

The area is not pristine, but still retains a wilderness feel to it, having very little development compared with much of the North Piceance Basin. Rio Blanco County Road 122, the main public road accessing Calamity Ridge, runs along the ridge to the southwest of Fletcher Gulch and affords wide views of the general project area. The Proposed Action area is accessed via BLM 1100. Traffic in the vicinity of the project area typically consists of oil and gas industry employees, big game hunters, other recreationists, and ranchers. Five Genesis well pads and associated roads and infrastructure are currently visible from a vehicle on RBC 122, and more will become visible as approved development proceeds. Ranching infrastructure including gates, pens, and chutes are visible along RBC 122 in the general project area.

The BLM maintains four Visual Resource Management (VRM) classes to describe the level of acceptable change allowable at a given location, with the most restrictive being Class I. Class I and II lands are of primary concern to the BLM (BLM 1997). The project area is on Class II and III lands. According to BLM Manual H-8410-1, the management objective for Class II lands is to retain the existing character of the landscape, allowing only for a low level of change. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. 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.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Table 25 shows the VRM classes at proposed well and road locations, along with proposed disturbance acreages in each class. The bulk of proposed surface disturbance would be on Class III lands (36.81 ac), with the remaining on Class II lands (10.24 ac). Access to proposed well 14-24 would be largely on unclassified private surface. Locations 14-22 and 14-24 are directly adjacent to Class II lands.

Table 255. Visual Resource Management Classes at Proposed Well and Road Locations

Surface Geologic Unit	Well Number[1]	Disturbed Surface (ac)
VRM III	2-11, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 14-24, 34-22, 34-33, 34-44	36.81
VRM II	2-43, 2-44, 14-11	10.24

[1] Well locations that occupy more than one VRM class appear twice.

Pads 14-11, 14-22, and 14-24 would be visible from a vehicle on RBC 122. The other pads and roads would be variously visible from several BLM roads in the area that are currently lightly used by the public: 1100, 1036, and 1038. To an observer driving along the main service road in the Genesis field, four of the seven wells in Section 2 (2-21, 2-32, 2-33, and 2-43), and the three wells in Section 14 would be prominent.

To the casual observer in the project area, the pads and gas facilities would attract attention and contrast with the basic elements of form, line, color, and texture in the surrounding landscape. The wells would alter the landscape by removing vegetation, re-contouring the natural surface, and introducing linear features and contrasting soil or vegetation colors and patterns not previously present. The removal of pinyon and juniper trees and mountain shrubland would have the most visual impact. Gas production facilities located on each well pad during the production phase of the project would appear as man-made artifacts to the public due to their size, color, and shape, and contrast with the surrounding landscape. The impact of these aboveground structures on the casual observer would be minimized with the use of natural color paint, as specified in the mitigation measures. After successful interim reclamation, the visual impact of the well pads and access roads would be reduced. After final reclamation, it is expected to take decades for the pads and roads to regain a visual character approaching that of the sites prior to disturbance. Impacts to the visual character of the landscape from the Proposed Action would be moderate and long-term inside the Genesis field and at the landscape scale.

With the implementation of the mitigation measures and adherence to the COAs, the change in visual character of the landscape on Class III lands would be consistent with the management objectives of that class. Proposed disturbance on Class II lands challenges the management objectives of that class, although the amount of development in that class is relatively small (10.24 acres).

Cumulative Effects: Oil and gas exploration and development is the main source of visual impacts in the area of analysis. The Genesis field in the Fletcher Gulch Shallow and Calamity Ridge II Units currently hosts 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more, with associated new access roads. Some of this development is visible from RBC 122, and the remainder is visible from various points upon less-traveled BLM and service roads. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. In addition to the recent development in the Genesis field, the COGCC database indicates that

approximately 15 other wells were previously permitted in the Fletcher Gulch Watershed; all of these have been plugged and abandoned. The Proposed Action would contribute incrementally to cumulative changes in the visual character of the area, creating contrasts in shape and color with the surrounding landscape that would be noticeable to the public using RBC 122 and BLM 1100, 1036, and 1038. These impacts would be reduced following successful interim reclamation, and less noticeable still following final reclamation.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: There would be no modifications on the existing landscape under the No Action Alternative; therefore there would be no additional visual disturbances.

Cumulative Effects: The No Action Alternative would not contribute to visual impacts in the area of analysis.

Mitigation: The following mitigation measures are required:

1) All above-ground facilities and equipment will be painted to blend in with the surrounding environment. Color of all above-ground equipment and facilities for the CR 2-21, 2-32, 2-43, and 2-44 shall be painted covert green. Color of all above-ground equipment and facilities for all other locations shall be painted Juniper Green using Standard Environmental Color Chart CC-001: June 2008. It is important to note that the color chart is an actual paint chart and cannot be faxed, scanned or photocopied as it will change the color and may not be consistent with the actual color.

2) At locations falling within or directly adjacent to VRM Class II lands, including 2-43, 2-44, 14-11, 14-22, and 14-24, all above ground structures and facilities will be low profile (generally 12 feet or lower).

3) Vegetative manipulation and screening will be utilized at locations falling within or directly adjacent to VRM Class II land, including 2-43, 2-44, 14-11, 14-22, and 14-24. This will involve retaining as much of the existing vegetation as possible, and where practical, use existing vegetation to screen the disturbance from public visibility areas (i.e., adjacent roads, etc.).

4) At locations falling within or directly adjacent to VRM Class II land, including 2-43, 2-44, 14-11, 14-22, and 14-24, earthwork manipulation will be used to screen development activities from public visibility areas (i.e., adjacent roads, etc.). Examples of earthwork manipulation may include retaining existing hills and rock formations, minimizing earth cuts, and using fill to create berms that will screen pad disturbance and above ground facilities.

5) Upon final reclamation, all disturbed areas will be re-contoured and restored as closely as possible to previous conditions and to blend with the natural topography. Blending is defined as reducing form, line, shape, and color contrast with the disturbing activity.

HAZARDOUS OR SOLID WASTES

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. Most of the exploration and production wastes that would be generated by the Proposed Action would be exempt from the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations (e.g., produced water, produced gas). 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 and garbage) would be generated 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:

Direct and Indirect Effects: 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 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, affecting existing vegetation adjacent to pads and greatly reducing the chance for successful reclamation. High salinity may also impact surface or ground water through run-off or leaching. The sodicity (i.e., excess sodium) of produced water causes deterioration of the soil structure, thereby increasing the potential for soil erosion and reducing the chances of reclamation success. With implementation of the mitigation measures and adherence to the COAs, 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, implementation of the mitigation measures and adherence to the COAs, impacts to aquifers above the producing zone are unlikely.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Wastes, Hazardous or Solid was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: Oil and gas exploration and development, and chemicals used for livestock and rangeland management are the principal sources of hazardous and solid wastes in the upper Fletcher Gulch Watershed. Down towards the confluence of Fletcher Gulch and the White River, agriculture and human habitation also contribute. Proper implementation of the surface use plans and adherence to the COAs would greatly reduce any contribution from the Proposed Action to cumulative adverse effects from hazardous and solid wastes on human health and/or the environment. Nonetheless, the Proposed Action is expected to contribute incrementally to release of hazardous and solid waste in the watershed.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: No hazardous or other solid wastes would be generated under the No Action Alternative.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects from hazardous or solid wastes in the area of analysis.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Wastes, Hazardous or Solid was reviewed. With the following exceptions, all apply:
    - Applicant Committed Measure (ACM) number four states reserve pits shall be lined with a minimum 24-millimeter (mm) liner. The BLM WRFO standard thickness for liners is 24 mil; therefore Genesis must not follow this ACM.
        - This ACM has been replaced by Surface and Ground Water Quality mitigation measure number two.
    - Applicant Committed Measure number three is no longer a BLM WRFO standard COA and is not required.

2) Comply with all Federal, State and/or local laws, rules and regulations, including but not limited to onshore orders and notices to lessees, addressing the emission of and/or the handling, use, and release of any substance that poses a risk of harm to human health or the environment. All spills or leakages of oil, gas, produced water, toxic liquids or waste materials, blowouts, fires, shall be reported by the operator in accordance with the regulations and as prescribed in applicable orders or notices.

3) Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.

4) When drilling to set the surface casing, drilling fluid will be composed only of fresh water, bentonite, and/or a benign lost circulation material that does not pose a risk of harm to human health or the environment (e.g., cedar bark, shredded cane stalks, mineral fiber and hair, mica flakes, ground and sized limestone or marble, wood, nut hulls, corncobs, or cotton hulls).

5) All substances that pose a risk of harm to human health or the environment shall be stored in appropriate containers. Fluids that pose a risk of harm to human health or the environment, including but not limited to produced water, shall be stored in appropriate containers and in secondary containment systems at 110% of the largest vessel's capacity. Secondary fluid containment systems, including but not limited to tank batteries shall be lined with a minimum 24 mil impermeable liner.

6) As a reasonable and prudent lessee/operator in the oil and gas industry, acting in good faith, all lessees/operators and right-of-way holders will report all emissions or releases that may pose a risk of harm to human health or the environment, regardless of a substance's status as exempt or nonexempt and regardless of fault, to the BLM WRFO (970) 878-3800.

7) As a reasonable and prudent lessees/operator and/or right-of-way holder in the oil and gas industry, acting in good faith, all lessees/operators and right-of-way holders will provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, regardless of that substance's status as exempt or non-exempt. Where the lessee/operator or right-of-way holder fails, refuses or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground) and soils at the lessee/operator's expense. Such action will not relieve the lessee/operator of any liability or responsibility.

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 and mountain shrubland that comprise the bulk of the project area carry heavy fuel loads in many areas. Most of the pinyon-juniper woodland is classed as productive exposure; this habitat type features understory plant communities and crown densities that increase fire frequency (see *Forest Management*).

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 nine fires in the C-10 Fire Management Unit with an average fire size of 866 ac. The two largest fires in the project area have been the Yanks and Switchback fires, which burned in the Year 2000 and covered 572 acres and 1,590 acres, respectively. Both of these wildfires were successfully revegetated with a mixture of native and introduced species. None of the historical fires in the C-10 Fire Management Unit were managed as wildland fire use for resource benefit.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The pinyon-juniper and mountain shrubland communities in which the Proposed Action would take place carry high fuel loads in many places, which could cause a fire to become aggressive. A fire in the sagebrush and mixed greasewood-sagebrush communities would burn more quickly. The main service road that runs through the project area may serve as a firebreak to help control fire spread. Five of the pads would be located adjacent to this road or a proposed extension of it.

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. Once well completion is achieved, the small facilities associated with natural gas wells would be relatively isolated from fires due to the vegetation clearing that is maintained around the pads.

The Proposed Action would require the removal of a substantial amount of woody vegetation (see Table 13, above). Stockpiled dead vegetation is very receptive to fire brands and spotting from wind-driven fires and can greatly accelerate the rate of spread of the fire front, creating a threat to the public, gas well personnel, and fire management personnel. With the implementation of mitigation measure 2, below, redistribution of cleared woody debris during interim reclamation will not exceed 20 percent ground cover. This will reduce the threat from the dead fuel load. 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 will nearly always result in an increased potential for human-caused wildland fires. By managing the stockpiled vegetation in accordance with the mitigation measures and COAs, the operator will minimize fire risk.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Fire Management was reviewed for conformance with BLM WRFO Standard COAs. With the following exceptions noted in mitigation measure number one below, all apply.

Cumulative Effects: The Proposed Action would contribute incrementally to cumulative effects from oil and gas development and other human activities to the fire environment. The result will be a higher fire potential in the area and the establishment of some fire breaks that may limit the travel of fire and aid fire personnel should BLM choose to suppress a fire.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: The No Action Alternative would result in no change from the present conditions.

Cumulative Effects: Under the No Action Alternative, the fire environment would remain the same without increase of human starts and without a future fire break.

Mitigation: The following mitigation measures will be required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Fire Management was reviewed. With the following exceptions, all apply:
    - Applicant Committed Measure number one is not a current BLM WRFO standard COA and is not required.
    - Applicant Committed Measure numbers two and three are not BLM WRFO Standard COAs and therefore have been replaced by Forest Management mitigation measure numbers two, three, four, and five therefore Genesis must not follow this ACM.

2) When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.

    - The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.

    - The reporting party, or a representative of, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.

    - The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by welding, cutting, grinding, etc. will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.

    - Natural ignitions caused by lightning will be managed by Federal fire personnel. If a natural ignition occurs within the approved project area, the fire may be initially contained by the applicant only if employee safety is not endangered. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Office Manager.

FOREST MANAGEMENT

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

Most of the project area is composed of mature productive exposure pinyon-juniper woodland that provides 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 34-22, which could be eligible for management as commercial woodlands, although pinyon pines constitute less than 50 percent of the tree layer. In these areas, pinyon pines reach heights of up to 35 feet, with an average of 20 to 25 feet.

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Under the Proposed Action, roughly 30.1 acres of pinyon-juniper woodlands would be removed (Table 26). This represents roughly 0.004 percent of the pinyon-juniper woodlands in the resource area. Roughly 62 percent (18.65 acres) of the woodland that would be affected is classed as mature productive exposure. Many of the trees that would be removed as a result of the Proposed Action could otherwise be utilized for personal woodland products, including 203.5 cords of wood. The effect to this resource would be low and long-term. After interim and final reclamation, it may take 30 to 50 years for trees to establish dominance and 400 years for mature stands to reestablish (see *Vegetation*).

Table 26. Estimated Loss of Woodland Acres as a Result of the Proposed Action

Well Name	Acreage In Woodlands				
	Pad (ac)	Access Rd. (ac)	Total Acres Disturbed	Stand Class[1]	Total Cords
2-11	2.0	2.8	4.8	PJ-PE-M	33.6
2-33	1.8	0.3	2.1	PJ-PE-Y	10.5
2-41	1.6	0.03 (1,500 square feet)	1.63	PJ-DE	8.15
14-11	1.6	1.8	3.4	PJ-PE-M	23.8
14-22	1.9	0.3	2.2	PJ-PE-M	15.4
34-22	1.9	6.3	8.2	PJ-PE-M	57.4
34-33	1.4	1.1	2.5	PJ-PE-M	17.5
34-44	2.8	2.5	5.3	PJ-PE-M	37.1
Total acres	15.7	17.6	30.1	Total cords	203.5

[1] PJ-DE = dry exposure pinyon-juniper woodland; PJ-PE-M = mature productive exposure pinyon-juniper woodland; PJ-PE-Y = young productive exposure pinyon-juniper woodland

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Forest Management was reviewed for conformance with BLM WRFO Standard COAs. As noted in mitigation measure number one below, this ACM listed in Appendix C does not apply.

Cumulative Effects: Removal of mature pinyon and juniper trees would reduce the potential for outbreak of woodland diseases and pest infestations. Adherence to the mitigation measures and COAs outlined for fire management would reduce the build-up of cleared woody

material from the project area, reducing the likelihood of slash contributing to large fire events. Other cumulative effects such as loss of wildlife habitat would be long-term until woodlands regenerate successfully.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative there would be no well pad or access road and pipeline construction and no removal of pinyon-juniper woodlands. Forest resources and management in the Fletcher Gulch Watershed would not be affected.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects on pinyon-juniper woodlands in the Fletcher Gulch Watershed.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Forest Management was reviewed. Applicant Committed Measure number one does not apply as it is no longer a BLM WRFO Standard COA and has been replaced by Forest Management Mitigation measure numbers two, three, four, and five below, therefore Genesis must not follow this ACM.

2) In accordance with the 1997 White River RMP/ROD, all trees removed in the process of construction shall be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.

3) First, woody material will be chipped and stockpiled for later use in reclamation. Wood chips can be incorporated into the topsoil layer to add an organic component to the soil to aid in reclamation success.

4) Woody materials, not used for woods chips, required for reclamation shall be removed in whole with limbs intact and shall be stockpiled along the margins of the authorized use area separate from the topsoil piles. Once the disturbance has been recontoured and reseeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20-30 percent ground cover. Limbed material shall be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use.

5) Trees that must be removed for construction and are not required for reclamation shall be cut down to a stump height of six inches or less prior to other heavy equipment operation. These trees shall be cut in four foot lengths (down to four inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

RANGELAND MANAGEMENT

Affected Environment: The proposed project would span the Upper Fletcher Draw (06040), Duck Creek (06031), and Hammond Draw (06039) grazing allotments (BLM 1996a). Public land acres in the Upper Fletcher Draw allotment total 6,250 ac; in the Duck Creek allotment, 21,830 ac; and in the Hammond Draw allotment, 6,905 ac. Livestock use within these allotments occurs as outlined in Table 27.

Table 27. Livestock Use in the Upper Fletcher Draw, Duck Creek, and Hammond Draw Allotments

Allotment	Pasture	Livestock		Grazing Period		% Public Land	AUMs[1]
		Number	Kind	Begin	End		
Upper Fletcher Draw	N/A	140	Cattle	7/1	11/15	80	508
Duck Creek	Indian Spring	125	Cattle	3/1	6/30	83	416
	Dry Duck Creek	125	Cattle	7/1	11/15	83	471
	Indian Spring	265	Cattle	11/16	1/7	83	383
Hammond Draw	N/A	58	Cattle	3/1	4/20	100	97
	N/A	109	Cattle	4/21	5/23	100	118

[1] AUM = animal unit month

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: Proposed access routes cross fencelines that serve as boundaries between the Hammond Draw and Upper Fletcher Draw allotments and the Upper Fletcher Draw and Duck Creek allotments. Table 28 shows the acreage of disturbance that would be caused by the proposed wells and roads in each allotment. After successful interim reclamation, herbaceous forage would be regained over approximately 80 percent of this area.

Table 28. Estimated Loss of Forage from the Proposed Action

Allotment	Wells	Construction Disturbance (acres/AUM loss)
Upper Fletcher Draw	2-11, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 14-24, 34-44	33.3 / 2.7
Duck Creek	14-24	5 / 0.1
Hammond Draw	34-22, 34-33	7.4 / 0.2

Potential impacts from loss of these amounts of forage are considered to be of low intensity given the size of the allotments. Once interim reclamation of the unused disturbed areas is complete, a portion of the forage lost would be regained. Herbaceous forage would replace woody forage during the early stages of reclamation, creating the potential for a short-term increase in herbaceous forage in the area. After final reclamation, acreage and forage production available for livestock would return close to pre-project levels. Forage availability within the allotments is sufficient to compensate for the short- and long-term loss of forage from the Proposed Action. Potential forage losses in these allotments are not expected to require any alteration in livestock management or stocking rates.

Construction and drilling activities and associated traffic may cause some annoyance impact to cattle if these activities coincide 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.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Rangeland Management was reviewed for conformance with BLM WRFO Standard COAs. The ACM listed in Appendix C will apply.

Cumulative Effects: With implementation of the mitigation measure below, the Proposed Action in conjunction with past, existing, and future uses is not expected to impede or affect the proper management of livestock on rangelands within the grazing allotments in which the Proposed Action occurs.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative, there would be no change from the present situation.

Cumulative Effects: Under the No Action Alternative, there would be no vegetation disturbing activities which would contribute to short-term reduction of forage within the project area. There would be no potential for damage to range improvement projects as a result of the proposed project.

Mitigation: The following mitigation measure is required:

1) Any range improvement projects such as fences, water developments, cattleguards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action shall be promptly repaired or replaced by the applicant to restore pre-disturbance functionality.

2) The operator must coordinate with the livestock grazing permittees (Wade Cox for the 34-22 and 34-33 and O.S. Wyatt Jr./Davie Brooks for the 34-44, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22 and 14-24) authorized to graze livestock within the project area a minimum of 72 hours prior to construction activities associated with this permit. Livestock grazing permittee contact information may be found at www.blm.gov/ras/ or by contacting the WRFO Range staff (970-878-3800). The operator will provide the grazing permittee the location, nature, and extent of the anticipated activity being completed.

FLOODPLAINS, HYDROLOGY, AND WATER RIGHTS

Affected Environment: Refer to the *Surface and Ground Water Quality* section for a description of the surface and ground water resources in the Proposed Action area. Appendix A, Figure 5 shows the locations of water wells, springs, and diversion structures within a one-mile radius of the project area. 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. The project lies within the Fletcher Gulch Watershed, which drains to the White River above its confluence with Douglas Creek. This segment of the river serves as the primary water source for the Town of Rangely (Williams 2010). Proposed disturbance would occur approximately six miles north of the confluence of Fletcher Gulch and the river. In the vicinity of the proposed project, the White River is under-appropriated (WWL 2009).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The *Stream Depletion Analysis* written by Western Water & Land in 2009 and updated for the current proposed project in 2010 estimated potential effects to offsite surface and subsurface flows from the pumping and re-injection of ground water (WWL 2009, 2010). The results of this study are summarized in the *Surface and Ground Water Quality* and *Special Status Animal Species* sections of this EA. The study showed a potential hydraulic connection between the Mesaverde and Sego Sandstone aquifers and the White River. This is of concern given that the White River serves as the primary water source for the Town of Rangely. Study results indicated that area wells drawing from the alluvial plain of the White River would not be affected by the project. Seasonal variations in the aquifer would be greater than any changes caused by coalbed methane extraction. Significant depletions would not be expected in the White River. Given the connection between the Mesaverde aquifer and the White River, there is the possibility that pollutants associated with loss of drilling fluids, well failure, or spills could migrate to the river. The *Stream Depletion Analysis* and *Supplemental Report* (WWL 2009, 2010) evaluated the potential impacts to water quality in the White River and its alluvial aquifer to be minor and generally within the range of laboratory error.

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 to depletion of groundwater and potential loss of surface water flows. No detectable changes to surface flows in the White River Basin are expected as a result of the project (WWL 2009, 2010). The segment 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 could experience depletions due to the proposed project, but no water rights exist below the assumed depletion point and no water rights exist along Fletcher Gulch.
One BLM spring (149-12) under permit with the Colorado Division of Water Resources (DWR) is located west of the proposed facility and stratigraphically within the depletion and accretion flow path. The *Stream Depletion Analysis* and *Supplemental Report* (WWL 2009, 2010) predict increased flows to this spring from the Proposed Action. A potential impact to livestock use of this spring may occur if any change in flow rate affects water quality. The BLM has requested and Genesis agreed to monitor this spring (see mitigation measure, below).

The potential for mitigation of local water sources such as BLM Spring 149-12 may need to be addressed through individual agreements whereby spring water is replaced by leased or purchased water from other sources (WWL 2009, 2010). Stock tanks could be installed at certain locations and supplied by various means. Domestic water supplies could be temporarily supplied by water hauling. Potential impacts to this spring should be avoided, if possible, before mitigation is pursued. Monitoring of the spring would identify any measureable changes to the water quantity and quality that may be due to the proposed project.

More rapid runoff from disturbed and compacted soils might have some effect on flows within Fletcher Gulch and its 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 potential impacts on water quality is provided in the *Surface and Ground Water Quality*

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. However, there are no plans for this currently and any proposed conversion would have to be analyzed and approved by the BLM.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Hydrology and Water Rights was reviewed for conformance with BLM WRFO Standard COAs. As noted in mitigation measure number one below, neither ACM applies.

Cumulative Effects: The Proposed Action may contribute incrementally to cumulative effects to springs within a one-mile radius of the project area, although these are expected to be detectable only at one spring allocated for livestock use. According to the *Stream Depletion Analysis* (WWL 2009, 2010), the Proposed Action would not measurably affect the White River alluvial aquifer, and therefore would not contribute to cumulative effects to the drinking water supply of the Town of Rangely. Detectable effects to the Spring Creek alluvial aquifer may occur, but are not expected to affect downstream hydrology in the White River. The Proposed Action would not contribute to cumulative effects to the White River floodplain given the six-mile distance to the floodplain from the maximum limits of disturbance.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: The No Action Alternative would not affect floodplains, hydrology, or water rights in the project area.

Cumulative Effects: The No Action Alternative would not contribute to effects to floodplains, hydrology, or water rights in the project area.

Mitigation: The following mitigation measures are required:

1) Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA) Hydrology and Water Rights was reviewed. None of the ACMs apply:
   - Applicant Committed Measure number one, the requirement has been submitted in the Surface Use Plans of the APDs, therefore Genesis is not required to submit additional information under this ACM unless changes occur.
   - Applicant Committed Measure number two is not current and has been replaced by Floodplains, Hydrology, and Water Rights mitigation measure number two below, therefore Genesis must not follow this ACM.

2) The operator will monitor BLM Spring 149-12 by doing a Spring Survey in the spring of 2014 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 2013 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, 2014. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

REALTY AUTHORIZATIONS

Affected Environment: Nine of the proposed 13 wells in this Proposed Action are on the Calamity Ridge Unit II (COC-074676X) and four are on the Fletcher Gulch Shallow Unit (COC-068958X). The bulk of well pad 14-24 would be on fee land, with a small portion on split estate. Roughly half of the access road to that well is on Federal land, and half is on fee land. Genesis has an existing agreement with the private landowner that would authorize construction of the pad and road for the 14-24 location (*Wyatt ROW and Surface Use Agreement*).

Gathering lines for natural gas and produced water would be installed within the 50-foot ROW for the proposed roads (see Appendix A, Figure 2). Where proposed roads meet existing roads, the gathering lines would join the existing approved gathering system that follows the main service road. Natural gas gathering lines for all proposed wells would run to the existing compressor station on the Fletcher Gulch Shallow Unit. Right-of-way has not yet been issued for the existing gathering pipelines that follow the main service road from the existing well 14-15C to the compressor station. Produced water from the 13 wells would be run to the existing approved FGSU 3-31 injection well. Right-of-way authorization for use of this injection well as a multi-unit facility is in process.

Existing ROWs within the legal description of the Proposed Action are shown in Table 29. Additional ROWs have been authorized for existing access from RBC 122 to the boundaries of the two units.

Table 29. Existing ROWS in the Project Area

Case File	Holder	Authorized Use	Acres Encumbered
COC-67978	Encana Oil & Gas (USA) Inc.	ROW-Roads, Non-energy Facilities	9.450
COC-70201	Genesis Gas & Oil Colorado LLC	ROW-Roads, Non-energy Facilities	16.600
COC-70781	Genesis Gas & Oil Colorado LLC	ROW-O&G Pipelines, O&G Facilities	17.750
COC-74192	Genesis Gas & Oil Colorado LLC	ROW-Water Facility, Non-energy Facilities	0.744
COC-75169	Laramie Energy II LLC	ROW-Roads, O&G Facilities	24.250
COC-15820	BLM White River Field Office	ROW-Roads Fed 44LD513, Non-energy Facilities	40.000

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: The off-unit portions of the access road, water line, and natural gas pipeline will require ROWs. Gas and water gathering lines for the proposed FG 2-11, FG 34-22, FG 34-33, and FG 34-44 would cross the Calamity Ridge Unit II as they follow the

proposed road from Yanks Gulch south to the existing main service road. Gathering lines for all proposed wells on the Calamity Ridge Unit II would cross onto the Fletcher Gulch Shallow Unit to access the injection well and compressor station. The Colorado State Highway Department, Rio Blanco County, or other state or local entities may require permits for entrance locations or for facility permits.

Cumulative Effects: As the number of ROW holders in the project area increases, so would competition for suitable locations for facilities. Increased ROW densities would also lead to a higher probability of conflict between ROW users.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Failure to authorize the proposed project would not result in any increased impacts to realty authorizations in the area.

Cumulative Effects: There would not be any cumulative effects from not authorizing the proposed project.

Mitigation: The following mitigation measures are required:

1) All activities shall comply with all applicable local, State, and Federal laws, statutes, regulations, standards, and implementation plans. This includes acquiring all required State and/or local permits, effectively coordinating with existing facility ROW holders, and implementing all applicable mitigation measures required by each permit.

2) The holder shall conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW.

3) Accurate as-builts will be submitted to WRFO in accordance with provisions in ACM Post-Construction Notifications number one.

4) At least 90 days prior to termination of the ROW, the holder shall contact the AO to arrange a joint inspection of the ROW. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan shall include, but is not limited to, removal of facilities, drainage structures, of surface material; recontouring, topsoiling, or seeding. The AO must approve the plan in writing prior to the holder's commencement of any termination activities.

RECREATION

Affected Environment: Recreational use of the Proposed Action area is primarily confined to big game hunting during the fall seasons. The project area is in Game Management Unit 22. No evidence of camping, hiking, or horseback riding has been seen by field survey crews, although these activities may occur at a low level in the project area. The Proposed Action would occur 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 (BLM 1996b). 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:

Direct and Indirect Effects: The construction of pads, access roads, and pipelines would result in disturbance to approximately 47.1 acres of vegetation (see Table 13, above). Clearing, construction, and operation of facilities would be expected to result in some loss of dispersed recreation potential due to noise and visual impacts. The experience of hunters in the area could be negatively impacted if construction and drilling activities occur during big game hunting seasons (mid-August through December). The recreational hunting experience may also be negatively affected if project activities displace big game away from the area (see *Terrestrial Wildlife*).

The Proposed Action would alter the landscape and viewsheds in the area of the Proposed Action. The intensity of these visual impacts would be moderate and long-term when viewed from BLM 1100 and RBC 122 (see *Visual Resources*). After interim reclamation, the reclaimed portions of pads and roads would most likely still have very low recreation potential for many users, given the noise and visual impact of the producing wells. The loss of recreation potential following final reclamation is expected to be low and long-term given the time required for pinyon-juniper woodland and mountain shrubland communities to return to their current age and size structure (see *Vegetation*).

Cumulative Effects: Oil and gas exploration and development is the main potential source of adverse effects to the recreational potential of the project area. The proposed project would contribute incrementally to cumulative effects to big game hunters and other recreationists in the Fletcher Gulch Watershed. On the one hand, the increase in road density would likely broaden opportunities for use of the area by recreationists. On the other hand, noise and visual impacts may discourage recreational use of the area due to noise, visual impacts, and potential displacement of big game. The Genesis field in the Fletcher Gulch Shallow and Calamity Ridge II Units currently hosts 16 wells. Twenty-two additional wells have been approved, and Genesis is currently seeking approval of 13 more, with associated new access roads. Further development of these units is still hypothetical and would depend upon the currently operational and approved wells proving themselves. As a whole, the Fletcher Gulch Watershed is lightly developed; although proposed development may discourage use of the local area by big game hunters or other recreationists, other opportunities for these activities would be available in the watershed.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: Under the No Action Alternative, there would be no activities that would redirect recreational use in the area.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to recreational use in the area.

Mitigation: None

ACCESS AND TRANSPORTATION

Affected Environment: Rio Blanco County Road 122 and BLM 1100 are the main access roads into the project area. Access to the proposed project area would require travel along approximately 8.4 miles of RBC 122 and an additional 2.5 miles of BLM 1100. Just after the turnoff to proposed well 14-24, BLM 1100 diverges northeast overland and an existing service road continues into the Calamity Ridge II and Fletcher Gulch Shallow Units. Road density in the Genesis field prior to field development was approximately 3.0 miles per square mile. Based on that baseline estimate, current field development has brought road density to 4.1 miles per square mile (see *Terrestrial Wildlife*).

Environmental Consequences of the Proposed Action:

Direct and Indirect Effects: A total of 3.8 miles of access road would be constructed, 2.4 miles of which would be along existing little used two-tracks. Six of the proposed wells (2-21, 2-32, 2-33, 2-41, 2-43, and 14-22) would be directly adjacent to or within 0.3 miles of the existing main service road, minimizing the construction of new spur roads. Construction of the proposed roads would bring road density to approximately 4.4 miles per square mile (see *Terrestrial Wildlife*).

An increase in traffic along RBC 122 and BLM 1100 would be expected during the life of the 13 wells, with increases concentrated during construction, drilling, and completion. Traffic load summary statistics for the Proposed Action are provided in Table 8, above. Attendant impacts to air quality, wildlife, and wild horses are expected to be low to moderate and short-term (see sections on *Air Quality, Terrestrial Wildlife, Migratory Birds,* and *Wild Horses*). During the production period, these same types of impacts would be expected to be low and long-term given the less concentrated traffic and decreased use of heavy equipment. Impacts to native plant communities from the transport of noxious weeds are expected to be moderate and long-term (see *Invasive, Non-native Species*).

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures of this document (DOI-BLM-CO-110-2012-0041-EA), Access and Transportation was reviewed for conformance with BLM WRFO Standard COAs. The ACM listed in Appendix C does not apply.

Cumulative Effects: The Proposed Action would add 3.8 miles to the existing road network in the project area. The resulting increase in road density will likely increase public access into previously roadless areas, contributing incrementally to cumulative effects from recreation in the area. An increase in oil and gas traffic volume will contribute incrementally to cumulative effects to air quality, use of the area by game and non-game animal species, and may increase the transport of noxious weeds to and from the area with ensuing effects on native plant communities.

Environmental Consequences of the No Action Alternative:

Direct and Indirect Effects: No change to access and transportation opportunities in the Proposed Action area would occur as a result of the No Action Alternative.

Cumulative Effects: The No Action Alternative would not contribute to cumulative effects to access and transportation in the Proposed Action area.

Mitigation: None

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TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED:

INTERDISCIPLINARY REVIEW:

BIO-Logic, Inc., an environmental consulting firm, with the guidance, participation, and independent evaluation of the 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.

Name	Title	Area of Responsibility	Final Review
Bob Lange	Hydrologist	Air Quality; Surface and Ground Water Quality; Floodplains, Hydrology, and Water Rights; Soils	8/8/2012
Zoe Miller	Ecologist	Areas of Critical Environmental Concern;	8/22/2012

Name	Title	Area of Responsibility	Final Review
		Special Status Plant Species	
Michael Selle	Archaeologist	Cultural Resources; Native American Religious Concerns; Paleontological Resources	8/23/2012
Tyrell Turner	Rangeland Management Specialist	Invasive, Non-Native Species; Vegetation; Rangeland Management;	8/20/2012
Ed Hollowed	Wildlife Biologist	Migratory Birds; Special Status Animal Species; Terrestrial and Aquatic Wildlife; Wetlands and Riparian Zones	8/22/2012
Jay Johnson	Natural Resource Specialist	Hazardous or Solid Wastes	11/21/2012
Chad Schneckenburger	Outdoor Recreation Planner	Wilderness; Visual Resources; Access and Transportation; Recreation; Scenic Byways	8/22/2012
Zoe Miller	Ecologist	Forest Management	8/22/2012
Kyle Frary	Fuels Specialist	Fire Management	
Paul Daggett	Mining Engineer	Geology and Minerals	8/22/2012
Janet Doll	Realty Specialist	Realty	8/13/2012
Melissa J. Kindall	Range Technician	Wild Horse Management	8/6/2012
Jay Johnson	Natural Resource Specialist	Project Lead – Document Preparer	1/30/2013
Paul Kelley	Supervisory Natural Resources Specialist	Realty, Lands, Minerals section supervisor	2/19/2013

Contractor				
Name	**Title**	**Area of Responsibility**	**Initial Draft**	**Final Draft**
Jim Le Fevre	Wildlife Biologist, BIO-Logic	Raptor Surveys	2/6/2012	7/24/2012
Bruce Smith	Hydrologist, Western Water & Land	Stream Depletion Analysis	2/6/2012	2/6/2012
Kae McDonald	Archaeologist, Flattops Archaeology	Cultural Resource Surveys	2/6/2012	2/6/2012
Alison Graff	Plant Ecologist, BIO-Logic	Document Preparer; Rare Plant and Weed Surveys	2/6/2012	7/24/2012
Steve Boyle	Wildlife Biologist, BIO-Logic	Technical Reviewer	2/6/2012	7/24/2012

ATTACHMENTS

Appendix A:

- Figure 1 - Project Location and Vicinity Map
- Figure 2 - Existing, Approved, and Proposed Locations of Wells, Pipelines, and Roads
- Figure 3 - Surface and Minerals Ownership
- Figure 4 - Sensitive Soils in the Project Area
- Figure 5 - Water Wells and Diversions within a One-mile Radius
- Figure 6 - Geologic Outcrops Relevant to Water Depletions
- Figure 7 - Dudley Bluffs Twinpod Occupied and Suitable Habitat in the Project Area
- Figure 8a - Debris Milkvetch Occupied and Suitable Habitat in the Northern Project Area
- Figure 8b - Debris Milkvetch Occupied and Suitable Habitat in the Southern Project Area

Appendix B - WATER QUALITY DATA FROM THE GENESIS FIELD

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures

APPENDIX A – FIGURES

Figure 1 - Project Location and Vicinity Map

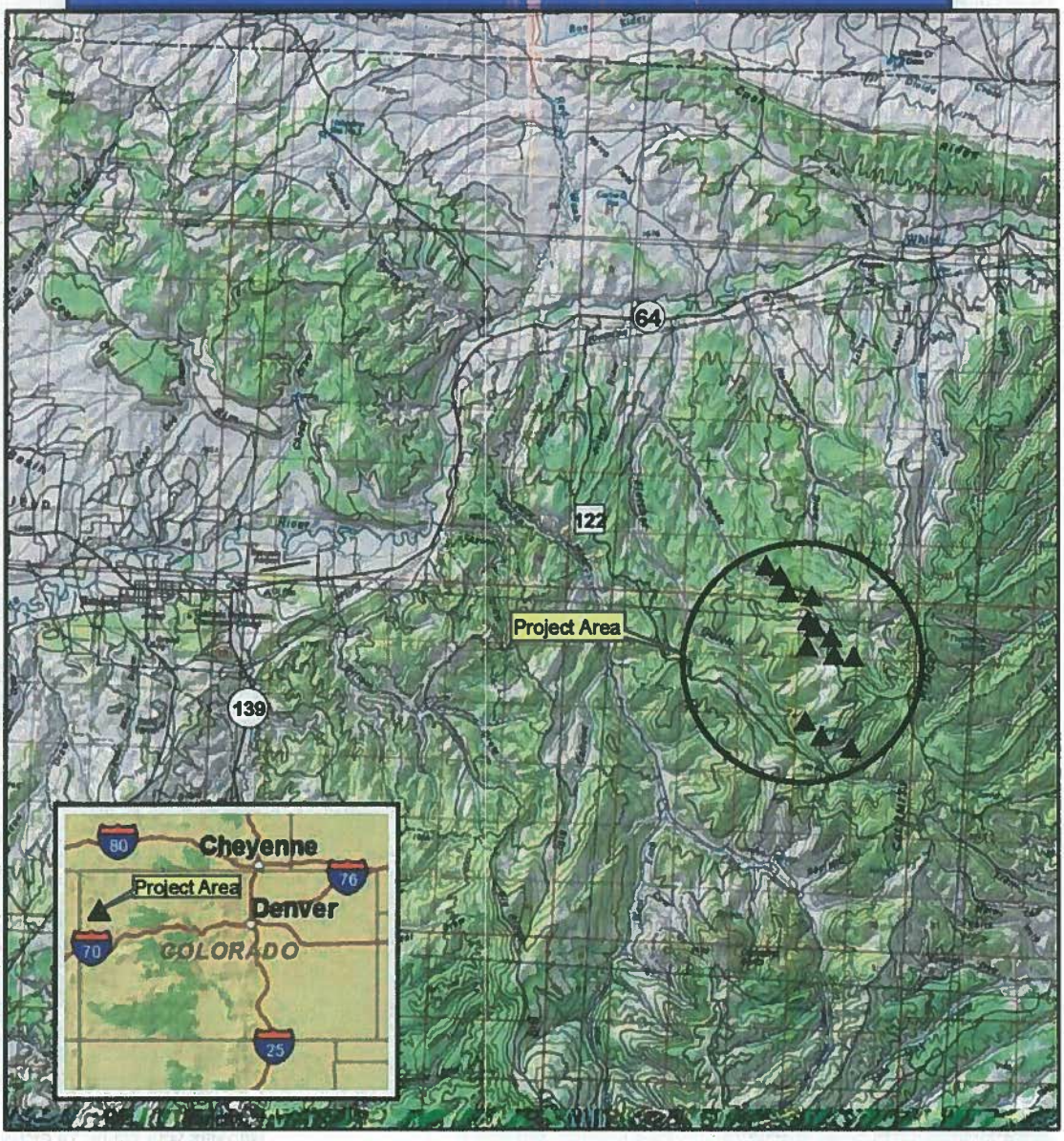

Figure 1
Genesis Gas Wells: 13 APDs
Project Location and Vicinity Map

Legend

▲ **Proposed Wells**

July 23, 2012

N
1:151,500
1 inch = 12,625 feet

0 2.5 5 Miles

Basemap Source: NGS Topographic Map

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(970) 240-4374
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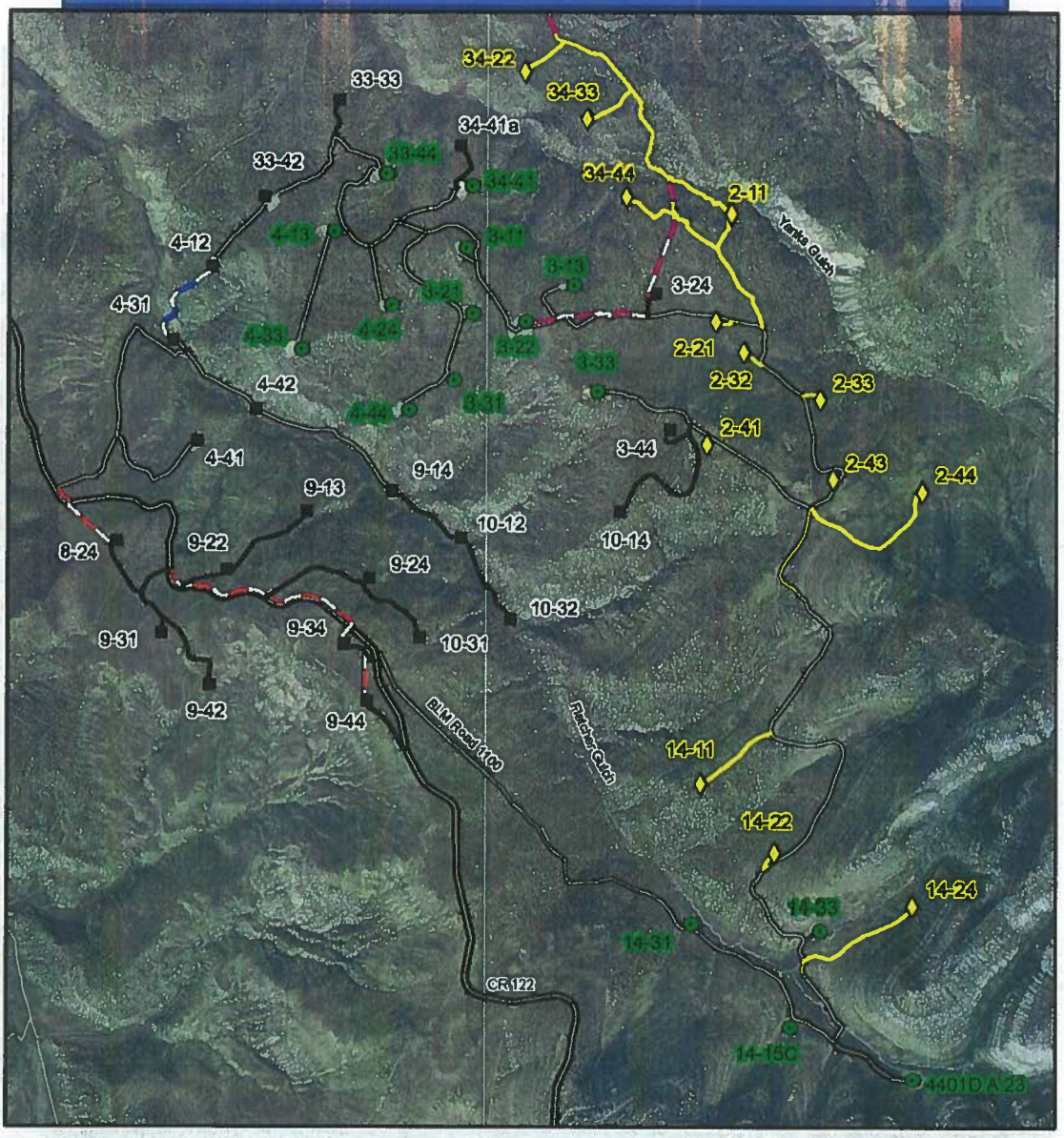
Figure 2 - Existing, Approved, and Proposed Locations of Wells, Pipelines, and Roads



Legend

- Proposed Wells
- Proposed Roads
- Approved Wells
- Approved Roads
- Existing Wells
- Existing Road
- Approved Overland Gathering Lines
- Existing Overland Gathering Lines
- Existing Distribution Line

Gathering lines for gas and produced water follow all roads; only overland pipelines are shown on the map.

0 0.5 1 Miles

N

1:33,000
1 inch = 2,750 feet

Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 aerial

Figure 2
Genesis Gas Wells: 13 APDs
Existing, Approved, and Proposed Locations of Wells, Pipelines, and Roads

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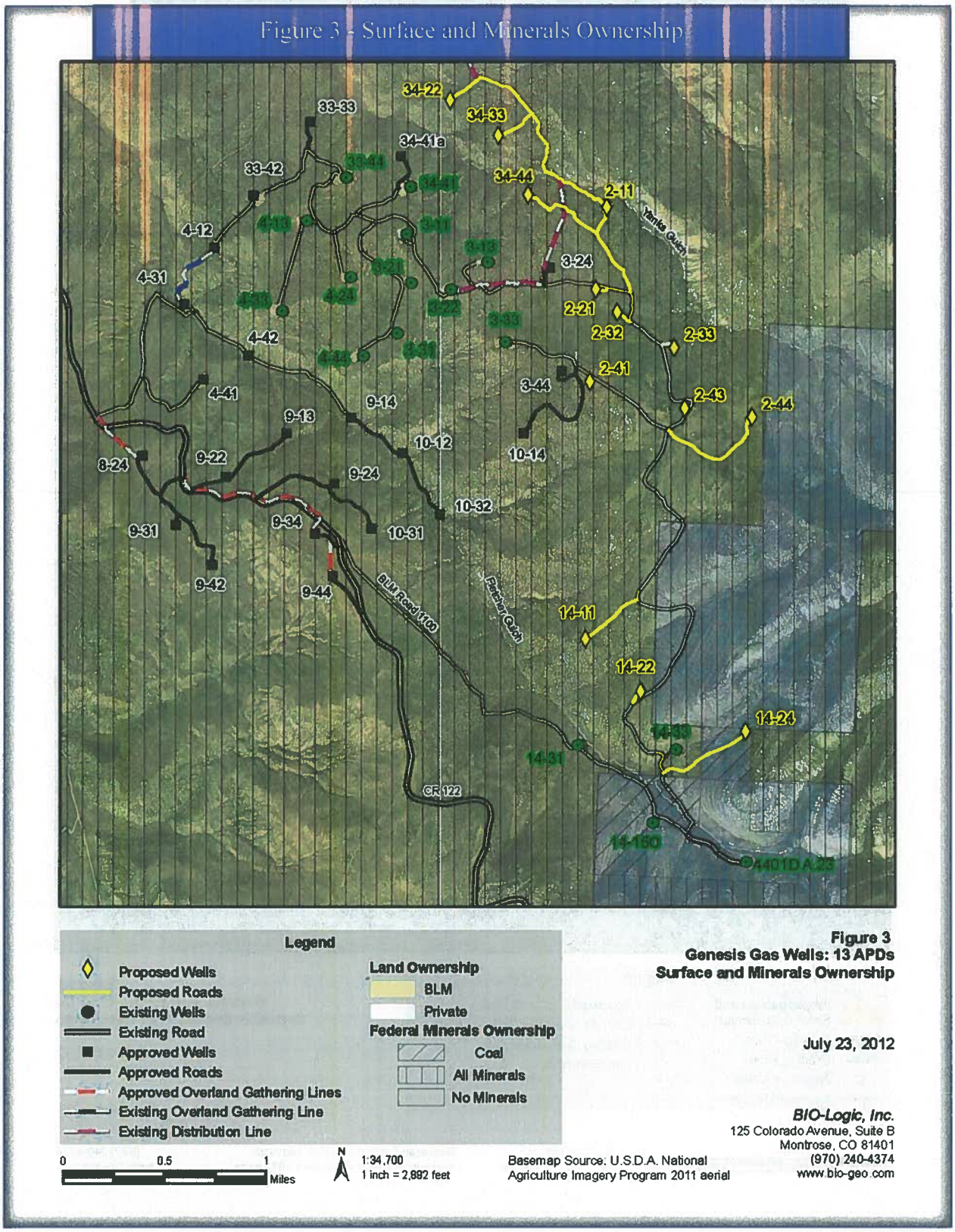
Figure 3 - Surface and Minerals Ownership
34-22
33-33
34-41a
34-33
33-42
34-44
2-11
4-12
4-13
3-11
3-13
3-24
4-31
3-21
4-24
3-22
2-21
2-32
2-33
4-42
3-31
3-33
2-41
4-41
9-14
3-44
2-43
2-44
9-13
10-12
10-14
8-24
9-22
9-24
10-32
9-31
9-34
10-31
9-42
9-44
BLM Road 1100
Parachute Gulch
14-11
14-22
14-24
14-31
CR 122
14-15O
Legend
Proposed Wells
Proposed Roads
Existing Wells
Existing Road
Approved Wells
Approved Roads
Approved Overland Gathering Lines
Existing Overland Gathering Line
Existing Distribution Line
Land Ownership
BLM
Private
Federal Minerals Ownership
Coal
All Minerals
No Minerals
0
0.5
1
Miles
N
1:34,700
1 inch = 2,892 feet
Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 aerial
Figure 3
Genesis Gas Wells: 13 APDs
Surface and Minerals Ownership
July 23, 2012
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Montrose, CO 81401
(970) 240-4374
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Figure 4 - Sensitive Soils in the Project Area

Legend

- Proposed Pad and Road Disturbance
- Existing Wells
- Existing Road
- Approved Wells
- Approved Roads
- Approved Overland Gathering Lines
- Existing Overland Gathering Lines
- Existing Distribution Line
- Sensitive Soils

0 0.5 1 Miles

N

1:33,100
1 inch = 2,758 feet

Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 aerial

Figure 4
Genesis Gas Wells: 13 APDs
Sensitive Soils in the Project Area

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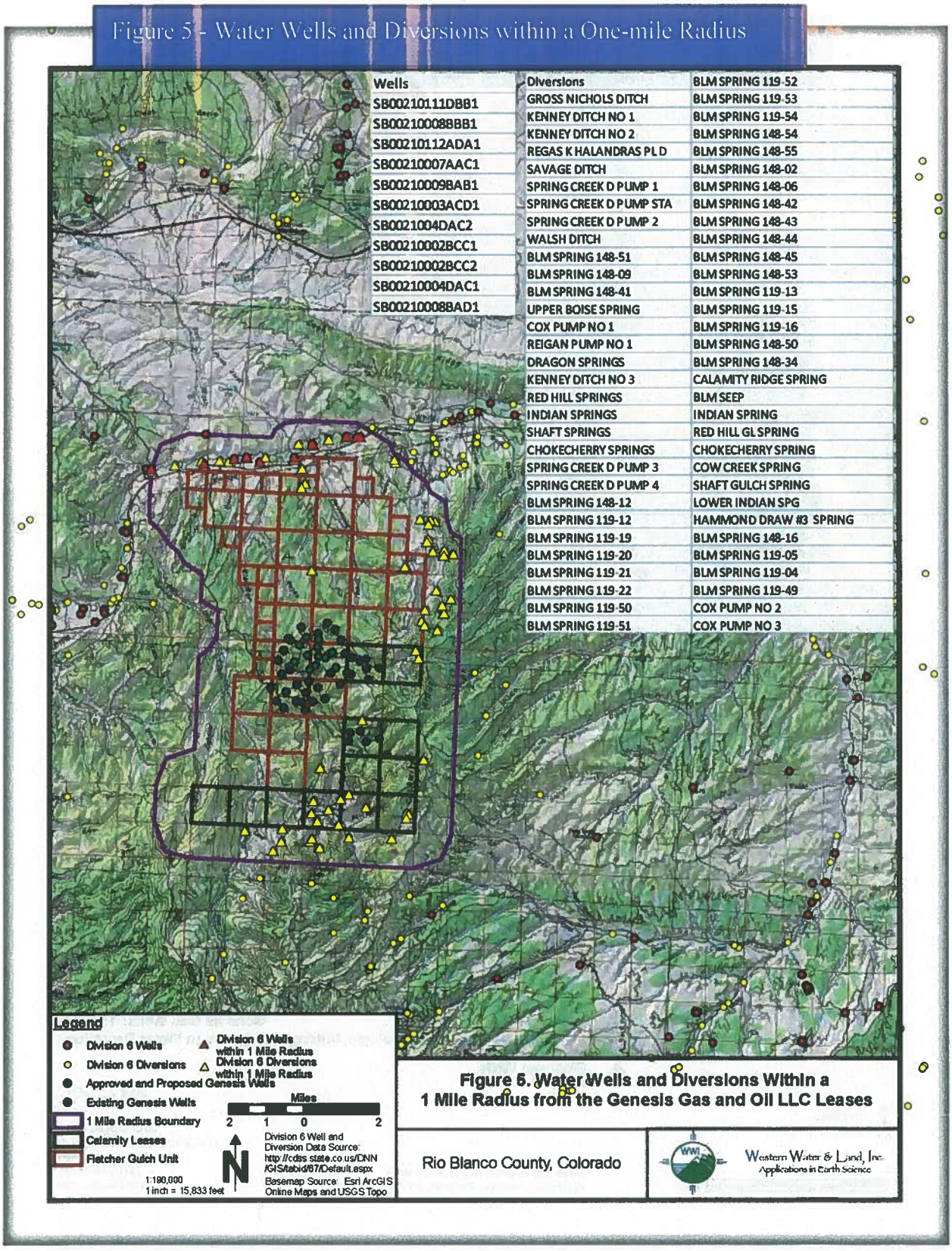
Figure 5 - Water Wells and Diversions within a One-mile Radius
Wells
SB00210111DBB1
SB00210008BBB1
SB00210112ADA1
SB00210007AAC1
SB00210009BAB1
SB00210003ACD1
SB00210004DAC2
SB00210002BCC1
SB00210002BCC2
SB00210004DAC1
SB00210008BAD1
Diversions
GROSS NICHOLS DITCH
KENNEY DITCH NO 1
KENNEY DITCH NO 2
REGAS K HALANDRAS PL D
SAVAGE DITCH
SPRING CREEK D PUMP 1
SPRING CREEK D PUMP STA
SPRING CREEK D PUMP 2
WALSH DITCH
BLM SPRING 148-51
BLM SPRING 148-09
BLM SPRING 148-41
UPPER BOISE SPRING
COX PUMP NO 1
REIGAN PUMP NO 1
DRAGON SPRINGS
KENNEY DITCH NO 3
RED HILL SPRINGS
INDIAN SPRINGS
SHAFT SPRINGS
CHOKECHERRY SPRINGS
SPRING CREEK D PUMP 3
SPRING CREEK D PUMP 4
BLM SPRING 148-12
BLM SPRING 119-12
BLM SPRING 119-19
BLM SPRING 119-20
BLM SPRING 119-21
BLM SPRING 119-22
BLM SPRING 119-50
BLM SPRING 119-51
BLM SPRING 119-52
BLM SPRING 119-53
BLM SPRING 119-54
BLM SPRING 148-54
BLM SPRING 148-55
BLM SPRING 148-02
BLM SPRING 148-06
BLM SPRING 148-42
BLM SPRING 148-43
BLM SPRING 148-44
BLM SPRING 148-45
BLM SPRING 148-53
BLM SPRING 119-13
BLM SPRING 119-15
BLM SPRING 119-16
BLM SPRING 148-50
BLM SPRING 148-34
CALAMITY RIDGE SPRING
BLM SEEP
INDIAN SPRING
RED HILL GL SPRING
CHOKECHERRY SPRING
COW CREEK SPRING
SHAFT GULCH SPRING
LOWER INDIAN SPG
HAMMOND DRAW #3 SPRING
BLM SPRING 148-16
BLM SPRING 119-05
BLM SPRING 119-04
BLM SPRING 119-49
COX PUMP NO 2
COX PUMP NO 3
Legend
Division 6 Wells
Division 6 Diversions
Approved and Proposed Genesis Wells
Existing Genesis Wells
1 Mile Radius Boundary
Calamity Leases
Fletcher Gulch Unit
Division 6 Wells within 1 Mile Radius
Division 6 Diversions within 1 Mile Radius
Miles
2 1 0 2
1:190,000
1 inch = 15,833 feet
N
Division 6 Well and Diversion Data Source: http://cdss.state.co.us/DNN/GIS/tabid/67/Default.aspx
Basemap Source: Esri ArcGIS Online Maps and USGS Topo
Figure 5. Water Wells and Diversions Within a 1 Mile Radius from the Genesis Gas and Oil LLC Leases
Rio Blanco County, Colorado
Western Water & Land, Inc.
Applications in Earth Science

Figure 6 - Geologic Outcrops Relevant to Water Depletions

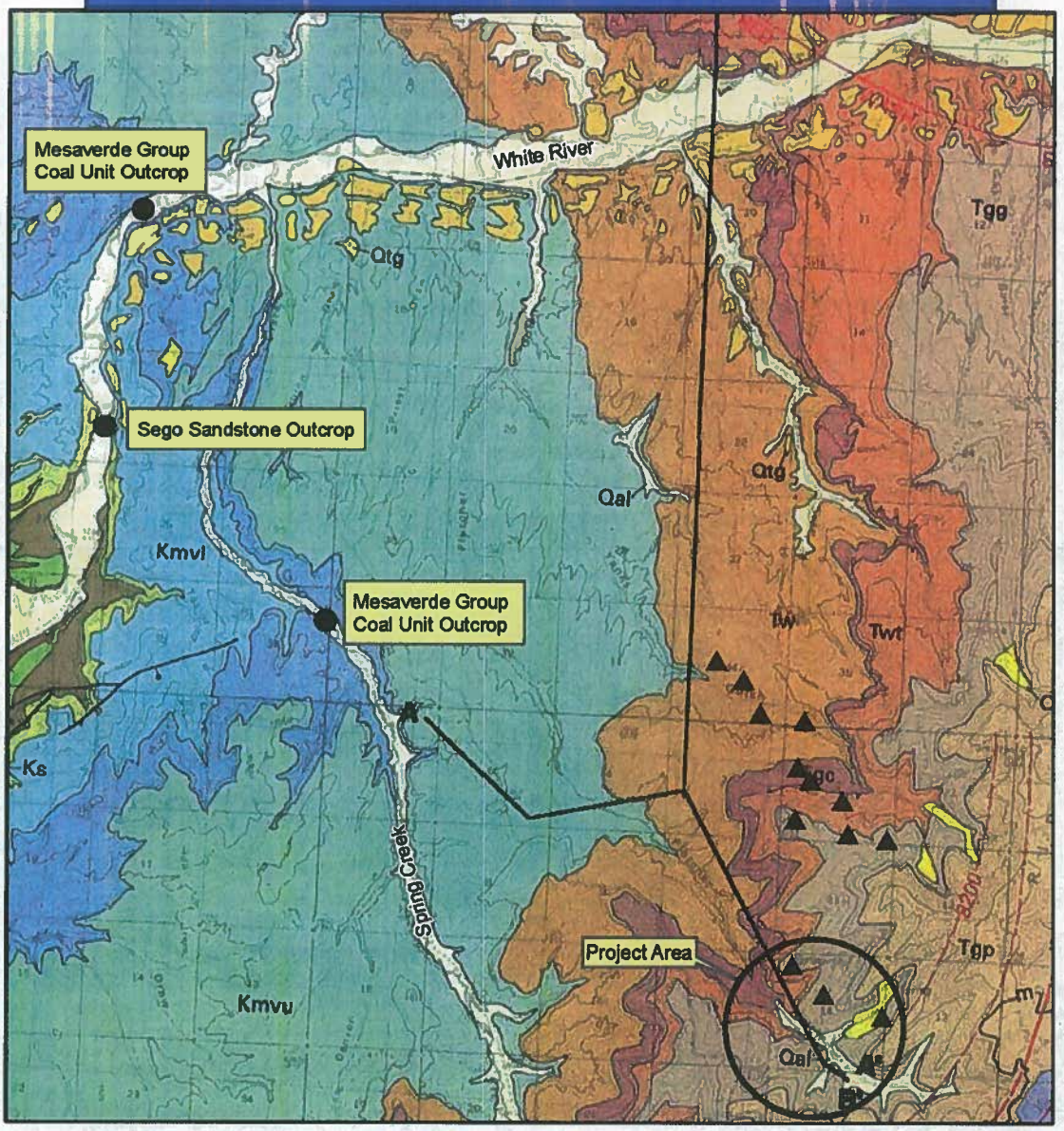

Figure 6
Genesis Gas Wells: 13 APDs
Geologic Outcrops Relevant to Water Depletions

Legend

▲ Proposed Wells

July 23, 2012

N
1:77,000
1 inch = 6,417 feet

0 2 Miles

Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 Aerial

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Figure 7 - Dudley Bluffs Twinpod Occupied and Suitable Habitat in the Project Area

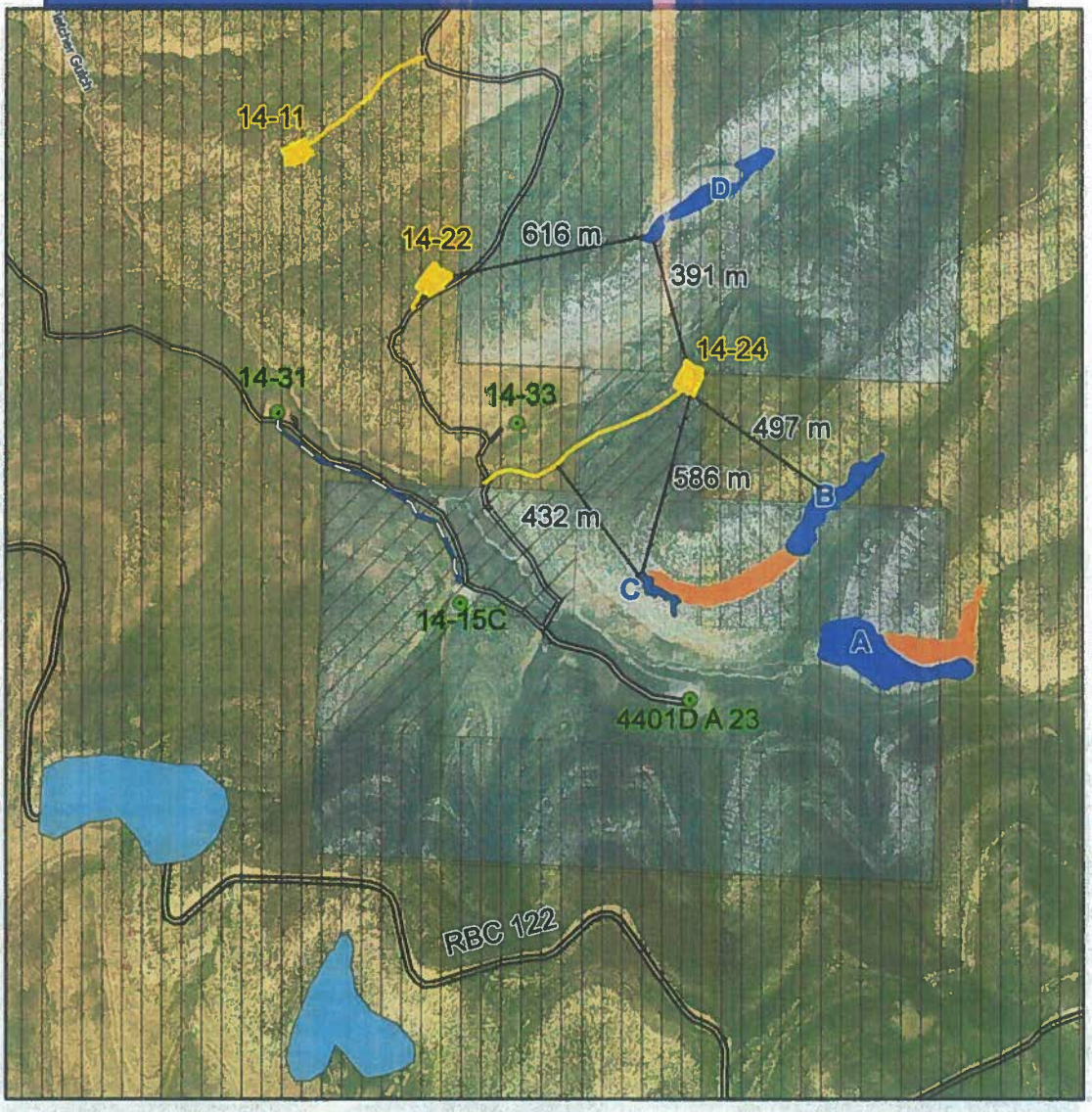

Figure 7
Genesis Gas Wells: 13 APDs
Dudley Bluffs Twinpod Occupied and Suitable Habitat

July 23, 2012

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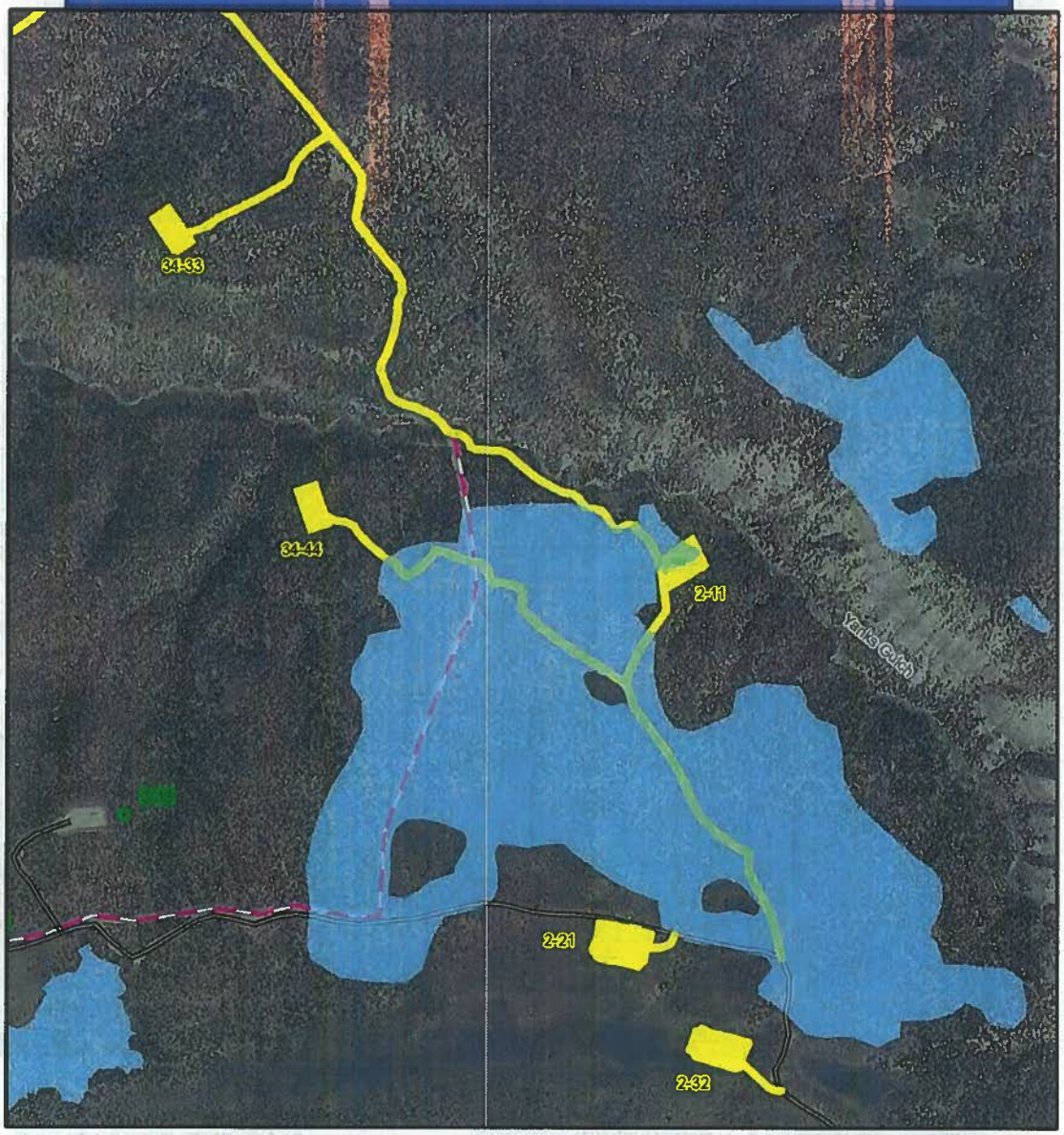
Figure 8a - Debris Milkvetch Occupied and Suitable Habitat in the Northern Project Area



Legend

- Proposed Pad and Road Disturbance
- Existing Wells
- Existing Roads
- Existing Distribution Line
- Debris Milkvetch Occupied Habitat
- Debris Milkvetch Suitable Habitat

N

1:9,500
1 inch = 792 feet

0 0.25 0.5 Miles

Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 aerial

Figure 8a
Genesis Gas Wells: 13 APDs
Debris Milkvetch Occupied and Suitable Habitat in the Northern Project Area

July 23, 2012

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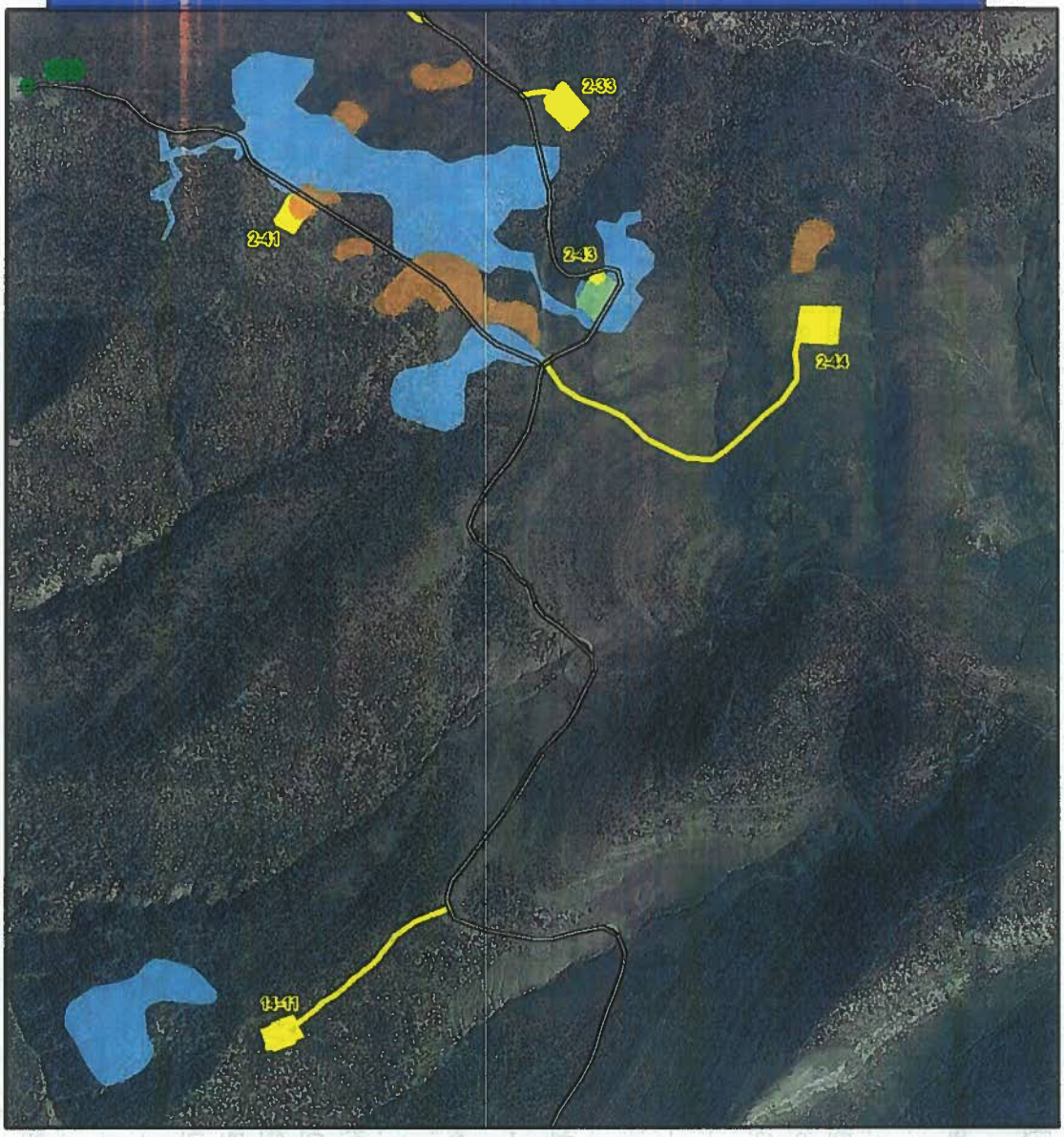
Figure 8b - Debris Milkvetch Occupied and Suitable Habitat in the Southern Project Area



Legend

- Proposed Pad and Road Disturbance
- Existing Wells
- Existing Roads
- Debris Milkvetch Occupied Habitat
- Debris Milkvetch Suitable Habitat

N

1:13,700
1 inch = 1,142 feet

0 0.25 0.5 Miles

Basemap Source: U.S.D.A. National Agriculture Imagery Program 2011 aerial

Figure 8b
Genesis Gas Wells: 13 APDs
Debris Milkvetch Occupied and Suitable Habitat in the Southern Project Area

July 23, 2012

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APPENDIX B - WATER QUALITY DATA FROM THE GENESIS FIELD

Recent water analyses from the producing coal seams

Well Number	3-11	3-22	3-31	4-13	4-24	4-33	4-44	34-41	34-41	Average	Maximum
Date	8/20/2009	8/20/2009	8/20/2009	8/20/2009	8/20/2009	4/20/2010	8/20/2009	8/20/2009	4/20/2010		
Chlorides (mg/l)	10,635	14,570	12,727	12,351	4,626	4,970	3,471	11,769	13,845	9,885	14,570
Bicarbonates (mg/l)	10,980	9,516	11,102	9,516	10,248	5,978	9,699	10,553	5,978	9,286	11,102
Sulfates (mg/l)	75	52	52	90	50	0	50	55	375	89	375
Iron (mg/l)	3	4	3	2	5	2	4	3	2	3	5
Magnesium (mg/l)	24	49	49	49	49	48	24	49	48	43	49
Calcium (mg/l)	0	0	0	0	0	80	0	0	80	18	80
TDS (mg/l)	21,717	24,191	23,932	22,007	14,978	17,008	13,248	22,429	31,731	21,249	31,731
pH	8	8	9	8	9	8	8	9	8	8	9

Recent water analysis from the injection zone in the Sego sands

Well Number	3-31 WD	3-31 WD	Average
Date	9/26/2008	9/26/2008	
Chlorides (mg/l)	12,408	11,309	11,859
Bicarbonates (mg/l)	3,904	3,904	3,904
Sulfates (mg/l)	5,000	5,000	5,000
Iron (mg/l)	6	10	8
Magnesium (mg/l)	0	0	0
Calcium (mg/l)	80	80	80
TDS (mg/l)	21,392	20,293	20,843
pH	7	8	7

Source: Genesis Gas & Oil Colorado, LLC

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures

Applicant Committed Mitigation:

Timing Limitations

1) The operator shall apply proper pre-planning and plan all activities and operations in a manner so as to avoid infringing on any timing limitations; without the need to apply for exceptions to the specified timing limitations.

Pre-Construction Activities and Notifications

1) The designated Natural Resource Specialist 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.

Post-Construction Notifications

1) In an attempt to track interim and final reclamation of federal actions related to the development of federal mineral resources, the operator shall provide the designated Natural Resource Specialist with geospatial data in a format compatible with the WRFO's ESRI ArcGIS Geographic Information System (GIS); GIS point and polygon features. These data will be used to accurately locate and identify all geographic as-built (i.e., constructed and design implemented) features associated with this project and included in the Application for Permit to Drill (APD) or Sundry Notice (SN), as appropriate.
   - These data shall be submitted within 60 days of construction completion. If the operator is unable to submit the required information within the specified time period, the operator shall notify the designated Natural Resource Specialist via email or by phone, and provide justification supporting an extension of the required data submission time period.
   - GIS polygon features may include, but are not limited to; full well pad footprints (including all stormwater and design features), constructed access roads/widths, existing roads that were upgraded/widths, and pipeline corridors.
   - Acceptable data formats are: (1) corrected global positioning system (GPS) files with sub-meter accuracy or better; (2) ESRI shapefiles or geodatabases; or, (3) AutoCAD .dwg or .dxf files. If possible, both (2) and (3) should be submitted for each as-build feature. Geospatial data must be submitted in UTM Zone 13N, NAD 83, in units of meters. Data may be submitted as: (1) an email attachment; or (2) on a standard compact disk (CD) in compressed (WinZip only), or uncompressed format. All data shall include metadata, for each submitted layer, that conforms to the Content Standards for Digital Geospatial Metadata from the Federal Geographic Data Committee standards. Questions shall be directed to WRFO BLM GIS staff at (970) 878-3800.

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
Attn: Natural Resource Specialist
220 East Market Street
Meeker, Colorado 81641

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.

2) If for any reason the location or orientation of the geographic feature associated with the proposed action changes, the operator shall submit updated GIS "As-Built" data to designated Natural Resource Specialist within 7 calendar days of the change. This information shall be submitted via Sundry Notice.

Pre & Post-Drilling Notifications

1) The designated Natural Resource Specialist will be notified 24 hours prior to well spud (Breaking ground for drilling surface casing) via email or phone.

2) The designated Natural Resource Specialist will be notified 24 hours prior to commencing Completion operations via email or phone.

Pre-Reclamation Notification

1) The designated Natural Resource Specialist 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, seed bed preparation that requires disturbance of surface soils, seeding, constructing exclosures (e.g., fences) to exclude livestock from reclaimed areas.

Air Quality

1) All access roads will be maintained according to BLM Manual Section 9113 standards for road shape and drainage features at all times during pad construction, drilling, and production.

2) 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 or 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

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

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) If erosion features such as rilling, gullying, piping, and mass wasting occur at anytime in the future on disturbed surfaces, the erosion features will be addressed immediately after observation by contacting the AO submitting and implementing a plan to assure successful soil stabilization with BMPs to address the erosion problems.

Wastes, Hazardous or Solid

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 13 wells, regardless if additional wells were planned for these pads. See also applicant committed 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 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 designated Natural Resource Specialist.

Water Quality, Surface and Ground

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) 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.

4) 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.

5) 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.

6) 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.

7) Access roads should be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features. Culverts and waterbars should be installed according to 9113 standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.

8) 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.

9) The operator will 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.

10) To mitigate project-related soil erosion and increased surface runoff to nearby surface waters, it is recommended that all reserve pits be closed and pads recountoured 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.

11) 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.

12) Construction and drilling activities will not occur between December 1st and May 1st without prior approval from the AO to avoid travel in times of saturated soils.

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 twentyfour (24) mm 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 spoils 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. New construction will require a Sundry Notice.

Wetlands and Riparian Zones

1) Riparian and wetland areas disturbed by construction must be seeded or planted with species adapted to the specific riparian site as directed by the AO. This must occur during the first fall following disturbance, unless otherwise authorized by the WRFO.

Vegetation

1) Genesis will clear the minimum vegetation necessary for construction of the proposed facilities.

2) Trees or shrubs that must be removed for construction or ROW preparation shall be cut down or masticated 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. It is recommended to chip the smaller limbs and trees and incorporate that debris into the topsoil; the boles and limbs of the larger trees should be retained for redistribution not to exceed 20% total ground cover.

3) Stripped topsoil and vegetation shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed.

4) Genesis shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes planned for use in reclamation are provided in Table 4 and are based on the ecological site defined by the soil MUs within the project area.

5) Livestock will be excluded from reclaimed areas (as required by BLM) until successful reclamation is achieved. These decisions will be made by the BLM on a case-by-case basis. Fences, cattle guards, and gates (all built to BLM specifications per BLM manual H-1741-1) will be installed, maintained, and removed by the operator upon approval by the WRFO BLM. BLM specifications for cattle fencing provided in Chapter 4 of H-1741-1 are as follows: "H. Domestic Livestock Fence: Fencing is commonly used to control domestic livestock to achieve safety and vegetation management objectives. The standard BLM fence design for control of cattle only, consists of a four-wire (barbed) fence with 42-inch top height and wire spacings of 16, 6, 8, and 12 inches." In specific and predetermined instances, livestock exclosures may be retained for extended periods to meet other resource objectives.

6) Seeding shall occur between September 1 and March 31, as approved by the BLM.

7) All seed tags will be submitted to the designated Natural Resource Specialist 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 SN 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.

Table 4. Native seed mixes appropriate for reclamation efforts at well sites

Well	Seed Mix	Species	Lbs/Acre
2-21, 2-22, 2-34, 14-24, 14-33	1	Western Wheatgrass (Arriba) (*Pascopyrum smithii*)	4.5
		Thickspike Wheatgrass (Critana) (*Elymus lanceolatus* ssp. lanceolatus)	3.5
		Bottlebrush Squirreltail (Toe Jam Creek) (*Elymus elymoides*)	3
		Scarlet Globemallow (*Sphaeralcea coccinea*)	0.5
		Annual Sunflower (Helianthus annus)	3
		Winterfat (*Krascheninnikovia lanata*)	1
2-23, 2-32, 2-41, 2-43, 13-41, 14-21, 14-22	3	Western Wheatgrass (Rosanna) (*Pascopyrum smithii*)	4
		Bluebunch Wheatgrass (Whitmar) (*Pseudoroegneria spicata* ssp. *Inermis*)	3.5
		Indian Ricegrass (Rimrock) (*Achnatherum hymenoides*)	3
		Needle and Thread Grass (*Hesperostipa comata* ssp. *comata*)	2.5
		Northern Sweetvetch (Timp) (*Hedysarum boreale*)	3.5
		Scarlet Globemallow (*Sphaeralcea coccinea*)	0.5
14-31	6	Sandberg bluegrass (UP Plateau) (*Poa secunda* ssp. *sandbergii*)	0.5
		Slender Wheatgrass (San Luis) (*Elymus trachycaulus* ssp. *trachycaulus*)	2
		Big Bluegrass (Sherman) (*Poa secunda* ssp. *ampla*)	1
		Mountain Brome (Bromar) (*Bromus marginatus*)	2
		Lewis Flax (Maple Grove) (*Linum lewisii*)	1
		Rocky Mountain Penstemon (Bandera) (*Penstemon strictus*)	0.25

8) 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.

9) The Reclamation Status Report will be submitted electronically via email and as a hard-copy to WRFO Reclamation Coordinator, Brett Smithers (brett_smithers@blm.gov). 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.

10) 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. Operators 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.

11) 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 should occur on all disturbed areas affected by construction and drilling, except areas needed for production operations.

12) 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 hydro-mulch or an erosion control fabric, unless interim reclamation activities will occur within one month of the spud date.

13) Soils shall be replaced during reclamation in their respective original position (last out, first in) to minimize mixing of soil horizons.

14) Genesis shall be required to monitor all reclaimed areas for signs of erosion. If problems arise, Genesis will notify BLM as soon as possible and will prepare a reclamation plan to be submitted via Sundry to address the concern(s).

15) It shall be the responsibility of Genesis 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.

16) Genesis 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.

17) 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 (see Table 4). 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.

Invasive, Non-Native Species

1) All disturbed areas shall be revegetated as outlined in the applicant committed mitigation measures related to Vegetation and Water Quality, Surface and Ground and as directed by the AO.

2) Genesis 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 2010). 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.

3) 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.

4) All activities shall comply with the requirements of Rio Blanco County for noxious and invasive species management.

5) Use of pesticides shall comply with the applicable federal and state laws and would 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. Prior to the use of pesticides, Genesis shall obtain written approval from the AO of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the AO. Emergency use of pesticides shall be approved in writing by the AO prior to such use.

Threatened, Endangered and Sensitive Plant Species

1) No surface occupancy will be allowed on mapped populations of Endangered, Threatened, Proposed, or Candidate plant species (NSO-08 cited in BLM 1997).

2) 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 BLM 1997).

3) In the future, if it becomes evident that impacts to any plant species listed as Endangered or Threatened are resulting from project related activities, Section 7 consultation with USFWS will be initiated.

4) If fugitive dust is determined qualitatively or quantitatively to be affecting Dudley Bluffs twinpod or debris milkvetch populations, either during construction or during production, additional requirements may be applied as deemed necessary by the AO.

Threatened, Endangered and Sensitive Animal Species

1) Raptor surveys are only valid for the same breeding season in which a nest was reported and the next breeding season following the report. A new raptor survey would be required if the project were delayed until a subsequent breeding season. The raptor breeding season occurs from April 1 to August 15 in woodland habitats and February 1 to August 15 in cliff habitats.

2) Should the project be delayed and if an active raptor nest is found in the project area during a new raptor survey, Table 5 outlines the appropriate No Surface Occupancy and timing limitation restrictions related to listed and unlisted nesting raptors that shall be placed into 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 (BLM 1997).

Table 5. No Surface Occupancy and timing limitation restrictions for 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
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.

3) Based on the currently proposed total water used for the 13 gas wells, BLM WRFO will log and report the project's average annual depletion from the Upper Colorado River Basin.

4) 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.

Migratory Birds

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 applicant committed mitigation Measures related to Endangered, Threatened and Sensitive Animal Species.

Cultural Resources

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.

3) 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.

4) 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.

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

Paleontological Resources

1) A paleontological monitor will need to be present any time it becomes necessary to excavate into the underlying rock formations.

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).

4) 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.

Fire Management

1) Fire avoidance and prevention measures would be implemented and described in the APDs Surface Use Plan.

2) Options available to Genesis for removing project-related slash are set forth in applicant committed mitigation measure 2 related to Vegetation.

3) Some tree boles shall be retained for use as erosion control, as stated in the applicant committed mitigation measures related to Water Quality, Surface and Ground and Vegetation. 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 avoid creating pockets of fuels that exceed 5 tons/ac.

Forest Management

1) As listed in the COAs for all surface-disturbing activities in the White River ROD/RMP, Appendix B, Page B-1 (BLM 1997), Genesis shall be required to purchase from the BLM all trees that would be removed as a result of the Proposed Action. Cut trees not being used for reclamation (see applicant committed mitigation measure 39 for 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

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) BLM Spring 149-12 will be monitored by doing a spring survey in the spring of 2011 using the technique and spring survey form developed by the WRFO Hydrologist. A water quality sample will be taken, if possible, during the 2011 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, 2011. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

Rangeland Management

1) Livestock mortality from operations conducted by the applicant shall require a negotiated settlement between the applicant and the livestock owner.

Access and Transportation

1) Genesis would implement road construction and maintenance standards and procedures described in the COAs listed in the White River ROD/RMP (BLM 1997). More detailed lists of mitigation pertinent to transportation issues are contained in the applicant committed mitigation measures related to Air Quality; Soils; Water Quality, Surface and Ground; Vegetation; Invasive Non-native Species; and Wildlife, Terrestrial.

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

Finding of No Significant Impact (FONSI)

DOI-BLM-CO-110-2012-0041-EA

BACKGROUND

Genesis proposes to expand current development by constructing 13 new well pads and drilling one vertical hole well on each pad. The proposed wells located in the Calamity Ridge Unit II are: 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22 and 14-24. The proposed wells located in the Fletcher Gulch Shallow Unit are: 2-11, 34-22, 34-33 and 34-44. Construction of associated access roads and gathering pipelines would accompany well pad construction.

The project would be located in Rio Blanco County, Colorado, approximately 10 air miles east of Rangely in the vicinity of Fletcher Gulch and Yanks Gulch. To access the project area from the intersection of Colorado State Highway (SH) 64 and Rio Blanco County Road (RBC) 122, travel 8.4 miles southeast on RBC 122 and turn left onto BLM Road 1100 (BLM 1100).

The proposed facilities would be located primarily on land administered by the BLM, with some on private surface. All proposed pads, roads, and pipelines would be on Genesis lease tracts.

Total disturbance for the Proposed Action is estimated at 47.1 acres, with 45.60 acres on BLM surface and 1.50 acres on private surface.

FINDING OF NO SIGNFICANT IMPACT

Based upon a review of the EA and the supporting documents, I have determined that the Proposed Action is not a major Federal action and will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity, as defined at 40 CFR 1508.27 and do not exceed those effects as described in the White River Record of Decision and Approved Resource Management Plan (1997). Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below.

Context

The project is a site-specific action directly involving BLM administered public lands that do not in and of itself have international, national, or state-wide importance, but has regional importance. The area of the Proposed Action is in area that has a known distribution of the BLM Sensitive debris milkvetch that is currently known to be confined confined to two counties in Colorado (Rio Blanco and Moffat) and two counties in Utah (Uintah and Duchesne). Based on debris milkvetch surveys completed, there 40,000 plus individuals currently known in the

Calamity Ridge area. It is estimated that 2,100 individuals will be removed during implementation of the Proposed Action.

Intensity

The following discussion is organized around the 10 Significance Criteria described at 40 CFR 1508.27. The following have been considered in evaluating intensity for this Proposed Action:

1. Impacts that may be both beneficial and adverse. The Proposed Action has impacts that will be both beneficial and adverse. The beneficial aspect of the Proposed Action is that the natural gas hydrocarbon resources would be depleted in the targeted formations by the development of the wells causing an economic gain, and if developed correctly, future development of natural gas hydrocarbon reserves would not be required. The adverse impacts would be the disturbance in an already disturbed well field causing a loss of acres for wildlife and domestic animals use of 47.1 additional acres of which 30.1 acres is pinyon-juniper woodlands including some old growth stands, most notably in the vicinity of proposed well location 34-22, which could be eligible for management as commercial woodlands. The acres impacted would increase the potential for loss of soil by erosion, and a potential for an increase of noxious and/or invasive weeds. The BLM Sensitive debris milkvetch inhabits the area and 2,100 individual would be removed as a result of the project. Should one occur, releases of produced water would present the greatest threat for widespread impacts from hazardous waste. There could be some potential loss of paleontological resources during project construction and recreation will be impeded and wildlife may disperse from the area during construction and drilling activities.

2. The degree to which the Proposed Action affects public health or safety. There would be an impact to public health and safety during certain times of implementation of the Proposed Action. Most notably would be during construction and drilling of the wells when well field traffic will likely be higher increasing the danger of the public using the same roads as well field traffic. Additionally, during construction of the roads and access roads as well as use of the new access roads, air quality may be affected and may cause the public to have health effects.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. There would be no impacts associated if mitigation is followed.

4. Degree to which the possible effects on the quality of the human environment are likely to be highly controversial. The project is not likely to be highly controversial.

5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risk. There are unknown risks to the human environment identified during analysis of the Proposed Action in the Aquatic Wildlife and Wetlands and Riparian Zones sections of DOI-BLM-CO-110-2012-EA. **Aquatic Wildlife:** 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 Public Land Health Standard for Plant

and Animal Communities and would lead to a degraded capacity to achieve the standard for an undetermined length of time. **Wetlands and Riparian Zones:** 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 Public Land Health Standard for Riparian Systems and would lead to a degraded capacity to achieve the standard for an undetermined length of time.

6. Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. The Proposed Action neither establishes a precedent for future BLM actions with significant effects nor represents a decision in principle about a future consideration.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. There have been projects approved in the vicinity of the project area with similar impacts, DOI-BLM-CO-110-2009-0180-EA signed on December 8, 2009 approved 18 Genesis gas wells and DOI-BLM-CO-110-2011-0043-EA signed on June 11, 2011 approved two Genesis gas wells.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. There are Cultural resources in the project area that have been evaluated as eligible for the National Register of Historic Places. Four pad/road relocations have taken place as a result of the cultural surveys completed. If mitigation is followed, there should be no adverse effects to objects listed on the National Register of Historic Places.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973. The project as proposed is not likely to adversely affect an endangered or threatened species or its habitat.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment. Neither the Proposed Action nor impacts associated with it violate any laws or requirements imposed for the protection of the environment.

SIGNATURE OF AUTHORIZED OFFICIAL: Kent E. Walter

Field Manager

DATE SIGNED: 04/17/13

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

DECISION RECORD

PROJECT NAME: Genesis Gas Wells, 13 Applications for Permit to Drill:
Calamity Ridge Unit II: 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 14-24
Fletcher Gulch Shallow Unit: 2-11, 34-22, 34-33, 34-44

ENVIRONMENTAL ASSESSMENT NUMBER: DOI-BLM-CO-110-2012-0041-EA

DECISION

With the exception of the Fletcher Gulch Shallow Unit 2-11 (2-11) well and its associated infrastructure; it is my decision to implement the Proposed Action. The 2-11 location was not relocated following onsite review, and subsequently the 2-11 APD submitted, received and analyzed in DOI-BLM-CO-110-2012-0041-EA did not reflect the new location. The 2-11 will be required to be formally withdrawn by Genesis, and cannot be approved in this EA. Should Genesis choose to pursue a replacement APD, a new APD submittal will be required. The selection of a new location will be required to start at the Notice of Staking process followed by onsite inspection, APD submittal and NEPA analysis as required by Onshore Order Number One and the BLM WRFO.

The Proposed Action (with the exception of the 2-11) is mitigated in DOI-BLM-CO-2012-0041-EA, authorizing the construction, drilling, operation, and maintenance of 12 Genesis gas wells and associated infrastructure including pipelines and access roads for the Calamity Ridge Unit II wells 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22, 14-24 and Fletcher Gulch Shallow Unit wells 4-22, 34-33, and 34-44. In addition to the BLM mitigation, the applicant has committed to Applicant Committed Measures as Appendix C of DOI-BLM-CO-110-2012-0041-EA.

Mitigation Measures

The following Applicant Committed Measures based on analysis and review of the Proposed Action and DOI-BLM-CO-110-2012-0041-EA **are not applicable** and therefore will not apply:

Post-Construction Notifications

2) If for any reason the location or orientation of the geographic feature associated with the proposed action changes, the operator shall submit updated GIS "As-Built" data to designated Natural Resource Specialist within 7 calendar days of the change. This information shall be submitted via Sundry Notice.

Air Quality

2) 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 or 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.

Wastes, Hazardous or Solid

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 13 wells, regardless if additional wells were planned for these pads. See also applicant committed mitigation measures under Water Quality, Surface and Ground.

Water Quality, Surface and Ground

9) The operator will 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) All pits will be lined with a synthetic liner(s) with a minimum thickness of twentyfour (24) mm 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.

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.

Vegetation

2) Trees or shrubs that must be removed for construction or ROW preparation shall be cut down or masticated 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. It is recommended to chip the smaller limbs and trees and incorporate that debris into the topsoil; the boles and limbs of the larger trees should be retained for redistribution not to exceed 20% total ground cover.

4) Genesis shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes planned for use in reclamation are provided in Table 4 and are based on the ecological site defined by the soil MUs within the project area.

Table 4. Native seed mixes appropriate for reclamation efforts at well sites

Well	Seed Mix	Species	Lbs/Acre
2-21, 2-22, 2-34, 14-24, 14-33	1	Western Wheatgrass (Arriba) (*Pascopyrum smithii*)	4.5
		Thickspike Wheatgrass (Critana) (*Elymus lanceolatus* ssp. lanceolatus)	3.5
		Bottlebrush Squirreltail (Toe Jam Creek) (*Elymus elymoides*)	3
		Scarlet Globemallow (*Sphaeralcea coccinea*)	0.5
		Annual Sunflower (Helianthus annus)	3
		Winterfat (*Krascheninnikovia lanata*)	1
2-23, 2-32, 2-41, 2-43, 13-41, 14-21, 14-22	3	Western Wheatgrass (Rosanna) (*Pascopyrum smithii*)	4
		Bluebunch Wheatgrass (Whitmar) (*Pseudoroegneria spicata* ssp. *Inermis*)	3.5
		Indian Ricegrass (Rimrock) (*Achnatherum hymenoides*)	3
		Needle and Thread Grass (*Hesperostipa comata* ssp. *comata*)	2.5
		Northern Sweetvetch (Timp) (*Hedysarum boreale*)	3.5
		Scarlet Globemallow (*Sphaeralcea coccinea*)	0.5
14-31	6	Sandberg bluegrass (UP Plateau) (*Poa secunda* ssp. *sandbergii*)	0.5
		Slender Wheatgrass (San Luis) (*Elymus trachycaulus* ssp. *trachycaulus*)	2
		Big Bluegrass (Sherman) (*Poa secunda* ssp. *ampla*)	1
		Mountain Brome (Bromar) (*Bromus marginatus*)	2

		Lewis Flax (Maple Grove) (*Linum lewisii*)	1
		Rocky Mountain Penstemon (Bandera) (*Penstemon strictus*)	0.25

8) 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.

9) The Reclamation Status Report will be submitted electronically via email and as a hard-copy to WRFO Reclamation Coordinator, Brett Smithers (brett_smithers@blm.gov). 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.

17) 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 (see Table 4). 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.

Invasive, Non-Native Species

2) Genesis 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 2010). 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.

3) 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.

4) All activities shall comply with the requirements of Rio Blanco County for noxious and invasive species management.

5) Use of pesticides shall comply with the applicable federal and state laws and would 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. Prior to the use of pesticides, Genesis shall obtain written approval from the AO of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the AO. Emergency use of pesticides shall be approved in writing by the AO prior to such use.

Threatened, Endangered and Sensitive Animal Species

1) Raptor surveys are only valid for the same breeding season in which a nest was reported

and the next breeding season following the report. A new raptor survey would be required if the project were delayed until a subsequent breeding season. The raptor breeding season occurs from April 1 to August 15 in woodland habitats and February 1 to August 15 in cliff habitats.

2) Should the project be delayed and if an active raptor nest is found in the project area during a new raptor survey, Table 5 outlines the appropriate No Surface Occupancy and timing limitation restrictions related to listed and unlisted nesting raptors that shall be placed into 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 (BLM 1997).

Table 5. No Surface Occupancy and timing limitation restrictions for 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
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.

Migratory Birds

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 applicant committed mitigation

Measures related to Endangered, Threatened and Sensitive Animal Species.

Cultural Resources

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.

3) 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.

Paleontological Resources

1) A paleontological monitor will need to be present any time it becomes necessary to excavate into the underlying rock formations.

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).

4) 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.

Fire Management

1) Fire avoidance and prevention measures would be implemented and described in the APDs Surface Use Plan.

2) Options available to Genesis for removing project-related slash are set forth in applicant committed mitigation measure 2 related to Vegetation.

3) Some tree boles shall be retained for use as erosion control, as stated in the applicant committed mitigation measures related to Water Quality, Surface and Ground and Vegetation. 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 avoid creating pockets of fuels that exceed 5 tons/ac.

Forest Management

1) As listed in the COAs for all surface-disturbing activities in the White River ROD/RMP, Appendix B, Page B-1 (BLM 1997), Genesis shall be required to purchase from the BLM all trees that would be removed as a result of the Proposed Action. Cut trees not being used for reclamation (see applicant committed mitigation measure 39 for 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

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) BLM Spring 149-12 will be monitored by doing a spring survey in the spring of 2011 using the technique and spring survey form developed by the WRFO Hydrologist. A water quality sample will be taken, if possible, during the 2011 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, 2011. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

Appendix C - Genesis Gas and Oil Colorado LLC Applicant Committed Measures (Carried Forward)

The following Applicant Committed Measures based on analysis and review of the Proposed Action and DOI-BLM-CO-110-2012-0041-EA **are applicable** and therefore apply:

Timing Limitations

1) The operator shall apply proper pre-planning and plan all activities and operations in a manner so as to avoid infringing on any timing limitations; without the need to apply for exceptions to the specified timing limitations.

Pre-Construction Activities and Notifications

1) The designated Natural Resource Specialist 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.

Post-Construction Notifications

1) In an attempt to track interim and final reclamation of federal actions related to the development of federal mineral resources, the operator shall provide the designated Natural Resource Specialist with geospatial data in a format compatible with the WRFO's ESRI ArcGIS Geographic Information System (GIS); GIS point and polygon features. These data will be used to accurately locate and identify all geographic as-built (i.e., constructed and design implemented) features associated with this project and included in the Application for Permit to Drill (APD) or Sundry Notice (SN), as appropriate.
   - These data shall be submitted within 60 days of construction completion. If the operator is unable to submit the required information within the specified time period, the operator shall notify the designated Natural Resource Specialist via email or by phone, and provide justification supporting an extension of the required data submission time period.
   - GIS polygon features may include, but are not limited to; full well pad footprints (including all stormwater and design features), constructed access roads/widths, existing roads that were upgraded/widths, and pipeline corridors.
   - Acceptable data formats are: (1) corrected global positioning system (GPS) files with sub-meter accuracy or better; (2) ESRI shapefiles or geodatabases; or, (3) AutoCAD .dwg or .dxf files. If possible, both (2) and (3) should be submitted for each as-build feature. Geospatial data must be submitted in UTM Zone 13N, NAD 83, in units of meters. Data may be submitted as: (1) an email attachment; or (2) on a standard compact disk (CD) in compressed (WinZip only), or uncompressed format. All data shall include metadata, for each submitted layer, that conforms to the Content Standards for Digital Geospatial Metadata from the Federal Geographic Data Committee standards. Questions shall be directed to

WRFO BLM GIS staff at (970) 878-3800.

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
Attn: Natural Resource Specialist
220 East Market Street
Meeker, Colorado 81641

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.

Pre & Post-Drilling Notifications

1) The designated Natural Resource Specialist will be notified 24 hours prior to well spud (Breaking ground for drilling surface casing) via email or phone.

2) The designated Natural Resource Specialist will be notified 24 hours prior to commencing Completion operations via email or phone.

Pre-Reclamation Notification

1) The designated Natural Resource Specialist 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, seed bed preparation that requires disturbance of surface soils, seeding, constructing exclosures (e.g., fences) to exclude livestock from reclaimed areas.

Air Quality

1) All access roads will be maintained according to BLM Manual Section 9113 standards for road shape and drainage features at all times during pad construction, drilling, and production.

Soils

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

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) If erosion features such as rilling, gullying, piping, and mass wasting occur at anytime in the future on disturbed surfaces, the erosion features will be addressed

immediately after observation by contacting the AO submitting and implementing a plan to assure successful soil stabilization with BMPs to address the erosion problems.

Wastes, Hazardous or Solid

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.

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 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 designated Natural Resource Specialist.

Water Quality, Surface and Ground

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) 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.

4) 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.

5) 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.

6) 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.

7) Access roads should be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features. Culverts and waterbars should be installed according to 9113 standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.

8) 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) To mitigate project-related soil erosion and increased surface runoff to nearby surface waters, it is recommended that all reserve pits be closed and pads recountoured 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.

11) 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.

12) Construction and drilling activities will not occur between December 1st and May 1st without prior approval from the AO to avoid travel in times of saturated soils.

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.

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 spoils material if necessary to reduce potential damage to the liner by sharp rock edges.

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. New construction will require a Sundry Notice.

Wetlands and Riparian Zones

1) Riparian and wetland areas disturbed by construction must be seeded or planted with species adapted to the specific riparian site as directed by the AO. This must occur during the first fall following disturbance, unless otherwise authorized by the WRFO.

Vegetation

1) Genesis will clear the minimum vegetation necessary for construction of the proposed facilities.

3) Stripped topsoil and vegetation shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed.

5) Livestock will be excluded from reclaimed areas (as required by BLM) until successful reclamation is achieved. These decisions will be made by the BLM on a case-by-case basis. Fences, cattle guards, and gates (all built to BLM specifications per BLM manual H-1741-1) will be installed, maintained, and removed by the operator upon approval by the WRFO BLM. BLM specifications for cattle fencing provided in Chapter 4 of H-1741-1 are as follows: "H. Domestic Livestock Fence: Fencing is commonly used to control domestic livestock to achieve safety and vegetation management objectives. The standard BLM fence design for control of cattle only, consists of a four-wire (barbed) fence with 42-inch top height and wire spacings of 16, 6, 8, and 12 inches." In specific and predetermined instances, livestock exclosures may be retained for extended periods to meet other resource

objectives.

6) Seeding shall occur between September 1 and March 31, as approved by the BLM.

7) All seed tags will be submitted to the designated Natural Resource Specialist 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 SN 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.

10) 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. Operators 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.

11) 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 should occur on all disturbed areas affected by construction and drilling, except areas needed for production operations.

12) 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 hydro-mulch or an erosion control fabric, unless interim reclamation activities will occur within one month of the spud date.

13) Soils shall be replaced during reclamation in their respective original position (last out, first in) to minimize mixing of soil horizons.

14) Genesis shall be required to monitor all reclaimed areas for signs of erosion. If problems arise, Genesis will notify BLM as soon as possible and will prepare a reclamation plan to be submitted via Sundry to address the concern(s).

15) It shall be the responsibility of Genesis 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.

16) Genesis 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.

Invasive, Non-Native Species

1) All disturbed areas shall be revegetated as outlined in the applicant committed mitigation measures related to Vegetation and Water Quality, Surface and Ground and as directed by the AO.

Threatened, Endangered and Sensitive Plant Species

1) No surface occupancy will be allowed on mapped populations of Endangered, Threatened, Proposed, or Candidate plant species (NSO-08 cited in BLM 1997).

2) 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 BLM 1997).

3) In the future, if it becomes evident that impacts to any plant species listed as Endangered or Threatened are resulting from project related activities, Section 7 consultation with USFWS will be initiated.

4) If fugitive dust is determined qualitatively or quantitatively to be affecting Dudley Bluffs twinpod or debris milkvetch populations, either during construction or during production, additional requirements may be applied as deemed necessary by the AO.

Threatened, Endangered and Sensitive Animal Species

3) Based on the currently proposed total water used for the 13 gas wells, BLM WRFO will log and report the project's average annual depletion from the Upper Colorado River Basin.

4) 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.

Cultural Resources

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.

4) 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.

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

Rangeland Management

1) Livestock mortality from operations conducted by the applicant shall require a negotiated settlement between the applicant and the livestock owner.

Access and Transportation

1) Genesis would implement road construction and maintenance standards and procedures described in the COAs listed in the White River ROD/RMP (BLM 1997). More detailed lists of mitigation pertinent to transportation issues are contained in the applicant committed mitigation measures related to Air Quality; Soils; Water Quality, Surface and Ground; Vegetation; Invasive Non-native Species; and Wildlife, Terrestrial.

CONDITIONS OF APPROVAL FOR GENESIS APDs

In addition to the Application Committed Mitigation above, the following Conditions of Approval apply:

PRE-CONSTRUCTION

1) The six well pads that have been constructed and not drilled are the following: FGSU 4-12, FGSU 33-42, FGSU 4-31, FGSU 4-41, FGSU 4-42, and FGSU 9-14. Total combined disturbance for the subject six wellpads, roads, and pipelines was approved at 29.90 acres. These areas will be drilled or put into final reclamation as described in the surface use plans for the wells before any additional disturbance will be allowed to construct approved well pads. Earthwork and reclamation must be approved by the BLM AO before earthwork can begin on wells approved in this document.

2) Prior to issuing a Notice to Proceed in writing to approve the APDs for the FGSU 34-33, FGSU 34-22, and FGSU 34-44; the New and Reconstructed Access Roads section of the Surface Use Plan for the FGSU 34-33, FGSU 34-22, and FGSU 34-44 APDs must be updated by Sundry Notice to state the entire length of new road required. Additionally, all sections of the Surface Use Plans and APDs affected by the changes must also be updated. As currently submitted, the Surface Use Plan only includes a portion of the new access road required.

3) Prior to issuing a Notice to Proceed in writing, 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 one to August 15 in woodland habitats and February one to August 15 in cliff habitats) in which they are conducted and the following breeding season.

4) Pending results of the raptor 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). Well and road/pipeline locations would be subject to NSO restrictions if a nest is identified within the NSO buffer. These stipulations will remain in effect over the life of the project, although the timing limitation provisions are contingent on occupancy status. Table 18 outlines the appropriate NSO and timing limitation restrictions related to nesting raptors that shall be in effect during the life of the project. Exceptions or 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 (BLM 1997).

Table 18. No Surface Occupancy and Timing Limitation Restrictions for 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
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]
Golden Eagle	1/4 mi of nests	1/2 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.

5) General access to well locations 2-41, 10-14, 3-44, and 3-33 shall be restricted by means of a lockable gate (may require fence wings) placed as close as possible to the intersection of the main service road and the spur access leading to the wells. This gate will be required to effectively deter (including preventing bypass) vehicle use unrelated to Genesis well operations throughout the year.

6) Disruptive forms of activity, including preparation of pads and pipeline and access rights-of-way, road construction, well drilling and completion operations, and scheduled workover and refracing, will be prohibited in severe winter range for mule deer from December one to April 30. This includes all proposed pads, wells, access, and pipelines except those associated with the following locations: 2-41, 2-43, and 2-44.

7) The BLM Ecologist must be notified at least one week prior to the commencement of construction of the well pads.

8) If construction of the Proposed Action will not be completed before May 2013, areas within 100 meters of the edge of all disturbances must be re-surveyed for special status plant species, as the current plant surveys will expire. The new survey must be completed the growing season before construction is planned and a written Notice to Proceed from the BLM will be issued. If new populations are found or existing populations have expanded since previous surveys, additional NEPA or mitigation may be required. The results of this survey must be reviewed and approved by the BLM Ecologist prior to construction. All plant surveys expire after three years and all project construction (e.g. vegetation clearing, road, well pad, and pipeline construction, etc.) requires current surveys.

9) Construction and drilling of pads (wells 2-11, 2-21, 34-44, 2-41, 2-43, 14-24) and access roads (2-11, 2-21, 2-41, 2-43, 34-44) must occur outside the growing season of twinpod and debris milkvetch or not between April 1st – July 1st.

10) To ensure all construction activities (including but not limited to: well pad construction, access road construction, and pipeline construction and installation) stay within the

boundaries of the permit and are within the requirements of the COAs; third party oversight by a qualified botanist will be required during development of the following wells: well locations (wells 2-11, 2-21, 34-44, 2-41, 2-43, 14-24) and five of the access roads (wells 2-11, 2-21, 2-41, 2-43, 34-44) to reduce impacts to debris milkvetch. Additionally, the botanist will provide oversight of the construction of the 2-32, 2-33, 2-44, 14-11, 14-22, 34-22 and 34-33, and 34-44. Third party oversight contractor must be approved by the BLM WRFO, and must have a MOU and Financial Disclosure Statement with the operator. Within 30 days of completion of construction activities the third party contractor must submit a monitoring report to the BLM WRFO with the details of the construction.

a. Seed from individual debris milkvetch plants will be collected prior to construction/plant removal by a third party botany consultant. Seed will be collected from all plant populations within the disturbance footprint so that the material of the plants to be removed is preserved. Seed must also be collected at any new plant populations found within the disturbance footprint after pre-construction plant surveys (COA #8). The seed must be collected prior to construction. The seed can be preserved by a botanical preservation organization (such as the Denver Botanical Gardens). The seed must also be grown out at the Upper Colorado Environmental Plant Center to be used in the reclamation in all areas where plants were removed. A third party botany consultant and the BLM ecologist should be consulted throughout this process.

a. Construction fences must be used around the permitted construction area of well pads, pipelines, and access roads so that workers and the public will avoid the sensitive area. These fences must be removed after construction is completed. These fences will be placed under the direction of the third party oversight contractor.

b. The third party oversight contractor will also advise placement of fences and gates to protect the debris milkvetch populations (see above).

11) General access to well locations (wells 2-11, 2-21, 34-44, 2-41, 2-43) and five of the access roads (wells 2-11, 2-21, 2-41, 2-43, 34-44) shall be restricted by means of a lockable gate (may require fence wings) to protect future disturbance to the affected debris milkvetch populations. The independent third party oversight contractor will help place the gates to avoid further impacts to the rare plants and to ensure the placement of the gates will provide the most protection of the species. Also, when possible gates should be placed as close as possible to the intersection of the main service road and the spur access leading to the wells. The gates will be required to effectively deter (including preventing bypass) vehicle use unrelated to Genesis well operations throughout the year. Final location and design of gates must be submitted and approved by the BLM via Sundry Notice prior to installation.

- Additionally, permanent fences must be installed around the well pads and the length of the access roads, blocking all human access (foot and motorized) where gates are not appropriate. "Sensitive Area" signs must be place along fences to deter public access. The third party oversight contractor will help place the fence to avoid further impacts and to ensure the placement of the fence will provide the most protection of the species. BLM must approve the final location and design of gates and fence used.

12) All equipment that may act as a vector for weeds will be cleaned before entering the WRFO. Equipment will also be cleaned when leaving and/or moving between work sites if the pre-disturbance weed survey indicated the presence of undesirable invasive or noxious weeds and there is a risk of transporting weed seeds or other propagules.

13) Any excavations into the underlying native sedimentary stone must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.

14) The operator must coordinate with the livestock grazing permittees (Wade Cox for the 34-22 and 34-33 and O.S. Wyatt Jr./Davie Brooks for the 34-44, 2-21, 2-32, 2-33, 2-41, 2-43, 2-44, 14-11, 14-22 and 14-24) authorized to graze livestock within the project area a minimum of 72 hours prior to construction activities associated with this permit. Livestock grazing permittee contact information may be found at www.blm.gov/ras/ or by contacting the WRFO Range staff (970-878-3800). The operator will provide the grazing permittee the location, nature, and extent of the anticipated activity being completed.

AIR QUALITY

15) Genesis will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable Federal, state, and local air quality laws and regulations.

SOIL RESOURCES

16) Topsoil will be removed to a depth of six to eight inches or as determined on-site by BLM in areas of surface disturbance. To protect topsoil for future use during reclamation, topsoil piles will be covered, seeded, labeled, and stored unmixed with other soils.

17) Genesis shall be required to monitor all reclaimed areas for signs of erosion (using guidance "Interpreting Indicators of Rangeland Health", Technical Reference 1734-6). If problems arise, Genesis will notify the BLM as soon as possible and will prepare a reclamation plan/erosion control to address erosion to be submitted via Sundry Notice to address the concern(s). Any erosion features (e.g., rilling, gullying, piping, or mass wasting) that are the result of this action and are located either on or adjacent to surface disturbance will be addressed immediately by Genesis.

- "Interpreting Indicators of Rangeland Health", Technical Reference 1734-6 a PDF version is available at: http://www.blm.gov/nstc/library/pdf/1734-6.pdf

18) All areas where the topsoil has been removed and soils have become compacted will be ripped to a depth of 18 inches below the finished grade or to bedrock, whichever is less. Another suitable method of de-compaction may be used before topsoil is re-spread with approval of the BLM AO. Areas where the topsoil has not been removed, but have been compacted, must be de-compacted by disking or other methods to prepare the soils for reclamation.

19) At final reclamation of the 2-44 pad, unless otherwise directed by the BLM, the 2-track road that was upgraded to access the 2-44 will be returned to a 2-track road to its

functionality and use prior to the upgrading the road.

SURFACE & GROUND WATER QUALITY

20) Genesis will line pits with a minimum 24 mil synthetic liner, which 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 liners shall also be resistant to deterioration by ultraviolet light, punctures and tearing, and shall be designed for the life of the pit.

21) 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.

22) The operator will submit a SN if average water volumes within the lease area exceed the 300 barrel-per-day maximum volume assumed for produced water production for each well.

WETLANDS AND RIPARIAN ZONES

23) The Yanks Gulch crossing will be installed as close to perpendicular to the channel as possible to reduce the affected length of the channel.

24) Genesis will revegetate the herbaceous riparian zone upstream and downstream of the Yanks Gulch crossing. Revegetation will be done within the limits of disturbance from culvert installation or up to 30 feet upstream and downstream of the culvert footprint, whichever is larger. Species used for revegetation will include *Juncus arcticus*, *Eleocharis macrostachya, Carex nebrascensis,* and possibly other hydrophytic species found upstream of the culvert location. Within 60 days of completion of the Yanks Gulch crossing (see Appendix C – Genesis Gas and Oil Colorado LLC Applicant Committed Measures – Post-Construction Notification Measure Number one), Genesis will submit an as-built of the culvert to the WRFO Wildlife Biologist. The submittal will include photos of current conditions upstream and downstream of the culvert and a brief description of water availability and flow characteristics upstream and downstream of the culvert. The WRFO staff will then determine the approach to revegetation and communicate this to Genesis. Revegetation will be completed by October 15 of the year the culvert is installed. A report documenting the revegetation effort will be submitted to the Wildlife Biologist within three months of the completion of planting.

25) Physical means to prevent livestock and big game access to revegetated areas at the Yanks Gulch crossing will be required to accelerate development of an erosion-resistant vegetative armor in disturbed channel areas described above. Genesis will monitor fencing regularly to ensure that it prevents access by livestock to the revegetated area. Fences will not be removed without approval of the WRFO.

VEGETATION

26) All disturbed areas for wells 2-21, 2-32, 2-44 shall be promptly seeded with Seed Mix one (see Table 14 below). It is recommended that all sites be seeded between September one and March 31. If an alternate date of seeding is requested, contact the designated NRS (Natural

Resource Specialist) or Realty Specialist prior to seeding for approval. Seed mixture rates are Pure Live Seed (PLS) pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 14. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites (2-21, 2-32, 2-44)

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
1	Rosana	Western wheatgrass	*Pascopyrum smithii*	4.5
	Critana	Thickspike wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*	3.5
	Toe Jam Creek	Bottlebrush squirreltail	*Elymus elymoides*	3.0
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5
		Sulphur flower	*Eriogonum umbellatum*	1.5
		Winterfat	*Krascheninnikovia lanata*	1.0

27) All disturbed areas for wells 2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-22, 34-33, 34-44 shall be promptly seeded with Seed Mix three (see Table 15 below). It is recommended that all sites be seeded between September one and March 31. If an alternate date of seeding is requested, contact the designated NRS or Realty Specialist prior to seeding for approval. Seed mixture rates are PLS pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 305. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites (2-11, 2-33, 2-41, 2-43, 14-11, 14-22, 34-22, 34-33, 34-44)

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
3	Rosana	Western wheatgrass	*Pascopyrum smithii*	4.0
	Whitmar	Bluebunch wheatgrass	*Pseudoroegneria spicata* ssp.	3.5

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
			inermis	
	Rimrock	Indian ricegrass	*Achnatherum hymenoides*	3.0
		Needle and thread grass	*Hesperostipa comata* ssp. *comata*	2.5
	Maple Grove	Lewis flax	*Linum lewisii*	1.0
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5

28) Refer to Special Status Plant Species section for the recommended seed mix to be used for reclamation of well 14-24.

29) Use seed that is certified free of noxious weeds. All seed tags will be submitted via SN to the designated NRS within 14 calendar days from the time the seeding activities have ended. The SN will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor, etc.). In addition, the SN 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.

30) A Reclamation Status Report will be submitted to the WRFO annually (by January first) for all actions that require disturbance of surface soils on BLM administered lands as a result of the Proposed Action. The Reclamation Status Report will include the well number, API number, legal description, UTM coordinates, project description (e.g., well pad, pipeline, etc.), reclamation status (e.g., interim or final), whether the well pad or pipeline has been revegetated and/or re-contoured, 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 responsible for developing the report. The report will include maps showing each point (i.e., well pad), polygon, or polyline (i.e., pipeline) feature that was included in the report. The data must be submitted in UTM Zone 13N, NAD 83, in units of meters. In addition, scanned copies of seed tags that accompanied the seed bags will be included with the report. 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. The Reclamation Status Report will be submitted to the BLM Reclamation Coordinator.

31) Stripped topsoil shall be stockpiled for subsequent reclamation of unused areas on the well pad where it was originally removed. Properly store topsoil to protect it from erosion and compaction, assure that it remains readably identifiable (i.e., signed), viable, and available for redistribution during reclamation. Topsoil piles that will be stored for more than one month should be seeded with an approved BLM seed mix, stabilized with certified weed free erosion fabric or mulch, and may require fencing. When topsoil will be stored for more than one year and other resource values can be accommodated, topsoil will be stored in piles with a depth of two feet or less.

32) Genesis shall be responsible for reclamation of unused portions of well pads, including revegetation with a BLM-approved seed mix. Seed mixes planned for use in reclamation are provided in Tables 14, 15, and 22, and are based on the ecological site defined by the soil map units within the project area.

33) If necessary to achieve successful reclamation, livestock shall be excluded from reclaimed areas. Fences, cattle guards, and gates (all built to BLM specifications per BLM manual H-1741-1) will be installed, maintained, and removed by the operator upon approval by the WRFO BLM. BLM specifications for cattle fencing provided in Chapter 4 of H-1741-1 are as follows: "H. Domestic Livestock Fence: Fencing is commonly used to control domestic livestock to achieve safety and vegetation management objectives. The standard BLM fence design for control of cattle only, consists of a 4-wire (barbed) fence with 42-inch top height and wire spacings of 16, 6, 8, and 12 inches." In specific and predetermined instances, livestock exclosures may be retained for extended periods to meet other resource objectives.

34) Upon final abandonment of well pads, 100 percent 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 (see Tables 14, 15, and 22). 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.

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:

- Final reclamation is considered successful when the entire reclamation site (including obliterated roads) has attained the following criteria:

    i. Basal vegetative cover must be at least 80 percent of the DPC. On woodland or shrub sites, this would equate to the capability of those sites in an herbaceous state.

    ii. The resulting plant community (in a healthy early seral state) must contain at least five desirable plant species, at least one of which must be a forb or shrub, each

comprising at least five percent relative cover. No one species may exceed 70 percent relative cover in the resulting plant community to ensure that site species diversity is achieved. Desirable species include those defined by the range site, seeded in the BLM approved mix, or other desired species found in the surrounding areas (approved by the BLM).

iii. Undesirable weed cover must not exceed amounts addressed below.

- Cover, composition, and diversity data should be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. Approved methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start. Other data collection methods such as those described in BLM Technical Reference 1730-1 or 1734-4 may be pre-approved by the BLM.
- The vegetation community established on the reclaimed site stabilizes soils, is capable of persisting without continued intervention (excluding routine weed management), and will allow plant community successional processes to progress toward advanced community states.
- Bare ground does not exceed that of the range site or if not described, bare ground does not exceed that of a representative undisturbed DPC meeting the Colorado Standards for Public Land Health.
- Reclamation success in areas affected by cheatgrass and/or other invasive annuals will be qualified based on the condition of the project site (i.e., the relative vegetative cover) prior to disturbance.
- If the project site contains less than 25 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed five percent.
- If the project site contains 25 percent to 50 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 10 percent.
- If the project site contains more than 50 percent relative cover of undesirable species, final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed the level defined by site-specific criteria established in the reclamation plan developed for that site.

INVASIVE, NON-NATIVE SPECIES

36) All seed placed on BLM and split-estate lands will comply with United States Department of Agriculture (USDA) state noxious weed seed requirements and shall be certified by a qualified Federal, State, or county office as free of noxious weeds. Any seed lot with test results showing presence of State of Colorado A or B list species will be rejected in its entirety and a new tested lot will be used instead.

37) All straw, mulch, or other vegetative material used on site (e.g., for site stability or rehabilitation) shall be certified by a qualified Federal, State, or county office as free of noxious weeds or weed seed.

38) All sites shall be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the BLM.

39) Application of herbicides shall comply with the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environments Impact Statement* (EIS), and the WRFO Integrated Weed Management Plan (DOI-BLM-CO-110-2010-0005-EA).

40) Pesticide Use Proposals (PUPs) shall be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds.

41) All disturbed areas shall be revegetated as outlined in the mitigation measures related to Vegetation and Surface and Ground Water Quality and Special Status Plant Species sections, and as directed by the AO.

SPECIAL STATUS PLANT SPECIES

42) Pipelines must be put in the access roadways where debris milkvetch is present to avoid more disturbances to the species. Areas include wells 2-11, 2-41, 2-43 and seven of the access roads: 2-11, 2-21, 2-41, 2-43, 34-44, 2-44, and 34-33.

43) Weed management shall follow measures provided in the *Invasive, Non-native Species* section:

- All sites shall be monitored and treated for noxious weeds on an annual basis for the life of the project until Final Abandonment has been approved by the BLM.
- All herbicide use must comply with buffers found in DOI-BLM-CO-110-2010-0005-EA. If buffers will not be met then consultation with FWS within 600 m of the twinpod habitat is required.
- Invasive species found in and near debris milkvetch populations must be manually controlled. Surrounding areas must be spotted treated with backpack sprayers. BLM must approve all herbicides used within 300 m of debris milkvetch populations.
- Herbicide applicator personnel must be trained in the identification of debris milkvetch.

44) All disturbed areas for well 14-24 shall be promptly seeded with Native or Standard Seed Mix 1 (see Table 22 below). Therefore it is recommended that all sites be seeded between September 1 and March 31. If an alternate date of seeding is requested, contact the designated NRS or Realty Specialist prior to seeding for approval. Seed mixture rates are PLS pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding and harrowed into the soil.

Table 22. Native Seed Mixes Appropriate for Reclamation Efforts at Well Sites 14-24

Seed Mix	Cultivar	Common name	Scientific Name	Application Rate (lbs PLS/acre)
1	Rimrock	Indian ricegrass	*Achnatherum hymenoides*	3
	Critana	Thickspike wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*	3
	Toe Jam Creek	Bottlebrush squirreltail	*Elymus elymoides*	3.5
		Scarlet globemallow	*Sphaeralcea coccinea*	0.5
		Sulphur flower buckwheat	*Eriogonum umbellatum*	1.5
		Winterfat	*Krascheninnikovia lanata*	1
		Rocky Mountain beeplant	*Cleome serrulata*	2
		Annual sunflower	*Helianthus annuus*	2
		Mat saltbush	*Atriplex corrugata*	2
		Rayless tansyaster	*Machaeranthera grindelioides*	0.25

45) Where debris milkvetch is removed, the soil layers must be stored separately and replaced in the proper order: last out, first in. The third party oversight monitor should include observations of this COA in their report for confirmation.
    - Soils shall be replaced during reclamation in their respective original position (last out, first in) to minimize mixing of soil horizons.

46) Dust abatement near all special status plant species will be required using fresh water. Third Party oversight and compliance monitoring (COA number 10) may temporarily halt construction if fugitive dust plumes become large enough to affect debris milkvetch. If fugitive dust is determined qualitatively or quantitatively to be affecting Dudley Bluffs twinpod or debris milkvetch populations, either during construction or during production, additional requirements may be applied as deemed necessary by the AO.
    - Dust abatement in areas outside of special status plant species:
        - All access roads and pipeline ROW will be treated with water and/or a BLM-approved chemical dust suppressant during construction and drilling activities so that there is not a visible dust plume behind vehicles. All vehicles will abide by company or 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.

MIGRATORY BIRDS

47) The operator shall prevent migratory bird access to facilities that store or are expected to store fluids which may pose a risk to such birds (e.g., toxicity, compromised insulation, drowning). 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. It will be the responsibility of the operator to notify the BLM of the method that will be used to prevent use two weeks prior to when completion activities are expected to begin. All lethal and non-lethal events that involve migratory birds will be reported to the designated NRS immediately.

CULTURAL RESOURCES

48) If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator/holder/applicant will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator/holder/applicant, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.

49) To protect the visual landscape surrounding site 5RB6683, the locations 2-21, 2-32 and 2-33 shall adhere to the same COAs listed under the Visual Resources section (below).

PALEONTOLOGICAL RESOURCES

50) The operator/holder is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25 lbs./day, up to 250 lbs./year), or collecting fossils for commercial purposes on public lands.

51) If any paleontological resources are discovered as a result of operations under this authorization, the operator or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinator's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinator's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

VISUAL RESOURCES

52) All above-ground facilities and equipment will be painted to blend in with the surrounding environment. Color of all above-ground equipment and facilities for the CR 2-21, 2-32, 2-43, and 2-44 shall be painted covert green. Color of all above-ground equipment and facilities for

all other locations shall be painted Juniper Green using Standard Environmental Color Chart CC-001: June 2008. It is important to note that the color chart is an actual paint chart and cannot be faxed, scanned or photocopied as it will change the color and may not be consistent with the actual color. Color charts can be obtained by contacting the BLM.

53) At locations falling within or directly adjacent to VRM Class II lands, including 2-43, 2-44, 14-11, 14-22, and 14-24, all above ground structures and facilities will be low profile (generally 12 feet or lower).

54) Genesis must obtain approval of a Visual Resource Management plan via Sundry Notice for wells 2-43, 2-44, 14-11, 14-22, and 14-24 to screen pad disturbance and above ground facilities from public visibility areas

55) Upon final reclamation, all disturbed areas will be re-contoured and restored as closely as possible to previous conditions and to blend with the natural topography. Blending is defined as reducing form, line, shape, and color contrast with the disturbing activity.

HAZARDOUS OR SOLID WASTES

56) Any accumulation of oil or condensate in a pit will be removed within 24 hours of discovery. Only de minimus (non-visible show) may be present on the reserve pits.

57) Comply with all Federal, State and/or local laws, rules and regulations, including but not limited to onshore orders and notices to lessees, addressing the emission of and/or the handling, use, and release of any substance that poses a risk of harm to human health or the environment. All spills or leakages of oil, gas, produced water, toxic liquids or waste materials, blowouts, fires, shall be reported by the operator in accordance with the regulations and as prescribed in applicable orders or notices.

58) Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.

59) When drilling to set the surface casing, drilling fluid will be composed only of fresh water, bentonite, and/or a benign lost circulation material that does not pose a risk of harm to human health or the environment (e.g., cedar bark, shredded cane stalks, mineral fiber and hair, mica flakes, ground and sized limestone or marble, wood, nut hulls, corncobs, or cotton hulls).

60) All substances that pose a risk of harm to human health or the environment shall be stored in appropriate containers. Fluids that pose a risk of harm to human health or the environment, including but not limited to produced water, shall be stored in appropriate containers and in secondary containment systems at 110% of the largest vessel's capacity. Secondary fluid containment systems, including but not limited to tank batteries shall be lined with a minimum 24 mil impermeable liner.

61) As a reasonable and prudent lessee/operator in the oil and gas industry, acting in good faith, all lessees/operators and right-of-way holders will report all emissions or releases that may

pose a risk of harm to human health or the environment, regardless of a substance's status as exempt or nonexempt and regardless of fault, to the BLM WRFO (970) 878-3800.

62) As a reasonable and prudent lessees/operator and/or right-of-way holder in the oil and gas industry, acting in good faith, all lessees/operators and right-of-way holders will provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, regardless of that substance's status as exempt or non-exempt. Where the lessee/operator or right-of-way holder fails, refuses or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground) and soils contaminated by the emission or release of any quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground) and soils at the lessee/operator's expense. Such action will not relieve the lessee/operator of any liability or responsibility.

FIRE MANAGEMENT

63) When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.

- The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.
- The reporting party, or a representative of, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.
- The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by welding, cutting, grinding, etc. will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.
- Natural ignitions caused by lightning will be managed by Federal fire personnel. If a natural ignition occurs within the approved project area, the fire may be initially contained by the applicant only if employee safety is not endangered. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Office Manager.

FOREST MANAGEMENT

64) In accordance with the 1997 White River RMP/ROD, all trees removed in the process of construction shall be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.

65) First, woody material will be chipped and stockpiled for later use in reclamation. Wood chips can be incorporated into the topsoil layer to add an organic component to the soil to aid in reclamation success.

66) Woody materials, not used for woods chips, required for reclamation shall be removed in whole with limbs intact and shall be stockpiled along the margins of the authorized use area

separate from the topsoil piles. Once the disturbance has been recontoured and reseeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20-30 percent ground cover. Limbed material shall be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use.

67) Trees that must be removed for construction and are not required for reclamation shall be cut down to a stump height of six inches or less prior to other heavy equipment operation. These trees shall be cut in four foot lengths (down to four inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

RANGELAND MANAGEMENT

68) Any range improvement projects such as fences, water developments, cattleguards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action shall be promptly repaired or replaced by the applicant to restore pre-disturbance functionality.

FLOODPLAINS, HYDROLOGY, AND WATER RIGHTS

69) The operator will monitor BLM Spring 149-12 by doing a Spring Survey in the spring of 2014 (if possible during the 2013 field season) 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, 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, 2014. At this time a decision will be made by the BLM to determine if additional monitoring will be needed.

REALTY AUTHORIZATIONS

70) All activities shall comply with all applicable local, State, and Federal laws, statutes, regulations, standards, and implementation plans. This includes acquiring all required State and/or local permits, effectively coordinating with existing facility ROW holders, and implementing all applicable mitigation measures required by each permit.

71) The holder shall conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW.

72) Accurate as-builts will be submitted to WRFO in accordance with provisions in Applicant Committed Mitigation, Post-Construction Notification number 1.

73) At least 90 days prior to termination of the ROW, the holder shall contact the AO to arrange a joint inspection of the ROW. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan shall include, but is not limited to, removal of

facilities, drainage structures, of surface material; recontouring, topsoiling, or seeding. The AO must approve the plan in writing prior to the holder's commencement of any termination activities.

COMPLIANCE WITH LAWS & CONFORMANCE WITH THE LAND USE PLAN

This decision is in compliance with the Endangered Species Act, and the National Historic Preservation Act. It is also in conformance with the 1997 White River Record of Decision/Approved Resource Management Plan.

ENVIRONMENTAL ANALYSIS AND FINDING OF NO SIGNIFICANT IMPACT

The Proposed Action was analyzed in DOI-BLM-CO-2012-0041-EA and it was found to have no significant impacts, thus an EIS is not required.

PUBLIC INVOLVEMENT

Internal scoping was initiated when the project was presented to the White River Field Office (WRFO) interdisciplinary team on 02/07/2012. External scoping was conducted by posting this project on the WRFO's on-line National Environmental Policy Act (NEPA) register on 02/15/2012.

RATIONALE

Analysis of the Proposed Action has concluded that there are no significant negative impacts and that it meets Colorado Standards for Public Land Health.

ADMINISTRATIVE REMEDIES

State Director Review

Under regulations addressed in 43 CFR 3165.3(b), any adversely affected party that contests a decision of the Authorized Officer may request an administrative review, before the State Director, either with or without oral presentation. Such request, including all supporting documentation, shall be filed in writing with the BLM Colorado State Office at 2850 Youngfield Street, Lakewood, Colorado 80215 within 20 business days of the date such decision was received or considered to have been received. Upon request and showing of good cause, an extension may be granted by the State Director. Such review shall include all factors or circumstances relevant to the particular case.

Appeal

Any party who is adversely affected by the decision of the State Director after State Director review, under 43 CFR 3165.3(b), of a decision may appeal that decision to the Interior Board of Land Appeals pursuant to the regulations set out in 43 CRF Part 4.

SIGNATURE OF AUTHORIZED OFFICIAL: Kent T. Walter

Field Manager

DATE SIGNED: 04/17/13