

2.0 - PROPOSED ACTION AND ALTERNATIVES

This chapter provides detailed descriptions of the three alternatives for the Southam Canyon EA. Because the three alternatives share a number of common features related to construction, operation, and reclamation activities, **Section 2.1** provides information on the details common to Alternatives A, B and C. Differences between the alternatives, or features unique to an individual alternative, are provided within the alternative-specific discussions in **Sections 2.2** through **2.4**. The alternatives are as follows:

Alternative A – Proposed Action

Alternative B – No Action

Alternative C – Vertical Drilling within the Potential Oil Shale Development Area

Section 2.5 details the applicant-committed environmental protection measures (ACEPMs) that would be implemented under all alternatives to reduce the potential environmental impacts of the proposed development activity.

2.1 DETAILS COMMON TO ALL ALTERNATIVES

Proposed wells, pipelines, and access roads for each of the alternatives are conceptually illustrated in **Figures 2-1, 2-2, and 2-3**. Gathering pipelines would be installed on the surface within the edge of the 50-foot wide right-of-way (ROW) constructed for the proposed access roads, shown as co-located roads and pipelines. Trunk pipelines would be installed within the existing ROW adjacent to existing roads. Where possible, new roads, well pads, and pipelines would be located as near as possible to existing access roads to minimize new surface disturbance. The routes for the proposed new roads have been designed to minimize road construction impacts. Actual locations of wells, roads, and pipelines may be sited differently during the APD process, which includes site-specific consideration of environmental conditions such as wildlife and plant habitats, archaeological and paleontological sites, as well as consideration of the performance of wells initially completed.

Implementation of any of the alternatives would occur in three primary phases: drilling and construction of facilities; production and maintenance; and decommissioning and reclamation.

2.1.1 CONSTRUCTION AND DEVELOPMENT

Construction of wells, pipelines, access roads, and ancillary facilities are expected to be completed over a 10-year period (less than 10 years for the No Action Alternative). However, favorable economic conditions and evaluation of preliminary drilling results would determine the actual drilling timeframe, as well as the total number of wells drilled and the total number of pads required for construction. Construction activities on Federal lands would follow guidelines described in the “Gold Book,” Surface Operating Standards for Oil and Gas Exploration and Development (BLM/FS 2007), as well as other applicable guidelines, including API 1104, “Welding of Pipelines and Related Facilities”(1999) or the latest edition. Construction activities on State and private lands would follow applicable guidelines of the appropriate SMA.

2.1.1.1 Well Pads

Prior to well pad construction or surface disturbing activities, Enduring Resources would obtain approval of an APD by the appropriate authorized officer (AO) for the lease. Each APD would

contain site-specific Conditions of Approval (COAs) that would apply to construction and well operations.

Well pad construction would consist of roughing in an access road to the well pad location and then leveling a roughly rectangular pad by balancing cut and fill areas. Well pads would be constructed from the native sand/soil/rock materials present. A small reserve pit (150 feet x 75 feet x 12 feet deep, occupying approximately 0.25 acre) would be excavated on each pad. All reserve pits would be constructed on the uphill side of the pad (in cut material) and would be fenced “sheep tight” on three sides prior to drilling activity and closed off on the fourth side after drilling is finished. The reserve pit would be designed to prevent the collection of surface runoff and would be constructed with a minimum of one half of the total reserve pit in cut. The appropriate SMA would determine on a case-by-case basis if unlined pits are acceptable, or if site-specific conditions indicate that a synthetic liner in the fluid reserve pit is required.

Stockpiles for both topsoil and subsoil would be established and maintained for future use in backfilling the reserve pit and rehabilitating the location upon abandonment. Depending on the amount of cut and fill required to level each site, these stockpiles would occupy approximately 0.5 acre.

Single well pads are expected to occupy approximately 4.0 acres initially to accommodate drill rigs and equipment. Well pads on which multiple wells would be sited are expected to occupy approximately 5.0 acres initially to accommodate drill rigs and equipment. Since the alternatives contain a combination of both single and multiple well pads, for disturbance calculation purposes, average well pad size is estimated to be 4.5 acres.

2.1.1.2 Access Roads

Under all alternatives, existing roadways would be used where possible and new roads would be constructed where needed. The approximately 22 miles of existing roads within the SCPA would provide the primary trunk roads for access to the new well pads. Conceptual access routes to the proposed well pads are depicted on **Figures 2-1, 2-2, and 2-3**. Exact locations of access roads would be determined by the appropriate SMA at the time of the onsite inspection. Proposed roads are expected to cross Federal, State, and private surfaces. Prior to any construction, improvement, or maintenance on County-authorized ROWs, Enduring Resources would coordinate with the Uintah County Roads Department to determine County requirements.

Construction of proposed roads on BLM surface would conform to standards outlined in “The Gold Book” (BLM/FS 2007). All construction materials for the proposed access roads would consist of native borrow and soil accumulated during road construction. New access roads on Federal surface would be crowned (2 to 3 percent), ditched, and constructed with a running surface of approximately 18 feet. Although the running surface of the new roads would be 18 feet, initial surface disturbance calculations are based upon a 50 foot wide corridor (the width of a typical road ROW). Co-located pipelines would lie along the surface at the edge of the road ROW.

Graveling or capping the roadbed may be performed as necessary to provide a well constructed, safe road. Prior to construction or upgrading, the proposed road ROW would be cleared of any snow and allowed to dry completely.

All new access roads would be constructed with appropriate drainage and erosion control features, and structures to include cut-and-fill slope and drainage stabilization, relief and drainage

culverts, water bars, and wing ditches similar to those described in the “Gold Book” (BLM/FS 2007). Access roads would be constructed using standard equipment and techniques. Bulldozers and/or road graders would first clear vegetation and topsoil from the ROW. These materials may be windrowed for future redistribution during the reclamation process. Surface disturbance and vehicular use would be limited to the approved ROW.

2.1.1.3 Pipelines

Steel pipe gathering lines with a 4- to 6-inch outside diameter (OD) would be installed on the surface to transport the produced gas from the wells to larger lateral (or trunk) lines. Conceptual pipeline routes are depicted on **Figures 2-1, 2-2 and 2-3**. Exact location of pipelines would be determined at the time of the onsite inspection with the appropriate SMA. Proposed pipelines are expected to cross Federal, State, and private surface.

All proposed pipelines would be laid on the surface with the exception of burial at road crossings in order to provide and maintain access routes. All of the proposed pipelines are expected to be installed parallel to the proposed and existing access roads within the 50-foot ROW. For co-located roads and pipelines, a total initial width of 50 feet was used to calculate disturbance. For pipelines installed along existing roads, an initial 10-foot wide disturbance buffer was used. Removal of vegetation would be kept to a minimum.

2.1.1.4 Compression

Under each alternative, in order accommodate the increased production expected to occur, a 1,500-horsepower (hp) compressor station would be constructed in Section 36 of T10S R25E. The compressor station would require approximately 4 acres of surface disturbance and would consist of a compressor, central glycol dehydrator, meter run, and 300-barrel stock tanks to collect produced water and condensate that would be removed from the gas stream.

2.1.1.5 Well Drilling

Drilling operations would be conducted in compliance with all Federal Oil and Gas Onshore Orders, all State of Utah Division of Oil, Gas, and Mining (UDOGM) rules and regulations, and all applicable local rules and regulations. Enduring Resources estimates that each well will require an average of approximately 20 days to drill.

The drilling operation would be conducted in two phases. The first phase would utilize a surface-hole rig and an air mist system to drill to a depth of approximately 2,000 feet. During the second phase, a larger rotary drilling rig with conventional mud system would be mobilized to drill the remainder of the hole to a total depth of between 8,000 and 9,000 feet. The larger rig would pump fresh water as a circulating fluid to drive the mud motor, cool the drill bit, and remove cuttings from the wellbore. Prior to drilling below the surface casing, a Blowout Preventer (BOP) would be installed on the surface casing and both the BOP and surface casing would be tested for pressure integrity. The BOP and related equipment would meet the minimum requirements of Onshore Oil and Gas Order No. 2.

Drill cuttings from the wellbore (mainly shale, sand, and miscellaneous rock minerals) and drilling fluids carried over with the cuttings would be held in the reserve pit. No chemicals subject to reporting under SARA Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the

drilling, testing, or completion activities. No hazardous substances subject to reporting under SARA Title III or 40 CFR 355 would be placed in this pit.

Upon drilling the hole to the total depth, a series of data-logging tools would be run in the well to evaluate the potential hydrocarbon resource. If the evaluation concludes that adequate hydrocarbon resources are present and recoverable, then steel production casing would be run and cemented in place in accordance with the well design, as approved in the APD, and any applicable COAs. The types of casing used, and the depths to which they are set, would depend upon the physical characteristics of the formations that are drilled. The casing and cementing program would be designed to isolate and protect the various formations encountered in the wellbore, and to prohibit pressure communication or fluid migration between zones.

2.1.1.6 Completion Operations

Once production casing has been cemented in place, the drilling rig would be released and a completion rig would be moved in. Enduring Resources estimates that an average of approximately 10 days would be required to complete an individual well.

Well completion consists of running a cement bond log to evaluate the cementing integrity, correlating (on depth) the cased hole logs to the open hole logs, perforating the casing across the hydrocarbon producing zones, and initiating a stimulation treatment of the formation to enhance its transmissibility of oil and gas. The typical stimulation used in the area is a hydraulic fracture treatment of the reservoir, wherein freshwater/sand slurry is pumped into the producing formation with sufficient hydraulic horsepower to fracture the rock formation. The sand serves as a proppant to keep the created fracture open, thereby allowing reservoir fluids to move more readily into the well.

2.1.2 OPERATIONS AND MAINTENANCE

Each completed well pad would contain one or more wellheads, three-phase separators with a 0.5 million British thermal unit per hour (MMBtu/hr) boilers, 300-barrel condensate tanks, 300-barrel water tanks, glycol dehydration units, and a meter house. Produced water and condensate would be stored in the tanks and periodically transported by tanker trucks to commercial points outside the SCPA. Produced gas would be transported from the SCPA (through the compressor station) via the Archy Bench/Evacuation Creek Pipeline east of the Project Area.

2.1.2.1 Project Area Maintenance

Trash containers and portable toilets would be located on construction sites during well pad and pipeline installation. Toilet holding tanks would be regularly pumped and their contents disposed of at Vernal, Utah's municipal sewage facility in accordance with applicable rules and regulations regarding sewage treatment and disposal. Accumulated trash and nonflammable waste materials would be hauled to the Uintah County landfill once a week or as often as necessary. All debris and waste materials not contained in the trash containers would be cleaned up, removed from the SCPA, and disposed of at the Uintah County landfill. Cleanup would occur everyday.

2.1.2.2 Water Requirements

Water needed for the drilling and completion of each well would be obtained from the White River (Permit # 49-2279[T77865]) or from other permitted water sources to be determined as necessary. Water would be trucked from the well to drilling locations. Specific details regarding

water use are addressed in the alternative specific discussions in **Sections 2.2** through **2.4**. For the purposes of analysis, all water use would be considered to be diversionary.

2.1.3 DECOMMISSIONING AND RECLAMATION

2.1.3.1 Interim Reclamation

Following completion activities, Enduring Resources would reduce the size of each well pad to the minimum surface area needed for production facilities, while providing for adequate safety measures, and would reshape and stabilize cut and fill slopes to mimic the original topography. Reserve pits would be reclaimed within 360 days after initial production on State or private land (per UDOGM regulations), and within 90 days or as soon as practicable on BLM-administered lands (per Onshore Order #7). On BLM-administered lands, pits may be reused if additional wells are drilled from the same well pad within a one-year timeframe. The subsoil and liner (if used) would be pushed back into the pit, and the topsoil would be respread and reseeded. Enduring Resources would reduce the pad size for single wells to approximately 3 acres. The reduced well pad size for multiple well locations would vary depending on the number of wells on each pad, but would average 4 acres. Since the alternatives include a combination of single and multiple well pads, an average of 3.5 acres was used for calculating disturbance. Roads would be reclaimed to a 24-foot corridor (an 18 foot running surface and 3 feet on either side of the road for drainage ditches). All disturbed areas not necessary for drilling and production operations would undergo the following reclamation standards after completing dirt work and operations.

Portions of well pads and ROWs not utilized for the operational phase of the project would be reseeded using seed mixtures determined by the appropriate SMA. Post-construction seeding applications and reclamation practices would continue as needed, until such time as written approval is received from the SMA. Given the history of reclamation efforts in the area, some locations would require special reclamation practices such as hydromulching, straw mat application on steeper slopes, fertilizing, and soil analysis to determine the need for fertilizer, seed-bed preparation, contour furrowing, watering, terracing, water barring, and the replacement of topsoil.

2.1.3.2 Well Abandonment and Final Reclamation

While the life span of individual wells may vary, the typical life span is estimated to be approximately 20 to 30 years. Abandonment of a well and its facilities would be performed in compliance with all applicable regulations. All hydrocarbons and water-bearing horizons in an abandoned well bore would be isolated via cement plugs. At the time of final abandonment, all aboveground facilities, including pipelines, would be removed and abandoned well pads, roads, and other disturbed areas would be reclaimed.

Final reclamation includes reestablishing soil conditions and revegetating disturbed areas to the specifications of the SMA at the time of abandonment. All disturbed surfaces would be re-contoured to the approximate natural contours, with reclamation of the well pad and access road performed as soon as practical after final abandonment. Re-seeding would be performed in the fall following completion of the reclamation operations, after August 9th and before the ground freezes, or in the spring. Reclamation practices would continue as needed, until determined successful by the appropriate SMA.

2.2 ALTERNATIVE A – PROPOSED ACTION

Under the Proposed Action, Enduring Resources anticipates constructing approximately 152 well pads from which up to 249 wells would be drilled. Of the planned well pads, 89 are expected to support a single vertically drilled well. The remaining 63 well pads would support up to 4 wells. As planned, directionally drilled wells represent approximately 49 percent (122 wells) of the total new wells proposed. The actual number of directionally drilled wells would depend upon the feasibility of directional wells providing for the optimum recovery of natural gas reserves from the SCPA. The majority of the proposed wells would be drilled on 40-acre downhole spacing. Conceptual well locations under the Proposed Action are illustrated in **Figure 2-1**.

In addition to new wells and well pads, the Proposed Action requires the construction of the following primary components:

- Approximately 36 miles of new access roads or upgraded two-tracks;
- Approximately 47 miles of pipeline
- One compressor station (with a 1,500 horsepower gas-fired compressor engine) and, at each well pad the installation of a three-phase separator with a heater, a glycol dehydration unit, and two 300-barrel tanks (one for water and the other for condensate).

Approximately 25 wells per year would be drilled for a maximum of 10 years under the Proposed Action. Typically, water use for drilling and completion would be approximately 0.75 acre-feet (7,758 barrels) per well. Resulting annual water use would be approximately 18.75 acre-feet per year. The 10-year development use would be approximately 187.50 acre-feet. In addition, approximately 0.1 acre-feet (775 barrels) of water per well pad per year would be utilized for dust abatement, or a maximum of 15.2 acre-feet per year. Total estimated water use during the 10-year development period would be approximately 339.50 acre-feet.

At full development, about three pumpers would be employed to check and maintain facilities on a daily basis. An average of five trucks per day would be needed to haul produced water and condensate from the Project Area.

Under the Proposed Action, construction of the proposed well pads, roads, and pipelines would result in an initial disturbance of approximately 858 acres¹. Disturbance would consist of direct removal of vegetation from grading of the proposed roads, well pads, and other project facilities.

Initial surface disturbance estimates from the Proposed Action are summarized in **Table 2-1**. Initial disturbances are those that would last the 1 to 5 years it generally takes for vegetation to be re-established during normal precipitation in the Uinta Basin (BLM 2006a). Under drought conditions, which are common in the Uinta Basin, revegetation efforts can take a longer time. For that reason, all disturbance calculations referenced throughout this document refer to initial disturbance only.

¹ Surface disturbance calculations are based on conceptual well pad, compressor station, road, and pipeline locations as presented in **Figure 2-1**. Actual surface disturbance may vary based on site-specific analysis through the APD process.

Table 2-1. Alternative A - Initial Surface Disturbance in the SCPA

Design Element	Initial Disturbance (acres)
Well Pads	684
Compressor Station	4
Surface Pipeline (along existing roads)	13
Co-located Roads and Pipeline	218
Total	858*

* The total disturbance for Alternative A used throughout this document is 858 acres. This total is the result of GIS analysis which eliminates areas of overlapping surface disturbance from individual development components (or approximately 61 acres).

2.3 ALTERNATIVE B – NO ACTION

Under the No Action Alternative, no drilling would be permitted on Federal leases. Drilling and production would continue to occur on State of Utah and private leases. Surface land use would be controlled by State agencies and/or the landowner. Rights-of-way for roads and pipelines would be granted across Federal lands to access the leases on the State and private lands.

The No Action Alternative provides for four well pads on State of Utah leases and 20 on private leases, which would accommodate 36 wells. As planned, directionally drilled wells represent approximately 47 percent (17 wells) of the total new wells proposed. The actual number of directionally drilled wells, however, would depend upon the feasibility of directional wells providing for the optimum recovery of natural gas reserves from the Project Area.

In addition to new wells and well pads, the No Action Alternative requires the construction of the following primary components:

- Approximately 12 miles of new access roads or upgraded two-tracks;
- Approximately 17 miles of pipeline;
- One compressor station (with a 1,500 horsepower gas-fired compressor engine) and, at each well pad the installation a three-phase separator with a heater, a glycol dehydration unit, and two 300-barrel tanks (one for water and the other for condensate).

Wells would be drilled at a variable rate per year for a maximum of 5 years. Typically, water use for drilling and completion would be approximately 0.75 acre-feet (7,758 barrels) per well. Annual water usage would vary depending upon the total wells drilled per year. In addition to water for drilling and completion activities, approximately 0.1 acre-feet (775 barrels) of water per well pad would be utilized for dust abatement each year for a maximum of 2.4 acre-feet of water per year. Total water usage for the 5-year development period is expected to be 29.4 acre-feet.

The total expected initial disturbance for the No Action Alternative as described would be approximately 181 acres. **Table 2-2** shows the approximate initial disturbance from the No Action Alternative. The conceptual locations of facilities are shown on **Figure 2-2**.

Table 2-2. Alternative B - Initial Surface Disturbance in the SCPA

Design Element	Initial Disturbance (acres)
Well Pads	108
Compressor Station	4
Surface Pipeline (along existing roads)	1
Co-located Roads and Pipeline	73
Total	181*

* The total disturbance for Alternative A used throughout this document is 181 acres. This total is the result of GIS analysis which eliminates areas of overlapping surface disturbance from individual development components (or approximately 5 acres).

2.4 ALTERNATIVE C – VERTICAL DRILLING IN THE POTENTIAL OIL SHALE DEVELOPMENT AREA

Within the Project Area, the Oil shale Exploration company (OSEC) holds an existing Research, Development and Demonstration (RD&D) lease on 160 acres of public land (**Figure 2-3**), OSEC is currently conducting the RD&D project at the existing White River mine site. If the RD&D project proves to be productive, OSEC has a preferential right to commercially lease all or portions of an oil shale development preferential lease area (4,960 acres) within the SCPA (**Figure 2-3**). There is the potential, therefore, that oil shale development and traditional drilling operations for oil and gas could occur simultaneously in the majority of the Project Area in the future. In order to maximize future development needs and minimize risk, Alternative C proposes no drilling within the RD&D area and vertical drilling of wells (at 40-acre surface spacing) within the preferential lease area. The wells would be located on the ground in a manner to facilitate predictability during mining of the preferential oil shale lease area.

Alternative C provides for 196 well pads on, which will accommodate 240 wells. As planned, directionally drilled wells represent approximately 25 percent (59 wells) of the total new wells proposed. The actual number of directionally drilled wells, however, would depend upon the feasibility of directional wells providing for the optimum recovery of natural gas reserves from the Project Area.

In addition to new wells and well pads, Alternative C requires the construction of the following primary components:

- Approximately 50 miles of new access roads or upgraded two-tracks;
- Approximately 61 miles of pipeline;
- One compressor station (with a 1,500 horsepower gas-fired compressor engine) and, at each well pad the installation a three-phase separator with a heater, a glycol dehydration unit, and two 300-barrel tanks (one for water and the other for condensate).

Wells would be drilled at a variable rate per year for a maximum of 10 years. Typically, water use for drilling and completion would be approximately 0.75 acre-feet (7,758 barrels) per well. Annual water usage would vary depending upon the total wells drilled per year. In addition to water for drilling and completion activities, approximately 0.1 acre-feet (775 barrels) of water per well pad would be utilized for dust abatement each year for a maximum of 19.6 acre-feet of water per year. Total water usage for the 10-year development period is expected to be 376 acre-feet.

Initial surface disturbance estimates from Alternative C are summarized in **Table 2-3**. Initial disturbances are those that would last the 1 to 5 years it generally takes for vegetation to be re-established during normal precipitation in the Uinta Basin (BLM 2006a). Under drought conditions, which are common in the Basin, revegetation efforts can take a longer time. For that reason, all disturbance calculations referenced throughout this document refer to initial disturbance only.

Table 2-3. Alternative C - Initial Surface Disturbance in the SCPA

Design Element	Initial Disturbance (acres)
Well Pads	882
Compressor Station	4
Surface Pipeline (along existing roads)	13
Co-located Roads and Pipeline	305
Total	1117*

* The total disturbance for Alternative A used throughout this document is 1,117 acres. This total is the result of GIS analysis which eliminates areas of overlapping surface disturbance from individual development components (or approximately 87 acres).

2.5 APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES

Enduring would adhere to 1) all COAs and stipulations associated with their existing leases; 2) restrictions set out in the Vernal ROD and Approved RMP (BLM 2008e), as applicable; 3) guidelines developed by BLM and USFWS for oil and gas operations; and 4) other statutory or regulatory requirements. In addition to required mitigation measures, several procedures are described below that would be implemented under all alternatives to reduce the potential environmental impacts of the proposed development activity. These ACEPMs are based upon the guidelines developed by BLM for oil and gas operations.

In addition to these ACEPMs, the BLM on-site inspection for each new well pad may identify specific resources that may be affected on a particular location. The on-site inspection would be used to determine which of the below measures would be necessary on a site-specific basis to avoid or reduce impacts.

2.5.1 CULTURAL RESOURCES

A Class III cultural resources survey, conducted by a BLM-approved archaeologist and funded by Enduring Resources, would be conducted on all areas proposed for surface disturbance. Class III cultural resource block surveys have been conducted in portions of the proposed development area and would be utilized where applicable. If these surveys identify areas with a high probability of encountering potentially significant subsurface archaeological sites, a qualified archaeologist would monitor surface disturbance.

Enduring Resources and their contractors would inform their employees about relevant Federal regulations intended to protect cultural resources. Equipment operators would be informed that if a site is uncovered during construction, activities in the vicinity would immediately cease and the BLM Authorized Officer (AO) would be notified. Historic properties considered eligible for the

National Register of Historic Places (NRHP) would be avoided or mitigated through an approved data recovery plan.

2.5.2 PALEONTOLOGICAL RESOURCES

Based on site-specific recommendations from the BLM AO, surveys for paleontological resources would be conducted on areas with sandstone outcrops and where excavations into sensitive formations may be needed for road, well pad, or pipeline construction.

The survey would be conducted by a BLM-approved paleontologist funded by Enduring Resources and would determine fossil localities and the sensitivity of the area for fossil resources. These actions would determine the necessity of having a qualified paleontologist on-site during construction. If paleontological resources were uncovered during ground-disturbing activities, Enduring Resources would suspend all operations that would further disturb such materials and would immediately contact the BLM AO, who would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan.

2.5.3 WILDLIFE AND FISHERIES

On BLM land, raptor management would be guided by “*Best Management Practices for Raptors and Their Associated Habitats in Utah*” (see Appendix A of the Vernal ROD and Approved RMP) (BLM 2008e). As such, prior to any surface-disturbing activities during the breeding season, a BLM-approved biologist would survey all areas within 1 mile of proposed surface disturbance for the presence of raptor nests. If occupied/active raptor nests are found, construction would not occur during the nesting season for that species within the species-specific buffer described in the “*Guidelines*” above. In addition, as specified in these “*Guidelines*”, and as determined by the AO, modifications of these spatial and seasonal buffers for BLM-authorized actions would be permitted, so long as protection of nesting raptors is ensured (BLM 2008e).

No construction or surface-disturbing activities would occur within ½-mile of a bald eagle roost site from November 1 through March 31. Temporary actions may occur within this ½-mile buffer outside of this seasonal restriction. If temporary actions must occur within the seasonal restriction, a qualified biologist approved by the appropriate SMA would monitor all project activities within ½-mile of known bald eagle roosts. Enduring Resources’ work-related activities would be allowed to occur between 9:00 AM (typically after a bald eagle leaves a roost site for the day) and 5:00 PM (typically before a bald eagle returns to the roost site for the evening). Daytime restrictions may vary depending on the biologist’s evaluation of when the eagle is at the roost.

Netting or bird balls would be utilized on open reserve pits as directed by the AO.

To minimize wildlife mortality due to vehicle collisions, Enduring Resources would advise project personnel regarding appropriate speed limits in the SCPA. The Utah Division of Wildlife Resources (UDWR) would be contacted regarding the presence of carrion within or along roadways.

2.5.4 VEGETATION

A pre-project weed inventory of areas proposed for disturbance (e.g., well pads, ROWs, etc.) would be conducted prior to beginning ground-disturbing activities. Inventory data would be

collected using BLM VFO-designed data collection sheets and data elements. Equipment and vehicles entering the Project Area from outside the Uinta Basin would be power washed to remove seeds and plant material.

Enduring Resources would monitor and control noxious and invasive weeds along access road use authorizations, pipeline route authorizations, well pads, or other applicable facilities by spraying or mechanical removal, as approved by the appropriate SMA.

In accordance with the VFO Approved RMP (BLM 2008e), equipment and vehicles entering the Project Area from outside the Uinta Basin would be power washed to remove seeds and plant material. Additionally, on BLM administered land, a Pesticide Use Proposal would be submitted and approved prior to the application of herbicides, pesticides, or other hazardous chemicals.

2.5.5 RECLAMATION

Interim and final reclamation actions would occur on all disturbed areas. These actions are described in detail in the Reclamation Plan (**Appendix B**).

2.5.6 EROSION PROTECTION

Well pads and other project facilities would be constructed to minimize the overland flow of water and sediment leaving the facilities. Erosion protection and silt retention would be provided by the construction of structural and non-structural controls (e.g., silt catchment dams, riprap, bales, and heavy vegetation) where needed and where feasible.

The operators would prepare a Storm Water Management Plan.

In accordance with the VFO Approved RMP (BLM 2008e), if surface-disturbing activities cannot be avoided on slopes from 21-40 percent, a plan would be required and would include an erosion control strategy, GIS modeling, and proper survey and design by a certified engineer.

2.5.7 EXISTING FACILITIES AND RIGHTS-OF-WAY

Cattle guards would be used for fence crossings whenever practicable. If a fence must be cut, H-braces would be installed to support the existing fence and a cattle guard installed to prevent livestock movement.

2.5.8 WETLANDS/RIPARIAN ZONES/FLOODPLAINS

In accordance with the Vernal RMP (BLM 2008e), no new surface-disturbing activities would be allowed within active floodplains, wetlands, public water reserves, or within 100 meters of riparian areas. An exception could be authorized if:

- There are no practical alternatives,
- Impacts could be fully mitigated, or
- The action is designed to enhance the riparian resources.

If an exception is authorized, all well pads located within or immediately adjacent to 100-year floodplains would feature a closed-loop system. The need for closed-loop systems at individual

well pads would be determined by the AO during the onsite process. No well pads will be located within the active channel.

Pipelines within floodplains would be buried to a depth of 15 feet or a scouring analysis would be performed to determine the proper depth of burial to prevent pipeline exposure in the event of a flood.

2.5.9 LIVESTOCK GRAZING

Enduring Resources would repair or replace any fences, cattleguards, gates, drift fences, and natural barriers that are damaged due to project-related activities. Cattleguards or gates would be installed for livestock control on road ROWs when fences are crossed and these structures would be maintained by Enduring for the life of the project.

2.5.10 ROAD USAGE MONITORING

Enduring Resources would meet with the BLM and other appropriate surface owners and government agencies once every 5 years to review usage of existing access roads inside the SCPA. If it is determined by all that a certain access road is no longer used or needed, Enduring Resources would reseed the road and return it to its native condition.

2.5.11 ROAD MAINTENANCE

Enduring Resources would maintain new access roads leading to their facilities inside the SCPA. Access roads are the short spur access roads from the established trunk road network to the well pads.

2.5.12 MULTIPLE MINERAL DEVELOPMENT

Enduring would coordinate with OSEC to minimize subsurface conflict within OSEC's RD&D area.

2.5.13 VISUAL RESOURCES

All operating equipment would be painted a flat non-reflective color that is compatible with the surrounding landscape as specified by the BLM.