

**APPENDIX A: EXISTING OIL AND GAS LEASING
STIPULATIONS**

APPENDIX A: EXISTING OIL AND GAS LEASING STIPULATIONS

APPENDIX A-1: GENERAL SURFACE USE AND OCCUPANCY REQUIREMENTS

This appendix describes practices intended to be applied, when needed, to minimize surface disturbance.

The intent of the Surface Use and Occupancy Requirements is to best manage mechanical surface disturbance and other effects on specified natural resources. Mechanical surface disturbance is created by the use of such things as tools and machinery. Circumstances for waivers of the requirements have been included so that they will not be applied needlessly. Exceptions to the requirements will be considered in emergency situations involving human health and safety and the protection of the environment.

The basis for the “200 meter rule” used in the Surface Use and Occupancy Requirements is 43 CFR 3101.1-2, which states that, at a minimum, mitigation measures are deemed consistent with oil and gas lease rights if they do not require “...relocation of proposed operations by more than 200 meters...” The intent of the actions described in this Appendix is to comply with the regulations and allow the relocation of proposed activities to mitigate impacts, but by no more than 200 meters, without undertaking additional NEPA analysis. The opportunity exists through the NEPA process to design mitigation of impacts that would require relocation greater than 200 meters. The “200 meter rule” simply allows relocation of an activity, such as during on-site meetings prior to APD approval, without the need for detailed NEPA analysis.

The Surface Use and Occupancy Requirements identify minimum use standards for activities around certain natural and man-made features to ensure protection of those features.

- **Wildlife Habitat Projects:** Surface disturbance will not be allowed within 200 meters of existing or planned wildlife habitat improvement projects. Large-scale vegetation manipulation projects such as prescribed burns will be excepted. This requirement will be considered for waiver with appropriate off-site mitigation, as determined by the Authorized Officer.
- **Endangered Species:** Surface disturbance will not be allowed within 200 meters of critical endangered species habitat.
- **Raptor Nests and Heronries:** Surface disturbance will not be allowed within 200 meters of active heronries or by delaying activity for up to 120 days, or a combination of both. Raptor nests on special, natural habitat features, such as trees, large brush, cliff faces and

escarpments, will be protected by not allowing surface disturbance within 200 meters of nests or by delaying activity for up to 90 days, or a combination of both. Exceptions to this requirement for raptor nests will be considered if the nests expected to be disturbed are inactive, the proposed activity is of short duration (e.g. habitat enhancement projects, fences, pipelines), and will not result in continuing activity in proximity to the nest.

- **Slopes or Fragile Soils:** Surface disturbance will not be allowed on slopes over 30 percent. Exceptions will be considered for projects designed to enhance or protect renewable natural resources, or if a plan of operations and development which provides for adequate mitigation of impacts was approved by the Authorized Officer. Occupancy or use of fragile soils will be considered on a case-by-case basis.

- **Streams, Rivers, and Floodplains:** Surface disturbance will not be allowed within 200 meters of the outer edge of the 100-year floodplain (As Defined by the Federal Emergency Management Agency FEMA), to protect the integrity of the floodplain. On a case-by-case basis, an exception to this requirement may be considered based on one or more of the criteria listed below. The first three criteria would not be applied in areas of identified critical or occupied habitat for federally listed threatened or endangered species.
 - Additional development in areas with existing developments that have shown no adverse impacts to the riparian areas as determined by the Authorized Officer, following a case-by-case review at the time of permitting.
 - Suitable off-site mitigation if habitat loss has been identified.
 - An approved plan of operations ensures the protection of water or soil resources, or both.
 - Installation of habitat, rangeland or recreation projects designed to enhance or protect renewable natural resources.

- **Playas and Alkali Lakes:** Surface disturbance will not be allowed within 200 meters of playas or alkali lakes. Waiver of this requirement will be considered on a case-by-case basis for projects designed to enhance or protect renewable natural resources. An exception for oil and gas development will be considered if playa lake loss was mitigated by the protection and development of another playa exhibiting the potential for improvement. Mitigation could include: installing fencing; developing a supplemental water supply; planting trees and shrubs for shelter belts; conducting playa basin excavation; constructing erosion control structures or cross dikes; or by improving the habitat in another area.

- **Springs, Seeps, and Tanks:** Surface disturbance will not be allowed within 200 meters of the source of a spring or seep, or within downstream riparian areas created by flows from the source or resulting from riparian area management. Surface disturbance will not be allowed within 200 meters of earthen tanks or the adjacent riparian areas created as a result of the presence of tanks. Exceptions to this requirement will be considered for the installation of habitat or rangeland projects designed to enhance the spring or seep, or downstream flows.
- **Caves and Karst:** Surface disturbance will not be allowed within 200 meters of known cave entrances, passages or aspects of significant caves, or significant karst features. Waiver of this requirement will be considered for projects that enhance or protect renewable natural resource values, when the proposed activity is of a short duration, or when an approved plan of operations ensures the protection of the cave and karst resources. Also see Appendix A-3 for cave and karst drilling practices.
- **Visual Resource Management:** Painting of oil field equipment and structures to minimize visual impacts will be conducted according to the requirements of Notice to Lessees (NTL) 87-1, New Mexico. Low profile facilities also may be required, when needed, to reduce the contrast of a project with the dominant color, line, texture, and form of the surrounding landscape. Other surface facilities or equipment approved by the BOR, such as large-scale range improvements or pipelines, will be painted, when needed, to conform with the requirements of visual resource management to minimize visual impacts. Paint colors will be selected from the ten standard environmental colors approved by the Rocky Mountain Coordinating Committee. The selected paint color will match as closely as possible the predominant soil or vegetation color of the area.
- **Recreation Areas:** Facilities must be located so that they are not visible from designated recreation areas such as campgrounds, picnic areas, boat launch ramps, etc.
- **Spacing Requirements:** The lease or portion of a lease for an area within and below the full conservation pool elevation may be issued for the sole purpose of assisting the orderly development of the Federal mineral estate. This lease will only be used to maintain state well-spacing requirements on the lands noted above. With the exception of providing access, determined on a case-by-case basis, this lease does not grant surface occupancy.

The specific stipulations listed below are designed to protect the dams, water conveyance facilities, and the water quality in the Project Area.

1. Permittee agrees to provide written notice to the Bureau of Reclamation (BOR) 15 days prior to any and all intended surface activities in connection with exploration, drilling, or any other activity associated with, or leading to, oil and gas, geothermal or other leasable mineral

- production including seismic activity on any lands which the BOR has jurisdiction as the surface agency.
2. Permittee agrees to no surface occupancy within 800 horizontal meters (~1/2 mile) from the Brantley or Avalon Dam sites. Drilling proposed within 800 to 1600 meters (~ 1/2 to ~ 1 mile) of either dam will be considered on a case-by-case basis after review of the geology of the proposed site. This stipulation is to ensure the integrity of the structures.
 - 3a. Permittee agrees to no surface occupancy within 200 horizontal meters (~ 1/8 mile) or below the full conservation pool elevation (Brantley full pool elevation is 3,271 feet AMS) and no storage facilities below the maximum flood zone elevation at Brantley Reservoir (Brantley maximum flood surface elevation is 3286 feet above sea level). This stipulation is to reduce the possibility of contamination (pollution) affecting the reservoir waters.
 - 3b. Permittee agrees to no surface occupancy within 200 horizontal meters (~ 1/8 mile) of the maximum conservation pool elevation (Avalon maximum conservation pool surface elevation is 3190 feet) and no storage facilities below 3,200 feet at Avalon Reservoir.
 4. Permittee agrees to no surface occupancy within 200 horizontal meters (~ 1/8 mile) of the centerline of any constructed or proposed BOR tunnel, canal, aqueduct, pipeline, lateral, drain, transmission line, telephone line, roadway, building, or other permanent structures or facilities under the administration, jurisdiction, or ownership of the BOR. BOR operation and maintenance roads will not be used for access without prior approval of the BOR.
 5. Permittee agrees to no surface occupancy within 200 horizontal meters (approximately 1/8 mile) of any improved campground, boat ramp, or other permanent recreation facility.
 6. Permittee agrees to locate production facilities so they are not visible from the reservoir or public recreation facilities (campgrounds, etc.).
 7. Permittee agrees to no surface occupancy within the boundaries of Brantley Lake State Park or other designated public recreation areas.

APPENDIX A-2: GENERAL CONDITIONS OF APPROVAL

This appendix describes standard conditions of approval. When appropriate, conditions of approval may be selected from this list and attached to use authorizations. A check-list or other suitable means may be used to identify applicable conditions of approval. The emphasis is primarily on oil and gas operations and rights-of-way, but these conditions may be applied to other activities, as well.

General Conditions

1. Reclamation does, through the duly authorized officer executing this Permit, hereby consent to Permittee’s request to enter onto lands of the United States for the purpose of; establishing, constructing, placing, operating and maintaining an oil and gas well head and appurtenant facilities approved _____ by the State of New Mexico’s Energy, Minerals and Natural Resources Department (_____) and constructing, improving and maintaining an access road to that site, subject to the terms and conditions herein written:

said lands located in the XX (XX)of Section XX and the XX of the XX (XX) of Section XX of Township XX South, Range XX East, New Mexico Principal Meridian in Eddy County, New Mexico. The area is shown in the attached “Exhibit A,” and made a part hereof.

2. This permission given herein will neither constitute nor be construed as any surrender of the jurisdiction and supervision of the United States over the lands described herein.
3. The Permittee hereby agrees to indemnify and hold harmless the United States, their employees, agents, and assigns from any loss or damage and from any liability on account of personal injury, property damage, or claims for personal injury or death arising out the Permittee’s activities under this Permit.
4. The Permittee will comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the Permittee will comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et. seq.) with regard to any toxic substances that are used, generated by or stored on United States lands or on facilities authorized by this permit. (Re: 40 CFR, Part 702-799 and particularly provisions on polychlorinated biphenyls, 40 CFR, Part 761.1 - 761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 will be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of the reportable release or spill of toxic substances will be furnished to Reclamation concurrent with the filing of the reports to the involved Federal agency or State government.
5. The Permittee agrees to indemnify and hold harmless the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601 et. seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et. seq.) on United States lands unless the release is wholly unrelated to the



Permittee's activities on United States lands. This agreement applies without regard to whether a release is caused by the Permittee, its agent or unrelated third parties.

6. If, during any phase of the construction, operation, maintenance, or termination of the facilities authorized by this permit, any oil or other pollutant should be discharged, impacting United States lands, the control and removal, disposal, and cleaning up of such oil or other pollutant, wherever found will be the responsibility of the Permittee, regardless of fault. Upon failure of the Permittee to control, repair all damages to United States lands resulting therefrom, Reclamation may take such measures as deemed necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the Permittee. Such action by Reclamation will not relieve the Permittee of any liability or responsibility.
7. The Permittee will comply with all applicable water, ground, and air pollution laws and regulations of the United States, the State of New Mexico and local authorities. In addition the Permittee will comply with the following hazardous materials restrictions:
 - A. The Permittee will comply with all applicable Federal, State, and local laws and regulations, and Reclamation policies and instructions, existing or hereafter enacted or promulgated, concerning any hazardous material that will be used, produced, transported, stored or disposed of on or in lands, waters or facilities owned by the United States or administered by Reclamation.
 - B. "Hazardous material" means any substance, pollutant or contaminant listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601, et seq., and the regulations promulgated pursuant to that Act.
 - C. The Permittee may not allow contamination of lands, waters or facilities owned by the United States or administered by Reclamation by hazardous materials, thermal pollution, refuse, garbage, sewage effluent, industrial waste, petroleum products, mine tailings, mineral salts, pesticides (including, but not limited to, the misuse of pesticides), pesticide containers or any other pollutants.
 - D. The Permittee will report to Reclamation, within 24 hours of its occurrence, any events which may or does result in pollution or contamination adversely affecting lands, water or facilities owned by the United States or administered by Reclamation.

- E. Violation of any of the provisions of this Article will constitute grounds for immediate termination of this Permit and will make the Permittee liable for the cost of full and complete remediation and/or restoration of any Federal resources or facilities that are adversely affected as a result of violation.
 - F. The Permittee agrees to include the provision contained in paragraphs (a) through (e) of this Article in any subcontract or third party contract it may enter into pursuant to this Permit.
 - G. Reclamation agrees to provide information necessary for the Permittee, using reasonable diligence, to comply with the provision of this Article.
8. The holder shall be responsible for maintaining the site in a sanitary condition at all times; waste materials 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.
9. The Permittee will minimize disturbance to existing fences and other improvements on United States lands. The Permittee is required to promptly repair improvements to at least their former condition. Functional use of these improvements will be maintained at all times. The Permittee will make a documented good-faith effort to contact the owner of any improvements prior to disturbing those facilities. When necessary to pass through a fence line, the fence will be braced on both sides of the passageway prior to cutting the fence.
10. This Permit is granted subject to the existing rights in favor of the public or third parties for highways, roads, railroads, telegraph, telephone and electrical transmission lines, canals, laterals, ditches, flumes, siphons, and pipelines on, over, and across said land.
11. This Permit is personal, revocable, and nontransferable and will become effective on the date hereinabove written and unless otherwise sooner terminated, will continue for ten (10) years so long as in the opinion of Reclamation it is considered expedient and not detrimental to the public interest, and will be revocable upon sixty (60) days written notice to the Permittee in accordance with Article 11. Upon such revocation or termination, the aforesaid structure or structures and all accessories will be removed without delay at the expense of the Permittee. The Permittee will leave the site(s) in a condition satisfactory to Reclamation and the Bureau of Land Management.
12. This Permit may be revoked by Reclamation upon sixty (60) days written notice to the Permittee if:
- A. The Permittee's use of the land interferes with existing or proposed facilities; or

- B. The land contained in the Permit is needed for any United States purpose; or
 - C. The United States disposes of its interest in the land contained in this Permit; or
 - D. The Permittee fails to comply with any other terms or conditions of this Permit and upon notification of the violation, Permittee fails to adequately cure the violation in a timely manner. Reclamation will have the final determination regarding the adequacy of the cure.
13. Reclamation has appraised the fair market value of the right-of-use fee in accordance with 43 CFR, Part 429.3. Said appraisal has established the fee for the right-of-use as \$_____, and is due prior to the United States executing this Permit.
14. The Permittee will comply with Section 106 of the National Historic Preservation Act (P.L. 89-665, 80 Stat.915 [16 USC 470] as amended, the New Mexico Cultural Properties Act (NMSA 1978, 18-6-1 through 18-6-23), and the Prehistoric and Historic Sites Preservation Act (NMSA 18-8-1 through 18-8-8) and their implementing regulations for all registered cultural properties on Reclamation lands, specifically including all properties and lands within the Carlsbad Irrigation District National Historic Landmark. The New Mexico State Cultural Properties Act requires that survey work for archaeological sites be conducted prior to any development on State or Federal lands. The Permittee will get written authorization before any work is started within the Carlsbad Irrigation District National Historic Landmark. Any cultural resources discovered shall be immediately reported to the authorizing officer.

Pursuant to the Memorandum of Agreement with the Bureau of Reclamation, the Advisory Council on Historic Preservation and the New Mexico State Historic Preservation Officer, the Carlsbad Irrigation District will ensure compliance with the New Mexico Cultural Properties Act (NMSA 1978, 18-6-1 through 18-6-23), and the Prehistoric and Historic Sites Preservation Act (NMSA 18-8-1 through 18-8-8) and their implementing regulations for all registered cultural properties conveyed to the CID by the Bureau of Reclamation.

In the event cultural resources (including architecture, artifacts, and/or cultural debris of bone, shell, charcoal, or wood) are discovered during activities authorized herein, Permittee will immediately cease work in proximity of the discovery location and contact the Reclamation archaeologist immediately at (505) 462-3644, giving location and nature of the findings. The Permittee will exercise care so as not to disturb or damage the cultural materials discovered, and will provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition by the Government.

Discovery of Human Remains: Any person who knows or has reason to know that he or she has inadvertently discovered possible human remains on Federal lands, must provide

immediate telephone notification of the inadvertent discovery to the Reclamation archaeologist at (505) 462-3644.

If the discovery occurred in connection with an activity, including (but not limited to) construction, mining, logging, and agriculture, the person will cease the activity in the area of the discovery, make a reasonable effort to protect the items discovered, and wait for approval from the Reclamation archaeologist before resuming such activity. The requirement is prescribed under the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Stat. 3042) of November 1990 and National Historic Preservation Act, Section 110(a)(2)(E)(iii) (Public Law 102-575, 106 Stat. 4753) of October 1992.

Destruction of Archaeological Resources: Any person who excavates, removes, damages, alters or defaces or attempts to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian land is subject to a maximum of five years in prison and \$250,000 fine, as prescribed under Sections 6 and 7 of the Archaeological Resources Protection Act of 1979 (Public Law 96-95, 93 Stat. 721), as amended.

15. No member of or delegate to Congress or the Resident Commissioner will be admitted to any share or part of this Permit or to any benefit to arise therefrom, but this restriction will not be construed to extend to this Permit if made with a corporation or company for its general benefit.
16. The Permittee warrants that no person or agency has been employed or retained to solicit or secure this Permit upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee except bona fide employees and bona fide commercial agencies maintained by the Permittee for the purpose of securing business. For breach or violation of this warranty, Reclamation will have the right to revoke this Permit without liability or in its discretion to require the Permittee to pay the full amount of such commission, percentage, brokerage, or contingency fee to the United States.

Road Construction, Improvement, and Maintenance

17. The road will have a driving surface of 14 feet. The maximum grade is 10 percent unless agreed to by Reclamation in writing. If Reclamation does permit grades in excess of 10 percent for a distance of more than 300 feet, that segment will be designed by a professional engineer. Maximum width of surface disturbance from construction, improvement and maintenance activities will be 30 feet.
18. Crowning with materials on site and ditching on one side of the road of the uphill side will be required. The crown will have a grade of approximately 2 percent, i.e. 1 inch crown per

12 feet of width. If conditions dictate, ditching may be required for both sides of the road; if conditions permit, flat-bladed road may be considered.

19. Drainage control will be ensured over the entire road through the use of borrow ditches, outsloping, insloping, natural rolling topography, lead-off (turnout) ditches, culverts, and/or drainage dips. All lead-off ditches will be graded to a 3 percent maximum ditch slope. The spacing interval for lead-off ditches will be determined according to the following table, but may be amended depending upon existing soil types and centerline road slope in percentage.

SPACING INTERVAL FOR TURNOUT DITCHES

<u>Percent Slope</u>	<u>Spacing Interval</u>
0 – 4	400 feet – 150 feet
4 – 6	250 feet – 125 feet
6 – 8	200 feet – 100 feet
8 – 10	150 feet – 75 feet

A typical lead-off ditch has a minimum depth of one foot below and a berm 6 inches above the natural surface elevation. The berm will be on the downslope side of the lead-off ditch. The ditch will tie into vegetation wherever possible.

Culvert pipes will be used for cross drainage dips where low water crossings are not feasible. The minimum culvert diameter must be 18 inches. Any culvert pipe installed will be of a sufficient diameter to pass the anticipated flow of water. Culvert location and diameters will be submitted to Reclamation by Permittee for Reclamation approval.

On road slopes exceeding 2 percent, drainage dips will drain water into an adjacent lead-off ditch. Drainage dip location and spacing will be determined by the following formula:

$$\text{spacing interval} = 400 \text{ ft} / \text{road slope percent} + 100 \text{ ft.}$$

example 2% slope: $400/2 + 100 = 300 \text{ feet}$

20. The road or those portion identified by Reclamation may, as determined by Reclamation, be required to be surfaced with caliche, gravel, or other surfacing material which will be approved by Reclamation. When surfacing is required, surfacing material will be compacted to a minimum thickness of six inches with caliche material. The width of surfacing will be no less than the driving surface. Prior to using any mineral materials from any existing or proposed source, authorization must be obtained from Reclamation.
21. Where used, all Cattleguard grids and foundation design and construction will meet the American Association of State Highway and Transportation Officials (AASHTO) Load Rating H-20, although AASHTO U-80 rated grids will be required where heavy loads



- (Exceeding H-20 loading), are anticipated. Cattleguard grids will not be less than 8 feet in length nor less than 14 feet in width. A wire gate, 16 foot minimum width will be provided on one side unless otherwise requested by the surface user.
22. Permittee will maintain the road in a safe, usable condition. A maintenance program will include, but not limited to blading, ditching, culvert cleaning, drainage installation, cattle guard maintenance and surfacing.
 23. Unless otherwise approved by the Authorized Officer, vehicle turnouts will be required. Turnouts will be located at 2000-foot intervals, or the turnouts will be intervisible, whichever is less.
 24. Unless otherwise determined by Reclamation, the road will not be used as an access for the public. Reclamation withdrawn lands are established for project purposes and are not subject to the use by the general public. Permittee will be responsible to ensure that the public use is restricted from the withdrawn lands under management by Reclamation.
 25. The area will be kept free of the following plant species: Malta starthistle, African rue, Scotch thistle, and Saltcedar.
 26. Reclamation will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction and no further construction will be done at that point until clearance has been issued by Reclamation. Special restoration stipulations or a realignment may be required at such intersections, if any. Roads and pipelines will be routed around sinkholes and other karst features when practical. Turnout ditches and drainage leadoffs will not be constructed in such a manner as to increase or decrease the natural flow of water into or out of cave or karst features.

Road Rehabilitation

27. When the road is abandoned, it will be ripped at least sixteen inches deep, including all turnouts. The caliche may be reclaimed for re-use before ripping. The caliche will be removed and topsoil placed over the impacted area, and the surface disced before seeding. All culverts or other structures will be removed. All fill material will be replaced into the cut areas; borrow and lead-off ditches, drainage dips, or other erosion control earthwork will be filled or smoothed, and the abandoned road returned to the natural contours, as closely as possible. Traffic barriers will be installed at all vehicular access points to prevent further use of the road. Water breaks at least 8-inches high will be constructed as directed by Reclamation.

28. Permittee will reseed the entire area with the following mixture:

<u>Seed</u>	<u>Rate (lbs. per acre PLS)</u>
Alkali sacaton (<i>Sporobolus airoides</i>)	3 lbs. per acre
Sideoats grama (<i>Bouteloua curtipendula</i>)	5 lbs. per acre

Pounds of pure live seed (PLS): (Pounds of seed) * (percent of purity) * (percent of germination).

All disturbed areas are to be seeded with the seed mixture listed above. The seed and fertilizer are to be applied together by broadcasting with a seed spreader, than harrowed for seed coverage. Use of a seed drill is acceptable. Appropriate measures will be taken to insure that the seed/fertilizer mixture is evenly and uniformly planted. There will be no primary or secondary noxious weeds in the seed mixture. Seeds will be tested for viability and purity in accordance with State law(s) within nine months prior to purchase. Commercial seed will be either certified or registered and the seed mixture container will be tagged in accordance with State law(s). The seed will be available for inspection by Reclamation. The seeding will be repeated until a satisfactory stand is established as determined by Reclamation. Evaluation of growth will not be made before completion of the growing season after seeding.

- 29. Normally the best time for seeding is between June 15 and September 15. However, the Permittee may reseed immediately after completing surface abandonment procedures. In any event, Reclamation reserves the right to require reseeding at a specified time if the seed does not germinate after one complete growing season.
- 30. Permittee will contact Reclamation at 505.462.3599 at least three working days prior to the start of reseeding activities.

Drilling Surface Requirements: Standards

- 31. The approval of this action does not in any way grant or imply approval of any off-lease or off-unit action. It is the responsibility of the applicant to obtain any such approvals from the appropriate surface managing agency, including the Reclamation, and/or any private landowners.
- 32. Prior to commencing construction of the road, pad, or other associated developments, the operator shall provide the dirt contractor with a copy of the approved Surface Use Plan and the attached Conditions of Approval.



33. All topsoil and vegetation encountered during the construction of the drill site areas shall be stockpiled and made available for resurfacing of the disturbed areas after completion of the drilling operations. Topsoil on the (well name and number) is approximately (specify) inches in depth. A minimum of approximately (specify) Cubic yards of topsoil material shall be stockpiled on the (specify) edge / at the (specify) corner of the location for reclamation of the pad and pit area.

34. The Permittee shall post signs identifying the location permitted herein in accordance with the requirements contained in 43 CFR 3162.6. The following data is required on the well sign:

Operator's Name: _____

Well Name and No.: _____

Lease No.: _____

Location: xx' fxl & xx' fxl - Sec. nn T nn S, R nn E NMPM

35. All vehicles and equipment associated with the drilling, completion, or production phases of this well shall be confined to the approved road, pad and other areas approved herein.

36. The drill pad and access road for this well must be surfaced with 6 inches on compacted caliche, gravel or other approved surfacing material. Caliche, gravel or other related materials from new or existing pits on Federal mineral estate shall not be taken without the approval of Reclamation and the Bureau of Land Management. Payment for Federal mineral materials to be used for construction is required prior to construction of the pad and road.

37. Reserve or mud pits shall not be constructed within the Project Area. The Permittee will use the Closed Loop System with no reserve pits. The entire well pad will be bermed to prevent oil, salt, and other contaminants from leaving the well pad. Topsoil shall not be used to construct any of the berms. The berms shall be maintained throughout the life of the well.

38. Stockpiling of topsoil is required. The topsoil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. Any water erosion that may occur during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. The surface material for the road and well pad shall be removed before reclamation can begin.

39. Firewalls/Containment Dikes are to be constructed and maintained around all storage facilities/batteries. A 20-millimeter, permanent liner will be installed with a 4-ounce felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain



1.5 times the capacity of the largest tank. Automatic shut-off check valves, or similar systems, will be installed to minimize the effects of catastrophic line failures used in production or drilling. Exhaust noise from pump jack engines must be muffled or otherwise controlled.

40. If during any drilling or construction activities any sinkholes or cave openings are discovered, all drilling or construction activities shall cease immediately and Reclamation will be notified. Within one working day, Reclamation will evaluate the situation and determine if construction can continue or provide mitigation measures to lessen damage to the karst environment. Reclamation will coordinate this activity with the Bureau of Land Management and a verbal recommendation to proceed or stop the operation will be issued.
41. All trash, junk and other waste material will be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Waste burial on site is not permitted.
42. All above ground structures not subject to safety requirements shall be painted by the Permittee to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" designated by the Rocky Mountain Five-State Interagency Committee. The color selected for this project will be provided within thirty days following the execution of this permit.
43. All open-vent exhaust stacks associated with heater-treater, separator and dehydrator units shall be modified to prevent birds and bats from entering them and to the extent practical to discourage perching and nesting.

New production equipment installed on federal leases after November 1, 1993, will have the open-vent exhaust stacks constructed to prevent the entry of birds and bats and, to the extent practical, to discourage perching and nesting.

Buried Pipelines

44. The holder shall conduct all activities associated with the construction, operation, and termination of the pipeline within the authorized limits.
45. The pipeline shall be buried with a minimum cover of _____ inches between the top of the pipe and ground level.
46. Blading of all vegetation shall/shall not be allowed. Blading is defined as the complete removal of brush and ground vegetation. Clearing of brush species shall be allowed. Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds,

- etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface. In areas where blading and/or clearing is allowed, the maximum width of these operations shall not exceed _____ feet.
47. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair impacted improvements to at least their former state. The holder shall contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates shall be allowed unless approved by the Authorized Officer.
 48. Vegetation, soil, and rocks left as a result of construction or maintenance activity shall be randomly scattered over the project area and shall not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer, except that an earthen berm shall be left over the ditch line to allow for settling back to grade.
 49. The holder shall seed all surface disturbed by construction activities. Seeding shall be done according to the attached seeding requirements (Exhibit _____), using the attached seed mixture (as determined to meet Desired Plant Community objectives).
 50. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates “Standard Environmental Colors” designated by the Rocky Mountain Five-State Interagency Committee. The color selected for this project is _____, Munsell Soil Color Chart Number _____.
 51. The holder shall post signs designating the Reclamation serial number assigned to this authorization at the following locations: the points of origin and completion, or entry to and exit from public lands, of the pipeline and at all major road crossings. These signs shall be posted in a permanent, conspicuous manner, and shall be maintained in a legible condition for the term of the authorization.
 52. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder shall take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

Surface Installed Pipeline

- 53. No surface pipeline will be placed within/below the 100-year floodplain at Brantley Reservoir (elevation 3,283 feet [1,000 meters]) or Avalon Reservoir (elevation 3,200 feet [975 meters]).

- 54. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2803/2883. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from fire or soil movement (including landslides and slumps as well as wind and water caused movement of particles) caused or substantially aggravated by any of the following within the permit area:
 - A. Activities of the holder, including but not limited to, construction, operation, maintenance, and termination of the facility.

 - B. Activities of other parties including but not limited to:
 - 1. Land clearing.
 - 2. Earth-disturbing and earth-moving work.
 - 3. Blasting.
 - 4. Vandalism and sabotage.

 - C. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction of in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from the negligent acts of the United States.

- 55. The holder shall conduct all activities associated with the construction, operation, and termination of the pipeline within the authorized width of _____ feet.

- 56. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

- 57. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be “snaked” around hummocks and dunes rather than suspended across these features.



58. The pipeline shall be buried a minimum of _____ inches under all roads, including “two-tracks” and trails. Burial shall continue for 20 feet on each side of each crossing. The condition of the road, upon completion of the construction, shall be returned to at least its former state, with no bumps, dips, or soft spots remaining in the road surface.
59. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair impacted improvements to at least their former state. The holder shall contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates shall be allowed unless approved by the Authorized Officer.
60. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates “Standard Environmental Colors” designated by the Rocky Mountain five-State Interagency Committee. The color selected for this project is _____, Munsell Soil Color Chart Number _____.
61. The holder shall post signs designating the Reclamation serial number assigned to this pipeline at the following locations: the points of origin and completion, or entry to and exit from public lands, of the pipeline and at all major road crossings. These signs shall be posted in a permanent, conspicuous manner, and shall be maintained in a legible condition for the term of the authorization.
62. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder shall take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

Overhead Electric Distribution Lines

63. The holder shall conduct all activities associated with the construction, operation, and termination of the power line within the authorized limits.
64. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.
65. Power lines shall be constructed to standards outlined in “Suggested Practices for Raptor Protection on Power lines,” Raptor Research Foundation, Inc., 1981, unless otherwise agreed to by the Authorized Officer in writing. The holder is responsible for demonstrating that power pole designs not meeting these standards are “raptor safe”. Such proof shall be

- provided by a raptor expert approved by the Authorized Officer. The Reclamation reserves the right to require modifications or additions to power line structures constructed under this authorization, should they be necessary to ensure the safety of large perching birds. These modifications and/or additions shall be made by the holder without liability or expense to the United States.
66. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair impacted improvements to at least their former state. The holder shall contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence will be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.
 67. Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.
 68. The holder shall evenly spread the excess soil excavated from pole holes in the immediate vicinity of the pole structure.
 69. The Reclamation serial number assigned to this authorization grant shall be posted in a permanent, conspicuous manner, and be maintained in a legible condition for the term of the authorization at all major road crossings and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.
 70. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures prescribed in the grant or determined at the time of abandonment.
 71. All surface structures (poles, lines, transformers, etc.) Shall be removed within _____ days of abandonment, relinquishment, or termination of use of the serviced facilities or within _____ days of abandonment, relinquishment, or termination of this authorization, whichever comes first. This will not apply where the power line extends to serve an active, adjoining facility or facilities.

Communication Sites

72. The authorization is conditioned upon the submission of a copy of an approved license and/or renewal license granted by the Federal Communication Commission (FCC) or the Interdepartmental Radio Advisory Committee (IRAC) for each electronic station installation

- authorized or future amendments of this authorization. A copy of the FCC or IRAC authorization shall be submitted with 90 days of issuance of this authorization or within 90 days following approval of an amendment to this authorization. Failure to submit the FCC or IRAC authorization copy within the time specified shall be grounds for termination of this authorization or cancellation of an amendment to this authorization. The Authorized Officer may grant an extension of up to 90 days, if requested in writing by the holder.
73. The holder and its sublessees shall at all times operate their radio-electronic equipment in such a manner as not to cause interference with radio-electronic operations of existing users in the vicinity. If such interference results from holder's or sublessee's operations, holder shall promptly, at its own expense, modify the equipment and operations, or shut down if necessary to eliminate or reduce the interference to the satisfaction of the FCC, IRAC, and/or the Authorized Officer.
74. The holder shall notify the Authorized Officer of any intent to locate additional users within or upon their existing facilities, not less than 45 days prior to occupancy of holder's facilities. Information that must included is:
- A. Name, current address, and phone number of the third party user(s).
 - B. Expected date of occupancy.
 - C. A photo or sketch of the type of antennas to be installed, as well as any other planned physical changes to the exterior facilities operated by the holder. If the proposed use is not specified in the original authorization shall be required.
75. No less than 45 days prior to occupancy of the holder's facility, the holder shall notify existing users within a 1-mile radius that the holder intends to accommodate a new communication user in its facility. Existing users can then file any comments pertaining to potential frequency or electromagnetic problems with the Federal Communications Commission, 1919 M Street NW, Washington, DC 20554, with a copy to the Authorized Officer.
76. The holder shall be responsible for the actions and operations of any third party users associated with this facility. All such use shall be subject to the applicable terms, conditions, and stipulations of this authorization.
77. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" designated by the Rocky Mountain Five-State Interagency Committee. The color selected for this project is _____, Munsell Soil Color Chart Number _____.

78. The holder shall post signs designating the Reclamation serial number assigned to this facility at the points of entry to and exit from the site. These signs shall be posted in a permanent, conspicuous manner, and shall be maintained in a legible condition for the term of the authorization.
79. The holder agrees to share road maintenance costs with all present and future users of the access road. At such future time as a Users Association for this communication site is formed, the holder shall join the Users Association and remain a member in good standing. Within 30 days of the creation of such Users Association the holder shall provide the authorized officer with evidence of membership. Failure of the holder to join the Users Association and remain a member in good standing shall constitute sufficient grounds for termination of this authorization.

Mineral Material Sites (Gravel, Sand, Saleable Type Minerals)

80. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices, and include Storm Water Pollution Prevention Plans that address erosion and sediment control as well as other potential pollutants.
81. The holder shall conduct all activities associated with the construction, operation, and termination of the material pit within the authorized limits.
82. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair impacted improvements to at least their former state. The holder shall contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates shall be allowed unless approved by the Authorized Officer.
83. The holder shall be responsible for the actions and operations of any third party users associated with this authorization. All such use shall be subject to the applicable terms, conditions, and stipulations of this authorization.
84. The road proposed as part of this authorization shall be constructed and maintained in accordance with Reclamation road standards, including the New Mexico Roads Policy.
85. The holder shall seed all surface disturbed by construction activities. Seeding shall be done according to the attached seeding requirements (Exhibit _____), using the attached seed mixture (as determined by DPC).

86. Suitable topsoil material removed in conjunction with clearing and stripping shall be conserved in stockpiles (within the material site) (at the following staked locations: specify location). Topsoil shall be stripped to an average depth of (specify) inches. A total of (specify) cubic yards of topsoil shall be stockpiled.
87. Excess excavated, unsuitable, or slide material shall be disposed of as directed by the Authorized Officer.
88. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of (designate) inches deep, the soil shall be deemed too wet to adequately support construction equipment.
89. Existing roads and trails on public lands that are blocked as the result of the material pit activities shall be rerouted or rebuilt as directed by the authorized officer.
90. The holder shall recontour the disturbed area and obliterate all earthwork by removing embankments, backfilling excavations, and grading to reestablish the approximate original contour of the land as determined by the Authorized Officer.
91. The holder shall uniformly spread topsoil over all unoccupied disturbed areas. Spreading shall not be done when the ground or topsoil is frozen or wet.
92. Reclamation will monitor construction on this material pit site. Notify the appropriate Reclamation Resource Area Office at least _____ working days prior to commencing excavation at _____.

Floodplain Development

93. If a threat of flooding by the Pecos River occurs during drilling operations, the _____ Resource Area Manager will issue a shut-in order. Toxic substances and, possibly, drilling equipment will be removed from the floodplain.
94. A drilling pad will be elevated at least _____ (inches, feet) and surfaced according to Condition of Approval 36.
95. All riparian habitat will be protected according to instructions provided by the Authorized Officer. Trees will not be cut down unless authorized.
96. No storage facilities will be allowed within 660 horizontal feet (200 horizontal meters) of the 100-year floodplain at Brantley or Avalon Reservoirs.

97. Pits containing oil, tank bottoms or other hydrocarbons, salt water, or any toxic substances will not be allowed in the floodplain.
98. Provision for containing salt water flow must be made prior to beginning drilling, without resorting to reserve pits constructed in the ground. Metal tanks or tank trucks must be in place to collect salt water. Salt water storage will not be allowed in the floodplain.
99. Production facilities will be located outside the floodplain.
100. Flow lines from the wellhead to production facilities will be buried, if soil conditions permit burial.
101. Special precautions will be taken to reduce damage from flooding:
 - A. The well will be equipped with a down-hole shut-in device, rated at working pressure of 1,500 psi; or
 - B. The wellhead will be buried below ground in a concrete cellar with a grate over it; or
 - C. Three steel posts will be set in concrete. Horizontal steel cross bars will connect the posts. Heavy gauge chain link fencing will be welded or bolted to the post and cross bars. The V must point upstream or in the direction specified.
102. Chemical toilets will be used instead of latrines.

Drilling Rig Storage

103. The holder shall conduct all activities associated with the operation, and termination of the rig storage within the authorized limits. All activity will be limited to _____ (describe authorized area of activity) and the immediate perimeter _____ (describe distance; maximum of 20 feet).
104. If the storage of this rig should interfere with the producer's operations, the holder shall be required to remove it immediately.
105. Should the well be plugged and abandoned during the term of this permit, the permittee will be required either to remove the drilling rig within 30 days or assume all responsibility for restoration of the well pad and access road.

106. The Reclamation will be notified in writing within 30 days after removal of the drilling rig. Address correspondence to:

Bureau of Reclamation
Carlsbad Project Office
620 East Greene
Carlsbad, NM 88221-1356

Geophysical Exploration

107. All large, hummocky sand dunes encountered during geophysical operations shall be avoided by driving around the sand dunes.
108. Any large trees (e.g., soapberry, elm or large mesquite) encountered in the area of operations shall be avoided and shall not be disturbed.
109. Playas shall be avoided by using re-routes or skips.
110. Wildlife watering facilities shall be avoided by using re-routes or skips.
111. Archaeological sites shall be avoided by adhering to the re-routes flagged in the field, which are listed in the attachment to the NOI. Additional cultural resources protections provided in cultural report _____, which are listed in the attachment, shall be followed.
112. Any fence needing to be cut during operations to allow access shall be immediately repaired to a condition as good as or better than the condition in which the fence was found. No fence shall be removed.
113. Where appropriate, disturbed areas shall be rehabilitated as directed by the Authorized Officer. Rehabilitation techniques may include, but are not limited to: ripping, discing, or other seed bed preparation; reseeding; placement of erosion control devices; and berming, barricading, and/or signing geophysical routes where they cross roads.
114. Operations shall be suspended when, in the judgment of the Authorized Officer, they have the possibility of unduly harming the surface during periods of wet weather or drought.

APPENDIX A-3: PRACTICES FOR OIL AND GAS DRILLING AND OPERATIONS IN CAVE AND KARST AREAS

This appendix describes practices for detecting and avoiding significant caves and significant karst features with respect to oil and gas drilling, and for mitigating impacts to significant caves and karst when they cannot be avoided. These mitigations are predicated on the Reclamation’s responsibilities for resource management and protection derived from the Federal Land Policy and Management Act, the Federal Cave Resources Protection Act, and the National Environmental Policy Act. The practices described here supersede those of the Draft “Interim Guide for Oil and Gas Drilling and Operations in Cave and Karst Areas” (February 1993).

Potential for Caves or Karst

A map of cave or karst potential will be maintained to provide the public with current information about the likelihood of the presence of cave or karst resources. The map will serve as an indicator of the potential for encountering caves or karst for which special practices could be required, following NEPA analysis, to mitigate drilling impacts. The primary use of the map is as a source of information for individuals or companies contemplating the leasing of federal minerals.

Three zones of cave or karst occurrence have been identified and categorized: high potential; medium potential; and low potential. Areas that contain known cave or karst features are in the high potential zone. Areas containing known soluble rock formations with the potential for cave or karst development are in the medium potential zone. These zones were identified using geological maps and existing information on caves and karst. All other lands fall into the low potential zone. These zones were identified using geologic maps and existing information on caves and karst. All other lands fall into the low potential zone. These zones may be increased or decreased in size as new information from drilling, cave exploration or other sources becomes available.

The cave or karst occurrence zones have been further divided into smaller geographic areas to provide an additional means of identification of a specific area. An estimate has been made for each of these areas as to the lowest likely depth at which caves might be expected. Again, this is simply a source of information for individuals or companies contemplating the leasing of Federal minerals. The lease notice “Potential Cave or Karst Occurrence Area” (Roswell 46), will be applied to leases when all or part of the lease is located in a high or medium potential cave or karst occurrence area. An example of the least notice is included below. The purpose of the lease notice, as with maps of cave or karst potential, is to provide information to the purchasers of federal oil and gas leases.

Table C3-1. Cave or Karst Occurrence Areas, Brantley and Avalon Project Area.

AREA NAME	DEPTH ^b	POTENTIAL ^b
Burton Flats	350	High

Because the identification of cave or karst potential zones is only informational, the mitigations described below will be applied, when and where appropriate, irrespective of any identified zone of cave or karst potential. However, the emphasis of management will be on caves presently designated significant or on those designated in the future as significant, and on significant karst features.

Lease Notice

Potential Cave or Karst Occurrence Area

All or portions of the lease are located in a potential cave or karst occurrence area. Within this area, caves or karst features such as sinkholes, passages, and large rooms may be encountered from the surface to a depth of as much as 2,500 feet, within surface areas ranging from a few acres to hundreds of acres. Due to the sensitive nature of the cave or karst systems of this area, special protective measures may be developed during environmental analyses and be required as part of approvals for drilling or other operations on this lease. These measures could include relocation of the proposed well; changes in drilling operations; special casing and cementing programs; modifications to surface facilities; or other reasonable measures to mitigate impacts to cave or karst values. These measures may be imposed in accordance with 43 CFR 3101.1-2; 43 CFR 3162.5-1; Onshore Oil and Gas Order No. 1; and Section 6 of the lease terms (Roswell 46 February 1991).

Mitigation of Drilling Impacts

The need to relocate drilling locations to avoid caves or karst, and any special drilling or production practices employed to mitigate impacts to caves or karst, will be determined during the NEPA analysis of APDs or other applications.

The practices described below will be applied where needed, and to the extent necessary, to ensure that the potential impacts of drilling oil or gas wells, or of constructing other facilities, in cave or karst areas would be minimized according to the following process:

1. Detect potential cave or karst resources and determine their significance.
2. Avoid cave or karst resources where possible.
3. Mitigate impacts to caves or karst that cannot be avoided.



The result of any detection efforts will be addressed in the NEPA analysis and appropriate mitigations will be developed, if needed as part of the analysis.

Depending on the results of detection, avoidance will be considered as a means of mitigating potential impacts. In most cases, avoidance will be accomplished by relocation of the proposed well location, which is often done in consultation with the operator at the time of a field examination. Moving a proposed location up to 200 meters is a commonly employed avoidance measure. The need to move a location more than 200 meters will be addressed in the NEPA analysis of an APD. If the construction of a pipeline, road, power line or other facility is proposed, rerouting or relocation will be required to accomplish avoidance.

The management of oil and gas operations in cave or karst areas, including approvals for drilling oil or gas wells, will be guided by procedures described below, Surface Use and Occupancy Requirements (Appendix A-1), and Conditions of Approval (Appendix A-2). These practices will be modified as new and cost effective technologies for cave and karst protection become available.

Detection Methods

The primary detection method will be the review of Reclamation or other records on the presence of caves or karst features in the area of interest, in conjunction with a field exam by a Reclamation employee or cave inventory contractor to determine the presence of unrecorded cave or karst features. Depending on the results of initial detection efforts and a determination of potential significance by the Reclamation, cave exploration could be employed to gain additional information. As various geophysical techniques are proven useful for cave detection and become generally available for use, they may be considered on a case-by-case basis as a means of locating unrecorded cave or karst features.

Surface Mitigation

Whether or not a proposed activity has been relocated to reduce potential impacts on caves or karst, surface mitigations will be applied, when needed to minimize the risk of impacts during construction, drilling or production. Appropriate surface mitigations will be developed during the NEPA analysis of a proposal and could include one or more of the following practices, most of which have long been employed to mitigate impacts.

Practices to minimize potential impacts from reserve pit spill or leakage:

- The use of a Closed Loop System or steel tanks.

Practices to minimize potential impacts from leaking tanks or pipelines:

- The construction of berms around storage tanks sufficient to contain spills, in accordance with Conditions of Approval (Appendix A-2);
- The installation of leak detection systems for pipelines or tanks;
- The use of permanent liners in storage tank areas;
- The use of differential pressure shut-off valves;
- The use of corrosion-inhibiting coatings and cathodic protection.

Practices to minimize the potential impacts of vented or escaping gases settling in caves:

- The flaring or venting of gas to protect human safety and to better disperse the gases and eliminate possible gas ignitions;
- The use of stock tank vapor recovery systems.

Subsurface Mitigation

Applicable and reasonable subsurface mitigations will be applied where the presence of caves or karst is obvious or expected, based on the results of detection efforts, and in lost circulation zones. The options could include, but are not limited to, the following practices:

Drilling

- Cable tool drilling techniques will be used when possible in areas where encounters of caves or karst are expected at depths not greater than 350 feet.
- Rotary drilling techniques in cave or karst areas will include the use of either fresh water mud, foam, or compressed air as a circulating medium in zones where caves or karst are expected. Below those zones, the operator may use whatever drilling fluid is appropriate.

Casing and Cementing

- All casing will meet or exceed National Association of Corrosion Engineers specifications pertaining to the geology of the location and be run according to American Petroleum Institute and Reclamation standards.

- A “cave protection” casing could be required in instances when a designated significant cave would be jeopardized. The cave-protection casing string would be set at least 100 feet below the deepest known cave-bearing zone as determined by drilling or other pertinent methods.
- Regardless of the type of drilling machinery used, if bit drops of four feet or more and circulation losses greater than 75 percent occur simultaneously while drilling in any cave-bearing zone, drilling operations will immediately stop and the Reclamation will be notified by the Operator. The Reclamation will assess the consequences of the situation and work with the Operator on corrective actions to resolve the problem. If corrective actions fail, the well will be plugged.
- The casing will be cemented in place using one or a combination of any of the following methods that are environmentally sound, as determined by the Reclamation and the Operator:
 1. If a large void or severe lost circulation zone is encountered, isolation from above and below rather than complete cement coverage of these zones could be employed. This would be accomplished by using stage cementing equipment, external casing packers, cement baskets, and one-inch remedial cementing techniques.
 2. For a less severe lost circulation zone encountered while drilling, the operator would attempt to circulate cement to the surface using a single or multistage cementing job composed of a “lead” and “tail” slurry for each stage.
 3. Foam cementing techniques may be used.

Any corrective actions proposed to resolve problems related to bit drops or lost circulation will require Reclamation concurrence before implementation. A decision on how to proceed will be reached within 24 hours of notification.

Monitoring Drilling Operations

Where the presence of significant caves or significant karst features are obvious or expected based on the results of detection efforts, and in lost circulation zones, constant monitoring of drilling operations by the Reclamation could be required.

Monitoring Production Operations

On wells within one-half mile of significant caves, annual pressure tests will be performed by the Operator on all casing annuli. If the test results indicated a casing failure, remedial actions approved by the Reclamation will be undertaken to correct the problem.

Plugging and Abandonment

The BLM standards for plugging and abandonment in Onshore Oil and Gas Order No. 2 will be applied to protect or isolate all useable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, caves, and any prospectively valuable deposits of minerals. This includes any zones encountered during drilling that contain fluids with a potential to migrate.

Record Keeping

The Operator will track the customary drilling activities, including the rate of penetration, pump pressure, weight on bit, bit drops, percent of mud returns, and presence or absence of cuttings returning to the surface. As part of customary record keeping, each detectable void or sudden increase in the rate of penetration not attributable to a change in the formation type should be documented and evaluated as it is encountered.

The Reclamation may review data held by companies on wells drilled in cave or karst areas, to gain information about impacts to caves and karst. This information will be used to categorize lost-circulation zones on the basis of depth, relative volume, and severity, and to evaluate and compare the relative success or failure of different remedies attempted to combat lost-circulation problems while drilling and cementing casing in these zones. This information also will be used to update information about the occurrence of cave and karst features. Information concerning cave resources gathered during drilling will be submitted, as well, to be retained by Reclamation in accordance with the regulations implementing the Federal Cave Resources Protection Act.

