

**Response/Remediation Plan
Enterprise Field Services, LLC
1009 Relief Valve Release Site
Unit Letter E Section 15 Township 22
South Range 31 East**

April 8, 2015

Enterprise Field Services, LLC (Enterprise) is submitting this Response/Remediation Plan to New Mexico Oil Conservation Division (NMOCD), Bureau of Land Management (BLM) and Waste Isolation Pilot Project (WIPP) operated by Department of Energy (DOE) to mitigate the release of natural gas and natural gas liquids associated with the Enterprise 1009 natural gas gathering pipeline. The release was discovered on March 4, 2015 by Mr. Randy Pair, BLM. The release site is located in Unit Letter E Section 15 Township 22 South Range 31 East. The GPS coordinates for the release site are N 32.39358, W 103.77006.

Site History

Enterprise was notified of the release on March 10, 2015 by BLM. No water courses were affected. Three areas of impact have been noted, originating from the release point at the pressure relief valve. Two fluid spray ("spray area") areas were noted which extend to the northeast and the northwest near the cattle pens. Liquid contamination was observable around the valve and remaining on the Right-of-Way (ROW), flowing west down the lease road, with fluid staining approximately 145 feet long by three (3) feet wide, observed on the ground surface. Surface impacts of the spray area are approximately 165 feet wide and 950 feet long to the northwest and approximately 160 feet wide and 465 feet long to the northeast. The pipeline ROW is 50 feet wide perpendicular to the length of the pipeline. The approximate area of the surface indication of the impact is shown on Figure 1, attached.

Site Ranking

The ranking for this release site has been determined by site specific criteria outlined in the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases* (1993). This release location has been assigned a n NMOCD ranking of 10 which requires a soil remediation standard of 10 parts per million (ppm) benzene, 50 ppm combined benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 1,000 ppm total petroleum hydrocarbons (TPH).

Assessment and Field Work

All field activities will be overseen by a third party environmental contractor. The third party environmental contractor will delineate the perimeters of the two spray areas and treat the affected areas by applying a microbial-decomposition product (Microblaze®) to introduce additional nonpathogenic bacterial strains designed to metabolize petroleum hydrocarbons. Any equipment and cattle pens affected within spray areas will be power washed with the Microblaze solution and then rinsed with potable water to ensure decontamination. For the "spray area" and power washing activities, a 3% mixture of Microblaze® and water will be utilized.

Preliminary soil samples (CS-1, CS-2 and CS-3) were collected from the liquid contamination area and analyzed for BTEX, TPH and RCRA (Resource Conservation and Recovery Act) (8) Metals which include arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver. A Site Plan depicting the approximate location of the affected areas and confirmation soil sample locations is included as attachment Figure 1 – Site Map and Figure 1A – Affected Area Detail Map. Based on soil confirmation analytical results, contaminant concentrations for BTEX and TPH are compliant with the NMOCD/BLM site specific remediation standards (site ranking) with the exception of an elevated chloride level of 1,260 milligrams per Kilogram (mg/Kg) for confirmation soil sample CS-2. However, due to the fact that contamination from the release only affected surface soils, it is safe to assume that the chloride concentration will decline at depth and be protective of groundwater. No further excavation will be necessary.

The spray areas will be sampled approximately four (4) to five (5) weeks after the first application of the Microblaze solution. One confirmation soil sample will be collected per 100 square feet of each spray area. The affected vegetation within the spray areas will also be sampled. Enterprise will notify the BLM, WIPP and DOE forty-eight hours (48) prior to the collection of final (closure) soil samples.

Soil samples will be analyzed per the following United States Environmental Protection Agency Methods:

- Method 8021 BTEX
- Method 8015B DRO/GRO (Diesel Range Organics/Gasoline Range Organics)

Upon confirmation that BTEX and TPH concentrations comply with the applicable NMOCD remediation standard, the laboratory analytical reports will be emailed to the BLM for prompt review.

Documentation

Upon completion of remediation activities, the third party environmental contractor will prepare and submit a Corrective Action Report (CAR) documenting the field work. The CAR will include the following information:

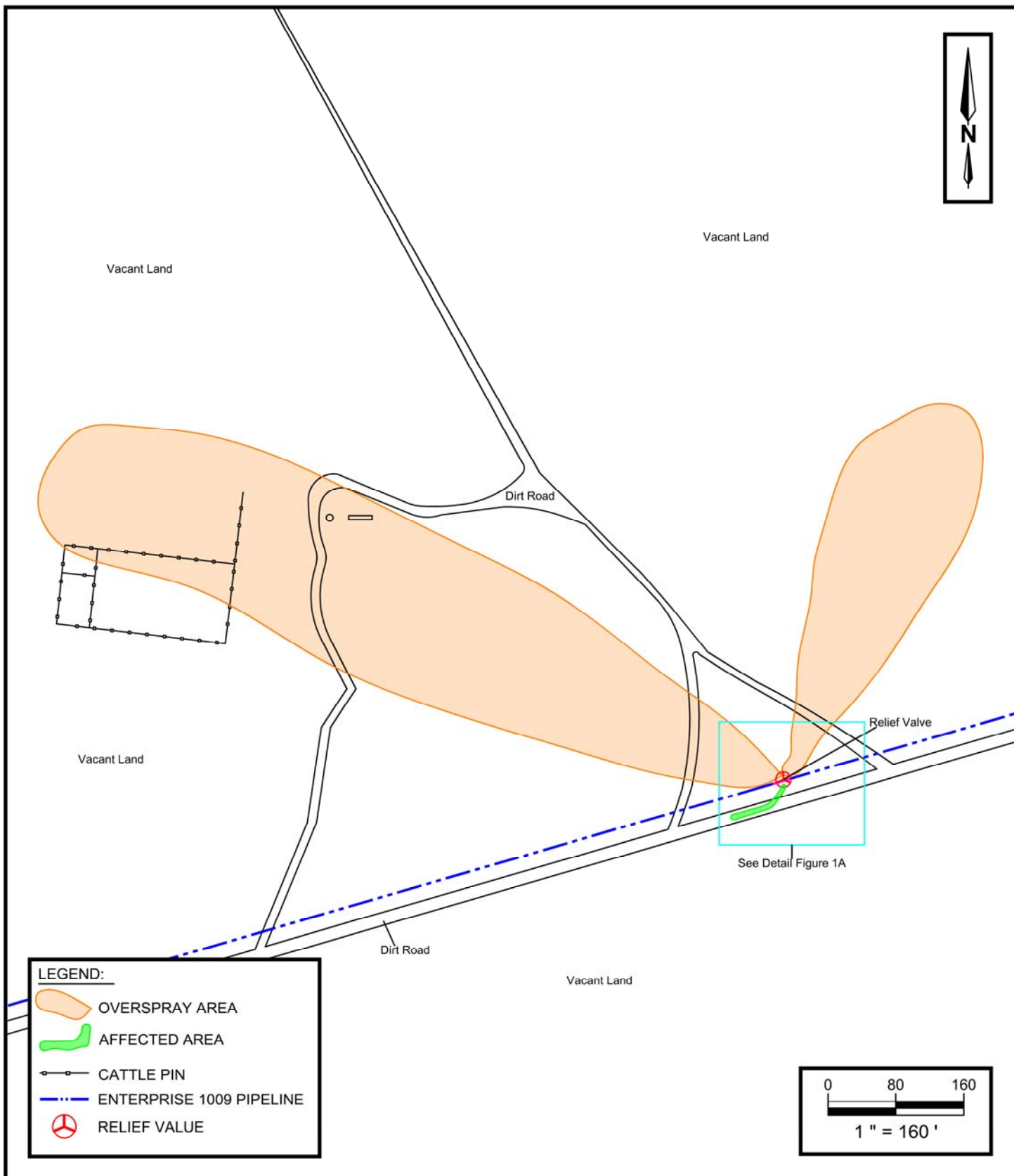
- Description of the field activities
- Site Map illustrating sample locations (as applicable)
- Laboratory Analytical Reports for soil samples collected
- Photographic documentation

Attachments

Figure 1 – Site Map

Figure 1A – Affected Area Detail Map

Natural and Cultural Resources Due Diligence Memorandum



Enterprise Field Services, LLC
1009 Relief Valve Release
 Eddy County, New Mexico
 32.39358 N, 103.77006 W

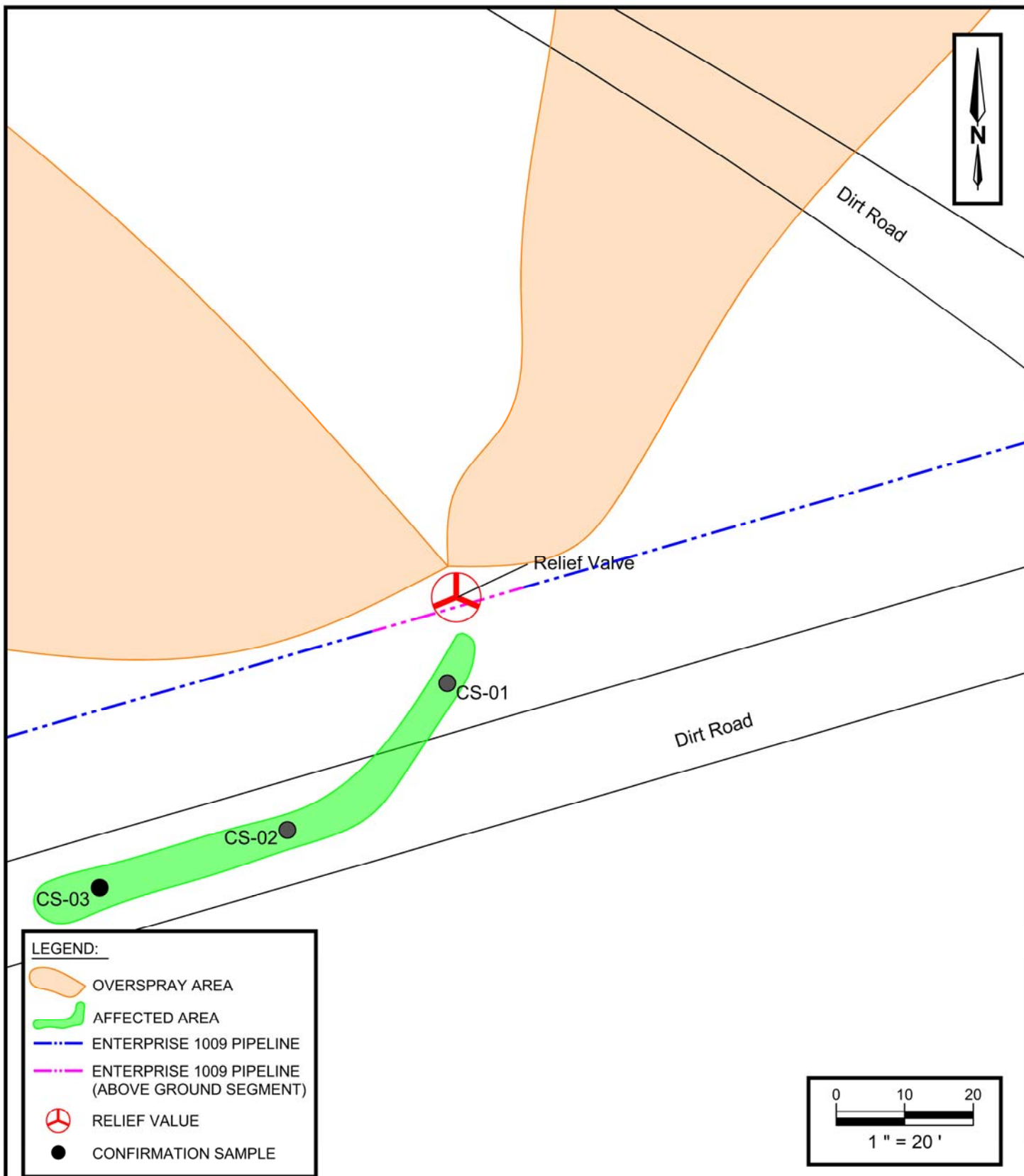
Project No. 7250715028.001



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FIGURE 1

Site Map



Enterprise Field Services, LLC
1009 Relief Valve Release
 Eddy County, New Mexico
 32.39358 N, 103.77006 W

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FIGURE 1A

Affected Area Detail Map



TO: Dina Babinski, Enterprise Field Services, LLC
FROM: Robin Laine, Apex TITAN, Inc.
SUBJECT: Natural and Cultural Resources Due Diligence for Casing Installation the 1009 Relief Valve Overspray in Eddy County, NM
DATE: April 1, 2015

The purpose of this memorandum is to provide a desktop review for natural and cultural resources constraints for a relief valve overspray that occurred on an existing pipeline in Eddy County, NM. The project is located at 32.394009, -103.77062. The footprint of the action includes oblong areas within approximately 945 feet northwest of the release and 470 feet northeast of the release. Figure 1 below shows the project extent. Apex understands that the pipeline easement is on land managed by the Bureau of Land Management (BLM) and the overspray area is on land managed by the Department of Energy (DOE).



Figure 1 – Approximate Project Extent

Potential Waters of the U.S.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has the authority to permit the discharge of dredged or fill material into waters of the United States (U.S). The term “waters of the U.S.” is defined as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;

- All impoundments of waters otherwise defined as waters of the U.S. under the definition;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) Which are used or could be used for industrial purpose by industries in interstate commerce; and
- The territorial seas.

In 2006, *Rapanos v. United States* clarified that waters of the U.S. are also defined as: Traditional Navigable Waters (TNW) and their adjacent wetlands; non-navigable tributaries of TNWs that are relatively permanent; and, wetlands that directly abut such tributaries. In addition, the *Rapanos* decision clarified that the USACE asserts jurisdiction over every water body that is not a relatively permanent water (RPW) if that water body is determined to have a significant nexus with a TNW. A significant nexus exists if the tributary, in combinations with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, or biological integrity of a TNW.

The limit of USACE jurisdiction for non-tidal waters of the United States in the absence of adjacent wetlands is the ordinary high water mark (OHWM). "Ordinary high water mark" is defined as that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Results

Using aerial imagery, USGS 7.5' topographic quadrangle maps (Figure 2), National Hydrography Dataset (NHD), the National Wetlands Inventory (NWI) database, and site photographs, the project area was assessed for the presence of potential jurisdictional waters of the U.S., including wetlands. No potential waters of the U.S. were identified during the background search. The project does not appear to be subject to Section 404 of the Clean Water Act. No further action is recommended.

Federally-listed Species Habitat

The United States Fish and Wildlife Service (USFWS) has authority under the Endangered Species Act (ESA) to list and monitor the status of species whose populations are considered imperiled. Species listed as threatened or endangered by the USFWS are provided full protection under the ESA including a prohibition of indirect "take." The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct with regards to a federally-endangered species. Critical habitat is also protected under the ESA. Critical habitat is defined as areas that are essential for the conservation of a threatened or endangered species and that may require special management and protection. Candidate species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA.

According to the USFWS Information, Planning, and Conservation System (IPaC), fifteen species were identified in Eddy County, New Mexico to be considered in the effects analysis for the project area and were assessed by this study. Table 1 provides a species list, habitat summary, and evaluation of potential occurrence in the project area.

Table 1: Endangered, Threatened, and Candidate Species in Eddy County, New Mexico

Common Name	Scientific Name	Federal Status	Species Likely to Occur in Project Area?
Least Tern	<i>Sterna antillarum</i>	E	No; there are no rivers or beaches consistent with tern migratory or nesting habitat.
Lesser Prairie-chicken	<i>Tympanuchus pallidicinctus</i>	T	The project is within the range of the species. See discussion below.
Mexican Spotted owl	<i>Strix occidentalis lucida</i>	T	No; no structurally complex old growth or mature forests, mixed conifer forests, or canyons are within the vicinity of the project.
Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	Experimental Population, Non-Essential	Yes, the open grassland terrain in the project area is potential habitat for the species. However, if falcons occur in the area, they will likely be flying overhead. No nesting habitat is present in the project area.
Piping Plover	<i>Charadrius melodus</i>	T	No; no preferred shoreline or riverine habitat is within the vicinity of the project.
Southwestern Willow flycatcher	<i>Falco femoralis septentrionalis</i>	E	No; no dense riparian cottonwood/willow and tamarisk habitat is present in the vicinity of the project. No saturated soils, standing water, pools, streams, or cienegas.
Sprague's Pipit	<i>Anthus spragueii</i>	C	Unlikely; mixed grasslands and wet meadow breeding habitat is not present in the vicinity of the project. The species may migrate through the area.
Texas Hornshell	<i>Popenaias popei</i>	C	No; no aquatic habitat is present in the vicinity of the project.
Pecos Bluntnose shiner	<i>Notropis simus pecosensis</i>	T	No; no aquatic habitat is present in the vicinity of the project
Pecos gambusia	<i>Gambusia nobilis</i>	E	No; no aquatic habitat is present in the vicinity of the project
Gypsum wild-buckwheat	<i>Eriogonum gypsophilum</i>	T	No; known only to occur in three populations that are distant from the project area. Restricted to almost pure gypsum habitats, which are not located in the vicinity of the project.

Common Name	Scientific Name	Federal Status	Species Likely to Occur in Project Area?
Kuenzler Hedgehog cactus	<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>	E	No; no preferred habitat of gravelly or rocky slopes, benches, limestone, or sandstone.
Lee Pincushion cactus	<i>Coryphantha sneedii</i> var. <i>leei</i>	T	No; limestone cracks and steep slopes not present. The project is below the typical occurrence elevation of the species of 4,000 to 5,000 ft.
Sneed Pincushion cactus	<i>Coryphantha sneedii</i> var. <i>sneedii</i>	E	No; limestone cracks and steep slopes not present.
Wright's Marsh thistle	<i>Cirsium wrightii</i>	C	No; no wet, alkaline soils around spring seeps or marshy pond or stream edges are within the project area.

E – Endangered, T – Threatened, C - Candidate

Lesser Prairie-chicken

The project area is within the current range of the lesser prairie-chicken (LEPC). In New Mexico, LEPC habitat consists of sand shinnery communities dominated by shinnery oak (*Quercus havardii*) and various native grasses. From March to July, male LEPC gather on breeding grounds, known as leks, to perform mating displays for females. According to the Southern Great Plains Crucial Habitat Assessment Tool (CHAT), previous surveys in the last 5 years have not identified the presence of leks within the immediate vicinity of the project. A historic lek is known approximately 12 miles east of the project. The nearest known current lek is 54 miles north of the project. However, much of the LEPC range in New Mexico has not been surveyed for the presence of leks.

The project is on federal land and is therefore not eligible for enrollment in the LEPC Range-wide Conservation Plan (RWP). Under Section 7 of the Endangered Species Act, federal agencies are responsible for ensuring that federal actions, including those funded or authorized by the agency, do not jeopardize the existence of any federally-protected species. Apex recommends coordinating with BLM and/or DOE regarding minimization strategies and best management practices to avoid effects to LEPC.

Cultural Resources

There have been a few small negative cultural resource surveys conducted for the BLM in the general area of the proposed Project. However, no cultural resource surveys have been conducted, and therefore, no cultural resource sites have been recorded within the proposed project area. The project area is located in hummocky sand dunes, stabilized against wind erosion by native vegetation; these have good potential for containing buried archeological deposits. As the responsible federal agency, the BLM, Roswell District, and/or the DOE should be contacted to determine whether they would require immediate cleanup of the released material and whether it should be preceded or followed by a cultural resource investigation. The BLM and/or DOE has the final authority to determine the need for a cultural resource investigation. The proposed project is subject to the provisions of Section 106 of the NHPA and a BLM permit could be necessary. Any archeological permitting would likely require consultation with the BLM Archeologists located in the Carlsbad Field Office.

Migratory Bird Treaty Act

The migratory Bird Treaty Act (MBTA) makes it illegal to “pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird...or any part, nest, or egg of any such bird.”

Burrowing Owl

Apex understands that burrowing owls (*Athene cunicularia*) may have been observed in the vicinity of the project. Burrowing owls are protected under the MBTA, but are not protected by the State of New Mexico. According to USFWS, the New Mexico population of burrowing owl is apparently secure¹.

Burrowing owls are generally found on breeding grounds from mid-March through September, with courtship and pair formation in March and April in most areas. Burrowing owls generally stay close to the nest burrow during daylight and forage farther from the nest between dusk and dawn¹. USFWS recommends that construction activities should not occur within 250 feet of an active nest².

According to Ms. Kristin Madden, Bird Program Manager at the New Mexico Department of Game and Fish Wildlife Management Division and participant in the New Mexico Burrowing Owl Work Group, burrowing owls have not likely started to nest at this point in the season (pers. comm March 25, 2015). As such, impacts to active nest burrows are unlikely. Please see Attachment A for additional guidance. Coordination with the BLM and/or DOE may be warranted if burrowing owls appear to be exhibiting nesting behaviors.

Please feel free to contact me if you have any further questions or comments.

Sincerely,



Robin Laine
National Program Manager, Natural Resources

¹ U.S. Fish and Wildlife Service. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. Biological Technical Publication. BTP-R6001-2003.

² U.S. Fish and Wildlife Service. 2015. Protecting Burrowing Owls At Construction Sites. Nevada Fish and Wildlife Office. Available online at http://www.fws.gov/nevada/nv_species/burrowing_owl.htm

Attachment A

**GUIDELINES AND RECOMMENDATIONS
FOR BURROWING OWL
SURVEYS AND MITIGATION**

NEW MEXICO DEPARTMENT OF GAME AND FISH

JULY 2007

(Note: Most of the following recommendations were developed by the New Mexico Burrowing Owl Working Group (2005), The California Burrowing Owl Consortium (1993), and The California Department of Fish and Game (1995))

The burrowing owl (*Athene cunicularia*) is considered a species of concern by the U.S. Fish and Wildlife Service and is protected by both the Migratory Bird Treaty Act and by New Mexico statute 17-2-14 (NMSA 1978). These guidelines are provided to assist in conducting burrowing owl surveys and mitigation during the preparation of environmental assessment reports and environmental impact statements. The guidelines also aid in the decision making process implemented when there is potential for any type of project to adversely affect burrowing owls or any of the resources that support them.

Project proponents should: 1) identify burrowing owl habitats and burrows; 2) choose and implement an appropriate survey method to confirm the presence of owls; and 3) determine and implement appropriate mitigation.

Step 1. Identify Burrowing Owl Habitat and Burrows

Seventy-five percent of New Mexico's ecological zones, as described by Dick-Peddie (1993), support or have the potential to support burrowing owls (Arrowood et al. 2001). These zones include: Chihuahuan desert scrub, closed basin scrub, desert grassland, Great Basin desert scrub, juniper savanna, lava beds, plains-mesa grassland, plains-mesa sand scrub, sand dunes, urban, and farmland (Arrowood et al. 2001). More specifically, burrowing owls generally are associated with dry, open, short-grass, treeless plains (Haug et al. 1993). Burrowing owls are also known to use areas that include shrubs such as creosote bush (*Larrea tridentata*), mesquite (*Prosopis* spp.), four-wing saltbush (*Atriplex canescens*), and rabbit-brush (*Chrysothamnus nauseosus*) (Martin 1973, Botelho and Arrowood 1996). Burrowing owls also inhabit human-modified landscapes, such as golf courses and parking lots.

Burrowing owls rarely dig their own burrows and, therefore, depend in part upon the presence of burrowing animals. In New Mexico, burrowing owls are associated with Gunnison's prairie dogs (*Cynomys gunnisoni*), black-tailed prairie dogs (*C. ludovicianus*), American badgers (*Taxidea taxus*), ground squirrels (*Spermophilus* spp.), rock squirrels (*S. variegatus*), foxes (*Vulpes* spp.), and coyotes (*Canis latrans*). Burrowing owls and prairie dogs are included as species of greatest conservation need in the western great plain shortgrass prairie vegetation type (Comprehensive Wildlife Conservation Strategy for New Mexico 2006). Burrowing owls can also utilize human-made structures, such as, storm drains, berms, roadsides, irrigation canals, and artificial burrows specifically constructed for the owls.

Occupancy of suitable burrowing owl sites can be verified by observing at least one burrowing owl, or owl molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance (The California Burrowing Owl Consortium 1993).

Step 2. Choose and Implement an Appropriate Survey Method to Confirm Owl Presence

The most suitable time to survey for burrowing owls in New Mexico is during the nest initiation and incubation phases (Table 1). Most burrowing owls are migratory in the state, although some over-winter in New Mexico, particularly males in southern New Mexico (Arrowood et al. 2001, Johnson et al. 1997). Migratory owls typically arrive on the breeding grounds by March and remain there until October.

Table 1. General breeding chronology of the burrowing owl in New Mexico.

Location	Pair Bonding/Nest Initiation	Egg Laying and Incubation	Chicks Fledge above Ground	Independence
New Mexico	March to April	Late April to early June	Early-Mid June	Mid-Late July

Surveys should not be conducted in certain weather conditions when owls are more likely to be in their burrows and not visible, such as temperatures above 30°C (86°F) and winds exceeding 20 km/hr (approx. 12 mph). Surveys also should be restricted to the early morning and evening hours, because above ground activity is often higher during these times (Conway and Simon 2003).

A single survey on a proposed project site is adequate to determine the presence or absence of active burrows. If owls are not observed, all active burrows should be inspected for indications of use by the presence of owl pellets, droppings, or feathers. If active burrows are found follow-up survey, utilizing the methods described below, should be scheduled to confirm the presence or absence and numbers of owls on a project site.

Burrowing owl surveys can be accomplished effectively by either walking or driving transects. Either the entire length of the transect or point count stations along the transect can be surveyed, and surveys can be conducted with or without broadcasting audio burrowing owl alarm (*quick-quick-quick*) and/or male territory (*coo-coo*) calls. Studies have shown that broadcasting calls increases detection probability of burrowing owls (Haug and Didiuk 1993, Conway and Simon 2003) and that trained surveyors can detect owls up to 300 m (Conway and Simon 2003). These methods might need to be modified depending upon the terrain and equipment being used, which, respectively, affect the distance owls and the broadcasted vocalizations can be heard.

If burrowing owl habitat is found at the project site, a 150-m buffer zone around the project should also be assessed for potential burrowing owl habitat. At the project site, use one of the following survey methods as recommended by the New Mexico Burrowing Owl Working Group (NMBOWG).

METHOD 1: Walking Surveys

Without Audio Calls

Transects should be established in suitable owl habitat. A single, straight line should be walked for the entire length of the transect (for specific protocol and comparison of line transect methodology see Emlen 1971 and 1977). Observers should record all owls observed along either side of the line. If a more thorough estimate of abundance in a specific area is desired, an observer should walk multiple parallel lines (or many observers walk parallel lines concurrently) that are approximately 50 m apart. All owls observed along either side of the transect line should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

With Audio Calls

Observers should proceed along a transect line, stopping at points approximately every 200 m to broadcast owl vocalizations and listen for responses. Distance between points will depend upon terrain and broadcast system, which, respectively, affect the distance owls and the broadcasted vocalizations can be heard. If the broadcast system and owl response calls, can be heard up to 200 m. then the observer should stop every 200 m. The distance between observation points can be shortened if necessary. If a more thorough estimate of abundance is desired, the observer should walk multiple parallel lines (or many observers walk parallel lines concurrently) to cover a greater proportion of the area. The lines should be spaced according to the same distance of audio coverage. At each observation point, the observer should scan for any owls with binoculars for the first two minutes, after which a territorial and/or alarm calls should be played for one minute. Finally, there should be two additional minutes of scanning after broadcasting. Scanning and broadcasting should be done in a 360° arc. All owls detected during this five-minute observation period should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

METHOD 2: Roadside Point-count Surveys

Without Audio Calls

Routes should be established along roads in the project site. Observers should stop the vehicle and pull off the side of the road at 0.5-mile (0.8 km) intervals (if project site is large enough). If visibility is impaired at a point, observers should continue until the next immediate suitable surveying spot is reached. All surveyors should exit the vehicle at each point and scan with binoculars in a 360° arc for a total of five minutes. All owls detected during this five-minute observation period should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

With Audio Calls

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Step 3. Determine and Implement Appropriate Mitigation

The objectives of these mitigation guidelines are to minimize the negative impacts to burrowing owls at a project site and preserve habitat that will support burrowing owl populations into the future. The mitigation process begins with the survey protocol to document the presence of burrowing owl habitat, and to determine if burrowing owls use the project site and the surrounding buffer zone. Occupied burrows should be determined based on survey information. If more than 30 days elapse between the initial survey and construction activities, project sites and buffer zones with suitable habitat should be resurveyed to ensure no burrowing owls have occupied these areas in the interim period. Resurveying the project site should be conducted no more than 30 days prior to initial project initiation. If ground disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site should be resurveyed.

If burrowing owls are present on a project site, the following mitigation measures should be followed to minimize negative impacts to burrowing owls, nest burrows and burrowing owl habitat.

According to the California Burrowing Owl Consortium there are three definitions of negative impacts:

- Disturbance or harassment within 50 m of occupied burrows.
- Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs and debris piles that provide shelter to burrowing owls.
- Destruction and/or degradation of foraging habitat adjacent to occupied burrows (within 100 m).

If burrowing owls are found at a project site, measures to avoid or mitigate negative impacts should follow one of three general approaches. These approaches are listed below:

1. Design and implement project activities to spatially avoid negative impacts and disturbance to burrowing owls and their habitat.
 - No disturbance should occur within 50 m of occupied burrows during the non-breeding season (September through February) or within 75 m during the breeding season (March through August). Avoidance also requires that a minimum of 6.5 acres of foraging habitat be maintained in undisturbed habitat condition for each pair or unpaired burrowing owl.
 - No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.

2. Design and implement project activities to seasonally avoid negative impacts and disturbances to burrowing owls.
 - Occupied burrows should not be disturbed during the nesting period, from March 1st through August 1st.
 - No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.
 - When destruction of burrows is unavoidable, burrow destruction or ground disturbing activities should only occur during the season when migratory owls have left the breeding site. The unoccupied season can be expected to begin in September or October and end in February or March. However, burrowing owl occupancy always must be confirmed by survey data, regardless of season. Immediately prior to burrow destruction a video probe should be used to confirm that the burrow is unoccupied.
 - For any occupied burrows that are destroyed outside of the nesting season, any remaining, undestroyed, burrows should be enhanced (enlarged or cleared of debris) or new burrows should be created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site. A minimum of 6.5 acres of foraging habitat should be maintained in an undisturbed habitat condition for each pair or unpaired resident bird.
 - To ensure compliance with the federal Migratory Bird Treaty Act and state laws and regulations, the U.S. Fish and Wildlife Service and New Mexico Department of Game and Fish must be contacted to confirm that any construction activities resulting in destruction of burrows will not result in a taking of burrowing owls and, thus, violation of federal and state law.
3. Relocate burrowing owls that will be negatively impacted by project activities to protected areas of potential burrowing owl habitat.
 - If owls must be moved away from the disturbance area, passive relocation techniques should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and to allow the owls to acclimate to alternate burrows. Passive relocation can be accomplished by use of one-way doors. Owls should be excluded from burrows in the immediate negatively impacted zone and within a 50-m buffer zone by installing one-way doors in burrow entrances. One-way doors should be left in place for approximately 48 hours to ensure that owls have left burrows before excavation. Prior to burrow destruction a video probe should be used to confirm that the burrow is unoccupied. If a video probe is not available burrows should be excavated with hand tools to ensure that the burrows are unoccupied. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. Passive relocation should only be used during the non-breeding season,. This method should not be used once a pair of owls is at a burrow unless it is determined that the female does not exhibit a brood patch.
 - If removal or relocation is necessary, trapped burrowing owls should be released in a new location with suitable habitat in a soft release cage. Soft release involves placing owls in a cage with an artificial burrow and fed mice daily for three weeks. After three weeks one side of the cage is removed. More information on this technique is available from NMBOWG.
 - A minimum of 6.5 acres of foraging habitat should be maintained in an undisturbed habitat condition for each pair or unpaired resident bird. No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.
 - To ensure compliance with the federal Migratory Bird Treaty Act and state laws and regulations, the U.S. Fish and Wildlife Service (505-248-7882) and New Mexico Department of Game and Fish (505-476-8101) must be contacted and federal and state permits must be obtained for handling of owls.

Links

New Mexico Burrowing Owl Working Group

<http://www.hawksaloft.org/BUOW/BUOW.htm>

Use of Artificial Burrows by Burrowing Owls at the HAMMER Facility on the U.S. Dept. of Energy Hanford Site

http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15414.pdf

How to Install Artificial Nesting Burrows for Burrowing Owls

<http://www.usga.org/turf/articles/environment/general/Burrowing-Owl-Brochure.pdf>

Artificial Burrowing Owl Burrow Design

<http://www2.ucsc.edu/scpbrg/artifici.htm>

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