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Lincoln County, Nevada

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July 7, 2008

Hon. Anne K. Quinlan
Acting Secretary
Surface Transportation Board
395 E Street, S.W.
Washington, D.C. 20423-0001

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RE: Finance Docket No. 35106: Department of Energy Application for a Certificate of Public Convenience and Necessity for the Caliente Rail Alignment. Comments of Lincoln County, NV

Dear Secretary Quinlan:

The Board of County Commissioners of Lincoln County, Nevada respectfully submits these comments on the application of the Department of Energy ("DOE") referenced above, in accordance with the STB's decisions in this matter dated April 11, May 30, and June 13, 2008.

The DOE seeks an STB certificate authorizing its proposed 336-mile railroad across Lincoln County, which would be used to transport the nation's spent nuclear fuel and high-level radioactive waste to a proposed repository at Yucca Mountain, Nevada. While the proposed rail line may provide an alternative means for transportation of industrial commodities to/from Lincoln County and may stimulate related economic activity, construction and operation of the line will, if not properly mitigated, result in significant impacts to the environment, public land uses, private land uses and related economic and social attributes of the County. If the Caliente Rail Alignment is to be constructed, Lincoln County supports shared-use of said line for commercial rail traffic. Accordingly, Lincoln County supports the DOE application for a Certificate of Public Convenience and Necessity for the Caliente Rail Alignment, but only if impacts of the proposed rail line are fully identified and completely mitigated. In the event that the DOE is unwilling or unable to commit to the numerous mitigation measures identified within this comprehensive comment letter Lincoln County may seek to prevent construction and operation of the proposed Caliente rail alignment.

Lincoln County is a large, rural county, where ranching and other land-based pursuits form the backbone of the local economy and have defined the character of the community for over 150 years. Tracing their history to the Old West, many county residents have resided in the area all their lives and their pioneer families have resided here since before Nevada's statehood in 1864.

Residents of Lincoln County own homes, farms, businesses and ranches comprised of what is a very limited private land base in an otherwise federally administered landscape. Indeed, of the more than 10,600 square miles that comprise Lincoln County, private land constitutes less than two percent of that area. Federal land, principally managed by the Bureau of Land Management ("BLM"), serves to support nearly every facet of economy and the daily lives of Lincoln County residents, anchored by private landholdings, upon which the economy and social structure is based. Together, public and private land resources in Lincoln County synergistically support customs and practices that define Lincoln County as a highly desirable place to live, work and visit.

The County's rural character and social fabric have been woven out of the residents' familiarity with and ability to depend upon other community members; a sense of security owing to little crime; and the ability to enjoy the largely unspoiled lands, vistas, solitude, and quiet in the region, among other important attributes.

Lincoln County would be the division point from the Union Pacific mainline railroad to the proposed Caliente Rail Alignment for all rail shipments of spent nuclear and high-level radioactive waste bound for Yucca Mountain. Construction and operation of the railroad would bisect the County from its origin in the County's only incorporated city, Caliente, west to the Lincoln/Nye county line, drastically altering the longstanding character of Lincoln County and causing significant environmental and socioeconomic impacts.

While not opposed to change per se, the County demands—and the law requires—that if the Caliente Rail Alignment is constructed and operated, it must be done in a manner that allows the STB and other decision makers to consider all relevant information and avoid and minimize, to the extent practicable, impacts to private land and water owners and public land users. As you know, the STB has an independent obligation under NEPA and its own guiding statutes and regulations to consider and mitigate all significant environmental impacts, and must independently evaluate whether the DOE's application and supporting environmental impact statements provide an adequate basis upon which to do so.

The Caliente Rail Alignment will result in a wide variety of impacts to private and public land resources in Lincoln County.¹ Construction and operation of the rail line to Yucca Mountain will impact the way of life and the livelihoods of Lincoln County residents. If properly identified and fully evaluated, however, we believe that many of the potential impacts may be avoided or minimized through design and implementation of appropriate mitigation

¹ Submitted with this comment letter is the following report prepared last year by Lincoln County, which evaluates in detail the potential impacts on grazing and public and private lands of the construction and operation of a railroad through Lincoln County "Proposed DOL Caliente Rail Corridor, Lincoln, County, Nevada: An Analysis of Impacts & Alternatives, With Recommended Mitigation," November 30, 2007 ("2007 Lincoln County Report"). The 2007 Lincoln County Report also is available on the internet, at <http://www.lcnop.com/transportation.html>.

Additionally, Lincoln County has sponsored over 80 impact studies concerning Yucca Mountain. STB is encouraged to consider the conclusions of these studies which can be found on web at <http://www.lcnop.com/Reports.html>

measures. To the extent that potential impacts are not fully identified and properly evaluated, however, the rail line would have profound, unmitigated impacts.

If the Caliente Rail Alignment is to be built and operated, Lincoln County believes that all impacts, regardless of their apparent significance, must be mitigated. The County believes that no owner of private property or user of public land should be left to contend with any unmitigated consequence of the Caliente Rail Alignment. If the Caliente Rail Alignment is to be constructed and operated, all impacted parties must be kept whole through various means, including, as a last resort, compensation. Where the Caliente Rail Alignment crosses private property, recognition that the portion of the private parcel not under the actual rail easement or right-of-way may be left partially, if not wholly, unable to support its former land use. Any such loss of use must be recognized and mitigated.

Access to public land in the vicinity of the Caliente Rail Alignment must be ensured during construction and operation of the line. Notwithstanding DOE's stated intent to allow public access along and across the Caliente Rail Alignment to enable continued access to adjacent public lands, Lincoln County is concerned that Department of Homeland Security restrictions may impede access to public lands. STB is encouraged to require DOE to ensure that maintenance to public land is not in any way impeded by construction and operation of the Caliente Rail Alignment.

Lincoln County is concerned that mitigation for impacts to private and public land resources be designed, funded and implemented as soon after a decision to construct and operate the Caliente Rail Alignment is made. For many types of impacts, implementation of mitigation during pre-construction phases of the project will be required to ensure that consequences of construction are effectively avoided or minimized. This may require that mitigation be planned, funding secured, and implementation completed three-four years prior to the start of construction on the rail line and related facilities. Recognition of the spatial aspects of impact and the temporal dimensions of mitigation success will be key to keeping the residents of Lincoln County whole.

1. Land Use: Grazing, Agriculture, and Community Character

The DOE's analysis of the proposed rail line's effects on grazing allotments is wholly inadequate. Although many outsiders think of this corner of Nevada as desolate, empty land, Lincoln County contains 66 operating ranches grazing on public land, which sustain nearly 15,000 cows and sheep. As it has for over 100 years, ranching forms the backbone of the local economy and defines the character of Lincoln County life.

As illustrated on page 3-61 of the DOE's Draft Rail Alignment EIS², DOE's preferred rail alignment affects at least 15 public land grazing allotments within Lincoln County, often cutting the allotment in half (see also Figure 4.1. of the Lincoln County sponsored report entitled *Proposed DOE Caliente Rail Corridor, Lincoln County, Nevada: An Analysis of Impacts & Alternatives, With Recommended Mitigation*, November 30, 2007 which has been submitted with this comment letter to STB and is also available at <http://www.lcnop.com/transportation.html>). Lincoln County is concerned that the DOE NEPA analysis does not accurately reflect how

² DOE submitted with its application two draft environmental impact statements, which were released for public comment in October 2007: (1) Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada -- Nevada Rail Transportation Corridor, DOE/EIS-0250F-S2D ("Rail Corridor DSEIS"), and (2) Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada, DOE/EIS-0369D ("Rail Alignment DEIS")

grazing allotments are actually utilized. The DOE has narrowly defined the potential region of land use influence as only the "footprints of construction and operations support facilities," or the "nominal width of the construction right-of-way," and "the locations of construction and operations support facilities outside the nominal width of the construction right-of-way." Rail Alignment DEIS at 3-3, 3-36. Far from being a "conservative" assumption, as asserted by the DOE, limiting the region of influence to the rail footprint completely ignores how grazing is conducted and obscures the numerous significant impacts to grazing allotments. In fact, as the County's detailed assessment demonstrates, all affected grazing operations, including land and water property rights, will be profoundly harmed and, even with implementation of mitigation, a number of grazing operations may be forced out of business.

The Taylor Grazing Act requires ownership of "base property" in order to receive a permit to graze domestic livestock on public land. Base property can be either land based, which requires private ownership of and/or access to a commensurate amount of private land, or water based, which requires ownership of and/or access to rights to quantities of water required to sustain the number of livestock for which a grazing permit is sought. The movement of livestock for forage and water is an essential element of ranching operations and the maintenance of a healthy range, and varies considerably between allotments. Additionally, livestock become conditioned to a given area's terrain and resources and animals familiar with a given area are more efficient grazers. Construction and operation of the rail will have numerous effects on grazing operations including creating barriers to livestock movement, separating pasture areas from water sources, opening holes in existing fences, frightening animals away from water sources due to construction noise, and other impacts. If construction and operation of the railroad affects access to an allotment's base property (i.e., private land resources in land base allotments, or water resources in water base allotments), ranchers may not be able to utilize those resources, resulting in a loss of "animal unit months," or AUMs, or even jeopardizing the entire grazing permit.

The proposed Caliente Rail Alignment will cross various parcels of private irrigated parcels and numerous public land grazing allotments permitted by the Bureau of Land Management (BLM). Each allotment is one component of a range livestock operation developed to balance the availability of public and private land, feed sources, and water. The rail alignment will disrupt livestock movements between springs and other water and feed sources. Infrastructure required by the BLM and put in at significant cost by ranchers, such as fences, water pipelines, access roads, and trails, will be crossed and damaged by the construction and operation of the rail line. In addition to the obvious direct losses in forage, where the rail alignment crosses currently irrigated agricultural fields, the ability to effectively irrigate the remaining land will be challenged. The unmitigated loss of any resource to these agricultural operations will serve to render the balance of the enterprise less feasible and, depending upon the nature of the loss, infeasible.

A summary of likely impacts include: loss of functionality for existing fencing; destruction of capital improvements; destruction or loss of functionality of water sources, stockwaters, and pipelines; loss or restriction of access to allotments; temporary and permanent loss of forage; fragmentation of allotments; loss or restriction of livestock movement and distribution within allotments; establishment of invasive species; establishment of noxious weeds; short-term deferment or loss of grazing rights due to construction; and long-term deferment or loss of grazing rights due to operations. None of these impacts are disclosed in the DOE's application, and no mitigation was proposed.

Although many of these impacts cannot be fully mitigated, required mitigation measures for impacts to the agricultural sector in Lincoln County include:

1.1 Maintenance of existing fencing. The Caliente Rail Corridor will cross existing pasture and allotment fences. Sections of the fence will need to be removed to allow for construction activities. Once there is a hole in the fence it is ineffective. Therefore, the integrity of the pasture or allotment is lost; livestock will trespass onto other allotments or be lost. Without some form of mitigation this would render many allotments useless until construction is complete (4-10 years)

1.2 Right-of-way fencing. Some allotments rely on fencing to manage livestock. The rail line and access roads would punch holes through existing fences, rendering the entire fence ineffective, resulting in the loss of livestock. The operational right-of-way will result in a hole in every allotment or pasture fence that it crosses unless some form of mitigation is completed. Typically railroads will fence the right-of-way and tie into allotment or pasture fences to ensure no holes are left. If the right-of-way was fenced it would have to be done in such a manner as to allow wildlife crossing while preventing a breach from livestock.

1.3 Construction Area Temporary Fencing/Delineation. An important mitigation would be temporary fencing or other delineation of the immediate areas of authorized construction disturbance to avoid any larger than necessary land disturbance.

1.4 Stockpiling and Application of Topsoil for Revegetation Purposes. Another essential mitigation would be the requirement to stockpile the topsoil from construction disturbed areas. Once construction is completed, the topsoil could then be redistributed as near as possible to original location and reseeding with native and adaptive plant seeds should occur to minimize the lost forage and maintain erosion controls.

1.5 In-road cattle guards and gates at exiting fence crossings. Access road(s) associated with the rail would provide another means by which livestock could cross through existing fences. If the right-of-way is not fenced, or if the access roads are outside of such a fence, then the only way to prevent a breach is to install a cattle guard or gates. Cattle guards are preferred as they require less maintenance, and minimize the chance of passers-by leaving gates open. It is standard practice to install a gate next to each cattle guard in order to allow passage of livestock when needed or for access by large or tracked equipment in order to prevent damage to the cattle guard.

1.6 Relocation of Existing Infrastructure. Corrals, chutes and other infrastructure that would be directly within the construction or operations corridor would have to be relocated, or else they would be completely lost.

1.7 Livestock and wildlife crossings or underpasses The rail and associated access road(s) will severely impact movement of livestock, wildlife and wild horses. The likelihood of collision increases with the height of the cuts and fills, and the number of obstacles such as roads, fences, and sidings. Train speed is also a major factor associated with collisions. If the right-of-way is fenced it will be imperative to construct the fence to wildlife specifications. Crossings, most likely underpasses, will need to be constructed to maintain free, safe movement of livestock, wildlife, and wild horses. Without adequate crossings livestock could lose access to portions of the impacted allotments. This would have a significant impact on the allotment grazing system and could well result in the loss of AUMs. The specifications for the underpasses will need to be coordinated with allotment permittees and appropriate agency personnel. If the right-of-way is not fenced, at-grade crossings consisting of earthen ramps would be required in areas of cut and fill. If these mitigation actions are not taken there will be significant detrimental effects to livestock operators, wildlife and wild horses along the entire corridor.

1.8 Water rights and water base property. Water rights held by grazing permittees are considered to be private property rights under State of Nevada Water Law. Those allotments that are water based have an added layer of private property ownership under the Taylor Grazing Act. As such, potential impacts must be mitigated. Direct impacts may result from construction or operation of the rail; however, significant indirect impacts could occur as a result of pumping by DOE for construction water. DOE should be responsible for contracting an impartial third-party representative to monitor all existing privately held water rights or water base properties. Monitoring should be conducted prior to construction, and continue until groundwater pumping is complete.

1.9 Relocation of all water sources, stockwaters and wildlife guzzlers within one mile of the construction right-of-way. Livestock, wildlife and wild horses congregate around water sources given the dry, hot nature of the environment. Any water sources, including stockwaters and guzzlers within a mile of the rail will result in a higher probability of train collisions with livestock, wildlife and wild horses. Appropriate rail crossings will also be needed near water sources. DOE should coordinate with grazing permittees and appropriate agency personnel to discuss the relocation of any water sources within a mile of the proposed rail, and the need for rail crossings in these areas. Without mitigation there will be significant impacts to livestock, wildlife and wild horses due to a loss of, or danger associated with water accessibility.

1.10 Protect existing waterlines. The proposed rail line would cross many existing waterlines used for grazing operations, many of which are used to convey water to which the permittee holds water rights or that serves as base property for the allotment (see Figure 4.4 in the accompanying Lincoln County sponsored report entitled *Proposed DOE Caliente Rail Corridor, Lincoln County, Nevada An Analysis of Impacts & Alternatives, With Recommended Mitigation*, November 30, 2007 available at <http://www.lcnop.com/transportation.html>). These lines must be maintained during construction and operations of the rail line. Permittees must be allowed to perform routine maintenance on these pipelines over the life of the rail. As discussed above and in more depth in the accompanying 2007 Lincoln County Report, if these pipelines were severed, grazing operations would be significantly impacted and possibly rendered useless.

1.11 Reimbursement for lost livestock. The DOE should commit to implement all possible measures to minimize livestock loss due to train collisions, including right-of-way fencing with proper maintenance, appropriate crossing structures, and relocation of water sources within a mile of the track, and reduced train speeds. In any event, Nevada is an open-range state and any loss of livestock due to train operations must be reimbursed with a fair market price. See, e.g., NRS § 705.120.

1.12 Reimbursement for lost or deferred Animal Unit Months (AUMs) and capital costs Grazing on many allotments will be constrained or may be infeasible during construction of the rail line. Construction activities likely will have a significant impact on operations due to disturbance, limited access, and restricted or altered livestock movement and utilization patterns. Construction will result in a temporary loss of forage, which may result in a long-term loss of forage due to the nature of the climate and soils if not properly restored and maintained. The operational footprint will result in a long-term loss of forage, primarily in key grazing areas of gentle terrain and key forage species. Permittees will incur increased operational and capital costs to reshape their grazing operations around a new obstruction. Interim Grazing Management Plans will need to be developed for impacted allotments prior to construction, and new or revised Allotment Management Plans will be necessary once rail operations begin to enable the permittee to cope and keep operating with the modified and restricted circumstances. Mitigation will be essential in the form of opening new water sources to better distribute livestock to areas not disturbed by the construction activities. Additional feed will need to be

developed, either on public land or the grazing operator's private land, in the form of vegetative manipulation and supplementation, to provide forage necessary to continue operations. Without some form of impact mitigation, many grazing operations will be simply infeasible.

1.13 Replacement/Provision of fence and waterline maintenance trail crossings. Many allotments possess waterlines and fence lines with associated maintenance trails. These trails are critical to allotment operations. The rail line would cross many of these trails, and have a profound impact on operations, requiring mitigation, such as the provision of crossings. Replacement fencing either temporary or permanent will be required prior to removal or breach of any existing fencing.

1.14 Design and Installation of alternative irrigation systems. The balance of currently irrigated fields crossed by the Caliente Rail Alignment may require design and installation of alternative irrigation systems to enable continued effective irrigation of the balance of agricultural fields crossed by the rail line. Because Nevada water law requires that water permitted for irrigation use by the Nevada State Engineer be used or the water right is subject to forfeiture, it is imperative that the balance of currently irrigated lands within partially impacted parcels be made irrigable. In the event that the subject fields can no longer be feasibly irrigated, property rights would be lost. DOE must compensate the owner for loss of use of the entire parcel as well as the loss of uses of related water.

1.15 Provision of alternative access to isolated parcels. To provide access for the safe movement of farm equipment to fields and pastures which otherwise would have to operate on public highways, as a result of road closures during and following construction and during operation of the Caliente Rail Alignment, DOE shall provide or develop appropriate alternative access to these fields and pastures. Alternatives for access could include development of frontage roads adjacent to yard boundaries, agreements for farmers to coordinate with the yard master to cross through the yard, if rail operations and safety conditions permit, or development of additional access roads. DOE should be required to plan and implement appropriate mitigation and monitoring measures if additional access roads are built. Providing alternative access to these isolated parcels will create a need for more maintenance of existing fencing and require additional new fencing to facilitate continuing operations. Allowing new access ways into these isolated parcels will require additional road maintenance operations.

1.16 Provision of construction schedule to agricultural producers. DOE must provide its project-related construction schedule to affected farmers and ranchers to allow them to determine whether they should continue to crop or graze in right-of-way areas or discontinue such activities due to impending construction and reconstruction activities. Notification should also be made to Lincoln County officials, Lincoln County Sheriff, local ambulance services and EMS providers, and other public officials to facilitate safety and medical services as needed to the construction operations.

1.17 Establish Community Liaison to coordinate with impacted parties. As a condition to the certificate, prior to initiation of construction or reconstruction activities related to this project, DOE should establish community liaisons to consult with affected communities, farmers, ranchers, businesses, landowners, and agencies; develop cooperative solutions to local concerns, be available for public meetings; conduct periodic public outreach; and assist communities and other entities in establishing quiet zones. Such assistance may include coordination with the Federal Railroad Administration ("FRA") for identification of appropriate supplemental and alternative safety measures at grade crossings where quiet zones are desired, identifying potential sources of funding, providing assistance preparing funding applications and grant requests, and coordinating with representatives of potential lending organizations. The Community Liaison(s)

shall have access to DOE's upper management. DOE shall provide the name and phone number of the Community Liaison(s) to County Commissioners and other appropriate local officials in each local jurisdiction through which the new rail line passes. The Community Liaison also must have authority to provide information on anticipated train schedules to farmers and ranchers to facilitate movement of equipment or livestock from one side of the rail line to the other.

1.18 Development and implementation of mitigation policy and action plan. As set forth in greater detail in the accompanying 2007 Lincoln County Report, each allotment and grazing operation is operated differently. DOE, the BLM, landowners, grazing permittees, appropriate state grazing boards and Lincoln County must work cooperatively to develop a Land Use Mitigation Policy and Plan addressing areas of concern, including:

- Direct and indirect land loss
- Displacement of capital improvements (wells, windmills, corrals, outbuildings, irrigation systems, etc.)
- Noxious weed control
- Fencing
- Livestock casualty
- Fire prevention and suppression
- Fire casualty
- Construction-related impacts
- Property takings
- Compensation
- Access
- Grazing Management Plans
- Water use and rights

1.19 Standard for repair/replacement of range improvements. Any damage to existing range improvements caused by construction activities must be repaired using material that meets or exceeds the quality of the existing improvement. If damage occurs, the BLM, livestock operator and Lincoln County must be notified immediately. If damage occurs during active livestock grazing, repairs should be made within 24 hours. In addition, where required, tortoise fencing would be approximately 18 to 24 inches high, consisting of welded mesh attached to small stakes so cattle should be able to move over it.

1.20 Fire Prevention. Many of the plants located near the proposed rail line are susceptible to fire. Moreover, in seasons with high rainfall, combustible growth and the threat of wildfires are increasing. Once burned, it may be difficult or impossible to reestablish a community of native vegetation. To minimize the loss of vegetation due to wildfire, prior to initiating any construction activities related to this project, DOI must be required, in consultation with the Natural Resource Conservation Service, local grazing organizations, appropriate State of Nevada and Federal agencies, and local fire and emergency response departments, to develop an adequate plan for fire prevention and suppression and subsequent land restoration, including natural habitats, during construction and operation of the new rail line. DOE's plan must ensure that all rail infrastructure be selected and procured, and operated with the best technology and operational practices to reduce the threat of wildfires caused by the railroad. For instance, locomotives should be equipped with functioning spark arresters on exhaust stacks, fire extinguishers suitable for flammable liquid fires, and low-spark brake shoes.

1.21 Minimize indirect Off Highway Vehicle (OHV) use impacts in the project area.
The construction of the rail alignment and associated access roads will facilitate and encourage OHV use, whose use can be destructive to vegetation. DOE must fund the provision of additional rangers to monitor improper OHV use in the rail project area. DOE should be required to fund appropriate mitigation measures and monitoring to alleviate the identified adverse and indirect OHV impacts to the project area.

2. Noxious and Invasive Weeds

The spread of noxious and invasive weeds in Lincoln County is a problem which, if not mitigated, can result in the loss of forage for livestock, impairment of wildlife habitat, and increased threat and severity of wildfires. Construction and other equipment and vehicles can spread seeds of invasive plant species. The proposed railroad construction area is in an environment susceptible to the establishment of certain invasive species. Any certificate should be conditioned on DOE's implementation of the following measures to limit the introduction of and quickly eradicate any invasive plants:

2.1 Prior to approval, a site-specific weed survey and a weed risk assessment, funded by DOE, must be completed by a BLM qualified contractor or the Tri-County Weed Control District. Monitoring should be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports are provided to BLM. If the spread of noxious weeds is noted, appropriated weed-control procedures must be determined in consultation with BLM personnel, private property owners, permitted public land ranchers, and Tri-County Weed Control District personnel and would be in compliance with the appropriate BLM handbook sections and applicable laws and regulations. All weed-control efforts on BLM-administered lands must be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management.

2.2 Prior to the entry of vehicles and equipment to a project area, areas of concern identified in the required site specific weed survey would be flagged in the field by a weed scientist or qualified biologist. The flagging would alert personnel or participants to avoid areas of concern. These sites would be recorded using GPS or other BLM Ely Field Office-approved equipment and provided to the Field Office Weed Coordinator or designated contact person.

2.3 All contractors, operators, or permit holder must provide information and training regarding noxious-weed management and identification to all personnel working on public lands.

2.4 To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes, all vehicles and heavy equipment must be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment must be cleaned with power or high-pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression would be cleaned as a part of check-in and demobilization procedures. Cleaning efforts should concentrate on tracks, feet, and tires, and on the undercarriage. Special emphasis would be applied to axles, frames, cross-members, motor mounts, steps (on and underneath), running boards, and front and rear bumper/brush guard assemblies. Vehicle cabs should be swept out, and refuse disposed of in suitable waste receptacles. Cleaning sites would be recorded using GPS or other equipment and provided to the BLM Field Office weed coordinator or designated contact person.

2.5 To All interim and final seed mixes, hay, straw, hay/straw, or other organic products used for reclamation or stabilization activities, feed, or bedding must be certified free of

plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office

2.6 All source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation must be inspected prior to this site being put into active use and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office. Inspections should be conducted by a weed scientist or qualified biologist whose work would be funded by DOE and coordinated with private property owner, permitted public land rancher, and Tri-County Weed Control District personnel.

2.7 Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in areas that are a safe distance from environmentally sensitive areas and points of entry to bodies of water (e.g., storm drains, irrigation ditches, streams, lakes, or wells).

2.8 Methods used to accomplish weed and insect control objectives must consider seasonal distribution of large wildlife species.

2.9 No noxious weeds would be allowed on the site at the time of reclamation release. Any noxious weeds that become established would be controlled with funding provided by DOE and completed by a BLM qualified contractor or the Tri-County Weed Control District. It is essential that all efforts be made throughout construction and operations to minimize the area disturbed. Efforts must be made to reseed with native species as soon as possible after the disturbed activities take place to assure revegetation with beneficial plants, or adaptive plant species that will establish a healthy and beneficial plant community in the disturbed area. Once again it is most desirable to require the removal of the top soil before construction activities begin, stock pile the desirable soil, and redistribute it following construction. This will help assure beneficial plants will be able to grow in this area.

3. Private Land/Water Property Rights

Development and operation of the proposed Caliente Rail Alignment will conflict with existing land and water uses in Lincoln County. Within Lincoln County the rail alignment will cross nearly 100 parcels of private property and will be immediately proximate to many others. Many of these parcels are residential in nature, with many existing homes located along the alignment. Commercial property, including one existing motel would be bisected by the rail line. As discussed previously, numerous parcels of improved and unimproved agricultural land will be crossed by the rail. The proposed rail line also crosses through land identified by Lincoln County for disposal by BLM for community expansion purposes, primarily residential in nature. The rail line will result in a wide variety of land use impacts, will impact privately held water rights and related existing uses, and will likely result in a diminution of value of property. Suggested measures to mitigate these significant impacts include.

3.1 Location of construction camps closely coordinated with local government. To minimize adverse and maximize beneficial impacts associated with DOE planned construction camps in Lincoln County, the location and post-construction disposition of all camps should be closely coordinated with the County.

3.2 Minimize land disturbance and water usage. The use of above-ground water storage tanks with standpipes to reduce the level of disturbance and conserve water by minimizing leakage and evaporation should be required.

3.3 Minimize visual impacts to surrounding lands. DOE should be required to design the staging yard and related facilities and structures in a manner that blends with the natural environment and fits with the local architecture. DOE should be required to place native vegetation on berms around the staging yard to soften the visual impact to adjacent lands. DOE should adopt a protocol to minimize cuts and fills and areas that will be cleared of vegetation during construction.

3.4 Avoid or compensate for impacts to property rights. DOE should be required to select an alignment which, to the maximum extent practical, minimizes impacts to private property. Where private property must be crossed, DOE should be required to compensate land owners for loss of use or devaluation of private property crossed, divided or otherwise disturbed by, but not located within DOE easements and right-of-ways.

3.5 Avoid/Minimize impacts to existing residential, commercial and industrial land uses. Construction vehicles, equipment, and workers should be prohibited from accessing work areas by crossing private property, parking on private property, or blocking ingress or egress to private property unless agreed to by the property owner. DOE should store its equipment and materials in established storage areas or on DOE's property to the extent practicable. The Community Liaison shall work with affected businesses or industries to appropriately redress any damage to the business's property caused by DOE's project-related construction or reconstruction activities

3.6 Avoid or compensate impacts to privately held water resources. If it is determined that withdrawing groundwater for construction and dust control will have a detrimental effect on any existing water right in Lincoln County, DOE should be required to avoid this impact by trucking in the water from another more abundant source. DOE should be required to provide funds to the impacted communities in Lincoln County to upgrade and improve their water systems including wells, pumping, and storage capabilities to offset the additional demands that will be made by new permanent and temporary residents, servicing the staging yard and related facilities and construction camps, and servicing additional through traffic. DOE should be required to consider leasing unused water rights from existing willing right-holders rather than seeking new water permits and the construction and pumping of new wells which may adversely impact existing water rights.

4. Rail Safety

The DOE's proposal entails constructing a new railroad more than 300 miles long through remote, rugged terrain, and shipping dangerous, heavy cargo. As with any railroad, incidents and accidents involving shipments of nuclear waste and non-nuclear materials are nearly inevitable over the life of the project. Although expected to be of low probability, such incidents/accidents could create substantial risks and severe consequences. As discussed more fully in Section 7 which follows, accidents of any magnitude will likely receive considerable media attention, stigmatizing the region as a place to live, work and visit. It is therefore imperative that DOE ensure that the frequency, severity and consequence of rail incidents be minimized. Accordingly, the following rail safety mitigation measures have been identified to minimize rail related incidents/accidents.

4.1 Decrease distance between locations of passing track. DOE's spent fuel train would be delayed if a commercial train was in a passing siding with an attached commercial siding. According to the DEIS (Rail Alignment DEIS at 2-2), the next passing siding would be 25 miles away, causing significant delay for the waste train. To reduce time in transit for nuclear waste shipments, an alternative of placing passing sidings every ten miles should be considered.

4.2 Maximize rail safety. Due to the excessive weight of the cask cars and to encourage maximum system safety, DOE should be required to use 141 lb. rail. DOE should be required to adhere to Federal Occupational Safety and Health Administration (OSHA), FRA, and State construction and operational safety regulations to minimize the potential for accidents.

4.3 Maximize bridge safety. To encourage system safety, the Cooper Rating for all bridges constructed by DOE should be a minimum E80.

4.4 Rolling stock safety. To enhance rail system safety, wheel bearing detectors and dragging equipment detectors should be required at 20 mile intervals.

4.5 On-line equipment failure management. An Action Plan for locomotive failure on-line and an Action Plan to repair cask cars that fail on-line should be required to be provided by DOE.

4.6 Real-time tracking of cask cars. DOE should be required to install and monitor tracking devices mounted on all cask rail cars and/or casks to track all nuclear fuel shipments from point of origin to point of destination.

4.7 Public notification of impending increases in train traffic. DOE shall coordinate with the Nevada Department of Transportation, counties, and affected communities to develop a program for installation of temporary notification signs or message boards on railroad property at public grade-crossings, determined by the State and/or County to warrant such measures, clearly advising motorists of the impending increase in train traffic and train speeds along its existing system and commencement of operations along its new rail line. The format and lettering of these signs should comply with the U.S. Department of Transportation (DOT), Federal Highway Administration's Manual on Uniform Traffic Control Devices, and should be in place no less than 30 days before, and 6 months after, completion of project-related construction and reconstruction activities in the area.

4.8 Installation of grade-crossing signage. For each of the public grade-crossings on the new and existing rail line, DOE should provide and maintain permanent signs prominently displaying both a toll-free telephone number and a unique grade crossing identification number in compliance with Federal Highway Regulations (23 CFR Part 655). The toll-free number should be answered 24 hours per day by DOE's personnel. Where DOE's right-of-way is close to another rail carrier's crossing, DOE should coordinate with the other rail carrier to establish a procedure regarding reported accidents and grade crossing device malfunctions.

4.9 Develop alternatives to train horns. DOE shall consult with interested communities along its new rail line to identify alternative safety measures to eliminate the need to sound train horns in the community, in accordance with FRA's final rule on the *Use of Locomotive Horns at Highway-Rail Crossings*.

4.10 Design and implement transportation coordination team. DOE should establish and fund an organization to coordinate and plan for high level nuclear waste train movements through the rail corridor. This organization, which could be formed from an existing county organization such as the sheriff's department, would monitor, detect and react to potential sabotage in the corridor.

4.11 Institute regular track inspection program. Before the rail shipments containing nuclear waste begin and at regular intervals thereafter, a complete inspection of the rail corridor should be conducted and repairs made. The result of the existing "rugged" alignment with high quantity of curved track is a railroad that requires constant inspection of track for gauge

widening in the curves. The consequence of not maintaining proper gage is an increased potential risk of derailment. In undertaking project-related construction activities, DOE shall use construction materials and safety practices recommended by the American Railway Engineering and Maintenance of Way Association (AREMA) and the recommended standards for track construction in the AREMA Manual for Railway Engineering. DOE shall maintain the track and provide for track inspection in compliance with AREMA and FRA requirements at 49 CFR 213.

4.12 Identify and implement extra-regulatory safety measures. DOE should be required to evaluate additional safety measures and infrastructure safety standards for the rail transport (rather than relying on federal safety standards), because of the high consequence nature of a rail accident with spent nuclear fuel. DOE should be responsible for the costs of upgrading equipment and maintaining the additional safety standards for the duration of transport of the spent nuclear fuel.

4.13 Institute regular rail system inspection program. The railroad lines, switching equipment, and lights should be inspected regularly for regular wear and repairs should be made promptly. Appropriate records should be kept and made available to Lincoln County officials. DOE shall properly maintain its new and existing rail line. Maintenance shall include trimming vegetation on railroad property that obscures visibility of oncoming trains and assuring that rail, railroad ties, track fastenings, and ballast material are in good repair, and that warning devices operate properly and are legible.

4.14 Design and implement natural hazards detection system. A system for detecting natural hazards, such as land slides and floods should be implemented. This could be a pilot train or pilot vehicle (or both) that would travel the rail corridor two to five miles ahead of the train carrying high level nuclear waste casks, or sensors and monitors on the tracks to warn of natural hazards.

4.15 Provision of grade separated rail crossings. Safety at existing and new railroad crossings would be enhanced if they were modified to reduce potential contact between cars and trains. If complete grade separation at existing crossings is not possible, railroad crossing and signals should be evaluated for possible enhancement and upgrading. DOE shall make Operation Lifesaver programs available to communities, schools, and other organizations located along the new and existing rail line. DOE shall consult and coordinate with school districts regarding placement on railroad property of equipment to permit use of in-vehicle warning devices on school buses. DOE shall assure that roadway approaches and rail line crossings for both new and existing grade crossings are constructed or re-constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) design manual, applicable state rules, guidelines, or statutes, and the AREMA standards. The goal of grade crossing design should be to eliminate rough or humped crossings to the extent practicable. To the extent practicable, DOE shall minimize trains blocking grade-crossings throughout its system.

4.16 Provide grade crossing warning devices. DOE shall consult with appropriate Federal and State transportation agencies to determine the final design and other details of the grade-crossing protections and grade separations on the new rail line. Implementation of all grade-crossing protections shall be subject to the review and approval of the Federal Rail Administration (FRA) and the Nevada Department of Transportation, in consultation with Lincoln County officials. DOE shall install reflective material on the back of all passive crossing warning devices, such as crossbucks, on the new and existing rail line. Reflective material shall be installed so that headlights from vehicles approaching the grade crossing on the opposite side of the rail line will strike the material and illuminate it to provide a continual illumination in the

absence of a passing train and a flashing appearance when a train is passing due to the space between the rail cars.

4.17 Minimize travel restrictions during rail construction. During project-related construction at grade-crossings, when practicable, DOE shall maintain at least one open lane of traffic at all times or provide for detours and associated signage, as appropriate, to allow for the quick passage of emergency and other vehicles.

5. Radiation Exposure

Lincoln County is located downwind of the Nevada Test Site, and its residents have suffered from fallout from the federal government's above-ground testing of over 100 nuclear bombs in the 1950s and '60s. County residents can still recall watching nuclear explosions and seeing the radioactive dust settle on their homes and farms. Accordingly, Lincoln County understandably is skeptical of the federal government's assurances of nuclear safety and risk management.

The Rail Alignment DEIS discloses that exposure to radiation will result to persons employed in operation and maintenance of the Caliente Rail Alignment and related nuclear waste shipments to Yucca Mountain. The DEIS also reveals that persons living, working or recreating in proximity to the Caliente Rail Alignment will be exposed to radiation. While the radiation doses and related acute and latent health effects associated with these exposures is reported by DOE to be small, the scientific uncertainty surrounding radiological health consequences to even very small rates of exposure dictate that DOE make every effort to avoid or minimize human exposure to radiation associated with shipments along the Caliente Rail Alignment, and to mitigate the consequences and alleviate public fears of any such exposure. Measures to avoid, minimize and otherwise mitigate rates and consequences of radiation exposure associated with the proposed Caliente Rail Alignment follow:

5.1 Minimization of occupational exposure. For transportation and related facility workers, DOE should be required to ensure that radiation dose badges are being used correctly and workers receiving higher than acceptable levels of radiation should be reassigned to work in areas with less risk of exposure. If workers are regularly exceeding dose limits, DOE should be required to reexamine exposure management procedures and to revise same to reduce exposure to recognized safe levels.

5.2 Location of facilities away from population. In order to avoid risk of exposure for the residents of Lincoln County, any staging yard, if constructed, should be required to be sited at an appropriate distance from residential or public functions. DOE should be required to further isolate the staging yard facility with physical barriers. Special care should be taken that children cannot climb fences or otherwise put themselves into close proximity of the staging yard.

5.3 Limit quantities/duration of nuclear waste stored at staging area. Limits should be placed on the number of casks allowed at the staging yard at any one time. Transportation protocols should be designed to ensure that the staging yard facility does not become a holding place in the event the repository is temporarily unable to accept additional casks. (i.e. departures of train shipments must be stopped at the place of origin, if the repository cannot accept casks.)

5.4 Limit train stop times to reduce radiation exposure. The majority of the risk of radiological exposure to the population along the Caliente Rail alignment will be during train stoppage. As stop time increases so does the exposure to the population. This indicates that

controls on the duration and location of stops are an important technique for reducing exposure to radiation. DOE should be required to minimize stop times in populated areas and designated safe stopping areas for rail transport should be isolated from communities.

5.5 Encourage train operating speeds which reduce time in transit while maintaining rail safety. Increased speeds were also found to reduce exposure. For train shipments, DOE should be required to assess the trade-off between increased speeds to lower radiation exposure and the risk of an accident that increases with travel speed. The optimal operating speed should be determined and adhered to.

5.6 Provision to Lincoln County of independent oversight of federal radiation monitoring activities. Lincoln County officials should be granted independent or concurrent oversight over the Federal radiation monitoring at the staging yard and along rail corridors. DOE should provide funding for staff to perform independent monitoring and obtain and maintain necessary equipment.

5.7 Establish and monitor baseline epidemiological conditions. In consultation with Lincoln County, DOE should be required to design and implement a baseline epidemiological assessment and monitoring project in the County. Collection of baseline epidemiological data in the County should begin as soon after a DOE decision to construct the Caliente rail alignment or otherwise transport spent nuclear fuel and other high-level radioactive waste through Lincoln County is made. This would provide at least three years of pre-shipment baseline health conditions data for the County. Regardless of whether SNF/HLW is shipped through Lincoln County said baseline study and monitoring project should be implemented at least three years prior to initial receipt of radioactive waste at the Yucca Mountain site.

5.8 Establish protocol for radiation exposure related compensation. DOE should be required to negotiate advance agreements with Lincoln County regarding compensation that will automatically go into effect if background radiation levels exceed an agreed upon level. This "bright-line" approach assures residents of the County that they will be compensated for any latent cancer effects that may accrue to them and it reduces the likelihood of long drawn-out litigation between DOE and citizens in these communities. DOE should be required to bear the full cost of clean-up activities if radiation is detected in Lincoln County, using best available clean up techniques and equipment. DOE should be required to conduct an ecological risk assessment to determine the radiological risks to the wildlife and vegetation directly adjacent to the transportation corridors and the staging yard.

6. Emergency Management

Emergency response systems in Lincoln County will be impacted by construction and operation of the Caliente Rail Alignment. As a sparsely populated by large rural area, any increase in emergency related demands on fire and ambulance crews, emergency medical technicians and medical facilities associated with the rail line will impair the availability of these emergency resources to respond to non-rail alignment emergencies. With the exception of paid full and part-time staff associated with the Grover C. Dils Medical Center, Lincoln County's emergency response and medical system is staffed entirely by volunteers. Local volunteer fire and volunteer emergency medical teams consider themselves to be generally under-prepared to respond to the existing shipments of all manner of hazardous materials transported via truck and rail through Lincoln County, and even less prepared to respond to incidents/accidents involving radioactive materials. In order to maintain the current capacity to respond to non-hazardous/non-radiological emergencies, various measures must be implemented to offset the normal and unique (radiation related) demands for services posed by construction and operation of the

Caliente Rail Alignment. Various emergency response capabilities in Lincoln County will need to be upgraded to handle additional accidents associated with increased traffic flow and population and to handle an emergency involving the release of radioactive material into the environment. Emergency medical systems will need to be upgraded to handle additional accidents associated with increased traffic flow and a larger population base. In addition, the Grover C. Dils Medical Center and community clinics will need to be able to handle an emergency involving the release of radioactive material into the environment and human contamination. The hospital and clinics must have the capability of handling this additional burden without compromising service to existing communities. Lincoln County must have the capability of handling this additional burden without compromising service to existing communities or to visitors and tourists. Although Section 180(c) of the Nuclear Waste Policy Act, as amended, does require DOE to provide funding for emergency response training, said funding is provided to States and Indian Tribes, not affected communities. Section 180(c) funding would not be sufficient to meet emergency management needs in Lincoln County. The following measures would serve to mitigate the effects of the additional burden

6.1 Upgrade emergency response equipment DOE funding to upgrade current emergency response equipment to handle additional emergency situations (including fire and medical response capabilities) due to a larger population base and accidents associated with the construction and operation of a rail spur line, the staging yard and construction camps.

6.2 Provide specialized equipment DOE funding to purchase the necessary equipment to enable the County to provide early response to handle an incident involving the release of radioactive material into the environment and human contamination.

6.3 Expand staffing DOE funding to assist in establishing at least a modest paid full time emergency response staff and continuing grants to maintain said staff.

6.4 Training of staff DOE funding to enable ongoing training for the emergency management/medical personnel, including hospital staff, and to cover special training for handling of radiation contaminated patients, radioactive material handling and evacuation/crowd control training. In addition, DOE should fund training of doctors, medical staff, emergency response personnel and ambulance attendants in Lincoln County to identify radiation sickness and DOE must provide funding to the Grover C Dils Medical Center so that the hospital has the capability to isolate patients and treat them for radiation exposure.

6.5 Funding for overtime and unanticipated response costs A contingency for grants to cover additional staff time and equipment in the event of a radiological emergency must be established by DOE.

6.6 Preparation of radiological emergency evacuation plans DOE funding and technical assistance for developing and publicizing evacuation plans for Lincoln County communities. The evacuation plan should include route planning, emergency personnel coordination, public education, acquisition of emergency signal and communication equipment, acquisition of vehicles needed for evacuating students, hospital patients, elderly persons and others with special needs.

6.7 Provision of construction schedule and related contact person information At least one month prior to initiation of construction activities in the area, DOE shall provide the information described below, as well as any additional information, as appropriate, to each local emergency response organization or other similar body for communities within the project area regarding project-related construction and operation of both the new and existing rail line:

- The schedule for construction throughout the project area, including the sequence of construction of public grade crossings and approximate schedule for these activities at each crossing.
- Expected schedule for any changes in rail line operations along DOE's system, including when changes in train speeds and levels of traffic are anticipated to occur, and current and new train speeds and levels of rail traffic.
- A toll-free number for the DOE's contact who shall be available to answer
- Questions or attend meetings for the purpose of informing emergency-service providers about the project construction and operation.
- Revisions to this information, including changes in construction schedule, as appropriate.

6.8 Coordination/notification of train movements DOE shall consult with the Board of Lincoln County Commissioners and representatives of affected communities that so request, to coordinate train movements and emergency response and discuss the possible installation by DOE of a state-of-the-art electronic display board, or equivalent technology, such as a real time or Global Positioning System (GPS) train location monitoring system in the local emergency-response center of each community showing the location of trains and/or the position of grade crossing warning signals.

6.9 Provision of technical support. In addition to financial support and training, DOE should be required to take a proactive and positive role in helping Lincoln County with emergency planning for a radiological event. This includes:

- a) Providing guidance for appropriate levels of community preparedness, training, equipment, and response procedures.
- b) Clarifying responsibilities in response planning between the federal, state, and local governments, as well as between federal agencies, such as FEMA, DOE, and EPA.
- c) Taking responsibility to ensure (perhaps through certification training) that the local governments have the necessary training and equipment to handle an accident involving a radiological release.

Back-up emergency help is at the present a long way off. Three hours is the minimum drive time for additional emergency personnel and equipment to arrive from Las Vegas. Under these circumstances, DOE needs to be required to evaluate:

- a) If there are upgrades to dirt roads or cut-through routes that could be established which would reduce the drive time between NTS, Las Vegas and Lincoln County communities. For example, improvements to Kane Springs Road and access through Gate 700 from the Nevada Test Site through the Nevada Test and Training Range to the Rachel area.
- b) Which critical heavy or large equipment should be stored in Lincoln County so that personnel being flown in via small plane or helicopter would have the necessary equipment without the delay of waiting for trucks to arrive.
- c) Strategically locating adequate DOE emergency response capabilities along transport routes.

6.10 Provision of funding to remodel/expand medical facilities DOE should provide funds to upgrade hospital facilities and to accommodate the additional demands for basic and radiological related service. This would include DOE funding to modify hospital facilities to provide the capability for radiological quarantine in the event that persons contaminated with radiation are admitted for initial treatment.

7. Socioeconomic Conditions & Fiscal Impacts

Construction and operation of the Caliente Rail Alignment will result in a variety of socioeconomic effects in Lincoln County.

For instance, while DOE's proposed use of construction labor camps might minimize construction-related demands for community services, those demands will not be eliminated. Not all construction workers will elect to reside in camps, and workers will also visit area communities for various services or to "unwind." Construction workers will spend money in Lincoln County and will also require the expenditure of additional public funds. Construction workforce related demands on local law enforcement, emergency medical, judicial, social services and in some cases, dependent-related education will occur. During operations, the project workforce will become significantly smaller but more stable, and related demands for local services will also be reduced. As a small rural area, Lincoln County has little ability to service additional demands for community services. As a result, any demand for such services resulting from construction and operation of the Caliente Rail Alignment must be mitigated by DOE. If Lincoln County is required to use its already limited fiscal resources to provide public services and facilities for Caliente Rail Alignment related workers and their dependents, existing residents of the County may see the existing level of community service decline.

Fiscally, the construction of the project will result in some added tax revenues (due to tax receipts on construction materials and increased local spending) to Lincoln County, although the DOE's environmental impact statements fail to address this issue. Payments-Equal-To-Taxes (PETT) payments, required to be made by DOE to Lincoln County (pursuant to Section 116(c)(3) of the Nuclear Waste Policy Act, as amended), may add appreciably to local government revenues. DOE however, failed to address PETT in the Rail Alignment DEIS.

The following are Lincoln County's recommendations for mitigation of socioeconomic impacts:

7.1 Community Cohesion. Trust, control, and self-determination are important to increased comfort levels with hazardous facilities. Conversely, significant impacts to local communities may occur without such trust, control, and self-determination. For example, in some European communities if a local community accepts a repository, then that community is

granted a greater degree of control over operations as well as local participation in decisions and monitoring functions. DOE's implementation of greater local participation will help to mitigate negative impacts to community cohesion. Residents will have a much greater level of trust in fellow community members who are participating in decisions and monitoring the Yucca Mountain repository transportation system. Strains on community cohesion can be reduced if there are clear benefits to the community that are available to all residents. Suggested measures to mitigate possible impacts include:

7.1.1 DOE should provide Lincoln County with funds to (1) hire experts and conduct independent oversight during the characterization, construction, and emplacement and closure phases of the rail line; (2) enable the County to monitor the impacts of the Caliente Rail Alignment on key socioeconomic indicators in Lincoln County, such as population, jobs, and income; and (3) enhance the quality of community life through investments in community centers, public parks, public pools, or other facilities that are valued by the community.

7.1.2 DOE should be required to provide funding for community programs which enhance community cohesion in Lincoln County.

7.2 Political Divisiveness. Since originally being proposed in the early 1980's the Caliente Rail Alignment has resulted in political divisiveness in Lincoln County. Perhaps the most significant example was an attempt by former Nevada Attorney General Frankie Sue Del Papa to have 2 of 3 Lincoln County Commissioners and all five Caliente City Councilmen removed from office for passing a resolution addressing recommendations to DOE regarding transportation of nuclear waste through Lincoln County. Many County Commission meetings have seen heated discussion between Commissioners and the public or among members of the public regarding the Caliente Rail Alignment. At least one attempt to recall a Lincoln County Commissioner has occurred as a result of the rail alignment. All of this political divisiveness has cost the County time and money, not to mention the stress placed upon local public officials forced to deal with DOE rail related matters. Measures to mitigate existing and future project related political divisiveness include:

7.2.1 DOE should be required to compensate the County for costs associated with Caliente Rail alignment related special elections and increased time that elected officials and local government employees may need to put towards related issues.

7.2.2 DOE should be required to assist Lincoln County elected and appointed officials in obtaining training designed to effectively avoid or manage Caliente Rail Alignment related political divisiveness.

7.3 Employment. The Site Repository Draft SEIS suggests that approximately 40-50 new jobs would be created in Lincoln County for operation of the Caliente Rail Alignment (related to operation of the Staging Area). The Yucca Mountain Geologic Repository, but for which the rail line would not be built and operated, will result in the employment of over a thousand employees, most of which DOE reports will work and reside in Clark County. Accordingly, Lincoln County will be subject to the risks of transportation of radioactive waste and the related impacts associated with construction and operation of the Caliente Rail Alignment. Clark County on the other hand will see few, if any shipments of radioactive waste, yet will reap a majority of economic benefits associated with the Yucca Mountain repository system. In its comments to DOE's DEIS, Lincoln County pointed out the inequitable distribution of repository system employment benefits and repository system (including transportation) impacts. The following measures would help ensure that employment opportunities and benefits are maximized in Lincoln County: A DOE funded local job training program will enhance

employment opportunities for residents of Lincoln County. The type of skills required for repository work as compared to the capabilities possessed by County workers will affect the chances of local workers being used and in what capacity. These skills include management, engineering, craft, equipment operators, etc.

7.3.1 DOE should be required to facilitate location of ancillary activities in the County. At peak employment, DOE anticipates requiring several hundred clerical/office workers to support site development/operations at Yucca Mountain and most of these are anticipated to be located in the Las Vegas area. Through the use of currently available data transmission technologies (i.e. modems, internet access, etc), certain "back office" functions could be conducted at locations in Lincoln County

7.3.2 There is an issue of whether the jobs available will be union or non-union positions. Because union hiring halls are typically located in metropolitan centers, rural workers often find it difficult to obtain union jobs. Consequently, if union labor is relied upon for Yucca Mountain work, employment opportunities for Lincoln County residents may be limited. DOE should be required to implement a hiring policy that gives Lincoln County residents a fair opportunity to apply for the available positions. Agreements between DOE and unions should require within Lincoln County community based training programs.

7.3.3 The HUBZone Empowerment Contracting program was enacted into law as part of the Small Business Reauthorization Act of 1997, and is implemented by the U.S. Small Business Administration ("SBA"). The program encourages economic development in historically underutilized business zones ("HUBZones"). The SBA designated Lincoln County as a HubZone area. DOE should commit to identifying appropriate and significant procurements to be set-aside for SBA HubZone businesses, particularly those located in Lincoln County.

7.3.4 Due to the long distance between communities in Lincoln County and the repository and the cost of gasoline, DOE should provide bus or jitney service to bring Lincoln County residents to various rail construction sites and ultimately, to the repository for work. A bus or jitney service would also serve to reduce vehicle miles traveled and mitigate any traffic or air quality impacts.

7.4 Local Procurement and Income. According to the State of Nevada, the mean wage in Lincoln County during 2007 was \$17.26/hr. Employees working in construction and operation of the Caliente Rail Alignment would likely receive wages significantly higher than prevailing wages in the County.³ As a consequence, existing businesses in the County may find it difficult to retain employees who leave to seek employment with DOE and its contractors. Instability in the local labor market will result as will impacts to existing businesses faced with the prospects of paying higher wages to retain or attract employees. In the event that wages in the County increase, the prices of goods and services provided locally may increase thereby increasing the cost of living for area residents. The following measure may serve to mitigate impacts which construction and operation of the Caliente Rail Alignment may have on existing businesses.

³ Based upon information found in Table J-2 of the Rail Alignment DEIS and DOE's assumption of a 2,000 hour work year, during operations in the year 2015, it is projected that the average hourly wage during operations would be approximately \$23.57 (\$4,148,820 in real disposable income divided by 88 employees divided by 2,000 hours)

7.4.1 DOE should be required to implement a procurement policy that would increase purchases of goods and services from within Lincoln County that would benefit businesses and their employees in the City of Caliente and in other areas of Lincoln County.

7.5 Population. Construction and operation of the Caliente Rail Alignment will impose demands on Lincoln County services that otherwise could have been used to service other anticipated/planned development. Due to the unique nature of the repository system, including transportation, population impacts are difficult to forecast and should be monitored closely, with a commitment from DOE to implement appropriate mitigation if adverse impacts are detected. Transportation of spent nuclear fuel and other high-level radioactive waste is an industrial activity with attendant public health risks which would be involuntarily imposed upon the residents of Lincoln County. Any related population induced demand for public facilities and services will be using existing public facility and service capacity which would otherwise be available for desired industrial projects. In fact, Lincoln County and its principal community the City of Caliente are actively seeking to attract certain types of industry to the area. To the extent that public facility and service capacity must be allocated to support DOE's Caliente Rail Alignment construction and operations needs, said capacity will be unavailable to support other desired industries being encouraged to expand or relocate to Lincoln County. Caliente Rail Alignment construction and operation related population growth in Lincoln County communities will place an additional strain on government services, such as wastewater treatment, water, public safety, roads, schools, parks and recreation, etc. These are services that the local governments are required to provide, although the repository is an involuntary project and may reduce the community's ability to provide services for desired projects. Conversely, if there is out-migration due to radioactive waste related imagined or real risk induced stigma effects, or if the population does not experience the anticipated growth, there will also be negative fiscal impacts because the County and City of Caliente will need to absorb fixed tax or other revenue supported outlays (i.e. bonded indebtedness or other debt) on a smaller population base. Higher taxes or fees on remaining residents may be required to generate required revenues to cover outstanding debt.

Increases in population may strain an already limited supply of housing for sale and rent. Results from an economic, fiscal and demographic model developed by the University of Nevada, Reno Center for Economic Development⁴ to support County and City repository oversight initiatives suggests that as many as 30 new housing units may be required to support 150 construction or operational workers associated with the Caliente Rail Alignment. Of these units, demand for mobile homes would be greatest. Over time demand for housing would shift to conventional single family dwellings. DOE has recently estimated that between as many as 127 construction and 100 operational workers may be required in Lincoln County (DOE/EIS-0369D). Although DOE assumes that most, if not all construction workers would reside in DOE project related construction camps, no requirement for said workers to reside in said camps has been presented by DOE. If 100 workers elect to reside in Lincoln County communities, an estimated 20 new residential dwelling units would be required. Given existing shortages in housing in Lincoln County, any DOE-project related demand on housing will impede the ability of the area to provide housing for workers of other industries which the County and City may be seeking to attract to the area.

⁴ *Lincoln County Economic, Fiscal, Demographic Model*, University of Nevada, Reno, Center for Economic Development, 1999.

7.5.1 DOE should provide Lincoln County with funding to develop and implement a Caliente Rail Alignment related population impact monitoring program.

7.6 Traffic and Road Maintenance. If percent growth in vehicle miles traveled (VMT) is assumed to match percent growth in population due to construction and operation of the Caliente Rail Alignment, the unincorporated area of Lincoln County between the City of Caliente and the DOE proposed staging yard and the City of Caliente can expect an increase in VMT that may exceed 10 percent.⁵ Local street traffic will be increased to the degree that temporary and permanent population increases due to Caliente Rail Alignment related construction and operational activity. This will result in additional road wear, increased traffic, and decreased parking availability. Ultimately, Caliente Rail Alignment related growth in VMT may contribute to the need for additional street maintenance and traffic control improvements and equipment.

7.6.1 DOE should be required to assist Lincoln County in developing and implementing a traffic monitoring and mitigation plan.

7.6.2 DOE should be required to identify county roads to be used during construction of the railroad. These roads should be improved for safety and dust suppression prior to the start of significant engineering of the rail alignment and the beginning of any construction activities.

7.6.3 DOE should be required to enter into cooperative agreements with local Lincoln County officials and road department management for adequate safety and road maintenance activities.

7.7 Schools. Any additional population in Lincoln County and the City of Caliente will include some school age children. The DOE DEIS estimates that construction of the Caliente Rail Alignment will result in an additional 21 school-aged children in Lincoln County. The DOE DEIS further estimates that operation of the Caliente Rail Alignment will result in an additional 43 school-aged children in Lincoln County. The operating cost per student incurred by the County (including elementary, middle and high schools) was \$8,044 per student in 2000. This figure includes instruction, administration, building maintenance and operations, student support and staff support. In addition, capital costs for buildings and facilities per student have been estimated at \$10,630 (Bleak, 2001)⁶. If the construction and operation of the Caliente Rail Alignment does result in 43 additional students in the Lincoln County School District, the operating cost to the District would be approximately \$345,000 annually to educate these students. (The County currently receives \$7,000 per student from the State of Nevada).⁷ In addition, capital facilities whether existing or new, costing approximately \$457,000 would be required to support this new student population

Current school facilities would be capable of handling the Caliente Rail Alignment related student population⁸ However, if this capacity is used to meet demands created by

⁵ Assuming a current City of Caliente population of 1,015 (as noted in DOE/EIS-0369D, Table 3-59), an increased in population of 100 persons required to operate the Caliente Rail Alignment (as noted in DOE/EIS-0369D, Table 4-107), could result in an approximate 10 percent increase in vehicle miles traveled (VMT) in the community. Analyses based upon Intertech Services Corporation, *The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County Characterization of Socioeconomic Impacts and Framework for Assessment of Effects*, Submitted to the Joint City/County Impact Alleviation Committee. October 1994 P 19

⁶ Bleak, Lorell. (2001, May). Superintendent of the School District. Personal communication

⁷ Jenkins, Deana (2001, May). Pahrnagat Valley Middle School. Personal conversation.

⁸ Intertech Services Corporation. *Assessment of Facility Capacity and Student Loads*. Prepared for the Lincoln County School District. September 2000.

Caliente Rail Alignment, capacity will no longer be available to meet additional student population needs created by desirable industry recruited by Lincoln County. Given the involuntary nature of and risks associated with use of the Caliente Rail Alignment to transport radioactive waste, DOE should be required to mitigate all project induced demands on school facilities and programs in Lincoln County. Mitigation measures which should be considered for implementation by DOE include:

7.7.1 DOE should provide the Lincoln County School District with funding to monitor impacts and changes in student populations and demands due to the repository system.

7.7.2 DOE should reimburse the School District for the cost of educating additional students induced by repository system construction and operation.

7.7.3 DOE should commit in advance to provide funds to expand school facilities, purchase equipment, and hire additional staff if monitoring indicates that the school system is experiencing additional demands due to the repository system.

7.8 Public Perception of Risks and Stigma. In its recent Rail Alignment DEIS and recently released Rail Alignment FEIS, DOE elected not to analyze in any detail potential impacts associated with Rail Alignment related public perception of risks and related stigma. With the Yucca Mountain repository less than 100 miles away from community areas and frequent shipments of radioactive waste passing through Lincoln County and the City of Caliente, stigmatization may affect people's perception of the quality of life in Lincoln County. Indeed, nuclear waste may be located within the staging yard located along the Caliente Rail Alignment just north of Caliente in rural Lincoln County each and every day for the next 50 years. Current residents may view the area as less attractive due to perceived radiological risks and this may ultimately lead to an out-migration of residents. Furthermore, retirees, who are attracted to rural areas due to the higher quality of life and personal security that they perceive to exist there, may choose to locate elsewhere if they view Lincoln County as having a lesser appeal or quality of life due to the shipment of nuclear waste across the county.

People associate the greatest degree of risk with technologies where the risks are new, unknown to science, not voluntarily incurred, not observable, and unknown to those exposed, and where the effects of exposure are delayed.⁹ With the possible exception of risks being unknown to science, most of these characteristics apply to the transport of nuclear waste on the Caliente Rail Alignment.

In a study on perceived risk and stigma from the Yucca Mountain repository in Nevada Slovic also found:¹⁰

The possibility that intense negative imagery associated with the repository may cause significant harm to Nevada's economy can no longer be ignored by serious attempts to assess the risks and impacts of this unique facility.

The same intense negative imagery is also likely, of course, with the shipment of nuclear waste by rail along the Caliente Rail Alignment.

⁹ Slovic, P., Layman, M., Kraus, N., Flynn, J., Chalmers, J., & Gessel, G. (1991) Perceived Risk, Stigma, and Potential Economic Impacts of a High-Level Nuclear Waste Repository in Nevada Risk Analysis: An International Journal, Vol 11, No 4 pp 683-695.

¹⁰ Ibid.

If stigma results in out-migration that causes a reduction in the population of Lincoln County or growth is not as rapid as anticipated, then many of the fiscal, school, traffic, and other impacts would be substantially different from the standard population induced impacts that would otherwise be expected. For example, if population decreases due to stigma, the school system will still have the same fixed costs, which will mean the cost per resident or household will increase. Likewise, if the population decreases, the costs of current roadway systems will have to be spread over fewer residents, raising the cost per person. This "opposite" effect due to stigma could have a significant impact on many functions of the City and County governments.

If there is an outflow of residents due to the effects of stigma, there could be a downturn in the local economy. Reduced local income could result in a lowered demand for goods and services and may lead to a decline in the number of employees, and possible business closures. This might result in fewer employment opportunities. In addition, an increase in residential vacancy rates may occur which may lead to reduced property values and lower housing costs within the County. This could result in a decline in rents collected by landowners, yet might also lower the cost of living for area residents. Some industries, such as construction, would also be affected by a declining population base. Demand for housing and infrastructure development would decrease, resulting in more unemployment. The ripple effect of a small reduction in population through the economy of Lincoln County could be significant.¹¹

Although the DOE considers the chance of a transportation accident with significant environmental and health consequences in or near Lincoln County to be a low probability, that chance nevertheless cannot be ignored and could produce serious economic impacts. Accident consequences might be in the form of actual physical damage from the accident, radiological contamination, or from the economic disruption from an evacuation of the area. Business disruption may result in lost sales revenue and lost wages for employees. Depending on the length of the disruption, existing businesses may experience irreversible effects.

The Goiania event in Brazil, where radioactive material from a medical device at an abandoned medical facility, was salvaged for scrap, disassembled, and contaminated a wide area and hundreds of people, and killed four people, provides an example of how a relatively minor accident involving radioactive material could result in a chain of events affecting a geographic region much larger than that of the actual impacts, disrupting social relations throughout a community and region. It also provided a classic example of the process by which the public's perception of risks, not the actual event or risk itself, can result in a wide array of painful and costly responses.¹²

In the event of an accident involving release of radiation, the value of agricultural crops and land in the vicinity of transportation corridors may be affected. An incident involving little risk of exposure but receiving wide media coverage could result in stigma-induced reductions in land and commodity values.¹³

¹¹ Intertech Services Corporation. (1994a, October 12) *The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County Characterization of Socioeconomic Impacts and Framework for Assessment of Effects*. Submitted to the Joint City/County Impact Alleviation Committee

¹² Goble, Robert (1994, June) Perspectives on Risks from the Nevada Test Site: Feasibility and Methods for Assessing Cumulative Radiological Exposure Risks Associated with Department of Energy Activities at the Nevada Test Site. Center for Technology, Environment and Development, Clark University, Worcester, MA.

¹³ Intertech Services Corporation (1994a, October 12). *The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County Characterization of Socioeconomic Impacts and Framework for Assessment of Effects*. Submitted to the Joint City/County Impact Alleviation Committee. p. 26.

7.9 Stigma and Tourism. Lincoln County is characterized by an abundance of outdoor recreational opportunities such as camping, fishing, hunting, water skiing, off-highway vehicle use, hiking, rock hounding, camping and backpacking. There are five state parks in Lincoln County—Spring Valley State Park, Echo Canyon State Recreation Area, Cathedral Gorge State Park, Kershaw-Ryan State Park, and Beaver Dam State Park. There are also two federally designated wildlife areas—the Desert National Wildlife Range and the Pahrangat National Wildlife Refuge.

In addition, there are numerous historic mining districts, prehistoric sites, historic sites from early settlements and silver mining. These include Indian camps, petroglyphs, mines, town sites, homesteads, and other historic relics. Most of these areas are unstudied, undeveloped and unprotected. These sites are part of the heritage of Lincoln County and represent potential additional attractions for visitors.

Lincoln County also has many buildings and structures that are of local significance. Such structures include historic homes, commercial buildings and public buildings. Many structures predating 1900 can be found in Panaca and Pioche. Several of the sites and structures may be eligible for listing on the National Historic Register.

As shown in Table 1, annual visitation to the five state parks in Lincoln County have shown a steady increase during the 1990s.

Table 1. Annual Visitation at State Parks in Lincoln County, Selected Years

Year	Visitors
1998	233,805
1999	250,898
2000	255,829
2001	249,012
2002	245,969
2003	243,843
2004	228,742
2005	248,545
2006	239,063
2007	266,061

Source: Division of Conservation and Natural Resources <http://dcnr.nv.gov/nrp01/table5-6.gif> (1998-2000) Michelle Hudson, Division of State Parks [775-684-2770] (2001-2008)

In 1988, each visitor to the five state parks in Lincoln County spent an average of \$7.60 per day in Lincoln County¹⁴. Adjusted for inflation this amount would be \$13.32 in 2007 dollars. Although visitor spending habits may have changed over time, based upon visitation statistics it is estimated that visitors to Lincoln County state parks spent \$3,543,932 in Lincoln County in 2007. Since many visitors spend multiple days in a park, this figure may

¹⁴ Intertech Services Corporation. (1993, November 16). Tourism Impacts of Three Mile Island and Other Adverse Events. Implications for Lincoln County and Other Rural Nevada Counties Bisected by Radioactive Waste Transport Corridors Submitted to the Joint City/County Impact Alleviation Committee.

underestimate tourist spending. A decline in visitation may harm sales to local businesses, particularly gasoline and retail sales.¹⁵

If Lincoln County were to become stigmatized due to public perception that it is a transportation corridor and storage location for nuclear waste, tourism in the County could well decline. Moreover, media attention following a transportation accident involving nuclear waste, even one not involving a release of radiation, could greatly exacerbate perceptions of risk and related tourism impacts.¹⁶

Research indicates that tourism impacts from hazard events may be short-lived and distance-dependent.¹⁷ However, these impacts would constitute a significant consequence for residents and businesses in Lincoln County. Tourism destinations within thirty miles of accident sites reportedly experience up to fifty percent sales and hotel occupancy declines lasting three to eight weeks.¹⁸ In the case of Three Mile Island, some evidence suggests that mild adverse impacts affected a minority of area businesses for an additional four to six months.¹⁹ Clustered near the eastern edge of Lincoln County, all five State parks are located within a thirty mile impact zone corresponding to the mainline Union Pacific railway corridor and the proposed Caliente Rail Alignment. The prospect of a transportation accident near one of the County's tourist destinations is a real concern to local officials. A study of the potential stigma induced economic impact of a nuclear waste related rail transportation accident in Lincoln County resulting in a temporary decline in visitation to the areas five state parks predicted losses in visitor spending approaching \$1 million.²⁰

Reduced tourism would likely mean a decrease in local sales resulting in less sales and gasoline taxes being collected. In addition, lost revenues, which occur in other areas of the State of Nevada (i.e. Clark County) as a result of repository system stigmatization will affect Lincoln County as shared tax revenues decline. Lincoln County receives several times more in sales tax revenue than is generated locally (mostly as a result of tourism driven sales in Clark County). Lincoln County may be faced with a declining revenue base, which becomes insufficient to cover costs. The County may be forced to lay off some employees and overburden others as it attempts to balance revenues with costs and the need for continued essential public services.²¹

The following measures should be required of DOE to mitigate the potential stigma related impacts to tourism of the Caliente Rail Alignment in Lincoln County:

¹⁵ Intertech Services Corporation (1994a, October 12) *The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County Characterization of Socioeconomic Impacts and Framework for Assessment of Effects*. Submitted to the Joint City/County Impact Alleviation Committee, p. 38.

¹⁶ Intertech Services Corporation, *Media Amplification of Risks Implications for Hazardous Transport*, May 1991

¹⁷ Himmelberger, Jeffery J, Mike Baughman and Yelena A Ogneva-Himmelberger, *Tourism Impacts of Three Mile Island and Other Adverse Impacts Implications for Lincoln County and Other Rural Counties Bisected by Radioactive Wastes Intended for Yucca Mountain*, Environmental Management, Vol. 19, No. 6, pp 915-922

¹⁸ Ibid

¹⁹ Ibid

²⁰ Ibid.

²¹ Intertech Services Corporation (1994a, October 12) *The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County Characterization of Socioeconomic Impacts and Framework for Assessment of Effects* Submitted to the Joint City/County Impact Alleviation Committee p. 40.

7.9.1 DOE should assist Lincoln County in developing and funding implementation of a comprehensive monitoring system to detect if there are negative impacts on tourism in Lincoln County due to the Caliente Rail Alignment. The monitoring system should be capable of detecting changes in tourism under no incident/accident conditions as well as in the event of a transportation incident/accident.

7.9.2 Set in place clear trigger points at which predetermined mechanisms for compensating businesses and Lincoln County affected by a potential drop in tourism, both short term and long term would be implemented. The compensation package should address both no incident/accident scenarios as well as incident/accident-related declines in tourism.

7.9.3 DOE should assist Lincoln County in developing and funding a standby tourism marketing campaign to be implemented immediately in the event of an incident/accident involving a radioactive waste shipment in Lincoln.

7.10 Real Property Values and Stigma. There are a number of linked factors that could affect property values in Lincoln County and in the City of Caliente. Some factors could exert upward pressure on property prices, while other impacts may reduce property values. This situation highlights the need for close monitoring and quick implementation of a property value related mitigation strategy.

To the degree that construction and use of the Caliente Rail Alignment to transport nuclear waste increases the population of Lincoln County and the City of Caliente, there may be upward (demand related) pressure on real estate prices. Alternatively, public perception of the risks associated with transporting nuclear waste along the Caliente Rail Alignment could also have a noticeable detrimental effect on property values, with attendant effects on taxes and the fiscal health of Lincoln County and/or the City of Caliente.

Property in proximity to the DOE proposed staging yard, at which nuclear waste might be located every day for the fifty year shipping campaign to Yucca Mountain, may be particularly vulnerable to stigma induced impacts to property values. Similarly property bisected by or immediately adjacent to the Caliente Rail Alignment may be impacted. Studies indicate that all of the City of Caliente is within the distance from the rail line that could experience reduced property values due to transport of high level nuclear waste. A 1989 analysis of housing prices due to proximity to an environmental dis-amenity indicates that:²²

- 1) Devaluation occurred out to a limit of approximately six miles.
- 2) The market did not distinguish between severity of the sites. For example, diminution in value was greater near one site that was considered less severe than another.
- 3) Loss in value was due to perception that in some cases was contradictory to scientific evidence.

In a study of property values near the Rocky Flats Nuclear Weapons Plant survey respondents wanted extraordinary distances between themselves and the plant itself. Denver metropolitan area respondents said that the "closest distance to Rocky Flats" they would consider was a mean distance of 21 miles and a median distance of 15 miles. Sixteen percent of the respondents would consider a house in the affected community without a discount. Forty-six

²² Hunsperger, Wayne L. The Effects of the Rocky Flats Nuclear Weapons Plant on Neighboring Property Values
n d

percent would not trade distance and/or discounts of any size as compensation for a house located within six miles of Rocky Flats.²³

A sample of Boston area housing prices between 1975 and 1992 found that the distance to superfund sites significantly impacted residential prices.²⁴ This same study included analysis of property values along a nuclear transportation route in South Carolina, finding reductions in property values associated with proximity to the transportation route.

Studies also indicate that it is the perception of risk that matters, even when public perceptions differ from those of expert opinion. The greater the perceived risk, the greater the expectation of harm due to the dis-amenity, and the greater the diminution of property values, regardless of expert opinions. Thus, while information matters, it is the translation of information into the public expectations associated with the dis-amenity that appears to affect housing prices.²⁵

The New Mexico Supreme Court, in considering a partial condemnation of a parcel of private land, held that the public fear of a road to transport hazardous waste, whether well-founded or not, may cause a diminution in value of to the remaining land not taken, and is compensable. City of Santa Fe v. Komis, 114 N.M. 659 (1992).²⁶

If the public perceives the Caliente Rail Alignment and its attendant facilities such as the staging yard as similar in nature to a hazardous waste facility, Lincoln County and the City of Caliente may experience reductions in property value. If property values decline, related property tax revenues may also decline.

The DOE should implement the following measures to mitigate the potential for stigma-induced impacts to property values in Lincoln County:

7.10.1 Establish pre-project property value data-base.

7.10.2 Monitor for changes in property values along the transportation corridor.

7.10.3 Monitor for changes in property values throughout the County.

7.10.4 Set in place clear impact threshold criteria that will trigger compensation to property owners for lost valuation and Lincoln County and the City of Caliente for lost property tax revenues; and establish related mechanisms for compensation.

8. Air Quality

Lincoln County and the City of Caliente currently are within federal National Ambient Air Quality Standards (NAAQS). However, in the Rail Alignment DEIS, DOE only modeled air quality for construction and operation of the rail alignment in Caliente. It did not model air quality impacts along other segments of the Caliente Rail Alignment or near the staging yard in Lincoln County.

²³ Ibid

²⁴ Gwande, Kishore & Jenkins-Smith, Hank. (1999, June). Nuclear Waste Transportation and Residential Property Values Estimating the Effects of Transient Perceived Risks. University of New Mexico, Albuquerque, NM

²⁵ Ibid.

²⁶ See also, Hunsperger, Wayne L. The Effects of the Rocky Flats Nuclear Weapons Plant on Neighboring Property Values n d

Construction and operation of the Caliente Rail Alignment outside of the City of Caliente may result in enough fugitive dust to exceed the 24-hour NAAQS standard for particulate matter (PM₁₀ and/or PM_{2.5}), potentially impairing visibility, causing or exacerbating health difficulties for individuals with asthma or other respiratory ailments, and degrading scenic quality.

Construction and operation of the Caliente Rail Alignment and related roadway improvements, coupled with additional legal-weight or heavy-haul trucks and trains passing through the County associated with construction and operation of the rail alignment and the Yucca Mtn. repository and will all adversely impact the air quality. Emissions of criteria pollutants will increase due to both combustion and evaporation of gasoline and diesel fuels. Clean, healthy air has a high value and is an attribute that people expect and seek with rural community living. This is especially important to retirees when choosing a location to live. If the air quality is degraded too much, current residents may feel compelled to move away and prospective new residents may pass up Lincoln County communities in favor of areas with lesser levels of air pollution. Likewise, air quality in attainment with national standards is an attribute and not a constraint to businesses considering locating in Lincoln County or the City of Caliente. Accordingly, any erosion of the air quality in the County may serve to make attraction of new industry to the area more difficult.

Measures that DOE should undertake to limit emissions and seek to maintain air quality in Lincoln County at its current high quality include:

- 1) Requiring all trucks, other vehicles, and locomotives associated with the repository to use the best available emissions control technology and to undergo regular emissions control testing to meet stringent standards.
- 2) Setting strict limits on truck and locomotive idling.
- 3) During construction of the intermodal facility, new rail lines and road improvements or maintenance, implement practices to minimize fugitive dust, including spraying roads, construction sites, and earth movement sites with water.

In addition to a commitment to avoid emissions associated with construction and operation of the Caliente Rail Alignment through Lincoln County, DOE should be required to implement programs to offset additional unavoidable emissions. The goal of the DOE offset program should be to keep total emissions in Lincoln County at or below current levels. Examples of such programs include:

- 4) Help for businesses and residences (existing and new) to control emissions at no additional cost to the property owners and tenants. This could include assistance with emissions control technology, and the purchase of more efficient appliances and education about techniques for improving efficiency.
- 5) Providing assistance to residents to insulate their homes, purchase more efficient appliances, and improve overall efficiency.
- 6) Assistance for local citizens with emissions control technology on their personal vehicles and general maintenance to reduce emissions with an emphasis on the "high emitters."
- 7) Assistance to County in paving dirt roads.
- 8) Assistance to County with landscaping of barren areas.
- 9) Reduction of non-Caliente Rail Alignment related vehicle trips through enhanced pedestrian and bicycle trails.

9. Noise

Existing noise levels in Lincoln County are low. The average day-night noise level in the desert ranges from 22 to 38 decibels. Rural agricultural communities in Lincoln County, such as Panaca, Rachel, and Alamo have sound levels in the range of 40-47 decibels. Small towns or rural commercial communities, such as the City of Caliente typically have sound levels in the range of 45-55 decibels. Many agencies, including the Environmental Protection Agency, recognize an average day-night sound level of 55 decibels as an outdoor goal for protecting public health and welfare in residential areas.²⁷

Communities in Lincoln County generally have very low ambient noise levels. (Except the DMOA which is subject to periodic military aircraft overflights with varying levels of intensity.) Lincoln County and the City of Caliente can both expect to be impacted from additional noise due to the construction and operation of the Caliente Rail Alignment and related interchange and staging yards and related additional rail and truck movements through the region.

Recently, DOE estimated that construction of the Caliente Rail Alignment would result in noise levels that would exceed the STB criteria of 65 DNL or greater at both Caliente (77 DNL) and Eccles (70 DNL).²⁸ DOE also estimates an up to 3 dBA increase in noise level (also an STB criterion) during construction of the Caliente Rail Alignment in the Caliente.

Previously, DOE estimated the noise level for railroad construction would range from 62 to 74 dBA within 500 feet of the construction and from 54 to 67 dBA within 2,000 feet of the noise source.²⁹ This is a decibel level increase of approximately 100 percent in non-community areas and up to 50 percent in community areas. Residents living near the rail corridor will also experience increased noise levels due to the increased number of trains passing by.

Measures to mitigate the impacts of constructing and operating the Caliente Rail Alignment within Lincoln County should require the following:

9.1 Contractors must use proven techniques to reduce noise in the surrounding environment during construction

9.2 Time of day restrictions should be imposed on construction activity to avoid early morning, evening and nighttime.

9.3 Time of day restrictions on truck and locomotive operations involving operation of the staging yard.

9.4 Other restrictions on truck operations, including idling and the use of engine brakes in certain zones to reduce noise impacts on local residents.

9.5 Strategic use of sound barriers to minimize the distance that noise will travel.

9.6 Consultation with Lincoln County and with other affected communities regarding DOE's project-related construction schedule, including the hours during which construction

²⁷ U.S. Department of Energy, Office of Civilian Radioactive Waste Management (1999a, July) *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada Volume I—Impact Analyses Chapters 1 through 15*, p 3-87. Neither Lincoln County nor the City of Caliente have established numerical noise standards.

²⁸ DOE/EIS-0369D, Section 4.2.8. See 49 CFR § 1105.7(f).

²⁹ DOE, 1999a, p 6-50.

takes place, to minimize, to the extent practicable, construction-related noise disturbances in residential areas.

9.7 Lubrication of track curves, where doing so would reduce noise for residential or other noise sensitive receptors.

9.8 Prior to initiating project-related construction activities, DOE should develop a construction noise and vibration control plan to minimize construction noise and vibration along the rail line. DOE should designate a qualified noise control officer/engineer to develop this plan (at least five years' experience with major construction noise projects and board certification membership with the Institute of Noise Control Engineering or registration as a Professional Engineer in Mechanical Engineering or Civil Engineering).

9.9 Compliance with all applicable noise regulations, including FRA regulations establishing decibel limits for train operations (49 CFR Part 210).

9.10 Consultation with Lincoln County and other interested communities to identify measures to eliminate the need to sound train horns consistent with FRA standards.

9.11 Regular inspection of rail car wheels to maintain wheels in good working order and minimize the development of wheel flats.

9.12 Mitigation of train wayside noise (locomotive engine and wheel/rail noise) for the noise-sensitive receptors along DOE's new rail line construction that fall within the 70 dBA Ldn noise contour for wayside noise, as specified below. With the written concurrence of the responsible local government(s), DOE should mitigate wayside noise with building sound insulating treatments, including insulated windows.

9.13 To minimize noise and vibration, DOE should install and properly maintain rail and rail beds according to the American Railway Engineering and Maintenance-of-Way Association (AREMA) standards, and shall regularly maintain locomotives, keeping mufflers in good working order to control noise.

The design goal for noise mitigation through the use of barriers should be a 10 dBA noise reduction, with a minimum noise reduction achieved of 5 dBA. Noise barrier performance should be determined in accordance with ANSI S12.8-1987, *American National Standard Methods for Determination of Insertion Loss of Outdoor Noise Barriers*. Sound insulation performance should be determined in accordance with ASTM 966-90, *Standard Guide for Field Measurements of Airborne Sound Insulation of Building Facades and Facade Elements*. Should noise mitigation be required at locations identified as containing structures that are potentially eligible for listing on the National Register of Historic Places, DOE must consult with the appropriate State Historic Preservation Officer and Lincoln County officials to assess effects and implement appropriate mitigation measures.

10. General Monitoring and Enforcement

Lincoln County should be empowered by implementation of the following measures to monitor and evaluate the effectiveness of DOE's implementation of measures to mitigate the impacts of the Caliente Rail alignment.

10.1 DOE should provide funding to Lincoln County to enable it to independently monitor the effectiveness of and, where applicable, enforce implementation by DOE of all

requirements of county-issued permits and mitigation of impacts to private and local-government resources in the County.

10.2 To ensure DOE's compliance with the environmental mitigation conditions required by any agency, DOE should submit quarterly reports to Lincoln County for the duration of the construction, operation, and decommissioning oversight period documenting the status of its mitigation implementation for each condition.

10.3 Where monitoring demonstrates that implementation of mitigation measure has been ineffective, DOE should be required to work with Lincoln County to identify and implement alternative measures to mitigate the relevant impact.

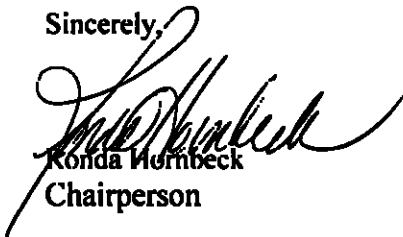
11. Conclusion

The Board of Lincoln County Commissioners thanks the STB for the opportunity to present these comments. The County requests the opportunity to meet with STB staff and/or participate in any related hearings to discuss impacts and mitigation. The County encourages STB to condition the DOE requested Certificate of Public Convenience and Necessity with a broad range of measures intended to avoid, minimize or otherwise mitigate (including compensation when appropriate) potential impacts of the Caliente Rail Alignment.

Lincoln County is, of course, concerned that appropriate mitigation be designed, funded and implemented as soon as possible. For many types of impacts, implementation of mitigation during pre-construction phases of the project will be required to ensure that consequences of construction are effectively avoided or minimized. This may require that mitigation be planned, funding secured, and implementation completed approximately four years before the start of construction on the rail line and related facilities. Of particular concern to the County is the DOE's ability to commit to funding and implementation of mitigation. DOE is at the mercy of Congressional authorizations and annual appropriations for all activities it undertakes. Given that the Congress has traditionally under-funded requests for funding made by the DOE's Office of Civilian Radioactive Waste Management, the County is deeply concerned that DOE will not be able to commit to, and may not receive adequate funding to implement, maintain and monitor the effectiveness of necessary mitigation. STB is encouraged to impose conditions to its Certificate of Public Convenience and Necessity requiring that a sufficient component of funds appropriated to this project be set aside for early planning, design and implementation of appropriate mitigation.

Should you have any questions regarding these comments, please do not hesitate to contact the County's counsel, Barry S. Neuman of Carter Ledyard & Milburn LLP (202-623-5705), the County's technical consultant, Dr. Mike L. Baughman of Intertech Services Corporation (775-883-2051), or myself at the number above.

Sincerely,



Ronda Hurnbeck
Chairperson

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 14th day of July, 2008, a true and correct copy of. (1) Comment letter of Lincoln County, NV, dated July 7, 2008; and (2) "Proposed DOE Caliente Rail Corridor, Lincoln County, Nevada: An Analysis of Impacts & Alternatives, With Recommended Mitigation," dated November 30, 2007 were served on parties or counsel of record and others identified below by first-class U.S. mail, postage prepaid.

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PROPOSED DOE CALIENTE RAIL CORRIDOR LINCOLN COUNTY, NEVADA

AN ANALYSIS OF IMPACTS & ALTERNATIVES, WITH RECOMMENDED MITIGATION

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Volume I

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Executive Summary

In a Record of Decision (ROD) issued by the Department of Energy (DOE) on April 8, 2004, the preferred mode to transport nuclear waste to Yucca Mountain, nationwide and within the State of Nevada, was identified as a mostly rail scenario. Within the same ROD, the CRC (CRC) was also identified by DOE as the preferred route to transport waste from the existing Union Pacific Railroad (UP) near Caliente to Yucca Mountain across Lincoln, Nye, and Esmeralda Counties. In the spring of 2007 Lincoln County, under the advisement of the Joint City County Impact Alleviation Committee (JCCIAC), determined it was important to conduct an independent study of the potential impacts of a proposed nuclear waste rail line through the County. Lincoln County contracted with Resource Concepts, Inc. (RCI), Robison/Seidler, Inc. and L&H Consulting to analyze the potential impacts to public lands, the citizens, and industry within Lincoln County, and to identify required mitigation measures to minimize impacts. The Project Team, consisting of those three companies listed above, was tasked with assessing the DOE proposed CRC and all proposed alternative segments within the County. In an effort to minimize impacts, the Project Team was asked to identify and analyze at least two alternative rail segments not considered by the DOE. All impacts and required mitigation identified in this report are preliminary and subject to change as more information is provided by DOE, or as construction and/or operations are initiated. Only the grazing allotment permittees, and property owners/managers directly impacted by the rail alignments were interviewed. Permittees, citizens and businesses impacted by construction or operational activities away from the alignment could not be identified without the DOE's cooperation in identifying construction and operational areas.

L&H Consulting identified potential alternative routes for analysis. However, the Project Team cooperatively with Lincoln County selected two alternatives to consider for further analysis. The two alternatives include the Lincoln County Cottontail Pass Alternative and the Lincoln County Short Route. The Cottontail Pass Alternative is a new alignment between Coal Valley and Sand Springs Valley that is intended to alleviate impacts to the Water Gap and Mike Heizer's "City" art project. The Lincoln County Short Route is a much longer segment that diverges from the DOE proposed route in Dry Lake Valley and more or less follows US Highway 93 and Nevada State Route 375 to the western portion of the County. The route passes over Hancock Summit and continues west across Tikaboo Valley along Groom Lake Road until it reaches the boundary with the Nevada Test and Training Site (NTTS). The necessary clearance was not provided to continue analysis of the route beyond that point or beyond the boundary of Lincoln County. In order to complete this route the DOE and Department of Defense (DOD) would have to work cooperatively to resolve national security and operational concerns within the NTTS. This approach would have some inherent advantages, as the overall length of new rail would be shorter than the DOE proposed CRC, and would cross the NTTS, which is already a highly disturbed area with limited public access. Routing of this portion of rail could follow a portion of the previously considered DOE Caliente-Chalk Mountain Route, which was previously dropped from consideration due to concerns raised by DOD. These inherent advantages warrant further efforts to alleviate DOD concerns, or aid in developing a similar alignment that avoids the DOD areas of concern.

A third alternative was identified by Jerry Parker of Energy and Railroad Consulting, in which the new rail alignment would depart the Union Pacific line at the Eccles Siding, cross US 93 by bridge at Indian Cove and proceed west through Antelope Canyon. From that point the alternative could either connect to the CRC or to the Lincoln County Short Route. Analyses of

the potential impacts of this Alternative were not considered in this report as it was outside of the scope of work and timeframe of the project. However, cursory reviews indicate a potential to reduce impacts to both public land grazing and private property. As part of a separate contract, Mr. Parker has developed a report discussing the feasibility of this Alternative (Parker, 2007).

RCI conducted the Public Lands Grazing Analysis. Background information was obtained from the Bureau of Land Management (BLM), and support mapping was developed prior to fieldwork. Impacts and needed mitigations were identified through personal interviews with affected public land grazing allotment permittees, and agency personnel. Interviews were conducted prior to release of the DOE *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DEIS-RA). Much of the pertinent information regarding rail construction and operation was not known, and was not released to the Project Team despite attempts to obtain the information from the DOE. Certain assumptions, as discussed in Section 2, were made in order to standardize the interview process. It was assumed that the corridor would consist of a rail and single associated access road both located on a common raised roadbed. The final rail alignment would be located within a quarter-mile wide buffer of the alignment as provided by DOE, and consist of a 1,000'-wide construction corridor and 200'-wide operational corridor. DOE did not indicate if either of these corridors would be fenced, nor did they indicate anticipated train speeds or train frequencies. Permittees were asked to state a fencing preference, and all impacts and mitigations were assessed based on that choice. Construction and operational details were not available, so analysis focused primarily on the presence of the rail.

The public lands grazing analysis, discussed further in Section 4.0, concluded that a suite of impacts to public lands grazing operations would result from the construction and operation of any of the studied routes and alternatives. Some key impacts include: conflicts with land and/or water base property as defined by the Taylor Grazing Act, loss of functionality for existing fencing, destruction of capital improvements, destruction or loss of functionality of water sources, stockwaters, and pipelines, loss or restriction of access to allotments, temporary and permanent loss of forage, fragmentation of allotments, loss or restriction of livestock movement and distribution within allotments, establishment of invasive species, establishment of noxious weeds, short-term deferment or loss of grazing rights due to construction, and long-term deferment or loss of grazing rights due to operations. Many of these impacts would be highly detrimental to existing public lands grazing operations unless mitigation actions were carried out. Working from east to west, the DOE Proposed Eccles Alternative had relatively few impacts, including restricted livestock movement and permittee access to grazing allotments, while the DOE Proposed Caliente Alternative had no impacts to grazing allotments as it is situated primarily on private lands. The portion of the DOE Proposed Common Segment 1, east of the point of divergence with the Lincoln County Short Route, had profound effects on grazing operations in the Bennett Pass area. The winding rail alignment needed to traverse the east side of Bennett Pass resulting in significant segmentation of several allotments, and the isolation of Bennett Springs, which is circled by the rail on three sides. These allotments run sheep, and stage their operations on private property around Bennett Springs thereby magnifying the impact of the rail. The anticipated impacts were so severe that several of the permittees indicated that even with mitigation, the rail would likely put them out of business due to the severe level of disturbance it would create within their grazing allotments and associated private lands. These portions of rail, the Eccles and Caliente Alternatives and Common Segment 1 prior to the point of divergence, would be common to both the CRC and the Lincoln

County Short Route. The only means of alleviating most impacts in this Section would be a route across Indian Cove and through Antelope Canyon.

The Lincoln County Short Route was compared with the DOE Preferred Alternative from the point of divergence of the two routes on the west side of Bennett Pass near The Bluffs. West of the point of divergence only one allotment, the Ely Springs Cattle Allotment, would be impacted by both routes. The Ely Springs Cattle Allotment is one of the most intensely managed operations in the entire county. The CRC poses serious impacts to that system, while the Lincoln County Short Route greatly reduces the impacts. All other allotments were only impacted by one route, either the DOE proposed CRC and alternatives or the Lincoln County Short Route. Three allotments along a loop in the rail alignment extending north into Nye County were included in the assessment of the DOE Preferred Alternative as the permittees run livestock operations across multiple allotments within Lincoln County. The majority of their operations are in Lincoln County with those allotments in Nye County serving as their base of operations. Overall, the impacts of the Lincoln County Short Route would be less than those of the DOE Preferred Alternative. However, both routes resulted in heavy impacts on permittees, with several along either route who indicated that the rail would likely put them out of business even with mitigation, due to the high level of disruption and fragmentation of their allotments.

None of the DOE Proposed Garden Valley Alternatives were different with regard to having fewer impacts than the others. The Cottontail Pass Alternative would not result in significant impact reduction as compared to the other DOE Proposed Garden Valley Alternatives. Permittees in the area described the alternative as shifting the burden of impacts without a major reduction of impacts.

Mitigation measures that would be required in order to keep livestock operations viable include: maintenance, relocation and/or improvements to, fences, springs, wells, pipelines, stockwaters, roads, and trails to keep infrastructure functional. The installation of new fencing, gates, and cattleguards would be required to maintain the viability of existing allotment and pasture fences. Livestock movement and distribution within allotments must be maintained through the use of either at-grade crossings or underpasses where cuts and fills become too great for livestock to cross the tracks. Some permittees prefer that the right-of-way (ROW) be fenced, while others felt that compensation for lost livestock would be adequate. Many permittees indicated a need for more detailed information before indicating a ROW fencing preference. All permittees indicated an absolute necessity to keep construction disturbance and the operational footprint to a minimum. Measures were identified to minimize the establishment and spread of invasive species and noxious weeds. Some of the permittees suggested alignment adjustments within their allotment in order to help minimize impacts. None of the current livestock operations would remain viable in the absence of mitigation, and some of the more heavily impacted allotments may not be viable even with mitigation.

Each allotment would require an allotment-specific mitigation plan that was cooperatively developed and agreed upon by the Permittee, BLM, DOE, and at the invitation of the permittee, JCCIA staff, and/or the N-4 State Grazing Board. Every allotment would have to alter its current grazing system for both construction and operation of the rail. This could include increased labor expenses, deferred or lost grazing rights, and infrastructure relocation, repair or replacement. Interim grazing management plans should be developed for each allotment for the construction phase, and new or revised long-term allotment management plans (AMPs) should be developed for the operational phase.

Even with mitigation, there are some unavoidable adverse impacts to public land allotment permittees. Some may lose the ability to operate a viable grazing enterprise. To a large extent the intrinsic values of solitude, isolation, and tranquility will be infringed upon. The physical environment as well as vegetative communities will be permanently altered. Every permittee will be negatively impacted economically as short and long-term deferment or loss of grazing rights is anticipated in addition to increased capital costs in order to acclimate to, and function around, rail construction and operations. All of these negative impacts serve to threaten the family traditions, rural lifestyle, and culture of Lincoln County.

Robison/Seidler, Inc. and L&H Consulting addressed the Community at Large Analysis. Personal interviews were the primary means of identifying potential impacts and baseline mitigations. The analysis concluded that significant impacts to private property and quality of life would result from the construction and operation of any of the studied routes and alternatives. Working from east to west, the DOE Proposed Eccles Alternative had relatively few private property impacts in terms of the number of affected parcels. However, the private property impacts were still substantial in terms of the acreage that would be impacted. The DOE Proposed Caliente Alternative had a significantly greater number of private parcels that would be impacted. The portion of the DOE Proposed Common Segment 1, east of the point of divergence with the Lincoln County Short Route, affected a few private parcels. These portions of rail would be common to both the DOE Proposed Caliente Corridor and the Lincoln County Short Route.

The Lincoln County Short Route as described in this report would have additional private property impacts. L&H Consulting did not have sufficient access to the necessary maps and parcel detail information to fully describe these impacts. However, there are alternative routes that are similar to the Lincoln County Short Route that would potentially eliminate these additional private property impacts.

None of the DOE Proposed Alternatives in Garden Valley had fewer impacts than the others. The Cottontail Pass Alternative would not result in significant impact reduction as compared to the other DOE Proposed Garden Valley Alternatives.

Section 5.3 summarizes the mitigation measures identified by the stakeholders interviewed. Nearly every property owner preferred that the impacts be avoided through the selection of an alternative alignment or through the selection of truck transportation as the primary mode of transportation for these shipments within the State of Nevada. If avoidance of the impacts was not possible, nearly all of those interviewed indicated that compensation for the entire parcel would be necessary.

This report does not advocate a given rail alignment, nor a preferred mode of transportation of nuclear waste across Lincoln County. The intent of this report is to identify the potential impacts to the Public Land Grazing Operations and the Community at Large in Lincoln County, Nevada as a result of the construction and operation of a new rail corridor. This report establishes baseline mitigation that would be required for the citizens and enterprises within Lincoln County to maintain some semblance of the lifestyle and culture they currently possess. The impacts and mitigations identified need to be refined as new or more detailed information becomes available, or as the project moves forward.

There is no way to completely avoid serious impacts to the community and public land uses within Lincoln County if a new rail is constructed. The use of alternative corridors can reduce impacts at the cost of shifting the burden of those impacts from one group to another. It is essential for those who establish policy within Lincoln County to recognize these impacts and baseline mitigations in order to best represent their constituents.

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*File Doc 11-30-2007 Analysis Impacts-Alt w-RecMit rpt final R-S RCI L-H doc
[November 30, 2007]*

List of Acronyms

AMP	Allotment Management Plan
AUM	Animal Unit Month
BLM	Bureau of Land Management
CRC	Caliente Rail Corridor
DOD	Department of Defense
DOE	Department of Energy
DEIS-RA	<i>Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada</i>
DWR	Nevada Division of Water Resources
FEIS	Final Environmental Impact Statement
GV	Garden Valley
HLRW	High Level Radioactive Waste
HMA	Herd Management Area (specific to wild horses)
JCCIAC	Joint City County Impact Alleviation Committee
LC	Lincoln County
NDOW	Nevada Department of Wildlife
NRCS	Natural Resource Conservation Service
NTTS	Nevada Test and Training Site
NWPA	Nuclear Waste Policy Act of 1982
OCRWM	Office of Civilian Radioactive Waste Management
RCI	Resource Concepts, Inc.
ROD	Record of Decision
ROW	Right-of-way
SNF	Spent Nuclear Fuel
SNWA	Southern Nevada Water Authority
UP	Union Pacific Railroad

1.0 Introduction

1.1 BACKGROUND

In the 1950s, the United States government decided it was in the nation's best interest to pursue nuclear energy technologies that would significantly reduce environmental pollutant emissions through sustainable, economical means. The federal government agreed to take responsibility for the spent nuclear fuel (SNF) and other high level radioactive waste (HLRW) that resulted from this process. Numerous methods of disposal were examined and an independent body of scientists concluded that a deep geologic repository was the safest solution to the disposition of SNF and HLRW. The Nuclear Waste Policy Act of 1982 (NWPAA), acknowledged the federal government's obligation as it relates to SNF and set forth a process for selecting a site for the final disposition of these materials. In 1987, the NWPAA was amended, selecting only Yucca Mountain in Nevada for further site characterization studies. Site characterization proceeded and in 2002, Yucca Mountain was recommended by the Secretary of the Department of Energy (DOE) as a suitable site. President George W. Bush approved the site recommendation and in 2003 he signed into law the joint resolution of the U.S. House of Representatives and the U.S. Senate that officially designated Yucca Mountain for development as the nation's first deep geologic repository for SNF and HLRW. In or around 1988, Lincoln County, Nevada applied for status as an Affected Unit of Local Government. Lincoln County received this designation and has engaged in a robust oversight program.

Lincoln County, its residents and property owners will primarily be affected by the transportation of the SNF and HLRW. The national experience with these types of shipments includes over 2,700 shipments across 1,600,000 miles over 30 years without a harmful release of radiation. These shipments have been made by rail, barge and truck. The DOE began studying transportation modes and routes for SNF and HLRW shipments to Yucca Mountain, Nevada decades ago. In the 2002 Final Environmental Impact Statement for Yucca Mountain (FEIS), the DOE included analysis of five potential rail corridors: Jean, Valley Modified, Carlin, Caliente and Caliente-Chalk Mountain. Caliente-Chalk Mountain was listed as a non-preferred alternative in the FEIS due to national security issues relating to Nellis Air Force Range and the Nevada Test Site. The DOE's Office of Civilian Radioactive Waste Management (OCRWM) announced December 2003, that the Caliente rail corridor (CRC) was its preference for construction of a rail line to serve the Yucca Mountain Repository in Nevada. The DOE also identified Carlin as the secondary preferred corridor. The Bureau of Land Management (BLM) also released a Notice of Proposed Land Withdrawal for the CRC in December 2003. In 2004, DOE issued a Record of Decision (ROD) to select mostly rail as the shipment mode nationwide and in Nevada, and to select the CRC as the preferred transportation corridor in which to construct a railroad to Yucca Mountain, Nevada. At the same time, DOE issued a Notice of Intent to issue a Draft Environmental Impact Statement for the Construction and Operation of a railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada. This *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DEIS-RA) was released for review and comment on October 12, 2007.

1.2 PURPOSE AND NEED FOR REPORT

Lincoln County, with advice from the Joint City County Impact Alleviation Committee (JCCIAC), determined a more thorough assessment of the impacts and associated mitigation actions of the CRC and Alternatives would be necessary to better inform their citizenry and prepare requests for impact mitigation. Specifically, Lincoln County contracted with two professional services firms, Resource Concepts Inc. (RCI) and Robison/Seidler, Inc. to evaluate the impacts of the proposed alignments that are outlined in the DOE's DEIS-RA. Furthermore, they directed that two additional alternatives with the potential for less adverse impacts than the DOE proposed route be considered. This report is intended to present the findings of this evaluation. No policy recommendations are contained within this report regarding whether any person or agency in Lincoln County or the City of Caliente should support or oppose any of the alternatives analyzed.

Robison/Seidler, Inc., at the request of the Lincoln County Commission, subcontracted the fieldwork for the route identification, impact analysis and recommended mitigation actions to L&H Consulting, a locally based firm. L & H had the task of identifying potential routes that may result in fewer impacts to the citizens and property owners in Lincoln County. Additionally, L & H had the responsibility of identifying impacts to the community at large and suggesting mitigation actions. Robison/Seidler, Inc. served as a facilitator in the production of this report.

Resource Concepts, Inc. was tasked with the identification of the impacts to public land, specifically regarding grazing operations and required mitigations.

1.3 DELIMITATIONS AND LIMITATIONS OF THIS REPORT

The project team was assigned a very specific and narrow scope for this report. This is not intended to be a complete environmental assessment of the DOE's plans to construct and operate a railroad or a complete analysis of all existing options, including the no action alternative that must be considered in a full environmental impact statement. The team was only to consider the impacts of and mitigation requirements for the construction and operation of a proposed railroad commencing at an existing Union Pacific track near Caliente and traveling through Lincoln County to Yucca Mountain, Nevada. The team was not assigned the task of analyzing other alternatives such as truck transportation. Furthermore, the team was to look primarily at the impacts to public land—grazing permittees and private property owners within Lincoln County. There are numerous other potential impacts that have not been evaluated as part of this report due to time and resource constraints or have only been evaluated in so far as they relate to the specific scope. This includes, but is not limited to the following:

1. Rail support facilities and construction facilities (i.e., staging yards, man camps)
2. Shared use rail system
3. Seismic activities and hazards
4. Air quality
5. Hydrology (i.e., drainage, groundwater)
6. Wetlands
7. Biological resources (i.e., land cover, special status species)
8. Noise and vibration
9. Occupational and public health and safety

Time and resource constraints also affected the existing report. Information had been requested from the DOE prior to their release of the DEIS-RA. Much of this information was not provided to the team. Once the DEIS-RA was released, the size and questionable basis for some of the conclusions contained within the DEIS-RA made it difficult to fully analyze and discuss the relevant information as a part of this report.

2.0 Methodology

2.1 IDENTIFICATION OF POTENTIAL ALTERNATE ROUTES

A literature review of previous DOE-commissioned studies and extensive field analysis were conducted to determine potential alternate routes. Two alternate routes were recommended to the Lincoln County Commission and selected for detailed analysis early in the process at a public meeting. Below is a brief summary of the previous studies reviewed:

2.1.1 1990 – Preliminary Rail Access Study (Tappen et al, 1990)

This study identified 11 different routes within Nevada between existing rail lines and Yucca Mountain including 3 alternative routes posed by Lincoln County. It concluded that Caliente was one of three (also including Jean and Carlin) preferred alternatives to be further evaluated. The Caliente "base" option was found to be the most favorable, but would incur significant costs due to "complex engineering and construction required to traverse through rough terrain" This route began "on Union Pacific Railroad (UP) mainline 4 miles east of Caliente crossing US 93 on a long trestle at Indian Cove" proceeding to US 93 and paralleling it and SR 375 to US 6 The options proposed by Lincoln County included:

- Route A which was similar to what DOE is currently proposing, but after going through Water Gap it then turned south into the Nellis Air Force Range near Chalk Mountain.
- Route B was very similar to the "Crestline Alternative" that has been potentially pulled from consideration, and then followed Route A from Panaca on.
- Route C departed the UP mainline near Elgin, following Kane Springs Valley and Coyote Springs Valley to U.S. Highway 93 and into the Desert National Wildlife Refuge.

The report stated that all of these options were discounted due to land-use conflicts, but would "continue to be monitored for changes in their status that could affect their potential feasibility".

2.1.2 1992 – Yucca Mountain Rail Access Study: Caliente Route Conceptual Design Report (DeLeuw, Cather and Company, 1992)

Two routes were "conceptually designed" using USGS quad maps. These two routes were selected based on engineering criteria (max 2.5% slope), flood considerations, geological considerations, and preliminary environmental impacts. Option A is the route that the Lincoln County Short Route was based upon with only a slight modification near Hancock Summit. The only other difference is that Option A paralleled SR 375 northwest through Rachel in order to bypass the Nellis Air Force Range. Option B presented in the report is similar to what DOE currently presents as the Caliente Corridor.

2.1.3 1995 - Nevada Potential Repository Preliminary Transportation Strategy – Study 1 (TRW Environmental Safety Systems, Inc., 1995)

This report cites the 1990 report regularly. It says several times that "although feasible from an engineering viewpoint, routes through rugged terrain would be exposed to a higher level of environmental and operational hazards than routes with comparatively gentler terrain" (page 25). It again reiterates that Routes A and B posed by Lincoln County in 1990 could be added to the list of feasible alternatives if there was a "change of status of those areas within the DOD Nellis Air Force Range" (Pg 26). Later in the report it states that, "Verbal input from DOE has indicated that the land use status has not changed in the last five years" (Pg 99). It states that the Caliente route has been conceptually designed. Option A traverses much more rugged terrain, and requires a tunnel at one point, while Option B traverses much gentler terrain. The report then says, "This discussion will focus on the Option B route as the preferred option" (Pg 35).

2.1.4 1996 – Nevada Potential Repository Preliminary Transportation Strategy – Study 2 (TRW Environmental Safety Systems, Inc., 1996)

The executive summary of this report states the purpose as further study of the four rail routes, including Caliente Option B only, identified by Study 1 including archaeological and historical sites. It also discusses a reduction in the cost estimate due to reduced engineering cost projections. This report only discusses that portion of rail from Mud Lake west. The balance of the route, "from Mud Lake to the UP connection at Caliente has been left for subsequent studies because of the remote nature of this portion of route" (Pg 2-15). The report begins to set much more stringent engineering standards. "A maximum grade of 1.5% is desired in order to provide a level of operating safety consistent with adjacent rail lines. In areas where 1.5% grades are not feasible, a maximum grade of 2.2% may be used." The report goes on to say that "it is generally recognized by the industry that operating difficulties increase significantly as grades increase above about 1.5%" citing a 1973 study (Pg 3-3).

Page 3-8 also acknowledges that an alternate route was proposed in the 1992 study that closely paralleled US 95 and SR 375. It says "This route required either extensive earthwork or a 2.5 – 3-mile tunnel to cross Hancock Summit near State Route 375, and was estimated to cost about 30 percent more than the more northern alignment. Because of the significantly higher cost with little benefit, the alternative alignment is not included in Study 2 and will not be considered in future studies unless it becomes necessary when more detailed studies are performed on the Caliente base route" (page 3-9). Two key items should be noted. The 1992 report only studies preliminary environmental issues, and did not discuss other impacts such as private property or land-use conflicts. The conclusion also states "no significant population issues to the potential rail corridors were identified in any of the counties studied" (Pg 11-2).

2.2 PUBLIC LANDS GRAZING ANALYSIS

The RCI Project Team analyzed public lands grazing impacts and associated mitigation actions for the following: DOE Proposed Corridor and Alternatives, Lincoln County Cottontail Pass Alternative, and Lincoln County Short Route. The primary means of identifying impacts and mitigation actions was to interview grazing allotment permittees.

In order to conduct field interviews, Resource Concepts, Inc. (RCI) identified the permittees directly impacted by the rail corridor and alternatives listed above. An effort was made to identify additional allotments, not directly in the path of the rail corridors, which would be impacted due to associated construction and operations activities. However, requests to DOE for pertinent information were not filled, and analysis was already complete when the *Draft Environmental*

Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada (DEIS-RA) was released. Grazing permits and range improvements were requested and gathered from the pertinent Bureau of Land Management (BLM) offices ahead of interviews with permittees.

The DOE Proposed Corridor and Alternatives was analyzed by RCI in a May, 2005 report titled "Proposed Yucca Mountain Corridor." It should be noted that for the most part the same protocol and assumptions were used to develop the 2005 and 2007 reports. The permittees were sent copies of the 2005 impact analysis for their allotment(s) and asked if the findings were still valid. They were asked to inform RCI if the analyses needed updating or changes to accurately reflect their current view of the impacts and mitigation. In addition they were offered the chance for a personal interview if that would help them convey their views. New allotment specific analyses were prepared from these contacts.

The Lincoln County Cottontail Pass Alternative and Short Route were both new proposals and had not been previously analyzed. Appointments were made and interviews conducted with the permittees in all affected allotments. Appointments were conducted with the aid of allotment specific maps that showed existing BLM improvements, and the most current rendition of either the DOE Caliente Corridor alignment or the new alternatives were identified. It should be noted that in nearly every case, the permittees identified many more improvements than those that had been documented by BLM. The permittee-identified improvements were mapped by hand on the allotment maps. The interview team then went through the entire list of "Issues Evaluated" (see Section 4.1) with each permittee. Allotment specific analyses were developed based on the content and information gathered from these interviews.

In order to standardize the interviews, some assumptions were made. It was assumed that the rail corridor would consist of a rail bed and single associated access road located on the common raised rail bed. The final alignment of the rail would occur somewhere within the mapped quarter mile strip, and the minimum construction width was 1,000 feet. Despite RCI's requests for information from the DOE, there were certain items that were not known. Key issues that were not clear during the interview and analysis portion of the report included any and all construction details, associated operations infrastructure, and operations criteria, specifically the number of trains and train speeds. DOE did not indicate if fencing of the ROW would be optional, or required. As such, Permittees were asked their preference for either fencing or not fencing the right-of-way (ROW) and the balance of the impacts and mitigations were based on that decision. A change in any of these assumptions, particularly a change in fencing preference, would likely result in a much different set of impacts and mitigations. For that reason, it is imperative to view the impacts and mitigations discussed in Chapter 4 as fluid and subject to change as details of DOE's design, construction activities, and operational criteria are presented.

All of the allotment analyses are contained in Volume II, Appendix 2.0 of this Report. The allotment analyses served as the foundation for the Public Lands Grazing Analysis portion of this report, as discussed in Section 4. The data from the allotment specific analyses were compiled and analyzed by route to determine impacts and mitigation. Ultimately impacts of each alternative were compared in Section 4.5.

2.3 PRIVATE PROPERTY IMPACTS ANALYSIS

The impacts to private property owners along the DOE proposed Caliente Rail Alignment and Alternatives, Cottontail Pass Alternative, and the Short Route were evaluated for this report. The DOE's timetable for releasing the DEIS-RA did not allow for a full-fledged study of the fiscal, economic, social, land use, cultural, aesthetic, public services and other impacts. Therefore, the methodology involved primarily interviewing those private property owners along the rail corridors included in this study to collect their thoughts and reactions.

The precise alignment is still unknown, making it difficult to effectively evaluate the potential impacts to private property. Therefore, four buffer zone areas were established: The first is within 50 feet on either side of the preferred alignment and alternatives, as they are understood to be. The other buffer zones were 200 feet, 500 feet, and one-half mile on either side of the alignments and alternatives. Literally hundreds of parcels fall within the mile-wide corridor. A more manageable number lie within the other buffer zones. Impacts from construction, staging yards and other facilities were not evaluated at all and could likely impact properties outside the 500 foot buffer zone.

3.0 Description of Proposed Rail Corridors & Alternatives

3.1 DOE PROPOSED RAIL CORRIDORS AND ALTERNATIVES

This Section describes the Caliente Rail Corridor (CRC) as well as the associated alternative segments that lie within the boundaries of Lincoln County, Nevada. A map depicting the CRC and alternatives is included in Figure 4.1.

3.1.1 Alternative Segments at the Interface with Union Pacific Mainline

DOE included two alternative segments to connect the proposed railroad to the existing Union Pacific Railroad (UP) mainline in or near the City of Caliente, Nevada. The Caliente Alternative Segment is the DOE's Preferred Alternative as outlined in the *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DEIS-RA) (DOE, 2007). The second alternative the DOE included in its DEIS-RA for this segment is the Eccles Alternative. The descriptions of these Alternatives have been taken directly from the DEIS-RA (DOE, 2007).

3.1.1.1 Caliente Alternative

The Caliente Alternative Segment would begin in Caliente, enter Meadow Valley at Indian Cove, and extend generally north through Meadow Valley and along U.S. Highway 93. This Alternative Segment would then cross U.S. Highway 93 about 5 kilometers (3 miles) southwest of Panaca and connect to Caliente Common Segment 1 about 1 kilometer (0.6 mile) northwest of U.S. Highway 93 and 18 kilometers (11 miles) south of Pioche. The Caliente Alternative Segment would be approximately 18 kilometers long (DOE, 2007).

3.1.1.2 Eccles Alternative

The Eccles Alternative Segment would begin along Clover Creek about 8 kilometers (5 miles) east of Caliente and trend generally north to enter Meadow Valley from the southeast. This Alternative Segment would then cross U.S. Highway 93 about 5 kilometers (3 miles) southwest of Panaca and connect to Caliente Common Segment 1 about 1 kilometer (0.6 mile) northwest of U.S. Highway 93 and 18 kilometers (11 miles) south of Pioche. The Eccles Alternative Segment would be about 19 kilometers (12 miles) long (DOE, 2007).

3.1.2 Caliente Common Segment 1

The Caliente Common Segment 1 is approximately 71 miles in length. In the DEIS-RA, this portion of the Caliente Rail Alignment is simply referred to as the Caliente Common Segment 1. This report analyzes another alternative route commonly referred to as the Lincoln County Short Route. For ease of review, the DOE's Caliente Common Segment 1 was divided into two subsections – Caliente Common Segment 1A and Caliente Common Segment 1B, dividing at the point at which the Lincoln County Short Route diverges from the DOE Common Segment 1. This point of divergence is located west of Bennett Pass near The Bluffs, on the west side of the Chief Range or the east side of Dry Lake Valley. The description of Caliente Common Segment 1 is as follows:

Common Segment 1 would begin at the end of the Caliente or Eccles Alternative Segments, and trend generally west from Meadow Valley through the Chief Range (Bennett Pass) and

across Dry Lake Valley and the North Pahroc Range. On the west side of the North Pahroc Range, Common Segment 1 would cross Nevada Route 318 near Timber Mountain about 5 kilometers (3 miles) southeast of the Lincoln and Nye County line. It would continue to the northwest and then west, passing the northern end of the Seaman Range before turning southwest through Coal Valley. It would then connect to one of the Garden Valley Alternative Segments about 8 kilometers (5 miles) north of the Lincoln and Nye County line and 28 kilometers (17 miles) west of Nevada Route 318 (see Figure 2-7). Caliente Common Segment 1 would be approximately 110 kilometers (71 miles) long (DOE, 2007).

3.1.3 Garden Valley Alternative Segments

The CRC currently under consideration by the DOE requires passage through Garden Valley. The DOE has labeled these alternatives as Garden Valley Alternative Segments 1, 2, 3 and 8. These Segments run generally east to west with 3 being the northernmost, followed by 1, and 2, with 8 being the southernmost. This report adopts the DOE naming convention to assist the reader in comparing the information contained herein with the DEIS-RA. The descriptions of these alternative segments have been taken directly from the DEIS-RA.

3.1.3.1 Garden Valley Alternative Segment 1

Garden Valley Alternative Segment 1 would begin at the end of Caliente Common Segment 1 and run due west through the Golden Gate Range for about 7 kilometers (4 miles), trend in a southwesterly direction through Garden Valley, cross the Lincoln and Nye County line, and connect to Caliente Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area. Garden Valley Alternative Segment 1 would be approximately 35 kilometers (22 miles) long (DOE, 2007).

3.1.3.2 Garden Valley Segment 2

Garden Valley Alternative Segment 2 would begin at the end of Caliente Common Segment 1 and run to the south of the locations of Garden Valley Alternative Segments 1 and 3 (see below), crossing the Lincoln and Nye County line. Garden Valley 2 would continue southwestwardly through the Golden Gate Range at Water Gap, turn westward through Garden Valley, and continue southwesterly to connect to Caliente Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area. Garden Valley Alternative Segment 2 would be about 35 kilometers (22 miles) long (DOE, 2007).

3.1.3.3 Garden Valley Alternative Segment 3

Garden Valley Alternative Segment 3 would begin at the end of Caliente Common Segment 1 and run due west through the Golden Gate Range and then in a northwesterly direction until turning southwest to run along the southeast base of the Quinn Canyon Range. Continuing in a southwesterly direction, it would run through Garden Valley, cross the Lincoln and Nye County line, and connect to Caliente Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area. Garden Valley Alternative Segment 3 would be approximately 37 kilometers (23 miles) long (DOE, 2007).

3.1.3.4 Garden Valley Alternative Segment 8

Garden Valley Alternative Segment 8 would begin at the end of Caliente Common Segment 1 and run to the south of the locations of Garden Valley Alternative Segments 1 and 3, crossing the Lincoln and Nye County line and paralleling Cherry Creek Road. It would continue southwestwardly through the Golden Gate Range at Water Gap, turn westward

through Garden Valley, parallel Garden Valley Road, and run in a southwesterly direction before turning sharply westward. Garden Valley Alternative Segment 8 would proceed westward and connect to Caliente Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area. Garden Valley Alternative Segment 8 would be about 37 kilometers (23 miles) long (DOE, 2007)

3.1.4 Caliente Common Segment 2

Common Segment 2 is only partially contained within Lincoln County and therefore this report only addresses impacts along a portion of this Segment. The description in the DEIS-RA for the Caliente Common Segment 2 is as follows: It would begin at the west end of Garden Valley and would trend southwest through Sand Springs Valley, where it would exit Lincoln County and enter Nye County. It would cross State Route 375 near the south end of Railroad Valley before connecting to one of the South Reveille alternative segments near the southern end of the Reveille Range. Caliente Common Segment 2 would be approximately 50 kilometers (31 miles) long (DOE, 2007).

3.2. ADDITIONAL CALIENTE RAIL ALIGNMENT OPTIONS

The Joint City County Impact Alleviation Committee (JCCIAC) recommended and the Lincoln County Commission approved the detailed analysis of two alignment alternatives not included in the DEIS-RA. After evaluating several options, the preparers of this report performed detailed analysis on the Cottontail Pass Alternative and the Lincoln County Short Route Alternative.

3.2.1 Lincoln County Cottontail Pass Alternative

The majority of the Caliente Rail Alignment would remain unchanged from the DOE's proposed alignment and alternatives. The line would initiate at Caliente or Eccles and continue on Caliente Common Segment 1. However, instead of the proposed entrance into Garden Valley through Water Gap, this Alternative would traverse Cottontail Pass. Cottontail Pass is located four miles south of Water Gap (Approximate UTM, NAD 1927, zone 11: 4205083 m. North, 641292 m. East). The elevation of the Cottontail Pass Summit is 5440 ft. at a distance of 3.3 miles from the West Coal Valley Road. There is an elevation gain of 413 feet between the road and the top of the pass. Cottontail Pass enters Garden Valley at a gradual slope. This Alternative would join the DOE's CRC where the Garden Valley Alternative Segments and Common Segment 2 join together.

3.2.2 Lincoln County Short Route Alternative

The eastern portion of the Lincoln County Short Route would follow the same alignment as the DOE Proposed Caliente Corridor from the UP mainline, including either the Eccles or Caliente Alternative Segment and a portion of Common Segment 1. The Lincoln County Short Route would diverge from Common Segment 1 of the DOE Proposed Caliente Corridor west of Bennett Pass near The Bluffs. From this point to the east side of Hancock Summit, the Lincoln County Short Route follows the alignment described by the 1992 Caliente Rail Access Studies "Option A" (De Leuw *et al.*, 1992). From the point of divergence it would travel southwest along the eastern edge of Dry Lake Valley parallel to an existing power transmission access road. The route would then turn westerly and run parallel to US Highway 93 on the north side through Dry Lake and Pahroc Valleys. At the northern tip of the South Pahroc Range, the route would turn somewhat southwesterly, diverging from the US Highway 93 alignment as it crossed Sixmile Flat. The route would wind through Hiko Canyon and across a portion of private property and Nevada State Route 318 in Pahrangat Valley before turning southwesterly. The route would top the Pahrangat Range near Hancock Summit, approximately 1 mile north of Nevada State Route 375, crossing it on the eastern side of Tikaboo Valley at the toe of the

Pahranagat Range From there the route would travel southwesterly along the Groom Lake Road to a point where it would enter the Nevada Test and Training Site (NTTS). The project team did not have the access or resources to continue the alignment from the entry point with the Nellis Air Force Range to Yucca Mountain, but several viable options would be available including a portion of the Caliente-Chalk Mountain Route previously studied by DOE. The Departments of Energy and Defense would need to work closely in order to complete an alignment that did not interfere with the NTTS or Nellis Air Force Range operations. The project team viewed this as a major benefit for this route as the NTTS is already a highly disturbed environment with limited public access. Based on total length, this alignment would be significantly shorter than the CRC.

3.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Numerous alternatives were considered but eliminated from Detailed Analysis. This Section includes the written descriptions of these alternatives as well as the justification for their elimination from detailed analysis.

3.3.1 Blind Canyon Alternative

The majority of the Caliente Rail Alignment would remain unchanged from the DOE's proposed alignment and alternatives through Lincoln County. The line would initiate at Caliente or Eccles, and continue on Caliente Common Segment 1 until reaching the junction with the Lincoln County Cottontail Pass Alternative. The Blind Canyon Alternative follows the Cottontail Pass Alternative southward along the west side of Coal Lake Valley, extending two miles further south of Cottontail Pass to reach Blind Canyon. This southern entrance to Garden Valley would make this Alternative less visible from the 'City art site than the Cottontail Pass Alternative, however it would present more engineering challenges. It would exit Garden Valley in the same location as the other Garden Valley Alternative Segments. Blind Canyon is located six and a half miles south of Water Gap, (approximate UTM: 4201040 m. North, 640284 m. East). The Blind Canyon Alternative was eliminated from detailed analysis because it would have added length to the CRC, required extensive earthwork or tunneling, and would not have bypassed Garden Valley.

3.3.2 Murphy Gap Alternative

The Murphy Gap Alternative would completely bypass Garden Valley and reconnect to the existing DOE Preferred Alternative in Sand Springs/Penoria Valley. The Murphy Gap Alternative was eliminated from detailed analysis because it would not have lessened the overall impacts to grazing permittees but rather would have simply shifted the burden from one set of permittees to another. Additionally, the Murphy Gap Alternative would have presented more engineering and construction challenges than the DOE Preferred Alignment.

3.3.3 Crystal Wash Alternative

The Crystal Wash Alternative was a potential variation of the Lincoln County Short Route that would diverge from the Short Route at Pahroc Summit. From there it follows U.S. Highway 93 to the junction of Lincoln County State Route 375, which it then follows through Crystal Springs, rejoining the Short Route in the western portion of Pahranagat Valley. This Alternative was removed from consideration because it lacked the strengths of the Lincoln County Short Route.

3.3.4 West Sixmile Alternative

The West Sixmile Alternative was a potential variation of the Lincoln County Short Route, which would avoid the private property concerns around Hiko. This Alternative would require bridging or tunneling, and travels through a pass approximately five miles north of Hiko Canyon. The rail

line would follow a route along the hills in north Sixmile flat, maintaining an altitude of approximately five thousand feet through a pass south of the John Wright Reservoir and north of the Stewart Ranch private property. The West Sixmile Alternative was eliminated from detailed analysis because the Lincoln County Short Route (which was selected) most closely resembled an alternative previously evaluated and established as a feasible alternative by the DOE.

3.3.5 Hancock Summit 1 Alternative

This was a potential alternative to the portion of the Lincoln County Short Route that crosses Hancock Summit. Hancock Summit 1 Alternative would cross through a pass that crosses the West Pahrnatagat range from Pahrnatagat Valley on the east side. It passes into Tikaboo Valley on the west. It is located south of the Lincoln County power line, which provides power to Rachel, Nevada, and runs north of Highway 375. The altitude of the pass is 5,601 ft. The west side of Hancock Summit 1 is much steeper than the east side. A tunnel ranging from one, to one and a half miles in length would be needed to maintain a two percent rail grade through this canyon and connect with the Groom Lake Road. The Hancock Summit 1 Alternative was eliminated from detailed analysis because the Hancock Summit Alternative included in the Lincoln County Short Route more closely resembled an alternative previously evaluated and established as feasible by the DOE.

3.3.6 Hancock Summit 2 Alternative

This was a potential alternative to the portion of the Lincoln County Short Route that crosses Hancock Summit. The Hancock Summit 2 Alternative would cross through a pass from Pahrnatagat Valley through the West Pahrnatagat Mountains. The pass is located 1.5 miles south of Highway 375 Hancock Summit at an elevation of 6,012 feet. The route to this pass would require crossing Hwy 375 north of the "Sharp" livestock water haul on the east, and climbing through steep canyons to the pass (Approximate UTM. 4141496 m. North, 646092 m. East). From the pass a route west to the Groom Road would require extensive cut and fill and/or tunneling. The Hancock Summit 2 Alternative was removed from consideration because it appeared to offer more engineering challenges than the Hancock Summit 1 Alternative that was selected as part of the Lincoln County Short Route.

3.3.7 Indian Cove Alternatives

Two alternatives were identified near Indian Cove, which is located 2 miles north of the City of Caliente (Approximate UTM. 4170390 m. North, 721018 m. East). Indian Cove is a narrow canyon with steep limestone cliffs jutting skyward. Highway 93, the old Pioche Rail line, Meadow Valley Creek, natural wetlands, and pasture are all contained within the Cove in a narrow canyon that opens into Meadow Valley Range to the north. This is an area that was previously studied by DOE as a route from Caliente to Yucca Mountain. In 1990 DOE planned to use a bridge at Indian Cove that would allow a rail line to cross Meadow Valley with minimal impact on private land (Tappen *et al.*, 1990). The route would have had a rail line leave the UP at Eccles Siding and continue west bridging Indian Cove in order to avoid private property in the Meadow Valley.

The second Indian Cove Alternative is located about one-quarter mile south of the first Indian Cove Alternative. There is a steep, rocky canyon that opens up into a juniper forest that is crisscrossed by ATV and jeep roads. The summit of this canyon is at approximately 5,300 feet above sea level. The summit is located on the south end of the Chief Mountain Range. The

team was not able to consider the Indian Cove Alternative for detailed analysis due to time constraints.

3.3.8 Antelope Canyon Alternative

This alternative was initially identified by L&H Consulting, but was not included as part of this report due to questions of engineering feasibility and time constraints. Lincoln County subsequently contracted with Energy and Railroad Consulting. Mr. Jerry Parker from Energy and Railroad Consulting is preparing a report entitled *Comments and Recommendations on the 2007 Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada*. This Alternative is more fully evaluated in that report. The Antelope Canyon Alternative could be used to link the Union Pacific mainline to either the DOE proposed CRC or the Lincoln County Short Route in Dry Lake Valley. Although not evaluated within this report, this Alternative could alleviate impacts to private lands identified in Meadow Valley and impacts to public land grazing identified in and around Bennett Pass.

4.0 Public Lands Grazing Analysis

4.1 ISSUES EVALUATED

The below listed issues were identified as being pertinent to public lands grazing and the potential impacts and subsequent mitigations as a result of constructing and operating a new rail line within Lincoln County. Each of these issues was raised by the project team and discussed with all interviewed Bureau of Land Management (BLM) Allotment Permittees. A description of each issue is as follows.

4.1.1 Grazing Allotments

Grazing allotments are areas of public land officially designated by BLM under the Taylor Grazing Act for grazing use. Grazing permits are officially adjudicated by BLM to be used in specified grazing allotments. The adjudication includes numbers of livestock, periods of use and other terms and conditions. One common term used within grazing permits and plans is Animal Unit Month, or AUM. This is defined as the forage utilized by one cow (or five sheep) for one month. It is the common measurement of forage specified in grazing permits. In association with grazing permits, range improvement permits are authorized for various improvements such as wells, spring developments, pipelines, fences, seedings, etc. on the public lands.

Twenty-nine (29) different grazing allotments were analyzed in this report. Nineteen (19) would be affected by the Corridor and Alternatives proposed by the Department of Energy (DOE), and eleven (11) by the Lincoln County Short Route. The Ely Springs Cattle Allotment would be affected by both routes and was evaluated twice, once for each route. See Figure 4.1 for a display of the routes and affected allotments.

The DOE Proposed Corridor and Alternatives allotments are numbered 1 through 19 starting with the Clover Creek Allotment in the Eccles Alternative Segment east of Caliente, and continuing westerly through Lincoln County towards Tonopah. The Lincoln County Short Route allotments are numbered 20 through 30 starting with the Ely Springs Cattle Allotment and proceeding southwesterly through Lincoln County towards Yucca Mountain.

Table 4.1 provides data for all the affected allotments including the Permittees, permittee contacts, acreages, permitted use, class of stock, and the administering BLM Office. The allotment specific analyses are provided in Volume II, Appendix 2.0.

4.1.2 Grazing Systems and Planning

Grazing systems are made up of various components, and the manipulation of those components dictates how livestock graze a given pasture, use area, or allotment to achieve a given set of goals. These components consist of livestock movement (either forced or passive) and distribution, stocking rates, and the availability of water or supplements. Components of the system are manipulated in order to dictate the timing, duration and intensity of livestock use. In many cases, the Permittee and the BLM will develop a grazing management plan that identifies the goals of the grazing operation and the means used to achieve those goals. Grazing management plans are designed to guide and regulate grazing by livestock. They specify the numbers of livestock and periods of use for various herds. This can be for one pasture, or multiple pastures. If there are multiple pastures, it is common to provide for deferment and/or

rotation of grazing use between pastures to accommodate the physiological needs of the forage plants in order to improve the ecological condition of the vegetation.

Movement of the livestock is an essential component of a grazing system. Livestock can be moved in a forced manner through herding or hauling, and movement can be restricted through the use of fencing or impassible topography. Passive means of moving livestock can consist of manipulating water availability or supplement availability such as salt or mineral blocks. Livestock will move and distribute themselves within a given area based on water, feed, and supplement availability. These movements can be influenced by weather, season, disturbance or terrain. Over time livestock will acclimate to a given use area given their familiarity with the area and its resources. This acclimation of behavior conditioning can make the livestock more efficient in their use of the area. As such, older animals or those familiar with a given use area may be considered more valuable by the Permittee. Older animals expose young stock to the knowledge of water sources, different seasonal feed areas and other cues. Heifer calves are often retained as replacements for this reason.

Barriers to movement, such as a railroad or raised access roads can disrupt grazing systems, and alter the service area of stockwaters. The construction and operational activities would be highly disruptive to many of the allotment grazing systems. This would render existing grazing management plans obsolete and would require a new generation of plans for the disrupted allotment grazing systems. The new generation of plans would require working directly with BLM and the Permittees to develop plans tailored to the changes that have resulted from the right-of-way (ROW) track placement. The objective should be to retool the existing plans to help maintain existing livestock numbers, while not creating an increased burden on the Permittees that affect their ability to sustain an economic unit.

Construction staking, mobilizing, and construction activity would impose considerable disruption to the livestock operations, requiring varying amounts of added labor, equipment, and materials inputs on the part of the Permittees. This may include limiting access, relocating pipelines and watering facilities, temporary crossings, conditioning livestock behavior to unfamiliar conditions, noise, and other impacts. It is anticipated that livestock would tend to migrate away from close proximity grazing areas as a result of the construction activities. This may require temporary changes in the grazing system to relocate livestock until construction passes through the area. Increased livestock hauling and trailing and time on horseback may be required to drive livestock to and from distant alternate feed areas during this period. Efforts should be made to minimize these movements, as frequent and abnormal herding of livestock can result in undue stress, weight loss, and reduced birth rates. To help minimize these impacts, the development of Interim Grazing Plans are imperative to assure that livestock operations are secure during construction. These construction and rehabilitation plans would also help assure that favorable working relationships are maintained during construction, and would serve as a bridge between the existing Management Plans and the post-construction plan revisions.

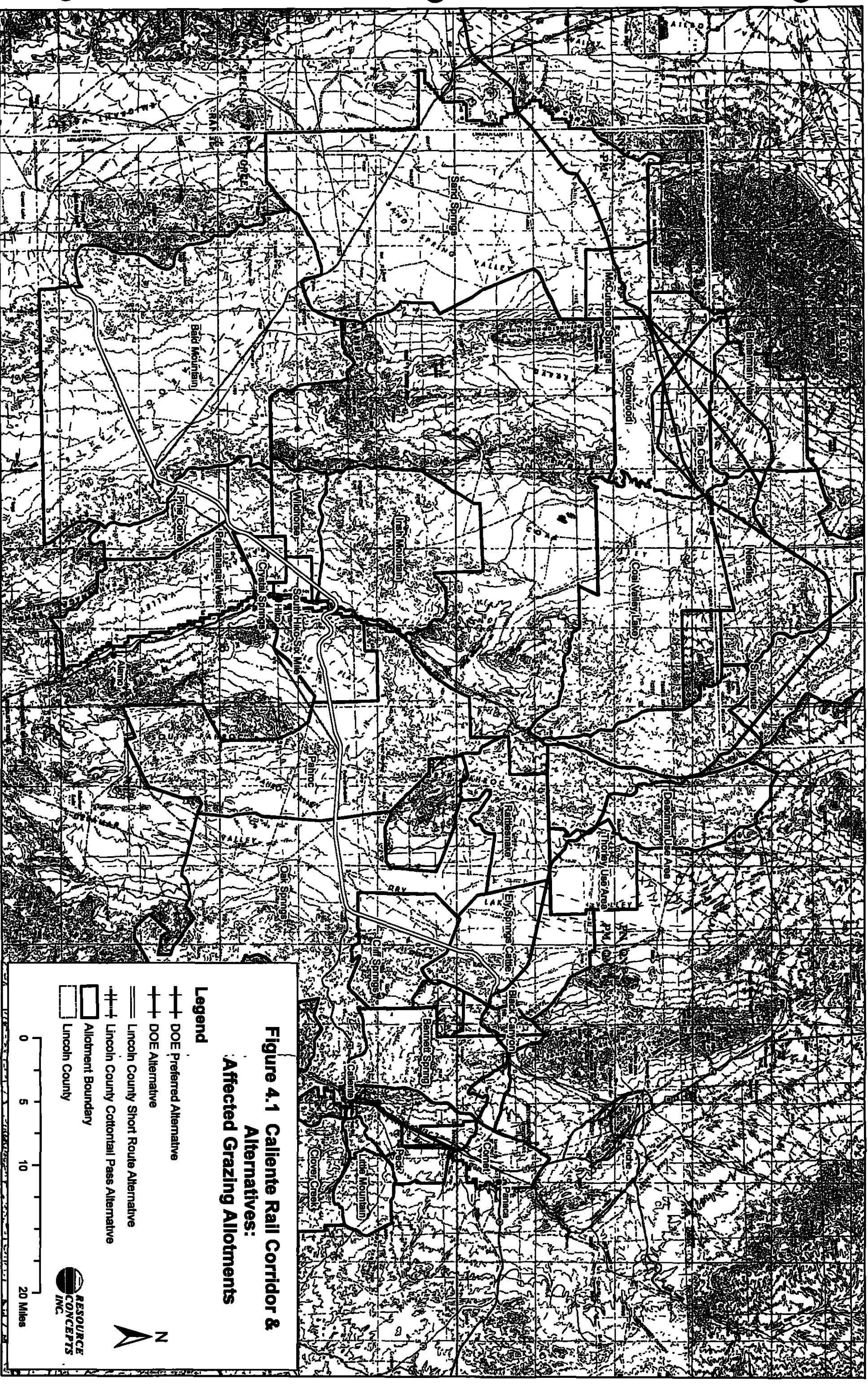


Table 4.1 – Affected Grazing Allotment Data

NO.	NAME	PERMITTEE	CONTACT	Acreages			Permitted Use			CLASS OF STOCK	BLM OFFICE
				PUBLIC LAND	PRIVATE	TOTAL	ACTIVE	SUSPENDED	TOTAL		
1.	Clover Creek Allotment	Roger Dieleman National Mustang Assoc.	Roger Dieleman Richard Sewing	22,538	246	22,784	447 166 Total 613	357 137 Total 494	804 303 Total 1,107	Cattle Cattle	Caliente
2.	Little Mountain Allotment	National Mustang Assoc	Richard Sewing	18,386	234	18,621	400	0	400	Cattle	Caliente
3.	Peck Allotment	Harvey Whittemore	Linda Carriger	13,291	1,292	14,584	397	346	743	Cattle	Caliente
4.	Comet Allotment	Ray Thompson	Ray Thompson	10,553	10,622	21,175	214	40	254	Cattle	Caliente
5.	Bennett Spring Allotment	Brad Guyman Thomas L & Warren Williams	Brad Guyman Thomas Williams	48,677	169	48,849	1,992 1,506 Total 3,498	1,518 1,149 Total 2,667	3,510 2,655 Total 6,165	Sheep Sheep Sheep	Caliente
6.	Black Canyon Allotment	Brad Guyman Thomas L & Warren Williams	Brad Guyman Thomas Williams	8,636	0	8,636	770 335 Total 1,105	176 88 Total 264	946 423 Total 1,369	Sheep Sheep	Caliente
7.	Ely Springs Cattle Allotment	Laird Whipple	Laird Whipple	57,240	606	57,846	4,248	600	4,848	Cattle	Caliente
8.	Rattlesnake Allotment	Dean Carter & Sons	Dean Carter	34,946	0	34,946	1,180	324	1,504	Cattle	Caliente
9.	Thorley Use Area	Bullock Bros.	Matt Bullock	40,519	0	40,519	1,271	529	1,800	Cattle	Caliente
10.	Deadman Use Area	Blue Diamond Oil Co. SNWA	Gary Sprouse Joe Guild	42,373	0	42,373	1,787 445 Total 1,232	823 0 Total 823	2,610 445 Total 3,055	Sheep/Cattle Sheep	Ely
11.	Timber Mountain Allotment	Blue Diamond Oil Co.	Gary Sprouse	43,839	0	43,839	2,368	0	2,368	Cattle	Ely
12.	Sunnyside Allotment	Bruce Jensen	Bruce Jensen	224,508	4,234	237,391	5,402	0	5,402	Cattle	Ely
13.	Needles Allotment	Double U Livestock LLC	Wade West	84,567	931	85,498	2,679	0	2,679	Sheep/Cattle	Ely
14.	Coal Valley Lake Allotment	Blue Diamond Oil Co. Charles & Clayton Wadsworth Thomas W Steele	Gary Sprouse Monte Wadsworth Robert Steele	115,174	0	115,174	395 1,769 2,657 Total 4,821	0 0 0 Total 0	395 1,769 2,657 Total 4,821	Sheep Cattle Cattle	Caliente
15.	Batterman Wash Allotment	Gracian Uhalde	Gracian Uhalde	41,035	440	41,475	2,093	0	2,093	Sheep/Cattle	Ely
16.	Pine Creek Allotment	Thomas W. Steele	Robert Steele	33,221	1,617	34,865	2,667	0	2,667	Cattle	Caliente
17.	Cottonwood Allotment	Kay Wright Ranch LLC	Rocky & Linda Hatch	41,135	302	41,437	1,177	1,839	2,016	Cattle	Caliente
18.	McCutcheon Springs Allotment	Kay Wright Ranch LLC	Rocky & Linda Hatch	18,061	40	18,101	446	0	446	Cattle	Caliente
19.	Sand Springs Allotment	Templute Grazing Assoc.	Dirk and Marta Agee	231,907	7,757	239,664	7,005	2,995	10,000	Cattle	Caliente
20.	Ely Springs Cattle Allotment	Laird Whipple	Laird Whipple	57,240	606	57,846	4,248	600	4,848	Cattle	Caliente
21.	Ciff Springs Allotment	Delamar Valley Cattle	Merlin Flake				2,043	1,200	3,243	Cattle	Caliente
22.	Oak Springs Allotment	Delamar Valley Cattle	Merlin Flake				9,268	5,729	14,997	Cattle	Caliente
23.	Pahroc Allotment	Stewart Brothers Co.	Brent Stewart				4,783	2,100	6,883	Cattle	Caliente
24.	South Hiko – Six Mile Allotment	William Wright Charles Wadsworth Stewart Bros. Co Orren Nash	Jay Wright Monty Wadsworth Brent Stewart Orren Nash	34,429	0	34,429	352 90 859 144	0 0 300 0	352 90 1,159 144	Cattle Cattle Cattle Cattle	Caliente
25.	Irish Mountain Allotment	Double U Livestock LLC	Wade West				600 2,541	0 0	600 2,541	Sheep Cattle	Caliente
26.	Wildhorse Allotment	Orren Nash	Orren Nash	18,254	0	18,254	315	0	315	Cattle	Caliente
27.	Crystal Springs SCS Allotment	William Wright	Jay Wright	7,571	0	7,571	437	0	437	Cattle	Caliente
28.	Pahrnanagat West Allotment	Ed Sharp Ranch Trust Joe Sharp Charles Wadsworth Kent Whipple Ranch (Trust)	Mary Anne or Lola Sharp Joe Sharp Monty Wadsworth Brett Whipple	68,476	0	68,476	488 951 224	0 0 0	488 951 224	Cattle Cattle Cattle	Caliente Caliente Caliente
29.	Pine Cone Allotment	Stewart Brothers Co	Brent Stewart	26,081	0	26,081	1,205	0	1,205	Cattle	Caliente
30.	Bald Mountain Allotment	Steve Medlin	Steve Medlin	260,090	0	260,090	5,751 60	487 0	6,238 60	Cattle Horses	Caliente Caliente

4.1.3 ROW Fencing

Whether or not to fence the operational ROW was an issue of significant magnitude to the Permittees. During the interview process Permittees were asked to identify a ROW fencing preference. Impacts and mitigation measures were analyzed by allotment, taking into account the individual preference for fencing. This type of analysis was performed to illuminate the Permittee's fencing preference and the resulting consequences.

Responses were mixed between preferences to fence or not to fence the ROW. Some Permittees were undecided, did not have a preference, or declined to state a preference (see Table 4.2 and Figure 4.2). In these instances, the allotments were analyzed assuming no fencing of the ROW. One Permittee stated that even though fencing itself would be highly disruptive to his grazing management pasture system, he would opt for the fencing if the train speeds exceeded 40 mph. Below 40 he would accept the risk without fencing.

The proposed railroad presents many undesirable features to choose between from the Permittees' point of view. The choice is driven by the least undesirable option for each Permittees' specific grazing and livestock operation. It is apparently a troubling choice for many. They were generally hesitant to decide either way due to insufficient information and data regarding train-livestock collisions, and the consequences of either choice on their respective grazing operations. There was also a lack of information regarding the anticipated number and the speed of trains, despite RCI's request to DOE for such information.

4.1.4 Base Property

The Taylor Grazing Act established the ownership of base property as a requirement for holding a grazing permit. Section 3 of the Act states:

Preference shall be given in the issuance of grazing permits to those within or near a district who are landowners engaged in the livestock business, bona fide occupants or settlers, or owners of water or water rights, as may be necessary to permit the proper use of lands, water, or water rights owned, occupied, or leased by them.

The Grazing Regulations interpret the Act in 43CFR §4100.0-5, which states:

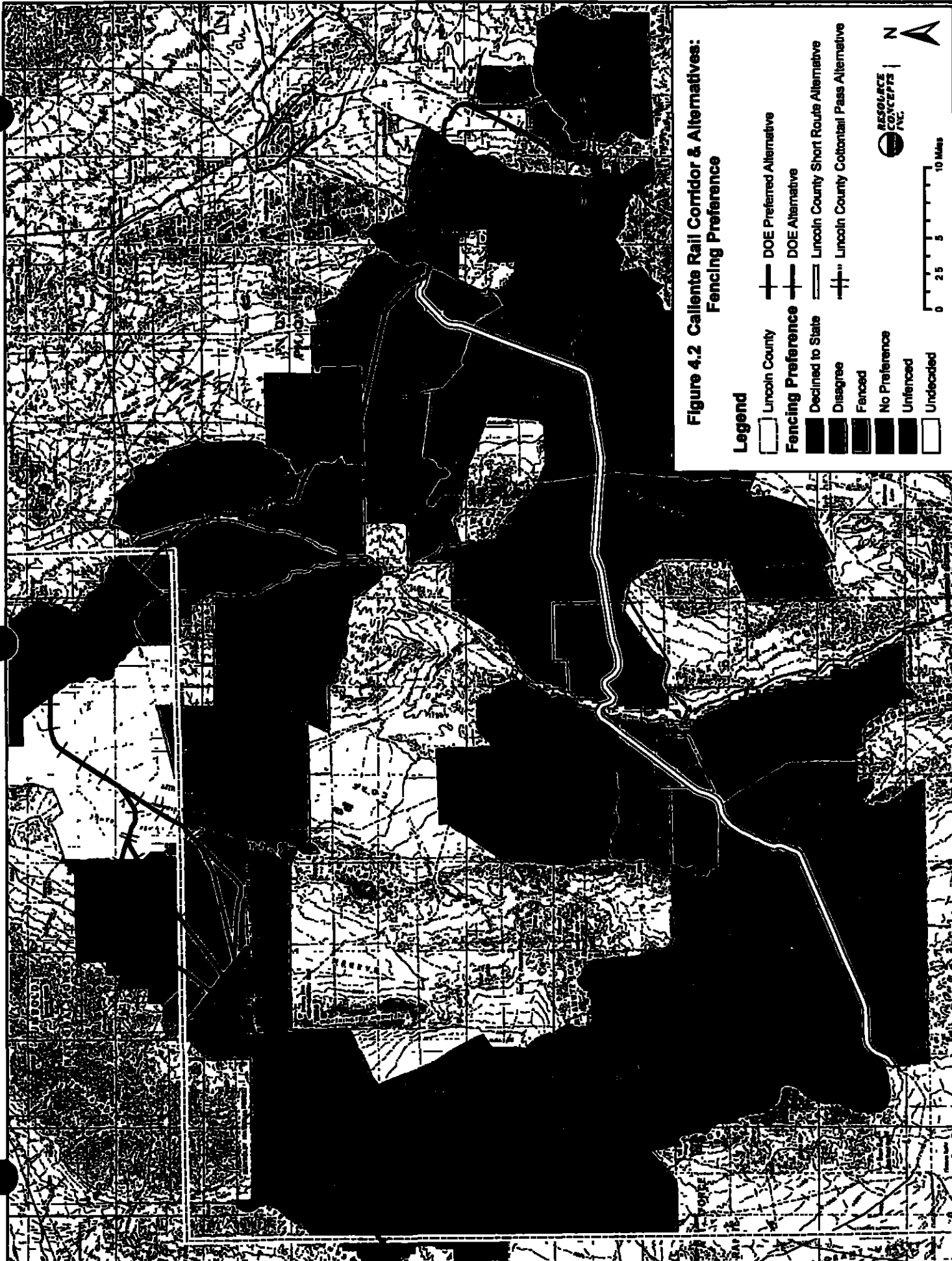
Base Property means: (1) Land that has the capability to produce crops or forage that can be used to support authorized livestock for a specified period of the year, or (2) water that is suitable for consumption by livestock and is available and accessible, to the authorized livestock when the public lands are used for livestock grazing.

Table 4.2: Fencing Preferences

No.	NAME	PERMITTEE	CONTACT	FENCING PREFERENCE*	ALLOTMENT ANALYSIS**
1	Clover Creek	Roger Dieleman National Mustang Assoc.	Roger Dieleman Richard Sewing	Y N	W/O
2.	Little Mountain	National Mustang Assoc	Richard Sewing	N	W/O
3.	Peck	Tuffy Ranch Properties LLC	Linda Carriger	Y	W
4.	Comet	Ray Thompson	Ray Thompson	U	W/O
5	Bennett Spring	Brad Guyman Thomas L & Warren Williams	Brad Guyman Thomas Williams	N N	W/O
6.	Black Canyon	Brad Guyman Thomas L & Warren Williams	Brad Guyman Thomas Williams	N N	W/O
7	Ely Springs Cattle	Laird Whipple	Laird Whipple	N	W/O
8.	Rattlesnake	Dean Carter & Sons	Dean Carter	Y	W
9.	Thorley Use Area	Bulloch Bros	Matt Bulloch	N	W/O
10.	Deadman Use Area	Blue Diamond Oil Co. SNWA	Gary Sprouse	Y Y	W
11	Timber Mountain	Blue Diamond Oil Co.	Gary Sprouse	Y	W
12	Sunnyside	Bruce Jensen	Bruce Jensen	N	W/O
13.	Needles	Double U Livestock LLC	Wade West	U	W/O
14	Coal Valley Lake	Blue Diamond Oil Co Charles & Clayton Wadsworth Thomas W. Steele	Gary Sprouse Monte Wadsworth Robert Steele	Y Y Y	W
15	Batterman Wash	Gracian Uhalde	Gracian Uhalde	DE	W/O
16.	Pine Creek	Thomas W Steele	Robert Steele	Y	W
17.	Cottonwood	Kay Wright Ranch LLC	Rocky and Linda Hatch	N	W/O
18.	McCutcheon Sp.	Kay Wright Ranch LLC	Rocky and Linda Hatch	N	W/O
19.	Sand Springs	Tempiute Grazing Association	Dirk and Marta Agee	N	W/O
20.	Ely Springs Cattle	Laird Whipple	Laird Whipple	N	W/O
21	Cliff Springs	Delamar Valley Cattle	Merlin Flake	NP	W/O
22.	Oak Springs	Delamar Valley Cattle	Merlin Flake	NP	W/O
23	Pahroc	Stewart Brothers Co.	Brent Stewart	Y	W
24	South Hiko – Six Mile	William Wright Charles Wadsworth Stewart Bros Co Orren Nash	Jay Wnght Monty Wadsworth Brent Stewart Orren Nash	Y Y Y Y	W
25.	Insh Mountain	Double U Livestock LLC Orren Nash	Wade West Orren Nash	NP NP	W/O
26	Wildhorse	Orren Nash	Orren Nash	Y	W
27	Crystal Springs SCS	William Wnght	Jay Wnght	Y	W
28	Pahranagat West	Ed Sharp Ranch Trust Joe Sharp Charles Wadsworth Kent Whipple Ranch (Trust)	Mary Anne/Lola Sharp Joe Sharp Monty Wadsworth Brett Whipple	Y Y Y Y	W
29	Pine Cone	Stewart Brothers Co	Brent Stewart	N	W/O
30.	Bald Mountain	Steve Medlin	Steve Medlin	N	W/O

(*Y-Yes, fence; N-No fence; U-Undecided, NP-No Preference, PF-Partial Fence, DE-Denial to state)

(**W – Fence, W/O – Without Fence)



**Figure 4.2 Calliente Rail Corridor & Alternatives:
Fencing Preference**

Legend

-  Lincoln County
-  DOE Preferred Alternative
-  DOE Alternative
-  Declined to State
-  Lincoln County Short Route Alternative
-  Lincoln County Cottontail Pass Alternative
-  Disagree
-  Fenced
-  No Preference
-  Unfenced
-  Undecided



Typically, land was used for base property when the Permittees owned sufficient qualifying land. In desert areas like southern Nevada, it was (and is) common to have Permittees who did not own qualifying land to use water for base property. In those cases, the grazing allotments were classified as water base property (see Figure 4.3).

The means by which the BLM has administered this law is by adjudicating the base properties and grazing privileges, and maintaining records showing the privately owned property(s) to which various grazing privileges are attached. Land base is important where the railroad approaches the vicinity of, or crosses private lands. Some of these properties are base lands. The railroad could impact the uses, values, and/or management practices on each parcel of land. If they were permanently impacted, the Permittees may not be able to utilize them with livestock as required under the conditions of the land-based permits, and their grazing privileges would be in jeopardy. The water base property is particularly significant because they are considered private property rights under the Taylor Grazing Act.

Twelve of the 29 allotments are classified as having water base property (see Table 4.3). When the base property classification for these stockwaters is added to the ownership of state water rights for the same waters, the private property right is increased in significance and value. Thus, the significance of damaging or impairing these stockwaters is greater. The loss of access to the forage around stockwaters or the loss of the water itself could result in the reduction of AUMs on the BLM permit. This could be for the reason of direct loss of forage as well as the loss of base property to which the permit is attached. If the base property is impacted, the entire grazing permit is placed in jeopardy.

Table 4.3: Water Base Property

ALLOTMENT INFORMATION					
ROUTE/SEGMENT	NO.	NAME	WATERS WITHIN 4 MILES	WATERS WITHIN 1 MILE	PIPELINE CROSSINGS
Common Seg. 1A	6	Black Canyon	2	0	0
DOE, Common Seg. 1B	7	Ely Springs Cattle	12	6	4
DOE, Common Seg. 1B	8.	Rattlesnake	2	2	0
DOE, Common Seg. 1B	9	Thorley Use Area ¹	10	6	1
DOE, GV Alt. Seg. 1	13	Needles*	8	3	1
DOE, GV Alt. Seg. 1	17.	Cottonwood*	13	3	1
DOE, Common Seg. 2	19	Sand Springs	19	6	3
LC Short Route	20.	Ely Springs Cattle	12	6	4
LC Short Route	21	Cliff Springs	9	2	1
LC Short Route	22	Oak Springs	4	0	1
LC Short Route	23.	Pahroc	2	0	1
LC Short Route	30.	Bald Mountain	0	0	0

¹ Eligible for reinstatement of partial water-base property under the Ely Special Rule.

* DOE Preferred Alternative

Note: GV=Garden Valley

LC=Lincoln County

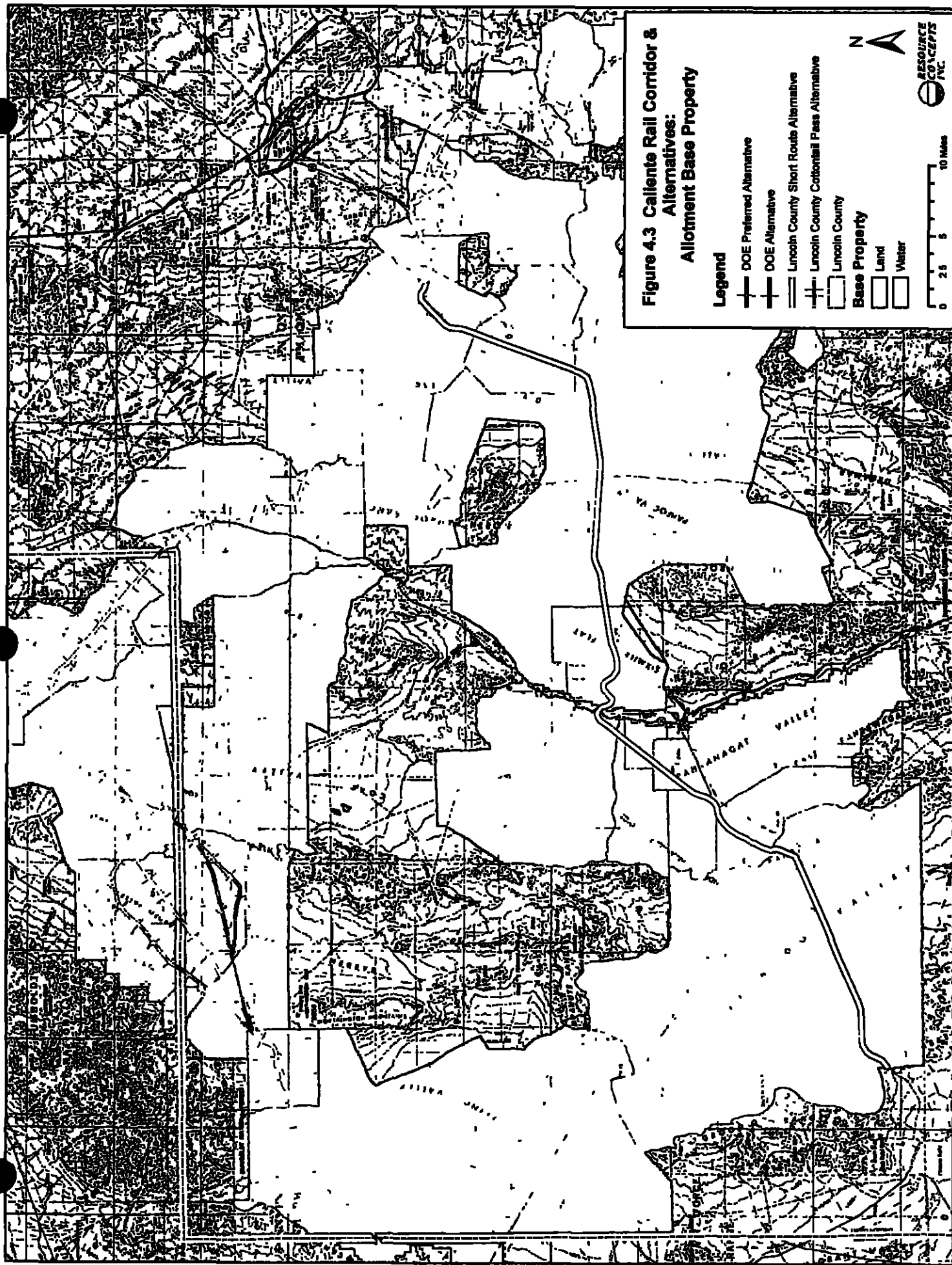


Figure 4.3 Calliente Rail Corridor & Allotment Base Property

Legend

DOE Preferred Alternative

DOE Alternative

Lincoln County Short Route Alternative

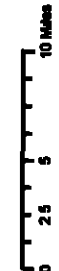
Lincoln County Cottonail Pass Alternative

Lincoln County

Base Property

Land

Water



RESOURCE
CONCEPTS
INC.

4.1.5 Water Rights

The stockwaters are all permitted, certified, or vested by the State Engineer in the Nevada Division of Water Resources (DWR). All of the waters and water rights are private property rights. This ownership is bestowed by virtue of Nevada State Water Law. Federal laws recognize state supremacy in the matter of stockwater rights. The waters within four miles of the tracks would be impacted by the proposed railroad, as four miles is considered the service area of a stockwater. The stockwaters listed in Figure 4.4 and Table 4.4 fall into this class.

The proposed railroad would trigger the need for many modifications to existing stockwater sources as well as development of new sources. The Permittees may find themselves in the middle of water rights disputes between BLM, the DWR, Southern Nevada Water Authority (SNWA), and the DOE. In the interest of efficiency and enhanced cooperation, and in all fairness to the Permittees, consideration should be given to seeking agreement between all of the agencies, organizations, and affected parties on how to coordinate and expedite the necessary authority for water development, what rules would apply, who would be responsible, and who would provide the funding. For example, BLM routinely protests all new filings and co-files on new water claims, change of place of use, and change of point of diversions. Neither BLM nor DOE has authority regarding how DWR assigns water rights, and outside interests can use various tactics to assert competing filings in the event of permittee dilemmas. Filings for new water sources and changes in places of use are costly and time consuming. Under existing rules, pipeline extensions should be used whenever possible rather than new wells as the latter require new water rights. When the waters that are impacted and need modification or replacement are in fact base property, the situation is even more complex and subject to additional controversy. The Permittees are vulnerable to substantial losses if this is not addressed by the advance development and implementation of a mutually satisfactory protocol.

4.1.6 Stockwaters and Associated Infrastructure

Water is possibly the most valued resource for stockmen in the desert. Every source is carefully developed and maintained to maximize its availability and dependability for livestock and irrigation. For the purposes of this study stockwaters were considered to include natural springs, perennial creeks, wells, troughs, tanks, catchments or reservoirs, and water hauls.

Water hauls are not linked by a piped conveyance from a natural source or well. As a result, water hauls are some of the easiest stockwaters to relocate. However, that does not decrease their level of importance to grazing operations. Water must be obtained from a permitted source, and hauled to the place of use. Water haul locations must be approved by the BLM, installed at a cost to the Permittee, and must be accessible by a water truck.

Catchments or reservoirs are typically used to capture either local precipitation or storm water runoff. Reservoirs must be approved by the BLM and installed at a cost to the either BLM, the Permittee, or as a shared cost. Reservoir functionality is extremely susceptible to any change in drainage patterns.

Spring water or well water is frequently piped for miles with intermittent stockwater tanks and troughs along the pipelines. The Sand Springs Allotment (#19) is an unusual example where over 135 miles of pipelines have been constructed to distribute the stockwater as needed to maintain a viable livestock grazing system and production operation within the allotment.

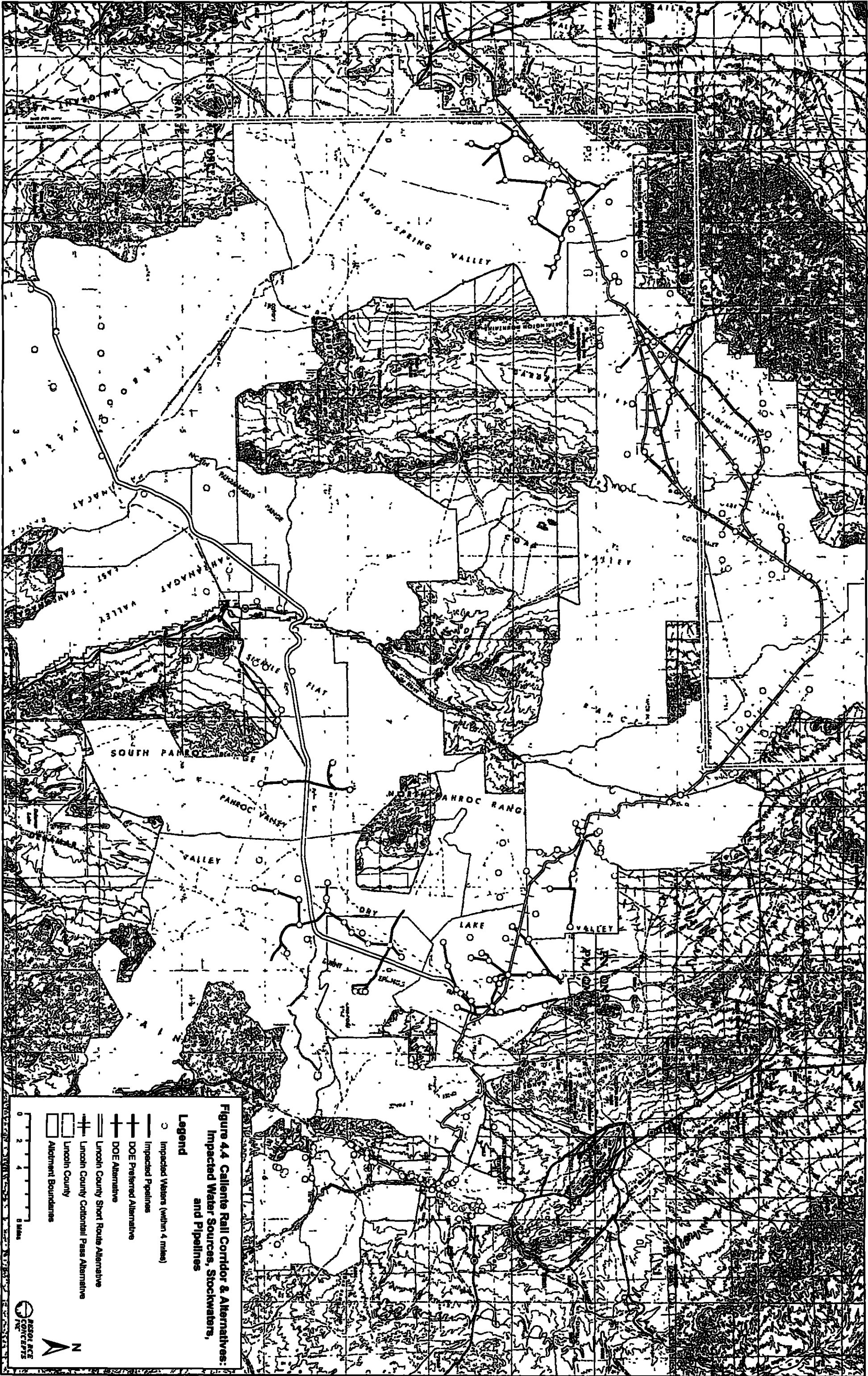


Table 4.4: Impacted Stockwaters

ALLOTMENT INFORMATION				
No.	NAME	WATERS WITHIN 4 MILES	WATERS WITHIN 1 MILE	PIPELINE CROSSINGS
1.	Clover Creek [†]	8	1	0
2.	Little Mountain [†]	1	1	0
4.	Comet [†]	1	1	0
5.	Bennett Spring	1	0	0
6.	Black Canyon	2	0	0
7.	Ely Springs Cattle	12	6	4
8.	Rattlesnake	2	2	0
9.	Thorley Use Area [†]	10	6	1
10.	Deadman Use Area	2	2	0
11.	Timber Mountain	2	2	0
12.	Sunnyside	4	0	0
13.	Needles*	10	3	1
14.	Coal Valley Lake*	1	1	0
15.	Batterman Wash*	6	4	0
16.	Pine Creek*	8	5	2
17.	Cottonwood*	13	3	1
18.	McCutcheon Springs	1	1	0
19.	Sand Springs	23	9	4
20.	Ely Springs Cattle**	12	6	4
21.	Cliff Springs**	9	2	1
22.	Oak Springs**	4	0	1
23.	Pahroc**	2	0	1
24.	South Hiko – Six Mile**	4	3	0
25.	Irish Mountain**	0	0	0
26.	Wildhorse**	0	0	0
27.	Crystal Springs SCS**	0	1	0
28.	Pahranagat West**	3	0	0
29.	Pine Cone**	1	0	0
30.	Bald Mountain**	9	4	0

[†] Eccles Alternative

[†] Eligible for reinstatement of partial water-base property under the Ely Special Rule

* Tallied for Garden Valley Alternative Segment 1, DOE's Preferred Alternative

** Allotments number 20 to 30 would be located along the Lincoln County Short Route.

As would be expected, the proposed corridor would impact many stockwaters and water sources, as well as distribution facilities (see Figure 4.4 and Table 4.4). Water sources within four miles and one mile of the track have been identified and tallied. The basis for the four-mile impact distance (4 miles on each side of track = 8 mile zone) is based on a four-mile service area for base property stockwaters. This customary figure of a 4-mile service area originated when the Grazing Service, the predecessor agency to BLM, first adjudicated grazing permits. The track can potentially interfere with the ability of livestock to utilize a water's full service area as far as four miles from the track. The basis for the one-mile impact zone is the proximity to the track and the increased risk of livestock/train collision and death loss because of livestock congregation around watering locations.

The railroad would cross pipelines as well, posing a unique challenge because the pipelines must remain functional during construction in areas of the allotments that require water be present for livestock to utilize and promote distribution across the allotment. A widely recommended pipeline crossing design feature is the installation of a protective conduit through which the water conveyance pipe can be inserted so the Permittee or responsible party can readily maintain, replace, and repair the pipeline.

Each type of water source requires unique consideration when determining impacts and mitigation. Impacts to a reservoir might be disruption of overland flow, or redirecting flow away from the reservoir. Springs cannot be moved. Once impacted at the source, they could be lost forever as a stockwater source, along with the wetland and riparian habitat they support.

The vulnerability of stockwaters to impairment and reduction in service area (area and distance livestock graze from a water source) is one of the biggest concerns, and a universal concern, of all the Permittees impacted by the proposed railroad. This concern is understandable, as the stockwaters are the lifeblood of their livestock operations. Without adequate water delivery, availability, and distribution, adequate distribution of the livestock and access to key forage cannot occur. Adequate livestock distribution allows the vegetation communities to be used sustainably. If the impacts to livestock waters are not mitigated during the construction, use, and maintenance of the proposed railroad, natural resource conditions could suffer, and the Permittees could be penalized by the loss of grazing privileges for any adverse impacts on the natural resources caused by the improper distribution of livestock.

The stockwaters within an eight-mile zone (4 miles on each side of the track) are shown in red on each of the figures in the allotment specific portions of Volume II, Appendix 2.0. For adequate impact mitigation, agreement should be reached and documented between BLM, DOE, and the Permittees about who would be responsible for planning, implementation, and maintenance of livestock water impact mitigation. This includes NEPA compliance, engineering, compliance surveys, water filings, materials, and labor.

4.1.7 Existing Fencing and Capital Improvements

The allotments have many existing fences. They all constitute barriers between allotments, pastures or use areas. It is essential that the integrity of these barriers to livestock movement be maintained both during construction and operation of the rail.

During construction many existing fences, or sections of fence, will likely need to be taken down to allow construction activities to occur. This makes the fence ineffective, and would create livestock trespass issues or a complete loss of livestock. These issues must be addressed and mitigated with the input of the BLM and the Permittee prior to altering any existing fences.

When the railroad and associated access road(s) cross an existing fence, the fence barrier must not be compromised by leaving a hole that allows livestock to pass through. If the railroad ROW is fenced, the ROW fence can tie off on the intersected existing fence and the barrier remains in effect. If the railroad is not fenced, then a railroad cattleguard would be essential to prevent livestock from passing through the existing fence along the rail as well as roadway cattleguard(s) to prevent a breach of the fence along the access road(s). All road cattleguards should also include adjacent gates in order to move livestock through when desired. It is imperative that the integrity of the existing or proposed range fences be maintained.

The only capital improvements that have been encountered along the studied rail corridors are corrals. Those impacted would have to be replaced by relocating them to another suitable location, as selected by the Permittee and approved by the BLM.

Failure to honor either of these standards would wreak havoc on the livestock operations that occupy the Lincoln County rangelands.

4.1.8 Roads and Trails

For the purposes of this study, roads were considered those identified on USGS quad maps as such, or as County roads. Trail were considered to be those existing unimproved roads or two-tracks identified by USGS maps or by permittees as trails used for ranching operations. Both roads and trails are critical for access to the remote areas of Lincoln County. Operations such as water hauling, livestock hauling, maintaining infrastructure, and moving livestock are dependent on the existing road and trail network. This network is one of multiple use, oftentimes used by land management personnel, sportsmen, OHV users, and other outdoor enthusiasts.

It is imperative that every effort be made to minimize road and trail closures or delays during construction or operation of the rail. Failure to honor this standard would wreak havoc on the local transportation system that serves the livestock operations as well as visiting agency personnel and public. Significant impacts were experienced when the Union Pacific ROW within Lincoln County was closed to the public due to homeland security concerns. A similar situation with the proposed rail corridors would likely be much more significant.

4.1.9 Vegetation and Forage

This issue is addressed under various sub-headings.

4.1.9.1 Disturbed Area Rehabilitation

Ongoing construction would result in extensive surface disturbances along the entire proposed railroad route. Many different soil types, each supporting a distinct plant community as shown in Figure 4.5, and various exposures, are present along the proposed route. To properly plan for disturbed area rehabilitation, a soil survey and a map of ecological sites would be required. This would help to identify the rehabilitation options at each site. A variety of exotic adapted plant species and native vegetation communities should be a minimum objective to have on each site after construction of the proposed railroad is completed.

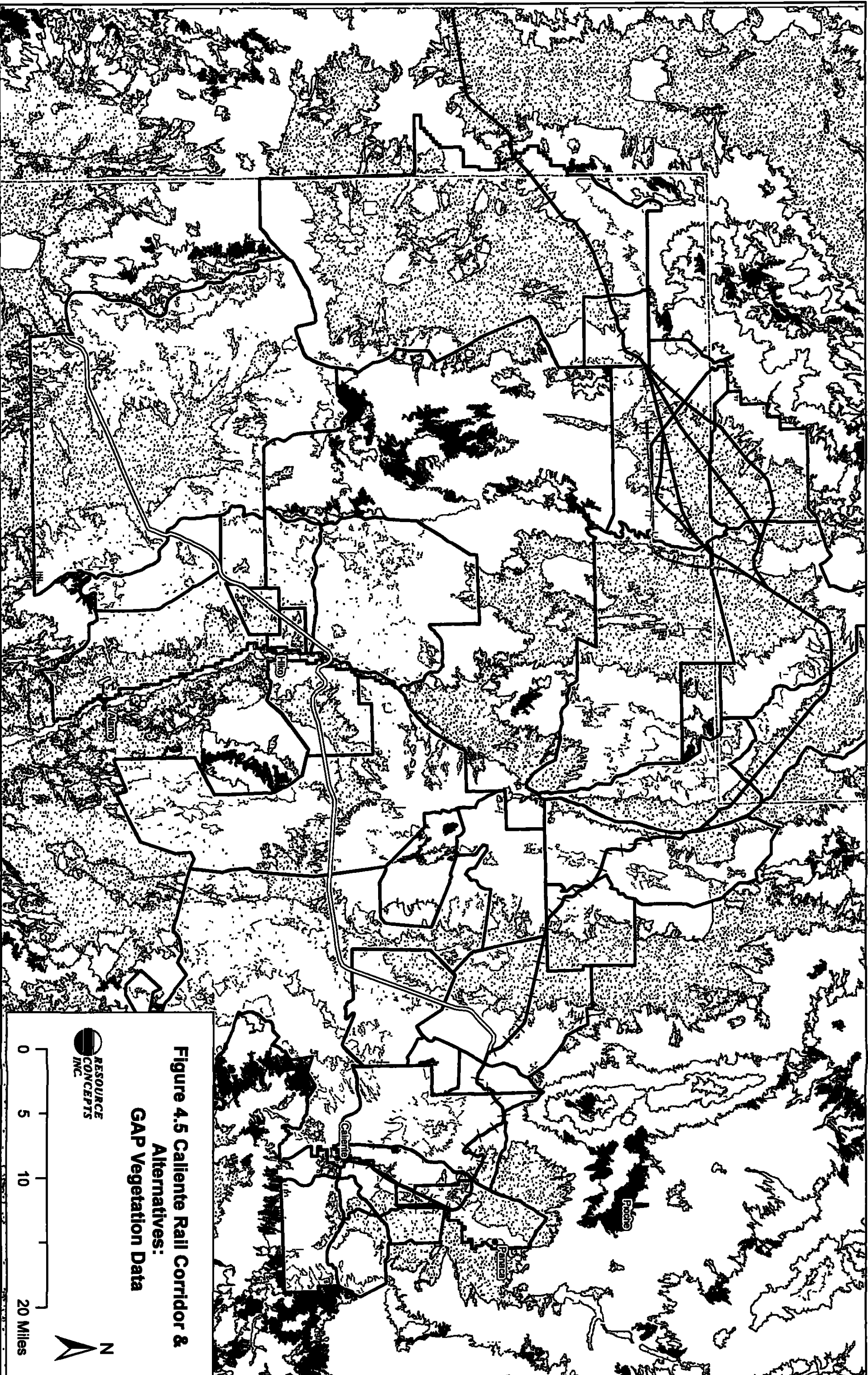
Figure 4.5a Caliente Rail Corridor & Alternatives: GAP Vegetation Data Legend

Legend

GAP Vegetation Data

-  Urban
-  Agriculture
-  Grassland
-  Lowland Riparian
-  Sagebrush/Perennial Grass
-  Sagebrush
-  Mountain Sagebrush
-  Hopsage
-  Blackbrush
-  Creosote/Bursage
-  Greasewood
-  Mojave Mixed Scrub
-  Mountain Shrub
-  Salt Desert Scrub
-  Playas
-  Limber Pine 30-60% cover
-  Limber Pine <30% cover
-  Mountain Mahogany 30-60% cover
-  Mountain Mahogany >59% cover
-  Ponderosa/Mountain Shrub <30% cover
-  Pinyon/Juniper <30% cover
-  Pinyon/Juniper 30-60% cover
-  Pinyon Pine 30-60% cover
-  Utah Juniper 30-60% cover
-  Utah Juniper <30% cover
-  White Fir 30-60% cover
-  White Fir >60% cover

-  DOE Preferred Alternative
-  DOE Alternative
-  Lincoln County Short Route Alternative
-  Lincoln County Cottontail Pass Alternative
-  Allotment Boundary
-  Lincoln County



**Figure 4.5 Caliente Rail Corridor & Alternatives:
GAP Vegetation Data**



A number of rehabilitation challenges would be encountered, including cuts and fills for the railroad bed. Borrow areas, construction well pads, work camps and haul roads would likely be located in numerous areas, in close vicinity, and convenient for the construction and maintenance of the railroad corridor. Borrow areas would expose inert subsoil material, which is typically unsuitable for reseeding and revegetation. It is critical that wherever surface disturbance occurs, or where soils are stripped for the railroad pad construction, that the topsoil be stockpiled for reapplication as a planting medium. In desert regions revegetating disturbed areas is extremely difficult and high risk, even when using a suitable planting medium, and plant species adapted to the conditions of each site, and proper post-rehabilitation management practices. To plant into subsoil material in lieu of topsoil would greatly reduce the chances for planting success. In the region of the proposed railroad alignment, precipitation is extremely limited and the soils lack organic matter. The science, along with technical, and practical knowledge available for successfully rehabilitating desert disturbances, is also limited. It may be necessary to explore alternatives such as temporary irrigation along the proposed route to help ensure seeding success and vegetation establishment. A carefully developed rehabilitation plan, closely coordinated with researchers and scientists familiar with Nevada ecosystems, is critical to the success of the rehabilitation efforts.

Clearly, the most successful and least costly approach is to minimize or limit the areas of disturbance to those specific areas which are absolutely necessary, and to hold the contractor accountable to that footprint. This would save countless dollars and frustration from failed rehabilitation efforts, and the need for repeated efforts at a high cost. It is advisable that the DOE and the rehabilitation contractor use materials such as lath snow fences to establish the boundaries of allowable disturbance areas prior to the initiation of any land disturbing activity, and to impose a steep penalty for any infringement beyond the boundaries of the designated areas. All seedings would require at least two years of protection from grazing to allow for stand establishment. Seedings in white sage and salt desert shrub areas may take much longer (3-4 years or more depending on the amount and timing of precipitation). Some Permittees may need compensation during construction to feed cattle off site due to the temporary loss of critical forage areas.

The only means of protection for the seedings is to fence the treated areas during the establishment period. Exposing rehabilitation seedings to grazing use prematurely would very likely result in failure of the seeding. Where the ROW is not to be permanently fenced, it would be necessary to construct temporary fencing to protect the treatment areas. Selection of species for seeding is also critical. A mixture that most closely represents the composition and structure of the surrounding plant community is one potential mix that could be utilized. Another mix would simply be composed of those native and non-native species that present the greatest chance for seeding success.

4.1.9.2 Soils

Published soil surveys are extremely valuable tools, when available, for planning and/or assessing the types, conditions, and class of natural resources. Provided by the USDA Natural Resources Conservation Service, these soil surveys map the soil types and classes of a given region or area in accordance with the National Soil Survey standards, which provides a wealth of interpretation data on soils and vegetation limitations and capabilities for each soil type encountered. The interpretations include Ecological Site Descriptions (ESD) that present a plant community by species, and percent species composition by weight, soil pH, soils engineering information, and the suitability of each soil as a growth medium. Soil surveys should be the starting point of resource evaluations for large-scale projects in a given region.

Soil surveys have been completed over a significant portion of the area covered by the proposed Caliente to Yucca Mountain Corridor. However, there are areas along the proposed route that do not have soil survey information. It is advisable for the DOE to coordinate with the BLM and Natural Resource Conservation Service (NRCS) to determine if those areas absent soil surveys can be surveyed to provide current soils information. In addition, some of the existing soil surveys are outdated and should be updated to current standards. The availability of the information would be invaluable in locating topsoil material, assisting in determination of appropriate species for reseeding disturbed areas, and locating off-site areas with the potential for replacement forage if necessary. The Soil Survey engineering interpretations would also greatly assist in the final routing of the railroad and design aspects.

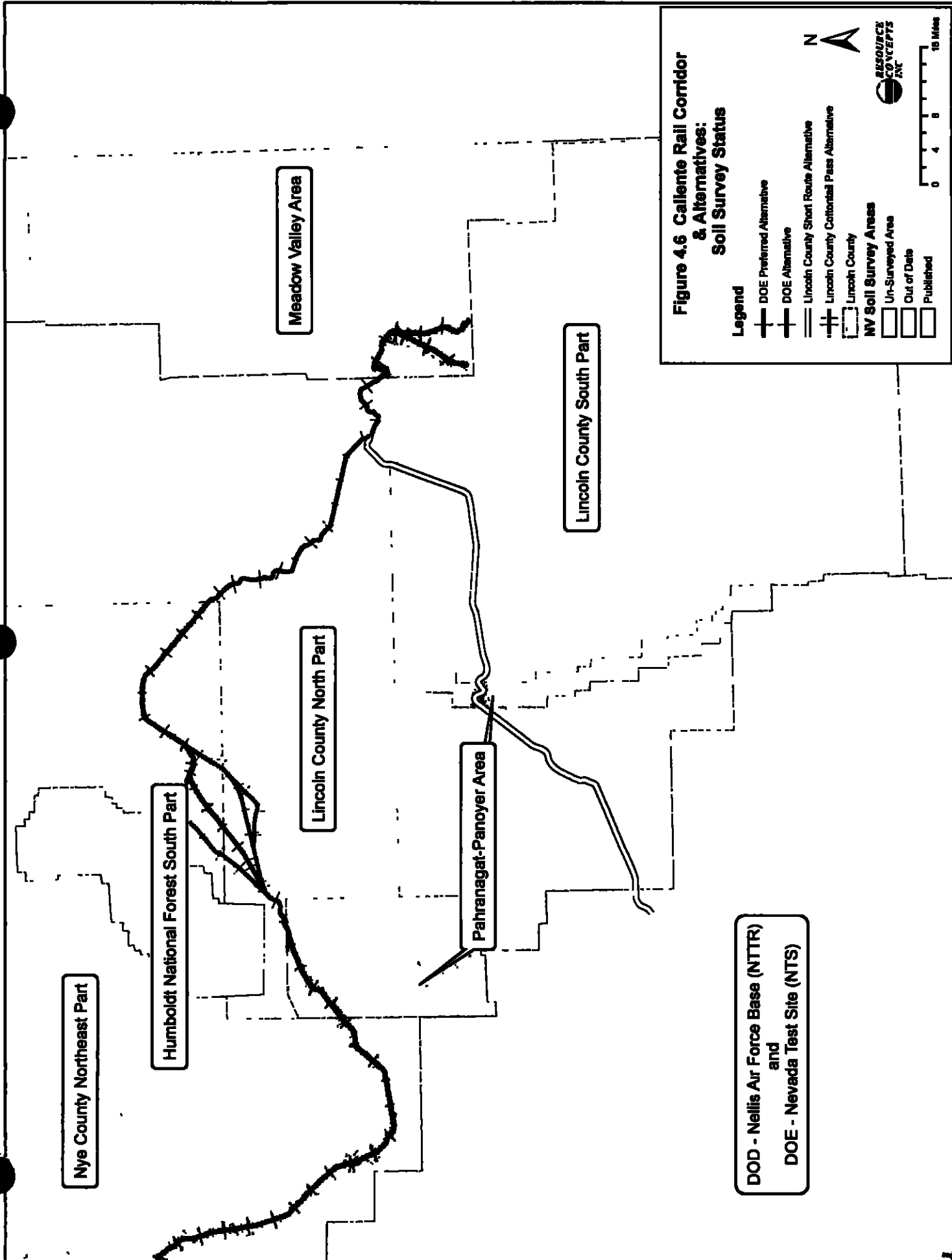
Table 4.5 provides the soil survey availability and status for the proposed railroad route. The locations of the various soil surveys and unsurveyed areas are detailed on Figure 4.6.

Table 4.5: Soil Survey Availability and Status

SOIL SURVEY NAME	DATE	SURVEY STATUS
Meadow Valley Area	1976	Out of Date
Pahrnagat-Penoyer Area	1968	
Nye County Northeast	2002	Published/Usable
Lincoln County North Part	N/A	Mapping In Progress
Lincoln County South Part	1990	Published/Usable
Nevada Test and Training Range (NTTR); Nevada Test Site (NTS)	N/A	Unsurveyed

4.1.9.3 Invasive Species

In recent years, the National Governors' Association has led a national invasive species initiative to highlight the very serious, growing, and costly problem of invasive species throughout the country. Nevada is one of the few remaining states with the opportunity to avoid being overrun by invasive species, and the state is working hard to fend off the growing threat. A variety of invasive species have already become established in Nevada, and researchers in cooperation with local, state, and federal agencies are actively engaged in efforts to hold invasive species at bay and prevent further expansion. Invasive species spread through a variety of ways. For instance, seeds can collect on the tires and body of construction equipment and be transported to new areas, thereby contaminating other sites. The same is true of almost any vehicle in use in the construction area. The proposed railroad construction area is in one of the most sensitive and susceptible environments for certain invasive species, including noxious weeds. Invasive species found in the construction area would require immediate control and abatement treatment. In addition, the treated areas would require careful planning and monitoring by qualified specialists to assure that adaptive species and sound cultural practices are effectively utilized to avoid reinvasion by undesirable species. The proposed railroad route is presently mostly free of invasive species. Priority must be given to identifying and mapping existing invasive species and development of avoidance plans to assure that construction does not encourage the spread of invasive and noxious weeds. Coordinating with the local weed districts such as the Tri-County Weed District (White Pine, Nye, and Lincoln counties) would help to familiarize the DOE and the contractors with weed issues, and provide a means to best address the problem.



**Figure 4.6 Calliente Rail Corridor
& Alternatives:
Soil Survey Status**

- Legend**
- DOE Preferred Alternative
 - DOE Alternative
 - Lincoln County Short Route Alternative
 - Lincoln County Colter Road Pass Alternative
 - Lincoln County
- NV Soil Survey Areas**
- Un-Surveyed Area
 - Out of Date
 - Published
- RESOURCE CONCEPTS INC.**

**DOD - Nellis Air Force Base (NTTR)
and
DOE - Nevada Test Site (NTS)**

Russian knapweed (*Acroptilon repens*) is a state-listed noxious weed with the potential to invade the proposed corridor area. Russian thistle, an annual weed (*Salsola kali*) dries as tumbleweeds and accumulates into piles of flammable material. Halogeton (*Halogeton glomeratus*) is a weed species that has spread throughout many areas through which the track would run. It establishes in disturbed areas, out-competes native vegetation for life sustaining resources, and has poisonous properties. Cheatgrass (*Bromus tectorum*) is another species that establishes in disturbed areas, although typically this annual grass invades burned or other heavily disturbed areas and establishes on a site before native species can re-establish. Tall whitetop (*Cardaria draba*) and saltcedar (*Tamarix ramosissima*, AKA tamarisk) are a concern as well in more mesic areas. The best way to control weeds is to reseed the disturbed area with adapted plant species as soon as possible to prevent weed species from establishing and out-competing the seeded species.

The subject of invasive species is a matter of universal concern to the Permittees interviewed for this report. The proposed railroad presents a risk of exposing Nevada to an unprecedented introduction of invasive species from outside areas during the construction, use, and maintenance activities. Preventative measures must be developed and implemented to reduce the risk of invasive species on-site. The threat of invasive species can be minimized if contemporary science, current technical knowledge, and practical application are fully utilized.

4.1.9.4 Wildfire

Nevada has experienced devastation across millions of acres of rangeland and natural resources from wildfires over the past decade. Millions of dollars have been spent combating wildfires, with millions more spent on the subsequent revegetation attempts. The region where the proposed railroad is to be located is presently not a notable area for historic wildfire activity, although large-scale wildfires are now beginning to occur as a result of some unusually intense rainfall seasons. The majority of the vegetation communities located within the proposed project area are known to be susceptible to ignition. Some of the most susceptible communities include the sagebrush, salt desert shrub, white sage, pinyon pine, and Utah juniper communities, which can also be highly valued and essential to the success of livestock production operations that depend upon them for forage and/or cover.

Because only limited vehicle traffic occurs in this remote area and there is little residential occupancy, human-caused wildfires are rare. In addition, very little biomass accumulates in the typically short-stature salt-desert shrub vegetation type because of the dry conditions and short growing seasons. However, under conditions of increased annual precipitation, the fire threat is exacerbated by the flush of annual grasses such as cheatgrass and red brome. Unless these plants are grazed or otherwise reduced during the short growing season, they rapidly convert to a dry flashy fuel, capable of fueling a fast-moving and destructive wildfire. Once a site has burned in the presence of such annual invasive species, it can be infeasible or impossible to reestablish native vegetation under an environment characterized by such intense, inter-specific competitive interactions and possible site-potential alteration. This means that valuable forage sources and native vegetation communities could be lost entirely through fire and subsequent invasion of exotic species, especially if rehabilitation efforts are precluded because of threshold-crossing and environmental conditions that are not conducive to such actions. In addition, fires often result in allotment closure to livestock grazing for at least two years, and in some cases several years due to the length of time that is deemed necessary for the vegetation to become reestablished following fire. These temporary and indefinite allotment closures can have detrimental and terminal consequences for the livestock grazing operations that depend on the allotments for a forage base.

All phases of the project including exploration, construction, maintenance, and operation of the railroad should be performed in a manner that reduces fire ignition risks in every possible manner. During all phases of the project, vehicles traveling through vegetation can pose significant risks of ignition due to the heated undercarriage parts. Human activities such as campfires, using camp-style stoves, throwing unextinguished smoking materials out of vehicle windows or on the ground, and improper garbage disposal can present potential ignition risks. Earth moving equipment can produce sparks due to metal-on-metal and metal-on-rock friction inducing activities. There is concern that trains may still be susceptible to occasional wheel sparking, despite new technology that has mitigated many of the historic ignition risks. In a region with minimal water and fire suppression capabilities, every effort should be made to strengthen and ensure the presence of fire suppression resources such as stored water along the railroad route, additional firefighting apparatus, heavy equipment (i.e. graders), and trained first responders, so that all risks and impacts of fire can be effectively minimized during every stage of the project.

4.1.10 Loss of Livestock

This issue mirrors the foregoing 4.1.3 ROW Fencing issue. A dominant reason to consider fencing the ROW is to reduce the risk of train-livestock collisions and the resulting loss of livestock. The fact that the Permittees' fencing preferences are so varied reflects two factors. The circumstances are highly variable from allotment to allotment, and the perceptions of the problem itself are equally variable.

There is no denying the fact that livestock will be struck, injured or killed due to rail construction and operations. The extent to which this may occur is highly variable and depends on construction and worker activity, cuts and fills, train speed, and train frequency. Even if ranchers are compensated for the value of lost animals, as mandated by state law, the prospect of losing the animals is unpleasant and disruptive to livestock operations. The market value of the lost animal does not include the lost production of that animal (i.e. a cow with calf or future offspring), or the lost behavioral conditioning of that animal. Replacing a range acclimated animal with an animal unfamiliar with its range comes with a loss of grazing efficiency. Dead livestock creates an unpleasant situation, and may further affect grazing operations by attracting scavengers and predators. It should be the DOE's responsibility to remove those animals killed by rail construction or operations in a timely manner.

4.1.11 Construction

Construction activities associated with the proposed rail could have profound impacts on grazing operations both during and after construction. Construction activities have the potential to greatly alter the grazing system within a particular allotment on a temporary basis, see Section 4.1.1. These impacts may be applicable to some allotments outside of the designated ROW. For example, well pads, quarries, borrow pits, haul roads, and construction camps may cross or be located on allotments that would not be directly affected by the proposed ROW. The project team requested information regarding these items from the DOE prior to the analysis stage of the report preparation. The DOE did not provide any information regarding these issues until the Draft EIS was released. The release date was well after the analysis and grazing Permittee interviews had taken place. As such, only generic information could be conveyed between the project team and the Permittees. The following issues were raised in regards to construction.

Water is of critical importance to all Permittees. Many Permittees hold water rights, considered private property, as governed under Nevada State Water Law. Allotments that contain water-base property have additional private property rights associated by Federal Law under the Taylor Grazing Act. Drilling of construction wells and subsequent pumping could result in ill effects to critical stockwater sources, and infringe upon the private property rights associated with these water sources. Exploration and drilling of test or production wells would also increase the amount of disturbance to the vegetation and livestock within an allotment.

Excess soil disturbance from construction activities could have long-term ill effects on the Permittees. Disturbed soils would result in the loss of native vegetation as well as increasing the potential for noxious weed establishment. Due to the fragile ecosystems encountered within Lincoln County, the chances of successful revegetation may be low. Above all else, the amount of disturbance must be kept to an absolute minimum. All areas must be revegetated and monitored for multiple growing seasons to determine success. If initial revegetation efforts are not successful, then alternate efforts may be required. Monitoring and control of noxious weeds must be conducted. Establishment of noxious weeds on disturbed areas can create a host of issues within an allotment. This includes the potential loss of livestock due to establishment of poisonous plants, and/or the potential loss of AUMs due to vegetation conversion or wildfires as a result of highly flammable invasive species.

Construction activities as well as the activities of workers have the potential to negatively affect livestock operations. Construction activities such as excavation, hauling of materials or blasting may directly affect livestock and alter use patterns as discussed in Section 4.1.1. Additionally, the presence and activities of construction personnel may result in damage to allotment vegetation and infrastructure or the injury and/or loss of livestock. The presence and leisure time activities by construction crews at work camps and the transportation of construction crews to and from work camps could result in increased disturbance of soil, increased vandalism of infrastructure, and increased harassment of livestock.

Waste disposal and hazardous materials is yet another potential issue associated with construction. Human waste created by construction crews and work camps could result in increased littering, and the potential for unsanitary conditions. The transport and use of hazardous materials such as fuel, lubricants, and parts for machinery increase the potential for negative impacts to water, vegetation and livestock within an allotment. If personal pet dogs are brought on site, this could present an issue with livestock harassment.

4.1.12 Maintenance

The construction and establishment of many types and kinds of infrastructure would occur with the implementation of the proposed DOE Proposed Corridor and Alternatives project. Many of these pieces of infrastructure are subject to decay and disrepair over time due to natural processes and intended use. Maintenance would require regular inputs of labor and materials to preserve the functionality of such infrastructure, which needs to have an identified responsible and qualified party. This party should be able to perform the maintenance at predetermined and acceptable frequencies and quality standards. Construction and maintenance should conform to BLM standards and guidelines.

4.1.12.1 Fencing and Gates

The ROW may be fenced along at least some portions, and potentially all portions of the railroad. Fences and the associated gates typically have to be regularly maintained and

repaired due to the nature of the present environmental conditions, human activities, and animal activities that threaten the viability of the fences and gates over time, and therefore the purpose of excluding livestock. Maintenance can include anything from replacing single strands or stays, to entire fence or gate replacement. Fences would have to undergo regular maintenance at frequencies recommended by the BLM. Without regularly maintained fencing, the financial solidarity of the livestock production activities can be jeopardized by unnecessary livestock losses due to train collisions and livestock drifting into adjacent allotments. Unmaintained fences can also jeopardize compliance with the Permittee's BLM grazing permit, resulting in penalties and potential reduction or loss of permitted forage use.

Any ROW fence must be rigorously maintained to keep livestock out. If livestock get in and get trapped, there could be higher casualty loss of livestock than if the ROW was not fenced. Additionally, those portions of existing fencing, and newly required gates and cattleguards discussed in Section 4.1.7, within the operational corridor must be rigorously maintained.

4.1.12.2 Cattleguards / Underpasses / Livestock Trail, Vehicular Trail, and Road Crossings

The DOE Proposed Corridor and Alternatives would intersect many livestock trails, vehicular trails, and roads that are used regularly during the normal function of the livestock grazing operations. Many of these intersections would be mitigated with construction of traditional ramp-style crossings over the railroad, or underpasses. Cattleguards would also need to be installed at the crossings where the ROW is fenced. Without maintenance of the crossings and cattleguards the livestock grazing operations could be negatively impacted due to the difficulty or impossibility of moving vehicles and livestock throughout the allotments as required for normal livestock operations.

4.1.12.3 Rehabilitation Areas and Seedings

During the construction phase of the DOE Proposed Corridor and Alternatives, some of the vegetation and forage along the ROW would be disturbed either permanently or temporarily. If the disturbed vegetation and forage were mitigated using rehabilitation techniques, these sites would have to be maintained at least temporarily with exclusion fencing or other means to prevent compromise of seeding success. When the rehabilitation has been deemed successful, then the fencing could be removed or used as a continuing livestock management facility. Without proper maintenance of the rehabilitation areas and seedings, the success of the mitigation efforts could be compromised.

4.1.12.4 Invasive Species, Noxious Weeds and Wildfire

As discussed in the previous section the establishment of invasive and/or noxious weeds is of critical concern to grazing permittees and land management personnel. Any time soil is disturbed it provides an opportunity for the establishment of these species. In addition, trains, construction and maintenance equipment can serve as vectors for seeds and other materials that may result in the introduction and establishment of noxious weeds. It is imperative that the ROW is monitored and maintained to limit the establishment of noxious weeds. This entails the rapid revegetation of disturbed sites, and the potential need for mechanical or herbicide treatments to prevent establishment and spread of noxious weeds.

Wildfire is yet another issue of critical concern for permittees and land management agency personnel. The threat of wildfire is exacerbated by increased human presence, construction activities, and railway operations. All feasible measures must be taken to prevent the start, or limit the spread of wildfire during the construction and operation of the rail.

4.1.12.5 Pipeline Crossings and Other Culverts

The DOE Proposed Corridor and Alternatives would cross numerous water conveyance infrastructures and natural formations such as pipelines, ditches, canals, drainages, creeks, and washes. These are all either directly important to the livestock production operations as water sources for livestock production and farming practices, or indirectly as water sources for rangeland and forage vegetation conservation. All of these crossings should be mitigated in some way or another with culvert types of infrastructure, but the maintenance of the mitigation units is critical for maintaining their functionality to the Permittees and ecological processes. Pipeline maintenance could include regular inspections and pipeline repair where vibration or other sources of disturbance compromise the strength of the pipes. All culverts and pipeline crossings must be kept clear of debris so that water can flow freely and pipelines can be inspected, removed, repaired, and replaced as necessary. If maintenance on such infrastructure is not completed, the livestock production operations could be potentially impacted due to a lack of water for livestock consumption, farming practices, and natural resource conservation. A pipeline crossing design feature that is widely recommended is to bury a culvert pipe larger than the water conveyance pipe so the conveyance pipe can be inserted, removed and reinserted easily for maintenance.

4.1.13 Wildlife

As it pertains to public lands, Resource Concepts, Inc. (RCI) conducted a cursory review of the wildlife impacts posed by both the Lincoln County Short Route and the DOE proposed corridor and alternatives. Wildlife specific impacts consist mostly of degradation of suitable habitat, restriction of free movement of wildlife, disturbances and potential impacts associated with sensitive, threatened or endangered species. Information was garnered from interviews with wildlife staff from both the Nevada Department of Wildlife (NDOW) and the BLM. Distribution maps were obtained for sage grouse, and big game species from NDOW, and are shown in the following figures (Figures 4.7, 4.8, 4.9, & 4.10). Mitigation of impacts was not presented in this report, and should be conducted with the input of state and federal agency personnel.

The loss and fragmentation of suitable habitat is of some concern during construction and operation of the rail line. In addition to the area that is disturbed during construction, the increased potential for invasive weeds, and wildfire pose a long-term threat to wildlife habitat. Of particular concern are water sources near the proposed rail line. Natural springs and streams, along with man-made water sources such as stockwaters and guzzlers provide critical water sources for terrestrial wildlife. Natural springs and streams provide critical habitat for terrestrial wildlife as well as aquatic species. The rail itself may pose a barrier to movement of terrestrial wildlife, particularly if the rail is fenced. Any fencing should be constructed to wildlife specifications. Loss of wildlife due to train operations can be expected especially in areas where cuts and fills are extensive, or train speeds are high. Disturbance caused by rail construction and operation may result in avoidance of suitable habitat or water sources near the rail.

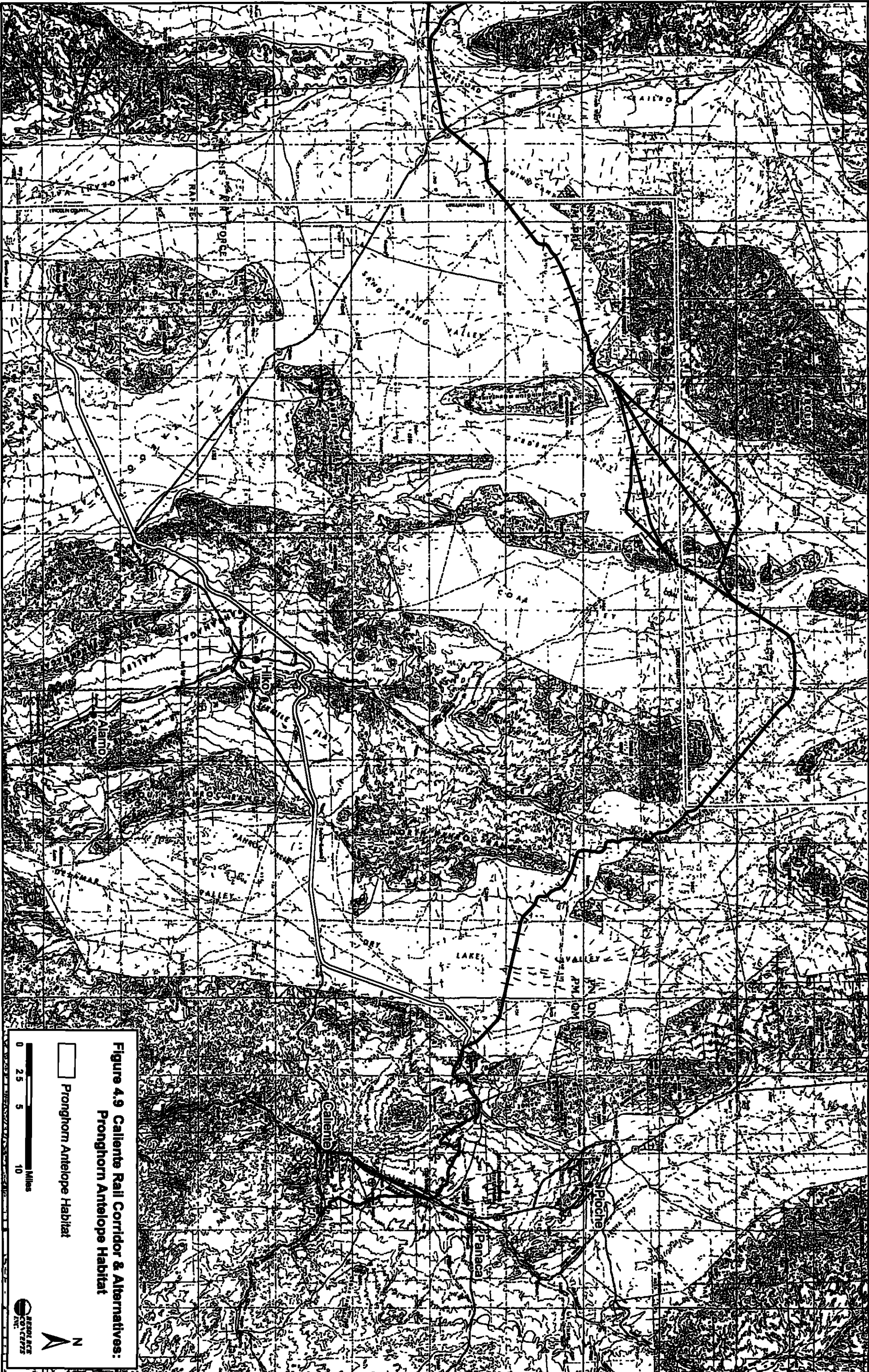


Figure 4.7 Caliente Rail Corridor
and Alternatives: Bighorn Sheep Distribution

Bighorn Sheep Distribution

0 2.5 5 10 Miles





**Figure 4.9 Caliente Rail Corridor & Alternatives:
Pronghorn Antelope Habitat**

□ Pronghorn Antelope Habitat

0 2.5 5 10
Miles





Figure 4.10 Caliente Rail Corridor & Alternatives: Sage Grouse Habitat and Distribution

-  Sage Grouse Nesting Habitat
-  Sage Grouse Summer Distribution
-  Sage Grouse Winter Distribution

0 2.5 5 10 Miles



4.1.14 Wild Horses

Wild Horses are a protected specie by virtue of the Wild and Free-Roaming Horse and Burro Act (Public Law 92-195).

The DOE Proposed Corridor and Alternatives bisects four Herd Management Areas (HMAs) for wild horses. See Figure 4.11. The four HMAs are Little Mountain, Highland Peak, Dry Lake, and Seaman.

If the railroad ROW is fenced, the wild horses would be adversely impacted by dividing their HMAs which would restrict the opportunity for wild and free roaming movement within their habitat, as well as restrict their access to certain portions of their legally designated habitat. If the ROW is not fenced, the protected specie would be subjected to train-wild horse collisions and loss of life. Both potential adverse impacts should be analyzed in the EIS for the proposed DOE Proposed Corridor and Alternatives – that is the habitat restrictions, and the taking of the protected specie.

On the other hand, the Lincoln County Short Route does not bisect any HMAs. It only parallels the southern boundary of the Rattlesnake HMA.

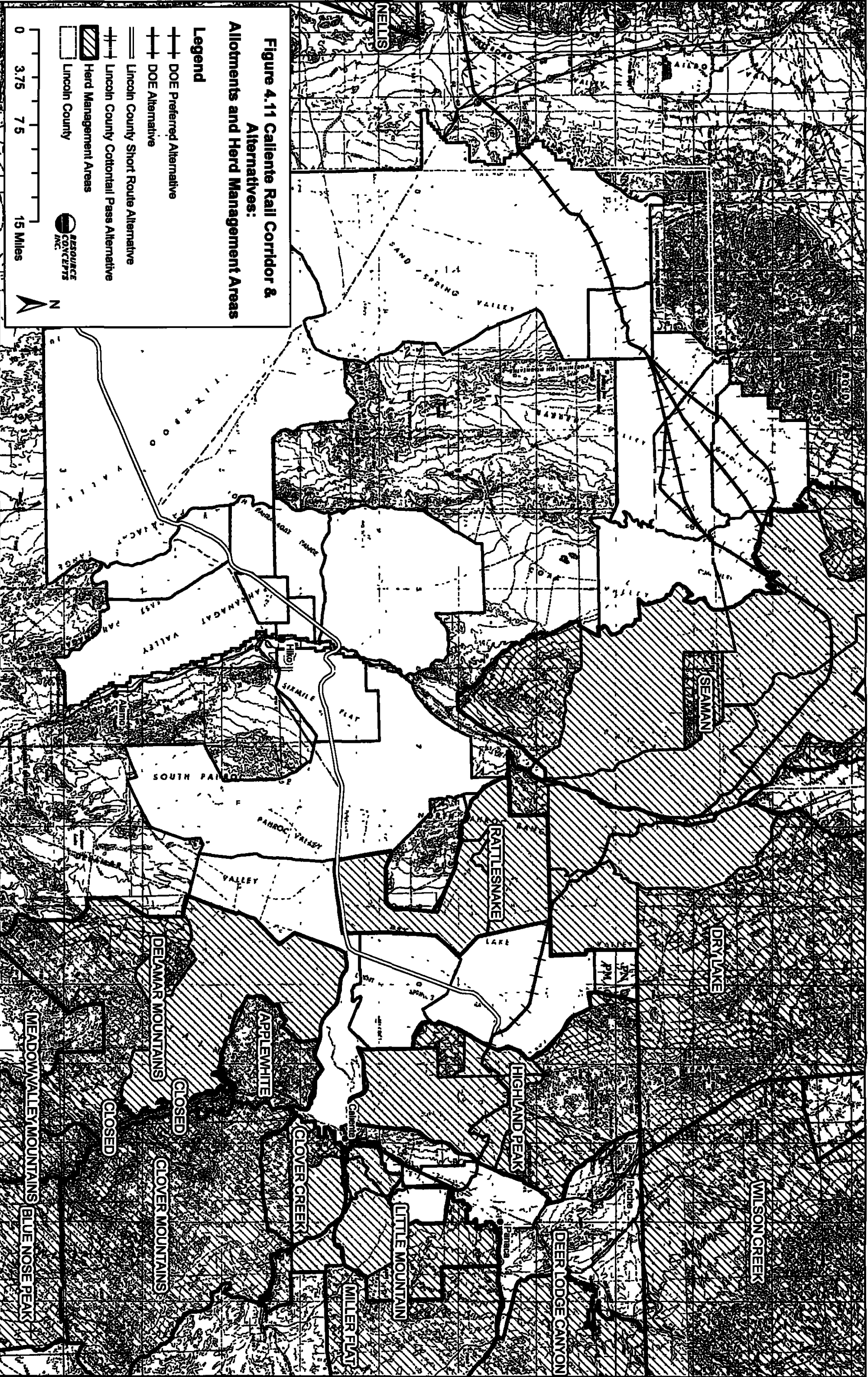
4.1.15 Unavoidable Adverse Impacts

Adverse impacts that are unavoidable, and in large part unmitigatable have been evaluated, see Section 4.4. These impacts were identified by the Permittees, and include such items as impacts to solitude, tranquility and views. They also include devastating impacts on grazing operations that threaten the existence of an economic enterprise in any given allotment.

4.2 IMPACTS OF PROPOSED RAIL CORRIDORS AND ALTERNATIVES

This Section includes a summary of the impacts that were identified by the project team. Impacts were assessed through interviews with Permittees who held permits on grazing allotments that had a significant portion of the proposed alignment within them. This assessment did not consider those peripheral allotments that may be impacted by construction activities away from the proposed rail corridor. In general impacts were lumped into one of the categories listed below. An allotment specific analysis, which discusses the specific impacts associated with each allotment analyzed, is included in Volume II, Appendix 2.0 of this report. These impacts should be considered preliminary, and subject to change based on final rail alignment and operational criteria. Permittees should be included in the final impact assessment for their allotments. A brief summary of each general impact category is as follows.

Grazing allotments: The project team assessed each grazing allotment that was deemed to have potentially significant impacts due to the proposed rail corridor or alternatives. An allotment specific analysis, which discusses the specific impacts to each allotment analyzed, is included in Volume II, Appendix 2.0 of this report.



Grazing systems, livestock movement and distribution: These impacts were not tabulated, as they applied to every grazing allotment. It would be difficult to quantify the degree to which the proposed rail corridor would affect these items as every allotment and grazing system is different. The degree to which these items would be impacted can be correlated to the length of proposed corridor through a given allotment. However, location of the corridor and the topography of the allotment also play a critical role. These impacts are accounted for in Section 4.3 Suggested Management Actions to Mitigate Potential Adverse Impacts.

Construction right-of-way and length of line: The length of the proposed rail line across each allotment was estimated using the proposed rail corridor and alignment that was provided by DOE at the time of the project team analysis. The construction ROW was calculated as 1,000' wide. This is consistent with the dimensions presented in the Draft EIS. It was assumed that the entire area within the construction ROW would be disturbed. It is likely that the amount of disturbance within a given allotment would exceed this amount as it does not account for excessive cuts and fills. Nor does this figure account for areas disturbed by construction camps, ballast quarries, borrow pits, haul routes, or construction water well pads and explorations. These numbers should be viewed as preliminary, as the exact quantities cannot be determined prior to establishing a final alignment and associated construction areas.

Land base property: Any parcel of private property serving as the base property for a given allotment with the potential to be affected by the proposed rail corridor was counted as being impacted. This entailed the rail running directly through or adjacent to the land base property.

Water base property: Any allotment that had a water base, a combination base property, or the potential for a water base was analyzed for impacts. Impacts to water base property was broken into three categories: permanent stockwaters within four miles of the proposed rail corridor, permanent stockwaters within one mile of the proposed rail corridor, and pipe crossings. Permanent stockwaters included tanks, troughs, or reservoirs where the source of water was the base property. Each place of use originating from a base property was classified as its own individual water base property as well as any pipeline which conveyed water from water base property to a place of use. These waters carry an added level of significance as they are considered private property under the Taylor Grazing Act, as well as under State Water Law for those waters that possess a water right.

Existing fence: If the proposed rail corridor crossed an existing fence, such as an allotment boundary fence or interior pasture fence, it was considered to be an impact. Unless properly mitigated, any such crossing would result in a loss of functionality of the fence during construction and operation of the rail.

Capital improvements: Any stock corrals or chutes that would be directly impacted by the proposed rail corridor were counted as being impacted.

Stockwaters within 4 miles: Any water source used for the purposes of watering livestock was considered to be impacted if it resided within four miles of either side of the proposed rail corridor. This includes precipitation catchments, water haul reservoirs, tanks, troughs, natural springs, etc. Only one impacted source was counted in the case of water combinations such as a tank with an associated trough. Four miles is considered the service

area for a stockwater. The stockwaters within one mile were also counted within this category. This category includes water-based stockwaters.

Stockwaters within 1 mile: Any water source used for the purposes of watering livestock was considered to be impacted if it resided within one mile of either side of the proposed rail corridor. This includes precipitation catchments, water haul reservoirs, tanks, troughs, natural springs, etc. Only one impacted source was counted in the case of water combinations such as a tank with an associated trough. Stockwaters within a mile of the proposed rail corridor carry a degree of significance due to cattle congregation near water. This category includes water-based stockwaters.

Creeks: Any creeks or washes that are used as a source of stockwater or were identified by the Permittee as important to the allotment watering system were considered to be impacted if crossed by the proposed rail corridor.

Pipelines: Any pipeline associated with stockwater was considered to be impacted if crossed by the proposed rail corridor

Roads: Any road that was identified on USGS quad maps was considered to be impacted if crossed by the proposed rail corridor.

Trails: Any vehicle trail that was identified on USGS quad maps or by the Permittee was considered to be impacted if crossed by the proposed rail corridor. This classification includes pipeline or fence line maintenance trails, two track roads or livestock trails identified by the Permittee as essential to grazing operations.

It should be noted that all Permittees interviewed felt that it was essential to maintain free access to all roads and trails identified. If at any time access to these roadway and trail crossings becomes restricted it would prove to be detrimental to their livestock operations.

Other: Any other impacts the Permittee felt could result from the proposed rail corridor were tabulated under this category. Many of these items would be discussed further in Section 4.4 Unavoidable Adverse Impacts; Short-term Uses and Long-term Productivity; and Irreversible or Irretrievable Commitments of Resources

An overall tabulation of the impacts identified during the project team assessment is shown in Table 4.6.

4.2.1 DOE Proposed Corridor and Alternatives

The naming convention for the various segments of the DOE Proposed Caliente Corridor was adopted to match those designated in the Draft EIS.

4.2.1.1 DOE Caliente Alternative Segment

Following analysis, the project team determined that there were no significant impacts to grazing allotments by the DOE Caliente Alternative Segment as the segment runs primarily on private land as shown in Figure 4.12. This is the DOE preferred alternative.

Table 4.6: Impacted Features

Route and Alternative	Figure	Allotment	Impacted Features															
			Allotments	Land Base Property	Water Base Property (within 4 Miles)	Water Base Property (within 1 Mile)	Water Base Property (Pipelines)	Existing Fence	Capital Improvements	Stockwaters within 4 Miles	Stockwaters within 1 Mile	Creeks	Pipelines	Roads	Trails	Other	Construction Right-of-Way (acres)	Length of Line (miles)
Department of Energy Callente Alternative Segment	None	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Department of Energy Eccles Alternative Segment	4.13	1. Clover Creek	1	0	0	0	0	1	0	8	1	0	0	1	0	0	96	0.79
		2. Little Mountain	1	0	0	0	0	0	0	1	1	0	0	0	1	0	421	3.47
		3. Peck	1	0	0	0	0	2	0	0	0	0	0	1	1	2	642	5.30
		Total	3	0	0	0	0	3	0	9	2	0	0	2	2	2	1,159	9.56
Department of Energy Common Segment 1A	4.14	4. Comet	1	0	0	0	0	2	0	2	2	0	0	0	0	0	291	2.40
		5. Bennett Spring	1	1	0	0	0	1	0	1	1	0	1	3	0	0	1,245	10.27
		6. Black Canyon	1	0	2	0	0	0	0	2	0	0	0	0	0	0	415	3.42
		Total	3	1	2	0	0	3	0	5	3	0	1	3	0	0	1,950	16.09
Department of Energy Common Segment 1B	4.16	7. Ely Springs	1	0	11	7	5	3	0	12	7	3	5	3	3	0	1,389	11.46
		8. Rattlesnake	1	0	2	2	0	1	0	2	2	0	0	1	0	0	119	0.98
		9. Thorley Use Area	1	0	10	6	1	1	1	10	6	0	1	3	0	0	805	6.64
		10. Deadman Use Area	1	0	0	0	0	1	0	5	4	0	0	1	3	0	1,027	8.47
		11. Timber Mountain	1	0	0	0	0	2	0	2	1	0	0	2	1	0	787	6.49
		12. Sunnyside	1	0	0	0	0	0	0	5	1	0	0	1	3	0	1,321	10.90
		Total	6	0	23	15	6	6	1	36	21	3	6	11	10	0	5,447	44.94
Department of Energy Garden Valley Alternative Segment 3	4.17	13. Needles	1	0	8	3	1	0	0	11	3	0	1	3	8	1	1,632	13.46
		15. Batterman Wash	1	0	0	0	0	1	0	5	4	3	0	2	2	5	1,142	9.42
		16. Pine Creek	1	0	0	0	0	2	0	5	2	1	1	1	1	0	349	2.88
		17. Cottonwood	1	0	4	1	1	2	0	12	4	0	1	1	3	0	497	4.10
		Total	4	0	12	4	2	5	0	33	13	4	3	7	14	6	3,619	29.86
Department of Energy Garden Valley Alternative Segment 1 (Preferred Alternative)	4.17	13. Needles	1	0	8	2	1	0	0	11	3	0	1	3	8	1	1,632	13.46
		15. Batterman Wash	1	0	0	0	0	1	0	3	4	3	0	1	1	5	657	5.42
		16. Pine Creek	1	0	0	0	0	2	0	7	2	3	1	1	1	0	570	4.70
		17. Cottonwood	1	0	3	1	1	2	0	13	4	0	1	2	1	0	536	4.42
		Total	4	0	11	3	2	5	0	34	13	6	3	7	11	6	3,394	28.00
Department of Energy Garden Valley Alternative Segment 2	4.17	13. Needles	1	0	8	3	1	1	0	10	4	0	1	2	10	1	1,612	13.30
		15. Batterman Wash	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0.00
		14. Coal Valley Lake	1	0	0	0	0	2	0	0	0	1	0	1	1	0	95	0.78
		16. Pine Creek	1	0	0	0	0	2	0	7	2	3	1	3	3	0	1,161	9.58
		17. Cottonwood	1	0	3	0	1	2	0	13	2	0	1	1	3	0	623	5.14
Total	5	0	11	3	2	7	0	30	8	4	3	7	17	7	3,491	28.80		
Department of Energy Garden Valley Alternative Segment 8	4.17	13. Needles	1	0	8	3	1	1	0	10	4	0	1	2	10	1	1,612	13.30
		15. Batterman Wash	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0.00
		14. Coal Valley Lake	1	0	0	0	0	2	0	0	0	1	0	1	0	0	95	0.78
		16. Pine Creek	1	0	0	0	0	1	0	7	3	1	0	1	2	0	1,270	10.48
		17. Cottonwood	1	0	3	0	1	2	0	13	2	0	1	1	3	0	623	5.14
		Total	5	0	11	3	2	6	0	30	9	2	2	5	15	7	3,600	29.70
Department of Energy Common Segment 2	4.18	18. McCutcheon Springs	1	0	0	0	0	1	0	3	2	0	0	0	3	0	784	6.47
		19. Sand Springs	1	0	23	9	4	2	0	23	9	0	4	1	3	0	1,622	13.38
		Total	2	0	23	9	4	3	0	26	11	0	4	1	6	0	2,406	19.85
Lincoln County Cottontail Pass Alternative	4.20	13. Needles	1	0	8	3	1	1	0	10	4	0	1	2	10	0	1,656	13.66
		15. Batterman Wash	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0.00
		14. Coal Valley Lake	1	0	0	0	0	1	0	3	0	3	0	3	1	0	697	5.75
		16. Pine Creek	1	0	0	0	0	1	0	0	0	0	0	1	0	0	182	2.43
		17. Cottonwood	1	0	3	1	1	3	0	14	3	0	1	2	4	0	1,138	10.89
		Total	5	0	11	4	2	6	0	27	7	3	2	6	15	5	3,673	32.73
Lincoln County Short Route	4.22	20. Ely Springs	1	0	13	6	2	2	0	13	6	0	2	3	1	0	865	7.14
		21. Cliff Springs	1	0	9	2	1	1	0	9	2	0	1	2	0	0	925	7.63
		22. Oak Springs	1	0	4	0	1	1	0	4	0	0	1	3	0	0	973	8.03
		23. Pahroc	1	0	2	0	1	1	0	2	0	0	1	2	0	0	1,128	9.31
		24. South Hiko - Six Mile	1	0	0	0	0	3	0	4	3	0	0	5	2	0	1,321	10.90
		25. Irish Mountain	1	0	0	0	0	0	0	0	0	0	0	0	0	0	318	2.62
		26. Wildhorse	1	0	0	0	0	0	0	0	0	0	0	1	0	0	91	0.75
		27. Crystal Springs	1	0	0	0	0	2	0	0	1	0	0	1	0	0	496	4.09
		28. Pahrangat West	1	0	0	0	0	0	0	3	0	0	0	1	0	0	218	1.80
		29. Pine Cone	1	0	0	0	0	0	0	1	0	0	0	1	0	0	639	5.27
		30. Bald Mountain	1	0	4	0	0	0	0	9	4	0	0	5	0	0	2,228	18.38
Total	11	0	32	8	5	10	0	45	16	0	5	24	3	0	9,202	75.92		

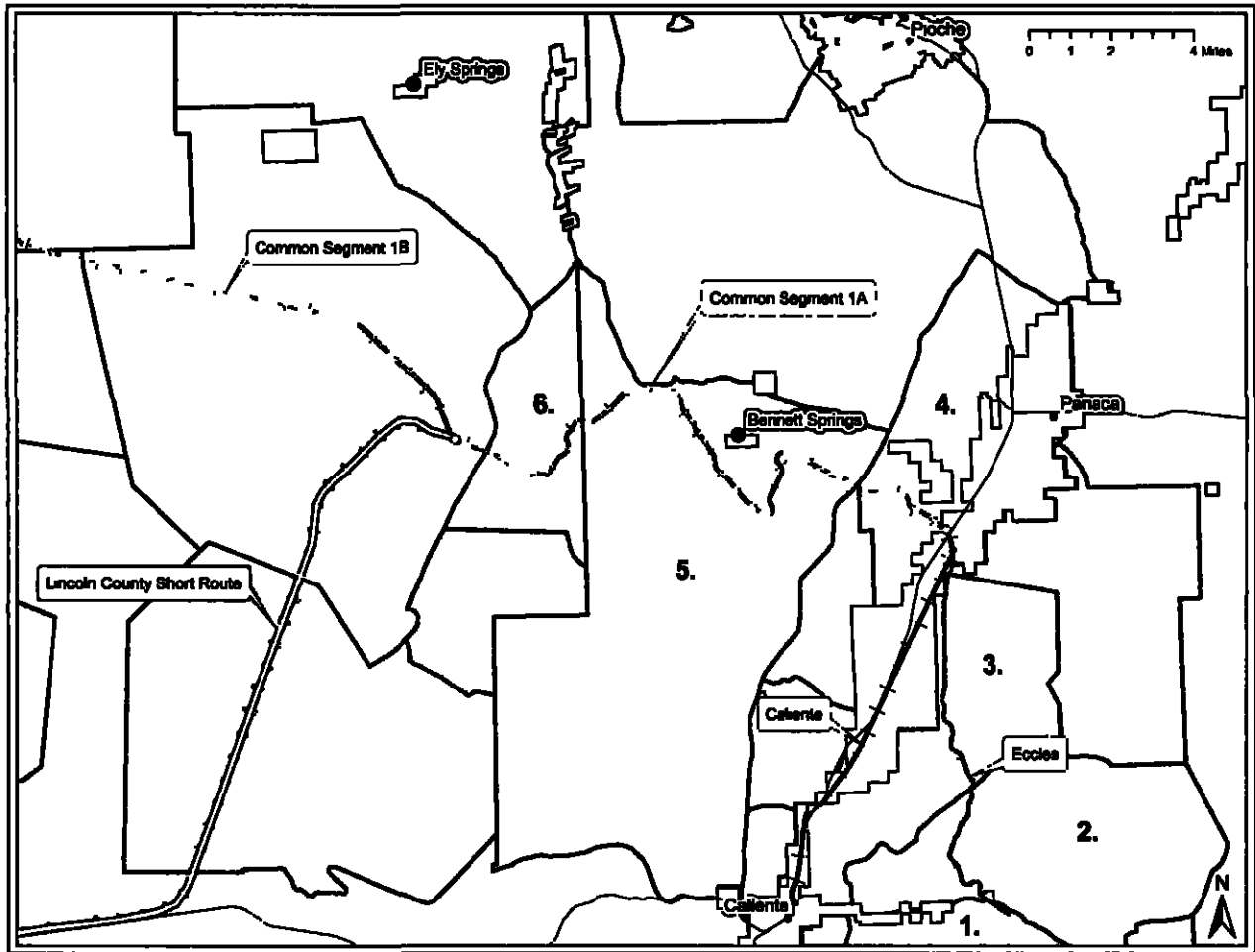


Figure 4.12: DOE Proposed Callente Corridor and Affected Allotments – Callente Alternative Segment, Eccles Alternative Segment, and Common Segment 1A

4.2.1.2 DOE Eccles Alternative Segment

The Eccles Alternative Segment impacts three allotments as listed in Table 4.7. This is not the DOE preferred alternative.

Table 4.7: DOE Eccles Alternative Segment – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Department of Energy Eccles Alternative Segment	1 Clover Creek	96	0.79
	2 Little Mountain	421	3.47
	3. Peck	642	5.30
	Total	1,159	9.56

Impacts within the three allotments are depicted in Figure 4.13.

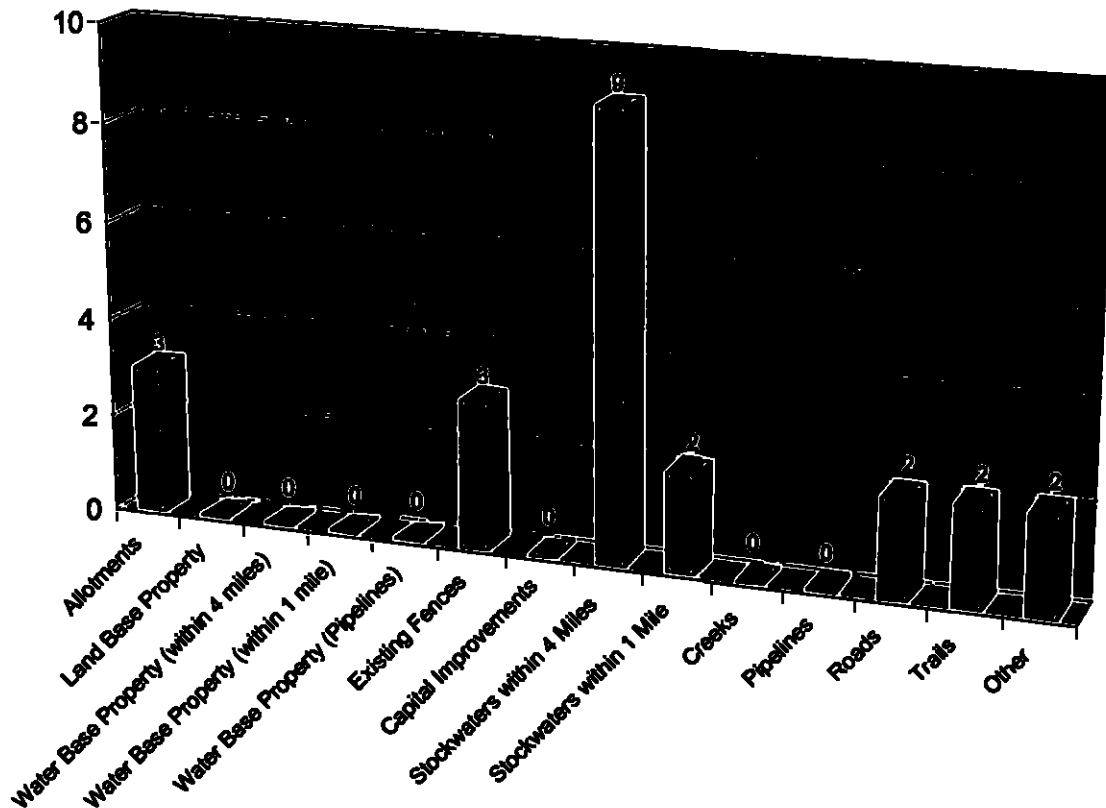


Figure 4.13: DOE Eccles Alternative Segment – Impacted Features

Impacts within these allotments are relatively minor. The most significant impacts would be those associated with loss of vegetation and disturbance of soils. Impacts to current grazing systems and livestock movement would be significant in the Little Mountain and Peck Allotments.

4.2.1.3 DOE Common Segment 1A

For the purposes of this project DOE Common Segment 1 was split into two segments. Segment 1A begins where the Eccles and Callente Alternatives converge, and ends where the Lincoln County Short Route would split from the shared segment. Segment 1B begins at the Lincoln County Short Route departure, and ends where the DOE Garden Valley Alternative Segments begin. There were several instances where the junction of two or more route segments was located within a grazing allotment, rather than at the border of grazing allotments. In such cases the impacts associated with the allotment concerned were assigned to one of the routes, rather than dividing the impacts between routes. Impacts associated with the portion of Segment 1A within the Ely Springs Cattle Allotment were tallied as part of the DOE Common Segment 1B in Section 4.2.1.4. The DOE Common Segment 1A impacts three allotments as listed in Table 4.8.

Table 4.8: DOE Common Segment 1A – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
DOE & Lincoln County Short Route Common Segment 1A	4. Comet	291	2.40
	5. Bennett Spring	1,245	10.27
	6. Black Canyon	415	3.42
	Total	1,951	16.09

Impacts within the three allotments are depicted in Figure 4.14.

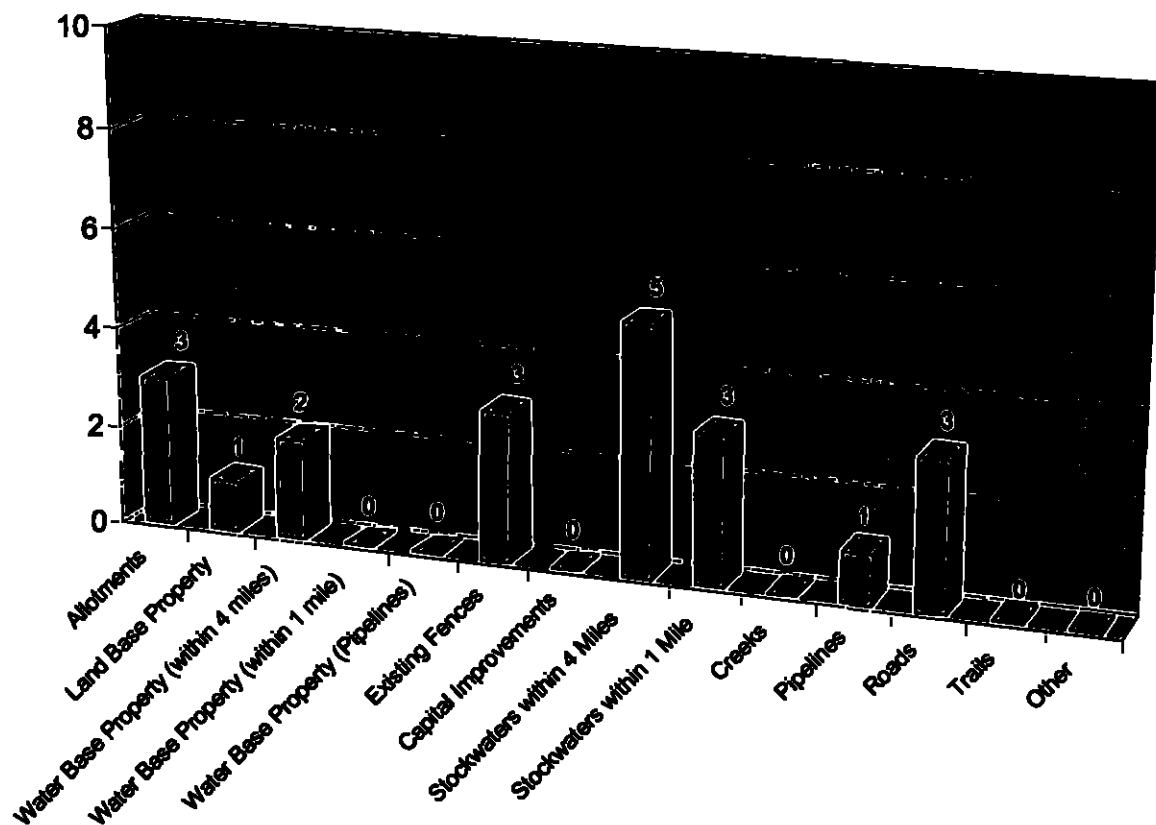


Figure 4.14: DOE Common Segment 1A – Impacted Features

The proposed corridor would isolate the southern portion of the Comet Allotment and affect the grazing system and livestock distribution. Two waters within the allotment would be within one mile of the track. If unmitigated this could result in increased livestock loss due to train collisions. The other two allotments, Bennet Spring and Black Canyon, would suffer tremendous impacts. Both allotments are permitted for sheep use. The proposed rail corridor would isolate the northern portion of the Bennet Spring Allotment and cut the Black Canyon Allotment in half. This would have a profound effect on the grazing system and livestock movement, particularly in the Bennet Spring Allotment. The proposed rail makes a jog to the south around Bennet Spring proper. The private property surrounding the Spring serves as the land base property for the allotment, and the Springs are used as a primary source of stockwater. The proposed corridor would have a direct affect on the land base as it isolates it from the remainder of the allotment. This portion of private property is used for staging of sheep prior to turn out on the allotments. The Permittees on both the Bennet Spring and Black Canyon Allotments feel that the proposed corridor would make their livestock operation economically infeasible, and put them out of business.

4.2.1.4 DOE Common Segment 1B

For the purposes of this analysis the DOE Common Segment 1 was split into two sub-segments, 1A and 1B. Segment 1B begins where the Lincoln County Short Route splits from the DOE proposed rail corridor, and continues to the divergence point of the Garden Valley Alternative Segments. In order to standardize the allotment impact tally, Segment 1B includes all allotments beginning with number 7 Ely Springs Cattle Allotment, and ending with number 12 Sunnyside Allotment as shown in Figure 4.15. That portion of Segment 1B within the Needles Allotment, number 13, was evaluated as part of the Garden Valley Alternative Segments in Section 4.2.1.5.

It should be noted that the Sunnyside Allotment is situated almost entirely within Nye County. This is one of three Nye County Allotments that have been included in this analysis. The other two are the Needles and Batterman Wash Allotments that would be discussed under Section 4.2.1.5. The project team determined that it was appropriate to include these three allotments within the analysis in order to obtain a representative comparison with the Lincoln County Short Route, Section 4.3. In addition, all three Permittees conduct at least a part of their overall ranching operations within Lincoln County. A portion of the Sunnyside Allotment is within Lincoln County. The Permittees in the Needles and Batterman Wash Allotments run these allotments as part of a complex of allotments within Lincoln County. These two allotments serve as a base of operations for their respective grazing complexes.

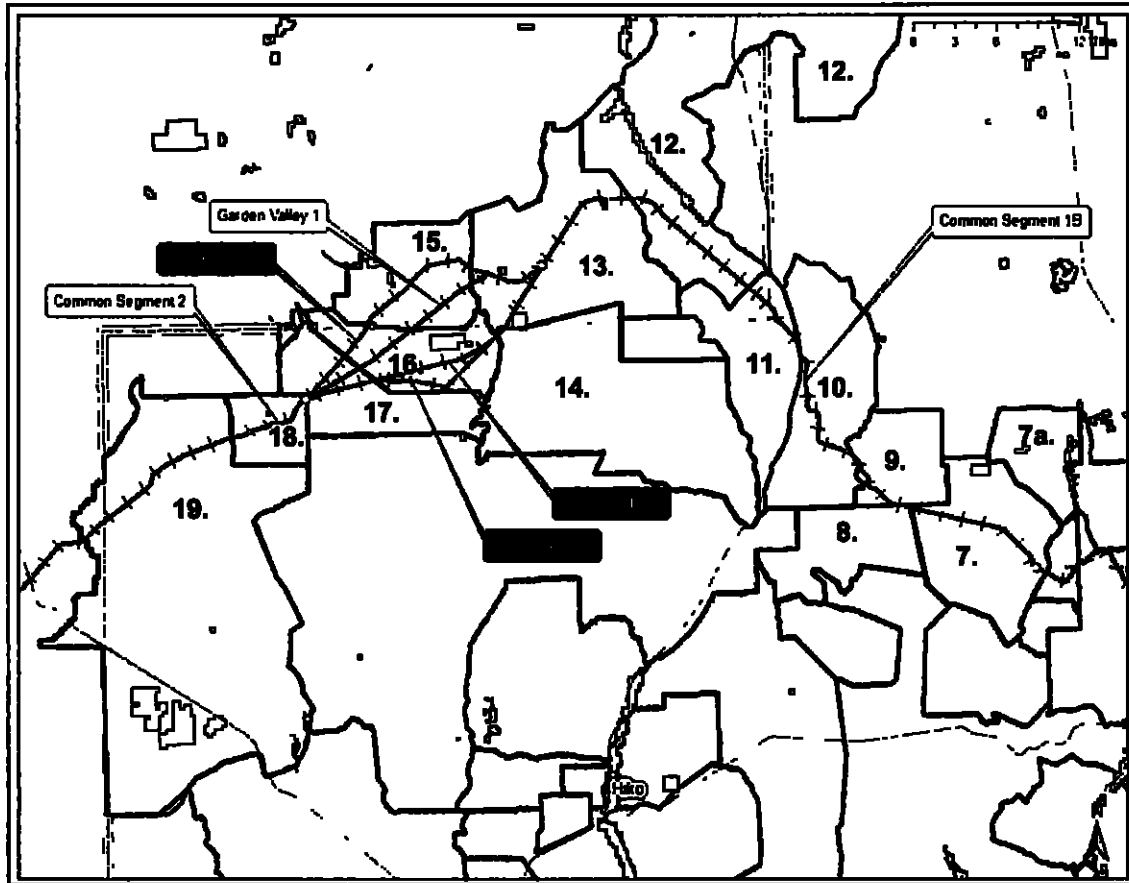


Figure 4.15: DOE Proposed Callente Corridor and Affected Allotments – Common Segment 1B, Garden Valley Alternative Segments, and Common Segment 2

The DOE Common Segment 1B impacts six allotments as listed in Table 4.9.

Table 4.9: DOE Common Segment 1B – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Department of Energy Proposed Route Common Segment 1B	7 Ely Springs Cattle	1,389	11.5
	8. Rattlesnake	119	1.0
	9. Thorley Use Area	805	6.6
	10. Deadman Use Area	1,027	8.5
	11. Timber Mountain	787	6.5
	12 Sunnyside	1,321	10.9
	Total	5,448	45.0

Impacts within the six allotments are summarized in Figure 4.16 below.

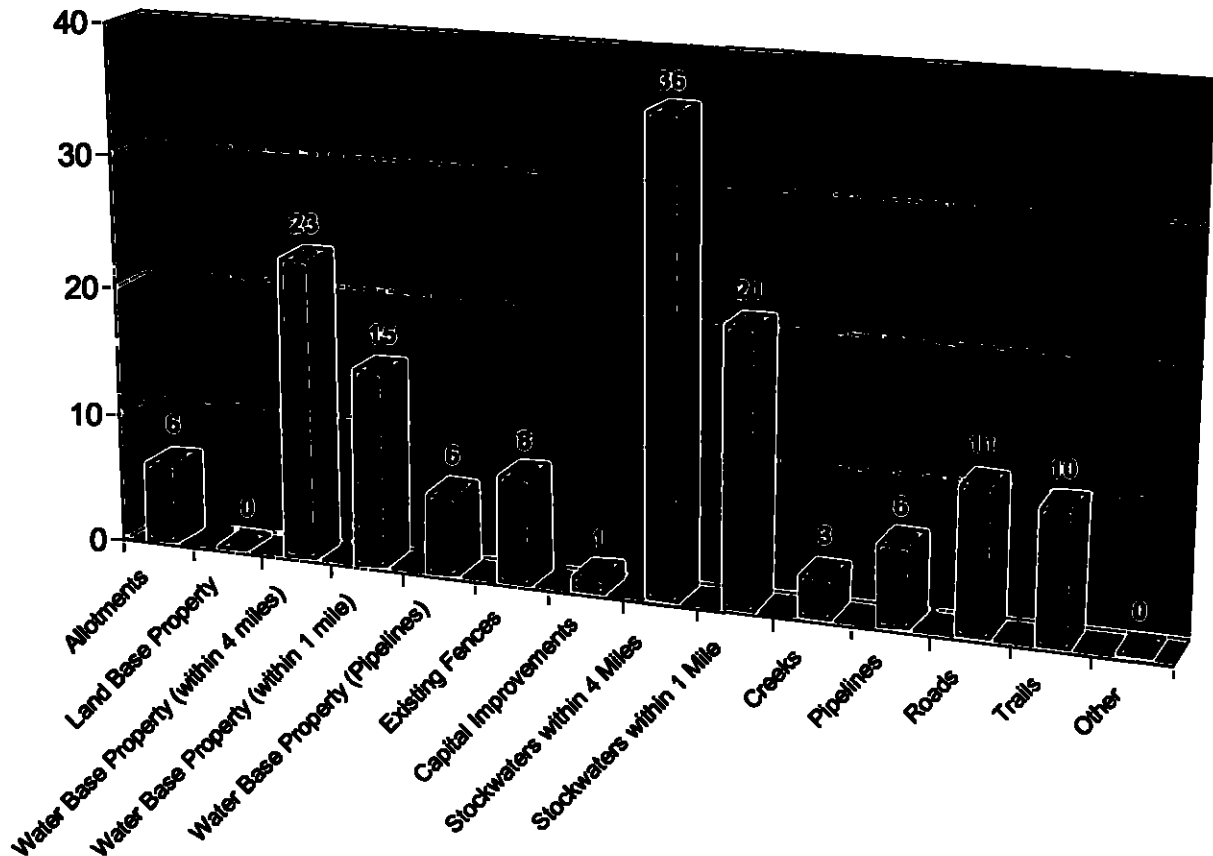


Figure 4.16: DOE Common Segment 1B – Impacted Features

The overall impacts of DOE Common Segment 1B are significant. Five of the six grazing allotments would experience serious impacts to their current grazing operations. The Ely Springs, Cattle Allotment currently operates one of the most intense grazing systems in the entire County. The Allotment is split into four pastures, and employs a rest rotation grazing system in concert with the Ely Springs Sheep Allotment (number 7a in Figure 4.15) to the north. The proposed corridor would cross three of the four pastures, greatly affecting cattle distribution and movement, and isolating small strips of area within the pastures. The majority of the stockwater within the allotment originates at the water base property of Ely Springs and is piped south throughout the allotment. The proposed corridor would impact 11 water base properties within four miles of the track, of which seven are within one mile, in addition to crossing five distribution pipelines. The proposed alignment would also cross three branches of Coyote Wash, tallied as creek crossings, that are critical to livestock watering.

Impacts on the Rattlesnake Allotment are relatively minor compared to the other allotments, as the proposed corridor would cross the extreme corner of the allotment. However, within that short segment the proposed alignment would impact two water-based properties within one mile of the proposed corridor.

Two use areas, Deadman and Thorley, within the Wilson Creek Allotment would be heavily impacted. The proposed corridor would severely impact grazing systems and livestock movement within each allotment, particularly in the Deadman Use Area where sheep are permitted. The Thorley use area is currently a land-based allotment, but is eligible for a partial water base designation under the Ely Rule. If that option was exercised the proposed alignment would run within four miles of 10 water base stockwaters, within one mile of six of those, and cross one pipeline. Three of the stockwaters within one mile of the proposed corridor are springs that serve as stockwater sources for both the Thorley and Deadman Use Areas. The Permittee expressed concern over potential long-term impacts to those springs from construction, particularly any blasting within the area. The Deadman Use Area would also face major impacts. The western portion of the use area contains primary water sources for the Allotment as well as critical feed areas. The proposed corridor would isolate these critical water sources used primarily for water hauling throughout the use area. The proposed corridor would also result in the loss of critical forage, primarily white sage, and the isolation of remaining white sage areas. White sage has been proven very difficult to re-establish once it has been disturbed.

The Timber Mountain Allotment would face significant impacts to the current grazing system, livestock distribution and critical forage. The proposed alignment would isolate the primary source of stockwater and cut across the best forage area within the Allotment, primarily consisting of white sage.

Impacts within the Sunnyside Allotment would be significant. The proposed alignment would isolate primary stockwater sources in the lower elevation of the Allotment from primary upland feed areas. This is of particular concern to the Permittee, as cattle tend to graze the bottoms of large washes in the upland areas. If cattle cannot access these areas or get trapped within the drainages there is a potential for significant loss of cattle or needs to key forage.

4.2.1.5 DOE Garden Valley Alternative Segments

In order to keep impact tallies consistent, all DOE Garden Valley Alternatives were considered to begin where DOE Common Segment 1 enters the Needles Allotment (number 13), and end where the four DOE Garden Valley Alternatives converge at the west end of the Cottonwood Allotment (number 17). It should be noted that the DOE Garden Valley Alternative 1 was identified as the preferred alternative in the DEIS-RA, therefore it has been shown in red while the other alternatives have been depicted in green in Figure 4.15.

The DOE Garden Valley Alternatives 3 and 1 directly impact four allotments as listed in Table 4.10, while DOE Garden Valley Alternatives 2 and 8 directly impact three allotments. Garden Valley Alternatives 2 and 8 do not pass through the Batterman Wash Allotment, but do impact the Allotment as it serves as the base allotment that is part of a seven-allotment grazing complex.

Table 4.10: DOE Garden Valley Alternative Segments – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Department of Energy Garden Valley Alternative 3	13. Needles	1,632	13.46
	15. Batterman Wash	1,142	9.42
	16. Pine Creek	349	2.88
	17. Cottonwood	497	4.10
	Total	3,620	29.86
Department of Energy Garden Valley Alternative 1 (Preferred Alternative)	13. Needles	1,632	13.46
	15. Batterman Wash	657	5.42
	16. Pine Creek	570	4.70
	17. Cottonwood	536	4.42
	Total	3,395	28.00
Department of Energy Garden Valley Alternative 2	13. Needles	1,612	13.30
	15. Batterman Wash	0	0.00
	14. Coal Valley Lake	95	0.78
	16. Pine Creek	1,161	9.58
	17. Cottonwood	623	5.14
	Total	3,491	28.80
Department of Energy Garden Valley Alternative 8	13. Needles	1,612	13.30
	15. Batterman Wash	0	0.00
	14. Coal Valley Lake	95	0.78
	16. Pine Creek	1,270	10.48
	17. Cottonwood	623	5.14
	Total	3,600	29.70

Impacts within the affected allotments are summarized by alternative in Figure 4.17.

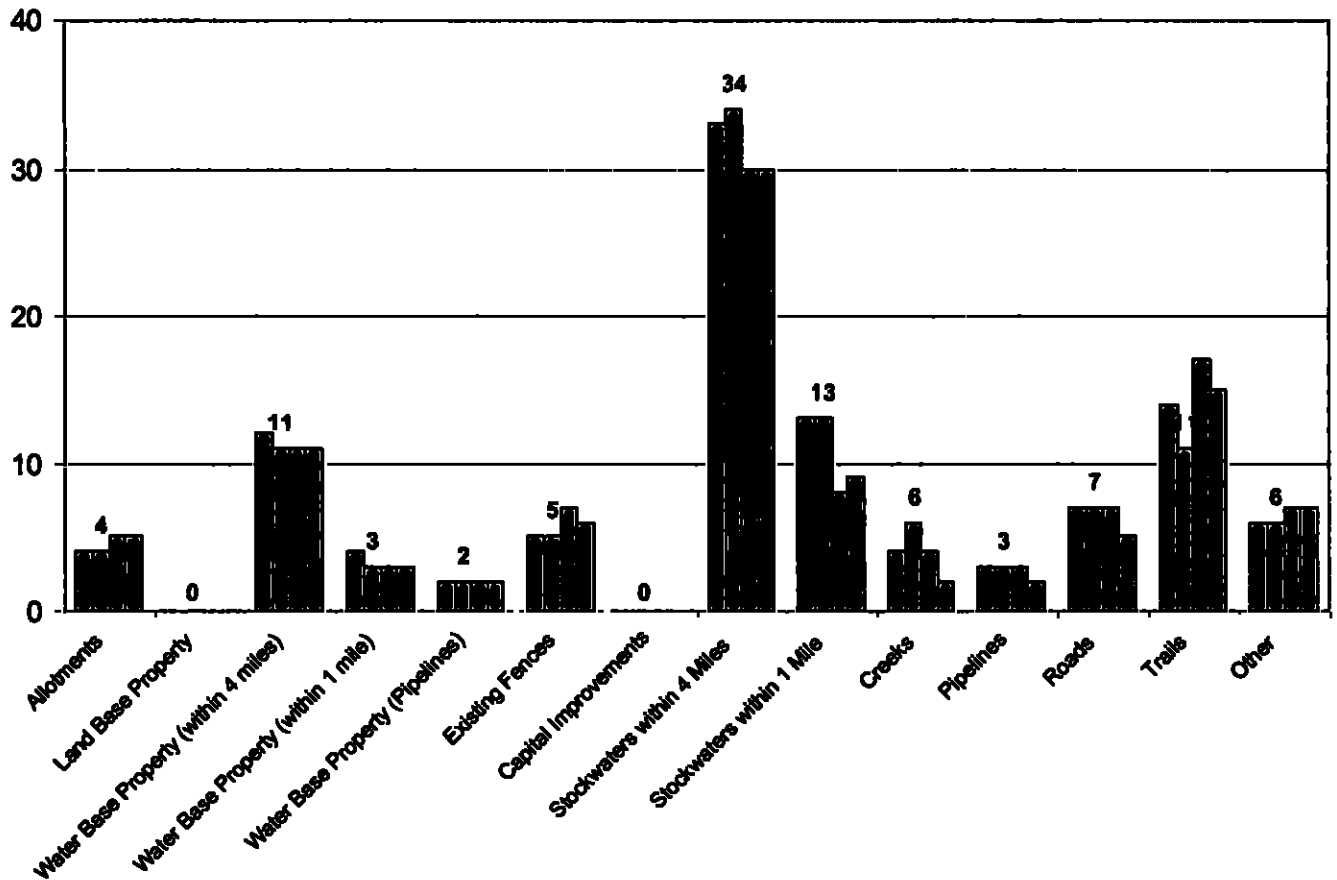


Figure 4.17: DOE Garden Valley Alternative Segments – Impacted Features

Note: Garden Valley Alternative 3 (green)
Garden Valley Alternative 1 – Preferred Alternative (red)
Garden Valley Alternative 2 (green)
Garden Valley Alternative 8 (green)

Impacts within the Needles Allotment would be devastating no matter which proposed corridor was selected. The Permittee runs a combined sheep and cattle operation and a winter camp within the Allotment. The proposed rail corridors would have significant impacts on his grazing system particularly with the current sheep lambing and grazing operations. Either rail alignment would have effects on water base property within the Allotment as well as critical feed. The Permittee uses the Needles Allotment as a base for a broader multi-allotment grazing complex. The proposed rail would impact the greater complex, particularly with regard to livestock trailing operations. Although a major concern was raised over the proposed rail passing through Water Gap for the potential impacts to livestock trailing, the Permittee preferred either Route 2 or 8.

Much like with the Needles Allotment, the impacts to the Batterman Wash Allotment would be devastating. The Batterman Wash Allotment serves as the base allotment for a seven-allotment complex. Other allotments within the complex reside to the west and south of Batterman Wash. Livestock hauling in 18-wheel semi trucks, water hauling by 18-wheel trucks, and livestock trailing would all be greatly impacted, even by proposed corridors 2 and 8 that do not directly cross the Batterman Wash Allotment. In either instance these operations would have to cross the proposed alignment in two locations. One running east-west through Water Gap, and the other running north-south through the Pine Creek and Cottonwood Allotments.

These impacts were tallied under the "Other Impacts" category. In addition to this both Permittees in the Batterman Wash and Needles Allotments felt strongly about unmitigatable loss of their lifestyle, and tranquility in the locations where they reside. Both felt that private property within the allotments would be severely impacted.

All four of the Garden Valley alternatives run through the Pine Creek Allotment. The Allotment is currently managed as one pasture. All of the routes would cut the Allotment into at least two pastures and the fenced rail alignment would be a major impediment to livestock movement. In addition to grazing management impacts the northern three routes cut across an important pipeline and several creeks, which are vital components of the watering scheme for the Allotment. Garden Valley Alternatives 2 and 8 run through Water Gap in the northeastern corner of the Allotment. This is a crucial access point for livestock trailing for all of the Permittees in this area.

The Cottonwood Allotment would be impacted in much the same way by the Garden Valley Alternatives. Impacts to the grazing system would be more severely impacted in the Cottonwood Allotment due to the fenced three-pasture rotation system used by the Permittee. In addition, all of the alternatives also cross a pipeline with water base property rights attached to it.

Alternatives 2 and 8 would also cut across the northwest corner to the Coal Valley Lake Allotment. While overall length and disturbance of the rail corridor is minimal, the major impacts are related to livestock movement and access through Water Gap.

4.2.1.6 DOE Common Segment 2

Two allotments were impacted by DOE Common Segment 2 as listed in Table 4.11.

Table 4.11: DOE Common Segment 2 – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
DOE Proposed Route Common Segment 2	18 McCutcheon Springs	784	6.5
	19 Sand Springs	1,622	13.4
	Total	2,406	19.9

Impacts within the affected allotments are summarized by alternative in Figure 4.18.

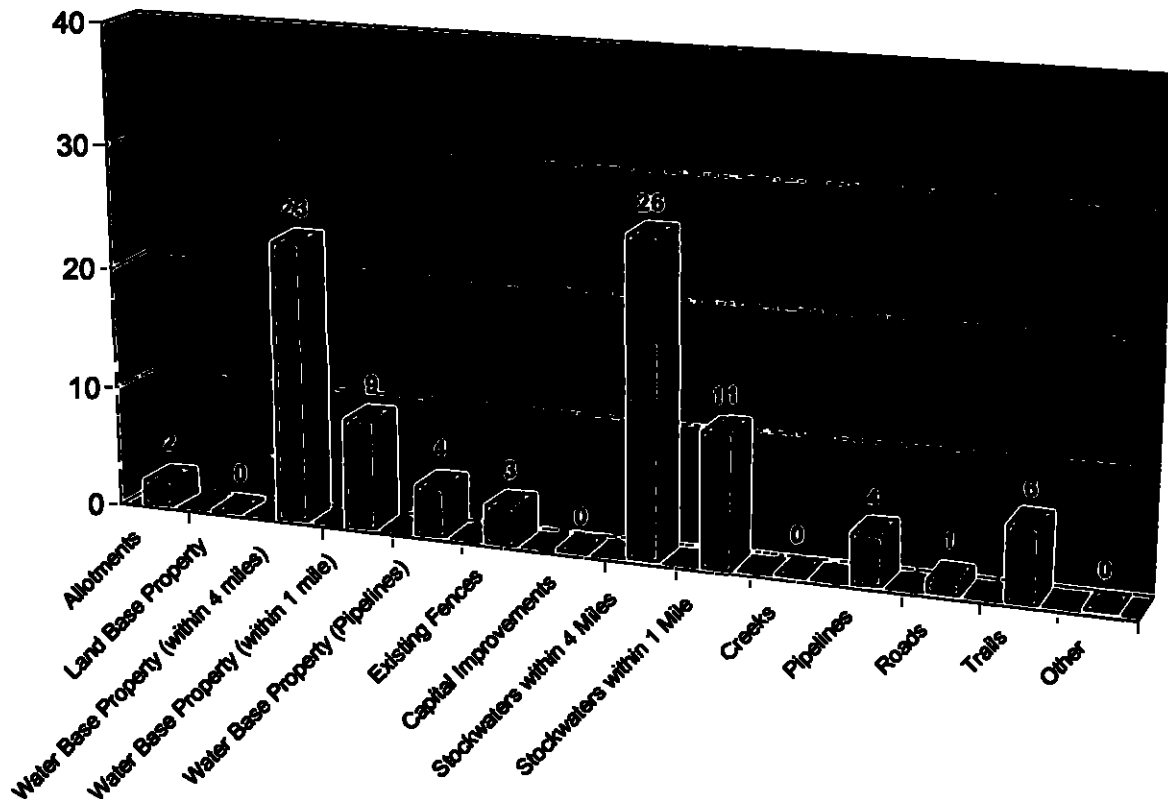


Figure 4.18: DOE Common Segment 2 – Impacted Features

Even though DOE Common Segment 2B only impacts two allotments within Lincoln County, the impacts within these two allotments are significant. The proposed alignment would cut the McCutcheon Springs Allotment in half. The primary water source, McCutcheon Spring, would be isolated in the northern portion of the Allotment leaving that portion to the south of the proposed alignment with no stockwater. This would greatly alter grazing patterns and livestock distribution, and likely result in loss of livestock due to train collisions.

The proposed alignment would also isolate a small portion of the northern Sand Springs Allotment from the bulk of the Allotment to the south. In the process the rail would cross four pipelines and pass within one mile of nine different stockwaters served by Sand Springs, the water base property for the Allotment. The proposed alignment would have a profound impact on stockwater as well as the movement and distribution of cattle.

4.2.2 Lincoln County Cottontail Pass Alternative

The impacts associated with the Lincoln County Cottontail Pass Alternative are very similar to those discussed in Section 4.2.1.5 for DOE Alternatives 2 and 8. For standardization of the impact tallies, the Cottontail Pass Alternative was assumed to start where DOE Common Segment 1B enters the Needles Allotment, and end where it would join back up at the start of DOE Common Segment 2 at the west end of the Cottonwood Allotment (Figure 4.19).



Figure 4.19: Lincoln County Cottontail Pass Alternative and Affected Allotments

The Lincoln County Cottontail Pass Alternative would directly impact four allotments, as well as the Batterman Wash Allotment despite not traveling directly through it. The lengths and disturbance area quantities are shown in Table 4.12.

Table 4.12: Lincoln County Cottontail Pass Alternative – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Lincoln County Cottontail Pass Alternative	13. Needles	1,656	13.66
	14. Coal Valley Lake	697	5.75
	15. Battleman Wash	0	0.00
	16. Pine Creek	182	2.43
	17. Cottonwood	1,138	10.89
	Total	3,673	32.73

Impacts within the affected allotments are summarized by alternative in Figure 4.20.

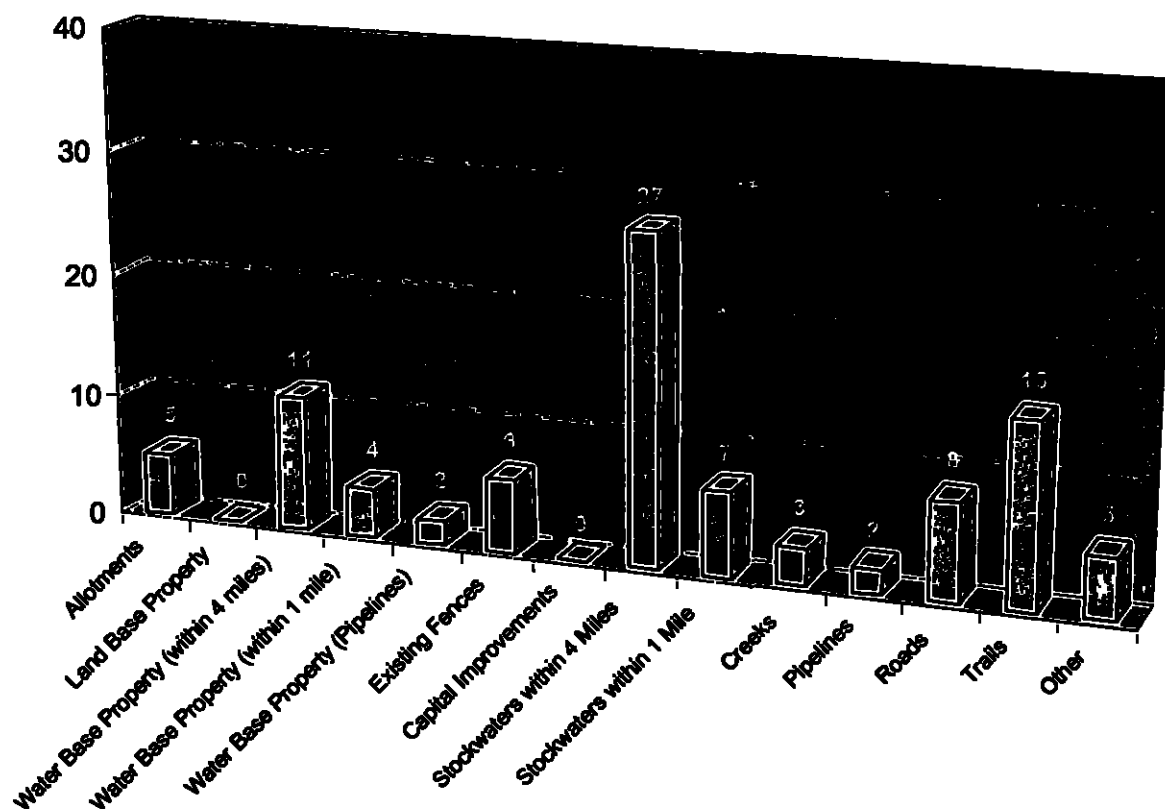


Figure 4.20: Lincoln County Cottontail Pass Alternative – Impacted Features

In general, the impacts to the Needles Allotment remain detrimental despite some relief of impacts associated with Water Gap. The same holds true for the Batterman Wash Allotment.

The Permittees within the Coal Valley Lake Allotment expressed a great deal of concern over the potential loss of forage and re-routing of existing waterways that terminate in Coal Valley Lake. The Permittees within the Pine Creek and Cottonwood Allotments both indicated that the proposed alignment would severely impact their existing operation, more so than the DOE Alternatives, and potentially putting them out of business.

4.2.3 Lincoln County Short Route

The Lincoln County Short Route would diverge from the DOE Proposed Caliente Corridor within the Ely Springs Cattle Allotment (number 20). All impacts prior to the point of divergence, including the DOE Eccles Alternative, Caliente Alternative, and Common Segment 1A, would be the same as discussed in Section 4.2.1. In order to provide a consistent impact tally, the Lincoln County Short Route includes that small portion of the DOE Segment 1A between the point of divergence and the eastern entry point into the Ely Springs Allotment (Figure 4.21).

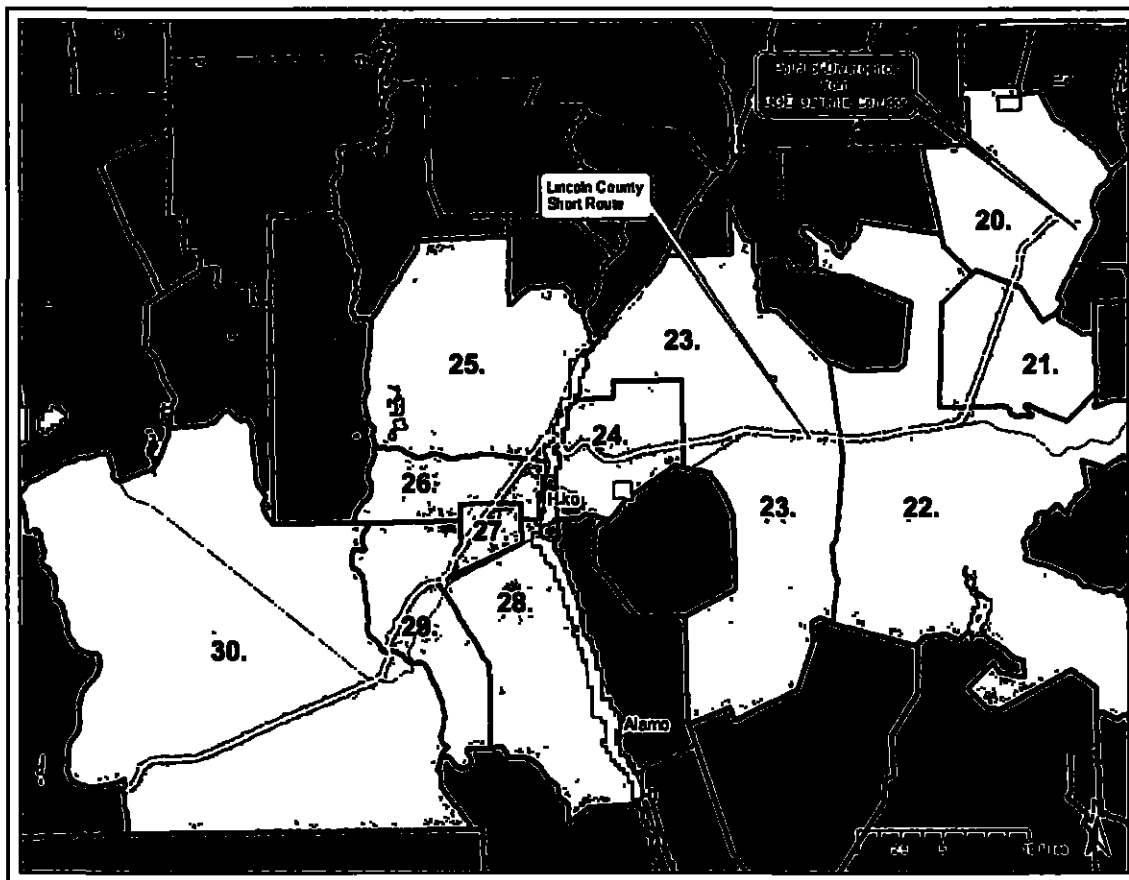


Figure 4.21: Lincoln County Short Route and Affected Allotments

The segment of the Lincoln County Short Route from the point of divergence with the DOE Proposed Caliente Corridor to the entry point to the Nevada Test Site (NTS) would impact a total of twelve allotments listed in Table 4.13.

Table 4.13: Lincoln County Short Route – Impacted Allotments and Disturbed Area

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Lincoln County Short Route	20 Ely Springs	865	7.1
	21. Cliff Springs	925	7.6
	22 Oak Springs	973	8.0
	23. Pahroc	1,128	9.3
	24. South Hiko – Six Mile	1,321	10.9
	25. Irish Mountain	318	2.6
	26. Wildhorse	91	0.8
	27. Crystal Springs	496	4.1
	28. Pahrnagat West	218	1.8
	29 Pine Cone	639	5.3
	30. Bald Mountain	2,228	18.4
	Total	9,202	75.9

The impacts associated with the affected allotments are listed in Figure 4.22.

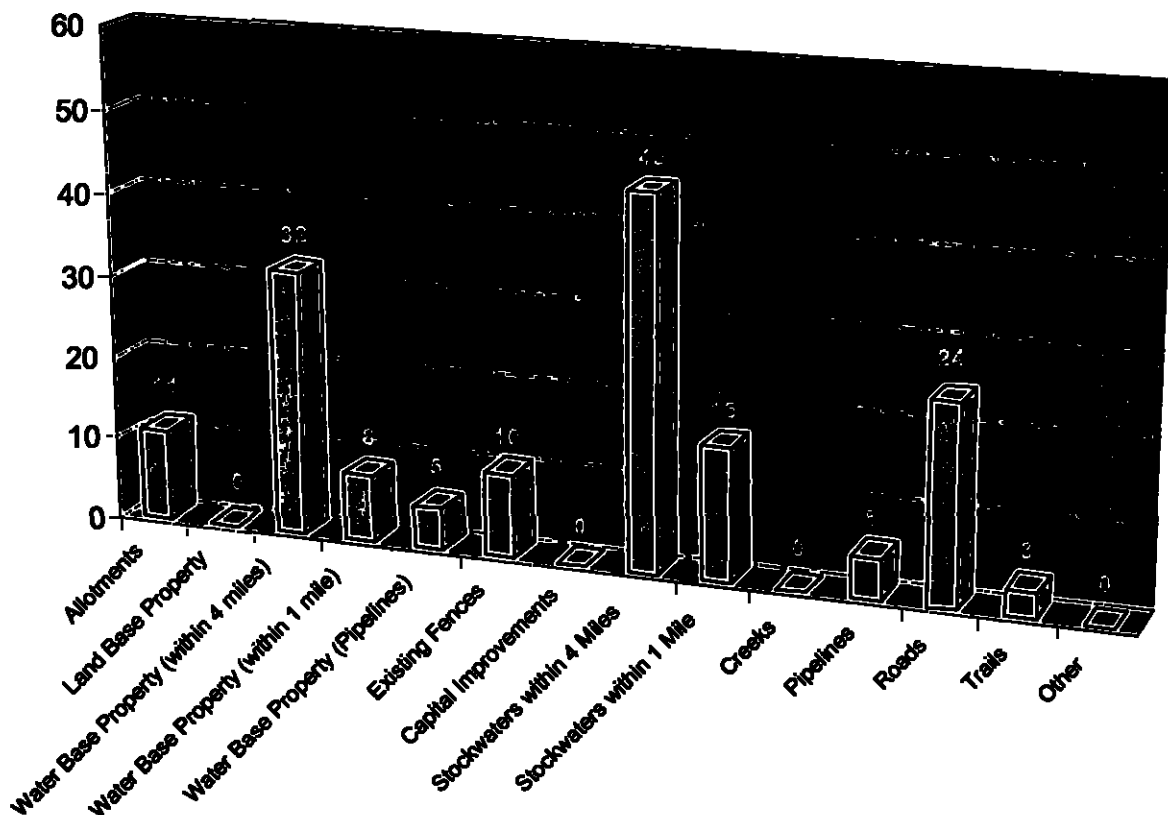


Figure 4.22: Lincoln County Short Route – Impacted Features

The Ely Springs Cattle Allotment as mentioned earlier is one of the most intensely managed allotments in Lincoln County. The Lincoln County Short Route would cut across two of the four interior allotment pastures. If unmitigated, the proposed alignment would isolate small segments from each of these two pastures and greatly affect cattle distributions. The Permittee indicated that with minor realignment the proposed rail could be turned into a pasture boundary and lessen the impacts to his grazing system. The Lincoln County Short Route would impact thirteen base property stockwaters within four miles of the proposed alignment, six of which are within one mile and cross two pipelines that convey water from the water base property originating at Ely Springs. In spite of these impacts, the LCSR imposes far less impacts on this allotment than the DOS Proposed Corridor.

Both the Cliff Springs and Oak Springs Allotments are run by a common permittee. Both are water base properties and the existing water rights are commingled, meaning water from either allotment may be used at a place of use in either allotment. As such the proposed alignment would run within four miles of 13 base property stockwaters, two of which are within one mile, and cross two pipelines conveying water from base property springs. The grazing system and cattle movement within the Cliff Springs Allotment would be altered within the lower pasture, as the proposed rail would isolate a strip of the pasture to the east from the stockwater to the west. Virtually no impacts to livestock movement or cattle distribution would be experienced with the Oak Springs Allotment as the proposed rail would run along US Highway 93, which is already fenced. Loss of critical vegetation, specifically white sage, was a concern to the Permittee.

The Pahroc Allotment is a water base Allotment with the proposed rail running within four miles of two water base stockwaters and crossing one water base pipeline. The Permittee was primarily concerned with the loss of key forage, particularly white sage and the segregation of a key pasture within his allotment. The the rail would severely alter the movement and grazing patterns of his livestock. Invasive species, particularly loco weed, and the potential for loss of livestock were also raised as key concerns in areas that would be disturbed by construction.

The Permittees on the South Hiko-Six Mile Allotment also had some serious concerns over loss of critical forage and alteration of grazing patterns and cattle movement. This was particularly emphasized within Hiko Canyon where the proposed alignment would run, as it serves as the primary trailing route for cattle between Six Mile Flat and the eastern slope of the Pahranaagat Valley. This canyon also provides road access for maintenance of allotment improvements. One Permittee in particular felt that they would be significantly impacted and, without extensive mitigation, could be put out of business. Similar concerns were expressed in the Crystal Springs Allotment, as the proposed rail would cut a relatively small allotment in half.

Minimal impacts were expressed by Permittees in the Irish Mountain, Wildhorse, and Pine Cone Allotments, and the key concern in the Pahranaagat West Allotment was cattle movement and access.

The Bald Mountain Allotment would experience several critical impacts. Cattle movement and distribution was an issue of key concern as the rail would cut the allotment in half. The location of the rail would also create a need to continuously cross the rail for water hauling operations. Most noteworthy is a loss of solitude for the residence located within the Bald Mountain Allotment.

4.3 SUGGESTED MANAGEMENT ACTIONS TO MITIGATE POTENTIAL ADVERSE IMPACTS

This Section includes a summary of the mitigation actions that were identified by the project team. Mitigations were assessed through interviews with Permittees who held permits on grazing allotments that had any significant portion of the proposed alignment within them. This assessment did not consider those peripheral allotments that may be impacted by construction activities away from the proposed rail corridor. In general, mitigation actions are segregated into one of the below listed categories. A brief summary of each category is as follows. An allotment specific analysis, which discusses the specific mitigation actions for each allotment analyzed as identified by the permittee, is included in Volume II, Appendix 2.0 of this report.

These mitigation measures should be considered preliminary, and subject to change based on final rail alignment and operational criteria. The mitigations listed are based on the assumptions RCI had to make as discussed in Section 2.1. These assumptions, and the design and layout of the rail corridor and associated facilities have and will continue to change. In addition, permittee preferences could change based on new information. Permittees should be included in the placement, planning and design of any and all mitigation measures pertinent to the livestock grazing system(s) they maintain. Nearly every mitigation action listed below would have to be conducted in conjunction with BLM policies and procedures. Some mitigation measure may require the involvement of other state and federal agencies such as the Nevada Division of Water Resources. In order to conduct efficient and effective mitigation actions, a working relationship must be established and maintained between the permittees, DOE and BLM.

Fence Construction: A length of new fence construction was estimated if a permittee indicated a desire to fence the rail corridor, or a need to create new pasture or boundary fences in order to effectively maintain their current grazing system.

Fence Removal: A length of fence removal was estimated if a permittee indicated a desire to remove any existing pasture or allotment boundary fence in order to effectively maintain their current grazing system.

Gates: Gates would need to be placed any time the proposed alignment crossed an existing fence. This provides an option for moving livestock through the fence when so desired, and provides an alternative to passing large equipment across cattleguards with the potential to damage them. In the case of fenced right-of-ways gates would be required on either side of the track at road and trail crossings and underpasses or livestock crossings.

Railroad Cattleguards: In-rail cattleguards would need to be installed at every location where the rail crosses an existing or proposed new fence, and the ROW is not fenced on either side of the cross fence. The in-rail cattleguards would be necessary to prevent livestock from walking along the track and crossing through the fence if the right-of-way is not fenced. It should be the DOE's responsibility to implement some sort of mitigation that will keep fences functional and keep livestock enclosed. The only solutions are to fence the ROW boundary in total or design and construct an in-rail cattle guard.

Road Cattleguards: In-road cattleguards would need to be installed at every location where the rail access road crosses an existing or proposed new fence. As indicated by the DOE, the rail would be paralleled by an access road. In order to prevent a breach of the fence by livestock traveling along the access road, cattleguards would be required. Gates would be another possible alternative in these areas, but are not preferred due to maintenance and the potential of individuals leaving the gates open. In the case of fenced right-of-ways road cattleguards would be required on either side of the rail at each road crossing, and two on the rail access road at underpasses to prevent a breach of the fence by livestock traveling along the access road..

Grazing Management Plan: In many instances, a grazing management plan is already in place for the affected allotments. The plan is agreed upon by the BLM and the permittee(s) and outlines the grazing system and objectives for the allotment. In instances where the current grazing system would be significantly altered by rail operation, revisions to the existing plan or a new grazing management plan may be required for long-term management. In every instance, construction activities will alter grazing management within the identified allotments on a temporary basis. There may also be some allotments away from the proposed corridor not identified within this report that will be impacted by construction activities. In either case, it is imperative that an interim grazing management plan be developed for each affected allotment. The plan should account for construction activities, and adjust management practices and objectives to keep livestock operations feasible throughout the construction period and minimize conflicts.

Corral and Chute Relocation: Corrals and chutes within the proposed rail corridor would have to be relocated.

Wells, Troughs, Springs and Unspecified Stockwaters: Livestock water sources within the proposed rail corridor would have to be relocated. Those within a mile of the proposed corridor would either have to be relocated or improved, i.e. piped, to a location in excess of a mile from the rail in order to reduce the potential for livestock/train collisions. In most instances the proposed rail corridor would alter livestock distribution, utilization and movement patterns. New water sources may be required to maintain or alter these patterns in order to counter the affects of the proposed rail corridor.

Creek Crossings: The proposed rail corridor crosses numerous creeks or washes that are critical to livestock operations. The flow patterns of these drainages would need to be maintained in such a manner as to minimize the impacts to livestock use.

Pipeline Crossings: The proposed rail corridor would cross a multitude of existing stockwater distribution pipelines. The pipelines would need to be maintained and protected from construction, standard rail operations and maintenance, and allowances made for repair or maintenance of the pipelines.

Pipeline Construction: New pipeline construction would be required in cases where existing stockwater sources need to be moved or new stockwater sources need to be developed.

Road Crossings: The proposed rail corridor would cross a multitude of existing roads. Many of the roads are used for vehicle access, water hauling, and livestock hauling. Road crossings would require earthen approaches not to exceed 6% grades. Road crossings should be anticipated to function as livestock crossings in areas where the ROW is

unfenced. In cases where the ROW is fenced, each road crossing would require a gate and in-road cattleguard on either side of the rail.

Trail Crossings: The proposed rail corridor would cross a multitude of existing vehicle trails. Many of the trails are used for vehicle access or maintenance of allotment infrastructure. Trail crossings would require earthen approaches not to exceed a 12% grade. Trail crossings should be anticipated to function as livestock crossings in areas where the ROW is unfenced. In cases where the ROW is fenced, each trail crossing would require a gate on either side of the rail.

Road/Trail Realignment: In instances where the proposed alignment runs parallel to, or crosses existing roads and trails multiple times, it may be more effective to realign the road or trail. In these cases the new alignment should be built to the same standard as the existing road or trail

Sheep Crossings: At-grade sheep crossings would need to be a minimum of 100'-150' wide. Earthen approach ramps should not exceed 25%. Placement and any special design consideration should be based on consultation with the permittee.

Cattle Crossings: At-grade cattle crossings would need to be a minimum of 20' and up to 100' wide. Earthen approach ramps should not exceed 25%. Placement and any special design consideration should be based on consultation with the permittee.

Underpasses: Underpasses should be of sufficient width and height to accommodate the type of livestock permitted in a given allotment. Placement and design consideration should be based on consultation with the permittee. In areas where the ROW is fenced, underpasses should be equipped with gates in the instance that the permittee wants to isolate a given pasture. The rail access road would need to have two in-road cattleguards to prevent cattle from moving up the road onto the rail bed and getting stuck within the fence

Other: Some Permittees indicated a desire for additional mitigations that did not fall into one of the above listed categories. One example would be a recommended alternate alignment through the allotment. In some cases an adjustment of the proposed alignment within the allotment can greatly reduce potential impacts. A more specific description of the "other" mitigations is included with the allotment specific analysis included in Volume II, Appendix 2.0

Table 4.14 summarizes the mitigation actions identified by the permittees along the studied corridors. For a detailed listing of mitigations identified by the permittee(s) for each allotment reference Volume II Appendix 2.0.

Best Management Practices (BMP) and Blanket Mitigations: There are several important BMPs and mitigation actions that would apply to each and every allotment affected. Since they applied to every allotment they were not tabulated within the categories listed above or within Table 4.14.

Table 4.14: Mitigation Summary

Route and Alternative	Figure	Allocation	Mitigation Summary																
			Fence Construction	Fence Removal	Gates	Railroad Cattleguards	Roadway Cattleguards	Grazing Management Plan	Corral Relocation	Chute Relocation	Wells	Troughs	Springs	Creek Crossings	Unspecified Stockwaters	Pipeline Crossings	Pipeline Construction	Road Crossings	Trail Crossings
Department of Energy Callenta Alternative Segment	None	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Department of Energy Eccles Alternative Segment	4.23	1 Clover Creek	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	1	0
		2 Little Mountain	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	1	0
		3 Peck	10.6	2.25	9	2	8	1	0	0	0	0	0	0	0	0	0	1	0
		Total	10.6	2.25	13	4	10	3	0	0	0	0	0	0	0	0	0	3	1
		4 Cornet	8.25	0	0	2	2	1	0	0	1	1	0	0	2	0	0	0	1
Department of Energy Common Segment 1A	4.24	5 Bennett Spring	0	0	0	1	1	1	0	0	0	2	0	0	1	1	0	3	0
		6 Black Canyon	0	0	2	1	1	1	0	0	0	1	0	0	0	0	0	2	0
		Total	6.25	0	2	4	4	3	0	0	1	4	0	0	4	1	2.5	5	1
		7 Ely Springs	0	0	3	3	3	1	0	0	0	3	0	3	0	5	1.5	3	3
		8 Rattlesnake	2	0	1	1	2	1	1	1	0	4	4	0	0	1	12.5	3	0
Department of Energy Common Segment 1B	4.25	9 Thorley Use Area	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	3	0
		10 Deadman Use Area	17	0	21	1	15	1	0	0	0	0	0	0	3	0	1.5	3	1
		11 Timber Mountain	13	0	16	2	14	1	0	0	1	1	0	0	0	0	0	2	1
		12 Sunnyside	0	0	0	0	0	1	0	0	1	0	0	0	5	0	0	1	3
		Total	32	0	42	8	38	6	2	1	2	8	4	3	8	15.5	0	13	8
Department of Energy Garden Valley Alternative Segment 3	4.26	13 Needles	0	0	0	0	0	1	0	0	0	3	0	0	3	1	0.5	3	8
		15 Bateman Wash	0	0	1	1	1	1	0	0	0	2	0	3	1	0	0.75	2	2
		16 Pine Creek	5.8	0	8	4	3	1	0	0	0	2	0	1	0	1	0.75	1	1
		17 Cottonwood	0	0	2	2	2	1	0	0	0	2	0	0	2	1	0.5	1	3
		Total	5.8	0	11	7	6	4	0	0	1	7	0	4	6	3	1.75	7	14
Department of Energy Garden Valley Alternative Segment 1 (Preferred Alternative)	4.26	13 Needles	0	0	1	0	0	1	0	0	0	3	0	0	3	1	0.5	3	8
		15 Bateman Wash	0	0	1	1	1	1	0	0	0	0	0	3	1	0	0	0	2
		16 Pine Creek	9.4	0	11	2	1	1	0	0	0	1	0	0	2	1	0	1	0
		17 Cottonwood	0	0	6	2	2	1	0	0	0	2	0	0	2	1	0.5	2	2
		Total	9.4	0	18	5	4	4	0	0	1	6	0	5	7	3	1	7	12
Department of Energy Garden Valley Alternative Segment 2	4.26	13 Needles	0	0	1	1	1	1	0	0	1	3	0	0	4	1	0.5	2	10
		15 Bateman Wash	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		14 Coal Valley Lake	1.6	0	4	0	2	1	0	0	0	0	0	1	0	0	0	1	1
		16 Pine Creek	19.2	0	27	21	0	1	0	0	0	8	0	3	1	2	7.3	3	3
		17 Cottonwood	0	0	8	1	1	1	0	0	0	2	0	0	0	0	0.5	1	3
Department of Energy Garden Valley Alternative Segment 8	4.26	Total	20.8	0	40	23	4	5	0	0	1	11	0	4	7	4	8.3	7	17
		13 Needles	0	0	1	1	1	1	0	0	1	3	0	0	4	1	0.5	2	10
		15 Bateman Wash	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		14 Coal Valley Lake	1.6	0	4	0	2	1	0	0	0	0	0	1	0	0	0	1	1
		16 Pine Creek	21	0	20	18	2	1	0	0	0	1	0	0	0	0	1	1	0
Department of Energy Common Segment 2	4.27	17 Cottonwood	0	0	2	2	2	1	0	0	0	2	0	0	2	0	0.5	1	3
		Total	22.6	0	25	19	5	5	0	0	1	4	0	2	4	1	1.5	4	11
		18 McCutcheon Springs	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	0	3
		19 Sand Springs	0	0	2	2	2	2	0	0	0	9	0	0	1	4	8	1	2
		Total	0	0	3	3	3	3	0	0	1	10	0	0	1	4	8	1	5
Lincoln County Cottontail Pass Alternative	4.28	13 Needles	0	0	1	1	1	1	0	0	1	3	0	0	4	1	0.5	2	10
		15 Bateman Wash	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		14 Coal Valley Lake	0	0	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0
		16 Pine Creek	0	0	16	1	7	1	0	0	0	1	0	3	0	0	5	0	0
		17 Cottonwood	8.5	4	8	16	2	2	1	0	0	0	0	0	0	0	0	1	0
Lincoln County Short Route	4.29	Total	8.5	4	27	20	12	5	0	0	1	6	0	3	5	3	8	3	10
		20 Ely Springs	16	2.25	7	1	5	1	0	0	0	3	0	0	0	3	5	2	1
		21 Cliff Springs	0	0	1	1	1	1	0	0	0	4	0	0	0	1	5	2	0
		22 Oak Springs	0	0	4	1	4	1	0	0	0	0	0	0	0	1	0	3	0
		23 Pahroc	0	0	3	1	3	1	0	0	0	0	0	0	0	0	0	0	0
		24 South Hiko - Six Mile	21.6	0.75	2	2	4	1	0	0	0	3	0	0	0	1	1.25	0	2
		25 Irish Mountain	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		26 Wildhorse	1.5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		27 Crystal Springs	8.2	1.4	2	1	2	1	0	0	0	1	0	0	0	0	0.25	1	0
		28 Pahnamag West	3.6	0	2	2	0	1	0	0	0	0	0	0	0	0	2	1	0
		29 Pine Cone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		30 Bald Mountain	0	0	0	0	0	1	0	0	0	3	0	0	4	0	0	1	0
		Total	50.9	4.4	21	9	19	11	0	0	0	14	0	0	4	7	13.5	17	1

Loss of Vegetation and Land Disturbance: Every permittee raised concerns over the amount of vegetation and land disturbed during construction, and the amount of forage that would be lost in the long-term due to the operation corridor. On its face, construction disturbance may seem to be a temporary loss. Given the fragile nature of the native plant community, the unpredictable weather, and propensity for noxious weed establishment in disturbed areas this could very easily turn into a long-term loss. It is essential to reclaim all disturbed areas as soon possible. Site-specific reclamation standards and plans should be established prior to any disturbance. It is imperative that every measure be taken to minimize the construction ROW and the area disturbed. All limits of disturbance should be temporarily fenced, and any work conducted outside of the limits should result in stiff penalties.

Rail Construction and Operations Disturbance: Permittees raised multiple concerns about running their livestock operations while construction is under way within their allotments. There will be a loss of forage in the disturbed areas during construction, and following construction during revegetation. The integrity of the existing fences must be maintained throughout construction. Disturbance from construction activities and human presence would likely alter livestock behavior and use patterns. Increased stress could result in loss of livestock, or loss of body condition and weight. Interruptions to water distribution systems or stockwater sources may result in altered distribution and utilization patterns. Altered or restricted access could interfere with standard operations within the allotments. Any of these factors could result in a reduction of AUMs, or a loss of overall income from the livestock operations. Due to the significant changes that could occur on some allotments, the BLM should require the development of an interim grazing management plan. Permittees may incur increased overhead costs due to altered operations. There are various mitigation measures for these issues. However, until the construction details are solidified it is difficult to recommend specific mitigation actions. The DOE must work with permittees and the BLM to ensure proper mitigation once more detailed information becomes available

Reimbursement for Lost AUMs: Nearly every Permittee felt that the rail corridor would result in the loss of critical forage, and the subsequent loss of AUMs. In most allotments the proposed corridor would travel through key forage areas and across gentle topography. Traditionally these areas support a much higher proportion of the AUMs than do areas of poor quality forage, or areas that are inaccessible to livestock due to rugged topography or a lack of water. The loss of AUMs would not be proportional to the amount of acreage disturbed within the 1,000' wide construction corridor. In nearly every allotment the proportion of AUMs lost would be higher than the amount of vegetation and soil disturbed. The potential for a loss of AUMs is not only related to construction and the railroad footprint. AUMs could be lost from construction and operational disturbances. Also, much higher loss of AUMs could occur if noxious weeds become a problem, if wildfires caused by the rail burn any portion of the allotment, or if altered drainage patterns from rail construction alter forage distribution. Mitigation for the loss of AUMs may be difficult. Some Permittees felt that monetary compensation for lost AUMs was appropriate, while others felt improved range infrastructure such as fencing and troughs was sufficient. Still others felt that the only way to compensate for the potential impacts was a new forage source such as new irrigated pastures or pivots.

Livestock Behavioral Conditioning: The majority of the permittees raised the issue of livestock conditioning to the range and allotments they occupy. Permittees will often keep the same livestock for many years, as those older individuals learn how to maximize the range within an allotment. Older livestock will learn how to best utilize key forage and water

sources, and young livestock held over will learn from the older stock. The installation of a new feature such as a rail corridor would require a re-conditioning of some of the older individuals. This is typically accomplished by herding livestock until they become acclimated with the allotment. Herding requires manual labor and increased capital costs incurred by the permittee. Livestock conditioning is also impacted by the potential for train/livestock collisions. An older animal may be more valuable than a younger animal from the Permittees' standpoint, but the market may not reflect that. If a cow or ewe is lost, the production and conditioning of that individual is lost, and the purchase of a new animal is not necessarily a one-to-one tradeoff.

Invasive and Noxious Weeds: Nearly every Permittee expressed concern in regard to construction resulting in loss of native vegetation and forage, disturbance of the soils, and subsequent establishment of invasive and noxious weeds. Permittees felt that the most effective means of mitigation for these impacts was avoidance. The construction area should be kept to as small a footprint as feasible. Permittees felt that the DOE was responsible for successfully revegetating any and all areas disturbed during construction in an effort to minimize the establishment of problem weeds. Permittees also indicated that it should be the rail operator's responsibility to monitor, manage and treat any and all invasive and noxious weeds within the rail corridor for the life of the rail, and following abandonment and removal. Construction equipment can serve as a vector for establishment and spread of weeds. The most effective means of limiting this possibility is to steam clean all equipment prior to allowing it to enter the construction site. In this case, such practices would be best applied prior to equipment or transports leaving paved roads.

Reimbursement for Lost Livestock: Every Permittee expressed concern for livestock lost due to train collision. Some felt that fencing the ROW was the appropriate mitigation actions. All felt that any livestock lost due to the operation and maintenance of the rail should be fully compensated in the form of a monetary payment.

4.3.1 DOE Proposed Corridor and Alternatives

The following series of figures summarizes the mitigation actions identified by permittees along each identified segment.

4.3.1.1 DOE Caliente Alternative Segment

There were no impacts identified by the project team for this segment. This segment is entirely on private land, so impacts and mitigation will be identified in Section 5.0 of this report.

4.3.1.2 DOE Eccles Alternative Segment (Figure 4.23)

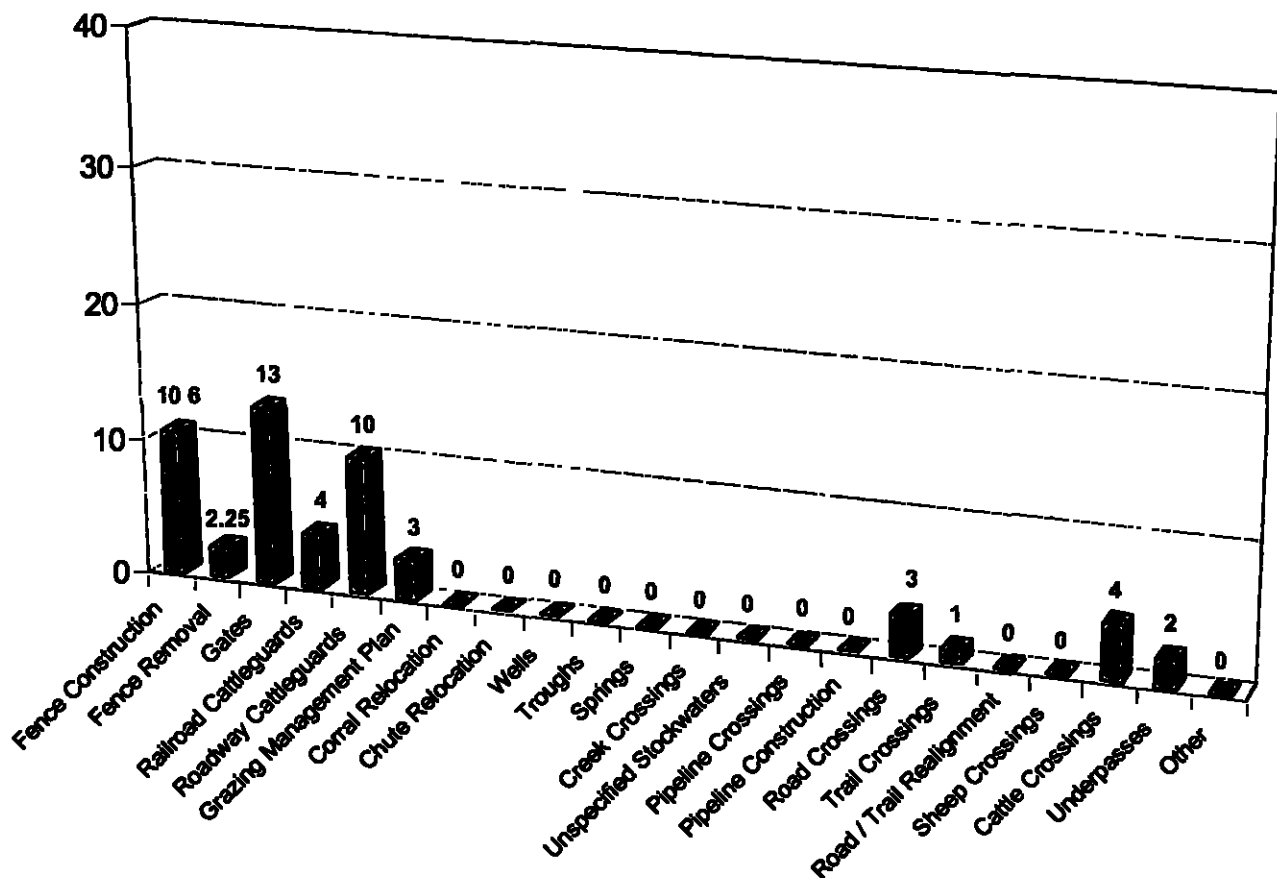


Figure 4.23: DOE Eccles Alternative Segment – Mitigation Actions

4.3.1.3 DOE Common Segment 1A (Figure 4.24)

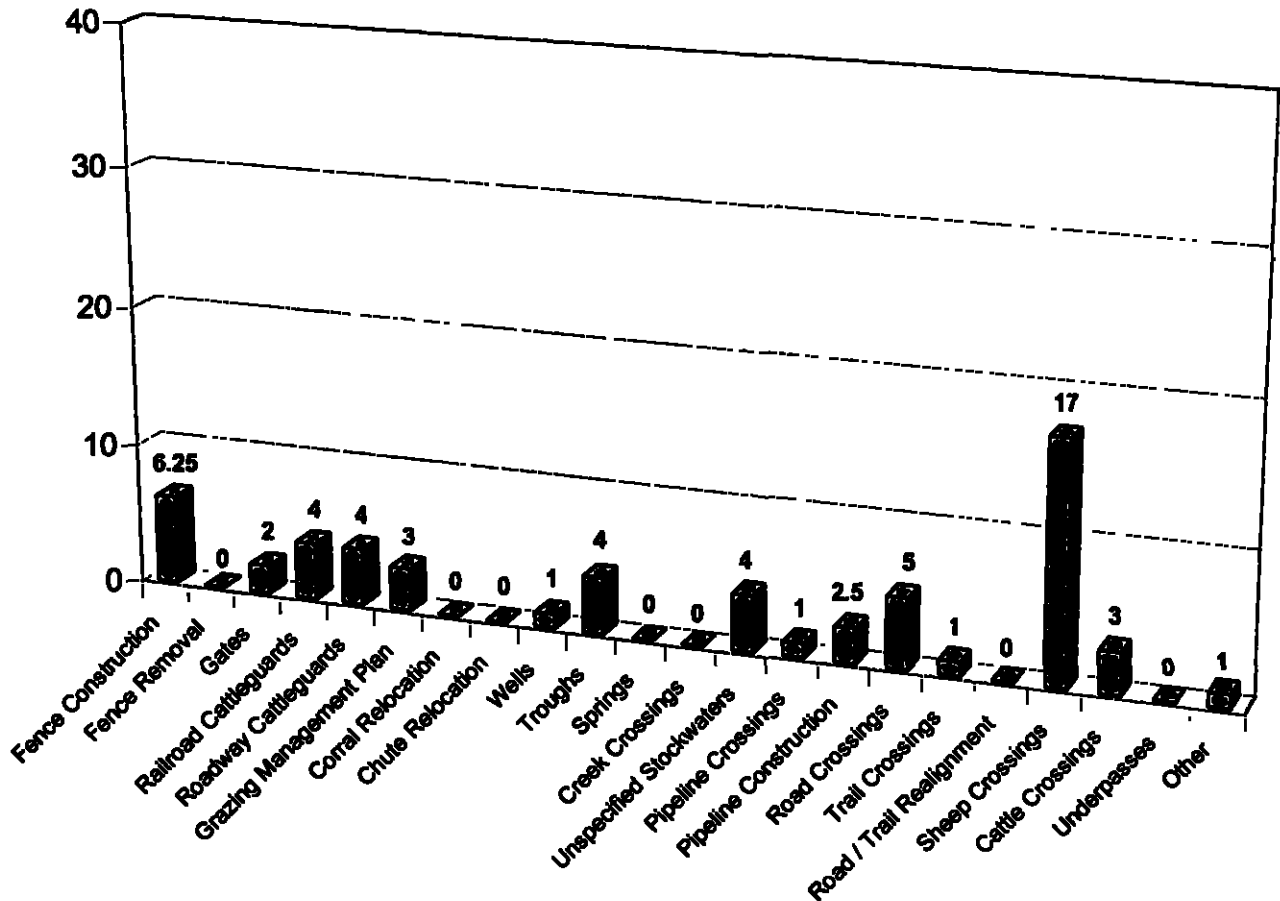


Figure 4.24: DOE Common Segment 1A – Mitigation Actions

4.3.1.4 DOE Common Segment 1B (Figure 4.25)

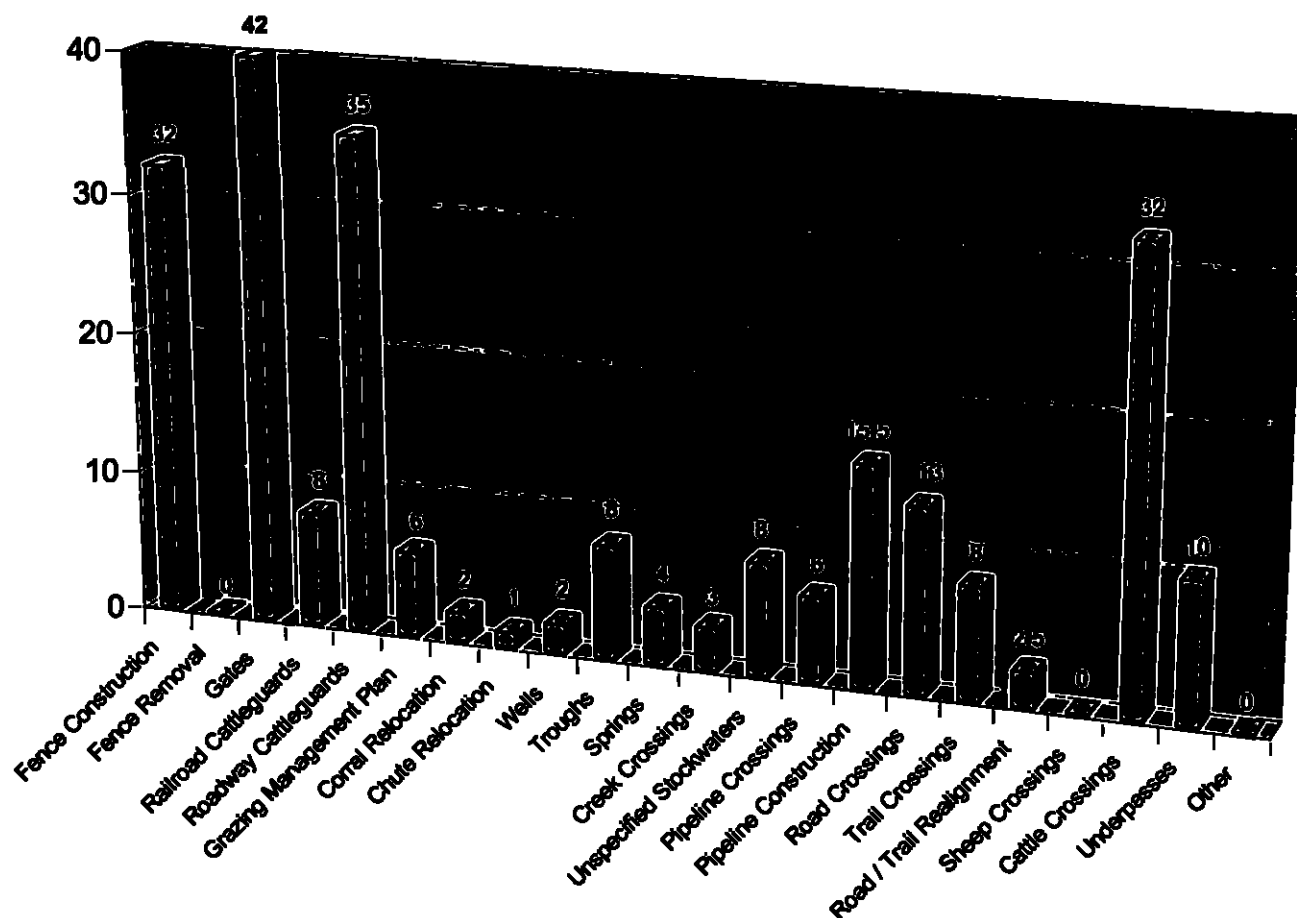


Figure 4.25: DOE Common Segment 1B – Mitigation Actions

4.3.1.5 DOE Garden Valley Alternative Segments (Figure 4.26)

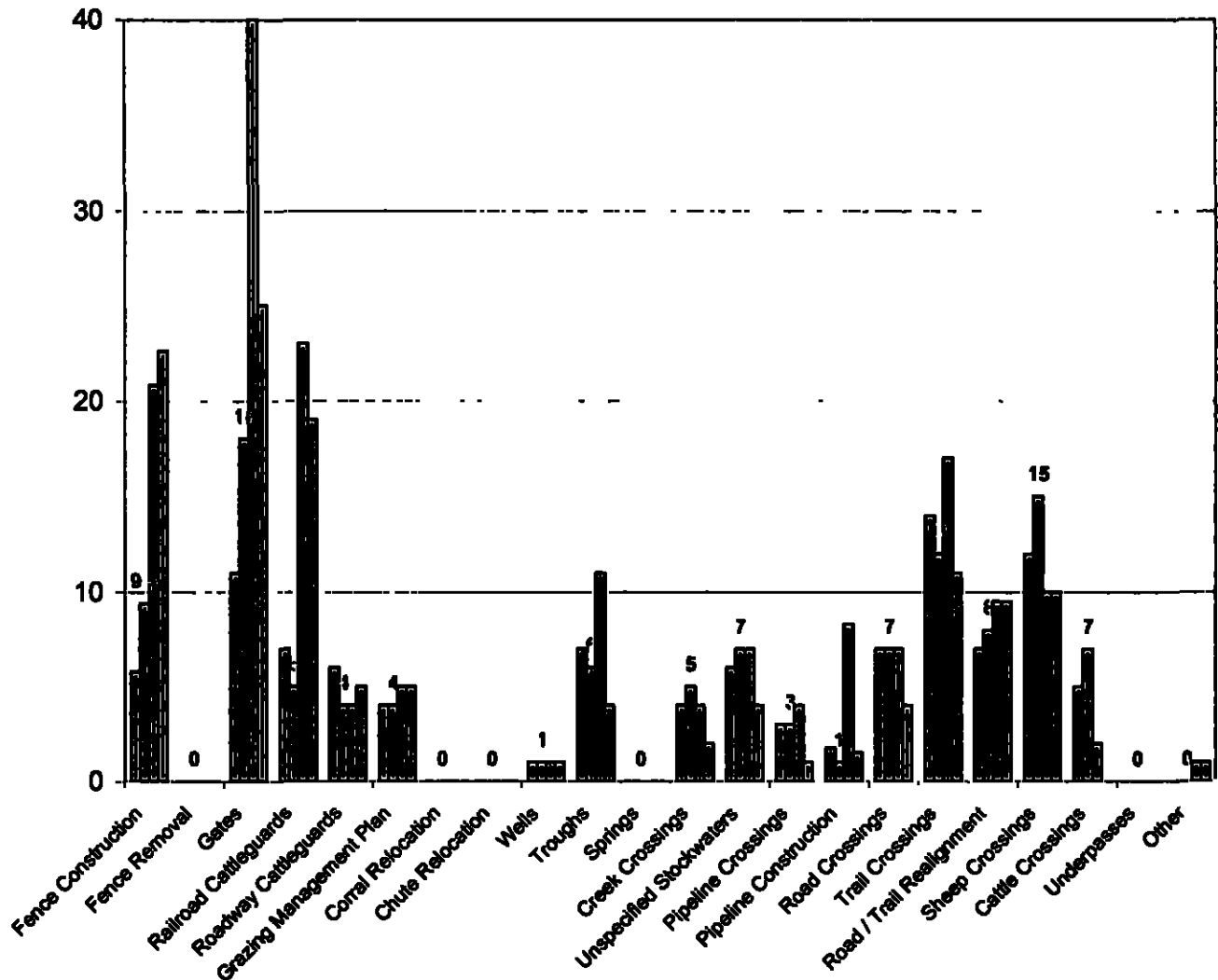


Figure 4.26: DOE Garden Valley Alternative Segments 1, 2, 3, and 8 – Mitigation Actions

Note:
 Garden Valley Alternative 3 (green)
 Garden Valley Alternative 1 – Preferred Alternative (red)
 Garden Valley Alternative 2 (green)
 Garden Valley Alternative 8 (green)

4.3.1.6 DOE Common Segment 2 (Figure 4.27)

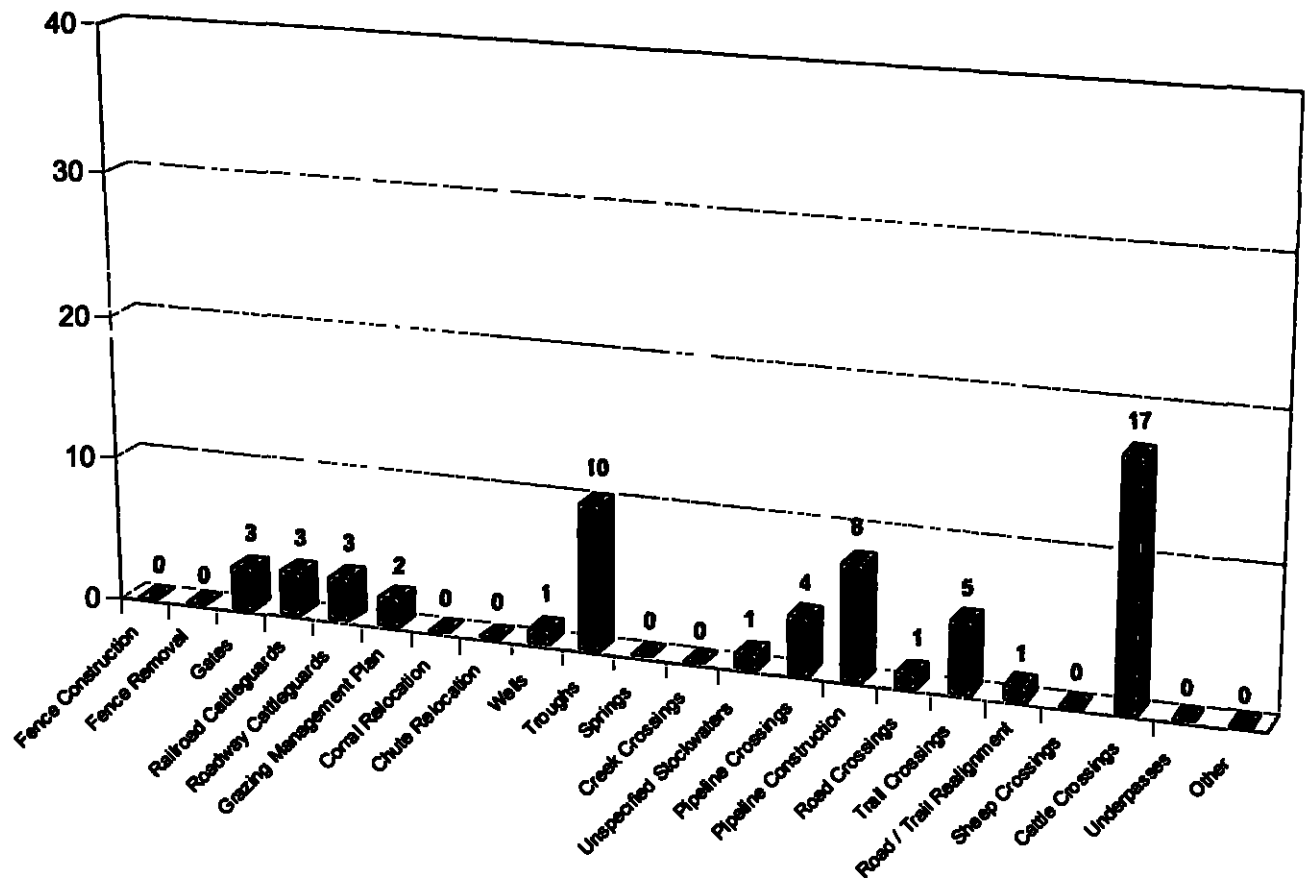


Figure 4.27: DOE Common Segment 2 – Mitigation Actions

4.3.2 Lincoln County Cottontail Pass Alternative (Figure 4.28)

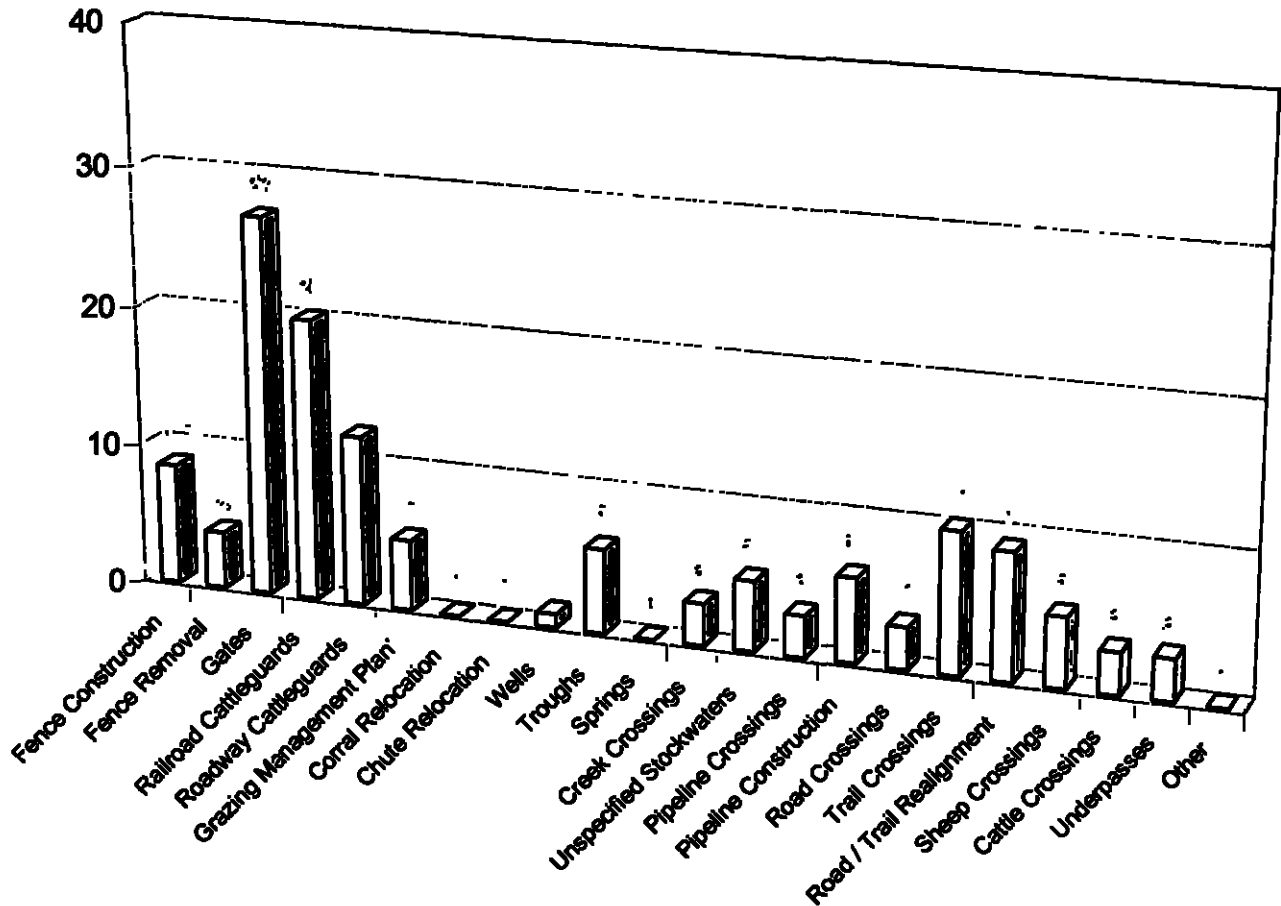


Figure 4.28: Lincoln County Cottontail Pass Alternative – Mitigation Actions

4.3.3 Lincoln County Short Route (Figure 4.29)

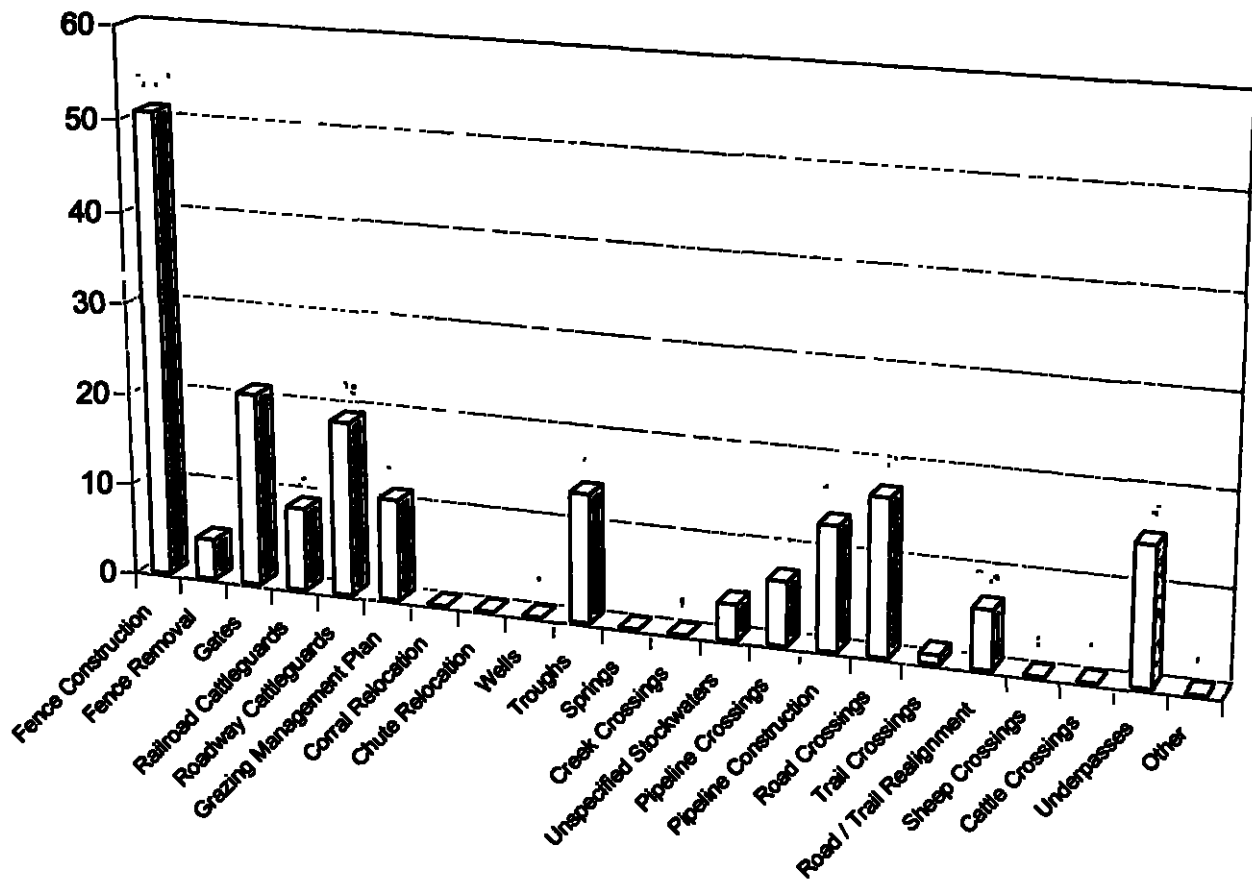


Figure 4.29: Lincoln County Short Route – Mitigation Actions

4.4 UNAVOIDABLE ADVERSE IMPACTS

4.4.1 DOE Proposed Corridor and Alternatives

4.4.1.1 Viable Grazing Enterprise

The Needles Allotment serves as winter range for a multi-county sheep operation. The railroad renders the Allotment unusable for the sheep operation. The necessary trailing, water hauling, and sheep husbandry activities would not be possible with the railroad. Consequently, the Permittee has requested mitigation that would replace and relocate the Needles Allotment grazing permit in its entirety. This Allotment is classified as water base property and has eight livestock waters that are both certificated and base property. The base property status of the waters adds another level of private property rights that are being impacted on top of the certificated property rights.

The Bennett Spring Allotment has a partially similar situation. This Allotment is part of a large winter sheep operation in Lincoln County. The DOE Proposed Corridor and Alternatives encircles base property land on three sides with a critical certificated stockwater, Bennett Spring, on the base property. The rail alignment effectively separates the critical water from the vast majority of the Allotment. The rail alignment renders this Allotment, as well as the adjacent and associated Black Canyon Allotment, unusable for the sheep operation. The permittees have not asked for replacement or relocation as was done for the Needles Allotment.

The Batterman Wash Allotment is another similar situation. This is another winter sheep operation, but it is also used year round with cattle. The Batterman Wash Allotment is part of a complex of six allotments, five in Lincoln County, that are all linked with the sheep and cattle operations. The six allotments are linked by sheep and cattle trailing routes, trucking routes, and water hauling routes. The Batterman Wash Allotment is adjacent to the Cherry Creek Ranch which serves as the hub for both the sheep and cattle operations. Because of the linkage described above, the railroad impacts are greater on the southern five allotments, and the operation as a whole, than they are on the Batterman Wash Allotment. The Permittee is adamant that there is no possible onsite mitigation that can keep the grazing operation in business. Therefore, he discussed impacts but declined to discuss mitigation options.

A notable thread here is that the sheep operations seem more vulnerable to devastation than cattle operations. Part of that is due to the nature of the animals and their husbandry. Sheep typically require more water hauling. They require trailing in bands, and the bands are cumbersome and slow to move. Moving a band across a track is exasperatingly slow, and the time requirement uncertain. With uncertain train schedules, they are vulnerable to train collisions while moving a band across a track. In such a case, dozens of animals could be lost from one collision.

The exception to the sheep thread is the Ely Springs Cattle Allotment that has the most sophisticated fenced pasture design, and scientifically based grazing system on the whole DOE Proposed Corridor and Alternatives. Untold effort and investment of time and money have gone into this operation to bring it to its advanced state of management. This intensely managed cattle operation could be put out of business because the rail alignment would cross three of four pastures.

4.4.1.2 Solitude and Tranquility

The invasion of the railroad on solitude and tranquility is exacerbated to an unavoidable and unmitigatable level when residences and residents are involved. In the Needles Allotment, the Permittee and his family live on the allotment for six months every winter. The railroad crosses the valley below their home and it would shatter the solitude and tranquility as experienced from their homesite.

4.4.1.3 White sage (winterfat) Vegetation

A majority of the allotments have islands of white sage that are intersected by the rail alignment. Various construction activities would destroy the white sage plants. It is an unavoidable adverse impact that cannot be mitigated. White sage is a highly palatable forage plant that is sought out by livestock. It is robust and productive with protein content on a level with alfalfa. White sage is an inclusion in the Salt Desert Scrub vegetation type displayed on Figure 4 5. Extensive research has been done in an effort to find ways to reestablish white sage stands that have been killed. Successful revegetation has proven to be very difficult and highly dependent on local conditions.

4.4.2 Cottontail Pass Alternative

4.4.2.1 Viable Grazing Enterprise

While any rail route would have unavoidable and immitigable adverse impacts, the Cottontail Pass Alternative does not create any unique impacts to the grazing enterprise of the affected permittees. As in all cases, the rail creates a barrier that hinders cattle movement though the allotments concerned. Re-conditioning cattle to the post-rail grazing system would require additional manpower and time.

4.4.2.2 Solitude and Tranquility

The Cottontail route would have the same impacts to solitude and tranquility as the DOE Caliente Rail Alignment.

4.4.2.3 White sage (winterfat) Vegetation

The Cottontail Pass alternative isolates a valuable section of white sage in the Coal Valley Lake allotment. This is a major concern to the permittees who utilize this area for winter grazing. The loss of this valuable forage due to rail construction activities and the footprint of the rail itself would be devastating to the permittees involved See Section 4.4.1.3 for more detail.

4.4.3 Short Route Alternative

4.4.3.1 Viable Grazing Enterprise

Some of the allotments would be heavily impacted and would require a great deal of mitigation in order for the permittees to maintain a viable grazing operation. However, none of the Permittees indicated that they would be impacted to the degree that they would be put out of business if the necessary mitigations were implemented.

4.4.3.2 Solitude and Tranquility

The Bald Mountain Allotment Permittee lives year round on the allotment. His solitude and tranquility would be shattered by the Short Route rail alignment.

4.4.3.3 White Sage (winterfat) Vegetation

Several of the allotments have islands of white sage that are intersected by the Short Route Alternative similar to the DOE Proposed Corridor and Alternatives. However, as Figure 4.5 demonstrates, the Short Route Alternative traverses the Salt Desert Scrub type (white sage is an inclusion) somewhat less than the DOE Proposed Corridor and Alternatives does. The unavoidable impacts are the same as described in 4.4.1.3 above.

4.4.4 Unavoidable Adverse Impacts Common to all Routes

Livestock behavioral conditioning is critical to rangeland livestock management. This term refers to the ability of cattle to remember the locations of water and food sources and to return to them without guidance. Older, more experienced herd members will guide young offspring to these locations perpetuating the cycle or shared experience. In addition, experienced cows or ewes teach their young which plants in their environment are desirable, seasonal drift patterns, hazardous areas to avoid, how to avoid predators, and how to react to a variety of weather events. This behavior conditioning is an invaluable resource to livestock managers as it greatly reduces the amount of time and resources that must be spent to manage a herd. The disruption caused by any of the proposed rail alignments could result in the short-term inability of livestock herds to locate water and food sources. As a result the Permittee will be required to spend a great deal of time reconditioning the animals (via herding) to acclimate to the disturbance. In some cases this may require additional hired labor resulting in an unrecoverable loss of capital. In the case of livestock hit by a train, the Permittee would be paid the market value to the animal that was lost, however this price does not reflect the value of the behavioral conditioning held by this animal.

The indirect impacts of the proposed rail alignments may result in a loss of AUMs outside of the rail construction footprint. The rail alignment may dissect allotments to the point where some areas of forage are inaccessible and others are overused resulting in a loss of AUMs. In addition, invasions of noxious weeds spread by the rail construction and operation could replace valuable native forage, resulting in a similar effect. Wildfires caused by the rail could also result in short to long-term suspension of AUMs.

Any rail alignment through the area concerned would result in localized changes in vegetation types and drainage patterns. The affected permittees and residents also face the potential loss of treasured aspects of rural life, such as solitude and tranquility.

4.5 COMPARATIVE ANALYSIS OF PROPOSED RAIL CORRIDORS

This Section compares the impacts between the DOE Proposed Caliente Corridor and the Lincoln County Identified Alternate Routes. For the purposes of comparison, impacts were determined to be more appropriate than mitigation actions. The primary reason for this approach is that most impacts were quantified on a similar scale. Mitigation actions are difficult to compare on an equal plane, as they tend to follow the preferences and biases of the individual permittee, and special conditions of each individual allotment.

The only impacts that could not be quantified on a similar scale were those unavoidable adverse impacts discussed within Section 4.4. Such impacts are difficult to weigh against one another, and any alignments would have such impacts. There is no alignment across Lincoln County that would not have unavoidable adverse impacts to public lands and grazing allotments. The

preference of one route over another only shifts these impacts to another geographical area or from one user to another.

4.5.1 DOE Proposed Garden Valley Alternative Segments Compared to the Lincoln County Cottontail Pass Alternative

4.5.1.1 Public Land Grazing Allotments

The comparison analyzed in this Section is between the four DOE proposed Garden Valley Alternatives and the Lincoln County Cottontail Pass Alternative as depicted in Figure 4.30.

The list of allotments affected by each alternative, the length of the corridor across each allotment and the construction area through each allotment are displayed in Table 4.15.

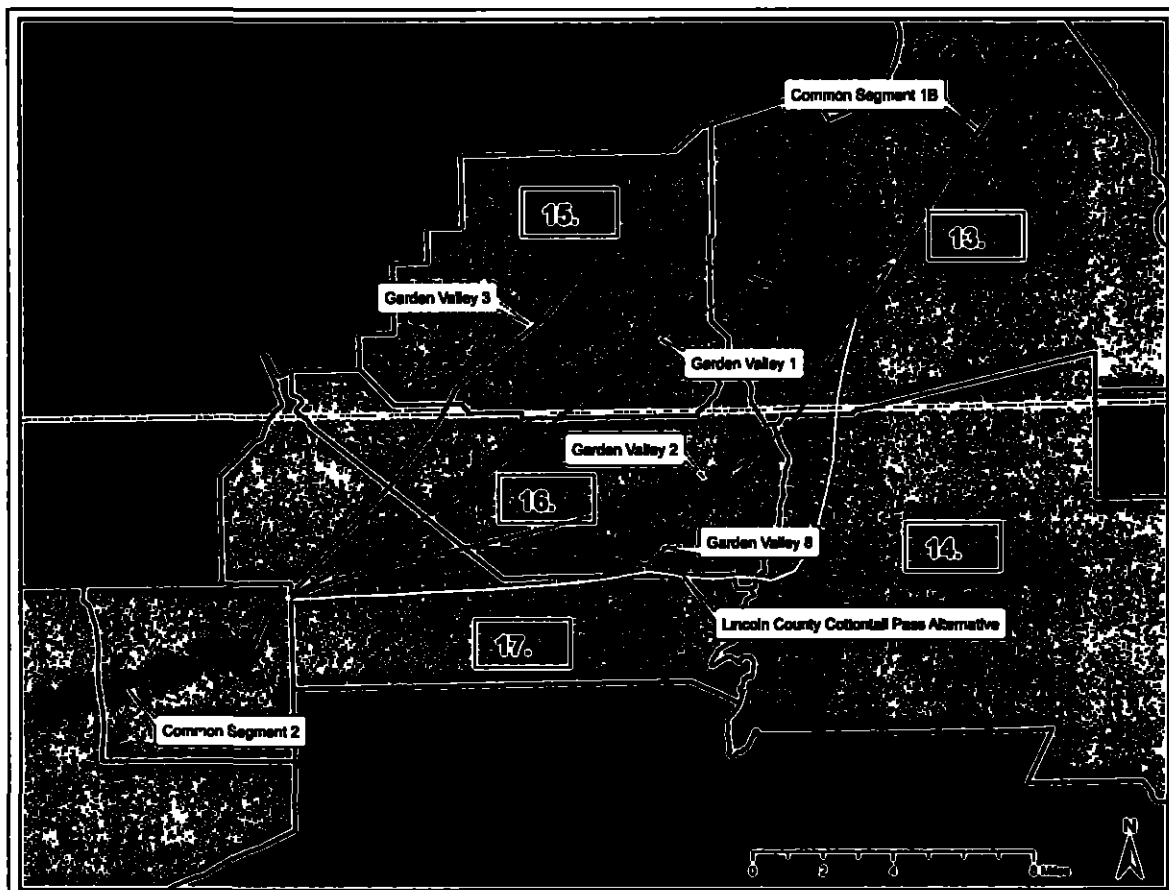


Figure 4.30: DOE Garden Valley Alternative Segments and Lincoln County Cottontail Pass Alternative - Affected Allotments Comparison

Table 4.15: DOE Garden Valley Alternative Segments and Lincoln County Cottontail Pass Alternative – Impacted Allotments & Disturbed Area Comparison

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Lincoln County Cottontail Pass Alternative	13. Needles	1,656	13.66
	14. Coal Valley Lake	697	5.75
	15. Batterman Wash	0	0
	16. Pine Creek	182	2.43
	17. Cottonwood	1,138	10.89
	Total	3,673	32.73
Department of Energy Garden Valley Alternative 1 (Preferred Alternative)	13. Needles	1,632	13.46
	15. Batterman Wash	657	5.42
	16. Pine Creek	570	4.70
	17. Cottonwood	536	4.42
	Total	3,395	28.00
Department of Energy Garden Valley Alternative 3	13. Needles	1,632	13.46
	15. Batterman Wash	1,142	9.42
	16. Pine Creek	349	2.88
	17. Cottonwood	497	4.10
	Total	3,620	29.86
Department of Energy Garden Valley Alternative 2	13. Needles	1,612	13.30
	14. Coal Valley Lake	95	0.78
	15. Batterman Wash	0	0
	16. Pine Creek	1,161	9.58
	17. Cottonwood	623	5.14
	Total	3,491	28.8
Department of Energy Garden Valley Alternative 8	13. Needles	1,612	13.30
	14. Coal Valley Lake	95	0.78
	15. Batterman Wash	0	0
	16. Pine Creek	1,270	10.48
	17. Cottonwood	623	5.14
	Total	3,600	29.7

The Lincoln County Cottontail Pass Alternative is the longest of the alternatives as measured from the eastern boundary of the Needles Allotment to the western boundary of the Cottonwood Allotment. As such it also would result in the largest amount of disturbance. By comparison the DOE Garden Valley Alternative 1, the preferred alternative, is 4.73 miles shorter, and would disturb approximately 573 less acres based on the 1,000' wide construction corridor.

Other impacts within the affected allotment are summarized in Figure 4.31 below.

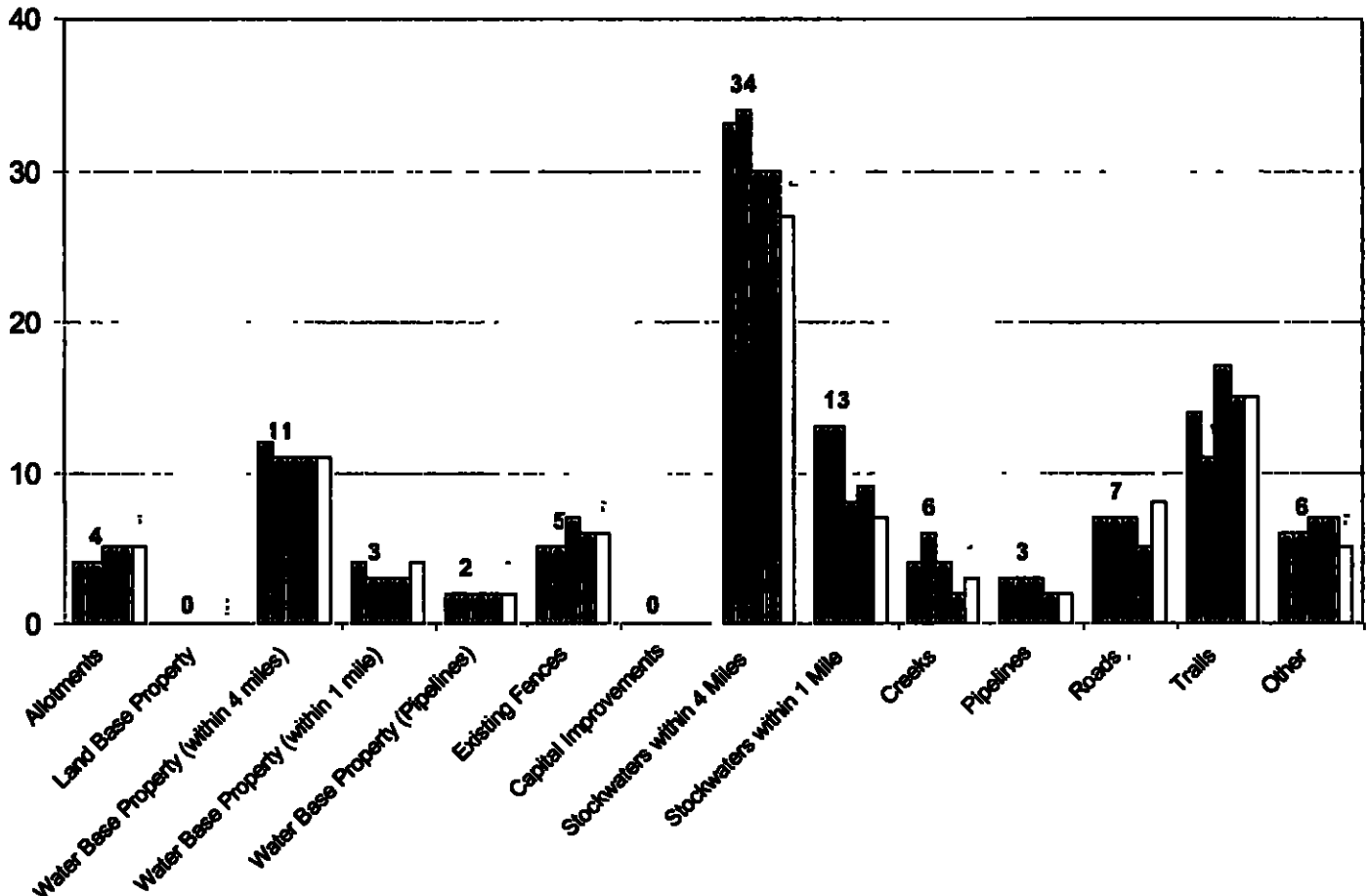


Figure 4.31: DOE Garden Valley Alternative Segments and Lincoln County Cottontail Pass Alternative – Impacted Features Comparison

Note: Garden Valley Alternative 3 (green)
Garden Valley Alternative 1 – Preferred Alternative (red)
Garden Valley Alternative 2 (green)
Garden Valley Alternative 8 (green)
LC Cottontail Pass Alternative (yellow)

The DOE proposed alternatives are very similar in the potential impacts they present. The preferred alternative avoids the impacts within Water Gap, but impacts more stockwaters. The preferred alternative would avoid more roads and trails than the other DOE proposed alternatives. While nearly all Permittees indicated a need to avoid Water Gap, one Permittee voiced a preference for a variation of the alternatives (2 and 8) through Water Gap.

The potential impacts posed by the DOE Preferred Alternative are also similar to those posed by the Lincoln County Cottontail Pass Alternative. The Lincoln County Cottontail Pass Alternative would impact one more allotment, Coal Valley Lake, than would the DOE Preferred Alternative. The Lincoln County Cottontail Pass Alternative would impact fewer stockwaters, but that does not translate similarly to water base properties impacted. The Lincoln County Cottontail Pass Alternative would impact more roads and trails than the DOE Preferred Alternative. The Permittees in the Coal Valley Lake, Pine Creek and Cottonwood Allotments were adamantly opposed to the Lincoln County Cottontail Pass Alternative. The Permittees in the Batterman Wash and Needles Allotments indicated that while the Lincoln County Cottontail Pass Alternative would alleviate some of the impacts to their operations by avoiding Water Gap, this alternative only shifted the focus of the impact onto permittees in other allotments.

4.5.1.2 Wildlife and Wild Horses

The impacts to wildlife and wild horses are relatively similar for each of the five potential alternatives. None of the alignments would significantly reduce the impacts to either wildlife or wild horses.

4.5.2 DOE Proposed Corridor Compared to Lincoln County Short Route

4.5.2.1 Public Land Grazing Allotments

The comparison analyzed in this Section is between the DOE Proposed Caliente Corridor including Common Segment 1B, Garden Valley Alternative 1, that portion of Common Segment 2 within Lincoln County, and the Lincoln County Short Route from the point of diversion with the DOE Proposed Caliente Corridor west to where it would enter the NTTS as depicted in Figure 4.32. It should be noted that the impacts of the Caliente or Eccles Alternative Segments and Common Segment 1A would be the same for both the DOE proposed corridor and the Lincoln County Short Route.

The list of allotments affected by each proposed corridor, the length of the corridor across each allotment and the construction area through each allotment are displayed in Table 4.16.

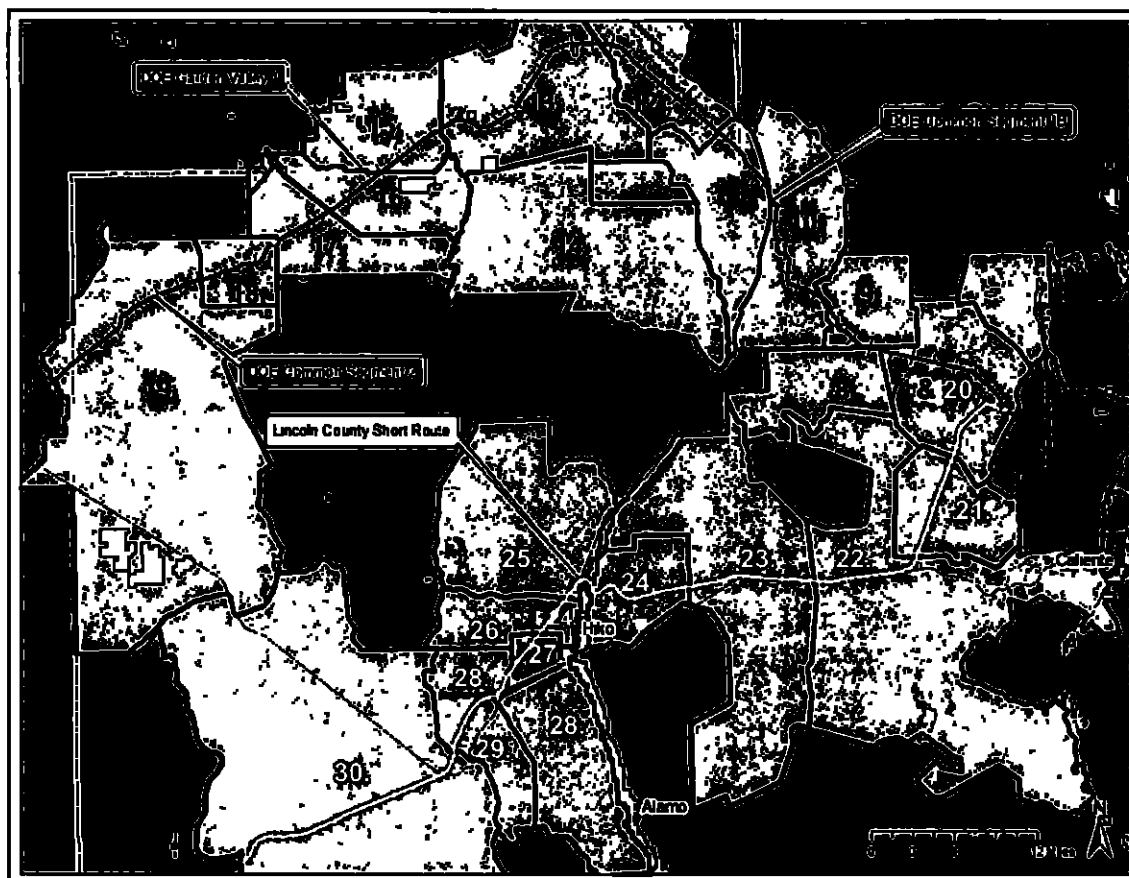


Figure 4.32. DOE Caliente Corridor and Lincoln County Short Route - Affected Allotments Comparison

Table 4.16: DOE Caliente Corridor and Lincoln County Short Route – Impacted Allotments and Disturbed Area Comparison

Route and Alternative	Allotment	Construction Right-of-Way (acres)	Length of Line (miles)
Department of Energy Proposed Route Common Segment 1B	7 Ely Springs	1,389	11.5
	8. Rattlesnake	119	1.0
	9. Thorley Use Area	805	6.6
	10. Deadman Use Area	1,027	8.5
	11. Timber Mountain	787	6.5
	12. Sunnyside	1,321	10.9
	Total	5,448	45.0
Department of Energy Garden Valley Alternative 1 (Preferred Alternative)	13. Needles	1,632	13.5
	15. Batterman Wash	657	5.4
	16. Pine Creek	570	4.7
	17. Cottonwood	536	4.4
	Total	3,395	28.0
DOE Proposed Route Common Segment 2	18. McCutcheon Springs	784	6.5
	19. Sand Springs	1,622	13.4
	Total	2,406	19.9
DOE Proposed Caliente Corridor Totals		11,249	92.9
Lincoln County Short Route Totals		9,202	75.9
Lincoln County Short Route	20. Ely Springs	865	7.1
	21. Cliff Springs	925	7.6
	22. Oak Springs	973	8.0
	23. Pahroc	1,128	9.3
	24. South Hiko - Six Mile	1,321	10.9
	25. Irish Mountain	318	2.6
	26. Wildhorse	91	0.8
	27. Crystal Springs	496	4.1
	28. Pahrnagat West	218	1.8
	29. Pine Cone	639	5.3
	30. Bald Mountain	2,228	18.4

The DOE Proposed Caliente Corridor would be approximately 16.9 miles longer, and disturb approximately 2,045 more acres than the Lincoln County Short Route for the portion of each corridor analyzed. The DOE Proposed Corridor would affect 12 allotments, while the Lincoln County Short Route would affect 11 allotments.

Other impacts within the affected allotment are summarized in Figure 4.33.

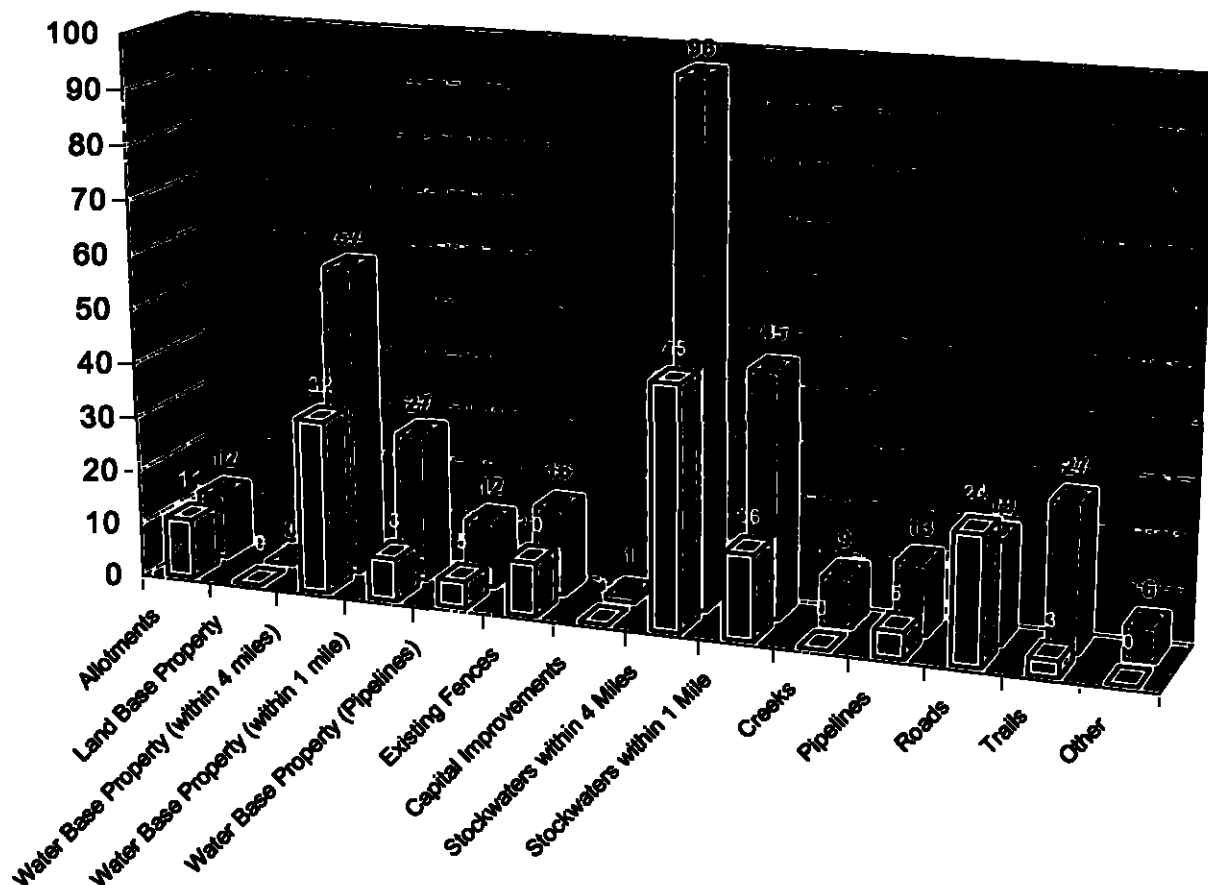


Figure 4.33. DOE Preferred Alternative (Red) and Lincoln County Short Route (Yellow) Impacted Features Comparison

Neither alignment would directly impact land base property. Only one corral would have to be relocated, and that would be along the DOE proposed route. The DOE proposed route would impact more than twice the number of water base properties. This trend holds true for stockwaters as well. There would be more fence, creek and pipeline crossings along the DOE proposed route. The Lincoln County Short Route would cross more designated roads, but significantly fewer trails. Other impacts tallied along the DOE proposed route primarily include impacts pertinent Permittees operating on more than one allotment.

The figures listed above constitute impacts that could be quantified by the project team. There would be immeasurable, unavoidable impacts to any grazing allotment that a proposed rail might cross. These impacts are difficult to quantify and even more difficult to compare.

4.5.2.2 Wildlife and Wild Horses

The project team conducted a cursory comparison of the wildlife and wild horse impacts posed by both proposed corridors from the point of divergence west. Impacts of the proposed Caliente Corridor have been documented in previous studies and within the current DEIS-RA. Impacts from the point of divergence east would be the same for either the DOE Proposed Caliente Corridor or Lincoln County Short Route. Big game species and sage grouse information was provided by the NDOW, as shown in Figures 4.7 – 4.10 and information regarding wild horse HMAs was provided by BLM as shown in Figure 4.11. The distance of each rail through these distribution and habitat areas west of the point of divergence was tabulated using ArcView Software (See Figure 4.34).

It should be noted that elk distribution mapping was not available. Elk herds continue to expand and pioneer into new areas within Lincoln County. Small herds have been documented in the North Pahroc Range crossed by the DOE Proposed Caliente Corridor as well as the Highland and Chief Ranges crossed by Common Segment 1A.

Three of the species, mule deer, bighorn sheep and sage grouse, included in Figure 4.34 are discussed in the state Wildlife Action Plan as species of interest. The sage grouse is of particular interest as multiple petitions to list the bird as an endangered species have been filed in recent years. Other species of concern or special status species have been identified by the NDOW and the BLM along both rail corridors. A list of these species along with habitat type and location can be obtained from the appropriate agency

The NDOW Regional Biologist expressed more concern about landscape level wildlife impacts associated with the Lincoln County Short Route than with the DOE Proposed Caliente Corridor.

Water is a critical resource to nearly every type of wildlife listed above. The impacted stockwaters, and creek crossings discussed in previous sections also serve as critical wildlife water sources and habitat, particularly the natural spring and riparian areas. The DOE Proposed Caliente Corridor impacts many more of these areas than does the Lincoln County Short Route, as shown in Figure 4.33.

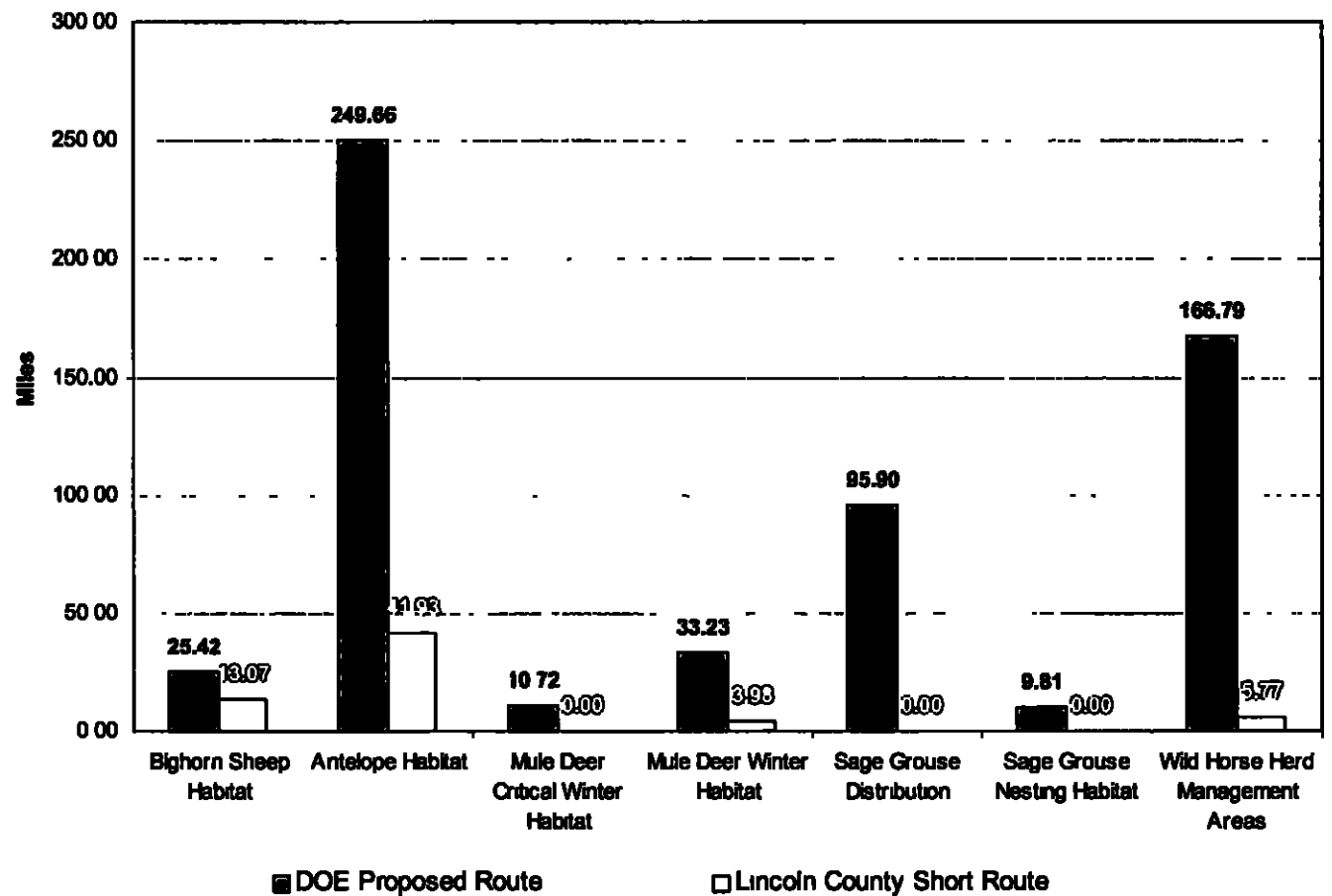


Figure 4.34: Impacted Wildlife and Wild Horse Habitat

5.0 Private Property Impacts Analysis

5.1 ISSUES EVALUATED

In our interviews with impacted property owners, nine issues were repeated by several of the owners. It is important to note that these interviews were conducted in such a manner that the respondent was asked to consider possible impacts. No guidance or examples were provided. It is quite likely that if this list was provided to those interviewed, the percentages for each issue would rise dramatically. The five basic stages of any project are:

1. planning/policy development
2. detailed planning/funding/impact assessment
3. construction/implementation
4. operation/maintenance, and
5. abandonment/decommissioning

For each issue evaluated, we evaluated in which stage(s) the stated concerns would possibly arise. The Caliente Rail Corridor (CRC) project is currently in the second stage of detailed planning and impact assessment. However policy development, part of the first stage, is ongoing.

5.1.1 Infrastructure

The primary concern of those interviewed was the impact the construction and operation of the Caliente Railroad would have on the local infrastructure. Almost one-fourth of those interviewed were concerned about infrastructure for health, safety, communications, housing, roads and education.

5.1.1.1 Planning/policy development

Impacts to infrastructure have not been experienced thus far in the planning/policy stage. It is not anticipated that any infrastructure impacts will occur in this stage.

5.1.1.2 Detailed planning/funding/impact assessment

Impacts to infrastructure have not been experienced thus far in the detailed planning/funding/impact assessment stage. It is not anticipated that any infrastructure impacts will occur in this stage. However, a formal framework for assessing and mitigating impacts needs to be established and should include specific impacts identified and appropriate mitigation measures for each phase of the project development. The Caliente Railroad, if constructed, would be the longest rail line built in the United States since the construction of the transcontinental railroad. Given the magnitude of this project, appropriate attention must be given to ensuring significant local involvement and control in impact identification and mitigation. Some of the public officials interviewed for this study indicated that it would be appropriate and beneficial for the Department of Energy (DOE) to cooperate and consult with all local governmental agencies with jurisdictional boundaries that encompass part of the proposed Caliente Railroad about various aspects of impact assessment and mitigation, including the following:

1. evaluating the impacts,
2. establishing appropriate mitigation measures,
3. monitoring the progress of the project to continue identifying new impacts,
4. monitoring the effectiveness of mitigation measures to determine needed alterations or revisions to the mitigation plan.

5.1.1.3 Construction/implementation

Significant infrastructure impacts are anticipated during this phase of the development. The significant influx of temporary workers coupled with the intense use of public roads for movement of the workers and the materials to construct the railroad will result in impacts to the public infrastructure that will need mitigation. Public infrastructure is meant to include all public services and facilities that are necessary to provide the same quality of life to the citizens of Lincoln County as are currently enjoyed. This includes, but is not limited to the following:

1. Emergency services, including police and fire protection
2. Public health, including hospital care, state or county health departments, and sanitation services
3. Public education
4. Public transportation, including construction and maintenance of public roadways and provision of mass transit services
5. Cultural and recreational activities and facilities, including parks, historical sites, and community shared-use facilities.

5.1.1.4 Operation/maintenance

Significant infrastructure impacts are anticipated during this phase of the development. These impacts will need to be mitigated.

5.1.1.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.2 Taking of Private Property

Lincoln County is a vast county with very minimal private land. Almost 18 percent of those interviewed found it unacceptable for the federal government to be considering taking more privately held land for their management and/or use.

5.1.2.1 Planning/policy development

On December 28, 2005, the Bureau of Land Management (BLM) granted DOE's application for land withdrawal and issued a Public Land Order withdrawing approximately 308,600 acres of public lands within the CRC, Nevada. While this withdrawal did not directly affect existing private property, it did prohibit certain activities, including the sale of that land should it become a candidate for disposal for a period of ten years.

5.1.2.2 Detailed planning/funding/impact assessment

Construction of the Caliente Railroad will require the acquisition of rights-of-way over private land. It is anticipated that this acquisition will commence during the detailed planning phase

5.1.2.3 Construction/implementation

The magnitude of the Caliente Railroad construction project lends itself to unexpected, unplanned changes to the implementation plan as the project progresses. Thus, even if all of the land acquisition that is anticipated is accomplished in the previous phase, it is very likely that additional acquisition may be required as time goes on.

5.1.2.4 Operation/maintenance

It is not anticipated that additional impacts to private property will occur during this phase that were not already identified during previous phases, unless the scope of the shipping campaign substantially increases and requires expansion of staging yards or other such facilities.

5.1.2.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.3 Federal Infringement/Unfunded Mandates

5.1.3.1 Planning/policy development

No unfunded mandates have occurred thus far in the planning/policy development stage and it is not anticipated that any will occur in this stage. Federal infringement impacts refer to the public perception that the federal government is exerting undue control over land use or other activities within the State of Nevada. The western United States in general, and Nevada specifically, has a history of development that has led to a tenuous and often strained relationship between citizens and the federal government. This is especially true when it comes to land use issues. Those interviewed are generally supportive of the Caliente Railroad and even more supportive of Yucca Mountain as an appropriate site for disposal of used nuclear fuel and high-level radioactive waste. Still, they express concern that this is another example of the federal government dictating how the land in Nevada will and will not be used. This impact has been felt from the initial stage in development.

5.1.3.2 Detailed planning/funding/impact assessment

No unfunded mandates occurred thus far in the detailed planning/funding/impact assessment stage and it is not anticipated that any will occur in this stage. The impact regarding federal infringement remains and will persist without more significant and substantial inclusion of the citizens and governments in Lincoln County in the planning process.

5.1.3.3 Construction/implementation

Without full and appropriate mitigation it is anticipated that local governmental agencies, and any agency providing public services funded in part or in whole by federal or state funds, will be faced with unfunded mandates related to the Caliente Railroad and related activities in this stage. The impact regarding federal infringement will persist without more significant and substantial inclusion of the citizens and governments in Lincoln County in the planning process.

5.1.3.4 Operation/maintenance

Without full and appropriate mitigation it is anticipated that local governmental agencies, and any agency providing public services funded in part or in whole by federal or state funds, will be faced with unfunded mandates related to the Caliente Railroad and related activities in this stage. The impact regarding federal infringement will persist without more significant and substantial inclusion of the citizens and governments in Lincoln County in the planning process.

5.1.3.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed. Based on knowledge of previous government projects, it is very likely that a possibility for unfunded mandates in this stage will occur without full and appropriate mitigation.

5.1.4 Effects on Property Values

5.1.4.1 Planning/policy development

Some of those interviewed indicated they already have felt an impact from the proposed project that resulted in lost economic opportunities related to the possible sale of their property.

5.1.4.2 Detailed planning/funding/impact assessment

The impact of the Caliente Railroad on property values continues to concern citizens. The vast majority is concerned about possible devaluation of their property as a result of the specific loss or disruption of use on their property and/or the stigma associated with the nature of the shipments that will be transported on the Caliente Railroad to Yucca Mountain.

5.1.4.3 Construction/implementation

The value of property directly traversed by the railroad or directly impacted by the various activities needed to construct the railroad will definitely be impacted. Whether the potential increase in market pressure will drive surrounding property values higher or the stigma will result in a loss of economic opportunity will need to be closely monitored. Impacts to the community result with either scenario and should be mitigated.

5.1.4.4 Operation/maintenance

In this stage there will be impacts similar to those that occurred in the previous stage. Whether the potential increase in market pressure will drive surrounding property values higher or the stigma will result in a loss of economic opportunity will need to be closely monitored. Impacts to the community result with either scenario and should be mitigated.

5.1.4.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed. However, if the DOE plans on abandoning or decommissioning the railroad, nationwide experience with the abandonment of railroads and federal projects show that significant impacts often occur.

5.1.5 Impacts on Scenic Vistas

5.1.5.1 Planning/policy development

Impacts to scenic vistas have not been experienced thus far in the planning/policy stage to our knowledge. It is not anticipated that any such impacts will occur in this stage.

5.1.5.2 Detailed planning/funding/impact assessment

It is not anticipated that any impacts to scenic vistas will occur in this stage.

5.1.5.3 Construction/implementation

Construction of the Caliente Railroad will unavoidably impact the scenic vistas in Lincoln County.

5.1.5.4 Operation/maintenance

Operation of the Caliente Railroad will unavoidably impact the scenic vistas in Lincoln County.

5.1.5.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.6 Additional Operational Costs for Governmental Agencies and Other Public Service Providers

5.1.6.1 Planning/policy development

Impacts to the operational costs have been experienced, but mitigated through the provision of oversight funding. Funding for the Affected Units of Local Governments has failed to meet the programmatic requirements for all of the agencies. Therefore, less analysis and planning can take place than the local governments would desire. Furthermore, the restrictions on the funding have at times prevented the governments from maximizing the beneficial use of funding.

5.1.6.2 Detailed planning/funding/impact assessment

Operational costs for governmental agencies will continue to increase for those governments with jurisdiction over lands included in the CRC. So long as adequate oversight funding is provided to Lincoln County, these costs should be able to be mitigated appropriately.

5.1.6.3 Construction/implementation

Operational costs for governmental agencies will significantly change in size and scope. No longer will planning and impact assessment be the sole thrust of the expenses. Expenses for public services and infrastructure will be required.

5.1.6.4 Operation/maintenance

Operational costs for governmental agencies will be more similar to the construction/implementation phase.

5.1.6.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.7 Interference with Recreational Activities

5.1.7.1 Planning/policy development

Impacts to recreational activities have not been experienced thus far in the planning/policy stage. It is not anticipated that any such impacts will occur in this stage.

5.1.7.2 Detailed planning/funding/impact assessment

Impacts may occur as rights-of-way are granted on private and public lands during this phase.

5.1.7.3 Construction/implementation

Those interviewed expressed concerns regarding the impact construction of a railroad would have on traditional recreational activities, both organized activities and independent activities.

5.1.7.4 Operation/maintenance

Those interviewed expressed concerns regarding the impact that the operation of a railroad would have on traditional recreational activities, both organized activities and independent activities.

5.1.7.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.8 Inflate the Cost of Living

5.1.8.1 Planning/policy development

Impacts to the cost of living have not been experienced thus far in the planning/policy stage. It is not anticipated that any such impacts will occur in this stage.

5.1.8.2 Detailed planning/funding/impact assessment

As planning progresses, market forces may inflate the cost of living for the citizens of Lincoln County.

5.1.8.3 Construction/implementation

During construction of the Caliente railroad, market forces may inflate the cost of living for the citizens of Lincoln County.

5.1.8.4 Operation/maintenance

Throughout the operation of the Caliente railroad, market forces may inflate the cost of living for the citizens of Lincoln County.

5.1.8.5 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

5.1.9 Wildlife/Open Country

Some of those interviewed expressed concerns regarding issues such as migration routes for wildlife and access to the open country. There is a distinction between these issues and the issues analyzed in depth in Section 4.0 of this volume that addresses public grazing and ranching issues

5.1.9.1 Planning/policy development

Impacts to the wildlife/open country have not been experienced thus far in the planning/policy stage. It is not anticipated that any such impacts will occur in this stage.

5.1.9.2 Detailed planning/funding/impact assessment

It is not anticipated that any impacts to wildlife/open country will occur in this stage.
Construction/implementation

Those interviewed expressed concerns regarding the impact construction of a railroad would have on wildlife and access to the open country

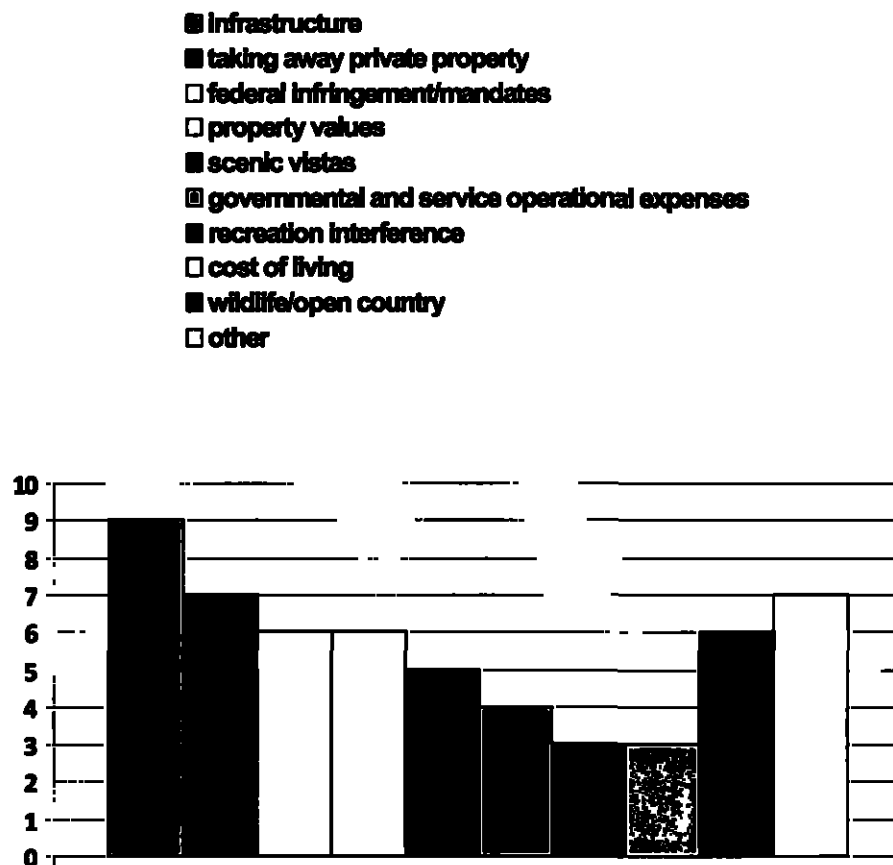
5.1.9.3 Operation/maintenance

Those interviewed expressed concerns regarding the impact that the operation of a railroad would have on wildlife and access to the open country.

5.1.9.4 Abandonment/decommissioning

More detailed information is needed from the DOE regarding future possible plans for abandonment or decommissioning of the railroad before impacts can be properly assessed.

Figure 5.1: Impacts Identified by Those Surveyed



5.2 IMPACTS OF PROPOSED RAIL CORRIDORS AND ALTERNATIVES

This Section includes a summary of the impacts to Lincoln County and private property owners that were identified by the project team along the DOE proposed Caliente Rail Alignment and Alternatives, Lincoln County Cottontail Pass Alternative, and the Lincoln County Short Route Alternative.

The precise alignment is still unknown, making it difficult to effectively evaluate the potential impacts to private property. Therefore, four buffer zone areas were established: The first is within 50 feet on either side of the preferred alignment and alternatives, as they are understood to be. The other buffer zones are at 200 feet, 500 feet, and one-half mile on either side of the alignments and alternatives. Literally hundreds of parcels fall within the mile-wide corridor. A more manageable number lie within the other buffer zones. However, impacts from staging yards and other facilities were not evaluated at all and could likely fall well outside the 500 foot buffer zone.

The DOE identified a nominal width of approximately 31 meters, or about 100 feet, as the preferred width for a construction right-of-way (ROW), where practicable in areas with private land. Therefore, this is the absolute minimum of the properties that will lie within the construction ROW. Along the Caliente Alternative, there are 29 parcels within this boundary. The Eccles Alternative contains four parcels within this nominal width. Additionally, the Caliente Common Segment 1 contains three parcels within this width.

The DOE identified the operations ROW as having a nominal width of 122 meters, or about 400 feet, generally. It is likely that this is the true minimum width of direct and irreversible impacts during the construction and operation of the Caliente Railroad. Along the Caliente Alternative, there are 58 parcels within this boundary. The Eccles Alternative contains four parcels within this nominal width. Additionally, the Caliente Common Segment 1 contains three parcels within this width.

The DOE identified the general construction ROW for the Caliente Railroad as having a nominal width of 300 meters, or about 1,000 feet. While they state they will try to limit that where there is private property, there are no commitments, let alone guarantees. Therefore, it is highly likely that all of the properties within this boundary will be seriously impacted during the construction and operation of the Caliente Railroad. Along the Caliente Alternative, there are 89 parcels within this boundary. The Eccles Alternative contains five parcels within this nominal width. Additionally, the Caliente Common Segment 1 contains three parcels within this width.

5.2.1 DOE Proposed Corridor and Alternatives

The naming convention for the various segments of the DOE Proposed Caliente Corridor was adopted to match those designated in the Draft EIS.

5.2.1.1 DOE Caliente Alternative Segment

The Caliente Alternative Segment impacts numerous private parcels. Eighty-nine (89) of these parcels are within 500 feet of the assumed centerline of the proposed route. Detailed information on each of these parcels, including a map of the parcel showing the location of the parcel in relation to the proposed route is included in Appendix 2.0, Parcel Specific Analyses, of this report.

In addition to the private property specific impacts, the project team evaluated other community-wide impacts to the extent possible during the course of this project. These impacts included infrastructure (i.e., roads and public utilities), recreation, wildlife, mining and natural resource impacts.

INFRASTRUCTURE

The Caliente Alternative will potentially impact two power lines, 14 county roads, one Nevada State Highway, two U.S. highways and three public utilities.

RECREATION AND WILDLIFE

Mule deer migration routes and winter range are bisected on both the east and west sides of Meadow Valley. The Caliente Alternative impacts small game and birds. If fencing is mandatory, Nevada Department of Wildlife (NDOW) has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County, and the private sale of thousands of acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

MINING

Two mining claims exist in the vicinity of the Caliente Alternative.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the Caliente Alternative include 21 wells and four springs. The *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DEIS-RA), Summary indicates that ground water withdrawals during the construction phase of Meadow Valley (Panaca Valley) area are projected by DOE to require the drilling of six new wells (DOE, 2007). These new wells are located in Meadow Valley between Indian Cove and Common Segment 1 of the CRC. During an eight-month growing season twenty high production agricultural wells (500-1,000 gallons per minute) are pumping at full capacity in the same area. In addition within two miles west of Common Segment 1, four more high production irrigation wells are in operation. Twenty-five more agricultural wells could be impacted in the same Meadow Valley water basin. Panaca and Caliente both draw their culinary water from the same water basin as well as a large number of shallow private culinary wells in the valley. The private wells, because of their shallow depth, would be impacted first, potentially leaving hundreds of people with no water. Approximately one half of Lincoln Counties' residential population could be impacted.

5.2.1.2 DOE Eccles Alternative Segment

The Eccles Alternative Segment impacts private parcels, five of which are within 500 feet of the assumed centerline of this Alternative. Detailed information on each of these parcels, including a map of the parcel showing the location of the parcel in relation to this Alternative is included in Appendix 3.0, Parcel Specific Analyses, of this report.

In addition to the private property specific impacts, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife, mining and natural resource impacts.

INFRASTRUCTURE

The Eccles Alternative will potentially impact two power lines, 12 county roads, one U.S. highway and two public utilities.

RECREATION AND WILDLIFE

The Eccles Alternative impacts mule deer winter range. If fencing is mandatory, NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

The Eccles Alternative will also potentially impact up to five existing and future trailheads, trails and crossings.

MINING

Two mining claims exist in the vicinity of the Eccles Alternative.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the Eccles Alternative include five wells and eight springs. The DEIS-RA, Summary indicates that ground water withdrawals during the construction phase of Meadow Valley (Panaca Valley) area are projected by DOE to require the drilling of six new wells (DOE, 2007). These new wells are located in Meadow Valley between Indian Cove and Common Segment 1 of the CRC. During an eight-month growing season twenty high production agricultural wells (500-1,000 gallons per minute) are pumping at full capacity in the same area. In addition, within two miles west of Common Segment 1, four more high production irrigation wells are in operation. Twenty-five more agricultural wells could be impacted in the same Meadow Valley water basin. Panaca and Caliente both draw their culinary water from the same water basin as well as a large number of shallow private culinary wells in the valley. The private wells because of their shallow depth would be impacted first, potentially leaving hundreds of people with no water. Approximately one half of Lincoln Counties' residential population could be impacted.

5.2.1.3 DOE Common Segment 1

The DOE Common Segment impacts private parcels, three of which are within 500 feet of the assumed centerline of this alternative. Detailed information on each of these parcels, including a map of the parcel showing the location of the parcel in relation to this alternative is included in Appendix 3.0, Parcel Specific Analyses, of this report.

In addition to the private property specific impacts, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife, mining and natural resource impacts.

INFRASTRUCTURE

The DOE Common Segment 1 will potentially impact two power lines, 52 county roads and one Nevada State highway. Caliente Public Utilities connects to Lincoln County Power substation in Antelope Canyon near Jim Wilkin Trucking. A new Caliente Public Utility building is under construction next to the Lincoln County Power Substation yard as of November 13, 2007. These facilities are within one quarter mile of Common Segment 1. Impacts to Caliente Public Utility Power Lines will occur as the CRC line exits the City of Caliente. CRC Common Segment 1 will intersect the Lincoln County Power mainline at least two times as it winds over Bennett Pass. This will not require major modifications to the power line.

RECREATION AND WILDLIFE

Mule Deer migration routes and winter range are bisected on both the east and west sides of Meadow Valley. Bennett Pass is a mule deer range, migration route and watering site. Dry Lake Valley, White River, Coal Valley, Garden Valley and Railroad Valley are all pronghorn antelope habitat. Migration routes, watering sites and hunter access would all need to be carefully addressed. White River and Warm Springs are both sage grouse habitat. Sage grouse are being considered for the Endangered Species list. Winter migration patterns are north to south. Fencing the CRC would seriously impact these migrations. If fencing is mandatory NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

Lincoln County is a popular, sought after hunting area. Deer, antelope, elk and wild bird hunting as well as fishing are popular. No fishing areas are within Common Segment 1. Echo Dam and Eagle Valley State Park are ten and twenty miles away. Deer and elk hunting areas include Bennett Pass, Ely Springs and Highland Peak. Many deer hunting roads will be crossed by the CRC. Deer and elk migration routes will be bisected by the CRC which could impact the number of animals available to hunt. Dry Lake Valley is a popular antelope hunting area. The presence of the railroad will bisect antelope migration routes which could impact the numbers of antelope available to hunt. Chukar hunting is popular in the mountain areas around the springs. Ely, Bennett, Deadman, and Hamilton Spring areas are near the CRC route as it leaves Meadow Valley and crosses Dry Lake Valley. Quail, duck and goose hunting will be seriously impacted during the construction phase and for some time after in Meadow Valley as the CRC travels directly through the habitat of these birds. Mountain lion, coyote, and rabbit hunting are also popular hunting activities that occur on a regular basis along the CRC in Lincoln County. Coyote, bobcat, fox, and badger are animals that are trapped by many people in Lincoln County. This activity occurs along the full length of the CRC and will directly impact the road travel to and from trapping areas. Rail crossings at non-marked areas could be very common.

The DOE Common Segment 1 would intersect ATV and jeep trails on the Bennett Pass and multiple times in Dry Lake Valley. A marked network of Nevada state trails has been marked and is still in the development stage. Other areas are being considered. The impact on these trails would be significant due to the fact that ATV travel would be compromised if extensive travel were required to reach rail crossings. ATV activity in Lincoln County has grown tremendously in the last five years. People from Las Vegas come on weekends and holidays in droves to enjoy the wide open spaces on their all terrain vehicles. This phenomenon will directly impact the CRC.

MINING

Mining land use conflicts along the CRC will occur in DOE Common Segment 1. Jim Wilkin Trucking operates a gravel pit and rock quarry in Antelope Canyon in Caliente. The public gravel pit is also located in this area. These mining activities are located within one quarter mile west of this Segment as it exits Caliente going north. This gravel pit is in use every working day. The Short Route Alternative would also impact this mining activity.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the DOE Common Segment 1 include 22 wells and four springs.

5.2.1.4 DOE Garden Valley Alternative Segments

No private parcels lie within 500 feet of the assumed centerline of any of the DOE Garden Valley Alternative Segments 1, 2, 3 or 8. Therefore, detailed information on the private parcels that are impacted by these alternatives is not included in Appendix 3.0, Parcel Specific Analyses, of this report. The private land that is directly impacted by all of these alternatives is owned by Michael Heizer and is home to a major art project, 'City'. Mr. Heizer's concerns are shared by many in the art community and some others in Lincoln County.

Each of the DOE Garden Valley Alternative segments will negatively impact the scenic vistas that are the background for Mr. Heizer's art. The only acceptable mitigation measure according to Mr. Heizer is to avoid the impact by not building a rail line through Garden Valley at all. This can be accomplished by adopting the Lincoln County Short Route or by shipping the material by truck in Nevada. Either of these options seems potentially acceptable to Mr. Heizer.

In addition to the private property impacts noted above, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife, mining and natural resource impacts.

INFRASTRUCTURE

The Garden Valley Alternatives will potentially impact up to one power line and 12 county roads. Mount Wheeler Power provides power to Adaven and nearby areas in the Grant Mountain Range. These areas are outside of Lincoln County but some of the cabins and properties are owned by Lincoln County residents. The CRC will parallel the power line for many miles but will not cross it in any of the proposed CRC alignments in Garden Valley.

RECREATION AND WILDLIFE

Dry Lake Valley, White River, Coal Valley, Garden Valley and Railroad Valley are all pronghorn antelope habitat. Migration routes, watering sites and hunter access would all need to be carefully addressed. White River and Warm Springs are both sage grouse habitat. Sage grouse are being considered for the Endangered Species list. Winter migration patterns are north to south. Fencing the CRC would seriously impact these migrations. If fencing is mandatory NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

MINING

Ten mining claims exist in the vicinity of the Garden Valley Alternative 2.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the Garden Valley Alternatives include up to two wells and three springs.

5.2.1.5 DOE Common Segment 2

The DOE Common Segment does not impact private parcels within Lincoln County. The project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

The DOE Common Segment 2 will potentially impact 10 county roads. Mount Wheeler Power provides power to Adaven and nearby areas in the Grant Mountain Range. These areas are outside of Lincoln County but some of the cabins and properties are owned by Lincoln County residents. The CRC will parallel the power line for many miles but will not cross it in any of the proposed CRC alignments in Garden Valley.

RECREATION AND WILDLIFE

Dry Lake Valley, White River, Cole Valley, Garden Valley and Railroad Valley are all pronghorn antelope habitat. Migration routes, watering sites and hunter access would all need to be carefully addressed. White River and Warm Springs are both sage grouse habitat. Sage grouse are being considered for the Endangered Species list. Winter migration patterns are north to south. Fencing the CRC would seriously impact these migrations. If fencing is mandatory NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of

acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

Coal Valley and Garden Valley are antelope and deer hunting areas. The CRC Common Segment 2 will cross many of the roads used to travel to deer hunting areas. The most common deer hunting areas are in the Grant Range in Nye County. The CRC would intersect both deer and antelope migration trails and could impact the deer and antelope populations. Chukar and quail are also hunted. The CRC Common Segment 2 would not interfere with these birds' habitat. Mountain lion, coyote, and rabbit hunting are also popular hunting activities that occur on a regular basis along the CRC in Lincoln County. Coyote, bobcat, fox, and badger are trapped by many people in Lincoln County. This activity occurs along the full length of the CRC and will directly impact the road travel to and from trapping areas. Rail crossings at non-marked areas could be very common.

The remote areas along the proposed and CRC route are popular areas for hiking, camping and rock climbing. Travel to remote areas will be impacted by the construction of the CRC. It is anticipated that those individuals participating in these activities would use appropriate rail crossings.

Many Native American sites are found along the proposed CRC. Travel to these sites will not be hindered by the CRC.

Many prospectors roam the far reaches of Lincoln County looking for the 'Mother Lode'. Every mountain range has the remnants of some old 'diggings'. Travel to these areas should not be restricted by the CRC.

MINING

Mining land use conflicts may occur in Common Segment 2 as the CRC exits Garden Valley going west. The Frieburg Mining District in the Worthington Mountains contains patented mining claims that are not in operation at this time. Gold and silver were mined in this area and rumor indicates that this area may again be active as gold and silver prices continue to climb. The CRC exits Garden Valley through McCutcheon Pass one mile west of the Frieburg Mining District.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the DOE Common Segment 2 include three wells and one spring.

5.2.2 Lincoln County Short Route

The Lincoln County Short Route would share the same impacts as either the DOE Caliente Alternative or the DOE Eccles Alternative. Therefore, these impacts have not been repeated in this Section. Maps and parcel-level details of the private property along the remainder of the Lincoln County Short Route were not available to the project team. Therefore detailed information on each of the parcels along the Lincoln County Short Route other than those affected by the Caliente and Eccles Alternatives were not included in Appendix 3.0, Parcel Specific Analyses, of this report.

In addition to the private property specific impacts, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife, mining and natural resource impacts.

INFRASTRUCTURE

The Lincoln County Short Route will potentially impact three power lines, 11 county roads, three Nevada State highways, three U.S. highways and four public utilities.

RECREATION AND WILDLIFE

Mule deer migration routes and winter range are bisected on both the east and west sides of Meadow Valley. The Short Route Alternative impacts small game and birds. If fencing is mandatory NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the rail corridor. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The Lincoln County Short Route in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of acres under the Lincoln County Land Act could seriously impact the wildlife in Lincoln County.

The proposed Lincoln County Short Route will impact Desert Big Mountain Sheep habitat and hunting as it enters Pahranaagat Valley through Crystal Wash and exits Pahranaagat Valley on Hancock Summit. Hancock Summit is also a popular deer and bird hunting area. Hunting roads would be crossed. Four bird guzzlers are within ¼ mile of the Lincoln County Short Route on the Hancock Summit. The Key Pitman Wildlife Management area is within one quarter mile of the Lincoln County Short Route as it crosses Pahranaagat Valley. This area is a popular fishing and bird hunting area. Impact should be minimal if the rail route stays near the highway ROW.

The Lincoln County Short Route would intersect ATV and jeep trails on the Bennett Pass and multiple times in Dry Lake Valley. A marked network of Nevada state trails has been marked and is still in the development stage. Other areas are being considered. The impact on these trails would be significant due to the fact that ATV travel would be compromised if extensive travel was required to reach rail crossings. ATV activity in Lincoln County has grown tremendously in the last five years. People from Las Vegas come on weekends and holidays in droves to enjoy the wide open spaces on their all terrain vehicles. This phenomenon will directly impact the Lincoln County Short Route.

MINING

The Lincoln County Short Route comes within the vicinity of 12 mining claims.

NATURAL RESOURCES

Natural resources within the immediate vicinity of the Lincoln County Short Route include seven wells and four springs.

5.2.3 Cottontail Pass Alternative

Following analysis, the project team determined that there were no significant impacts to the community at large or specific private parcels from the use of this Alternative that had not already been analyzed. Furthermore, it was determined that no community at large or specific private parcel impacts were successfully avoided through the use of this Alternative.

5.3 SUGGESTED MANAGEMENT ACTIONS TO MITIGATE POTENTIAL ADVERSE IMPACTS

This Section includes a summary of the mitigation actions that were identified by the project team. Mitigations were assessed through interviews with community stakeholders and private property owners. These mitigation measures should be considered preliminary, and subject to change based on final rail alignment and operational criteria. Lincoln County and the City of Caliente should be included in the placement, planning and design of any and all mitigation measures pertinent to the planning, design, construction, operation and possible abandonment or decommissioning of the railroad that lies within their respective jurisdictions.

The Council of Environmental Quality (CEQ) has defined impact management techniques as follows:

1. Avoid
2. Minimize
3. Rectify
4. Reduce or eliminate
5. Compensate

5.3.1 DOE Proposed Corridor and Alternatives

The naming convention for the various segments of the DOE Proposed Caliente Corridor was adopted to match those designated in the Draft EIS.

5.3.1.1 DOE Caliente Alternative Segment

The Caliente Alternative Segment impacts numerous private parcels. Eighty-nine (89) of these parcels are within 500 feet of the assumed centerline of the proposed route. Detailed information on the proposed mitigation measures for each of these parcels is included in Appendix 2.0, Parcel Specific Analyses, of this report. The Parcel Specific Analyses did not detail the recommendations for avoiding the impacts by choosing a different alignment or mode of transportation as it is intended to describe the mitigation measures recommended should that alignment be selected. However, it is important to note that many of those private property owners interviewed indicated a mitigation preference of avoidance through the implementation of truck shipments in Nevada. The general consensus among property owners interviewed is that if the impacts cannot be avoided, they expect fair compensation not only for the actual ROW required for the construction and operation of the railroad, but also for whatever impact that acquisition has on the remainder of the property.

In addition to the private property specific mitigation, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

It is recommended that infrastructure upgrades occur prior to the first shipments arriving in Nevada.

RECREATION AND WILDLIFE

More detailed information regarding the design, construction plans, operational plans and possible abandonment or decommissioning is needed to recommend effective mitigation measures. It is recommended that local stakeholders be involved extensively in planning for each of these stages to help ensure the avoidance, minimization, rectification and/or reduction of impacts to the maximum extent practicable.

NATURAL RESOURCES

The potentially drastic impact on water resources that the construction of the Caliente Railroad will have on the citizens of Lincoln County and the City of Caliente needs to be more fully evaluated before appropriate mitigation measures can be recommended.

5.3.1.2 DOE Eccles Alternative Segment

The Eccles Alternative Segment impacts private parcels, five of which are within 500 feet of the assumed centerline of this alternative. Detailed information on the proposed mitigation measures for each of these parcels is included in Appendix 3.0, Parcel Specific Analyses, of this report. The Parcel Specific Analysis did not detail the recommendations for avoiding the impacts by choosing a different alignment or mode of transportation as it is intended to describe the mitigation measures recommended should that alignment be selected. However, it is important to note that many of those private property owners interviewed indicated a mitigation preference of avoidance through the implementation of truck shipments in Nevada. The general consensus among property owners interviewed is that if the impacts cannot be avoided, they expect fair compensation not only for the actual ROW required for the construction and operation of the railroad, but also for whatever impact that acquisition has on the remainder of the property.

In addition to the private property specific mitigation, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

It is recommended that infrastructure upgrades occur prior to the first shipments arriving in Nevada.

RECREATION AND WILDLIFE

More detailed information regarding the design, construction plans, operational plans and possible abandonment or decommissioning is needed to recommend effective mitigation measures. It is recommended that local stakeholders be involved extensively in planning for each of these stages in to help ensure the avoidance, minimization, rectification and/or reduction of impacts to the maximum extent practicable.

NATURAL RESOURCES

The potentially drastic impact on water resources that the construction of the Caliente Railroad will have on the citizens of Lincoln County and the City of Caliente needs to be more fully evaluated before appropriate mitigation measures can be recommended.

5.3.1.3 DOE Common Segment 1

The DOE Common Segment 1 impacts private parcels, three of which are within 500 feet of the assumed centerline of this alternative. Detailed information on the proposed mitigation measures for each of these parcels is included in Appendix 3.0, Parcel Specific Analyses, of this report. The Parcel Specific Analyses did not detail the recommendations for avoiding the impacts by choosing a different alignment or mode of transportation as it is intended to describe the mitigation measures recommended should that alignment be selected. However, it is important to note that many of those private property owners interviewed indicated a mitigation preference of avoidance through the implementation of truck shipments in Nevada. The general consensus among property owners interviewed is that if the impacts cannot be avoided, they expect fair compensation not only for the actual ROW required for the construction and operation of the railroad, but also for whatever impact that acquisition has on the remainder of the property.

In addition to the private property specific mitigation, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

It is recommended that infrastructure upgrades occur prior to the first shipments arriving in Nevada.

RECREATION AND WILDLIFE

More detailed information regarding the design, construction plans, operational plans and possible abandonment or decommissioning is needed to recommend effective mitigation measures. It is recommended that local stakeholders be involved extensively in planning for each of these stages in to help ensure the avoidance, minimization, rectification and/or reduction of impacts to the maximum extent practicable.

NATURAL RESOURCES

The potentially drastic impact on water resources that the construction of the Caliente Railroad will have on the citizens of Lincoln County and the City of Caliente needs to be more fully evaluated before appropriate mitigation measures can be recommended.

5.3.1.4 DOE Garden Valley Alternative Segments

No private parcels lie within 500 feet of the assumed centerline of any of the DOE Garden Valley Alternative Segments 1, 2, 3 or 8. Therefore, detailed information on the private parcels that are impacted by these Alternatives is not included in Appendix 3.0, Parcel Specific Analyses, of this report. The private land that is directly impacted by all of these Alternatives is owned by Michael Heizer and is home to a major art project, 'City'. Mr. Heizer's concerns are shared by many in the art community as well as others in Lincoln County.

Each of the DOE Garden Valley Alternative Segments will negatively impact the scenic vistas that are the background for Mr. Heizer's art. The only acceptable mitigation measure according to Mr. Heizer is to avoid the impact by not building a rail line through Garden Valley at all. This can be accomplished by adopting the Lincoln County Short Route or by shipping the material by truck in Nevada. Either of these options seem potentially acceptable to Mr. Heizer.

In addition to the private property impacts noted above, the project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

It is recommended that infrastructure upgrades occur prior to the first shipments arriving in Nevada.

RECREATION AND WILDLIFE

More detailed information regarding the design, construction plans, operational plans and possible abandonment or decommissioning is needed to recommend effective mitigation measures. It is recommended that local stakeholders be involved extensively in planning for each of these stages to help ensure the avoidance, minimization, rectification and/or reduction of impacts to the maximum extent practicable.

NATURAL RESOURCES

The potentially drastic impact on water resources that the construction of the Caliente Railroad will have on the citizens of Lincoln County and the City of Caliente needs to be more fully evaluated before appropriate mitigation measures can be recommended.

5.3.1.5 DOE Common Segment 2

The DOE Common Segment does not impact private parcels within Lincoln County. The project team evaluated other community-wide impacts to the extent possible during the course of this project including infrastructure (i.e., roads and public utilities), recreation, wildlife and natural resource impacts.

INFRASTRUCTURE

It is recommended that infrastructure upgrades occur prior to the first shipments arriving in Nevada.

RECREATION AND WILDLIFE

More detailed information regarding the design, construction plans, operational plans and possible abandonment or decommissioning is needed to recommend effective mitigation measures. It is recommended that local stakeholders be involved extensively in planning for each of these stages to help ensure the avoidance, minimization, rectification and/or reduction of impacts to the maximum extent practicable.

NATURAL RESOURCES

The potentially drastic impact on water resources that the construction of the Caliente Railroad will have on the citizens of Lincoln County and the City of Caliente needs to be more fully evaluated before appropriate mitigation measures can be recommended.

5.3.2 Lincoln County Short Route

The Lincoln County Short Route would share the same impacts and recommended mitigation measures as either the DOE Caliente Alternative or the DOE Eccles Alternative. Therefore, these mitigation measures have not been repeated in this Section. Maps and parcel-level details of the private property along the remainder of the Lincoln County Short Route were not available to the project team. Therefore detailed information on each of the parcels along the Lincoln County Short Route other than those affected by the Caliente and Eccles Alternatives were not included in Appendix 3.0, Parcel Specific Analyses, of this report.

5.3.3 Cottontail Pass Alternative

Following analysis, the project team determined that there were no significant impacts to the community at large or specific private parcels from the use of this Alternative that had not already been analyzed. Furthermore, it was determined that no community at large or specific private parcel impacts were successfully avoided through the use of this alternative. Therefore, no additional mitigation measures have been recommended.

5.3.4 Corridor-wide Mitigation Recommendations

5.3.4.1 Infrastructure

Those interviewed repeatedly recommended upgrading infrastructure PRIOR to the commencement of shipping. The consensus was that the federal government should fund the upgrades, but significant local control would be beneficial.

5.3.4.2 Taking of Private Property

The suggested mitigation measures for the impacts to private property were somewhat diverse. Most agreed that economic benefits for locals should be maximized as they are among the most impacted populations. Others, either in conjunction with or in place of recommending the maximization of economic benefits suggested various ways to avoid private property. Some suggested constructing a rail line that bypasses private property to the maximum amount practicable through a more direct route such as the Caliente-Chalk Mountain route or the Lincoln County Short Route. Others suggested intermodal or highway trucking of the shipments as a way to reduce the impact on private property.

5.3.4.3 Federal Infringement/Unfunded Mandates

Many of those interviewed feel disenfranchised by the public consultation process of the DOE. Even those who support the Caliente Railroad, which is the majority of those interviewed, are somewhat disillusioned with the process the DOE has utilized thus far. More local involvement in the planning process is highly recommended to mitigate this impact. Additionally, many believe the DOE and the federal government could do a lot more to maximize the local economic benefit of this project as there are plenty of existing positive examples from both the federal sector and the private nuclear industry sector.

5.3.4.4 *Effects on Property Values*

The recommended mitigation measures for the effects on property values are similar to those recommended for mitigating the taking of private property—construction of a direct route/bypass private property, compensation, and maximization of economic benefit for locals.

5.3.4.5 *Impacts on Scenic Vistas*

Truck shipping was the primary recommended mitigation measure as any railroad constructed in Lincoln County will impact the scenic vistas. The secondary preferred mitigation measure is to construct a more direct route that traverses the Nevada Test Site (NTS). In summary, as one interviewee stated, the only mitigation of this impact is to “keep it out of sight”

5.3.4.6 *Additional Operational Costs for Governmental Agencies and Other Public Service Providers*

Additional operational costs for governmental agencies and other public service providers need to be mitigated through a combination of three things:

1. Federal funding should be provided for an direct cost.
2. Economic opportunities should be maximized for locals to give companies and industries incentives to relocate.
3. Payments equal to taxes must be paid, even on the ROW, as if it were privately owned land and equipment.

5.3.4.7 *Interference with Recreational Activities*

Those interviewees who expressed concern with the potential interference with recreational activities believed these impacts could be mitigated with meaningful local involvement in planning. Other mitigation measures mentioned were to construct a more direct route or ship the material by truck.

5.3.4.8 *Inflate the Cost of Living*

This impact is a result of market pressures that are largely out of the control of the DOE. Therefore, the interviewees who mentioned this impact primarily suggested maximizing the economic benefit of the project for locals as the only possible mitigation.

5.3.4.9 *Wildlife/Open Country*

Those interviewees who expressed concern with the potential impact to wildlife and access to open country believed these impacts could be mitigated with meaningful local involvement in planning. Other mitigation measures mentioned were to construct a more direct route or ship the material by truck.

Table 5.1: Summary of Recommended Mitigation Measures

IMPACTS	MITIGATION
infrastructure	infrastructure upgrades PRIOR to shipments
taking away private property	direct route/bypass private property, compensation, truck shipments, maximize economic benefit for locals
federal infringement/mandates	local involvement in planning, local control, federal funding, maximize economic benefit for locals
property values	direct route/bypass private property, compensation, federal funding, maximize economic benefit for locals
scenic vistas	direct route/bypass private property, keep out of sight, truck shipments
governmental and service operational expenses	federal funding
recreation interference	local involvement in planning, direct route, truck shipments
cost of living	direct route/bypass private property, compensation, federal funding, maximize economic benefit for locals
wildlife/open country	local involvement in planning, direct route/bypass private property, truck shipments

5.4 COMPARATIVE ANALYSIS OF PROPOSED RAIL CORRIDORS

The private parcel and community at large impacts are largely the same when compared between the DOE proposed routes and the Lincoln County assessed routes (Lincoln County Short Route and Cottontail Pass). The largest differences are between the two initiating Segments-Caliente Alternative versus Eccles Alternative.

5.4.1 Private Property

The Caliente Alternative Segment impacts numerous private parcels. Eighty-nine (89) of these parcels are within 500 feet of the assumed centerline of the proposed route. The Eccles Alternative also impacts private parcels, but only five of these parcels are within 500 feet of the assumed centerline of the proposed route.

5.4.2 Infrastructure

The Caliente Alternative will potentially impact two power lines, 14 county roads, one Nevada State highway, two U.S. highways and three public utilities. The Eccles Alternative will potentially impact two power lines, 12 county roads, one U.S. highway and two public utilities.

5.4.3 Recreation and Wildlife

Mule deer migration routes and winter range are bisected on both the east and west sides of Meadow Valley. The Caliente Alternative impacts small game and birds. If fencing is mandatory NDOW has game fencing that would allow both deer and pronghorn antelope to safely cross the CRC. If a well is developed for construction wildlife may grow dependent on it as a watering site. If the well is removed after construction the wildlife may die due to the fact that they have grown dependent on the watering site. The CRC in combination with power generating windmills on Mt. Wilson, construction of the water pipeline to Clark County and the private sale of thousands of acres under the Lincoln County Land Act will seriously impact the wildlife in Lincoln County.

The Eccles Alternative will impact wildlife less, but will still impact mule deer winter range. The Eccles Alternative will also potentially impact up to five existing and future trailheads, trails and crossings.

5.4.4 Mining

Two mining claims exist in the vicinity of the Caliente Alternative and the Eccles Alternative.

5.4.5 Natural Resources

Natural resources within the immediate vicinity of the Caliente Alternative include 21 wells and four springs. Natural resources within the immediate vicinity of the Eccles Alternative include five wells and eight springs.

The DEIS-RA Summary indicates that ground water withdrawals during the construction phase of Meadow Valley (Panaca Valley) area are projected by DOE to require the drilling of six new wells. These new wells are located between in Meadow Valley between Indian Cove and the Common Segment 1 of the CRC. During an eight month growing season twenty high production agricultural wells (500-1,000 gallons per minute) are pumping at full capacity in the same area. In addition within two miles west of Common Segment 1, four more high production irrigation wells are in operation. Twenty-five more agricultural wells could be impacted in the same Meadow Valley water basin. Panaca and Caliente both draw their culinary water from the same water basin as well as a large number of shallow private culinary wells in the valley. The private wells because of their shallow depth would be impacted first, potentially leaving hundreds of people with no water. Approximately one half of Lincoln Counties' residential population could be impacted. These impacts will likely be comparable no matter which alternative is selected.

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